CAPSTONE COLLEGIATE COMMUNITIES, LLC
DEMOCRACY LANE PROPOSAL

Traffic Impact Study

City of Fairfax, Virginia

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Prepared by:

Wells + Associates

William F. Johnson, P.E.
A. William Steinhilber
Charlie W. Strunk

wfjohnson@wellsandassociates.com

703.365.9262

www.WellsAndAssociates.com

@WellsAssoc @WellsandAssociates Wells + Associates

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Section 1
INTRODUCTION

This report presents the results of a traffic impact study conducted in support of a proposed residential redevelopment in the City of Fairfax, Virginia. The subject property, identified as tax parcel 57-2 ((20)) 6A (the "Subject Property") is located on the south side of Layton Hall Drive, east of University Drive, and west of Old Lee Highway, as shown on Figure 1-1.

The Subject Property is currently zoned CR ("Commercial Retail"). The property is currently developed with office uses, including three office buildings and townhouse-style office units, totaling approximately 82,800 gross square feet (GSF).

The Applicant, Capstone Collegiate Communities, proposes to rezone the Subject Properties to the Planned Development Residential (PD-R) and Old Town Fairfax Transitional Overlay (TO) Districts in order to permit redevelopment with multifamily dwelling units. The Applicant proposes to remove the existing office buildings and subsequently redevelop the property with up to 270 apartment units, representing up to 800 beds. The units will be marketed primarily to students of George Mason University (GMU) as off-campus student housing. A reduction of the Applicant's development plan is shown on Figure 1-2.

According to the City's Comprehensive Plan, the subject site is designated for future development as "Business-Commercial". Therefore, a change in the Comprehensive Plan Future Land Use designation will be necessary. In conjunction with the rezoning application, the Applicant proposes a Comprehensive Plan amendment to reclassify the Subject Property as Residential – High. A copy of the Applicant's Statement of Justification is included in Appendix A.

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 VDOT's Traffic Impact Analysis Regulations Administrative Guidelines ("Administrative Guidelines"). In January 2012, an amendment to the Administrative Guidelines took effect that 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 subject development would not require a Chapter 870 compliant traffic study.

Although a traffic impact analysis is not required per 24VAC30-155, the City of Fairfax requires the submission of a traffic study in conjunction with any development application. The basis of this traffic impact assessment includes a field reconnaissance of the area to determine access opportunities and constraints, traffic counts conducted at key intersections in the site vicinity, a review of the City's Comprehensive Plan, conversations with City staff to ascertain planned transportation improvements/enhancements, and information from the Applicant including preliminary site concepts.

Figure 1-1
Site Location

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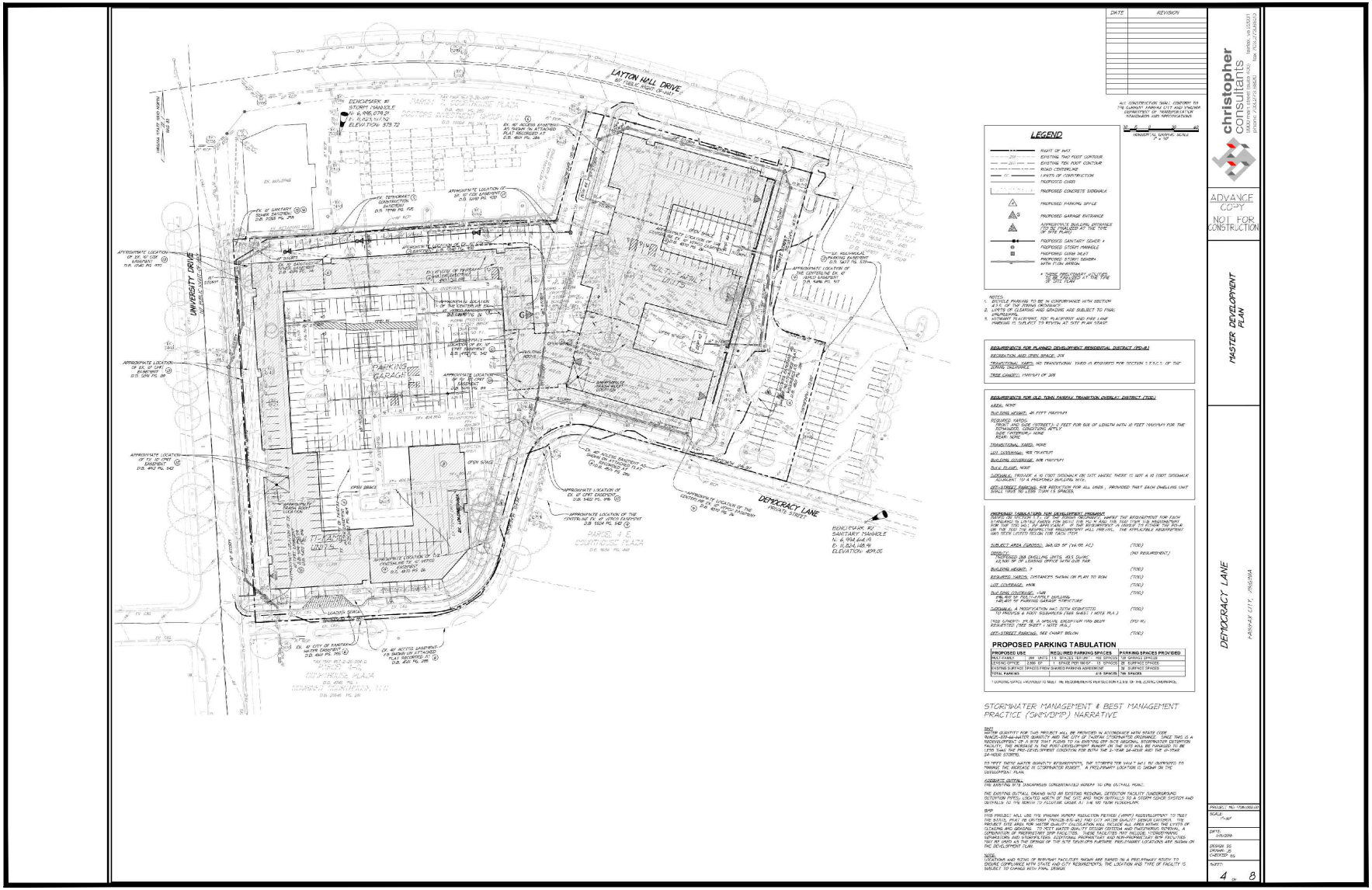

Figure 1-2
Development Plan

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

1. Estimation of the total vehicle trips ends generated by the planned land use during the AM and PM peak hours.

2. Determination of the effects of the development proposal on the surrounding local roadway network.

3. Identification of potential road and/or operational improvements necessary to mitigate the impacts of the developer's proposal.

A scoping meeting was held with City staff to determine specific study parameters. The resulting traffic study scoping form is provided in Appendix B. Tasks undertaken in the course of this study included the following:

1. A review of the Applicant's conceptual plans for the subject site.

2. A field reconnaissance of 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. Peak hour turning movement, pedestrian, and bicycle counts were obtained at the following study intersections:

    a. University Drive/Layton Hall Drive
    b. Layton Hall Drive/Democracy Lane
    c. Old Lee Highway/Layton Hall Drive/Farrcroft Drive
    d. University Drive/Kenmore Drive
    e. University Drive/Democracy Lane/Whitehead Street
    f. Chain Bridge Road/Kenmore Drive
    g. Chain Bridge Road/Whitehead Street
    h. All existing site entrances

4. Calculation of existing AM and PM peak hour intersection levels of service at the study intersections.

5. Identification of the number of peak hour trips that would be generated by the proposed mixed-use development based on standard Institute of Transportation Engineers (ITE) 10th edition Trip Generation rates/equations.

6. Determination of future background traffic forecasts based on estimates of traffic that would be generated by other approved/planned developments in the site vicinity.

7. Calculation of future levels of service both with and without the proposed development at the key study intersections for a proposed build-out year of 2021.

Sources of data for this analysis included traffic counts conducted by Wells + Associates Inc., information obtained from the City of Fairfax, the Institute of Transportation Engineers (ITE), the Highway Capacity Manual 2000 (Synchro software, version 9), Capstone Collegiate Communities, 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 redevelopment plan proposed by the Applicant is complementary to the City's and community's long-term vision for the area adjacent to the Old Town district.

2. All signalized intersections within the study area currently operate at overall adequate levels of service (LOS "D" or better).

3. Under future 2021 traffic conditions, without the development of the subject site, delays would increase at study intersections due to regional traffic growth and trips generated by other approved/pending development within the City. However, overall levels of service would remain generally consistent with existing conditions.

4. The Layton Hall Apartments redevelopment project is forecasted to generate 128 AM peak hour and 246 PM peak hour net vehicle trips upon completion and full occupancy by 2021, and without accounting for any trip reductions resulting from non-auto modes of travel.

5. Under future 2021 traffic conditions, with the development of the Subject Property, intersection levels of service would remain consistent with background conditions. Additional mitigation measures, as outlined below, would serve to further improve the transportation network.

RECOMMENDATIONS

Based on the above conclusions and in order to mitigate the impacts of the subject development and improve the overall transportation network, the following recommendations should be considered:

1. As part of the redevelopment plan and to encourage walking trips, the Applicant should provide and enhance the pedestrian facilities within the site's block. The Applicant should further ensure connections between the site's internal network and the surrounding pedestrian system, as envisioned in the Comprehensive Plan.

2. The Applicant should encourage bicycling as a mode of travel. Bicycle racks for site visitors as well as bicycle storage lockers or a secure bike room for residents should be provided. The Applicant should consider bikesharing facility locations, subject to further evaluation and coordination with City staff.

3. The Applicant should implement Transportation Demand Management (TDM) strategies to encourage the use of alternate modes of transportation. The application of TDM strategies is particularly beneficial for the site since the units will be marketed primarily to a student population who will likely be more inclined to select non-auto modes of travel to/from the GMU campus and other destinations within the City. As a result, there are opportunities to reduce vehicle trips to and from the Subject Property.

4. To encourage and promote street connectivity consistent with the City's *Multimodal Transportation Plan* recommendations, a new north-south street should be constructed within the eastern confines of the site between Democracy Lane and Layton Hall Drive.

5. In order to facilitate site access and to establish defined intersections consistent with the City's *Multimodal Transportation Plan* objectives, a portion of Democracy Lane should be realigned as shown in the Applicant's development plan and the site entrance should be designed as a three-leg, All-Way STOP intersection with crosswalks and necessary pedestrian features.

Section 2
BACKGROUND INFORMATION

LOCATION AND SURROUNDING USES

The site is located within the City of Fairfax and is currently developed with approximately 82,800 GSF of office uses housed in three low rise office buildings and townhouse-style office units. Low to medium density residential dwelling units generally surround the property to the north and west. Retail commercial and office uses are found to the east and south.

COMPREHENSIVE PLAN LAND USE RECOMMENDATIONS

The City's Comprehensive Plan shows the subject parcel as "Business-Commercial" on the Future Land Use Map. The redevelopment of the subject site, as proposed, requires an amendment to the Comprehensive Plan.

EXISTING TRANSPORTATION NETWORK

Existing Road Network. The following is a description of the roadways surrounding the proposed residential redevelopment. Figure 2-1 depicts existing lane use and traffic controls in the vicinity of the subject site:

Layton Hall Drive. Layton Hall Drive is a two-lane, undivided roadway that runs along the southern property boundary of the subject site. Layton Hall Drive is classified by the City as an "active street". According to the City's *Multimodal Transportation Plan*, active streets are roads that "connect multiple destinations within a neighborhood and are more mixed-use or commercial in nature than residential street typologies." Layton Hall Drive operates with a posted speed limit of 25 miles per hour (mph). On-street parking is currently permitted along Layton Hall Drive on both sides of the street. Furthermore, a designated bike lane is provided in the westbound direction. The intersection of Layton Hall Drive with Old Lee Highway operates under signal control. The VDOT 2016 Average Daily Traffic (ADT) report indicates Layton Hall Drive carries 4,600 vehicles per day (vpd).

Old Lee Highway. Old Lee Highway intersects Layton Hall Drive to the east of the subject site. Old Lee Highway is constructed as a two-lane, undivided highway to the north of Layton Hall Drive and as a four-lane, undivided highway to the south of Layton Hall Drive with a posted speed limit of 30 mph. According to the Plan, Old Lee Highway is classified as an active street in the vicinity of the subject site. The VDOT 2016 ADT report indicates Old Lee Highway carries 16,000 vpd.

University Drive. University Drive is constructed as a two-lane, undivided roadway to the north of Layton Hall Drive and as a four-lane, undivided roadway to the south of Layton Hall Drive. The

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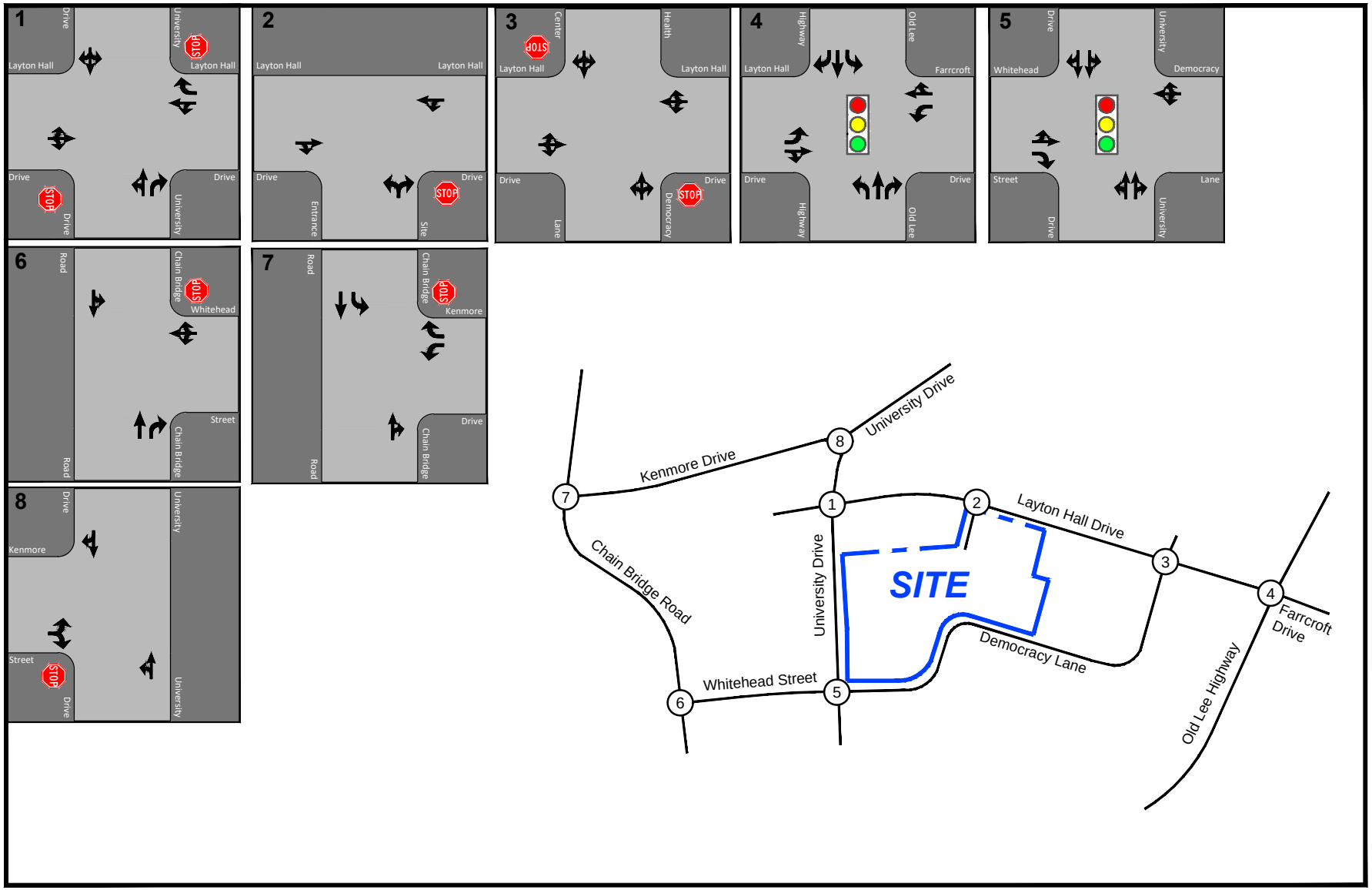

Figure 2-1
Existing Lane Use and Traffic Controls

Represents One Travel Lane
Signalized Intersection
Stop Sign

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roadway carries a posted speed limit of 25 mph. According to the Plan, University Drive is classified as an active street. The VDOT 2016 ADT report indicates University Drive carries 10,000 vpd.

Kenmore Drive. Kenmore Drive is constructed as a two-lane, undivided roadway to the west of the subject site. Kenmore Drive is classified by the City as a "neighborhood circulator" and carries a posted speed limit of 25 mph. According to the Plan, neighborhood circulators are "residential streets that contribute to community connectivity…" The VDOT 2016 ADT report indicates Kenmore Drive carries 3,300 vpd.

Democracy Lane. Democracy Lane is a private local street that runs from University Drive to Layton Hall Drive and provides direct vehicular access to the subject site and adjoining properties.

Public Transit Service. The subject site is most directly served by the City of Fairfax's City-University Energysaver (CUE) Bus "Gold Route" which provides service between George Mason University, Old Town Fairfax, and the Vienna/Fairfax-GMU Metrorail station. The route travels north and south along Old Lee Highway and includes two stops (one in each direction) at two bus shelters adjacent to the Old Lee Highway/Layton Hall Drive intersection. Figure 2-2 depicts the existing transit routes and bus stops located proximate to the subject application site.

Pedestrian Facilities. Concrete sidewalks are generally provided along the roadways in the immediate area of the subject site. As shown on Figure 2-3, sidewalks are located on both sides of Layton Hall Drive and a trail runs parallel to University Drive to the north of Layton Hall Drive. There are marked crosswalks at the study intersections on University Drive and Old Lee Highway as well as a crosswalk which crosses Layton Hall Drive from a pedestrian connection to the Layton Hall Apartments development from the northeast corner of the subject site.

FUTURE TRANSPORTATION NETWORK RECOMMENDATIONS

The City of Fairfax has developed the *Multimodal Transportation Plan* (2017) which provides recommended strategies for the improvement of the City's transportation network. While the *Plan* has not been officially adopted by City Council, the document was reviewed in order to obtain guidance in the planning of the subject site and incorporate appropriate Citywide transportation strategies.

The Plan acknowledges that the City's roadway network is largely built out and that "few opportunities remain to add substantially more vehicle capacity on city streets. As such, the City will need to focus on ways to efficiently move more people within the existing street network." Therefore, no specific capacity improvements (i.e., roadway widening) are recommended for the active streets that immediately surround the subject site. According to the Plan's Multimodal Goal 3, streets should be designed to accommodate context and function. The subject site is described in the Plan as being located in a "local activity center". As such, any improvements to the active street network should focus on enhancing safety and the mobility of pedestrians, bicycles, and in some cases transit vehicles.

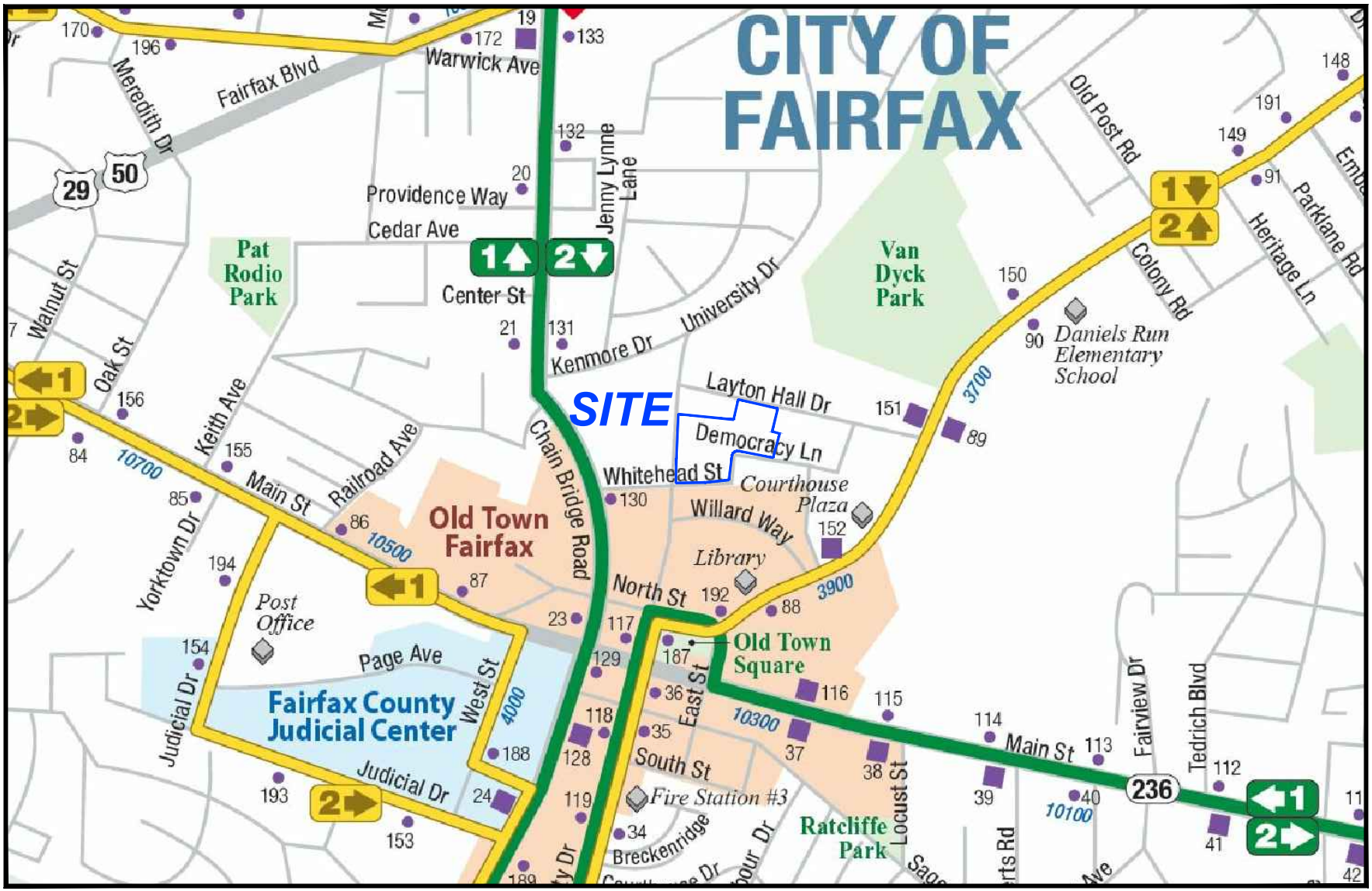

Figure 2-2
CUE Transit Service

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Figure 2-3
Existing Pedestrian Facilities

Asphalt Trail
Sidewalk
Crosswalk

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One of the Plan's recommendations for integrating transportation with land use states that "with development projects, break up large blocks to a more walkable scale. Pursue additional secondary and tertiary street network opportunities. Streets should be well designed as complete streets and align at regular intersections for a continuous street grid" (MM Action 3.2.2).

Proposed Enhancements by the Applicant. In harmony with the recommendations of the City's *Multimodal Transportation Plan*, the Applicant proposes to enhance the transportation network by providing the following improvements:

1. The Applicant proposes enhanced pedestrian facilities along the site's frontages of University Drive, Layton Hall Drive, and Democracy Lane in order to promote pedestrian connectivity to the surrounding area, including Old Town Fairfax. As shown on the Applicant's development plan, the community will have multiple points of pedestrian access to the surrounding network and the streetscape and building facades will be designed to feature more urban characteristics, including widened sidewalks and street trees. Such features will promote and encourage the use of the pedestrian network as an alternative mode choice to driving, consistent with the objectives set forth in the Plan.

2. The Applicant proposes to realign a portion of existing Democracy Lane in order to establish a regular intersection at one of the proposed vehicular entrances to the site. This standard intersection configuration will improve vehicle and pedestrian safety by establishing All-way STOP control and providing crosswalks.

3. The Applicant proposes to provide on-street parking along a portion of the site's frontage on Democracy Lane. In addition to providing additional parking opportunities for site visitors, the presence of on-street parking will promote Democracy Lane as an active street.

4. The Applicant has proposed a new north-south street connection from Democracy Lane to Layton Hall Drive on the eastern end of the site, thereby supporting the City's vision for a more robust street grid in order to improve connectivity. This street connection will feature on-street parking and enhanced pedestrian features, consistent with the other street frontages.

5. The Applicant has proposed to incorporate other transportation elements in the development project to promote multimodalism, as recommended by the City, including the provision of bicycle racks, resident bicycle storage, potential bikeshare locations, active building facades, and other Transportation Demand Management (TDM) strategies as described later in this report.

Section 3
STUDY SCOPE AND ANALYSIS PARAMETERS

OVERVIEW

The primary objective of this study is to assess the impacts associated with the proposed development plan on the surrounding street system. This traffic study was conducted in accordance with meetings/discussions with Wells + Associates, City staff, and the Applicant. The traffic study scoping meeting with City staff was held on December 6, 2017. Subsequent discussions further refined the desired study parameters and established an acceptable timeframe for collecting existing traffic counts. As discussed with City staff, collecting traffic count data at a time when local public schools and George Mason University were in session and operating normally was considered critical in ensuring that the study reflected typical peak traffic conditions. The scoping document is provided for reference as Appendix B.

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:

- University Drive/Layton Hall Drive
- Layton Hall Drive/Democracy Lane
- Old Lee Highway/Layton Hall Drive/Farrcroft Drive
- University Drive/Kenmore Drive
- University Drive/Democracy Lane/Whitehead Street
- Chain Bridge Road/Kenmore Drive
- Chain Bridge Road/Whitehead Street
- All Site Entrances

METHODOLOGY

Traffic (or site) impact studies are generally required by jurisdictions to assess the level of impact proposed changes in land use or development could have on a community's transportation system. Traffic impact studies focus on access to/from a property and those off-site local intersections that would potentially be impacted by traffic from the proposed development or land use change. Utilizing a four-step process, intersections are evaluated in terms of levels of service and then appropriate mitigation measures are identified to remediate sub-standard levels of service. The four-step planning process consists of trip generation, trip distribution, a determination of mode split, and traffic assignment.

As recommended by the City, trip generation estimates were developed based on standard Institute of Transportation Engineers (ITE), 10th edition, Trip Generation rates/equations for all land uses. Directional distributions and traffic assignments were developed based on a review of existing travel patterns, data from other traffic studies, local knowledge and experience, and engineering judgment.

Levels of service and vehicle queues were estimated using established Highway Capacity Manual 2000 methodologies as reported by Synchro software, version 9. Synchro is a macroscopic analysis tool and has the advantage of analyzing not only individual intersection performance but also how the performance measures of the intersection relate to other intersections in the same network. Important roadway network parameters, such as signal coordination/offsets and vehicle progression, are included in the Synchro analysis.

SITE DEVELOPMENT PROGRAM

For purposes of this analysis, the proposed development was evaluated as an off-campus student housing project consisting of up to 800 beds. For purposes of this assessment, build-out of the project is anticipated to occur in a single phase by the year 2021.

ANALYSIS STUDY PERIODS

As requested by City staff, the intersections within the study area were analyzed under weekday AM and PM peak hour conditions.

REGIONAL GROWTH

Based on conversations/discussions with City staff, a 1% per year compounded growth rate was applied to existing traffic to account for background traffic growth. The growth rate was only applied to through streets in the study network, including Old Lee Highway, University Drive, and Chain Bridge Road.

OTHER APPPROVED/PLANNED DEVELOPMENTS

Background developments to be included in this analysis were discussed with City staff and include the following planned (i.e. “pipeline”) developments:

- George Mason University Expansion
- Layton Hall Apartments Redevelopment

EXISTING TRAFFIC VOLUMES

Existing AM and PM peak hour turning movement, pedestrian, and bicycle counts were conducted on Wednesday, December 6, 2017 at the following intersections from 6:00 AM to 10:00 AM and from 3:00 PM to 7:00 PM:

- University Drive/Layton Hall Drive
- University Drive/Kenmore Drive
- University Drive/Whitehead Street/Democracy Lane
- Layton Hall Drive/Democracy Lane
- Old Lee Highway/Layton Hall Drive/Farrcroft Drive
- Chain Bridge Road/Kenmore Drive
- All Existing Site Entrances

Additionally, a traffic count was conducted at the following intersection on Tuesday, January 23, 2018:

- Chain Bridge Road/Whitehead Street

The existing vehicle traffic volumes used in the analysis are provided on Figure 3-1. Existing pedestrian counts are provided on Figure 3-2. The data showed few bicyclists within the study network. All counts data are included in Appendix C.

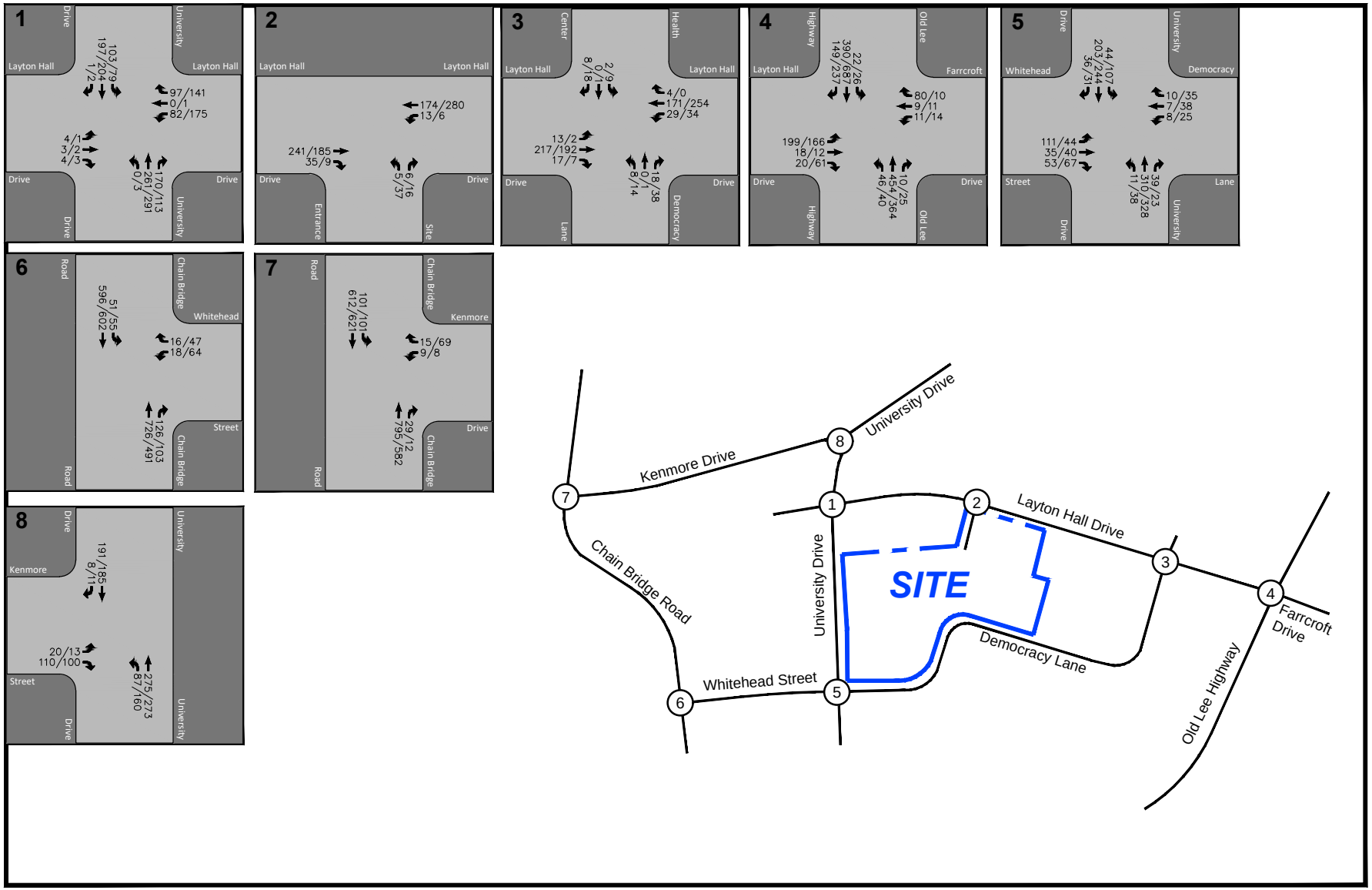

Figure 3-1
Existing Traffic Volumes

AM PEAK HOUR
PM PEAK HOUR
000 / 000

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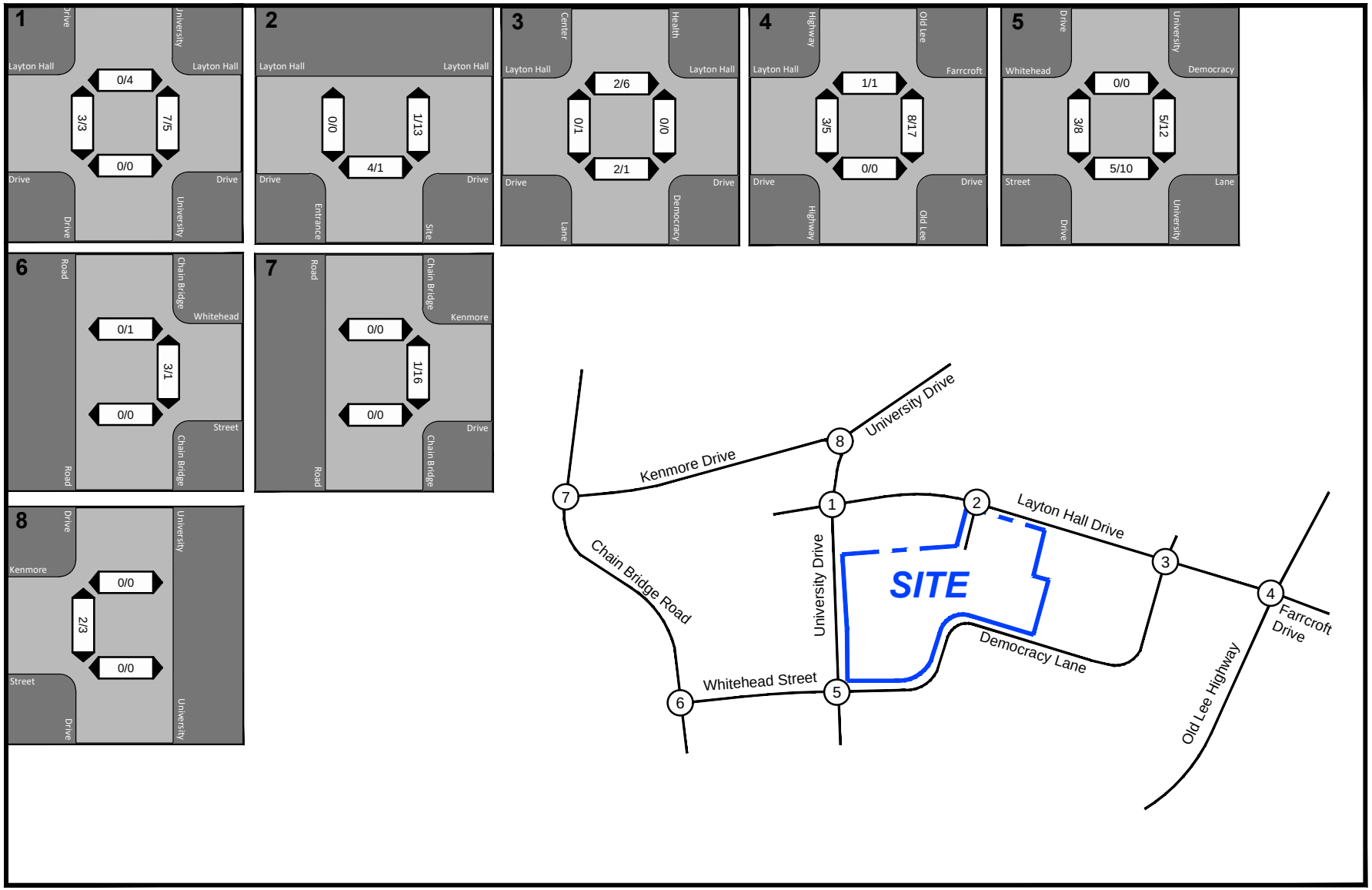

Figure 3-2
Existing Pedestrian Volumes

AM PEAK HOUR
PM PEAK HOUR
000 / 000

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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 Figures 3-1, signal timings/phasings obtained from the City of Fairfax as included in the base Synchro files, and the 2000 Highway Capacity Manual (HCM) analysis procedures for signalized and unsignalized intersections. The results are presented in Appendix D and summarized on Table 4-1 and Figure 4-1. Descriptions of levels of service are provided as Appendix E.

As reflected in Table 4-1, the unsignalized intersections are currently operating at acceptable levels of service (LOS "D" or better) during peak hours. The signalized intersections currently operate at overall adequate levels of service (LOS "D" or better) based on the analysis results.

EXISTING INTERSECTION QUEUES

As requested by staff, an analysis of intersection 95th-percentile queues was performed at key locations. The results of the queuing analysis, as reported by Synchro, are summarized in Table 4-2. As shown in the table, all intersection turn bays within the study area are currently of adequate length to accommodate existing vehicle queues during peak periods.

Table 4-1
Capstone - Democracy Lane
Existing Levels of Service (1) (2) (3)

Intersection	Operating Condition	Street Name	Approach/ Movement	Existing (2017) AM	PM
1 Layton Hall Drive/**University Drive**	STOP	Layton Hall Drive	EBLTR	C [18.0]	B [13.9]
		Layton Hall Drive	WBLT	C [17.7]	D [26.9]
		Layton Hall Drive	WBR	A [0.0]	A [0.0]
		University Drive	NBLT	A [0.0]	A [0.1]
		University Drive	NBR	A [0.0]	A [0.0]
		University Drive	SBLTR	A [3.8]	A [2.9]
2 Layton Hall Drive/**Driveway**	STOP	Layton Hall Drive	EBTR	A [0.0]	A [0.0]
		Layton Hall Drive	WBLT	A [0.6]	A [0.2]
		Driveway	NBLR	B [11.1]	B [12.4]
3 Layton Hall Drive/**Democracy Lane/Health Center**	STOP	Layton Hall Drive	EBTLR	A [0.5]	A [0.1]
		Layton Hall Drive	WBTLR	A [1.3]	A [1.2]
		Layton Hall Drive	NBTLR	B [11.2]	B [11.6]
		University Drive	SBTLR	B [10.3]	B [12.4]
4 Layton Hall Drive/Farrcroft Drive**/Old Lee Highway**	Signal	Layton Hall Drive	EBL	D (38.0)	D (55.0)
		Layton Hall Drive	EBTR	C (29.7)	D (41.2)
		Farrcroft Drive	WBL	D (41.2)	D (54.4)
		Farrcroft Drive	WBTR	D (41.7)	D (53.9)
		Old Lee Highway	NBL	B (15.4)	B (16.0)
		Old Lee Highway	NBT	C (26.5)	B (15.9)
		Old Lee Highway	NBR	B (16.6)	B (12.2)
		Old Lee Highway	SBL	B (17.1)	B (11.8)
		Old Lee Highway	SBT	C (25.4)	C (26.7)
		Old Lee Highway	SBR	B (18.4)	B (14.8)
			Overall	**C (27.6)**	**C (26.0)**
5 Whitehead Street/Democracy Lane**/University Drive**	Signal	Whitehead Street	EBLT	A (8.2)	A (8.1)
		Whitehead Street	EBR	A (6.7)	A (7.3)
		Democracy Lane	WBLTR	A (6.8)	A (7.9)
		University Drive	NBLTR	A (7.7)	A (7.3)
		University Drive	SBLTR	A (7.7)	A (7.6)
			Overall	**A (7.7)**	**A (7.5)**
6 Whitehead Street/**Chain Bridge Road**	STOP	Whitehead Street	WBLR	E [38.4]	E [40.3]
		Chain Bridge Road	NBT	A [0.0]	A [0.0]
		Chain Bridge Road	NBR	A [0.0]	A [0.0]
		Chain Bridge Road	SBLT	A [2.3]	A [1.7]
7 Kenmore Drive/**Chain Bridge Road**		Kenmore Street	WBL	E [37.9]	C [18.3]
	STOP	Kenmore Street	WBR	A [0.0]	A [0.0]
		Chain Bridge Road	NBTR	A [0.0]	A [0.0]
		Chain Bridge Road	SBL	B [11.1]	A [9.7]
		Chain Bridge Road	SBT	A [0.0]	A [0.0]
8 Kenmore Drive/**University Drive**	STOP	Kenmore Street	EBLR	B [11.9]	B [11.6]
		University Drive	NBLT	A [2.5]	A [3.8]
		University Drive	SBTR	A [0.0]	A [0.0]

Notes : (1) Numbers in parentheses ( ) represent delay at signalized intersections in seconds per vehicle.
(2) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.
(3) Roadway names in bold are considered north/south for purposes of this analysis

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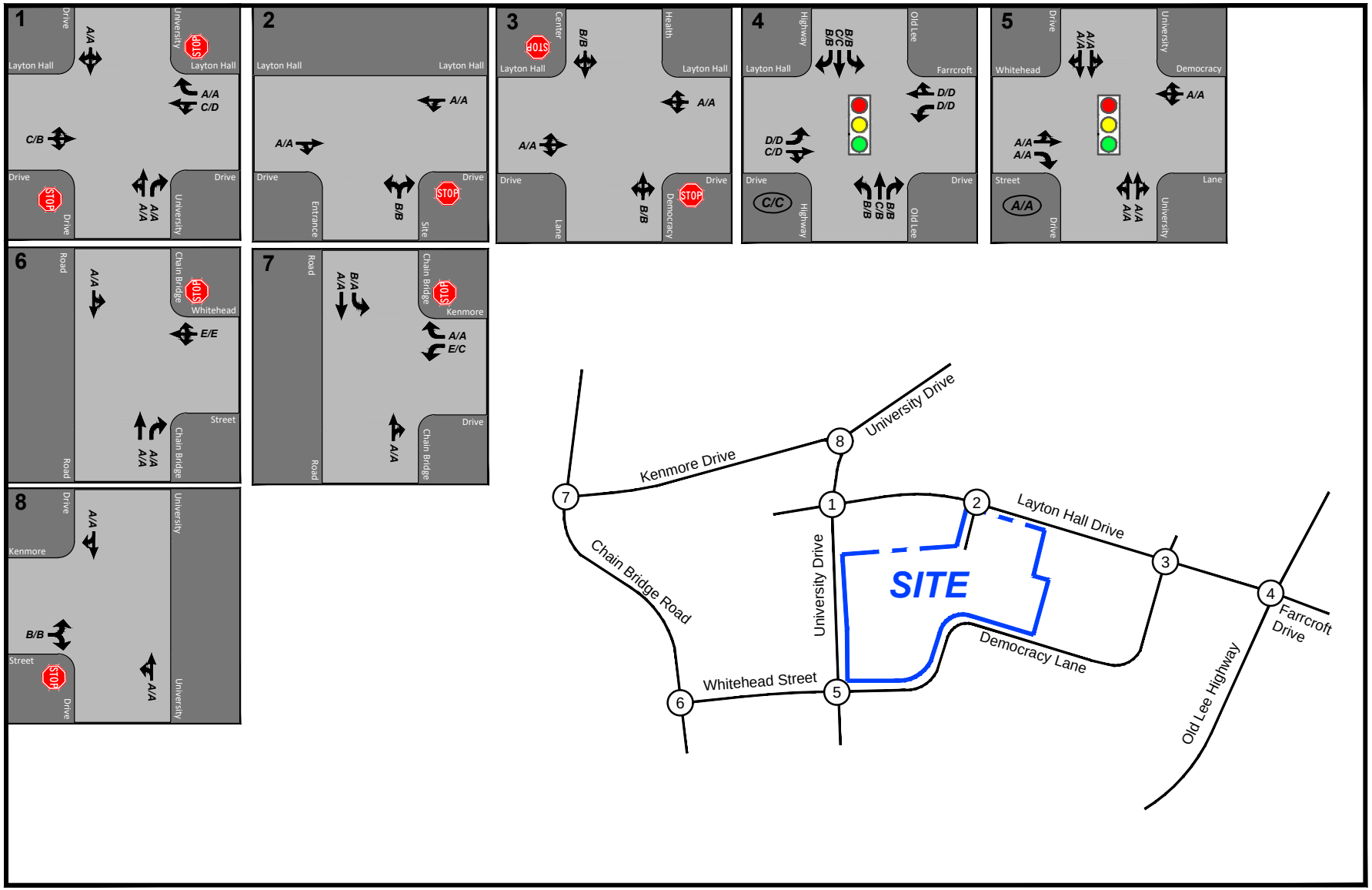

Figure 4-1
Existing Levels of Service

Represents One Travel Lane
Signalized Intersection
Stop Sign

AM/PM
X/X Lane Group Level of Service
(X/X) Overall Level of Service

NORTH

Capstone - GMU Housing
Fairfax City, Virginia

Table 4-2
Capstone - Democracy Lane
Existing Queues (1) (2) (3) (4) (5)

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage (ft)	Existing (2017) AM	PM
1 Layton Hall Drive/**University Drive**	STOP	Layton Hall Drive	EBLTR	N/A	4	1
		Layton Hall Drive	WBLT	N/A	40	136
		Layton Hall Drive	WBR	50	0	0
		University Drive	NBLT	N/A	0	0
		University Drive	NBR	N/A	0	0
		University Drive	SBLTR	N/A	10	6
2 Layton Hall Drive/**Driveway**	STOP	Layton Hall Drive	EBTR	N/A	0	0
		Layton Hall Drive	WBLT	N/A	1	0
		Driveway	NBLR	N/A	2	10
3 Layton Hall Drive/**Democracy Lane/Health Center**	STOP	Layton Hall Drive	EBTLR	N/A	1	0
		Layton Hall Drive	WBTLR	N/A	2	2
		Layton Hall Drive	NBTLR	N/A	4	8
		University Drive	SBTLR	N/A	1	5
4 Layton Hall Drive/Farrcroft Drive**/Old Lee Highway**	Signal	Layton Hall Drive	EBL	N/A	243	206
		Layton Hall Drive	EBTR	250	43	49
		Farrcroft Drive	WBL	N/A	28	33
		Farrcroft Drive	WBTR	140	55	36
		Old Lee Highway	NBL	N/A	38	32
		Old Lee Highway	NBT	N/A	428	308
		Old Lee Highway	NBR	200	0	0
		Old Lee Highway	SBL	130	22	23
		Old Lee Highway	SBT	N/A	355	814
		Old Lee Highway	SBR	300	36	86
5 Whitehead Street/Democracy Lane**/University Drive**	Signal	Whitehead Street	EBLT	N/A	63	38
		Whitehead Street	EBR	80	15	17
		Democracy Lane	WBLTR	N/A	13	34
		University Drive	NBLTR	N/A	60	68
		University Drive	SBLTR	N/A	48	70
6 Whitehead Street/**Chain Bridge Road**	STOP	Whitehead Street	WBLR	N/A	26	80
		Chain Bridge Road	NBT	N/A	0	0
		Chain Bridge Road	NBR	N/A	0	0
		Chain Bridge Road	SBLT	N/A	7	5
7 Kenmore Drive/**Chain Bridge Road**		Kenmore Street	WBL	N/A	15	17
	STOP	Kenmore Street	WBR	50	0	0
		Chain Bridge Road	NBTR	N/A	0	0
		Chain Bridge Road	SBL	100	15	11
		Chain Bridge Road	SBT	N/A	0	0
8 Kenmore Drive/**University Drive**	STOP	Kenmore Street	EBLR	N/A	21	18
		University Drive	NBLT	N/A	6	11
		University Drive	SBTR	N/A	0	0

Notes : (1) Queue length is based on the 95th percentile queue in feet as reported by Synchro, Version 9.
(2) Queue lengths at All-way STOP controlled intersections are based on the 95th percentile queue in feet as reported by SimTraffic 9.
(3) Roadway names in bold are considered north/south for purposes of this analysis
(4) For available storage, "N/A" at the left and right-turn lanes indicate the turn-lane would extend back to the immediate upstream intersection.
(5) For available storage, "N/A" at the through movements indicate storage available up to the immediate upstream intersection.

Section 5
ANALYSIS OF FUTURE CONDITIONS WITHOUT SITE DEVELOPMENT

OVERVIEW

Forecasts for traffic conditions without the proposed Capstone development were estimated at key study intersections based on a composite of existing traffic, regional traffic growth, and pipeline development trips as described in Section 3 of this report. Future levels of service and queues under these forecasted conditions were evaluated at the key study intersections.

REGIONAL TRAFFIC GROWTH

For purposes of this traffic assessment, a study horizon year of 2021 was assumed for the anticipated build-out of the subject development. In order to develop future traffic forecasts, the existing traffic volumes shown on Figure 3-1 were adjusted to account for increases associated with regional traffic growth.

In order to account for a continued pattern of growth, a rate of one (1) percent per year compounded was applied to existing through volumes along key roadways within the study area, specifically Old Lee Highway, University Drive, and Chain Bridge Road. This rate is compatible with other area studies. The resulting increases in traffic volumes due to regional growth are depicted on Figure 5-1.

TRAFFIC FROM OTHER APPROVED/PENDING DEVELOPMENTS

At the request of staff, the following approved or pending (i.e., "pipeline") developments were included in the forecasting of future traffic conditions:

- GMU Expansion
- Layton Hall Apartments Redevelopment

The land use assumptions for each of these pipeline developments is summarized as follows and, as much as possible, are based on the most current development plans for each respective site and/or application.

GMU Expansion

- Assumed an increase in enrollment of 5,000 students between the present and 2021

Layton Hall Apartments Redevelopment

- Redevelopment of 110 existing multifamily units to 360 total future multifamily units

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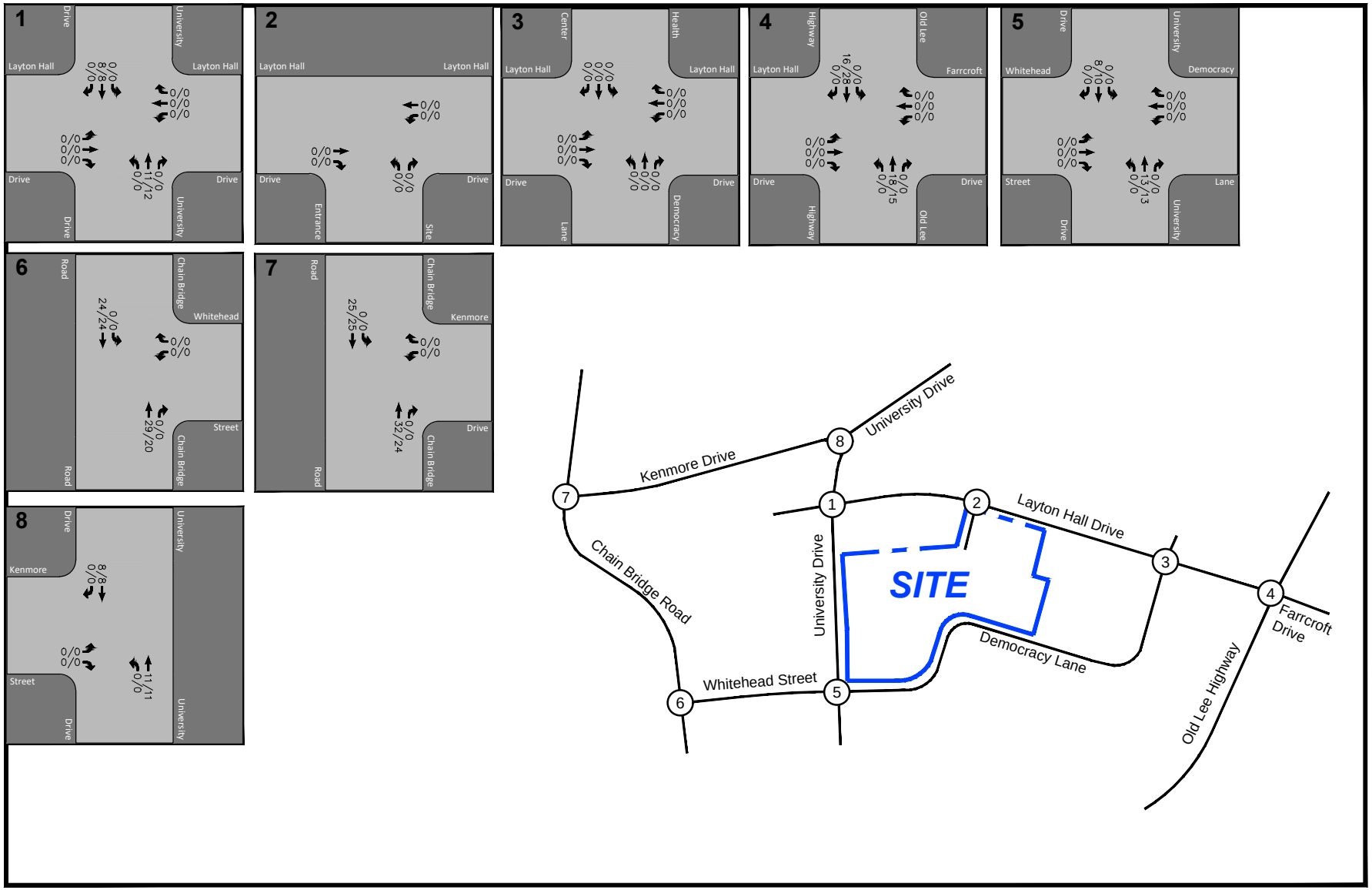

Figure 5-1
Regional Growth

AM PEAK HOUR
PM PEAK HOUR
000 / 000

NORTH

Capstone - GMU Housing
Fairfax City, Virginia

Trips generated by these pipeline developments were estimated using ITE Trip Generation rates/equations and are consistent with the trip estimates documented in the *Layton Hall Apartments Traffic Impact Study* prepared by Wells + Associates and dated November 26, 2012. The trips are summarized in Table 5-1. It should be noted that the trip generation estimates associated with these pipeline developments are not based on economic prediction models.

The pipeline development trips summarized in Table 5-1 were assigned to the public street network consistent with the Layton Hall Apartments TIS. Trip assignments related to each individual pipeline development are provided in Appendix F. The sum total of all pipeline development related trips through each study intersection is summarized in Figure 5-2. Due to the locations of several of these pipeline developments, not all pipeline trips will impact the study intersections.

BACKGROUND TRAFFIC FORECASTS

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

BACKGROUND FUTURE LEVELS OF SERVICE

Capacity analyses of 2021 future traffic conditions without the proposed redevelopment are provided in Appendix G and summarized in Table 5-2. The forecasted levels of service are also depicted graphically on Figure 5-4.

As shown on Table 5-2, the individual turning movements at the unsignalized intersections are forecasted to operate at acceptable levels of service (LOS “D” or better) during the AM peak hour. During the PM peak hour the westbound left-through movement at the University Drive/Layton Hall Drive intersection is forecasted to operate at LOS “E” under background conditions. Additionally, the westbound approach at the Chain Bridge Road/Whitehead Street intersection is forecasted to operate at LOS “E” under background conditions.

The signalized intersection of Old Lee Highway/Layton Hall Drive will continue to operate at overall adequate levels of service (LOS “D”). However, the eastbound left turn movement will begin to operate at LOS “E” during the AM and PM peak hours, without development of the site.

BACKGROUND FUTURE QUEUING

As requested by staff, an analysis of intersection queues was performed at key locations under background future traffic conditions. The results of the queuing analysis are summarized in Table 5-3.

Table 5-1

Capstone - Democracy Lane

Pipeline Development Trip Generation [1]

Land Use	Land Use Code	Amount	Units	AM Peak Hour of the Adjacent In	AM Peak Hour of the Adjacent Out	AM Peak Hour of the Adjacent Total	PM Peak Hour of the Adjacent In	PM Peak Hour of the Adjacent Out	PM Peak Hour of the Adjacent Total
GMU Expansion									
Projected Enrollment Increase	550	5,000	Students	840	210	1,050	285	665	950
Layton Hall Apartments									
Approved Development	220	360	DU	36	144	180	140	76	216
Existing Development				(18)	(32)	(50)	(50)	(32)	(82)
Net New Trips				18	112	130	90	44	134

Note(s):

(1) Trip generation based on Layton Hall Apartments Traffic Impact Study, prepared by Wells + Associates.

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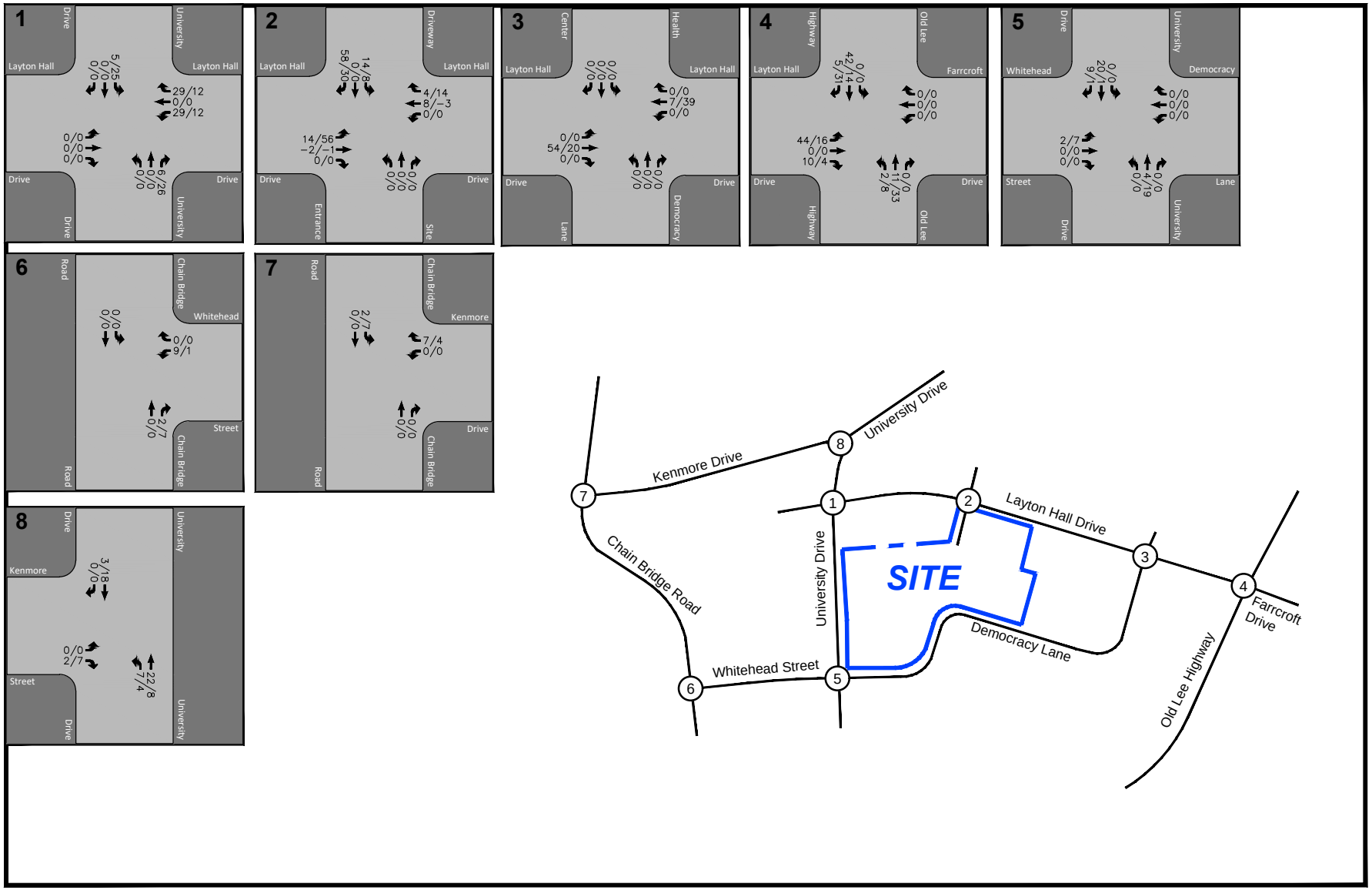

Figure 5-2
Combined Pipeline Trip Assignments

AM PEAK HOUR
PM PEAK HOUR
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NORTH

Capstone - GMU Housing
Fairfax City, Virginia

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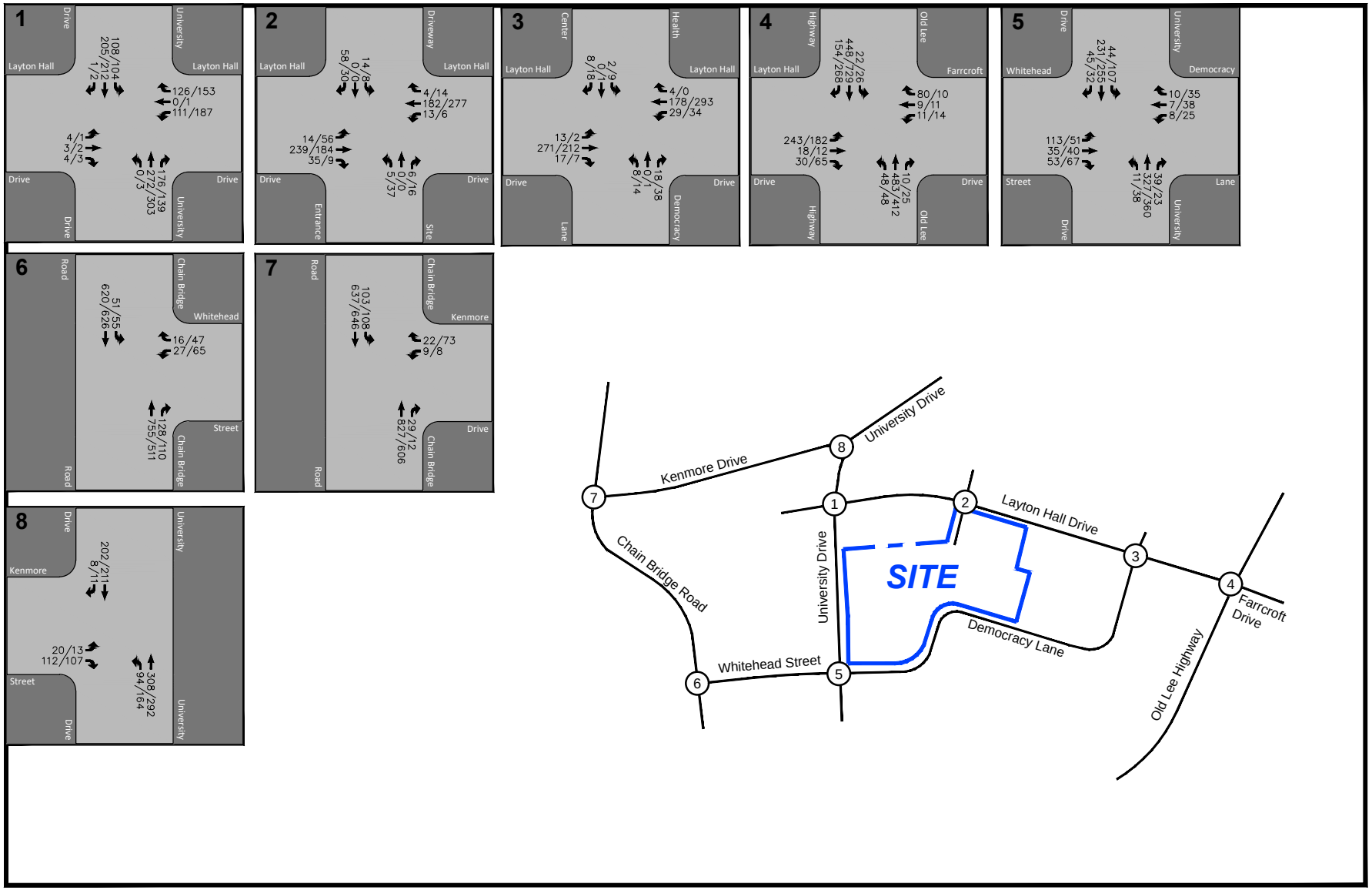

Figure 5-3

Background Future Traffic Forecasts

AM PEAK HOUR
PM PEAK HOUR
000 / 000

NORTH

Capstone - GMU Housing
Fairfax City, Virginia

Table 5-2
Capstone - Democracy Lane
Background Future Levels of Service (1) (2) (3)

Intersection	Operating Condition	Street Name	Approach/ Movement	Existing (2017) AM	Existing (2017) PM	Background (2021) AM	Background (2021) PM
1 Layton Hall Drive/**University Drive**	STOP	Layton Hall Drive	EBLTR	C [18.0]	B [13.9]	C [17.5]	C [15.9]
		Layton Hall Drive	WBLT	C [17.7]	D [26.9]	C [18.4]	E [45.5]
		Layton Hall Drive	WBR	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		University Drive	NBLT	A [0.0]	A [0.1]	A [0.0]	A [0.1]
		University Drive	NBR	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		University Drive	SBLTR	A [3.8]	A [2.9]	A [3.8]	A [3.6]
2 Layton Hall Drive/**Driveway**	STOP	Layton Hall Drive	EBTR	A [0.0]	A [0.0]	N/A	N/A
		Layton Hall Drive	WBLT	A [0.6]	A [0.2]	N/A	N/A
		Driveway	NBLR	B [11.1]	B [12.4]	N/A	N/A
New Layton Hall Apartments Driveway	*STOP*	*Layton Hall Drive*	*EBLTR*	*N/A*	*N/A*	*A [0.5]*	*A [2.2]*
		Layton Hall Drive	*WBLTR*	*N/A*	*N/A*	*A [0.6]*	*A [0.2]*
		Driveway	*NBLR*	*N/A*	*N/A*	*B [12.0]*	*C [15.4]*
		Driveway	*SBLR*	*N/A*	*N/A*	*B [10.7]*	*B [11.6]*
3 Layton Hall Drive/**Democracy Lane/Health Center**	STOP	Layton Hall Drive	EBTLR	A [0.5]	A [0.1]	A [0.4]	A [0.1]
		Layton Hall Drive	WBTLR	A [1.3]	A [1.2]	A [1.3]	A [1.1]
		Layton Hall Drive	NBTLR	B [11.2]	B [11.6]	B [11.6]	B [11.7]
		University Drive	SBTLR	B [10.3]	B [12.4]	B [10.3]	B [12.5]
4 Layton Hall Drive/Farrcroft Drive**/Old Lee Highway**	Signal	Layton Hall Drive	EBL	D (38.0)	D (55.0)	D (38.7)	E (56.1)
		Layton Hall Drive	EBTR	C (29.7)	D (41.2)	C (29.3)	D (41.1)
		Farrcroft Drive	WBL	D (41.2)	D (54.4)	D (42.6)	D (54.3)
		Farrcroft Drive	WBTR	D (41.7)	D (53.9)	D (43.0)	D (53.9)
		Old Lee Highway	NBL	B (15.4)	B (16.0)	B (16.1)	B (17.4)
		Old Lee Highway	NBT	C (26.5)	B (15.9)	C (25.8)	B (16.3)
		Old Lee Highway	NBR	B (16.6)	B (12.2)	B (16.6)	B (12.3)
		Old Lee Highway	SBL	B (17.1)	B (11.8)	B (18.3)	B (12.0)
		Old Lee Highway	SBT	C (25.4)	C (26.7)	C (27.9)	C (28.9)
		Old Lee Highway	SBR	B (18.4)	B (14.8)	B (19.2)	B (15.2)
			Overall	**C (27.6)**	**C (26.0)**	**C (28.5)**	**C (27.0)**
5 Whitehead Street/Democracy Lane**/University Drive**	Signal	Whitehead Street	EBLT	A (8.2)	A (8.1)	A (8.2)	A (8.1)
		Whitehead Street	EBR	A (6.7)	A (7.3)	A (6.8)	A (7.3)
		Democracy Lane	WBLTR	A (6.8)	A (7.9)	A (7.3)	A (7.9)
		University Drive	NBLTR	A (7.7)	A (7.3)	A (7.7)	A (7.4)
		University Drive	SBLTR	A (7.7)	A (7.6)	A (7.6)	A (7.6)
			Overall	**A (7.7)**	**A (7.5)**	**A (7.7)**	**A (7.6)**
6 Whitehead Street/**Chain Bridge Road**	STOP	Whitehead Street	WBLR	E [38.4]	E [40.3]	E [40.8]	E [40.3]
		Chain Bridge Road	NBT	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		Chain Bridge Road	NBR	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		Chain Bridge Road	SBLT	A [2.3]	A [1.7]	A [2.0]	A [1.7]
7 Kenmore Drive/**Chain Bridge Road**		Kenmore Street	WBL	E [37.9]	C [18.3]	D [30.6]	C [18.0]
	STOP	Kenmore Street	WBR	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		Chain Bridge Road	NBTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		Chain Bridge Road	SBL	B [11.1]	A [9.7]	B [10.8]	A [9.6]
		Chain Bridge Road	SBT	A [0.0]	A [0.0]	A [0.0]	A [0.0]
8 Kenmore Drive/**University Drive**	STOP	Kenmore Street	EBLR	B [11.9]	B [11.6]	B [11.8]	B [11.9]
		University Drive	NBLT	A [2.5]	A [3.8]	A [2.4]	A [3.8]
		University Drive	SBTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]

Notes : (1) Numbers in parentheses ( ) represent delay at signalized intersections in seconds per vehicle.
(2) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.
(3) Roadway names in bold are considered north/south for purposes of this analysis

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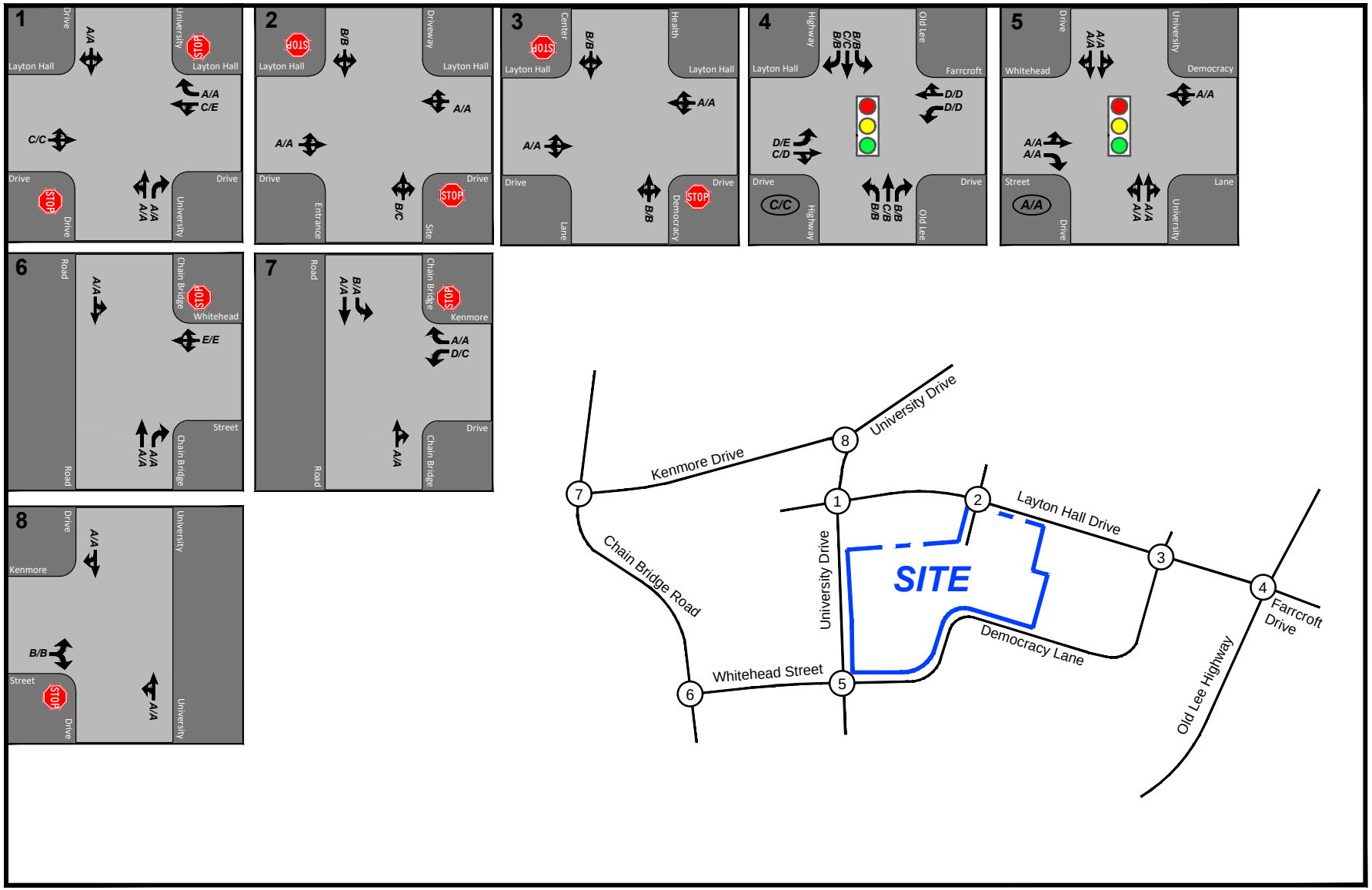

Figure 5-4
Background Future Levels of Service

Represents One Travel Lane
Signalized Intersection
Stop Sign

AM/PM
X/X Lane Group Level of Service
(X/X) Overall Level of Service

NORTH

Capstone - GMU Housing
Fairfax City, Virginia

Table 5-3
Capstone - Democracy Lane
Background Future Queues (1) (2) (3) (4) (5)

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage (ft)	Existing (2017) AM	Existing (2017) PM	Background (2021) AM	Background (2021) PM
1 Layton Hall Drive/**University Drive**	STOP	Layton Hall Drive	EBLTR	N/A	4	1	3	1
		Layton Hall Drive	WBLT	N/A	40	136	53	211
		Layton Hall Drive	WBR	50	0	0	0	0
		University Drive	NBLT	N/A	0	0	0	0
		University Drive	NBR	N/A	0	0	0	0
		University Drive	SBLTR	N/A	10	6	9	9
2 Layton Hall Drive/**Driveway**	STOP	Layton Hall Drive	EBTR	N/A	0	0	N/A	N/A
		Layton Hall Drive	WBLT	N/A	1	0	N/A	N/A
		Driveway	NBLR	N/A	2	10	N/A	N/A
New Layton Hall Apartments Driveway	*STOP*	*Layton Hall Drive*	*EBLTR*	*N/A*	*N/A*	*N/A*	*1*	*4*
		Layton Hall Drive	*WBLTR*	*N/A*	*N/A*	*N/A*	*1*	*0*
		Driveway	*NBLR*	*N/A*	*N/A*	*N/A*	*2*	*12*
		Driveway	*SBLR*	*N/A*	*N/A*	*N/A*	*9*	*6*
3 Layton Hall Drive/**Democracy Lane/Health Center**	STOP	Layton Hall Drive	EBTLR	N/A	1	0	1	0
		Layton Hall Drive	WBTLR	N/A	2	2	2	2
		Layton Hall Drive	NBTLR	N/A	4	8	4	8
		University Drive	SBTLR	N/A	1	5	1	5
4 Layton Hall Drive/Farrcroft Drive**/Old Lee Highway**	Signal	Layton Hall Drive	EBL	N/A	243	206	311	222
		Layton Hall Drive	EBTR	250	43	49	48	52
		Farrcroft Drive	WBL	N/A	28	33	28	34
		Farrcroft Drive	WBTR	140	55	36	59	37
		Old Lee Highway	NBL	N/A	38	32	39	36
		Old Lee Highway	NBT	N/A	428	308	454	351
		Old Lee Highway	NBR	200	0	0	0	0
		Old Lee Highway	SBL	130	22	23	22	23
		Old Lee Highway	SBT	N/A	355	814	415	863
		Old Lee Highway	SBR	300	36	86	42	99
5 Whitehead Street/Democracy Lane**/University Drive**	Signal	Whitehead Street	EBLT	N/A	63	38	63	41
		Whitehead Street	EBR	80	15	17	16	18
		Democracy Lane	WBLTR	N/A	13	34	15	35
		University Drive	NBLTR	N/A	60	68	63	73
		University Drive	SBLTR	N/A	48	70	53	71
6 Whitehead Street/**Chain Bridge Road**	STOP	Whitehead Street	WBLR	N/A	26	80	32	76
		Chain Bridge Road	NBT	N/A	0	0	0	0
		Chain Bridge Road	NBR	N/A	0	0	0	0
		Chain Bridge Road	SBLT	N/A	7	5	6	5
7 Kenmore Drive/**Chain Bridge Road**		Kenmore Street	WBL	N/A	15	17	12	16
	STOP	Kenmore Street	WBR	50	0	0	0	0
		Chain Bridge Road	NBTR	N/A	0	0	0	0
		Chain Bridge Road	SBL	100	15	11	13	11
		Chain Bridge Road	SBT	N/A	0	0	0	0
8 Kenmore Drive/**University Drive**	STOP	Kenmore Street	EBLR	N/A	21	18	20	18
		University Drive	NBLT	N/A	6	11	6	12
		University Drive	SBTR	N/A	0	0	0	0

Notes : (1) Queue length is based on the 95th percentile queue in feet as reported by Synchro, Version 9.
(2) Queue lengths at All-way STOP controlled intersections are based on the 95th percentile queue in feet as reported by SimTraffic 9.
(3) Roadway names in bold are considered north/south for purposes of this analysis
(4) For available storage, "N/A" at the left and right-turn lanes indicate the turn-lane would extend back to the immediate upstream intersection.
(5) For available storage, "N/A" at the through movements indicate storage available up to the immediate upstream intersection.

As shown in the table, all intersection turn bays within the study area are currently of adequate length to accommodate forecasted vehicle queues during peak periods, with the exception of the eastbound left turn movement at the Layton Hall Drive/Old Lee Highway intersection, which would begin to exceed the available storage length during the AM peak hour at the 95th-percentile. However, the average queue will be accommodated.

Section 6
SITE ANALYSIS

OVERVIEW

As part of the four-step process described previously, trips anticipated to be generated by the proposed redevelopment plan were forecasted and then assigned to the surrounding roadway network based on a trip distribution. The generation, distribution, and assignment of site trips were based on the proposed development 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 approximately 82,800 GSF of office uses. The Applicant proposes to remove the existing office buildings in order to redevelop the site. As a result, trips currently generated by these uses would no longer be experienced on the surrounding roadway network. Driveway counts were conducted at each of the existing site driveways in order to determine the number of existing trips that should be removed from the network. These driveway count data are provided in Appendix H and summarized in Table 6-1. As shown in Table 6-1, the current site uses generate 52 AM peak hour and 82 PM peak hour trips. For purposes of forecasting future traffic conditions with the proposed redevelopment plan, these trips were removed at key study intersections based on these driveway counts as shown on Figure 6-1.

PROPOSED SITE ACCESS

A reduction of the proposed redevelopment plan is provided on Figure 1-2. As shown, the plan depicts locating vehicular access to two points: 1) access via Layton Hall Drive (shared with the adjacent medical office building, and 2) access via Democracy Lane. The analysis of these site access points is detailed in Section 7 of this report. The future lane use and intersection controls (with the proposed site entrances) are provided on Figure 6-2.

TRIP GENERATION

Overview. Trip generation estimates for the weekday AM and PM peak hours, as well as the average weekday daily traffic (ADT), were derived from the standard Institute of Transportation Engineers (ITE) trip generation rates, as published in the 10th edition. The "Off-Campus Student Housing" (225) land use code was used for the analysis which is the appropriate land use category for the subject development. The trip generation analysis is presented in Table 6-1.

Table 6-1
Capstone - Democracy Lane
Site Trip Generation [1]

Scenario	Land Use Code	Setting/Location	Amount	Units	AM Peak Hour of the Adjacent In	AM Peak Hour of the Adjacent Out	AM Peak Hour of the Adjacent Total	PM Peak Hour of the Adjacent In	PM Peak Hour of the Adjacent Out	PM Peak Hour of the Adjacent Total	Weekday Average Daily Trips
Observed Driveway Counts	n/a				37	15	52	31	51	82	n/a
Existing Development Trip Potential											
General Office	710		82,800	GSF	145	20	165	29	142	171	1,137
Proposed Development											
Off-Campus Student Apartment	225	Over 1/2 mile from Campus	800	Beds	36	92	128	128	118	246	3,193

Note(s):
(1) Trip generation based on the Institute of Transportation Engineers' Trip Generation, 10th Edition equations and/or rates.

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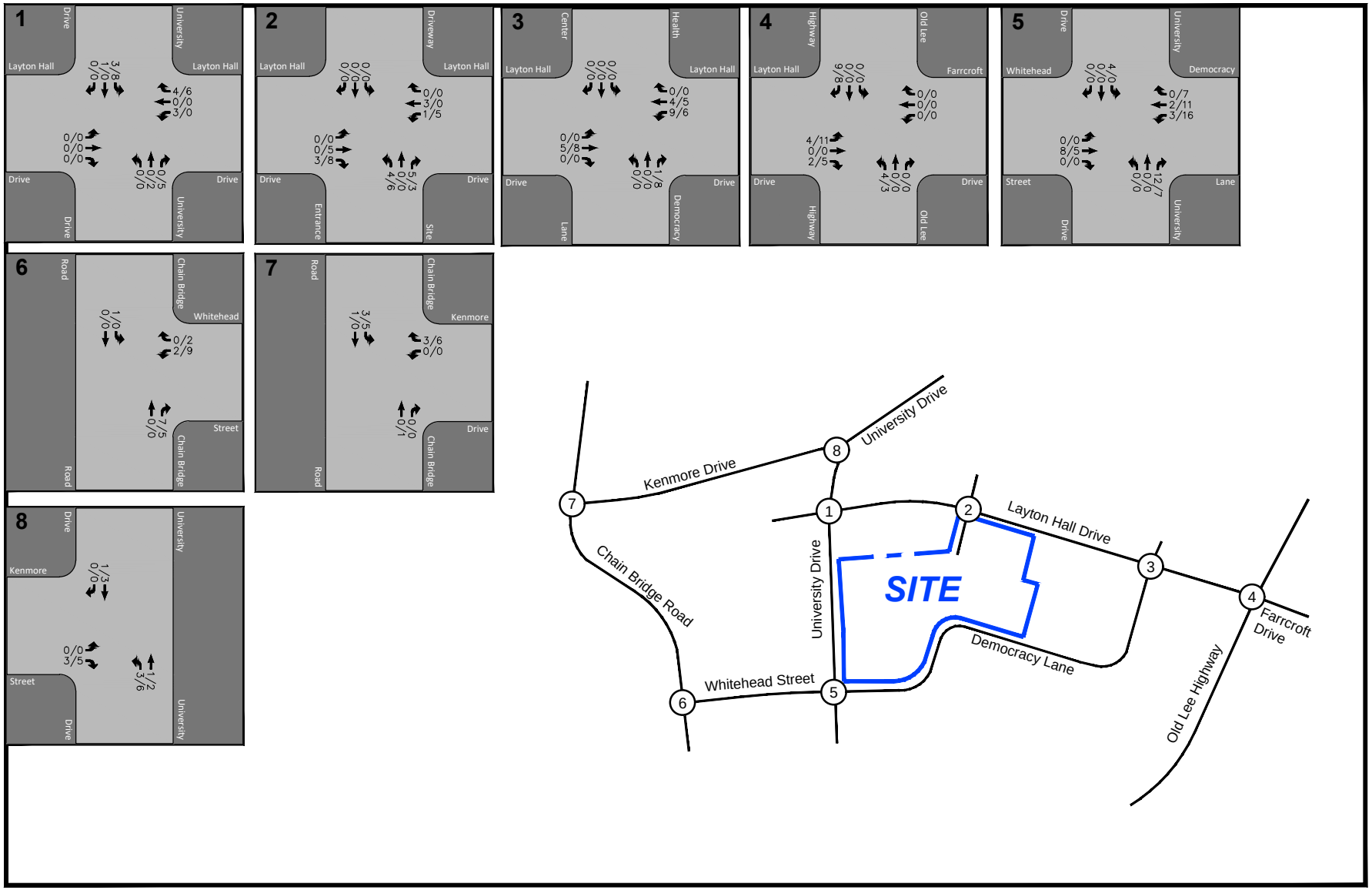

Figure 6-1
Existing Site Trips Removed

AM PEAK HOUR
PM PEAK HOUR
000 / 000

NORTH

Capstone - GMU Housing
Fairfax City, Virginia

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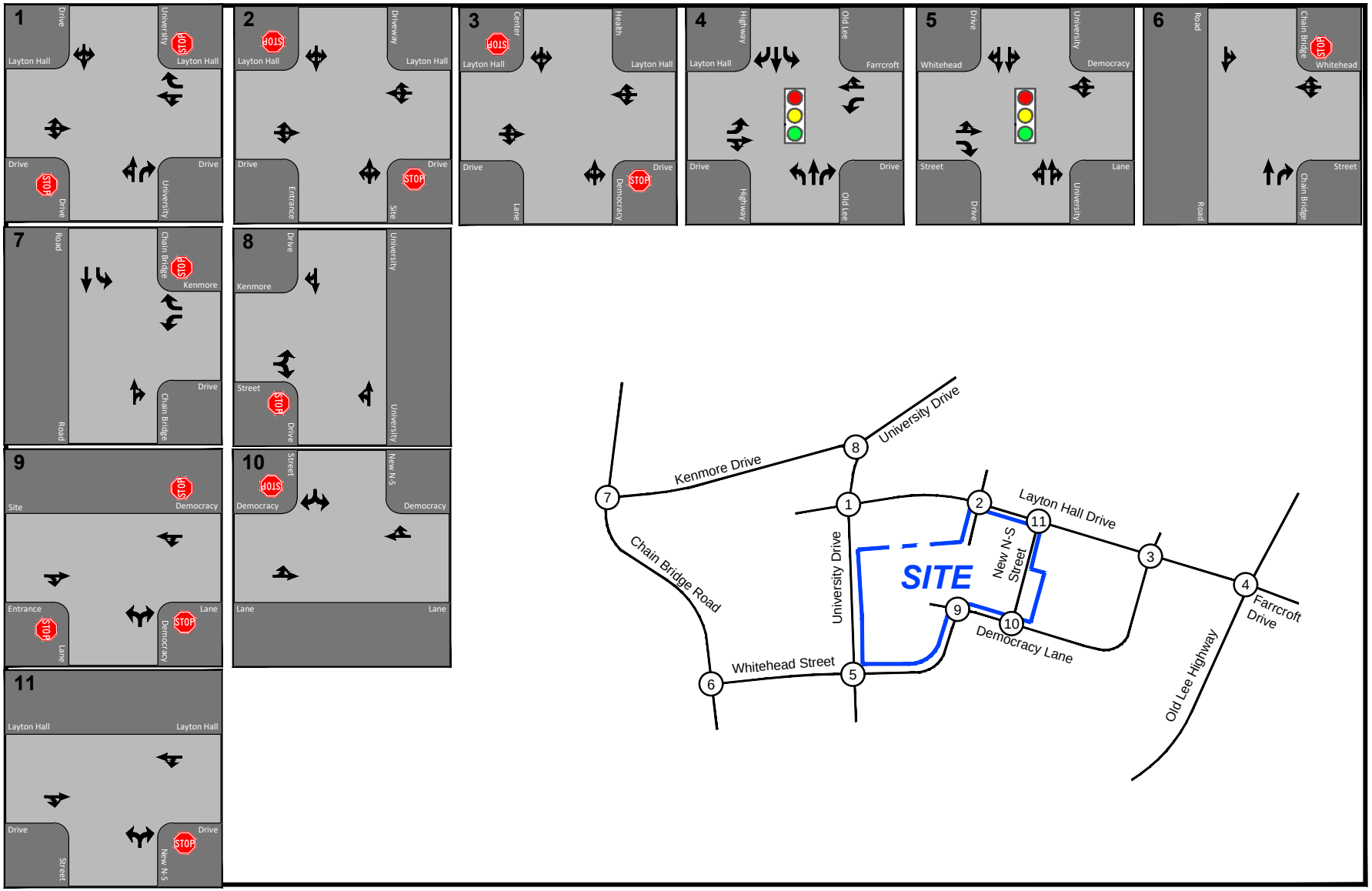

Figure 6-2
Future Lane Use and Traffic Controls

Represents One Travel Lane
Signalized Intersection
Stop Sign

NORTH

Capstone - GMU Housing
Fairfax City, Virginia

Net Site Trips. The net vehicle trips that would be generated by the proposed redevelopment plan (after discounting the driveway trips generated by the existing office uses) are summarized in Table 6-1. As shown, the site would generate, upon completion and full occupancy, 128 AM peak hour and 246 PM peak hour net vehicle trips prior to any reductions due to non-auto modes of travel, such as transit, walk, and bicycle.

It should be noted that no reduction in site generated trips due to transit mode split was taken in this analysis. However, the Applicant intends to take advantage of public transit opportunities as well as pedestrian/bicycle opportunities available and will implement certain transportation demand management (TDM) strategies as elaborated in Section 8 of this report. With these measures in place, it is anticipated that a significant portion of site generated trips will use non-single auto (non-SOV) modes of travel.

Existing Development Trip Generation. Based on field observations, the existing office uses on the subject site are not utilized to their fullest extent. In order to understand how many trips the existing office development could generate if fully occupied, an analysis was conducted applying the ITE trip generation rates/equations for general office use to the existing office floor area. The analysis is provided in Table 6-1. As shown, the existing office development could generate 165 AM peak hour and 171 PM peak hour trips. As shown, the proposed residential use represents a reduction in AM peak hour generated trips and an increase of only 75 PM peak hour trips when compared to the existing office. Further reductions to the residential generated trips can be achieved upon the application of TDM strategies as outlined in Section 8 of this report.

SITE TRIP DISTRIBUTION

The distribution of the anticipated trips generated by the completion of the proposed redevelopment was based on an examination of existing traffic counts and local knowledge. As agreed to with City staff, the 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 the south on University Drive: 35%
- To/from the north on University Drive: 5%
- To/from the north on Old Lee Highway: 25%
- To/from the south on Old Lee Highway: 10%
- To/from the north on Chain Bridge Road: 10%
- To/from the south on Chain Bridge Road: 15%

SITE TRIP ASSIGNMENTS

The assignment of the net vehicle trips generated upon the future build-out of the Capstone redevelopment project was based on the above distribution. These trip assignments are depicted on Figure 6-3.

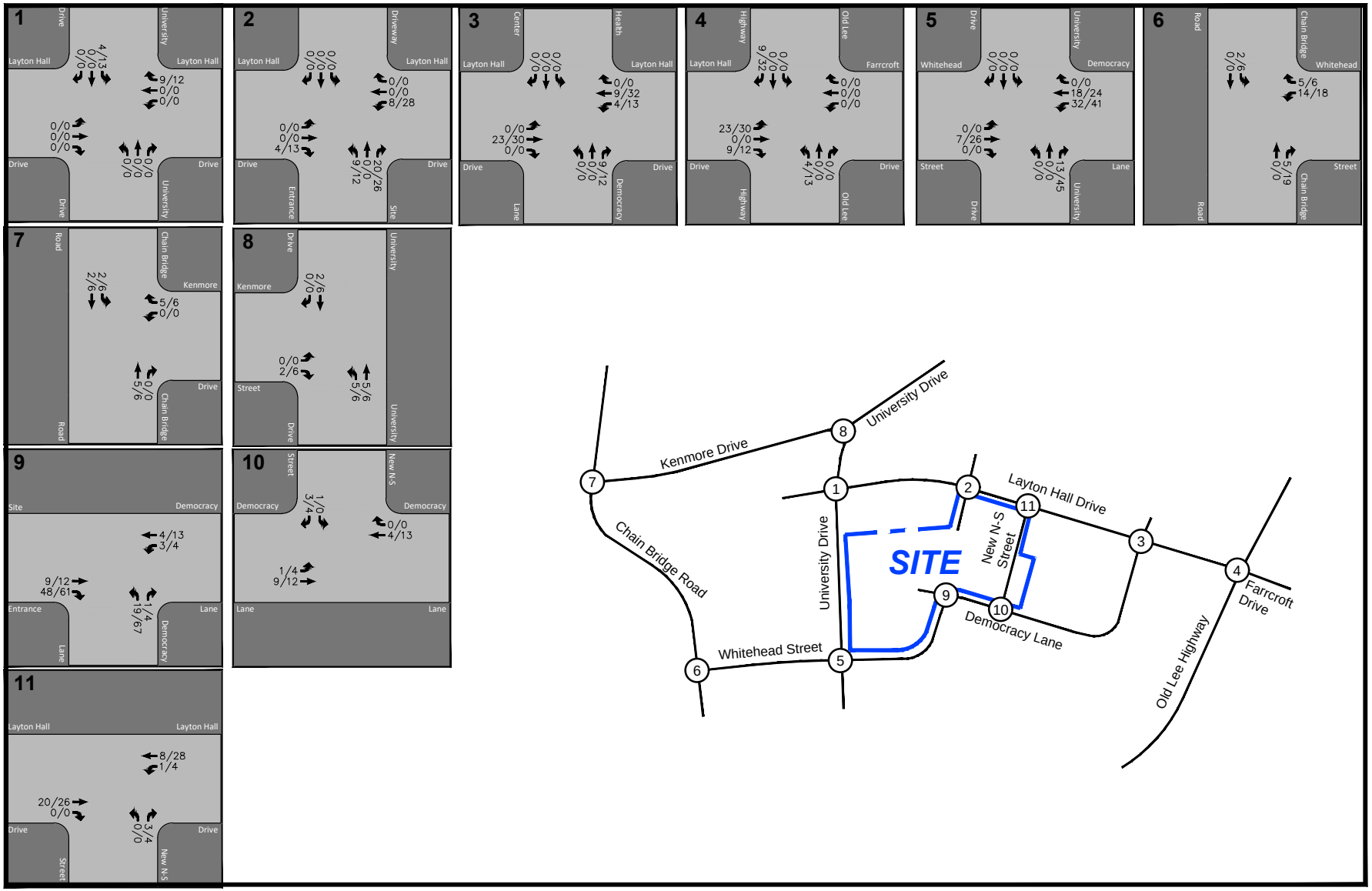

Figure 6-3
Site Trip Assignments

AM PEAK HOUR
PM PEAK HOUR
000 / 000

NORTH

Capstone - GMU Housing
Fairfax City, Virginia

Section 7
ANALYSIS OF FUTURE CONDITIONS WITH SITE DEVELOPMENT

TOTAL FUTURE TRAFFIC FORECASTS

The 2021 total future traffic forecasts shown on Figure 7-1 were estimated by adding the site trip assignments (Figure 6-3) to the background future traffic forecasts (Figure 5-3) after discounting those trips generated by the existing site uses (Figure 6-1).

TOTAL FUTURE LEVELS OF SERVICE

Future levels of service with the proposed redevelopment plan were estimated at key study intersections based on the future traffic volumes shown on Figure 7-1, the future lane use on Figure 6-2, the signal timings for the signalized intersections provided by the City of Fairfax and the 2000 HCM methodologies for signalized and unsignalized intersections. The results of these analyses are provided in Appendix I and presented in Table 7-1. Total future levels of service are also presented graphically on Figure 7-2.

Consistent with those results under background future conditions, the westbound left-through movement at the University Drive/Layton Hall Drive intersection would continue to operate at LOS "E". Additionally, the westbound approach of the Chain Bridge Road/Whitehead Street intersection would continue to operate at LOS "E", consistent with background conditions. All proposed site entrances, including the garage entrance along the proposed realignment of Democracy Lane would operate at acceptable levels of service. An All-Way STOP control is recommended at the realigned Democracy Lane at the proposed site entrance.

TOTAL FUTURE QUEUING

Total future queues were forecasted using Synchro software. The results of the queuing analysis are summarized in Table 7-2. As shown, existing turn bays within the study network will continue to be of sufficient length to accommodate future queues, with the exception of the eastbound left turn movement at the Layton Hall Drive/Old Lee Highway signalized intersection, which would continue to exceed its turn bay length consistent with background traffic conditions without the development of the subject site.

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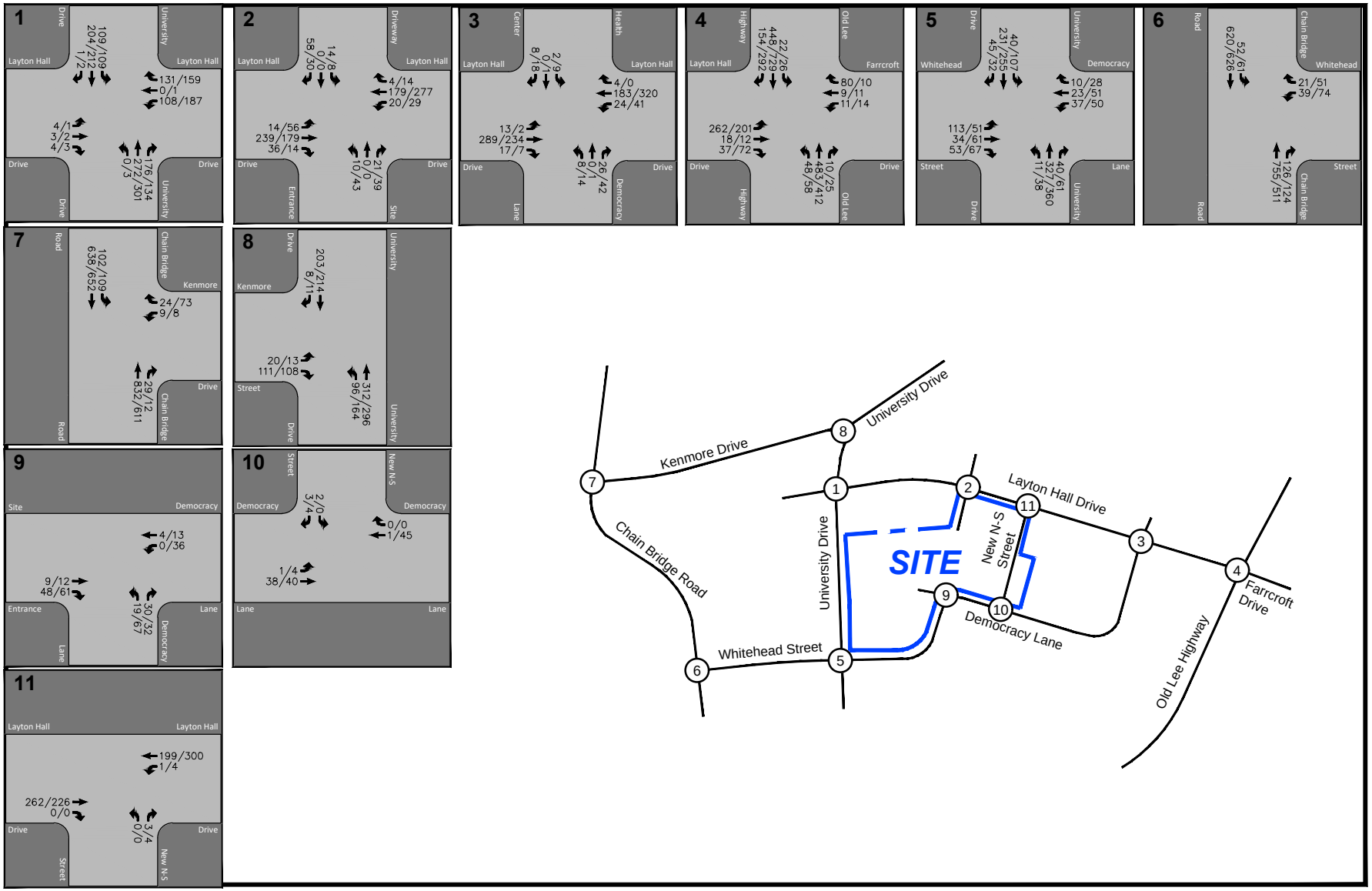

Figure 7-1
Total Future Traffic Forecasts

AM PEAK HOUR
PM PEAK HOUR
000 / 000

NORTH

Capstone - GMU Housing
Fairfax City, Virginia

Table 7-1
Capstone - Democracy Lane
Total Future Levels of Service (1) (2) (3)

Intersection	Operating Condition	Street Name	Approach/ Movement	Existing (2017) AM	Existing (2017) PM	Background (2021) AM	Background (2021) PM	Total Future (2021) AM	Total Future (2021) PM
1 Layton Hall Drive/**University Drive**	STOP	Layton Hall Drive	EBLTR	C [18.0]	B [13.9]	C [17.5]	C [15.9]	C [17.6]	C [16.1]
		Layton Hall Drive	WBLT	C [17.7]	D [26.9]	C [18.4]	E [45.5]	C [18.0]	E [47.8]
		Layton Hall Drive	WBR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.1]
		University Drive	NBLT	A [0.0]	A [0.1]	A [0.0]	A [0.1]	A [0.0]	A [0.0]
		University Drive	NBR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		University Drive	SBLTR	A [3.8]	A [2.9]	A [3.8]	A [3.6]	A [3.8]	A [3.7]
2 Layton Hall Drive/**Driveway**	STOP	Layton Hall Drive	EBTR	A [0.0]	A [0.0]	N/A	N/A	N/A	N/A
		Layton Hall Drive	WBLT	A [0.6]	A [0.2]	N/A	N/A	N/A	N/A
		Driveway	NBLR	B [11.1]	B [12.4]	N/A	N/A	N/A	N/A
New Layton Hall Apartments Driveway	*STOP*	*Layton Hall Drive*	*EBLTR*	*N/A*	*N/A*	*A [0.5]*	*A [2.2]*	*A [0.5]*	*A [2.2]*
		Layton Hall Drive	*WBLTR*	*N/A*	*N/A*	*A [0.6]*	*A [0.2]*	*A [0.9]*	*A [0.9]*
		Driveway	*NBLR*	*N/A*	*N/A*	*B [12.0]*	*C [15.4]*	*B [11.9]*	*C [15.5]*
		Driveway	*SBLR*	*N/A*	*N/A*	*B [10.7]*	*B [11.6]*	*B [10.8]*	*B [12.1]*
3 Layton Hall Drive/**Democracy Lane/Health Center**	STOP	Layton Hall Drive	EBTLR	A [0.5]	A [0.1]	A [0.4]	A [0.1]	A [0.4]	A [0.1]
		Layton Hall Drive	WBTLR	A [1.3]	A [1.2]	A [1.3]	A [1.1]	A [1.1]	A [1.2]
		Layton Hall Drive	NBTLR	B [11.2]	B [11.6]	B [11.6]	B [11.7]	B [11.5]	B [12.1]
		University Drive	SBTLR	B [10.3]	B [12.4]	B [10.3]	B [12.5]	B [10.4]	B [13.3]
4 Layton Hall Drive/Farrcroft Drive/**Old Lee Highway**	Signal	Layton Hall Drive	EBL	D (38.0)	D (55.0)	D (38.7)	E (56.1)	D (38.3)	E (57.9)
		Layton Hall Drive	EBTR	C (29.7)	D (41.2)	C (29.3)	D (41.1)	C (28.6)	D (40.5)
		Farrcroft Drive	WBL	D (41.2)	D (54.4)	D (42.6)	D (54.3)	D (43.2)	D (54.8)
		Farrcroft Drive	WBTR	D (41.7)	D (53.9)	D (43.0)	D (53.9)	D (43.6)	D (54.3)
		Old Lee Highway	NBL	B (15.4)	B (16.0)	B (16.1)	B (17.4)	B (14.1)	B (18.5)
		Old Lee Highway	NBT	C (26.5)	B (15.9)	C (25.8)	B (16.3)	C (27.6)	B (16.9)
		Old Lee Highway	NBR	B (16.6)	B (12.2)	B (16.6)	B (12.3)	B (17.5)	B (12.7)
		Old Lee Highway	SBL	B (17.1)	B (11.8)	B (18.3)	B (12.0)	B (19.3)	B (12.5)
		Old Lee Highway	SBT	C (25.4)	C (26.7)	C (27.9)	C (28.9)	C (29.7)	C (30.5)
		Old Lee Highway	SBR	B (18.4)	B (14.8)	B (19.2)	B (15.2)	C (20.1)	B (16.0)
			Overall	**C (27.6)**	**C (26.0)**	**C (28.5)**	**C (27.0)**	**C (29.8)**	**C (28.2)**
5 Whitehead Street/Democracy Lane/**University Drive**	Signal	Whitehead Street	EBLT	A (8.2)	A (8.1)	A (8.2)	A (8.1)	A (8.3)	B (10.1)
		Whitehead Street	EBR	A (6.7)	A (7.3)	A (6.8)	A (7.3)	A (6.8)	A (8.9)
		Democracy Lane	WBLTR	A (6.8)	A (7.9)	A (7.3)	A (7.9)	A (7.2)	B (10.1)
		University Drive	NBLTR	A (7.7)	A (7.3)	A (7.7)	A (7.4)	A (7.7)	A (6.7)
		University Drive	SBLTR	A (7.7)	A (7.6)	A (7.6)	A (7.6)	A (7.6)	A (6.8)
			Overall	**A (7.7)**	**A (7.5)**	**A (7.7)**	**A (7.6)**	**A (7.7)**	**A (7.5)**
6 Whitehead Street/**Chain Bridge Road**	STOP	Whitehead Street	WBLR	E [38.4]	E [40.3]	E [40.8]	E [40.3]	E [50.0]	E [47.6]
		Chain Bridge Road	NBT	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		Chain Bridge Road	NBR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		Chain Bridge Road	SBLT	A [2.3]	A [1.7]	A [2.0]	A [1.7]	A [2.1]	A [1.9]
7 Kenmore Drive/**Chain Bridge Road**		Kenmore Street	WBL	E [37.9]	C [18.3]	D [30.6]	C [18.0]	D [30.1]	C [18.2]
	STOP	Kenmore Street	WBR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		Chain Bridge Road	NBTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		Chain Bridge Road	SBL	B [11.1]	A [9.7]	B [10.8]	A [9.6]	B [10.8]	A [9.7]
		Chain Bridge Road	SBT	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
8 Kenmore Drive/**University Drive**	STOP	Kenmore Street	EBLR	B [11.9]	B [11.6]	B [11.8]	B [11.9]	B [11.9]	B [11.9]
		University Drive	NBLT	A [2.5]	A [3.8]	A [2.4]	A [3.8]	A [2.5]	A [3.8]
		University Drive	SBTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
9 Site Entrance/Democracy Lane/**Democracy Lane**	All-Way STOP	Site Entrance	EBTR	N/A	N/A	N/A	N/A	A [6.8]	A [7.1]
		Democracy Lane	WBTL	N/A	N/A	N/A	N/A	A [7.1]	A [7.7]
		Democracy Lane	NBLR	N/A	N/A	N/A	N/A	A [7.0]	A [7.7]
			Overall	**N/A**	**N/A**	**N/A**	**N/A**	**A [6.9]**	**A [7.5]**
10 Democracy Lane/**New N-S Street**	STOP	Democracy Lane	EBTL	N/A	N/A	N/A	N/A	A [0.2]	A [0.6]
		Democracy Lane	WBTR	N/A	N/A	N/A	N/A	A [0.0]	A [0.0]
		New N-S Street	SBLR	N/A	N/A	N/A	N/A	A [8.5]	A [8.5]
11 Layton Hall Drive/**New N-S Street**	STOP	Layton Hall Drive	EBTR	N/A	N/A	N/A	N/A	A [0.0]	A [0.0]
		Layton Hall Drive	WBLT	N/A	N/A	N/A	N/A	A [0.0]	A [0.1]
		New N-S Street	NBLR	N/A	N/A	N/A	N/A	A [9.8]	A [9.6]

Notes : (1) Numbers in parentheses ( ) represent delay at signalized intersections in seconds per vehicle.
(2) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.
(3) Roadway names in bold are considered north/south for purposes of this analysis

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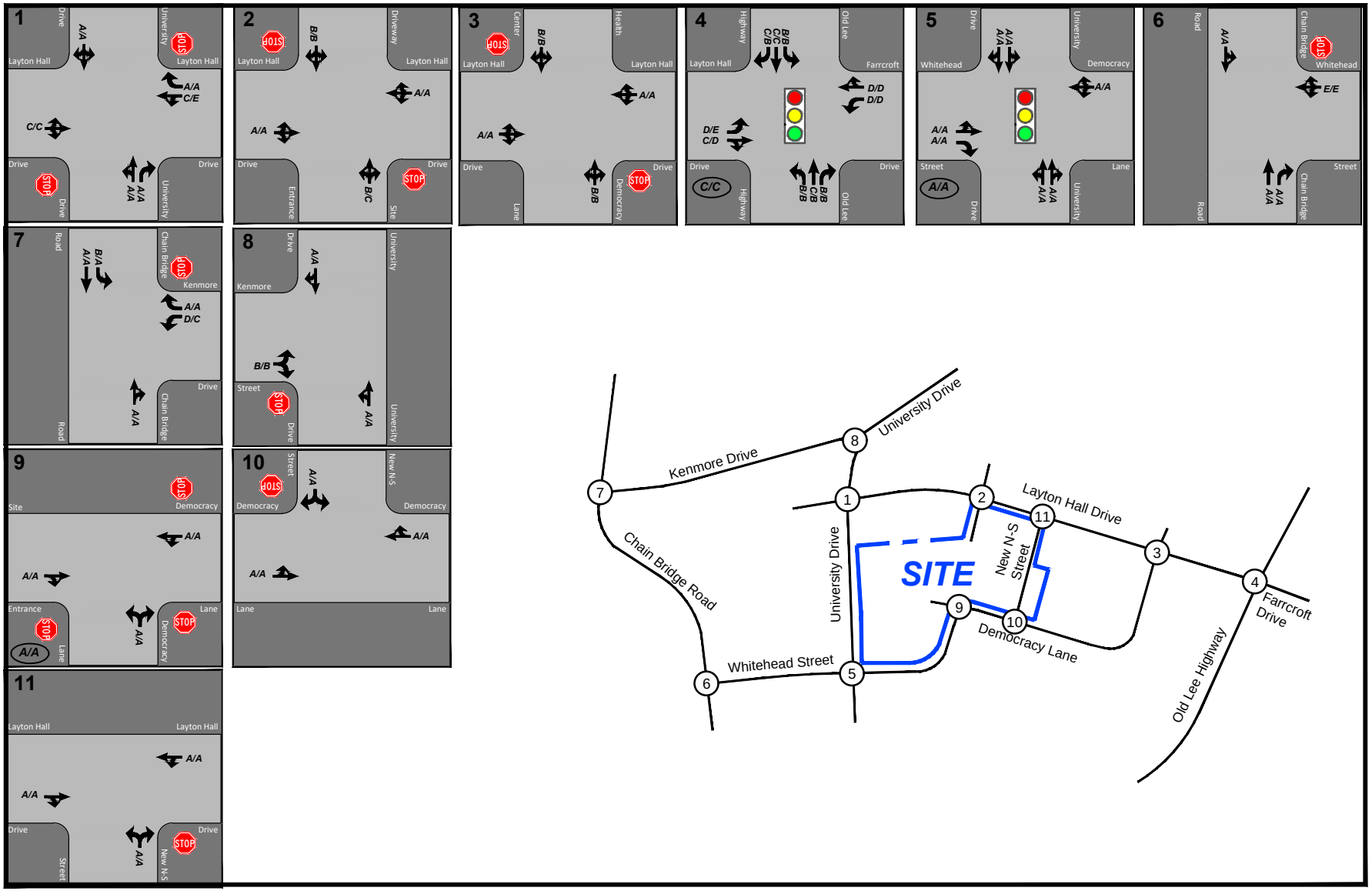


Figure 7-2
Total Future Levels of Service

Represents One Travel Lane
Signalized Intersection
Stop Sign

AM/PM
X/X Lane Group Level of Service
(X/X) Overall Level of Service

Capstone - GMU Housing
Fairfax City, Virginia

Table 7-2
Capstone - Democracy Lane
Total Future Queues (1) (2) (3) (4) (5)

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage (ft)	Existing (2017) AM	Existing (2017) PM	Background (2021) AM	Background (2021) PM	Total Future (2021) AM	Total Future (2021) PM
1 Layton Hall Drive/**University Drive**	STOP	Layton Hall Drive	EBLTR	N/A	4	1	3	1	3	1
		Layton Hall Drive	WBLT	N/A	40	136	53	211	50	221
		Layton Hall Drive	WBR	50	0	0	0	0	0	0
		University Drive	NBLT	N/A	0	0	0	0	0	0
		University Drive	NBR	N/A	0	0	0	0	0	0
		University Drive	SBLTR	N/A	10	6	9	9	9	9
2 Layton Hall Drive/**Driveway**	STOP	Layton Hall Drive	EBTR	N/A	0	0	N/A	N/A	N/A	N/A
		Layton Hall Drive	WBLT	N/A	1	0	N/A	N/A	N/A	N/A
		Driveway	NBLR	N/A	2	10	N/A	N/A	N/A	N/A
New Layton Hall Apartments Driveway	*STOP*	*Layton Hall Drive*	*EBLTR*	*N/A*	*N/A*	*N/A*	*1*	*4*	*1*	*4*
		Layton Hall Drive	*WBLTR*	*N/A*	*N/A*	*N/A*	*1*	*0*	*1*	*2*
		Driveway	*NBLR*	*N/A*	*N/A*	*N/A*	*2*	*12*	*5*	*19*
		Driveway	*SBLR*	*N/A*	*N/A*	*N/A*	*9*	*6*	*9*	*6*
3 Layton Hall Drive/**Democracy Lane/Health Center**	STOP	Layton Hall Drive	EBTLR	N/A	1	0	1	0	1	0
		Layton Hall Drive	WBTLR	N/A	2	2	2	2	2	3
		Layton Hall Drive	NBTLR	N/A	4	8	4	8	5	9
		University Drive	SBTLR	N/A	1	5	1	5	1	5
4 Layton Hall Drive/Farrcroft Drive/**Old Lee Highway**	Signal	Layton Hall Drive	EBL	N/A	243	206	311	222	350	244
		Layton Hall Drive	EBTR	250	43	49	48	52	50	54
		Farrcroft Drive	WBL	N/A	28	33	28	34	28	34
		Farrcroft Drive	WBTR	140	55	36	59	37	59	37
		Old Lee Highway	NBL	N/A	38	32	39	36	38	42
		Old Lee Highway	NBT	N/A	428	308	454	351	454	351
		Old Lee Highway	NBR	200	0	0	0	0	0	0
		Old Lee Highway	SBL	130	22	23	22	23	22	23
		Old Lee Highway	SBT	N/A	355	814	415	863	415	863
		Old Lee Highway	SBR	300	36	86	42	99	42	106
5 Whitehead Street/Democracy Lane/**University Drive**	Signal	Whitehead Street	EBLT	N/A	63	38	63	41	64	48
		Whitehead Street	EBR	80	15	17	16	18	16	18
		Democracy Lane	WBLTR	N/A	13	34	15	35	31	49
		University Drive	NBLTR	N/A	60	68	63	73	63	77
		University Drive	SBLTR	N/A	48	70	53	71	52	71
6 Whitehead Street/**Chain Bridge Road**	STOP	Whitehead Street	WBLR	N/A	26	80	32	76	52	94
		Chain Bridge Road	NBT	N/A	0	0	0	0	0	0
		Chain Bridge Road	NBR	N/A	0	0	0	0	0	0
		Chain Bridge Road	SBLT	N/A	7	5	6	5	6	6
7 Kenmore Drive/**Chain Bridge Road**		Kenmore Street	WBL	N/A	15	17	12	16	12	16
	STOP	Kenmore Street	WBR	50	0	0	0	0	0	0
		Chain Bridge Road	NBTR	N/A	0	0	0	0	0	0
		Chain Bridge Road	SBL	100	15	11	13	11	13	11
		Chain Bridge Road	SBT	N/A	0	0	0	0	0	0
8 Kenmore Drive/**University Drive**	STOP	Kenmore Street	EBLR	N/A	21	18	20	18	20	19
		University Drive	NBLT	N/A	6	11	6	12	6	12
		University Drive	SBTR	N/A	0	0	0	0	0	0
9 Site Entrance/Democracy Lane/**Democracy Lane**	STOP	Site Entrance	EBTR	N/A	N/A	N/A	N/A	N/A	52	47
		Democracy Lane	WBTL	N/A	N/A	N/A	N/A	N/A	18	44
		Democracy Lane	NBLR	N/A	N/A	N/A	N/A	N/A	51	48
10 Democracy Lane/**New N-S Street**	STOP	Democracy Lane	EBTL	N/A	N/A	N/A	N/A	N/A	0	0
		Democracy Lane	WBTR	N/A	N/A	N/A	N/A	N/A	0	0
		New N-S Street	SBLR	N/A	N/A	N/A	N/A	N/A	0	0
11 Layton Hall Drive/**New N-S Street**	STOP	Layton Hall Drive	EBTR	N/A	N/A	N/A	N/A	N/A	0	0
		Layton Hall Drive	WBLT	N/A	N/A	N/A	N/A	N/A	0	0
		New N-S Street	NBLR	N/A	N/A	N/A	N/A	N/A	0	0

Notes : (1) Queue length is based on the 95th percentile queue in feet as reported by Synchro, Version 9.
(2) Queue lengths at All-way STOP controlled intersections are based on the 95th percentile queue in feet as reported by SimTraffic 9.
(3) Roadway names in bold are considered north/south for purposes of this analysis
(4) For available storage, "N/A" at the left and right-turn lanes indicate the turn-lane would extend back to the immediate upstream intersection.
(5) For available storage, "N/A" at the through movements indicate storage available up to the immediate upstream intersection.

Section 8
TRANSPORTATION DEMAND MANAGEMENT

In order to mitigate the potential impacts of the development and take full advantage of the site's proximity to transit facilities/services and non-auto opportunities, a key component of the project will be the implementation of comprehensive transportation demand management (TDM) strategies. The subject development proposal is especially suited for trip reduction measures since the units will be marketed primarily to students of George Mason University (GMU) and, as a result, the majority of trips will be oriented to a specific origin/destination. According to data provided by GMU, approximately 26% of current GMU students use means other than driving alone to access the campus. Therefore, vehicle trips generated by the proposed development can be significantly reduced.

In an effort to decrease reliance on the personal automobile and encourage the use of transit, ridesharing, bicycling, and walking, the Applicant will implement a Transportation Demand Management (TDM) Program. "TDM is a general term for strategies that result in more efficient use of transportation resources. There are many different TDM strategies with a variety of impacts. Some improve the transportation options available to consumers, while others provide an incentive to choose more efficient travel patterns. Some reduce the need for physical travel through mobility substitutes or more efficient land use. TDM strategies can change travel timing, route, destination, or mode."

The following strategies should be considered:

A. Designate a Transportation Management Coordinator (TMC) to implement the TDM program and advise residents, tenants, and employees of the availability and location of the TDM coordinator and program at least once a year. The position may be part of other duties assigned to the individual. Duties of the Transportation Management Coordinator would include the following:

1. Assist residents and employees in making effective and efficient commuting choices.
2. Disseminate Metrorail, CUE bus, ridesharing, and other relevant transit options to new residents and employees.
3. Solicit support from the Metropolitan Washington Council of Governments (MWCOG) Commuter Connections program, the Washington Metropolitan Area Transit Authority (WMATA), the City of Fairfax government, and others.
4. Provide on-site assistance to residents and employees in forming and maintaining carpools and vanpools.
5. Register carpool/vanpool participants, transit users, bicyclists, and walkers in the Guaranteed Ride Home (GRH) program.
6. Encourage residents and employees to ride bicycles or walk to the GMU campus and other destinations.

7. Provide on-site facilities for both short and long-term bicycle parking and/or storage, including bike racks for visitors and bike storage lockers or a secure bike room for residents.
8. Locate and install bikesharing facilities (e.g., Capital Bikeshare) at convenient and visible location(s) within the site, subject to the City and/or GMU establishing such services.
9. Market and promote the TDM Program among residents and employees through printed materials and web sites (if available).

B. Commuter Center.

1. Designate a centralized space on-site as a "Commuter Center". The TMC functions would take place in this space, as appropriate.
2. Install display racks that would provide information on local transit options.
3. Establish a location for displaying real-time transit information (e.g., TransitScreen).
4. Sell transit fare media, such as SmarTrip cards, Metro fare cards, and Metrobus passes.
5. Promote transit and multi-modal options provided by the City.

C. Incentives to use transit, including:

1. Provide information on Metrorail, CUE Bus, Metrobus, and other public transportation facilities, services, routes, schedules, and fares.
2. Disseminate information to transit users regarding free guaranteed rides home in cases of emergency.
3. At the time of initial lease, provide SmarTrip cards to residents.
4. Provide safe, convenient, and attractive pedestrian connections on and off-site.

D. Carpool programs, including:

1. Disseminate information to carpoolers regarding free guaranteed rides home in cases of emergency.
2. Reserve a number of conveniently-located, parking spaces for carpools only.

E. Parking management, including:

1. Reserve a number of conveniently-located, parking spaces for carpools, and/or hybrid vehicles.
2. Implement a parking pass system in order to manage the number of vehicular parking spaces allotted per resident or dwelling unit.
3. Provide a parking space on site for a car sharing service (i.e., Zip or Flex Car).

Section 9
CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

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

1. The redevelopment plan proposed by the Applicant is complementary to the City's and community's long-term vision for the area adjacent to the Old Town district.

2. All signalized intersections within the study area currently operate at overall adequate levels of service (LOS "D" or better).

3. Under future 2021 traffic conditions, without the development of the subject site, delays would slightly increase at study intersections due to regional traffic growth and trips generated by other approved/pending development within the City. The largest overall intersection delay increase over existing conditions would be 1.0 seconds from LOS "C" (26.0s) to LOS "C" (27.0s) in the PM at intersection 4 (Old Lee Highway/Layton Hall Drive/Farrcroft Drive). All intersections would continue operate at acceptable levels of service.

4. The Layton Hall Apartments redevelopment project is forecasted to generate 128 AM peak hour and 246 PM peak hour net vehicle trips upon completion and full occupancy by 2021, and without accounting for any trip reductions resulting from non-auto modes of travel.

5. Under future 2021 traffic conditions, with the development of the subject site, delays would slightly increase at study intersections. The largest overall intersection delay increase over future conditions without site development would be 1.3 seconds from LOS "C" (28.5s) to LOS "C" (29.8s) in the AM at intersection 4 (Old Lee Highway/Layton Hall Drive/Farrcroft Drive). All intersections would continue operate at acceptable levels of service.

6. Additional mitigation measures, as outlined below, would serve to further improve the transportation network.

RECOMMENDATIONS

Based on the above conclusions and in order to mitigate the impacts of the subject development and improve the overall transportation network, the following recommendations should be considered:

1. As part of the redevelopment plan and to encourage walking trips, the Applicant should provide and enhance the pedestrian facilities within the site's block. The Applicant should further ensure connections between the site's internal network and the surrounding pedestrian system, as envisioned in the Comprehensive Plan.

2. The Applicant should encourage bicycling as a mode of travel. Bicycle racks for site visitors as well as bicycle storage lockers or a secure bike room for residents should be provided. The Applicant should consider bikesharing facility locations, subject to further evaluation and coordination with City staff.

3. The Applicant should implement Transportation Demand Management (TDM) strategies to encourage the use of alternate modes of transportation. The application of TDM strategies is particularly beneficial for the site since the units will be marketed to a student population who will likely be more inclined to select non-auto modes of travel to/from the GMU campus and other destinations within the City. As a result, vehicle trips to and from the subject development can be significantly reduced.

4. To encourage and promote street connectivity consistent with the City's *Multimodal Transportation Plan* recommendations, a new north-south street should be constructed on the eastern portion of the Subject Property between Democracy Lane and Layton Hall Drive.

5. In order to facilitate site access and to establish defined intersections consistent with the City's *Multimodal Transportation Plan* objectives, a portion of Democracy Lane should be realigned as shown in the Applicant's development plan and the site entrance should be designed as a three-leg, All-Way STOP intersection with crosswalks and necessary pedestrian features.

APPENDIX A
STATEMENT OF JUSTIFICATION

[REMOVED]

The original Statement of Justification has been removed as an updated Statement of Justification will be filed under separate cover.

APPENDIX B
SCOPE OF WORK

SCOPE OF WORK MEETING FORM

Information on the Project
Traffic Impact Analysis Base Assumptions

CAPSTONE - GMU STUDENT APARTMENTS
CITY OF FAIRFAX, VIRGINIA

Contact Information	
Consultant Name: Tele: E-mail:	William F. Johnson P.E. - Wells + Associates, Inc. 703-365-9262 wfjohnson@wellsandassociates.com
Developer/Owner Name: Tele: E-mail:	Amanda Wallis - Capstone 205-612-1107 awallis@capstonemail.com

Project Information				
Project Name:	Capstone-GMU Student Apartments		Locality/County:	City of Fairfax
Project Location: (Attach regional and site specific location map)	The subject site for the proposed redevelopment in the City of Fairfax, Virginia is generally located south of Layton Hall Drive, east of University Drive and north of Democracy Lane. See Attachment 1 for the specific site location.			
Submission Type	Comp Plan ☐	Rezoning ☒	Site Plan ☐	Subd Plat ☐
Project Description: (Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary)	The subject site is currently zoned Commercial Retail (CR) and is developed with office uses, including three office buildings and townhouse-style office units. The Applicant is proposing to redevelop the property with between 230 to 270 multifamily student housing units which will be marketed to nearby George Mason University (GMU) students. The development will contain a mix of one, two, and four-bedroom units with a total of between 750 and 800 beds. Access to the property is currently provided by Democracy Lane, Layton Hall Drive, and several inter-parcel connections with adjacent office uses. As conceptually proposed, access along Democracy Lane will be relocated to support the development and serve a future parking deck. Other points of access will remain generally in their current locations. A conceptual development plan is provided as Attachment 2.			
Proposed Use(s): (Check all that apply; attach additional pages as necessary)	Residential ☒	Commercial ☐	Mixed Use ☐	Other ☐

	Residential Uses(s) Number of Units: 230-270 Units; 750-800 Beds ITE LU Code(s): 225 ("Off-Campus Student Apartment") – ITE Trip Generation 10th Edition _____ _____ **Commercial Use(s)** ITE LU Code(s): _____ _____ Square Ft or Other Variable:	_____ _____ _____ **Other Use(s)** ITE LU Code(s): _____ _____ _____ Independent Variable(s): _____ _____ _____

Total Peak Hour Trip Projection:	Less than 100 ☐	100 – 499 ☒	500 – 999 ☐	1,000 or more ☐

Traffic Impact Analysis Assumptions

Study Period	Existing Year: 2017	Build-out Year: 2021	Design Year: n/a

Study Area Boundaries (See Attachment 3)	North: Kenmore Drive (Route 2-151)	South: Democracy Lane
	East: Old Lee Highway (Route 6628)	West: University Drive (Route 6627)
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	Any approved and/or proposed pipeline development projects as well as potential external factors will be discussed with City staff. According to the City's Comprehensive Plan, no additional transportation improvements are recommended on Layton Hall Drive.	
Consistency With Comprehensive Plan (Land use, transportation plan)	Based on the information provided in the City's GIS mapper, the designated land use on the subject property is categorized as Business-Commercial. A change in the Comprehensive Plan Future Land Use designation for the subject site may be necessary to support the proposed development.	
Available Traffic Data (Historical, forecasts)	The analysis will utilize the most recent available VDOT traffic count data and counts conducted by Wells + Associates. 2016 VDOT Average Annual Daily Traffic (AADT): Layton Hall Dr (Route 3-151): 4,600 vpd (Old Lee Highway to University Drive) University Dr (Route 6627): 10,000 vpd (Whitehead Street to Layton Hall Drive)	
Trip Distribution	Road Name: University Drive – North: 5%/ South: 35%	Road Name: Chain Bridge Road - North: 10%/ South: 15%
	Road Name: Old Lee Highway – North: 25%/ South: 10%	Road Name:

Annual Vehicle Trip Growth Rate:	1%	Peak Period for Study (check all that apply)	☒ AM ☒ PM ☐ SAT
		Peak Hour of the Generator	See Attachment 3
Study Intersections	1. Layton Hall Drive/University Drive	6. Chain Bridge Road/Whitehead Street	

and/or Road Segments (See Attachment 3)	2. Layton Hall Drive/Site Entrance	7. Chain Bridge Road/Kenmore Drive
	3. Layton Hall Drive/Democracy Lane	8. University Drive/Kenmore Drive
	4. Old Lee Highway/Layton Hall Drive	9. Site Entrances
	5. University Drive/Democracy Lane/Whitehead Street	10.
Trip Adjustment Factors	Internal allowance: ☐ Yes ☒ No Reduction: _____ trips	Pass-by allowance: ☐ Yes ☒ No Reduction: _____ trips
Software Methodology	☒ Synchro ☐ HCS (v.2000/+) ☐ aaSIDRA ☐ CORSIM ☐ Other _____	
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	The capacity analysis will be based on Synchro (version 9) and the Synchro network and signal timing/phasing data as may be provided by the City of Fairfax and/or VDOT.	
Improvement(s) Assumed or to be Considered	According to the City's Comprehensive Plan, there are no roadway improvements in the immediate study area that would directly impact the proposed development.	
Background Traffic Studies Considered	1. GMU Expansion 2. Layton Hall Apartments	
Plan Submission	☒ Master Development Plan (MDP) ☐ Generalized Development Plan (GDP) ☐ Preliminary/Sketch Plan ☐ Other Plan type (Final Site, Subd. Plan)	
Additional Issues to be Addressed	☒ Queuing analysis ☐ Actuation/Coordination ☐ Weaving analysis ☐ Merge analysis ☒ Bike/Ped Accommodations ☐ Intersection(s) ☒ TDM Measures ☐ Other _____	

NOTES on ASSUMPTIONS:

1. Synchro, version 9 will be used to conduct capacity analysis with peak hour factors measured in the field. The field measured PHFs will be adjusted to 0.85 < PHF < 0.92 under existing conditions. Under background and total future conditions, a PHF of 0.92 will be used for all movements.

2. The percent heavy vehicles (% HV) for Layton Hall Drive will be based on the most recent VDOT traffic count data or a default 2% or the existing count data, whichever is higher; all other roadways/driveways will use

a default % HV of 2%. The %HV under background and total future conditions will be assumed to be consistent with existing conditions.

3. The trip generation analysis will be based on the Institute of Transportation Engineers (ITE) *Trip Generaion Manual*, 10th Edition. The trip generation forecast may be further refined based on information provided by Capstone and/or local student housing data from Wells + Associates.

4. Trip reduction measures will be discussed in the report. These measures may include, but are not limited to, coordination with local bus (CUE) and/or Mason Shuttle system operators as well as other Transportation Demand Management (TDM) strategies.

SIGNED: _____ DATE: _____
Applicant or Consultant

PRINT NAME: _____
Applicant or Consultant

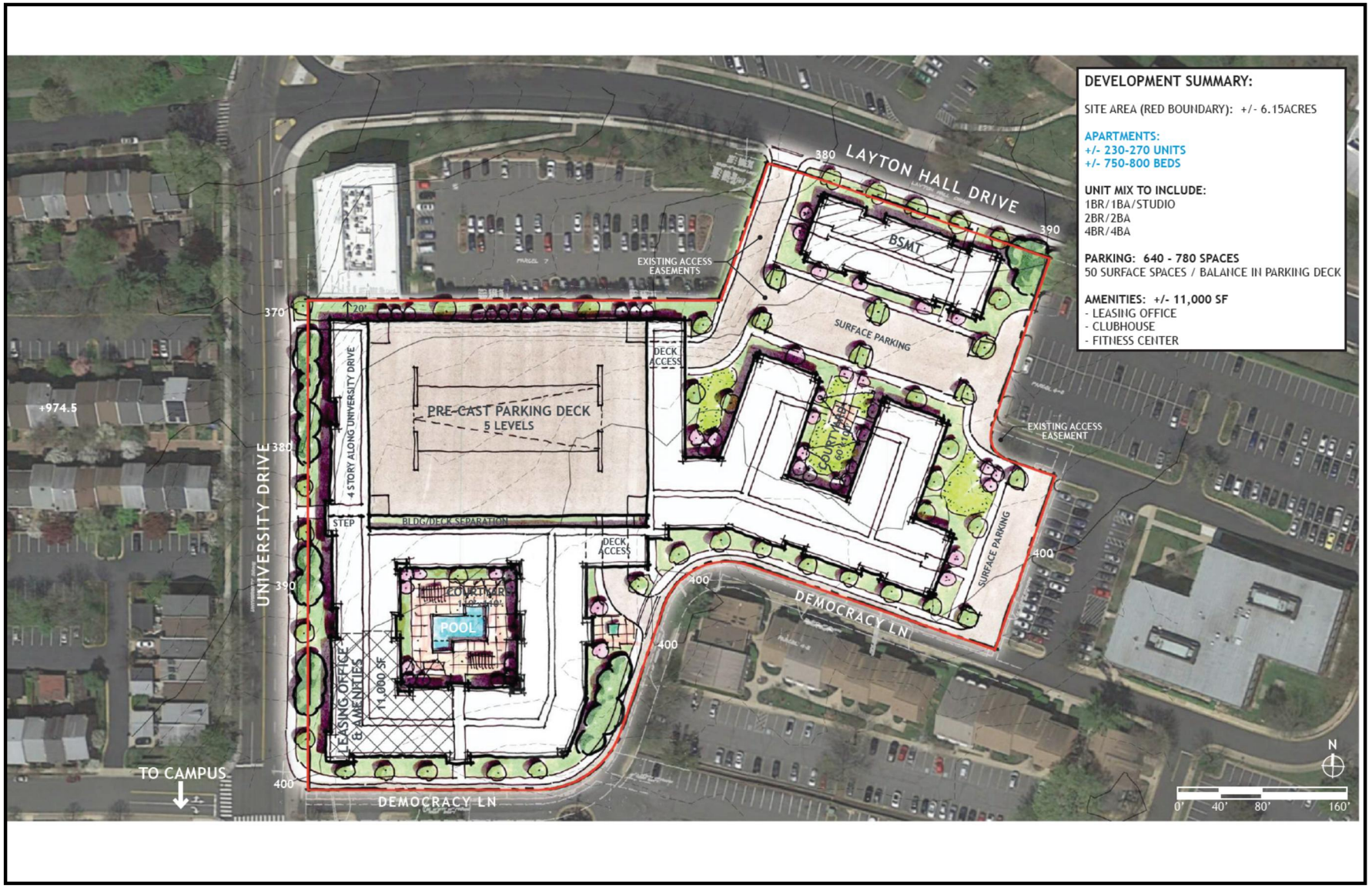
R:\PROJECTS\7302 CAPSTONE-GMU HOUSING\GRAPHICS\7302 GRAPHICS.DWG

Attachment 1
Site Location

NORTH

Capstone-GMU Student Apartments
City of Fairfax, Virginia

R:\PROJECTS\7302 CAPSTONE-GMU HOUSING\GRAPHICS\7302 GRAPHICS.DWG



Attachment II

Conceptual Development Plan

NORTH

Capstone-GMU Student Apartments

City of Fairfax, Virginia

Attachment III
Capstone - GMU Student Apartments
Trip Generation [1]

Scenario	Land Use Code	Setting/Location	Amount	Units	AM Peak Hour of the Adjacent In	AM Peak Hour of the Adjacent Out	AM Peak Hour of the Adjacent Total	PM Peak Hour of the Adjacent In	PM Peak Hour of the Adjacent Out	PM Peak Hour of the Adjacent Total	Weekday Average Daily Trips
Proposed Development											
Off-Campus Student Apartment	225	Over 1/2 mile from Campus	800	Beds	36	92	128	128	118	246	3,193

Note(s):
(1) Trip generation based on the Institute of Transportation Engineers' Trip Generation, 10th Edition equations and/or rates.

APPENDIX C
EXISTING TRAFFIC COUNT DATA

Wells & Associates,Inc

McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT: Capstone - GMU Housing
W+A JOB NO: 7302
INTERSECTION: Layton Hall Dr. & University Dr.
LOCATION: City of Fairfax,VA

DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Laura & Mina
INPUTED BY: agan

SOUTHBOUND ROAD: University Drive
NORTHBOUND ROAD: University Drive
WESTBOUND ROAD: Layton Hall Drive
EASTBOUND ROAD: Layton Hall Drive

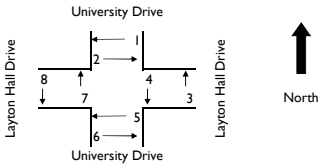
Time	Southbound University Drive					Westbound Layton Hall Drive					Northbound University Drive					Eastbound Layton Hall Drive					North & South	East & West	Total
Period	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM		6	13	19		5	1	4	10		16	4	1	21			1	1	2		40	12	52
6:15 AM - 6:30 AM		6	8	14		6		2	8		23	13		36			1		1		50	9	59
6:30 AM - 6:45 AM		8	6	14		11		5	16		27	19		46		3		1	4		60	20	80
6:45 AM - 7:00 AM		17	6	23		15		14	29		49	20		69		1	1		2		92	31	123
7:00 AM - 7:15 AM	1	16	15	32		15		10	25		49	22	1	72		1	1	1	3		104	28	132
7:15 AM - 7:30 AM		24	18	42		19		9	28		75	35		110		1		1	2		152	30	182
7:30 AM - 7:45 AM		22	31	53		12		12	24		78	64		142			1		1		195	25	220
7:45 AM - 8:00 AM		39	22	61		37		22	59		57	96		153		3		3	6		214	65	279
8:00 AM - 8:15 AM		46	21	67		22		14	36		31	50		81			2		2		148	38	186
8:15 AM - 8:30 AM		45	25	70		21		26	47		50	59		109		1		1	2		179	49	228
8:30 AM - 8:45 AM	1	67	35	103		17		20	37		32	56		88			1		1		191	38	229
8:45 AM - 9:00 AM		58	26	84		33	1	24	58		30	43		73		1		1	2		157	60	217
9:00 AM - 9:15 AM	1	63	20	84		32		16	48		26	38		64		1		1	2		148	50	198
9:15 AM - 9:30 AM		58	20	78		16		13	29		25	57	1	83		3	1		4		161	33	194
9:30 AM - 9:45 AM		46	19	65		17		13	30		33	46	2	81		2			2		146	32	178
9:45 AM - 10:00 AM		44	29	73		15	1	24	40		24	27	1	52							125	40	165
3:00 PM 3:15 PM	1	41	24	66		61		43	104		39	34	2	75							141	104	245
3:15 PM 3:30 PM		55	27	82		36		37	73		25	57	1	83							165	73	238
3:30 PM 3:45 PM		52	36	88		17		38	55		31	43	2	76		3			3		164	58	222
3:45 PM 4:00 PM	1	60	20	81		35		36	71		25	50	1	76							157	71	228
4:00 PM 4:15 PM		61	21	82		30	1	47	78		20	57		77				1	1		159	79	238
4:15 PM 4:30 PM		51	13	64		35	1	36	72		27	63	1	91			2		2		155	74	229
4:30 PM 4:45 PM		56	22	78		34		55	89		30	79		109		1		1	2		187	91	278
4:45 PM 5:00 PM		44	22	66		32		46	78		26	74	1	101		1			1		167	79	246
5:00 PM 5:15 PM	2	52	22	76		40		38	78		30	75	1	106		1			1		182	79	261
5:15 PM 5:30 PM	1	47	16	64		29		56	85		33	57		90			1	1	2		154	87	241
5:30 PM 5:45 PM		64	17	81		22		53	75		30	67	1	98		1			1		179	76	255
5:45 PM 6:00 PM		56	20	76		39	2	41	82		29	47	3	79		4		2	6		155	88	243
6:00 PM 6:15 PM		61	23	84		23	1	50	74		24	46	1	71		2	1		3		155	77	232
6:15 PM 6:30 PM		43	17	60		19	2	47	68		31	45		76			2		2		136	70	206
6:30 PM 6:45 PM	1	42	16	59		22		33	55		16	36	3	55		1		1	2		114	57	171
6:45 PM 7:00 PM	1	63	26	90		13		25	38		29	48	2	79		1			1		169	39	208
Total	10	1413	656	2079		780	10	909	1699		1070	1527	25	2622		32	15	16	63		4701	1762	6463
One Hour Volumes																							
6:00 AM - 7:00 AM		37	33	70	0.7609	37	1	25	63	0.5431	115	56	1	172	0.6232	4	3	2	9	0.5625	242	72	314
6:15 AM - 7:15 AM	1	47	35	83	0.6484	47		31	78	0.6724	148	74	1	223	0.7743	5	3	2	10	0.625	306	88	394
6:30 AM - 7:30 AM	1	65	45	111	0.6607	60		38	98	0.8448	200	96	1	297	0.675	6	2	3	11	0.6875	408	109	517
6:45 AM - 7:45 AM	1	79	70	150	0.7075	61		45	106	0.9138	251	141	1	393	0.6919	3	3	2	8	0.6667	543	114	657
7:00 AM - 8:00 AM	1	101	86	188	0.7705	83		53	136	0.5763	259	217	1	477	0.7794	5	2	5	12	0.5	665	148	813
7:15 AM - 8:15 AM		131	92	223	0.8321	90		57	147	0.6229	241	245		486	0.7941	4	3	4	11	0.4583	709	158	867
7:30 AM - 8:30 AM		152	99	251	0.8964	92		74	166	0.7034	216	269		485	0.7925	4	3	4	11	0.4583	736	177	913
7:45 AM - 8:45 AM	1	197	103	301	0.7306	97		82	179	0.7585	170	261		431	0.7042	4	3	4	11	0.4583	732	190	922
8:00 AM - 9:00 AM	1	216	107	324	0.7864	93	1	84	178	0.7672	143	208		351	0.805	2	3	2	7	0.875	675	185	860
8:15 AM - 9:15 AM	2	233	106	341	0.8277	103	1	86	190	0.819	138	196		334	0.7661	3	1	3	7	0.875	675	197	872
8:30 AM - 9:30 AM	2	246	101	349	0.8471	98	1	73	172	0.7414	113	194	1	308	0.875	5	2	2	9	0.5625	657	181	838
8:45 AM - 9:45 AM	1	225	85	311	0.9256	98	1	66	165	0.7112	114	184	3	301	0.9066	7	1	2	10	0.625	612	175	787
9:00 AM 10:00 AM	1	211	88	300	0.8929	80	1	66	147	0.7656	108	168	4	280	0.8434	6	1	1	8	0.5	580	155	735
3:00 PM 4:00 PM	2	208	107	317	0.9006	149		154	303	0.7284	120	184	6	310	0.9337	3			3	0.25	627	306	933
3:15 PM 4:15 PM	1	228	104	333	0.946	118	1	158	277	0.8878	101	207	4	312	0.9398	3		1	4	0.3333	645	281	926
3:30 PM 4:30 PM	1	224	90	315	0.8949	117	2	157	276	0.8846	103	213	4	320	0.8791	3	2	1	6	0.5	635	282	917
3:45 PM 4:45 PM	1	228	76	305	0.9299	134	2	174	310	0.8708	102	249	2	353	0.8096	1	2	2	5	0.625	658	315	973
4:00 PM 5:00 PM		212	78	290	0.8841	131	2	184	317	0.8904	103	273	2	378	0.867	2	2	2	6	0.75	668	323	991
4:15 PM 5:15 PM	2	203	79	284	0.9103	141	1	175	317	0.8904	113	291	3	407	0.9335	3	2	1	6	0.75	691	323	1014
4:30 PM 5:30 PM	3	199	82	284	0.9103	135		195	330	0.927	119	285	2	406	0.9312	3	1	2	6	0.75	690	336	1026
4:45 PM 5:45 PM	3	207	77	287	0.8858	123		193	316	0.9294	119	273	3	395	0.9316	3	1	1	5	0.625	682	321	1003
5:00 PM 6:00 PM	3	219	75	297	0.9167	130	2	188	320	0.9412	122	246	5	373	0.8797	6	1	3	10	0.4167	670	330	1000
5:15 PM 6:15 PM	1	228	76	305	0.9077	113	3	200	316	0.9294	116	217	5	338	0.8622	7	2	3	12	0.5	643	328	971
5:30 PM 6:30 PM		224	77	301	0.8958	103	5	191	299	0.9116	114	205	5	324	0.8265	7	3	2	12	0.5	625	311	936
5:45 PM 6:45 PM	1	202	76	279	0.8304	103	5	171	279	0.8506	100	174	7	281	0.8892	7	3	3	13	0.5417	560	292	852
6:00 PM 7:00 PM	2	209	82	293	0.8139	77	3	155	235	0.7939	100	175	6	281	0.8892	4	3	1	8	0.6667	574	243	817

Wells + Associates, Inc.

McLean, Virginia

Pedestrian Volume Survey

PROJECT: Capstone - GMU Housing
W + A JOB NO: 7302
INTERSECTION: Layton Hall Dr. & University Dr.
LOCATION: City of Fairfax,VA
DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Laura
INPUTED BY: agan



Time Period	Movement 1	2	3	4	5	6	7	8	1 + 2	3 + 4	5 + 6	7+ 8	Total
15 Minute Volumes													
6:00 AM - 6:15 AM													
6:15 AM - 6:30 AM	1												
6:30 AM - 6:45 AM													
6:45 AM - 7:00 AM													
7:00 AM - 7:15 AM													
7:15 AM - 7:30 AM													
7:30 AM - 7:45 AM													
7:45 AM - 8:00 AM							1						
8:00 AM - 8:15 AM			2					1					
8:15 AM - 8:30 AM				5									
8:30 AM - 8:45 AM								1					
8:45 AM - 9:00 AM				3			1						
9:00 AM - 9:15 AM													
9:15 AM - 9:30 AM													
9:30 AM - 9:45 AM	2			2									
9:45 AM - 10:00 AM													
3:00 PM - 3:15 PM							1						
3:15 PM - 3:30 PM						2	1						
3:30 PM - 3:45 PM													
3:45 PM - 4:00 PM													
4:00 PM - 4:15 PM	3		1	1				4					
4:15 PM - 4:30 PM			1	1									
4:30 PM - 4:45 PM		2		2				1					
4:45 PM - 5:00 PM	1			1				1					
5:00 PM - 5:15 PM		1					1						
5:15 PM - 5:30 PM		1				2	1						
5:30 PM - 5:45 PM			1										
5:45 PM - 6:00 PM				1									
6:00 PM - 6:15 PM				1			2						
6:15 PM - 6:30 PM							1						
6:30 PM - 6:45 PM					2								
6:45 PM - 7:00 PM				1									
Total	7	4	5	18	2	4	9	8					
One Hour Volumes													
6:00 AM - 7:00 AM	1								1				1
6:15 AM - 7:15 AM	1								1				1
6:30 AM - 7:30 AM													
6:45 AM - 7:45 AM													
7:00 AM - 8:00 AM							1					1	1
7:15 AM - 8:15 AM			2				1	1		2		2	4
7:30 AM - 8:30 AM			2	5			1	1		7		2	9
7:45 AM - 8:45 AM			2	5			1	2		7		3	10
8:00 AM - 9:00 AM			2	8			1	2		10		3	13
8:15 AM - 9:15 AM				8			1	1		8		2	10
8:30 AM - 9:30 AM				3			1	1		3		2	5
8:45 AM - 9:45 AM	2			5			1		2	5		1	8
9:00 AM - 10:00 AM	2			2					2	2			4
3:00 PM - 4:00 PM						2	2				2	2	4
3:15 PM - 4:15 PM	3		1	1		2	1	4	3	2	2	5	12
3:30 PM - 4:30 PM	3		2	2				4	3	4		4	11
3:45 PM - 4:45 PM	3	2	2	4				5	5	6		5	16
4:00 PM - 5:00 PM	4	2	2	5				6	6	7		6	19
4:15 PM - 5:15 PM	1	3	1	4			1	2	4	5		3	12
4:30 PM - 5:30 PM	1	4		3		2	2	2	5	3	2	4	14
4:45 PM - 5:45 PM	1	2	1	1		2	2	1	3	2	2	3	10
5:00 PM - 6:00 PM		2	1	1		2	2		2	2	2	2	8
5:15 PM - 6:15 PM		1	1	2		2	3		1	3	2	3	9
5:30 PM - 6:30 PM			1	2			3			3		3	6
5:45 PM - 6:45 PM				2	2		3			2	2	3	7
6:00 PM - 7:00 PM				2	2		3			2	2	3	7

McLean, Virginia

Turning Movement Count - Bicycles

PROJECT:	Capstone - GMU Housing	**DATE:**	12/6/2017	**SOUTHBOUND ROAD:**	University Drive
W+A JOB NO:	7302	**DAY:**	Wednesday	**NORTHBOUND ROAD:**	University Drive
INTERSECTION:	Layton Hall Dr. & University Dr.	**WEATHER:**	clear	**WESTBOUND ROAD:**	Layton Hall Drive
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Laura	**EASTBOUND ROAD:**	Layton Hall Drive
		INPUTED BY:	agan		

Time	Southbound University Drive				Westbound Layton Hall Drive				Northbound University Drive				Eastbound Layton Hall Drive				North & South	East & West	Total
Period	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total			
15 Minute Volumes																			
6:00 AM - 6:15 AM																			
6:15 AM - 6:30 AM																			
6:30 AM - 6:45 AM									1			1					1		1
6:45 AM - 7:00 AM																			
7:00 AM - 7:15 AM		1		1													1		1
7:15 AM - 7:30 AM																			
7:30 AM - 7:45 AM																			
7:45 AM - 8:00 AM							1	1										1	1
8:00 AM - 8:15 AM		1		1													1		1
8:15 AM - 8:30 AM																			
8:30 AM - 8:45 AM					2			2										2	2
8:45 AM - 9:00 AM														1		1		1	1
9:00 AM - 9:15 AM																			
9:15 AM - 9:30 AM									1			1					1		1
9:30 AM - 9:45 AM						1		1										1	1
9:45 AM - 10:00 AM																			
3:00 PM - 3:15 PM					1			1							1	1		2	2
3:15 PM - 3:30 PM																			
3:30 PM - 3:45 PM																			
3:45 PM - 4:00 PM																			
4:00 PM - 4:15 PM																			
4:15 PM - 4:30 PM										1		1					1		1
4:30 PM - 4:45 PM																			
4:45 PM - 5:00 PM										1		1					1		1
5:00 PM - 5:15 PM																			
5:15 PM - 5:30 PM										1		1					1		1
5:30 PM - 5:45 PM																			
5:45 PM - 6:00 PM																			
6:00 PM - 6:15 PM																			
6:15 PM - 6:30 PM		1																	
6:30 PM - 6:45 PM																			
6:45 PM - 7:00 PM																			
Total	0	3	0	2	3	1	1	5	2	3	0	5	0	1	1	2	7	7	14
One Hour Volumes																			
6:00 AM - 7:00 AM									1			1					1		1
6:15 AM - 7:15 AM		1		1					1			1					2		2
6:30 AM - 7:30 AM		1		1					1			1					2		2
6:45 AM - 7:45 AM		1		1													1		1
7:00 AM - 8:00 AM		1		1			1	1									1	1	2
7:15 AM - 8:15 AM		1		1			1	1									1	1	2
7:30 AM - 8:30 AM		1		1			1	1									1	1	2
7:45 AM - 8:45 AM		1		1	2		1	3									1	3	4
8:00 AM - 9:00 AM		1		1	2			2						1		1	1	3	4
8:15 AM - 9:15 AM					2			2						1		1		3	3
8:30 AM - 9:30 AM					2			2	1			1		1		1	1	3	4
8:45 AM - 9:45 AM						1		1	1			1		1		1	1	2	3
9:00 AM - 10:00 AM						1		1	1			1					1	1	2
3:00 PM - 4:00 PM					1			1							1	1		2	2
3:15 PM - 4:15 PM																			
3:30 PM - 4:30 PM										1		1					1		1
3:45 PM - 4:45 PM										1		1					1		1
4:00 PM - 5:00 PM										2		2					2		2
4:15 PM - 5:15 PM										2		2					2		2
4:30 PM - 5:30 PM										2		2					2		2
4:45 PM - 5:45 PM										2		2					2		2
5:00 PM - 6:00 PM																			
5:15 PM - 6:15 PM																			
5:30 PM - 6:30 PM																			
5:45 PM - 6:45 PM																			
6:00 PM - 7:00 PM										1		1					1		1

Wells & Associates,Inc

McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT: Capstone - GMU Housing
W+A JOB NO: 7302
INTERSECTION: Layton Hall Dr. & Site Entr.
LOCATION: City of Fairfax,VA

DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Muris
INPUTED BY: agan

SOUTHBOUND ROAD: 0
NORTHBOUND ROAD: Site Entrance
WESTBOUND ROAD: Layton Hall Drive
EASTBOUND ROAD: Layton Hall Drive

Time	Southbound 0					Westbound Layton Hall Drive					Northbound Site Entrance					Eastbound Layton Hall Drive					North & South	East & West	Total
Period	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM							9		9				1	1			30		30		1	39	40
6:15 AM - 6:30 AM							3		3		1		1	2			31		31		2	34	36
6:30 AM - 6:45 AM							12	1	13				2	2			36		36		2	49	51
6:45 AM - 7:00 AM							28		28							2	55		57			85	85
7:00 AM - 7:15 AM							23		23		1			1		4	60		64		1	87	88
7:15 AM - 7:30 AM							26	4	30							6	86		92			122	122
7:30 AM - 7:45 AM							23	1	24		1		1	2		5	105		110		2	134	136
7:45 AM - 8:00 AM							58	4	62		2		1	3		2	75		77		3	139	142
8:00 AM - 8:15 AM							36	2	38		1			1		10	38		48		1	86	87
8:15 AM - 8:30 AM							42	4	46				2	2		14	59		73		2	119	121
8:30 AM - 8:45 AM							34	3	37		3		2	5		9	67		76		5	113	118
8:45 AM - 9:00 AM							52	2	54		1		4	5		5	54		59		5	113	118
9:00 AM - 9:15 AM							40	1	41		3		5	8		6	39		45		8	86	94
9:15 AM - 9:30 AM							26	1	27		1		4	5		6	45		51		5	78	83
9:30 AM - 9:45 AM							31	1	32		4		4	8		14	42		56		8	88	96
9:45 AM - 10:00 AM							31	3	34		1		6	7		11	40		51		7	85	92
3:00 PM 3:15 PM							92	3	95		3		7	10		3	51		54		10	149	159
3:15 PM 3:30 PM							65	2	67		2		8	10		7	43		50		10	117	127
3:30 PM 3:45 PM							42	3	45		4		7	11		6	59		65		11	110	121
3:45 PM 4:00 PM							59	2	61		5		7	12		3	42		45		12	106	118
4:00 PM 4:15 PM							73	1	74		3		6	9		1	41		42		9	116	125
4:15 PM 4:30 PM							61	1	62		1		10	11		4	34		38		11	100	111
4:30 PM 4:45 PM							81	1	82		6		13	19		1	56		57		19	139	158
4:45 PM 5:00 PM							73	4	77		4		3	7		1	44		45		7	122	129
5:00 PM 5:15 PM							66		66		5		11	16		3	50		53		16	119	135
5:15 PM 5:30 PM							75	1	76		2		5	7		1	45		46		7	122	129
5:30 PM 5:45 PM							69		69		2		3	5		2	46		48		5	117	122
5:45 PM 6:00 PM							74		74				3	3		1	44		45		3	119	122
6:00 PM 6:15 PM							75		75		2		1	3		2	46		48		3	123	126
6:15 PM 6:30 PM							58		58				3	3			49		49		3	107	110
6:30 PM 6:45 PM							53		53				3	3		1	28		29		3	82	85
6:45 PM 7:00 PM							33		33		1			1		1	52		53		1	86	87
Total	0	0	0	0		0	1523	45	1568		59	0	123	182		131	1592	0	1723		182	3291	3473
One Hour Volumes																							
6:00 AM - 7:00 AM							52	1	53	0.4732	1		4	5	0.625	2	152		154	0.6754	5	207	212
6:15 AM - 7:15 AM							66	1	67	0.5982	2		3	5	0.625	6	182		188	0.7344	5	255	260
6:30 AM - 7:30 AM							89	5	94	0.7833	1		2	3	0.375	12	237		249	0.6766	3	343	346
6:45 AM - 7:45 AM							100	5	105	0.875	2		1	3	0.375	17	306		323	0.7341	3	428	431
7:00 AM - 8:00 AM							130	9	139	0.5605	4		2	6	0.5	17	326		343	0.7795	6	482	488
7:15 AM - 8:15 AM							143	11	154	0.621	4		2	6	0.5	23	304		327	0.7432	6	481	487
7:30 AM - 8:30 AM							159	11	170	0.6855	4		4	8	0.6667	31	277		308	0.7	8	478	486
7:45 AM - 8:45 AM							170	13	183	0.7379	6		5	11	0.55	35	239		274	0.8896	11	457	468
8:00 AM - 9:00 AM							164	11	175	0.8102	5		8	13	0.65	38	218		256	0.8421	13	431	444
8:15 AM - 9:15 AM							168	10	178	0.8241	7		13	20	0.625	34	219		253	0.8322	20	431	451
8:30 AM - 9:30 AM							152	7	159	0.7361	8		15	23	0.7188	26	205		231	0.7599	23	390	413
8:45 AM - 9:45 AM							149	5	154	0.713	9		17	26	0.8125	31	180		211	0.8941	26	365	391
9:00 AM 10:00 AM							128	6	134	0.8171	9		19	28	0.875	37	166		203	0.9063	28	337	365
3:00 PM 4:00 PM							258	10	268	0.7053	14		29	43	0.8958	19	195		214	0.8231	43	482	525
3:15 PM 4:15 PM							239	8	247	0.8345	14		28	42	0.875	17	185		202	0.7769	42	449	491
3:30 PM 4:30 PM							235	7	242	0.8176	13		30	43	0.8958	14	176		190	0.7308	43	432	475
3:45 PM 4:45 PM							274	5	279	0.8506	15		36	51	0.6711	9	173		182	0.7982	51	461	512
4:00 PM 5:00 PM							288	7	295	0.8994	14		32	46	0.6053	7	175		182	0.7982	46	477	523
4:15 PM 5:15 PM							281	6	287	0.875	16		37	53	0.6974	9	184		193	0.8465	53	480	533
4:30 PM 5:30 PM							295	6	301	0.9177	17		32	49	0.6447	6	195		201	0.8816	49	502	551
4:45 PM 5:45 PM							283	5	288	0.9351	13		22	35	0.5469	7	185		192	0.9057	35	480	515
5:00 PM 6:00 PM							284	1	285	0.9375	9		22	31	0.4844	7	185		192	0.9057	31	477	508
5:15 PM 6:15 PM							293	1	294	0.9671	6		12	18	0.6429	6	181		187	0.974	18	481	499
5:30 PM 6:30 PM							276		276	0.92	4		10	14	0.7	5	185		190	0.9694	14	466	480
5:45 PM 6:45 PM							260		260	0.8667	2		10	12	1	4	167		171	0.8724	12	431	443
6:00 PM 7:00 PM							219		219	0.73	3		7	10	0.8333	4	175		179	0.8443	10	398	408

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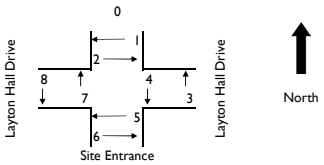
McLean, Virginia

Pedestrian Volume Survey

PROJECT: Capstone - GMU Housing
W + A JOB NO: 7302
INTERSECTION: Layton Hall Dr. & Site Entr.
LOCATION: City of Fairfax,VA
DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Muris
INPUTED BY: agan



Time Period	1	2	3	4	5	6	7	8	1 + 2	3 + 4	5 + 6	7+ 8	Total
	Movement												
15 Minute Volumes													
6:00 AM - 6:15 AM													
6:15 AM - 6:30 AM													
6:30 AM - 6:45 AM													
6:45 AM - 7:00 AM													
7:00 AM - 7:15 AM													
7:15 AM - 7:30 AM		1		1									
7:30 AM - 7:45 AM	1	1											
7:45 AM - 8:00 AM				1									
8:00 AM - 8:15 AM					3								
8:15 AM - 8:30 AM	2												
8:30 AM - 8:45 AM					1								
8:45 AM - 9:00 AM	2			1		3							
9:00 AM - 9:15 AM													
9:15 AM - 9:30 AM				1									
9:30 AM - 9:45 AM				2									
9:45 AM - 10:00 AM	1		3	3									
3:00 PM - 3:15 PM			2	1									
3:15 PM - 3:30 PM		2	1	3									
3:30 PM - 3:45 PM	3			1									
3:45 PM - 4:00 PM			`			1							
4:00 PM - 4:15 PM			4	2									
4:15 PM - 4:30 PM			2										
4:30 PM - 4:45 PM	3		1	1									
4:45 PM - 5:00 PM				4		1							
5:00 PM - 5:15 PM			3	2									
5:15 PM - 5:30 PM			3	2			1						
5:30 PM - 5:45 PM			1	1									
5:45 PM - 6:00 PM	2			2									
6:00 PM - 6:15 PM			1										
6:15 PM - 6:30 PM			1			2							
6:30 PM - 6:45 PM			1	4									
6:45 PM - 7:00 PM		1											
Total	14	5	23	32	4	7	1	0					
One Hour Volumes													
6:00 AM - 7:00 AM													
6:15 AM - 7:15 AM													
6:30 AM - 7:30 AM		1		1					1	1			2
6:45 AM - 7:45 AM	1	2		1					3	1			4
7:00 AM - 8:00 AM	1	2		2					3	2			5
7:15 AM - 8:15 AM	1	2		2	3				3	2	3		8
7:30 AM - 8:30 AM	3	1		1	3				4	1	3		8
7:45 AM - 8:45 AM	2			1	4				2	1	4		7
8:00 AM - 9:00 AM	4			1	4	3			4	1	7		12
8:15 AM - 9:15 AM	4			1	1	3			4	1	4		9
8:30 AM - 9:30 AM	2			2	1	3			2	2	4		8
8:45 AM - 9:45 AM	2			4		3			2	4	3		9
9:00 AM - 10:00 AM	1		3	6					1	9			10
3:00 PM - 4:00 PM	3	2	3	5		1			5	8	1		14
3:15 PM - 4:15 PM	3	2	5	6		1			5	11	1		17
3:30 PM - 4:30 PM	3		6	3		1			3	9	1		13
3:45 PM - 4:45 PM	3		7	3		1			3	10	1		14
4:00 PM - 5:00 PM	3		7	7		1			3	14	1		18
4:15 PM - 5:15 PM	3		6	7		1			3	13	1		17
4:30 PM - 5:30 PM	3		7	9		1	1		3	16	1	1	21
4:45 PM - 5:45 PM			7	9		1	1			16	1	1	18
5:00 PM - 6:00 PM	2		7	7			1		2	14		1	17
5:15 PM - 6:15 PM	2		5	5			1		2	10		1	13
5:30 PM - 6:30 PM	2		3	3		2			2	6	2		10
5:45 PM - 6:45 PM	2		3	6		2			2	9	2		13
6:00 PM - 7:00 PM		1	3	4		2			1	7	2		10

McLean, Virginia

Turning Movement Count - Bicycles

PROJECT:	Capstone - GMU Housing	**DATE:**	12/6/2017	**SOUTHBOUND ROAD:**	0
W+A JOB NO:	7302	**DAY:**	Wednesday	**NORTHBOUND ROAD:**	Site Entrance
INTERSECTION:	Layton Hall Dr. & Site Entr.	**WEATHER:**	clear	**WESTBOUND ROAD:**	Layton Hall Drive
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Muris	**EASTBOUND ROAD:**	Layton Hall Drive
		INPUTED BY:	agan		

Time	Southbound 0				Westbound Layton Hall Drive				Northbound Site Entrance				Eastbound Layton Hall Drive				North & South	East & West	Total
Period	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total			
15 Minute Volumes																			
6:00 AM - 6:15 AM																			
6:15 AM - 6:30 AM																			
6:30 AM - 6:45 AM																			
6:45 AM - 7:00 AM																			
7:00 AM - 7:15 AM																			
7:15 AM - 7:30 AM																			
7:30 AM - 7:45 AM																			
7:45 AM - 8:00 AM						1		1										1	1
8:00 AM - 8:15 AM																			
8:15 AM - 8:30 AM							1	1										1	1
8:30 AM - 8:45 AM						1		1	1			1					1	1	2
8:45 AM - 9:00 AM																			
9:00 AM - 9:15 AM														1		1		1	1
9:15 AM - 9:30 AM																			
9:30 AM - 9:45 AM						1		1										1	1
9:45 AM - 10:00 AM																			
3:00 PM - 3:15 PM																			
3:15 PM - 3:30 PM																			
3:30 PM - 3:45 PM																			
3:45 PM - 4:00 PM									1			1					1		1
4:00 PM - 4:15 PM																			
4:15 PM - 4:30 PM																			
4:30 PM - 4:45 PM																			
4:45 PM - 5:00 PM																			
5:00 PM - 5:15 PM																			
5:15 PM - 5:30 PM																			
5:30 PM - 5:45 PM																			
5:45 PM - 6:00 PM																			
6:00 PM - 6:15 PM																			
6:15 PM - 6:30 PM																			
6:30 PM - 6:45 PM																			
6:45 PM - 7:00 PM																			
Total	0	0	0	0	0	3	1	4	2	0	0	2	0	1	0	1	2	5	7
One Hour Volumes																			
6:00 AM - 7:00 AM																			
6:15 AM - 7:15 AM																			
6:30 AM - 7:30 AM																			
6:45 AM - 7:45 AM																			
7:00 AM - 8:00 AM						1		1										1	1
7:15 AM - 8:15 AM						1		1										1	1
7:30 AM - 8:30 AM						1	1	2										2	2
7:45 AM - 8:45 AM						2	1	3	1			1					1	3	4
8:00 AM - 9:00 AM						1	1	2	1			1					1	2	3
8:15 AM - 9:15 AM						1	1	2	1			1		1		1	1	3	4
8:30 AM - 9:30 AM						1		1	1			1		1		1	1	2	3
8:45 AM - 9:45 AM						1		1						1		1		2	2
9:00 AM - 10:00 AM						1		1						1		1		2	2
3:00 PM - 4:00 PM									1			1					1		1
3:15 PM - 4:15 PM									1			1					1		1
3:30 PM - 4:30 PM									1			1					1		1
3:45 PM - 4:45 PM									1			1					1		1
4:00 PM - 5:00 PM																			
4:15 PM - 5:15 PM																			
4:30 PM - 5:30 PM																			
4:45 PM - 5:45 PM																			
5:00 PM - 6:00 PM																			
5:15 PM - 6:15 PM																			
5:30 PM - 6:30 PM																			
5:45 PM - 6:45 PM																			
6:00 PM - 7:00 PM																			

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McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT: Capstone - GMU Housing
W+A JOB NO: 7302
INTERSECTION: Layton Hall Dr. & Democracy Ln..
LOCATION: City of Fairfax,VA

DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Jose
INPUTED BY: agan

SOUTHBOUND ROAD: Driveway
NORTHBOUND ROAD: Democracy Lane
WESTBOUND ROAD: Layton Hall Drive
EASTBOUND ROAD: Layton Hall Drive

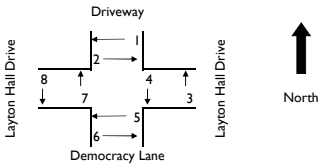
Time	Southbound Driveway					Westbound Layton Hall Drive					Northbound Democracy Lane					Eastbound Layton Hall Drive					North & South	East & West	Total
Period	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM	1	1		2			7	2	9							1	29	1	31		2	40	42
6:15 AM - 6:30 AM							3	1	4		2			2			33		33		2	37	39
6:30 AM - 6:45 AM	1			1			8	1	9		1			1			36		36		2	45	47
6:45 AM - 7:00 AM	1			1			22		22							3	52	4	59		1	81	82
7:00 AM - 7:15 AM	4		1	5			14	3	17		3		1	4		2	63		65		9	82	91
7:15 AM - 7:30 AM							31	1	32		4			4		3	78	3	84		4	116	120
7:30 AM - 7:45 AM			1	1		2	29	3	34		3	1		4		1	103	3	107		5	141	146
7:45 AM - 8:00 AM	6			6		1	53	6	60		4			4		1	74	5	80		10	140	150
8:00 AM - 8:15 AM	2		1	3		1	34	10	45		7		1	8		6	41		47		11	92	103
8:15 AM - 8:30 AM			1	1		1	39	11	51		3		4	7		4	40	6	50		8	101	109
8:30 AM - 8:45 AM						1	37	2	40		4		3	7		5	55	2	62		7	102	109
8:45 AM - 9:00 AM	1			1			45	8	53		3	1	2	6		9	43	3	55		7	108	115
9:00 AM - 9:15 AM							18	6	24		2			2			22	2	24		2	48	50
9:15 AM - 9:30 AM	3			3		1	18	6	25		2		4	6		2	40		42		9	67	76
9:30 AM - 9:45 AM	1		1	2			25	2	27		6		2	8		5	38	4	47		10	74	84
9:45 AM - 10:00 AM	3		2	5		2	24	6	32		11		1	12		5	28	6	39		17	71	88
3:00 PM 3:15 PM	9		5	14		1	80	3	84		8		2	10		4	56		60		24	144	168
3:15 PM 3:30 PM	3			3		1	57	4	62		10	1	2	13		4	42		46		16	108	124
3:30 PM 3:45 PM	4		5	9		1	36	4	41		12		2	14		4	61		65		23	106	129
3:45 PM 4:00 PM	2	1	1	4			52	8	60		15		5	20		2	39		41		24	101	125
4:00 PM 4:15 PM	6		1	7			57	7	64		8		2	10		3	36	4	43		17	107	124
4:15 PM 4:30 PM	6		4	10			48	12	60		9		3	12		1	36		37		22	97	119
4:30 PM 4:45 PM	5		4	9			71	6	77		10		2	12		3	55	1	59		21	136	157
4:45 PM 5:00 PM	1			1			60	7	67		9		3	12			51	1	52		13	119	132
5:00 PM 5:15 PM	4	1	1	6			51	9	60		10	1	5	16		3	52		55		22	115	137
5:15 PM 5:30 PM	5		1	6			74	3	77		10		2	12		2	43		45		18	122	140
5:30 PM 5:45 PM	1		4	5			67	4	71		7		2	9			50		50		14	121	135
5:45 PM 6:00 PM	1		3	4			64	12	76				1	1		4	42		46		5	122	127
6:00 PM 6:15 PM	3		1	4			69	2	71		9		1	10		2	49		51		14	122	136
6:15 PM 6:30 PM	1			1			55	3	58		7		2	9		1	45		46		10	104	114
6:30 PM 6:45 PM	1			1			54	10	64		8			8		1	34		35		9	99	108
6:45 PM 7:00 PM	2		1	3			34	5	39		5			5		2	51		53		8	92	100
Total	77	3	38	118		12	1336	167	1515		192	4	52	248		83	1517	45	1645		366	3160	3526
One Hour Volumes																							
6:00 AM - 7:00 AM	3	1		4	0.5		40	4	44	0.5	3			3	0.375	4	150	5	159	0.6737	7	203	210
6:15 AM - 7:15 AM	6		1	7	0.35		47	5	52	0.5909	6		1	7	0.4375	5	184	4	193	0.7423	14	245	259
6:30 AM - 7:30 AM	6		1	7	0.35		75	5	80	0.625	8		1	9	0.5625	8	229	7	244	0.7262	16	324	340
6:45 AM - 7:45 AM	5		2	7	0.35	2	96	7	105	0.7721	10	1	1	12	0.75	9	296	10	315	0.736	19	420	439
7:00 AM - 8:00 AM	10		2	12	0.5	3	127	13	143	0.5958	14	1	1	16	1	7	318	11	336	0.785	28	479	507
7:15 AM - 8:15 AM	8		2	10	0.4167	4	147	20	171	0.7125	18	1	1	20	0.625	11	296	11	318	0.743	30	489	519
7:30 AM - 8:30 AM	8		3	11	0.4583	5	155	30	190	0.7917	17	1	5	23	0.7188	12	258	14	284	0.6636	34	474	508
7:45 AM - 8:45 AM	8		2	10	0.4167	4	163	29	196	0.8167	18		8	26	0.8125	16	210	13	239	0.7469	36	435	471
8:00 AM - 9:00 AM	3		2	5	0.4167	3	155	31	189	0.8915	17	1	10	28	0.875	24	179	11	214	0.8629	33	403	436
8:15 AM - 9:15 AM	1		1	2	0.5	2	139	27	168	0.7925	12	1	9	22	0.7857	18	160	13	191	0.7702	24	359	383
8:30 AM - 9:30 AM	4			4	0.3333	2	118	22	142	0.6698	11	1	9	21	0.75	16	160	7	183	0.7379	25	325	350
8:45 AM - 9:45 AM	5		1	6	0.5	1	106	22	129	0.6085	13	1	8	22	0.6875	16	143	9	168	0.7636	28	297	325
9:00 AM 10:00 AM	7		3	10	0.5	3	85	20	108	0.8438	21		7	28	0.5833	12	128	12	152	0.8085	38	260	298
3:00 PM 4:00 PM	18	1	11	30	0.5357	3	225	19	247	0.7351	45	1	11	57	0.7125	14	198		212	0.8154	87	459	546
3:15 PM 4:15 PM	15	1	7	23	0.6389	2	202	23	227	0.8867	45	1	11	57	0.7125	13	178	4	195	0.75	80	422	502
3:30 PM 4:30 PM	18	1	11	30	0.75	1	193	31	225	0.8789	44		12	56	0.7	10	172	4	186	0.7154	86	411	497
3:45 PM 4:45 PM	19	1	10	30	0.75		228	33	261	0.8474	42		12	54	0.675	9	166	5	180	0.7627	84	441	525
4:00 PM 5:00 PM	18		9	27	0.675		236	32	268	0.8701	36		10	46	0.9583	7	178	6	191	0.8093	73	459	532
4:15 PM 5:15 PM	16	1	9	26	0.65		230	34	264	0.8571	38	1	13	52	0.8125	7	194	2	203	0.8602	78	467	545
4:30 PM 5:30 PM	15	1	6	22	0.6111		256	25	281	0.9123	39	1	12	52	0.8125	8	201	2	211	0.8941	74	492	566
4:45 PM 5:45 PM	11	1	6	18	0.75		252	23	275	0.8929	36	1	12	49	0.7656	5	196	1	202	0.9182	67	477	544
5:00 PM 6:00 PM	11	1	9	21	0.875		256	28	284	0.9221	27	1	10	38	0.5938	9	187		196	0.8909	59	480	539
5:15 PM 6:15 PM	10		9	19	0.7917		274	21	295	0.9578	26		6	32	0.6667	8	184		192	0.9412	51	487	538
5:30 PM 6:30 PM	6		8	14	0.7		255	21	276	0.9079	23		6	29	0.725	7	186		193	0.9461	43	469	512
5:45 PM 6:45 PM	6		4	10	0.625		242	27	269	0.8849	24		4	28	0.7	8	170		178	0.8725	38	447	485
6:00 PM 7:00 PM	7		2	9	0.5625		212	20	232	0.8169	29		3	32	0.8	6	179		185	0.8726	41	417	458

Wells + Associates, Inc.

McLean, Virginia

Pedestrian Volume Survey

PROJECT: Capstone - GMU Housing
W + A JOB NO: 7302
INTERSECTION: Layton Hall Dr. & Democracy Ln..
LOCATION: City of Fairfax,VA
DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Jose
INPUTED BY: agan



Time Period	1	2	3	4	5	6	7	8	1 + 2	3 + 4	5 + 6	7+ 8	Total
	Movement												
15 Minute Volumes													
6:00 AM - 6:15 AM		1											
6:15 AM - 6:30 AM													
6:30 AM - 6:45 AM													
6:45 AM - 7:00 AM		1											
7:00 AM - 7:15 AM													
7:15 AM - 7:30 AM		2											
7:30 AM - 7:45 AM	2	13											
7:45 AM - 8:00 AM		1											
8:00 AM - 8:15 AM		1			2								
8:15 AM - 8:30 AM													
8:30 AM - 8:45 AM													
8:45 AM - 9:00 AM													
9:00 AM - 9:15 AM													
9:15 AM - 9:30 AM	1	1											
9:30 AM - 9:45 AM													
9:45 AM - 10:00 AM					1								
3:00 PM - 3:15 PM	14	1											
3:15 PM - 3:30 PM		1											
3:30 PM - 3:45 PM			1										
3:45 PM - 4:00 PM	2	2					1						
4:00 PM - 4:15 PM		1		2	1								
4:15 PM - 4:30 PM					1								
4:30 PM - 4:45 PM	5												
4:45 PM - 5:00 PM								1					
5:00 PM - 5:15 PM		1											
5:15 PM - 5:30 PM	3	1											
5:30 PM - 5:45 PM													
5:45 PM - 6:00 PM													
6:00 PM - 6:15 PM													
6:15 PM - 6:30 PM						2							
6:30 PM - 6:45 PM													
6:45 PM - 7:00 PM													
Total	27	27	1	2	5	2	1	1					
One Hour Volumes													
6:00 AM - 7:00 AM		2							2				2
6:15 AM - 7:15 AM		1							1				1
6:30 AM - 7:30 AM		3							3				3
6:45 AM - 7:45 AM	2	16							18				18
7:00 AM - 8:00 AM	2	16							18				18
7:15 AM - 8:15 AM	2	17			2				19		2		21
7:30 AM - 8:30 AM	2	15			2				17		2		19
7:45 AM - 8:45 AM		2			2				2		2		4
8:00 AM - 9:00 AM		1			2				1		2		3
8:15 AM - 9:15 AM													
8:30 AM - 9:30 AM	1	1							2				2
8:45 AM - 9:45 AM	1	1							2				2
9:00 AM - 10:00 AM	1	1			1				2		1		3
3:00 PM - 4:00 PM	16	4	1				1		20	1		1	22
3:15 PM - 4:15 PM	2	4	1	2	1		1		6	3	1	1	11
3:30 PM - 4:30 PM	2	3	1	2	2		1		5	3	2	1	11
3:45 PM - 4:45 PM	7	3		2	2		1		10	2	2	1	15
4:00 PM - 5:00 PM	5	1		2	2			1	6	2	2	1	11
4:15 PM - 5:15 PM	5	1			1			1	6		1	1	8
4:30 PM - 5:30 PM	8	2						1	10			1	11
4:45 PM - 5:45 PM	3	2						1	5			1	6
5:00 PM - 6:00 PM	3	2							5				5
5:15 PM - 6:15 PM	3	1							4				4
5:30 PM - 6:30 PM						2					2		2
5:45 PM - 6:45 PM						2					2		2
6:00 PM - 7:00 PM						2					2		2

McLean, Virginia

Turning Movement Count - Bicycles

PROJECT:	Capstone - GMU Housing	**DATE:**	12/6/2017	**SOUTHBOUND ROAD:**	Driveway
W+A JOB NO:	7302	**DAY:**	Wednesday	**NORTHBOUND ROAD:**	Democracy Lane
INTERSECTION:	Layton Hall Dr. & Democracy Ln..	**WEATHER:**	clear	**WESTBOUND ROAD:**	Layton Hall Drive
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Jose	**EASTBOUND ROAD:**	Layton Hall Drive
		INPUTED BY:	agan		

Time	Southbound Driveway				Westbound Layton Hall Drive				Northbound Democracy Lane				Eastbound Layton Hall Drive				North & South	East & West	Total
Period	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total			
15 Minute Volumes																			
6:00 AM - 6:15 AM																			
6:15 AM - 6:30 AM																			
6:30 AM - 6:45 AM																			
6:45 AM - 7:00 AM														1		1		1	1
7:00 AM - 7:15 AM																			
7:15 AM - 7:30 AM																			
7:30 AM - 7:45 AM																			
7:45 AM - 8:00 AM																			
8:00 AM - 8:15 AM										1		1					1		1
8:15 AM - 8:30 AM																			
8:30 AM - 8:45 AM																			
8:45 AM - 9:00 AM																			
9:00 AM - 9:15 AM																			
9:15 AM - 9:30 AM														1		1		1	1
9:30 AM - 9:45 AM																			
9:45 AM - 10:00 AM																			
3:00 PM - 3:15 PM																			
3:15 PM - 3:30 PM						1		1										1	1
3:30 PM - 3:45 PM																			
3:45 PM - 4:00 PM																			
4:00 PM - 4:15 PM																			
4:15 PM - 4:30 PM																			
4:30 PM - 4:45 PM																			
4:45 PM - 5:00 PM														1		1		1	1
5:00 PM - 5:15 PM																			
5:15 PM - 5:30 PM																			
5:30 PM - 5:45 PM											1	1					1		1
5:45 PM - 6:00 PM																			
6:00 PM - 6:15 PM																			
6:15 PM - 6:30 PM																			
6:30 PM - 6:45 PM																			
6:45 PM - 7:00 PM																			
Total	0	0	0	0	0	1	0	1	0	1	1	2	0	3	0	3	2	4	6
One Hour Volumes																			
6:00 AM - 7:00 AM														1		1		1	1
6:15 AM - 7:15 AM														1		1		1	1
6:30 AM - 7:30 AM														1		1		1	1
6:45 AM - 7:45 AM														1		1		1	1
7:00 AM - 8:00 AM																			
7:15 AM - 8:15 AM										1		1					1		1
7:30 AM - 8:30 AM										1		1					1		1
7:45 AM - 8:45 AM										1		1					1		1
8:00 AM - 9:00 AM										1		1					1		1
8:15 AM - 9:15 AM																			
8:30 AM - 9:30 AM														1		1		1	1
8:45 AM - 9:45 AM														1		1		1	1
9:00 AM - 10:00 AM														1		1		1	1
3:00 PM - 4:00 PM						1		1										1	1
3:15 PM - 4:15 PM						1		1										1	1
3:30 PM - 4:30 PM																			
3:45 PM - 4:45 PM																			
4:00 PM - 5:00 PM														1		1		1	1
4:15 PM - 5:15 PM														1		1		1	1
4:30 PM - 5:30 PM														1		1		1	1
4:45 PM - 5:45 PM											1	1		1		1	1	1	2
5:00 PM - 6:00 PM																			
5:15 PM - 6:15 PM																			
5:30 PM - 6:30 PM																			
5:45 PM - 6:45 PM																			
6:00 PM - 7:00 PM											1	1					1		1

Wells & Associates,Inc

McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT: Capstone - GMU Housing
W+A JOB NO: 7302
INTERSECTION: Layton Hall Dr. & Old Lee Hwy.
LOCATION: City of Fairfax,VA

DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Muha & Teuta
INPUTED BY: agan

SOUTHBOUND ROAD: Old Lee Highway
NORTHBOUND ROAD: Old Lee Highway
WESTBOUND ROAD: Farrcroft Drive
EASTBOUND ROAD: Layton Hall Drive

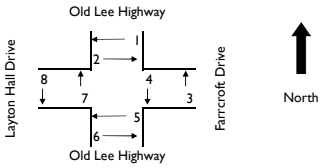
Time	Southbound Old Lee Highway					Westbound Farrcroft Drive					Northbound Old Lee Highway					Eastbound Layton Hall Drive					North & South	East & West	Total
Period	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM	7	9		16		3	1		4			39		39		1		28	29		55	33	88
6:15 AM - 6:30 AM	1	21		22		4	1		5			47	1	48		4		28	32		70	37	107
6:30 AM - 6:45 AM	8	19	1	28		5		1	6		1	55	1	57		6	1	30	37		85	43	128
6:45 AM - 7:00 AM	20	45	3	68		3	1		4		2	54	4	60		1		51	52		128	56	184
7:00 AM - 7:15 AM	14	24	3	41		4	2	1	7		1	99	3	103		4	2	53	59		144	66	210
7:15 AM - 7:30 AM	17	54	9	80		6	2	3	11		1	141	7	149		4	2	85	91		229	102	331
7:30 AM - 7:45 AM	30	80	3	113		21	1	7	29		2	152	6	160		3	4	95	102		273	131	404
7:45 AM - 8:00 AM	50	112	8	170		46	4	4	54		4	114	8	126		3	11	70	84		296	138	434
8:00 AM - 8:15 AM	31	103	6	140		17	2	3	22		2	137	16	155		3	6	47	56		295	78	373
8:15 AM - 8:30 AM	35	76	5	116		5	2	2	9		3	103	8	114		7		43	50		230	59	289
8:30 AM - 8:45 AM	28	99	3	130		12	1	2	15		1	100	14	115		7	3	49	59		245	74	319
8:45 AM - 9:00 AM	44	84	11	139		11	3	4	18		3	99	8	110		9		36	45		249	63	312
9:00 AM - 9:15 AM	32	94	2	128		4	5	3	12		2	66	6	74		7	1	19	27		202	39	241
9:15 AM - 9:30 AM	28	75		103		2	3	3	8		2	83	5	90		9	1	29	39		193	47	240
9:30 AM - 9:45 AM	18	93	3	114		7	1	4	12		2	67	7	76		6	1	35	42		190	54	244
9:45 AM - 10:00 AM	25	91	5	121		4	3	4	11		3	70	17	90		11	1	28	40		211	51	262
3:00 PM 3:15 PM	73	149	43	265		10		4	14		7	76	10	93		17	4	41	62		358	76	434
3:15 PM 3:30 PM	53	162	3	218		2	3	5	10		6	88	8	102		10	1	38	49		320	59	379
3:30 PM 3:45 PM	28	113	2	143		4	1	4	9		2	90	11	103		18	4	54	76		246	85	331
3:45 PM 4:00 PM	45	154	12	211		1	1	5	7		5	73	13	91		17	2	38	57		302	64	366
4:00 PM 4:15 PM	60	169	5	234		6	1	4	11		3	75	9	87		15	5	26	46		321	57	378
4:15 PM 4:30 PM	45	170	5	220		3	5	3	11		8	90	16	114		15		31	46		334	57	391
4:30 PM 4:45 PM	87	181	1	269		1		3	4		8	89	7	104		22	3	43	68		373	72	445
4:45 PM 5:00 PM	70	173	15	258		3	3	1	7		3	71	8	82		13	5	42	60		340	67	407
5:00 PM 5:15 PM	52	163	5	220		3	3	7	13		6	114	9	129		10	4	48	62		349	75	424
5:15 PM 5:30 PM	70	186	6	262		8	5	1	14		5	94	5	104		12	6	41	59		366	73	439
5:30 PM 5:45 PM	71	204	10	285		2	2	4	8		5	106	8	119		9	4	46	59		404	67	471
5:45 PM 6:00 PM	65	180	6	251		8	2	1	11		4	100	12	116		9	4	31	44		367	55	422
6:00 PM 6:15 PM	64	166	13	243		3	1	2	6		6	88	9	103		8	6	45	59		346	65	411
6:15 PM 6:30 PM	38	165	12	215		4	5		9		7	91	13	111		6	2	44	52		326	61	387
6:30 PM 6:45 PM	48	165	10	223		2	5	4	11		5	74	11	90		9	2	31	42		313	53	366
6:45 PM 7:00 PM	24	114	4	142		6	3		9		3	90	10	103		11	1	56	68		245	77	322
Total	1281	3693	214	5188		220	72	89	381		112	2835	270	3217		286	86	1381	1753		8405	2134	10539
One Hour Volumes																							
6:00 AM - 7:00 AM	36	94	4	134	0.4926	15	3	1	19	0.7917	3	195	6	204	0.85	12	1	137	150	0.7212	338	169	507
6:15 AM - 7:15 AM	43	109	7	159	0.5846	16	4	2	22	0.7857	4	255	9	268	0.6505	15	3	162	180	0.7627	427	202	629
6:30 AM - 7:30 AM	59	142	16	217	0.6781	18	5	5	28	0.6364	5	349	15	369	0.6191	15	5	219	239	0.6566	586	267	853
6:45 AM - 7:45 AM	81	203	18	302	0.6681	34	6	11	51	0.4397	6	446	20	472	0.7375	12	8	284	304	0.7451	774	355	1129
7:00 AM - 8:00 AM	111	270	23	404	0.5941	77	9	15	101	0.4676	8	506	24	538	0.8406	14	19	303	336	0.8235	942	437	1379
7:15 AM - 8:15 AM	128	349	26	503	0.7397	90	9	17	116	0.537	9	544	37	590	0.9219	13	23	297	333	0.8162	1093	449	1542
7:30 AM - 8:30 AM	146	371	22	539	0.7926	89	9	16	114	0.5278	11	506	38	555	0.8672	16	21	255	292	0.7157	1094	406	1500
7:45 AM - 8:45 AM	144	390	22	556	0.8176	80	9	11	100	0.463	10	454	46	510	0.8226	20	20	209	249	0.7411	1066	349	1415
8:00 AM - 9:00 AM	138	362	25	525	0.9375	45	8	11	64	0.7273	9	439	46	494	0.7968	26	9	175	210	0.8898	1019	274	1293
8:15 AM - 9:15 AM	139	353	21	513	0.9227	32	11	11	54	0.75	9	368	36	413	0.8978	30	4	147	181	0.7669	926	235	1161
8:30 AM - 9:30 AM	132	352	16	500	0.8993	29	12	12	53	0.7361	8	348	33	389	0.8457	32	5	133	170	0.7203	889	223	1112
8:45 AM - 9:45 AM	122	346	16	484	0.8705	24	12	14	50	0.6944	9	315	26	350	0.7955	31	3	119	153	0.85	834	203	1037
9:00 AM 10:00 AM	103	353	10	466	0.9102	17	12	14	43	0.8958	9	286	35	330	0.9167	33	4	111	148	0.881	796	191	987
3:00 PM 4:00 PM	199	578	60	837	0.7896	17	5	18	40	0.7143	20	327	42	389	0.9442	62	11	171	244	0.8026	1226	284	1510
3:15 PM 4:15 PM	186	598	22	806	0.8611	13	6	18	37	0.8409	16	326	41	383	0.9296	60	12	156	228	0.75	1189	265	1454
3:30 PM 4:30 PM	178	606	24	808	0.8632	14	8	16	38	0.8636	18	328	49	395	0.8662	65	11	149	225	0.7401	1203	263	1466
3:45 PM 4:45 PM	237	674	23	934	0.868	11	7	15	33	0.75	24	327	45	396	0.8684	69	10	138	217	0.7978	1330	250	1580
4:00 PM 5:00 PM	262	693	26	981	0.9117	13	9	11	33	0.75	22	325	40	387	0.8487	65	13	142	220	0.8088	1368	253	1621
4:15 PM 5:15 PM	254	687	26	967	0.8987	10	11	14	35	0.6731	25	364	40	429	0.8314	60	12	164	236	0.8676	1396	271	1667
4:30 PM 5:30 PM	279	703	27	1009	0.9377	15	11	12	38	0.6786	22	368	29	419	0.812	57	18	174	249	0.9154	1428	287	1715
4:45 PM 5:45 PM	263	726	36	1025	0.8991	16	13	13	42	0.75	19	385	30	434	0.8411	44	19	177	240	0.9677	1459	282	1741
5:00 PM 6:00 PM	258	733	27	1018	0.893	21	12	13	46	0.8214	20	414	34	468	0.907	40	18	166	224	0.9032	1486	270	1756
5:15 PM 6:15 PM	270	736	35	1041	0.9132	21	10	8	39	0.6964	20	388	34	442	0.9286	38	20	163	221	0.9364	1483	260	1743
5:30 PM 6:30 PM	238	715	41	994	0.8719	17	10	7	34	0.7727	22	385	42	449	0.9433	32	16	166	214	0.9068	1443	248	1691
5:45 PM 6:45 PM	215	676	41	932	0.9283	17	13	7	37	0.8409	22	353	45	420	0.9052	32	14	151	197	0.8347	1352	234	1586
6:00 PM 7:00 PM	174	610	39	823	0.8467	15	14	6	35	0.7955	21	343	43	407	0.9167	34	11	176	221	0.8125	1230	256	1486

Wells + Associates, Inc.

McLean, Virginia

Pedestrian Volume Survey

PROJECT: Capstone - GMU Housing
W + A JOB NO: 7302
INTERSECTION: Layton Hall Dr. & Old Lee Hwy.
LOCATION: City of Fairfax,VA
DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Muhamet
INPUTED BY: agan



Time Period	1	2	3	4	5	6	7	8	1 + 2	3 + 4	5 + 6	7+ 8	Total
15 Minute Volumes													
6:00 AM - 6:15 AM	1	1					1						
6:15 AM - 6:30 AM			1				1	1					
6:30 AM - 6:45 AM													
6:45 AM - 7:00 AM			1										
7:00 AM - 7:15 AM		1	1	1			1	1					
7:15 AM - 7:30 AM								1					
7:30 AM - 7:45 AM		13	1										
7:45 AM - 8:00 AM			1										
8:00 AM - 8:15 AM		1	2										
8:15 AM - 8:30 AM			1				1						
8:30 AM - 8:45 AM			4				2						
8:45 AM - 9:00 AM		3	4					1					
9:00 AM - 9:15 AM								1					
9:15 AM - 9:30 AM								1					
9:30 AM - 9:45 AM		1	1					1					
9:45 AM - 10:00 AM								1					
3:00 PM - 3:15 PM		2			1								
3:15 PM - 3:30 PM		1						2					
3:30 PM - 3:45 PM			1	1	1								
3:45 PM - 4:00 PM			2	1			4						
4:00 PM - 4:15 PM					2								
4:15 PM - 4:30 PM			2				1						
4:30 PM - 4:45 PM		1	2	9				1					
4:45 PM - 5:00 PM				3				2					
5:00 PM - 5:15 PM			1					1					
5:15 PM - 5:30 PM		2					2						
5:30 PM - 5:45 PM		1						1					
5:45 PM - 6:00 PM			3	3									
6:00 PM - 6:15 PM							2	1					
6:15 PM - 6:30 PM				1	2		2						
6:30 PM - 6:45 PM			3	2	1								
6:45 PM - 7:00 PM			4	3									
Total	1	27	35	24	7	0	17	16					
One Hour Volumes													
6:00 AM - 7:00 AM	1	1	2				2	1	2	2		3	7
6:15 AM - 7:15 AM		1	3	1			2	2	1	4		4	9
6:30 AM - 7:30 AM		1	2	1			1	2	1	3		3	7
6:45 AM - 7:45 AM		14	3	1			1	2	14	4		3	21
7:00 AM - 8:00 AM		14	3	1			1	2	14	4		3	21
7:15 AM - 8:15 AM		14	4					1	14	4		1	19
7:30 AM - 8:30 AM		14	5				1		14	5		1	20
7:45 AM - 8:45 AM		1	8				3		1	8		3	12
8:00 AM - 9:00 AM		4	11				3	1	4	11		4	19
8:15 AM - 9:15 AM		3	9				3	2	3	9		5	17
8:30 AM - 9:30 AM		3	8				2	3	3	8		5	16
8:45 AM - 9:45 AM		4	5					4	4	5		4	13
9:00 AM - 10:00 AM		1	1					4	1	1		4	6
3:00 PM - 4:00 PM		3	3	2	2		4	2	3	5	2	6	16
3:15 PM - 4:15 PM		1	3	2	3		4	2	1	5	3	6	15
3:30 PM - 4:30 PM			5	2	3		5			7	3	5	15
3:45 PM - 4:45 PM		1	6	10	2		5	1	1	16	2	6	25
4:00 PM - 5:00 PM		1	4	12	2		1	3	1	16	2	4	23
4:15 PM - 5:15 PM		1	5	12			1	4	1	17		5	23
4:30 PM - 5:30 PM		3	3	12			2	4	3	15		6	24
4:45 PM - 5:45 PM		3	1	3			2	4	3	4		6	13
5:00 PM - 6:00 PM		3	4	3			2	2	3	7		4	14
5:15 PM - 6:15 PM		3	3	3			4	2	3	6		6	15
5:30 PM - 6:30 PM		1	3	4	2		4	2	1	7	2	6	16
5:45 PM - 6:45 PM			6	6	3		4	1		12	3	5	20
6:00 PM - 7:00 PM			7	6	3		4	1		13	3	5	21

McLean, Virginia

Turning Movement Count - Bicycles

PROJECT:	Capstone - GMU Housing	**DATE:**	12/6/2017	**SOUTHBOUND ROAD:**	Old Lee Highway
W+A JOB NO:	7302	**DAY:**	Wednesday	**NORTHBOUND ROAD:**	Old Lee Highway
INTERSECTION:	Layton Hall Dr. & Old Lee Hwy.	**WEATHER:**	clear	**WESTBOUND ROAD:**	Farrcroft Drive
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Teuta	**EASTBOUND ROAD:**	Layton Hall Drive
		INPUTED BY:	agan		

Time	Southbound Old Lee Highway				Westbound Farrcroft Drive				Northbound Old Lee Highway				Eastbound Layton Hall Drive				North & South	East & West	Total
Period	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total			
15 Minute Volumes																			
6:00 AM - 6:15 AM																			
6:15 AM - 6:30 AM																			
6:30 AM - 6:45 AM																			
6:45 AM - 7:00 AM															1	1		1	1
7:00 AM - 7:15 AM																			
7:15 AM - 7:30 AM																			
7:30 AM - 7:45 AM		1		1													1		1
7:45 AM - 8:00 AM		1		1						1		1					2		2
8:00 AM - 8:15 AM																			
8:15 AM - 8:30 AM		2		2													2		2
8:30 AM - 8:45 AM																			
8:45 AM - 9:00 AM																			
9:00 AM - 9:15 AM			1	1													1		1
9:15 AM - 9:30 AM		1		1											1	1	1	1	2
9:30 AM - 9:45 AM																			
9:45 AM - 10:00 AM																			
3:00 PM - 3:15 PM																			
3:15 PM - 3:30 PM		1		1													1		1
3:30 PM - 3:45 PM										1		1					1		1
3:45 PM - 4:00 PM																			
4:00 PM - 4:15 PM																			
4:15 PM - 4:30 PM																			
4:30 PM - 4:45 PM									1	1		2					2		2
4:45 PM - 5:00 PM																			
5:00 PM - 5:15 PM		1		1						1		1					2		2
5:15 PM - 5:30 PM										1		1					1		1
5:30 PM - 5:45 PM																			
5:45 PM - 6:00 PM																			
6:00 PM - 6:15 PM																			
6:15 PM - 6:30 PM										1									
6:30 PM - 6:45 PM																			
6:45 PM - 7:00 PM																			
Total	0	7	1	8	0	0	0	0	1	6	0	6	0	0	2	2	14	2	16
One Hour Volumes																			
6:00 AM - 7:00 AM															1	1		1	1
6:15 AM - 7:15 AM															1	1		1	1
6:30 AM - 7:30 AM															1	1		1	1
6:45 AM - 7:45 AM		1		1											1	1	1	1	2
7:00 AM - 8:00 AM		2		2						1		1					3		3
7:15 AM - 8:15 AM		2		2						1		1					3		3
7:30 AM - 8:30 AM		4		4						1		1					5		5
7:45 AM - 8:45 AM		3		3						1		1					4		4
8:00 AM - 9:00 AM		2		2													2		2
8:15 AM - 9:15 AM		2	1	3													3		3
8:30 AM - 9:30 AM		1	1	2											1	1	2	1	3
8:45 AM - 9:45 AM		1	1	2											1	1	2	1	3
9:00 AM - 10:00 AM		1	1	2											1	1	2	1	3
3:00 PM - 4:00 PM		1		1						1		1					2		2
3:15 PM - 4:15 PM		1		1						1		1					2		2
3:30 PM - 4:30 PM										1		1					1		1
3:45 PM - 4:45 PM									1	1		2					2		2
4:00 PM - 5:00 PM									1	1		2					2		2
4:15 PM - 5:15 PM		1		1					1	2		3					4		4
4:30 PM - 5:30 PM		1		1					1	3		4					5		5
4:45 PM - 5:45 PM		1		1						2		2					3		3
5:00 PM - 6:00 PM																			
5:15 PM - 6:15 PM																			
5:30 PM - 6:30 PM																			
5:45 PM - 6:45 PM																			
6:00 PM - 7:00 PM		1		1						2		2					3		3

Wells & Associates,Inc

McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT: Capstone - GMU Housing
W+A JOB NO: 7302
INTERSECTION: University Dr. & Kenmoore Dr.
LOCATION: City of Fairfax,VA

DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Maria & Anita
INPUTED BY: agan

SOUTHBOUND ROAD: University Drive
NORTHBOUND ROAD: University Drive
WESTBOUND ROAD: Democracy Lane
EASTBOUND ROAD: Whitehead Street

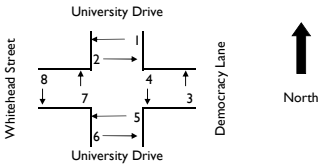
Time Period	Southbound University Drive					Westbound Democracy Lane					Northbound University Drive					Eastbound Whitehead Street					North & South	East & West	Total
	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM		7	1	8							1	14	2	17		2	1	8	11		25	11	36
6:15 AM - 6:30 AM	1	9	4	14		1			1		4	20		24		2	3	17	22		38	23	61
6:30 AM - 6:45 AM	2	11	2	15							1	24	2	27		6	4	24	34		42	34	76
6:45 AM - 7:00 AM	2	25	3	30		1		1	2		3	40	5	48		5	3	32	40		78	42	120
7:00 AM - 7:15 AM	3	18	7	28		2	1	1	4		10	35	1	46		11	4	33	48		74	52	126
7:15 AM - 7:30 AM	4	21	8	33		1	2		3		5	72	2	79		6	7	31	44		112	47	159
7:30 AM - 7:45 AM	3	25	4	32		1		2	3		10	108	3	121		11	5	31	47		153	50	203
7:45 AM - 8:00 AM	2	47	8	57		2	1		3		7	81	2	90		12	10	46	68		147	71	218
8:00 AM - 8:15 AM	6	24	10	40		2	2	2	6		11	64	4	79		17	11	18	46		119	52	171
8:15 AM - 8:30 AM	11	47	12	70		4	1	3	8		8	81	2	91		9	7	16	32		161	40	201
8:30 AM - 8:45 AM	12	62	9	83		2	3	3	8		13	60	3	76		15	7	22	44		159	52	211
8:45 AM - 9:00 AM	15	54	12	81		4	2	2	8		14	57	3	74		10	10	15	35		155	43	198
9:00 AM - 9:15 AM	12	53	13	78		7	2	9	18		12	44	8	64		11	5	16	32		142	50	192
9:15 AM - 9:30 AM	6	24	11	41		2	1	3	6		15	65	8	88		13	8	17	38		129	44	173
9:30 AM - 9:45 AM	8	40	13	61		11	2	6	19		9	49	7	65		11	8	10	29		126	48	174
9:45 AM - 10:00 AM	9	51	23	83		2	1	3	6		10	42	2	54		12	17	12	41		137	47	184
3:00 PM 3:15 PM	17	57	7	81		4	2	2	8		7	36	4	47		11	4	4	19		128	27	155
3:15 PM 3:30 PM	21	62	9	92		8	5	6	19		4	69	11	84		14	11	8	33		176	52	228
3:30 PM 3:45 PM	18	66	8	92		5	4	4	13		7	70	16	93		15	4	5	24		185	37	222
3:45 PM 4:00 PM	21	62	9	92		7	5	6	18		5	56	5	66		18	11	11	40		158	58	216
4:00 PM 4:15 PM	19	74	8	101		4	5	6	15		8	69	8	85		12	3	5	20		186	35	221
4:15 PM 4:30 PM	21	53	13	87		8	6	4	18		7	72	7	86		16	12	10	38		173	56	229
4:30 PM 4:45 PM	26	67	8	101		11	5	8	24		8	84	12	104		21	13	15	49		205	73	278
4:45 PM 5:00 PM	24	54	5	83		7	11	6	24		6	85	10	101		15	9	7	31		184	55	239
5:00 PM 5:15 PM	34	65	5	104		9	16	7	32		2	78	9	89		15	6	12	33		193	65	258
5:15 PM 5:30 PM	37	78	7	122		7	11	4	22		6	78	11	95		11	9	9	29		217	51	268
5:30 PM 5:45 PM	36	77	6	119		7	7	5	19		3	79	11	93		18	6	13	37		212	56	268
5:45 PM 6:00 PM	28	69	5	102		9	6	5	20		8	69	6	83		30	6	3	39		185	59	244
6:00 PM 6:15 PM	36	79	2	117		11	9	9	29		4	62	10	76		16	6	9	31		193	60	253
6:15 PM 6:30 PM	23	89	5	117		3	2	2	7		6	58	11	75		15	5	15	35		192	42	234
6:30 PM 6:45 PM	21	71	4	96		5	5	1	11		7	50	9	66		11	2	7	20		162	31	193
6:45 PM 7:00 PM	17	81	3	101		4	3	2	9		5	58	3	66		23	5	13	41		167	50	217
Total	495	1622	244	2361		151	120	112	383		226	1929	197	2352		414	222	494	1130		4713	1513	6226
One Hour Volumes																							
6:00 AM - 7:00 AM	5	52	10	67	0.5583	2		1	3	0.375	9	98	9	116	0.6042	15	11	81	107	0.6688	183	110	293
6:15 AM - 7:15 AM	8	63	16	87	0.725	4	1	2	7	0.4375	18	119	8	145	0.7552	24	14	106	144	0.75	232	151	383
6:30 AM - 7:30 AM	11	75	20	106	0.803	4	3	2	9	0.5625	19	171	10	200	0.6329	28	18	120	166	0.8646	306	175	481
6:45 AM - 7:45 AM	12	89	22	123	0.9318	5	3	4	12	0.75	28	255	11	294	0.6074	33	19	127	179	0.9323	417	191	608
7:00 AM - 8:00 AM	12	111	27	150	0.6579	6	4	3	13	0.8125	32	296	8	336	0.6942	40	26	141	207	0.761	486	220	706
7:15 AM - 8:15 AM	15	117	30	162	0.7105	6	5	4	15	0.625	33	325	11	369	0.7624	46	33	126	205	0.7537	531	220	751
7:30 AM - 8:30 AM	22	143	34	199	0.7107	9	4	7	20	0.625	36	334	11	381	0.7872	49	33	111	193	0.7096	580	213	793
7:45 AM - 8:45 AM	31	180	39	250	0.753	10	7	8	25	0.7813	39	286	11	336	0.9231	53	35	102	190	0.6985	586	215	801
8:00 AM - 9:00 AM	44	187	43	274	0.8253	12	8	10	30	0.9375	46	262	12	320	0.8791	51	35	71	157	0.8533	594	187	781
8:15 AM - 9:15 AM	50	216	46	312	0.9398	17	8	17	42	0.5833	47	242	16	305	0.8379	45	29	69	143	0.8125	617	185	802
8:30 AM - 9:30 AM	45	193	45	283	0.8524	15	8	17	40	0.5556	54	226	22	302	0.858	49	30	70	149	0.8466	585	189	774
8:45 AM - 9:45 AM	41	171	49	261	0.8056	24	7	20	51	0.6711	50	215	26	291	0.8267	45	31	58	134	0.8816	552	185	737
9:00 AM 10:00 AM	35	168	60	263	0.7922	22	6	21	49	0.6447	46	200	25	271	0.7699	47	38	55	140	0.8537	534	189	723
3:00 PM 4:00 PM	77	247	33	357	0.9701	24	16	18	58	0.7632	23	231	36	290	0.7796	58	30	28	116	0.725	647	174	821
3:15 PM 4:15 PM	79	264	34	377	0.9332	24	19	22	65	0.8553	24	264	40	328	0.8817	59	29	29	117	0.7313	705	182	887
3:30 PM 4:30 PM	79	255	38	372	0.9208	24	20	20	64	0.8889	27	267	36	330	0.8871	61	30	31	122	0.7625	702	186	888
3:45 PM 4:45 PM	87	256	38	381	0.9431	30	21	24	75	0.7813	28	281	32	341	0.8197	67	39	41	147	0.75	722	222	944
4:00 PM 5:00 PM	90	248	34	372	0.9208	30	27	24	81	0.8438	29	310	37	376	0.9038	64	37	37	138	0.7041	748	219	967
4:15 PM 5:15 PM	105	239	31	375	0.9014	35	38	25	98	0.7656	23	319	38	380	0.9135	67	40	44	151	0.7704	755	249	1004
4:30 PM 5:30 PM	121	264	25	410	0.8402	34	43	25	102	0.7969	22	325	42	389	0.9351	62	37	43	142	0.7245	799	244	1043
4:45 PM 5:45 PM	131	274	23	428	0.877	30	45	22	97	0.7578	17	320	41	378	0.9356	59	30	41	130	0.8784	806	227	1033
5:00 PM 6:00 PM	135	289	23	447	0.916	32	40	21	93	0.7266	19	304	37	360	0.9474	74	27	37	138	0.8846	807	231	1038
5:15 PM 6:15 PM	137	303	20	460	0.9426	34	33	23	90	0.7759	21	288	38	347	0.9132	75	27	34	136	0.8718	807	226	1033
5:30 PM 6:30 PM	123	314	18	455	0.9559	30	24	21	75	0.6466	21	268	38	327	0.879	79	23	40	142	0.9103	782	217	999
5:45 PM 6:45 PM	108	308	16	432	0.9231	28	22	17	67	0.5776	25	239	36	300	0.9036	72	19	34	125	0.8013	732	192	924
6:00 PM 7:00 PM	97	320	14	431	0.9209	23	19	14	56	0.4828	22	228	33	283	0.9309	65	18	44	127	0.7744	714	183	897

Wells + Associates, Inc.

McLean, Virginia

Pedestrian Volume Survey

PROJECT: Capstone - GMU Housing
W + A JOB NO: 7302
INTERSECTION: University Dr. & Kenmoore Dr.
LOCATION: City of Fairfax,VA
DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Maria
INPUTED BY: agan



Time Period	1	2	3	4	5	6	7	8	1 + 2	3 + 4	5 + 6	7+ 8	Total
15 Minute Volumes													
6:00 AM - 6:15 AM													
6:15 AM - 6:30 AM								1					
6:30 AM - 6:45 AM								1					
6:45 AM - 7:00 AM					1		1	1					
7:00 AM - 7:15 AM						1		1					
7:15 AM - 7:30 AM													
7:30 AM - 7:45 AM					1								
7:45 AM - 8:00 AM							1						
8:00 AM - 8:15 AM								1					
8:15 AM - 8:30 AM				3	3								
8:30 AM - 8:45 AM				2	2			1					
8:45 AM - 9:00 AM			1	1			1	1					
9:00 AM - 9:15 AM				1	2		1						
9:15 AM - 9:30 AM			1			1		2					
9:30 AM - 9:45 AM			1		2	2		1					
9:45 AM - 10:00 AM						1		2					
3:00 PM - 3:15 PM							1						
3:15 PM - 3:30 PM	1	1					1	1					
3:30 PM - 3:45 PM			1			1	1	1					
3:45 PM - 4:00 PM				1	1								
4:00 PM - 4:15 PM			1	1		1	1						
4:15 PM - 4:30 PM			2		3			1					
4:30 PM - 4:45 PM			2	2	1	1	1	2					
4:45 PM - 5:00 PM			1	4	2	1	2	2					
5:00 PM - 5:15 PM				1	1	1							
5:15 PM - 5:30 PM				1	4	4	1	1					
5:30 PM - 5:45 PM			2					1					
5:45 PM - 6:00 PM				1									
6:00 PM - 6:15 PM			2	1	1	1							
6:15 PM - 6:30 PM							4						
6:30 PM - 6:45 PM					1	1							
6:45 PM - 7:00 PM						1		1					
Total	1	1	14	19	25	17	16	22					
One Hour Volumes													
6:00 AM - 7:00 AM					1		1	3			1	4	5
6:15 AM - 7:15 AM					1	1	1	4			2	5	7
6:30 AM - 7:30 AM					1	1	1	3			2	4	6
6:45 AM - 7:45 AM					2	1	1	2			3	3	6
7:00 AM - 8:00 AM					1	1	1	1			2	2	4
7:15 AM - 8:15 AM					1		1	1			1	2	3
7:30 AM - 8:30 AM				3	4		1	1		3	4	2	9
7:45 AM - 8:45 AM				5	5		1	2		5	5	3	13
8:00 AM - 9:00 AM			1	6	5		1	3		7	5	4	16
8:15 AM - 9:15 AM			1	7	7		2	2		8	7	4	19
8:30 AM - 9:30 AM			2	4	4	1	2	4		6	5	6	17
8:45 AM - 9:45 AM			3	2	4	3	2	4		5	7	6	18
9:00 AM - 10:00 AM			2	1	4	4	1	5		3	8	6	17
3:00 PM - 4:00 PM	1	1	1	1	1	1	3	2	2	2	2	5	11
3:15 PM - 4:15 PM	1	1	2	2	1	2	3	2	2	4	3	5	14
3:30 PM - 4:30 PM			4	2	4	2	2	2		6	6	4	16
3:45 PM - 4:45 PM			5	4	5	2	2	3		9	7	5	21
4:00 PM - 5:00 PM			6	7	6	3	4	5		13	9	9	31
4:15 PM - 5:15 PM			5	7	7	3	3	5		12	10	8	30
4:30 PM - 5:30 PM			3	8	8	7	4	5		11	15	9	35
4:45 PM - 5:45 PM			3	6	7	6	3	4		9	13	7	29
5:00 PM - 6:00 PM			2	3	5	5	1	2		5	10	3	18
5:15 PM - 6:15 PM			4	3	5	5	1	2		7	10	3	20
5:30 PM - 6:30 PM			4	2	1	1	4	1		6	2	5	13
5:45 PM - 6:45 PM			2	2	2	2	4			4	4	4	12
6:00 PM - 7:00 PM			2	1	2	3	4	1		3	5	5	13

McLean, Virginia

Turning Movement Count - Bicycles

PROJECT:	Capstone - GMU Housing	**DATE:**	12/6/2017	**SOUTHBOUND ROAD:**	University Drive
W+A JOB NO:	7302	**DAY:**	Wednesday	**NORTHBOUND ROAD:**	University Drive
INTERSECTION:	University Dr. & Kenmoore Dr.	**WEATHER:**	clear	**WESTBOUND ROAD:**	Democracy Lane
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Anita	**EASTBOUND ROAD:**	Whitehead Street
		INPUTED BY:	agan		

Time Period	Southbound University Drive				Westbound Democracy Lane				Northbound University Drive				Eastbound Whitehead Street				North & South	East & West	Total
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total			
15 Minute Volumes																			
6:00 AM - 6:15 AM																			
6:15 AM - 6:30 AM																			
6:30 AM - 6:45 AM										1		1					1		1
6:45 AM - 7:00 AM																			
7:00 AM - 7:15 AM		1		1													1		1
7:15 AM - 7:30 AM																			
7:30 AM - 7:45 AM																			
7:45 AM - 8:00 AM	1			1													1		1
8:00 AM - 8:15 AM		1		1										1		1	1	1	2
8:15 AM - 8:30 AM																			
8:30 AM - 8:45 AM																			
8:45 AM - 9:00 AM																			
9:00 AM - 9:15 AM																			
9:15 AM - 9:30 AM										1		1					1		1
9:30 AM - 9:45 AM																			
9:45 AM - 10:00 AM																			
3:00 PM - 3:15 PM																			
3:15 PM - 3:30 PM																			
3:30 PM - 3:45 PM																			
3:45 PM - 4:00 PM																			
4:00 PM - 4:15 PM										1		1					1		1
4:15 PM - 4:30 PM																			
4:30 PM - 4:45 PM																			
4:45 PM - 5:00 PM																			
5:00 PM - 5:15 PM										1		1					1		1
5:15 PM - 5:30 PM					1			1										1	1
5:30 PM - 5:45 PM																			
5:45 PM - 6:00 PM																			
6:00 PM - 6:15 PM																			
6:15 PM - 6:30 PM		1																	
6:30 PM - 6:45 PM																			
6:45 PM - 7:00 PM																			
Total	1	3	0	3	1	0	0	1	0	4	0	4	0	1	0	1	7	2	9
One Hour Volumes																			
6:00 AM - 7:00 AM										1		1					1		1
6:15 AM - 7:15 AM		1		1						1		1					2		2
6:30 AM - 7:30 AM		1		1						1		1					2		2
6:45 AM - 7:45 AM		1		1													1		1
7:00 AM - 8:00 AM	1	1		2													2		2
7:15 AM - 8:15 AM	1	1		2										1		1	2	1	3
7:30 AM - 8:30 AM	1	1		2										1		1	2	1	3
7:45 AM - 8:45 AM	1	1		2										1		1	2	1	3
8:00 AM - 9:00 AM		1		1										1		1	1	1	2
8:15 AM - 9:15 AM																			
8:30 AM - 9:30 AM										1		1					1		1
8:45 AM - 9:45 AM										1		1					1		1
9:00 AM - 10:00 AM										1		1					1		1
3:00 PM - 4:00 PM																			
3:15 PM - 4:15 PM										1		1					1		1
3:30 PM - 4:30 PM										1		1					1		1
3:45 PM - 4:45 PM										1		1					1		1
4:00 PM - 5:00 PM										1		1					1		1
4:15 PM - 5:15 PM										1		1					1		1
4:30 PM - 5:30 PM					1			1		1		1					1	1	2
4:45 PM - 5:45 PM					1			1		1		1					1	1	2
5:00 PM - 6:00 PM																			
5:15 PM - 6:15 PM																			
5:30 PM - 6:30 PM																			
5:45 PM - 6:45 PM																			
6:00 PM - 7:00 PM					1			1		1		1					1	1	2

Wells & Associates,Inc

McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT:	Capstone - GMU Housing	**DATE:**	1/23/2018	**SOUTHBOUND ROAD:**	Chain Bridge Road - 123
W+A JOB NO:	7302	**DAY:**	Tuesday	**NORTHBOUND ROAD:**	Chain Bridge Road - 123
INTERSECTION:	Chain Bridge Rd. & Kenmoore Dr.	**WEATHER:**	clear	**WESTBOUND ROAD:**	Whitehead Street
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Muha & Teuta	**EASTBOUND ROAD:**	0
		INPUTED BY:	agan		

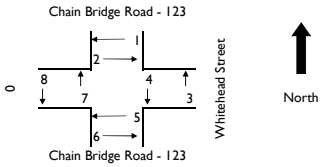
Time	Southbound Chain Bridge Road - 123					Westbound Whitehead Street					Northbound Chain Bridge Road - 123					Eastbound 0					North & South	East & West	Total
Period	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM		17		17							5	78		83							100		100
6:15 AM - 6:30 AM		35		35		3		3	6		26	105		131							166	6	172
6:30 AM - 6:45 AM		39	3	42				1	1		11	126		137							179	1	180
6:45 AM - 7:00 AM		54	6	60		6		4	10		32	162		194							254	10	264
7:00 AM - 7:15 AM		58	3	61		9		3	12		26	139		165							226	12	238
7:15 AM - 7:30 AM		109	2	111		1		4	5		33	199		232							343	5	348
7:30 AM - 7:45 AM		126	6	132		2		4	6		51	170		221							353	6	359
7:45 AM - 8:00 AM		111	16	127		4		1	5		41	137		178							305	5	310
8:00 AM - 8:15 AM		130	6	136		5		5	10		37	185		222							358	10	368
8:15 AM - 8:30 AM		168	16	184		3		5	8		25	138		163							347	8	355
8:30 AM - 8:45 AM		187	13	200		4		7	11		23	125		148							348	11	359
8:45 AM - 9:00 AM		158	15	173		5		3	8		30	144		174							347	8	355
9:00 AM - 9:15 AM		187	10	197		5		5	10		29	146		175							372	10	382
9:15 AM - 9:30 AM		155	20	175		5		11	16		25	125		150							325	16	341
9:30 AM - 9:45 AM		149	19	168		7		7	14		24	128		152							320	14	334
9:45 AM - 10:00 AM		144	8	152		4		9	13		19	123		142							294	13	307
3:00 PM 3:15 PM		148	14	162		17		17	34		22	142		164							326	34	360
3:15 PM 3:30 PM		147	12	159		14		8	22		16	101		117							276	22	298
3:30 PM 3:45 PM		146	12	158		11		9	20		21	107		128							286	20	306
3:45 PM 4:00 PM		146	9	155		9		10	19		19	93		112							267	19	286
4:00 PM 4:15 PM		164	16	180		20		19	39		24	109		133							313	39	352
4:15 PM 4:30 PM		166	18	184		14		12	26		22	134		156							340	26	366
4:30 PM 4:45 PM		150	15	165		12		13	25		22	128		150							315	25	340
4:45 PM 5:00 PM		138	11	149		6		16	22		32	112		144							293	22	315
5:00 PM 5:15 PM		148	11	159		15		23	38		27	108		135							294	38	332
5:15 PM 5:30 PM		151	13	164		16		18	34		27	116		143							307	34	341
5:30 PM 5:45 PM		127	17	144		9		9	18		25	116		141							285	18	303
5:45 PM 6:00 PM		148	12	160		5		22	27		28	102		130							290	27	317
6:00 PM 6:15 PM		143	17	160		14		23	37		32	132		164							324	37	361
6:15 PM 6:30 PM		137	14	151		10		18	28		22	81		103							254	28	282
6:30 PM 6:45 PM		124	8	132		9		10	19		24	99		123							255	19	274
6:45 PM 7:00 PM		152	9	161		11		24	35		26	74		100							261	35	296
Total	0	4162	351	4513		255	0	323	578		826	3984	0	4810		0	0	0	0		9323	578	9901
One Hour Volumes																							
6:00 AM - 7:00 AM		145	9	154	0.6417	9		8	17	0.425	74	471		545	0.7023						699	17	716
6:15 AM - 7:15 AM		186	12	198	0.8115	18		11	29	0.6042	95	532		627	0.808						825	29	854
6:30 AM - 7:30 AM		260	14	274	0.6171	16		12	28	0.5833	102	626		728	0.7845						1002	28	1030
6:45 AM - 7:45 AM		347	17	364	0.6894	18		15	33	0.6875	142	670		812	0.875						1176	33	1209
7:00 AM - 8:00 AM		404	27	431	0.8163	16		12	28	0.5833	151	645		796	0.8578						1227	28	1255
7:15 AM - 8:15 AM		476	30	506	0.9301	12		14	26	0.65	162	691		853	0.9192						1359	26	1385
7:30 AM - 8:30 AM		535	44	579	0.7867	14		15	29	0.725	154	630		784	0.8829						1363	29	1392
7:45 AM - 8:45 AM		596	51	647	0.8088	16		18	34	0.7727	126	585		711	0.8007						1358	34	1392
8:00 AM - 9:00 AM		643	50	693	0.8663	17		20	37	0.8409	115	592		707	0.7962						1400	37	1437
8:15 AM - 9:15 AM		700	54	754	0.9425	17		20	37	0.8409	107	553		660	0.9429						1414	37	1451
8:30 AM - 9:30 AM		687	58	745	0.9313	19		26	45	0.7031	107	540		647	0.9243						1392	45	1437
8:45 AM - 9:45 AM		649	64	713	0.9048	22		26	48	0.75	108	543		651	0.93						1364	48	1412
9:00 AM 10:00 AM		635	57	692	0.8782	21		32	53	0.8281	97	522		619	0.8843						1311	53	1364
3:00 PM 4:00 PM		587	47	634	0.9784	51		44	95	0.6985	78	443		521	0.7942						1155	95	1250
3:15 PM 4:15 PM		603	49	652	0.9056	54		46	100	0.641	80	410		490	0.9211						1142	100	1242
3:30 PM 4:30 PM		622	55	677	0.9198	54		50	104	0.6667	86	443		529	0.8478						1206	104	1310
3:45 PM 4:45 PM		626	58	684	0.9293	55		54	109	0.6987	87	464		551	0.883						1235	109	1344
4:00 PM 5:00 PM		618	60	678	0.9212	52		60	112	0.7179	100	483		583	0.9343						1261	112	1373
4:15 PM 5:15 PM		602	55	657	0.8927	47		64	111	0.7303	103	482		585	0.9375						1242	111	1353
4:30 PM 5:30 PM		587	50	637	0.9652	49		70	119	0.7829	108	464		572	0.9533						1209	119	1328
4:45 PM 5:45 PM		564	52	616	0.939	46		66	112	0.7368	111	452		563	0.9774						1179	112	1291
5:00 PM 6:00 PM		574	53	627	0.9558	45		72	117	0.7697	107	442		549	0.9598						1176	117	1293
5:15 PM 6:15 PM		569	59	628	0.9573	44		72	116	0.7838	112	466		578	0.8811						1206	116	1322
5:30 PM 6:30 PM		555	60	615	0.9609	38		72	110	0.7432	107	431		538	0.8201						1153	110	1263
5:45 PM 6:45 PM		552	51	603	0.9422	38		73	111	0.75	106	414		520	0.7927						1123	111	1234
6:00 PM 7:00 PM		556	48	604	0.9379	44		75	119	0.8041	104	386		490	0.747						1094	119	1213

Wells + Associates, Inc.

McLean, Virginia

Pedestrian Volume Survey

PROJECT: Capstone - GMU Housing
W + A JOB NO: 7302
INTERSECTION: Chain Bridge Rd. & Kenmoore Dr.
LOCATION: City of Fairfax,VA
DATE: 1/23/2018
DAY: Tuesday
WEATHER: clear
COUNTED BY: Muha
INPUTED BY: agan



Time Period	Movement 1	2	3	4	5	6	7	8	1 + 2	3 + 4	5 + 6	7+ 8	Total
15 Minute Volumes													
6:00 AM - 6:15 AM													
6:15 AM - 6:30 AM													
6:30 AM - 6:45 AM													
6:45 AM - 7:00 AM													
7:00 AM - 7:15 AM													
7:15 AM - 7:30 AM													
7:30 AM - 7:45 AM													
7:45 AM - 8:00 AM													
8:00 AM - 8:15 AM			1										
8:15 AM - 8:30 AM													
8:30 AM - 8:45 AM				2									
8:45 AM - 9:00 AM													
9:00 AM - 9:15 AM													
9:15 AM - 9:30 AM													
9:30 AM - 9:45 AM													
9:45 AM - 10:00 AM													
3:00 PM - 3:15 PM			2										
3:15 PM - 3:30 PM				2									
3:30 PM - 3:45 PM				1									
3:45 PM - 4:00 PM				1									
4:00 PM - 4:15 PM			2				5	5					
4:15 PM - 4:30 PM													
4:30 PM - 4:45 PM	1		1										
4:45 PM - 5:00 PM								1					
5:00 PM - 5:15 PM													
5:15 PM - 5:30 PM													
5:30 PM - 5:45 PM				2									
5:45 PM - 6:00 PM													
6:00 PM - 6:15 PM				3									
6:15 PM - 6:30 PM													
6:30 PM - 6:45 PM				1									
6:45 PM - 7:00 PM													
Total	1	0	6	12	0	0	5	6					
One Hour Volumes													
6:00 AM - 7:00 AM													
6:15 AM - 7:15 AM													
6:30 AM - 7:30 AM													
6:45 AM - 7:45 AM													
7:00 AM - 8:00 AM													
7:15 AM - 8:15 AM			1							1			1
7:30 AM - 8:30 AM			1							1			1
7:45 AM - 8:45 AM			1	2						3			3
8:00 AM - 9:00 AM			1	2						3			3
8:15 AM - 9:15 AM				2						2			2
8:30 AM - 9:30 AM				2						2			2
8:45 AM - 9:45 AM													
9:00 AM - 10:00 AM													
3:00 PM - 4:00 PM			2	4						6			6
3:15 PM - 4:15 PM			2	4			5	5		6		10	16
3:30 PM - 4:30 PM			2	2			5	5		4		10	14
3:45 PM - 4:45 PM	1		3	1			5	5	1	4		10	15
4:00 PM - 5:00 PM	1		3				5	6	1	3		11	15
4:15 PM - 5:15 PM	1		1					1	1	1		1	3
4:30 PM - 5:30 PM	1		1					1	1	1		1	3
4:45 PM - 5:45 PM				2				1		2		1	3
5:00 PM - 6:00 PM				2						2			2
5:15 PM - 6:15 PM				5						5			5
5:30 PM - 6:30 PM				5						5			5
5:45 PM - 6:45 PM				4						4			4
6:00 PM - 7:00 PM				4						4			4

McLean, Virginia

Turning Movement Count - Bicycles

PROJECT:	Capstone - GMU Housing	**DATE:**	1/23/2018	**SOUTHBOUND ROAD:**	Chain Bridge Road - 123
W+A JOB NO:	7302	**DAY:**	Tuesday	**NORTHBOUND ROAD:**	Chain Bridge Road - 123
INTERSECTION:	Chain Bridge Rd. & Kenmoore Dr.	**WEATHER:**	clear	**WESTBOUND ROAD:**	Whitehead Street
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Teuta	**EASTBOUND ROAD:**	0
		INPUTED BY:	agan		

Time	Southbound				Westbound				Northbound				Eastbound				North	East	
	Chain Bridge Road - 123				Whitehead Street				Chain Bridge Road - 123				0				&	&	Total
Period	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	South	West	
15 Minute Volumes																			
6:00 AM - 6:15 AM																			
6:15 AM - 6:30 AM																			
6:30 AM - 6:45 AM																			
6:45 AM - 7:00 AM																			
7:00 AM - 7:15 AM																			
7:15 AM - 7:30 AM																			
7:30 AM - 7:45 AM																			
7:45 AM - 8:00 AM																			
8:00 AM - 8:15 AM																			
8:15 AM - 8:30 AM																			
8:30 AM - 8:45 AM																			
8:45 AM - 9:00 AM																			
9:00 AM - 9:15 AM																			
9:15 AM - 9:30 AM																			
9:30 AM - 9:45 AM																			
9:45 AM - 10:00 AM																			
3:00 PM - 3:15 PM																			
3:15 PM - 3:30 PM		1		1													1		1
3:30 PM - 3:45 PM										1		1					1		1
3:45 PM - 4:00 PM										1		1					1		1
4:00 PM - 4:15 PM		1		1													1		1
4:15 PM - 4:30 PM																			
4:30 PM - 4:45 PM																			
4:45 PM - 5:00 PM																			
5:00 PM - 5:15 PM																			
5:15 PM - 5:30 PM																			
5:30 PM - 5:45 PM																			
5:45 PM - 6:00 PM																			
6:00 PM - 6:15 PM										1									
6:15 PM - 6:30 PM																			
6:30 PM - 6:45 PM										1									
6:45 PM - 7:00 PM		1																	
Total	0	3	0	2	0	0	0	0	0	4	0	2	0	0	0	0	4	0	4
One Hour Volumes																			
6:00 AM - 7:00 AM																			
6:15 AM - 7:15 AM																			
6:30 AM - 7:30 AM																			
6:45 AM - 7:45 AM																			
7:00 AM - 8:00 AM																			
7:15 AM - 8:15 AM																			
7:30 AM - 8:30 AM																			
7:45 AM - 8:45 AM																			
8:00 AM - 9:00 AM																			
8:15 AM - 9:15 AM																			
8:30 AM - 9:30 AM																			
8:45 AM - 9:45 AM																			
9:00 AM - 10:00 AM																			
3:00 PM - 4:00 PM		1		1						2		2					3		3
3:15 PM - 4:15 PM		2		2						2		2					4		4
3:30 PM - 4:30 PM		1		1						2		2					3		3
3:45 PM - 4:45 PM		1		1						1		1					2		2
4:00 PM - 5:00 PM		1		1													1		1
4:15 PM - 5:15 PM																			
4:30 PM - 5:30 PM																			
4:45 PM - 5:45 PM																			
5:00 PM - 6:00 PM																			
5:15 PM - 6:15 PM																			
5:30 PM - 6:30 PM																			
5:45 PM - 6:45 PM																			
6:00 PM - 7:00 PM																			

Wells & Associates,Inc

McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT: Capstone - GMU Housing
W+A JOB NO: 7302
INTERSECTION: Chain Bridge Rd. & Kenmoore Dr.
LOCATION: City of Fairfax,VA

DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: James & Dragan
INPUTED BY: agan

SOUTHBOUND ROAD: Chain Bridge Road - 123
NORTHBOUND ROAD: Chain Bridge Road - 123
WESTBOUND ROAD: Kenmore Drive
EASTBOUND ROAD: 0

Time	Southbound Chain Bridge Road - 123					Westbound Kenmore Drive					Northbound Chain Bridge Road - 123					Eastbound 0					North & South	East & West	Total
Period	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM		76	31	107		12		1	13		5	83		88							195	13	208
6:15 AM - 6:30 AM		37	11	48		11		1	12			100		100							148	12	160
6:30 AM - 6:45 AM		54	9	63		10			10		1	169		170							233	10	243
6:45 AM - 7:00 AM		74	14	88		6		1	7		2	234		236							324	7	331
7:00 AM - 7:15 AM		67	12	79		12		1	13			196		196							275	13	288
7:15 AM - 7:30 AM		96	23	119		15			15			241		241							360	15	375
7:30 AM - 7:45 AM		101	19	120		2			2		3	217		220							340	2	342
7:45 AM - 8:00 AM		140	18	158		2		2	4		10	236		246							404	4	408
8:00 AM - 8:15 AM		125	20	145		2		4	6		4	189		193							338	6	344
8:15 AM - 8:30 AM		173	20	193		5		1	6		7	182		189							382	6	388
8:30 AM - 8:45 AM		174	27	201		6		2	8		3	188		191							392	8	400
8:45 AM - 9:00 AM		156	24	180		11		1	12		5	166		171							351	12	363
9:00 AM - 9:15 AM		150	30	180		9		1	10		4	163		167							347	10	357
9:15 AM - 9:30 AM		174	25	199		13		1	14		1	166		167							366	14	380
9:30 AM - 9:45 AM		164	27	191		10			10		3	147		150							341	10	351
9:45 AM - 10:00 AM		135	35	170		6		3	9		1	186		187							357	9	366
3:00 PM 3:15 PM		153	24	177		15		1	16		1	154		155							332	16	348
3:15 PM 3:30 PM		158	24	182		16		2	18		5	163		168							350	18	368
3:30 PM 3:45 PM		141	47	188		7		2	9		4	178		182							370	9	379
3:45 PM 4:00 PM		165	22	187		21		3	24		2	193		195							382	24	406
4:00 PM 4:15 PM		174	27	201		18		2	20		3	192		195							396	20	416
4:15 PM 4:30 PM		151	14	165		22		3	25		5	176		181							346	25	371
4:30 PM 4:45 PM		165	30	195		14		1	15		3	141		144							339	15	354
4:45 PM 5:00 PM		145	20	165		22			22		2	149		151							316	22	338
5:00 PM 5:15 PM		160	26	186		11		4	15		1	116		117							303	15	318
5:15 PM 5:30 PM		133	15	148		19		2	21		2	140		142							290	21	311
5:30 PM 5:45 PM		167	11	178		12		2	14			167		167							345	14	359
5:45 PM 6:00 PM		140	28	168		11			11		4	194		198							366	11	377
6:00 PM 6:15 PM		134	26	160		6			6			182		182							342	6	348
6:15 PM 6:30 PM		104	17	121		5			5		1	153		154							275	5	280
6:30 PM 6:45 PM		133	17	150		6			6		1	147		148							298	6	304
6:45 PM 7:00 PM		160	31	191		7			7		2	141		143							334	7	341
Total	0	4279	724	5003		344	0	41	385		85	5449	0	5534		0	0	0	0		10537	385	10922
One Hour Volumes																							
6:00 AM - 7:00 AM		241	65	306	0.715	39		3	42	0.8077	8	586		594	0.6292						900	42	942
6:15 AM - 7:15 AM		232	46	278	0.7898	39		3	42	0.8077	3	699		702	0.7436						980	42	1022
6:30 AM - 7:30 AM		291	58	349	0.7332	43		2	45	0.75	3	840		843	0.8745						1192	45	1237
6:45 AM - 7:45 AM		338	68	406	0.8458	35		2	37	0.6167	5	888		893	0.9263						1299	37	1336
7:00 AM - 8:00 AM		404	72	476	0.7532	31		3	34	0.5667	13	890		903	0.9177						1379	34	1413
7:15 AM - 8:15 AM		462	80	542	0.8576	21		6	27	0.45	17	883		900	0.9146						1442	27	1469
7:30 AM - 8:30 AM		539	77	616	0.7979	11		7	18	0.75	24	824		848	0.8618						1464	18	1482
7:45 AM - 8:45 AM		612	85	697	0.8669	15		9	24	0.75	24	795		819	0.8323						1516	24	1540
8:00 AM - 9:00 AM		628	91	719	0.8943	24		8	32	0.6667	19	725		744	0.9637						1463	32	1495
8:15 AM - 9:15 AM		653	101	754	0.9378	31		5	36	0.75	19	699		718	0.9398						1472	36	1508
8:30 AM - 9:30 AM		654	106	760	0.9453	39		5	44	0.7857	13	683		696	0.911						1456	44	1500
8:45 AM - 9:45 AM		644	106	750	0.9422	43		3	46	0.8214	13	642		655	0.9576						1405	46	1451
9:00 AM 10:00 AM		623	117	740	0.9296	38		5	43	0.7679	9	662		671	0.8971						1411	43	1454
3:00 PM 4:00 PM		617	117	734	0.9761	59		8	67	0.6979	12	688		700	0.8974						1434	67	1501
3:15 PM 4:15 PM		638	120	758	0.9428	62		9	71	0.7396	14	726		740	0.9487						1498	71	1569
3:30 PM 4:30 PM		631	110	741	0.9216	68		10	78	0.78	14	739		753	0.9654						1494	78	1572
3:45 PM 4:45 PM		655	93	748	0.9303	75		9	84	0.84	13	702		715	0.9167						1463	84	1547
4:00 PM 5:00 PM		635	91	726	0.903	76		6	82	0.82	13	658		671	0.8603						1397	82	1479
4:15 PM 5:15 PM		621	90	711	0.9115	69		8	77	0.77	11	582		593	0.8191						1304	77	1381
4:30 PM 5:30 PM		603	91	694	0.8897	66		7	73	0.8295	8	546		554	0.9172						1248	73	1321
4:45 PM 5:45 PM		605	72	677	0.9099	64		8	72	0.8182	5	572		577	0.8638						1254	72	1326
5:00 PM 6:00 PM		600	80	680	0.914	53		8	61	0.7262	7	617		624	0.7879						1304	61	1365
5:15 PM 6:15 PM		574	80	654	0.9185	48		4	52	0.619	6	683		689	0.8699						1343	52	1395
5:30 PM 6:30 PM		545	82	627	0.8806	34		2	36	0.6429	5	696		701	0.8851						1328	36	1364
5:45 PM 6:45 PM		511	88	599	0.8914	28			28	0.6364	6	676		682	0.8611						1281	28	1309
6:00 PM 7:00 PM		531	91	622	0.8141	24			24	0.8571	4	623		627	0.8613						1249	24	1273

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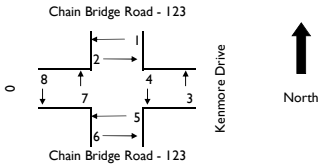
McLean, Virginia

Pedestrian Volume Survey

PROJECT: Capstone - GMU Housing
W + A JOB NO: 7302
INTERSECTION: Chain Bridge Rd. & Kenmoore Dr.
LOCATION: City of Fairfax,VA
DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Dragan
INPUTED BY: agan



Time Period	1	2	3	4	5	6	7	8	1 + 2	3 + 4	5 + 6	7+ 8	Total
15 Minute Volumes													
6:00 AM - 6:15 AM			1										
6:15 AM - 6:30 AM													
6:30 AM - 6:45 AM	1												
6:45 AM - 7:00 AM													
7:00 AM - 7:15 AM													
7:15 AM - 7:30 AM			1	1				1					
7:30 AM - 7:45 AM													
7:45 AM - 8:00 AM													
8:00 AM - 8:15 AM													
8:15 AM - 8:30 AM													
8:30 AM - 8:45 AM			1										
8:45 AM - 9:00 AM													
9:00 AM - 9:15 AM			1										
9:15 AM - 9:30 AM			1					1					
9:30 AM - 9:45 AM			2										
9:45 AM - 10:00 AM			3	1									
3:00 PM - 3:15 PM													
3:15 PM - 3:30 PM													
3:30 PM - 3:45 PM													
3:45 PM - 4:00 PM													
4:00 PM - 4:15 PM			17	4									
4:15 PM - 4:30 PM			6	1									
4:30 PM - 4:45 PM			3										
4:45 PM - 5:00 PM			2	1									
5:00 PM - 5:15 PM			2	1			1	1					
5:15 PM - 5:30 PM			1	2									
5:30 PM - 5:45 PM			2					1					
5:45 PM - 6:00 PM								1					
6:00 PM - 6:15 PM			1										
6:15 PM - 6:30 PM			2	4				1					
6:30 PM - 6:45 PM			1	1									
6:45 PM - 7:00 PM			1	2									
Total	1	0	48	18	0	0	1	6					
One Hour Volumes													
6:00 AM - 7:00 AM	1		1						1	1			2
6:15 AM - 7:15 AM	1								1				1
6:30 AM - 7:30 AM	1		1	1				1	1	2		1	4
6:45 AM - 7:45 AM			1	1				1		2		1	3
7:00 AM - 8:00 AM			1	1				1		2		1	3
7:15 AM - 8:15 AM			1	1				1		2		1	3
7:30 AM - 8:30 AM													
7:45 AM - 8:45 AM			1							1			1
8:00 AM - 9:00 AM			1							1			1
8:15 AM - 9:15 AM			2							2			2
8:30 AM - 9:30 AM			3					1		3		1	4
8:45 AM - 9:45 AM			4					1		4		1	5
9:00 AM - 10:00 AM			7	1				1		8		1	9
3:00 PM - 4:00 PM													
3:15 PM - 4:15 PM			17	4						21			21
3:30 PM - 4:30 PM			23	5						28			28
3:45 PM - 4:45 PM			26	5						31			31
4:00 PM - 5:00 PM			28	6						34			34
4:15 PM - 5:15 PM			13	3			1	1		16		2	18
4:30 PM - 5:30 PM			8	4			1	1		12		2	14
4:45 PM - 5:45 PM			7	4			1	2		11		3	14
5:00 PM - 6:00 PM			5	3			1	3		8		4	12
5:15 PM - 6:15 PM			4	2				2		6		2	8
5:30 PM - 6:30 PM			5	4				3		9		3	12
5:45 PM - 6:45 PM			4	5				2		9		2	11
6:00 PM - 7:00 PM			5	7				1		12		1	13

McLean, Virginia

Turning Movement Count - Bicycles

PROJECT:	Capstone - GMU Housing	**DATE:**	12/6/2017	**SOUTHBOUND ROAD:**	Chain Bridge Road - 123
W+A JOB NO:	7302	**DAY:**	Wednesday	**NORTHBOUND ROAD:**	Chain Bridge Road - 123
INTERSECTION:	Chain Bridge Rd. & Kenmoore Dr.	**WEATHER:**	clear	**WESTBOUND ROAD:**	Kenmore Drive
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	James	**EASTBOUND ROAD:**	0
		INPUTED BY:	agan		

Time	Southbound				Westbound				Northbound				Eastbound				North & South	East & West	Total
	Chain Bridge Road - 123				Kenmore Drive				Chain Bridge Road - 123				0						
Period	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total			
15 Minute Volumes																			
6:00 AM - 6:15 AM																			
6:15 AM - 6:30 AM																			
6:30 AM - 6:45 AM																			
6:45 AM - 7:00 AM																			
7:00 AM - 7:15 AM																			
7:15 AM - 7:30 AM																			
7:30 AM - 7:45 AM																			
7:45 AM - 8:00 AM																			
8:00 AM - 8:15 AM																			
8:15 AM - 8:30 AM																			
8:30 AM - 8:45 AM																			
8:45 AM - 9:00 AM		2		2						2		2					4		4
9:00 AM - 9:15 AM																			
9:15 AM - 9:30 AM																			
9:30 AM - 9:45 AM										1		1					1		1
9:45 AM - 10:00 AM		2		2													2		2
3:00 PM - 3:15 PM		1		1													1		1
3:15 PM - 3:30 PM																			
3:30 PM - 3:45 PM																			
3:45 PM - 4:00 PM																			
4:00 PM - 4:15 PM																			
4:15 PM - 4:30 PM																			
4:30 PM - 4:45 PM																			
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6:00 PM - 6:15 PM																			
6:15 PM - 6:30 PM																			
6:30 PM - 6:45 PM																			
6:45 PM - 7:00 PM																			
Total	0	5	0	5	0	0	0	0	0	3	0	3	0	0	0	0	8	0	8
One Hour Volumes																			
6:00 AM - 7:00 AM																			
6:15 AM - 7:15 AM																			
6:30 AM - 7:30 AM																			
6:45 AM - 7:45 AM																			
7:00 AM - 8:00 AM																			
7:15 AM - 8:15 AM																			
7:30 AM - 8:30 AM																			
7:45 AM - 8:45 AM																			
8:00 AM - 9:00 AM		2		2						2		2					4		4
8:15 AM - 9:15 AM		2		2						2		2					4		4
8:30 AM - 9:30 AM		2		2						2		2					4		4
8:45 AM - 9:45 AM		2		2						3		3					5		5
9:00 AM - 10:00 AM		2		2						1		1					3		3
3:00 PM - 4:00 PM		1		1													1		1
3:15 PM - 4:15 PM																			
3:30 PM - 4:30 PM																			
3:45 PM - 4:45 PM																			
4:00 PM - 5:00 PM																			
4:15 PM - 5:15 PM																			
4:30 PM - 5:30 PM																			
4:45 PM - 5:45 PM																			
5:00 PM - 6:00 PM																			
5:15 PM - 6:15 PM																			
5:30 PM - 6:30 PM																			
5:45 PM - 6:45 PM																			
6:00 PM - 7:00 PM																			

Wells & Associates,Inc

McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT: Capstone - GMU Housing
W+A JOB NO: 7302
INTERSECTION: University Dr. & Kenmoore Dr.
LOCATION: City of Fairfax,VA

DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Vic
INPUTED BY: agan

SOUTHBOUND ROAD: 0
NORTHBOUND ROAD: University Drive
WESTBOUND ROAD: University Drive
EASTBOUND ROAD: Kenmore Drive

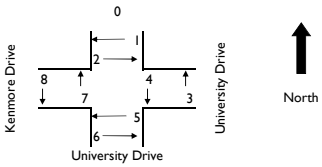
Time	Southbound 0					Westbound University Drive					Northbound University Drive					Eastbound Kenmore Drive					North & South	East & West	Total
Period	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM							1	7	8		5		4	9		10			10		9	18	27
6:15 AM - 6:30 AM							2	9	11		10		9	19		6	1		7		19	18	37
6:30 AM - 6:45 AM								6	6		21		13	34		9	1		10		34	16	50
6:45 AM - 7:00 AM								11	11		29		13	42		16	1		17		42	28	70
7:00 AM - 7:15 AM							1	12	13		20		17	37		17	3		20		37	33	70
7:15 AM - 7:30 AM							2	22	24		39		20	59		25	2		27		59	51	110
7:30 AM - 7:45 AM								28	28		70		9	79		16	2		18		79	46	125
7:45 AM - 8:00 AM							1	30	31		100		28	128		23	13		36		128	67	195
8:00 AM - 8:15 AM							2	37	39		50		18	68		23	2		25		68	64	132
8:15 AM - 8:30 AM							2	48	50		54		16	70		32	4		36		70	86	156
8:30 AM - 8:45 AM							3	69	72		57		21	78		27	1		28		78	100	178
8:45 AM - 9:00 AM							3	47	50		56		20	76		32	1		33		76	83	159
9:00 AM - 9:15 AM							1	52	53		52		22	74		37	3		40		74	93	167
9:15 AM - 9:30 AM							1	60	61		49		21	70		29	2		31		70	92	162
9:30 AM - 9:45 AM							1	37	38		39		28	67		29			29		67	67	134
9:45 AM - 10:00 AM							3	39	42		27		21	48		45			45		48	87	135
3:00 PM 3:15 PM							1	44	45		44		50	94		29	6		35		94	80	174
3:15 PM 3:30 PM								54	54		61		37	98		26	2		28		98	82	180
3:30 PM 3:45 PM							2	54	56		37		19	56		35			35		56	91	147
3:45 PM 4:00 PM							2	62	64		51		36	87		22	1		23		87	87	174
4:00 PM 4:15 PM							2	52	54		51		40	91		25	3		28		91	82	173
4:15 PM 4:30 PM							4	49	53		61		36	97		17	6		23		97	76	173
4:30 PM 4:45 PM							2	49	51		80		39	119		32	6		38		119	89	208
4:45 PM 5:00 PM							2	44	46		63		37	100		20	1		21		100	67	167
5:00 PM 5:15 PM							3	43	46		65		46	111		31			31		111	77	188
5:15 PM 5:30 PM							1	35	36		49		43	92		21			21		92	57	149
5:30 PM 5:45 PM							1	70	71		67		27	94		13	1		14		94	85	179
5:45 PM 6:00 PM							4	49	53		39		47	86		34	1		35		86	88	174
6:00 PM 6:15 PM							1	48	49		46		34	80		31	2		33		80	82	162
6:15 PM 6:30 PM							2	43	45		34		28	62		19			19		62	64	126
6:30 PM 6:45 PM							2	40	42		42		26	68		19	1		20		68	62	130
6:45 PM 7:00 PM							1	54	55		38		15	53		38			38		53	93	146
Total	0	0	0	0		0	53	1304	1357		1506	0	840	2346		788	66	0	854		2346	2211	4557
One Hour Volumes																							
6:00 AM - 7:00 AM							3	33	36	0.8182	65		39	104	0.619	41	3		44	0.6471	104	80	184
6:15 AM - 7:15 AM							3	38	41	0.7885	80		52	132	0.7857	48	6		54	0.675	132	95	227
6:30 AM - 7:30 AM							3	51	54	0.5625	109		63	172	0.7288	67	7		74	0.6852	172	128	300
6:45 AM - 7:45 AM							3	73	76	0.6786	158		59	217	0.6867	74	8		82	0.7593	217	158	375
7:00 AM - 8:00 AM							4	92	96	0.7742	229		74	303	0.5918	81	20		101	0.7014	303	197	500
7:15 AM - 8:15 AM							5	117	122	0.7821	259		75	334	0.6523	87	19		106	0.7361	334	228	562
7:30 AM - 8:30 AM							5	143	148	0.74	274		71	345	0.6738	94	21		115	0.7986	345	263	608
7:45 AM - 8:45 AM							8	184	192	0.6667	261		83	344	0.6719	105	20		125	0.8681	344	317	661
8:00 AM - 9:00 AM							10	201	211	0.7326	217		75	292	0.9359	114	8		122	0.8472	292	333	625
8:15 AM - 9:15 AM							9	216	225	0.7813	219		79	298	0.9551	128	9		137	0.8563	298	362	660
8:30 AM - 9:30 AM							8	228	236	0.8194	214		84	298	0.9551	125	7		132	0.825	298	368	666
8:45 AM - 9:45 AM							6	196	202	0.8279	196		91	287	0.9441	127	6		133	0.8313	287	335	622
9:00 AM 10:00 AM							6	188	194	0.7951	167		92	259	0.875	140	5		145	0.8056	259	339	598
3:00 PM 4:00 PM							5	214	219	0.8555	193		142	335	0.8546	112	9		121	0.8643	335	340	675
3:15 PM 4:15 PM							6	222	228	0.8906	200		132	332	0.8469	108	6		114	0.8143	332	342	674
3:30 PM 4:30 PM							10	217	227	0.8867	200		131	331	0.8531	99	10		109	0.7786	331	336	667
3:45 PM 4:45 PM							10	212	222	0.8672	243		151	394	0.8277	96	16		112	0.7368	394	334	728
4:00 PM 5:00 PM							10	194	204	0.9444	255		152	407	0.855	94	16		110	0.7237	407	314	721
4:15 PM 5:15 PM							11	185	196	0.9245	269		158	427	0.8971	100	13		113	0.7434	427	309	736
4:30 PM 5:30 PM							8	171	179	0.8775	257		165	422	0.8866	104	7		111	0.7303	422	290	712
4:45 PM 5:45 PM							7	192	199	0.7007	244		153	397	0.8941	85	2		87	0.7016	397	286	683
5:00 PM 6:00 PM							9	197	206	0.7254	220		163	383	0.8626	99	2		101	0.7214	383	307	690
5:15 PM 6:15 PM							7	202	209	0.7359	201		151	352	0.9362	99	4		103	0.7357	352	312	664
5:30 PM 6:30 PM							8	210	218	0.7676	186		136	322	0.8564	97	4		101	0.7214	322	319	641
5:45 PM 6:45 PM							9	180	189	0.8915	161		135	296	0.8605	103	4		107	0.7643	296	296	592
6:00 PM 7:00 PM							6	185	191	0.8682	160		103	263	0.8219	107	3		110	0.7237	263	301	564

Wells + Associates, Inc.

McLean, Virginia

Pedestrian Volume Survey

PROJECT: Capstone - GMU Housing
W + A JOB NO: 7302
INTERSECTION: University Dr. & Kenmoore Dr.
LOCATION: City of Fairfax,VA
DATE: 12/6/2017
DAY: Wednesday
WEATHER: clear
COUNTED BY: Vic
INPUTED BY: agan



Time Period	Movement 1	2	3	4	5	6	7	8	1 + 2	3 + 4	5 + 6	7+ 8	Total
15 Minute Volumes													
6:00 AM - 6:15 AM													
6:15 AM - 6:30 AM													
6:30 AM - 6:45 AM													
6:45 AM - 7:00 AM													
7:00 AM - 7:15 AM							1						
7:15 AM - 7:30 AM													
7:30 AM - 7:45 AM													
7:45 AM - 8:00 AM							2						
8:00 AM - 8:15 AM													
8:15 AM - 8:30 AM													
8:30 AM - 8:45 AM													
8:45 AM - 9:00 AM													
9:00 AM - 9:15 AM													
9:15 AM - 9:30 AM													
9:30 AM - 9:45 AM													
9:45 AM - 10:00 AM													
3:00 PM - 3:15 PM													
3:15 PM - 3:30 PM													
3:30 PM - 3:45 PM								1					
3:45 PM - 4:00 PM													
4:00 PM - 4:15 PM													
4:15 PM - 4:30 PM								2					
4:30 PM - 4:45 PM													
4:45 PM - 5:00 PM							1						
5:00 PM - 5:15 PM													
5:15 PM - 5:30 PM													
5:30 PM - 5:45 PM							1						
5:45 PM - 6:00 PM													
6:00 PM - 6:15 PM													
6:15 PM - 6:30 PM													
6:30 PM - 6:45 PM													
6:45 PM - 7:00 PM													
Total	0	0	0	0	0	0	5	3					
One Hour Volumes													
6:00 AM - 7:00 AM													
6:15 AM - 7:15 AM							1					1	1
6:30 AM - 7:30 AM							1					1	1
6:45 AM - 7:45 AM							1					1	1
7:00 AM - 8:00 AM							3					3	3
7:15 AM - 8:15 AM							2					2	2
7:30 AM - 8:30 AM							2					2	2
7:45 AM - 8:45 AM							2					2	2
8:00 AM - 9:00 AM													
8:15 AM - 9:15 AM													
8:30 AM - 9:30 AM													
8:45 AM - 9:45 AM													
9:00 AM - 10:00 AM													
3:00 PM - 4:00 PM								1				1	1
3:15 PM - 4:15 PM								1				1	1
3:30 PM - 4:30 PM								3				3	3
3:45 PM - 4:45 PM								2				2	2
4:00 PM - 5:00 PM							1	2				3	3
4:15 PM - 5:15 PM							1	2				3	3
4:30 PM - 5:30 PM							1					1	1
4:45 PM - 5:45 PM							2					2	2
5:00 PM - 6:00 PM							1					1	1
5:15 PM - 6:15 PM							1					1	1
5:30 PM - 6:30 PM							1					1	1
5:45 PM - 6:45 PM													
6:00 PM - 7:00 PM													

McLean, Virginia

Turning Movement Count - Bicycles

PROJECT:	Capstone - GMU Housing	**DATE:**	12/6/2017	**SOUTHBOUND ROAD:**	0
W+A JOB NO:	7302	**DAY:**	Wednesday	**NORTHBOUND ROAD:**	University Drive
INTERSECTION:	University Dr. & Kenmoore Dr.	**WEATHER:**	clear	**WESTBOUND ROAD:**	University Drive
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Vic	**EASTBOUND ROAD:**	Kenmore Drive
		INPUTED BY:	agan		

Time	Southbound 0				Westbound University Drive				Northbound University Drive				Eastbound Kenmore Drive				North & South	East & West	Total
Period	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total			
15 Minute Volumes																			
6:00 AM - 6:15 AM																			
6:15 AM - 6:30 AM																			
6:30 AM - 6:45 AM																			
6:45 AM - 7:00 AM																			
7:00 AM - 7:15 AM																			
7:15 AM - 7:30 AM											1	1					1		1
7:30 AM - 7:45 AM																			
7:45 AM - 8:00 AM																			
8:00 AM - 8:15 AM																			
8:15 AM - 8:30 AM																			
8:30 AM - 8:45 AM																			
8:45 AM - 9:00 AM																			
9:00 AM - 9:15 AM											3	3					3		3
9:15 AM - 9:30 AM																			
9:30 AM - 9:45 AM																			
9:45 AM - 10:00 AM																			
3:00 PM - 3:15 PM											1	1	1			1	1	1	2
3:15 PM - 3:30 PM																			
3:30 PM - 3:45 PM																			
3:45 PM - 4:00 PM																			
4:00 PM - 4:15 PM																			
4:15 PM - 4:30 PM																			
4:30 PM - 4:45 PM																			
4:45 PM - 5:00 PM																			
5:00 PM - 5:15 PM															1	1		1	1
5:15 PM - 5:30 PM																			
5:30 PM - 5:45 PM										1		1					1		1
5:45 PM - 6:00 PM																			
6:00 PM - 6:15 PM											1		1						
6:15 PM - 6:30 PM																			
6:30 PM - 6:45 PM																			
6:45 PM - 7:00 PM																			
Total	0	0	0	0	0	0	0	0	0	1	6	6	2	0	1	2	6	2	8
One Hour Volumes																			
6:00 AM - 7:00 AM																			
6:15 AM - 7:15 AM																			
6:30 AM - 7:30 AM											1	1					1		1
6:45 AM - 7:45 AM											1	1					1		1
7:00 AM - 8:00 AM											1	1					1		1
7:15 AM - 8:15 AM											1	1					1		1
7:30 AM - 8:30 AM																			
7:45 AM - 8:45 AM																			
8:00 AM - 9:00 AM																			
8:15 AM - 9:15 AM											3	3					3		3
8:30 AM - 9:30 AM											3	3					3		3
8:45 AM - 9:45 AM											3	3					3		3
9:00 AM - 10:00 AM											3	3					3		3
3:00 PM - 4:00 PM											1	1	1			1	1	1	2
3:15 PM - 4:15 PM																			
3:30 PM - 4:30 PM																			
3:45 PM - 4:45 PM																			
4:00 PM - 5:00 PM																			
4:15 PM - 5:15 PM															1	1		1	1
4:30 PM - 5:30 PM															1	1		1	1
4:45 PM - 5:45 PM										1		1			1	1	1	1	2
5:00 PM - 6:00 PM																			
5:15 PM - 6:15 PM																			
5:30 PM - 6:30 PM																			
5:45 PM - 6:45 PM																			
6:00 PM - 7:00 PM										1		1			1	1	1	1	2

APPENDIX D
EXISTING CONDITIONS SYNCHRO REPORTS

HCM Unsignalized Intersection Capacity Analysis
1: University Dr & Layton Hall Dr

02/13/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	3	4	82	0	97	0	261	170	103	197	1
Future Volume (Veh/h)	4	3	4	82	0	97	0	261	170	103	197	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)	5	4	5	96	0	114	0	307	200	121	232	1
Pedestrians		3			7							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			1							
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								640				
pX, platoon unblocked												
vC, conflicting volume	842	992	236	796	792	314	236			514		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	842	992	236	796	792	314	236			514		
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	98	99	64	100	84	100			88		
cM capacity (veh/h)	216	215	801	269	282	721	1327			1045		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	14	210	307	200	354
Volume Left	5	96	0	0	121
Volume Right	5	114	0	200	1
cSH	292	588	1327	1700	1045
Volume to Capacity	0.05	0.36	0.00	0.12	0.12
Queue Length 95th (ft)	4	40	0	0	10
Control Delay (s)	18.0	17.7	0.0	0.0	3.8
Lane LOS	C	C			A
Approach Delay (s)	18.0	17.7	0.0		3.8
Approach LOS	C	C			

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	241	35	13	174	5	6
Future Volume (Veh/h)	241	35	13	174	5	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	271	39	15	205	6	7
Pedestrians				1	5	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				3.5	3.5	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1052		
pX, platoon unblocked						
vC, conflicting volume			315		530	296
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			315		530	296
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1239		501	739

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	310	220	13
Volume Left	0	15	6
Volume Right	39	0	7
cSH	1700	1239	606
Volume to Capacity	0.18	0.01	0.02
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.6	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.6	11.1
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	217	17	29	171	4	8	0	18	2	0	8
Future Volume (Veh/h)	13	217	17	29	171	4	8	0	18	2	0	8
Sign Control		Free			Free			Stop			Stop	
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)	15	255	20	34	201	5	9	0	21	2	0	9
Pedestrians								2			2	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					360							
pX, platoon unblocked												
vC, conflicting volume	208			277			578	573	267	590	580	206
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	208			277			578	573	267	590	580	206
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			98	100	97	99	100	99
cM capacity (veh/h)	1360			1283			409	412	770	395	408	833

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	290	240	30	11
Volume Left	15	34	9	2
Volume Right	20	5	21	9
cSH	1360	1283	609	693
Volume to Capacity	0.01	0.03	0.05	0.02
Queue Length 95th (ft)	1	2	4	1
Control Delay (s)	0.5	1.3	11.2	10.3
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	1.3	11.2	10.3
Approach LOS			B	B

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	234	45	13	105	54	534	12	26	459	175
v/c Ratio	0.63	0.12	0.08	0.46	0.15	0.69	0.02	0.08	0.65	0.25
Control Delay	45.4	21.9	47.9	20.4	14.0	30.1	0.0	13.6	30.6	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	21.9	47.9	20.4	14.0	30.1	0.0	13.6	30.6	4.6
Queue Length 50th (ft)	126	10	7	6	15	275	0	7	226	0
Queue Length 95th (ft)	243	43	28	55	38	428	0	22	355	36
Internal Link Dist (ft)		280		153		358			327	
Turn Bay Length (ft)							200	130		300
Base Capacity (vph)	534	534	516	537	387	1193	1016	355	1193	1045
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.08	0.03	0.20	0.14	0.45	0.01	0.07	0.38	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	18	20	11	9	80	46	454	10	22	390	149
Future Volume (vph)	199	18	20	11	9	80	46	454	10	22	390	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1714		1770	1613		1768	1863	1520	1767	1863	1540
Flt Permitted	0.95	1.00		0.95	1.00		0.30	1.00	1.00	0.27	1.00	1.00
Satd. Flow (perm)	1770	1714		1770	1613		567	1863	1520	502	1863	1540
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)	234	21	24	13	11	94	54	534	12	26	459	175
RTOR Reduction (vph)	0	19	0	0	88	0	0	0	7	0	0	108
Lane Group Flow (vph)	234	26	0	13	17	0	54	534	5	26	459	67
Confl. Peds. (#/hr)							3		8	8		3
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases							6		6	2		2
Actuated Green, G (s)	18.4	18.4		5.5	5.5		41.7	36.5	36.5	38.3	34.8	34.8
Effective Green, g (s)	18.4	18.4		5.5	5.5		41.7	36.5	36.5	38.3	34.8	34.8
Actuated g/C Ratio	0.20	0.20		0.06	0.06		0.46	0.40	0.40	0.42	0.38	0.38
Clearance Time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	355	344		106	96		326	743	606	258	708	585
v/s Ratio Prot	c0.13	0.02		0.01	c0.01		c0.01	c0.29		0.00	0.25	
v/s Ratio Perm							0.07		0.00	0.04		0.04
v/c Ratio	0.66	0.08		0.12	0.17		0.17	0.72	0.01	0.10	0.65	0.11
Uniform Delay, d1	33.7	29.6		40.7	40.8		15.2	23.2	16.6	16.9	23.3	18.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	0.1		0.5	0.9		0.2	3.3	0.0	0.2	2.1	0.1
Delay (s)	38.0	29.7		41.2	41.7		15.4	26.5	16.6	17.1	25.4	18.4
Level of Service	D	C		D	D		B	C	B	B	C	B
Approach Delay (s)		36.7			41.7			25.3			23.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	27.6
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	NBT	SBT
Lane Group Flow (vph)	172	62	29	391	333
v/c Ratio	0.32	0.10	0.05	0.31	0.30
Control Delay	10.9	3.7	7.0	8.5	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	3.7	7.0	8.5	8.5
Queue Length 50th (ft)	19	0	2	21	17
Queue Length 95th (ft)	63	15	13	60	48
Internal Link Dist (ft)	497		78	245	560
Turn Bay Length (ft)		80			
Base Capacity (vph)	1276	1412	1337	2967	2623
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.04	0.02	0.13	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	35	53	8	7	10	11	310	39	44	203	36
Future Volume (vph)	111	35	53	8	7	10	11	310	39	44	203	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frpb, ped/bikes		1.00	0.99		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.94			0.98			0.98	
Flt Protected		0.96	1.00		0.98			1.00			0.99	
Satd. Flow (prot)		1794	1561		1731			3468			3435	
Flt Permitted		0.76	1.00		0.84			0.93			0.83	
Satd. Flow (perm)		1412	1561		1480			3243			2868	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.92	0.92	0.85	0.85	0.85
Adj. Flow (vph)	131	41	62	9	8	12	12	337	42	52	239	42
RTOR Reduction (vph)	0	0	44	0	9	0	0	16	0	0	20	0
Lane Group Flow (vph)	0	172	18	0	20	0	0	375	0	0	313	0
Confl. Peds. (#/hr)			5	5			3		5	5		3
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)		7.5	7.5		7.5			7.5			7.5	
Effective Green, g (s)		7.5	7.5		7.5			7.5			7.5	
Actuated g/C Ratio		0.29	0.29		0.29			0.29			0.29	
Clearance Time (s)		6.0	6.0		6.0			5.0			5.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		407	450		426			935			827	
v/s Ratio Prot												
v/s Ratio Perm		c0.12	0.01		0.01			c0.12			0.11	
v/c Ratio		0.42	0.04		0.05			0.40			0.38	
Uniform Delay, d1		7.5	6.7		6.7			7.4			7.4	
Progression Factor		1.00	1.00		1.02			1.00			1.00	
Incremental Delay, d2		0.7	0.0		0.0			0.3			0.3	
Delay (s)		8.2	6.7		6.8			7.7			7.7	
Level of Service		A	A		A			A			A	
Approach Delay (s)		7.8			6.8			7.7			7.7	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	26.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	16	726	126	51	596
Future Volume (Veh/h)	18	16	726	126	51	596
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	21	19	854	148	60	701
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	1675	854			1002	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1675	854			1002	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	78	95			91	
cM capacity (veh/h)	96	358			691	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	40	854	148	761
Volume Left	21	0	0	60
Volume Right	19	0	148	0
cSH	147	1700	1700	691
Volume to Capacity	0.27	0.50	0.09	0.09
Queue Length 95th (ft)	26	0	0	7
Control Delay (s)	38.4	0.0	0.0	2.3
Lane LOS	E			A
Approach Delay (s)	38.4	0.0		2.3
Approach LOS	E			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	15	795	29	101	612
Future Volume (Veh/h)	9	15	795	29	101	612
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.87	0.87
Hourly flow rate (vph)	11	18	935	34	116	703
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1888	953			970	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1888	953			970	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	94			84	
cM capacity (veh/h)	65	314			710	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	29	969	116	703
Volume Left	11	0	116	0
Volume Right	18	34	0	0
cSH	170	1700	710	1700
Volume to Capacity	0.17	0.57	0.16	0.41
Queue Length 95th (ft)	15	0	15	0
Control Delay (s)	37.9	0.0	11.1	0.0
Lane LOS	E		B	
Approach Delay (s)	37.9	0.0	1.6	
Approach LOS	E			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	110	87	275	191	8
Future Volume (Veh/h)	20	110	87	275	191	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	23	126	102	324	225	9
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				868		
pX, platoon unblocked						
vC, conflicting volume	760	232	236			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	760	232	236			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	84	92			
cM capacity (veh/h)	345	806	1329			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	149	426	234
Volume Left	23	102	0
Volume Right	126	0	9
cSH	668	1329	1700
Volume to Capacity	0.22	0.08	0.14
Queue Length 95th (ft)	21	6	0
Control Delay (s)	11.9	2.5	0.0
Lane LOS	B	A	
Approach Delay (s)	11.9	2.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: University Dr & Layton Hall Dr

02/13/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	2	3	175	1	141	3	291	113	79	204	2
Future Volume (Veh/h)	1	2	3	175	1	141	3	291	113	79	204	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.89	0.89	0.89	0.92	0.92	0.92	0.91	0.91	0.91
Hourly flow rate (vph)	1	2	4	197	1	158	3	316	123	87	224	2
Pedestrians		3			5						4	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		0			0						0	
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								640				
pX, platoon unblocked												
vC, conflicting volume	808	852	228	731	730	325	229			444		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	808	852	228	731	730	325	229			444		
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	99	100	36	100	78	100			92		
cM capacity (veh/h)	215	271	809	310	319	710	1335			1111		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	7	356	319	123	313
Volume Left	1	197	3	0	87
Volume Right	4	158	0	123	2
cSH	412	509	1335	1700	1111
Volume to Capacity	0.02	0.70	0.00	0.07	0.08
Queue Length 95th (ft)	1	136	0	0	6
Control Delay (s)	13.9	26.9	0.1	0.0	2.9
Lane LOS	B	D	A		A
Approach Delay (s)	13.9	26.9	0.1		2.9
Approach LOS	B	D			

Intersection Summary			
Average Delay	9.5		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	185	9	6	280	37	16
Future Volume (Veh/h)	185	9	6	280	37	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.88	0.88	0.85	0.85
Hourly flow rate (vph)	218	11	7	318	44	19
Pedestrians				13	1	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				3.5	3.5	
Percent Blockage				1	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1052		
pX, platoon unblocked						
vC, conflicting volume			230		556	238
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			230		556	238
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		91	98
cM capacity (veh/h)			1337		489	791

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	229	325	63
Volume Left	0	7	44
Volume Right	11	0	19
cSH	1700	1337	552
Volume to Capacity	0.13	0.01	0.11
Queue Length 95th (ft)	0	0	10
Control Delay (s)	0.0	0.2	12.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	12.4
Approach LOS			B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	192	7	34	254	0	14	1	38	9	1	18
Future Volume (Veh/h)	2	192	7	34	254	0	14	1	38	9	1	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	223	8	40	295	0	16	1	45	11	1	21
Pedestrians		1			3			2			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					360							
pX, platoon unblocked												
vC, conflicting volume	301			233			630	614	232	660	618	302
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	301			233			630	614	232	660	618	302
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			96	100	94	97	100	97
cM capacity (veh/h)	1253			1332			369	391	803	341	389	733

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	233	335	62	33
Volume Left	2	40	16	11
Volume Right	8	0	45	21
cSH	1253	1332	609	520
Volume to Capacity	0.00	0.03	0.10	0.06
Queue Length 95th (ft)	0	2	8	5
Control Delay (s)	0.1	1.2	11.6	12.4
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	1.2	11.6	12.4
Approach LOS			B	B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	191	84	16	25	47	428	29	29	763	263
v/c Ratio	0.69	0.27	0.14	0.21	0.17	0.41	0.03	0.05	0.77	0.29
Control Delay	56.9	15.6	54.6	38.7	11.6	18.8	0.1	10.7	30.7	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.9	15.6	54.6	38.7	11.6	18.8	0.1	10.7	30.7	6.4
Queue Length 50th (ft)	132	9	11	9	13	199	0	8	474	25
Queue Length 95th (ft)	206	49	33	36	32	308	0	23	#814	86
Internal Link Dist (ft)		280		153		358			327	
Turn Bay Length (ft)							200	130		300
Base Capacity (vph)	403	425	389	389	293	1055	885	567	990	902
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.20	0.04	0.06	0.16	0.41	0.03	0.05	0.77	0.29

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	12	61	14	11	10	40	364	25	26	687	237
Future Volume (vph)	166	12	61	14	11	10	40	364	25	26	687	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.93	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.88		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1630		1770	1729		1770	1863	1470	1752	1863	1528
Flt Permitted	0.95	1.00		0.95	1.00		0.16	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	1770	1630		1770	1729		291	1863	1470	829	1863	1528
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	191	14	70	16	13	12	47	428	29	29	763	263
RTOR Reduction (vph)	0	60	0	0	12	0	0	0	13	0	0	95
Lane Group Flow (vph)	191	24	0	16	13	0	47	428	16	29	763	168
Confl. Peds. (#/hr)							5		17	17		5
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	16.5	16.5		4.0	4.0		65.4	59.6	59.6	61.2	57.5	57.5
Effective Green, g (s)	16.5	16.5		4.0	4.0		65.4	59.6	59.6	61.2	57.5	57.5
Actuated g/C Ratio	0.15	0.15		0.04	0.04		0.59	0.54	0.54	0.55	0.52	0.52
Clearance Time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	262	241		63	62		247	996	786	486	961	788
v/s Ratio Prot	c0.11	0.01		c0.01	0.01		c0.01	0.23		0.00	c0.41	
v/s Ratio Perm							0.10		0.01	0.03		0.11
v/c Ratio	0.73	0.10		0.25	0.22		0.19	0.43	0.02	0.06	0.79	0.21
Uniform Delay, d1	45.3	41.0		52.2	52.2		15.6	15.6	12.2	11.7	22.1	14.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.7	0.2		2.1	1.8		0.4	0.3	0.0	0.1	4.6	0.1
Delay (s)	55.0	41.2		54.4	53.9		16.0	15.9	12.2	11.8	26.7	14.8
Level of Service	E	D		D	D		B	B	B	B	C	B
Approach Delay (s)		50.8			54.1			15.7			23.3	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	111.4	Sum of lost time (s)	27.6
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	NBT	SBT
Lane Group Flow (vph)	99	79	115	427	424
v/c Ratio	0.20	0.14	0.21	0.34	0.39
Control Delay	10.3	3.7	7.6	8.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	3.7	7.6	8.4	8.8
Queue Length 50th (ft)	11	0	8	21	22
Queue Length 95th (ft)	38	17	34	68	70
Internal Link Dist (ft)	497		78	245	560
Turn Bay Length (ft)		80			
Base Capacity (vph)	1311	1411	1420	2790	2406
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.08	0.15	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	40	67	25	38	35	38	328	23	107	244	31
Future Volume (vph)	44	40	67	25	38	35	38	328	23	107	244	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frpb, ped/bikes		1.00	0.98		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.95			0.99			0.99	
Flt Protected		0.97	1.00		0.99			1.00			0.99	
Satd. Flow (prot)		1815	1558		1749			3483			3436	
Flt Permitted		0.77	1.00		0.88			0.87			0.75	
Satd. Flow (perm)		1443	1558		1563			3042			2625	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	52	47	79	29	45	41	42	360	25	119	271	34
RTOR Reduction (vph)	0	0	59	0	31	0	0	8	0	0	11	0
Lane Group Flow (vph)	0	99	20	0	84	0	0	419	0	0	413	0
Confl. Peds. (#/hr)			10	10			13		12	12		13
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		6.6	6.6		6.6			8.2			8.2	
Effective Green, g (s)		6.6	6.6		6.6			8.2			8.2	
Actuated g/C Ratio		0.26	0.26		0.26			0.32			0.32	
Clearance Time (s)		6.0	6.0		6.0			5.0			5.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		369	398		399			966			834	
v/s Ratio Prot												
v/s Ratio Perm		c0.07	0.01		0.05			0.14			c0.16	
v/c Ratio		0.27	0.05		0.21			0.43			0.50	
Uniform Delay, d1		7.7	7.2		7.6			7.0			7.1	
Progression Factor		1.00	1.00		1.01			1.00			1.00	
Incremental Delay, d2		0.4	0.1		0.3			0.3			0.5	
Delay (s)		8.1	7.3		7.9			7.3			7.6	
Level of Service		A	A		A			A			A	
Approach Delay (s)		7.7			7.9			7.3			7.6	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	25.8	Sum of lost time (s)	11.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	64	47	491	103	55	602
Future Volume (Veh/h)	64	47	491	103	55	602
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	75	55	534	112	62	676
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	1334	534			646	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1334	534			646	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	53	90			93	
cM capacity (veh/h)	158	546			939	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	130	534	112	738
Volume Left	75	0	0	62
Volume Right	55	0	112	0
cSH	226	1700	1700	939
Volume to Capacity	0.57	0.31	0.07	0.07
Queue Length 95th (ft)	80	0	0	5
Control Delay (s)	40.3	0.0	0.0	1.7
Lane LOS	E			A
Approach Delay (s)	40.3	0.0		1.7
Approach LOS	E			

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	69	582	12	101	621
Future Volume (Veh/h)	8	69	582	12	101	621
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.91	0.91
Hourly flow rate (vph)	9	81	685	14	111	682
Pedestrians	16					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	2					
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1612	708			715	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1612	708			715	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	81			87	
cM capacity (veh/h)	99	428			872	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	90	699	111	682
Volume Left	9	0	111	0
Volume Right	81	14	0	0
cSH	476	1700	872	1700
Volume to Capacity	0.19	0.41	0.13	0.40
Queue Length 95th (ft)	17	0	11	0
Control Delay (s)	18.3	0.0	9.7	0.0
Lane LOS	C		A	
Approach Delay (s)	18.3	0.0	1.4	
Approach LOS	C			

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	100	160	273	185	11
Future Volume (Veh/h)	13	100	160	273	185	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	15	118	178	303	201	12
Pedestrians	3					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				868		
pX, platoon unblocked						
vC, conflicting volume	869	210	216			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	869	210	216			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	86	87			
cM capacity (veh/h)	279	828	1350			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	133	481	213
Volume Left	15	178	0
Volume Right	118	0	12
cSH	678	1350	1700
Volume to Capacity	0.20	0.13	0.13
Queue Length 95th (ft)	18	11	0
Control Delay (s)	11.6	3.8	0.0
Lane LOS	B	A	
Approach Delay (s)	11.6	3.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX E
LEVEL OF SERVICE DESCRIPTIONS

Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle for a 15-min analysis period. The criteria are given in Exhibit 16-2. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the *v/c* ratio for the lane group in question.

LOS A describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

Exhibit 16-2. Level-of-Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤10.0
B	> 10.0 and ≤20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	>80.0

LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.

LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council

Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Table 17-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. . . .

Table 17-2. Level of Service Criteria for TWSC Intersections

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. To remain consistent with the AWSC intersection analysis procedure described later in this chapter, a total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The proposed level of service criteria for TWSC intersections are somewhat different from the criteria used in Chapter 16 for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. . . .

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council

APPENDIX F
PIPELINE DEVELOPMENT INFORMATION

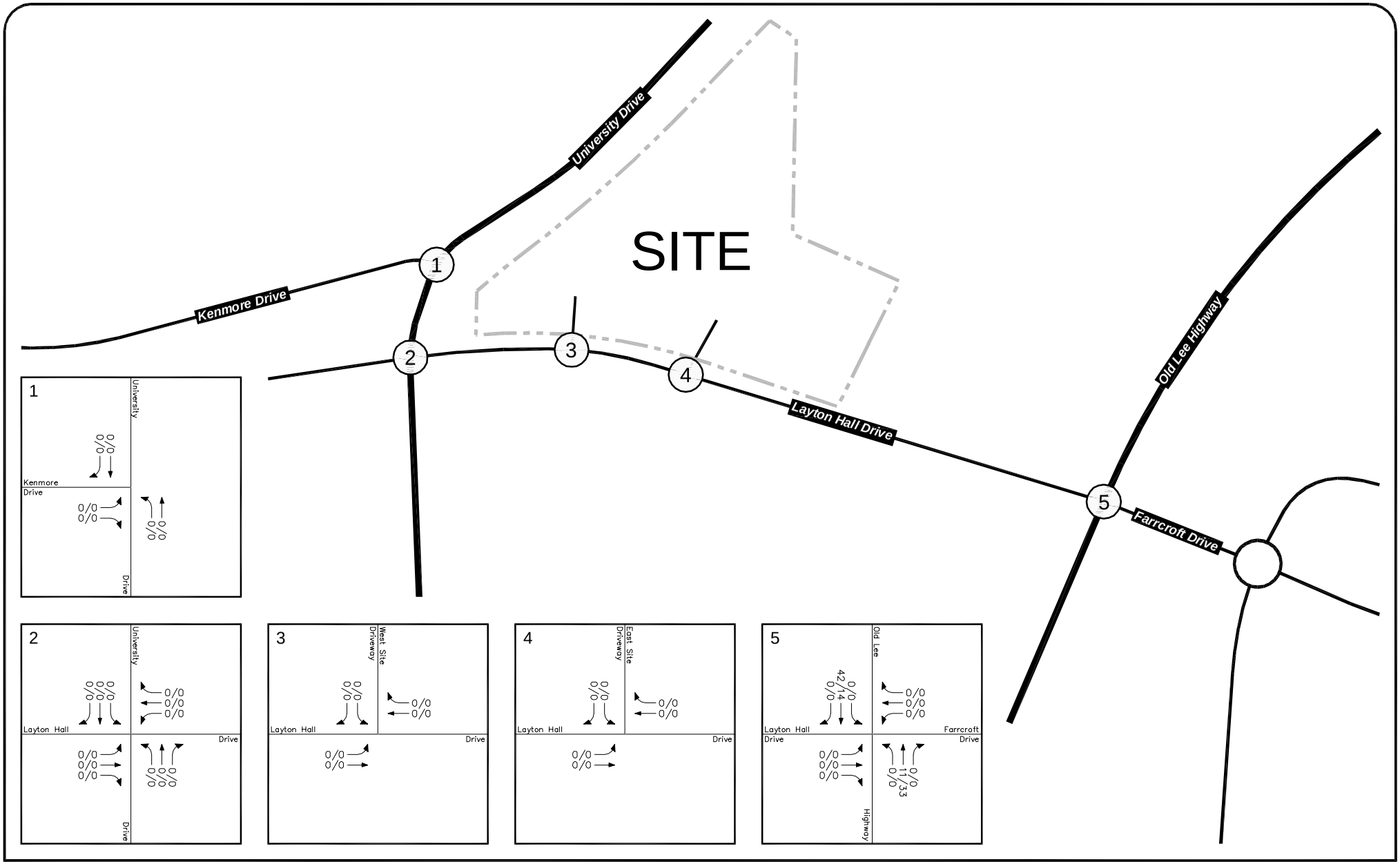


Figure F-1
Pipeline Generated Trip Assignments
GMU Expansion

AM PEAK HOUR
PM PEAK HOUR
000/000

North

Layton Hall Apartments
City of Fairfax, Virginia

Wells + Associates, Inc.

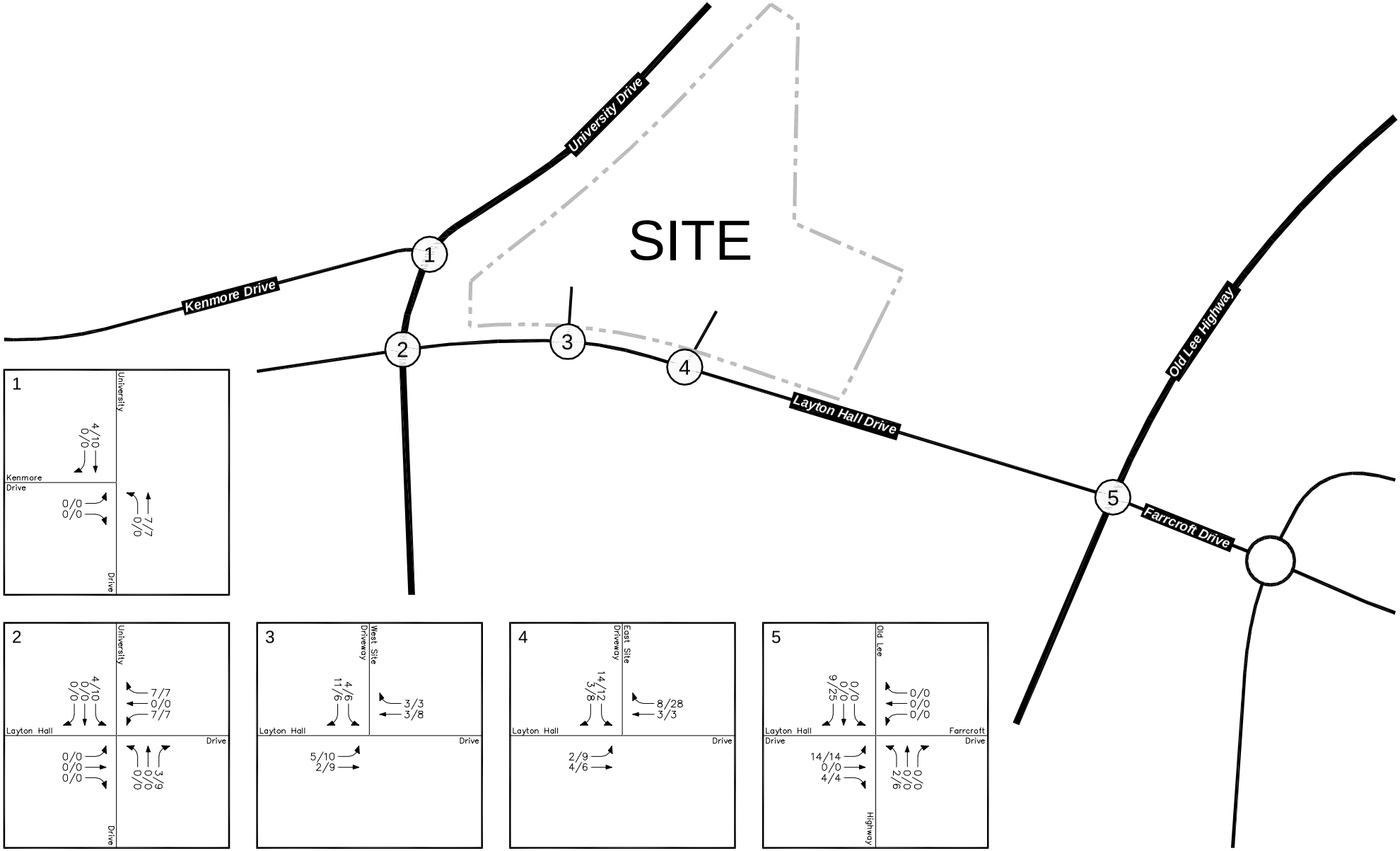


Figure 6–1
Existing Site Trips Removed

Layton Hall Apartments
City of Fairfax, Virginia

Wells + Associates, Inc.

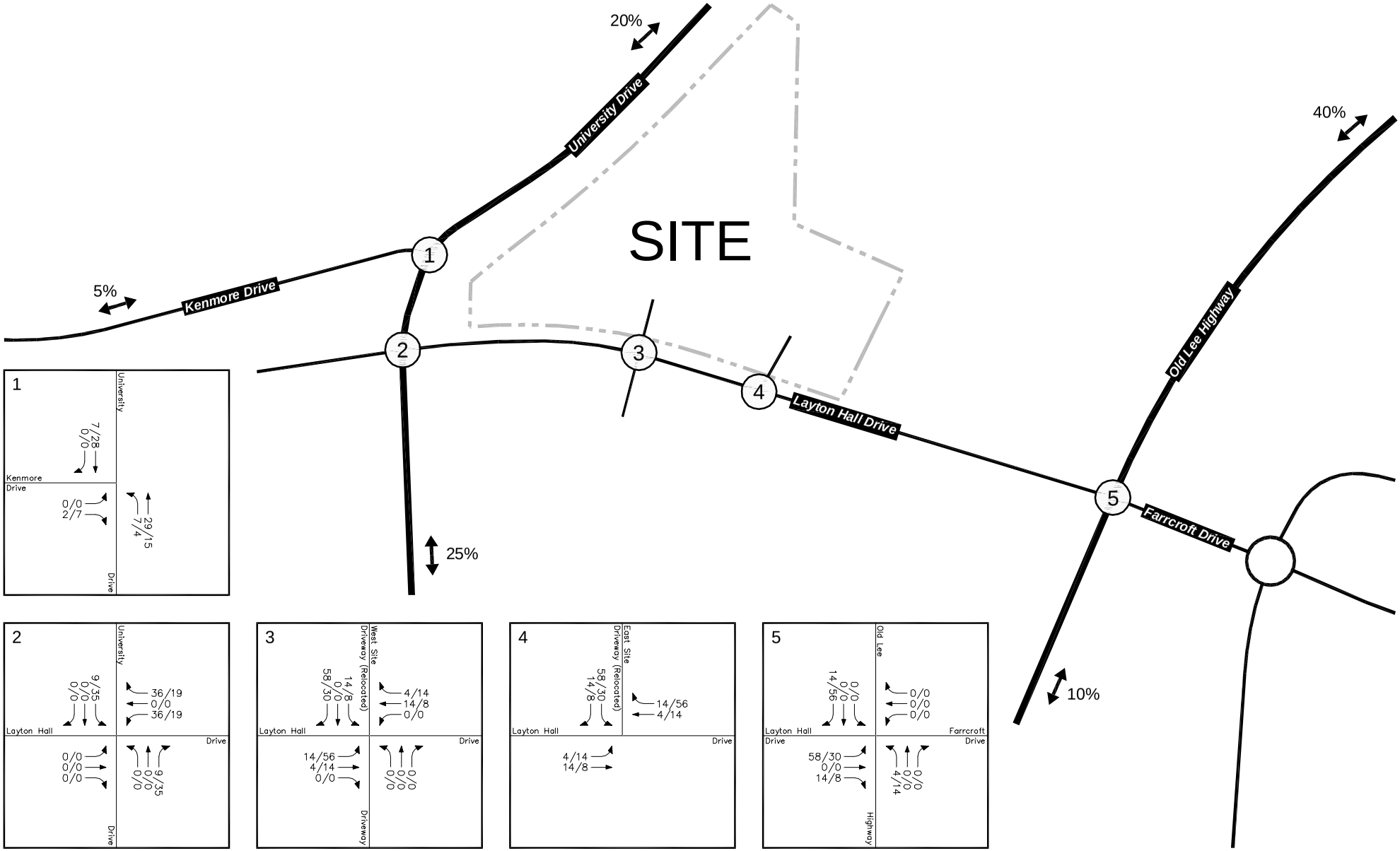


Figure 6–3
Site Trip Assignments

XX% Distribution Percentage and Direction

AM PEAK HOUR
PM PEAK HOUR
000/000

North

Layton Hall Apartments
City of Fairfax, Virginia

Wells + Associates, Inc.

APPENDIX G
BACKGROUND FUTURE CONDITIONS SYNCHRO REPORTS

HCM Unsignalized Intersection Capacity Analysis
1: University Dr & Layton Hall Dr

02/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	3	4	111	0	126	0	272	176	108	205	1
Future Volume (Veh/h)	4	3	4	111	0	126	0	272	176	108	205	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)	4	3	4	121	0	137	0	296	191	117	223	1
Pedestrians		3			7							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			1							
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								640				
pX, platoon unblocked												
vC, conflicting volume	825	954	226	766	764	303	227			494		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	825	954	226	766	764	303	227			494		
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	99	100	57	100	81	100			89		
cM capacity (veh/h)	215	228	811	284	294	732	1337			1062		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	11	258	296	191	341
Volume Left	4	121	0	0	117
Volume Right	4	137	0	191	1
cSH	300	606	1337	1700	1062
Volume to Capacity	0.04	0.43	0.00	0.11	0.11
Queue Length 95th (ft)	3	53	0	0	9
Control Delay (s)	17.5	18.4	0.0	0.0	3.8
Lane LOS	C	C			A
Approach Delay (s)	17.5	18.4	0.0		3.8
Approach LOS	C	C			

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	239	35	13	182	4	5	0	6	14	0	58
Future Volume (Veh/h)	14	239	35	13	182	4	5	0	6	14	0	58
Sign Control		Free			Free			Stop			Stop	
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)	15	260	38	14	198	4	5	0	7	15	0	63
Pedestrians					1			5				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					3.5			3.5				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					1052							
pX, platoon unblocked												
vC, conflicting volume	202			303			605	544	285	545	561	200
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	202			303			605	544	285	545	561	200
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	100	99	97	100	93
cM capacity (veh/h)	1370			1252			369	434	750	436	425	841

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	313	216	12	78
Volume Left	15	14	5	15
Volume Right	38	4	7	63
cSH	1370	1252	525	713
Volume to Capacity	0.01	0.01	0.02	0.11
Queue Length 95th (ft)	1	1	2	9
Control Delay (s)	0.5	0.6	12.0	10.7
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	0.6	12.0	10.7
Approach LOS			B	B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Democracy Ln/Health Ctr & Layton Hall Dr

02/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	271	17	29	178	4	8	0	18	2	0	8
Future Volume (Veh/h)	13	271	17	29	178	4	8	0	18	2	0	8
Sign Control		Free			Free			Stop			Stop	
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)	14	295	18	32	193	4	9	0	20	2	0	9
Pedestrians								2			2	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					360							
pX, platoon unblocked												
vC, conflicting volume	199			315			602	597	306	613	604	197
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	199			315			602	597	306	613	604	197
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			98	100	97	99	100	99
cM capacity (veh/h)	1371			1243			394	400	732	381	396	843

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	327	229	29	11
Volume Left	14	32	9	2
Volume Right	18	4	20	9
cSH	1371	1243	578	691
Volume to Capacity	0.01	0.03	0.05	0.02
Queue Length 95th (ft)	1	2	4	1
Control Delay (s)	0.4	1.3	11.6	10.3
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	1.3	11.6	10.3
Approach LOS			B	B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	264	53	12	97	52	525	11	24	487	167
v/c Ratio	0.65	0.13	0.08	0.45	0.16	0.66	0.02	0.07	0.72	0.25
Control Delay	44.7	18.9	47.6	20.3	14.6	27.7	0.0	14.0	33.7	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	18.9	47.6	20.3	14.6	27.7	0.0	14.0	33.7	4.7
Queue Length 50th (ft)	142	9	7	6	16	216	0	7	259	0
Queue Length 95th (ft)	#311	48	28	59	39	454	0	22	415	42
Internal Link Dist (ft)		280		153		358			327	
Turn Bay Length (ft)							200	130		300
Base Capacity (vph)	524	524	506	523	353	1177	1004	361	1177	1030
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.10	0.02	0.19	0.15	0.45	0.01	0.07	0.41	0.16

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	243	18	30	11	9	80	48	483	10	22	448	154
Future Volume (vph)	243	18	30	11	9	80	48	483	10	22	448	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1689		1770	1612		1769	1863	1519	1767	1863	1540
Flt Permitted	0.95	1.00		0.95	1.00		0.26	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)	1770	1689		1770	1612		484	1863	1519	547	1863	1540
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)	264	20	33	12	10	87	52	525	11	24	487	167
RTOR Reduction (vph)	0	26	0	0	82	0	0	0	7	0	0	104
Lane Group Flow (vph)	264	27	0	12	15	0	52	525	4	24	487	63
Confl. Peds. (#/hr)							3		8	8		3
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases							6		6	2		2
Actuated Green, G (s)	20.5	20.5		5.4	5.4		43.4	38.2	38.2	37.6	35.3	35.3
Effective Green, g (s)	20.5	20.5		5.4	5.4		43.4	38.2	38.2	37.6	35.3	35.3
Actuated g/C Ratio	0.22	0.22		0.06	0.06		0.46	0.41	0.41	0.40	0.38	0.38
Clearance Time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	386	368		101	92		294	757	617	248	699	578
v/s Ratio Prot	c0.15	0.02		0.01	c0.01		c0.01	c0.28		0.00	0.26	
v/s Ratio Perm							0.07		0.00	0.04		0.04
v/c Ratio	0.68	0.07		0.12	0.16		0.18	0.69	0.01	0.10	0.70	0.11
Uniform Delay, d1	33.8	29.2		42.0	42.1		15.8	23.1	16.6	18.1	24.8	19.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	0.1		0.5	0.8		0.3	2.8	0.0	0.2	3.0	0.1
Delay (s)	38.7	29.3		42.6	43.0		16.1	25.8	16.6	18.3	27.9	19.2
Level of Service	D	C		D	D		B	C	B	B	C	B
Approach Delay (s)		37.1			42.9			24.8			25.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	27.6
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	NBT	SBT
Lane Group Flow (vph)	161	58	28	409	348
v/c Ratio	0.31	0.09	0.05	0.32	0.31
Control Delay	10.8	3.8	7.5	8.5	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	3.8	7.5	8.5	8.3
Queue Length 50th (ft)	17	0	2	22	17
Queue Length 95th (ft)	63	16	15	63	53
Internal Link Dist (ft)	497		78	245	560
Turn Bay Length (ft)		80			
Base Capacity (vph)	1278	1413	1339	2974	2646
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.04	0.02	0.14	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	35	53	8	7	10	11	327	39	44	231	45
Future Volume (vph)	113	35	53	8	7	10	11	327	39	44	231	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frpb, ped/bikes		1.00	0.99		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.95			0.98			0.98	
Flt Protected		0.96	1.00		0.98			1.00			0.99	
Satd. Flow (prot)		1794	1561		1735			3471			3429	
Flt Permitted		0.76	1.00		0.84			0.93			0.84	
Satd. Flow (perm)		1413	1561		1480			3247			2888	
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)	123	38	58	9	8	11	12	355	42	48	251	49
RTOR Reduction (vph)	0	0	41	0	8	0	0	16	0	0	23	0
Lane Group Flow (vph)	0	161	17	0	20	0	0	393	0	0	325	0
Confl. Peds. (#/hr)			5	5			3		5	5		3
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)		7.4	7.4		7.4			7.6			7.6	
Effective Green, g (s)		7.4	7.4		7.4			7.6			7.6	
Actuated g/C Ratio		0.28	0.28		0.28			0.29			0.29	
Clearance Time (s)		6.0	6.0		6.0			5.0			5.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		402	444		421			949			844	
v/s Ratio Prot												
v/s Ratio Perm		c0.11	0.01		0.01			c0.12			0.11	
v/c Ratio		0.40	0.04		0.05			0.41			0.38	
Uniform Delay, d1		7.5	6.7		6.7			7.4			7.3	
Progression Factor		1.00	1.00		1.08			1.00			1.00	
Incremental Delay, d2		0.7	0.0		0.0			0.3			0.3	
Delay (s)		8.2	6.8		7.3			7.7			7.6	
Level of Service		A	A		A			A			A	
Approach Delay (s)		7.8			7.3			7.7			7.6	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	26.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	27	16	755	128	51	620
Future Volume (Veh/h)	27	16	755	128	51	620
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)	29	17	821	139	55	674
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	1605	821			960	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1605	821			960	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	73	95			92	
cM capacity (veh/h)	107	374			717	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	46	821	139	729
Volume Left	29	0	0	55
Volume Right	17	0	139	0
cSH	145	1700	1700	717
Volume to Capacity	0.32	0.48	0.08	0.08
Queue Length 95th (ft)	32	0	0	6
Control Delay (s)	40.8	0.0	0.0	2.0
Lane LOS	E			A
Approach Delay (s)	40.8	0.0		2.0
Approach LOS	E			

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	22	827	29	103	637
Future Volume (Veh/h)	9	22	827	29	103	637
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)	10	24	899	32	112	692
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1832	916			932	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1832	916			932	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	93			85	
cM capacity (veh/h)	71	330			734	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	34	931	112	692
Volume Left	10	0	112	0
Volume Right	24	32	0	0
cSH	241	1700	734	1700
Volume to Capacity	0.14	0.55	0.15	0.41
Queue Length 95th (ft)	12	0	13	0
Control Delay (s)	30.6	0.0	10.8	0.0
Lane LOS	D		B	
Approach Delay (s)	30.6	0.0	1.5	
Approach LOS	D			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	112	94	308	202	8
Future Volume (Veh/h)	20	112	94	308	202	8
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)	22	122	102	335	220	9
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				868		
pX, platoon unblocked						
vC, conflicting volume	766	226	231			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	766	226	231			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	85	92			
cM capacity (veh/h)	342	811	1334			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	144	437	229
Volume Left	22	102	0
Volume Right	122	0	9
cSH	671	1334	1700
Volume to Capacity	0.21	0.08	0.13
Queue Length 95th (ft)	20	6	0
Control Delay (s)	11.8	2.4	0.0
Lane LOS	B	A	
Approach Delay (s)	11.8	2.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: University Dr & Layton Hall Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	2	3	187	1	153	3	303	139	104	212	2
Future Volume (Veh/h)	1	2	3	187	1	153	3	303	139	104	212	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)	1	2	3	203	1	166	3	329	151	113	230	2
Pedestrians		3			5						4	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		0			0						0	
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								640				
pX, platoon unblocked												
vC, conflicting volume	882	951	234	801	801	338	235			485		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	882	951	234	801	801	338	235			485		
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	99	100	25	100	76	100			89		
cM capacity (veh/h)	184	230	803	272	281	698	1328			1073		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	6	370	332	151	345
Volume Left	1	203	3	0	113
Volume Right	3	166	0	151	2
cSH	336	434	1328	1700	1073
Volume to Capacity	0.02	0.85	0.00	0.09	0.11
Queue Length 95th (ft)	1	211	0	0	9
Control Delay (s)	15.9	45.5	0.1	0.0	3.6
Lane LOS	C	E	A		A
Approach Delay (s)	15.9	45.5	0.1		3.6
Approach LOS	C	E			

Intersection Summary			
Average Delay	15.1		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Driveway/Layton Hall Apts & Layton Hall Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	184	9	6	277	14	37	0	16	8	0	30
Future Volume (Veh/h)	56	184	9	6	277	14	37	0	16	8	0	30
Sign Control		Free			Free			Stop			Stop	
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)	61	200	10	7	301	15	40	0	17	9	0	33
Pedestrians					13			1				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					3.5			3.5				
Percent Blockage					1			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					1052							
pX, platoon unblocked												
vC, conflicting volume	316			211			684	658	219	680	656	308
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	316			211			684	658	219	680	656	308
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			88	100	98	97	100	95
cM capacity (veh/h)	1244			1358			332	363	810	338	364	732

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	271	323	57	42
Volume Left	61	7	40	9
Volume Right	10	15	17	33
cSH	1244	1358	403	586
Volume to Capacity	0.05	0.01	0.14	0.07
Queue Length 95th (ft)	4	0	12	6
Control Delay (s)	2.2	0.2	15.4	11.6
Lane LOS	A	A	C	B
Approach Delay (s)	2.2	0.2	15.4	11.6
Approach LOS			C	B

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	212	7	34	293	0	14	1	38	9	1	18
Future Volume (Veh/h)	2	212	7	34	293	0	14	1	38	9	1	18
Sign Control		Free			Free			Stop			Stop	
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)	2	230	8	37	318	0	15	1	41	10	1	20
Pedestrians		1			3			2			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					360							
pX, platoon unblocked												
vC, conflicting volume	324			240			654	638	239	680	642	325
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	324			240			654	638	239	680	642	325
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			96	100	95	97	100	97
cM capacity (veh/h)	1229			1324			357	380	796	333	378	711

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	240	355	57	31
Volume Left	2	37	15	10
Volume Right	8	0	41	20
cSH	1229	1324	593	510
Volume to Capacity	0.00	0.03	0.10	0.06
Queue Length 95th (ft)	0	2	8	5
Control Delay (s)	0.1	1.1	11.7	12.5
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	1.1	11.7	12.5
Approach LOS			B	B

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	198	84	15	23	52	448	27	28	792	291
v/c Ratio	0.70	0.26	0.14	0.19	0.20	0.43	0.03	0.05	0.80	0.32
Control Delay	57.4	15.2	54.8	39.3	12.1	19.2	0.1	10.8	32.6	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	15.2	54.8	39.3	12.1	19.2	0.1	10.8	32.6	7.0
Queue Length 50th (ft)	138	8	11	8	14	213	0	8	511	32
Queue Length 95th (ft)	222	52	34	37	36	351	0	23	#863	99
Internal Link Dist (ft)		280		153		358			327	
Turn Bay Length (ft)							200	130		300
Base Capacity (vph)	402	424	388	388	269	1053	883	549	986	905
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.20	0.04	0.06	0.19	0.43	0.03	0.05	0.80	0.32

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	12	65	14	11	10	48	412	25	26	729	268
Future Volume (vph)	182	12	65	14	11	10	48	412	25	26	729	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.93	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1627		1770	1729		1770	1863	1470	1754	1863	1528
Flt Permitted	0.95	1.00		0.95	1.00		0.13	1.00	1.00	0.43	1.00	1.00
Satd. Flow (perm)	1770	1627		1770	1729		248	1863	1470	798	1863	1528
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)	198	13	71	15	12	11	52	448	27	28	792	291
RTOR Reduction (vph)	0	60	0	0	11	0	0	0	13	0	0	102
Lane Group Flow (vph)	198	24	0	15	12	0	52	448	14	28	792	189
Confl. Peds. (#/hr)							5		17	17		5
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	16.8	16.8		4.0	4.0		65.5	59.6	59.6	61.1	57.4	57.4
Effective Green, g (s)	16.8	16.8		4.0	4.0		65.5	59.6	59.6	61.1	57.4	57.4
Actuated g/C Ratio	0.15	0.15		0.04	0.04		0.59	0.53	0.53	0.55	0.51	0.51
Clearance Time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	266	244		63	61		225	994	784	468	957	785
v/s Ratio Prot	c0.11	0.01		c0.01	0.01		c0.01	0.24		0.00	c0.43	
v/s Ratio Perm							0.12		0.01	0.03		0.12
v/c Ratio	0.74	0.10		0.24	0.20		0.23	0.45	0.02	0.06	0.83	0.24
Uniform Delay, d1	45.4	40.9		52.4	52.3		16.8	16.0	12.3	12.0	23.0	15.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.7	0.2		2.0	1.6		0.5	0.3	0.0	0.1	6.0	0.2
Delay (s)	56.1	41.1		54.3	53.9		17.4	16.3	12.3	12.0	28.9	15.2
Level of Service	E	D		D	D		B	B	B	B	C	B
Approach Delay (s)		51.7			54.1			16.2			24.9	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	111.7	Sum of lost time (s)	27.6
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	NBT	SBT
Lane Group Flow (vph)	98	73	106	457	428
v/c Ratio	0.20	0.13	0.19	0.36	0.39
Control Delay	10.4	3.8	7.6	8.5	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	3.8	7.6	8.5	8.8
Queue Length 50th (ft)	11	0	8	23	22
Queue Length 95th (ft)	41	18	35	73	71
Internal Link Dist (ft)	497		78	245	560
Turn Bay Length (ft)		80			
Base Capacity (vph)	1298	1410	1419	2815	2392
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.05	0.07	0.16	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	40	67	25	38	35	38	360	23	107	255	32
Future Volume (vph)	51	40	67	25	38	35	38	360	23	107	255	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frpb, ped/bikes		1.00	0.98		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.95			0.99			0.99	
Flt Protected		0.97	1.00		0.99			1.00			0.99	
Satd. Flow (prot)		1812	1558		1749			3487			3437	
Flt Permitted		0.77	1.00		0.88			0.88			0.75	
Satd. Flow (perm)		1430	1558		1561			3067			2611	
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)	55	43	73	27	41	38	41	391	25	116	277	35
RTOR Reduction (vph)	0	0	54	0	28	0	0	7	0	0	12	0
Lane Group Flow (vph)	0	98	19	0	78	0	0	450	0	0	416	0
Confl. Peds. (#/hr)			10	10			13		12	12		13
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		6.6	6.6		6.6			8.3			8.3	
Effective Green, g (s)		6.6	6.6		6.6			8.3			8.3	
Actuated g/C Ratio		0.25	0.25		0.25			0.32			0.32	
Clearance Time (s)		6.0	6.0		6.0			5.0			5.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		364	397		397			982			836	
v/s Ratio Prot												
v/s Ratio Perm		c0.07	0.01		0.05			0.15			c0.16	
v/c Ratio		0.27	0.05		0.20			0.46			0.50	
Uniform Delay, d1		7.7	7.3		7.6			7.0			7.1	
Progression Factor		1.00	1.00		1.01			1.00			1.00	
Incremental Delay, d2		0.4	0.0		0.2			0.3			0.5	
Delay (s)		8.1	7.3		7.9			7.4			7.6	
Level of Service		A	A		A			A			A	
Approach Delay (s)		7.8			7.9			7.4			7.6	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	25.9	Sum of lost time (s)	11.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	65	47	511	110	55	626
Future Volume (Veh/h)	65	47	511	110	55	626
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)	71	51	555	120	60	680
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	1355	555			675	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1355	555			675	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	54	90			93	
cM capacity (veh/h)	154	531			916	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	122	555	120	740
Volume Left	71	0	0	60
Volume Right	51	0	120	0
cSH	219	1700	1700	916
Volume to Capacity	0.56	0.33	0.07	0.07
Queue Length 95th (ft)	76	0	0	5
Control Delay (s)	40.3	0.0	0.0	1.7
Lane LOS	E			A
Approach Delay (s)	40.3	0.0		1.7
Approach LOS	E			

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	73	606	12	108	646
Future Volume (Veh/h)	8	73	606	12	108	646
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	79	659	13	117	702
Pedestrians	16					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	2					
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1618	682			688	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1618	682			688	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	82			87	
cM capacity (veh/h)	97	443			892	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	88	672	117	702
Volume Left	9	0	117	0
Volume Right	79	13	0	0
cSH	494	1700	892	1700
Volume to Capacity	0.18	0.40	0.13	0.41
Queue Length 95th (ft)	16	0	11	0
Control Delay (s)	18.0	0.0	9.6	0.0
Lane LOS	C		A	
Approach Delay (s)	18.0	0.0	1.4	
Approach LOS	C			

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	107	164	292	211	11
Future Volume (Veh/h)	13	107	164	292	211	11
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)	14	116	178	317	229	12
Pedestrians	3					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				868		
pX, platoon unblocked						
vC, conflicting volume	911	238	244			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	911	238	244			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	85	86			
cM capacity (veh/h)	263	799	1318			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	130	495	241
Volume Left	14	178	0
Volume Right	116	0	12
cSH	655	1318	1700
Volume to Capacity	0.20	0.14	0.14
Queue Length 95th (ft)	18	12	0
Control Delay (s)	11.9	3.8	0.0
Lane LOS	B	A	
Approach Delay (s)	11.9	3.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX H
EXISTING DRIVEWAY COUNT DATA

Wells & Associates,Inc

McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT:	Capstone - GMU Housing	**DATE:**	12/6/2017	**SOUTHBOUND ROAD:**	Site Entrance - West
W+A JOB NO:	7302	**DAY:**	Wednesday	**NORTHBOUND ROAD:**	0
INTERSECTION:	Democracy Ln. & Site Entr.- West	**WEATHER:**	clear	**WESTBOUND ROAD:**	Democracy Lane
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Ramiz	**EASTBOUND ROAD:**	Democracy Lane
		INPUTED BY:	agan		

Time	Southbound Site Entrance - West					Westbound Democracy Lane					Northbound 0					Eastbound Democracy Lane					North & South	East & West	Total
Period	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM																	1	1	2			2	2
6:15 AM - 6:30 AM						1	1		2								6	2	8			10	10
6:30 AM - 6:45 AM																	5		5			5	5
6:45 AM - 7:00 AM							2		2								5		5			7	7
7:00 AM - 7:15 AM	1			1			2		2								7	1	8		1	10	11
7:15 AM - 7:30 AM						4	1		5								14	1	15			20	20
7:30 AM - 7:45 AM	1			1		1	2		3								9	5	14		1	17	18
7:45 AM - 8:00 AM						2	2		4								12	6	18			22	22
8:00 AM - 8:15 AM						2	4		6								16	7	23			29	29
8:15 AM - 8:30 AM						2	9		11								17	2	19			30	30
8:30 AM - 8:45 AM	2			2			4		4								14	6	20		2	24	26
8:45 AM - 9:00 AM						1	7		8								23	4	27			35	35
9:00 AM - 9:15 AM	3		1	4		1	11		12								18	5	23		4	35	39
9:15 AM - 9:30 AM	1			1		1	5		6								23	2	25		1	31	32
9:30 AM - 9:45 AM	6		2	8		1	12		13								12	5	17		8	30	38
9:45 AM - 10:00 AM	3			3		2	4		6								24	7	31		3	37	40
3:00 PM 3:15 PM							6		6								12	1	13			19	19
3:15 PM 3:30 PM	4		1	5		1	14		15								11	3	14		5	29	34
3:30 PM 3:45 PM	5		2	7		1	12		13								11	3	14		7	27	34
3:45 PM 4:00 PM	6		3	9		1	10		11								12	1	13		9	24	33
4:00 PM 4:15 PM	4			4		1	23		24								11	5	16		4	40	44
4:15 PM 4:30 PM	4		1	5		3	15		18								19	2	21		5	39	44
4:30 PM 4:45 PM	6		4	10			14		14								13	3	16		10	30	40
4:45 PM 5:00 PM	4		1	5			17		17								9		9		5	26	31
5:00 PM 5:15 PM	8			8		2	35		37								5	1	6		8	43	51
5:15 PM 5:30 PM	3			3		3	21		24								10	2	12		3	36	39
5:30 PM 5:45 PM	9		2	11		2	11		13								5	4	9		11	22	33
5:45 PM 6:00 PM	2			2		1	21		22								9	3	12		2	34	36
6:00 PM 6:15 PM	3		2	5		1	25		26								4		4		5	30	35
6:15 PM 6:30 PM	1			1			6		6								9	2	11		1	17	18
6:30 PM 6:45 PM	3			3		1	7		8								8	1	9		3	17	20
6:45 PM 7:00 PM	1		1	2			8		8								3	4	7		2	15	17
Total	80	0	20	100		35	311	0	346		0	0	0	0		0	357	89	446		100	792	892
One Hour Volumes																							
6:00 AM - 7:00 AM						1	3		4	0.5							17	3	20	0.625		24	24
6:15 AM - 7:15 AM	1			1	0.25	1	5		6	0.75							23	3	26	0.8125	1	32	33
6:30 AM - 7:30 AM	1			1	0.25	4	5		9	0.45							31	2	33	0.55	1	42	43
6:45 AM - 7:45 AM	2			2	0.5	5	7		12	0.6							35	7	42	0.7	2	54	56
7:00 AM - 8:00 AM	2			2	0.5	7	7		14	0.7							42	13	55	0.7639	2	69	71
7:15 AM - 8:15 AM	1			1	0.25	9	9		18	0.75							51	19	70	0.7609	1	88	89
7:30 AM - 8:30 AM	1			1	0.25	7	17		24	0.5455							54	20	74	0.8043	1	98	99
7:45 AM - 8:45 AM	2			2	0.25	6	19		25	0.5682							59	21	80	0.8696	2	105	107
8:00 AM - 9:00 AM	2			2	0.25	5	24		29	0.6591							70	19	89	0.8241	2	118	120
8:15 AM - 9:15 AM	5		1	6	0.375	4	31		35	0.7292							72	17	89	0.8241	6	124	130
8:30 AM - 9:30 AM	6		1	7	0.4375	3	27		30	0.625							78	17	95	0.8796	7	125	132
8:45 AM - 9:45 AM	10		3	13	0.4063	4	35		39	0.75							76	16	92	0.8519	13	131	144
9:00 AM 10:00 AM	13		3	16	0.5	5	32		37	0.7115							77	19	96	0.7742	16	133	149
3:00 PM 4:00 PM	15		6	21	0.5833	3	42		45	0.75							46	8	54	0.9643	21	99	120
3:15 PM 4:15 PM	19		6	25	0.6944	4	59		63	0.6563							45	12	57	0.8906	25	120	145
3:30 PM 4:30 PM	19		6	25	0.6944	6	60		66	0.6875							53	11	64	0.7619	25	130	155
3:45 PM 4:45 PM	20		8	28	0.7	5	62		67	0.6979							55	11	66	0.7857	28	133	161
4:00 PM 5:00 PM	18		6	24	0.6	4	69		73	0.7604							52	10	62	0.7381	24	135	159
4:15 PM 5:15 PM	22		6	28	0.7	5	81		86	0.5811							46	6	52	0.619	28	138	166
4:30 PM 5:30 PM	21		5	26	0.65	5	87		92	0.6216							37	6	43	0.6719	26	135	161
4:45 PM 5:45 PM	24		3	27	0.6136	7	84		91	0.6149							29	7	36	0.75	27	127	154
5:00 PM 6:00 PM	22		2	24	0.5455	8	88		96	0.6486							29	10	39	0.8125	24	135	159
5:15 PM 6:15 PM	17		4	21	0.4773	7	78		85	0.8173							28	9	37	0.7708	21	122	143
5:30 PM 6:30 PM	15		4	19	0.4318	4	63		67	0.6442							27	9	36	0.75	19	103	122
5:45 PM 6:45 PM	9		2	11	0.55	3	59		62	0.5962							30	6	36	0.75	11	98	109
6:00 PM 7:00 PM	8		3	11	0.55	2	46		48	0.4615							24	7	31	0.7045	11	79	90

Wells & Associates,Inc

McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT:	Capstone - GMU Housing	**DATE:**	12/6/2017	**SOUTHBOUND ROAD:**	Site Entrance - East
W+A JOB NO:	7302	**DAY:**	Wednesday	**NORTHBOUND ROAD:**	0
INTERSECTION:	Democracy Ln. & Site Entr.- East	**WEATHER:**	clear	**WESTBOUND ROAD:**	Democracy Lane
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Ramiz	**EASTBOUND ROAD:**	Democracy Lane
		INPUTED BY:	agan		

Time	Southbound Site Entrance - East					Westbound Democracy Lane					Northbound 0					Eastbound Democracy Lane					North & South	East & West	Total
Period	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM							1		1								1		1			2	2
6:15 AM - 6:30 AM																	1	1	2			2	2
6:30 AM - 6:45 AM																	1		1			1	1
6:45 AM - 7:00 AM																	4		4			4	4
7:00 AM - 7:15 AM																	7		7			7	7
7:15 AM - 7:30 AM	1			1													10	2	12		1	12	13
7:30 AM - 7:45 AM							1		1								3		3			4	4
7:45 AM - 8:00 AM			1	1		2	2		4								5	1	6		1	10	11
8:00 AM - 8:15 AM							1		1								10		10			11	11
8:15 AM - 8:30 AM	3			3		1			1								7	1	8		3	9	12
8:30 AM - 8:45 AM																	7	1	8			8	8
8:45 AM - 9:00 AM							2		2								18	1	19			21	21
9:00 AM - 9:15 AM						1	3		4								12	1	13			17	17
9:15 AM - 9:30 AM						1			1								9	1	10			11	11
9:30 AM - 9:45 AM			1	1			3		3								4	2	6		1	9	10
9:45 AM - 10:00 AM	1			1		1	1		2								8	2	10		1	12	13
3:00 PM 3:15 PM							4		4								4	2	6			10	10
3:15 PM 3:30 PM	3		3	6		2	3		5								5		5		6	10	16
3:30 PM 3:45 PM	2		1	3			7		7								6		6		3	13	16
3:45 PM 4:00 PM							5		5								7	2	9			14	14
4:00 PM 4:15 PM	6		4	10		1	10		11								3		3		10	14	24
4:15 PM 4:30 PM	1			1			9		9								14	1	15		1	24	25
4:30 PM 4:45 PM	2			2		1	7		8								7	3	10		2	18	20
4:45 PM 5:00 PM	3		1	4			9		9								10		10		4	19	23
5:00 PM 5:15 PM	6		1	7			12		12								3	2	5		7	17	24
5:15 PM 5:30 PM	5		1	6			3		3								6		6		6	9	15
5:30 PM 5:45 PM	1			1		1	4		5								2		2		1	7	8
5:45 PM 6:00 PM	2			2		1	9		10								5	1	6		2	16	18
6:00 PM 6:15 PM	1			1			5		5								3	2	5		1	10	11
6:15 PM 6:30 PM							1		1								4	1	5			6	6
6:30 PM 6:45 PM			1	1		1	3		4								2		2		1	6	7
6:45 PM 7:00 PM							2		2								3	1	4			6	6
Total	37	0	14	51		13	107	0	120		0	0	0	0		0	191	28	219		51	339	390
One Hour Volumes																							
6:00 AM - 7:00 AM							1		1	0.25							7	1	8	0.5		9	9
6:15 AM - 7:15 AM																	13	1	14	0.5		14	14
6:30 AM - 7:30 AM	1			1	0.25												22	2	24	0.5	1	24	25
6:45 AM - 7:45 AM	1			1	0.25		1		1	0.25							24	2	26	0.5417	1	27	28
7:00 AM - 8:00 AM	1		1	2	0.5	2	3		5	0.3125							25	3	28	0.5833	2	33	35
7:15 AM - 8:15 AM	1		1	2	0.5	2	4		6	0.375							28	3	31	0.6458	2	37	39
7:30 AM - 8:30 AM	3		1	4	0.3333	3	4		7	0.4375							25	2	27	0.675	4	34	38
7:45 AM - 8:45 AM	3		1	4	0.3333	3	3		6	0.375							29	3	32	0.8	4	38	42
8:00 AM - 9:00 AM	3			3	0.25	1	3		4	0.5							42	3	45	0.5921	3	49	52
8:15 AM - 9:15 AM	3			3	0.25	2	5		7	0.4375							44	4	48	0.6316	3	55	58
8:30 AM - 9:30 AM						2	5		7	0.4375							46	4	50	0.6579		57	57
8:45 AM - 9:45 AM			1	1	0.25	2	8		10	0.625							43	5	48	0.6316	1	58	59
9:00 AM 10:00 AM	1		1	2	0.5	3	7		10	0.625							33	6	39	0.75	2	49	51
3:00 PM 4:00 PM	5		4	9	0.375	2	19		21	0.75							22	4	26	0.7222	9	47	56
3:15 PM 4:15 PM	11		8	19	0.475	3	25		28	0.6364							21	2	23	0.6389	19	51	70
3:30 PM 4:30 PM	9		5	14	0.35	1	31		32	0.7273							30	3	33	0.55	14	65	79
3:45 PM 4:45 PM	9		4	13	0.325	2	31		33	0.75							31	6	37	0.6167	13	70	83
4:00 PM 5:00 PM	12		5	17	0.425	2	35		37	0.8409							34	4	38	0.6333	17	75	92
4:15 PM 5:15 PM	12		2	14	0.5	1	37		38	0.7917							34	6	40	0.6667	14	78	92
4:30 PM 5:30 PM	16		3	19	0.6786	1	31		32	0.6667							26	5	31	0.775	19	63	82
4:45 PM 5:45 PM	15		3	18	0.6429	1	28		29	0.6042							21	2	23	0.575	18	52	70
5:00 PM 6:00 PM	14		2	16	0.5714	2	28		30	0.625							16	3	19	0.7917	16	49	65
5:15 PM 6:15 PM	9		1	10	0.4167	2	21		23	0.575							16	3	19	0.7917	10	42	52
5:30 PM 6:30 PM	4			4	0.5	2	19		21	0.525							14	4	18	0.75	4	39	43
5:45 PM 6:45 PM	3		1	4	0.5	2	18		20	0.5							14	4	18	0.75	4	38	42
6:00 PM 7:00 PM	1		1	2	0.5	1	11		12	0.6							12	4	16	0.8	2	28	30

Wells & Associates,Inc

McLean, Virginia

Turning Movement Count - Total Vehicles

PROJECT:	Capstone - GMU Housing	**DATE:**	12/6/2017	**SOUTHBOUND ROAD:**	Shared Driveway
W+A JOB NO:	7302	**DAY:**	Wednesday	**NORTHBOUND ROAD:**	Shared Driveway
INTERSECTION:	Interparcel access # 10	**WEATHER:**	clear	**WESTBOUND ROAD:**	Parking Entrance
LOCATION:	City of Fairfax,VA	**COUNTED BY:**	Abdul	**EASTBOUND ROAD:**	0
		INPUTED BY:	agan		

Time	Southbound Shared Driveway					Westbound Parking Entrance					Northbound Shared Driveway					Eastbound 0					North & South	East & West	Total
Period	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF	Right	Thru	Left	Total	PHF			
15 Minute Volumes																							
6:00 AM - 6:15 AM						2			2													2	2
6:15 AM - 6:30 AM						1			1			1		1							1	1	2
6:30 AM - 6:45 AM						2			2													2	2
6:45 AM - 7:00 AM																							
7:00 AM - 7:15 AM			1	1		1			1												1	1	2
7:15 AM - 7:30 AM		2		2								1		1							3		3
7:30 AM - 7:45 AM			1	1		1			1												1	1	2
7:45 AM - 8:00 AM			1	1		2			2			3		3							4	2	6
8:00 AM - 8:15 AM								1	1													1	1
8:15 AM - 8:30 AM		1		1		1			1												1	1	2
8:30 AM - 8:45 AM		2		2		1			1			2		2							4	1	5
8:45 AM - 9:00 AM																							
9:00 AM - 9:15 AM			1	1							1	1		2							3		3
9:15 AM - 9:30 AM			3	3							1			1							4		4
9:30 AM - 9:45 AM		1		1																	1		1
9:45 AM - 10:00 AM		2	4	6		1			1												6	1	7
3:00 PM 3:15 PM		1	1	2		3			3												2	3	5
3:15 PM 3:30 PM			1	1		3		1	4												1	4	5
3:30 PM 3:45 PM		1		1		3		1	4			1		1							2	4	6
3:45 PM 4:00 PM			2	2																	2		2
4:00 PM 4:15 PM			1	1		2			2		2			2							3	2	5
4:15 PM 4:30 PM		1	2	3		2			2		2	2		4							7	2	9
4:30 PM 4:45 PM		1	2	3		1		1	2		1	1		2							5	2	7
4:45 PM 5:00 PM		4	2	6		2			2												6	2	8
5:00 PM 5:15 PM			1	1								1		1							2		2
5:15 PM 5:30 PM			2	2		3			3												2	3	5
5:30 PM 5:45 PM		1	1	2		1			1			1		1							3	1	4
5:45 PM 6:00 PM			4	4		2			2												4	2	6
6:00 PM 6:15 PM			1	1		1			1												1	1	2
6:15 PM 6:30 PM						2			2		1			1							1	2	3
6:30 PM 6:45 PM								1	1													1	1
6:45 PM 7:00 PM			1	1																	1		1
Total	0	17	32	49		37	0	5	42		8	14	0	22		0	0	0	0		71	42	113
One Hour Volumes																							
6:00 AM - 7:00 AM						5			5	0.625		1		1	0.25						1	5	6
6:15 AM - 7:15 AM			1	1	0.25	4			4	0.5		1		1	0.25						2	4	6
6:30 AM - 7:30 AM		2	1	3	0.375	3			3	0.375		1		1	0.25						4	3	7
6:45 AM - 7:45 AM		2	2	4	0.5	2			2	0.5		1		1	0.25						5	2	7
7:00 AM - 8:00 AM		2	3	5	0.625	4			4	0.5		4		4	0.3333						9	4	13
7:15 AM - 8:15 AM		2	2	4	0.5	3		1	4	0.5		4		4	0.3333						8	4	12
7:30 AM - 8:30 AM		1	2	3	0.75	4		1	5	0.625		3		3	0.25						6	5	11
7:45 AM - 8:45 AM		3	1	4	0.5	4		1	5	0.625		5		5	0.4167						9	5	14
8:00 AM - 9:00 AM		3		3	0.375	2		1	3	0.75		2		2	0.25						5	3	8
8:15 AM - 9:15 AM		3	1	4	0.5	2			2	0.5	1	3		4	0.5						8	2	10
8:30 AM - 9:30 AM		2	4	6	0.5	1			1	0.25	2	3		5	0.625						11	1	12
8:45 AM - 9:45 AM		1	4	5	0.4167						2	1		3	0.375						8		8
9:00 AM 10:00 AM		3	8	11	0.4583	1			1	0.25	2	1		3	0.375						14	1	15
3:00 PM 4:00 PM		2	4	6	0.75	9		2	11	0.6875		1		1	0.25						7	11	18
3:15 PM 4:15 PM		1	4	5	0.625	8		2	10	0.625	2	1		3	0.375						8	10	18
3:30 PM 4:30 PM		2	5	7	0.5833	7		1	8	0.5	4	3		7	0.4375						14	8	22
3:45 PM 4:45 PM		2	7	9	0.75	5		1	6	0.75	5	3		8	0.5						17	6	23
4:00 PM 5:00 PM		6	7	13	0.5417	7		1	8	1	5	3		8	0.5						21	8	29
4:15 PM 5:15 PM		6	7	13	0.5417	5		1	6	0.75	3	4		7	0.4375						20	6	26
4:30 PM 5:30 PM		5	7	12	0.5	6		1	7	0.5833	1	2		3	0.375						15	7	22
4:45 PM 5:45 PM		5	6	11	0.4583	6			6	0.5		2		2	0.5						13	6	19
5:00 PM 6:00 PM		1	8	9	0.5625	6			6	0.5		2		2	0.5						11	6	17
5:15 PM 6:15 PM		1	8	9	0.5625	7			7	0.5833		1		1	0.25						10	7	17
5:30 PM 6:30 PM		1	6	7	0.4375	6			6	0.75	1	1		2	0.5						9	6	15
5:45 PM 6:45 PM			5	5	0.3125	5		1	6	0.75	1			1	0.25						6	6	12
6:00 PM 7:00 PM			2	2	0.5	3		1	4	0.5	1			1	0.25						3	4	7

APPENDIX I
TOTAL FUTURE CONDITIONS SYNCHRO REPORTS

HCM Unsignalized Intersection Capacity Analysis
1: University Dr & Layton Hall Dr

02/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	3	4	108	0	131	0	272	176	109	204	1
Future Volume (Veh/h)	4	3	4	108	0	131	0	272	176	109	204	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)	4	3	4	117	0	142	0	296	191	118	222	1
Pedestrians		3			7							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			1							
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								640				
pX, platoon unblocked												
vC, conflicting volume	828	956	226	767	765	303	226			494		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	828	956	226	767	765	303	226			494		
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	99	100	59	100	81	100			89		
cM capacity (veh/h)	212	227	812	284	293	732	1339			1062		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	11	259	296	191	341
Volume Left	4	117	0	0	118
Volume Right	4	142	0	191	1
cSH	297	628	1339	1700	1062
Volume to Capacity	0.04	0.41	0.00	0.11	0.11
Queue Length 95th (ft)	3	50	0	0	9
Control Delay (s)	17.6	18.0	0.0	0.0	3.8
Lane LOS	C	C			A
Approach Delay (s)	17.6	18.0	0.0		3.8
Approach LOS	C	C			

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Driveway/Layton Hall Apts & Layton Hall Dr

02/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	239	36	20	179	4	10	0	21	14	0	58
Future Volume (Veh/h)	14	239	36	20	179	4	10	0	21	14	0	58
Sign Control		Free			Free			Stop			Stop	
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)	15	260	39	22	195	4	11	0	23	15	0	63
Pedestrians					1			5				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					3.5			3.5				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					1052							
pX, platoon unblocked												
vC, conflicting volume	199			304			618	558	286	574	575	197
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	199			304			618	558	286	574	575	197
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			97	100	97	96	100	93
cM capacity (veh/h)	1373			1251			360	424	749	405	414	844

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	314	221	34	78
Volume Left	15	22	11	15
Volume Right	39	4	23	63
cSH	1373	1251	555	699
Volume to Capacity	0.01	0.02	0.06	0.11
Queue Length 95th (ft)	1	1	5	9
Control Delay (s)	0.5	0.9	11.9	10.8
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	0.9	11.9	10.8
Approach LOS			B	B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	289	17	24	183	4	8	0	26	2	0	8
Future Volume (Veh/h)	13	289	17	24	183	4	8	0	26	2	0	8
Sign Control		Free			Free			Stop			Stop	
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)	14	314	18	26	199	4	9	0	28	2	0	9
Pedestrians								2			2	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					360							
pX, platoon unblocked												
vC, conflicting volume	205			334			615	610	325	634	617	203
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	205			334			615	610	325	634	617	203
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	100	96	99	100	99
cM capacity (veh/h)	1364			1223			388	395	715	366	391	836

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	346	229	37	11
Volume Left	14	26	9	2
Volume Right	18	4	28	9
cSH	1364	1223	593	678
Volume to Capacity	0.01	0.02	0.06	0.02
Queue Length 95th (ft)	1	2	5	1
Control Delay (s)	0.4	1.1	11.5	10.4
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	1.1	11.5	10.4
Approach LOS			B	B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	29.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	285	60	12	97	50	525	11	24	487	167
v/c Ratio	0.65	0.14	0.08	0.45	0.16	0.67	0.02	0.08	0.73	0.26
Control Delay	44.1	17.6	47.8	20.6	14.9	28.7	0.0	14.2	35.1	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	17.6	47.8	20.6	14.9	28.7	0.0	14.2	35.1	4.7
Queue Length 50th (ft)	155	9	7	6	16	225	0	8	266	0
Queue Length 95th (ft)	#350	50	28	59	38	454	0	22	415	42
Internal Link Dist (ft)		280		153		358			327	
Turn Bay Length (ft)							200	130		300
Base Capacity (vph)	511	512	494	512	337	1166	995	344	1166	1022
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.12	0.02	0.19	0.15	0.45	0.01	0.07	0.42	0.16

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	18	37	11	9	80	46	483	10	22	448	154
Future Volume (vph)	262	18	37	11	9	80	46	483	10	22	448	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1676		1770	1612		1770	1863	1519	1767	1863	1539
Flt Permitted	0.95	1.00		0.95	1.00		0.25	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	1770	1676		1770	1612		462	1863	1519	523	1863	1539
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)	285	20	40	12	10	87	50	525	11	24	487	167
RTOR Reduction (vph)	0	31	0	0	82	0	0	0	7	0	0	106
Lane Group Flow (vph)	285	29	0	12	15	0	50	525	4	24	487	61
Confl. Peds. (#/hr)							3		8	8		3
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases							6		6	2		2
Actuated Green, G (s)	22.3	22.3		5.5	5.5		42.9	37.7	37.7	37.1	34.8	34.8
Effective Green, g (s)	22.3	22.3		5.5	5.5		42.9	37.7	37.7	37.1	34.8	34.8
Actuated g/C Ratio	0.23	0.23		0.06	0.06		0.45	0.40	0.40	0.39	0.36	0.36
Clearance Time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	413	391		102	92		279	736	600	233	679	561
v/s Ratio Prot	c0.16	0.02		0.01	c0.01		c0.01	c0.28		0.00	0.26	
v/s Ratio Perm							0.07		0.00	0.04		0.04
v/c Ratio	0.69	0.08		0.12	0.16		0.18	0.71	0.01	0.10	0.72	0.11
Uniform Delay, d1	33.4	28.5		42.6	42.8		16.8	24.3	17.5	19.1	26.1	20.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.9	0.1		0.5	0.8		0.3	3.3	0.0	0.2	3.6	0.1
Delay (s)	38.3	28.6		43.2	43.6		17.1	27.6	17.5	19.3	29.7	20.1
Level of Service	D	C		D	D		B	C	B	B	C	C
Approach Delay (s)		36.6			43.6			26.5			27.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	95.4	Sum of lost time (s)	27.6
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues
5: University Dr & Whitehead St/Democracy Ln

06/19/2018

Lane Group	EBT	EBR	WBT	NBT	SBT
Lane Group Flow (vph)	160	58	76	410	343
v/c Ratio	0.32	0.09	0.15	0.32	0.30
Control Delay	11.0	3.8	8.4	8.6	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	3.8	8.4	8.6	8.3
Queue Length 50th (ft)	17	0	7	22	17
Queue Length 95th (ft)	64	16	31	63	52
Internal Link Dist (ft)	497		78	245	560
Turn Bay Length (ft)		80			
Base Capacity (vph)	1221	1409	1236	2962	2674
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.04	0.06	0.14	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	34	53	37	23	10	11	327	40	40	231	45
Future Volume (vph)	113	34	53	37	23	10	11	327	40	40	231	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frpb, ped/bikes		1.00	0.99		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.98			0.98			0.98	
Flt Protected		0.96	1.00		0.97			1.00			0.99	
Satd. Flow (prot)		1794	1560		1778			3468			3429	
Flt Permitted		0.73	1.00		0.75			0.93			0.85	
Satd. Flow (perm)		1352	1560		1371			3246			2926	
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)	123	37	58	40	25	11	12	355	43	43	251	49
RTOR Reduction (vph)	0	0	41	0	8	0	0	16	0	0	23	0
Lane Group Flow (vph)	0	160	17	0	68	0	0	394	0	0	320	0
Confl. Peds. (#/hr)			6	6			4		10	10		4
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)		7.5	7.5		7.5			7.7			7.7	
Effective Green, g (s)		7.5	7.5		7.5			7.7			7.7	
Actuated g/C Ratio		0.29	0.29		0.29			0.29			0.29	
Clearance Time (s)		6.0	6.0		6.0			5.0			5.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		387	446		392			953			859	
v/s Ratio Prot												
v/s Ratio Perm		c0.12	0.01		0.05			c0.12			0.11	
v/c Ratio		0.41	0.04		0.17			0.41			0.37	
Uniform Delay, d1		7.6	6.7		7.0			7.4			7.3	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.7	0.0		0.2			0.3			0.3	
Delay (s)		8.3	6.8		7.2			7.7			7.6	
Level of Service		A	A		A			A			A	
Approach Delay (s)		7.9			7.2			7.7			7.6	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	26.2	Sum of lost time (s)	11.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	39	21	754	126	52	620
Future Volume (Veh/h)	39	21	754	126	52	620
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)	42	23	820	137	57	674
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	1608	820			957	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1608	820			957	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	60	94			92	
cM capacity (veh/h)	106	375			719	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	65	820	137	731
Volume Left	42	0	0	57
Volume Right	23	0	137	0
cSH	142	1700	1700	719
Volume to Capacity	0.46	0.48	0.08	0.08
Queue Length 95th (ft)	52	0	0	6
Control Delay (s)	50.0	0.0	0.0	2.1
Lane LOS	E			A
Approach Delay (s)	50.0	0.0		2.1
Approach LOS	E			

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	24	832	29	102	638
Future Volume (Veh/h)	9	24	832	29	102	638
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)	10	26	904	32	111	693
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1836	921			937	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1836	921			937	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	92			85	
cM capacity (veh/h)	71	328			730	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	36	936	111	693
Volume Left	10	0	111	0
Volume Right	26	32	0	0
cSH	254	1700	730	1700
Volume to Capacity	0.14	0.55	0.15	0.41
Queue Length 95th (ft)	12	0	13	0
Control Delay (s)	30.1	0.0	10.8	0.0
Lane LOS	D		B	
Approach Delay (s)	30.1	0.0	1.5	
Approach LOS	D			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	111	96	312	203	8
Future Volume (Veh/h)	20	111	96	312	203	8
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)	22	121	104	339	221	9
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				868		
pX, platoon unblocked						
vC, conflicting volume	774	228	232			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	774	228	232			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	85	92			
cM capacity (veh/h)	337	810	1333			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	143	443	230
Volume Left	22	104	0
Volume Right	121	0	9
cSH	667	1333	1700
Volume to Capacity	0.21	0.08	0.14
Queue Length 95th (ft)	20	6	0
Control Delay (s)	11.9	2.5	0.0
Lane LOS	B	A	
Approach Delay (s)	11.9	2.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	9	48	0	4	19	30
Future Volume (vph)	9	48	0	4	19	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	52	0	4	21	33

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	62	4	54
Volume Left (vph)	0	0	21
Volume Right (vph)	52	0	33
Hadj (s)	-0.47	0.03	-0.25
Departure Headway (s)	3.5	4.1	3.8
Degree Utilization, x	0.06	0.00	0.06
Capacity (veh/h)	994	860	927
Control Delay (s)	6.8	7.1	7.0
Approach Delay (s)	6.8	7.1	7.0
Approach LOS	A	A	A

Intersection Summary			
Delay	6.9		
Level of Service	A		
Intersection Capacity Utilization	13.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	38	1	0	2	3
Future Volume (Veh/h)	1	38	1	0	2	3
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)	1	41	1	0	2	3
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	1				44	1
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1				44	1
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1622				966	1084

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	42	1	5
Volume Left	1	0	2
Volume Right	0	0	3
cSH	1622	1700	1033
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.2	0.0	8.5
Lane LOS	A		A
Approach Delay (s)	0.2	0.0	8.5
Approach LOS			A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	262	0	1	199	0	3
Future Volume (Veh/h)	262	0	1	199	0	3
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)	285	0	1	216	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				790		
pX, platoon unblocked						
vC, conflicting volume			285		503	285
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			285		503	285
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1277		528	754

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	285	217	3
Volume Left	0	1	0
Volume Right	0	0	3
cSH	1700	1277	754
Volume to Capacity	0.17	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	9.8
Lane LOS		A	A
Approach Delay (s)	0.0	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: University Dr & Layton Hall Dr

02/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	2	3	187	1	159	3	301	134	109	212	2
Future Volume (Veh/h)	1	2	3	187	1	159	3	301	134	109	212	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)	1	2	3	203	1	173	3	327	146	118	230	2
Pedestrians		3			5						4	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		0			0						0	
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								640				
pX, platoon unblocked												
vC, conflicting volume	894	954	234	809	809	336	235			478		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	894	954	234	809	809	336	235			478		
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	99	100	24	100	75	100			89		
cM capacity (veh/h)	178	228	803	268	277	700	1328			1079		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	6	377	330	146	350
Volume Left	1	203	3	0	118
Volume Right	3	173	0	146	2
cSH	331	434	1328	1700	1079
Volume to Capacity	0.02	0.87	0.00	0.09	0.11
Queue Length 95th (ft)	1	221	0	0	9
Control Delay (s)	16.1	47.8	0.1	0.0	3.7
Lane LOS	C	E	A		A
Approach Delay (s)	16.1	47.8	0.1		3.7
Approach LOS	C	E			

Intersection Summary			
Average Delay	16.1		
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	179	14	29	277	14	43	0	39	8	0	30
Future Volume (Veh/h)	56	179	14	29	277	14	43	0	39	8	0	30
Sign Control		Free			Free			Stop			Stop	
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)	61	195	15	32	301	15	47	0	42	9	0	33
Pedestrians					13			1				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					3.5			3.5				
Percent Blockage					1			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					1051							
pX, platoon unblocked												
vC, conflicting volume	316			211			731	706	216	752	706	308
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	316			211			731	706	216	752	706	308
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			98			85	100	95	97	100	95
cM capacity (veh/h)	1244			1358			304	335	812	289	335	732

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	271	348	89	42
Volume Left	61	32	47	9
Volume Right	15	15	42	33
cSH	1244	1358	431	551
Volume to Capacity	0.05	0.02	0.21	0.08
Queue Length 95th (ft)	4	2	19	6
Control Delay (s)	2.2	0.9	15.5	12.1
Lane LOS	A	A	C	B
Approach Delay (s)	2.2	0.9	15.5	12.1
Approach LOS			C	B

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Democracy Ln/Health Ctr & Layton Hall Dr

02/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	234	7	41	320	0	14	1	42	9	1	18
Future Volume (Veh/h)	2	234	7	41	320	0	14	1	42	9	1	18
Sign Control		Free			Free			Stop			Stop	
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)	2	254	8	45	348	0	15	1	46	10	1	20
Pedestrians		1			3			2			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					360							
pX, platoon unblocked												
vC, conflicting volume	354			264			724	708	263	756	712	355
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	354			264			724	708	263	756	712	355
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			95	100	94	97	100	97
cM capacity (veh/h)	1198			1298			319	344	772	292	342	684

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	264	393	62	31
Volume Left	2	45	15	10
Volume Right	8	0	46	20
cSH	1198	1298	566	467
Volume to Capacity	0.00	0.03	0.11	0.07
Queue Length 95th (ft)	0	3	9	5
Control Delay (s)	0.1	1.2	12.1	13.3
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	1.2	12.1	13.3
Approach LOS			B	B

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Queues
4: Old Lee Hwy & Layton Hall Dr/Farrcroft Dr

02/12/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	218	91	15	23	63	448	27	28	792	317
v/c Ratio	0.73	0.27	0.14	0.19	0.25	0.43	0.03	0.05	0.82	0.35
Control Delay	58.4	14.4	55.1	39.3	13.1	19.7	0.1	11.1	34.0	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	14.4	55.1	39.3	13.1	19.7	0.1	11.1	34.0	7.2
Queue Length 50th (ft)	154	8	11	9	18	219	0	8	531	36
Queue Length 95th (ft)	244	54	34	37	42	351	0	23	#863	106
Internal Link Dist (ft)		280		153		358			327	
Turn Bay Length (ft)							200	130		300
Base Capacity (vph)	401	427	387	387	259	1040	874	538	971	903
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.21	0.04	0.06	0.24	0.43	0.03	0.05	0.82	0.35

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	201	12	72	14	11	10	58	412	25	26	729	292
Future Volume (vph)	201	12	72	14	11	10	58	412	25	26	729	292
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.93	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1623		1770	1729		1770	1863	1469	1754	1863	1527
Flt Permitted	0.95	1.00		0.95	1.00		0.12	1.00	1.00	0.43	1.00	1.00
Satd. Flow (perm)	1770	1623		1770	1729		233	1863	1469	792	1863	1527
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)	218	13	78	15	12	11	63	448	27	28	792	317
RTOR Reduction (vph)	0	66	0	0	11	0	0	0	13	0	0	113
Lane Group Flow (vph)	218	25	0	15	12	0	63	448	14	28	792	204
Confl. Peds. (#/hr)							5		17	17		5
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	17.9	17.9		4.0	4.0		65.2	59.2	59.2	60.6	56.9	56.9
Effective Green, g (s)	17.9	17.9		4.0	4.0		65.2	59.2	59.2	60.6	56.9	56.9
Actuated g/C Ratio	0.16	0.16		0.04	0.04		0.58	0.53	0.53	0.54	0.51	0.51
Clearance Time (s)	6.5	6.5		7.3	7.3		6.9	6.9	6.9	6.9	6.9	6.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	258		62	61		217	981	773	458	943	773
v/s Ratio Prot	c0.12	0.02		c0.01	0.01		c0.02	0.24		0.00	c0.43	
v/s Ratio Perm							0.15		0.01	0.03		0.13
v/c Ratio	0.78	0.10		0.24	0.20		0.29	0.46	0.02	0.06	0.84	0.26
Uniform Delay, d1	45.3	40.4		52.7	52.7		17.7	16.6	12.7	12.5	23.8	15.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.6	0.2		2.0	1.6		0.7	0.3	0.0	0.1	6.7	0.2
Delay (s)	57.9	40.5		54.8	54.3		18.5	16.9	12.7	12.5	30.5	16.0
Level of Service	E	D		D	D		B	B	B	B	C	B
Approach Delay (s)		52.8			54.5			16.9			26.0	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	112.4	Sum of lost time (s)	27.6
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues
5: University Dr & Whitehead St/Democracy Ln

06/19/2018

Lane Group	EBT	EBR	WBT	NBT	SBT
Lane Group Flow (vph)	121	73	139	498	428
v/c Ratio	0.25	0.13	0.27	0.33	0.34
Control Delay	10.8	3.8	9.7	8.1	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	3.8	9.7	8.1	8.7
Queue Length 50th (ft)	14	0	14	25	23
Queue Length 95th (ft)	48	18	49	77	71
Internal Link Dist (ft)	497		78	245	560
Turn Bay Length (ft)		80			
Base Capacity (vph)	1318	1395	1330	2799	2302
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.05	0.10	0.18	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	61	67	50	51	28	38	360	61	107	255	32
Future Volume (vph)	51	61	67	50	51	28	38	360	61	107	255	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frpb, ped/bikes		1.00	0.98		1.00			0.99			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.97			0.98			0.99	
Flt Protected		0.98	1.00		0.98			1.00			0.99	
Satd. Flow (prot)		1821	1556		1771			3436			3432	
Flt Permitted		0.79	1.00		0.82			0.89			0.73	
Satd. Flow (perm)		1467	1556		1481			3076			2531	
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)	55	66	73	54	55	30	41	391	66	116	277	35
RTOR Reduction (vph)	0	0	56	0	18	0	0	18	0	0	10	0
Lane Group Flow (vph)	0	121	17	0	121	0	0	480	0	0	418	0
Confl. Peds. (#/hr)			11	11			13		22	22		13
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		7.0	7.0		7.0			11.8			11.8	
Effective Green, g (s)		7.0	7.0		7.0			11.8			11.8	
Actuated g/C Ratio		0.23	0.23		0.23			0.40			0.40	
Clearance Time (s)		6.0	6.0		6.0			5.0			5.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		344	365		347			1218			1002	
v/s Ratio Prot												
v/s Ratio Perm		c0.08	0.01		0.08			0.16			c0.17	
v/c Ratio		0.35	0.05		0.35			0.39			0.42	
Uniform Delay, d1		9.5	8.8		9.5			6.4			6.5	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.6	0.1		0.6			0.2			0.3	
Delay (s)		10.1	8.9		10.1			6.7			6.8	
Level of Service		B	A		B			A			A	
Approach Delay (s)		9.7			10.1			6.7			6.8	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	29.8	Sum of lost time (s)	11.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	74	51	511	124	61	626
Future Volume (Veh/h)	74	51	511	124	61	626
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)	80	55	555	135	66	680
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	1367	555			690	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1367	555			690	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	47	90			93	
cM capacity (veh/h)	150	531			905	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	135	555	135	746
Volume Left	80	0	0	66
Volume Right	55	0	135	0
cSH	212	1700	1700	905
Volume to Capacity	0.64	0.33	0.08	0.07
Queue Length 95th (ft)	94	0	0	6
Control Delay (s)	47.6	0.0	0.0	1.9
Lane LOS	E			A
Approach Delay (s)	47.6	0.0		1.9
Approach LOS	E			

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	73	611	12	109	652
Future Volume (Veh/h)	8	73	611	12	109	652
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	79	664	13	118	709
Pedestrians	16					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	2					
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1632	686			693	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1632	686			693	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	82			87	
cM capacity (veh/h)	95	440			888	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	88	677	118	709
Volume Left	9	0	118	0
Volume Right	79	13	0	0
cSH	491	1700	888	1700
Volume to Capacity	0.18	0.40	0.13	0.42
Queue Length 95th (ft)	16	0	11	0
Control Delay (s)	18.2	0.0	9.7	0.0
Lane LOS	C		A	
Approach Delay (s)	18.2	0.0	1.4	
Approach LOS	C			

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	108	164	296	214	11
Future Volume (Veh/h)	13	108	164	296	214	11
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)	14	117	178	322	233	12
Pedestrians	3					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				868		
pX, platoon unblocked						
vC, conflicting volume	920	242	248			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	920	242	248			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	85	86			
cM capacity (veh/h)	259	795	1314			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	131	500	245
Volume Left	14	178	0
Volume Right	117	0	12
cSH	651	1314	1700
Volume to Capacity	0.20	0.14	0.14
Queue Length 95th (ft)	19	12	0
Control Delay (s)	11.9	3.8	0.0
Lane LOS	B	A	
Approach Delay (s)	11.9	3.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	12	61	36	13	67	32
Future Volume (vph)	12	61	36	13	67	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	66	39	14	73	35

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	79	53	108
Volume Left (vph)	0	39	73
Volume Right (vph)	66	0	35
Hadj (s)	-0.47	0.18	-0.03
Departure Headway (s)	3.7	4.4	4.1
Degree Utilization, x	0.08	0.06	0.12
Capacity (veh/h)	932	794	835
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	7.5		
Level of Service	A		
Intersection Capacity Utilization	21.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	40	45	0	0	4
Future Volume (Veh/h)	4	40	45	0	0	4
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)	4	43	49	0	0	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	49				100	49
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	49				100	49
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1558				896	1020

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	47	49	4
Volume Left	4	0	0
Volume Right	0	0	4
cSH	1558	1700	1020
Volume to Capacity	0.00	0.03	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.6	0.0	8.5
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	8.5
Approach LOS			A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	15.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	226	0	4	300	0	4
Future Volume (Veh/h)	226	0	4	300	0	4
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)	246	0	4	326	0	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)				792		
pX, platoon unblocked						
vC, conflicting volume			246		580	246
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			246		580	246
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1320		475	793

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	246	330	4
Volume Left	0	4	0
Volume Right	0	0	4
cSH	1700	1320	793
Volume to Capacity	0.14	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.1	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.1	9.6
Approach LOS			A

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		