Work Session Date: 05/11/2020
Agenda Item: 1a.

MEMORANDUM

To: **Chair Jaworski and Members of the Planning Commission**

From: **Albert Frederick, Senior Planner**

Through: **Jason D. Sutphin, Community Development Division Chief**
Brooke Hardin, Director of Community Development and Planning

RE: **Work Session for redevelopment of Northfax West**

Meeting Date: May 11, 2020

The attached documents are inclusive of all materials for the Planning Commission work session on the above-referenced item. This memorandum serves to provide explanation of the purpose of this item. The intent of this work session request is to receive feedback on a two-phased redevelopment plan that consist of townhouses, senior living facility with structured parking, road construction to be built by city and applicant, to culvert a portion of on-site stream, disturbance in floodplain and Resource Protection Area, and an undetermined mixture of uses along Chain Bridge Road. The applicant is requesting a Rezoning from RM Residential Medium and CR Commercial Retail to PD-M Planned Development Mixed Use, approval of a Master Development Plan, a Special Use Permit to culvert a portion of on-site stream and remove the 100-year floodplain, a Special Exception for disturbance of the Resource Protection Area to build a culvert, and a Certificate of Appropriateness.

CITY OF FAIRFAX

Department of Community Development & Planning

Zoning Map Amendment (Z-20-00006)
Special Use Permit (SU-20-00007)
Special Exception (SE-20-00150)

WORK SESSION DATE

May 11, 2020

APPLICANT

Northfax JV LLC

OWNER

Northfax JV LLC
Orchard RE Investment LLC
A.R.G. II, LLC

AGENT

Lynne J. Strobel, Attorney
Walsh, Colucci, Lubeley
& Walsh, P.C.

PARCEL DATA

Tax Map ID

- See Attachment A15

Street Address

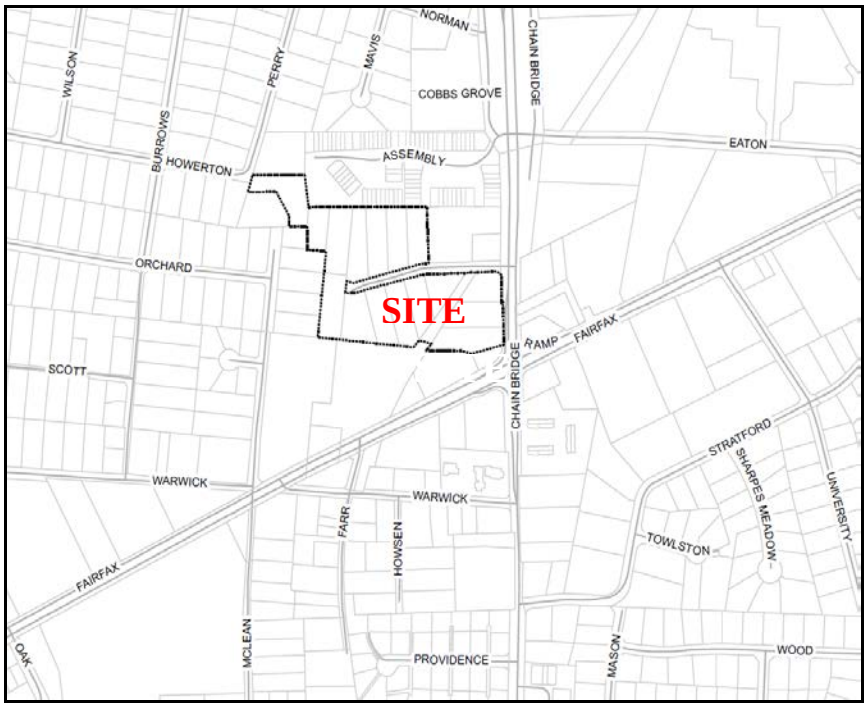
- See Attachment A15

Zoning District

- CR, Commercial Retail and RM, Residential Medium
- Architectural Control Overlay District (ACOD)

APPLICATION SUMMARY

The intent of this work session request is to receive feedback on a two-phased redevelopment plan that consist of townhouses, senior living facility with structured parking, road construction to be built by city and applicant, to culvert a portion of on-site stream, disturbance in floodplain and Resource Protection Area, and an undetermined mixture of uses along Chain Bridge Road. The applicant is requesting a Rezoning from RM Residential Medium and CR Commercial Retail to PD-M Planned Development Mixed Use, approval of a Master Development Plan, a Special Use Permit to culvert a portion of on-site stream and remove the 100-year floodplain, a Special Exception for disturbance of the Resource Protection Area to build a culvert, and a Certificate of Appropriateness.



BACKGROUND INFORMATION

The owner and applicant have assembled 17 parcels that total approximately 11.46 acres (including right-of-way for Orchard Street). The existing site consists of two one-story single-family homes, two temporary parking lots for vehicle storage and a sit-down restaurant. The 3,100 square foot restaurant was constructed around 1973. In 2005, a portion of the site received City Council approval for a Special Use Permit to allow a temporary use (storage of new vehicles) on the south side of Orchard Street. In March 2015, a Special Use Permit was approved to continue the use after the temporary use permit had expired. City Council also approved a Special Use Permit for a new temporary use for the north side of Orchard Street. Two single-family homes were constructed around the mid-1950's-early 1960's. A significant portion (5.44 +/- acres) of the subject property is also located in the 100-year floodplain. A stream on site flows from the northwest to the southeast into a box culvert that was installed by the City of Fairfax to improve the road and drainage system at Chain Bridge Road (Route 123) and Fairfax Boulevard (Route 50). The applicant has received a Virginia Water Protection Permit from the Virginia Department of Environmental Quality to place a large portion of the stream in a culvert the on-site stream and a Conditional Letter of Map Revision (CLOMR), Case No. 18-03 2239R, from the Federal Emergency Management Agency (FEMA) to remove the 100-year floodplain and RPA from the site. Further information on adjacent properties are provided below:

Table 1: Existing Use and Surrounding Properties

Direction	Existing Land Use/Uses	Zoning	Future Land Use
Site	Auto Dealer/Vehicle Storage; Residential/Two Single-Family Homes Commercial Retail/Restaurant	CR, Commercial Retail RM, Residential Medium in the ACOD	Activity Center Green Network - Private
North	Commercial – Office/Townhomes; Commercial – Office/Insurance Agency; Commercial – Retail/Gas Station Open Space – Recreation and Historic/ Undeveloped Land	CO, Commercial Office RM, Residential Medium RT, Residential Townhouse CR, Commercial Retail in the ACOD	Townhouse/ Single-Family Attached Neighborhood and Green Network - Private
South	Open Space – Undesignated/Vacant; Commercial – Retail/Car Dealership, Auto Body Repair and Restaurant	CR, Commercial Retail in the ACOD	Activity Center
East	Commercial – Retail; Unoccupied Commercial Structures/ Car Dealership	CR, Commercial Retail in the ACOD	Activity Center
West	Residential-Single Detached/ Single-Family Homes	RM, Residential Medium RL, Residential Low in the ACOD	Single-Family Detached Neighborhood

The Future Land Use designation for the subject property is Activity Center and Green Network. The Comprehensive Plan map does not indicate green network through the majority of the site where the applicant is proposing the culvert. The surrounding land use designations are a combination of Activity Center, Single-Family Detached Neighborhood, Green Space – Private, and Townhouse/Single-Family Attached Neighborhood. The subject property is zoned RM Residential Medium and CR Commercial Retail. The surrounding zoning districts are a combination of RL Residential Low, RM Residential Medium, RT Residential Townhouses, CO Commercial Office, and CR Commercial Retail. The subject property is immediately surrounded by uses that range from single-family homes to townhouses, auto dealers to offices, gas station to a restaurant and City property. Immediately to the west of the site is a single-family neighborhood on McLean Avenue and Orchard Street. To the north of the site is a townhouse community,

office building and a Shell gas station. The subject property is located near two major corridors of Fairfax Boulevard and Chain Bridge that are predominately non-residential uses.

The Fairfax Boulevard (Route 50) corridor from McLean Avenue to the west and Eaton Place to the east are commercial uses. On the north side of Fairfax Boulevard and south of the subject property is DARCAR Pre-owned Fairfax at McLean Avenue, Brown's Fairfax Mazda, sit-down restaurant in 29 Diner, a used auto-sales lot and finally, a parcel owned by the City of Fairfax. On the northeast side of Chain Bridge Road to Eaton Place are commercial uses that include Fairfax Exxon, Jim McKay Chevrolet Used Car Sales, and Point 50, a recently approved and under construction shopping center. On the south side of Fairfax Boulevard from Warwick Avenue to Chain Bridge Road are commercial uses that include Fairfax Kia, a meat and grocery store, insurance agency, dental office, an automotive oil change and lubrication shop, medical spa, religious institution and the former Rite Aid site (proposed Wawa convenience store). On the south east side of the Chain Bridge Road along Fairfax Boulevard to Eaton Place are commercial uses that range from convenience stores and gas stations to auto sales, and hotel to sit-down restaurants.

Project Summary

In January 2020, City Council and Planning Commission held pre-application development briefings with the applicant to discuss a two-phased redevelopment plan at the subject site. Phase I is 7.8 +/- acres and situated along the northern and western property line. Phase I of the proposed project consists of 56 townhouses, up to 200 unit senior living facility (114 Congregate Living Facility and 86 Assisted Living Units) with 120 structured parking spaces, a joint road construction project by the applicant and the City of Fairfax, construct a culvert for the stream on-site, and disturbance in floodplain and Resource Protection Area. The proposed townhomes are planned at 40 +/- feet in height and the senior living building is planned at a height of 80 +/- feet. The Farr Avenue extension to Fairfax Boulevard requires coordination with the proposed redevelopment of the Brown's Mazda property. Phase II of the proposal is 3.5 +/- acres with an undetermined mix of future uses along Chain Bridge Road and a future access road from Chain Bridge Road.

Master Development Plan Summary

The subject property is comprised of seventeen (17) parcels that would be redeveloped into residential and commercial uses in two phases of a Master Development Plan:

- Phase one includes fifty-six (56) townhouses by Madison Homes with a density of 4.88 units per acres. Townhouses would be a mix of front entry units that are 24-feet wide and rear entry units that are 20-feet wide. Each unit is required to have two parking spaces per unit and the applicant has provided two garaged spaces for each unit. The applicant has provided 134 parking spaces (112 garage spaces and 22 private surface spaces). The townhouses proposed at approximately 44 feet in height. In the middle of the site, the applicant is proposing a senior living building, owned and operated by Brightview Senior Living Development, LLC, with up to two hundred (200) units and structured parking in a seven (7) story building measuring at 78-feet on 2.24 +/- acres. The applicant is requesting City Council to modify the parking requirement to allow for a reduction of 38% in the required parking spaces from the 194 spaces to 120 spaces for the senior living facility referenced in the Parking Assessment Memo in Attachment A10.
- Phase two conceptualizes 25,000 square feet of office, retail, and restaurant uses; 180-units of residential dwelling units, and a 140-room hotel. The applicant does not seek approval of the potential uses in Phase Two of this Master Development Plan. The owner would be required to amend this Master Development Plan, if approved, prior to the commencement of Phase Two. The applicant is proposing uses and thresholds that are subject to change as the applicant studies Phase 2 of the site and prepares development options.

Redevelopment of the subject property requires a rezoning from CR Commercial Retail and RM Residential Medium to PDM Planned Development-Mixed Use in the Architectural Control Overlay District (ACOD), a Special Use Permit to culvert portions of on-site stream and remove portions of the 100 year floodplain, and a Special Exception for disturbance of Resource Protection Area to which would lead to the future remapping of the RPA for removal of portions through the site, and a Certificate of Appropriateness. The applicant also is requesting a right-of-way vacation of portions of Orchard Street to enable realignment of the street consistent with the City's road plan and provide land to facilitate the extension of Farr Avenue to the adjacent property line for Brown's Mazda as part of the approval of the Master Development Plan. The applicant will coordinate with Brown's Mazda and the City of Fairfax to facilitate the connection to Fairfax Boulevard (Route 50).

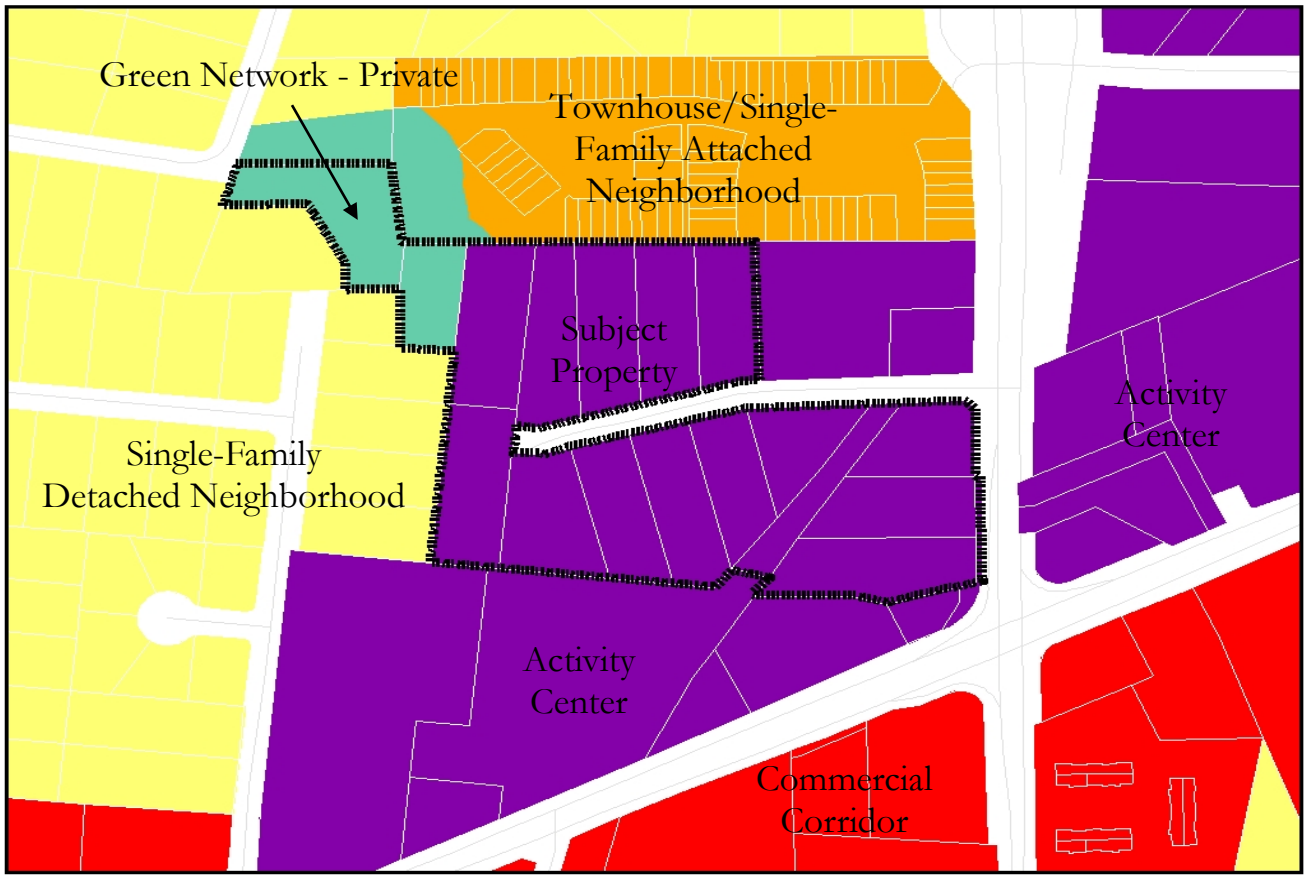
As a part of this proposed redevelopment, the applicant has approvals from Federal Emergency Management Agency (Conditional Letter of Map Revision – Case No. 18-03 2239R, April 1, 2019) and Virginia Department of Environmental Quality (Virginia Water Protection Permit No. 18-1003, March 5, 2019) to place a portion of the stream in a culvert in order to remove the 100-year floodplain and RPA from portions of the site. As part of the project approvals, the applicant intends to commit to a stream restoration project for a portion of Accotink Creek within the boundaries of Van Dyck Park. This stream restoration project will implement this component of the approved master plan for Van Dyck Park. VA DEQ is also requiring contribution to regional bank for stream restoration improvements outside of the City. Irrespective of these, City approval to construct and make these changes is required.

Comprehensive Plan

Land Use: The Comprehensive Plan provides a general plan and communicates a vision for future land use and development in the City; while, the zoning ordinance provides the regulatory mechanism to ensure the new development and changes in land use are consistent with the vision. The Comprehensive Plan states "where any new development is proposed that requires a land use action not consistent with the Comprehensive Plan, the applicant should request a modification to the Comprehensive Plan as well" (Chapter 1: Introduction, City of Fairfax 2035 Comprehensive Plan, page 15).

The Comprehensive Plan and the Zoning Ordinance provide opportunities for flexibility in site design and whether or not a use is appropriate and compatible with the adjacent properties. Some consideration for appropriateness is the ability to mitigate through site design, density and height limitations, setbacks, bufferyards and landscaping. The applicant is seeking to build a mixed use development that is comprised of townhouses and an up to 200-unit senior living building in Phase 1. The uses in Phase 2 have not been defined and will require an amendment to the Master Development Plan. In order to develop this project, the applicant seeks a Rezoning from CR Commercial Retail and RM Residential Medium to PD-M Planned Development-Mixed Use in the ACOD and Activity Center Place Type. The subject site is overlaid on the Future Land Use Map from the Comprehensive Plan in Figure 1 shown on the next page.

Figure 1: Comprehensive Plan Future Land Use Map



The Activity Center Place Type applies to locations in the City where pedestrian-oriented, mixed-use development is strongly encouraged. Mixed-use development is pedestrian-oriented development that allows multiple activities to take place by layering compatible land uses, public amenities, active streets accommodating multimodal transportation, and community serving commercial (City of Fairfax 2035 Comprehensive Plan, page 32). New development in Activity Center Place Type should provide integrated uses with structured or below grade parking. The overall project design within an activity center should improve the streetscape, and provide vehicular and pedestrian connections to the existing road network and surrounding uses as recommended by the Multimodal Transportation Chapter of the Comprehensive Plan (City of Fairfax 2035 Comprehensive Plan, page 32).

Although the City is primarily built out, a variety of new housing types can be accommodated through redevelopment on a relatively limited basis to broaden the current offerings and accommodate changing demands (Comprehensive Plan, Pg. 53). Likewise, it is vital that a variety of high-quality, attractive housing choices continue to be available in the City to support differing needs and demands of residents. Housing needs and demands are reflective of the existing housing stock and fluctuating market trends, making them subject to change over time. Specific housing types are identified in the Land Use Strategies Section of the Comprehensive Plan. Current shortages could include multifamily rentals and condominiums, of which the majority of the City's stock was built in the 1960s, and townhomes, of which the City currently has a lower ratio than many surrounding communities in Fairfax County (Comprehensive Plan, pg. 54). The applicant is providing a housing type that is underrepresented in the City's existing stock of housing units (Outcome H1.1). The applicant has indicated that there is not an affordable housing component to this proposal (Outcome H2.1). However, the senior living building addresses Outcome H3.1, Action H3.1.1 and Action

H.3.1.2 in the Comprehensive Plan as the applicant seeks to provide housing options for older adults that need the appropriate levels of support and care.

Predicated on the underlying zoning district, the Activity Center supports a density of a minimum FAR of 0.4; at least six (6) townhouses or at least twelve (12) multifamily dwelling units per acre; or any proportional combination of residential and commercial densities with building heights predominantly five stories or less, unless specified in an adopted Small Area Plan. (City of Fairfax 2035 Comprehensive Plan, Pg. 32). Residential townhouses should only be considered to serve as a transitional use to existing development outside of the Activity Center.

Many commercial properties in the city are underutilized with an overabundance of surface parking. The properties are often suitable for redevelopment, whether to achieve greater use of the land or to make the properties more market competitive. New development and redevelopment must enhance commercial activities along the City's major corridors with a mix of retail, office, and service offerings in an attractive and welcoming setting. (City of Fairfax 2035 Comprehensive Plan, Pg. 50). Likewise, the City's Comprehensive Plan encourages redevelopment in the City's Activity Centers. The City will promote redevelopment in Activity Centers to strengthen economic vitality; provide retail, office, and residential opportunities for sustained demand; and reinforce the City's regional appeal (City of Fairfax 2035 Comprehensive Plan, Pg. 51).

The subject property is located in the Activity Center Place Type and is located in Northfax, one of five Activity Centers identified in the 2035 Comprehensive Plan. The Northfax Activity Center is undergoing a Small Area Plan, which "are neighborhood-level plans intended to provide the City with guidance on each of its five Activity Centers defined in the 2035 Comprehensive Plan. While the Comprehensive Plan advises the Activity Center's development at a high level, Small Area Plans provide more specific guidance for each Activity Center, including the desired mix of uses, residential density, building density, design aesthetic, street locations, multimodal connections infrastructure improvements, parking, and open space. As each Small Area Plan is completed and adopted, its recommendations will supersede the pre-existing guidance in the 2035 Comprehensive Plan for its respective Activity Center" (City of Fairfax, https://www.fairfaxva.gov/government/community-development-planning/planning/current-studies-projects-plans/small-area-plans).

The City has several types of environmental resources that are easily impaired by urban land uses. Encompassing the headwaters of Accotink Creek, measures taken by the City to protect water quality, riparian and floodplain areas, open space, and the urban forest are critical to support regional efforts to improve environmental health. Located within the Chesapeake Bay Watershed, the City is committed to reducing stormwater runoff in order to protect the Bay through the adoption of the Chesapeake Bay Preservation Act and enforcement of other federal, state, and local stormwater regulations. (City of Fairfax 2035 Comprehensive Plan, Pg. 99).

Outcome NE1.5: Restored and preserved natural open spaces and contiguous greenway corridors that provide natural habitats for plants and wildlife.

Action NE1.5.1 Restore disturbed areas along streams and in conservation easements with native species.

Action NE1.5.3 Encourage new development that protects and preserves environmentally-sensitive areas and natural features, such as tree cover (especially significant stands of trees and healthy, mature trees), native vegetation, streams, wildlife habitat, and natural topography.

Staff is reviewing the proposed development to ensure that the Comprehensive Plan policies can be achieved through proper design of the planned development.

Multimodal Transportation Goal 3: Integrate transportation with land use.

Outcome MM3.1: On- and off-street parking and curbside uses are effectively managed.

Outcome MM3.2: Walkability to and within Activity Centers and between neighborhoods is increased.

Action MM3.2.1 Whenever possible, increase connections – particularly non-motorized connections – between neighborhoods, community facilities, and Activity Centers.

Action MM3.2.2 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.

Action MM3.2.3 Increase the number, safety, and frequency of pedestrian crossings, including across major streets. Provide crosswalks at all approaches of all signalized intersections at minimum intervals of 500 feet within Activity Centers. An exception exists in the case where the implementation of a crosswalk would result in operational failure of the corridor.

Action MM3.2.4 Improve the overall pedestrian environment, including pedestrian crossings, street trees, and furnishing zones; buffering sidewalk from vehicle travel lanes; improved pedestrian scale lighting; and active ground floor uses along primary street edges.

Outcome MM3.3: Streets are designed to accommodate context and function.

Action MM3.3.3 Ensure quality street design in both the pedestrian zone and travel zone of the street.

Action MM3.3.4 Improve access, circulation, walkability, and transportation management in Activity Centers.

Staff has attached an exhibit with other Comprehensive Plan policies that apply to the proposed development application.

Rezoning: The applicant is requesting to rezone the property from RM Residential Medium and CR Commercial Retail to PD-M Planned Development-Mixed Use.

> §3.2.3.B The PD-M, Planned Development Mixed Use District, is intended to provide for coordinated mixed use developments which may include general residential and nonresidential uses within a planned development. The variety of land uses available in this district allows greater flexibility to respond to market demands and the needs of tenants, thereby providing for a variety of physically and functionally integrated land uses.
>
> §3.8.2.B.2. Planned development district rezoning may be approved only when the applicant demonstrates to the satisfaction of the city council that a proposed planned development project would result in a greater benefit to the city than would development under general zoning district regulations.

If an existing lot is (currently) split into two or more zoning districts, each such portion of the split-zoned parcel may be used only for purposes allowed within the respective zoning district. No principal or accessory use of land, building or structure, and no use or building or structure authorized by special use permit or special exception is allowed unless the use, building or structure is expressly authorized or permitted within the subject district (Section 2.2.2. Split-zoned lots). The subject is currently split-zoned RM Residential Medium and CR Commercial Retail. The current thirteen (13) of the seventeen (17) parcels is zoned with a residential designation, RM Residential Medium, totaling 8.86 +/- acres and CR Commercial Retail on four (4) parcels totaling of 2.29 +/- acres. A portion of the site (0.31 +/- acres) is proposed to be vacated right-of-way. In total, approximately 77% of the site is designated as RM Residential Medium with the remaining 23% is designated as CR Commercial Retail. The total acreage for the subject property is 11.46 +/- acres. Under the current configuration, the proposal could not be developed and the site would remain largely as a residential site with limited commercial opportunities.

The proposed rezoning from RM Residential Medium and CR Commercial Retail to PD-M Planned Development-Mixed Use would allow for the "applicant to create special and unique developments by mixing and clustering, where appropriate, land uses and/or dwelling types and providing more usable recreation and open space in a master development plan proposed by the applicant and approved by the city council. Planned developments should create a more livable, affordable and sustainable community. Starting from the baseline, which is current zoning, applicants may be given increased development rights, such as increased density and height, as well as increased flexibility, in return for providing benefits that make the project "superior" and the community better in accordance with the goals and objectives of the city, including, but not limited to, those set forth in the comprehensive plan" (Zoning Ordinance, Pg. 3-59).

<u>Open Space</u>: The Planned Development Districts requires at least 20 percent (2.29 +/- acres) of the site to be designated as recreation and open space for use and enjoyment of the residents and occupants of the development. The plan currently proposes four areas of open space for a total of 1.61 +/- acres (70,132 square feet) or 15% of the property and this open space must be at 50-feet in width. Open space is programmed as an amenity area at the northeast corner of Orchard Street and Farr Avenue, on the north west and east side of the senior living building, and in the northwest corner of the site that includes an amenity center and a 6-foot wide walking trail. The applicant is retaining a large area of RPA and Floodplain in the northwest corner of the site, and only half that acreage can be counted towards the open space. The applicant will need to provide the remaining 5% (0.68 acres/29,621 square feet) of open space in Phase 2 of the project; therefore, limiting the potential footprint of commercial space. The Zoning Ordinance also requires at least 60% of the required open space be contiguous, however it may be bisected by a residential street. The applicant will need to clearly provide an exhibit to illustrate how this requirement is being met.

A transitional yard buffer of 15 feet is required along the site area boundary. The applicant is seeking a modification to the transitional yard requirement (from 15-feet to 8 feet) along the western property line adjacent to single-family detached homes fronting along McLean Avenue. The applicant intends to maintain the quantity and plant species along the western property line but reduce the width of the transitional yard. The northern property line adjacent to The Assembly townhouse community has an existing dense tree line that the applicant intends to preserve and add understory trees along the property line. The southern property line shared with Brown's Mazda will be developed with two parking structures. The applicant is installing a five (5) sidewalk along this property line that connects from Farr Avenue Extension to the east side of the Senior Living Building. The eastern property line has an existing dense tree line on the office building property with frontage on Orchard Street and Chain Bridge Road. Along this property line, the applicant proposes an alleyway for a row of rear-entry townhouses and the installation of a sanitary sewer line.

Scale: The applicant is proposing to develop fifty-six (56) townhouses on 11.46 acres with a density of 4.88 units per acre. The townhouses are approximately 44 feet in height. Townhouses would be a mix of front entry units that are 24-feet wide and rear entry units that are 20-feet wide. Townhouses aligned the north side of Orchard Street and the west side of Farr Avenue Extension to minimize the visibility of alleyways, as well as, to create a streetscape along the corridor. In the middle of the site, the applicant is proposing 114-units for congregate living facility and 86-units for assisted living in a seven (7) story building measuring at 78-feet on 2.24 +/- acres. The senior building includes a parking garage with 120 spaces. The overall densities for other approved projects as compared to the subject application is provided below:

Table 2: Density

Project	Site Area	Number of Units	Density	Height
Northfax West Phase I	**11.46**	**56 TH; 200 MF**	**22.3**	**40 +/- feet; 78 +/- feet**
Capstone	6.15	275	44.7	48 +/- feet
Paul VI	18.51	266	14.4	45 +/- feet
Scout on the Circle	9.81	400	40.7*	85 feet

* Project is located in an Activity Center

Circulation/Pedestrian Access: A joint effort between two private property owners (Northfax JC LLC and Brown's Mazda), and the City of Fairfax will create a new north-south roadway connecting Fairfax Boulevard/Farr Avenue and Orchard Street. This will create a grid network within the northwest quadrant of Fairfax Boulevard and Chain Bridge Road. This design will also provide an expanded street network for non-motorized traffic, and provide local access to existing commercial properties and a future redevelopment area. The street design includes 67-feet of right-of-way with 10-foot travel lanes, 8-foot on-street parking, 5-foot wide bike lanes, 4.5-feet planting strip or lights, pavers and trees, and a 6-foot wide sidewalk. The driveways in the townhouse section are 23-feet with alleyways of 19-feet for rear-loaded townhouses.

Three crosswalks are planned for this corridor near the entrance of the parking structure on Farr Avenue Extension, at the three-way stop for Orchard Street and Farr Avenue Extension, and the mid-block of Orchard Street at the entrance of senior living building. The applicant is also installing a five (5) sidewalk along southern property line that connects from Farr Avenue Extension to the east side of the Senior Living Building. A multi-use trail is proposed along the property frontage on Chain Bridge Road. Table 3 on the next page provides a summary of existing trips and proposed trips:

Table 3: Trip Generation

Land Use		ITE Code	Size	AM Peak Hour	PM Peak Hour	Daily
Existing	Single-Family Detached Homes	210	2	1	2	19
Proposed (Phase I)	Multifamily Housing (Low-Rise)	220	56	27	35	383
	Continuing Care	255	200	28	32	480
Total				55	67	863
Proposed (Phase II)	Multifamily Housing (Mid-Rise)	221	180	61	78	979
	Hotel	310	140	65	79	1,170
	Quality Restaurant	931	8 ksf	6	62	671
	High-Turnover Restaurant (Sit-Down)	932	5 ksf	50	49	561
	General Office	710	10 ksf	36	13	114

	Shopping Center	820	2 ksf	2	8	76
Total Phase 2 Development Trips (*without reductions*)				220	289	3,571
Total Phase 1 + Phase 2 Development Trips (*without reductions)*				275	356	4,434
Total Development Trips (*with reductions)*				265	344	4,274
Net New Trips Without Restrictions				274	354	4,415
Net New Trips with Reductions				264	342	4,255

The City's Transportation Division held a scoping meeting with the applicant's engineer to discuss the methodology and ITE data for the Traffic Impact Study (TIS). The applicant has provided a Traffic Impact Study estimating 274 AM peak hour trips, 354 PM peak hour trips and 4,415 daily trips upon buildout of the development before considering an internal capture ratio of 5% for a mixed-use development and a reduction of 5% for TDM/Transit.

Environmental: The 100-year floodplain cuts through the site and causes half (½) of the property to be undevelopable. During the VWP permitting process, the applicant had to demonstrate avoidance and minimization efforts. It was deemed that both efforts would require flood control due to the location of the perennial stream and the history of flooding onsite. A complete avoidance would result in a developable area of 4.4 +/- acres. The flood elevations under this scenario would render approximately half of the developable land area in an unstable condition to due to the presence of RPA and flood zones (VWP Individual Permit No. 18-1003, March 5, 2019, page 3). A partial streaming piping scenario was also considered and deemed infeasible whereby "500 linear feet of stream channel would be piped leaving most of the perennial stream and all the intermittent stream intact" (VWP Individual Permit No. 18-1003, March 5, 2019, page 3). However, the use of Orchard Street to access the western portion of the site "would necessitate significant alteration to the flood zones through the installation of a culverted road crossing, this constricting flood flows and increasing flooding to the northern portion of the property" (VWP Individual Permit No. 18-1003, March 5, 2019, page 3).

The subject property has a perennial and two intermittent streams that flow through the site from west to east. The perennial stream enters the site at the northwest corner of the project area and flows southeast before entering an 8-foot box culvert that conveys water under Route 123 that was installed by the City of Fairfax to improve drainage and reduce flooding. The two intermittent streams flow into the perennial stream from the west. As a result of having streams on site, a RPA Site-Specific Study in accordance with Section 4.18 (Chesapeake Bay Preservation) of the City's Zoning Ordinance is required by the applicant. In conjunction with a RPA Site-Specific Study, the applicant is required to submit a Water Quality Impact Assessment (WQIA) for land disturbance, development or redevelopment within the RPA including any buffer area modification or reduction. Due to the level of land disturbance proposed by the applicant, a major WQIA is required. Ultimately, the proposal would allow the new culvert to tie into the system installed by the City of Fairfax. The table below shows the change in floodplain and RPA based on the pre-development and post-development plans.

Table 4: Floodplain and RPA

Site Area (11.46 +/- acres)	RPA		Floodplain	
	Acreage	% of Site	Acreage	% of Site
Pre-Development	5.75	50.2%	5.44	47.5%
Post-Development	0.65	5.7%	0.76	6.6%

The applicant has provided a pre-development floodplain and RPA boundary on Sheet 18 and a post-development boundary on Sheet 18A of the Master Development Plan. As part of the project approvals, the applicant intends to commit to a stream restoration project for a portion of Accotink Creek within the boundaries of Van Dyck Park. This stream restoration project will implement this component of the approved master plan for Van Dyck Park. VA DEQ is also requiring contribution to regional bank for stream restoration improvements outside of the City. Irrespective of these, City approval to construct and make these changes are required.

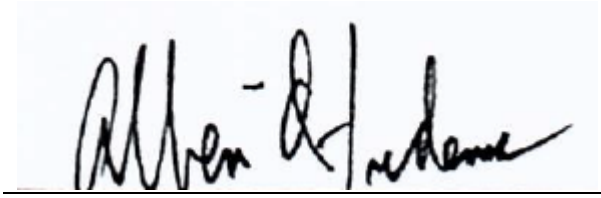
Architecture: The applicant had a pre-application work session with the Board of Architectural Review on March 4, 2020. The applicant submitted a formal application on April 28, 2020. The BAR will forward a recommendation for a Certificate of Appropriateness to the City Council for final action.

City Schools: The subject property is located in the Providence Elementary School school zone. Providence ES (PES) has a capacity of 910 students. This year, the school is at 99% capacity with a membership of 908 students. According to Fairfax County Public Schools (FCPS), PES is projected for a student membership of 951 in SY20-21 and 1012 in SY21-22 placing the school as much as 110% overcapacity. Providence ES currently has two trailers; both are used as resource rooms. Providence's Special Use Permit (SUP) for the trailers was renewed in November 2019 for five years. It is projected that the Northfax student yield ratio will be .230. According to City staff's projections, 13 students are estimated from the Northfax development based on Phase 1 with additional students to be determined in Phase 2.

ATTACHMENTS

A1 – Location Map
A2 – Aerial Photo
A3 – Comprehensive Plan Place Type
A4 – Current Zoning
A5 – Proposed Zoning
A6 – Statement of Justification
A7 – Certified Plat
A8 – Master Development Plan
A9 – Applicable Comprehensive Plan Policies
A10 – Parking Assessment Memo
A11 – Traffic Impact Assessment
A12 – Virginia Water Protection Permit
A13 – Conditional Letter of Map Revision (CLOMR)
A14 – Northfax WQIA Report
A15 – Parcel Ownership

PREPARED BY:



05/07/2020

Albert Frederick
Senior Planner

DATE

05/07/2020

Jason D. Sutphin
Community Development Division Chief

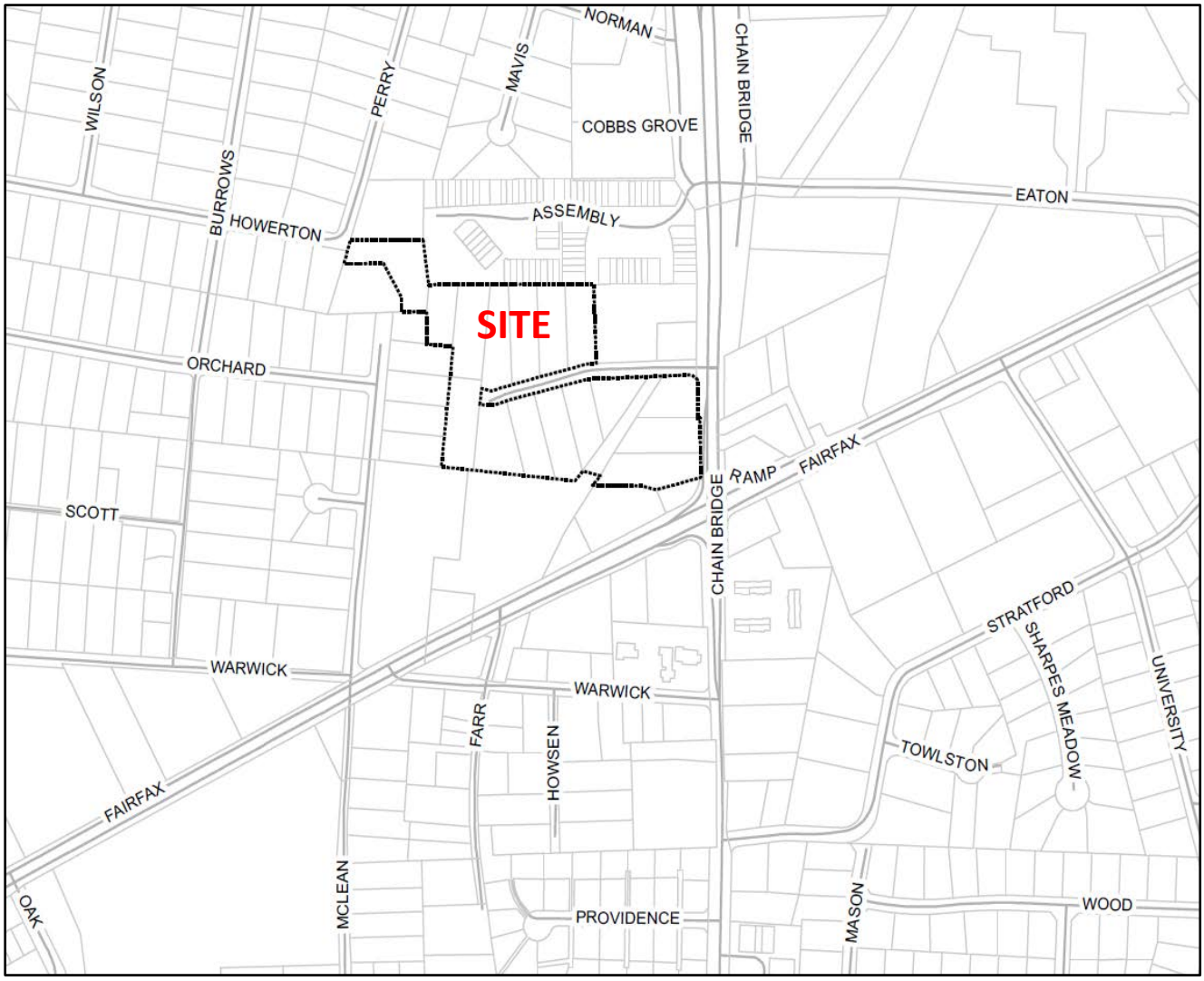
DATE

05/07/2020

Brooke Hardin
Director, Community Development & Planning

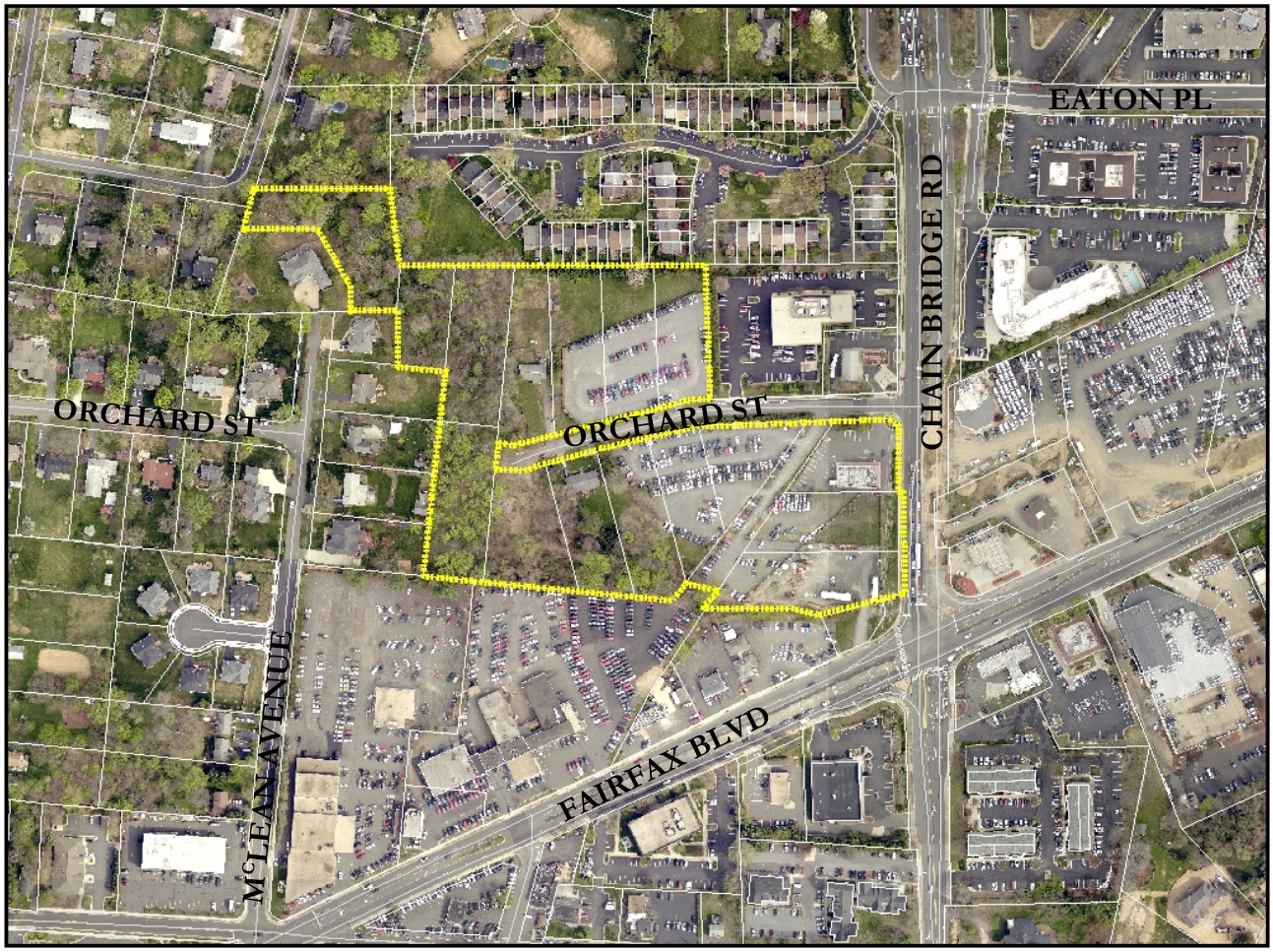
DATE

Attachment 1



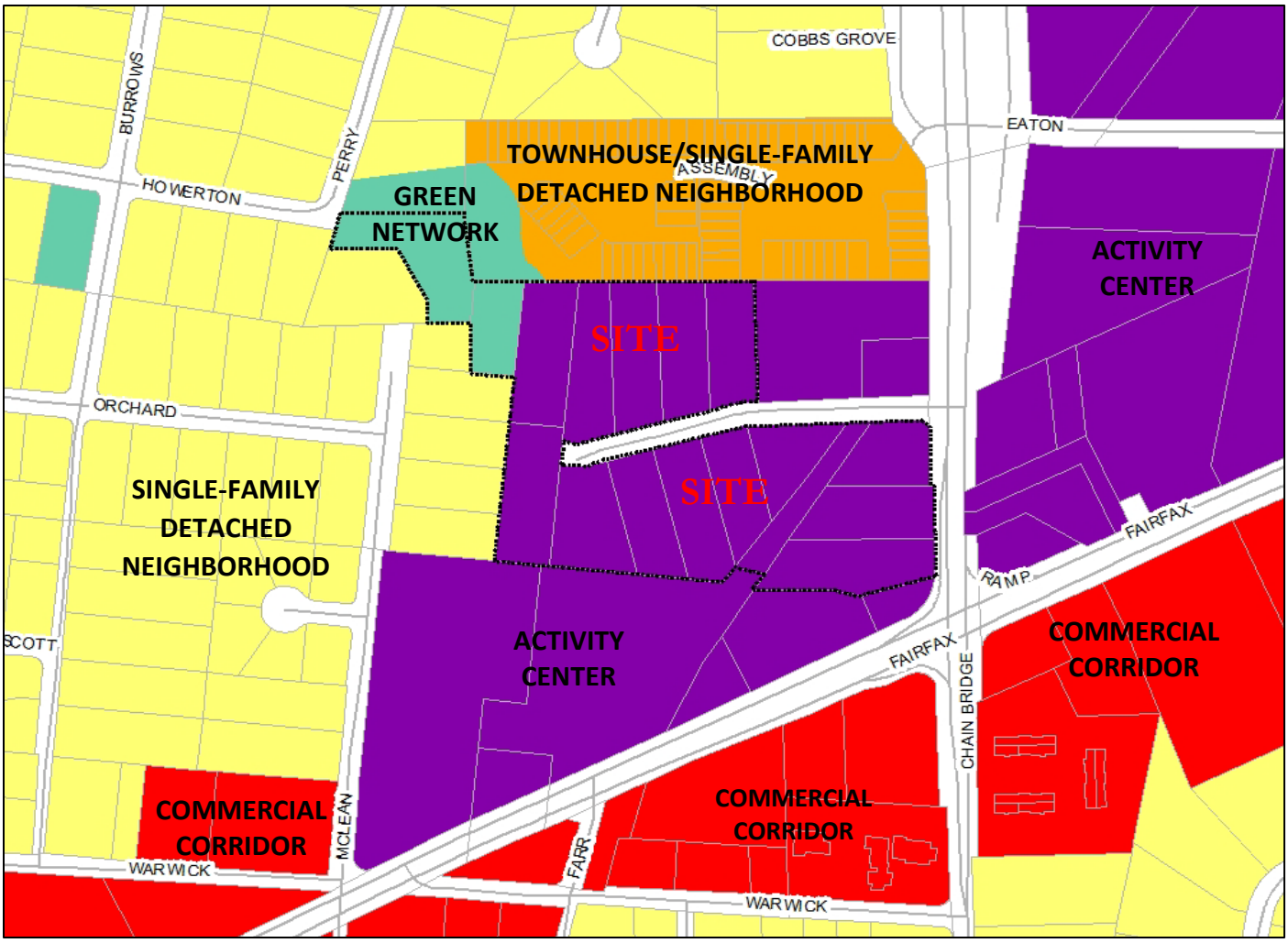
LOCATION MAP

Attachment 2



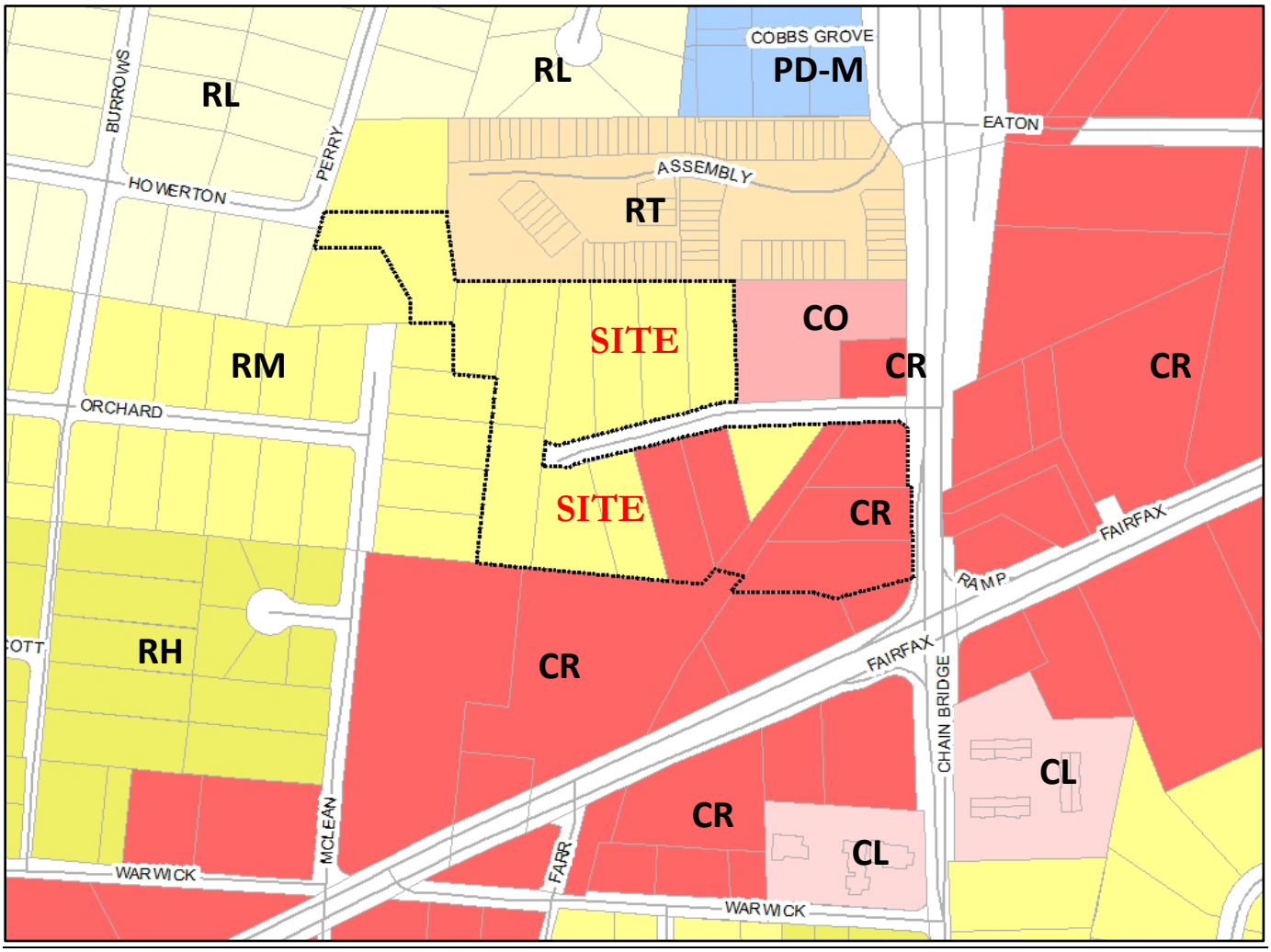
2019 AERIAL PHOTO

Attachment 3

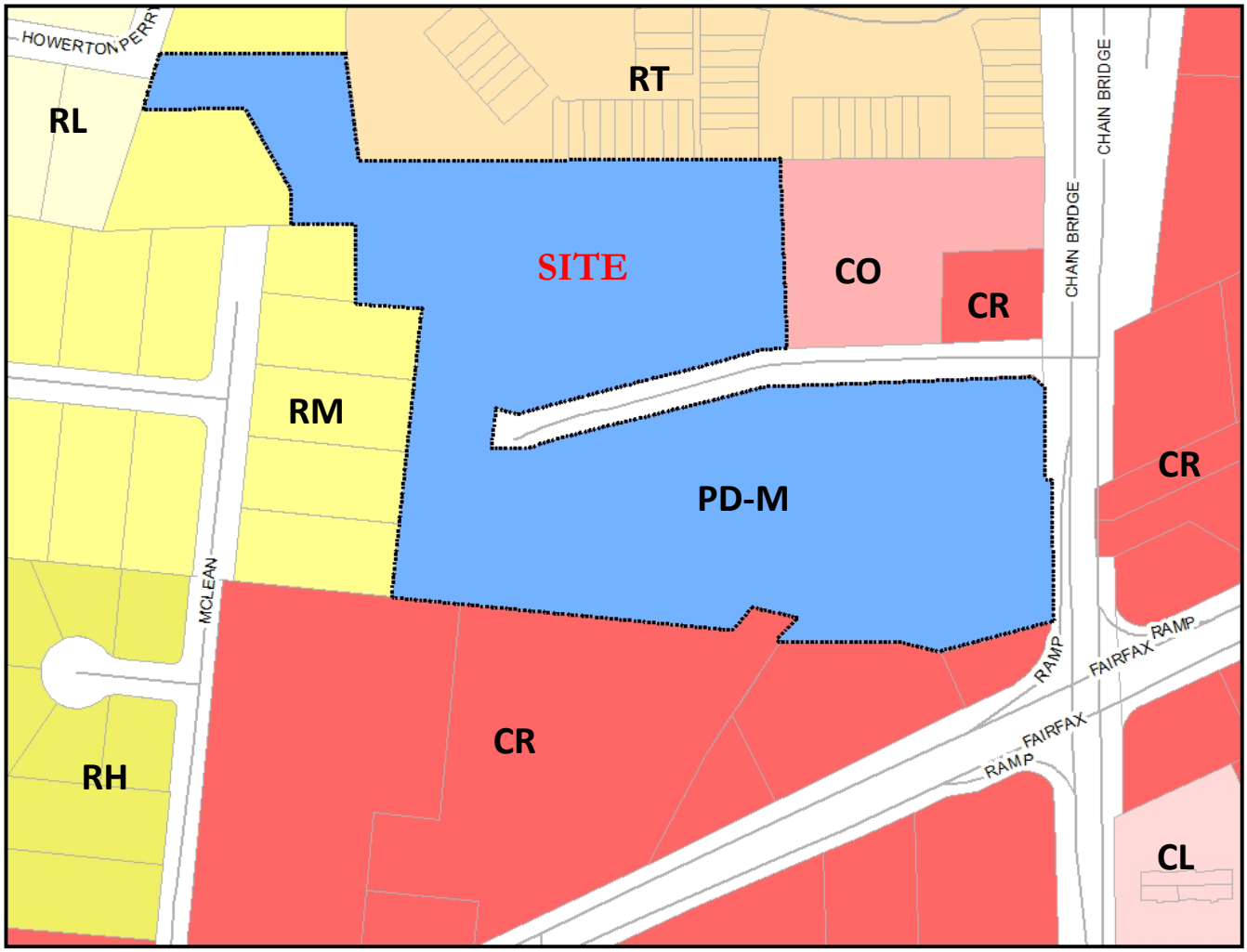


COMPREHENSIVE PLAN PLACE TYPE

Attachment 4



ZONING MAP



PROPSED ZONING MAP

RECEIVED
04 / 13 / 2020
Community Dev & Planning

NORTHFAX JV LLC

Statement of Justification
Revised: April 10, 2020

Please accept this Statement of Justification in support of a rezoning application to allow the redevelopment of an assemblage of seventeen (17) parcels and a portion of Orchard Street right-of-way to be vacated/abandoned. A complete list of all 17 parcels, the right-of-way, and each associated property address is attached to this Statement of Justification as **Exhibit A**. This Statement is submitted in conjunction with a Master Development Plan, prepared by Christopher Consultants, Ltd., dated January 3, 2020 and revised through April 10, 2020, consisting of thirty-four (34) sheets (the "MDP"), and other submitted supporting materials. The contents of this Statement of Justification address the requirements set forth in Section 3.8.2.C.1 of the City of Fairfax Zoning Ordinance, as amended by City Council through June 25, 2019 (the "Zoning Ordinance").

Northfax JV LLC, an affiliate of The Lann Companies, is the Applicant in the proposed rezoning of that area referred to as Northfax West. The 17 properties and the portion of Orchard Street right-of-way to be vacated/abandoned, which are identified on Exhibit A, comprise approximately 11.46 acres and are identified as Tax Map 57-2-02-003, 57-2-02-005, 57-2-02-017, 57-2-02-018, 57-2-02-019, 57-2-02-020, 57-2-07-015-B, 57-2-08-005, 57-2-08-006, 57-2-08-007, 57-2-08-008, 57-2-08-010, 57-2-08-011, 57-2-08-012, 57-2-08-013, 57-2-08-014, and 57-2-47-000-A (collectively, the "Subject Property"). Exhibit A includes the Title Owner of each parcel. The Subject Property is located along the western frontage of Chain Bridge Road (Route 123) and north of Fairfax Boulevard (Route 50). The uses surrounding the Subject Property are varied. The northern boundary is adjacent to The Assembly townhouses, a service station and an office building; the eastern boundary is Chain Bridge Road; the southern boundary is adjacent to City property, a used car lot, the 29 Diner, Brown's Fairfax Mazda, and the DarCar's Used Car Center; and the western boundary is adjacent to the rear property line of single-family detached dwellings fronting on McLean Avenue. The Subject Property is currently zoned CR (Commercial Retail) and RM (Residential Medium) and located within the Architectural Control Overlay District ("ACOD"). Existing improvements on the Subject Property include two (2) one-story houses located on the RM portion of the Subject Property. Commercial uses on the Subject Property include vehicle storage and an existing restaurant that fronts Chain Bridge Road. Approximately 4.0 acres on the western portion of the Subject Property is undeveloped, with approximately 5.5 acres located within a 100-year floodplain. The extent of the 100-year floodplain boundary is depicted on the Existing Conditions Plan on Sheets 2 and 2A of the MDP.

PROPOSED DEVELOPMENT

The Applicant proposes to rezone the Subject Property from the CR and RM Districts to the Planned Development Mixed Use ("PD-M") District to permit its redevelopment with a mix of residential and commercial uses that would be completed in two phases. Phase One includes the development of fifty-six (56) townhouses as well as a senior living facility with up to two hundred (200) units that is anticipated to be completed by 2023. The MDP reflects the general development plan for Phase One. Phase Two contemplates redevelopment of the area generally designated on

the MDP as the "Future Development Parcel" that is anticipated to be completed by 2027. The Applicant will submit an amended MDP for approval once the uses for Phase Two have been determined.

Phase One

Preliminarily, as part of Phase One and before construction of the proposed residential community and senior living building, the Applicant will submit the necessary materials to modify the 100-year floodplain on a portion of the Subject Property. The current 100-year floodplain cuts through the Subject Property and causes approximately one-half of the site to be undevelopable. A stream generally flows from the northwest to the southeast into a box culvert, which is located at the Chain Bridge Road frontage of the Subject Property and recently installed by the City of Fairfax and the Virginia Department of Transportation as part of their road and drainage improvement project (the "City/VDOT Northfax Project"). Despite the installation of this culvert, the existing floodplain still includes a substantial portion of existing Orchard Street. The Applicant intends to complement and continue the City's storm drainage improvements by enclosing the on-site stream in a box culvert, thereby modifying the area of the floodplain. The result will be an increase in the developable portion of the Subject Property. To accomplish the on-site stream channel improvements, the Applicant has applied for and has been issued the required approvals from governmental agencies, including a Virginia Water Protection ("VWP") Permit, Permit No. 18-1003, on March 5, 2019 issued by the Virginia Department of Environmental Quality ("VDEQ") and a Conditional Letter of Map Revision ("CLOMR") from the Federal Emergency Management Agency ("FEMA"), Case No. 18-03 2239R, on April 1, 2019. These approvals have been coordinated with the City of Fairfax and are included as part of the MDP. As a result of the on-site stream channel improvements, the Applicant will effectively reduce the Resource Protection Area ("RPA") on the Subject Property from 5.99 acres to 1.15 acres. Prior to the approval of the proposed rezoning, the Applicant will submit an RPA Delineation Plan and a Water Quality Impact Assessment. In connection with the floodplain modification, the Applicant proposes to grade within the redefined RPA area to install the box culvert. Pursuant to Section 4.18.10 of the Zoning Ordinance, this improvement will be located outside the RPA to the degree possible, and no more land will be disturbed than is necessary to construct the proposed improvement. Moreover, the installation and maintenance of this improvement will be in compliance with all applicable state and federal permits and will be designed and conducted in a manner that protects water quality. In addition, the Applicant proposes to construct a six-foot wide pedestrian trail in the redefined RPA area. Prior to any land disturbance related to the trail construction, the Applicant will obtain any required permits. The Applicant will also submit sufficient and reasonable proof that this intended use will not deteriorate water quality and will not conflict with any nearby planned or approved uses. Finally, the Applicant will comply with all erosion and sediment control requirements if any land disturbance in association with the construction of these improvements in the redefined RPA exceeds an area of 2,500 square feet.

To oversee and facilitate the townhouse development of Phase One, the Applicant has contracted with MHI-Northfax, LLC, an affiliate of Madison Homes, Inc. ("Madison Homes"). The proposed townhouse development will include 56 units. This results in a proposed density of approximately 11.34 dwelling units per acre, when the proposed density is associated with only the townhouse portion of the development. The townhouses will be a mix of front entry units that

are 24 feet wide, and rear entry units that are 20 feet wide. Each of the proposed townhouses will have an integrated two-car garage on the ground level, which will provide one hundred and twelve (112) total garage parking spaces. Twenty-two (22) additional guest parking spaces will be located on-site, including one handicap van-accessible space. The one hundred and thirty-four (134) parking spaces for the townhouse development will result in a parking ratio of 2.39 spaces per unit, which exceeds the required parking ratio of two (2) spaces per unit for townhouses. The townhouse layout includes rear entry units that will front on Orchard Street to activate the streetscape. Open space has been integrated into the layout. The proposed townhouses will be designed with architecture that will be compatible with the surrounding neighborhoods and will provide the appropriate transition between the surrounding residential neighborhoods and the higher density senior living facility planned with Phase One, as well as the future uses of Phase Two. Building materials may include, but are not limited to, masonry, cementitious siding, and other quality materials. Additional residential amenities include a proposed pocket park within the townhouse development and a proposed amenity area in the northwest potion of the Subject Property, as generally shown on the MDP. These amenity areas will be programmed open spaces that may include a tot lot and seating areas.

To develop and operate the proposed senior living facility on the Subject Property, the Applicant has contracted with Brightview Senior Living Development, LLC ("Brightview"). The proposed senior living facility will contain approximately 230,000 square feet of gross floor area in a seven-story building that incorporates a structured parking garage containing one hundred and fourteen (114) parking spaces with six (6) surface parking spaces, resulting in a total of one hundred and twenty (120) parking spaces. Based on the extensive industry experience of Brightview and market trends, the proposed number of parking spaces will meet the parking demand of a fully occupied community. The proposed facility will have up to 200 units comprised of approximately one hundred and fourteen (114) independent living units, sixty (60) assisted living units and twenty-six (26) memory care units. Resident amenities will include multiple dining venues, an area for fitness/wellness/yoga, physical therapy and occupational therapy services, an art studio, a multi-purpose space, a movie theater, and a hair and nail salon. In addition to the indoor amenities, the community will include outdoor courtyards and garden spaces for the enjoyment of the residents, residents' visitors, and the neighboring community. The outdoor courtyards will include features such as landscaping, hardscape, fountains, fire pits, lighting, and/or seating areas, as generally depicted on the MDP. These courtyards will be designed to encourage community use and will activate the streetscape. The design of the proposed building will include contemporary architecture that will be residential in style and scaled to be consistent with the proposed townhouse development on the north and west sides of the facility. The proposed residential community developed in Phase One will be served by public water and public sewer, as generally shown on the MDP.

Approximately one (1) acre in the northwest corner of the Subject Property will remain mostly in its current undisturbed condition, as generally shown on the MDP. The Applicant proposes to construct a six-foot wide pedestrian trail in this portion of the site, which will create connectivity to the adjacent neighborhoods. This area is part of approximately 20% of total area of the Subject Property that will remain in open space. However, the Zoning Ordinance permits only 50% of the land area located in a floodplain to qualify as open space; thereby the open space calculation on the Subject Property in accordance with the Zoning Ordinance is 15%. Combining

this land area with the permitted open space options and uses outlined in Zoning Ordinance Section 3.8.7, the Applicant is effectively providing 23% open space. Thus, Phase One meets the intent of the 20% open space requirement for the Subject Property, so that none of the Future Development Parcel is being counted as open space for the proposed development.

The Subject Property will be served by a primary vehicular access point at Orchard Street to Chain Bridge Road at an existing signalized intersection. The Applicant proposes to improve and realign Orchard Street to connect with the proposed extension of Farr Avenue (the "Farr Avenue Extension"). The Farr Avenue Extension will be completed by the City and will provide vehicular access between Chain Bridge Road and Fairfax Boulevard, through the Subject Property and the adjoining Brown's Mazda property. The Farr Avenue Extension will include a five-foot wide bike lane and a six-foot wide sidewalk to promote pedestrian connectivity. Similarly, the Orchard Street improvements will also include five-foot wide bike lanes as well as six-foot wide sidewalks. In conjunction with the proposed Orchard Street and Farr Avenue Extension improvements, approximately 0.31 acre of Orchard Street right-of-way will be vacated and approximately 0.97 acre of right-of-way will be dedicated to the City, the majority of which will facilitate the City's completion of the Farr Avenue Extension project. The Applicant is not proposing any vehicular access connections to adjoining residential neighborhoods nor proposing interparcel access to non-residential uses in Phase One. Given the proposed adjacent development, a vehicular connection is not warranted. The request for an interparcel access will be reevaluated in Phase Two during the redevelopment of the Future Development Parcel.

The Applicant's traffic consultant, Gorove/Slade Associates, Inc., has prepared a Traffic Impact Study for the Subject Property, dated January 2, 2020 (the "TIS"). The TIS takes into account the redevelopment of the Subject Property and considers a number of external factors, such as the Farr Avenue Extension, the University Boulevard Extension, and redevelopment of other approved but incomplete proximate development projects. For Phase One, the TIS concludes that the redevelopment of the Subject Property will have a negligible impact on the surrounding transportation and roadway network. Fairfax Boulevard shows an increase of less than 1.0% in peak hour traffic, and Chain Bridge Road shows an increase of less than 1.1% in peak hour traffic attributable to the proposed redevelopment of the Subject Property.

A series of on-site stormwater management devices, such as hydrodynamic separators, stormfilters, and filterras, will be utilized to meet stormwater management quality and quantity requirements. In addition to the stormwater management devices, a portion of the proposed senior living building will have two (2) green roofs. Any proposed on-site stormwater management and best management practices ("BMP") facilities will comply with all applicable stormwater regulations. As the site design progresses, the design team will incorporate sustainable design features into the development to the extent possible.

Finally, the Applicant will commit to the completion of an off-site stream restoration project for that portion of Accotink Creek within the boundaries of Van Dyck Park, where the stream has a width ranging from 8 to 15 feet and extends for a distance of approximately 2,190 linear feet. This stream restoration project has received preliminary funding from the City and has been designated by the City as an important public improvement project that is part of the approved master plan for Van Dyck Park. The Applicant intends to complete the stream restoration project

at no additional cost to the City. Recognized as a nutrient offset trading bank project, the Applicant will ensure that the off-site improvements will comply with the regulations of VDEQ. In addition, the Applicant will purchase 1,675 stream credits or 4,761 Stream Condition Units from a VDEQ approved mitigation bank, as required by the VWP Permit (Permit No. 18-1003), approved by VDEQ. By completing this stream restoration project, the Applicant will make a significant contribution to the implementation of the approved master plan for Van Dyck Park. Additional City benefits from this stream restoration project include improving the water quality of the stream through Van Dyck Park, reducing erosion in this stretch of the Accotink Creek, decreasing the effects of flooding, and enhancing and beautifying the natural habitat for native species in this area.

Phase Two

Phase Two anticipates the redevelopment of approximately 3.3 acres of the Subject Property, which is identified as the "Future Development Parcel" on the MDP. Specific uses on this area remain to be determined, which allows the Applicant to preserve maximum flexibility for optimal development in the future. Possible uses will be those permitted in the PD-M District under the Zoning Ordinance, to include permitted temporary uses. These uses may include, but are not limited to, approximately 25,000 square feet of office, retail, and restaurant uses; an additional 180 residential dwelling units; and a 140-room hotel. The Applicant is not seeking approval of these possible uses with the Phase One development plan. The Applicant may also consider opportunities to coordinate development of this parcel with adjoining properties, including the City-owned property at the corner of Chain Bridge Road and Fairfax Boulevard. Contemplated excluded uses include cemeteries, detention facilities or jails, adult uses, building supplies and lumber sales, fuel stations, vehicle repair facilities, vehicle sales and leasing establishments, and vehicle service establishments.

An additional right-in access from Chain Bridge Road will be constructed and completed in Phase Two of the development. The proposed access will ultimately connect to the realigned Orchard Street. In addition, the Applicant will provide an additional proposed location for ingress/egress at Orchard Street. The Applicant reserves the right to construct these future access points into the Future Development Parcel, as generally depicted on the MDP. The traffic impacts of Phase Two were considered as part of the TIS. Although the Applicant is not seeking approval of the possible uses listed above that are contemplated for Phase Two, the TIS takes into account the redevelopment of the Subject Property with such possible uses to ensure that all potential traffic impacts are considered. The TIS also considers a number of external factors, such as the Farr Avenue Extension; signalization of the Fairfax Boulevard and Farr Avenue intersection; the realignment of Warwick Avenue, Fairfax Boulevard, and McLean Avenue; the University Boulevard Extension; and redevelopment of other approved but incomplete proximate development projects. For Phase Two, the TIS concludes that the ultimate redevelopment of the Subject Property will have negligible impact on the surrounding transportation and roadway network. Fairfax Boulevard shows an increase of less than 3.3% in peak hour traffic and Chain Bridge Road shows an increase of less than 3.2% in peak hour traffic attributable to the proposed redevelopment of the Subject Property. At such time when the uses for Phase Two are selected and an amendment to the MDP is requested for the redevelopment of the Future Development Parcel, the Applicant will prepare and submit an amended TIS for review and approval.

With regard to stormwater management, similar devices to those provided in Phase One will be utilized in Phase Two to meet stormwater management quality and quantity requirements. The proposed development on the Future Development Parcel will include on-site stormwater management and BMP facilities that will comply will all applicable stormwater regulations. These measures will be evaluated by City staff when an amendment to the MDP is submitted.

In the interim, the Applicant proposes fencing, landscaping, and sodding/seeding/ground cover on the Future Development Parcel. Sidewalk improvements will be installed along the Chain Bridge Road frontage. In addition, the Applicant may seek permitted temporary uses on the Future Development Parcel in accordance with the Zoning Ordinance Section 3.5.6.B and C, including, but not limited to, temporary vehicle storage and temporary special events. Specifically, the Applicant seeks to retain the existing restaurant building on the Future Development Parcel. In accordance with the Zoning Ordinance, the Applicant may choose to convert the building to permitted temporary uses, including, but not limited to, temporary residential sales and/or leasing offices and temporary construction offices.

REZONING APPLICATION/COMPREHENSIVE PLAN

The Applicant proposes a rezoning of the Subject Property from the CR and RM Districts to the PD-M District in order to permit the proposed development. The proposed rezoning fulfills each of the approval considerations set forth in Section 6.4.9 of the Zoning Ordinance, as discussed below:

A. Substantial conformance with the Comprehensive Plan.

The proposed development is in substantial conformance with the recommendations of the Comprehensive Plan (the "Plan") and the Future Land Use Map for the City of Fairfax. The Comprehensive Plan and Future Land Use Map, which were adopted by City Council in February of 2019, designate the Subject Property as an Activity Center. Specifically, the Subject Property is located in the Northfax Activity Center, which the Plan considers the most appropriate location in the City to accommodate a regional mixed-use destination. Consolidating 17 parcels, the Applicant is proposing to integrate a mix of residential, retail, restaurant, and hotel uses on the Subject Property in a development that will be implemented in two phases. With Phase One, in addition to the improved vehicular access along realigned Orchard Street and the Farr Avenue Extension, the proposed development will create a pedestrian friendly streetscape that includes a five-foot wide bike lane and a six-foot wide sidewalk, providing a convenient, safe pedestrian access from Chain Bridge Road to Fairfax Boulevard. In addition, urban-style townhouses and a modern senior living facility will contribute to an urban streetscape along realigned Orchard Street and the Farr Avenue Extension, as both have been designed to implement the "active street" concept contemplated in the Plan. Moreover, the proposed townhouse residential use, combined with the incorporation of a senior living community, will diversify housing types in the City as well as address a growing need in the City for senior housing that allows City residents an opportunity to age in the City of Fairfax. The introduction of additional multifamily residential, hotel, restaurant, and retail uses in Phase Two will complete the

Northfax Activity Center's objective to provide a well-designed, desirable place to live, work, shop, and dine, as envisioned by the Plan.

While the proposed development is in substantial conformance with the recommendations of the Plan and the Future Land Use Map, the Plan recommends Small Area Plans be developed for each of the City's five Activity Centers, including Northfax. Currently, the City is undergoing a process to develop Small Area Plans for Northfax and Old Town Fairfax that will provide more specific guidance for these Activity Centers, including the desired mix of uses, residential density, building intensity, design aesthetic, street locations, multimodal connections, infrastructure improvements, parking, and open space. As each Small Area Plan is completed, its adopted recommendations will supersede the pre-existing guidance in the 2035 Comprehensive Plan for its respective Activity Center. Based on meetings coordinated by Cunningham/Quill Architects, the proposed development will be designed to be consistent with the overall vision for the Northfax Small Area Plan. Specifically, a significant feature of the envisioned Northfax Small Area Plan includes a linear park concept. Taking this into consideration, the Applicant has adjusted the sidewalk and landscape strip configuration on the north side of Orchard Street to provide the flexibility to ultimately allow for a design that will be compatible with the linear park concept. In addition, by providing the proposed pedestrian trail through the northwest corner of the site, the Applicant will provide a connection of the envisioned linear park, not only through the site itself, but also to surrounding neighborhoods.

B. *Any greater benefits the proposed rezoning provides to the City than would a development carried out in accordance with the current zoning district, and otherwise applicable requirements of this chapter.*

The proposed development will provide greater benefits to the City than a development in accordance with current zoning district regulations. The proposed rezoning to the PD-M District will consolidate 17 parcels to create a single zoning classification on the Subject Property. The rezoning will allow for the development of a mixed-use destination in Northfax that more properly aligns with and advances the goals of the City's vision in this Activity Center. Moreover, because the development will be completed in two Phases, with the development of the second Phase being subject to future evaluation and approval by the City Council, the proposed rezoning affords the Applicant flexibility to respond to market demands and the needs of City residents. As currently envisioned, it is planned that the contemplated mix of uses in Phase Two will create a critical mass of residential density that will support retail and restaurant uses in the Northfax Activity Center. In addition, the proposed development will provide road improvements to existing Orchard Street that will, in conjunction with the City's Farr Avenue Extension project, complete the connection between Fairfax Boulevard and Chain Bridge Road. This connection facilitates establishment of the Northfax street grid. The Farr Avenue Extension is a new roadway link that will improve the area's traffic circulation. Associated with these road improvements is the installation of a five-foot wide bike lane and a six-foot wide sidewalk along the realigned Orchard Street that will extend off-site, resulting in enhanced pedestrian connectivity. In addition, the proposed development will include the installation of a box culvert as part of a public improvement project on the Subject Property.

C. Suitability of the Subject Property for the development and uses permitted by the current versus the proposed district.

The Subject Property is highly suitable for the proposed development given its location proximate to a mix of existing residential and commercial uses. Under the existing zoning designations, the Subject Property is zoned to two different zoning classifications. While most of the proposed uses are permitted either by right or with a special use permit approval in the respective zoning districts, a townhouse residential use specifically is not permitted in either the RM or CR zoning districts. A townhouse component creates an appropriate transition use adjacent the existing townhouses of The Assembly. The consolidation and rezoning of the 17 parcels that comprise the Subject Property to the proposed PD-M District allows for a development of uses in a manner that will be compatible with nearby communities and consistent with the Plan's recommendations for the Northfax Activity Center. The proposed rezoning results in a more suitable development than could be achieved by the existing zoning.

D. Adequacy of existing or proposed public facilities such as public transportation facilities, public safety facilities, public school facilities, and public parks.

The proposed development will not have an adverse impact on public facilities such as public transportation facilities, public safety facilities, public school facilities, and public parks. Part of the proposal incorporates a separate Public Improvement Plan (the "PI Plan") that includes the construction of a storm drainage culvert, utility relocations, and the realignment of Orchard Street. The PI Plan will be reviewed and approved by the City in coordination with the City's plans for the construction of the Farr Avenue Extension. The completion of Orchard Street and the Farr Avenue Extension creates a street grid that connects Chain Bridge Road to Fairfax Boulevard and improves transportation use. In addition, the Applicant proposes to construct a six-foot wide pedestrian trail in the northwest corner of the Subject Property, creating additional usable public open space. Finally, the Applicant's commitment to stream restoration in Van Dyck Park will improve the health of Accotink Creek and benefit, not just Van Dyck Park, but the entire City.

E. Adequacy of existing and proposed public utility infrastructure.

The existing public utility infrastructure is adequate to serve the proposed development. All new utilities serving the proposed townhouse development and the senior living community development will be installed underground.

F. Compatibility of the proposed development with adjacent and nearby communities.

The proposed development has been designed to ensure compatibility with the surrounding residential uses to the north and west of the Subject Property as well as the retail uses to the south. The Applicant intends to utilize the open space in the northwest corner of the Subject Property, which will remain undisturbed, to foster connectivity to the adjacent neighborhoods. Furthermore, the Farr Avenue Extension that extends through the

Applicant's site and will connect to an improved Orchard Street that will provide a connected street network for motorists, bicyclists, and pedestrians. This will effectively unify the proposed projects on both sites and contribute to the creation of a pedestrian-oriented, mixed-use destination at Northfax.

G. Consistency with the stated purpose of the proposed district.

The stated purpose of the PD-M District is to provide for coordinated mixed-use developments, which may include general residential and nonresidential uses within a planned development. The variety of land uses available in this district allows greater flexibility to respond to market demands and the needs of tenants, thereby providing for a variety of physically and functionally integrated land uses. The proposed mixed-use development planned for Phase One is consistent with the purpose of the PD-M District. In addition, while the uses for Phase Two have not yet been specified, the uses ultimately selected will be in response to market demands and will fully integrate with, not only the uses of Phase One, but with the broader mixed-use development of the Northfax Activity Center.

The additional considerations of Section 6.6.8 of the Zoning Ordinance are met as follows:

- In order to ensure compatibility of each component within the overall development, the design of the proposed townhouses incorporates an aesthetic transition between the traditional style townhouses of The Assembly and the contemporary style of the proposed senior living building. In addition, the senior living community integrates a contemporary design that complements both the transitional architecture and massing of the adjacent townhouses to its north and west as well as the adjacent Brown's Mazda dealership to its south.

- The development will be completed in two Phases, with Phase Two being subject to future evaluation and approval by City Council. This ensures that the proposed rezoning will create a unified, cohesive environment at full build-out that will be responsive to market demands and the needs of the City to ultimately develop a mixed-use destination in the Northfax Activity Center.

- The overall development of the Subject Property will occur in phases[1] that are connected but are independent projects, in accordance with the MDP. Development will occur in the following stages:

    - <u>Stage One</u>: Construction of storm drainage culvert, utility relocations and the realignment of Orchard Street. Stage One will be subject to the PI Plan to be prepared by the Applicant and reviewed and approved by the City of Fairfax in coordination with the City's plans for the construction of the Farr Avenue

[1] The use of "phases" in Section 3.8.2.H, which is synonymous to "stages," is not to be confused with the previous use of "Phases" throughout this Statement and specifically refers to (1) the development of the townhouses and senior living community and (2) the redevelopment of the Future Development Parcel. The two uses of the term are not the same. To distinguish, the "phases" of Section 3.8.2.H is referred to as "stages."

Extension. Work is commencing on this PI Plan with anticipated submission to the City in May 2020. It is anticipated that construction of this Stage could begin in early 2021, subject to obtaining all necessary approvals, with completion in late 2021. The culmination of Stage One will be the submission and approval of a Letter of Map Revision ("LOMR") by FEMA, consistent with the approved CLOMR.

- Stage Two: Development and construction of the townhouse component, as shown on the MDP. Subject to final site plan approval and coordination with the LOMR resulting from the Stage One work, this work could begin in mid to late 2021. Timing for the completion of this Stage Two will be dependent upon market conditions for the sale of the proposed townhouses, but it is anticipated that this Stage will be developed, constructed, and sold over a 2-3 year period from commencement.

- Stage Three: Development and construction of the senior living building, as shown on the MDP. Subject to final site plan approval and coordination with the LOMR resulting from the Stage One work, this work could begin in mid to late 2021. Construction of the improvements included in Stage Three should be completed in approximately 18 months from commencement. Occupancy of the senior living building will commence upon completion of construction.

- Stage Four: Development and construction of the Future Development Parcel will occur after approval by the City Council of an amendment to the MDP, specifying the improvements and uses to be constructed on this Stage Four of the project. Details with regard to the timing of this development and construction will be provided as part of a future application for amendment to the MDP.

- To protect and preserve the ecologically sensitive areas within the Subject Property, the Applicant intends to complement and continue the City's storm drainage improvements that will ultimately reduce the impact of the floodplain on the Subject Property and on adjacent properties, including The Assembly. The Applicant is also proposing to maintain approximately one acre in the northwest corner of the Subject Property primarily in its current, undisturbed condition. The existing trees in the northwest corner of the site have been evaluated for health, structure, and impact from invasive species. The focus of this area will be on tree preservation with minimal development. The invasive species and dangerous trees will be removed so the higher quality trees can thrive. In addition, the trail and proposed amenity area will be designed to maximize the preservation of good quality trees. Finally, by completing the Van Dyck Stream restoration project, the Applicant will improve the water quality and reduce erosion in this portion of the Accotink Creek, decrease the effects of flooding, and enhance and beautify the natural habitat for native species in the area.

- The Applicant is not displacing any existing affordable housing on the Subject Property. The Applicant is providing a diverse mix of housing that includes single-family attached units as well as a senior living building that will include independent living, assisted living, and memory care units. This will provide a variety of housing types at various price points that will meet the needs of the City's residents, including its senior citizens.

MODIFICATIONS, WAIVERS, AND SPECIAL USE PERMIT REQUESTS

In conjunction with the proposed rezoning, the Applicant requests approval of the following modifications and special use permits:

1. Pursuant to Section 4.15.7.C.2.b.1 of the Zoning Ordinance, a special use permit is hereby requested to allow for disturbance within the 100-year floodplain boundary.

   The proposed floodplain boundary modification meets the approval considerations for a special use permit as set forth in Section 6.7.7 of the Zoning Ordinance. The modification of the floodplain boundary is consistent with the Comprehensive Plan and the Future Land Use Map, which designates the Subject Property as an Activity Center. The modification will relocate the on-site stream into a box culvert and remove the 100-year floodplain from the developable area of the site, which will allow a mixed-use development consistent with the Comprehensive Plan. The modification is compliant with all applicable Zoning Ordinance requirements related to floodplain regulations, Chesapeake Bay preservation, and open space. In addition, the modification of the floodplain will not adversely affect the health or safety of persons residing or working in the neighborhood of the proposed use nor will it have a negative, adverse effect on public welfare, property, and improvements in the neighborhood. Rather, the modification will have a positive and beneficial impact on the proposed development as well as the surrounding neighborhood by permitting the Applicant to properly redevelop this site in accordance with the mixed-use development planned for this area. Furthermore, the proposed floodplain boundary modification has already been identified by the City as a necessary public improvement project in order for the City to complete its Farr Avenue Extension project.

2. Pursuant to Section 3.8.2.I of the Zoning Ordinance, a modification is hereby requested of the development schedule requirement, as set forth in this provision.

   The development of the project is proposed to occur in phases. Phase One will include the development and construction of townhouses and a senior living facility. As previously discussed, the senior living community will comprise of a mix of independent living units, assisted living units, and memory care units. While the independent living component is considered a residential use, the assisted living and memory care components are considered non-residential uses. Additional non-residential uses are anticipated in Phase Two. As such, strict compliance with this provision precludes occupancy of the townhouses prior to the completion of the senior living facility. Therefore, a modification of this requirement is appropriate.

3. Pursuant to Section 3.8.7.G of the Zoning Ordinance, a modification is hereby requested of the requirement of a 20% minimum recreation and open space, as set forth in Section 3.8.2.G.

   Pursuant to Section 3.8.7.B.3 of the Zoning Ordinance, the minimum required width for recreation and open space is fifty (50) feet. As shown on Sheet 7 of the MDP, a total of 11% of the site is provided as open space that meets this dimensional requirement. In addition, by accounting for only 50% of the northwest corner of the site, which contains floodplain and/or steep slopes, this results in an additional 4% open space. Accordingly, the Applicant is providing 15% open space that meets the Zoning Ordinance requirements, which includes the area in the northwestern portion of the site, the open space within the townhouse development, and the courtyards to the east and west of the senior living community.

   However, approximately 0.8 acres of recreation and open space is provided that does not fall within a strict reading of the Zoning Ordinance requirements. These areas include 0.8 acre of sidewalks and planted areas within the townhouse and senior living building parcels that are not fifty (50) feet in both directions. Adding these components increases the green space by 8.0 percent (8%), effectively resulting in a total recreation and open space of 23 percent (23%). In addition, there is 0.55 acre that includes streetscape improvements along Farr Avenue Extension and Orchard Street, which provide 6-foot wide sidewalks, street trees, and lighting. The senior living building will also provide several rooftop amenitized green spaces that includes landscaping and seating areas for assisted living and memory care residents as well as a number of green roofs. Therefore, by including these additional recreational amenities and exceptionally designed green spaces, this modification request is appropriate.

4. Pursuant to Section 3.8.2.D of the Zoning Ordinance, a modification is hereby requested of the requirement that no more than two of any ten or one of any three to five abutting dwelling units have the same front yard setback, as set forth in Section 3.5.1.C.2

   The proposed townhouse development consists of a total of 56 townhouse units. As shown on the MDP, the townhouse sticks include a mix of four, five, and six units. Within the townhouse sticks, some varying setbacks have been incorporated. The Applicant also proposes an architectural variation of the design of the units, including façade, color, among other features, that will provide a visual appearance of various depths, despite several units having the same setback. This allows for a better overall design that creates an aesthetically-pleasing community.

5. Pursuant to Section 3.8.2.E.3 of the Zoning Ordinance, a modification is hereby requested of the requirement to provide 1.5 parking spaces per unit for the independent living portion of the proposed senior living facility, as set forth in Section 4.2.3.E.

The Applicant proposes a seven-story senior living facility of up to 200 units that includes a combination of independent living units, assisted living units, and memory care units. Included in the building will be a structured parking garage that provides 114 parking spaces. There will be an additional six surface parking spaces provided, resulting in a total of 120 parking spaces. Based on the Zoning Ordinance, the parking ratio for an assisted living facility is one (1) parking space per four (4) beds. There are 92 proposed assisted living and memory care beds, resulting in a parking requirement of 23 spaces. Currently, parking for an independent living use is not specified in the Zoning Ordinance. The most similar use may be a congregate living facility, which yields a parking ratio requirement of 1.5 spaces per unit. Therefore, the Applicant would be required to provide 171 parking spaces for the proposed 114 independent living units. Combined with the requisite spaces for the assisted living and memory care units, the requirement is 194 parking spaces, which exceeds what is practically needed given that many residents will not be driving or even have a vehicle. Based on the extensive experience of Brightview, and its research of optimal operating conditions, its industry knowledge dictates a much lower parking demand, which is also consistent with the Institute of Transportation Engineers' Parking Generation Manual. Brightview has determined that the requisite number of parking spaces for its proposed senior living facility to efficiently operate is 120 spaces. The Applicant has submitted a parking analysis that supports the provision of 120 parking spaces.

6. Pursuant to Section 3.8.2.E.3 of the Zoning Ordinance, a modification is hereby requested of the requirement to provide two (2) loading spaces for the independent living portion of the proposed senior living facility, as set forth in Section 4.2.9.B.

   While the Applicant is providing one loading space located on-street along the western side of the senior building facility on Farr Avenue Extension, as depicted on the MDP, the 50-foot drop off bay located at the main entrance on the eastern side of the facility effectively serves as the second loading space. It is in this area that most day-to-day deliveries from Amazon FedEx, UPS, and other delivery services will likely occur. Utilizing this drop off bay as a loading space will help to facilitate efficient traffic flow and will not impede the circulation of vehicles traversing the site, as regular deliveries to the senior living facility would be made off the public right-of-way. Thus, the Applicant meets the intent of the loading space requirement, and this modification request is appropriate.

7. Pursuant to Section 3.8.2.E.3 of the Zoning Ordinance, a modification is hereby requested of the requirement to provide vehicular access between abutting nonresidential lots fronting on arterial and collection streets prior to the erection or establishment of a principal building, as set forth in Section 4.3.3.B.

   The southern property line of the Subject Property is the only location of abutting nonresidential lots. Along this property line, the Applicant proposes the parking garage of the senior living building, which is adjacent to the Brown's Mazda dealership, a commercial use. Specifically, the dealership proposes a parking

garage adjacent to the Applicant's southern property line. Given the characteristics of the two uses, a vehicle access is not warranted or reasonable.

8. Pursuant to Section 3.8.2.E.3 of the Zoning Ordinance, a modification is hereby requested of the requirement to provide sidewalks on both sides of a collector and local street, as set forth in Section 4.4.4.A.1.

   The rear entry townhouse units are served by alleyways, as depicted on the MDP. In addition, the front entry townhouse units will be primarily comprised of driveway entryways that limit the ability to install and effectively use a sidewalk in front of these units. Thus, given the driveway access to each unit type, the installation of a sidewalk on such side of the internal street is not practical.

9. Pursuant to Section 3.8.2.E.3 of the Zoning Ordinance, a modification is hereby requested of the requirement to provide the minimum tree plantings as well as the minimum fence or wall height of the TY3 transitional yard specifications along the Subject Property's boundaries, as set forth in Sections 4.5.5.C.2(b)(2) and 4.5.5.D.

   The Applicant seeks to modify the minimum tree plantings requirements along the northern, western, southern and eastern property lines. Along the northern property line, the Applicant's proposed townhouse development is located immediately to the south of The Assembly townhouses. There is existing vegetation as well as existing privacy fences between the townhouse development and The Assembly townhouses that provide the requisite transitional yard. In the northeastern portion of this property line, the width and number of canopy trees must be reduced due to a proposed alley and sanitary easements. However, the Applicant intends to provide an increased number of understory trees. Along the western property line, the required transitional yard width must be reduced due to constraints created by the right-of-way dimensions that have been determined by the City as part of the Farr Avenue Extension project. Such constraints necessitate a modified transitional yard width in order for the Applicant to provide the proper site design for the proposed townhouses and alleyways. Furthermore, although single-family detached dwellings are located on the adjacent properties, these homes remain a significant distance from the property line. The Applicant anticipates that reducing the transitional yard width between the proposed townhouse development and the adjacent single-family detached dwellings will have minimal effect on these neighboring properties. Along the southern property line, the Applicant proposes to locate the parking garage of the senior living facility on the southeast portion of the boundary. The Brown's Mazda dealership is directly adjacent to the parking structure. Because a commercial use will be abutting a proposed parking garage, extensive TY3 transitional yard along this portion of the property line, including a fence or wall between the adjacent properties, is not needed. In addition, the proposed installation of a concrete sidewalk, the extension of the fire turnaround, and incorporation of surface parking spaces also warrants a modification of the TY3 transitional yard along the southeastern portion of the border. Finally, along the eastern property line, transitional yard modifications are needed for proper site

design of the townhouses and alleyways. Specifically, rear entry units are proposed for the easternmost townhouse stick, and this precludes the Applicant's ability to provide the full transitional yard width. The Applicant is also proposing to provide a reduced number of trees along this border due to existing vegetation between the townhouse development and the adjacent office building as well as because of proposed sanitary sewer utilities and easements in the northeastern corner of the Subject Property. In light of all of these conditions along the various property lines of the Subject Property, the Applicant will provide the appropriate transitional yard width and a modified number of canopy and understory tree plantings sufficient to mitigate any possible effects of the proposed development on the surrounding uses.

10. Pursuant to Section 3.8.2.E.3 of the Zoning Ordinance, a modification is hereby requested of the requirement to provide street trees along all streets at a rate of one canopy tree for every 40 linear feet and spaced a maximum of 50 feet apart and the requirement to plant trees no less than three feet from the back of the curb or edge of pavement, as set forth in Section 4.5.6.B.

    Street trees have been provided along Orchard Street and the Farr Avenue Extension to the extent possible. There are select areas where the requirements of Section 4.5.6 cannot be met due to proposed on-street parallel parking and various proposed utilities. The active street design provided by the City's consultant for the Farr Avenue Extension has been added to the MDP. In coordination with the City, this is also the desired design for Orchard Street. The proposed active street design includes planting areas generally every three parallel parking spaces, which results in a spacing greater than the required 50 feet maximum. In addition, the provided design shows a four-foot planting strip in between the curb and six foot wide sidewalk that cannot conform to the required three-foot minimum distance from paved surfaces. Therefore, a modification of this requirement is needed.

11. Pursuant to Section 3.8.2.E.3 of the Zoning Ordinance, a modification is hereby requested of the requirements to provide both interior islands with a minimum of 200 square feet per island and a minimum of 400 square feet per island that include sidewalks, where no parking space located more than 50 feet from a planting island, as well as curbed terminal islands at the end of a row of parking spaces, as set forth in Section 4.5.7.D.

    The Applicant requests this modification to permit head-in parking spaces in the northwest corner of the townhouse area. As generally shown on the MDP, this area is constrained by the proposed box culvert improvement that will run underneath a portion of the parking spaces. Since this parking area will function within an urban development project, these conditions prevent the Applicant from installing terminal landscaped islands with the square footage specified in the Zoning Ordinance. The modification request also applies to the parallel parking spaces within the townhouse parcel due to utility easements, urban conditions, and the incorporation of visitor parking spaces.

12. Pursuant to Section 2.10.1 of the Subdivision Ordinance, a modification is hereby requested of the requirement to provide street improvements to Perry Street and Howerton Avenue.

    The Applicant is not proposing vehicular access to Perry Street/Howerton Avenue. The only improvement shown in this area is the pedestrian trail connection. Given the minimal frontage and lack of vehicular connection or impact to these streets, street improvements at this location are not warranted.

13. Pursuant to Section 401-01 of the Public Facilities Manual ("PFM"), support for a waiver is hereby requested of the requirement to provide a typical curb and gutter street on private accessways that is less than 30 feet from face of curb to face of curb or edge of pavement.

    The proposed development is designed to be an urban community that is more compact and integrated with reduced roadway widths. The reduced road widths, in conjunction with other design features, will assist to discourage cut through traffic. Therefore, support of this waiver is appropriate in consideration of the intended urban design of the proposed development.

14. Pursuant to Section 2.4.5.3 of the PFM,[2] support for a waiver is hereby requested of the requirement that blocks shall not exceed 1,200 feet in length nor shall they be less than 300 feet in length.

    Because the proposed development is designed to be an urban community, private alleys are proposed to improve circulation within the development. As such, some alleys are approximately 100 feet. Therefore, the Applicant requests support for a waiver to allow for blocks that will be less than 300 feet in length.

The Applicant's proposal presents an opportunity to redevelop currently underutilized parcels and activate them with a mix of complementary uses that is consistent with the recommendations of the City's Comprehensive Plan and Future Land Use Map. The Applicant has designed a high-quality community that will advance the City's vision to make Northfax a regional mixed-use destination that will strengthen economic vitality, provide diverse residential and retail opportunities for sustained demand, and reinforce the City's regional appeal. The Applicant is committed to working with the City and the surrounding community to ensure that the proposed development fits into the fabric of the City of Fairfax.

[2] Section 2.4.2.B of the Subdivision Ordinance also provides a block length requirement, stating that "[b]lock length shall not be less than 250 feet or more than 800 feet." This requirement provides a lesser standard than the similar PFM requirement. As such, Section 1.1 of the PFM states that "[w]henver any provision of this [PFM] imposes a greater requirement or a higher standard than is required in any State or Federal statue or City Ordinance or regulation, the provision of this PFM shall govern." Thus, the Applicant only seeks a modification of the block length requirement of the PFM requirement.

109719

GENERAL NOTES

1. THE PROPERTIES SHOWN HEREON ARE IDENTIFIED ON THE CITY OF FAIRFAX, VIRGINIA GEOGRAPHIC INFORMATION SYSTEM AS 57-02-02-017, 57-02-02-018, 57-02-02-019, 57-02-02-020, 57-02-08-011, 57-02-08-012, 57-02-08-013, 57-02-08-014, 57-02-08-010, 57-02-02-005, 57-02-08-005, 57-02-08-006, 57-02-02-007, 57-02-02-008, 57-02-02-003, 57-02-07-015B, 57-02-01-015B AND 57-02-47-000-A AND ARE ALL CURRENTLY ZONED COMMERCIAL RETAIL (CR) AND RESIDENTIAL MEDIUM (RM).

2. THE PROPERTIES SHOWN HEREON ARE NOW IN THE NAME OF ARG II, LLC AND ORCHARD RE INVESTMENTS, LLC, DEED BOOK 13408, PAGE 1070 AS CORRECTED IN DEED BOOK 15230, PAGE 1182 (PARCELS A, B, C & D), DEED BOOK 15339, PAGE 102 (PARCEL E & F), DEED BOOK 16739, PAGE 1026 (PARCEL G), DEED BOOK 18823, PAGE 1535 (PARCEL H), DEED BOOK 19218, PAGE 1148 (PARCEL I), DEED BOOK 17602, PAGE 631 (PARCEL J), DEED BOOK 19837, PAGE 1920 (PARCEL K), DEED BOOK 17434, PAGE 444 (PARCEL L), DEED BOOK 18388, PAGE 265 (PARCEL M), DEED BOOK 20080, PAGE 1218 (PARCEL N), DEED BOOK 23812, PAGE 493 (PARCEL O), DEED BOOK 23812, PAGE 479 (PARCEL P) AND NORTHFAX JV LLC DEED BOOK 25751, PAGE 1696 (PARCEL Q), ALL AMONG THE LAND RECORDS OF FAIRFAX COUNTY, VIRGINIA.

3. THE PHYSICAL IMPROVEMENTS AND TOPOGRAPHY SHOWN HEREON ARE BASED UPON AN ARIEAL TOPOGRAPHIC SURVEY PERFORMED BY McKENZIE SNYDER, INC, FLOWN APRIL 6th, 2015 AND COMPILED NOVEMBER 14th, 2017. THIS DATA HAS BEEN SUPPLEMENTED BY CONVENTIONAL METHODS BY THIS FIRM BETWEEN THE DATES OF NOVEMBER 16th AND DECEMBER 5th, 2017 AND JANUARY 2nd AND JANUARY 3rd, 2018 AND FURTHER SUPPLEMENTED BETWEEN THE DATES OF APRIL 9th AND APRIL 17th, 2019 AND BETWEEN THE DATES OF OCTOBER 30th AND OCTOBER 31st, 2019.

4. HORIZONTAL DATUM SHOWN HEREON IS REFERENCED TO THE VIRGINIA COORDINATE SYSTEM (VCS) 1983 - NORTH AS ESTABLISHED FROM A GPS SURVEY.

5. NO GEOTECHNICAL, SUBSURFACE, FIELD REVIEWS, RESEARCH, AGENCY OR GOVERNMENTAL RECORD REVIEWS, OR OTHER INVESTIGATIONS HAVE BEEN MADE FOR THE PURPOSE OF LOCATING, OR DETERMINING THE EXISTENCE OF WETLANDS, HAZARDOUS MATERIALS, OR OTHER ENVIRONMENTAL CONCERNS ON SITE IN THE PERFORMANCE OF CHRISTOPHER CONSULTANTS, LTD SERVICES FOR THE PROJECT AS SHOWN HEREON.

6. THE PORTION OF ORCHARD STREET TO BE VACATED WAS ORIGINALLY DEDICATED AT DEED BOOK 407 AT PAGE 115.

FLOOD ZONE NOTE

THE AREA SHOWN HEREON IS LOCATED ON THE FLOOD INSURANCE RATE MAPS (FIRM), COMMUNITY PANEL NO. 5155240002 D, WITH AN EFFECTIVE DATE OF JUNE 2nd, 2006.

BY GRAPHICAL DEPICTION ONLY, THE PROPERTY SHOWN HEREON IS SHOWN IN:

- FLOOD ZONE "AE" (SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT OT INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - SHADED), BASE FLOOD ELEVATIONS DETERMINED.
- FLOOD ZONE "X" (OTHER FLOOD AREAS - SHADED), AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD.
- FLOOD ZONE "X" (OTHER AREAS), AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

A FIELD SURVEY WAS NOT PERFORMED TO DETERMINE THE FLOOD ZONES LISTED HEREON. AN ELEVATION CERTIFICATE MAY BE NEEDED TO VERIFY THIS DETERMINATION OR APPLY FOR A VARIANCE FROM THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

REZONING AREA

EXISTING ZONE: RESIDENTIAL MEDIUM	386,183 SQ. FT. OR 8.86554 ACRES
EXISTING ZONE: COMMERCIAL RETAIL	99,629 SQ. FT. OR 2.28717 ACRES
PORTION OF ORCHARD STREET TO BE VACATED	13,433 SQ. FT. OR 0.30838 ACRES
TOTAL AREA TO BE REZONED TO PD-M	499,245 SQ. FT. OR 11.46109 ACRES

OWNERSHIP TABLE

A — MAP #57-2-02-017, #3590 CHAIN BRIDGE ROAD — ARG II, LLC — D.B. 13408 PG. 1070, D.B. 15230 PG. 1182 — ZONED: COMMERCIAL RETAIL

B — MAP #57-2-02-018, #3580 CHAIN BRIDGE ROAD — ARG II, LLC — D.B. 13408 PG. 1070, D.B. 15230 PG. 1182 — ZONED: COMMERCIAL RETAIL

C — MAP #57-2-02-019, #10505 ORCHARD STREET — ARG II, LLC — D.B. 13408 PG. 1070, D.B. 15230 PG. 1182 — ZONED: COMMERCIAL RETAIL

D — MAP #57-2-08-011, #10507 ORCHARD STREET — ARG II, LLC — D.B. 13408 PG. 1070, D.B. 15230 PG. 1182 — ZONED: RESIDENTIAL MEDIUM

E — MAP #57-2-08-012, #10509 ORCHARD STREET — ARG II, LLC — D.B. 15339 PG. 102 — ZONED: RESIDENTIAL MEDIUM

F — MAP #57-2-08-013, #10511 ORCHARD STREET — ARG II, LLC — D.B. 15339 PG. 102 — ZONED: RESIDENTIAL MEDIUM

G — MAP #57-2-08-014, #10513 ORCHARD STREET — ARG II, LLC — D.B. 16739 PG. 1026 — ZONED: RESIDENTIAL MEDIUM

H — MAP #57-2-08-010, #10515 ORCHARD STREET — ORCHARD RE INVESTMENTS — D.B. 18823 PG. 1535 — ZONED: RESIDENTIAL MEDIUM

I — MAP #57-2-02-005, #10517 ORCHARD STREET — ORCHARD RE INVESTMENTS — D.B. 19218 PG. 1148 — ZONED: RESIDENTIAL MEDIUM

J — MAP #57-2-08-005, #10508 ORCHARD STREET — ORCHARD RE INVESTMENTS — D.B. 17602 PG. 631 — ZONED: RESIDENTIAL MEDIUM

K — MAP #57-2-08-006, #10510 ORCHARD STREET — ORCHARD RE INVESTMENTS — D.B. 19837 PG. 1921 — ZONED: RESIDENTIAL MEDIUM

L — MAP #57-2-08-007, #10512 ORCHARD STREET — ORCHARD RE INVESTMENTS — D.B. 17434 PG. 444 — ZONED: RESIDENTIAL MEDIUM

M — MAP #57-2-08-008, #10514 ORCHARD STREET — ORCHARD RE INVESTMENTS — D.B. 18388 PG. 265 — ZONED: RESIDENTIAL MEDIUM

N — MAP #57-2-02-003, #10516 ORCHARD STREET — ORCHARD RE INVESTMENTS — D.B. 20080 PG. 1218 — ZONED: RESIDENTIAL MEDIUM

O — MAP #57-2-07-015B, NO ADDRESS — ORCHARD RE INVESTMENTS — D.B. 23812 PG. 493 — ZONED: RESIDENTIAL MEDIUM

P — MAP #57-2-47-000A, NO ADDRESS — ORCHARD RE INVESTMENTS — D.B. 23812 PG. 479 — ZONED: RESIDENTIAL MEDIUM

Q — MAP #57-2-02-020, #3570 CHAIN BRIDGE ROAD — NORTHFAX JV, LLC — D.B. 25751 PG. 1696 — ZONED: COMMERCIAL RETAIL

R — PORTION OF ORCHARD STREET TO BE VACATED — CITY OF FAIRFAX — D.B. 407 AT PAGE 115

1 — MAP #57-2-18-001A — THE ASSEMBLY — D.B. 3161 PG. 508, D.B. 3319 PG. 738 — ZONED: RESIDENTIAL TOWNHOUSE

2 — MAP #57-2-08-004A — ELE NA, LLC — D.B. 24268 PG. 1935 — ZONED: COMMERCIAL OFFICE

3 — MAP #57-2-02-016 — CITY OF FAIRFAX — D.B. 18684 PG. 857 — ZONED: COMMERCIAL RETAIL

4 — MAP #57-2-02-015 — GLASCOCK & SONS, LP — D.B. 9172 PG. 571 — ZONED: COMMERCIAL RETAIL

5 — MAP #57-2-02-010 — SCHUILING T. ALPINE, INC. — D.B. 8871 PG. 1815 — ZONED: COMMERCIAL RETAIL

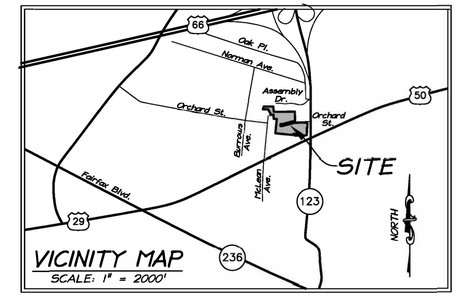
6 — MAP #57-2-02-006 — BRANCH AVENUE ASSOCIATES, LLC — D.B. 14796 PG. 1326 — ZONED: COMMERCIAL RETAIL

7 — MAP #57-2-07-015A — LOT 15R — FAIRFAX ACRES — D.B. 23803 PG. 185 — ZONED: RESIDENTIAL MEDIUM

8 — MAP #57-2-47-001 — SANJAY BAJAJ — D.B. 23803 PG. 185 — ZONED: RESIDENTIAL MEDIUM

9 — MAP #57-1-05-22 — PETER & KATHLEEN TYSON — D.B. 25960 PG. 1210 — ZONED: RESIDENTIAL LOW

10 — MAP #57-2-02-001A — RONALD & BARBARA FOWLER — D.B. 5923 PG. 1416 — ZONED: RESIDENTIAL MEDIUM



Attachment 7

RECEIVED
04 / 13 / 2020
Community Dev & Planning

COMMONWEALTH OF VIRGINIA
LONNY D. STURGEON
Lic. No. 1594
04/08/20
LAND SURVEYOR

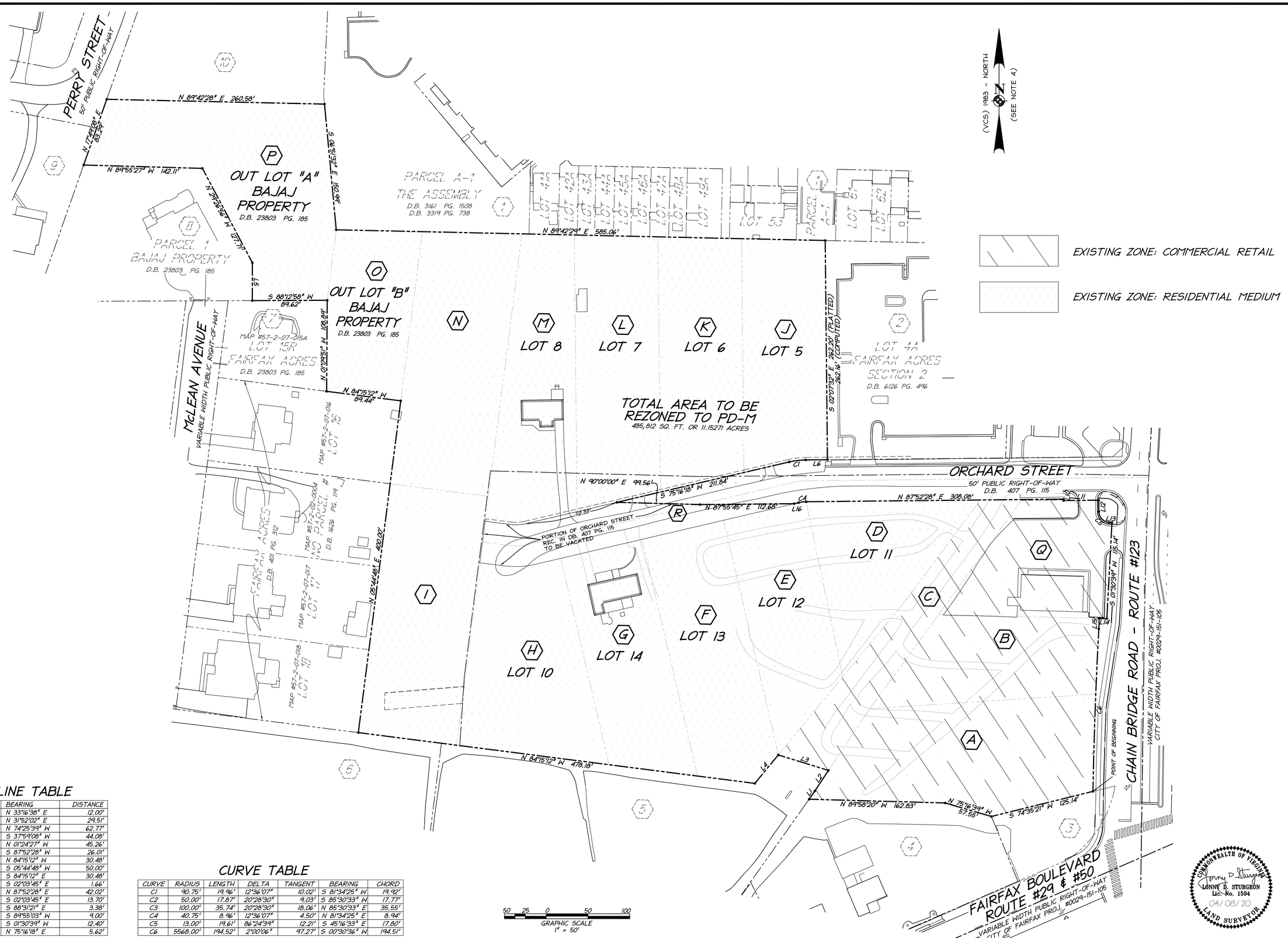
Rev#	DATE	REVISION
1	04/08/20	ORCHARD ST VAC.

christopher consultants
9301 innovation drive (suite 150) · manassas, va 20110
phone 703.393.9887 · fax 703.273.6820

CERTIFIED PLAT
ON THE PROPERTIES KNOWN AS
"NORTHFAX ASSEMBLAGE"
CITY OF FAIRFAX, VIRGINIA

PROJECT: 13139.005.00
SCALE: N/A
DATE: 01/02/2020
DRAWN: PGS
CHECKED: WEB
SHEET No.
1 OF 2

109719



LINE TABLE

LINE	BEARING	DISTANCE
L1	N 33°16'38" E	12.00'
L2	N 31°52'02" E	29.51'
L3	N 74°25'39" W	62.77'
L4	S 37°59'08" W	44.08'
L5	N 01°24'27" W	45.26'
L6	S 87°52'28" W	26.01'
L7	N 84°15'12" W	30.48'
L8	S 05°44'48" W	50.00'
L9	S 84°15'12" E	30.48'
L10	S 02°03'45" E	1.66'
L11	N 87°52'28" E	42.02'
L12	S 02°03'45" E	13.70'
L13	S 88°31'21" E	3.38'
L14	S 89°55'03" W	9.00'
L15	S 01°30'39" W	12.40'
L16	N 75°16'18" E	5.62'

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	BEARING	CHORD
C1	90.75'	19.96'	12°36'07"	10.02'	S 81°34'25" W	19.92'
C2	50.00'	17.87'	20°28'30"	9.03'	S 85°30'33" W	17.77'
C3	100.00'	35.74'	20°28'30"	18.06'	N 85°30'33" E	35.55'
C4	40.75'	8.96'	12°36'07"	4.50'	N 81°34'25" E	8.94'
C5	13.00'	19.61'	86°24'39"	12.21'	S 45°16'33" E	17.80'
C6	5568.00'	194.52'	2°00'06"	97.27'	S 00°30'36" W	194.51'

christopher consultants
9301 innovation drive (suite 150) · manassas, va 20110
phone 703.393.9887 · fax 703.273.6820

CERTIFIED PLAT
ON THE PROPERTIES KNOWN AS

"NORTHFAX ASSEMBLAGE"

CITY OF FAIRFAX, VIRGINIA

PROJECT: 13139.005.00

SCALE: 1" = 50'

DATE: 01/02/2020

DRAWN: PGS
CHECKED: WEB

SHEET No.

2 OF 2

109719

MASTER DEVELOPMENT PLAN
NORTHFAX WEST
CITY OF FAIRFAX, VIRGINIA

Attachment 8

RECEIVED
04 / 13 / 2020
Community Dev & Planning

GENERAL NOTES:

1. THE SUBJECT PROPERTY SHOWN HEREON IS RECORDED IN THE LAND RECORDS OF FAIRFAX CITY, VIRGINIA AS FOLLOWS:

PARCEL ID	OWNER	ADDRESS	EXISTING ZONING
57-02-02-017	ARG II, LLC	3590 CHAIN BRIDGE ROAD	CR (COMMERCIAL RETAIL)
57-02-02-018	ARG II, LLC	3580 CHAIN BRIDGE ROAD	CR (COMMERCIAL RETAIL)
57-02-02-019	ARG II, LLC	10505 ORCHARD STREET	CR (COMMERCIAL RETAIL)
57-02-02-020	NORTHFAX JV LLC	3570 CHAIN BRIDGE ROAD	CR (COMMERCIAL RETAIL)
57-02-08-011	ARG II, LLC	10507 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-08-012	ARG II, LLC	10509 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-08-013	ARG II, LLC	10511 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-08-014	ARG II, LLC	10513 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-08-010	ORCHARD RE INVESTMENTS	10515 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-02-005	ORCHARD RE INVESTMENTS	10517 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-08-005	ORCHARD RE INVESTMENTS	10508 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-08-006	ORCHARD RE INVESTMENTS	10510 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-08-007	ORCHARD RE INVESTMENTS	10512 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-08-008	ORCHARD RE INVESTMENTS	10514 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-02-003	ORCHARD RE INVESTMENTS	10516 ORCHARD STREET	RM (RESIDENTIAL MEDIUM)
57-02-07-015B	ORCHARD RE INVESTMENTS	NONE	RM (RESIDENTIAL MEDIUM)
57-02-47-000-A	ORCHARD RE INVESTMENTS	NONE	RM (RESIDENTIAL MEDIUM)
ORCHARD STREET R.O.W.	CITY OF FAIRFAX	NONE	RIGHT-OF-WAY
		PARCEL AREA SUB-TOTAL (ACRES):	11.15
		AREA OF ORCHARD STREET RIGHT-OF-WAY BEING VACATED (ACRES):	0.31
NOTE: SEE CERTIFIED PLAT FOR MORE INFORMATION.		TOTAL AREA (ACRES):	11.46

2. THIS MDP SUBMISSION IS AN APPLICATION TO REZONE THE SUBJECT PROPERTIES FROM CR (COMMERCIAL RETAIL) AND RM (RESIDENTIAL MEDIUM) TO PD-M (PLANNED DEVELOPMENT MIXED USE) DISTRICT. THE CURRENT SITE CONSISTS OF 17 PARCELS AND RIGHT-OF-WAY THAT WILL BE VACATED. THE APPLICATION PROPERTY WILL BE CONSOLIDATED AND THEN SUBDIVIDED INTO THREE PARCELS AND RIGHT-OF-WAY FOR DEVELOPMENT. THE THREE PARCELS WILL CONSISTS OF A PARCEL FOR TOWNHOUSES, A PARCEL FOR A SENIOR LIVING BUILDING AND A FUTURE DEVELOPMENT PARCEL WITH USES THAT HAVE YET TO BE DETERMINED. RIGHT-OF-WAY WILL BE DEDICATED FOR ORCHARD STREET AND FARR AVENUE EXTENDED.

3. THE BOUNDARY AND PHYSICAL IMPROVEMENTS SHOWN HEREON ARE BASED UPON AN AERIAL TOPOGRAPHIC SURVEY PERFORMED BY McKENZIE SNYDER, INC, FLOWN APRIL 6, 2015 AND COMPILED NOVEMBER 14, 2017. THIS DATA HAS BEEN SUPPLEMENTED BY CONVENTIONAL METHODS BY THIS FIRM BETWEEN THE DATES OF NOVEMBER 16 AND DECEMBER 5, 2017 AND JANUARY 2 AND JANUARY 3, 2018 AND FURTHER SUPPLEMENTED BETWEEN THE DATES OF APRIL 9 AND APRIL 17, 2019. CONTOUR INTERVAL FOR TOPOGRAPHIC SURVEY IS 2 FEET.

4. THE FOLLOWING DATUM WERE USED:
   A. HORIZONTAL DATUM SHOWN HEREON IS REFERENCED TO THE VIRGINIA COORDINATE SYSTEM (VCS) 1983 - NORTH AS ESTABLISHED FROM A GPS SURVEY.
   B. THE VERTICAL DATUM SHOWN HEREON IS REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29) AS ESTABLISHED FROM A CURRENT GPS SURVEY.

5. THE AREA SHOWN HEREON IS LOCATED ON THE FLOOD INSURANCE RATE MAPS (FIRM), COMMUNITY PANEL NO. 5155240002 D, WITH AN EFFECTIVE DATE OF JUNE 2, 2006.

   BY GRAPHICAL DEPICTION ONLY, THE PROPERTY IS SHOWN IN:

   - FLOOD ZONE "AE" (SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD), BASE FLOOD ELEVATIONS DETERMINED.

   A FIELD SURVEY HAS BEEN PERFORMED TO DETERMINE THE FLOOD ZONES LISTED HEREON. A CLOMR (PLAN # 18-03-2239R) HAS BEEN SUBMITTED AND APPROVED BY THE CITY OF FAIRFAX AND FEMA TO ADJUST THE FLOODPLAIN BOUNDARIES AROUND THE PROPERTY BASED ON THE PROPOSED SITE IMPROVEMENTS. REFER TO SHEET 18 FOR THE PRE-DEVELOPED FLOODPLAIN BOUNDARY AND SHEET 18A FOR THE POST-DEVELOPED FLOODPLAIN BOUNDARY.

6. A TITLE REPORT WAS PROVIDED BY FIRST AMERICAN TITLE INSURANCE COMPANY, COMMITMENT NO. A1401113-TD WITH AN EFFECTIVE DATE OF NOVEMBER 18, 2014 AND REVISED JANUARY 6, 2015. ALL EASEMENTS, SERVITUDES AND OTHER MATTERS OF TITLE REFERENCED THEREIN ARE SHOWN ON THIS PLAN.

7. THE SUBJECT PROPERTY IS CURRENTLY SERVED BY PUBLIC WATER AND PUBLIC SEWER PROVIDED BY CITY OF FAIRFAX AND FAIRFAX WATER.

8. DURING THE PROCESS OF THE PHYSICAL SURVEY CONDUCTED BY CHRISTOPHER CONSULTATNS, LTD. NO INDICATIONS OF A CEMETERY WERE FOUND. NO FURTHER INSPECTION OF THESE PROPERTIES HAVE BEEN MADE FOR POSSIBLE CEMETERIES. THE SUBJECT PROPERTY IS NOT LISTED UNDER THE NATIONAL REGISTER OF HISTORIC PLACES.

9. NO GEOTECHNICAL FIELD REVIEWS, RESEARCH, GOVERNMENTAL RECORD REVIEWS, OR OTHER INVESTIGATIONS HAVE BEEN MADE FOR THE PURPOSE OF LOCATING, OR DETERMINING THE EXISTENCE OF HAZARDOUS MATERIALS, OR OTHER ENVIRONMENTAL CONCERNS ON THIS SITE. A PRELIMINARY JURISDICTIONAL DETERMINATION HAS BEEN APPROVED BY THE ARMY CORPS OF ENGINEERS TO DELINEATE THE RPA.

10. THIS DEVELOPMENT PROPOSAL IS COMPATIBLE WITH THE EXISTING DEVELOPMENT IN THE VICINITY OF THIS SITE. NO ADVERSE EFFECTS TO NEIGHBORING PROPERTIES ARE ANTICIPATED WITH THIS PROJECT.

11. NOTWITHSTANDING THE IMPROVEMENTS AND TABULATIONS SHOWN ON THIS PLAN, THE APPLICANT RESERVES THE RIGHT TO MAKE MINOR MODIFICATIONS TO THE FINAL DESIGN, TO COMPLY WITH FINAL ENGINEERING AND NEW CRITERIA AND REGULATIONS WHICH MAY BE ADOPTED BY THE CITY OF FAIRFAX SUBSEQUENT TO THE SUBMISSION OF THIS APPLICATION, PROVIDED THAT SUCH MODIFICATIONS ARE SUBSTANTIALLY CONSISTENT WITH THE APPROVED DELVEPMENT PLAN AND COMMITMENTS AND SUBJECT TO THE DETERMINATIONS OF THE DIRECTOR OF DEVELOPMENT AND PLANNING.

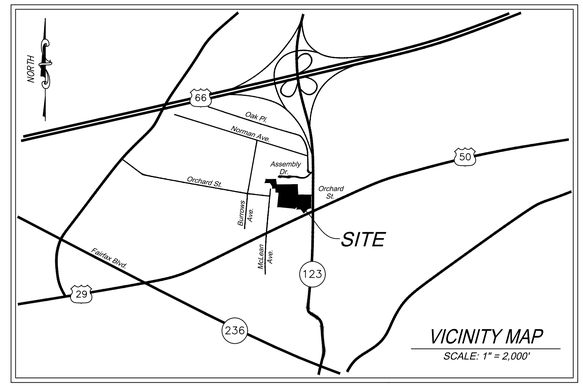
12. THE PROPOSED BUILDING FOOTPRINTS AND SITE IMPROVEMENTS SHOWN HEREIN ARE PRELIMINARY. THE PROPOSED SQUARE FOOTAGE FOR THE PROPOSED BUILDINGS IS APPROXIMATE ONLY AND MAY BE SUBJECT TO MINOR REVISIONS AT THE TIME OF SITE PLAN, SUBJECT TO MARKET CONDITIONS, BUT SUBSTANTIALLY CONSISTENT WITH THE APPROVED DEVELOPMENT PLAN.

13. ALL EXISTING UTILITY EASEMENTS ARE SHOWN ON THE EXISTING CONDITIONS PLAN.

14. SITE LIGHTING WITHIN THE PROJECT SITE AREA (I.E. ALONG SIDEWALKS AND PATHWAYS) WILL BE DETERMINED DURING FINAL SITE PLAN REVIEW AND SHALL BE IN GENERAL CONFORMANCE WITH SECTION 4.8 OF THE ZONING ORDINANCE AND SECTION 2.10 OF THE PUBLIC FACILITIES MANUAL.

15. ONSITE STORMWATER MANAGEMENT AND BEST MANAGEMENT PRACTICES SHALL BE PROVIDED AS REQUIRED BY CITY REGULATIONS AT THE TIME OF FINAL SITE PLAN. DETENTION TO PROVIDE THE REQUIRED STORMWATER QUANTITY CONTROLS AND ONSITE BEST MANAGEMENT PRACTICES (BMPs) TO MEET THE STORMWATER QUALITY REQUIREMENTS ARE SHOWN ON SHEETS 4A AND 4B.

16. ALL SIGNAGE WILL BE IN CONFORMANCE WITH SECTION 4.6 OF THE ZONING ORDINANCE.



GENERAL NOTES CONTNUED:

17. TO THE BEST KNOWLEDGE OF THE ENGINEER AND APPLICANT, THIS DEVELOPMENT PLAN CONFORMS TO ALL APPLICABLE ORDINANCES, REGULATIONS AND ADOPTED STANDARDS, WITH THE FOLLOWING MODIFICATIONS, WAIVERS, AND SPECIAL USE PERMIT:

   A. PURSUANT TO SECTION 4.15.7.C.2.b.1. OF THE ZONING ORDINANCE, A SPECIAL USE PERMIT IS REQUESTED TO ALLOW FOR DISTURBANCE WITHIN THE 100-YEAR FLOODPLAIN. SEE SHEETS 5, 5A, 18 AND 18A FOR MORE INFORMATION.
   B. PURSUANT TO SECTION 3.8.2.L OF THE ZONING ORDINANCE, A MODIFICATION TO THE DEVELOPMENT SCHEDULE REQUIREMENT IS REQUESTED. SEE THE STATEMENT OF JUSTIFICATION FOR ADDITIONAL INFORMATION.
   C. PURSUANT TO SECTION 3.8.7.G. OF THE ZONING ORDINANCE, A MODIFICATION TO THE REQUIREMENT THAT TWENTY (20) PERCENT OF THE DEVELOPMENT SITE BE MAINTAINED AS RECREATION AND OPEN SPACE IS REQUESTED, AS SET FORTH IN SECTION 3.8.2.G. SEE THE STATEMENT OF JUSTIFICATION, AND SHEET 7 OF THIS PLAN, FOR ADDITIONAL INFORMATION AND A DEPICTION OF PROVIDED OPEN SPACE.
   D. PURSUANT TO SECTION 3.8.2.D. OF THE ZONING ORDINANCE, A MODIFICATION IS REQUESTED TO THE REQUIREMENT THAT NO MORE THAN TWO (2) OF ANY TEN (10) OR ONE (1) OF ANY THREE (3) TO FIVE (5) ABUTTING DWELLING UNITS HAVE THE SAME FRONT YARD SETBACK AS SET FORTH IN SECTION 3.5.1.C.2. OF THE ZONING ORDINANCE. SEE THE STATEMENT OF JUSTIFICATION AND SHEET 4A OF THIS PLAN FOR ADDITIONAL INFORMATION.
   E. PURSUANT TO SECTION 3.8.2.E.3. OF THE ZONING ORDINANCE, A REDUCTION IS REQUESTED TO THE NUMBER OF PARKING SPACES REQUIRED TO BE PROVIDED FOR THE SENIOR LIVING FACILITY, AS SET FORTH IN SECTION 4.2.3.E. SEE THE STATEMENT OF JUSTIFICATION AND SHEET 4B OF THIS PLAN FOR ADDITIONAL INFORMATION.
   F. PURSUANT TO SECTION 3.8.2.E.3. OF THE ZONING ORDINANCE, A MODIFICATION IS HEREBY REQUESTED OF THE REQUIREMENT TO PROVIDE TWO (2) LOADING SPACES FOR THE INDEPENDENT LIVING PORTION OF THE PROPOSED SENIOR LIVING FACILITY, AS SET FORTH IN SECTION 4.2.9.B.
   G. PURSUANT TO SECTION 3.8.2.E.3. OF THE ZONING ORDINANCE, A MODIFICATION TO THE REQUIREMENT THAT VEHICULAR ACCESS BE PROVIDED BETWEEN ABUTTING NONRESIDENTIAL LOTS FRONTING ON ARTERIAL AND COLLECTOR STREETS PRIOR TO THE ERECTION OF A PRINCIPAL BUILDING, AS SET FORTH IN SECTION 4.3.3.B., IS REQUESTED. SEE THE STATEMENT OF JUSTIFICATION AND SHEET 4 OF THIS PLAN FOR ADDITIONAL INFORMATION.
   H. PURSUANT TO SECTION 3.8.2.E.3. OF THE ZONING ORDINANCE, A MODIFICATION IS REQUESTED TO THE REQUIREMENT THAT SIDEWALKS BE PROVIDED ON BOTH SIDES OF A COLLECTOR OR LOCAL STREET, AS SET FORTH IN SECTION 4.4.4.A.1. SEE THE STATEMENT OF JUSTIFICATION AND SHEET 4 OF THIS PLAN FOR ADDITIONAL INFORMATION.
   I. PURSUANT TO SECTION 3.8.2.E.3. OF THE ZONING ORDINANCE, A MODIFICATION TO THE REQUIREMENTS OF SECTION 4.5.5.C.2(b)(2) AND 4.5.5.D. ARE REQUESTED. MORE SPECIFICALLY, THE APPLICANT SEEKS MODIFICATIONS TO THE MINIMUM TREE PLANTING AS WELL AS MINIMUM FENCE OR WALL HEIGHT REQUIREMENTS OF THE TY3 TRANSITIONAL YARD SPECIFICATIONS. SEE THE STATEMENT OF JUSTIFICATION AND SHEET 6 AND 6A OF THIS PLAN FOR ADDITIONAL INFORMATION.
   J. PURSUANT TO SECTION 3.8.2.E.3 OF THE ZONING ORDINANCE, A MODIFICATION IS HEREBY REQUESTED OF THE REQUIREMENT TO PROVIDE STREET TREES ALONG ALL STREETS AT A RATE OF ONE CANOPY TREE FOR EVERY 40 LINEAR FEET AND SPACED A MAXIMUM OF 50 FEET APART AND THE REQUIREMENT TO PLANT TREES NO LESS THAN THREE FEET FROM THE BACK OF THE CURB OR EDGE OF PAVEMENT, AS SET FORTH IN SECTION 4.5.6.B. SEE THE STATEMENT OF JUSTIFICATION AND SHEET 6 AND 6A OF THIS PLAN FOR ADDITIONAL INFORMATION.
   K. PURSUANT TO SECTION 3.8.2.E.3 .OF THE ZONING ORDINANCE, A MODIFICATION IS REQUESTED TO THE REQUIREMENTS OF INTERIOR AND TERMINAL LANDSCAPED ISLANDS, AS SET FORTH IN SECTION 4.5.7.D. SEE THE STATEMENT OF JUSTIFICATION AND SHEET 6 AND 6A OF THIS PLAN FOR ADDITIONAL INFORMATION.
   L. PURSUANT TO SECTION 2.10.1. OF THE SUBDIVISION ORDINANCE, A MODIFICATION TO THE REQUIRED STREET IMPROVEMENTS TO PERRY STREET / HOWERTON AVENUE IS REQUESTED. SEE THE STATEMENT OF JUSTIFICATION FOR ADDITIONAL INFORMATION.
   M. PURSUANT TO SECTION 401-01 OF THE PUBLIC FACILITIES MANUAL, SUPPORT FOR A WAIVER IS REQUESTED OF THE REQUIREMENT THAT A TYPICAL CURB AND GUTTER STREET BE PROVIDED ON PRIVATE ACCESSWAYS THAT ARE LESS THAN THIRTY (30) FEET FROM FACE OF CURB TO FACE OF CURB (OR EDGE OF PAVEMENT). SEE THE STATEMENT OF JUSTIFICATION AND SHEET 4C OF THIS PLAN FOR ADDITIONAL INFORMATION.
   N. PURSUANT TO SECTION 2.4.5.3. OF THE PUBLIC FACILITIES MANUAL, SUPPORT FOR A WAVIER IS REQUESTED OF THE REQUIREMENT THAT BLOCKS SHALL NOT EXCEED 1,200 FEET IN LENGTH NOR BE LESS THAN 300 FEET IN LENGTH. SEE THE STATEMENT OF JUSTIFICATION FOR ADDITIONAL INFORMATION.

SHEET INDEX

1	COVER SHEET
2	EXISTING CONDITIONS PLAN
2A	EXISTING CONDITIONS PLAN
3	TREE MANAGEMENT PLAN
3A	TREE MANAGEMENT PLAN
3B	TREE MANAGEMENT SCHEDULE
3C	TREE MANAGEMENT SCHEDULE
3D	TREE MANAGEMENT NOTES & DETAILS
4	OVERALL MASTER DEVELOPMENT PLAN
4A	MASTER DEVELOPMENT PLAN
4B	MASTER DEVELOPMENT PLAN
4C	STREET SECTIONS
4D	SECTION A-A'
4E	SECTION B-B'
4F	SECTION C-C'
4G	TOWNHOUSE SITE DETAILS
5	PRELIMINARY GRADING PLAN
5A	PRELIMINARY GRADING PLAN
6	CONCEPTUAL LANDSCAPE PLAN
6A	CONCEPTUAL LANDSCAPE PLAN
6B	LANDSCAPE SPECS-DETAILS
7	OPEN SPACE & CIRCULATION PLAN
8	SANITARY SEWER OFF-SITE MAP
9	SANITARY SEWER ANALYSIS
10	SIGHT DISTANCE
11	SIGHT DISTANCE
12	SIGHT DISTANCE
13	SIGHT DISTANCE
14	SIGHT DISTANCE
15	SIGHT DISTANCE
16	TURNING MOVEMENTS
17	FIRE SERVICE PLAN
18	FLOODPLAIN AND RPA (PRE-DEVELOPED)
18A	FOODPLAIN AND RPA (POST-DEVELOPED)

SUBMISSIONS

SUBMISSION 1: JANUARY 3, 2020
SUBMISSION 2: APRIL 10, 2020

PROJECT TEAM:

OWNER / APPLICANT
NORTHFAX JV LLC c/o THE LANN COMPANIES
3900 JERMANTOWN ROAD, SUITE 300
FAIRFAX, VA 22030

CONTRACT PURCHASERS
MHI-NORTHFAX, LLC c/o MADISON HOMES, INC.
1950 OLD GALLOWS ROAD, SUITE 200
TYSONS CORNER, VA 22181

BRIGHTVIEW SENIOR LIVING DEVELOPMENT, LLC
218 N. CHARLES STREET, SUITE 220
BALTIMORE, MD 21201

ATTORNEY
WALSH COLUCCI LUBELEY & WALSH, P.C.
2200 CLARENDON BOULEVARD, SUITE 1300
ARLINGTON, VA 22201

ARCHITECTS
DEVEREAUX & ASSOCIATES, P.C.
(for MADISON HOMES)
1477 CHAIN BRIDGE ROAD
MCLEAN, VA 22101

SK&I ARCHITECTURAL DESIGN GROUP, LLC
(for BVSL)
4600 EAST WEST HIGHWAY, SUITE 700
BETHESDA, MD 20814

ENGINEER
christopher consultants
9900 MAIN STREET, SUITE 400
FAIRFAX, VA 22031

TRANSPORTATION ENGINEER
GOROVE / SLADE
1140 CONNECTICUT AVE. NW, SUITE 600
WASHINGTON, DC 20036

ENVIRONMENTAL AND GEOTECH CONSULTANTS
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MANASSAS, VA 20110

HILLIS-CARNES ENGINEERING ASSOCIATES, INC.
14155 SULLYFIELD CIRCLE, SUITE A
CHANTILLY, VA 20151

christopher consultants
9900 main st
suite 400
fairfax, va 22031
p 703.273.6820
engineering surveying land planning

COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
4/10/20
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

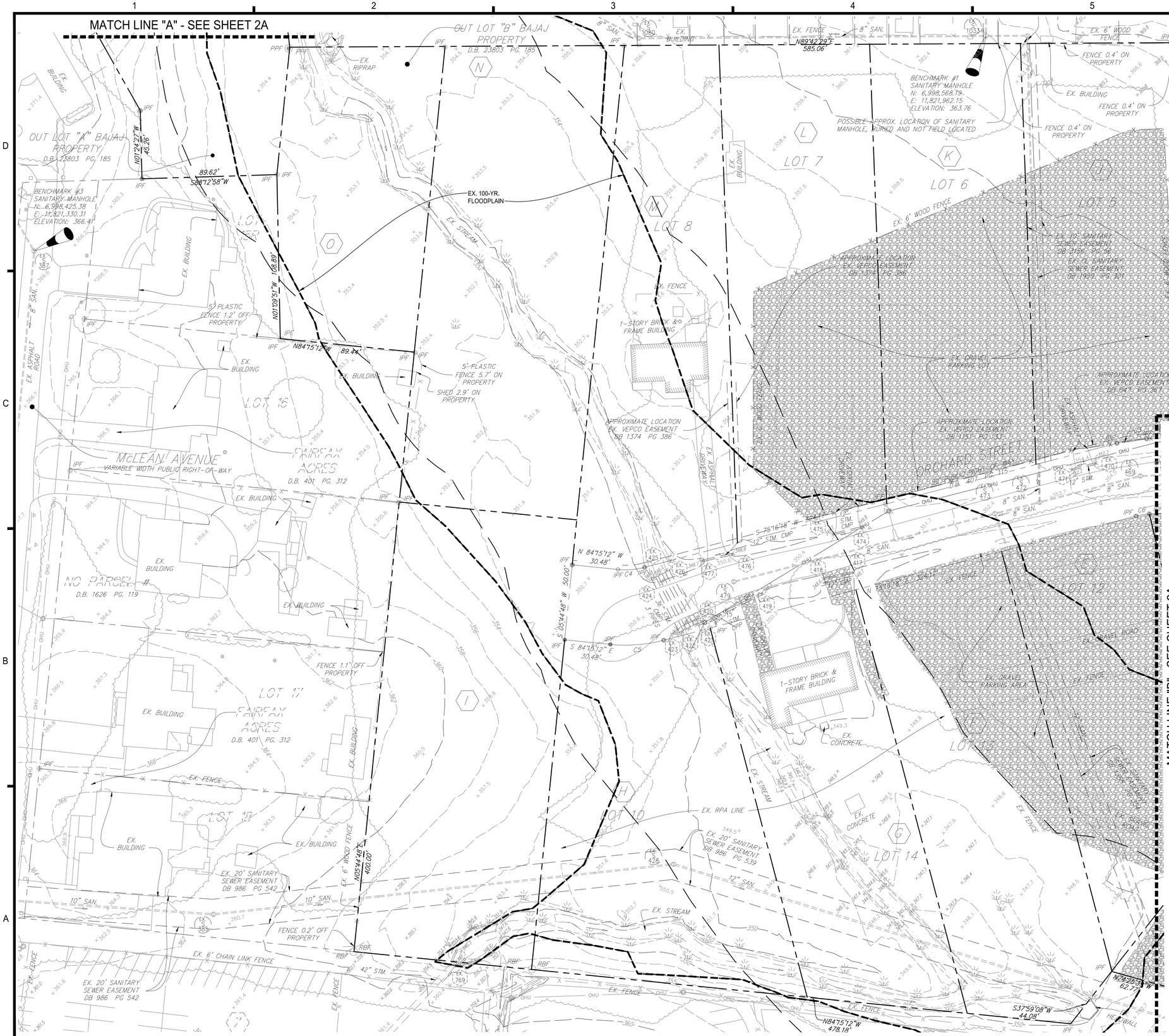
MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:
COVER SHEET

SHEET No.
1

SCALE: SEE DWGS.



LEGEND

Utilities - Storm
- STORM MANHOLE
- STORM CULVERT

Utilities - Sanitary
- SANITARY MANHOLE

Utilities - Water
- WATER VALVE
- WATER METER
- FIRE HYDRANT
- WATER MANHOLE

Utilities - Electric
- LIGHT POLE
- UTILITY POLE
- LAMP POST
- GUY WIRE

Utilities - Communication
- TELEPHONE PEDESTAL/POST

Misc. Structures
- 130.0 SPOT SHOT
- SIGN
- TREE
- BUSH
- FLAG POLE
- UNIDENTIFIED UTILITY

Abbreviations

EX.	EXISTING
CONC.	CONCRETE
C&G	CURB AND GUTTER
EP	EDGE OF PAVEMENT
IPF	IRON PIPE FOUND
IPS	IRON PIPE SET
RBF	REBAR FOUND
PPF	PINCH PIPE FOUND
CMF	CONCRETE MONUMENT FOUND
NS	NOT SET

Linetypes
- INDEX CONTOUR (5')
- INT. CONTOUR (1')
- FENCE
- OVERHEAD UTILITY WIRE
- VEGETATION LINE

NOTES:
1. SEE SHEET 2A FOR OWNERSHIP TABLE.
2. SEE SHEET 2A FOR STORM AND THIS SHEET FOR SANITARY AS-BUILT INFORMATION.

SANITARY STRUCTURE DATA

- EX 378: RIM EL. = 370.31; INV IN (8" DIP FROM SOUTH) = 361.58; INV OUT (8" DIP TO 379) = 361.54
- EX 379: RIM EL. = 365.73; INV IN (8" DIP FROM 378) = 357.00; INV OUT (8" DIP TO 381) = 356.96
- EX 369: RIM EL. = 367.08; INV OUT (8" PVC TO 381) = 356.53
- EX 381: RIM EL. = 363.64; INV IN (8" PVC FROM 369) = 355.24; INV IN (8" DIP FROM 379) = 354.92; INV OUT (8" DIP TO 384) = 354.83
- EX 371: RIM EL. = 364.95; INV IN (8" DIP FROM NW) = 357.15; INV OUT (8" DIP TO 384) = 357.13
- EX 1019: RIM EL. = 362.55; INV IN (8" PVC FROM WEST) = 357.68; INV IN (8" DIP FROM NORTHEAST) = 358.00; INV OUT (8" DIP TO 387) = 357.63
- EX 387: RIM EL. = 366.42; INV IN (8" DIP FROM 1019) = 356.10; INV OUT (8" DIP TO 386) = 356.07
- EX 386: RIM EL. = 367.74; INV IN (8" DIP FROM 387) = 355.17; INV OUT (8" DIP TO 384) = 355.11
- EX 384: RIM EL. = 363.37; INV IN (8" DIP FROM 381) = 354.04; INV IN (8" DIP FROM 371) = 354.06; INV IN (8" DIP FROM 386) = 353.92; INV OUT (10" DIP TO 385) = 353.88
- EX 385: RIM EL. = 360.45; INV IN (10" DIP FROM 384) = 352.05; INV OUT (10" DIP TO 428) = 351.91
- EX 428: RIM EL. = 354.14; INV IN (10" DIP FROM 385) = 344.80; INV OUT (12" DIP TO 615) = 344.66
- EX 541: RIM EL. = 369.90; INV OUT (8" DIP TO 1013) = 363.86
- EX 1013: RIM EL. = 360.71; INV IN (8" DIP FROM 541) = 355.01; INV OUT (8" DIP TO 1012) = 354.79
- EX 486: RIM EL. = 358.29; INV IN (8" DIP FROM 465) = 344.68; INV OUT (8" DIP TO 469) = 344.34
- EX 466: RIM EL. = 355.00; INV IN (8" DIP FROM 466) = 343.18; INV OUT (8" DIP TO 472) = 343.12
- EX 472: RIM EL. = 353.21; INV IN (8" DIP FROM NORTH) = 343.04; INV IN (8" DIP FROM 469) = 342.73; INV OUT (8" DIP TO 473) = 342.71
- EX 473: RIM EL. = 350.55; INV OUT (8" DIP TO 473) = 343.05
- EX 473: RIM EL. = 352.65; INV IN (8" DIP FROM 472) = 342.43; INV IN (8" DIP FROM 479) = 342.31; INV OUT (8" DIP TO 615) = 342.20
- EX 615: RIM EL. = 350.94; INV IN (8" DIP FROM 473) = 337.11; INV IN (12" DIP FROM 428) = 337.15; INV OUT (12" DIP TO 1008) = 336.89
- EX 1080: RIM EL. = 356.99; INV IN (8" DIP FROM NORTHWEST) = 350.34; INV OUT (8" DIP TO 1033) = 350.29
- EX 1033: RIM EL. = 363.76; INV IN (8" DIP FROM NORTH) = 348.95; INV IN (8" DIP FROM 1080) = 348.99; INV OUT (8" DIP TO EAST) = 348.92

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

christopher consultants
9900 main st
suite 400
fairfax, va 22031
p 703.273.6820
engineering surveying land planning

COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
4/10/20
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN

CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

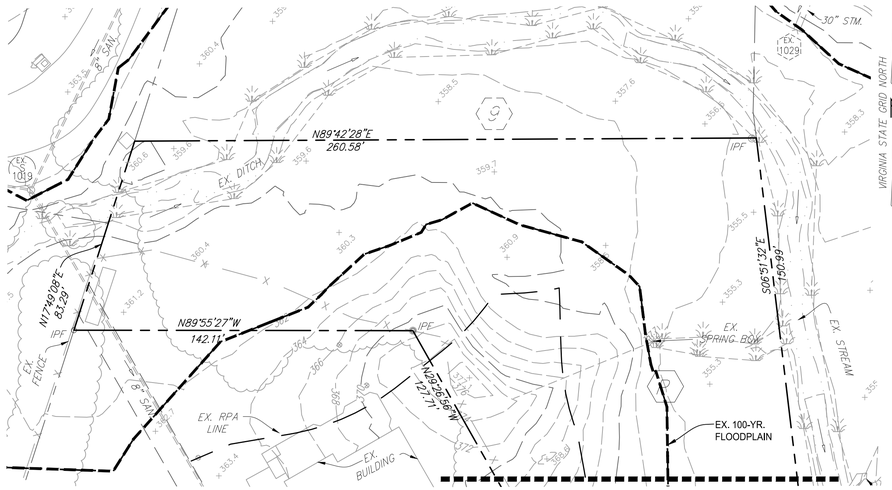
SHEET TITLE:

EXISTING CONDITIONS PLAN

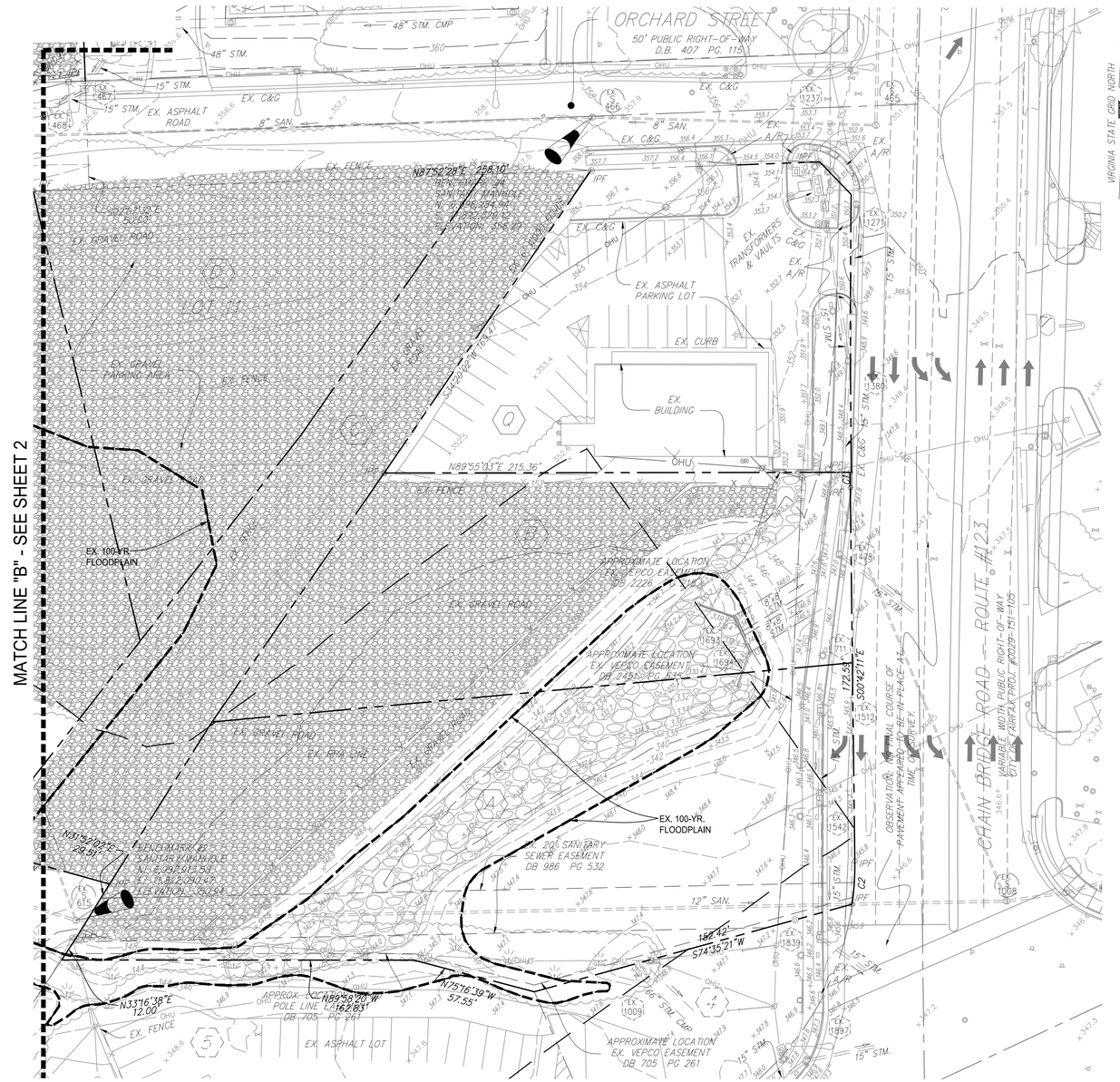
SHEET No.

2

SCALE: 1"=30'



MATCH LINE "A" - SEE SHEET 2



MATCH LINE "B" - SEE SHEET 2

OWNERSHIP TABLE

A	MAP #57-2-02-017 #3590 CHAIN BRIDGE ROAD ARG II, LLC D.B. 13408 PG. 1070 D.B. 15230 PG. 1182 ZONED: COMMERCIAL RETAIL	
B	MAP #57-2-02-018 #3580 CHAIN BRIDGE ROAD ARG II, LLC D.B. 13408 PG. 1070 D.B. 15230 PG. 1182 ZONED: COMMERCIAL RETAIL	
C	MAP #57-2-02-019 #10505 ORCHARD STREET ARG II, LLC D.B. 13408 PG. 1070 D.B. 15230 PG. 1182 ZONED: COMMERCIAL RETAIL	
D	MAP #57-2-08-011 #10507 ORCHARD STREET ARG II, LLC D.B. 13408 PG. 1070 D.B. 15230 PG. 1182 ZONED: RESIDENTIAL MEDIUM	
E	MAP #57-2-08-012 #10509 ORCHARD STREET ARG II, LLC D.B. 15339 PG. 102 ZONED: RESIDENTIAL MEDIUM	
F	MAP #57-2-08-013 #10511 ORCHARD STREET ARG II, LLC D.B. 15339 PG. 102 ZONED: RESIDENTIAL MEDIUM	
G	MAP #57-2-08-014 #10513 ORCHARD STREET ARG II, LLC D.B. 16739 PG. 1026 ZONED: RESIDENTIAL MEDIUM	
H	MAP #57-2-08-010 #10515 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 18823 PG. 1535 ZONED: RESIDENTIAL MEDIUM	
I	MAP #57-2-02-005 #10517 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 19218 PG. 1148 ZONED: RESIDENTIAL MEDIUM	
J	MAP #57-2-08-005 #10508 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 17602 PG. 631 ZONED: RESIDENTIAL MEDIUM	
K	MAP #57-2-08-006 #10510 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 19837 PG. 1921 ZONED: RESIDENTIAL MEDIUM	
L	MAP #57-2-08-007 #10512 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 17434 PG. 444 ZONED: RESIDENTIAL MEDIUM	
M	MAP #57-2-08-008 #10514 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 18388 PG. 265 ZONED: RESIDENTIAL MEDIUM	
N	MAP #57-2-02-003 #10516 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 20080 PG. 1218 ZONED: RESIDENTIAL MEDIUM	
O	MAP #57-2-07-015B NO ADDRESS ORCHARD RE INVESTMENTS D.B. 23812 PG. 493 ZONED: RESIDENTIAL MEDIUM	
P	MAP #57-2-47-000A NO ADDRESS ORCHARD RE INVESTMENTS D.B. 23812 PG. 479 ZONED: RESIDENTIAL MEDIUM	
Q	MAP #57-2-02-020 #3570 CHAIN BRIDGE ROAD NORTHFAX JV LLC D.B. 8904 PG. 1517 ZONED: COMMERCIAL RETAIL	
R	PORTION OF ORCHARD STREET TO BE VACATED CITY OF FAIRFAX D.B. 407 PG. 115	
1	MAP #57-2-18-001A THE ASSEMBLY D.B. 3161 PG. 508 ZONED: RESIDENTIAL TOWNHOUSE	
2	MAP #57-2-08-004A ELE N.A., LLC D.B. 24268 PG. 1935 ZONED: COMMERCIAL OFFICE	
3	MAP #57-2-08-003A PMG NORTHERN VIRGINIA, LLC D.B. 20769 PG. 1728 ZONED: COMMERCIAL RETAIL	
4	MAP #57-2-02-016 CITY OF FAIRFAX D.B. 18684 PG. 857 ZONED: COMMERCIAL RETAIL	
5	MAP #57-2-02-015 GLASCOCK & SONS, LP D.B. 9172 PG. 571 ZONED: COMMERCIAL RETAIL	
6	MAP #57-2-02-010 SCHUILING T. ALPINE, INC. D.B. 8871 PG. 1815 ZONED: COMMERCIAL RETAIL	
7	MAP #57-2-02-006 BRANCH AVENUE ASSOCIATES, LLC D.B. 14796 PG. 1326 ZONED: COMMERCIAL RETAIL	
8	MAP #57-2-47-001 SANJAY BAJAJ D.B. 23803 PG. 185 ZONED: RESIDENTIAL MEDIUM	
9	MAP #57-2-02-001A RONALD & BARBARA FOWLER D.B. 5923 PG. 1416 ZONED: RESIDENTIAL MEDIUM	

STORM STRUCTURE DATA

- EX 373: RIM EL. = 370.32; INV IN (15" RCP FROM 376) = 367.56; INV OUT (15" RCP TO 374) = 365.31
- EX 374: RIM EL. = 370.40; INV IN (30" RCP FROM 373) = 365.43; INV IN (15" RCP FROM WEST) = 363.28; INV OUT (30" RCP TO 356) = 363.26
- EX 355: INV OUT (21" RCP TO 356) = 362.44
- EX 356: RIM EL. = 365.40; INV IN (30" RCP FROM 374) = 361.65; INV IN (21" RCP FROM 355) = 361.82; INV OUT (30" RCP TO 357) = 361.60
- EX 360: RIM EL. = 366.13; INV OUT (15" RCP TO 361) = 359.51
- EX 362: RIM EL. = 364.62; INV OUT (15" RCP TO 361) = 359.72
- EX 361: RIM EL. = 365.77; INV IN (15" RCP FROM 360) = 359.31; INV IN (15" RCP FROM 362) = 359.37; INV OUT (18" RCP TO 357) = 359.23
- EX 357: RIM EL. = 365.55; INV IN (30" RCP FROM 356) = 360.89; INV IN (18" RCP FROM 361) = 358.97; INV OUT (42" RCP TO 358) = 358.94
- EX 383: RIM EL. = 362.61; INV OUT (12" RCP TO 382) = 360.26
- EX 382: RIM EL. = 362.68; INV IN (12" RCP FROM 383) = 359.81; INV OUT (12" RCP TO 364) = 359.78
- EX 370: RIM EL. = 366.82; INV OUT (29"x45" ERCP TO 364) = 362.34
- EX 364: RIM EL. = 362.16; INV IN (29"x45" ERCP FROM 370) = 358.26; INV IN (12" RCP FROM 382) = 359.11; INV OUT (19"x30" ERCP TO 363A) = 358.08; INV OUT (19"x30" ERCP TO 363B) = 358.06
- EX 363: RIM EL. = 361.88; INV IN (19"x30" ERCP FROM 364A) = 357.64; INV IN (19"x30" ERCP FROM 364B) = 357.71; INV OUT (19"x30" ERCP TO 365A) = 357.58; INV OUT (19"x30" ERCP TO 365B) = 357.60
- EX 365: RIM EL. = 361.96; INV IN (19"x30" RCP FROM 363A) = 357.54; INV IN (19"x30" RCP FROM 363B) = 357.60; INV OUT (24" RCP TO 359) = 357.32
- EX 359: RIM EL. = 360.24; INV IN (24" RCP FROM 365) = 354.69; INV OUT (24" RCP TO DOGHOUSE) = 354.55
- EX 358: RIM EL. = 360.07; INV IN (42" RCP FROM 357) = 354.43; INV OUT (42" RCP TO 769) = 354.40
- EX 769: INV IN (42" RCP FROM 358) = 348.74
- EX 1009: INV OUT (66" CMP TO SOUTHEAST) = 340.78
- EX 1030: INV IN (40"x31" CMPA FROM NORTH) = 357.03
- EX 424: INV OUT (36" CMP TO 423) = 346.12
- * EX 423: INV IN (36" CMP FROM 424)
- ** EX 425: INV OUT (36" CMP TO 422) = 346.17
- ** EX 422: INV IN (36" CMP FROM 425) = 346.19
- EX 426: INV OUT (36" CMP TO 421) = 346.18
- EX 421: INV IN (36" CMP FROM 426) = 346.12
- EX 419: INV OUT (15" CPP TO 420) = 348.33
- EX 420: INV IN (15" CPP FROM 419) = 347.48
- EX 476: INV OUT (12" CMP TO 477) = 348.81
- EX 477: INV IN (12" CMP FROM 476) = 348.67
- EX 474: INV OUT (12" CMP TO 475) = 349.80
- EX 475: INV IN (12" CMP FROM 474) = 349.70
- EX 417: INV OUT (12" CMP TO 418) = 348.69
- EX 418: INV IN (12" CMP FROM 417) = 348.63
- EX 470: INV OUT (12" RCP TO 471) = 352.72
- EX 471: INV IN (12" RCP FROM 470) = 352.24
- EX 446: RIM EL. = 360.36; INV OUT (48" CMP TO 447) = 353.31
- EX 447: RIM EL. = 360.07; INV IN (48" CMP FROM 446) = 353.06; INV OUT (48" RCP TO 448) = 353.04
- EX 448: RIM EL. = 360.00; INV IN (48" RCP FROM 447) = 353.11; INV IN (48" CMP FROM SWM) = 353.12; OUT - UNDERGROUND SWM STRUCTURE WITH WEIR WALL; INV OUT (15" RCP TO 467) = 353.08
- EX 467: RIM EL. = 355.85; INV IN (15" RCP FROM 449) = 352.98; INV OUT (15" RCP TO 468) = 352.95
- EX 468: INV IN (15" RCP FROM 467) = 352.82
- EX 1014: RIM EL. = 364.55; INV OUT (15" RCP TO EAST) = 359.98
- EX 2574: RIM EL. = 357.80; INV IN (15" RCP FROM NORTH) = 354.16; INV OUT (15" RCP TO 2538) = 354.12
- EX 2538: RIM EL. = 359.17; INV IN (15" RCP TO 2574) = 354.26
- EX 2537: RIM EL. = 359.14; INV OUT (30" RCP TO 488) = 354.14
- EX 488: RIM EL. = 360.97; INV IN (30" RCP FROM 2537) = 356.52; INV OUT (42"x29" CMPA FROM 489 VIA NORTH) = 356.49; INV OUT (42"x29" CMPA TO 489 VIA WEST) = 356.53
- EX 489: RIM EL. = 360.24; INV IN (42"x29" CMPA FROM 488) = 354.61; INV IN (42"x29" CMPA FROM 488) = 354.70; INV OUT (42"x29" CMPA TO SWM) = 354.60
- EX 1693: TOP OF WALL = 340.05; INV OUT (8'x8' BOX CULVERT TO EAST) = 330.35
- EX 1694: TOP OF WALL = 339.98; INV OUT (8'x8' BOX CULVERT TO EAST) = 330.27
- EX 1237: RIM EL. = 353.15; INV OUT (15" RCP TO 1380) = 347.85
- EX 1271: RIM EL. = 350.70; INV OUT (15" RCP TO 1380) = 344.50
- EX 1380: RIM EL. = 349.05; INV IN (15" RCP FROM 1271) = 343.25; INV OUT (15" RCP FROM 1237) = 343.15; INV OUT (15" RCP TO 1478) = 343.05
- EX 1478: RIM EL. = 347.12; INV IN (15" RCP FROM 1380) = 340.12; INV OUT (15" RCP TO SE) = 335.32
- EX 1512: RIM EL. = 346.18; INV OUT (15" RCP TO 1542) = 341.88
- EX 1542: RIM EL. = 346.10; INV IN (15" RCP FROM 1512) = 341.50; INV OUT (15" RCP TO 1839) = 341.40
- EX 1839: RIM EL. = 346.21; INV IN (15" RCP FROM 1542) = 340.81; INV OUT (15" RCP TO STRUCTURE IN ROAD) = 340.61
- EX 1940: RIM EL. = 348.09; INV OUT (15" RCP TO 1897) = 342.89
- EX 1897: RIM EL. = 342.62; INV IN (15" RCP FROM 1940) = 342.22; INV OUT (15" RCP TO STRUCTURE IN ROAD) = 336.92

* UNABLE TO OBTAIN INVERTS - STRUCTURE FULL OF DEBRIS

** REVERSE FLOW

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 87°52'28" W	26.01'

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	BEARING	CHORD
C1	5761.58'	7.14'	0°04'15"	3.57'	S 00°40'03" E	7.14'
C2	133.14'	20.03'	8°37'11"	10.03'	S 03°36'25" W	20.01'
C3	90.75'	19.96'	12°36'07"	10.02'	S 81°34'25" W	19.92'
C4	50.00'	17.87'	20°28'30"	9.03'	S 85°30'33" W	17.77'
C5	100.00'	35.74'	20°28'30"	18.06'	N 85°30'33" E	35.55'
C6	40.75'	8.96'	12°36'07"	4.50'	N 81°34'25" E	8.94'

HORIZONTAL GRAPHIC SCALE 1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
4/10/20
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

EXISTING CONDITIONS PLAN

SHEET No.
2A

SCALE: 1"=30'

MATCH LINE "A" - SEE SHEET 4B

MATCH LINE "B" - SEE SHEET 4B

ORCHARD STREET
50' PUBLIC RIGHT-OF-WAY
D.B. 407 PG. 115

McLEAN AVENUE
VARIABLE WIDTH PUBLIC RIGHT-OF-WAY

FAIRFAX ACRES
D.B. 401 PG. 312

NO PARCEL
D.B. 1626 PG. 119

LOT 17
FAIRFAX ACRES
D.B. 401 PG. 312

EX. 20' SANITARY SEWER EASEMENT DB 986 PG 542

EX. 10' SANITARY SEWER EASEMENT DB 3156 PG 56

EX. CL SANITARY SEWER EASEMENT DB 1950 PG 301

APPROXIMATE LOCATION EX. VEPCO EASEMENT DB 1374 PG 386

APPROXIMATE LOCATION EX. VEPCO EASEMENT DB 1151 PG 133

APPROXIMATE LOCATION EX. VEPCO EASEMENT DB 647 PG 267

EX. SANITARY SEWER EASEMENT DB 1338 PG 324

SANITARY MANHOLE
N: 6,998,568.73
E: 11,821,962.15
ELEVATION: 363.76

BENCHMARK #3
SANITARY MANHOLE
N: 6,998,425.38
E: 11,821,330.31
ELEVATION: 366.49

VIRGINIA STATE GRID NORTH
NAD 83

N84°15'12"W 89.44'

N01°20'31"W 40.00'

N01°12'12"W 92.40'

S07°07'41"E 262.20' (FIELD)
262.16' (COMPUTED)

N84°15'12"W 428.18'

N42°25'39"W 62.77'

33°59'46"W 108.

NOTES
1. SEE SHEETS 3B AND 3C - TREE MANAGEMENT SCHEDULE.
2. SEE SHEET 3D - TREE MANAGEMENT NOTES & DETAILS .

LEGEND

	EXISTING VEGETATION LINE
#6608	EXISTING TREE TO BE PRESERVED
#6608	EXISTING TREE TO BE REMOVED
LOD	LIMITS OF DISTURBANCE
TPF	TREE PROTECTION FENCE
RP	ROOT PRUNING

PLAN PREPARED BY LAURIE BETH DONNACHIE
ISA CERTIFIED ARBORIST NO. MA-5723A
SIGNATURE: Laurie B Donnachie DATE: 2020-04-10

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
LAURIE B. DONNACHIE
Lic. No. 0406001880
2020-04-10
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

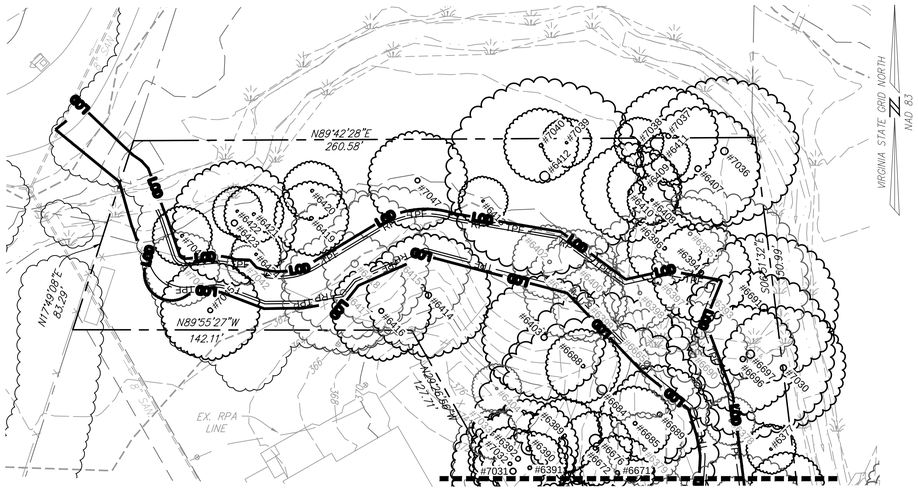
PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:

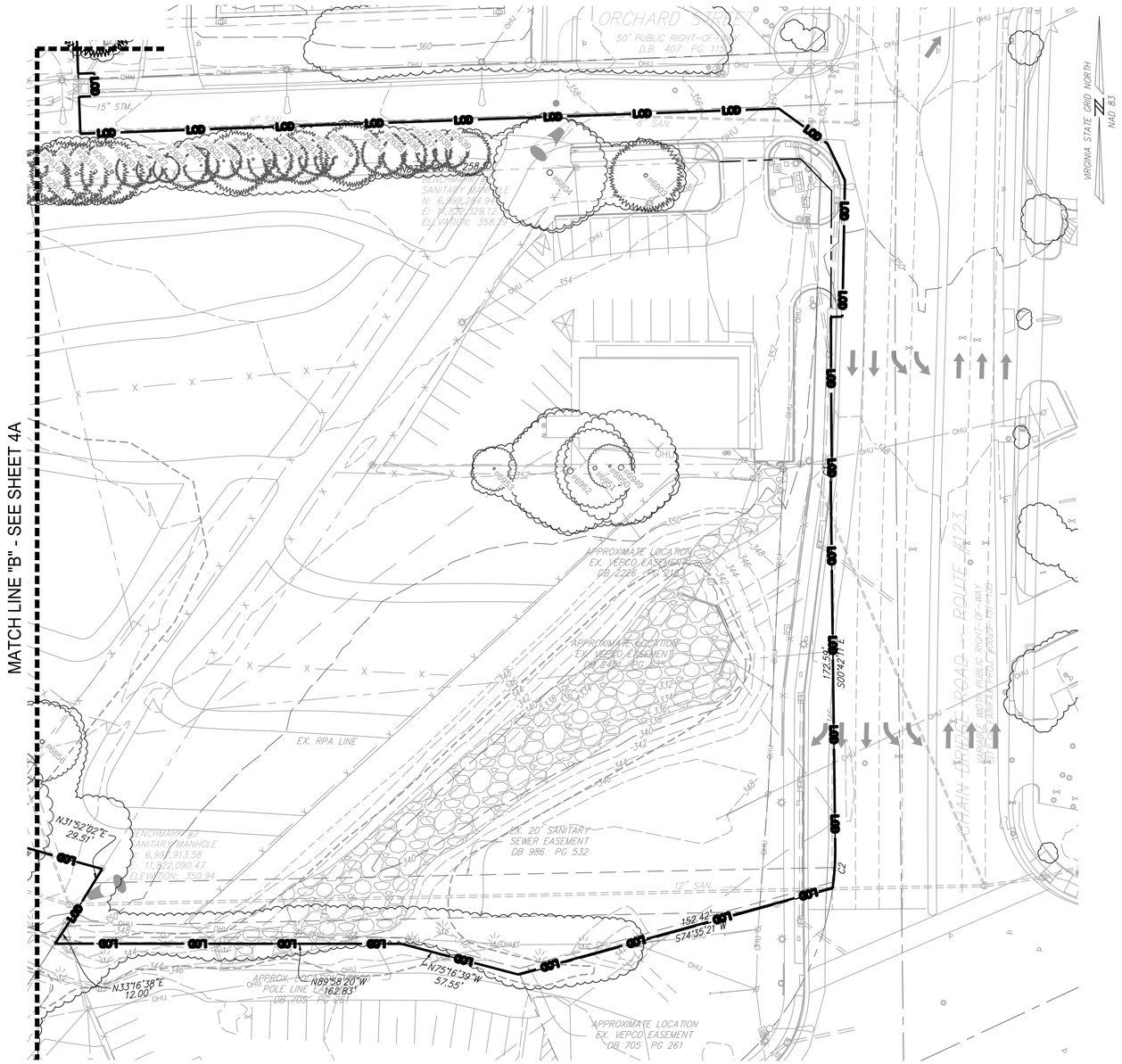
TREE MANAGEMENT PLAN

SHEET No.
3

SCALE: 1"=30'



MATCH LINE "A" - SEE SHEET 4A



MATCH LINE "B" - SEE SHEET 4A

NOTES
1. SEE SHEETS 3B AND 3C - TREE MANAGEMENT SCHEDULE.
2. SEE SHEET 3D - TREE MANAGEMENT NOTES & DETAILS .

LEGEND

- EXISTING VEGETATION LINE
- #6608 / #6859 — EXISTING TREE TO BE PRESERVED
- #6608 / #6859 — EXISTING TREE TO BE REMOVED
- LOD — LIMITS OF DISTURBANCE
- TPF — TREE PROTECTION FENCE
- RP — ROOT PRUNING

PLAN PREPARED BY LAURIE BETH DONNACHIE
ISA CERTIFIED ARBORIST NO. MA-5723A
SIGNATURE: Laurie B Donnachie DATE: 2020-04-10

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
LAURIE B. DONNACHIE
Lic. No. 0406001880
2020-04-10
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:

TREE MANAGEMENT PLAN

SHEET No.
3A

SCALE: 1"=30'

TREE MANAGEMENT SCHEDULE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
1974	*THUJA SPP.*	ARBORVITAE	8	8	76	PRESERVE
1975	*THUJA SPP.*	ARBORVITAE	8	8	75	REMOVE
1976	*THUJA SPP.*	ARBORVITAE	10	10	74	REMOVE
1977	*THUJA SPP.*	ARBORVITAE	8	8	78	REMOVE
1978	*THUJA SPP.*	ARBORVITAE	8	8	78	REMOVE
1979	*THUJA SPP.*	ARBORVITAE	8	8	78	REMOVE
1980	*THUJA SPP.*	ARBORVITAE	8	8	74	REMOVE
1981	*THUJA SPP.*	ARBORVITAE	8	8	72	REMOVE
1982	*THUJA SPP.*	ARBORVITAE	8	8	72	REMOVE
1984	*THUJA SPP.*	ARBORVITAE	10	10	74	REMOVE
1985	*THUJA SPP.*	ARBORVITAE	8	8	74	REMOVE
1986	*THUJA SPP.*	ARBORVITAE	10	10	72	REMOVE
1987	*THUJA SPP.*	ARBORVITAE	10	10	72	REMOVE
1988	*THUJA SPP.*	ARBORVITAE	10	10	72	REMOVE
1989	*THUJA SPP.*	ARBORVITAE	10	10	73	REMOVE
1990	*THUJA SPP.*	ARBORVITAE	10	10	74	REMOVE
1991	*THUJA SPP.*	ARBORVITAE	10	10	74	REMOVE
1992	*THUJA SPP.*	ARBORVITAE	10	10	78	REMOVE
1993	*THUJA SPP.*	ARBORVITAE	10	10	78	REMOVE
1994	*THUJA SPP.*	ARBORVITAE	10	10	75	REMOVE
1995	*THUJA SPP.*	ARBORVITAE	10	10	73	REMOVE
1996	*THUJA SPP.*	ARBORVITAE	10	10	73	REMOVE
1997	*THUJA SPP.*	ARBORVITAE	10	10	73	REMOVE
1998	*THUJA SPP.*	ARBORVITAE	10	10	73	REMOVE
1999	*THUJA SPP.*	ARBORVITAE	10	10	73	REMOVE
2000	*THUJA SPP.*	ARBORVITAE	10	10	78	REMOVE
2001	*THUJA SPP.*	ARBORVITAE	10	10	78	REMOVE
2002	*THUJA SPP.*	ARBORVITAE	10	10	78	REMOVE
2003	*THUJA SPP.*	ARBORVITAE	10	10	78	REMOVE
2005	*ACER RUBRUM*	RED MAPLE	36	36	65	REMOVE
2006	*ACER RUBRUM*	RED MAPLE	6	6	72	REMOVE
2007	*FRAXINUS PENNSYLVANICA*	GREEN ASH	16	16	0	REMOVE
2008	*ACER RUBRUM*	RED MAPLE	16	16	72	REMOVE
2009	*ACER RUBRUM*	RED MAPLE	14	14	67	REMOVE
2010	*ACER RUBRUM*	RED MAPLE	8	8	56	REMOVE
2011	*UNIDENTIFIED*	DEAD TREE	6	6	0	REMOVE
2012	*FRAXINUS PENNSYLVANICA*	GREEN ASH	18	18	0	REMOVE
2014	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	72	REMOVE
2015	*CATALPA SPECIOSA*	NORTHERN CATALPA	12	12	50	REMOVE
2016	*ACER RUBRUM*	RED MAPLE	6	6	66	REMOVE
2018	*MORUS ALBA*	WHITE MULBERRY	6	6	70	REMOVE
2019	*MORUS ALBA*	WHITE MULBERRY	16	16	50	REMOVE
2020	*ROBINIA PSEUDOACACIA*	BLACK LOCUST	6	6	50	REMOVE
2612	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	6	6	70	REMOVE
2615	*THUJA SPP.*	ARBORVITAE	10	10	72	REMOVE
2616	*THUJA SPP.*	ARBORVITAE	10	10	75	REMOVE
2617	*THUJA SPP.*	ARBORVITAE	10	10	72	REMOVE
2618	*THUJA SPP.*	ARBORVITAE	10	10	75	REMOVE
2619	*THUJA SPP.*	ARBORVITAE	10	10	72	REMOVE
2620	*THUJA SPP.*	ARBORVITAE	6	6	72	REMOVE
2621	*THUJA SPP.*	ARBORVITAE	4	4	68	REMOVE
2622	*THUJA SPP.*	ARBORVITAE	4	4	75	REMOVE
2623	*THUJA SPP.*	ARBORVITAE	8	8	68	REMOVE
2624	*THUJA SPP.*	ARBORVITAE	6	6	72	REMOVE
2625	*THUJA SPP.*	ARBORVITAE	6	6	67	REMOVE
2626	*THUJA SPP.*	ARBORVITAE	10	10	72	REMOVE
2627	*THUJA SPP.*	ARBORVITAE	8	8	68	REMOVE
2628	*THUJA SPP.*	ARBORVITAE	8	8	72	REMOVE
2629	*THUJA SPP.*	ARBORVITAE	8	8	68	REMOVE
2630	*THUJA SPP.*	ARBORVITAE	10	10	72	REMOVE
2631	*THUJA SPP.*	ARBORVITAE	6	6	67	REMOVE
2632	*THUJA SPP.*	ARBORVITAE	8	8	72	REMOVE
2633	*THUJA SPP.*	ARBORVITAE	10	10	68	REMOVE
2634	*THUJA SPP.*	ARBORVITAE	8	8	69	REMOVE
2635	*THUJA SPP.*	ARBORVITAE	8	8	67	REMOVE
2636	*THUJA SPP.*	ARBORVITAE	6	6	69	REMOVE
2637	*THUJA SPP.*	ARBORVITAE	6	6	68	REMOVE
2638	*THUJA SPP.*	ARBORVITAE	6	6	72	REMOVE
2639	*THUJA SPP.*	ARBORVITAE	8	8	66	REMOVE
2640	*THUJA SPP.*	ARBORVITAE	14	14	72	PRESERVE
2641	*THUJA SPP.*	ARBORVITAE	14	14	73	PRESERVE
2642	*THUJA SPP.*	ARBORVITAE	12	12	72	PRESERVE
2643	*THUJA SPP.*	ARBORVITAE	12	12	68	PRESERVE
2644	*THUJA SPP.*	ARBORVITAE	12	12	69	PRESERVE
2645	*THUJA SPP.*	ARBORVITAE	12	12	70	PRESERVE
2646	*THUJA SPP.*	ARBORVITAE	12	12	69	PRESERVE
2647	*THUJA SPP.*	ARBORVITAE	12	12	70	PRESERVE
2648	*THUJA SPP.*	ARBORVITAE	10	10	69	PRESERVE
2649	*THUJA SPP.*	ARBORVITAE	10	10	68	PRESERVE
2650	*THUJA SPP.*	ARBORVITAE	6	6	66	PRESERVE
2651	*THUJA SPP.*	ARBORVITAE	10	10	69	PRESERVE
2652	*THUJA SPP.*	ARBORVITAE	10	10	66	PRESERVE
2653	*THUJA SPP.*	ARBORVITAE	10	10	70	PRESERVE
2654	*THUJA SPP.*	ARBORVITAE	10	10	66	PRESERVE
2655	*THUJA SPP.*	ARBORVITAE	10	10	65	PRESERVE
2656	*THUJA SPP.*	ARBORVITAE	10	10	66	PRESERVE
2657	*THUJA SPP.*	ARBORVITAE	10	10	70	PRESERVE
2658	*THUJA SPP.*	ARBORVITAE	10	10	53	PRESERVE
2659	*THUJA SPP.*	ARBORVITAE	10	10	71	PRESERVE
2660	*THUJA SPP.*	ARBORVITAE	10	10	69	PRESERVE
2661	*THUJA SPP.*	ARBORVITAE	10	10	68	PRESERVE
2662	*THUJA SPP.*	ARBORVITAE	10	10	75	PRESERVE
2663	*THUJA SPP.*	ARBORVITAE	10	10	73	PRESERVE
2664	*THUJA SPP.*	ARBORVITAE	10	10	75	PRESERVE
2665	*THUJA SPP.*	ARBORVITAE	8	8	69	PRESERVE
6056	*ACER RUBRUM*	RED MAPLE	10	10	53	REMOVE
6301	*PRUNUS SEROTINA*	BLACK CHERRY	12	12	69	REMOVE
6302	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	66	REMOVE
6303	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	72	REMOVE
6304	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	72	REMOVE
6305	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	70	REMOVE
6306	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	72	REMOVE
6307	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	75	REMOVE
6308	*ACER RUBRUM*	RED MAPLE	15	15	73	REMOVE
6309	*FRAXINUS PENNSYLVANICA*	GREEN ASH	14	14	0	REMOVE
6310	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	6	6	72	REMOVE
6311	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	71	REMOVE
6312	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	26	26	75	REMOVE
6313	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	26	26	72	REMOVE
6314	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	69	REMOVE
6315	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	70	REMOVE
6316	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	72	REMOVE
6317	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	72	REMOVE
6318	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	69	REMOVE
6319	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	36	36	70	REMOVE
6320	*ACER RUBRUM*	RED MAPLE	12	12	50	REMOVE
6321	*ACER RUBRUM*	RED MAPLE	10	10	60	REMOVE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
6322	*ACER RUBRUM*	RED MAPLE	24	24	63	REMOVE
6323	*ACER RUBRUM*	RED MAPLE	12	12	0	REMOVE
6324	*ACER RUBRUM*	RED MAPLE	24	24	47	REMOVE
6325	*PRUNUS SEROTINA*	BLACK CHERRY	12	12	68	REMOVE
6326	*PRUNUS SEROTINA*	BLACK CHERRY	6	6	44	REMOVE
6327	*ACER RUBRUM*	RED MAPLE	6	6	65	REMOVE
6328	*ACER RUBRUM*	RED MAPLE	24	24	75	REMOVE
6329	*ACER RUBRUM*	RED MAPLE	15	15	67	REMOVE
6330	*ACER RUBRUM*	RED MAPLE	24	24	66	REMOVE
6331	*ACER RUBRUM*	RED MAPLE	14	14	67	REMOVE
6332	*ACER RUBRUM*	RED MAPLE	24	24	66	REMOVE
6333	*ACER RUBRUM*	RED MAPLE	8	8	72	REMOVE
6334	*QUERCUS RUBRA*	NORTHERN RED OAK	24	24	69	REMOVE
6335	*ACER RUBRUM*	RED MAPLE	10	10	69	REMOVE
6336	*ACER RUBRUM*	RED MAPLE	24	24	63	REMOVE
6337	*ACER RUBRUM*	RED MAPLE	12	12	70	REMOVE
6338	*PRUNUS SEROTINA*	BLACK CHERRY	10	10	60	REMOVE
6339	*ACER RUBRUM*	RED MAPLE	24	24	65	REMOVE
6340	*FRAXINUS PENNSYLVANICA*	GREEN ASH	24	24	0	REMOVE
6341	*FRAXINUS PENNSYLVANICA*	GREEN ASH	15	15	0	REMOVE
6342	*MORUS ALBA*	WHITE MULBERRY	24	24	44	REMOVE
6343	*ACER RUBRUM*	RED MAPLE	6	6	68	REMOVE
6344	*ACER RUBRUM*	RED MAPLE	6	6	72	REMOVE
6345	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	68	REMOVE
6346	*FRAXINUS PENNSYLVANICA*	GREEN ASH	15	15	0	REMOVE
6347	*PRUNUS SEROTINA*	BLACK CHERRY	10	10	71	REMOVE
6348	*FRAXINUS PENNSYLVANICA*	GREEN ASH	18	18	0	REMOVE
6349	*PRUNUS SEROTINA*	BLACK CHERRY	12	12	68	REMOVE
6350	*FRAXINUS PENNSYLVANICA*	GREEN ASH	36	36	40	REMOVE
6351	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	67	REMOVE
6352	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	28	28	69	REMOVE
6353	*ACER RUBRUM*	RED MAPLE	36	36	65	REMOVE
6354	*ACER RUBRUM*	RED MAPLE	24	24	72	REMOVE
6355	*ACER RUBRUM*	RED MAPLE	12	12	50	REMOVE
6356	*ACER RUBRUM*	RED MAPLE	26	26	53	REMOVE
6357	*ACER RUBRUM*	RED MAPLE	24	24	55	REMOVE
6359	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	70	REMOVE
6360	*ULMUS AMERICANA*	AMERICAN ELM	24	24	41	REMOVE
6361	*ULMUS AMERICANA*	AMERICAN ELM	8	8	50	REMOVE
6362	*ULMUS AMERICANA*	AMERICAN ELM	12	12	50	REMOVE
6363	*ACER RUBRUM*	RED MAPLE	24	24	60	REMOVE
6364	*JUGLANS NIGRA*	BLACK WALNUT	28	28	69	PRESERVE
6366	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	66	REMOVE
6367	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	8	8	67	REMOVE
6368	*JUGLANS NIGRA*	BLACK WALNUT	6	6	66	REMOVE
6369	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	8	8	69	REMOVE
6370	*ACER RUBRUM*	RED MAPLE	30	30	72	REMOVE
6372	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	6	6	75	PRESERVE
6373	*CARYA CORDIFORMIS*	BITTERNUT HICKORY	10	10	70	PRESERVE
6374	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	72	REMOVE
6375	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	66	REMOVE
6376	*CARYA CORDIFORMIS*	BITTERNUT HICKORY	15	15	25	PRESERVE
6377	*ULMUS AMERICANA*	AMERICAN ELM	8	8	40	PRESERVE
6378	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	53	REMOVE
6379	*MORUS ALBA*	WHITE MULBERRY	5	5	45	REMOVE
6381	*MORUS ALBA*	WHITE MULBERRY	6	6	60	REMOVE
6382	*PRUNUS SEROTINA*	BLACK CHERRY	10	10	56	PRESERVE
6383	*PRUNUS SEROTINA*	BLACK CHERRY	10	10	65	PRESERVE
6384	*PRUNUS SEROTINA*	BLACK CHERRY	5	5	75	PRESERVE
6385	*ALBIZIA JULIBRISSIN*	MIMOSA	7	7	50	REMOVE
6386	*CATALPA SPECIOSA*	NORTHERN CATALPA	12	12	69	PRESERVE
6387	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	45	PRESERVE
6388	*ACER RUBRUM*	RED MAPLE	12	12	66	PRESERVE
6389	*NYSSA SYLVATICA*	BLACK GUM	8	8	65	PRESERVE
6390	*QUERCUS RUBRA*	NORTHERN RED OAK	15	15	56	PRESERVE
6391	*QUERCUS RUBRA*	NORTHERN RED OAK	10	10	55	PRESERVE
6392	*ULMUS AMERICANA*	AMERICAN ELM	6	6	63	PRESERVE
6393	*ACER RUBRUM*	RED MAPLE	40	40	55	REMOVE
6394	*PRUNUS SEROTINA*	BLACK CHERRY	10	10	25	PRESERVE
6395	*ACER PLATANOIDES*	NORWAY MAPLE	6	6	70	REMOVE
6396	*QUERCUS ALBA*	WHITE OAK	15	15	56	PRESERVE
6397	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	36	36	68	REMOVE
6398	*PRUNUS SEROTINA*	BLACK CHERRY	6	6	66	REMOVE
6399	*ULMUS AMERICANA*	AMERICAN ELM	6	6	72	REMOVE
6400	*FAGUS GRANDFOLIA*	AMERICAN BEECH	8	8	59	REMOVE
6401	*MORUS ALBA*	WHITE MULBERRY	15	15	67	REMOVE
6402	*ACER RUBRUM*	RED MAPLE	6	6	63	REMOVE
6403	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	70	PRESERVE
6404	*MORUS ALBA*	WHITE MULBERRY	8	8	66	REMOVE
6407	*ACER RUBRUM*	RED MAPLE	24	24	72	PRESERVE
6408	*ACER RUBRUM*	RED MAPLE	15	15	63	PRESERVE
6409	*ACER RUBRUM*	RED MAPLE	8	8	65	PRESERVE
6410	*ULMUS AMERICANA*	AMERICAN ELM	10	10	59	PRESERVE
6411	*ACER RUBRUM*	RED MAPLE	8	8	70	PRESERVE
6412	*QUERCUS RUBRA*	NORTHERN RED OAK	48	48	53	PRESERVE
6413	*QUERCUS RUBRA*	NORTHERN RED OAK	10	10	66	PRESERVE
6414	*QUERCUS RUBRA*	NORTHERN RED OAK	36	36	69	PRESERVE
6415	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	50	50	72	REMOVE
6416	*FAGUS GRANDFOLIA*	AMERICAN BEECH	24	24	66	PRESERVE
6417	*QUERCUS RUBRA*	NORTHERN RED OAK	40	40	50	REMOVE
6418	*QUERCUS RUBRA*	NORTHERN RED OAK	40	40	56	REMOVE
6419	*ACER RUBRUM*	RED MAPLE	12	12	70	PRESERVE
6420	*PRUNUS SEROTINA*	BLACK CHERRY	8	8	72	PRESERVE
6421	*QUERCUS RUBRA*	NORTHERN RED OAK	10	10	74	PRESERVE
6422	*ACER RUBRUM*	RED MAPLE	12	12	75	PRESERVE
6423	*QUERCUS RUBRA*	NORTHERN RED OAK	24	24	73	PRESERVE
6424	*QUERCUS RUBRA*	NORTHERN RED OAK	8	8	72	PRESERVE
6504	*ACER SACCHARUM*	SUGAR MAPLE	6	6	75	PRESERVE
6505	*FRAXINUS PENNSYLVANICA*	GREEN ASH	8	8	25	REMOVE
6509	*MORUS ALBA*	WHITE MULBERRY	18	18	68	PRESERVE
6511	*ACER RUBRUM*	RED MAPLE	14	14	25	REMOVE
6512	*FRAXINUS PENNSYLVANICA*	GREEN ASH	14	14	40	REMOVE
6513	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	40	40	40	REMOVE
6514	*ACER SACCHARUM*	SUGAR MAPLE	5	5	53	REMOVE
6515	*FRAXINUS PENNSYLVANICA*	GREEN ASH	16	16	30	REMOVE
6516	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	8	8	69	REMOVE
6517	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	14	14	60	REMOVE
6518	*CATALPA SPECIOSA*	NORTHERN CATALPA	24	24	64	REMOVE
6519	*CATALPA SPECIOSA*	NORTHERN CATALPA	12	12	60	REMOVE
6520	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	66	REMOVE
6521	*MORUS ALBA*	WHITE MULBERRY	36	36	55	REMOVE
6522	*PRUNUS SEROTINA*	BLACK CHERRY	6	6	65	REMOVE
6523	*JUGLANS NIGRA*	BLACK WALNUT	8	8	65	REMOVE
6524	*ACER RUBRUM*	RED MAPLE	6	6	59	REMOVE
6525	*ACER RUBRUM*	RED MAPLE	12	12	65	REMOVE
6526	*ROBINIA PSEUDOACACIA*	BLACK LOCUST	14	14	56	REMOVE
6527	*ACER RUBRUM*	RED MAPLE	16	16	67	REMOVE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
6528	*ROBINIA PSEUDOACACIA*	BLACK LOCUST	12	12	53	REMOVE
6529	*FRAXINUS PENNSYLVANICA*	GREEN ASH	8	8	0	REMOVE
6530	*ILEX OPACA*	AMERICAN HOLLY	12	12	72	REMOVE
6531	*QUERCUS PALUSTRIS*	PIN OAK	36	36	60	REMOVE
6533	*PLATANUS OCCIDENTALIS*	SYCAMORE	40	40	75	REMOVE
6534	*ACER RUBRUM*	RED MAPLE	20	20	69	REMOVE
6535	*NYSSA SYLVATICA*	BLACK GUM	8	8	67	REMOVE
6536	*ACER RUBRUM*	RED MAPLE	5	5	69	REMOVE
6537	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	68	REMOVE
6538	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	75	REMOVE
6539	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	14	14	73	REMOVE
6540	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	16	16	72	REMOVE
6541	*ACER RUBRUM*	RED MAPLE	10	10	70	REMOVE
6542	*ACER RUBRUM*	RED MAPLE	12	12	69	REMOVE
6543	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	67	REMOVE
6544	*ACER RUBRUM*	RED MAPLE	12	12	69	REMOVE
6546	*ACER RUBRUM*	RED MAPLE	5	5	75	REMOVE
6547	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	70	REMOVE
6548	*ACER RUBRUM*	RED MAPLE	10	10	72	REMOVE
6549	*UNIDENTIFIED*	DEAD TREE	8	8	0	REMOVE
6551	*ACER RUBRUM*	RED MAPLE	10	10	73	REMOVE
6552	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	69	REMOVE
6553	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	5	5	65	REMOVE
6554	*ACER RUBRUM*	RED MAPLE	6	6	72	REMOVE
6555	*ACER RUBRUM*	RED MAPLE	14	14	68	REMOVE
6556	*ACER RUBRUM*	RED MAPLE	12	12	75	REMOVE
6557	*UNIDENTIFIED*	DEAD TREE	8	8	0	REMOVE
6558	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	72	REMOVE
6559	*ACER RUBRUM*	RED MAPLE	5	5	60	REMOVE
6560	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	22	22	75	REMOVE
6561	*ACER RUBRUM*	RED MAPLE	14	14	69	REMOVE
6562	*ACER RUBRUM*	RED MAPLE	10	10	72	REMOVE
6564	*ACER RUBRUM*	RED MAPLE	6	6	75	REMOVE
6565	*UNIDENTIFIED*	DEAD TREE	8	8	0	REMOVE
6566	*ACER RUBRUM*	RED MAPLE	6	6	66	REMOVE
6567	*ACER RUBRUM*	RED MAPLE	14	14	70	REMOVE
6568	*ACER RUBRUM*	RED MAPLE	8	8	53	REMOVE
6569	*ACER SACCHARINUM*	SILVER MAPLE	6	6	45	REMOVE
6570	*ACER RUBRUM*	RED MAPLE	12	12	69	REMOVE
6571	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	12	12	60	REMOVE
6572	*ACER RUBRUM*	RED MAPLE	8	8	75	REMOVE
6573	*ACER RUBRUM*	RED MAPLE	8	8	71	REMOVE
6574	*ACER RUBRUM*	RED MAPLE	10	10	69	REMOVE
6575	*UNIDENTIFIED*	DEAD TREE	18	18	0	REMOVE
6576	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	75	REMOVE
6577	*ACER RUBRUM*	RED MAPLE	6	6	73	REMOVE
6578	*ACER RUBRUM*	RED MAPLE	5	5	75	REMOVE
6579	*ACER RUBRUM*	RED MAPLE	20	20	70	REMOVE
6580	*ACER RUBRUM*	RED MAPLE	8	8	69	REMOVE
6581	*UNIDENTIFIED*	DEAD TREE	16	16	0	REMOVE
6582	*ACER RUBRUM*	RED MAPLE	6	6	63	REMOVE
6583	*ACER RUBRUM*	RED MAPLE	5	5	71	REMOVE
6584	*ACER RUBRUM*	RED MAPLE	8	8	60	REMOVE
6585	*UNIDENTIFIED*	DEAD TREE	6	6	0	REMOVE
6586	*ACER RUBRUM*	RED MAPLE	8	8	0	REMOVE
6587	*UNIDENTIFIED*	DEAD TREE	28	28	0	REMOVE
6588	*ACER RUBRUM*	RED MAPLE	12	12	75	REMOVE
6589	*UNIDENTIFIED*	DEAD TREE	10	10	0	REMOVE
6590	*QUERCUS RUBRA*	NORTHERN RED OAK	24	24	38	REMOVE
6591	*ACER RUBRUM*	RED MAPLE	10	10	65	REMOVE
6592	*ACER SACCHARINUM*	SILVER MAPLE	10	10	63	REMOVE
6593	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	6	6	70	REMOVE
6594	*FRAXINUS PENNSYLVANICA*	GREEN ASH	18	18	40	REMOVE
6595	*ACER RUBRUM*	RED MAPLE	10	10	55	REMOVE
6596	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	56	REMOVE
6597	*ACER RUBRUM*	RED MAPLE	12	12	72	REMOVE
6598	*ACER RUBRUM*	RED MAPLE	10	10	69	REMOVE
6599	*ACER RUBRUM*	RED MAPLE	12	12	70	REMOVE
6600	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	72	REMOVE
6601	*LIQUIDAMBAR STYRACIFLUA*	SWEETGUM	7	7	69	REMOVE
6602	*ACER RUBRUM*	RED MAPLE	6	6	0	REMOVE
6603	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	14	14	70	REMOVE
6604	*FRAXINUS PENNSYLVANICA*	GREEN ASH	6	6	0	REMOVE
6605	*ACER RUBRUM*	RED MAPLE	8	8	50	REMOVE
6606	*FRAXINUS PENNSYLVANICA*	GREEN ASH	10	10	0	REMOVE
6607	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	12	12	68	REMOVE
6608	*FRAXINUS PENNSYLVANICA*	GREEN ASH	12	12	0	REMOVE
6609	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	12	12	70	REMOVE
6610	*FRAXINUS PENNSYLVANICA*	GREEN ASH	8	8	0	REMOVE
6611	*ACER RUBRUM*	RED MAPLE	10	10	65	REMOVE
6612	*ACER RUBRUM*	RED MAPLE	6	6	69	REMOVE
6614	*ULMUS AMERICANA*	AMERICAN ELM	5	5	72	REMOVE
6615	*ACER RUBRUM*	RED MAPLE	14	14	50	REMOVE
6616	*ACER RUBRUM*	RED MAPLE	6	6	56	REMOVE
6617	*ACER RUBRUM*	RED MAPLE	6	6	71	REMOVE
6618	*FRAXINUS PENNSYLVANICA*	GREEN ASH	6	6	0	REMOVE
6619	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	10	10	65	REMOVE
6620	*ACER RUBRUM*	RED MAPLE	10	10	69	REMOVE
6621	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	12	12	60	REMOVE
6622	*FRAXINUS PENNSYLVANICA*	GREEN ASH	10	10	0	REMOVE
6624	*ACER RUBRUM*	RED MAPLE	8	8	66	REMOVE
6625	*ULMUS AMERICANA*	AMERICAN ELM	24	24	65	REMOVE
6626	*ACER RUBRUM*	RED MAPLE	8	8	66	REMOVE
6627	*QUERCUS RUBRA*	NORTHERN RED OAK	12	12	68	REMOVE
6628	*FRAXINUS PENNSYLVANICA*	GREEN ASH	22	22	0	REMOVE
6629	*ULMUS AMERICANA*	AMERICAN ELM	16	16	68	REMOVE
6630	*ULMUS AMERICANA*	AMERICAN ELM	8	8	66	REMOVE
6631	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	70	REMOVE
6632	*FRAXINUS PENNSYLVANICA*	GREEN ASH	16	16	0	REMOVE
6633	*ACER RUBRUM*	RED MAPLE	10	10	70	REMOVE
6634	*ACER RUBRUM*	RED MAPLE	6	6	75	REMOVE
6635	*ACER RUBRUM*	RED MAPLE	6	6	60	REMOVE
6636	*ACER RUBRUM*	RED MAPLE	10	10	75	REMOVE
6637	*ACER RUBRUM*	RED MAPLE	8	8	68	REMOVE
6638	*ACER RUBRUM*	RED MAPLE	12	12	69	REMOVE
6639	*ACER RUBRUM*	RED MAPLE	10	10	72	REMOVE
6640	*ULMUS AMERICANA*	AMERICAN ELM	8	8	75	REMOVE
6641	*ULMUS AMERICANA*	AMERICAN ELM	8	8	30	REMOVE
6643	*ACER RUBRUM*	RED MAPLE	16	16	70	REMOVE

PLAN PREPARED BY LAURIE BETH DONNACHIE
ISA CERTIFIED ARBORIST NO. MA-5723A
SIGNATURE: [signature] DATE: 20 20 -04 -10

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY STANDARDS AND SPECIFICATIONS

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engineering surveying land planning

COMMONWEALTH OF VIRGINIA
LAURIE B. DONNACHIE
Lic. No. 0406001880
2020-04-10
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:
TREE MANAGEMENT SCHEDULE

SHEET No.
3B

SCALE: N/A

TREE MANAGEMENT SCHEDULE CONTINUED

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
6845	*ACER RUBRUM*	RED MAPLE	7	7	72	REMOVE
6846	*ACER RUBRUM*	RED MAPLE	12	12	72	REMOVE
6847	*ACER RUBRUM*	RED MAPLE	8	8	69	REMOVE
6848	*ULMUS AMERICANA*	AMERICAN ELM	8	8	41	REMOVE
6849	*FRAXINUS PENNSYLVANICA*	GREEN ASH	12	12	30	REMOVE
6850	*ACER RUBRUM*	RED MAPLE	16	16	72	REMOVE
6851	*ACER RUBRUM*	RED MAPLE	8	8	50	REMOVE
6852	*ULMUS AMERICANA*	AMERICAN ELM	8	8	66	REMOVE
6853	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	5	5	72	REMOVE
6854	*ACER RUBRUM*	RED MAPLE	12	12	69	REMOVE
6855	*ACER SACCHARINUM*	SILVER MAPLE	26	26	71	REMOVE
6857	*ACER RUBRUM*	RED MAPLE	30	30	71	REMOVE
6858	*ACER RUBRUM*	RED MAPLE	16	16	72	REMOVE
6860	*ACER RUBRUM*	RED MAPLE	12	12	75	REMOVE
6861	*UNIDENTIFIED*	DEAD TREE	6	6	0	REMOVE
6862	*ACER RUBRUM*	RED MAPLE	16	16	72	REMOVE
6863	*UNIDENTIFIED*	DEAD TREE	14	14	0	REMOVE
6864	*PRUNUS SEROTINA*	BLACK CHERRY	8	8	66	PRESERVE
6865	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	68	REMOVE
6866	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	6	6	75	REMOVE
6867	*FRAXINUS PENNSYLVANICA*	GREEN ASH	10	10	0	REMOVE
6868	*FRAXINUS PENNSYLVANICA*	GREEN ASH	10	10	0	REMOVE
6869	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	5	5	70	REMOVE
6870	*QUERCUS RUBRA*	NORTHERN RED OAK	30	30	72	REMOVE
6871	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	66	PRESERVE
6872	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	8	8	66	PRESERVE
6873	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	50	REMOVE
6874	*ACER SACCHARINUM*	SILVER MAPLE	36	36	72	REMOVE
6875	*UNIDENTIFIED*	DEAD TREE	12	12	0	REMOVE
6876	*QUERCUS ALBA*	WHITE OAK	40	40	66	PRESERVE
6877	*ACER RUBRUM*	RED MAPLE	32	32	63	PRESERVE
6878	*ULMUS AMERICANA*	AMERICAN ELM	5	5	72	REMOVE
6879	*ACER RUBRUM*	RED MAPLE	20	20	70	REMOVE
6880	*FRAXINUS PENNSYLVANICA*	GREEN ASH	24	24	0	REMOVE
6881	*ULMUS AMERICANA*	AMERICAN ELM	6	6	55	REMOVE
6882	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	6	6	69	REMOVE
6883	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	6	6	68	REMOVE
6884	*QUERCUS ALBA*	WHITE OAK	36	36	56	PRESERVE
6885	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	69	PRESERVE
6886	*FRAXINUS PENNSYLVANICA*	GREEN ASH	20	20	40	REMOVE
6887	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	5	5	68	REMOVE
6888	*QUERCUS RUBRA*	NORTHERN RED OAK	6	6	75	PRESERVE
6889	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	69	PRESERVE
6890	*FRAXINUS PENNSYLVANICA*	GREEN ASH	18	18	0	REMOVE
6891	*ACER RUBRUM*	RED MAPLE	30	30	65	PRESERVE
6892	*FRAXINUS PENNSYLVANICA*	GREEN ASH	22	22	0	REMOVE
6893	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	8	8	72	REMOVE
6895	*ACER RUBRUM*	RED MAPLE	6	6	55	REMOVE
6896	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	69	PRESERVE
6897	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	30	68	PRESERVE
6898	*MORUS ALBA*	WHITE MULBERRY	15	15	34	REMOVE
6899	*ACER RUBRUM*	RED MAPLE	8	8	71	REMOVE
6700	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	75	REMOVE
6803	*CEDRUS ATLANTICA*	ATLAS CEDAR	14	14	70	REMOVE
6804	*QUERCUS PALUSTRIS*	PIN OAK	22	22	74	REMOVE
6807	*THUJA SPP.*	ARBORVITAE	8	8	76	REMOVE
6808	*THUJA SPP.*	ARBORVITAE	8	8	72	REMOVE
6809	*THUJA SPP.*	ARBORVITAE	8	8	74	REMOVE
6810	*THUJA SPP.*	ARBORVITAE	10	10	75	REMOVE
6811	*THUJA SPP.*	ARBORVITAE	10	10	75	REMOVE
6812	*THUJA SPP.*	ARBORVITAE	10	10	75	REMOVE
6813	*THUJA SPP.*	ARBORVITAE	8	8	75	REMOVE
6814	*THUJA SPP.*	ARBORVITAE	8	8	75	REMOVE
6815	*THUJA SPP.*	ARBORVITAE	10	10	75	REMOVE
6816	*THUJA SPP.*	ARBORVITAE	8	8	75	REMOVE
6817	*THUJA SPP.*	ARBORVITAE	8	8	70	REMOVE
6818	*THUJA SPP.*	ARBORVITAE	8	8	69	REMOVE
6819	*THUJA SPP.*	ARBORVITAE	8	8	76	REMOVE
6820	*THUJA SPP.*	ARBORVITAE	8	8	75	REMOVE
6821	*THUJA SPP.*	ARBORVITAE	8	8	77	REMOVE
6822	*THUJA SPP.*	ARBORVITAE	8	8	72	REMOVE
6823	*THUJA SPP.*	ARBORVITAE	8	8	74	REMOVE
6824	*JUNIPERUS VIRGINIANA*	EASTERN REDCEDAR	12	12	66	REMOVE
6825	*JUNIPERUS VIRGINIANA*	EASTERN REDCEDAR	12	12	74	REMOVE
6826	*FRAXINUS PENNSYLVANICA*	GREEN ASH	16	16	65	REMOVE
6827	*PICEA ABIES*	NORWAY SPRUCE	22	22	72	REMOVE
6828	*JUNIPERUS VIRGINIANA*	EASTERN REDCEDAR	6	6	72	REMOVE
6829	*JUNIPERUS VIRGINIANA*	EASTERN REDCEDAR	5	5	74	REMOVE
6830	*JUNIPERUS VIRGINIANA*	EASTERN REDCEDAR	10	10	76	REMOVE
6831	*JUNIPERUS VIRGINIANA*	EASTERN REDCEDAR	10	10	71	REMOVE
6832	*JUNIPERUS VIRGINIANA*	EASTERN REDCEDAR	8	8	76	REMOVE
6833	*JUNIPERUS VIRGINIANA*	EASTERN REDCEDAR	10	10	76	REMOVE
6834	*CARYA CORDIFORMIS*	BITTERNUT HICKORY	22	22	71	REMOVE
6835	*ACER RUBRUM*	RED MAPLE	22	22	68	REMOVE
6836	*FRAXINUS PENNSYLVANICA*	GREEN ASH	6	6	68	REMOVE
6837	*ACER RUBRUM*	RED MAPLE	16	16	72	REMOVE
6838	*ACER RUBRUM*	RED MAPLE	10	10	63	REMOVE
6839	*ACER RUBRUM*	RED MAPLE	8	8	70	REMOVE
6840	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	16	16	72	REMOVE
6841	*ACER RUBRUM*	RED MAPLE	18	18	70	REMOVE
6842	*ACER RUBRUM*	RED MAPLE	16	16	75	REMOVE
6843	*ACER RUBRUM*	RED MAPLE	14	14	72	REMOVE
6844	*ACER RUBRUM*	RED MAPLE	16	16	41	REMOVE
6845	*ACER RUBRUM*	RED MAPLE	20	20	71	REMOVE
6846	*ACER RUBRUM*	RED MAPLE	24	24	59	REMOVE
6847	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	68	REMOVE
6848	*ACER RUBRUM*	RED MAPLE	26	26	53	REMOVE
6849	*ACER RUBRUM*	RED MAPLE	14	14	71	REMOVE
6850	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	16	16	53	REMOVE
6851	*ACER RUBRUM*	RED MAPLE	22	22	70	REMOVE
6852	*ACER RUBRUM*	RED MAPLE	28	28	56	REMOVE
6853	*ACER RUBRUM*	RED MAPLE	28	28	70	REMOVE
6854	*CATALPA SPECIOSA*	NORTHERN CATALPA	6	6	53	REMOVE
6855	*CATALPA SPECIOSA*	NORTHERN CATALPA	10	10	72	REMOVE
6856	*ACER RUBRUM*	RED MAPLE	14	14	38	REMOVE
6859	*SASSAFRAS ALBIDUM*	SASSAFRAS	12	12	50	REMOVE
6861	*FRAXINUS PENNSYLVANICA*	GREEN ASH	36	36	0	REMOVE
6865	*MORUS ALBA*	WHITE MULBERRY	12	12	50	REMOVE
6866	*ACER RUBRUM*	RED MAPLE	12	12	50	REMOVE
6867	*PINUS STROBUS*	WHITE PINE	24	24	70	REMOVE
6868	*ILEX OPACA*	AMERICAN HOLLY	16	16	71	REMOVE
6870	*ROBINIA PSEUDOACACIA*	BLACK LOCUST	14	14	38	REMOVE
6871	*SASSAFRAS ALBIDUM*	SASSAFRAS	12	12	70	REMOVE
6872	*QUERCUS RUBRA*	NORTHERN RED OAK	20	20	72	REMOVE
6873	*QUERCUS PALUSTRIS*	PIN OAK	20	20	70	REMOVE
6874	*ACER RUBRUM*	RED MAPLE	14	14	72	REMOVE
6876	*ACER RUBRUM*	RED MAPLE	10	10	72	REMOVE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
6877	*ACER RUBRUM*	RED MAPLE	16	16	68	REMOVE
6878	*ACER RUBRUM*	RED MAPLE	22	22	69	REMOVE
6880	*ACER RUBRUM*	RED MAPLE	22	22	72	REMOVE
6881	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	72	REMOVE
6882	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	36	36	72	REMOVE
6883	*PRUNUS SEROTINA*	BLACK CHERRY	20	20	65	REMOVE
6884	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	69	REMOVE
6886	*ACER RUBRUM*	RED MAPLE	24	24	66	REMOVE
6887	*QUERCUS PALUSTRIS*	PIN OAK	14	14	50	REMOVE
6888	*ACER RUBRUM*	RED MAPLE	5	5	66	REMOVE
6889	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	40	40	55	REMOVE
6890	*ACER RUBRUM*	RED MAPLE	12	12	63	REMOVE
6891	*ACER RUBRUM*	RED MAPLE	16	16	68	REMOVE
6892	*PRUNUS SEROTINA*	BLACK CHERRY	16	16	63	REMOVE
6893	*ACER RUBRUM*	RED MAPLE	8	8	60	REMOVE
6894	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	22	22	75	REMOVE
6895	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	16	16	70	REMOVE
6896	*ACER RUBRUM*	RED MAPLE	10	10	63	REMOVE
6897	*ACER RUBRUM*	RED MAPLE	10	10	70	REMOVE
6898	*ACER RUBRUM*	RED MAPLE	16	16	63	REMOVE
6899	*PICEA ABIES*	NORWAY SPRUCE	14	14	70	REMOVE
6900	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	69	REMOVE
6901	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	14	14	67	REMOVE
6902	*UNIDENTIFIED*	DEAD TREE	10	10	31	REMOVE
6903	*ACER RUBRUM*	RED MAPLE	14	14	40	REMOVE
6904	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	36	36	75	REMOVE
6905	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	30	69	REMOVE
6907	*ACER RUBRUM*	RED MAPLE	20	20	45	REMOVE
6908	*QUERCUS RUBRA*	NORTHERN RED OAK	36	36	66	REMOVE
6909	*MAGNOLIA GRANDIFLORA*	SOUTHERN MAGNOLIA	12	12	60	REMOVE
6910	*ILEX OPACA*	AMERICAN HOLLY	10	10	31	REMOVE
6911	*PICEA ABIES*	NORWAY SPRUCE	8	8	65	REMOVE
6912	*ACER RUBRUM*	RED MAPLE	18	18	28	REMOVE
6913	*PINUS STROBUS*	WHITE PINE	8	8	50	REMOVE
6914	*ACER RUBRUM*	RED MAPLE	30	30	66	REMOVE
6915	*ACER RUBRUM*	RED MAPLE	22	22	65	REMOVE
6916	*ACER RUBRUM*	RED MAPLE	16	16	59	REMOVE
6917	*ACER RUBRUM*	RED MAPLE	22	22	30	REMOVE
6918	*JUGLANS NIGRA*	BLACK WALNUT	16	16	50	REMOVE
6919	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	30	69	REMOVE
6921	*JUGLANS NIGRA*	BLACK WALNUT	18	18	67	REMOVE
6925	*ACER RUBRUM*	RED MAPLE	5	5	30	REMOVE
6926	*ACER RUBRUM*	RED MAPLE	8	8	59	REMOVE
6927	*UNIDENTIFIED*	DEAD TREE	12	12	0	REMOVE
6928	*ACER RUBRUM*	RED MAPLE	8	8	69	REMOVE
6929	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	72	REMOVE
6932	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	60	REMOVE
6933	*PINUS VIRGINIANA*	VIRGINIA PINE	14	14	60	REMOVE
6934	*ACER RUBRUM*	RED MAPLE	5	5	63	REMOVE
6935	*PRUNUS SEROTINA*	BLACK CHERRY	30	30	60	REMOVE
6936	*CATALPA SPECIOSA*	NORTHERN CATALPA	5	5	69	REMOVE
6937	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	30	71	REMOVE
6939	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	72	REMOVE
6940	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	71	REMOVE
6941	*ACER RUBRUM*	RED MAPLE	12	12	70	REMOVE
6942	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	74	REMOVE
6943	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	73	REMOVE
6944	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	75	REMOVE
6945	*UNIDENTIFIED*	DEAD TREE	8	8	0	REMOVE
6946	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	63	REMOVE
6947	*ACER RUBRUM*	RED MAPLE	8	8	65	REMOVE
6948	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	27	27	59	REMOVE
6949	*ACER RUBRUM*	RED MAPLE	24	24	68	REMOVE
6950	*ACER RUBRUM*	RED MAPLE	12	12	30	REMOVE
6951	*ACER RUBRUM*	RED MAPLE	14	14	70	REMOVE
6952	*ULMUS AMERICANA*	AMERICAN ELM	24	24	60	REMOVE
6953	*ACER RUBRUM*	RED MAPLE	6	6	60	REMOVE
6954	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	69	REMOVE
6955	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	70	REMOVE
6956	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	21	21	69	REMOVE
6957	*ACER RUBRUM*	RED MAPLE	5	5	45	REMOVE
6958	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	8	8	69	REMOVE
6959	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	8	8	68	REMOVE
6960	*ACER RUBRUM*	RED MAPLE	12	12	28	REMOVE
6964	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	8	8	75	REMOVE
6965	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	70	REMOVE
6966	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	72	REMOVE
6967	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	27	27	72	REMOVE
6968	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	63	REMOVE
6969	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	72	REMOVE
6970	*FRAXINUS PENNSYLVANICA*	GREEN ASH	18	18	0	REMOVE
6971	*ACER RUBRUM*	RED MAPLE	10	10	65	REMOVE
6972	*FRAXINUS PENNSYLVANICA*	GREEN ASH	10	10	0	REMOVE
6973	*FRAXINUS PENNSYLVANICA*	GREEN ASH	5	5	30	REMOVE
6974	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	30	66	REMOVE
6975	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	28	28	73	REMOVE
6976	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	8	8	72	REMOVE
6977	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	44	44	72	REMOVE
6978	*JUGLANS NIGRA*	BLACK WALNUT	12	12	66	REMOVE
6979	*CATALPA SPECIOSA*	NORTHERN CATALPA	10	10	40	REMOVE
6980	*MORUS ALBA*	WHITE MULBERRY	14	14	50	REMOVE
6982	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	69	REMOVE
6983	*PINUS VIRGINIANA*	VIRGINIA PINE	24	24	70	REMOVE
6984	*CATALPA SPECIOSA*	NORTHERN CATALPA	6	6	72	REMOVE
6985	*ACER RUBRUM*	RED MAPLE	36	36	65	REMOVE
6986	*PRUNUS SEROTINA*	BLACK CHERRY	8	8	63	REMOVE
6987	*QUERCUS PALUSTRIS*	PIN OAK	32	32	71	REMOVE
6988	*PRUNUS SEROTINA*	BLACK CHERRY	10	10	59	REMOVE
6989	*ACER RUBRUM*	RED MAPLE	8	8	67	REMOVE
6990	*ACER RUBRUM*	RED MAPLE	12	12	56	REMOVE
6991	*LAGERSTROEMIA SPP.*	CREPE MYRTLE	20	20	70	REMOVE
6992	*QUERCUS PALUSTRIS*	PIN OAK	8	8	72	REMOVE
6993	*ACER RUBRUM*	RED MAPLE	10	10	70	REMOVE
6994	*ILEX OPACA*	AMERICAN HOLLY	24	24	70	REMOVE
6996	*ULMUS AMERICANA*	AMERICAN ELM	6	6	53	REMOVE
6997	*FRAXINUS PENNSYLVANICA*	GREEN ASH	20	20	50	REMOVE
6998	*ACER RUBRUM*	RED MAPLE	26	26	63	REMOVE
7000	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	38	REMOVE
7002	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	75	REMOVE
7003	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	27	27	73	REMOVE
7004	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	72	REMOVE
7005	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	69	REMOVE
7006	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	8	8	69	REMOVE
7007	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	30	67	REMOVE
7008	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	75	REMOVE
7009	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	72	REMOVE
7010	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	66	REMOVE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
7011	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	40	40	69	REMOVE
7012	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	56	REMOVE
7014	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	30	69	REMOVE
7015	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	24	72	REMOVE
7016	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	30	66	REMOVE
7019	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	40	40	69	REMOVE
7020	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	36	36	69	REMOVE
7023	*ACER RUBRUM*	RED MAPLE	36	36	55	REMOVE
7027	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	70	PRESERVE
7030	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	66	PRESERVE
7031	*ULMUS AMERICANA*	AMERICAN ELM	15	15	67	PRESERVE
7032	*ULMUS AMERICANA*	AMERICAN ELM	12	12	66	PRESERVE
7033	*MORUS ALBA*	WHITE MULBERRY	8	8	50	REMOVE
7036	*ACER RUBRUM*	RED MAPLE	36	36	41	REMOVE
7037	*QUERCUS RUBRA*	NORTHERN RED OAK	12	12	68	PRESERVE
7038	*PRUNUS SEROTINA*	BLACK CHERRY	8	8	59	PRESERVE
7039	*PRUNUS SEROTINA*	BLACK CHERRY	5	5	60	PRESERVE
7040	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	5	5	44	PRESERVE
7042	*ACER RUBRUM*	RED MAPLE	8	8	59	REMOVE
7043	*QUERCUS RUBRA*	NORTHERN RED OAK	10	10	70	PRESERVE
7045	*QUERCUS RUBRA*	NORTHERN RED OAK	20	20	73	PRESERVE
7047	*FAGUS GRANDFOLIA*	AMERICAN BEECH	24	24	73	PRESERVE
7048	*QUERCUS RUBRA*	NORTHERN RED OAK	12	12	66	REMOVE
7201	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	59	REMOVE
7202	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	70	REMOVE
7203	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	25	25	68	REMOVE
7204	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	12	12	40	REMOVE
7205	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	69	REMOVE
7206	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	70	REMOVE
7207	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	69	REMOVE
7208	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	70	REMOVE
7209	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	67	REMOVE
7210	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	8	8	68	REMOVE
7211	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	16	16	67	REMOVE
7212	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	26	26	65	REMOVE
7213	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	22	22	60	REMOVE
7214	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	26	26	70	REMOVE
7215	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	26	26	67	REMOVE
7216	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	30	69	REMOVE
7217	*ACER RUBRUM*	RED MAPLE	10	10	67	REMOVE
7218	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	18	63	REMOVE
8000	*ACER RUBRUM*	RED MAPLE	2	2	70	PRESERVE
8001	*AMELANCHIER LAEVIS*	ALLEGHENY SERVICEBERRY	2	2	70	PRESERVE
8002	*PLATANUS OCCIDENTALIS*	AMERICAN SYCAMORE	2	2	70	PRESERVE
8003	*ILEX OPACA*	AMERICAN HOLLY	2	2	70	PRESERVE
8004	*ILEX OPACA*	AMERICAN HOLLY	2	2	70	PRESERVE
8005	*FAGUS GRANDIFOLIA*	AMERICAN BEECH	2	2	70	PRESERVE
8006	*PLATANUS OCCIDENTALIS*	AMERICAN SYCAMORE	2	2	70	PRESERVE
8007	*FAGUS GRANDIFOLIA*	AMERICAN BEECH	2	2	70	PRESERVE
8008	*FAGUS GRANDIFOLIA*	AMERICAN BEECH	2	2	70	PRESERVE
8009	*AMELANCHIER LAEVIS*	ALLEGHENY SERVICEBERRY	2	2	70	PRESERVE
8010	*PLATANUS OCCIDENTALIS*	AMERICAN SYCAMORE	2	2	70	PRESERVE

PLAN PREPARED BY LAURIE BETH DONNACHIE
ISA CERTIFIED ARBORIST NO. MA-5723A
SIGNATURE: Laurie B Donnachie DATE: 2020-04-10

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
LAURIE B. DONNACHIE
Lic. No. 0406001880
2020-04-10
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

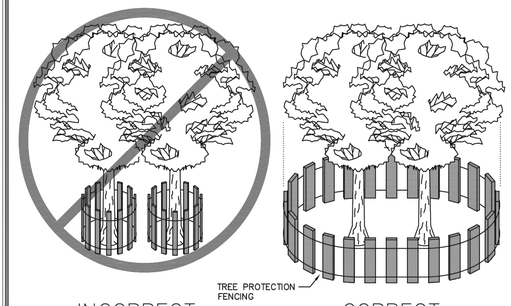
SHEET TITLE:

TREE MANAGEMENT SCHEDULE

SHEET No.
3C

SCALE: N/A

1. PROJECT NOTES
   1.1. THE REQUIREMENTS OF THE CITY OF FAIRFAX ZONING ORDINANCE AND PUBLIC FACILITIES MANUAL SHALL BE FOLLOWED.
   1.2. ALL TREE PRESERVATION ACTIVITIES SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION OF AN ISA CERTIFIED ARBORIST.
   1.3. ALL TREE WORK PERFORMED SHALL MEET OR EXCEED THE MOST RECENT INDUSTRY STANDARDS, AS PUBLISHED BY THE INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA).
2. PRE-CONSTRUCTION
   2.1. PRIOR TO THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL HAVE THE LIMITS OF CLEARING AND GRADING CLEARLY MARKED IN THE FIELD WITH FLAGGING. THESE LIMITS SHALL NOT EXCEED THOSE SHOWN ON THE APPROVED PLANS.
   2.2. AFTER LIMITS HAVE BEEN STAKED, THE CONTRACTOR SHALL REQUEST A PRE-CONSTRUCTION MEETING WITH CITY OF FAIRFAX AND PROJECT ARBORIST.
   2.3. DURING THE PRE-CONSTRUCTION MEETING, THE LIMITS MAY BE ADJUSTED TO BETTER PRESERVE OR REMOVE TREES IMPACTED BY CONSTRUCTION ACTIVITIES.
3. INSTALLATION OF TREE PROTECTION MEASURES
   3.1. ROOT PRUNING: PRIOR TO CONSTRUCTION, ROOT PRUNING SHALL BE COMPLETED AT THE LIMITS. ROOT PRUNING SHALL BE TO THE DEPTH OF EIGHTEEN (18) TO TWENTY-FOUR (24) INCHES AND SHALL BE ACCOMPLISHED BY USING A TRENCHER, VIBRATING PLOW OR BY HAND. TRENCH SHOULD BE IMMEDIATELY BACKFILLED WITH REMOVED SOIL. WHEN EXCAVATING ALL TREE ROOTS GREATER THAN 1 INCH IN DIAMETER THAT ARE EXPOSED AND/OR DAMAGED SHALL BE TRIMMED CLEANLY, AND COVERED WITH ORGANIC MULCH, TOPSOIL, OR OTHER SUITABLE MATERIAL TO PREVENT THE EXPOSED ROOTS FROM DRYING OUT.
   3.2. TREE PROTECTION FENCING: IMMEDIATELY FOLLOWING ROOT PRUNING, TREE PROTECTION FENCING SHALL BE COMPLETED AT THE LIMITS. TREE PROTECTION FENCING SHALL BE INSTALLED PER TREE PRESERVATION PLAN AND SHALL CONSIST OF EITHER OF THE FOLLOWING MATERIALS:
      3.2.1. FOURTEEN (14) GAUGE WELDED WIRE MESH THAT IS A MINIMUM OF FOUR (4) FOOT TALL. THE MESH SHALL BE ATTACHED TO SIX (6) FOOT TALL, TWO-INCH (2") STEEL U-CHANNEL ANCHOR POSTS DRIVEN EIGHTEEN (18) INCHES INTO THE GROUND. THE POSTS SHALL BE PLACED NO FURTHER THAN TEN (10) FEET APART.
      3.2.2. SUPER SILT FENCE
   3.3. TREE PROTECTION SIGNAGE: BILINGUAL SIGNS STATING "TREE PRESERVATION AREA - KEEP OUT" SHALL BE AFFIXED TO THE TREE PRESERVATION FENCE AT LEAST EVERY 50 FEET IMMEDIATELY FOLLOWING TREE PROTECTION FENCING INSTALLATION.
   3.4. CITY OF FAIRFAX SHALL BE NOTIFIED AND GIVEN THE OPPORTUNITY TO INSPECT THE SITE TO ASSURE THAT ALL TREE PROTECTION DEVICES HAVE BEEN CORRECTLY INSTALLED. IF IT IS DETERMINED THAT THE FENCING HAS NOT BEEN INSTALLED CORRECTLY, NO CONSTRUCTION ACTIVITIES SHALL OCCUR UNTIL THE FENCING IS INSTALLED CORRECTLY, AS DETERMINED BY CITY OF FAIRFAX .
   3.5. TREES BEING REMOVED SHALL NOT BE FELLED, PUSHED OR PULLED INTO TREE PRESERVATION AREAS. EQUIPMENT OPERATORS SHALL NOT CLEAN ANY PART OF THEIR EQUIPMENT BY SLAMMING AGAINST THE TRUNKS OF TREES TO BE RETAINED.
   3.6. TREES ON THE EDGE OF THE LIMITS OF CLEARING AND GRADING SHALL BE CUT DOWN BY HAND WITH A CHAIN SAW. REMAINING STUMPS SHALL EITHER BE LEFT IN PLACE OR GROUND DOWN WITH A STUMP GRINDER.
   3.7. TREES INDICATED WILL BE MULCHED WITH WOOD CHIPS GENERATED FROM ON SITE CLEARING OR TREE REMOVAL AND PRUNING OPERATIONS WHEN POSSIBLE. SHREDDED HARDWOOD MULCH FROM OFFSITE MAY BE UTILIZED IF APPROVED BY PROJECT ARBORIST. MULCH SHALL BE SPREAD IN A UNIFORM DEPTH OF THREE (3") INCHES BY HAND. MULCH SHALL BE PLACED IN AREAS AS INDICATED ON APPROVED PLANS.
4. CONSTRUCTION
   4.1. DURING CLEARING AND GRADING OPERATIONS AND THROUGHOUT CONSTRUCTION, NO ACTIVITY SHALL BE PERMITTED IN TREE SAVE AREAS WITHOUT AUTHORIZATION FROM OWNER, ARBORIST, OR CITY OF FAIRFAX . PRECLUDED ACTIVITIES INCLUDE:
      4.1.1. FELLING OF TREES INTO PRESERVATION AREAS OR OPERATION OF HEAVY MACHINERY IN SAVE AREAS TO FELL TREES ON THE PERIMETER OF PRESERVATION AREAS.
      4.1.2. OPERATION OF HEAVY EQUIPMENT OR MACHINERY OF ANY KIND IN PRESERVATION AREAS FOR ANY PURPOSE.
      4.1.3. PLACEMENT OF EXCESS SOIL, FILL, OR MATERIALS OF ANY KIND IN PRESERVATION AREAS.
      4.1.4. PLACEMENT OF ANY CONSTRUCTION MATERIALS OF ANY KIND IN PRESERVATION AREAS.
      4.1.5. PARKING OR STORING EQUIPMENT OR VEHICLES IN PRESERVATION AREAS.
      4.1.6. DUMPING CHEMICALS OR CONCRETE WASHOUT IN PRESERVATION AREAS.
      4.1.7. BURNING OF ANY MATERIAL OR DEBRIS IN PRESERVATION AREAS OR WITHIN 200 FEET OF PRESERVATION AREAS.
      4.1.8. TRENCHING, GRADING, EXCAVATING FOR ANY PURPOSE IN PRESERVATION AREAS.
   4.2. ALL EXISTING TRASH AND/OR DEBRIS ON SITE SHALL BE REMOVED AT THE TIME OF DISTURBANCE. INDIVIDUAL TREES AND FORESTED AREAS DESIGNATED TO BE PRESERVED SHALL BE PROTECTED AND MANAGED TO ENSURE TREE SURVIVAL DURING ALL PHASES OF DEMOLITION, CLEARING AND GRADING, AND CONSTRUCTION. IN ADDITION TO PROTECTING TREES, ALL UNDERSTORY PLANTS, LEAF LITTER AND SOIL CONDITIONS FOUND IN FORESTED AREAS DESIGNATED TO BE LEFT PRESERVED SHALL BE PROTECTED.
   4.3. TREES TO REMAIN LOCATED ALONG THE LIMITS OF CLEARING AND GRADING SHALL BE PRUNED DURING CLEARING OPERATIONS TO AVOID MECHANICAL DAMAGE. THIS SHALL BE ADMINISTRATED UNDER THE SUPERVISION OF AN ISA CERTIFIED ARBORIST.
   4.4. ANY DAMAGE INFLICTED TO THE ABOVE OR BELOW-GROUND PORTIONS OF THE TREES SHOWED TO BE PRESERVED SHALL BE REPAIRED IMMEDIATELY PER ISA STANDARDS.
   4.5. ALL PRUNING SHALL CONFORM TO THE LATEST EDITION OF ANSI A300 (PART 1) PRUNING STANDARDS. DISEASED LIMBS SHALL BE REMOVED OR TREATED AT THE DISCRETION OF THE ARBORIST. WHILE PRUNING, THE ARBORIST SHALL MAKE NOTE OF ANY CONDITIONS WHICH AFFECT THE HEALTH OR CONDITION OF THE TREE AND RECOMMEND CORRECTIVE TREATMENT FOR THESE CONDITIONS. VINE REMOVAL SHALL BE INCLUDED IN ALL PRUNING ACTIVITIES. UNDER NO CIRCUMSTANCES SHALL THE INTERIOR OF TREES BE STRIPPED OF FOLIAGE, SUCKERS, EPICORMIC BRANCHING, OR OTHER LIVE GROWTH. INTERIOR GROWTH MAY BE THINNED AS NECESSARY TO REMOVE BRANCHES DAMAGED DURING OPERATIONS. DEBRIS FROM PRUNING SHALL BE CHIPPED AND DEPOSITED INTO THE TREE SAVE AREA AND SPREAD BY HAND TO A UNIFORM THICKNESS OR BE REMOVED FROM SITE.

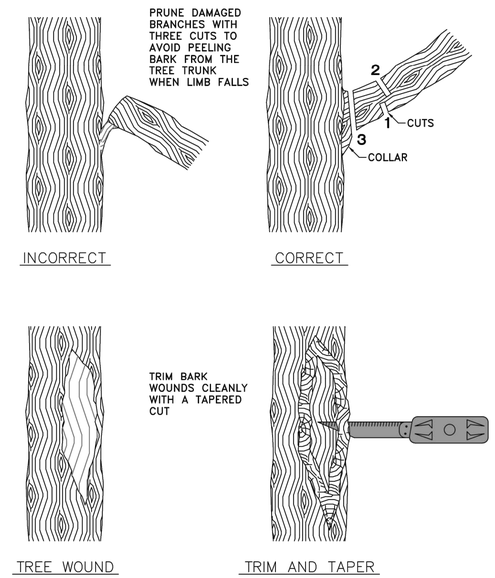


BARRIER INSTALLED AT THE DRIP LINE OF TREE BRANCHES

NOTES:

1. Precautions shall be taken to prevent and minimize damage to trees. In such cases repair any damage to crown, trunk or root system immediately.
   A. Repair roots by cleanly cutting off the damaged areas. Spread ~~peat moss~~ or moist topsoil over exposed roots.
   B. Repair damage to bark by trimming around the damaged area as shown in Detail 8.10. Taper the cut to provide drainage.
   C. Cut off damaged tree limbs above the tree collar at the trunk or main branch. Use three separate cuts as shown in Detail 8.10 to avoid peeling bark from healthy areas of tree.

Department of Public Works 10455 Armstrong Street Fairfax, VA 22030-3630	CITY of FAIRFAX USE WITH THE FAIRFAX STANDARD SPECIFICATIONS ONLY	Voice (703) 385-7810 FAX (703) 591-5727 www.fairfaxva.gov	
STANDARD TREE PROTECTION DETAIL	SCALE: Not To Scale	DETAIL # 8.09	
	REVISION DATE: December 2016	SHEET #: 1 of 2	



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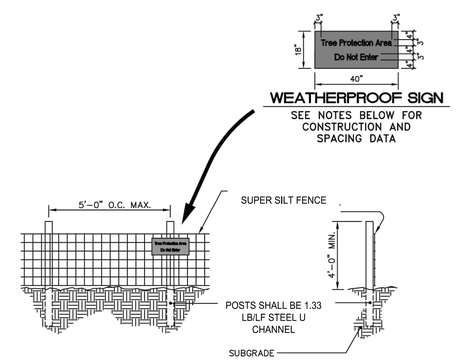
TREE SURGERY DETAIL	SCALE: Not To Scale	DETAIL # 8.10	
	REVISION DATE: December 2016	SHEET #: 1 of 1	



NOTES:

1. Install tree protection fence and signage prior to calling for the initial on site inspection by the City of Fairfax Inspector.
2. Warning signs shall be made of durable, weatherproof material.
3. Letters shall be 3" high minimum, clearly legible and spaced as detailed.
4. Signs shall be placed no greater than 50' on center or as approved.
5. For tree protection areas less than 200' in perimeter, provide no less than three signs per protected area.
6. Attach signs securely to fence posts and fabric.
7. Maintain tree protection fence throughout duration of project.
8. Additional signs may be required by City of Fairfax inspections based on actual field conditions.
9. No activity shall occur within the protected area including material storage, stockpiling, parking or any activity that may compact the ground or damage the trees.
10. The City reserves the right to require a 4' to 6' height chain link fencing for identified trees, such as specimen or champion trees, to maximize the protection of the tree and its critical root zone.

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STANDARD TREE PROTECTION DETAIL	SCALE: Not To Scale	DETAIL # 8.09	
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PLAN PREPARED BY LAURIE BETH DONNACHIE
ISA CERTIFIED ARBORIST NO. MA-5723A
SIGNATURE: Laurie B Donnachie DATE: 2020-04-10

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MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

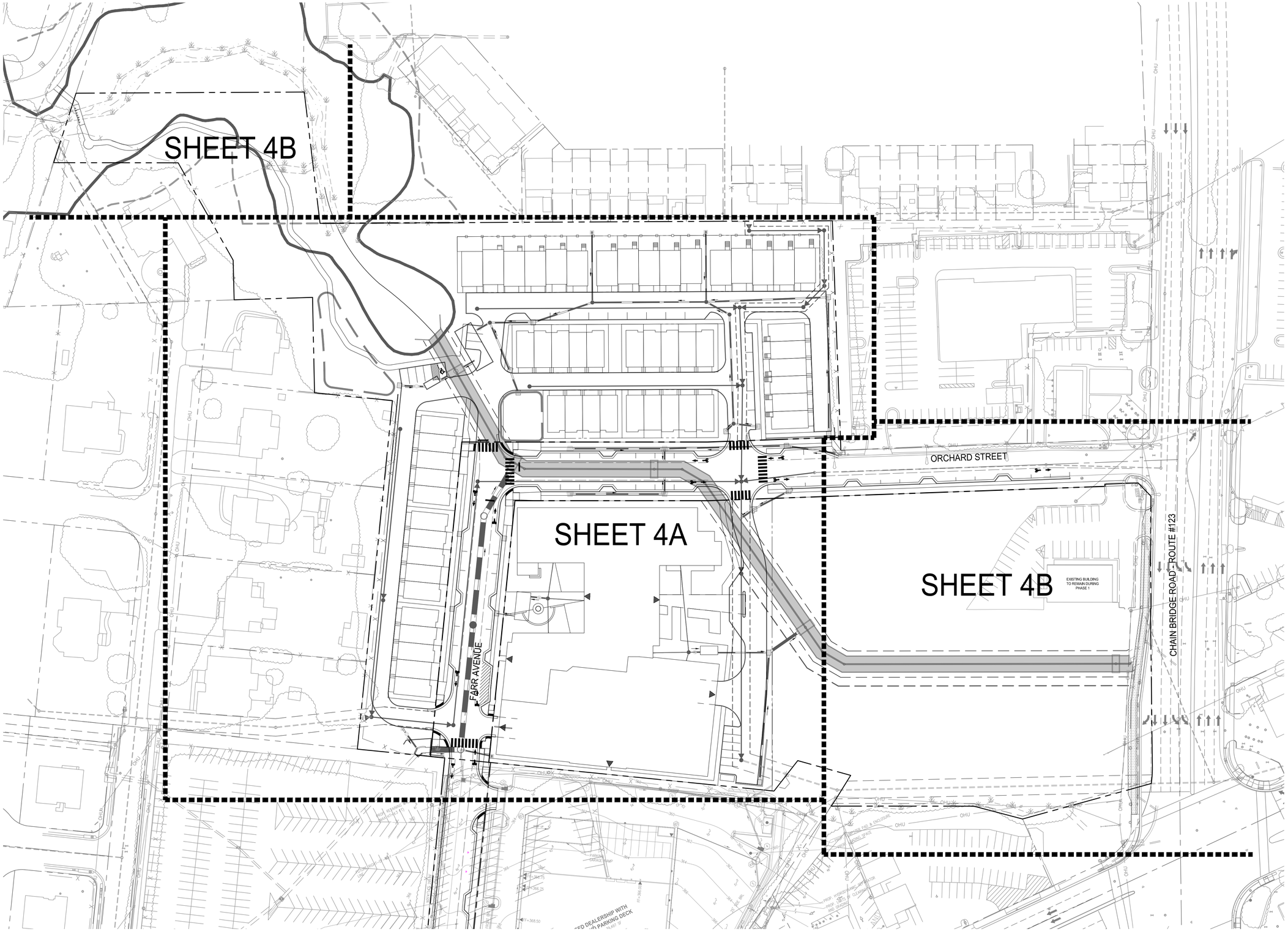
SHEET TITLE:

TREE MANAGEMENT NOTES & DETAILS

SHEET No.

3D

SCALE: N/A



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COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
4/10/20
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN

CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

OVERALL MASTER DEVELOPMENT PLAN

SHEET No.

4

SCALE: 1"=50'

MATCH LINE "A" - SEE SHEET 4B

RPA (POST-DEVELOPED)

SWALE CENTERLINE

PROP. TOWNHOUSES

TOWNHOUSE PARCEL ±4.94 ACRES

HYDRODYNAMIC SEPARATOR (BMP 5)

STORMFILTER (BMP 6)

APPROX. LOCATION OF BIKE RACKS

APPROXIMATE LOCATION OF AMENITY AREA

100-YR FLOODPLAIN

6' TRAIL

AMENITY AREA

PROP. 30' STM. ESMT.

HYDRODYNAMIC SEPARATOR (BMP 7)

STORMFILTER (BMP 8)

PROP. RETAINING WALL

19' ALLEY

4' LINEAR PARK PLANTER STRIP

6' SIDEWALK

ORCHARD STREET

5' BIKE LANE

PROP. TWIN 8'X8' BOX CULVERT

FARR AVENUE

FARR AVENUE TO BE DESIGNED AND CONSTRUCTED BY OTHERS

GREENROOF

PROPOSED BUILDING

HYDRODYNAMIC SEPARATOR (BMP 1)

STORMFILTER (BMP 2)

SENIOR LIVING PARCEL ±2.24 ACRES

COVERED WALK

HYDRODYNAMIC SEPARATOR (BMP 3)

STORMFILTER (BMP 4)

PARKING GARAGE ENTRANCE

LOADING SPACE

HYDRODYNAMIC SEPARATOR (BMP 9)

EX. 20' SANITARY SEWER EASEMENT DB 986 PG 542

PROP. 20' SAN. ESMT.

SEE NOTE BELOW ABOUT PROPOSED STORM CONNECTION AT THIS LOCATION

BROWN'S FAIRFAX MAZDA PROPOSED DEVELOPMENT (SUP SUB 01-20191106)

POTENTIAL FUTURE ALIGNMENT OF SANITARY SEWER

PROP. 10' SAN. ESMT.

VIRGINIA STATE GRID NORTH NAD 83

MATCH LINE "B" - SEE SHEET 4B

NOTE: THE CONNECTION TO THE STORM OUTFALL AT EX. 769 CAN BE REVISED TO A MANHOLE CONNECTION IF AN OFFSITE CONSTRUCTION EASEMENT IS GRANTED BY THE ADJACENT PROPERTY OWNER.

HORIZONTAL GRAPHIC SCALE 1" = 30'

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CHECKED: KMW

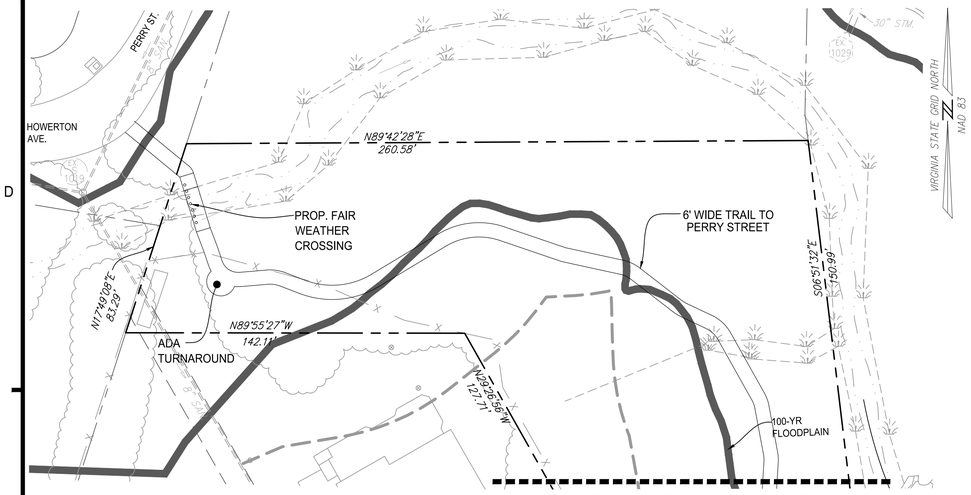
SHEET TITLE:

MASTER DEVELOPMENT PLAN

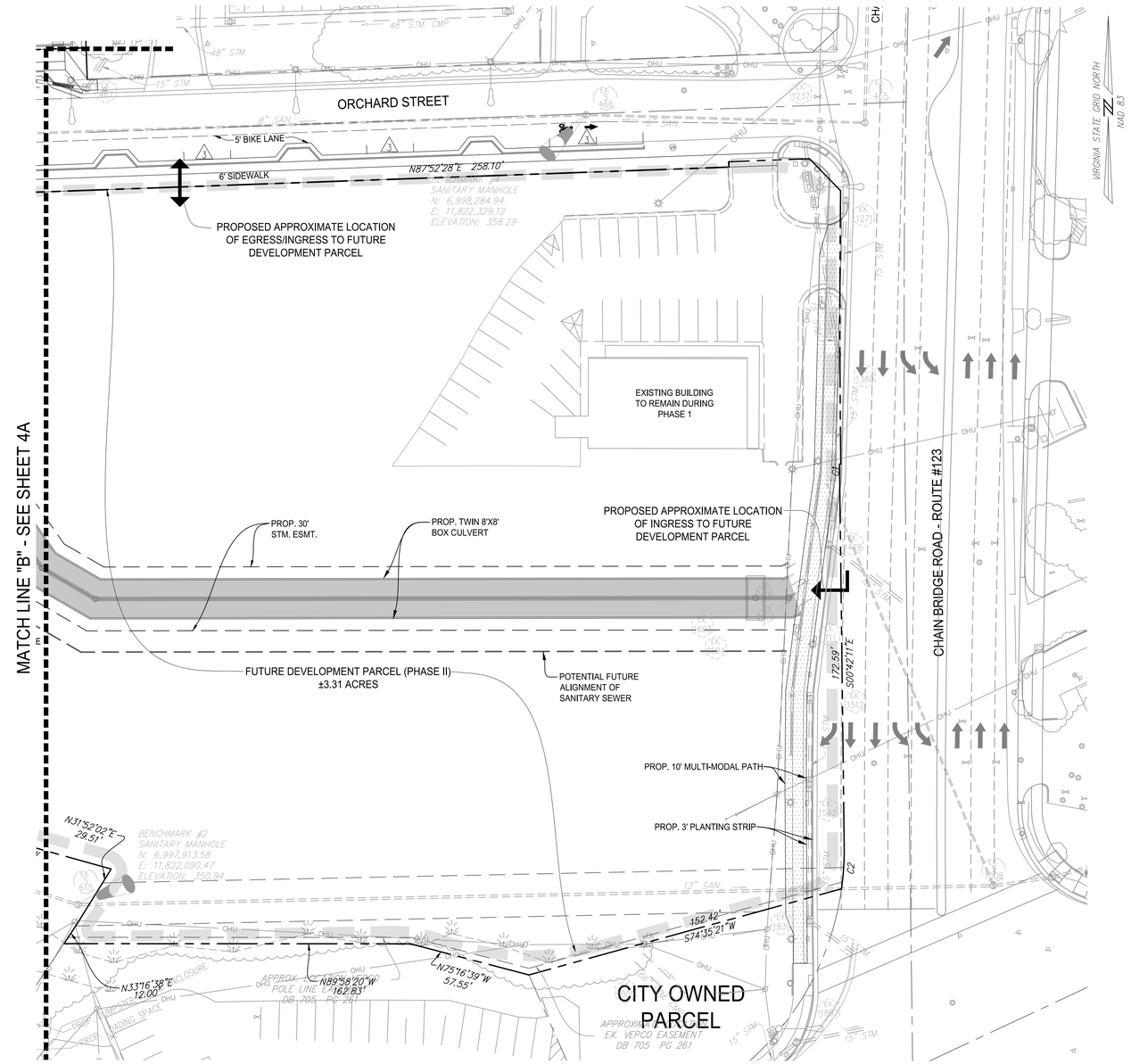
SHEET No.

4A

SCALE: 1"=30'



MATCH LINE "A" - SEE SHEET 4A



PROPOSED TABULATIONS FOR DEVELOPMENT PROGRAM

SITE AREA
REQUIRED: 2 ACRES (PD-M)
PROVIDED:
GROSS SITE AREA ±11.46 AC (±499,245 SF) TOTAL SITE AREA + VACATED ORCHARD STREET ROW
LESS DEDICATION ±0.97 AC (±42,215 SF) TOTAL AREA OF ORCHARD STREET AND FARR AVENUE EXTENSION DEDICATED
INCLUDES THE FOLLOWING:
ORCHARD STREET TO BE DEDICATED ±0.02 AC (±787 SF)
FARR AVENUE EXTENSION TO BE DEDICATED ±0.95 AC (±41,428 SF)
ADJUSTED SITE AREA ±10.49 AC (±457,030 SF) USED FOR ALL ZONING CALCULATIONS IN THIS MDP
INCLUDES THE FOLLOWING:
TOWNHOUSE PARCEL ±4.94 AC (±215,104 SF)
SENIOR LIVING PARCEL ±2.24 AC (±97,563 SF)
FUTURE DEVELOPMENT PARCEL ±3.31 AC (±144,363 SF)

DENSITY
PERMITTED: NO REQUIREMENT
PROVIDED: TOWNHOUSE PARCEL = 11.34 DU/AC (56 TOWNHOUSES / 4.94 AC = 11.34 DU/AC)
SENIOR LIVING = 200 UNITS (244 BEDS)
FUTURE DEVELOPMENT PARCEL = TO BE DETERMINED
NOTE: NO DENSITY CREDIT HAS BEEN TAKEN DUE TO FUTURE DEVELOPMENT PARCEL

BUILDING HEIGHT
PERMITTED: NO REQUIREMENT
PROVIDED: TOWNHOUSES = 44'
SENIOR LIVING BUILDING = 78'
FUTURE PARCEL = TO BE DETERMINED

BUILDING COVERAGE
PERMITTED: 80% MAXIMUM
PROVIDED: TOWNHOUSES = 23% (PER ±4.94 AC TOWNHOUSE PARCEL)
SENIOR LIVING BUILDING = 57% (PER ±2.24 AC SENIOR LIVING PARCEL)
FUTURE PARCEL = TO BE DETERMINED

SIDEWALK
REQUIRED: 5'
PROVIDED: 5' MINIMUM WITHIN TOWNHOUSE AND SENIOR LIVING PARCELS
6' ALONG ORCHARD STREET & FARR AVENUE

OPEN SPACE
REQUIRED: 20% (PD-M)
PROVIDED: SEE SHEET 7 FOR CALCULATIONS

TREE CANOPY
REQUIRED: 10% (PD-M)
PROVIDED: SEE SHEET 6A FOR CALCULATIONS

OFF-STREET PARKING
REQUIRED: SEE CHART BELOW
PROVIDED: SEE CHART BELOW

PROPOSED PARKING TABULATION

PROPOSED USE			REQUIRED PARKING SPACES		PARKING SPACES PROVIDED
TOWNHOUSES		56 UNITS	2.0 SPACES PER UNIT	112 SPACES	112 GARAGE SPACES 22 SURFACE SPACES
SENIOR LIVING	INDEPENDENT LIVING	114 UNITS	1.5 SPACES PER UNIT	171 SPACES	120 GARAGE SPACES
	ASSISTED LIVING / MEMORY CARE	92 BEDS	1.0 SPACE PER 4 BEDS	23 SPACES	
TOTAL PARKING				**283 SPACES**	**254 SPACES**

NOTES
(1) PARKING REQUIRED AND PROVIDED FOR THE FUTURE DEVELOPMENT PARCEL TO BE DETERMINED.
(2) AN ADDITIONAL 39 STREET SPACES ARE PROVIDED IN THE PUBLIC ROW ALONG ORCHARD STREET AND FARR AVENUE.
(3) SEE SHEET 1 FOR PARKING REDUCTION MODIFICATION REQUEST.

LOADING SPACES
REQUIRED: 2 SPACES
PROVIDED: 1 SPACE

NOTES:
(1) LOADING SPACES ONLY REQUIRED FOR SENIOR LIVING BUILDING
(2) SEE SHEET 1 FOR MODIFICATION REQUEST

BICYCLE PARKING
REQUIRED: 11 SPACES
PROVIDED: 11 SPACES

NOTES:
(1) REQUIRED BICYCLE PARKING TO BE PROVIDED IN THE SENIOR LIVING BUILDING PARKING GARAGE PER ZO 4.2.8.
(2) BICYCLE PARKING NOT REQUIRED FOR TOWNHOUSE USE. SEE SHEET 4A FOR APPROXIMATE LOCATION OF BIKE RACKS NEAR PUBLIC TRAIL

FUTURE DEVELOPMENT PARCEL PERMITTED USES:
SUBJECT TO APPROVAL OF AN AMENDED MASTER DEVELOPMENT PLAN, USES PERMITTED ON THE FUTURE DEVELOPMENT PARCEL SHALL INCLUDE ALL USES PERMITTED IN THE PD-M (PLANNED DEVELOPMENT MIXED USE) DISTRICT, AS MORE SPECIFICALLY DEFINED IN SECTION 3.8.4 OF THE ZONING ORDINANCE OF THE CITY OF FAIRFAX, EXCEPT FOR THE FOLLOWING PERMITTED USES, WHICH ARE SPECIFICALLY EXCLUDED:

- CEMETERIES
- DETENTION FACILITIES OR JAILS
- ADULT USES
- BUILDING SUPPLIES AND LUMBER SALES
- FUEL STATIONS
- VEHICLE REPAIRS
- VEHICLE SALES AND LEASING
- VEHICLE SERVICE

ADDITIONALLY, PERMITTED USES ON THE FUTURE DEVELOPMENT PARCEL SHALL INCLUDE ANY PERMITTED TEMPORARY USES, INCLUDING TEMPORARY VEHICLE STORAGE.

INTERIM USES MAY INCLUDE: FENCING, LANDSCAPING, OR SEEDING/SOD

ADJACENT PROJECT NARRATIVE:
AT THE TIME OF THIS REZONING APPLICATION THERE ARE TWO PROJECTS IN THE IMMEDIATE VICINITY THAT IMPACT THIS DEVELOPMENT AND REQUIRE COORDINATION. BROWN'S MAZDA, LOCATED SOUTH OF THE SUBJECT SITE HAS SUBMITTED A SPECIAL USE PERMIT TO ALLOW FOR A NEW DEALERSHIP WITH AN ABOVE GROUND PARKING DECK. THE CITY IS IN THE PROCESS OF DESIGNING A NEW PUBLIC ROAD (FARR AVENUE) THAT WILL CONNECT FAIRFAX BOULEVARD TO ORCHARD STREET. IN ORDER FOR BOTH OF THE PROJECTS TO MOVE FORWARD TO CONSTRUCTION, THE SUBJECT SITE WILL NEED TO BE REZONED AND RE-DEVELOPED.

STORMWATER MANAGEMENT & BEST MANAGEMENT PRACTICE (SWM/BMP) NARRATIVE

ADEQUATE OUTFALL
THE EXISTING SITE MAINLY DISCHARGES RUNOFF TO A STREAM THAT BISECTS THE PROPERTY AND FLOWS TO A TWIN BOX CULVERT THAT CROSSES BENEATH CHAIN BRIDGE ROAD.

THE MAJOR OUTFALL FOR THE SITE IS THE PROPOSED TWIN BOX CULVERT. THIS CULVERT FLOWS FROM WEST TO EAST AND CONNECTS TO THE EXISTING TWIN BOX CULVERT THAT CROSSES BENEATH CHAIN BRIDGE ROAD AND ULTIMATELY FLOWS TO ACCOTINK CREEK.

SWM
WATER QUANTITY FOR THIS PROJECT WILL BE PROVIDED IN ACCORDANCE WITH STATE CODE 9VAC25-870-66-WATER QUANTITY AND THE CITY OF FAIRFAX STORMWATER ORDINANCE.

THE WATER QUANTITY REQUIREMENTS WILL BE MET BY DISCHARGING STORMWATER INTO A MANMADE SYSTEM THAT DOES NOT CAUSE EROSION TO THE SYSTEM FOR THE TWO-YEAR STORM (CHANNEL PROTECTION) AND CONFINES THE STORMWATER RUNOFF DURING A 10-YEAR STORM (FLOOD PROTECTION). THE EXTENT OF THE REVIEW WILL BE THE TWIN BOX CULVERT, PRIOR TO ITS OUTFALL AT ACCOTINK CREEK. IF IT IS DETERMINED DURING THE FINAL SITE PLAN THAT DETENTION IS REQUIRED, THEN STORMWATER VAULTS OR ARCHED PIPES WILL BE USED TO MANAGE THE STORMWATER RUNOFF.

BMP
THIS PROJECT WILL USE THE VIRGINIA RUNOFF REDUCTION METHOD (VRRM) REDEVELOPMENT TO MEET THE STATE, PART IIB CRITERIA (9VAC25-870-65) AND CITY WATER QUALITY DESIGN CRITERIA. THE PROJECT SITE AREA FOR WATER QUALITY CALCULATIONS WILL INCLUDE ALL AREA WITHIN THE LIMITS OF CLEARING AND GRADING (EXCLUDING THE RIGHT-OF-WAY OF FARR AVENUE TO BE DEVELOPED BY OTHERS). TO MEET WATER QUALITY DESIGN CRITERIA AND PHOSPHORUS REMOVAL, A COMBINATION OF PROPRIETARY BMP FACILITIES WILL BE USED. THESE FACILITIES MAY INCLUDE; HYDRODYNAMIC SEPARATORS, FILTERRAS AND/OR STORMFILTERS. ADDITIONAL PROPRIETARY AND NON-PROPRIETARY BMP FACILITIES MAY BE USED AS THE DESIGN OF THE SITE DEVELOPS FURTHER. PRELIMINARY LOCATIONS ARE SHOWN ON THE DEVELOPMENT PLAN.

THE BMP FACILITIES FOR THE FUTURE DEVELOPMENT PARCEL WILL BE DESIGNED ONCE THE LAYOUT AND PROGRAMING OF THAT PARCEL IS COMPLETE. THE OVERALL SITE WILL BE IN COMPLIANCE WITH THE CITY AND STATE REQUIREMENTS.

NOTE:
LOCATIONS AND SIZING OF SWM/BMP FACILITIES SHOWN ARE BASED ON A PRELIMINARY STUDY TO ENSURE COMPLIANCE WITH STATE AND CITY REQUIREMENTS; THE LOCATION AND TYPE OF FACILITY IS SUBJECT TO CHANGE WITH FINAL DESIGN.

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

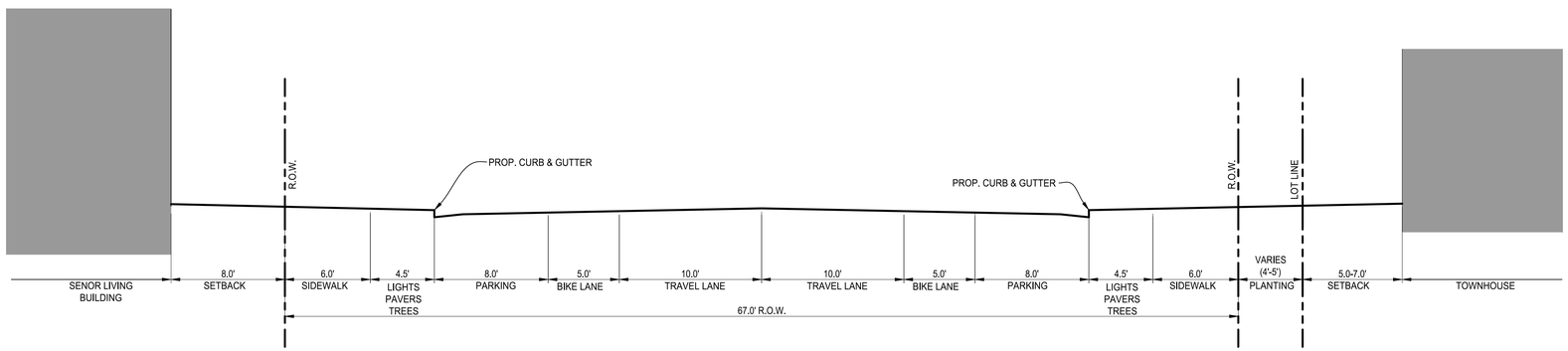
MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:
MASTER DEVELOPMENT PLAN

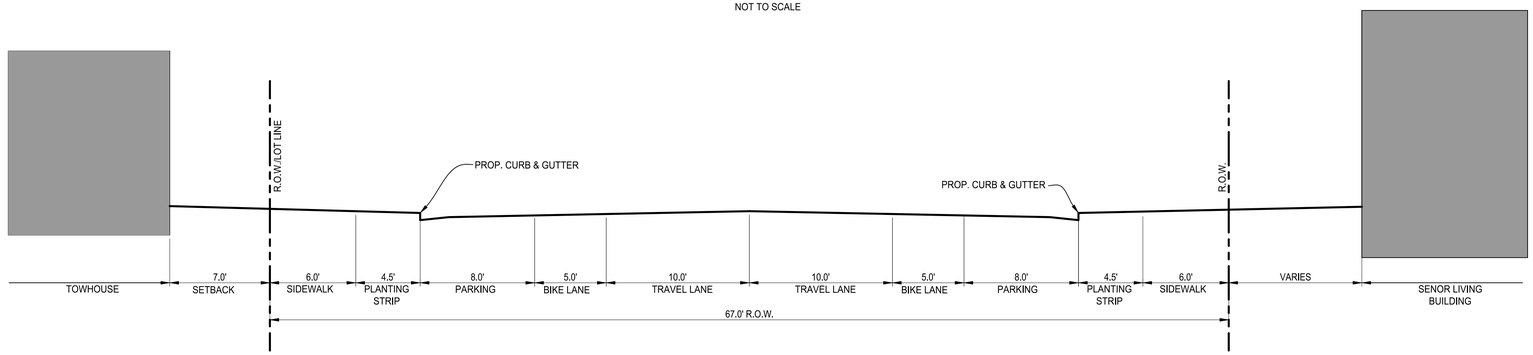
SHEET No.
4B

SCALE: 1"=30'



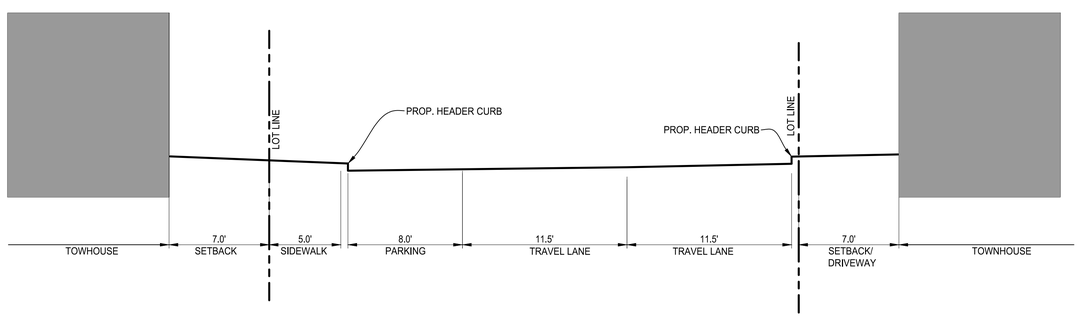
ORCHARD STREET TYPICAL SECTION

NOT TO SCALE



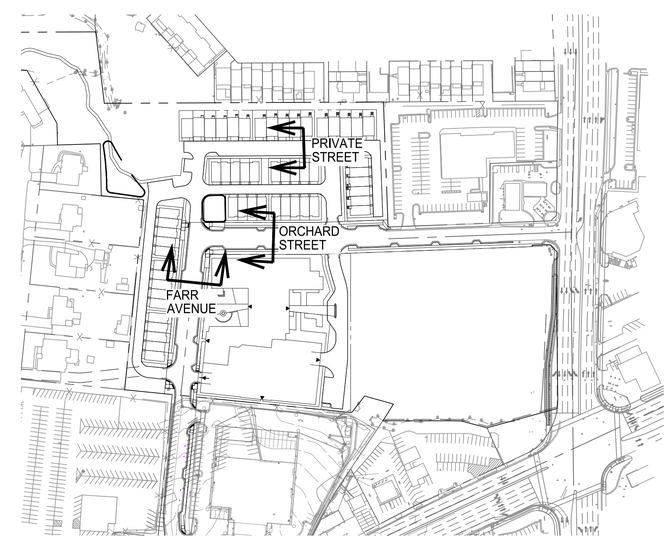
FARR AVENUE TYPICAL SECTION

NOT TO SCALE



PRIVATE STREET TYPICAL SECTION

NOT TO SCALE



KEY MAP

NOT TO SCALE

christopher consultants
9900 main st
suite 400
fairfax, va 22031
p 703.273.6820
engineering surveying land planning

COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
4/10/20
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
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DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

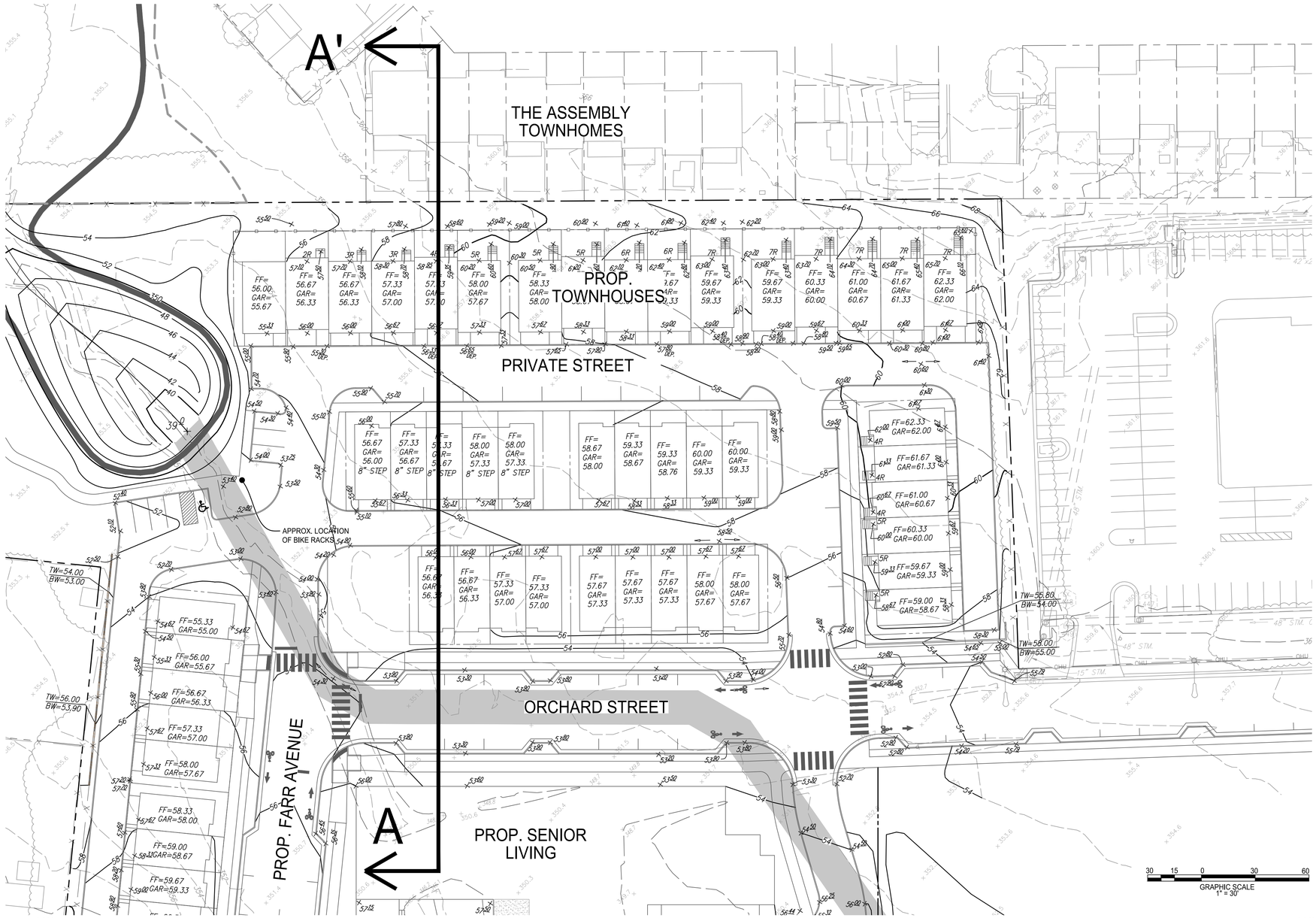
SHEET TITLE:

STREET SECTIONS

SHEET No.

4C

SCALE: SEE DWGS.



NOTES:

1. EXISTING OFFSITE RESIDENCES ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL HEIGHT OF RESIDENCES ARE SUBJECT TO SITE SURVEYING.
2. PROPOSED SIGHT LINE (VIEWSHED) FROM PEDESTRAIN VANTAGE POINT (EYE LEVEL IS 5'-6" ABOVE FLOOR LEVEL FOR A 6'-0" EXAMPLE PERSON)

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4/10/20
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

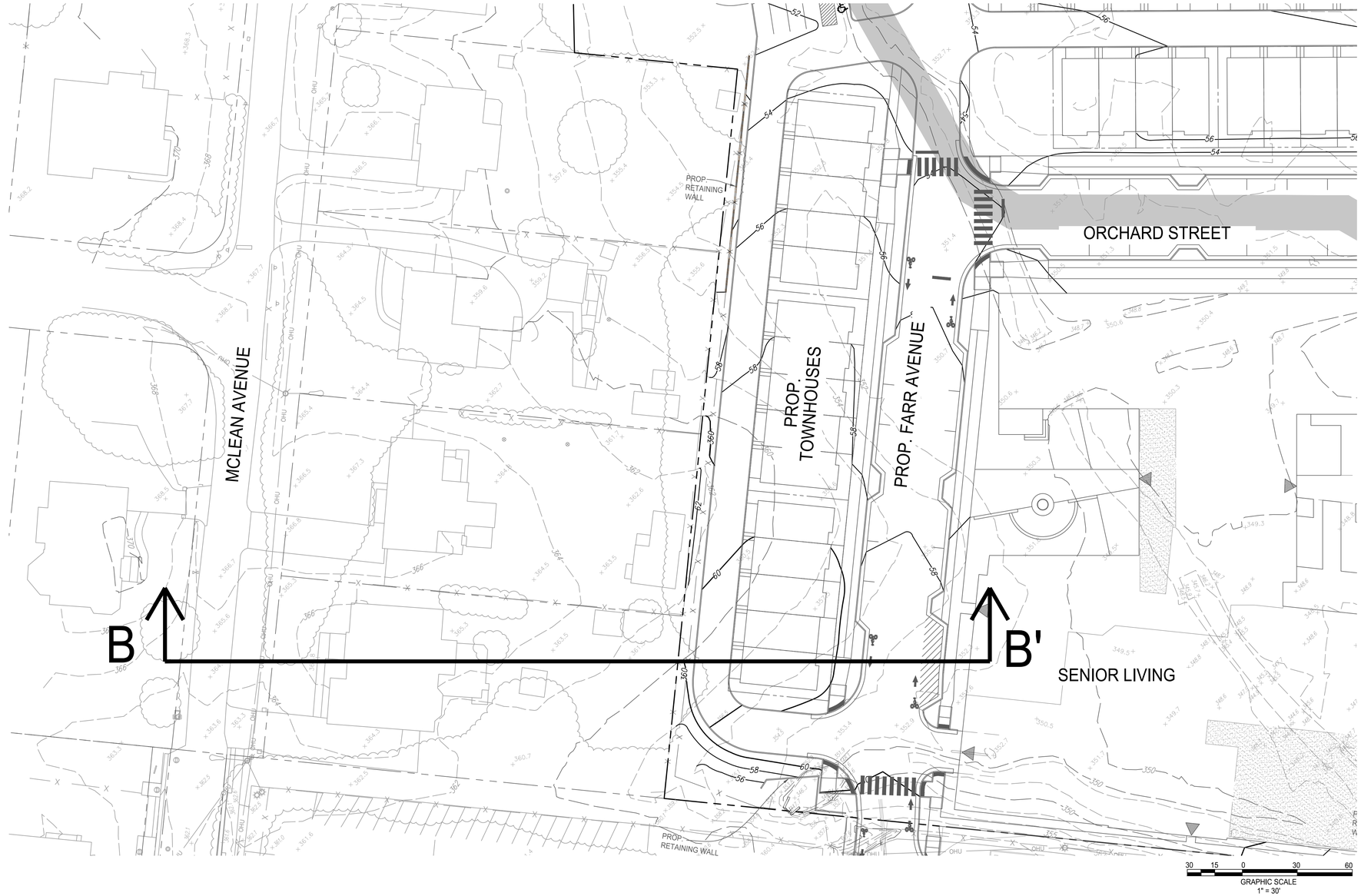
SHEET TITLE:

SECTION A-A'

SHEET No.

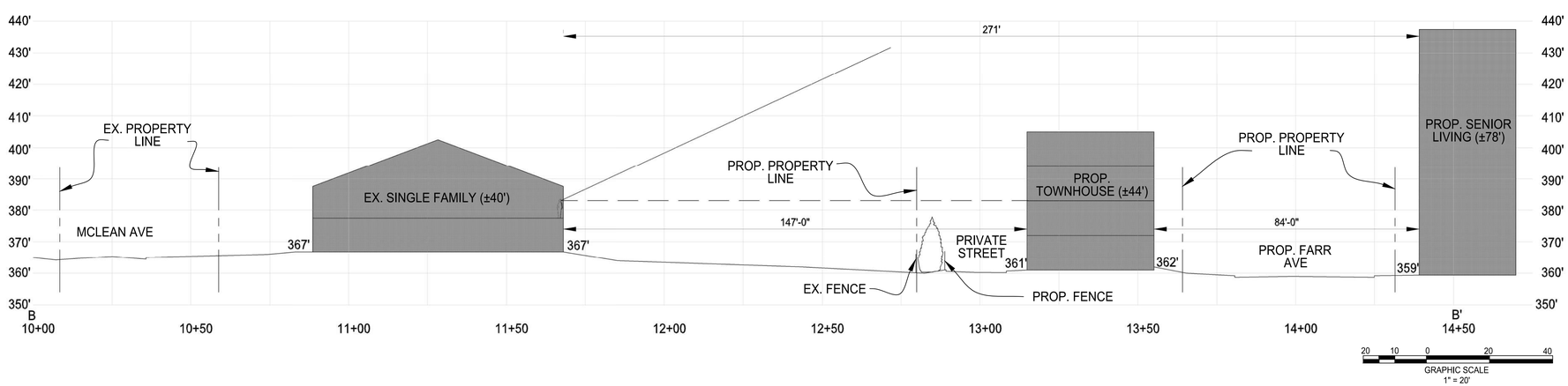
4D

SCALE: SEE DWGS.



NOTES:

1. EXISTING OFFSITE RESIDENCES ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL HEIGHT OF RESIDENCES ARE SUBJECT TO SITE SURVEYING.
2. PROPOSED SIGHT LINE (VIEWSHED) FROM PEDESTRAIN VANTAGE POINT (EYE LEVEL IS 5'-6" ABOVE FLOOR LEVEL FOR A 6'-0" EXAMPLE PERSON)



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NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

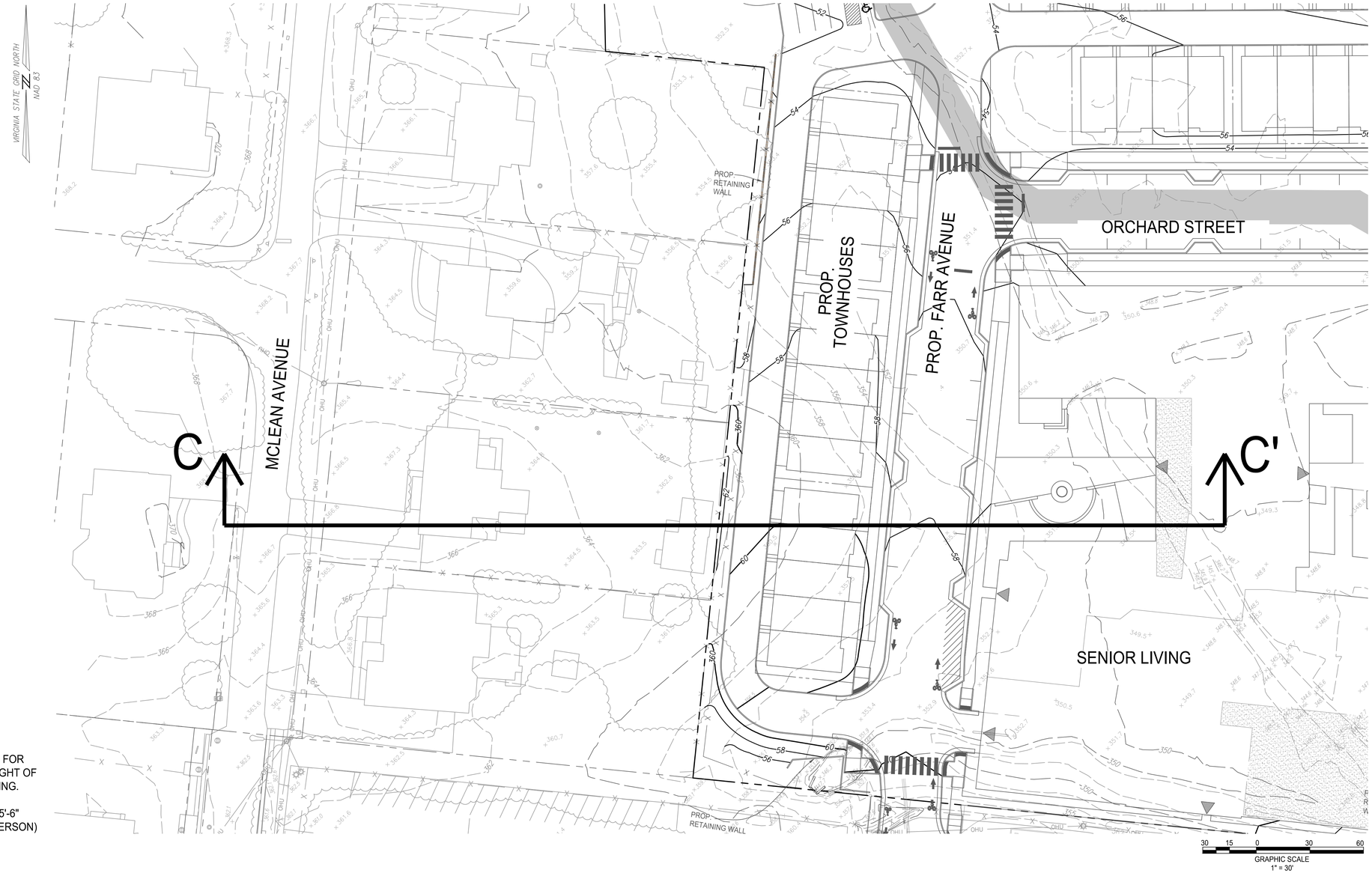
SHEET TITLE:

SECTION B-B'

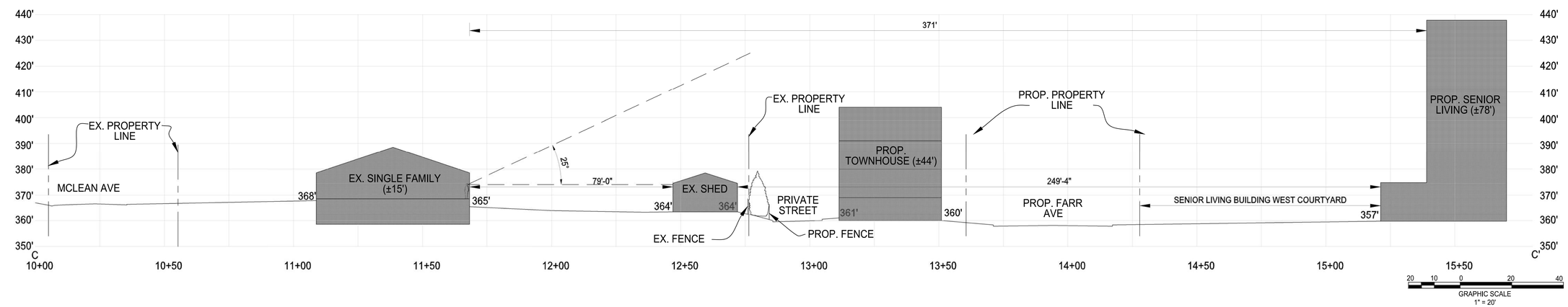
SHEET No.

4E

SCALE: SEE DWGS.



NOTES:
1. EXISTING OFFSITE RESIDENCES ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL HEIGHT OF RESIDENCES ARE SUBJECT TO SITE SURVEYING.
2. PROPOSED SIGHT LINE (VIEWSHED) FROM PEDESTRAIN VANTAGE POINT (EYE LEVEL IS 5'-6" ABOVE FLOOR LEVEL FOR A 6'-0" EXAMPLE PERSON)



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NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

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DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

SECTION C-C'

SHEET No.

4F

SCALE: SEE DWGS.

TYPICAL TOWNHOUSE LOT DETAILS

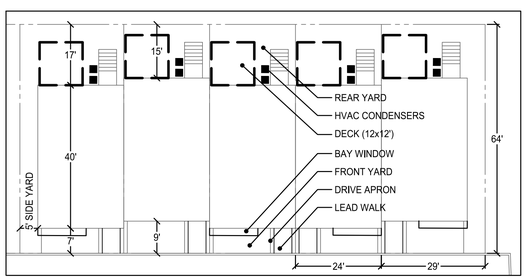
NOTE: NUMBER CORRESPONDS TO THE UNIT TYPES NOTED ON THE PLAN

KEY MAP

SCALE: 1" =100'

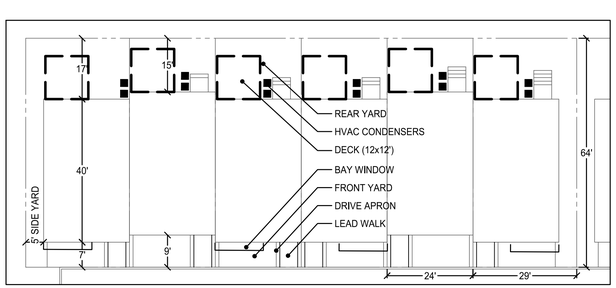
100 50 0 100 200
HORIZONTAL GRAPHIC SCALE
1" = 100'

20 10 0 20 40
HORIZONTAL GRAPHIC SCALE
1" = 20'



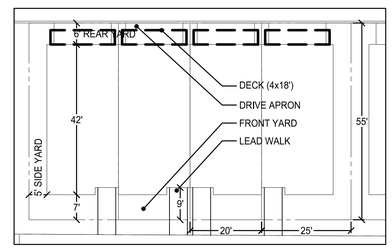
1 - FRONT ENTRY GARAGE TOWNHOUSES

SCALE: 1" =20'



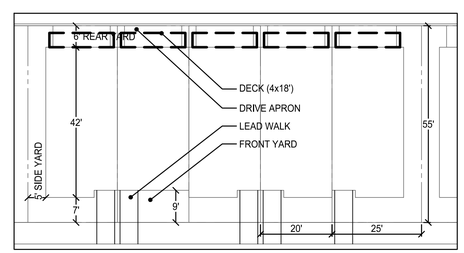
2 - FRONT ENTRY GARAGE TOWNHOUSES

SCALE: 1" =20'



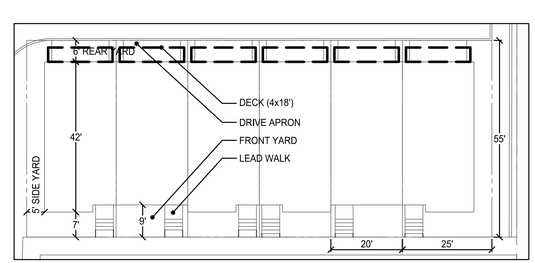
3 - REAR ENTRY GARAGE TOWNHOUSES

SCALE: 1" =20'



4 - REAR ENTRY GARAGE TOWNHOUSES

SCALE: 1" =20'

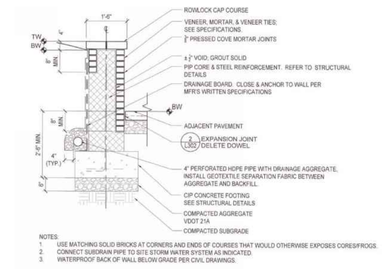


5 - REAR ENTRY GARAGE TOWNHOUSES

SCALE: 1" =20'

TOWNHOUSE PRIVACY FENCE & RETAINING WALL DETAILS

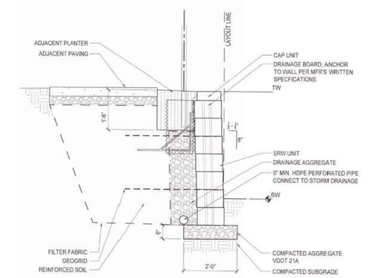
NOTE: THESE DETAILS ARE PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY. DETAILS TO BE FINALIZED AT TIME OF SITE PLAN.



NOTES:
1. USE MATCHING SOLID BRICKS AT CORNERS AND ENDS OF COURSES THAT WOULD OTHERWISE EXPOSES CORES/FROGS.
2. CONNECT SUBDRAIN PIPE TO SITE STORM WATER SYSTEM AS INDICATED.
3. WATERPROOF BACK OF WALL BELOW GRADE PER CIVIL DRAWINGS.

1 SITE WALL

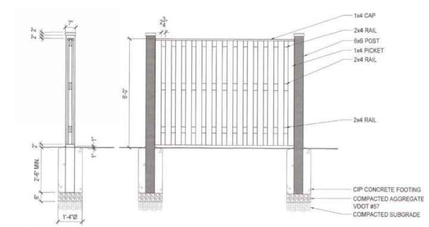
3/4" = 1'-0"



NOTES:
1. REFER TO STRUCTURAL DETAILS FOR GEOGRID, REINFORCED SOIL, AND ADDITIONAL REQUIREMENTS.

2 SEGMENTAL RETAINING WALL

3/4" = 1'-0"



NOTES:
1. ALL FASTENERS AND HARDWARE TO BE STAINLESS STEEL OR HOT-DIPPED GALVANIZED.
2. INSTALL POSTS AND PLANKS PLUMB. IPROVIDE DIMENSIONED POST SPACING LAYOUT WITH SHOP DRAWINGS. NOTE LOCATIONS AND DIMENSIONS OF ANY RECOMMENDED ADJUSTMENTS.
3. PROVIDE MOCKUP FOR REVIEW, ADJUSTMENT, AND APPROVAL BY ARCHITECT AND OWNER TO VERIFY WORKMANSHIP, MATERIALS, AND ORIENTATION PRIOR TO CONSTRUCTION.

3 WOOD FENCE

1/2" = 1'-0"

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4/10/20
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:

TOWNHOUSE SITE DETAILS

SHEET No.

4G

SCALE: SEE DWGS.

MATCH LINE "A" - SEE SHEET 5A

MATCH LINE "B" - SEE SHEET 5A

RPA (POST-DEVELOPED)

SWALE CENTERLINE

BENCHMARK #3 SANITARY MANHOLE N=4,338,425.38 E=7,921,330.31 ELEVATION: 364.41

100-YR FLOODPLAIN

6' TRAIL

APPROXIMATE LOCATION OF AMENITY AREA

HYDRODYNAMIC SEPARATOR (BMP 5)

TOWNHOUSE PARCEL ±4.94 ACRES

PROP. TOWNHOUSES

SIDEWALK

5' SIDEWALK

STORMFILTER (BMP 6)

APPROX. LOCATION OF BIKE RACKS

PROP. 30' STM. ESMT.

HYDRODYNAMIC SEPARATOR (BMP 7)

STORMFILTER (BMP 8)

PROP. RETAINING WALL

4' LINEAR PARK PLANTER STRIP

ORCHARD STREET

5' BIKE LANE

PROP. TWIN 8'X8' BOX CULVERT

FARR AVENUE

6' SIDEWALK

FARR AVENUE TO BE DESIGNED AND CONSTRUCTED BY OTHERS

GREENROOF

PROPOSED BUILDING FF=357.50

COVERED WALK

HYDRODYNAMIC SEPARATOR (BMP 1)

STORMFILTER (BMP 2)

SENIOR LIVING PARCEL ±2.24 ACRES

HYDRODYNAMIC SEPARATOR (BMP 3)

STORMFILTER (BMP 4)

PARKING GARAGE ENTRANCE

LOADING SPACE

HYDRODYNAMIC SEPARATOR (BMP 9)

EX. 20' SANITARY SEWER EASEMENT DB 986 PG 542

PROP. 20' SAN. ESMT.

POTENTIAL FUTURE ALIGNMENT OF SANITARY SEWER

PROP. 30' SAN. ESMT.

BROWN'S FAIRFAX MAZDA PROPOSED DEVELOPMENT (SUP SUB 01-2019110)

VIRGINIA STATE GRID NORTH NAD 83

LEGEND

150.0	EX. SPOT SHOT
	EX. INDEX CONTOUR (5')
	EX. INT. CONTOUR (1')
150.0	PROP. SPOT SHOT
	PROP. INDEX CONTOUR (5')
	PROP. INT. CONTOUR (1')
LOD	LIMITS OF DISTURBANCE

NOTE: THE GRADING FOR THE CONSTRUCTION OF THE TWIN BOX CULVERT AND THE CONSTRUCTION OF THE PEDESTRIAN TRAIL EXTENDS INTO THE REDEFINED RPA AREA AND ARE EXEMPT PER SECTION 4.18.10 OF THE ZONING ORDINANCE.

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
4/10/20
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
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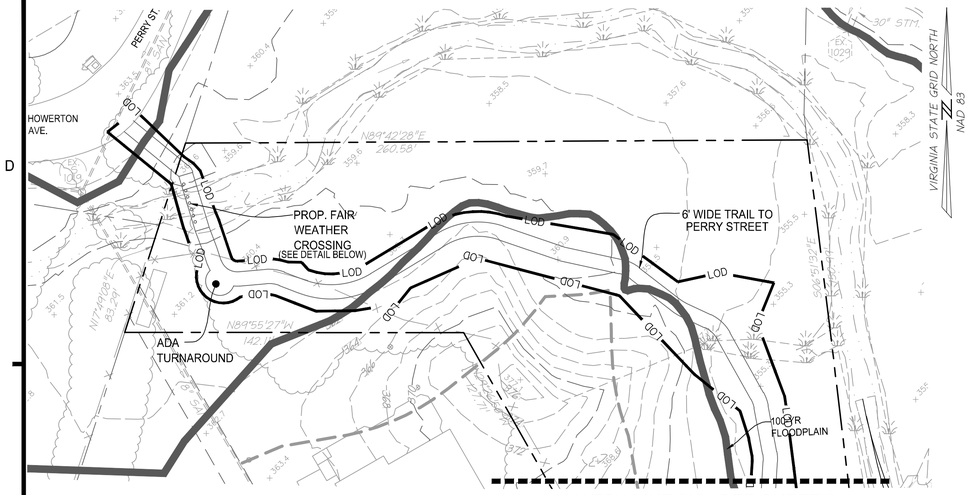
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

PRELIMINARY GRADING PLAN

SHEET No.
5

SCALE: 1"=30'



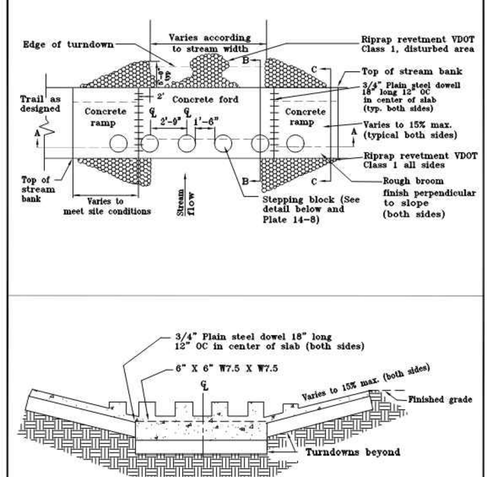
MATCH LINE "A" - SEE SHEET 5

NOTE: THE GRADING FOR THE CONSTRUCTION OF THE TWIN BOX CULVERT AND THE CONSTRUCTION OF THE PEDESTRIAN TRAIL EXTENDS INTO THE REDEFINED RPA AREA AND ARE EXEMPT PER SECTION 4.18.10 OF THE ZONING ORDINANCE.

INTERIM GRADING NARRATIVE:
THE GRADING SHOWN ON THIS PLAN IS FINAL GRADING THAT WILL BE SET AT THE COMPLETION OF THE DEVELOPMENT , PENDING THE COMPLETION OF CONSTRUCTION OF BOTH THE BROWN'S MAZDA SITE LOCATED TO THE SOUTH AND THE CITY'S FARR AVENUE PROJECT. IF THE CONSTRUCTION OF EITHER OF THOSE PROJECTS ARE DELAYED, THE GRADING FOR THIS SITE WILL BE IMPACTED AND THUS REQUIRE INTERIM GRADING. AT THE TIME OF FINAL SITE PLAN FOR THE TOWNHOUSE PARCEL OR SENIOR LIVING PARCEL, OR FOR THE PUBLIC IMPROVEMENT PLAN (STORM CULVERT, UTILITIES AND ORCHARD STREET), THE GRADING MAY BE MODIFIED BASED ON FIELD CONDITIONS AND STILL MEET THE OVERALL INTENT OF THE GRADING THAT IS GENERALLY SHOWN ON THIS MDP.

FAIR WEATHER STREAM CROSSING DETAIL

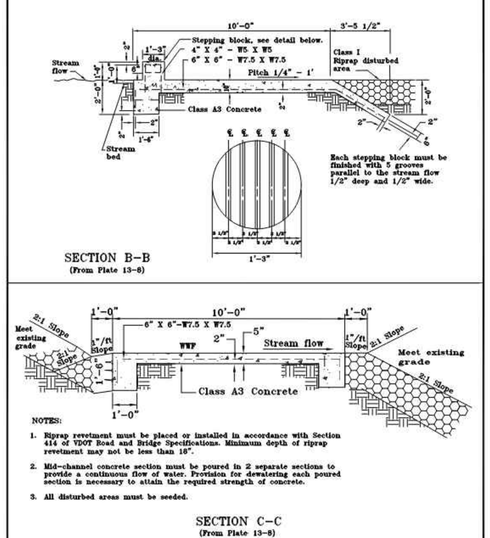
FAIRFAX COUNTY PUBLIC FACILITIES MANUAL



SECTION A–A

Ref. Sec. 8-0202.1B, 8-0203.1B, 8-0203.2G, Plate 14-8 Rev. 1-00, 2011 Reprint, 2018 Reprint	FAIR WEATHER STREAM CROSSING	PLATE NO. 13-8	STD. NO.

FAIRFAX COUNTY PUBLIC FACILITIES MANUAL

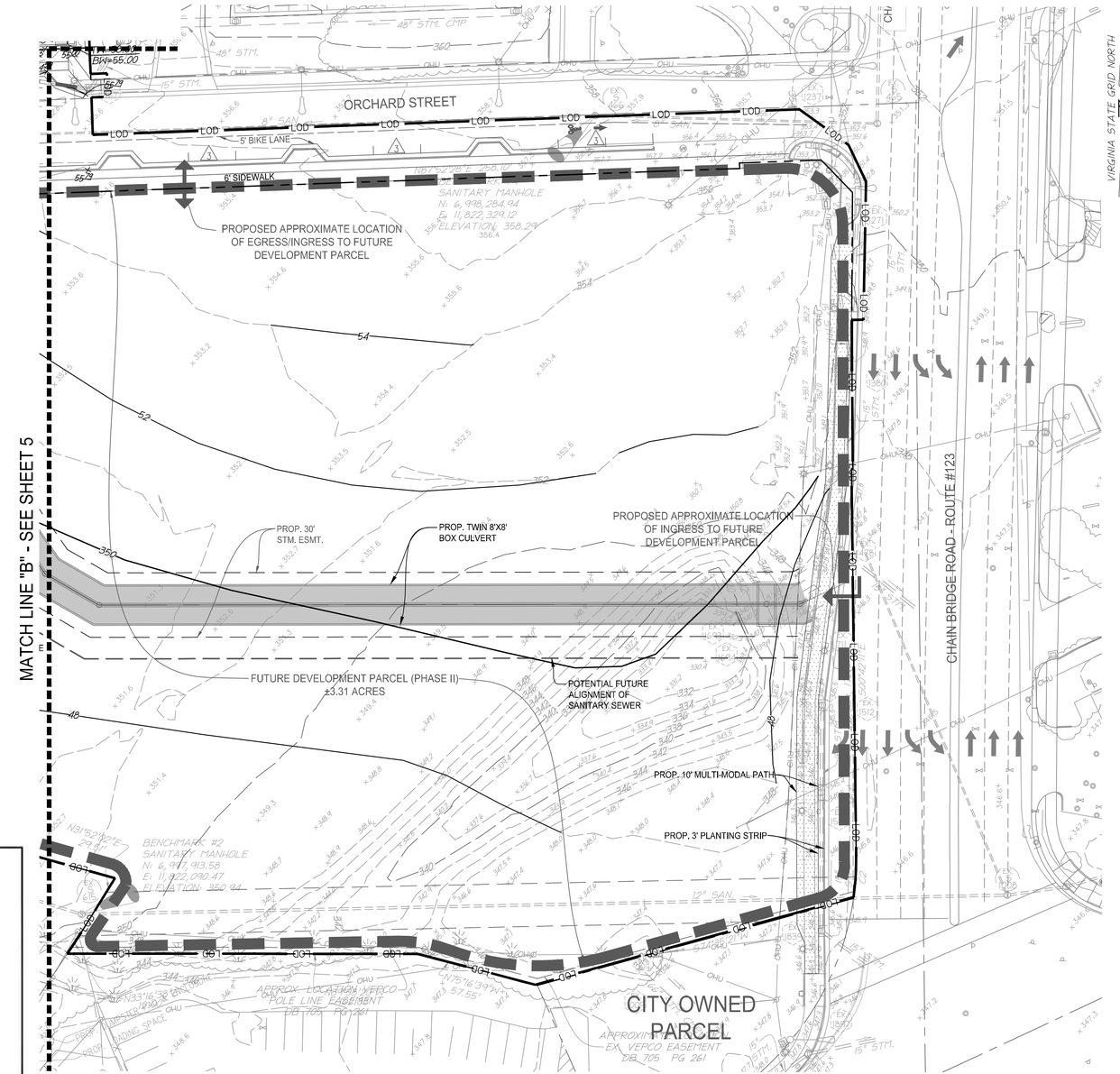


SECTION B–B
(From Plate 13-8)

NOTES:
1. Riprap revetment must be placed or installed in accordance with Section 414 of VDOT Road and Bridge Specifications. Minimum depth of riprap revetment may not be less than 18".
2. Mid-channel concrete section must be poured in 2 separate sections to provide a continuous flow of water. Provision for dewatering each poured section is necessary to attain the required strength of concrete.
3. All disturbed areas must be seeded.

SECTION C–C
(From Plate 13-8)

Ref. Sec. 8-0202.1B, 8-0203.2G, Plate 13-8 Rev. 1-00, 2011 Reprint, 2018 Reprint	FAIR WEATHER STREAM CROSSING	PLATE NO. 14-8	STD. NO.



LEGEND

150.0	EX. SPOT SHOT
	EX. INDEX CONTOUR (5')
	EX. INT. CONTOUR (1')
150.0	PROP. SPOT SHOT
	PROP. INDEX CONTOUR (5')
	PROP. INT. CONTOUR (1')
LOD	LIMITS OF DISTURBANCE

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
4/10/20
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

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DRAWING No.: 109632
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DRAWN: JS
CHECKED: KMW

SHEET TITLE:

PRELIMINARY GRADING PLAN

SHEET No.
5A

SCALE: 1"=30'

MATCH LINE "A" - SEE SHEET 6A

RPA (POST-DEVELOPED)

TREE PRESERVATION AREA

PROP. TOWNHOUSES

TOWNHOUSE PARCEL
±4.94 ACRES

5' SIDEWALK

6' TRAIL

LOWER FLOODPLAIN

APPROXIMATE LOCATION OF AMENITY AREA

APPROX. LOCATION OF BIKE RACKS

PROP. 30' STM. ESMT.

AMENITY AREA

4' LINEAR PARK PLANTER STRIP
6' SIDEWALK

PROP. RETAINING WALL

ORCHARD STREET

5' BIKE LANE

6' SIDEWALK

FARR AVENUE

PROPOSED BUILDING

COVERED WALK

SENIOR LIVING PARCEL
±2.24 ACRES

FARR AVENUE TO BE DESIGNED AND CONSTRUCTED BY OTHERS

LOADING SPACE

PARKING GARAGE ENTRANCE

PROP. 20' SAN. ESMT.

PROP. 10' SAN. ESMT.

PROP. 30' STM. ESMT.

MATCH LINE "B" - SEE SHEET 6A

BROWN'S FAIRFAX MAZDA
PROPOSED DEVELOPMENT
(SUP SUB 01-2019110)

LANDSCAPE KEY:

- EXISTING TREE TO BE PRESERVED
- COUNTS TOWARDS PARKING LOT REQUIREMENTS
- STREET TREE IN ROW NO CANOPY CREDIT
- CANOPY TREE - DECIDUOUS
- UNDERSTORY TREE - DECIDUOUS
- UNDERSTORY TREE - EVERGREEN
- SHRUB

VIRGINIA STATE GRID NORTH
NAD 83

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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engineering surveying land planning

COMMONWEALTH OF VIRGINIA
LAURIE B. DONNACHIE
Lic. No. 0406001880
2020-04-10
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN

CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

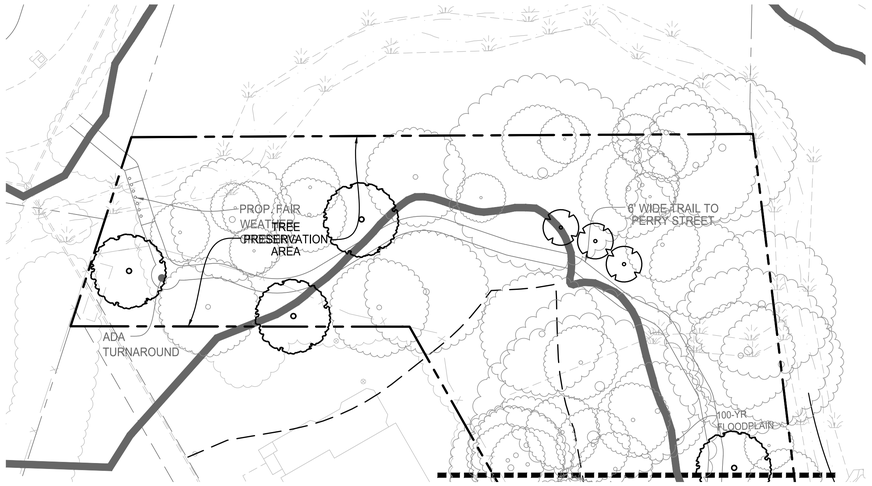
PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:

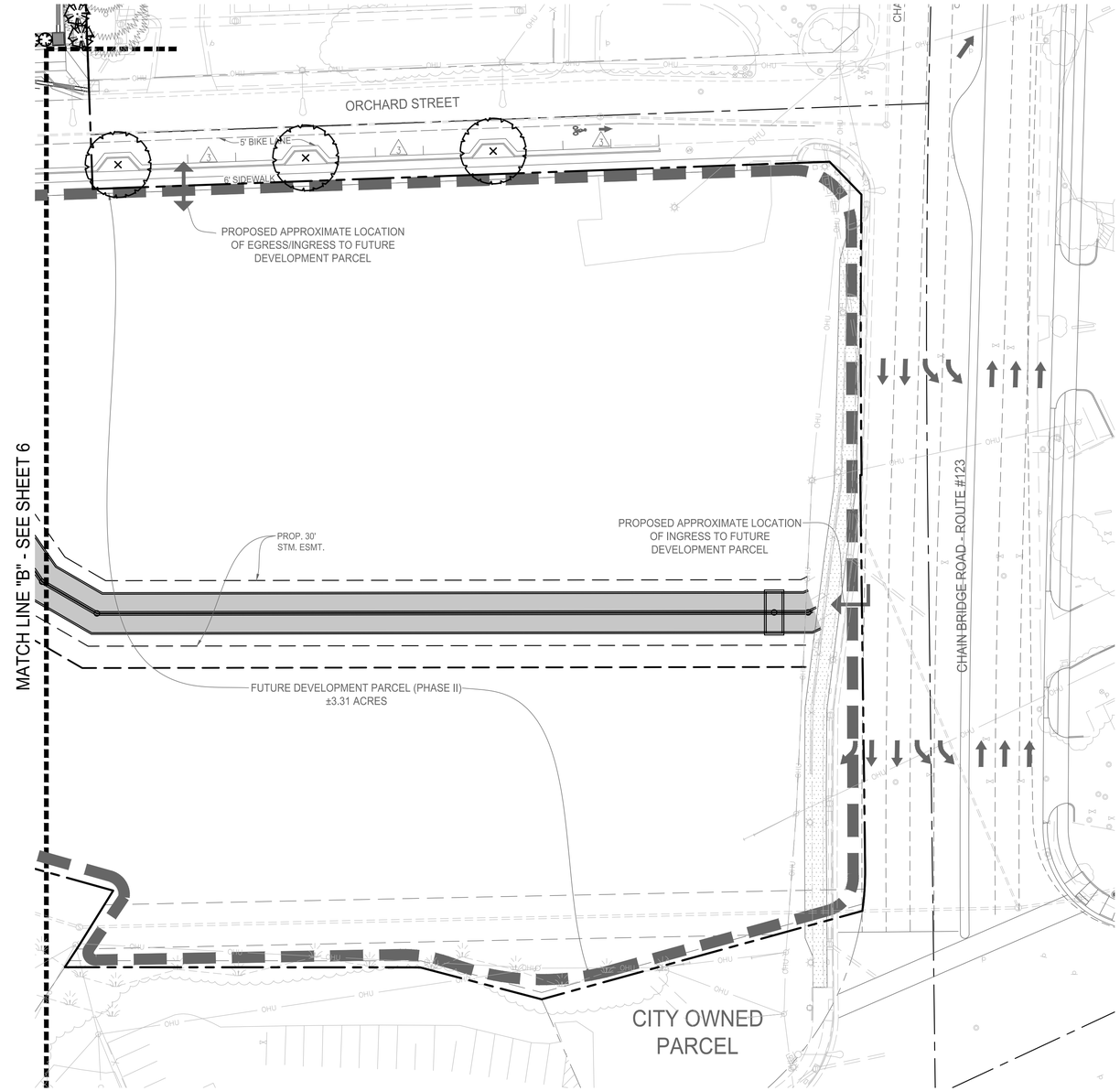
CONCEPTUAL LANDSCAPE PLAN

SHEET No.
6

SCALE: 1"=30'



MATCH LINE "A" - SEE SHEET 6



TRANSITIONAL YARDS

TRANSITIONAL YARD 3 - NORTH

LINEAR FEET		585'	
REQUIRED			**PROVIDED**
WIDTH OF LANDSCAPE STRIP		15'	15'
FENCE OR WALL HEIGHT		6'	6' FENCE
			NONE WALL
CANOPY TREE	(4 per 100 feet)	23	3
UNDERSTORY TREE	(4 per 100 feet)	23	17
UNDERSTORY TREE - EXISTING			20
SHRUB	(4 per 100 feet)	23	23

SEE SHEET 1 FOR MODIFICATION REQUEST

TRANSITIONAL YARD 3 - NORTHEAST

LINEAR FEET		232'	
REQUIRED			**PROVIDED**
WIDTH OF LANDSCAPE STRIP		15'	10'
FENCE OR WALL HEIGHT		6'	6' FENCE
			NONE WALL
CANOPY TREE	(4 per 100 feet)	9	4
UNDERSTORY TREE	(4 per 100 feet)	9	10
SHRUB	(4 per 100 feet)	9	24

SEE SHEET 1 FOR MODIFICATION REQUEST

TRANSITIONAL YARD 3 - SOUTHEAST

LINEAR FEET		327'	
REQUIRED			**PROVIDED**
WIDTH OF LANDSCAPE STRIP		15'	0'
FENCE OR WALL HEIGHT		6'	NONE FENCE
			NONE WALL
CANOPY TREE	(4 per 100 feet)	13	0
UNDERSTORY TREE	(4 per 100 feet)	13	0
SHRUB	(4 per 100 feet)	13	0

SEE SHEET 1 FOR MODIFICATION REQUEST

TRANSITIONAL YARD 3 - SOUTHWEST

LINEAR FEET		75'	
REQUIRED			**PROVIDED**
WIDTH OF LANDSCAPE STRIP		15'	15'
FENCE OR WALL HEIGHT		6'	6' FENCE
			NONE WALL
CANOPY TREE	(4 per 100 feet)	3	3
UNDERSTORY TREE	(4 per 100 feet)	3	3
SHRUB	(4 per 100 feet)	3	8

NO MODIFICATION NEEDED

TRANSITIONAL YARD 3 - WEST

LINEAR FEET		400'	
REQUIRED			**PROVIDED**
WIDTH OF LANDSCAPE STRIP		15'	8.5'
FENCE OR WALL HEIGHT		6'	6' FENCE
			1.0 - 2.1' WALL
CANOPY TREE	(4 per 100 feet)	16	16
UNDERSTORY TREE	(4 per 100 feet)	16	16
SHRUB	(4 per 100 feet)	16	28

SEE SHEET 1 FOR MODIFICATION REQUEST

NOTES:
1. EASTERN AND NORTHWESTERN TRANSITIONAL YARD PROVIDED BY EXISTING VEGETATION AND/OR FUTURE DEVELOPMENT PARCEL.
2. WHERE WALLS ARE LOCATED INSIDE THE TRANSITIONAL YARD A FENCE WILL BE ADDED IN ORDER TO MEET THE 6' HEIGHT REQUIREMENT.

10-YEAR TREE CANOPY CALCULATIONS

TREE CANOPY REQUIRED

SITE AREA (DOES NOT INCLUDE ROW)	457,030 SF
TREE CANOPY COVERAGE REQUIRED PER ZO 4.5.6.A.	**10 %**
TOTAL CANOPY AREA REQUIRED	45,703 SF

TREE CANOPY PROVIDED

PLANT TYPE	STOCK SIZE	QUANTITY	CANOPY PER TREE	CANOPY PER TYPE
CANOPY TREE	2" CALIPER	42	200 SF	8,400 SF
UNDERSTORY TREE	2" CALIPER	108	100 SF	10,800 SF
SUBTOTAL CANOPY AREA PROVIDED THROUGH TREE PLANTING				19,200 SF
SUBTOTAL CANOPY AREA PROVIDED THROUGH TREE PRESERVATION				37,000 SF
TOTAL CANOPY AREA PROVIDED				56,200 SF
TOTAL CANOPY COVERAGE PROVIDED				**12.3 %**

NOTE: THE FOLLOWING TREES ARE PROPOSED WITHIN THE ROW AND THEREFORE NOT INCLUDED IN THE ABOVE TREE CANOPY CALCULATIONS

CANOPY TREE	2" CALIPER	18	— —	— —

STREET TREES REQUIRED:
MINIMUM 10' WIDE LANDSCAPE STRIP ALONG ALL STREETS
1 CANOPY TREE PER 40 LINEAR FEET ALONG ALL STREETS

STREET TREES PROVIDED: PER CITY PROVIDED DESIGN
4' WIDE LANDSCAPE STRIP ALONG ALL PUBLIC AND PRIVATE STREETS
CANOPY TREES GREATER THAN EVERY 40 FEET
SEE SHEET 1 FOR MODIFICATION REQUEST.

INTERIOR PARKING LOT LANDSCAPING REQUIRED:
1 CANOPY TREE FOR EVERY 10 SPACES

INTERIOR PARKING LOT LANDSCAPING PROVIDED:
2 CANOPY TREES FOR 13 SPACES
SEE SHEET 1 FOR MODIFICATION REQUEST.

PROPOSED VEGETATION
PROPOSED TREE SPECIES MAY INCLUDE BUT NOT LIMITED TO: RED MAPLE, SWAMP WHITE OAK, SHADBUSH SERVICEBERRY, AMERICAN HOLLY, AND EASTERN RED CEDAR.

PROPOSED SHRUB SPECIES MAY INCLUDE BUT NOT BE LIMITED TO: REDOSIER DOGWOOD, WINTERBERRY HOLLY, VIRGINIA SWEETSPIRE, SWEET PEPPERBUSH, AND NORTHERN SPICEBUSH.

THESE SPECIES ARE SUBJECT TO CHANGE BASED ON AVAILBILITY AT THE TIME OF SITE PLAN PROCESS AND FINAL ENGINEERING. TREE AND SHRUB LOCATIONS SUBJECT TO CHANGE AT THE TIME OF SITE PLAN AND FINAL ENGINEERING.

VIRGINIA STATE GRID NORTH
NAD 83

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
LAURIE B. DONNACHIE
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2020-04-10
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:
CONCEPTUAL LANDSCAPE PLAN

SHEET No.
6A

SCALE: 1"=30'

ccl General Landscape Specification Summary - Short Form (Rev. 4/19)

Specification: This is a summary of christopher consultants, ltd. general landscape specification. All work shall follow the procedures outlined in the specifications and details contained herein, which are designed to exceed current industry standards. Should there exist a discrepancy between this specification and the included construction details, the written specification shall take precedence.

References: In lieu of providing comprehensive proprietary specifications, the following are referenced to be general default specifications with the following modifications. These modifications and the construction details shown in this plan set shall take precedence over the general referenced specifications.

- "Landscape Specification Guidelines" Landscape Contractors Association of MD, DC, VA - Most current edition.
- "American Standard for Nursery Stock - ANSI Z60.1" by AmericanHort - Most Current Edition
- "TT-77 Recommended Turfgrass Cultivars for Certified Sod Production in Maryland" - Maryland Turfgrass Council
- ""Landscape Architecture/Design Specifications for Compost Use" - US Composting Council

If there are discrepancies or contradictions in specification sections or details, the stricter specification shall take precedence. A Request for Information (RFI) can also be submitted for clarification.

List of Plant Material: The contractor will verify plant quantities prior to bidding and any discrepancies shall be brought to the attention of the Owner's Representative. The Contractor shall furnish and install all plant materials required to complete the work as shown on the drawings. Quantities in the planting schedule shall take precedence over quantities graphically shown on the plan. Substitutions shall not be made without the written approval of the Owner's Representative.

Plant Identification: All trees shall be true to name as on plant schedule or shown on planting plans and shall be correctly labeled individually or in groups by genus, species, variety and cultivar. Labels are to remain intact until site is approved through agency inspection, substantial completion approval, or per Owner's Representative's instruction.

Plant Quality: All plant materials shall conform to the size and form standards set forth in the latest edition of AmericanHort's "American Standard for Nursery Stock - ANSI Z60.1". Above Ground: Trees shall be healthy with the color, shape, size, and distribution of trunk, stems, branches, buds and leaves typical of the plant specified. Any signs of stress, improper handling (wounds or broken branches), insect or disease damage, or dead/distorted branches should not be present. Trees shall have one central leader (unless otherwise specified) and grafts should be fully closed and visible above the soil line. Below Ground: A minimum of 3 structural roots should be reasonably distributed around the trunk (reject a tree with structural roots only on one side), the root crown should not be more than 2 inches below the soil line, the top 2 structural roots should not be more than 3 inches below the soil line when measured 4 inches away from the trunk. The top of the other structural root should not be more than 5 inches below the surface. The root system should be free of potentially stem-girdling or kinked roots above the root collar and main structural roots.

Inspection: Plants are to be inspected upon delivery to contractor by a contractor's representative and/or owner's representative. Trees not presenting proper form, incorrect variety, signs of poor health or over-stress, and girdling roots are to be rejected.

Storage & Transport: Plant materials should be protected from dessication during transport via breathable fabric covering the canopy and by watering rootball/pot thoroughly immediately prior to transport. Plant materials should be installed on day of delivery to site. If that is not possible, a temporary storage area can be constructed on-site. Plants are not to be stored on bare asphalt. If storage area is asphalt, cover bare asphalt with a layer of woodchips. Storage should be in shade, and plants be regularly watered at root-ball level, and spaced so foliage from one plant does not interfere with foliage of another. Tall plant materials are to remain upright during storage. Longer term storage plants are to be heeled-in or stored in mulch to the top of the container/root ball. Plant materials shall not be stored on-site for more than two weeks. Plants stored improperly or for too long may be subject to rejection and replacement dependent on ultimate planting condition.

Planting: Plantings shall be installed in accordance with details and specifications on this sheet. Details and specifications for other specific landscape items, such as tree preservation or erosion control may be found elsewhere in this drawing set on their own respective sheet. For items not specifically addressed by this plan set, refer to the latest edition of the "Landscape Specification Guidelines" developed by the Landscape Contractors Association of MD, DC, and VA. Should there be any ambiguities or questions, please utilize the formal RFI/Submittal process.

Trees: The planting hole diameter is to be at a minimum three times the diameter of the root ball. The depth of the planting hole shall be dug so that the shoulder of the root ball is level with the existing grade leaving the root flare slightly higher. When planting on a slope, the depth of the hole shall be dug so that the bottom of the root flare is at the level of the existing grade at the sides of the hole. If the planting hole is mechanically dug, the hole is to be scarified by slightly enlarging hole by hand digging the sides and bottom to prevent glazing. The sides of the hole should be vertical or sloping outwards. Holes are not to be dug when soil is saturated. For balled and burlapped trees, the wire root ball cage is to be removed and burlap is to be cut and completely removed from the top and a minimum of 8" to 12" down the side of the root ball. Do not fold burlap down into hole, it must be removed. Any synthetic materials are to be completely removed from the trunk and root ball. Backfill in lifts using the same soil dug to create the hole, being careful not to over-compact the soil. Inoculate backfill soil or rootball with an approved balanced (Endo/Ecto) commercial mycorrhizae application. Do not amend or add fertilizer unless expressly specified to do so or is part of the approved mycorrhizae innoculant product. Do not place any soil on top of root ball. Trees are to be mulched to full depth specified immediately after planting. A ½" layer of approved compost is to be placed under the mulch layer. Do not place mulch against tree trunk.

Staking: Staking (if any) is to be installed per the accompanying details, utilizing tree webbing straps with grommets to prevent wire from coming in contact with the tree. While not preferred, full tree webbing systems are also permissible if approved through submittal, and installed per manufacturer's instructions. Wire is to be tensioned to allow for 1/2 inch of deflection up or down, and tension shall be rechecked and adjusted on a regular basis. Staking is to be removed as soon as possible after one year. GARDEN HOSE IS NOT TO BE UTILIZED FOR STAKING.

Irrigation: For permanent systems, irrigation should be largely installed prior to plant installation to avoid having to disturb planting beds or move plants to accommodate the installation of the irrigation system. For sites with no permanent irrigation system, Trees are to be irrigated until established by the use of temporary water bags through one growing year or until established. Shrubs, perennial beds, and lawns are to be thoroughly hand-watered or by movable temporary irrigation (sprinklers or drip hose) as necessary to reflect local weather conditions. Watering is to be deep into the soil and infrequent, as opposed to light surficial watering performed often.

Shrubs: For container shrubs, the planting hole is to be dug 3 times the width of the intact container. The container is to be completely removed and the sides of the soil/root clump scarified with a sterile sharp knife. They shall be planted so that the top of the soil level of the container is no more than 1.5" above the original grade. For balled and burlapped shrubs, remove as much burlap as possible from the top and sides of the rootball. Do not fold burlap into hole. Plant with the root flare slightly higher than the surrounding grade. Backfill with soil dug to create the hole. Do not cover top of root ball/clump.

Ground Covers/Perennials: Beds are to be prepared by tilling well to a minimum depth of 6", and soils shall be amended by incorporating 1" of compost meeting the US Composting Council reference specification, 1" of worm castings and/or well decomposed commercially produced compost, or a Class A biosolid also meeting the referenced US Composting Council specification prior to planting. Apply 3" of shredded non-dyed hardwood mulch immediately after planting.

Compacted or Poorly Drained Soils: For sites with heavily compacted or poorly draining soils, alternate planting methods will need to be employed. Contact project Landscape Architect for additional planting details and specifications should either unforeseen condition be encountered.

Conflicts with Existing Roots: Proposed landscape may be shown to be planted in the Critical Root Zones of existing large trees. Should, in the course of planting, large woody roots be discovered belonging to adjacent large trees that are to be preserved, shift the planting location of the tree to be planted to avoid cutting the woody root. Should a suitable planting location not be found within the proximity of where a proposed tree is to be planted, contact the project landscape architect for alternate planting location and recording of the discrepancy for landscape inspection/approval purposes.

Irrigation: New plant materials are to be watered as necessary to maintain health. If no permanent irrigation system is installed, trees are to be watered until established through the use of temporary water bags. Shrubs, perennials, and ground covers shall be hand-watered. Infrequent deep watering is preferred to more frequent quick/shallow watering.

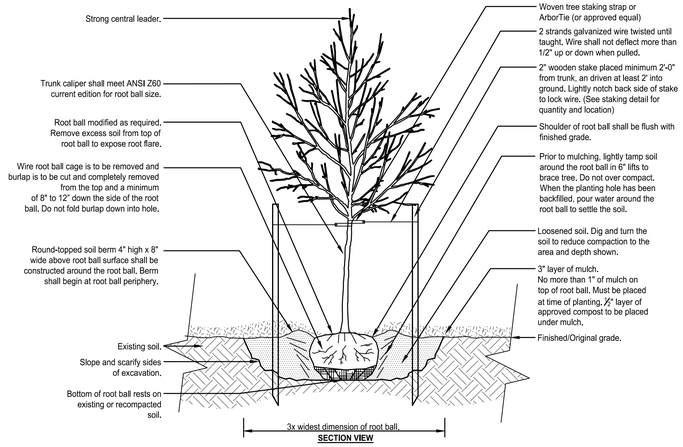
Lawn Areas:

Seeded Lawn Area: Areas to be seeded shall have planting soil tilled to a depth of 6" and free of stones greater than 1" diameter or length. Any amendments that are to be added should be tilled into soil prior to seeding. A seed mix composition chart shall be submitted for review prior to installation. Unless specified by the Owner's Representative, the seed mix must contain a minimum of three cultivars or types of grass in the blend, chosen from the recommended cultivars list of the most recent "TT-77 Recommended Turfgrass Cultivars for Certified Sod Production in Maryland" document produced by the University of Maryland and the Maryland Turfgrass Council. Use of cultivars also appearing on the Turfgrass Water Conservation Alliance approved list is encouraged. Seeds coatings that aid in germination, moisture retention and prevent loss to bird consumption are acceptable. Seeded areas are to be covered by a light and loose layer of rapidly degradable mulch such as straw or hydraulically applied cellulose. Use of erosion control blankets or any synthetic webbing is not permissible for lawn areas unless specified by the Owner's Representative.

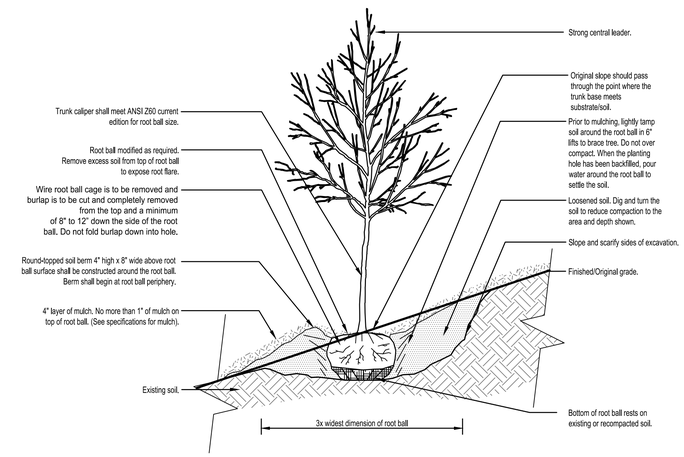
Sodded Lawn Area: Unless a proprietary sod is specified by the Owner's Representative, sod must be of a Maryland or Virginia certified variety suited to the specific growing requirements of where it is to be installed. Grower and variety to be submitted to Owner's Representative for review prior to ordering. Certification documentation for all sod is to be provided to the Owner's Representative upon delivery. For installation on slopes, the Contractor shall use biodegradable sod spikes to secure sod in place. Metal sod staples are not to be utilized for installation.

Invasive Species: Existing invasive species are to be removed utilizing appropriate approved methods including in the invasive species management plan (if applicable) prior to the installation of new plant materials, and is subject to inspection, and is a factor in the Certification of Installation.

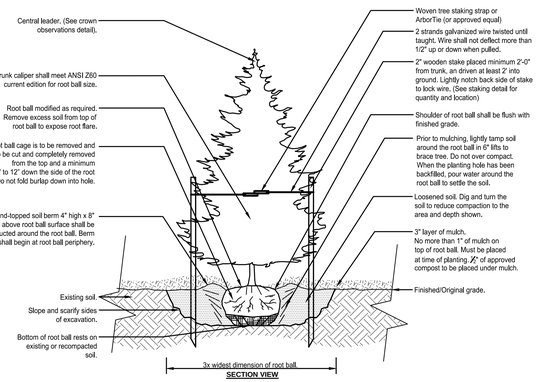
NOTE: These specifications and details are based on those developed by the Urban Tree Foundation, and have been improved to reflect current research into effective planting. The ISA has also replaced their own details and now reference the UTF details. The specifications and details illustrated in this plan set exceed the standards set in the ISA, LCA, and local jurisdictional planting details and specifications.



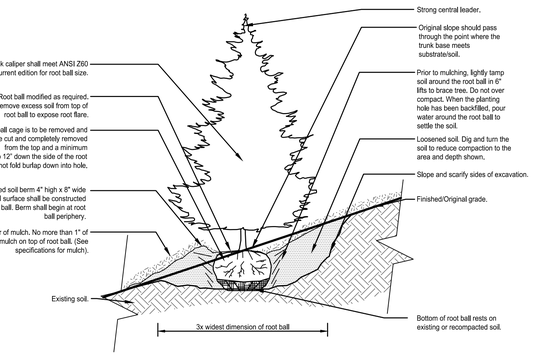
DECIDUOUS TREE PLANTING DETAIL
SCALE: NOT TO SCALE



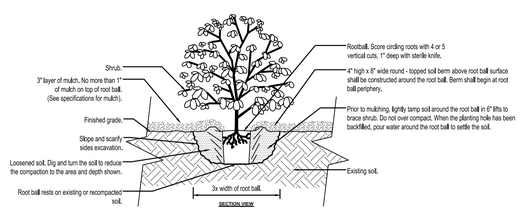
DECIDUOUS TREE SLOPE PLANTING DETAIL
SCALE: NOT TO SCALE



EVERGREEN TREE PLANTING DETAIL
SCALE: NOT TO SCALE

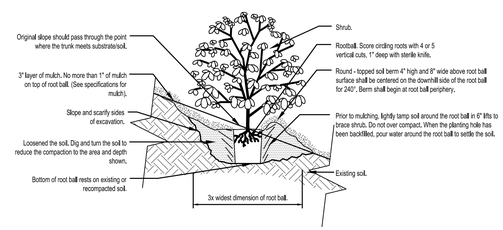


EVERGREEN TREE SLOPE PLANTING DETAIL
SCALE: NOT TO SCALE



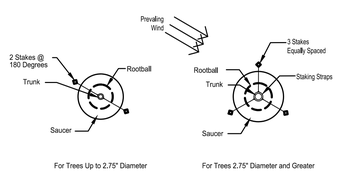
Notes:
1. For ball and burlapped shrubs, remove completely as much burlap as possible, minimum halfway down the side of the rootball. Do not fold burlap down into hole.
2. See specifications for further requirements related to this detail.

SHRUB PLANTING DETAIL
SCALE: NOT TO SCALE



Notes:
1. For ball and burlapped shrubs, remove completely as much burlap as possible, minimum halfway down the side of the rootball. Do not fold burlap down into hole.
2. See written specifications for further requirements related to this detail.

SHRUB SLOPE PLANTING DETAIL
SCALE: NOT TO SCALE



Notes:
1. Utilize only Arbor-tie or approved equal or staking straps against tree trunks.
2. Reference manufacturer's detail of approved system for installation instructions.
3. Wire tension (if used) should not allow greater than 1/2" of play in any direction.
4. Staking should be removed on year after planting or as instructed.

TREE STAKING DETAIL
SCALE: NOT TO SCALE

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2020-04-10
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

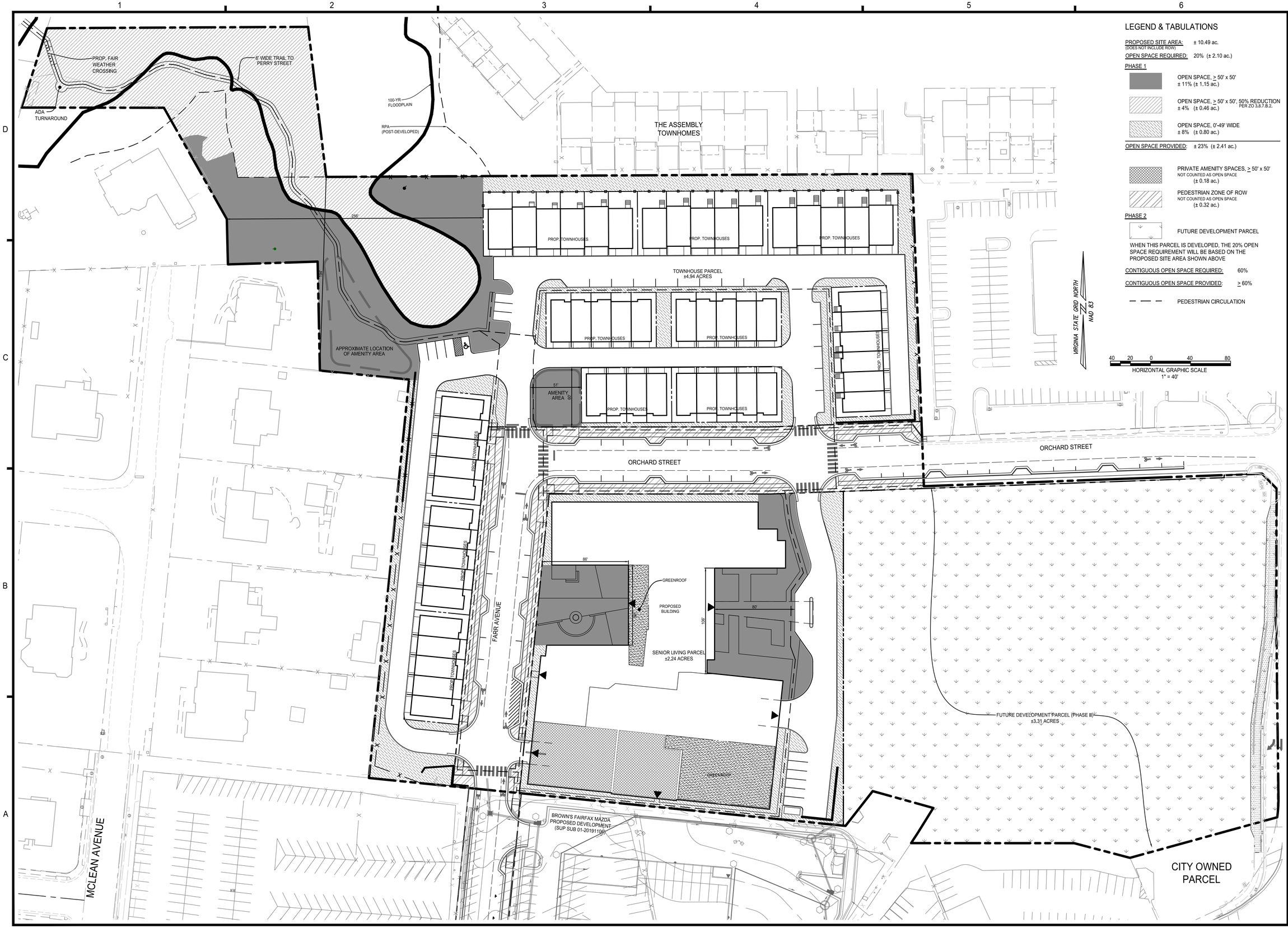
PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:

LANDSCAPE SPECS-DETAILS

SHEET No.
6B

SCALE: N/A



LEGEND & TABULATIONS

PROPOSED SITE AREA: ± 10.49 ac.
(DOES NOT INCLUDE ROW)

OPEN SPACE REQUIRED: 20% (± 2.10 ac.)

PHASE 1

- OPEN SPACE, ≥ 50' x 50' ± 11% (± 1.15 ac.)
- OPEN SPACE, ≥ 50' x 50', 50% REDUCTION PER ZO 3.8.7.B.2. ± 4% (± 0.46 ac.)
- OPEN SPACE, 0'-49' WIDE ± 8% (± 0.80 ac.)

OPEN SPACE PROVIDED: ± 23% (± 2.41 ac.)

- PRIVATE AMENITY SPACES, ≥ 50' x 50' NOT COUNTED AS OPEN SPACE (± 0.18 ac.)
- PEDESTRIAN ZONE OF ROW NOT COUNTED AS OPEN SPACE (± 0.32 ac.)

PHASE 2

- FUTURE DEVELOPMENT PARCEL

WHEN THIS PARCEL IS DEVELOPED, THE 20% OPEN SPACE REQUIREMENT WILL BE BASED ON THE PROPOSED SITE AREA SHOWN ABOVE

CONTIGUOUS OPEN SPACE REQUIRED: 60%

CONTIGUOUS OPEN SPACE PROVIDED: ≥ 60%

- PEDESTRIAN CIRCULATION

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2020-04-10
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:

OPEN SPACE & CIRCULATION PLAN

SHEET No.
7

SCALE: 1"=40'

OFFSITE SANITARY FLOW ESTIMATES:

AREA #1
EXISTING DEVELOPMENT ESTIMATES:
RESIDENTIAL= 162 DWELLING UNITS

FLOW ESTIMATES:
162 UNITS x 350 GPD/UNIT = 56,700 GPD

TOTAL FLOW = 56,700 GPD

TOTAL PEAK FLOW = 226,800 GPD = 0.23 MGD

AREA #2
EXISTING DEVELOPMENT ESTIMATES:
HOTEL= 152 ROOMS

FLOW ESTIMATES:
152 UNITS x 130 GPD/UNIT = 19,760 GPD

TOTAL FLOW = 19,760 GPD

TOTAL PEAK FLOW = 79,040 GPD = 0.08 MGD

AREA #3
EXISTING DEVELOPMENT ESTIMATES:
RESIDENTIAL= 53 DWELLING UNITS

FLOW ESTIMATES:
53 UNITS x 350 GPD/UNIT = 18,550 GPD

TOTAL FLOW = 18,550 GPD

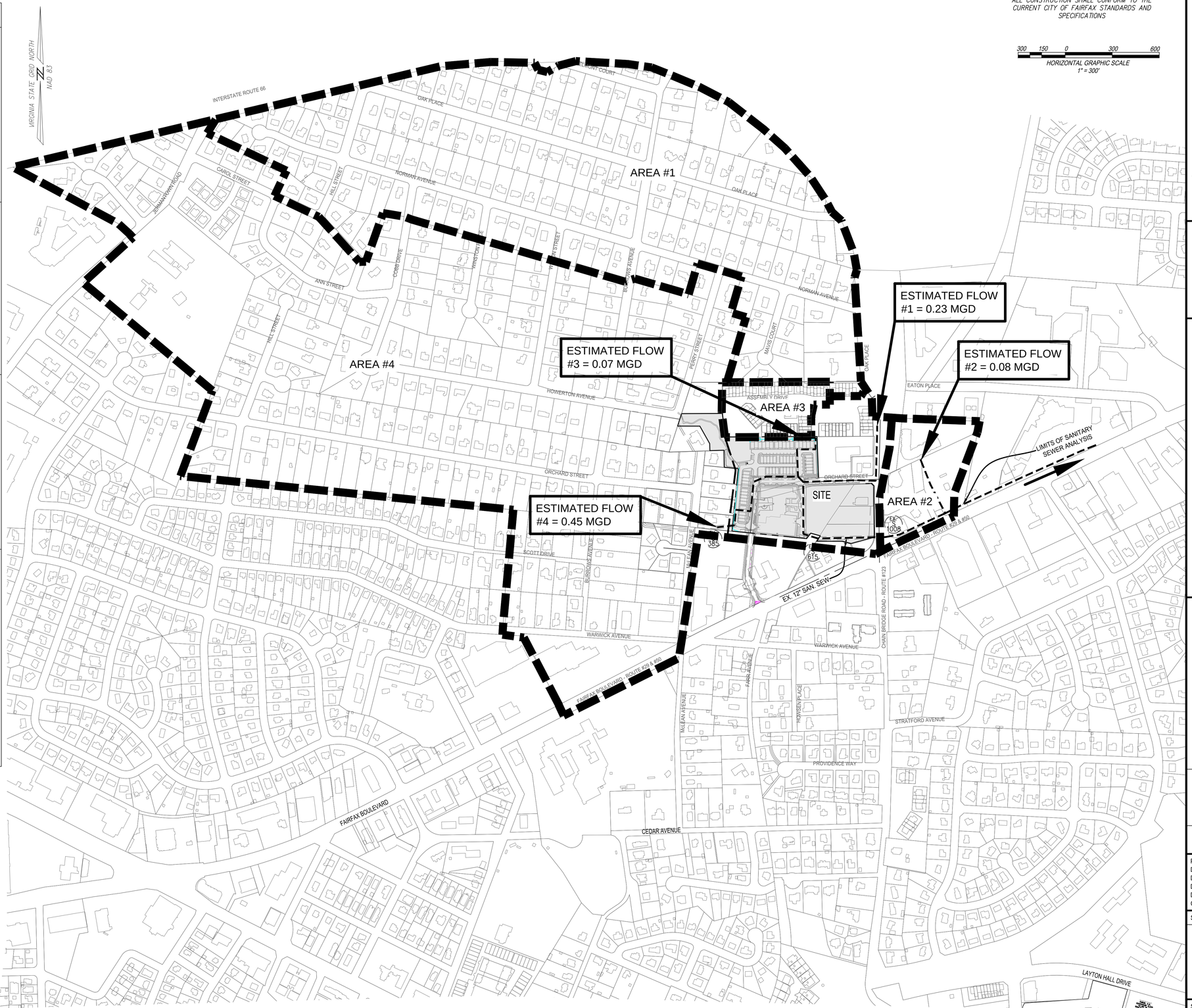
TOTAL PEAK FLOW = 74,200 GPD = 0.07 MGD

AREA #4
EXISTING DEVELOPMENT ESTIMATES:
RESIDENTIAL= 256 DWELLING UNITS
OFFICE/RETAIL = 113,830 SF

FLOW ESTIMATES:
256 UNITS x 350 GPD/UNIT = 89,600 GPD
113,830 SF OFFICE/RETAIL x 200 GPD/1000 SF = 22,766 GPD

TOTAL FLOW = 112,366 GPD

TOTAL PEAK FLOW = 449,464 GPD = 0.45 MGD



NOTES:
1. SEE SHEET 9 FOR SANITARY SEWER ANALYSIS.
2. SEE THE NARRATIVE TITLED "ANALYSIS OF EXISTING 12" SEWER" NARRATIVE ON SHEET 9 FOR FLOW ASSUMPTIONS.
3. A PEAK FACTOR OF 4.0 WAS USED FOR ALL OFFSITE SANITARY FLOWS.

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4/10/20
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NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

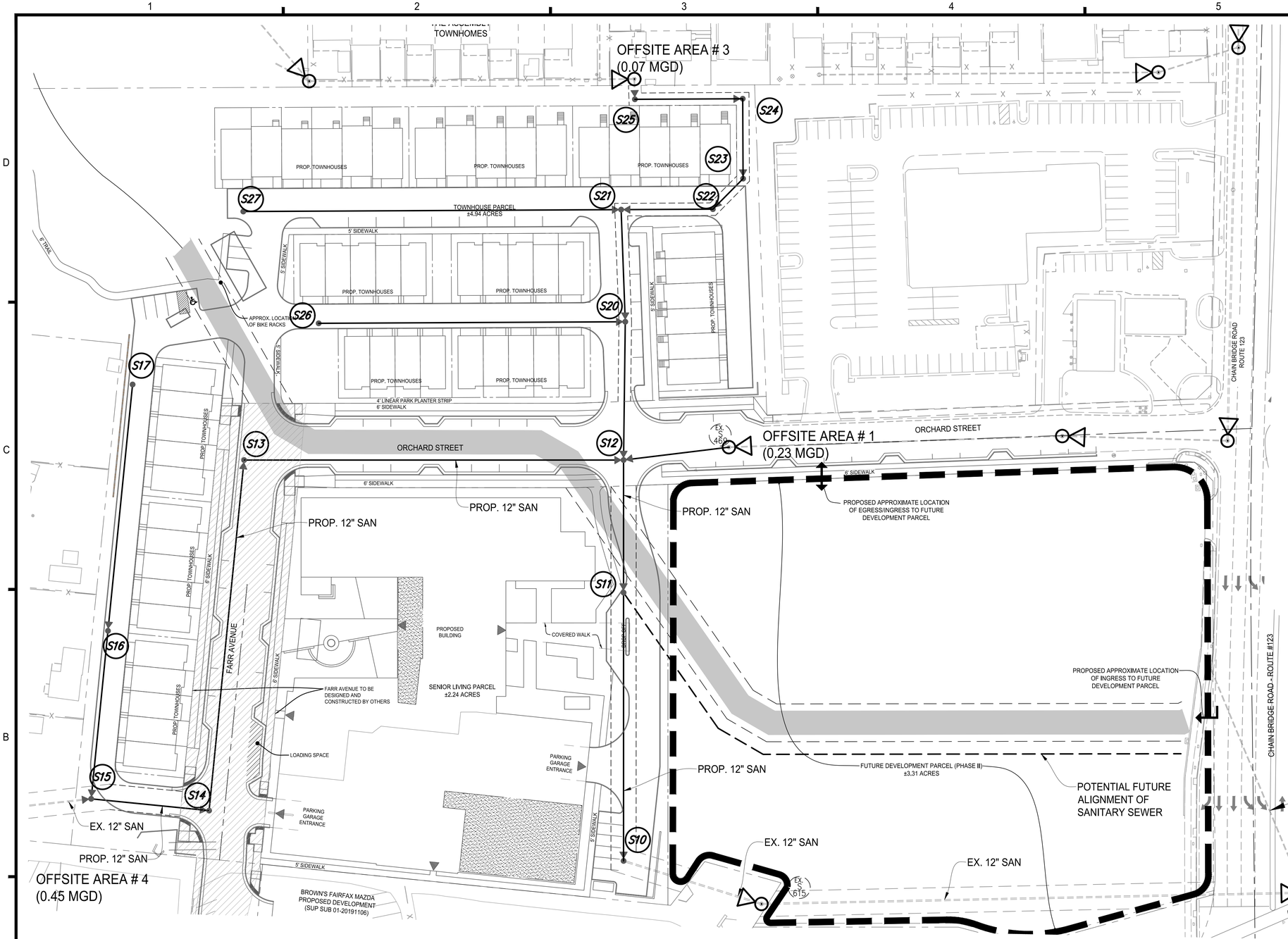
PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

SANITARY SEWER OFF-SITE MAP

SHEET No.
8

SCALE: 1"=300'



HORIZONTAL GRAPHIC SCALE
1" = 40'

SANITARY SEWER ANALYSIS

THE PURPOSE OF THIS ANALYSIS IS TO DEMONSTRATE THE CAPACITY AND HYDRAULIC ADEQUACY OF THE DOWN STREAM SANITARY SEWER MAIN.

EXISTING CONDITIONS:
CURRENTLY, THE EXISTING SITE CONSISTS OF TWO (2) 1-STORY BRICK & FRAME BUILDINGS, ONE (1) 4-STORY OFFICE BUILDING, AND ONE GASOLINE STATION WITH CONVENIENCE STORE. THE TWO (2) 1-STORY BRICK & FRAME BUILDINGS CONNECT TO EXISTING SANITARY LINE AT ORCHARD STREET. WHILE THE OFFICE BUILDING AND GASOLINE STORE CONNECT TO EXISTING SANITARY MAIN AT CHAIN BRIDGE ROAD AND ENTER INTO ORCHARD STREET (INTO THE PROJECT SITE). THE EXISTING SANITARY SEWER CONTINUE TOWARDS THE SOUTH INTO EXISTING MANHOLE S615 AND RUNS ACROSS THE CHAIN BRIDGE ROAD TO A 12-INCH SEWER MAIN INTO EXISTING MANHOLE S1008.

THE UPSTREAM FOR THIS SEWER-SHED IS SHOWN ON SHEET 8, DESIGNATED AS ESTIMATED FLOW #1, #3 AND #4.

PROPOSED CONDITIONS:
THE ON-SITE LATERALS WILL BE DEMOLISHED TO MAKE ROOM FOR THE NEW BUILDING. NEW LATERALS AND SANITARY MAIN WILL BE CONSTRUCTED. EXISTING SANITARY MAIN FROM THE WEST WILL BE REROUTED TO EX. S469. ALSO THE EXISTING SANITARY LINE FROM THE NORTH SIDE WILL BE REROUTED TO CONNECT TO THE PROPOSED MANHOLE S22.

CAPACITY AND HYDRAULIC ANALYSIS:
THE SANITARY SEWER WAS ANALYZED FROM THE ON-SITE 10-INCH AND 12-INCH SEWER TO EXISTING MANHOLE S469 AND THEN TO THE OUTFALL TO EXISTING MANHOLE S-S1.

THE VOLUME OF FLOW USED IN THIS ANALYSIS HAS BEEN COMPUTED IN ACCORDANCE WITH STATE CODE 9VAC25-790-460 AND 9VAC25-790-310. SEE COMPUTATIONS ON THIS SHEET.

CONCLUSION:
IT IS OUR CONCLUSION THAT THE PROPOSED ON-SITE 10-INCH AND 12-INCH SEWER AND EXISTING DOWNSTREAM 12-INCH SEWER HAS CAPACITY AND HYDRAULIC ADEQUACY WITH THE ADDED REDEVELOPMENT FLOWS.

A SEPARATE SANITARY SEWER ANALYSIS WILL BE COMPLETED FOR THE FUTURE DEVELOPMENT PARCEL ONCE THE PROGRAM IS KNOWN.

LEGEND

- : PROPOSED SANITARY MANHOLE AND FLOW DIRECTION
- : PROPOSED SANITARY SEWER
- S10 : PROPOSED SANITARY STRUCTURE NUMBER
- : EXISTING SANITARY MANHOLE AND FLOW DIRECTION
- : EX. SANITARY SEWER
- EX 7885 : EX. SANITARY STRUCTURE NUMBER

CONTRIBUTING SEWAGE FLOW ESTIMATE:

Discharge Facility	No. of Units	No. of People	No. of Dwellings	Average Flow for Dwellings (100 gpd/person)	No. of Beds	Average Flow per Bed (200 gpd/Bed)	Ultimate Floor Space	Average Flow per 1000 sf (250 gpd/1,000sf)	Total Incremetal Flow (gpd)	Total Cummulative Flow (gpd	Sanitary From	Sanitary To
Townhouses	15	5	75	7500					7,500	7,500	S15	S14
Townhouses	41	5	205	20500					20,500	28,000	S12	S11
Senior Living					200	40,000			40,200	68,200	S11	S10
Future Development							114,000	28500	114,000	182,200	EX.S615	EX.S1008

SANITARY COMPUTATION:

	FROM	TO	UPPER INV	LOWER INV	L (FT)	SLOPE (%)	DIA (IN)	MATERIAL	N	CAPACITY (cfs)	CAPACITY (MGD)	DESIGN FLOW (cfs)	DESIGN FLOW (MGD)	V (ft/s)	Assumptions	Inc (MGD)	Peak Flow Factor	Design Inc (MGD)
	EX. S385	S15	349.36	348.79	110.02	0.52	12	PVC	0.011	3.27	2.11	0.70	0.450	3.1	PEAK FLOW FROM OFFSITE AREA #4 = 0.45 MGD			0.450
	S15	S14	348.69	348.22	94.00	0.50	12	PVC	0.011	3.20	2.07	0.73	0.473	3.1		0.006	4.0	0.023
	S14	S13	348.12	346.72	279.62	0.50	12	PVC	0.011	3.20	2.07	0.73	0.473	3.1				0.000
	S13	S12	346.62	345.12	301.06	0.50	12	PVC	0.011	3.20	2.07	0.73	0.473	3.1				0.000
	S12	S11	342.60	341.57	115.23	0.89	12	PVC	0.011	4.27	2.76	0.93	0.604	4.1	PEAK FLOW FROM OFFSITE AREA #3 = 0.07 MGD	0.015	4.0	0.132
	S11	S10	341.47	339.69	212.93	0.84	12	PVC	0.011	4.15	2.68	1.48	0.955	4.6	PEAK FLOW FROM OFFSITE AREA #1 = 0.23 MGD	0.030	4.0	0.351
	S10	EX. S615	339.59	337.15	114.70	2.13	12	RCP	0.015	4.85	3.13	1.48	0.955	5.0				0.000
	EX. S615	EX. S1008	336.89	332.59	430.00	1.00	12	RCP	0.015	3.32	2.15	2.01	1.297	4.2		0.086	4.0	0.342

Notes:
1. See contributing sewage flow estimates on sheet 8.
2. All velocities shown are calculated per a partial flow analysis.
3. A peak factor fo 4.0 was used on all flows.
4. The lower invert of EX. S1008 is an assumed elevation and will need to be surveyed.

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CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:
SANITARY SEWER ANALYSIS

SHEET No.
9

SCALE: 1"=40'

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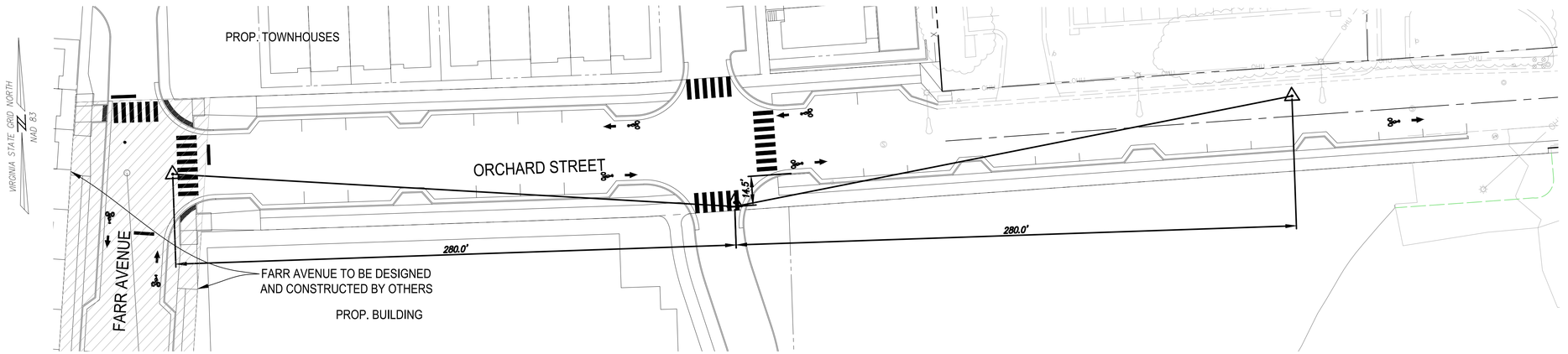
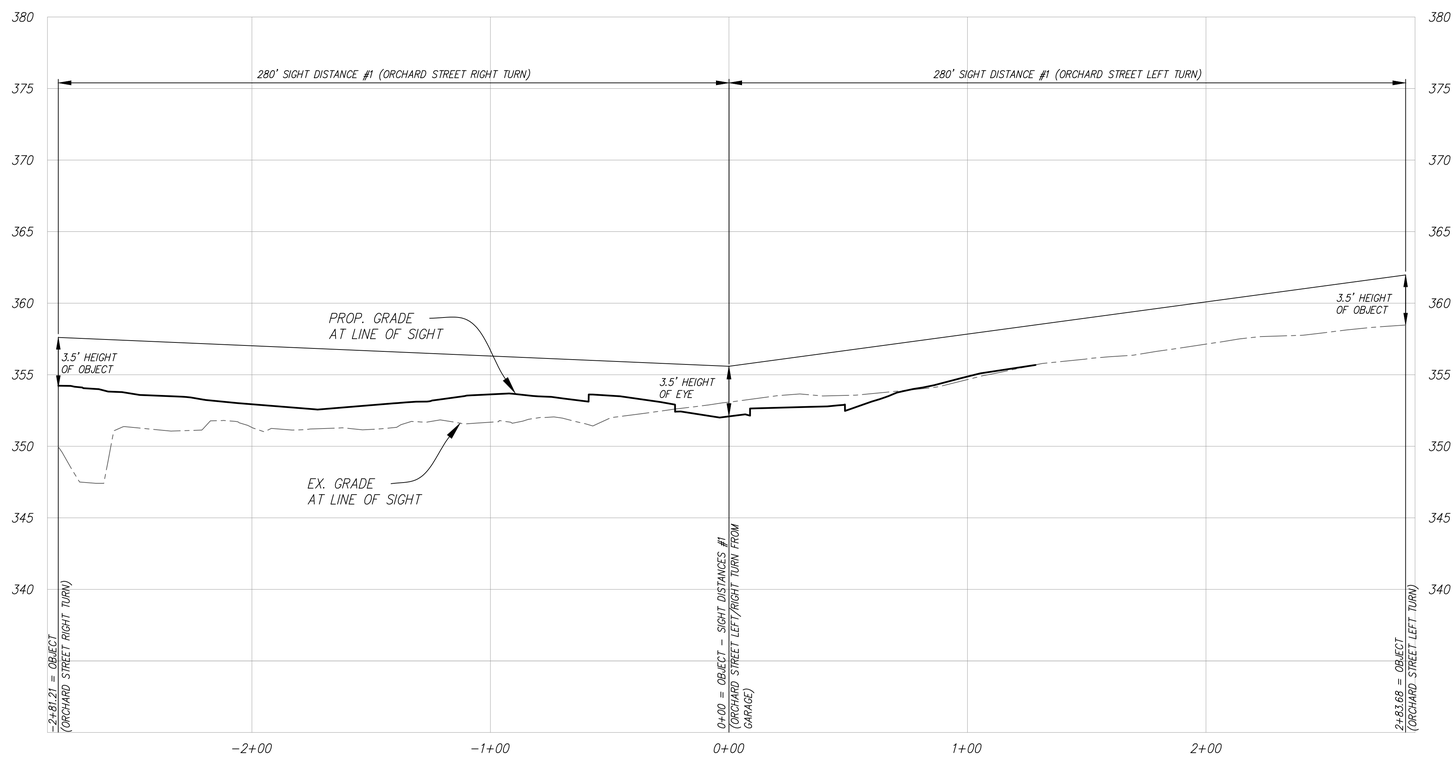


30 15 0 30 60
GRAPHIC SCALE
1" = 30'



ORCHARD STREET SIGHT DISTANCE #1 (FROM PRIVATE STREET)
POSTED SPEED: 25 MPH

5 2.5 0 5 10
VERTICAL GRAPHIC SCALE
1" = 5'

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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SHEET TITLE:

SIGHT DISTANCE

SHEET No.
10

SCALE: SEE DWGS.

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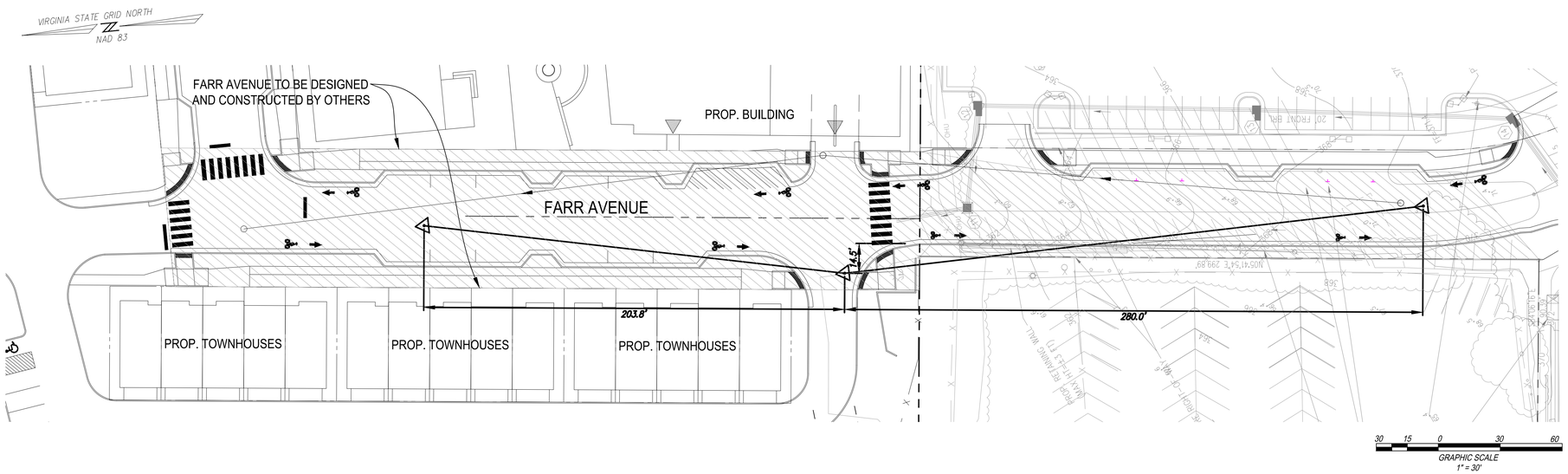

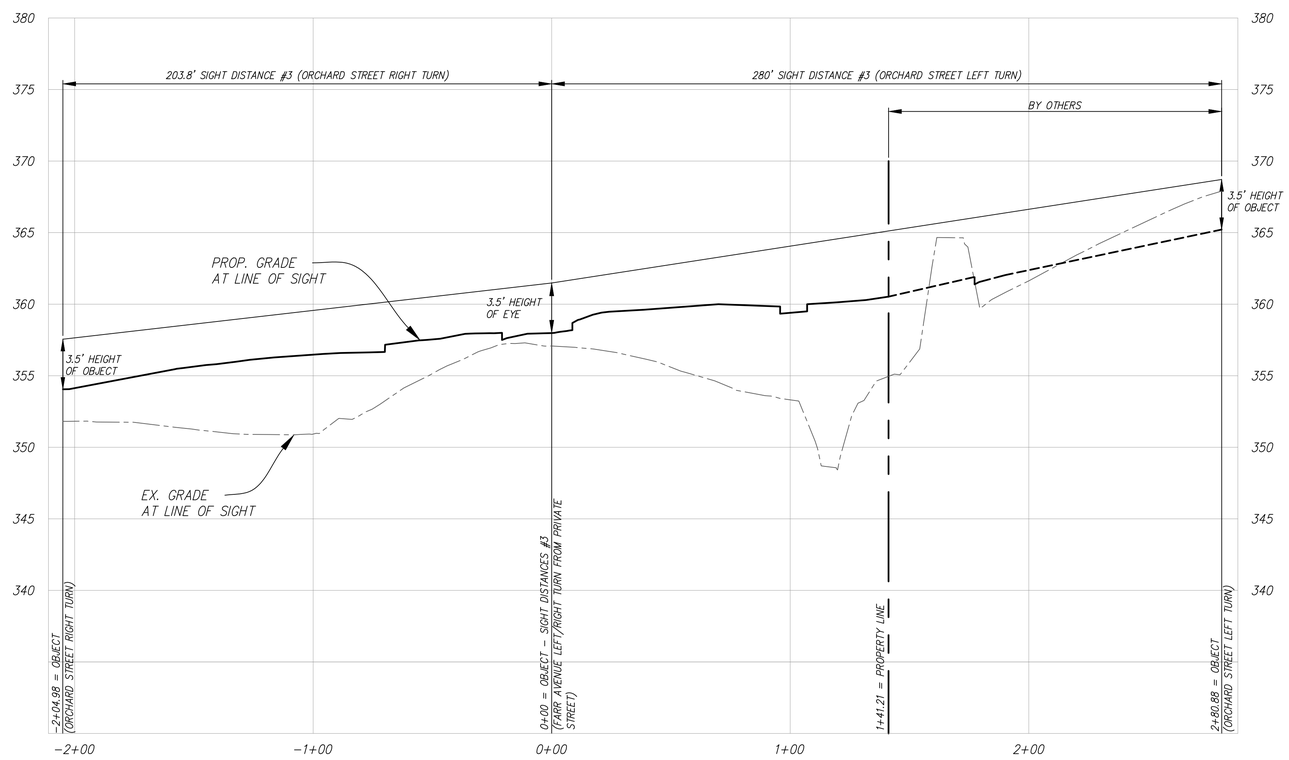

FARR AVENUE SIGHT DISTANCE #3 (FROM PRIVATE STREET)

POSTED SPEED: 25 MPH

5 2.5 0 5 10
VERTICAL GRAPHIC SCALE
1" = 5'

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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DESIGN: EG
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CHECKED: KMW

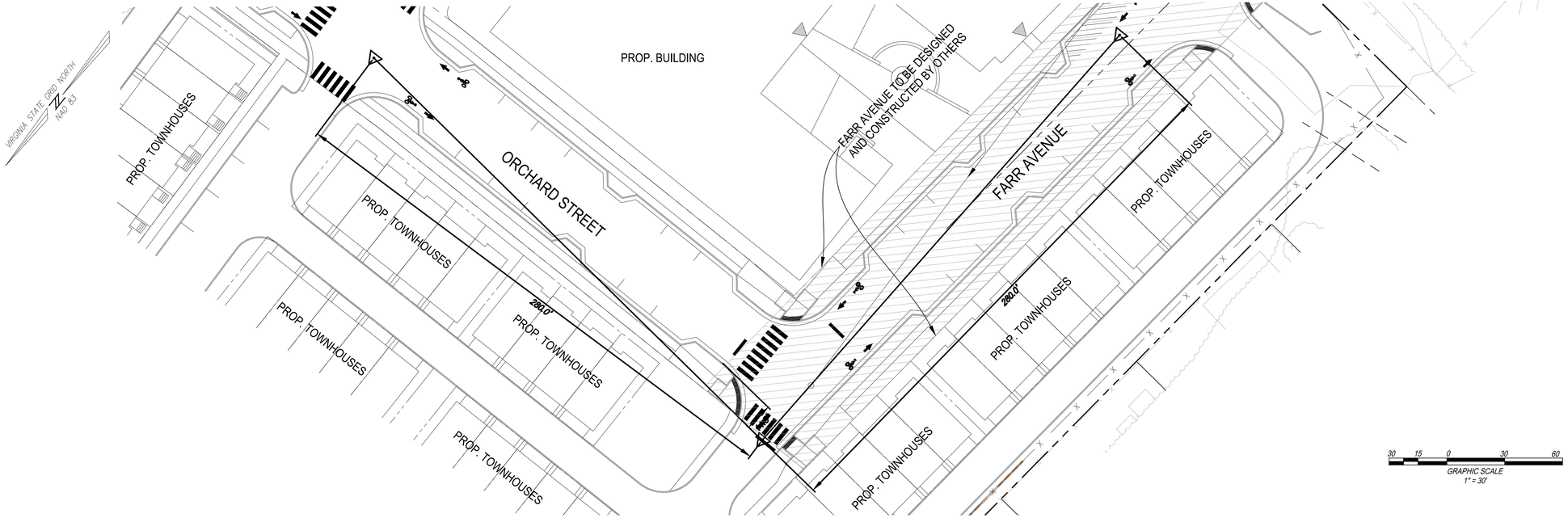
SHEET TITLE:

SIGHT DISTANCE

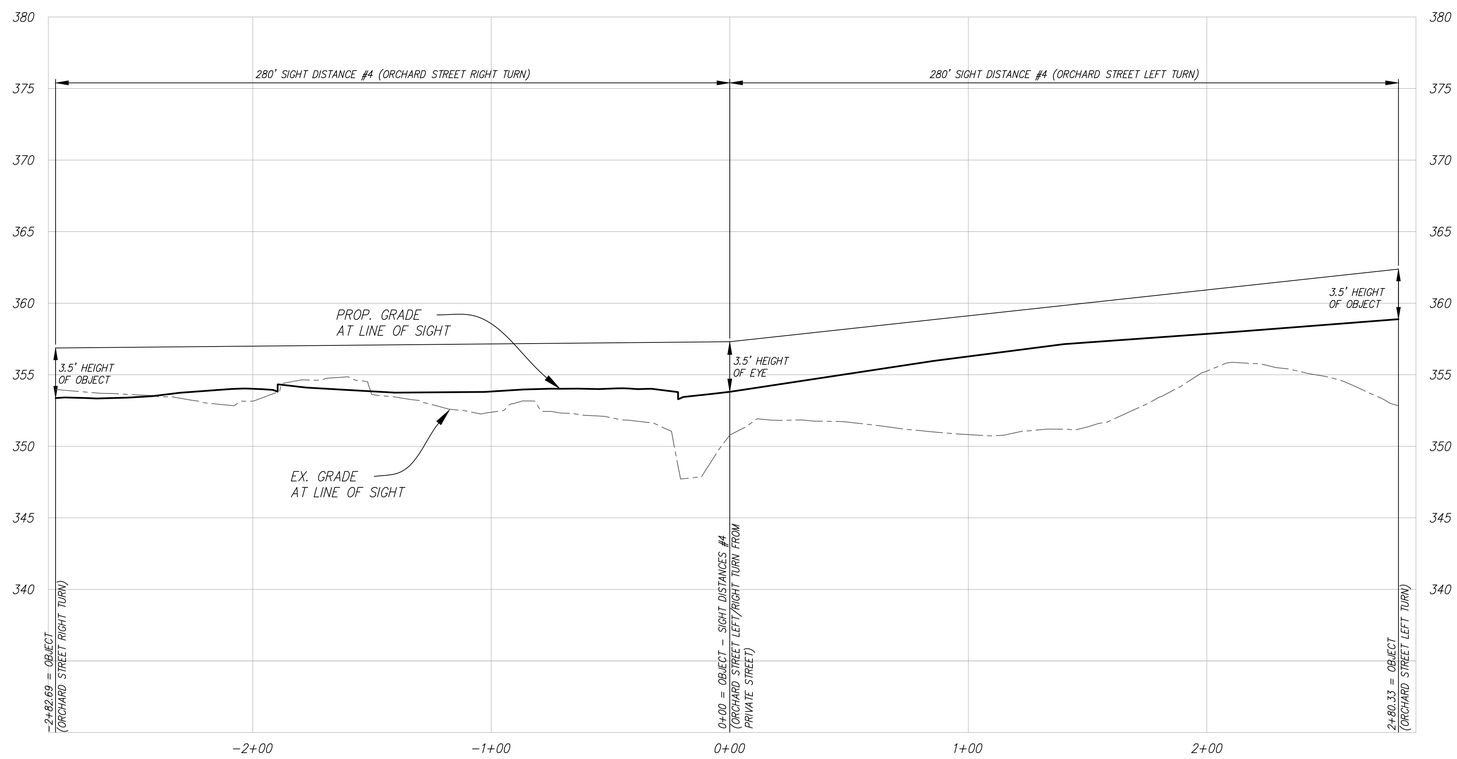
SHEET No.

11

SCALE: SEE DWGS.



ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS



ORCHARD STREET SIGHT DISTANCE #4 (FROM PRIVATE STREET)

POSTED SPEED: 25 MPH

VERTICAL GRAPHIC SCALE
1" = 5'

HORIZONTAL GRAPHIC SCALE
1" = 30'

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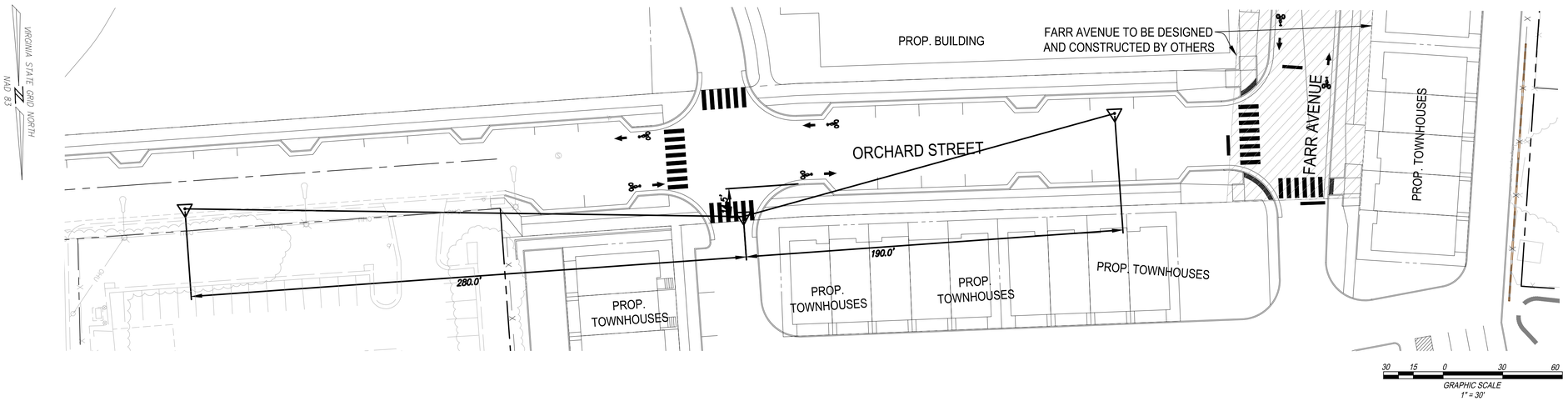
SHEET TITLE:

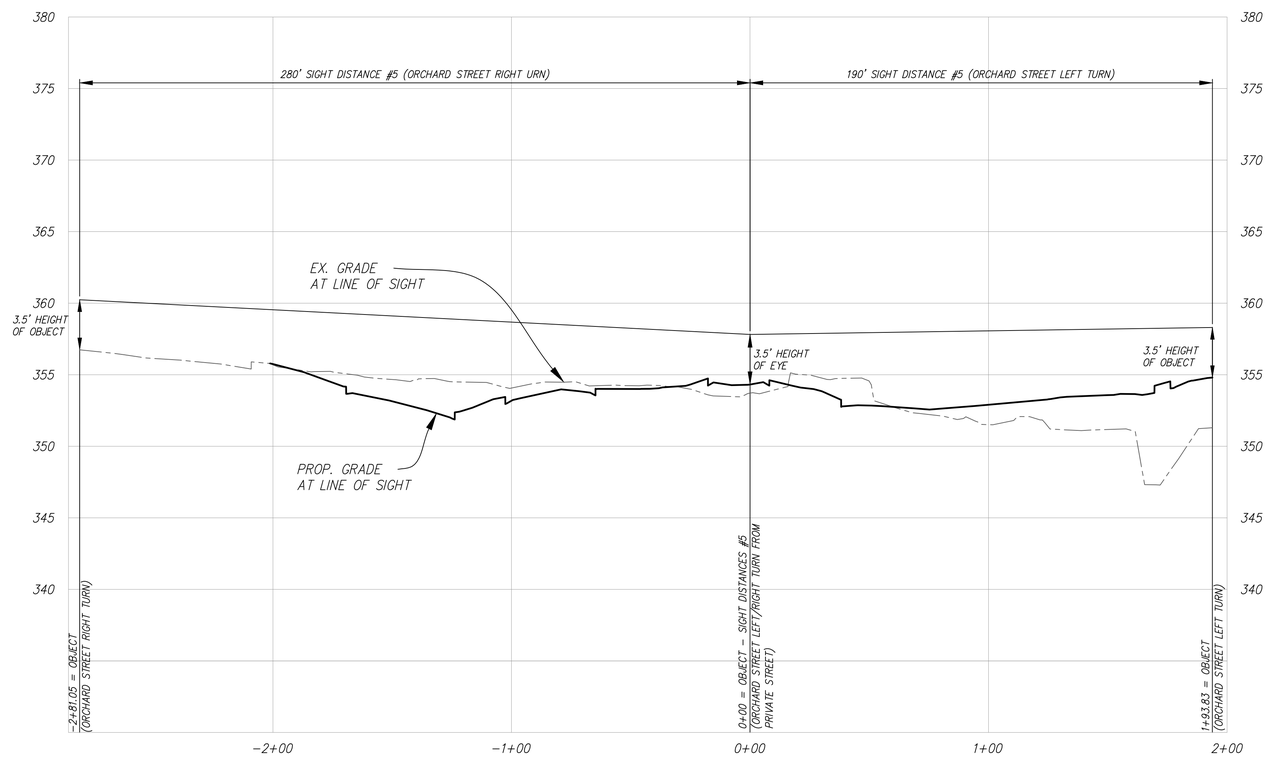
SIGHT DISTANCE

SHEET No.
12

SCALE: SEE DWGS.

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS





ORCHARD STREET SIGHT DISTANCE #5 (FROM PRIVATE STREET)

POSTED SPEED: 25 MPH

5 2.5 0 5 10
VERTICAL GRAPHIC SCALE
1" = 5'

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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DESIGN: EG
DRAWN: JS
CHECKED: KMW

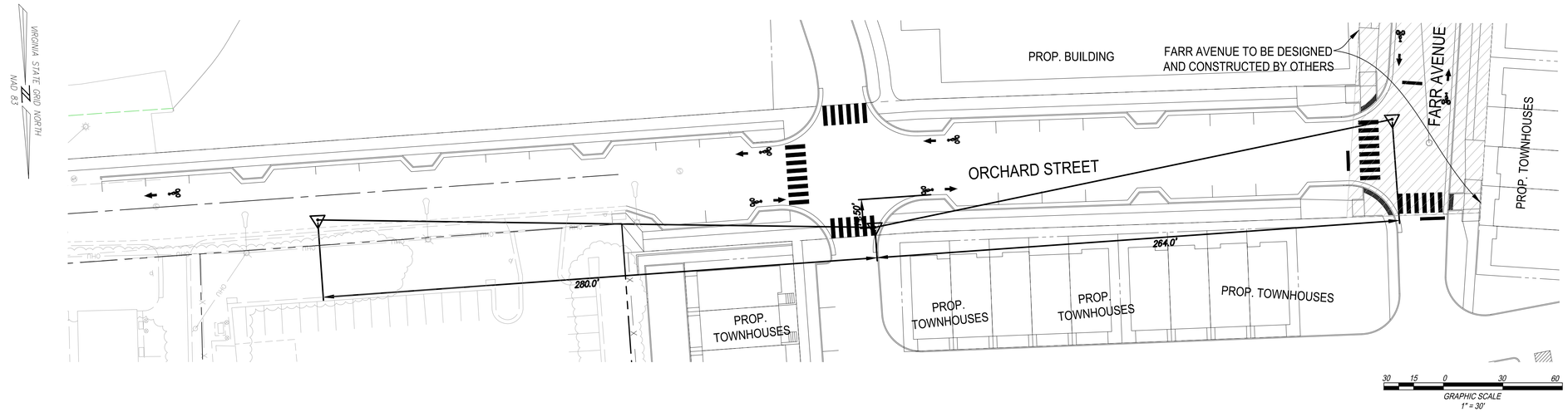
SHEET TITLE:

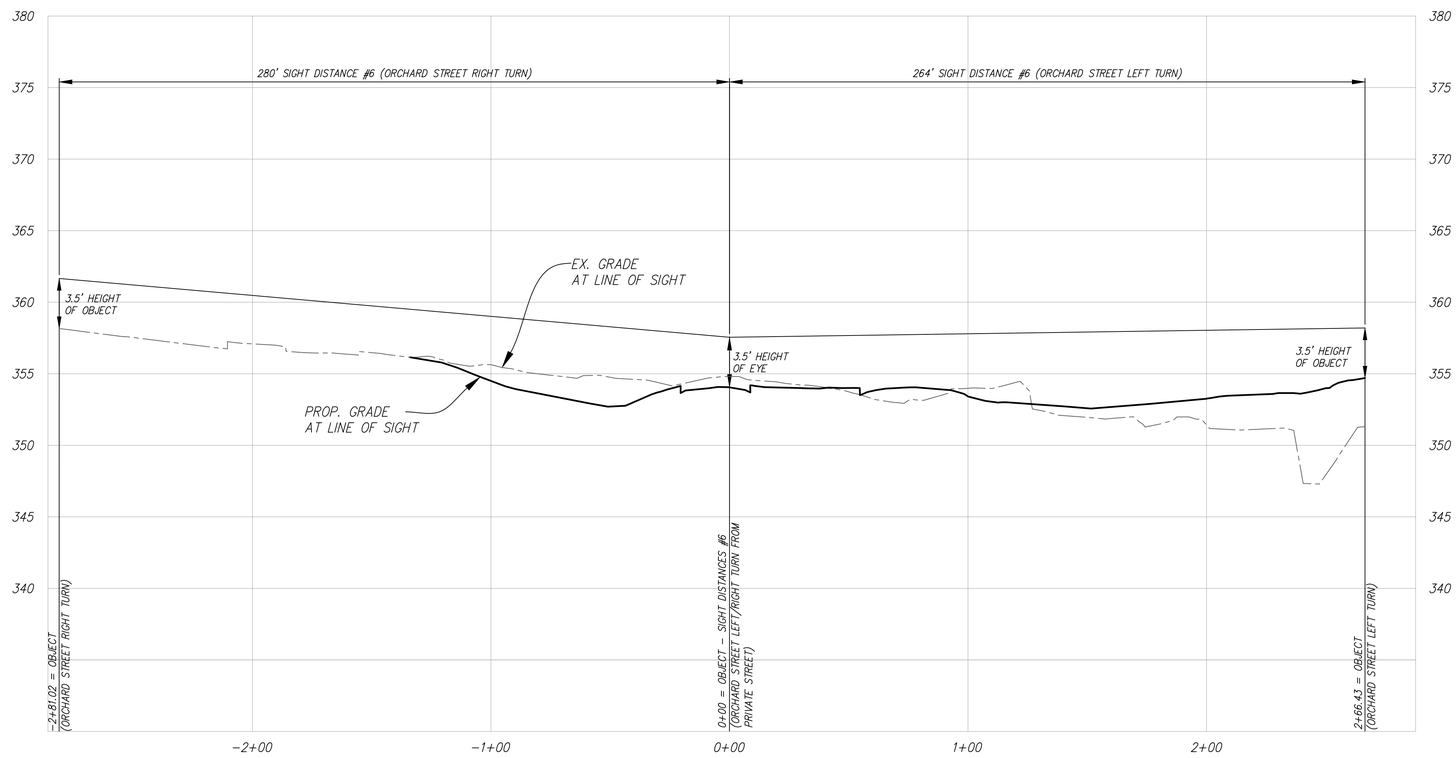
SIGHT DISTANCE

SHEET No.
13

SCALE: SEE DWGS.

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS





ORCHARD STREET SIGHT DISTANCE #6 (FROM PRIVATE STREET)

POSTED SPEED: 25 MPH

5 2.5 0 5 10
VERTICAL GRAPHIC SCALE
1" = 5'

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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DRAWN: JS
CHECKED: KMW

SHEET TITLE:

SIGHT DISTANCE

SHEET No.

14

SCALE: SEE DWGS.

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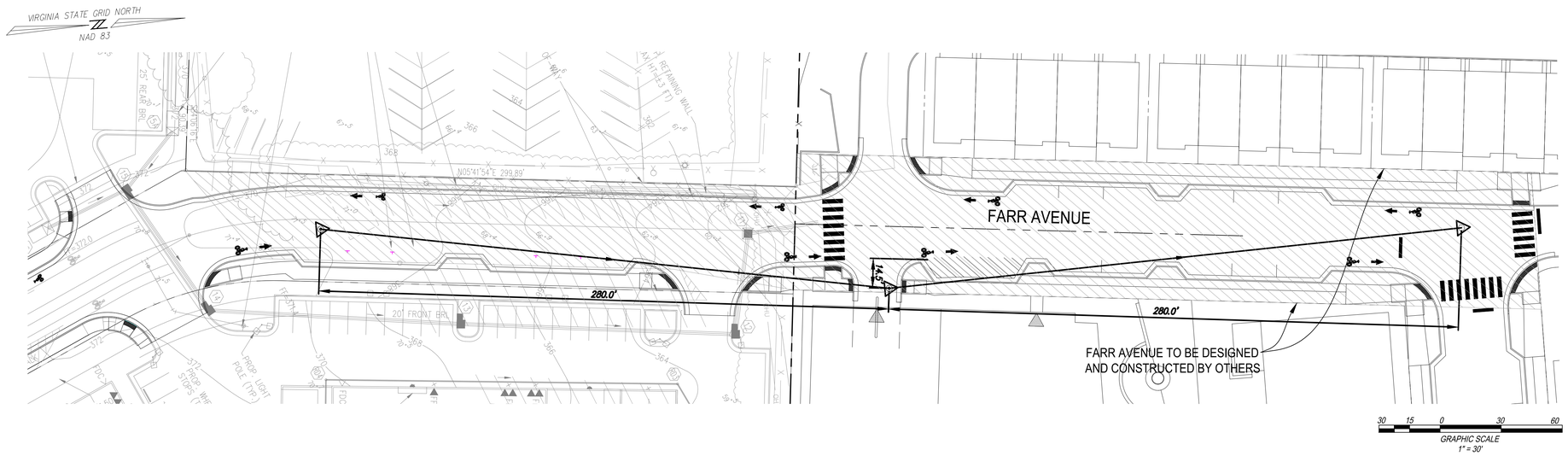

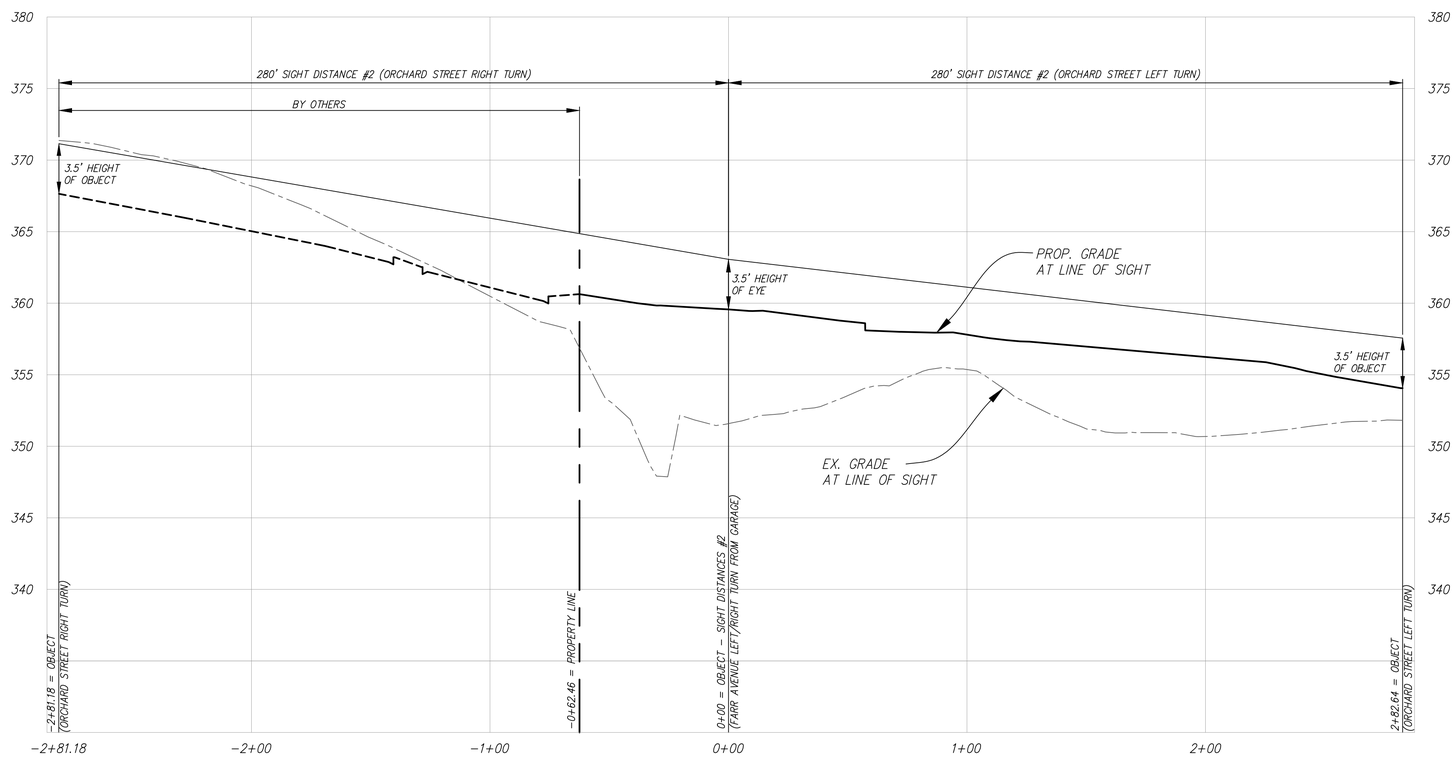

FARR AVENUE SIGHT DISTANCE #2 (FROM GARAGE)
POSTED SPEED: 25 MPH

VERTICAL GRAPHIC SCALE
1" = 5'

HORIZONTAL GRAPHIC SCALE
1" = 30'

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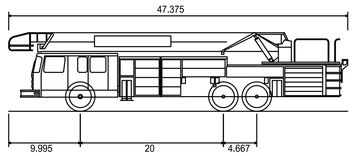
SHEET TITLE:

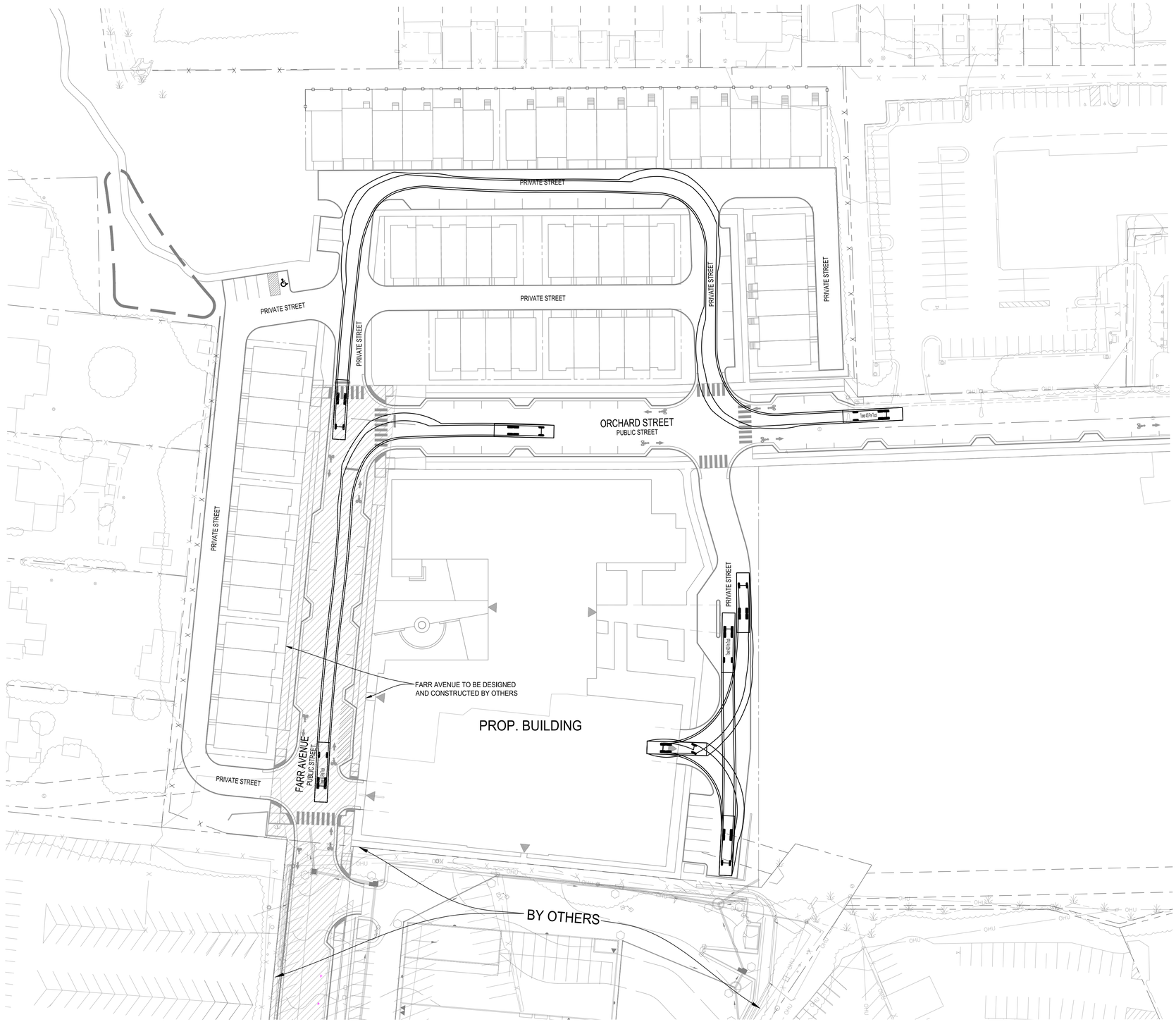
SIGHT DISTANCE

SHEET No.
15

SCALE: SEE DWGS.



Copy of Tower 403 Fire Truck	
Overall Length	47.375ft
Overall Width	10.083ft
Overall Body Height	12.125ft
Min Body Ground Clearance	1.512ft
Track Width	7.667ft
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	54.980ft



FIRE TRUCK TURNING MOVEMENTS

SCALE: 1"=40'

40 20 0 40 80
HORIZONTAL GRAPHIC SCALE
1" = 40'

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SHEET TITLE:

TURNING MOVEMENTS

SHEET No.
16

SCALE: 1"=40'

PROP. TOWNHOUSES
PROP. W/L
23'
19'
ORCHARD STREET
67' ROW
PROPOSED BUILDING
FARR AVENUE TO BE DESIGNED AND CONSTRUCTED BY OTHERS
FARR AVENUE
EX. FIRE HYDRANT
EX. 6" W/L (FROM GIS)
CHAIN BRIDGE ROAD - ROUTE 123
VIRGINIA STATE GRID NORTH
NAD 83

LEGEND

- : PROPOSED R.O.W.
- : BUILDING ENTRANCE
- FDC : PROPOSED FIRE DEPARTMENT CONNECTION
- : PROPOSED FIRE LANE
- : PROPOSED WATERLINE
- FCW : EXISTING WATERLINE
- : EXISTING FIRE HYDRANT

SENIOR LIVING BUILDING:

BUILDING TYPE:	7 STORY
OCCUPANCY TYPE:	RESIDENTIAL R-2
CONSTRUCTION TYPE:	1-B
SPRINKLER TYPE:	FULLY SPRINKLED, NFPA 13
BUILDING AREA:	230,000 SF

BUILDING HEIGHT: REFER TO ARCHITECTURAL EXTERIOR ELEVATIONS

TOWNHOUSE:

BUILDING TYPE:	TOWNHOUSE
OCCUPANCY TYPE:	RESIDENTIAL R-3
CONSTRUCTION TYPE:	5-B
SPRINKLER TYPE:	NFPA 13R

BUILDING HEIGHT: REFER TO ARCHITECTURAL EXTERIOR ELEVATIONS

45' TEMPORARY CULDESAC:

SCALE: 1"=100'

TEMPORARY CUL-DE-SAC NARRATIVE:
IF THE FARR AVENUE EXTENSION PROJECT IS NOT BEING CONSTRUCTED EITHER PRIOR TO OR CONCURRENTLY WITH THIS PROJECT, THEN A TEMPORARY CUL-DE-SAC MAY NEED TO BE PROVIDED. AN APPROXIMATE LOCATION OF THIS CUL-DE-SAC IS SHOWN ABOVE. IF THE CUL-DE-SAC IS REQUIRED DURING CONSTRUCTION, THEN THE CIVIL ENGINEER AND CONTRACTOR WILL WORK WITH THE FIRE MARSHAL TO DESIGN AND INSTALL A TEMPORARY CUL-DE-SAC TO MEET ALL MINIMUM REQUIREMENTS.

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

40 20 0 40 80
HORIZONTAL GRAPHIC SCALE
1" = 40'

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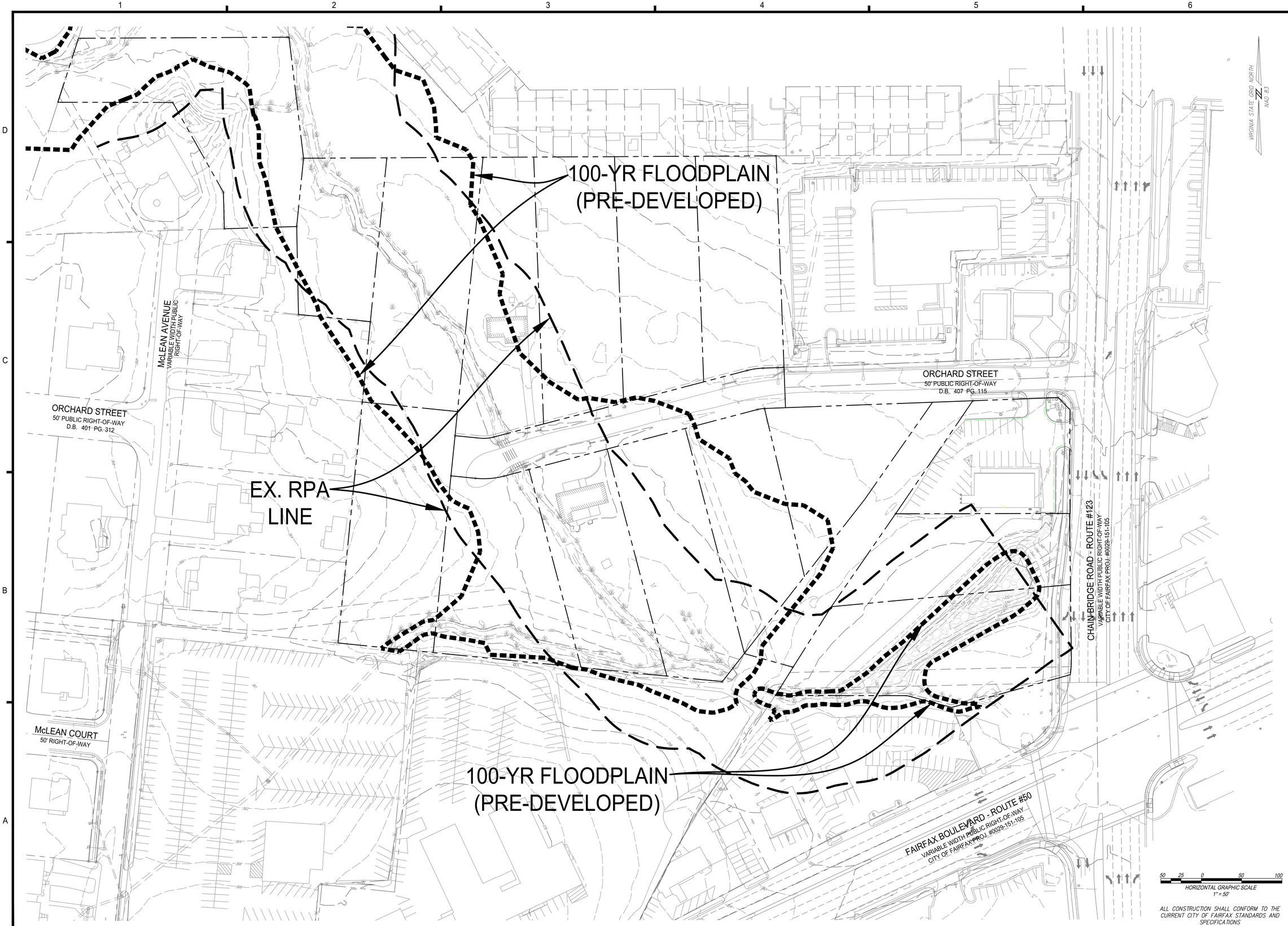
SHEET TITLE:

FIRE SERVICE PLAN

SHEET No.
17

SCALE: 1"=40'



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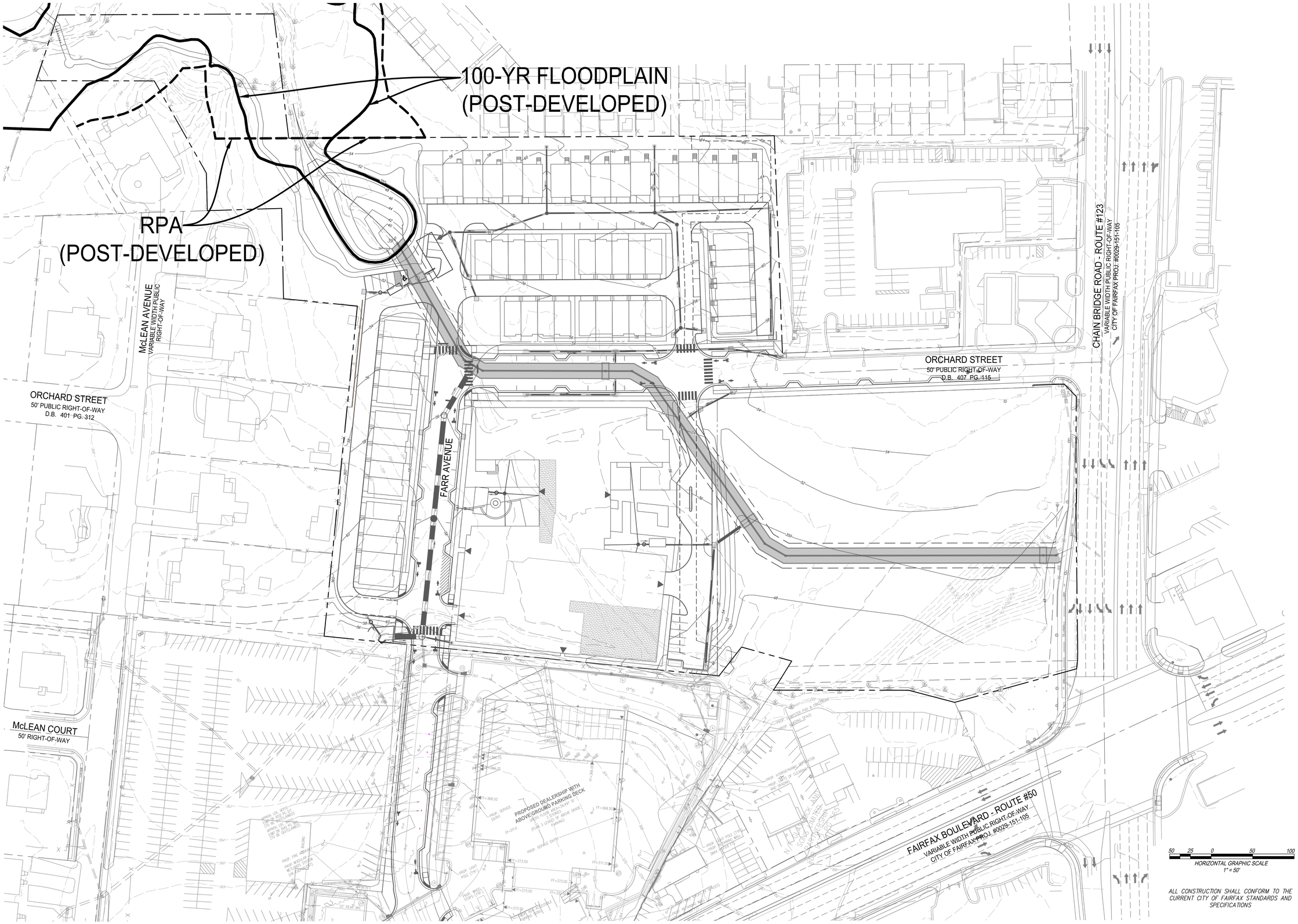
SHEET TITLE:

FLOODPLAIN AND RPA (PRE-DEVELOPED)

SHEET No.

18

SCALE: 1"=50'



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SHEET TITLE:

FOODPLAIN AND RPA (POST-DEVELOPED)

SHEET No.

18A

SCALE: 1"=50'

Attachment 9

Applicable Comprehensive Plan Policies

Outcome N1.1: Infill housing that complements the character of surrounding homes in existing neighborhoods.

Outcome N2.1: Residents of all abilities safely and easily move about the community.

Action N2.1.1 Identify opportunities for future open space and trails in neighborhoods that are currently deficient in offering these amenities.

Action N.2.1.2. Expand existing pedestrian network to increase connectivity neighborhoods and to other destinations.

Outcome CCAC2.2: A pedestrian-oriented, mixed-use destination at Northfax that capitalizes on its location to successfully compete with other regional centers.

Outcome CCAC2.3: Old Town, Northfax, and other Activity Centers are well-designed and desirable places to live, work, shop, and play.

Action CCAC2.3.1: Encourage structure parking and minimize surface parking, particularly adjacent to public rights-of-way.

Action CCAC2.3.2: Promote the orientation of building facing toward streets with architecture that engages street level activity.

Action CCAC2.3.3: Promote active streetscapes with minimal buildings setbacks, pedestrian amenities, street furniture, on-street parking, landscaping, and other features.

Action CCAC2.3.4: Support land planning that balances connectivity for pedestrians, bicyclists, and motorists.

Action CCAC2.3.5: Prepare individual Small Area Plans, as defined in Section 15.2- 2303.4 of the Code of Virginia, for each of the Activity Centers that clearly demonstrate the desired mix of uses, residential density, building intensity, design aesthetic, specific street locations and multimodal connections, infrastructure improvements, parking, and open space.

Action CCAC2.3.6: Target and coordinate public infrastructure improvements with desired infill, reinvestment, and redevelopment areas to encourage and stimulate private development.

Given the relatively high concentration of older adults in the City as compared to surrounding jurisdictions, demand for such units from existing City residents could be strong. Housing should be suitable for a range of choices, such as aging in place, accessory dwelling units, dedicated senior housing, and assisted living/nursing care. In addition, options should be available for people with a variety of disabilities and incorporate features of universal design - the design of buildings, products, or environments to make them accessible to all people, regardless of age, disability, or other factors (City of Fairfax 2035 Comprehensive Plan, Pg. 51).

Housing Goal 3: Provide housing options for older adults and persons with disabilities.

Outcome H3.1: A range of accessible housing types with appropriate levels of support and care is available for older adults and persons with disabilities that incorporate the concept of universal design.

Action H3.1.1 Express preferences regarding housing units that are appropriate and/ or in demand for seniors and those with disabilities and incorporate features of universal design at a range of price points.

Action H3.1.2 Encourage development of congregate living facilities - a group of independent dwelling units that have common kitchen and dining areas - to support older adults and persons with disabilities.

Land use and transportation are inextricably linked and must be planned and designed concurrently – the purpose of transportation is to improve access to land use, and development patterns impact the feasibility and attractiveness of mobility choices (City of Fairfax 2035 Comprehensive Plan, Pg. 84). Multimodal Transportation refers to the multiple ways people use to get around – car, bus, train, bike, walking, etc. – and a multimodal plan incorporates these various transportation modes into an efficient and connected system (City of Fairfax 2035 Comprehensive Plan, Pg. 66).

Action MM2.5.4 Evaluate opportunities to increase street grid connectivity to distribute traffic and to improve network resiliency. Opportunities for additional connections may be identified at any time but particularly as redevelopment occurs.

Multimodal Transportation Goal 3: Integrate transportation with land use.

Outcome MM3.1: On- and off-street parking and curbside uses are effectively managed.

Outcome MM3.2: Walkability to and within Activity Centers and between neighborhoods is increased.

Action MM3.2.1 Whenever possible, increase connections – particularly non-motorized connections – between neighborhoods, community facilities, and Activity Centers.

Action MM3.2.2 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.
Action MM3.2.3 Increase the number, safety, and frequency of pedestrian crossings, including across major streets. Provide crosswalks at all approaches of all signalized intersections at minimum intervals of 500 feet within Activity Centers. An exception exists in the case where the implementation of a crosswalk would result in operational failure of the corridor.

Action MM3.2.4 Improve the overall pedestrian environment, including pedestrian crossings, street trees, and furnishing zones; buffering sidewalk from vehicle travel lanes; improved pedestrian scale lighting; and active ground floor uses along primary street edges.

Outcome MM3.3: Streets are designed to accommodate context and function.

Action MM3.3.3 Ensure quality street design in both the pedestrian zone and travel zone of the street.

Action MM3.3.4 Improve access, circulation, walkability, and transportation management in Activity Centers.

Environment and Sustainability

The City has several types of environmental resources that are easily impaired by urban land uses. Encompassing the headwaters of Accotink Creek, measures taken by the City to protect water quality, riparian and floodplain areas, open space, and the urban forest are critical to support regional efforts to improve environmental health. Located within the Chesapeake Bay Watershed, the City is committed to reducing stormwater runoff in order to protect the Bay through the adoption of the Chesapeake Bay Preservation Act and enforcement of other federal, state, and local stormwater regulations. (City of Fairfax 2035 Comprehensive Plan, Pg. 99).

One of the characteristics of the City that makes it a desirable and healthy place in which to live is the extent, diversity, and quality of its environmental resources. The City's main environmental resources include wetlands, ponds, streams, public parks, open space, and urban forests. As the City continues to grow and redevelop, these resources are at risk of being impaired. Growth and development often cause pollution to the water, air, and soil; degradation to ecosystems; and loss of natural areas that contribute to residents' quality of life. Continuing to preserve and restore our environmental resources ensures a healthy environment by providing access to clean air, clean water, healthy ecosystems, and high quality recreation areas (City of Fairfax 2035 Comprehensive Plan, Pg. 105).

Outcome NE1.5: Restored and preserved natural open spaces and contiguous greenway corridors that provide natural habitats for plants and wildlife.

Action NE1.5.1 Restore disturbed areas along streams and in conservation easements with native species.

Action NE1.5.3 Encourage new development that protects and preserves environmentally-sensitive areas and natural features, such as tree cover (especially significant stands of trees and healthy, mature trees), native vegetation, streams, wildlife habitat, and natural topography.

Economic Vitality

Outcome EV1.1: New development and redevelopment that maximize revenue generation from nonresidential buildings and uses.

Goal 3 Transform the Commercial Corridors and Activity Centers

Outcome EV3.1: Redevelopment projects in the Commercial Corridors and Activity Centers create destinations that attract tenants, customers, and residents.

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04 / 13 / 2020
Community Dev & Planning

GOROVE SLADE
Transportation Planners and Engineers

TECHNICAL MEMORANDUM

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Date:	April 9, 2020	
Subject:	Northfax Development – Proposed Senior Living Facility Parking Assessment	

Introduction

This memorandum presents the findings of a parking assessment conducted for the proposed senior living facility portion of the Northfax development within the City of Fairfax, Virginia. The projection of parking space needs was assessed based on the Institute of Transportation Engineer's (ITE's) parking generation rates, past experience of the operator, and the parking requirements per the City of Fairfax's *Zoning Ordinance*; and was compared to the number of spaces planned.

As discussed in this memorandum, the Applicant is requesting the City Council to modify the parking requirement to allow for an approximately 38% reduction in the required parking spaces (from the 194 spaces required prior to any reductions to the proposed 120 spaces) for the senior living facility. Based on anticipated future demand, the proposed 120 spaces would adequately serve the future parking demand.

Background

The Northfax development would be generally located in the northwest quadrant of the intersection of Route 123 and Fairfax Boulevard (Rte. 29/50). The proposed redevelopment of the site would require a rezoning of the property. The parcels fronting Fairfax Boulevard and Chain Bridge Road are currently zoned CR (Commercial Retail District), while the interior parcels along Orchard Street are zoned RM (Residential Medium); the Applicant is proposing to rezone the subject property from the CR and RM districts to a PD-M (Planned Development Mixed Use) district.

With the rezoning and based on current plans, the proposed Northfax development is anticipated to consist of 236 multi-family residential dwelling units (i.e., townhomes), a senior living facility with a capacity of up to 200 units, approximately 25,000 square feet of commercial use (including restaurant, office space, and general retail), and a 140-room hotel. The development is projected to be fully constructed and in operation by 2027.

City of Fairfax Parking Requirements & Proposed Parking Supply

As noted, this memorandum assesses the parking demand and supply for the proposed senior living facility portion of the Northfax development. The senior living facility is anticipated to have an upward capacity of 200 units, split between independent living, assisted living, and memory care units. A summary of the number of units and beds by each type is provided below:

- Independent Living:
    - 76 one-bedroom units and 38 two-bedroom units (152 beds total)

- Assisted Living:
  - 54 one-bedroom units and 6 two-bedroom units (66 beds total)
- Memory Care:
  - 24 studios and 2 one-bedroom units (26 beds total)

The City of Fairfax's *Zoning Ordinance*, adopted in June 2016 and last amended June 2019, stipulates parking ratios (i.e., the number of parking spaces per unit type or square footage) required. A summary of the City's parking requirements relevant to the senior facility is summarized below in Table 1.

Table 1: City of Fairfax Parking Requirements

Land Use	Parking Requirements	Required Spaces
Independent Living	1.5 Spaces per dwelling unit*	171.00
Assisted Living	1 Space per 4 Beds	16.50
Memory Care	1 Space per 4 Beds	6.50
Total		**194**

Note: (*) The 1.5 spaces per dwelling unit is based on the City's guidelines for multifamily type land uses. Given the average age of an independent living resident, 82 years of age, it is anticipated this parking rate would be conservative given that many are not anticipated to own or operate personal vehicles.

As can be seen the table above, the Northfax senior facility is mandated to provide a total of 194 parking spaces per the City's *Zoning Ordinance*. The Applicant is planning to construct a total of 6 surface and 114 garage parking spaces (totaling 120 spaces), which would account for a reduction of approximately 38% from the City's requirements.

Of note, the City's *Zoning Ordinance* allows for a parking reduction of 20%, which could reduce the required parking spaces to 156. Based on previous discussions with the City, the Applicant is requesting the City Council to modify the parking requirement as part of the rezoning application.

Anticipated Parking Demand (ITE Parking Generation)

In order to assess if the proposed number of spaces would accommodate future demand, a future parking analysis was conducted based on the parking rates and methodology presented in the Institute of Transportation Engineer's (ITE's) *Parking Generation Manual*, 5th edition publication.

The *Parking Generation Manual* contains statistics that describe "current state-of-the-practice understanding of the relationship between parking demand and the many characteristics associated with an individual development site or land use." The manual presents land use descriptions and data plots for 121 land use types with various time periods, independent variables, and area types in order to provide forecasts of maximum daily parking demand.

As noted previously, the proposed senior living facility is projected to have a capacity of up to 200 units. The units would be split between independent living, assisted living, and memory care. In order to assess the parking demand, the rates for ITE Land Use Code 252 (Senior Adult Housing – Attached) were utilized for the independent living units, and the rates for ITE Lane Use Code 254 (Assisted Living) were utilized for both the assisted living units and the memory care units. The independent variable used for ITE Land Use Code 252 was based on the number of dwelling units, whereas the independent variable used for ITE Lane Use Code 254 was based on the number of beds. These independent variables coincide with the City's guidelines for parking requirements.

The resulting parking generation is presented in Table 2 and is based on the rates for a general "urban /suburban" setting. Additional documentation from ITE is presented in the Appendix.

Table 2: Senior Living Facility Parking Demand – Based on ITE's Parking Generation Manual (5 ED)

Land Use	ITE Code	Size		Daily	
				Rate	Total
Senior Adult Housing - Attached (Independent Living)	252	114	DU	0.61	70
Assisted Living (Assisted Living and Memory Care)	254	66+26	Beds	0.39	36
Total					**106**

As can be seen in the table above, per ITE's *Parking Generation Manual*, the proposed senior living facility is anticipated to require a daily maximum of 106 parking spaces in order to meet future demand (inclusive of residents, staff, and visitor needs). Thus, the proposed 120 parking space supply is anticipated to adequately serve future parking demand with an excess of 14 parking spaces at any given time.

Anticipated Parking Demand (Brightview Historic Parking Rates)

The proposed senior living facility is anticipated to be built, owned, and operated by Brightview Senior Living. Currently, Brightview operates more than 50 senior living facility in the East Coast with many of their site operating in urban environments, such as in the Rockville Town Center and in the Woodmont Triangle area of Bethesda, Maryland. The closest facilities to the proposed Northfax site are located in the Fair Oaks and Woodburn areas of Fairfax County.

Based on an assessment of six nearby Brightview sites, located within Fairfax County (Virginia) and Montgomery County (Maryland), it is anticipated that the projected parking ratio per unit is approximately 0.56 spaces and the parking ratio per bed is approximately 0.50 spaces. A summary of the six sites is presented below in Table 3.

Table 3: Parking Ratios of Existing Brightview Sites Near the City of Fairfax

Name	Total units	Total Beds	Parking Space	Parking / Unit	Parking / Bed
Fair Oaks	170	196	105	0.62	0.54
West End	198	236	123	0.62	0.52
Bethesda Woodmont	113	119	42	0.37	0.35
Great Falls	88	96	57	0.65	0.59
Grosvenor	96	100	47	0.49	0.47
Woodburn	100	114	63	0.63	0.55
Average	**128**	**144**	**73**	**0.56**	**0.50**

Assuming the above mentioned rates of 0.56 spaces per unit and the 0.50 spaces per bed, it is anticipated that the proposed senior living facility would require a 110 parking space supply, as shown below in Table 4.

Table 4: Senior Living Facility Parking Demand – Based on Brightview Historic Parking Rates

Land Use	Size		Daily	
			Rate	Total
Senior Adult Housing - Attached (Independent Living)	114	DU	0.56	64
Assisted Living (Assisted Living and Memory Care)	66+26	Beds	0.50	46
Total				**110**

Additional Considerations – On-Street Parking

In addition to the 120 on-site parking spaces, Orchard Street and the future extension of Farr Avenue are anticipated to supply 39 on-street parking spaces in their right-of-way as well as a single loading space for the senior facility. Though not included in this parking assessment as per the City's guidelines, these curb parking spaces could absorb parking demand fluctuations in excess of the 120 spaces on occasion and in excess of the 106 parking space demand as per ITE projections.

Additional Considerations – Parking Utilization

The proposed 120 parking spaces will be utilized by the facility's residents, staff, and visitors. At this time, it is not anticipated that on-site parking will be assigned or specifically designated. Of note, at other Brightview facilities, management has recommended their staff to park further way from the front door of the building. A similar practice will be recommended at this site.

Additional Considerations – Alternative Transportation Amenities

At other similar facilities, Brightview has operated company owned vehicles (vans and sedans) for the purposes of transporting residents. Brightview is planning to provide this service at the Northfax location with two vehicles (one van and one sedan). The vehicles will be operated by Brightview staff for planned activities/events as well a pre-reserved service to take residents for errands/appointments upon request.

The van service for this site is not anticipated to operate as a Metro shuttle, but would provide residents an alternative transportation mode in order to get to and from major hotspots (such as retail centers, medical centers, community centers, and places of worship). The service will be provided routinely. Of note, this service is practiced at Brightview's Rockville Town Center location (West End), which is a close proxy for the proposed Northfax location with 198 units in a walkable, mixed-use environment.

Per a meeting between City staff and representatives of the Applicant on March 19, 2020, Transportation Demand Management (TDM) plan for the Northfax Development will submitted as a separate document to the City of Fairfax prior to Site Plan and would include this service as a component.

Conclusions

This memorandum presents the findings of a parking assessment conducted for the proposed senior living facility portion of the Northfax development within the City of Fairfax, Virginia. This memorandum supports the following conclusions:

- Based on City guidelines, the site is required to provide a total of 194 parking spaces. With a 20% reduction allowable under the City's *Zoning Ordinance*, the parking requirements could be reduced to 156 parking spaces.
    - The Applicant is proposing to construct 120 spaces for the facility's residents, staff, and visitors. The 120 spaces would constitute of 38% reduction. Based on previous discussions with the City, the Applicant is requesting the City Council to modify the parking requirement as part of the rezoning application.
- The planned 120 spaces for the senior living facility are anticipated to adequately serve the future parking demand, based on either standard ITE data or Brightview's experience at similar operational facilities.
    - Based on ITE rates, a parking supply of 106 spaces would be required in order to meet anticipated demand. Thus, the proposed 120 parking spaces would accommodate the parking demand with an excess of 14 spaces.
    - Based on Brightview historic rates of nearby sites, a parking supply of 110 would be required in order to meet anticipated demand. Thus, the proposed 120 parking spaces would accommodate the parking demand with an excess of 10 spaces.

Technical Appendix

Appendix A: Excerpts from ITE's Parking Generation Manual (5th ED)

Appendix A:

Excerpts from ITE's Parking Generation Manual (5th ED)

Land Use: 252 Senior Adult Housing—Attached

Description

Senior adult housing consists of attached independent living developments, including retirement communities, age-restricted housing, and active adult communities This type of housing for active senior adults can take the form of bungalows, townhouses, and apartments. These developments may include limited social or recreational services. They generally lack centralized dining and on-site medical facilities. Residents in these communities live independently, are typically active (requiring little to no medical supervision) and may or may not be retired. Congregate care facility (Land Use 253), assisted living (Land Use 254), and continuing care retirement community (Land Use 255) are related uses.

The minimum age thresholds for the study sites in the database are not known. It would be expected that a development with an age restriction of 55 would include more households with an employed resident than would a development with an age restriction of 65. How this age restriction affects parking demand cannot be determined from the available data.

Additional Data

The average parking supply ratio for the three study sites in a general urban/suburban setting and with parking supply information is 0.9 spaces per dwelling unit.

The sites were surveyed in the 2000s in Pennsylvania.

It is expected that the number of bedrooms and number of residents are likely correlated to the parking demand generated by a residential site. Parking studies of multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex). Future parking studies should also indicate the number of levels contained in the residential building.

Source Number

431

Land Use: 254 Assisted Living

Description

An assisted living complex is a residential setting that provides either routine general protective oversight or assistance with activities necessary for independent living to mentally or physically limited persons. It commonly has separate living quarters for residents. Its centralized services typically include dining, housekeeping, social and physical activities, medication administration, and communal transportation.

Alzheimer's and ALS care are commonly offered by these facilities, though the living quarters for these patients may be located separately from the other residents. Assisted care commonly bridges the gap between independent living and nursing homes. In some areas of the country, assisted living residences may be called personal care, residential care, or domiciliary care. Staff may be available at an assisted care facility 24 hours a day, but skilled medical care—which is limited in nature—is not required. Congregate care facility (Land Use 253), continuing care retirement community (Land Use 255), and nursing home (Land Use 620) are related uses.

Time of Day Distribution for Parking Demand

The following table presents a time-of-day distribution of parking demand on a weekday (nine study sites), a Saturday (eight study sites), and a Sunday (nine study sites) in a general urban/suburban setting.

Attachment 11

TRAFFIC IMPACT STUDY

NORTHFAX

CITY OF FAIRFAX, VIRGINIA

January 2, 2020
Revised April 30, 2020

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EXECUTIVE SUMMARY

The following report presents the findings of a Traffic Impact Study (TIS) for the Northfax development in the City of Fairfax, Virginia.

Site Location and Study Area

The proposed development site is located in the City of Fairfax, Virginia and is bounded by Assembly Townhouse Community to the north, Fairfax Boulevard (Route 50) to the south, McLean Avenue to the west, and Chain Bridge Road (Route 123) to the east. The site is illustrated in Figure 1.

The vehicular study area consists of eight intersections along Fairfax Boulevard and Chain Bridge Road and include one future intersection providing access to the development.

The site currently consists of two-single family detached units, an excess parking lot for an adjacent car dealership, and a few vacant parcels. The parcels fronting Fairfax Boulevard and Chain Bridge Road are currently zoned CR (Commercial Retail District), while the interior parcels along Orchard Street are zoned RM (Residential Medium). The Applicant is proposing to rezone the subject property from the CR and RM districts to the PD-M (Planned Development Mixed Use) district.

Proposed Project

The proposed Northfax development is anticipated to be completed in two phases. Phase 1 focuses on residential development on the northern and western portions of the site, while Phase 2 includes a balance of the residential development and commercial development within the site.

It should be noted that the current application for the site only pertains to Phase 1. A separate application for Phase 2 will be submitted subsequently to the City of Fairfax. As such, the Phase 2 portion of the development described herein is for transportation planning purposes and is subject to change with the future application.

A description of each phase is presented below:

Phase 1: Phase 1 consists of 56 multi-family residential units and 200 continuing care retirement community units, which is anticipated to be completed and in operation by 2023. Access to the site is proposed to be provided via Orchard Street and via the proposed extension of Farr Avenue. Phase 1 will account for the planned extension of University Drive to join Eaton Place and the extension of Farr Avenue (by the City of Fairfax) to Orchard Street.

Phase 2: Phase 2 will include approximately 25,000 square feet of commercial uses (including retail space, office space, and restaurants) with approximately 180 residential dwelling units on the upper floors and a 140-room capacity hotel. Phase 2 is anticipated to be complete by 2027. In addition to Orchard Street, a right-in (RI) only access along Chain Bridge Road is proposed to provide access to the site. Phase 2 will account for the planned extension of University Drive to join Eaton Place; the extension of Farr Avenue to Orchard Street; signalization of Farr Avenue and Fairfax Boulevard; and Re-alignment of Warwick Avenue, Fairfax Boulevard, and McLean Avenue.

Of note, the development program for Phase 2 would be in addition to that of Phase 1.

Impacts and Recommendations

The analysis contained includes the following scenarios:

- Existing Conditions (2019),
- Future Conditions without Development – Phase 1 (2023),
- Future Conditions with Development – Phase 1 (2023),
- Future Conditions without Development – Phase 2 (2027), and
- Future Conditions with Development – Phase 2 (2027).

The analysis presented in this report supports the following major findings and recommendations:

Transit

The subject site is served by transit:

- There are 13 bus stops within a quarter-mile of the site. These stops are directly served by WMATA (Metrobus) and City of Fairfax City-University Energysaver (CUE) Bus routes.
- The site is approximately 3.6 miles from the nearest Vienna/Fairfax-GMU Metrorail Station. Access to the Vienna/Fairfax-GMU Metrorail Station from the site is served by the Gold1 and Green1 CUE bus routes.

It is anticipated that the proposed development will generate a small number of transit trips during the AM and PM peak hours

and is not anticipated to significantly increase the current boardings and alightings at adjacent bus stops.

Pedestrian

The roadways immediately surrounding the site provide sidewalks on both sides of the street, and crosswalks at major intersections. There are some existing deficiencies within a ¼ mile walk of the site, such as a lack of striped crosswalks and curb ramps that do not meet current ADA standards.

This project will reduce deficiencies by providing new ADA-compliant curb ramps at all site access points and an improved streetscape along Orchard Street and along internal roadways within the site. The future signal at the intersection of Farr Avenue and Fairfax Boulevard will provide an additional opportunity for pedestrians to cross Fairfax Boulevard.

Bicycle

The site does not have direct access to any designated bicycle facilities, although the sidewalk on Fairfax Boulevard is identified as a bikeable sidewalk according to the Bike Fairfax Interactive Map.

In Phase 1, the proposed site will include a five-foot bike lane along the south side of Orchard Street near the intersection with Chain Bridge Road and along both sides of Orchard Street internal to the site. Five-foot bike lanes are proposed along both sides of the Farr Avenue Extension to Orchard Street.

Vehicular

The site is well connected via Fairfax Boulevard and Chain Bridge Road, both classified as “Other Principal Arterials” by the Virginia Department of Transportation (VDOT). The arterials provide direct connections to I-66 and the Capital Beltway (I-495).

Under Phase 1, the proposed development will generate 51 new vehicular trips in the weekday morning (AM) peak hour, 62 new vehicular trips during the weekday afternoon (PM) peak hour, and 77 new vehicular trips during the Saturday midday (SAT) peak hour. Ultimately, under Phase 2, the proposed development will generate approximately 264 new vehicular trips in the AM peak hour, 342 new vehicular trips in the PM peak hour, and 402 new vehicular trips in the Saturday peak hour.

A trip generation comparison between the proposed and by-right uses was evaluated, and the results indicate that the proposed development program would generate approximately half of the peak hour traffic when compared to what is allowable by-right.

Under Phase 1 conditions, the increase in vehicular trips would attribute to an increase of less than 1.0% in peak hour traffic along Fairfax Boulevard and an increase of less than 1.1% in peak hour traffic along Chain Bridge Road as comparted to a future without the development conditions. Under Phase 2 conditions, the increase in vehicular trips would attribute to an increase of less than 3.3% in peak hour traffic along Fairfax Boulevard and an increase of less than 3.2% in peak hour traffic along Chain Bridge Road.

In order to determine the impacts of the proposed development on within the transportation network, this report projects future conditions with and without the proposed development and performs analyses of intersection delays.

Based on the analysis, the intersections within the study area have movements that operate at levels beyond acceptable thresholds in one or more peak hour in one or more conditions scenario, with the exception of Chain Bridge Road & Future (RI) Site Access (Intersection 8).

Under 2023 future with development conditions, the intersection of Chain Bridge Road at Eaton Place (main node) (Intersection 7) begins to operate at a LOS E during the AM peak hour with an increase in delay of 0.3 seconds over the LOS D/E threshold. Additionally, the intersection of Fairfax Boulevard at Chain Bridge Road begins to experience slight increases in delays. With slight increases in delays at these intersections, the impact of the proposed development is not anticipated to significantly alter driver’s expectation at the signals. However, if necessary, the increases in delay can be mitigated with a slight change in the signal timings at these intersections.

Under 2027 Future with Development Conditions, five of the eight intersections are recommended to have improvements (geometric and/or adjustments to signal timings). The five intersection are as follows:

- Int 1: Fairfax Boulevard & Eaton Place
- Int 3: Fairfax Boulevard & Chain Bridge Road
- Int 4: Fairfax Boulevard & Farr Avenue/Future Site Access
- Int 6: Chain Bridge Road & Orchard Street
- Int 7: Chain Bridge Road & Eaton Place (main node)
- Int 7a: Chain Bridge Road & Eaton Place (east node)

Transportation Demand Management

Transportation Demand Management (TDM) is the implementation of measures to influence travel behavior by mode, frequency, time, route, or trip length in order to achieve a maximally efficient use of transportation facilities. The TDM plan will have many components that are tailored to accommodate the Northfax site.

A few of the typical TDM components include establishing a TDM coordinator, promoting Metrorail/Metrobus/CUE Bus, establishing ride-sharing programs, parking management, lease agreements, and monitoring and compliance.

Once implemented, management measures taken by Northfax project can be monitored and adjusted as needed to continually create opportunities to reduce the amount of vehicular traffic generated by the site.

Summary and Recommendations

This report concludes that the proposed development **will have a negligible impact** to the surrounding transportation and roadway network assuming that all planned site design elements are implemented.

The development has several positive elements contained within its design that minimize potential transportation impacts, including:

- The streetscape improvements planned as part of the proposed development.
- The provision of bike lanes along Orchard Street and the site access opposite Farr Avenue.
- The proposed development's proximity to WMATA and CUE bus routes.
- The inclusion of long and short-term bicycle parking.
- The improvement of pedestrian sidewalks adjacent to the site that meet City of Fairfax and ADA requirements.
- A Transportation Management Plan (TMP) that aims to reduce the demand of single-occupancy, private vehicles to/from the proposed development during peak period travel times.

INTRODUCTION

This report presents the findings of a TIS conducted for the proposed Northfax development (the "Site") in the City of Fairfax, Virginia (the "City"). The proposed Northfax development is anticipated to be completed in two phases. Phase 1 focuses on residential development on the northern and western portions of the site, while Phase 2 includes a balance of the residential development and commercial development within the site. Phase 1 is anticipated to be completed by 2023, while Phase 2 is anticipated to be complete by 2027. The parcels fronting Fairfax Boulevard and Chain Bridge Road are currently zoned CR (Commercial Retail District), while the interior parcels along Orchard Street are zoned RM (Residential Medium). The Applicant is proposing to rezone the subject property from the CR and RM districts to the PD-M (Planned Development Mixed Use) district.

It should be noted that the current application for the site only pertains to Phase 1. A separate application for Phase 2 will be submitted subsequently to the City. As such, the Phase 2 portion of the development described herein is for transportation planning purposes and is subject to change with the future application.

PURPOSE OF STUDY

The purpose of this study is to evaluate the transportation network in the vicinity of the site and identify any potential transportation impacts that may result from the proposed redevelopment. Elements of this report include a description of the proposed development, an evaluation of the existing multimodal transportation network, and evaluations of the future transportation network with and without the proposed development.

STUDY TASKS

The following tasks were completed as part of this study.

- A scoping meeting was held on April 2, 2019 with City of Fairfax staff. After the first submission of this study, the scope and trip generation were revised. The scoping document, which includes the agreed to parameters of the study and relevant background information, is provided in the Appendix A.
- Traffic counts at the study area intersections were conducted on Wednesday, March 20, 2019 during the weekday morning and evening peak periods, and on Saturday, March 23, 2019 during the midday peak period. The raw traffic count data is included in Appendix B.
- As outlined in the scoping document, two planned developments in the vicinity of the proposed project were included as part of the analysis of future conditions. A 2.0% yearly growth rate was assumed for the years between 2019 and 2023, and a 1.0% yearly growth rate was assumed for the years between 2023 and 2027.
- Proposed site traffic volumes were generated based on the methodology outlined in Trip Generation Manual, 10th Edition, published by the Institute of Transportation Engineers (ITE).
- Intersection capacity analyses were performed using the software package Synchro, Version 10, based on the Highway Capacity Manual (HCM) methodology. Traffic analyses were performed for the existing conditions (2019), future conditions (2023) with and without development, and future conditions (2027) with and without development.
- Transportation Demand Management (TDM) strategies with respect to the development were assessed.
- A first submission of the study was submitted to the City in January 2020. Per subsequent discussion with the City, the trip generation was revised, and the network models were simulated using SimTraffic, Version 10.

PROJECT SUMMARY

Site Location

The project site is located in the City of Fairfax, Virginia and is bounded by Assembly Townhouse Community to the north, Fairfax Boulevard (Route 50) to the south, McLean Avenue to the west, and Chain Bridge Road (Route 123) to the east. The site location is shown in Figure 1.

Parcel Information

The site currently consists of two-single family detached units, an excess parking lot for the adjacent car dealership, and a few vacant parcels. A parcel map showing the location of the property is presented in Figure 2.

General Land Use Plan Recommendations

According to the City of Fairfax's Zoning Map, this site is listed as Commercial Retail (CR) and Residential Medium (RM) use. The zoning map for the site is illustrated in Figure 3.

Proposed Plan

The proposed development plan includes two phases. It should be noted that the current application for the site only pertains to Phase 1. A separate application for Phase 2 will be submitted subsequently to the City. As such, the Phase 2 portion of the development described herein is for transportation planning purposes and is subject to change with the future application.

Phase 1: Phase 1 consists of 56 multi-family residential units and 200 continuing care retirement community units, which is anticipated to be completed by 2023. Access to the site is proposed to be provided via Orchard Street and via the proposed extension of Farr Avenue. Phase 1 will account for the planned extension of University Drive to join Eaton Place and the extension of Farr Avenue (by the City of Fairfax) to Orchard Street.

Phase 2: Phase 2 will include approximately 25,000 square feet of commercial uses (including retail space, office space, and restaurants) with approximately 180 residential dwelling units on the upper floors and a 140-room capacity hotel. Phase 2 is anticipated to be complete by 2027. In addition to Orchard Street, a right-in (RI) only access along Chain Bridge Road is proposed to provide access to the site under this scenario. Phase 2 will account for the planned extension of University Drive to join Eaton Place; the extension of Farr Avenue to Orchard Street; signalization of Farr Avenue and Fairfax Boulevard; and Re-alignment of Warwick Avenue, Fairfax Boulevard and McLean Avenue. The development program for Phase 2 would be in addition to that of Phase 1.

The proposed site plan is shown in Figure 4. Of note, this plan is for conceptual purposes only.

Scope and Limits of the Study Area

The study area is bounded by Assembly Townhouse Community to the north, Fairfax Boulevard (Route 50) to the south, McLean Avenue to the west, and Chain Bridge Road (Route 123) to the east. The following intersections were identified for inclusion in the vehicular study area, as shown in Figure 5.

1. Fairfax Boulevard and Eaton Place
2. Fairfax Boulevard and University Drive
3. Chain Bridge Road and Fairfax Boulevard
4. Fairfax Boulevard and Farr Avenue/Future Site Access
5. Fairfax Boulevard and Warwick Lane/McLean Avenue
6. Chain Bridge Road and Orchard Street
7. Chain Bridge Road and Assembly Drive/Eaton Place
8. Chain Bridge Road and Right-in only Site Access (Future)

Data Sources

Sources of data for this study include the City of Fairfax (the "City"), the Virginia Department of Transportation (VDOT), the Institute of Transportation Engineers' (ITE's) Trip Generation Manual, 10th Edition publication, and the office files of Gorove/Slade Associates, Inc.

CONTENTS OF STUDY

This report contains 10 chapters as follows:

- *Study Area Overview*
  This chapter reviews the area near and adjacent to the project and includes an overview of the site location.
- *Transit*
  This chapter summarizes the existing and future transit service adjacent to the site, reviews how the project's transit demand will be accommodated, outlines impacts, and presents recommendations as needed.
- *Pedestrian Facilities*
  This chapter summarizes existing and future pedestrian access to the site, reviews walking routes to and from the project site, outlines impacts, and presents recommendations as needed.
- *Bicycle Facilities*
  This chapter summarizes existing and future bicycle access to the site, reviews the quality of cycling routes to and from the project site, outlines impacts, and presents recommendations as needed.
- *Project Design*
  This chapter reviews the transportation components of the project, including the site plan and access.
- *Trip Generation*
  This chapter outlines the travel demand of the proposed project. It summarizes the trip generation of the project.
- *Traffic Operations*
  This chapter provides a summary of the existing roadway facilities and an analysis of the existing and future roadway capacity in the study area. This section highlights the vehicular impacts of the project, including presenting mitigation measures for minimizing impacts as needed.

- *Traffic Simulation (Queuing Operations)*
  This chapter provides a summary of the existing and future roadway conditions in the study area. This section highlights potential queues within the road network, as part of a planning level exercise.
- *Transportation Demand Management Plan*
  This chapter outlines various components of a TDM Plan for the proposed development.
- *Safety/Crash Analysis*
  This chapter includes a review of existing intersections in the study area and a qualitative discussion on how the development will influence safety.
- *Summary and Conclusions*
  This chapter presents a summary of the recommended mitigation measures by mode and presents overall findings and conclusions.

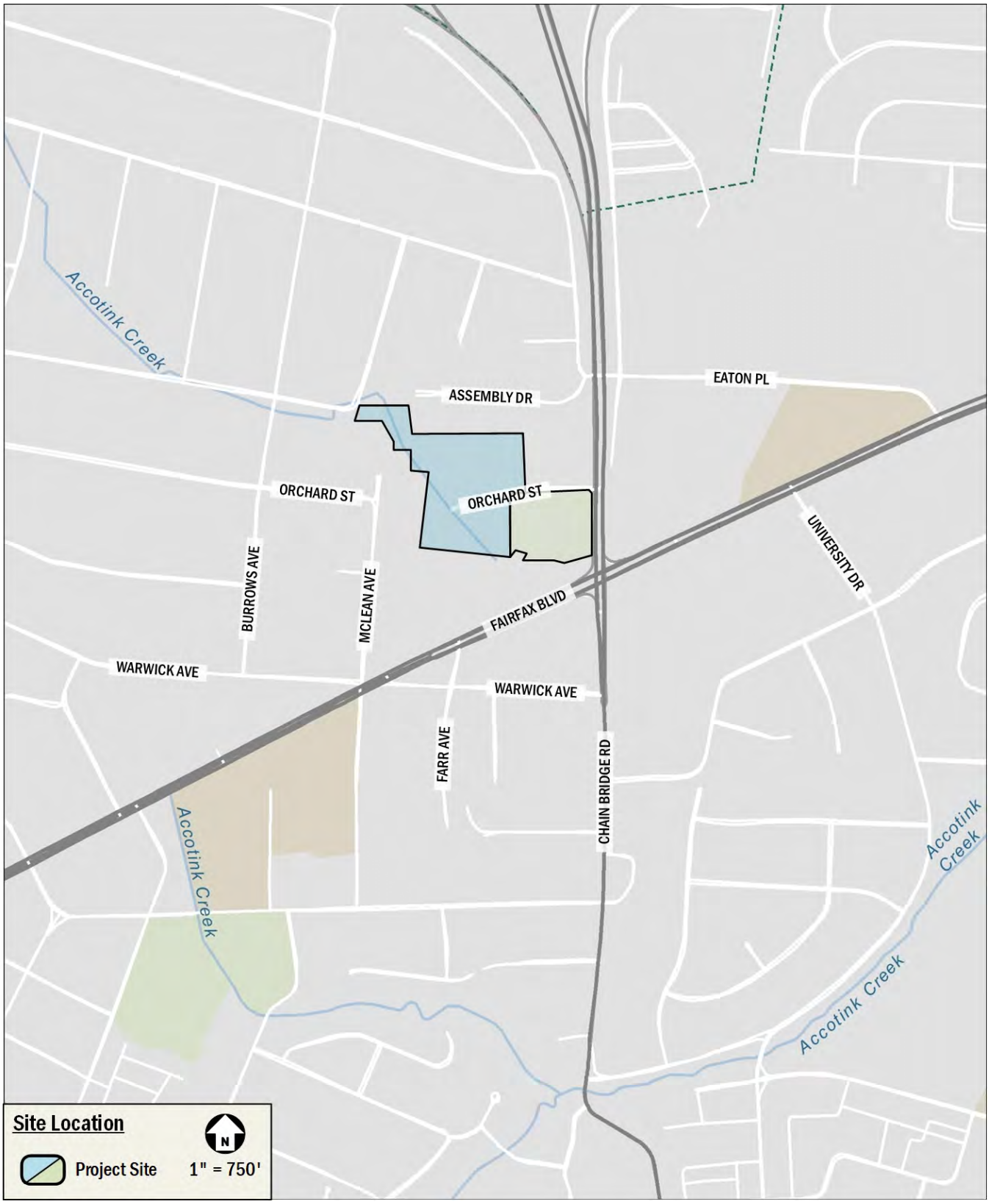


Figure 1: Site Location

Figure 2: Parcel Map (Source: City of Fairfax Real Estate Map)

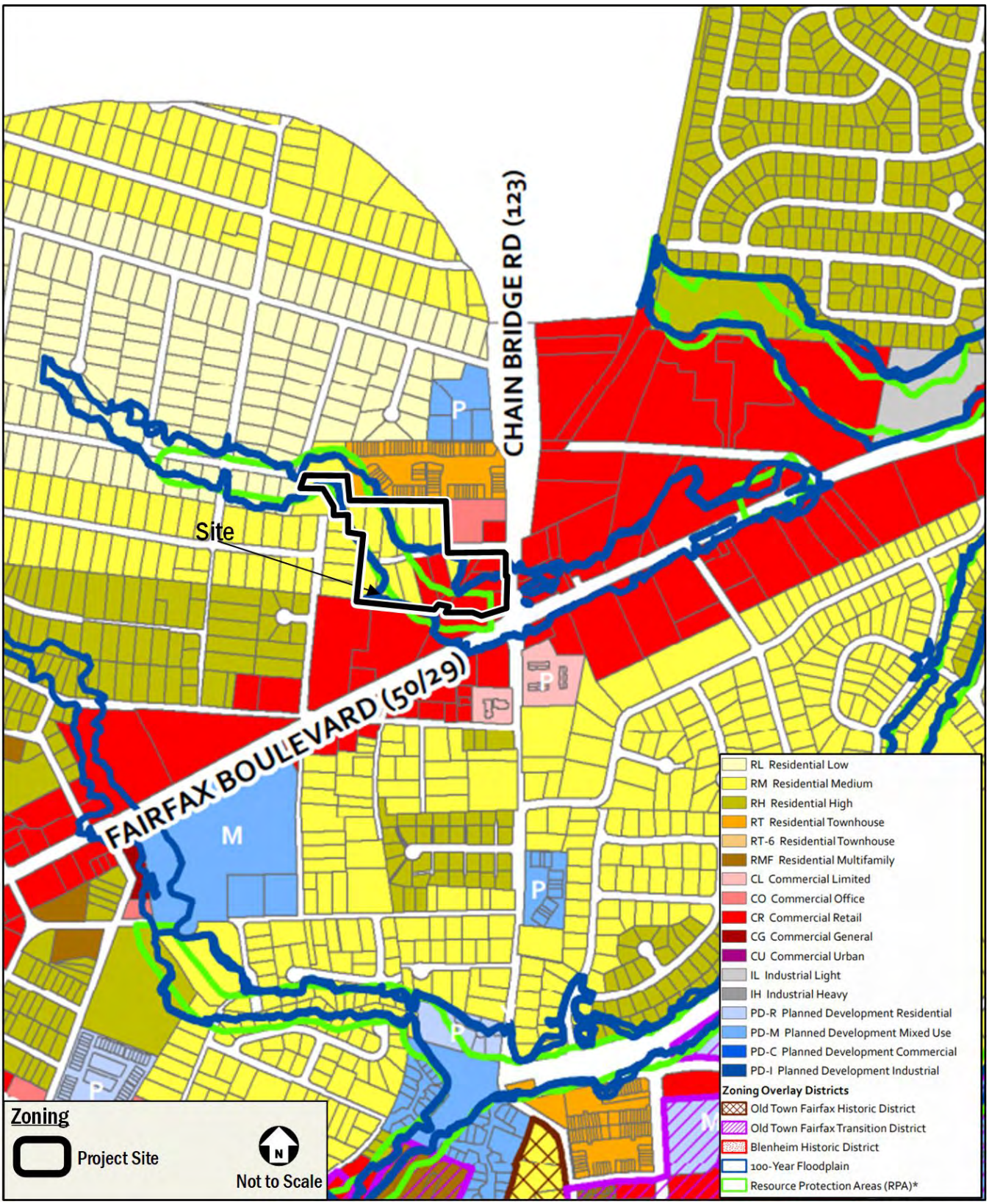


Figure 3: Planned Land Uses (Source: City of Fairfax Zoning Map, February 2019)

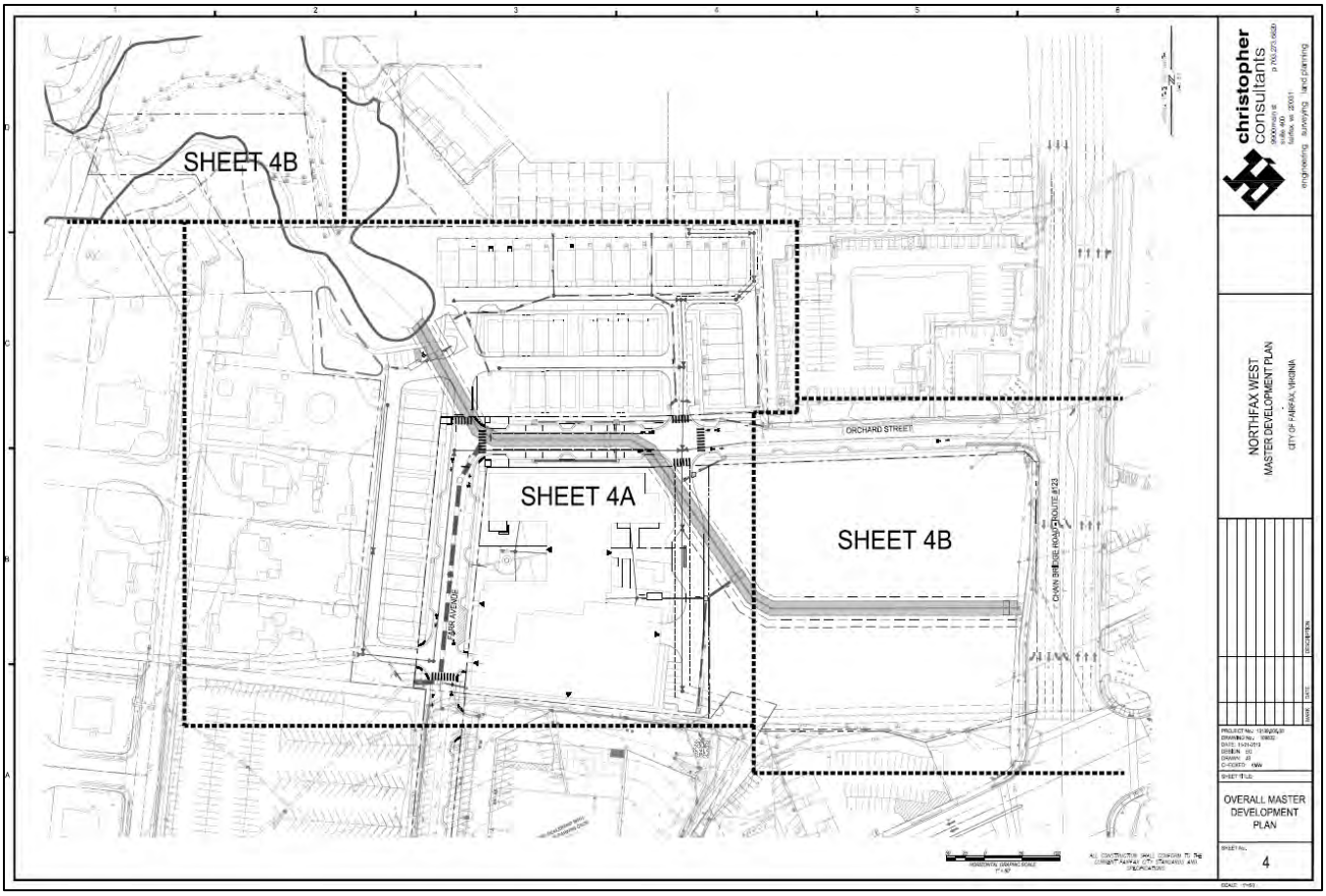


Figure 4: Overall Master Development Plan

Figure 5: Study Area Overview

STUDY AREA OVERVIEW

This chapter reviews the existing conditions of the surrounding transportation network and includes an overview of the site location, including a summary of the major transportation characteristics of the area and of future regional projects. More specific characteristics of each mode and their subsequent study areas will be defined in the following sections.

The following conclusions are reached within this chapter:

- The site is surrounded by a local transportation system that will accommodate the residents, employees, and patrons of the proposed development.
- In the vicinity of the site, most roadways have sidewalks on both sides of the street and crosswalks at major intersections. There are some existing deficiencies within a ¼ mile walk of the site, such as a lack of striped crosswalks and curb ramps not meeting ADA standards.
- The site has access to a bikeable sidewalk, as identified by the Bike Fairfax Interactive Map, along Fairfax Boulevard. There are a number of other streets in the vicinity of the site that are identified in the Bike Fairfax Interactive Map as "most comfortable" or "somewhat comfortable", such as Eaton Place, Burrows Avenue, and Orchard Street (west of Burrows Street).
- Several local initiatives will positively impact the study area, including the extension of University Drive to Eaton Place, the extension of Farr Avenue to Orchard Street, the signalization of Farr Avenue at Fairfax Boulevard, and a reconfiguration of the intersection of Fairfax Boulevard, Warwick Avenue, and McLean Avenue.

MAJOR TRANSPORTATION FEATURES

Overview of Regional Access

Under existing conditions, the proposed development site has access to regional vehicular and transit-based transportation options, as shown in Figure 6, that connect the site to destinations within Virginia, the District, and Maryland.

The site is directly accessible from several principal arterials such as Fairfax Boulevard (Route 50) and Chain Bridge Road (Route 123). The arterials create connections to I-66, and ultimately the Capital Beltway (I-495).

The site is located approximately 3.6 miles from the Vienna/Fairfax-GMU Metrorail Station, which provides connections to areas in Virginia, the District, and Maryland. The Orange Line connects Fairfax, VA with New Carrollton, MD while providing access to the District core. The Orange Line provides connections to the Red Line, which provides a direct connection to Union Station, a hub for commuter rail – such as Amtrak, MARC, and VRE – in addition to all additional Metrorail lines, allowing for access to much of the DC Metropolitan area.

The site is located approximately six miles from the Burke Center VRE Station, which provides peak hour commuter rail service between Northern Virginia and Washington, DC. The Burke Center Station is serviced by the VRE Manassas Line, which connects Broad Run with Washington Union Station.

Overall, the site has access to several regional roadways, transit, and bicycle options, making it convenient to travel between the site and destinations in Virginia, the District, and Maryland.

Overview of Local Access

There are several local transportation options near the site that serve vehicular, transit, walking, and cycling trips under existing conditions, as illustrated on Figure 7**.**

In addition to the two principal arterials described above, the site is served by a local vehicular network that includes an existing network of local and collector roadways that provide access to the site.

Two bus systems provide local transit service in the vicinity of the site, including connections to the Vienna/Fairfax-GMU Metro station. As illustrated in Figure 7, there are multiple bus routes that serve the site. In the vicinity of the site the majority of routes travel along Fairfax Boulevard, Chain Bridge Road and Eaton Place.

The existing pedestrian infrastructure surrounding the Site provides a mixed-quality walking environment. There are sidewalks along primary roadways but not along some minor streets. There are some crosswalk and curb ramp deficiencies. However, improvements to the pedestrian infrastructure surrounding the site will improve pedestrian comfort and connectivity. A detailed review of existing and proposed pedestrian access and infrastructure is provided in a later section of this report.

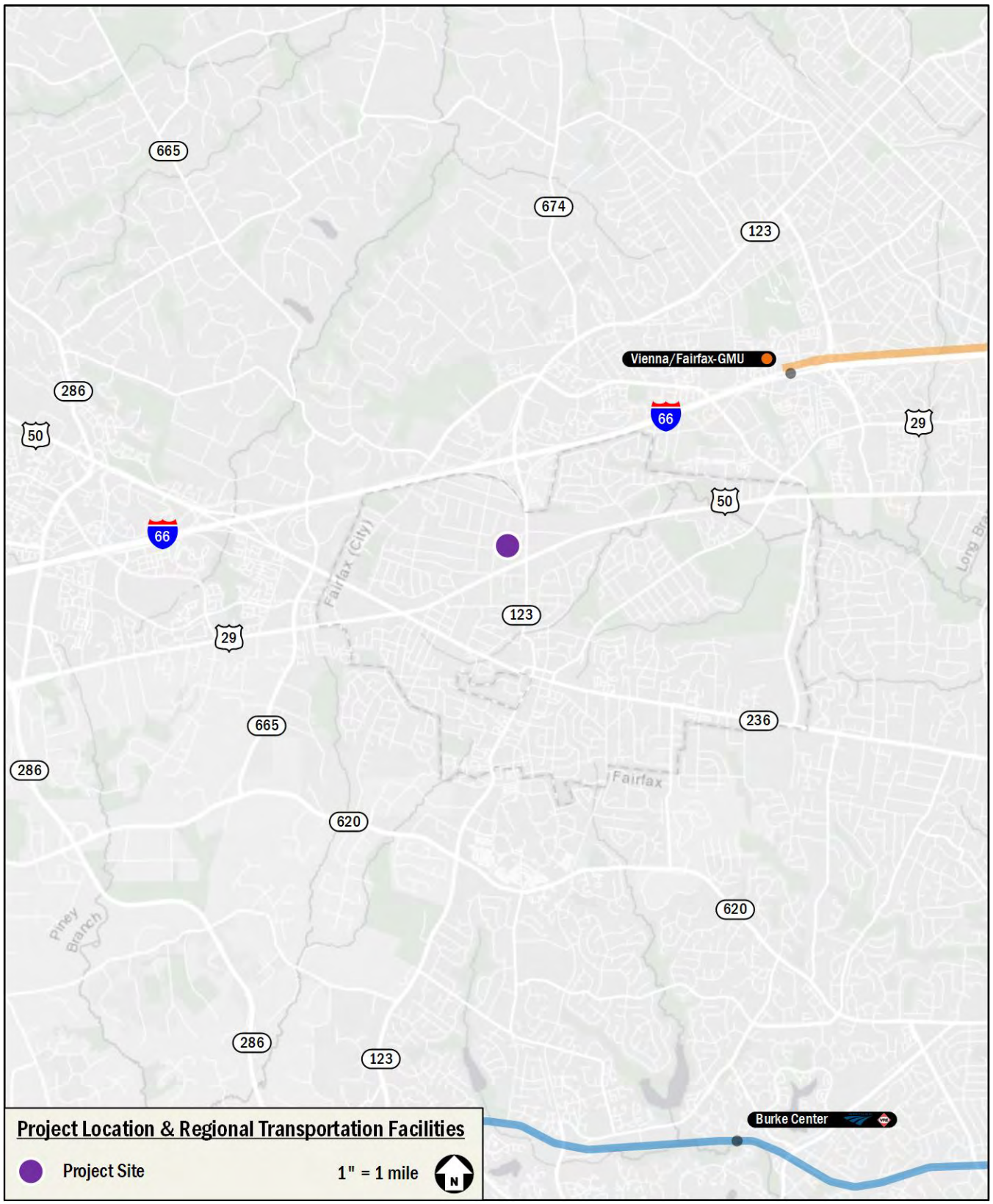


Figure 6: Major Regional Transportation Facilities

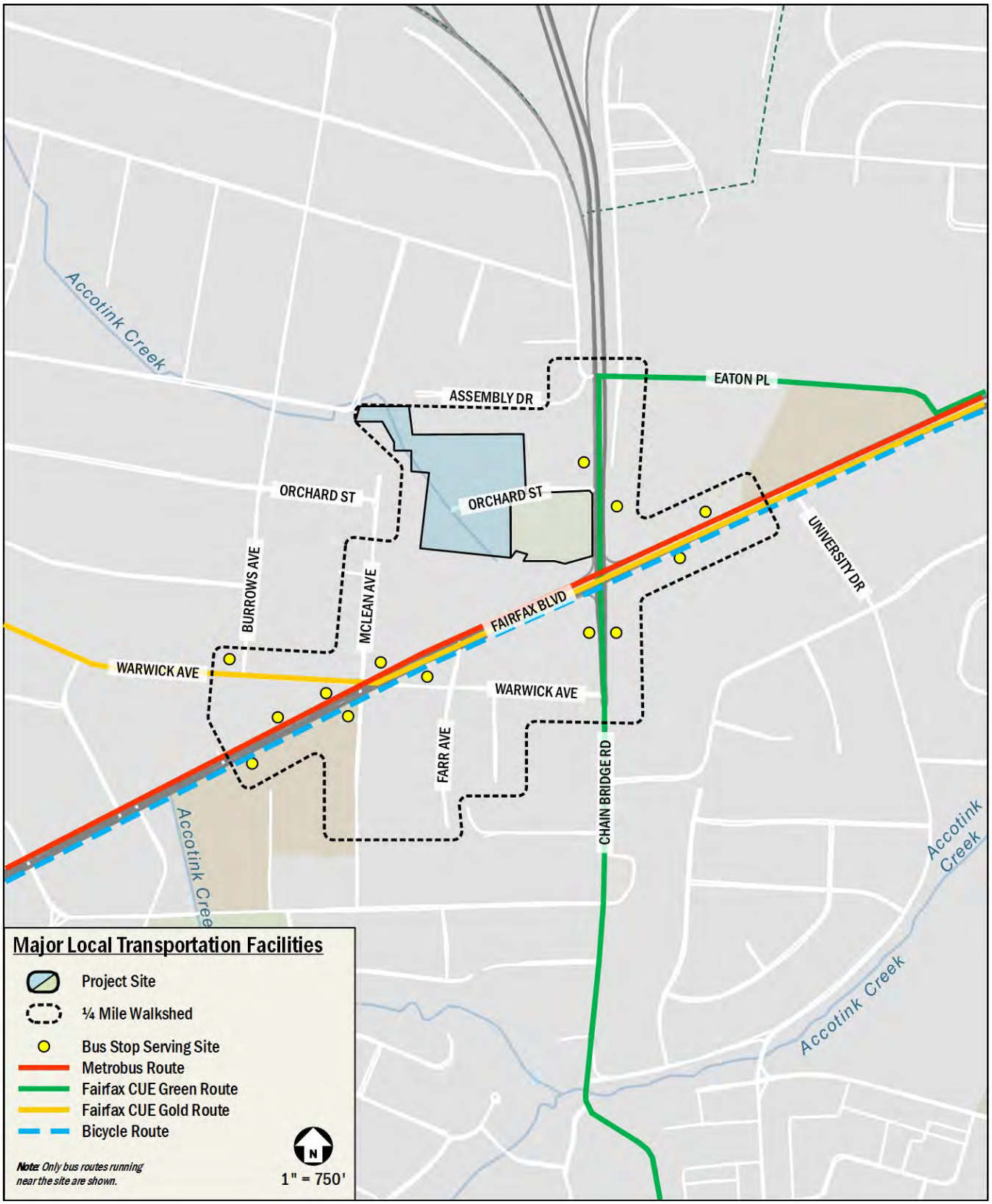


Figure 7: Major Local Transportation Facilities

Walk Score and Bike Score

Walkscore.com is a website that provides scores and rankings for the walking, biking, and transit conditions for an area. The project location was estimated to have a walk score of 64 (or "Somewhat Walkable"), a transit score of 39 (or "Some Transit"), and a bike score of 63 (or "Bikeable"). The City of Fairfax has an average walk score of 54, an average transit score of 38, and an average bike score of 51. Figure 8 shows the neighborhood borders in relation to the site location and displays a heat map for walkability.

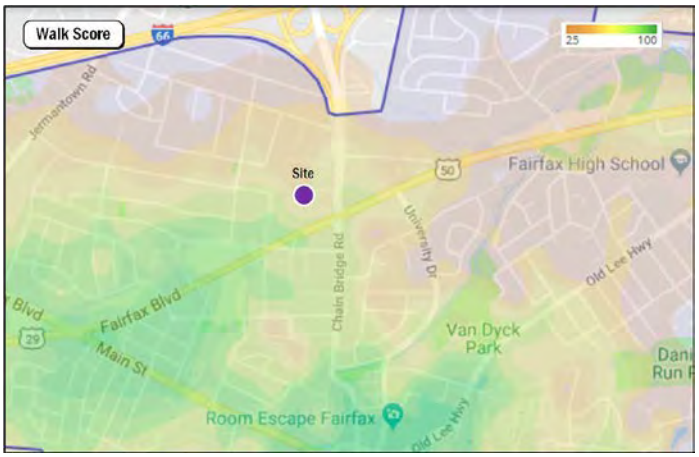


Figure 8: Walk Score (Source: Walkscore.com)

Local Initiatives

City of Fairfax Comprehensive Plan (2019)

The recent update to the City's Comprehensive Plan, "Livable Fairfax", was adopted in February 2019. The Plan provides the long-term vision for the City of Fairfax through 2035. The Plan identifies a number of guiding principles for various aspects of the City, such as land use, neighborhoods, economic vitality, housing, parks and recreation, infrastructure and utilities, community design and historic preservation, education, sustainability, multimodal transportation, and commercial corridors and activity centers, among others.

Specifically, the Plan describes the Northfax Activity Center, as follows, in part:

> *"The Northfax Activity Center ("Northfax") is considered the most appropriate location in the City to accommodate a regional mixed-use destination. Its location at the intersection of Fairfax Boulevard and Chain Bridge Road, with immediate access to Interstate 66 and a potential future Metro station, is more accessible than other Activity Centers. It is also equidistant from existing regional mixed-use destinations at Merrifield and Fairfax Corner."*

City of Fairfax Multimodal Transportation Plan (2017)

The City of Fairfax's *Multimodal Transportation Plan* was initiated in April 2016 and was developed as part of the City's Comprehensive Plan Update, "Livable Fairfax". The Plan identifies the goals of connecting the City with the region, providing viable and attractive mobility choices, integrating transportation with land use, and adopting policies and procedures for strategic transportation decision making. The Plan presents a transportation system based on the values of being safe, secure, connected, intergenerational, vibrant, green, and robust.

To realize a transportation system based on these values, the Plan identifies recommended action items that support the Plan's stated goals. In the immediate Northfax area, these action items include:

- Complete improvements to the Northfax intersection of Fairfax Boulevard and Chain Bridge Road.
- Simplify multi-leg and offset intersections, such as the intersection of McLean Avenue, Warwick Avenue, and Fairfax Boulevard.
- Address safety and operational deficiencies at major intersections, such as the intersection of Eaton Place and Chain Bridge Road.
- Identify a priority transit network providing enhanced transit operations and more frequent services along key corridors including Main Street, Old Lee Highway, and Fairfax Boulevard.
- Implement Complete Streets improvements on major corridors including Fairfax Boulevard, Chain Bridge Road and University Drive, Old Lee Highway, and Main Street.

The Plan identifies the following key recommended transportation policies and projects in the immediate Northfax area, as shown on Figure 9:

- Project 1: Improve Warwick Avenue and Fairfax Boulevard
- Project 9: Improve intersection of Eaton Place and Chain Bridge Road
- Project 11: Expand the roadway network in Northfax West

Finally, the Plan recommends improvements to the existing transit and bicycle networks, which are reviewed in the transit and bicycle chapters of this report.

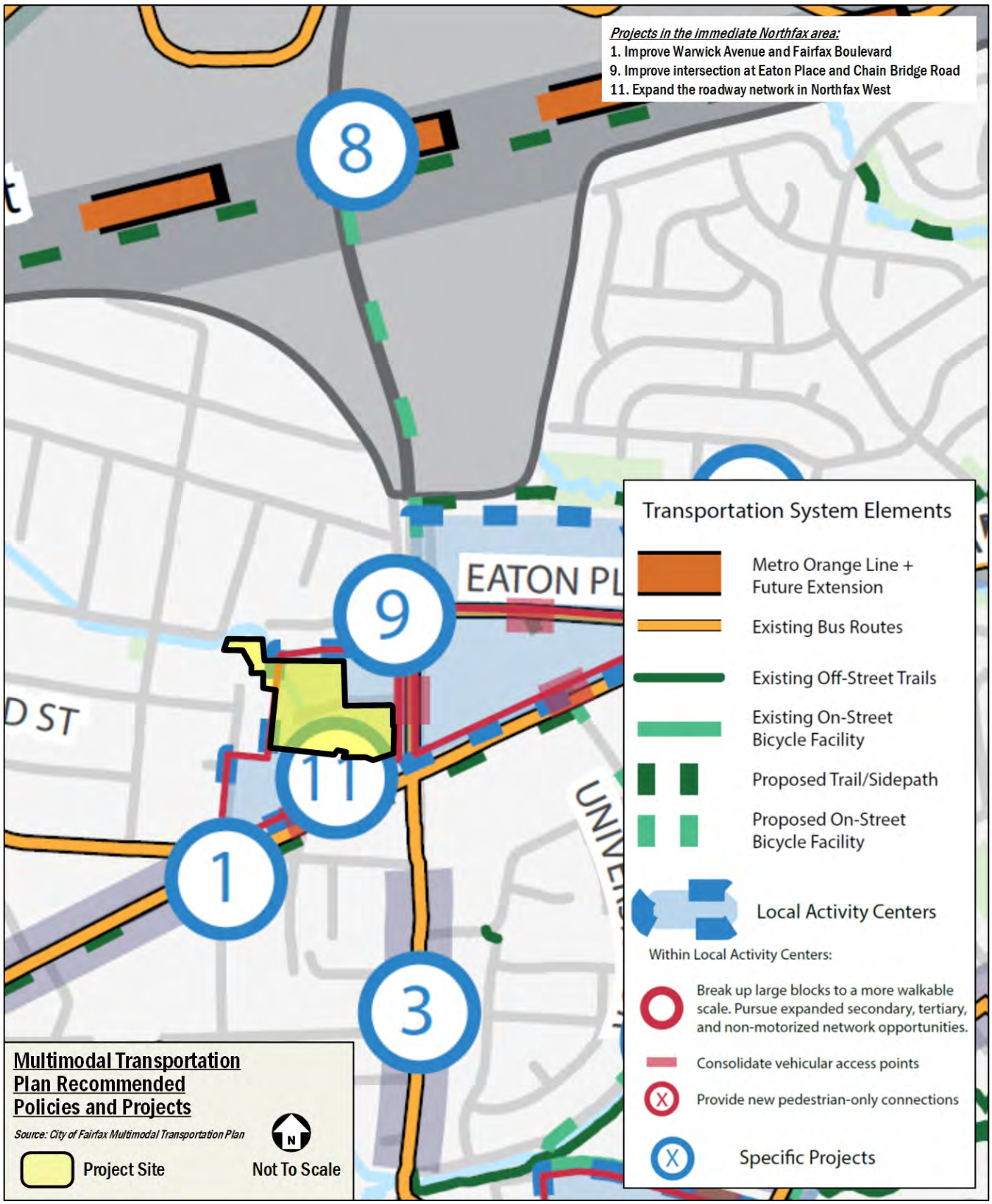


Figure 9: Multimodal Transportation Plan Recommended Policies and Projects

TRANSIT

This chapter discusses the existing and proposed transit facilities in the vicinity of the Site, accessibility to transit, and evaluates the overall transit impacts of the project.

The following conclusions are reached within this chapter:

- The development has some access to transit.
- The development is located 3.6 miles from the Vienna/Fairfax-GMU Metro Station.

The Site is served by five transit routes under existing conditions. Combined, these transit services provide local and city-wide transit connections and link the Site with major residential, employment, and commercial destinations throughout the area. Figure 10 identifies the major transit routes, stations, and stops in the study area.

Existing Metrorail Service

The Site is located approximately 3.6 miles from the Vienna/Fairfax-GMU Metrorail Station. The station is located northeast of the development site along Saintsbury Drive near I-66.

The Vienna/Fairfax-GMU Metrorail Station serves the Orange Line. The average daily ridership at the Crystal City and Pentagon City stations in 2018 were approximately 9,000 boardings on weekdays, according to the publication *Metrorail Average Weekday Daily Boardings* (WMATA, September 2018). The Orange Line travels west from Fairfax, VA into Washington, DC, then onto New Carrollton, MD. Trains run approximately every eight minutes during the morning and afternoon peak periods. They run about every 12 minutes during weekday non-peak periods, every 20 minutes on weekday evenings after 9:30pm, and every 12-20 minutes on weekends.

Existing Bus Service

The Site is served by several bus lines and routes along multiple primary corridors. These bus lines connect the site to many areas of the City of Fairfax, as well as the Metrorail Orange Line.

Table 1 shows a detailed inventory of the existing Metrobus and Fairfax CUE stops within a quarter-mile radius of the site, detailing individual bus stop amenities and conditions. These stops are served by one WMATA Metrobus route and four Fairfax CUE routes.

Table 2 presents bus route information, including service hours, headways, and walking distance from the site for each route.

Existing Commuter Rail Service

The site is located approximately six miles from the Burke Center VRE Station, which provides peak hour commuter rail service between Northern Virginia and Washington, DC. The Burke Center Station is serviced by the VRE Manassas Line, which connects Broad Run with Washington Union Station.

Recommended Transit Enhancements

The City of Fairfax's *Multimodal Transportation Plan* (2017) recommends several enhancements to the existing transit network. In the immediate Northfax area, these enhancements include:

- A bus improvement corridor along Fairfax Boulevard featuring enhanced transit operations and more frequent service.
- A bus transfer improvement area at the intersection of Fairfax Boulevard and Chain Bridge Road featuring quality passenger amenities, expanded information, and improved pedestrian facilities.

These recommended enhancements are shown on Figure 11.

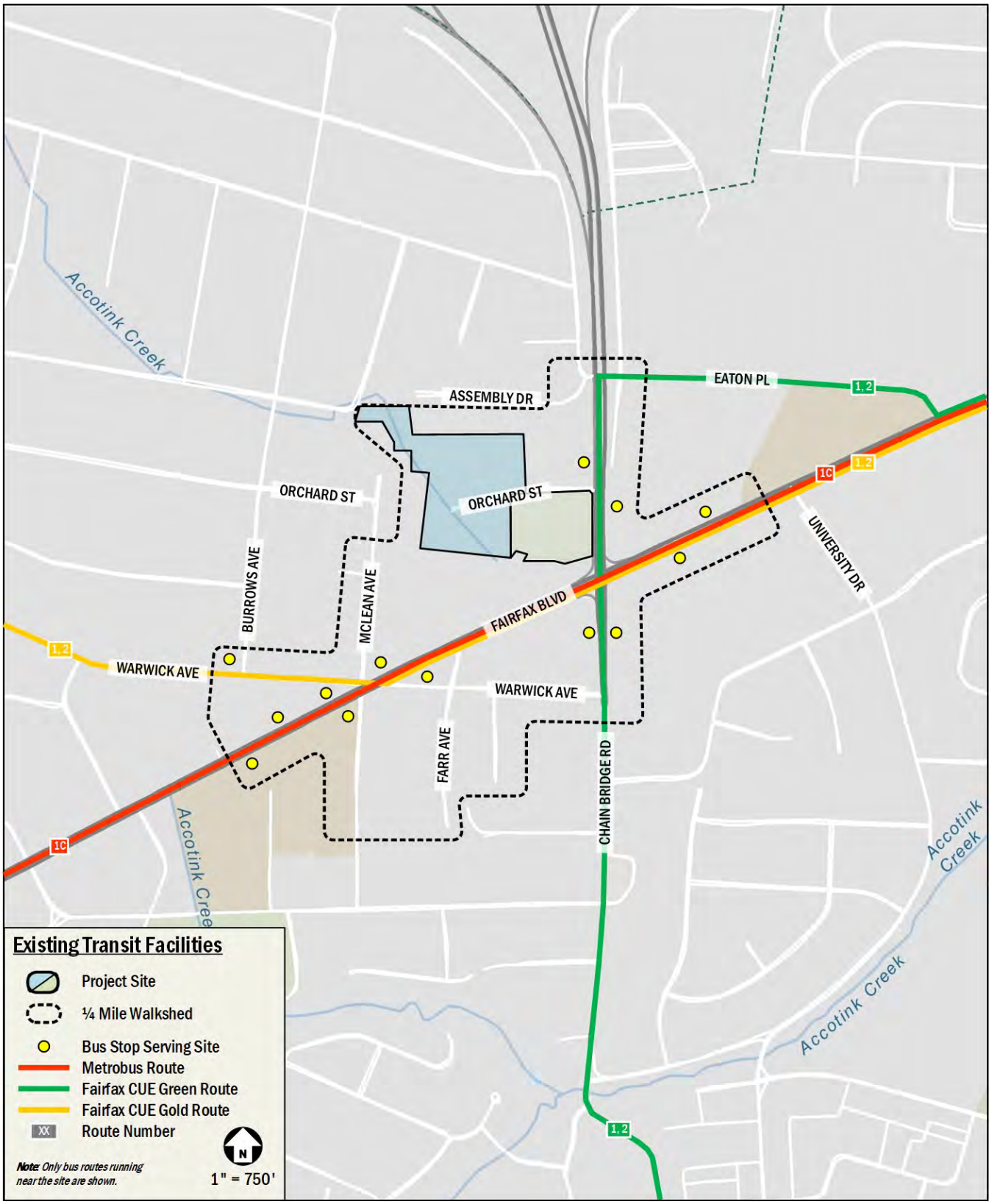


Figure 10: Existing Transit Facilities

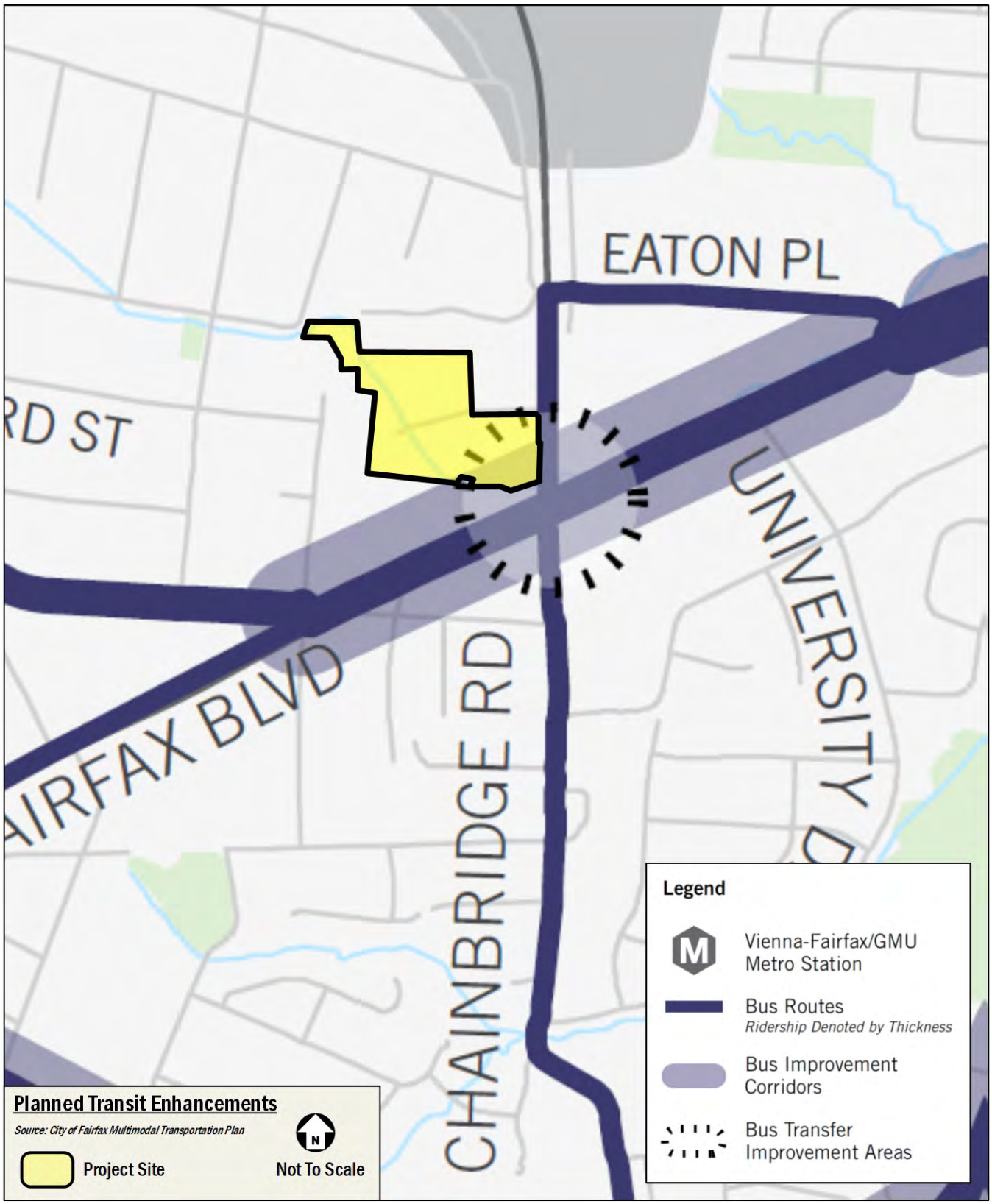


Figure 11: Planned Transit Enhancements

Table 1: Bus Stop Inventory

Location	Stop ID (WMATA, *CUE*)	Routes Served (WMATA, *CUE*)	Features							
			Sign	ADA Land-ing Pad	Side-walk	Street Lighting	Info Case	Seating	Shelter	Trash Recep.
Rt 29/50 Fairfax Blvd & Paul VI High School (EB)	5001049	1C	●	●	●	●				
Rt 29/50 Fairfax Blvd & Paul VI High School (WB)	5001054	1C	●	●	●	●				
Fairfax Blvd & McLean Ave (EB)	5001057	1C	●		●	●				
Fairfax Blvd & McLean Ave (WB)	5002129	1C	●							
Fairfax Blvd & Chain Bridge Rd (EB)	5001076 *173*	1C *Gold 1*	●		●		●			●
Fairfax Blvd & Chain Bridge Rd (WB)	5001079 *66*	1C *Gold 2*	●		●					
Chain Bridge Rd & Orchard St (SB)	*18*	*Green 2*	●		●	●				
Fairfax Blvd & Chain Bridge Rd (NB)	*133*	*Green 1*	●		●	●				●
Fairfax Blvd & Chain Bridge Rd (SB)	*19*	*Green 2*	●	●	●	●	●	●	●	●
Fairfax Blvd & McLean Ave (EB)	*172*	*Gold 1*	●		●	●				
Fairfax Blvd & McLean Ave (WB)	*67*	*Gold 2*	●		●	●				
Warwick Ave & Burrows Ave (WB)	*68*	*Gold 2*	●		●	●				●
Chain Bridge Rd & Marriott Hotel (NB)	*134*	*Green 1*	●	●		●				●

Table 2: Bus Route Information

Route Number	Service Hours	Headway	Walking Distance to Nearest Bus Stop
Metrobus Route 1C	Weekdays: 4:00AM-12:26AM Saturdays: 6:25AM-11:35PM Sundays: 7:20AM-11:09PM	30-60 min	0.1 miles, 3 minutes
CUE Green Route 1	Weekdays: 5:30AM-11:00PM Saturdays: 8:25AM-8:35PM Sundays: 10:00AM-5:55PM	30-90 min	0.1 miles, 3 minutes
CUE Green Route 2	Weekdays: 5:15AM-8:45PM Saturdays: 8:02AM-8:12PM Sundays: 9:37AM-5:32PM	30-90 min	150 feet, 1 minute
CUE Gold Route 1	Weekdays: 5:40AM-11:10PM Saturdays: 8:25AM-8:52PM Sundays: 10:00AM-6:28PM	30-90 min	0.2 miles, 3 minutes
CUE Gold Route 2	Weekdays: 5:25AM-9:57PM Saturdays: 8:00AM-8:27PM Sundays: 9:33AM-6:01PM	30-90 min	450 feet, 2 minutes

PEDESTRIAN FACILITIES

This chapter summarizes the existing and future pedestrian access to the Site.

The following conclusions are reached within this chapter:

- The existing pedestrian infrastructure surrounding the Site provides a mixed-quality walking environment. There are sidewalks along primary roadways but not along some minor streets. There were some crosswalk and curb ramp deficiencies identified.
- Improvements to the pedestrian infrastructure surrounding the site will improve pedestrian comfort and connectivity.

Pedestrian Study Area

Pedestrian facilities within a quarter-mile of the Site were evaluated for quality and adherence to City of Fairfax and ADA design standards. The Site is generally accessible to transit options, which all nearby bus routes stopping within 0.2 miles of the site perimeter. There are some areas of concern within the study area that negatively impact the quality of and attractiveness of the walking environment, especially the area south of Warwick Avenue. This includes nonexistent sidewalks and incomplete or insufficient crosswalks or curb ramps at busy intersections.

Existing Pedestrian Facilities

A review of pedestrian facilities surrounding the planned development shows that many facilities provide a quality walking environment. Figure 12 illustrates a detailed inventory of the existing pedestrian infrastructure surrounding the site. Sidewalks, crosswalks, and curb ramps are evaluated based on the guidelines set forth by the City of Fairfax and ADA standards.

The City of Fairfax's *Public Facilities Manual* (2005) requires that sidewalks be provided on both sides of all streets and have a minimum width of 4 feet. ADA standards require that curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, curb ramps shared between two crosswalks is not desired.

As shown in Figure 12, under existing conditions the primary roadways of Fairfax Boulevard and Chain Bridge Road have standards-compliant sidewalks on both sides, but sidewalks are lacking on minor streets, particularly south of Warwick Avenue. Under existing conditions there are some deficiencies with crosswalks and curb ramps near the site.

Figure 13 shows the existing pedestrian peak hour volumes at the existing vehicular study area intersections. The most heavily used crosswalk in the study area is across Fairfax Boulevard on the east side of Chain Bridge Road.

Planned Pedestrian Facilities

As a result of the development, pedestrian facilities around the perimeter of the Site will be improved to meet City of Fairfax and ADA standards. This includes providing new ADA-compliant curb ramps at all site access points and an improved streetscape along Orchard Street and internal roadways

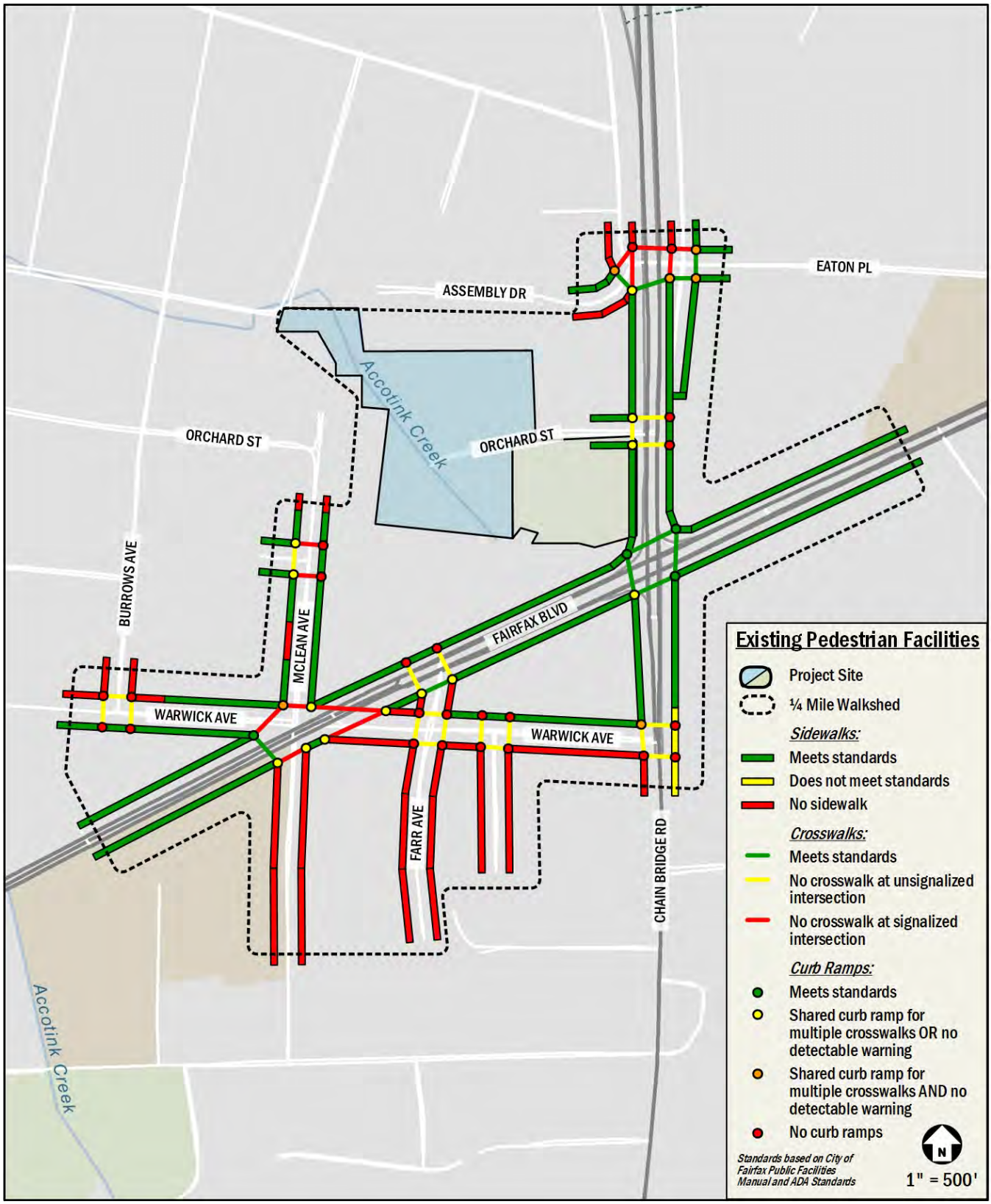


Figure 12: Existing Pedestrian Infrastructure

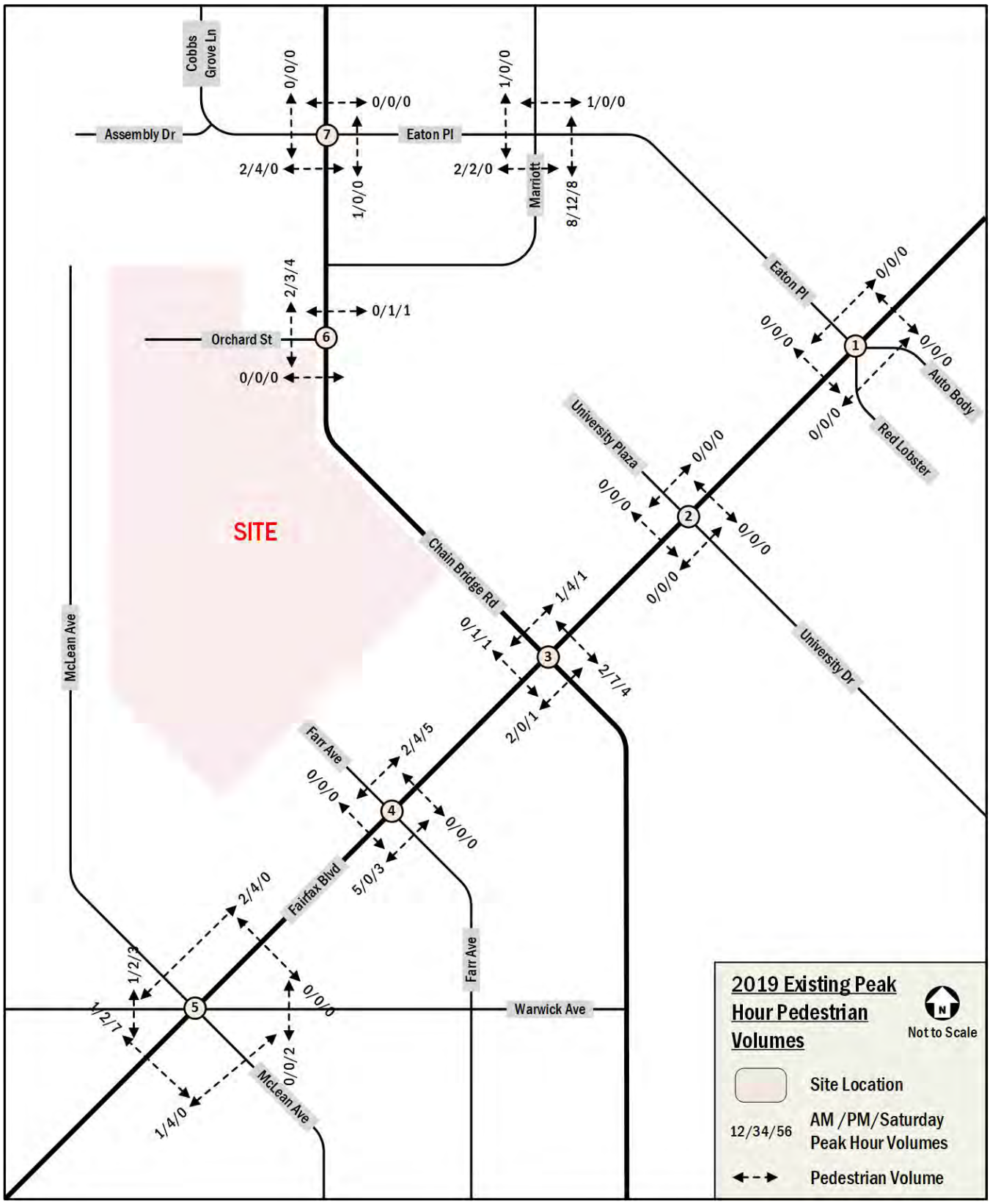


Figure 13: 2019 Existing Peak Hour Pedestrian Volumes

BICYCLE FACILITIES

This chapter summarizes existing and future bicycle access, reviews the quality of cycling routes to and from the Site, and presents recommendations.

The following conclusions are reached within this chapter:

- The site has access to an existing bikeable sidewalk along Fairfax Boulevard.
- Future plans in the vicinity of the Site include a shared use path along Fairfax Boulevard and an on-street bicycle facility along Chain Bridge Road, Eaton Place, and University Drive.

EXISTING BICYCLE FACILITIES

Figure 14 shows the existing facilities for bicycle travel and bicycle facilities within the site area. The only existing trail (shared use path) within the site area is a bikeable sidewalk along Fairfax Boulevard.

The City of Fairfax assigns bicycle comfort ratings to its streets, with ratings including 'Most Comfortable', 'Somewhat Comfortable', 'Less Comfortable', and 'Use Caution'. The majority of streets within the site area are rated 'Most Comfortable', with the exception of Chain Bridge Road, which is rated 'Less Comfortable', and Fairfax Boulevard, which is rated 'Use Caution'.

PLANNED BICYCLE FACILITIES

In Phase 1, the proposed site will include a five-foot bike lane along the south side of Orchard Street near the intersection with Chain Bridge Road and along both sides of Orchard Street internal to the site. Five-foot bike lanes are proposed along both sides of the Farr Avenue Extension to Orchard Street.

As part of the City of Fairfax's *Multimodal Transportation Plan* (2017), several bicycle network improvements are proposed throughout the City of Fairfax. In the immediate Northfax area, these improvements include:

- A shared use path along Fairfax Boulevard.
- An on-street bicycle facility on Chain Bridge Road north of Eaton Place, continuing onto Eaton Place and University Drive.

The improvements proposed as part of the *Multimodal Transportation Plan* are shown on Figure 15.

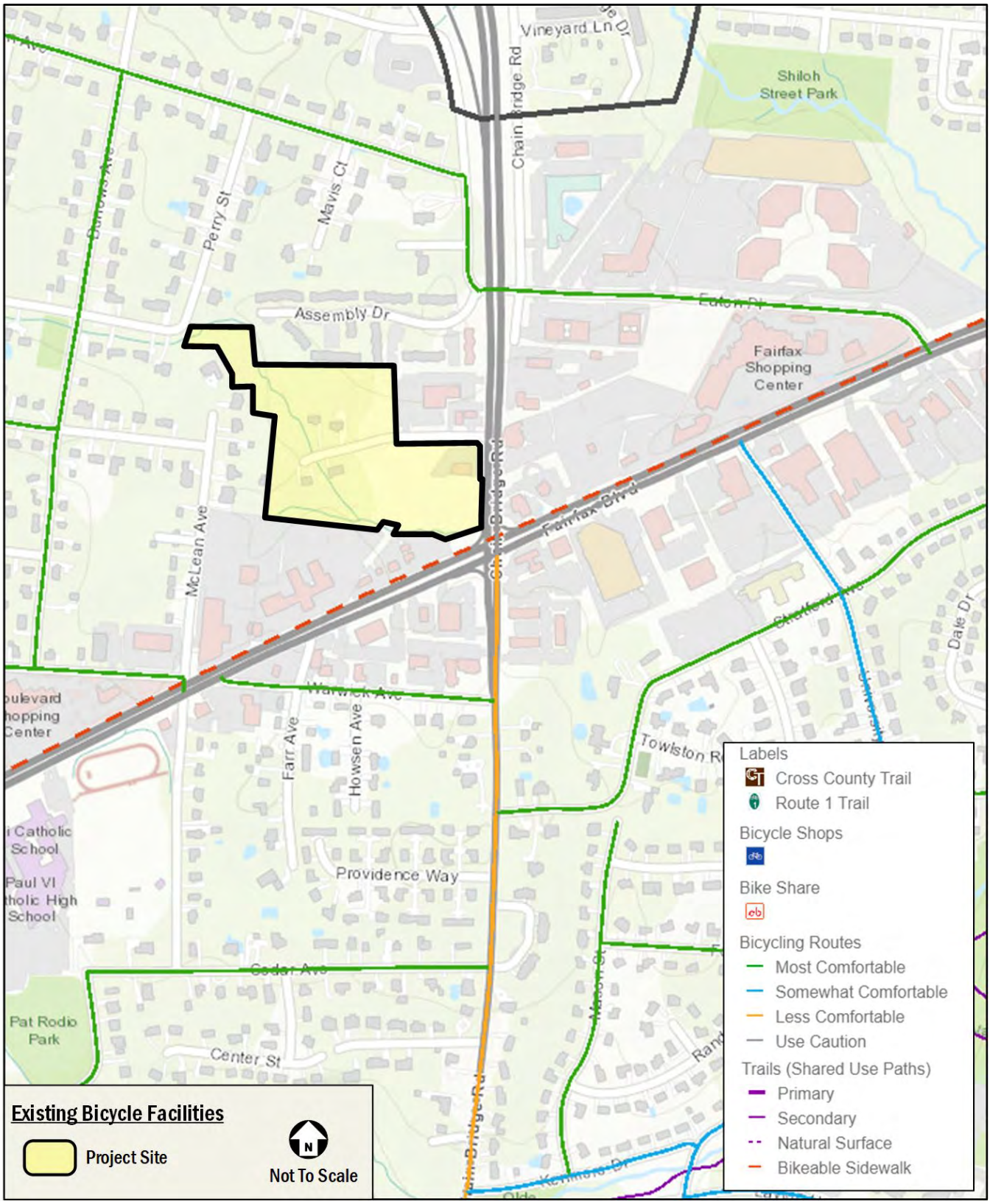


Figure 14: Existing Bicycle Facilities

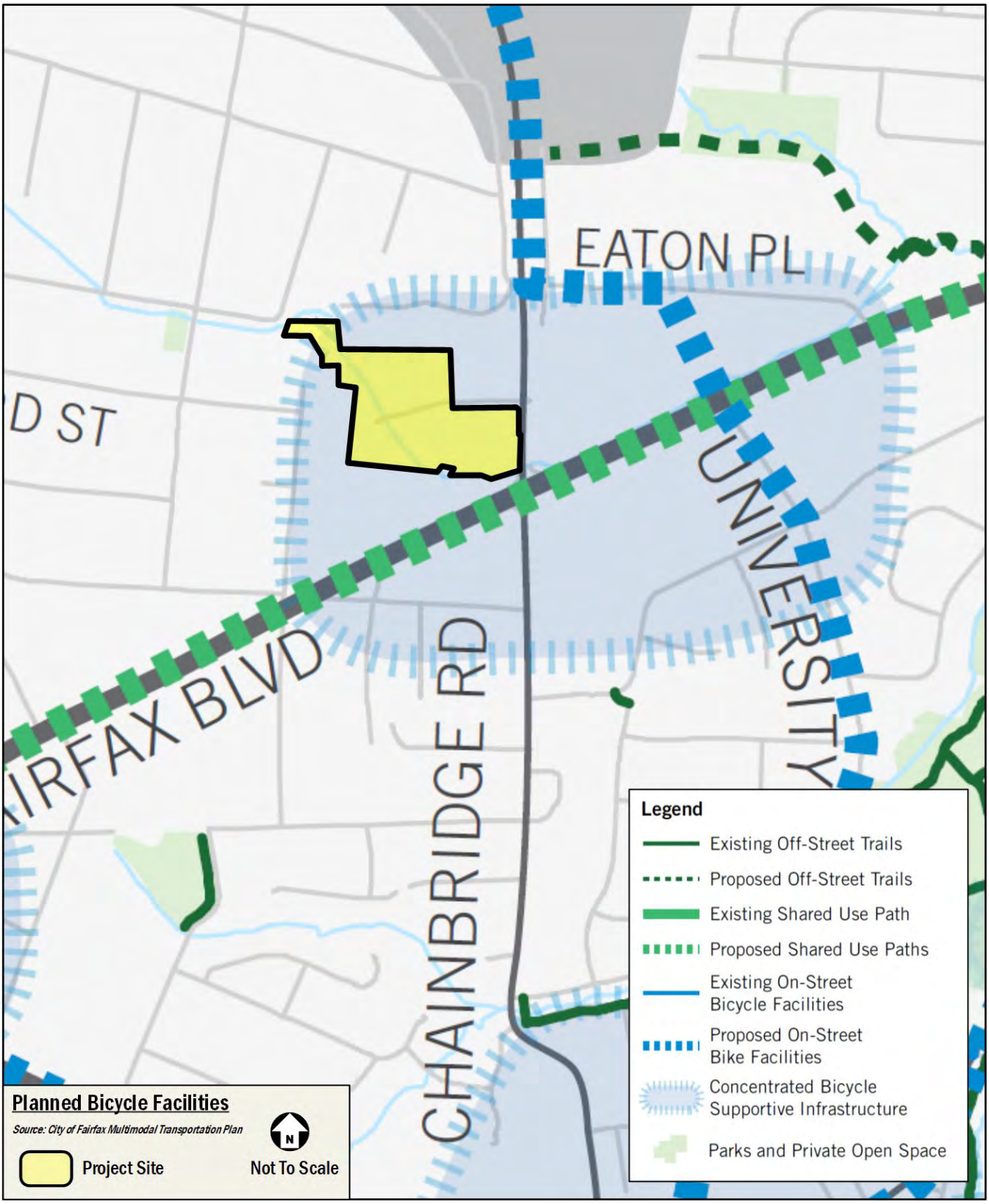


Figure 15: Planned Bicycle Facilities

PROJECT DESIGN

This chapter reviews the transportation components of the Northfax development, including the proposed site plan and access points.

The proposed development site is located in the City of Fairfax, Virginia and is bounded by Assembly Townhouse Community to the north, Fairfax Boulevard (Route 50) to the south, McLean Avenue to the west, and Chain Bridge Road (Route 123) to the east, as illustrated in Figure 1. The proposed site plan is illustrated in Figure 4.

The proposed Northfax development is anticipated to be completed in two phases. Phase 1 focuses on residential development on the northern and western portions of the site, while Phase 2 includes a balance of the residential development and commercial development within the site. A description of each phase is presented below.

Phase 1: Phase 1 consists of 56 multi-family residential units and 200 continuing care retirement community units, which is anticipated to be completed by 2023.

Phase 2: Phase 2 will include approximately 25,000 square feet of commercial uses (including retail space, office space, and restaurants) with approximately 180 residential dwelling units on the upper floors and a 140-room capacity hotel. Phase 2 is anticipated to be complete by 2027.

It should be noted that the current application for the site only pertains to Phase 1. A separate application for Phase 2 will be submitted subsequently to the City. As such, the Phase 2 portion of the development described herein is for transportation planning purposes and is subject to change with the future application.

SITE ACCESS

Access to the Northfax site is anticipated to be developed in phases. A description of site access for each phase is presented below.

Phase 1: As illustrated in Figure 4, Orchard Street provides access to the site in Phase 1. The existing section of Orchard Street, which intersects Chain Bridge Road north of Fairfax Boulevard, will be extended to the west to provide access to the proposed residential buildings. Furthermore, Farr Avenue will be extended to Orchard Street and would provide a right-in/right-out (RIRO) access along Fairfax Boulevard.

Phase 2: In Phase 2, the Orchard Street access identified for Phase 1 will remain, and an additional right-in (RI) only access to the site will be provided via Chain Bridge Road, south of Orchard Street. Furthermore, it is anticipated that Farr Avenue extension would be signalized and converted to a full movement as part of the planned project to modify the intersection of Warwick Avenue and Fairfax Boulevard.

BICYCLE AND PEDESTRIAN FACILITIES

In Phase 1, the proposed site will include a 5-foot bike lane along the south side of Orchard Street near the intersection with Chain Bridge Road. The streetscape along the south side of Orchard Street will include an 8-foot parallel parking lane, 5-foot zone for street trees, and a 6-foot sidewalk. The existing curb, grass strip, and sidewalk along the north side of Orchard Street will be maintained. One 11-foot travel lane will be provided in each direction.

The extension of Orchard Street to the west as part of Phase 1 will include 5-foot bike lanes, a 5-foot zone for street trees, and a 5 - 6 foot sidewalk on both sides of the street. An 8-foot parking lane will be provided on the south side of Orchard Street. One 11-foot travel lane will be provided in each direction.

The City's expansion of Farr Avenue will occur in conjunction with Phase 1 of the development. The roadway expansion would connect Farr Avenue from Chain Bridge Road to Orchard Street within the site. The Farr Avenue expansion will include 5-foot bike lanes, a 5-foot zone for street trees, and a 5 - 6 foot sidewalk on both sides of the street. In addition, 8-foot parking lanes will be provided on the both side of Farr Avenue. One 11-foot travel lane will be provided in each direction.

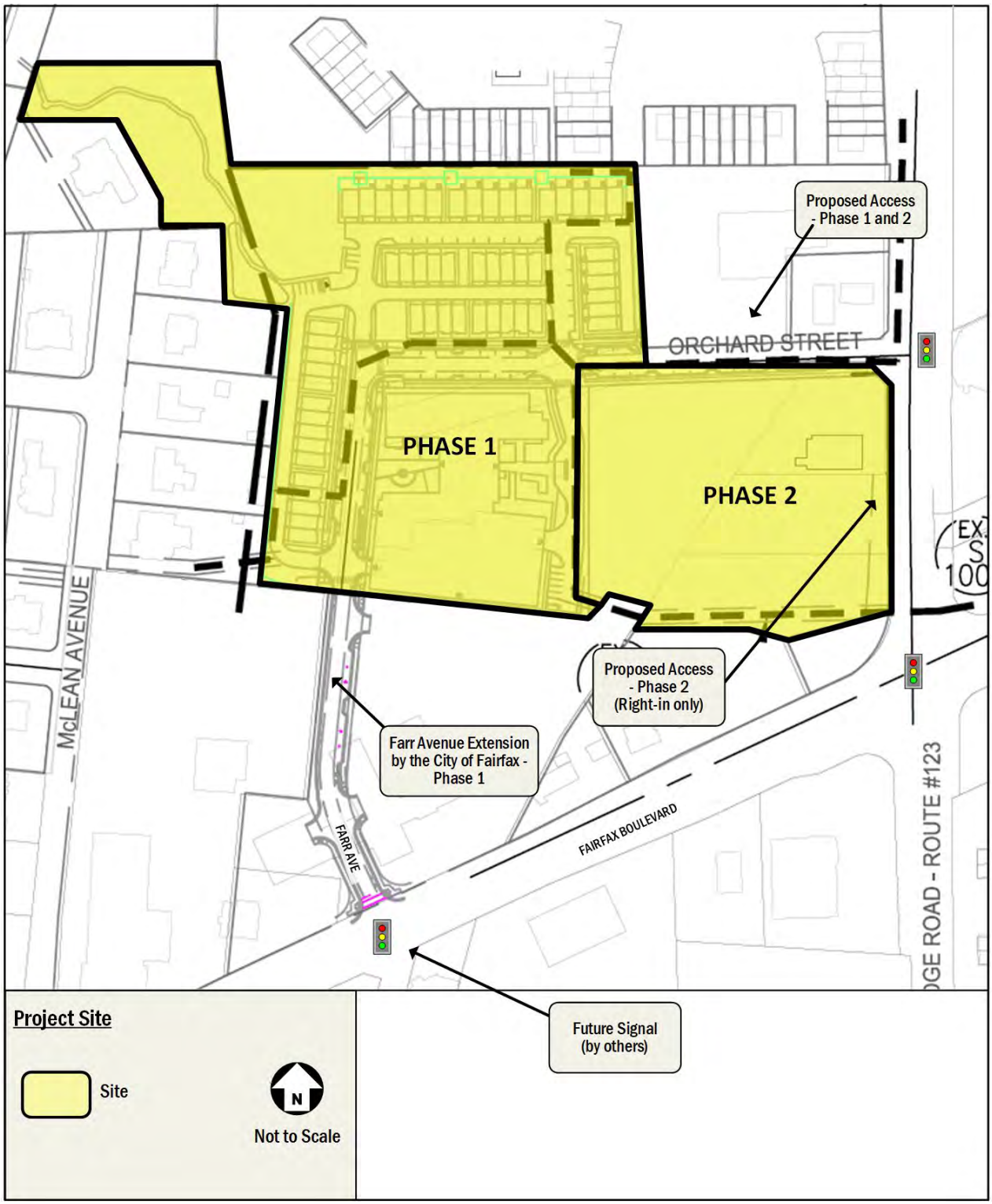


Figure 16: Site Access

TRIP GENERATION

This chapter outlines the transportation demand of the proposed Northfax development. It summarizes the projected trip generation of the site by land use and by mode, which forms the basis for the chapters that follow.

The Site is served by local transit and has multiple bus stops surrounding it. However, it is expected that the vast majority of trips during the weekday and Saturday peak hours will be by personal vehicle. The proposed mode splits were vetted and approved by the City of Fairfax during the scoping process and are illustrated in Table 3.

As noted previously, Phase 1 consists of 56 multi-family residential units and 200 continuing care retirement community units; Phase 2 will include approximately 25,000 square feet of commercial uses (including retail space, office space, and restaurants) with approximately 180 residential dwelling units on the upper floors and a 140-room capacity hotel. It should be noted that the current application for the site only pertains to Phase 1. A separate application for Phase 2 will be submitted subsequently to the City of Fairfax. As such, the Phase 2 portion of the development described herein is for transportation planning purposes and is subject to change with the future application.

In order to calculate the trips generated by the proposed development, peak hour trip generation is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE's) Trip Generation Manual, 10th Edition.

Trip generation rates for the two existing single-family homes that will be removed were calculated based on ITE Land Use 210, Single Family Detached Housing.

Trip generation rates for the 56 multi-family residential units in Phase 1 were calculated based on ITE Land Use 220, Multifamily Housing (Low-Rise).

Trip generation rates for the 200 continuing care retirement community units in Phase 1 were calculated based on ITE Land Use 255.

Trip generation rates for the 180 multi-family residential units in Phase 2 were calculated based on ITE Land Use 221, Multifamily Housing (Mid-Rise).

Trip generation rates for the 140-room hotel in Phase 2 were calculated based on ITE Land Use 310, Hotel.

To analyze the commercial portion to be constructed in Phase 2, the 25,000 square feet of commercial uses was split between retail space (2,000 square feet), office space (10,000 square feet), and restaurant space (5,000 square feet for high-turnover sit-down uses and 8,000 square feet of quality restaurant uses).

Trip generation rates for the 2,000 square foot GLA retail space in Phase 2 were calculated based on ITE Land Use 820, Shopping Center.

Trip generation rates for the 10,000 square foot GFA office space in Phase 2 were calculated based on ITE Land Use 710, General Office Building.

Trip generation rates for 5,000 square foot GFA restaurant in Phase 2 were calculated based on ITE Land Use 932, High-Turnover (Sit-Down) Restaurant.

Trip generation rates for 8,000 square foot GFA restaurant in Phase 2 were calculated based on ITE Land Use 931, Quality Restaurant.

Under Phase 1, the proposed development will generate 51 new vehicular trips in the weekday morning (AM) peak hour, 62 new vehicular trips during the weekday afternoon (PM) peak hour, and 77 new vehicular trips during the Saturday midday (SAT) peak hour. Ultimately, under Phase 2, the proposed development will generate approximately 264 new vehicular trips in the AM peak hour, 342 new vehicular trips in the PM peak hour, and 402 new vehicular trips in the Saturday peak hour.

Under Phase 1 conditions, the increase in vehicular trips would attribute to an increase of less than 1.0% in peak hour traffic along Fairfax Boulevard and an increase of less than 1.1% in peak hour traffic along Chain Bridge Road. Under Phase 2 conditions, the increase in vehicular trips would attribute to an increase of less than 3.3% in peak hour traffic along Fairfax Boulevard and an increase of less than 3.2% in peak hour traffic along Chain Bridge Road.

Table 4 below shows a comparison of trips generated by the proposed and the by-right uses. As illustrated in the table, the proposed development program would generate approximately half of the peak hour traffic when compared to what is allowable by-right. A technical memorandum, discussing the comparison of the by-right development trips and the proposed trips, was submitted to the City and is included in Appendix C.

Table 3: Proposed Site Trip Generation (ITE 10; Peak Hour of the Adjacent Street)

Land Use	ITE LUC	Size	AM PEAK HOUR			PM PEAK HOUR			DAILY	SAT PEAK HOUR			SATURDAY DAILY
			IN	OUT	TOTAL	IN	OUT	TOTAL	TOTAL	IN	OUT	TOTAL	TOTAL
Existing (to be removed)													
Single-Family Detached Homes	210	2 DU	0	1	1	1	1	2	19	1	1	2	19
Total Existing Trips (To Be Removed)			**0**	**1**	**1**	**1**	**1**	**2**	**19**	**1**	**1**	**2**	**19**
PHASE 1													
Multi-Family Housing (Low-Rise)	220	56 DU	6	21	27	22	13	35	383	21	18	39	263
Continuing Care	255	200 Units	18	10	28	12	20	32	480	23	21	44	406
Total Phase 1 Development Trips (without Reductions)			**24**	**31**	**55**	**34**	**33**	**67**	**863**	**44**	**39**	**83**	**669**
TDM/Transit Ructions		*5%*	*-1*	*-2*	*-3*	*-2*	*-1*	*-3*	*-43*	*-2*	*-2*	*-4*	*-33*
Total Phase 1 Development Trips (with Reductions)			**23**	**29**	**52**	**32**	**32**	**64**	**820**	**42**	**37**	**79**	**636**
Proposed New External Trips Under Phase 1 (Proposed Phase 1 Trips - Existing Trips)			**23**	**28**	**51**	**31**	**31**	**62**	**801**	**41**	**36**	**77**	**617**
PHASE 2													
Multi-Family Housing (Mid-Rise)	221	180 DU	16	45	61	48	30	78	979	39	40	79	884
Hotel	310	140 Rooms	38	27	65	40	39	79	1,170	56	45	101	1,147
Quality Restaurant	931	8 kSF	3	3	6	42	20	62	671	50	35	85	720
High-Turnover (Sit-Down) Restaurant	932	5 kSF	27	23	50	30	19	49	561	29	27	56	612
General Office Building	710	10 kSF	31	5	36	2	11	13	114	3	2	5	22
Shopping Center[2]	820	2 kSF	1	1	2	4	4	8	76	5	4	9	92
Total Phase 2 Development Trips (without Reductions)			**116**	**104**	**220**	**166**	**123**	**289**	**3,571**	**182**	**153**	**335**	**3,477**
Total Phase 1 + Phase 2 Development Trips (without Reductions)			**140**	**135**	**275**	**200**	**156**	**356**	**4,434**	**226**	**192**	**418**	**4,146**
Internal Capture - Res and Non-Res[1]		*5%*	*-1*	*-3*	*-4*	*-3*	*-2*	*-5*	*-68*	*-3*	*-3*	*-6*	*-57*
TDM/Transit Ructions		*5%*	*-2*	*-4*	*-6*	*-4*	*-3*	*-7*	*-92*	*-4*	*-4*	*-8*	*-75*
Total Development Trips (with Reductions)			**137**	**128**	**265**	**193**	**151**	**344**	**4,274**	**219**	**185**	**404**	**4,014**
Net New Trips without Reductions			**140**	**134**	**274**	**199**	**155**	**354**	**4,415**	**225**	**191**	**416**	**4,127**
Net New Trips with Reductions			**137**	**127**	**264**	**192**	**150**	**342**	**4,255**	**218**	**184**	**402**	**3,995**

Notes:

1. Internal capture between residential (multifamily) and non-residential uses (shopping center , quality restaurant, high turnover (sit-down) restaurant, and general office buidling) was based on a minimum of 5% for AM, PM and SAT peak hour trips.

2. For Shopping Center, the rates have been used as 2,000 sft of retail falls outside the data range.

Table 4: Trip Generation Comparison Between Proposed and By-Right Uses (without any Reductions Applied)

Land Use	ITE Code	Size	------ Weekday ------							------ Weekend ------			
			AM Peak Hour			PM Peak Hour			Daily	Saturday Peak Hour			Sat Daily
			In	Out	Total	In	Out	Total	Total	In	Out	Total	Total
Single-Family Detached Housing	210	42 DU	9	26	35	28	16	44	468	29	24	53	434
General Office Building	710	378 ksf of GFA	329	53	382	64	339	403	3,854	108	92	200	835
Shopping Center	820	91.5 kSF of GLA	53	33	86	168	181	349	3,454	214	198	412	4,220
Fast-Food Restaurant without Drive-Thru Window	933	3 KSF of GFA	66	44	110	43	42	85	1039	80	84	164	2088
By-Right Trips			**457**	**156**	**613**	**303**	**578**	**881**	**8,815**	**431**	**398**	**829**	**7,577**

	------ Weekday ------							------ Weekend ------			
	AM Peak Hour			PM Peak Hour			Daily	Saturday Peak Hour			Sat Daily
	In	Out	Total	In	Out	Total	Total	In	Out	Total	Total
By-Right Trips	457	156	613	303	578	881	8,815	431	398	829	7,577
Proposed Development	140	134	274	199	155	354	4,415	225	191	416	4,127
Delta	**-317**	**-22**	**-339**	**-104**	**-423**	**-527**	**-4,400**	**-206**	**-207**	**-413**	**-3,450**

TRAFFIC OPERATIONS

This chapter provides a summary of an analysis of the existing and future roadway capacity in the study area. Included is an analysis of potential vehicular impacts of the Northfax development and a discussion of potential improvements.

The purpose of the capacity analysis is to:

- Determine the existing capacity of the study area roadways;
- Determine the overall impact of the proposed development on the study area roadways; and
- Discuss potential improvements and mitigation measures to accommodate the additional vehicular trips.

The capacity analysis focuses on the weekday morning (AM), weekday afternoon (PM), and Saturday midday (SAT) peak hours, as determined by the existing traffic volumes in the study area.

The proposed development is considered to have an impact at an intersection within the vehicular study area if any of the following conditions are met:

- The overall intersection or any approach operates at LOS E or LOS F in the future conditions with the proposed development where one does not exist in the background conditions without the proposed development;
- The overall intersection or any approach operates at LOS E or LOS F during the background condition and the delay increases by more than 10 percent in the future conditions with the proposed development; or
- There is an increase in the 95th percentile queues along a movement where queues exceed available storage capacity of turning lanes in the future conditions with the proposed development where one does not exist in background conditions without the proposed development.

The following conclusions are reached within this chapter:

- Every study intersection except Chain Bridge Road & Future Site Access (Intersection 8) operates at unacceptable levels of service during at least one study scenario.
- Overall, this report concludes that the project **will have a negligible impact** to the surrounding transportation network.

STUDY AREA, SCOPE, & METHODOLOGY

This section outlines the vehicular trips generated in the study area along the vehicular access routes and defines the analysis assumptions.

The general methodology of the analysis follows industry standards on the preparation of transportation impact evaluations of site development, unless stated otherwise.

Capacity Analysis Scenarios

The vehicular analyses are performed to determine if the proposed development will lead to adverse impacts on traffic operations. This is accomplished by comparing future scenarios: (1) without the proposed development (referred to as the Background conditions) and (2) with the development approved and constructed (referred to as the Future conditions).

Specifically, the roadway capacity analysis examined the following scenarios:

1. 2019 Existing Conditions
2. 2023 Future Conditions without the Development (2023 Background)
3. 2023 Future Conditions with Phase 1 of the Development (2023 Total Future – Phase 1)
4. 2027 Future Conditions without the Development (2027 Background)
5. 2027 Future Conditions with Phase 1 and Phase 2 of the Development (2027 Total Future – Phase 2)

Study Area

The study area of the analysis is a set of intersections where detailed capacity analyses are performed for the scenarios listed above. The set of intersections included are those intersections most likely to have potential impacts or require changes to traffic operations to accommodate the proposed development. The aforementioned study area was discussed and agreed to in a scoping meeting with the City.

Based on the projected future trip generation and the location of the site access points, the following intersections were chosen for analysis:

1. Fairfax Boulevard and Eaton Place;
2. Fairfax Boulevard and University Drive;
3. Chain Bridge Road and Fairfax Boulevard;
4. Fairfax Boulevard, Farr Avenue, and Future Site Access;
5. Fairfax Boulevard, Warwick Lane, and McLean Avenue;
6. Chain Bridge Road and Orchard Street;
7. Chain Bridge Road and Eaton Place; and
8. Chain Bridge Road and Right-in Only Site Access (2027 Total Future scenario only).

Figure 5 illustrates the location of the aforementioned study intersections.

Geometry and Operations Assumptions

The following section reviews the roadway geometry and operations assumptions made and the methodologies used in the roadway capacity analyses.

Existing Geometry and Operations Assumptions

The geometry and operations assumed in the existing conditions scenario are those present when the main data collection occurred. Gorove/Slade made observations and confirmed the existing lane configurations and traffic controls at the intersections within the study area. Existing signal timings and offsets were obtained from the City of Fairfax.

A description of the roadways within the study area is presented below in Table 5. The existing local roadway network including lane configurations and intersection control is detailed in and illustrated in Figure 17.

2023 Background and Future Phase 1 Geometry and Operations Assumptions (with and/or without Phase 1 of the proposed development)

Following industry standard methodologies, a background improvement must meet the following criteria to be incorporated into the analysis:

- Be funded; and
- Have a construction completion date prior or close to the proposed development.

Based on these criteria, some geometry improvements were included in the 2023 Background and 2023 Future Phase 1 scenarios. Roadway improvements that are part of the Northfax East/University Drive Extension project and the Farr Avenue extension were incorporated. Detailed plans of this project are included in the Appendix D.

The Northfax East/University Drive Extension project consists of an extension of University Drive from Fairfax Boulevard to Eaton Place, providing new vehicular, pedestrian, and bicycle connections. The new roadway will include sidewalks, pedestrian crossings, on-road bike lanes, lighting, and landscaping. The new intersection of University Drive and Eaton Place will be controlled by two-way stop control.

The extension of Farr Avenue to Orchard Street would occur prior to the completion of Phase 1 of the development. The extension would provide new vehicular, pedestrian, and bicycle connections within the road network. Under Phase 1, it is anticipated that the intersection of Farr Avenue at Fairfax Boulevard would operate under stop-controlled conditions and would utilize right-in/right-out (RIRO) movements.

Because the Phase 1 portion of the Northfax development does not include any roadway geometry improvements, the 2023 Background and 2023 Future Phase 1 scenarios are combined for geometry and operations purposes.

The 2023 Background and Future Phase 1 lane configurations and intersection controls are illustrated on Figure 18.

2027 Background Geometry and Operations Assumptions (without the proposed development)

Based on the aforementioned background improvement criteria, some geometry improvements were included in the 2027 Background scenario in addition to those included in the 2023 Background and 2023 Future Phase 1 scenarios. Roadway improvements that are part of the Warwick Avenue/Fairfax Boulevard/McLean Avenue Intersection Improvements project were incorporated into the 2027 Background scenario. Detailed plans of this project are included in the Appendix D.

The Warwick Avenue/Fairfax Boulevard/McLean Avenue Intersection Improvements project consists of realigning the intersection to remove two of the intersection approaches (McLean Avenue to the north of Fairfax Boulevard and Warwick Avenue to the south of Fairfax Boulevard), reducing pedestrian crossing distances and intersection conflict points. The project adds a new traffic signal at Farr Avenue to allow neighborhood traffic south of Fairfax Boulevard access to a signal to make left turns onto Fairfax Boulevard.

The 2027 Background lane configurations and intersection controls is shown on Figure 19.

2027 Future Phase 2 Geometry and Operations Assumptions (with Phase 1 and Phase 2 of the proposed development)

In addition to the background improvements included in the 2027 Background scenario, the 2027 Future Phase 2 scenario includes roadway geometry improvements occurring as a result of Phase 2 of the Northfax development. These improvements include the addition of a right-in site access along Chain Bridge Road.

The 2027 Future Phase 2 lane configurations and intersection controls is illustrated on Figure 20.

Table 5: Existing Roadway Network

Roadway	Classification (VDOT) *	Classification (City of Fairfax) **	Lanes	Speed	On-Street Parking	ADT ***
Fairfax Boulevard (west of Chain Bridge Road	Other Principal Arterial	Arterial	4	35 mph	No	37,000
Fairfax Boulevard (east of Chain Bridge Road)	Other Principal Arterial	Arterial	4	35 mph	No	35,000
Chain Bridge Road	Other Principal Arterial	Arterial	2 to 6	30 mph	No	38,000
University Drive	Major Collector	Collector	2	25 mph	No	6,700

* Source: VDOT

** Source: City of Fairfax

*** Source: 2018 VDOT ADT Data

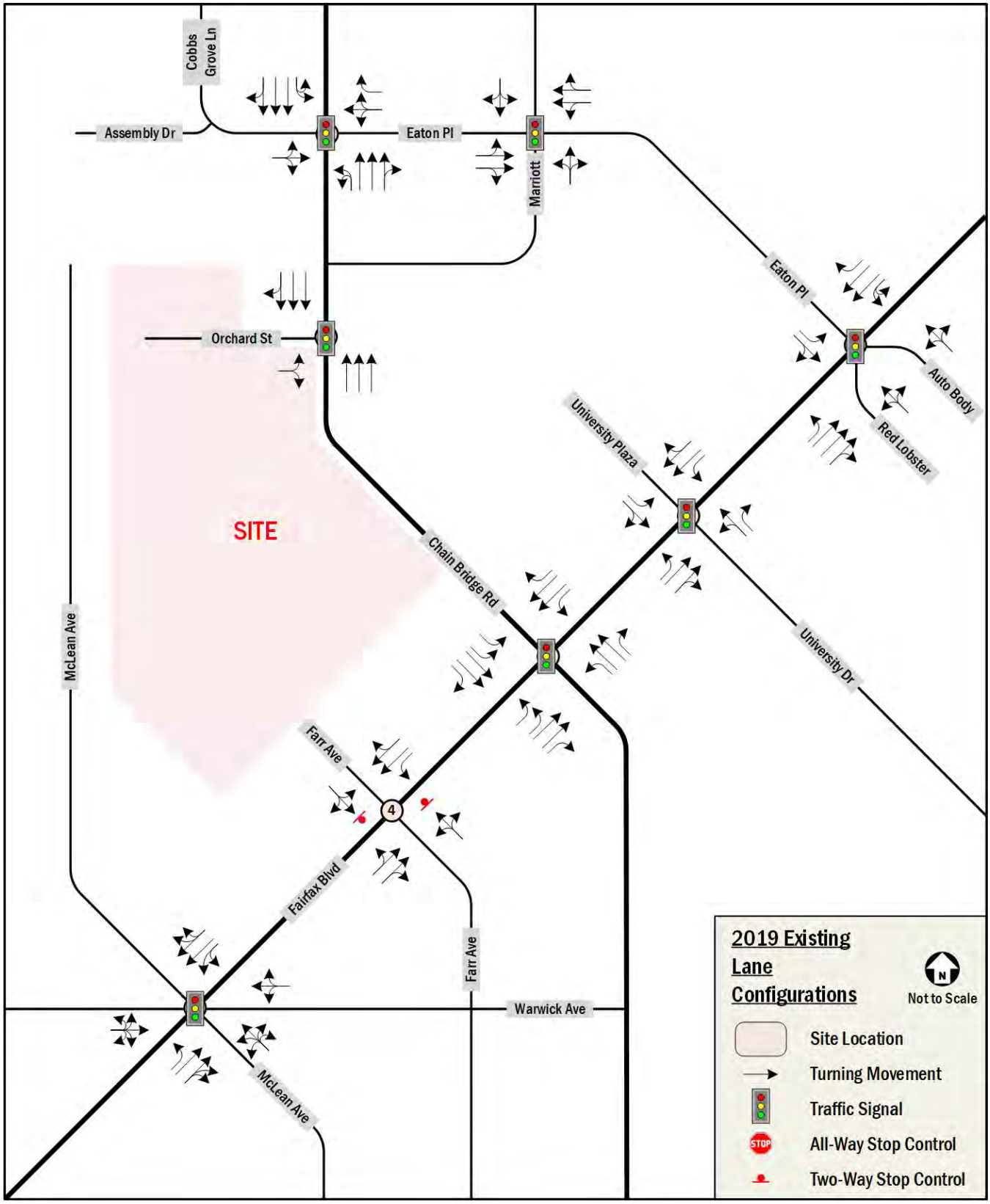


Figure 17: 2019 Existing Lane Configurations and Traffic Controls

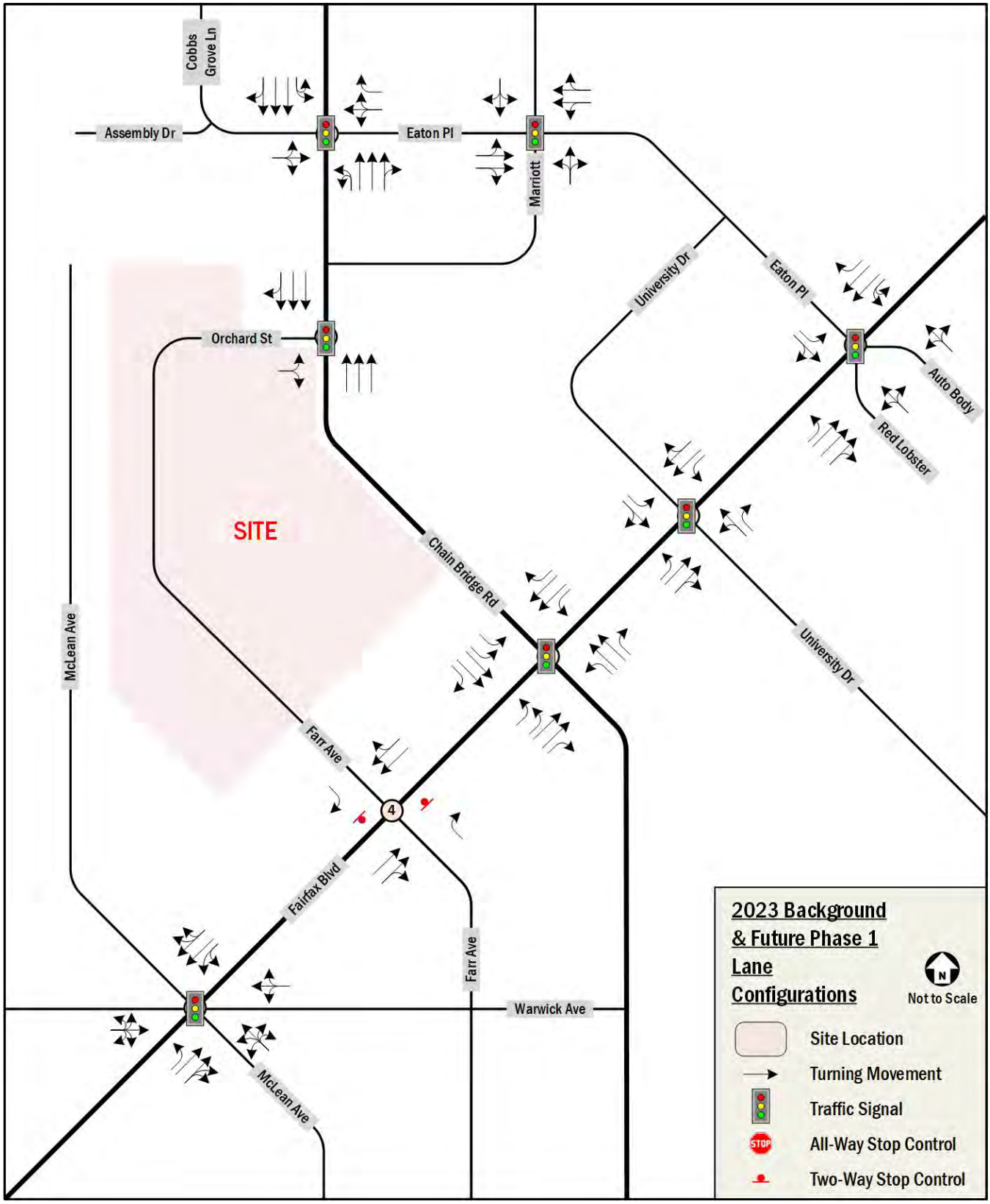


Figure 18: 2023 Background and Future Phase 1 Lane Configurations and Traffic Controls

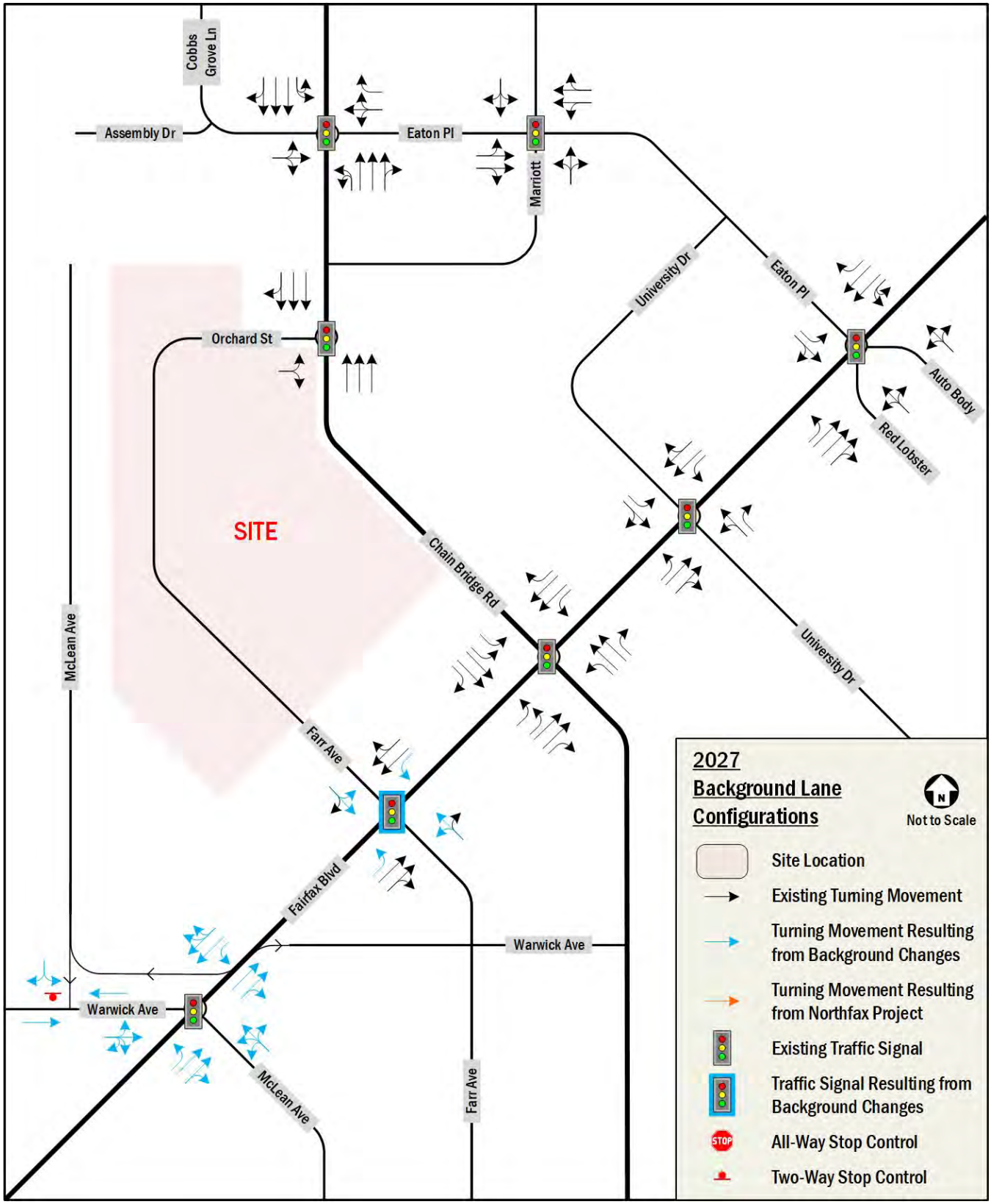


Figure 19: 2027 Background Lane Configurations and Traffic Controls

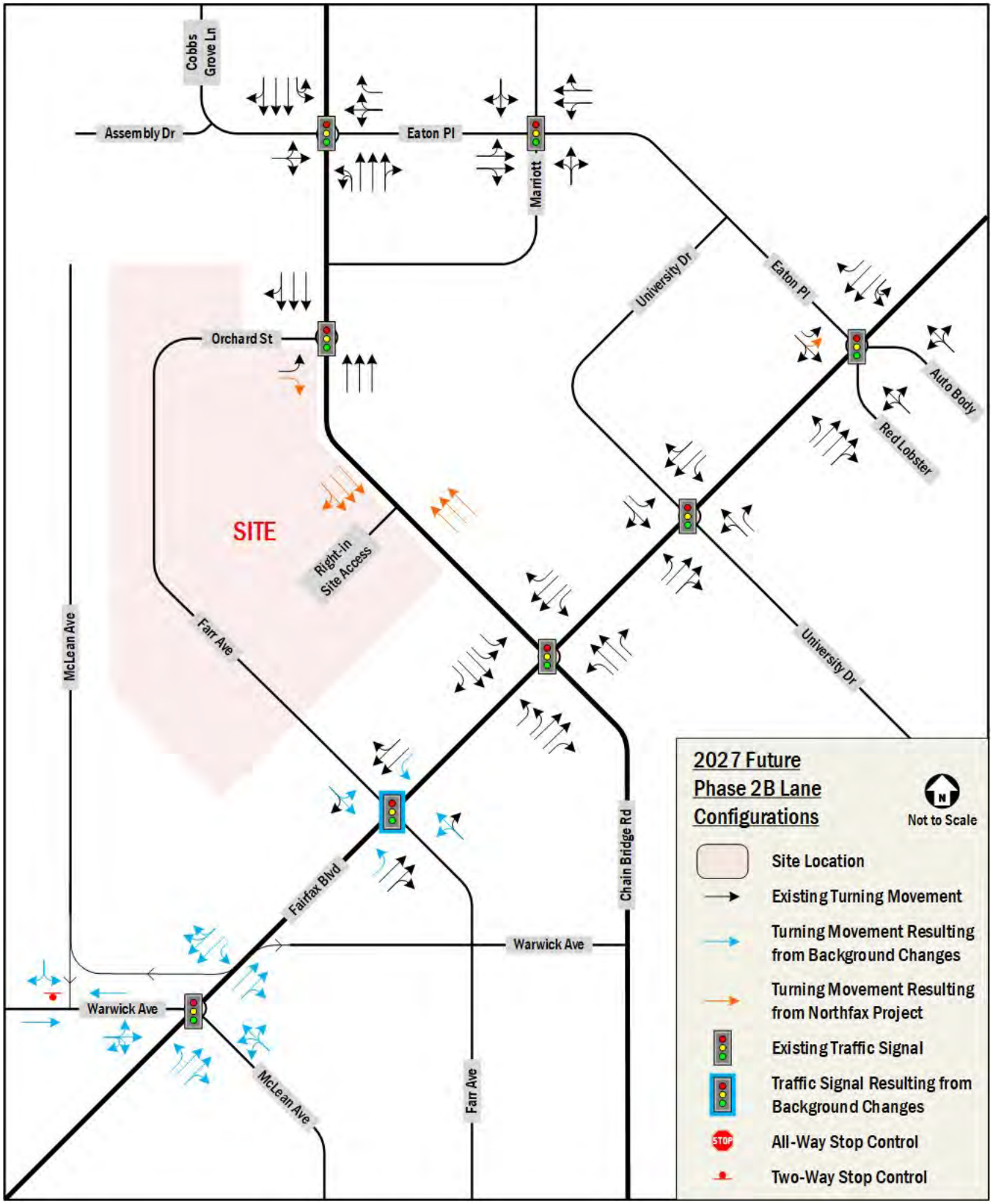


Figure 20: 2027 Future Phase 2 Lane Configurations and Traffic Controls

Traffic Volume Assumptions

The following section reviews the traffic volume assumptions and methodologies used in the roadway capacity analyses.

Existing Traffic Volumes

The existing traffic volumes are compiled from two sources:

- Turning movement count data, which was collected on Wednesday, March 20, 2019 from 6:00 AM to 9:00 AM and 4:00 PM to 7:00 PM and on Saturday, March 23, 2019 from 11:00 AM to 2:00 PM; and
- *Synchro* software files containing weekday morning, weekend afternoon, and Saturday midday peak hour traffic volumes provided by the City of Fairfax.

The existing turning movement counts are included in the Appendix B.

Based on the existing counts, the following system peak hours were identified:

- AM Peak Hour: 7:45 to 8:45 AM,
- PM Peak Hour: 5:00 PM to 6:00 PM, and
- SAT Peak Hour: 1:00 to 2:00 PM.

The existing peak hour traffic volumes for the intersections within the vehicular study area are shown in Figure 21. Of note, the traffic volumes were balanced between intersection where appropriate.

2023 Background Traffic Volumes (without the proposed development)

Traffic projections for the 2023 Background conditions consist of the existing volumes with three additions:

- Inherent growth on the roadway (representing regional traffic growth),
- Traffic generated by developments expected to be completed prior to the project (known as background developments), and
- Potential rerouting of traffic due to future roadway improvement projects.

To account for inherent growth on the roadway, a growth percentage has been applied to all movements at the intersection of Fairfax Boulevard and Chain Bridge Road, with the resulting volume differences carried through the remaining study intersections. This growth percentage is 2.0% between 2019 and 2023, and 1.0% between 2023 and 2027.

Following industry methodologies, a background development must meet the following criteria to be incorporated into the analysis:

- Be located in the study area, defined as having an origin or destination point within the cluster of study area intersections;
- Have entitlements; and
- Have a construction completion date prior or close to the proposed development.

The analysis considered the following two developments and their locations relative to the proposed Northfax development can be found in Figure 22.

1) **Fairfax Shopping Center (Whole Foods):** Located in the City of Fairfax north of Fairfax Boulevard, south of Eaton Place, and east of Chain Bridge Road, the development proposes to replace the existing 82,268 SF of retail space with approximately 48,200 SF of retail space. The development is expected to generate 100 weekday AM peak hour vehicle trips and 368 weekday PM peak hour vehicle trips, based on the Traffic Impact Study prepared by Wells + Associates dated December 21, 2016. A Saturday peak hour trip generation of 545 trips was extrapolated from the AM and PM peak hour trips provided in this Traffic Impact Study. **This development is considered in the Background and Future scenarios for both 2023 and 2027.**

2) **Paul VI**: Located in the City of Fairfax south of Fairfax Boulevard, east of Oak Street, and west of McLean Avenue, the development proposes to replace the existing private high school with 184 residential condominium units, 137 town homes, 20,000 SF of local serving retail, and 24,000 SF of community center space. Including the removed trips from the existing site, the development is expected to generate (-746) weekday AM peak hour vehicle trips and 295 weekday PM peak hour vehicle trips, based on the Traffic Impact Study prepared by Wells + Associates dated April 18, 2017 and revised November 15, 2017. A Saturday peak hour trip generation of 502 trips was extrapolated from the AM and PM peak hour trips provided in this Traffic Impact Study. **Because this development will not be complete by 2023, it is only considered in the 2027 Background and Future scenarios.**

Trip distribution assumptions for the background developments were based on the distributions included in their respective studies or was based on those determined for the development and altered where necessary based on anticipated travel patterns. The total traffic generated by these background developments is presented in Table 6. Diagrams showing the trips generated by each background development are presented in Appendix D.

The 2023 regional growth-generated peak hour traffic volumes are shown in Figure 23. The 2023 background development-generated peak hour traffic volumes are shown in Figure 24.

The reroute of traffic due to proposed roadway improvements is illustrated in Figure 25

The 2023 Background peak hour traffic volumes are shown in Figure 26**.**

Table 6: Vehicular Traffic Generated by Background Developments

Development	Vehicular Trip Generation								
	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	*Out*	*Total*	*In*	*Out*	*Total*	*In*	*Out*	*Total*
Fairfax Shopping Center (Whole Foods) *	62	38	100	177	191	368	284	261	545
Paul VI **	-573	-173	-746	187	108	295	258	244	502
Total	**-511**	**-135**	**-646**	**364**	**299**	**663**	**542**	**505**	**1,047**

* Source: TIA prepared by Wells + Associates dated December 21, 2016

** Source: TIA prepared by Wells + Associates dated April 18, 2017 and revised November 15, 2017

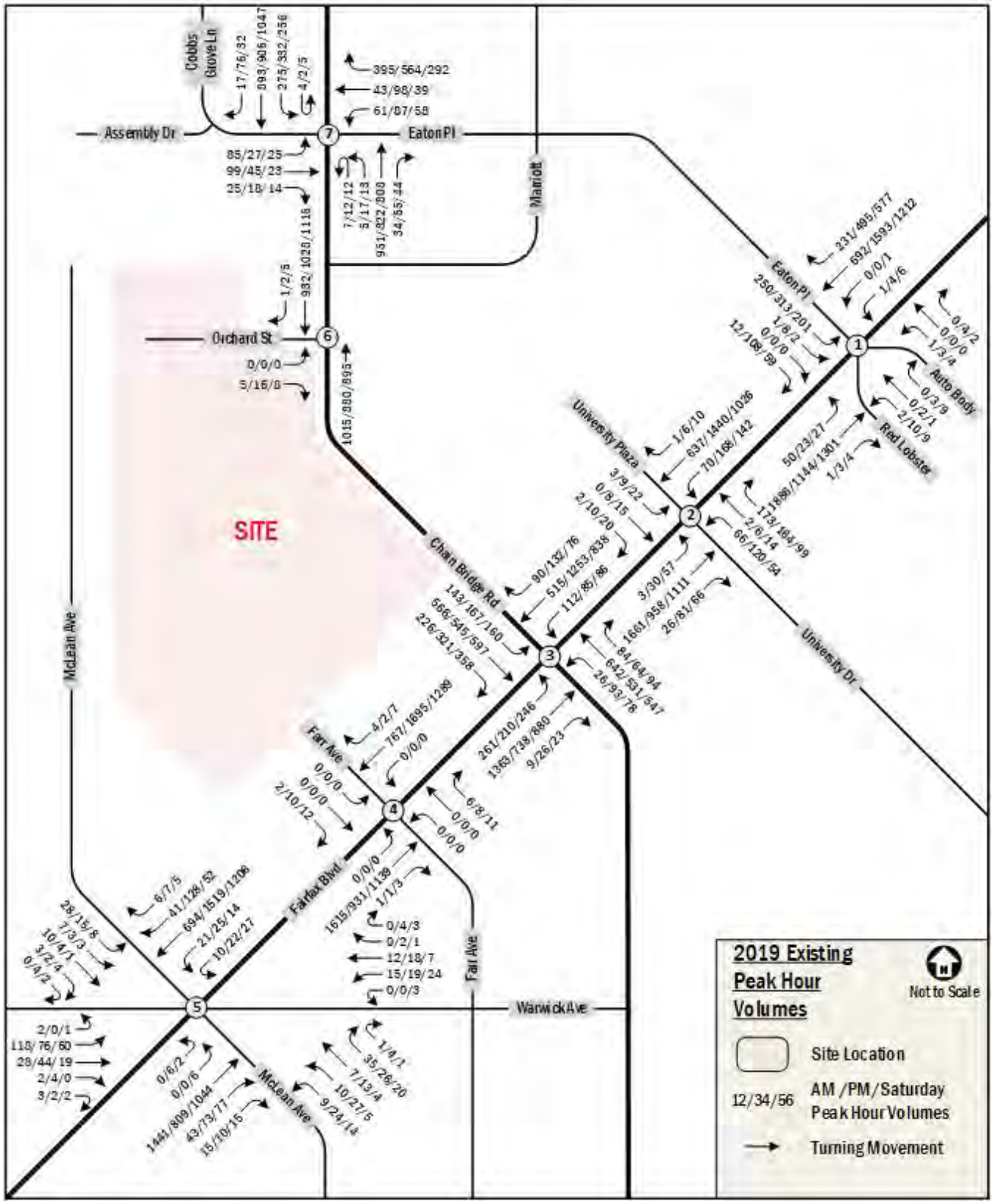


Figure 21: 2019 Existing Vehicular Peak Hour Traffic Volumes

Figure 22: Future Background Developments

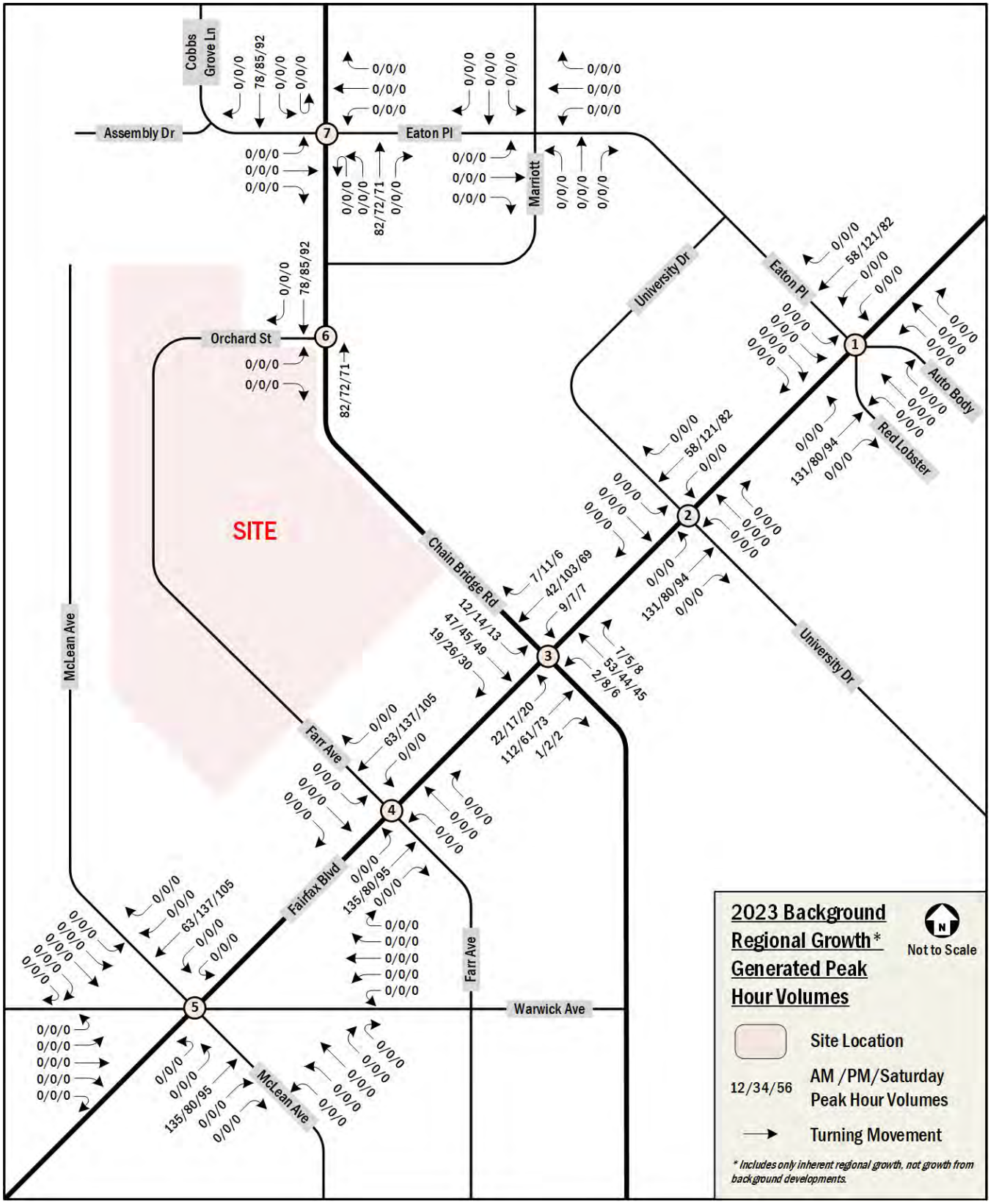


Figure 23: Inherent Regional Growth Peak Hour Traffic Volumes (2019 to 2023)

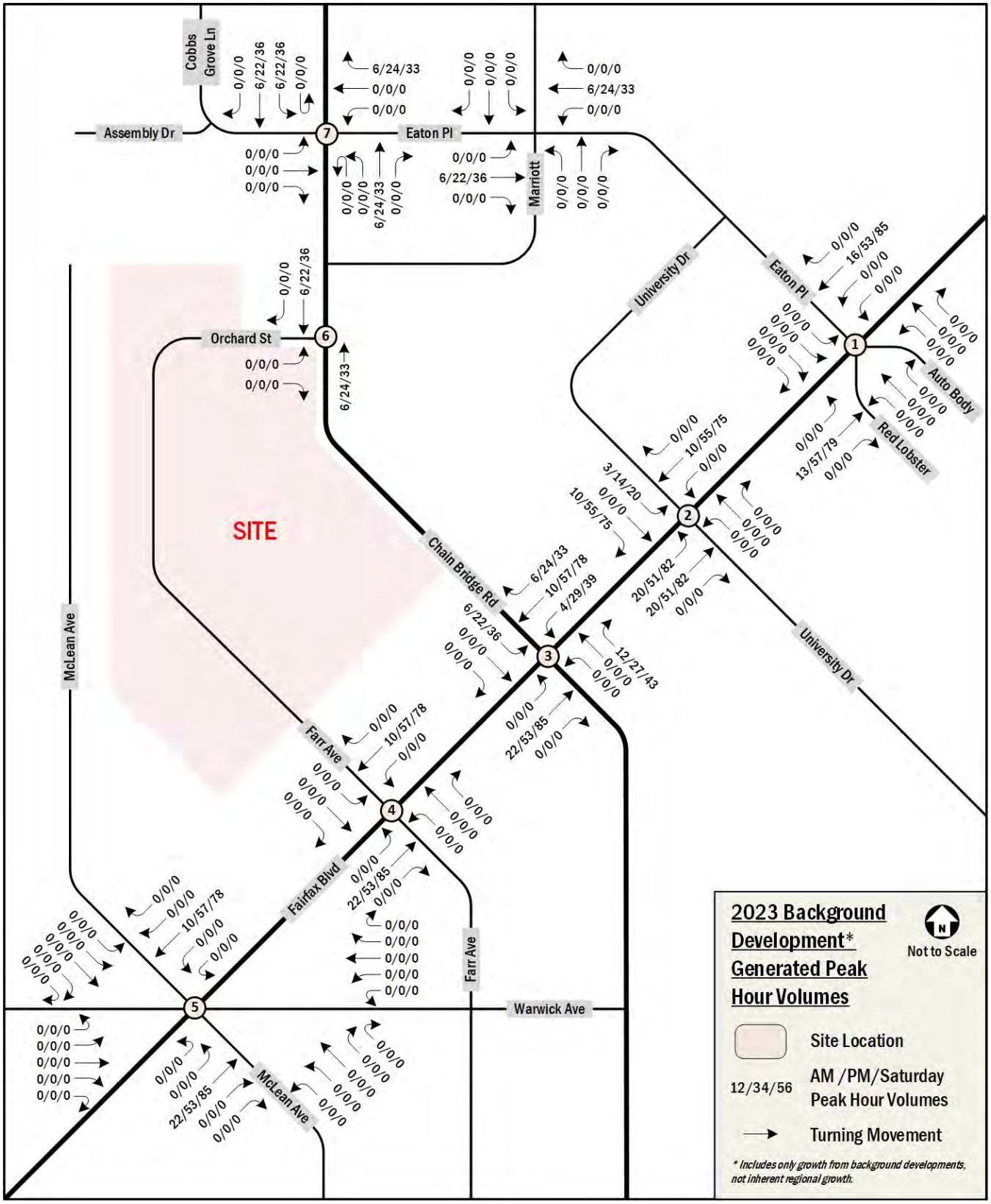


Figure 24: 2023 Background Development-Generated Peak Hour Traffic Volumes

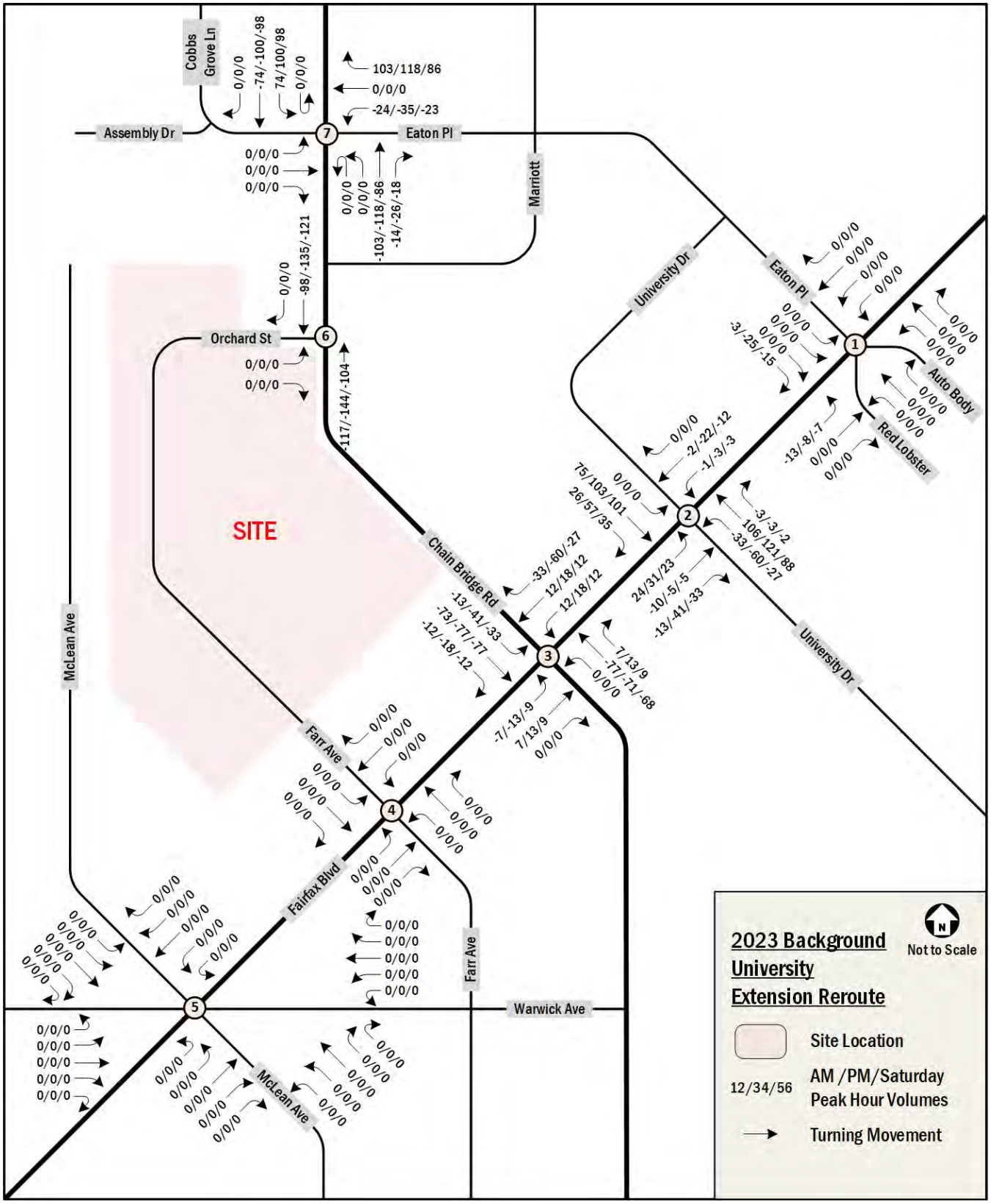


Figure 25: Rerouted Traffic due to Proposed Roadway Improvements (2023)

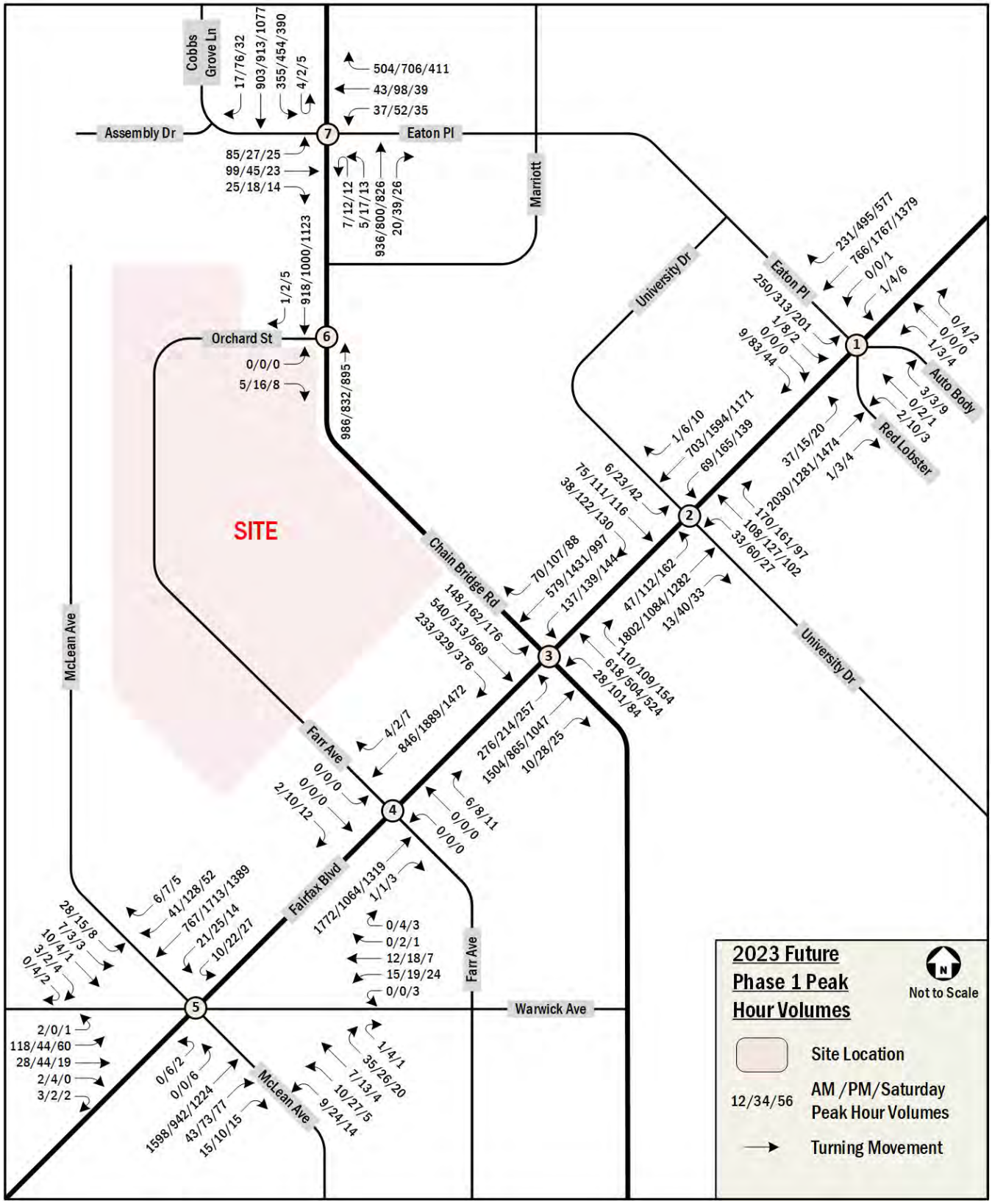


Figure 26: 2023 Background Peak Hour Vehicular Traffic Volumes

2023 Future Traffic Volumes (with Phase 1 of the Development)

The 2023 Future (with Phase 1 of the Development) traffic consists of the 2023 Background (without Development) volumes with the addition of the traffic volumes generated by Phase 1 of the proposed development. Thus, the 2023 Future (with Phase 1 of the Development) volumes include traffic generated by:

- Existing volumes,
- Inherent growth on the roadway (representing regional traffic growth),
- Developments expected to be completed prior to the project (known as background developments),
- Potential rerouting of traffic due to future roadway improvement projects,
- Removal of trips from the existing development(s) that would be replaced with the proposed development, and
- Phase 1 of the proposed development.

The distribution of site trips was based primarily on existing volumes, anticipated traffic patterns, other recent studies conducted in the area, and engineering judgment. The peak hour trips were calculated and assigned to the roadway network based on the traffic distributions shown in Figure 27 through Figure 31.

The 2023 Phase 1 site-generated trips are shown in Figure 32. The removal of existing trips, associated with the two single family detached homes, is illustrated in Figure 33. The 2023 Future (with Phase 1 of the Development) traffic volumes are shown in Figure 34.

Figure 27: Residential Trip Distribution

Figure 28: Continued Care Retirement Facility Trip Distribution

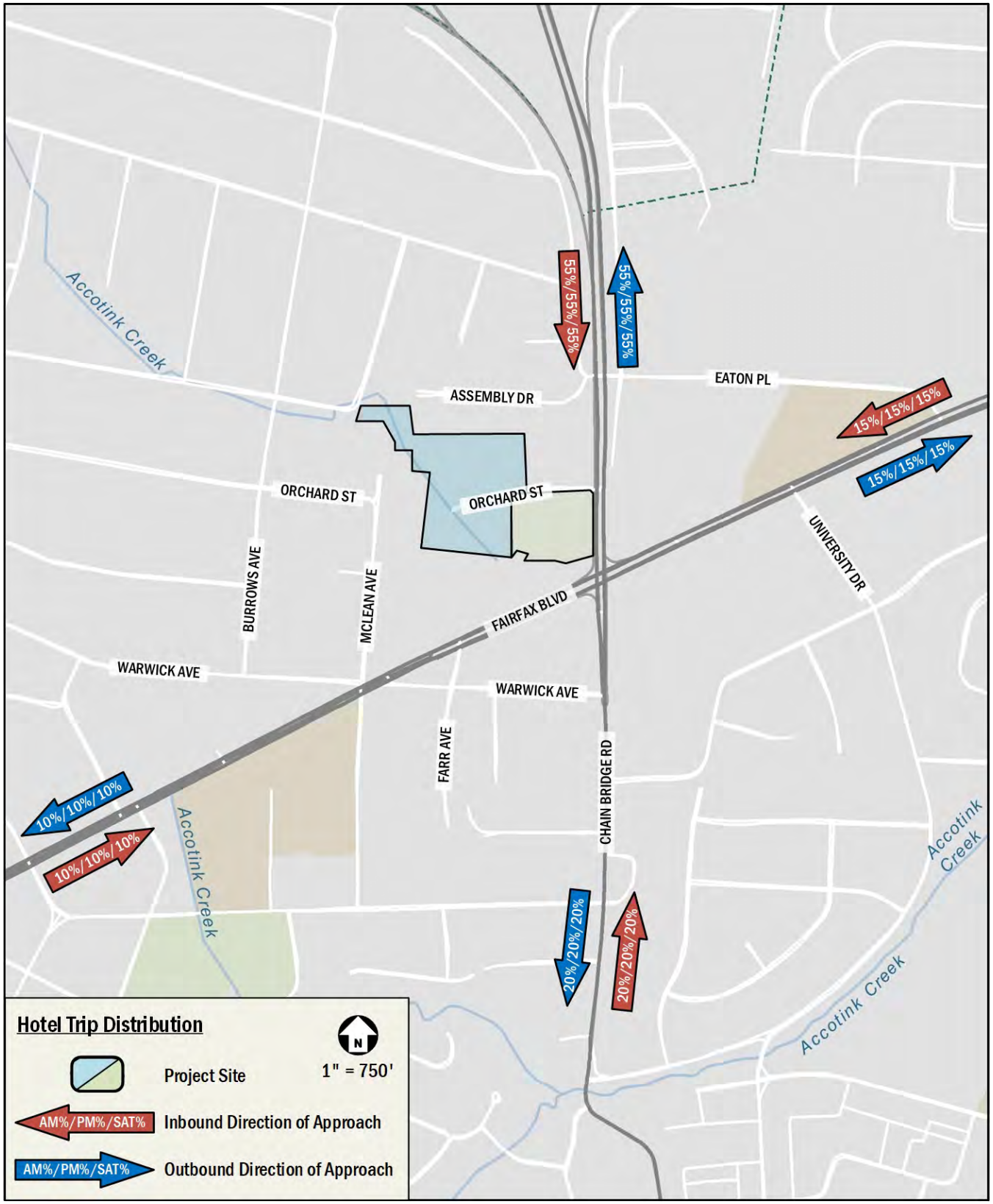


Figure 29: Hotel Trip Distribution

Figure 30: Restaurant Trip Distribution

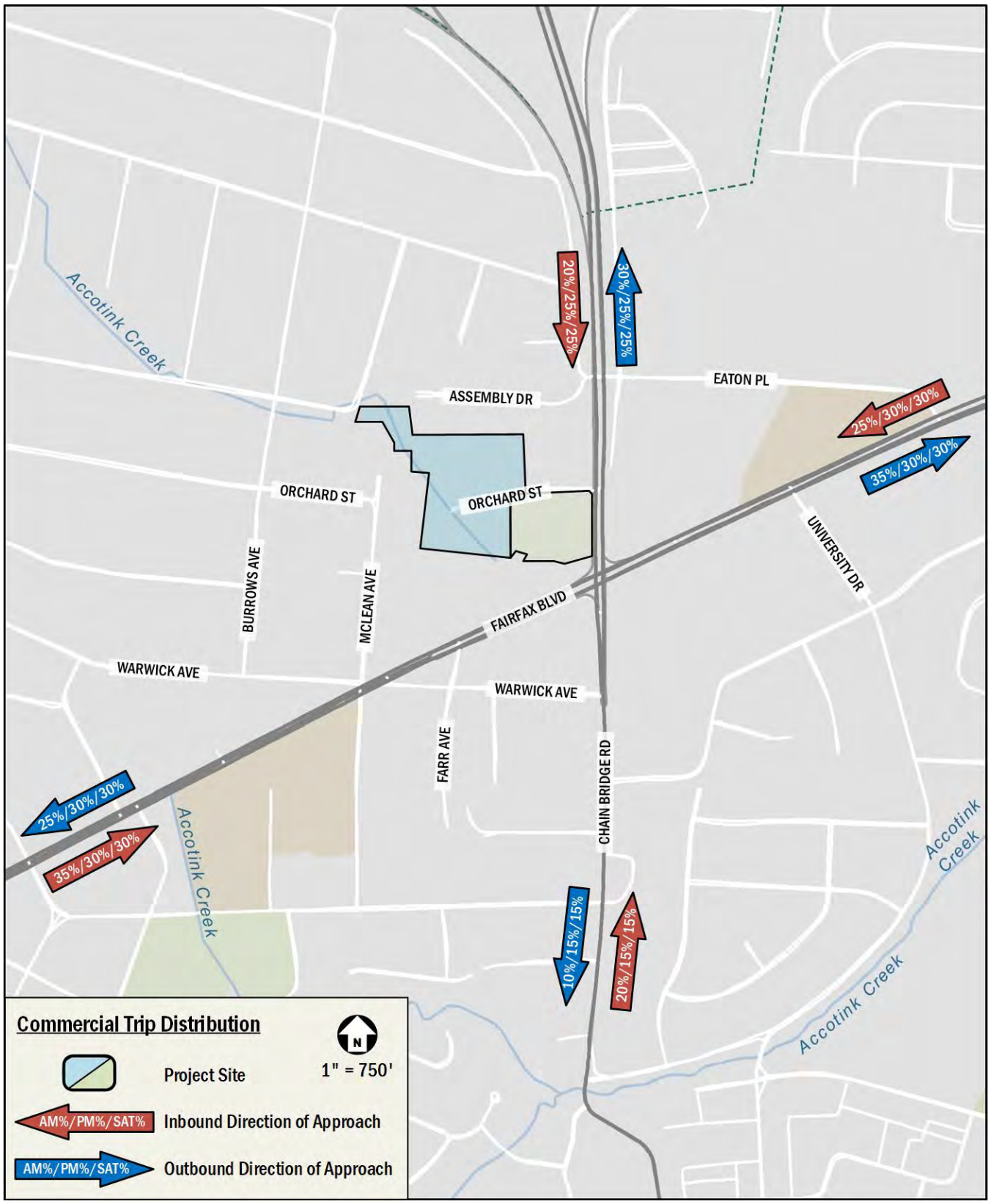


Figure 31: Commercial Trip Distribution

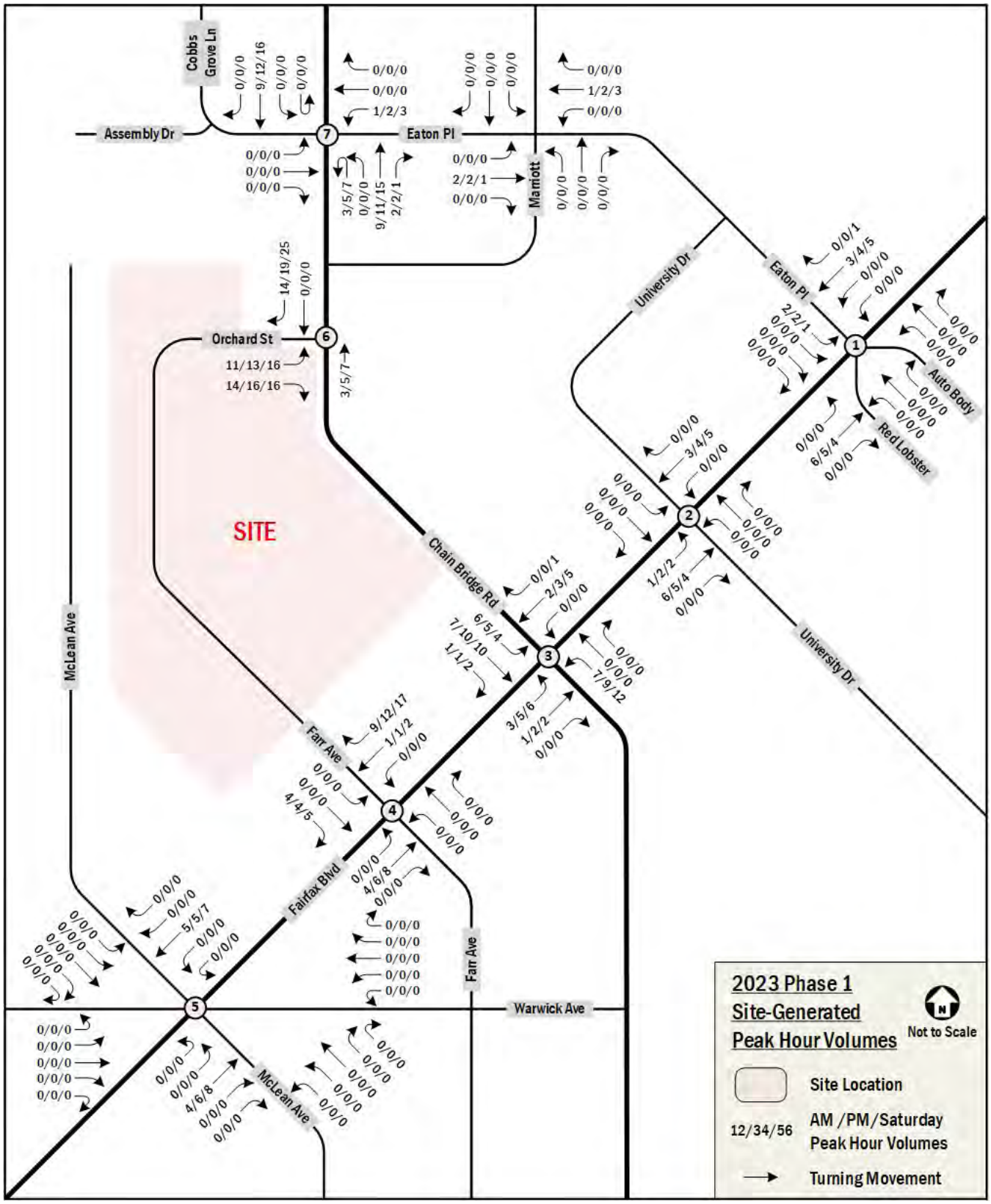


Figure 32: 2023 Phase 1 Site-Generated Peak Hour Traffic Volumes

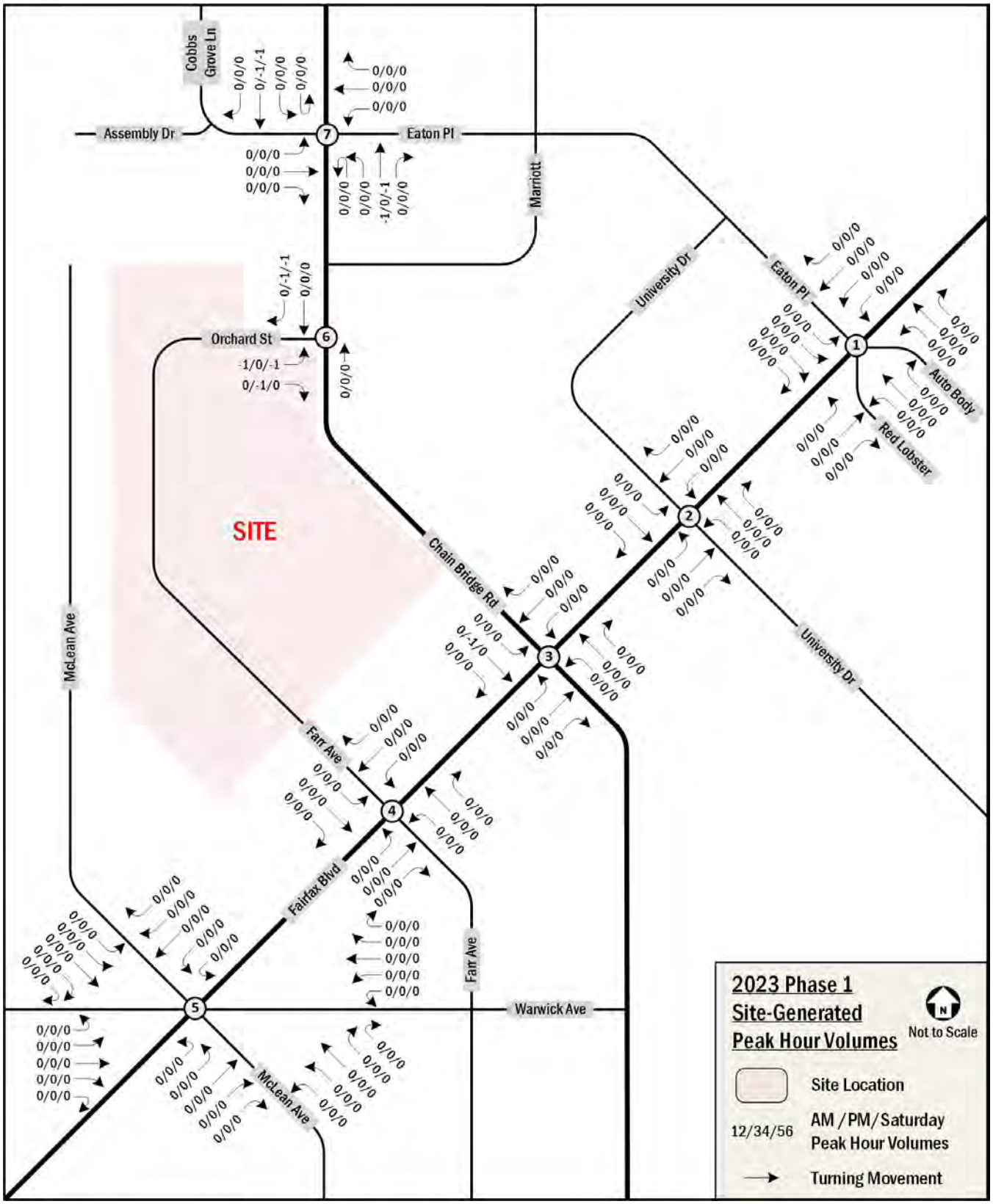


Figure 33: Removal of Existing Site Trips

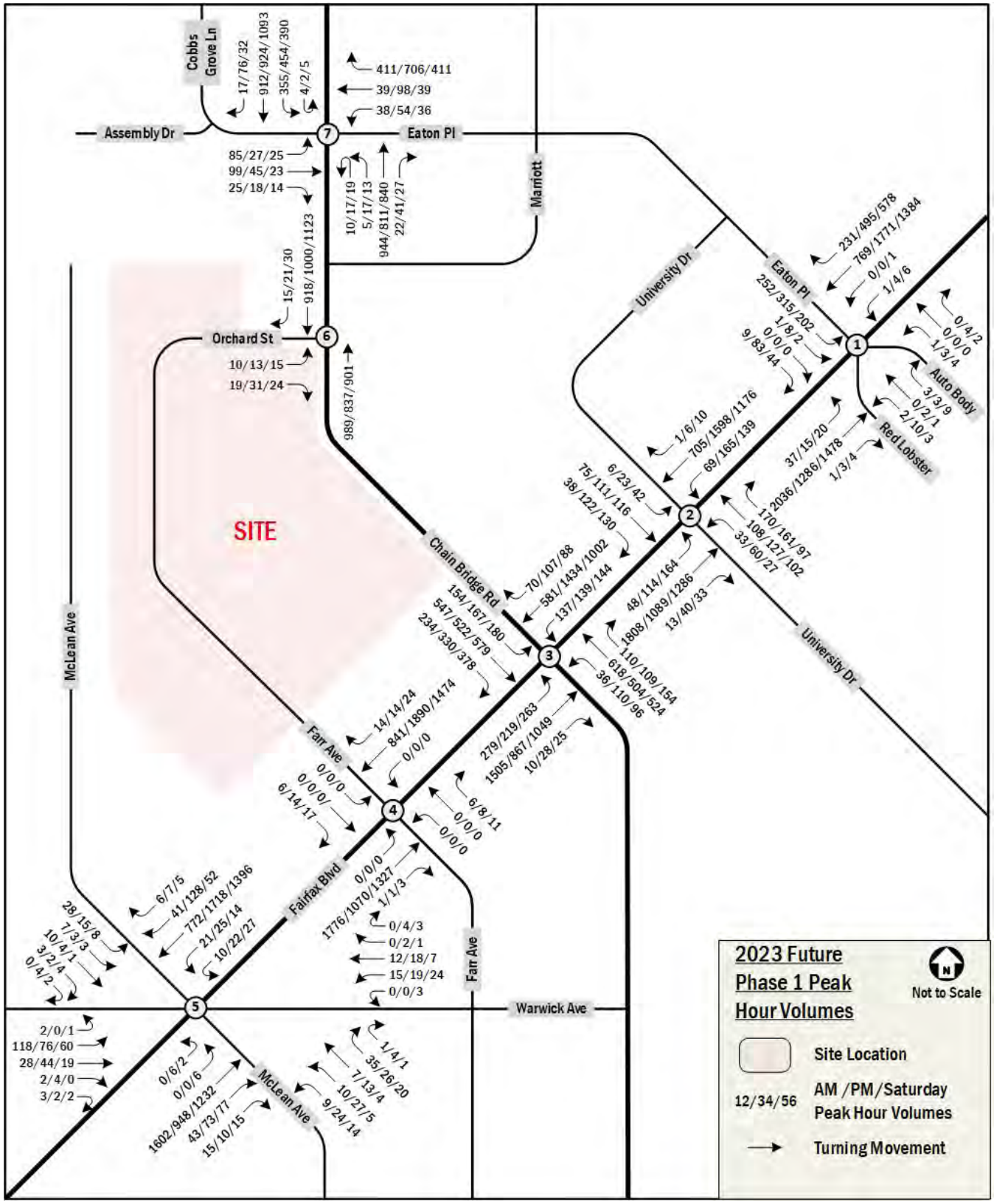


Figure 34: 2023 Future Phase 1 Peak Hour Volumes

2027 Background Traffic Volumes (without the proposed development)

Traffic projections for the 2027 Background conditions consist of the existing volumes with three additions:

- Inherent growth on the roadway (representing regional traffic growth),
- Traffic generated by developments expected to be completed prior to the project (known as background developments), and
- Potential rerouting of traffic due to future roadway improvement projects.

To account for inherent growth on the roadway, a growth percentage has been applied to all movements at the intersection of Fairfax Boulevard and Chain Bridge Road, with the resulting volume differences carried through the remaining study intersections. This growth percentage is 2.0% between 2019 and 2023, and 1.0% between 2023 and 2027.

Following industry methodologies, a background development must meet the following criteria to be incorporated into the analysis:

- Be located in the study area, defined as having an origin or destination point within the cluster of study area intersections;
- Have entitlements; and
- Have a construction completion date prior or close to the proposed development.

The analysis considered the following two developments and their locations relative to the proposed Northfax development can be found in Figure 22.

1) **Fairfax Shopping Center (Whole Foods):** Located in the City of Fairfax north of Fairfax Boulevard, south of Eaton Place, and east of Chain Bridge Road, the development proposes to replace the existing 82,268 SF of retail space with approximately 48,200 SF of retail space. The development is expected to generate 100 weekday AM peak hour vehicle trips and 368 weekday PM peak hour vehicle trips, based on the Traffic Impact Study prepared by Wells + Associates dated December 21, 2016. A Saturday peak hour trip generation of 545 trips was extrapolated from the AM and PM peak hour trips provided in this Traffic Impact Study. **This development is considered in the Background and Future scenarios for both 2023 and 2027.**

2) **Paul VI**: Located in the City of Fairfax south of Fairfax Boulevard, east of Oak Street, and west of McLean Avenue, the development proposes to replace the existing private high school with 184 residential condominium units, 137 town homes, 20,000 SF of local serving retail, and 24,000 SF of community center space. Including the removed trips from the existing site, the development is expected to generate (-746) weekday AM peak hour vehicle trips and 295 weekday PM peak hour vehicle trips, based on the Traffic Impact Study prepared by Wells + Associates dated April 18, 2017 and revised November 15, 2017. A Saturday peak hour trip generation of 502 trips was extrapolated from the AM and PM peak hour trips provided in this Traffic Impact Study. **Because this development will not be complete by 2023, it is only considered in the 2027 Background and Future scenarios.**

Trip distribution assumptions for the background developments were based on the distributions included in their respective studies or was based on those determined for the development and altered where necessary based on anticipated travel patterns. The total traffic generated by these background developments is presented in Table 6. Diagrams showing the trips generated by each background development are presented in the Appendix D.

The 2027 regional growth-generated peak hour traffic volumes are shown in Figure 35. The 2027 background development-generated peak hour traffic volumes are shown in Figure 36.

The reroute of traffic due to proposed roadway improvements is illustrated in Figure 37.

The 2023 Background peak hour traffic volumes are shown in Figure 26The 2027 Background peak hour traffic volumes are shown in Figure 38**.**

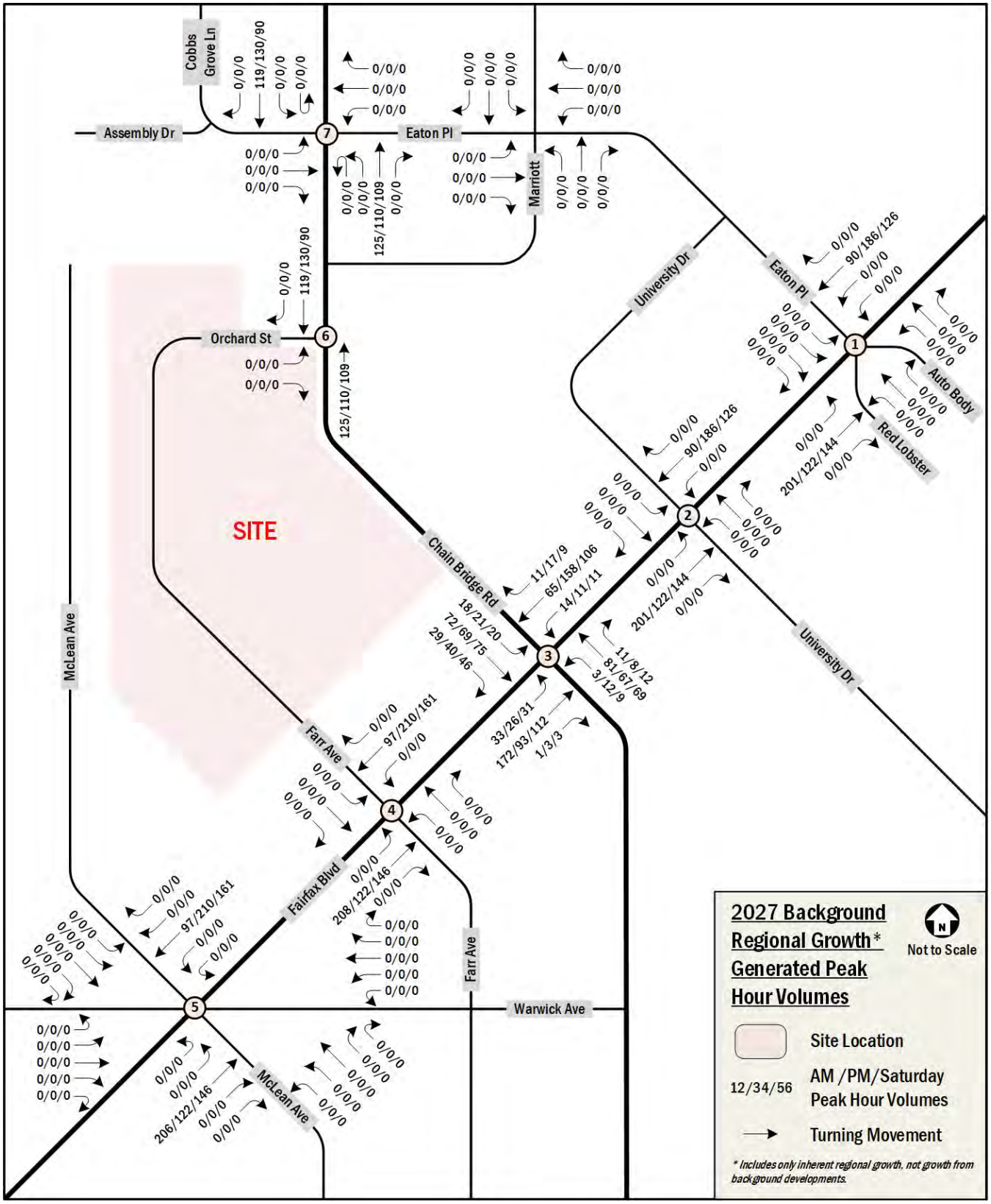


Figure 35: Inherent Regional Growth Peak Hour Traffic Volumes (2019-2027)

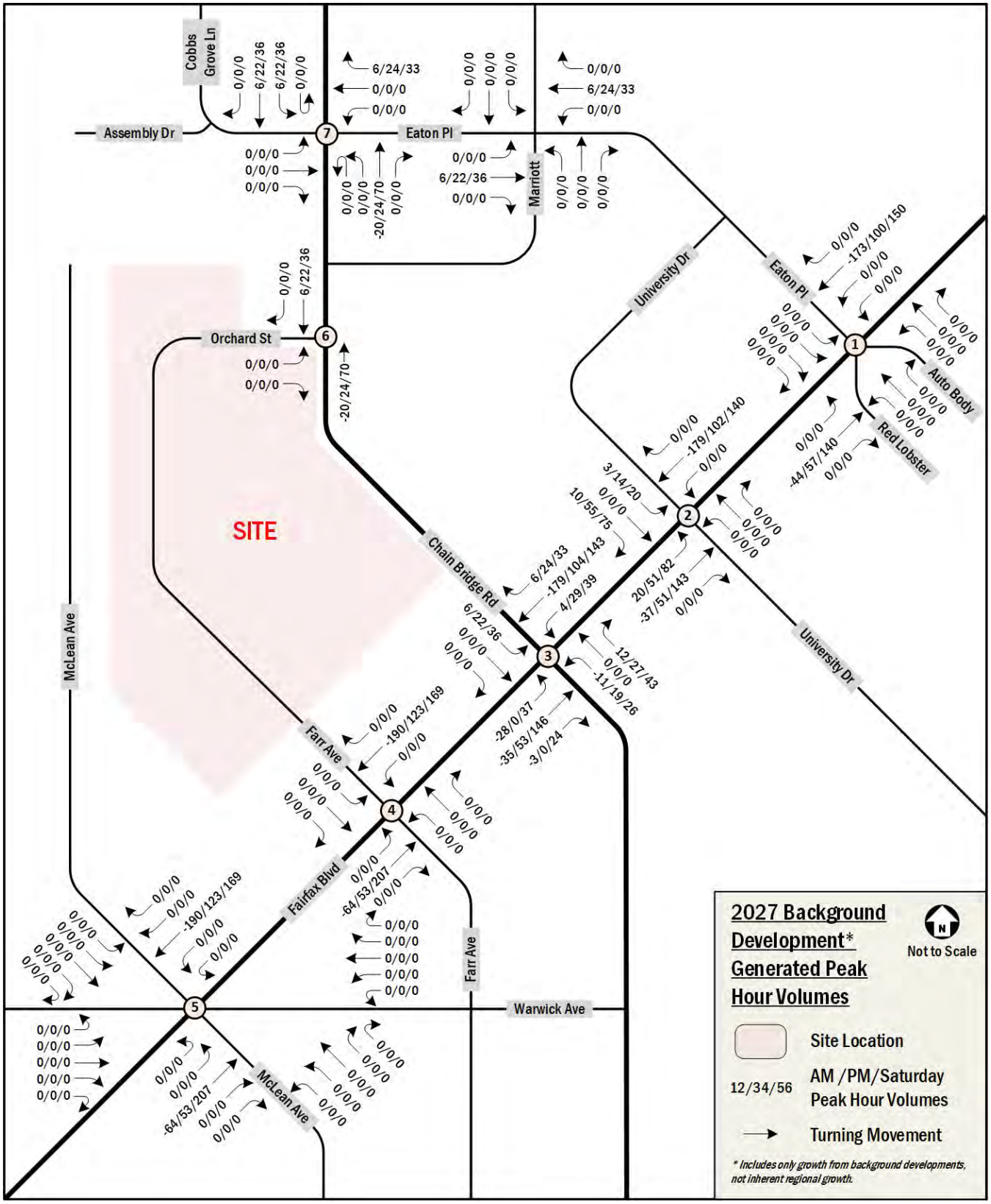


Figure 36: 2027 Background Development-Generated Peak Hour Traffic Volumes

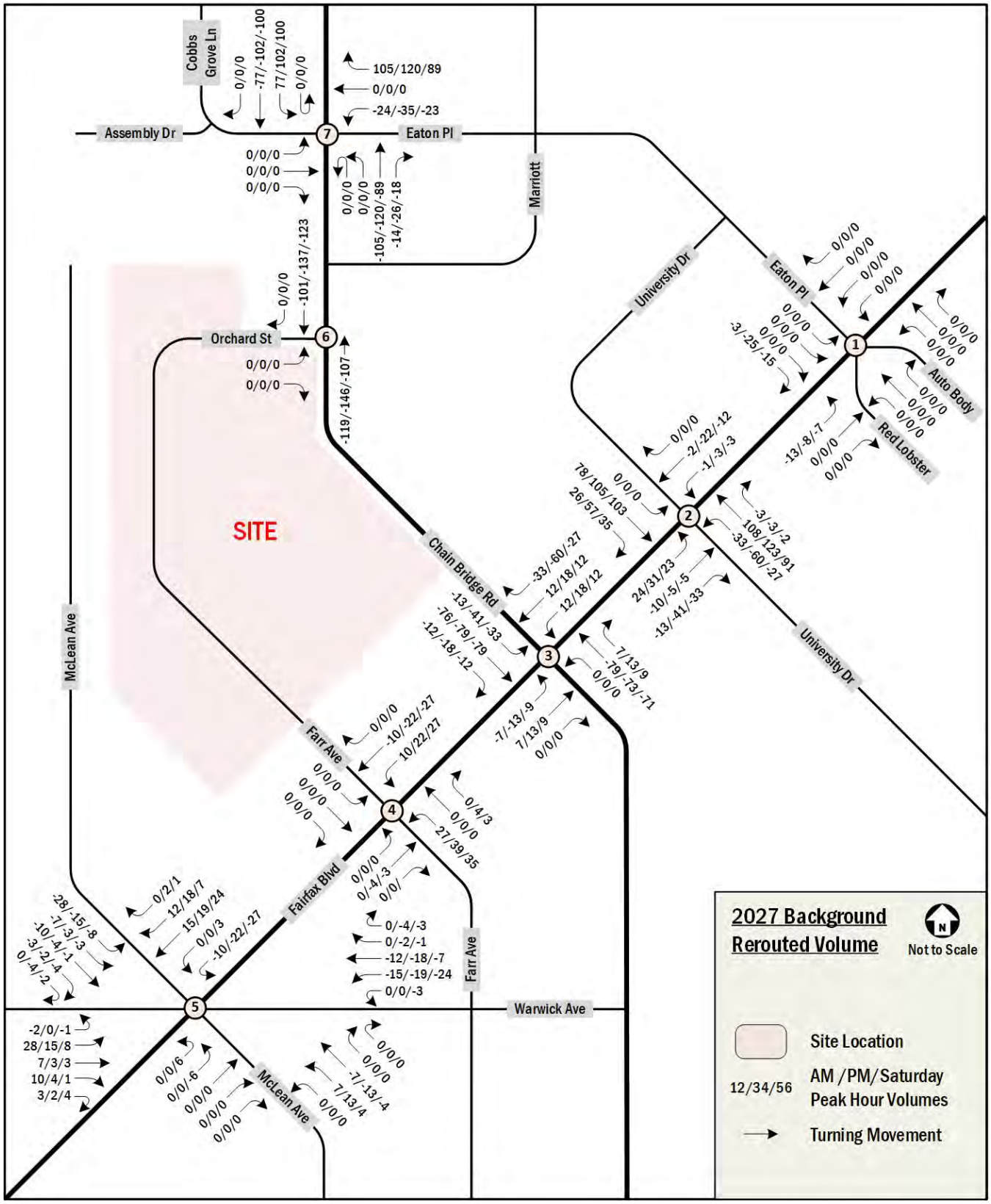


Figure 37: Rerouted Traffic due to Proposed Roadway Improvements (2027)

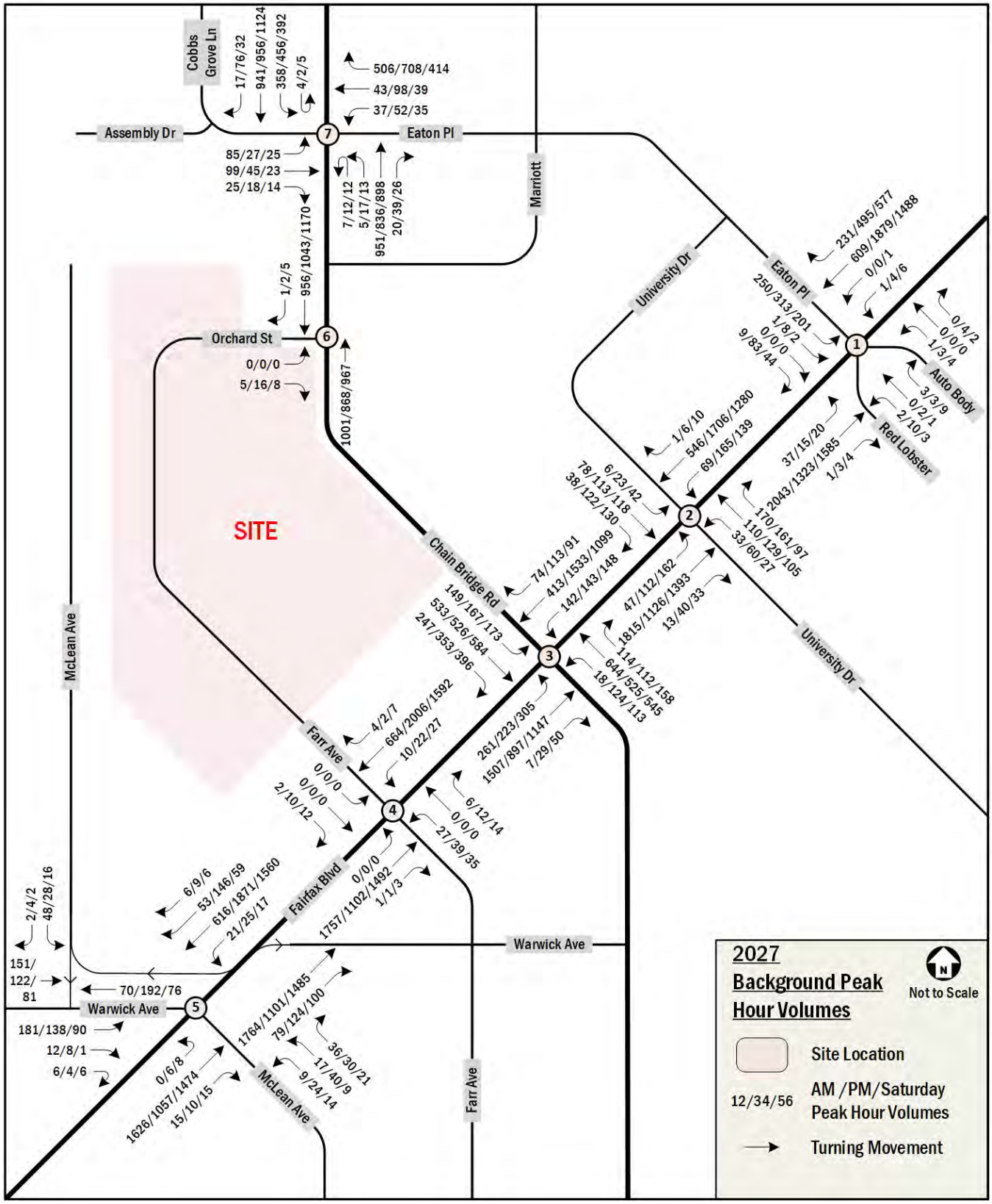


Figure 38: 2027 Background Peak Hour Vehicular Traffic Volumes

2027 Future Traffic Volumes (with Phase 2 of the Development)

The 2027 Future (with Phase 2 of the Development) traffic consists of the 2027 Background (without Development) volumes with the addition of the traffic volumes generated by Phase 1 and Phase 2 of the proposed development. Thus, the 2027 Future (with Phase 2 of the Development) volumes include traffic generated by:

- Existing volumes,
- Inherent growth on the roadway (representing regional traffic growth),
- Developments expected to be completed prior to the project (known as background developments),
- Potential rerouting of traffic due to future roadway improvement projects,
- Removal of trips from the existing development(s) that would be replaced with the proposed development,
- Phase 1 of the proposed development, and
- Phase 2 of the proposed development.

The distribution of site trips was based primarily on existing volumes, anticipated traffic patterns, and other recent studies conducted in the area. The peak hour trips were calculated and assigned to the roadway network based on the traffic distributions shown in Figure 27 through Figure 31.

The 2027 Phase 2 site-generated trips are shown in Figure 39. The removal of existing trips, associated with the two single family detached homes, is illustrated in Figure 33.The 2027 Future (with Phase 2 of the Development) traffic volumes are shown in Figure 40.

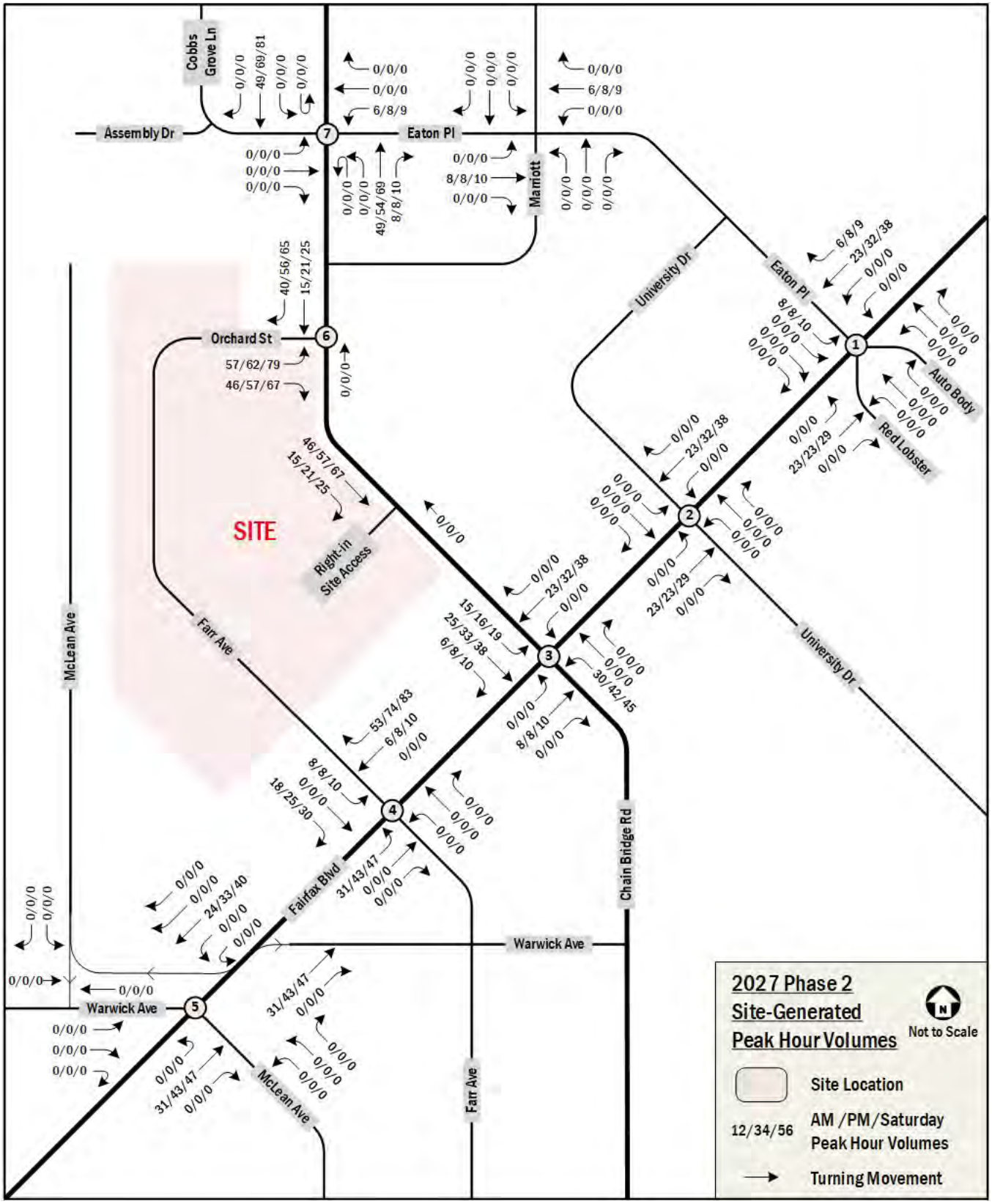


Figure 39: 2027 Phase 2 Site-Generated Peak Hour Traffic Volumes

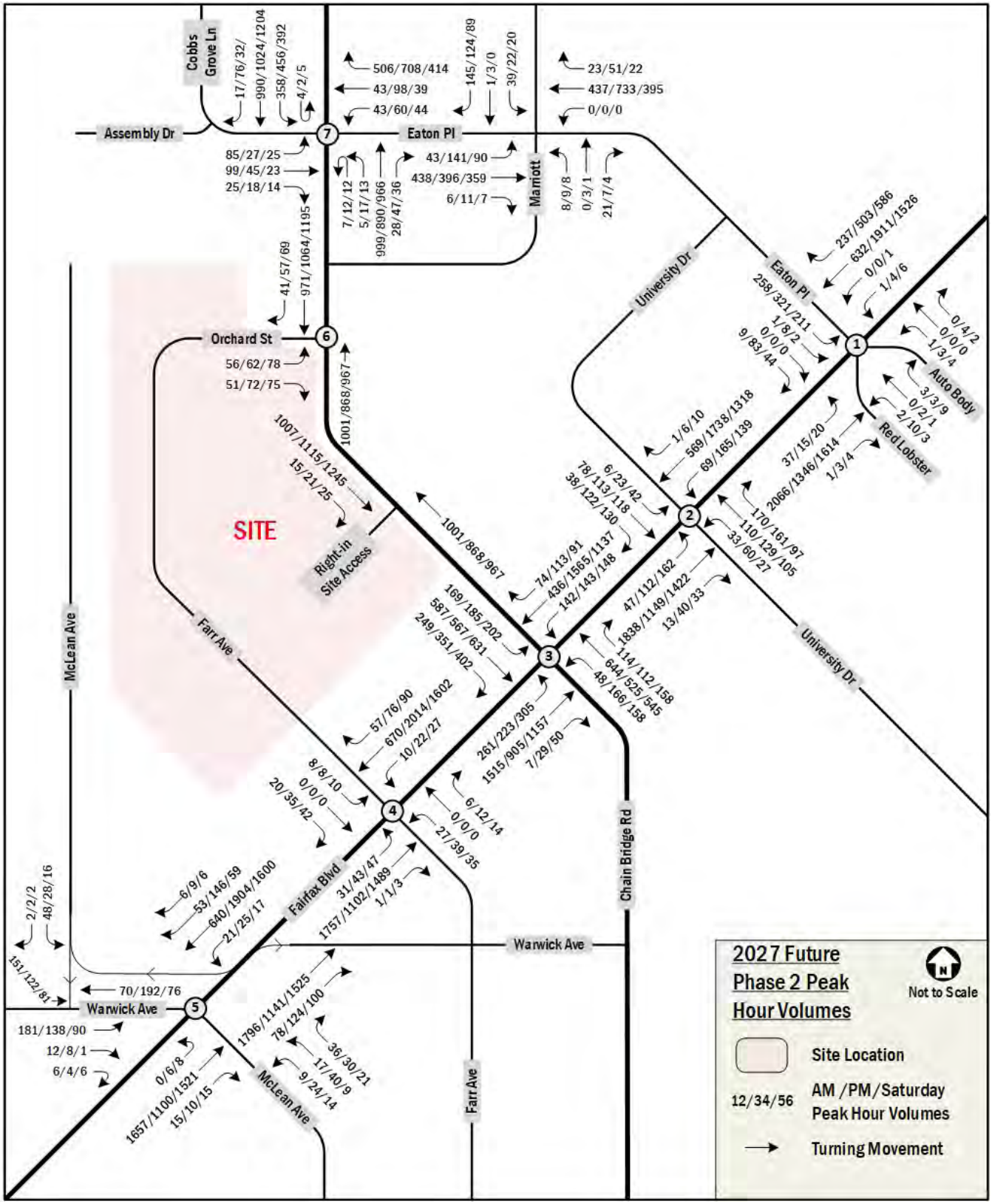


Figure 40: 2027 Future Phase 2 Peak Hour Vehicular Traffic Volumes

VEHICULAR ANALYSIS RESULTS

Intersection Capacity Analysis

Intersection capacity analyses were performed for the five scenarios outlined previously at the intersections contained within the study area during the weekday morning, weekday afternoon, and Saturday peak hours. *Synchro*, version 10 was used to analyze the study intersections based on the Highway Capacity Manual 2010 (HCM) methodology and includes level of service, delay, and queue length comparisons for the turning movements analyzed. HCM 2000 methodology was used when HCM 2010 methodology did not produce results.

Peak Hour Factors

Peak hour factors were applied in accordance with *Traffic Impact Analysis Regulations Administrative Guidelines* prepared by VDOT in 2018. As such, peak hour factors by intersection between 0.85 and 1.00 were used for the existing year analysis. Where the calculated peak hour factor based on the existing turning movement counts was greater than 0.85, the calculated factor was applied. Where the calculated factor was 0.85 or less, a factor of 0.85 was applied.

Peak hour factors by intersection between 0.92 and 1.00 were used for all future 2023 and 2027 scenarios. Where the calculated peak hour factor based on the existing turning movement counts was greater than 0.92, the calculated factor was applied. Where the calculated factor was 0.92 or less, a factor of 0.92 was applied.

Heavy Vehicle Percentages

Heavy vehicle percentages were based on existing turning movement counts. A default heavy vehicle percentage of 2.0% was used for any new movements.

Geometry and Operations

Existing signal timings were obtained from the City of Fairfax for signalized intersections in the vehicular study area. The geometry and operations were for the existing conditions were field verified.

Level of Service and Delay

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from “A” being the best to “F” being the worst. LOS D is typically used as the acceptable LOS threshold in the City of Fairfax although LOS E or F is sometimes accepted in urbanized areas if vehicular improvements would be a detriment to safety or non-auto modes of transportation. For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of D or better for each approach at the intersections, as per the agreed to by City staff.

The LOS capacity analyses were based on: (1) the peak hour traffic volumes; (2) the lane use and traffic controls; and (3) the Highway Capacity Manual (HCM) methodologies (using the *Synchro* software). The average delay of each movement and LOS is shown for the signalized intersections in addition to the overall average delay and intersection LOS grade. The HCM does not give guidelines for calculating the average delay for a two-way stop-controlled intersection, as the approaches without stop signs would technically have no delay. Detailed LOS descriptions and the analysis worksheets are contained in the Appendix E.

Queuing Analysis

In addition to the capacity analyses, a queuing analysis was performed at the study intersections. The queuing analysis was performed using *Synchro* software. The 95th percentile queue lengths are shown for each lane group at the study area signalized intersections. The 95th percentile queue is the maximum back of queue that is exceeded 5% of the time. For unsignalized intersection, only the 95th percentile queue is reported for each lane group (including free-flowing left turns and stop-controlled movements) based on the HCM 2010 calculations. HCM 2000 methodology was used when HCM 2010 methodology did not produce results.

Existing (2019) Conditions Results

The results of the intersection capacity analyses for the Existing (2019) conditions expressed in LOS and delay (seconds per vehicle) per movement are shown in Table 7. Detailed analysis worksheets are included in the Appendix F.

The capacity analysis results indicate that most intersections operate at acceptable LOS under Existing (2019) conditions; however, six intersections have one or more approaches that operate at levels beyond acceptable thresholds in one or more peak hour:

- 1. Fairfax Boulevard & Eaton Place
  - Westbound Approach (AM peak hour)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)
  - Northeastbound Approach (all peak hours)

- 2. Fairfax Boulevard & University Drive
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 3. Fairfax Boulevard & Chain Bridge Road
  - Overall Intersection (AM peak hour)
  - Northbound Approach (all peak hours)
  - Southbound Approach (AM and PM peak hours)

- 5. Fairfax Boulevard & Warwick Lane/McLean Avenue
  - Eastbound Approach (all peak hours)
  - Westbound Approach (all peak hours)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 6. Chain Bridge Road & Orchard Street
  - Eastbound Approach (all peak hours)

- 7. Chain Bridge Road & Eaton Place (main node)
  - Eastbound Approach (all peak hours)
  - Southbound Approach (AM peak hour)

- 7a. Chain Bridge Road & Eaton Place (east node)
  - Overall Intersection (AM and PM peak hours)
  - Westbound Approach (all peak hours)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

The 95th percentile turning movement queues at most lane groups at study area intersections do not exceed their available storage length in the Existing (2019) conditions; however, two intersections do have at least one movement with 95th percentile queues that exceed the available storage length in one or more peak hour:

- 3. Fairfax Boulevard & Chain Bridge Road
  - Westbound Left (AM peak hour)
  - Northbound Left (PM peak hour)
  - Southbound Right (SAT peak hour)

- 7. Chain Bridge Road & Eaton Place (main node)
  - Southbound Left/U (AM and PM peak hour)

Table 7: Intersection Capacity Analysis and Queuing Results – Existing (2019) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
1	**Fairfax Blvd & Eaton Pl**										
	Overall Intersection (Signalized)		**C**	**34.1**		**D**	**50.9**		**C**	**27.6**	
	Eastbound Approach		***B***	***13.5***		***B***	***15.0***		***C***	***20.2***	
	Eastbound Left	130	A	7.2	m28	C	28.8	m24	C	21.7	m22
	Eastbound TR		B	13.7	#1034	B	14.7	380	C	20.2	311
	Westbound Approach		***E***	***55.2***		***B***	***15.3***		***C***	***23.7***	
	Westbound Left	80	D	44.1	m4	B	10.1	m2	A	8.2	m3
	Westbound Thru		D	45.3	582	B	16.9	383	C	23.1	#863
	Westbound Right		F	84.9	215	B	10.1	92	C	25.3	627
	Northbound Approach		***F***	***93.7***		***F***	***110.2***		***E***	***76.3***	
	Northbound LTR		F	93.7	9	F	110.2	33	E	76.3	22
	Southbound Approach		***F***	***110.3***		***F***	***320.3***		***F***	***89.2***	
	Southbound Left		F	112.8	m389	F	351.2	m#928	F	99.7	#331
	Southbound TR		E	61.5	m0	F	237.1	m111	D	54.4	30
	Northeastbound Approach		***F***	***89.5***		***F***	***104.2***		***E***	***68.2***	
	Northeastbound LTR		F	89.5	22	F	104.2	53	E	68.2	34
2	**Fairfax Blvd & University Drive**										
	Overall Intersection (Signalized)		**B**	**14.6**		**B**	**14.7**		**B**	**10.1**	
	Eastbound Approach		***A***	***4.3***		***A***	***5.0***		***A***	***6.1***	
	Eastbound Left	165	A	1.3	m1	A	4.8	5	A	3.9	m18
	Eastbound TR		A	4.3	185	A	5.0	218	A	6.3	158
	Westbound Approach		***B***	***14.9***		***A***	***1.6***		***A***	***4.0***	
	Westbound Left	150	F	117.0	114	A	2.8	14	C	28.8	109
	Westbound TR		A	3.8	110	A	1.5	7	A	0.6	3
	Northbound Approach		***F***	***84.6***		***F***	***116.0***		***E***	***64.2***	
	Northbound LT		F	93.2	149	F	151.3	#357	E	68.2	119
	Northbound Right		F	81.2	104	F	88.9	87	E	61.5	57
	Southbound Approach		***E***	***79.2***		***F***	***88.7***		***E***	***62.3***	
	Southbound Left	120	E	79.5	16	F	89.6	38	E	62.8	50
	Southbound TR		E	78.9	0	F	88.2	46	E	61.9	50
3	**Fairfax Blvd & Chain Bridge Road**										
	Overall Intersection (Signalized)		**E**	**59.1**		**D**	**54.3**		**D**	**43.4**	
	Eastbound Approach		***D***	***36.2***		***D***	***44.7***		***D***	***41.1***	
	Eastbound Left	600	F	118.4	m234	F	149.5	223	F	88.2	186
	Eastbound Thru		C	20.6	376	B	15.9	165	C	28.7	370
	Eastbound Right	500	B	16.6	m0	B	16.7	m0	B	15.4	m1
	Westbound Approach		***D***	***49.8***		***C***	***21.8***		***C***	***24.8***	
	Westbound Left	200	F	194.8	#302	E	79.3	m198	E	57.2	132
	Westbound Thru		C	24.4	302	B	19.5	496	C	23.1	314
	Westbound Right	350	B	15.7	37	A	6.3	m16	A	6.5	5
	Northbound Approach		***F***	***80.6***		***F***	***100.4***		***E***	***58.7***	
	Northbound Left	200	F	90.4	72	F	134.6	#258	E	68.9	135
	Northbound Thru		F	84.1	#525	F	99.5	488	E	60.9	334
	Northbound Right	225	D	50.2	30	E	58.6	0	D	37.5	15
	Southbound Approach		***F***	***88.8***		***E***	***79.0***		***D***	***52.7***	
	Southbound Left	300	F	121.0	143	F	145.6	182	F	95.3	129
	Southbound Thru		F	103.8	472	F	85.5	326	E	59.3	314
	Southbound Right	200	C	31.0	74	C	33.2	106	C	22.6	358
4	**Fairfax Blvd & Farr Ave**										
	Overall Intersection (TWSC)										
	Eastbound Approach										
	Eastbound LTR		A	0	0	A	0	0	A	0	0
	Westbound Approach										
	Westbound Left	80	A	0	0	A	0	0	A	0	0
	Northbound Approach		***C***	***16.9***		***B***	***12.1***		***B***	***13.2***	
	Northbound LTR		C	16.9	3	B	12.1	3	B	13.2	3
	Southbound Approach		***B***	***11***		***C***	***18.7***		***B***	***14.4***	
	Southbound LTR		B	11	0	C	18.7	3	B	14.4	3

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

Table 7: Intersection Capacity Analysis and Queuing Results – Existing (2019) Conditions (continued)

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
5	**Fairfax Blvd & Warwick Ln/McLean Ave**										
	Overall Intersection (Signalized)		**C**	**25.1**		**C**	**26.6**		**C**	**24.9**	
	Eastbound Approach		***F***	***118.8***		***F***	***111.6***		***E***	***67.2***	
	Eastbound LTR		F	118.8	#334	F	111.6	274	E	67.2	138
	Westbound Approach		***F***	***93.1***		***F***	***105.9***		***E***	***69.7***	
	Westbound LTR		F	93.1	72	F	105.9	116	E	69.7	76
	Northbound Approach		***F***	***89.0***		***F***	***112.3***		***E***	***70.4***	
	Northbound LTR		F	89.0	132	F	112.3	#243	E	70.4	86
	Southbound Approach		***F***	***87.8***		***F***	***91.9***		***E***	***65.8***	
	Southbound Left	175	F	89.9	87	F	92.5	60	E	66.0	31
	Southbound TR		F	81.8	41	F	90.7	38	E	65.5	23
	Northeastbound Approach		***B***	***15.1***		***A***	***8.7***		***C***	***24.0***	
	Northeastbound Left		A	0		B	11.0		C	21.6	
	Northeastbound TR		B	15.1	294	A	8.7	131	C	24.0	358
	Southwestbound Approach		***B***	***14.8***		***C***	***22.1***		***B***	***19.6***	
	Southwestbound Left	150	C	33.8	35	B	14.5	m37	B	18.2	m35
	Southwestbound TR		B	14.0	187	C	22.3	690	B	19.6	465
6	**Chain Bridge Rd & Orchard St**										
	Overall Intersection (Signalized)		**A**	**0.7**		**A**	**1.3**		**A**	**0.6**	
	Eastbound Approach		***F***	***93.7***		***F***	***106.0***		***E***	***73.7***	
	Eastbound Left/Right		F	93.7	0	F	106.0	0	E	73.7	0
	Northbound Approach		***A***	***0.4***		***A***	***0.3***		***A***	***0.4***	
	Northbound Thru		A	0.4	0	A	0.3	0	A	0.4	0
	Southbound Approach		***A***	***0.5***		***A***	***0.6***		***A***	***0.3***	
	Southbound TR		A	0.5	m39	A	0.6	35	A	0.3	12
7	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)		**D**	**44.9**		**C**	**31.8**		**C**	**33.4**	
	Eastbound Approach		***F***	***145.8***		***F***	***120.1***		***E***	***65.4***	
	Eastbound LTR		F	145.8	#488	F	120.1	#244	E	65.4	100
	Westbound Approach		***A***	***6.2***		***A***	***8.1***		***A***	***9.2***	
	Westbound LTR		A	4.0	m14	A	8.8	m68	A	4.5	20
	Westbound Right		A	8.3	m0	A	7.4	m0	B	12.6	51
	Northbound Approach		***C***	***31.1***		***B***	***18.1***		***D***	***42.6***	
	Northbound Left/U	135	F	142.9	45	F	142.6	92	F	87.9	61
	Northbound TR		C	29.7	468	B	13.9	92	D	41.3	210
	Southbound Approach		***E***	***55.1***		***D***	***48.8***		***C***	***33.0***	
	Southbound Left/U	470	F	90.1	#502	E	70.2	#523	C	29.5	#398
	Southbound TR		D	44.3	413	D	41.5	435	C	33.8	422
7a	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)		**E**	**78.4**		**E**	**65.5**		**D**	**40.8**	
	Eastbound Approach		***A***	***1.9***		***A***	***1.6***		***A***	***2.3***	
	Eastbound LTR		A	1.9	m13	A	1.6	m9	A	2.3	13
	Westbound Approach		***F***	***85.9***		***F***	***93.2***		***E***	***70.3***	
	Westbound LTR		F	85.9	323	F	93.2	#658	E	70.3	220
	Northbound Approach		***F***	***89.0***		***F***	***103.8***		***E***	***69.0***	
	Northbound LTR		F	89.0	0	F	103.8	55	E	69.0	35
	Southbound Approach		***F***	***231.6***		***F***	***127.1***		***E***	***69.5***	
	Southbound LTR		F	231.6	#392	F	127.1	#246	E	69.5	0

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

Background (2023) Conditions Results

The results of the intersection capacity analyses for the Future without Development (2023) conditions ("Background 2023") expressed in LOS and delay (seconds per vehicle) per movement are shown in Table 8. Detailed analysis worksheets are included in the Appendix G.

The capacity analysis results indicate that most intersections operate at acceptable LOS under Background (2023) conditions; however, six intersections have one or more approaches that operate at levels beyond acceptable thresholds in one or more peak hour:

- 1. Fairfax Boulevard & Eaton Place
  - Overall Intersection (PM peak hour)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)
  - Northeastbound Approach (all peak hours)

- 2. Fairfax Boulevard & University Drive
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 3. Fairfax Boulevard & Chain Bridge Road
  - Overall Intersection (AM and PM Peak Hours)
  - Westbound Approach (AM peak hour)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 5. Fairfax Boulevard & Warwick Lane/McLean Avenue
  - Eastbound Approach (all peak hours)
  - Westbound Approach (all peak hours)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 6. Chain Bridge Road & Orchard Street
  - Eastbound Approach (all peak hours)

- 7. Chain Bridge Road & Eaton Place (main node)
  - Overall Intersection (SAT peak hour)
  - Eastbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 7a. Chain Bridge Road & Eaton Place (east node)
  - Overall Intersection (AM and PM peak hours)
  - Westbound Approach (AM and PM peak hours)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

The 95th percentile turning movement queues at most lane groups at study area intersections do not exceed their available storage length in the Background (2023) conditions; however, two intersections do have at least one movement with 95th percentile queues that exceed the available storage length in one or more peak hour:

- 3. Fairfax Boulevard & Chain Bridge Road
  - Northbound Left (PM peak hour)
  - Southbound Right (PM and SAT peak hour)

- 7. Chain Bridge Road & Eaton Place (main node)
  - Southbound left/U (all peak hours)

Table 8: Intersection Capacity Analysis and Queuing Results – Background (2023) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
1	**Fairfax Blvd & Eaton Pl**										
	Overall Intersection (Signalized)		**C**	**34.6**		**E**	**58.6**		**C**	**32.3**	
	Eastbound Approach		***B***	***14.5***		***A***	***9.5***		***C***	***31.4***	
	Eastbound Left	130	A	8.9	m19	C	27.4	m9	D	38.3	m28
	Eastbound TR		B	14.6	#1178	A	9.3	230	C	31.3	506
	Westbound Approach		***D***	***54.2***		***B***	***16.9***		***C***	***25.4***	
	Westbound Left	80	D	48.7	m4	B	11.7	m2	A	7.4	m2
	Westbound Thru		D	47.7	641	B	18.9	#1596	C	26.5	#1063
	Westbound Right		E	75.9	229	A	9.8	136	C	23.1	650
	Northbound Approach		***F***	***93.7***		***F***	***110.2***		***E***	***76.3***	
	Northbound LTR		F	93.7	9	F	110.2	33	E	76.3	22
	Southbound Approach		***F***	***118.2***		***F***	***447.5***		***F***	***89.5***	
	Southbound Left		F	120.5	m402	F	352.8	m#928	F	97.6	#338
	Southbound TR		E	61.5	m0	F	772.7	m91	D	54.3	24
	Northeastbound Approach		***F***	***89.5***		***F***	***104.2***		***E***	***68.2***	
	Northeastbound LTR		F	89.5	22	F	104.2	53	E	68.2	34
2	**Fairfax Blvd & University Drive**										
	Overall Intersection (Signalized)		**C**	**21.7**		**C**	**33.6**		**C**	**23.4**	
	Eastbound Approach		***A***	***9.5***		***C***	***24.3***		***B***	***12.8***	
	Eastbound Left	450	A	3.8	m10	E	74.0	174	C	27.2	78
	Eastbound TR		A	9.6	193	B	19.4	570	B	11.0	760
	Westbound Approach		***B***	***12.8***		***B***	***16.6***		***B***	***18.2***	
	Westbound Left	150	F	107.9	119	C	29.1	m134	D	47.9	m144
	Westbound TR		A	3.4	6	B	15.3	322	B	14.7	775
	Northbound Approach		***F***	***96.6***		***F***	***120.6***		***E***	***66.5***	
	Northbound LT		F	124.4	#301	F	166.1	#478	E	78.1	202
	Northbound Right		E	73.6	196	E	67.8	71	D	50.9	50
	Southbound Approach		***E***	***73.9***		***E***	***77.8***		***E***	***67.3***	
	Southbound Left	120	E	68.8	25	E	68.4	61	D	53.3	75
	Southbound TR		E	74.2	197	E	78.7	403	E	69.7	305
3	**Fairfax Blvd & Chain Bridge Road**										
	Overall Intersection (Signalized)		**E**	**61.8**		**E**	**56.1**		**D**	**50.4**	
	Eastbound Approach		***D***	***37.2***		***D***	***41.0***		***D***	***43.1***	
	Eastbound Left	600	F	117.4	m238	F	147.8	#229	F	86.6	192
	Eastbound Thru		C	22.7	412	B	15.4	181	C	33.1	454
	Eastbound Right	500	B	16.4	m0	B	16.0	m0	B	15.0	m1
	Westbound Approach		***E***	***68.7***		***C***	***32.6***		***D***	***38.1***	
	Westbound Left	450	F	284.4	m#383	F	110.8	m#306	F	99.7	#284
	Westbound Thru		C	22.9	338	C	26.4	1186	C	31.3	438
	Westbound Right	350	C	25.7	m38	B	13.7	m40	B	13.3	25
	Northbound Approach		***E***	***78.4***		***F***	***98.8***		***E***	***58.0***	
	Northbound Left	200	F	90.6	76	F	143.8	#285	E	70.1	145
	Northbound Thru		F	82.7	488	F	98.2	462	E	61.5	320
	Northbound Right	225	D	51.3	54	E	59.9	37	D	39.5	53
	Southbound Approach		***F***	***90.1***		***F***	***81.4***		***E***	***67.3***	
	Southbound Left	300	F	124.7	147	F	148.3	178	F	92.1	139
	Southbound Thru		F	106.1	452	F	89.7	302	E	76.8	340
	Southbound Right	200	C	31.2	76	D	35.6	208	D	41.3	446
4	**Fairfax Blvd & Farr Ave**										
	Overall Intersection (TWSC)										
	Northbound Approach		***C***	***18.5***		***B***	***12.9***		***B***	***14.5***	
	Northbound Right		C	18.5	3	B	12.9	3	B	14.5	3
	Southbound Approach		***B***	***11.4***		***C***	***21.2***		***C***	***15.9***	
	Southbound Right		B	11.4	0	C	21.2	3	C	15.9	3

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

Table 8: Intersection Capacity Analysis and Queuing Results – Background (2023) Conditions (Continued)

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
5	**Fairfax Blvd & Warwick Ln/McLean Ave**										
	Overall Intersection (Signalized)		**C**	**30.5**		**C**	**31.4**		**C**	**30.0**	
	Eastbound Approach		***F***	***118.8***		***F***	***111.6***		***E***	***67.2***	
	Eastbound LTR		F	118.8	#334	F	111.6	274	E	67.2	138
	Westbound Approach		***F***	***93.1***		***F***	***105.9***		***E***	***69.7***	
	Westbound LTR		F	93.1	72	F	105.9	116	E	69.7	76
	Northbound Approach		***F***	***89.0***		***F***	***112.3***		***E***	***70.4***	
	Northbound LTR		F	89.0	132	F	112.3	#243	E	70.4	86
	Southbound Approach		***F***	***87.8***		***F***	***91.9***		***E***	***65.8***	
	Southbound Left	175	F	89.9	87	F	92.5	60	E	66.0	31
	Southbound TR		F	81.8	41	F	90.7	38	E	65.5	23
	Northeastbound Approach		***C***	***24.8***		***B***	***10.5***		***C***	***27.1***	
	Northeastbound Left		A	0	0	C	22.2		C	26.8	
	Northeastbound TR		C	24.8	593	B	10.5	190	C	27.1	443
	Southwestbound Approach		***B***	***16.1***		***C***	***31.0***		***C***	***27.8***	
	Southwestbound Left	150	E	59.3	50	B	19.7	m38	C	26.3	m35
	Southwestbound TR		B	14.5	196	C	31.2	#1638	C	27.9	#617
6	**Chain Bridge Rd & Orchard St**										
	Overall Intersection (Signalized)		**A**	**0.5**		**A**	**1.3**		**A**	**0.5**	
	Eastbound Approach		***F***	***93.7***		***F***	***106.0***		***E***	***73.7***	
	Eastbound Left/Right		F	93.7	0	F	106.0	0	E	73.7	0
	Southbound Approach		***A***	***0.6***		***A***	***0.6***		***A***	***0.3***	
	Southbound TR		A	0.6	m39	A	0.6	36	A	0.3	6
7	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)		**D**	**54.4**		**D**	**46.8**		**E**	**57.3**	
	Eastbound Approach		***F***	***143.5***		***F***	***118.3***		***E***	***61.5***	
	Eastbound LTR		F	143.5	#486	F	118.3	#244	E	61.5	98
	Westbound Approach		***C***	***20.5***		***B***	***11.9***		***C***	***21.0***	
	Westbound LTR		A	1.4	m0	A	5.7	m41	A	0.6	0
	Westbound Right		C	34.8	m62	B	18.2	m57	C	31.9	118
	Northbound Approach		***C***	***31.1***		***B***	***17.0***		***D***	***43.5***	
	Northbound Left/U	135	F	144.0	45	F	146.4	92	F	94.7	60
	Northbound TR		C	29.7	423	B	12.4	79	D	42.0	213
	Southbound Approach		***E***	***73.0***		***F***	***80.9***		***E***	***77.0***	
	Southbound Left/U	470	F	146.4	#735	F	165.3	#895	F	176.9	#788
	Southbound TR		D	44.3	413	D	41.9	439	D	41.4	456
7a	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)		**E**	**71.9**		**F**	**88.9**		**D**	**36.9**	
	Eastbound Approach		***A***	***0.6***		***A***	***1.5***		***A***	***2.7***	
	Eastbound LTR		A	0.6	m3	A	1.5	m8	A	2.7	m11
	Westbound Approach		***F***	***86.7***		***F***	***140.6***		***E***	***64.6***	
	Westbound LTR		F	86.7	390	F	140.6	#844	E	64.6	284
	Northbound Approach		***F***	***88.8***		***F***	***103.0***		***E***	***69.0***	
	Northbound LTR		F	88.8	0	F	103.0	55	E	69.0	35
	Southbound Approach		***F***	***216.3***		***F***	***134.4***		***E***	***69.3***	
	Southbound LTR		F	216.3	#393	F	134.4	#246	E	69.3	0

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

Future – Phase 1 (2023) Conditions Results

The results of the intersection capacity analyses for the Future with Development – Phase 1 (2023) conditions ("Future – Phase 1") expressed in LOS and delay (seconds per vehicle) per movement are shown in Table 9. Detailed analysis worksheets are included in the Appendix H.

The capacity analysis results indicate that most intersections operate at acceptable LOS under Future – Phase 1 (2023) conditions; however, six intersections have one or more approaches that operate at levels beyond acceptable thresholds in one or more peak hour:

- 1. Fairfax Boulevard & Eaton Place
  - Overall Intersection (PM peak hour)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)
  - Northeastbound Approach (all peak hours)

- 2. Fairfax Boulevard & University Drive
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 3. Fairfax Boulevard & Chain Bridge Road
  - Overall Intersection (AM and PM peak hours)
  - Westbound Approach (AM peak hour)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 5. Fairfax Boulevard & Warwick Lane/McLean Avenue
  - Eastbound Approach (all peak hours)
  - Westbound Approach (all peak hours)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 6. Chain Bridge Road & Orchard Street
  - Eastbound Approach (all peak hours)

- 7. Chain Bridge Road & Eaton Place (main node)
  - Overall Intersection (AM and SAT peak hours)
  - Eastbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 7a. Chain Bridge Road & Eaton Place (east node)
  - Overall Intersection (AM and PM peak hours)
  - Westbound Approach (all peak hours)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

As noted, the intersection of Chain Bridge Road at Eaton Place (main node) (Intersection 7) begins to operate at a LOS E during the AM peak hour with an increase in delay of 0.3 seconds per vehicle over the LOS D/E threshold. Additionally, the intersection of Fairfax Boulevard at Chain Bridge Road begins to experience slight increases in delays.

With slight increases in delays at these intersections, the impact of the proposed development is not anticipated to significantly alter driver's expectation at the signals. However, if necessary, the increases in delay can be mitigated with a slight change in the signal timings at these intersections.

Table 9 shows the queuing results for the study area intersections for the Future – Phase 1 (2023) conditions. The 95th percentile queues at most lane groups at study area intersections do not exceed their available storage length in the Future – Phase 1 (2023) conditions; however, two intersections do have at least one movement with 95th percentile queues that exceed the available storage length in one or more peak hour:

- 3. Fairfax Boulevard & Chain Bridge Road
  - Northbound Left (PM peak hour)
  - Southbound Right (SAT peak hour)

- 7. Chain Bridge Road & Eaton Place (main node)
  - Southbound left/U (all peak hours)

The queueing analysis indicates that the 95th percentile queues remain comparable to the Background 2023 scenario.

Table 9: Intersection Capacity Analysis and Queuing Results – Future Phase 1 (2023) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
1	**Fairfax Blvd & Eaton Pl**										
	Overall Intersection (Signalized)		**C**	**34.8**		**E**	**59.0**		**C**	**32.4**	
	Eastbound Approach		***B***	***14.6***		***A***	***9.4***		***C***	***31.5***	
	Eastbound Left	130	A	9.1	m19	C	27.4	m9	D	39.0	m28
	Eastbound TR		B	14.7	#1184	A	9.2	228	C	31.4	508
	Westbound Approach		***D***	***54.5***		***B***	***17.0***		***C***	***25.5***	
	Westbound Left	80	D	49.3	m4	B	11.7	m2	A	7.4	m2
	Westbound Thru		D	48.0	643	B	19.0	#1601	C	26.6	#1068
	Westbound Right		E	76.0	230	A	9.8	136	C	23.1	652
	Northbound Approach		***F***	***93.7***		***F***	***110.2***		***E***	***76.3***	
	Northbound LTR		F	93.7	9	F	110.2	33	E	76.3	22
	Southbound Approach		***F***	***117.7***		***F***	***451.0***		***F***	***89.6***	
	Southbound Left		F	120.0	m406	F	356.7	m#934	F	97.7	#343
	Southbound TR		E	61.3	m0	F	776.8	m91	D	54.2	24
	Northeastbound Approach		***F***	***89.5***		***F***	***104.2***		***E***	***68.2***	
	Northeastbound LTR		F	89.5	22	F	104.2	53	E	68.2	34
2	**Fairfax Blvd & University Drive**										
	Overall Intersection (Signalized)		**C**	**21.7**		**C**	**33.8**		**C**	**23.5**	
	Eastbound Approach		***A***	***9.7***		***C***	***24.5***		***B***	***13.0***	
	Eastbound Left	450	A	3.9	m10	E	74.4	176	C	28.7	82
	Eastbound TR		A	9.9	197	B	19.5	574	B	11.1	763
	Westbound Approach		***B***	***12.4***		***B***	***16.8***		***B***	***18.5***	
	Westbound Left	150	F	104.2	120	C	29.7	m135	D	47.9	m144
	Westbound TR		A	3.4	6	B	15.5	323	B	15.0	777
	Northbound Approach		***F***	***96.6***		***F***	***120.6***		***E***	***66.5***	
	Northbound LT		F	124.4	#301	F	166.1	#478	E	78.1	202
	Northbound Right		E	73.6	196	E	67.8	71	D	50.9	50
	Southbound Approach		***E***	***73.9***		***E***	***77.8***		***E***	***67.3***	
	Southbound Left	120	E	68.8	25	E	68.4	61	D	53.3	75
	Southbound TR		E	74.2	197	E	78.7	403	E	69.7	305
3	**Fairfax Blvd & Chain Bridge Road**										
	Overall Intersection (Signalized)		**E**	**63.5**		**E**	**57.3**		**D**	**51.6**	
	Eastbound Approach		***D***	***37.5***		***D***	***41.6***		***D***	***43.7***	
	Eastbound Left	600	F	117.1	m241	F	148.0	#236	F	87.1	195
	Eastbound Thru		C	22.8	412	B	15.6	181	C	33.5	455
	Eastbound Right	500	B	16.2	m0	B	16.2	m0	B	15.1	m1
	Westbound Approach		***E***	***68.9***		***C***	***33.0***		***D***	***38.6***	
	Westbound Left	450	F	284.5	m#383	F	110.6	m#302	F	100.1	#282
	Westbound Thru		C	23.3	340	C	26.9	1188	C	32.0	443
	Westbound Right	350	C	26.0	m38	B	13.8	m40	B	13.9	26
	Northbound Approach		***E***	***78.0***		***F***	***102.5***		***E***	***57.9***	
	Northbound Left	200	F	91.4	91	F	165.5	#318	E	72.5	161
	Northbound Thru		F	81.9	488	F	97.9	462	E	60.8	320
	Northbound Right	225	D	51.1	54	E	59.9	37	D	39.2	53
	Southbound Approach		***F***	***97.0***		***F***	***82.6***		***E***	***70.7***	
	Southbound Left	300	F	124.0	#154	F	147.3	182	F	89.5	142
	Southbound Thru		F	114.8	456	F	91.4	321	F	84.2	356
	Southbound Right	200	D	37.6	82	D	35.9	134	D	41.0	449
3	**Fairfax Blvd & Chain Bridge Road**										
	Overall Intersection (Signalized) (MIT: Adjust signal timings during the PM peak hour by 1 second from Phase 8 to Phase 7. Adjust signal timings during SAT peak hour by 1 second from Phase 6 to Phase 5.)					**E**	**56.9**		**D**	**51.4**	
	Eastbound Approach					***D***	***41.3***		***D***	***44.7***	
	Eastbound Left	600				F	148.0	#236	F	87.1	195
	Eastbound Thru					B	15.7	181	C	34.8	464
	Eastbound Right	500				A	0.0	m0	B	15.5	m1
	Westbound Approach					***C***	***33.1***		***D***	***37.0***	
	Westbound Left	450				F	110.6	m#302	F	85.7	#270
	Westbound Thru					C	27.1	1188	C	32.0	443
	Westbound Right	350				B	13.9	m40	B	13.9	26
	Northbound Approach					***F***	***99.2***		***E***	***57.8***	
	Northbound Left	200				F	146.8	#305	E	72.5	161
	Northbound Thru					F	97.2	462	E	60.8	320
	Northbound Right	225				E	60.3	63	D	38.5	52
	Southbound Approach					***F***	***83.2***		***E***	***70.7***	
	Southbound Left	300				F	147.3	182	F	89.6	142
	Southbound Thru					F	92.6	321	F	84.2	356
	Southbound Right	200				D	36.1	134	D	41.0	449

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

Table 9: Intersection Capacity Analysis and Queuing Results – Future Phase 1 (2023) Conditions (Continued)

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
4	**Fairfax Blvd & Farr Ave**										
	Overall Intersection (TWSC)										
	Northbound Approach		***C***	***18.5***		***B***	***13***		***B***	***14.6***	
	Northbound Right		C	18.5	3	B	13	3	B	14.6	3
	Southbound Approach		***B***	***11.5***		***C***	***21.7***		***C***	***16.2***	
	Southbound Right		B	11.5	0	C	21.7	5	C	16.2	5
5	**Fairfax Blvd & Warwick Ln/McLean Ave**										
	Overall Intersection (Signalized)		**C**	**30.8**		**C**	**31.7**		**C**	**30.0**	
	Eastbound Approach		***F***	***118.8***		***F***	***111.6***		***E***	***67.2***	
	Eastbound LTR		F	118.8	#334	F	111.6	274	E	67.2	138
	Westbound Approach		***F***	***93.1***		***F***	***105.9***		***E***	***69.7***	
	Westbound LTR		F	93.1	72	F	105.9	116	E	69.7	76
	Northbound Approach		***F***	***89.0***		***F***	***112.3***		***E***	***70.4***	
	Northbound LTR		F	89.0	132	F	112.3	#243	E	70.4	86
	Southbound Approach		***F***	***87.8***		***F***	***91.9***		***E***	***65.8***	
	Southbound Left	175	F	89.9	87	F	92.5	60	E	66.0	31
	Southbound TR		F	81.8	41	F	90.7	38	E	65.5	23
	Northeastbound Approach		***C***	***25.0***		***B***	***10.7***		***C***	***27.3***	
	Northeastbound Left		A	0	0	C	22.9		C	27.4	
	Northeastbound TR		C	25.0	613	B	10.7	194	C	27.3	447
	Southwestbound Approach		***B***	***16.8***		***C***	***31.3***		***C***	***27.6***	
	Southwestbound Left	150	E	60.8	50	B	19.9	m39	C	26.6	m35
	Southwestbound TR		B	15.1	206	C	31.6	#1645	C	27.7	#627
6	**Chain Bridge Rd & Orchard St**										
	Overall Intersection (Signalized)		**A**	**1.9**		**A**	**2.9**		**A**	**1.6**	
	Eastbound Approach		***F***	***91.0***		***F***	***106.8***		***E***	***71.1***	
	Eastbound Left/Right		F	91.0	56	F	106.8	71	E	71.1	57
	Southbound Approach		***A***	***1.0***		***A***	***0.8***		***A***	***0.5***	
	Southbound TR		A	1.0	m50	A	0.8	53	A	0.5	8
7	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)		**E**	**55.3**		**D**	**47.9**		**E**	**60.0**	
	Eastbound Approach		***F***	***143.5***		***F***	***118.3***		***E***	***61.5***	
	Eastbound LTR		F	143.5	#486	F	118.3	#244	E	61.5	98
	Westbound Approach		***C***	***20.5***		***B***	***11.9***		***C***	***20.5***	
	Westbound LTR		A	1.4	m0	A	5.9	m43	A	0.6	0
	Westbound Right		C	35.0	m63	B	18.0	m57	C	31.3	115
	Northbound Approach		***C***	***33.0***		***B***	***18.6***		***D***	***44.8***	
	Northbound Left/U	135	F	142.3	53	F	146.2	105	F	92.4	72
	Northbound TR		C	31.3	430	B	13.4	85	D	43.0	220
	Southbound Approach		***E***	***73.8***		***F***	***82.5***		***F***	***81.6***	
	Southbound Left/U	470	F	146.5	#735	F	170.4	#906	F	189.2	#796
	Southbound TR		D	45.7	420	D	42.4	448	D	43.9	#487
7a	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)		**E**	**71.7**		**F**	**89.3**		**D**	**36.9**	
	Eastbound Approach		***A***	***0.6***		***A***	***1.5***		***A***	***2.7***	
	Eastbound LTR		A	0.6	m3	A	1.5	m8	A	2.7	m11
	Westbound Approach		***F***	***86.7***		***F***	***141.6***		***E***	***64.5***	
	Westbound LTR		F	86.7	391	F	141.6	#846	E	64.5	285
	Northbound Approach		***F***	***88.8***		***F***	***103.0***		***E***	***69.0***	
	Northbound LTR		F	88.8	0	F	103.0	55	E	69.0	35
	Southbound Approach		***F***	***216.3***		***F***	***134.4***		***E***	***69.3***	
	Southbound LTR		F	216.3	#393	F	134.4	#246	E	69.3	0
7	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Singalized)										
	(MIT: Adjust signal timings during the AM peak hour										
	by 1 second from Phase 2 to Phase 1.)		**D**	**54.8**							
	Eastbound Approach		***F***	***143.5***							
	Eastbound LTR		F	143.5	#486						
	Westbound Approach		***C***	***20.5***							
	Westbound LTR		A	1.4	m0						
	Westbound Right		C	35.0	m63						
	Northbound Approach		***D***	***35.4***							
	Northbound Left/U	135	F	142.3	53						
	Northbound TR		C	33.8	447						
	Southbound Approach		***E***	***70.7***							
	Southbound Left/U	470	F	135.3	#723						
	Southbound TR		D	45.7	420						

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

Table 9: Intersection Capacity Analysis and Queuing Results – Future Phase 1 (2023) Conditions (Continued)

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
7a	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Singalized) (MIT: Adjust signal timings during the AM peak hour by 1 second from Phase 2 to Phase 1.)		**E**	**71.7**							
	Eastbound Approach		***A***	***0.6***							
	Eastbound LTR		A	0.6	m3						
	Westbound Approach		***F***	***86.7***							
	Westbound LTR		F	86.7	391						
	Northbound Approach		***F***	***88.8***							
	Northbound LTR		F	88.8	0						
	Southbound Approach		***F***	***216.3***							
	Southbound LTR		F	216.3	#393						

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.
[2] $: Delays (reported from Synchro) exceed 300 seconds.
[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.
[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

2023 Mitigations

An intersection was considered to have an impact if it met any of the following criteria:

- The overall intersection or any movement operates at LOS E or LOS F in the future conditions with the proposed development where one does not exist in the background conditions without the proposed development;
- The overall intersection or any movement operates at LOS E or LOS F during the background condition and the delay increases by more than 10 percent in the future conditions with the proposed development; or
- There is an increase in the 95th percentile queues along a movement where queues exceed available storage in the future conditions with the proposed development where one does not exist in background conditions without the proposed development.

Following these guidelines, and as noted previously, the intersection of Chain Bridge Road at Eaton Place (main node) (Intersection 7) begins to operate at a LOS E during the AM peak hour. Additionally, the intersection of Fairfax Boulevard at Chain Bridge Road begins to experience slight increases in delays.

With slight increases in delays at these intersections, the impact of the proposed development is not anticipated to significantly alter driver's expectation at the signals. However, if necessary, the increases in delay can be mitigated with a slight change in the signal timings at these intersections.

The following mitigations are recommended:

- 3. Fairfax Boulevard & Chain Bridge Road
  - PM peak hour:
    - Adjust signal timings by 1 second from Phase 8 to Phase 7.
  - SAT peak hour:
    - Adjust signal timings by 1 second from Phase 6 to Phase 5.

- 7. Chain Bridge Road & Eaton Place (main node)
  - AM peak hour:
    - Adjust signal timings by 1 second from Phase 2 to Phase 1.

- 7a. Chain Bridge Road & Eaton Place (east node)
  - AM peak hour:
    - Adjust signal timings by 1 second from Phase 2 to Phase 1.

With the recommended improvements in place, it is anticipated that the 2023 Future Phase 1 road network conditions would operate similarly to the Background 2023 scenario. Thus, the development will have a negligible impact to the surrounding transportation and roadway network under 2023 future conditions.

Background (2027) Conditions Results

The results of the intersection capacity analyses for the Future without Development (2027) conditions ("Background 2027") expressed in LOS and delay (seconds per vehicle) per movement are shown in Table 10. Detailed analysis worksheets are included in the Appendix I.

The capacity analysis results indicate that most intersections operate at acceptable LOS under Background (2027) conditions; however, seven intersections have one or more approaches that operate at levels beyond acceptable thresholds in one or more peak hour:

- 1. Fairfax Boulevard & Eaton Place
  - Overall Intersection (PM peak hour)
  - Westbound Approach (AM peak hour)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)
  - Northeastbound Approach (all peak hours)

- 2. Fairfax Boulevard & University Drive
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 3. Fairfax Boulevard & Chain Bridge Road
  - Overall Intersection (AM and PM peak hours)
  - Westbound Approach (AM peak hour)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 4. Fairfax Boulevard & Farr Avenue
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 5. Fairfax Boulevard & Warwick Lane/McLean Avenue
  - Eastbound Approach (all peak hours)
  - Northbound Approach (all peak hours)

- 6. Chain Bridge Road & Orchard Street
  - Eastbound Approach (all peak hours)

- 7. Chain Bridge Road & Eaton Place (main node)
  - Overall Intersection (AM and SAT peak hours)
  - Eastbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 7a. Chain Bridge Road & Eaton Place (east node)
  - Overall Intersection (AM and PM peak hours)
  - Westbound Approach (all peak hours)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

The 95th percentile queues at most lane groups at study area intersections do not exceed their available storage length in the Background (2027) conditions; however, two intersections do have at least one movement with 95th percentile queues that exceed the available storage length in one or more peak hour:

- 3. Fairfax Boulevard & Chain Bridge Road
  - Northbound Left (PM peak hour)
  - Southbound Right (PM and SAT peak hour)

- 7. Chain Bridge Road & Eaton Place (main node)
  - Southbound left/U (all peak hours)

Table 10: Intersection Capacity Analysis and Queuing Results – Background (2027) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
1	**Fairfax Blvd & Eaton Pl**										
	Overall Intersection (Signalized)		**C**	**34.4**		**E**	**59.5**		**C**	**30.1**	
	Eastbound Approach		***B***	***11.2***		***A***	***8.7***		***C***	***26.0***	
	Eastbound Left	130	A	5.2	m16	D	52.1	m9	D	39.0	m21
	Eastbound TR		B	11.3	#1189	A	8.2	216	C	25.8	542
	Westbound Approach		***E***	***65.6***		***C***	***21.2***		***C***	***25.8***	
	Westbound Left	80	E	56.6	m5	B	12.8	m3	A	7.1	m2
	Westbound Thru		D	44.0	516	C	23.9	#1775	C	27.6	#1191
	Westbound Right		F	122.7	227	B	11.0	174	C	21.6	660
	Northbound Approach		***F***	***93.7***		***F***	***110.2***		***E***	***76.3***	
	Northbound LTR		F	93.7	9	F	110.2	33	E	76.3	22
	Southbound Approach		***F***	***117.8***		***F***	***451.3***		***F***	***89.9***	
	Southbound Left		F	120.1	m402	F	353.0	m#929	F	98.0	#336
	Southbound TR		E	61.5	m0	F	788.7	m91	D	54.3	26
	Northeastbound Approach		***F***	***89.5***		***F***	***104.2***		***E***	***68.2***	
	Northeastbound LTR		F	89.5	22	F	104.2	53	E	68.2	34
2	**Fairfax Blvd & University Drive**										
	Overall Intersection (Signalized)		**C**	**22.5**		**C**	**34.4**		**C**	**22.6**	
	Eastbound Approach		***A***	***9.5***		***C***	***23.7***		***B***	***16.3***	
	Eastbound Left	450	A	3.1	m12	F	91.5	198	D	49.3	m138
	Eastbound TR		A	9.6	235	B	17.1	514	B	12.5	884
	Westbound Approach		***B***	***15.7***		***B***	***20.0***		***B***	***13.8***	
	Westbound Left	150	F	105.6	135	D	36.7	m129	D	52.9	m139
	Westbound TR		A	4.3	39	B	18.4	342	A	9.6	231
	Northbound Approach		***F***	***93.7***		***F***	***119.3***		***E***	***66.1***	
	Northbound LT		F	122.6	277	F	163.6	#482	E	77.5	204
	Northbound Right		E	69.2	94	E	67.4	71	D	50.7	50
	Southbound Approach		***E***	***73.4***		***E***	***77.4***		***E***	***66.7***	
	Southbound Left	120	E	68.3	24	E	68.0	61	D	53.1	75
	Southbound TR		E	73.7	194	E	78.3	406	E	69.0	305
3	**Fairfax Blvd & Chain Bridge Road**										
	Overall Intersection (Signalized)		**E**	**65.8**		**E**	**59.8**		**D**	**49.0**	
	Eastbound Approach		***D***	***42.1***		***D***	***45.3***		***D***	***41.9***	
	Eastbound Left	600	F	106.6	208	F	141.0	#244	F	80.6	199
	Eastbound Thru		C	31.0	704	C	22.5	276	C	32.6	626
	Eastbound Right	500	B	18.1	m0	B	16.6	0	B	19.3	m5
	Westbound Approach		***F***	***85.4***		***D***	***35.7***		***D***	***35.9***	
	Westbound Left	450	F	305.9	#400	F	112.2	m#281	F	98.8	#293
	Westbound Thru		C	22.7	230	C	30.3	1282	C	29.4	472
	Westbound Right	350	B	13.1	m14	B	13.3	m43	B	11.6	m18
	Northbound Approach		***E***	***75.8***		***F***	***109.3***		***E***	***58.8***	
	Northbound Left	200	F	92.0	55	F	200.2	#372	E	78.7	#195
	Northbound Thru		E	79.9	#530	F	98.6	484	E	60.5	334
	Northbound Right	225	D	49.9	59	E	59.2	40	D	38.7	56
	Southbound Approach		***F***	***88.9***		***F***	***81.0***		***E***	***66.2***	
	Southbound Left	300	F	126.6	#153	F	148.4	184	F	91.4	144
	Southbound Thru		F	101.3	468	F	88.1	321	E	76.3	356
	Southbound Right	200	D	36.4	90	D	36.9	233	D	39.1	466
4	**Fairfax Blvd & Farr Ave**										
	Overall Intersection (Signalized)		**A**	**5.7**		**A**	**5.2**		**A**	**5.6**	
	Eastbound Approach		***A***	***5.5***		***A***	***4.9***		***A***	***6.9***	
	Eastbound Left	200	A	5.5		A	5.0		A	6.9	
	Eastbound TR		A	5.5	116	A	4.9	113	A	6.8	258
	Westbound Approach		***A***	***1.7***		***A***	***2.3***		***A***	***2.0***	
	Westbound Left	80	F	99.4	39	F	108.7	m46	E	72.8	m38
	Westbound TR		A	0.3	61	A	1.1	m142	A	0.8	268
	Northbound Approach		***F***	***95.7***		***F***	***109.2***		***E***	***74.1***	
	Northbound LTR		F	95.7	18	F	109.2	68	E	74.1	26
	Southbound Approach		***F***	***89.8***		***F***	***100.5***		***E***	***69.3***	
	Southbound LTR		F	89.8	0	F	100.5	0	E	69.3	0

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

Table 10: Intersection Capacity Analysis and Queuing Results – Background (2027) Conditions (Continued)

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
5	**Fairfax Blvd & Warwick Ln/McLean Ave**										
	Overall Intersection (Signalized)		**B**	**13.8**		**B**	**17.1**		**A**	**9.2**	
	Eastbound Approach		***F***	***107.6***		***F***	***123.0***		***E***	***69.0***	
	Eastbound LTR		F	107.6	#247	F	123.0	#350	E	69.0	158
	Northbound Approach		***F***	***89.8***		***F***	***102.5***		***E***	***69.4***	
	Northbound LTR		F	89.8	9	F	102.5	88	E	69.4	0
	Northeastbound Approach		***A***	***3.5***		***A***	***2.7***		***A***	***5.9***	
	Northeastbound TR		A	3.5	136	A	2.7		A	5.9	
	Southwestbound Approach		***A***	***4.5***		***B***	***13.0***		***A***	***7.1***	
	Southwestbound Left	150	B	11.6	13	A	8.5		A	5.3	
	Southwestbound TR		A	4.3	111	B	13.1	m14	A	7.1	m2
6	**Chain Bridge Rd & Orchard St**										
	Overall Intersection (Signalized)		**A**	**0.5**		**A**	**1.2**		**A**	**0.6**	
	Eastbound Approach		***F***	***93.7***		***F***	***106.0***		***E***	***73.7***	
	Eastbound Left/Right		F	93.7	0	F	106.0	0	E	73.7	0
	Southbound Approach		***A***	***0.6***		***A***	***0.6***		***A***	***0.6***	
	Southbound TR		A	0.6	m41	A	0.6	38	A	0.6	6
7	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)		**E**	**55.2**		**D**	**49.1**		**E**	**63.8**	
	Eastbound Approach		***F***	***143.5***		***F***	***118.3***		***E***	***61.4***	
	Eastbound LTR		F	143.5	#486	F	118.3	#244	E	61.4	98
	Westbound Approach		***C***	***20.5***		***B***	***11.7***		***C***	***21.5***	
	Westbound LTR		A	1.4	m0	A	5.8	m41	A	0.6	0
	Westbound Right		C	35.0	m63	B	17.6	m60	C	32.6	121
	Northbound Approach		***C***	***32.4***		***B***	***17.6***		***D***	***47.8***	
	Northbound Left/U	135	F	142.3	46	F	146.0	92	F	93.0	60
	Northbound TR		C	31.0	440	B	13.2	83	D	46.6	243
	Southbound Approach		***E***	***73.5***		***F***	***85.5***		***F***	***87.0***	
	Southbound Left/U	470	F	149.5	#745	F	182.6	#930	F	216.9	#819
	Southbound TR		D	44.9	434	D	42.4	461	D	42.5	#498
7a	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)		**E**	**71.2**		**F**	**90.0**		**D**	**37.3**	
	Eastbound Approach		***A***	***0.6***		***A***	***1.5***		***A***	***2.7***	
	Eastbound LTR		A	0.6	m3	A	1.5	m7	A	2.7	m10
	Westbound Approach		***F***	***85.6***		***F***	***142.8***		***E***	***65.5***	
	Westbound LTR		F	85.6	390	F	142.8	#847	E	65.5	286
	Northbound Approach		***F***	***88.8***		***F***	***103.0***		***E***	***69.0***	
	Northbound LTR		F	88.8	0	F	103.0	55	E	69.0	35
	Southbound Approach		***F***	***216.3***		***F***	***134.4***		***E***	***69.3***	
	Southbound LTR		F	216.3	#393	F	134.4	#246	E	69.3	0

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

Future – Phase 2 (2027) Conditions Results

The results of the intersection capacity analyses for the Future with Development – Phase 2 (2027) conditions ("Future – Phase 2") expressed in LOS and delay (seconds per vehicle) per movement are shown in Table 11. Detailed analysis worksheets are included in the Appendix J.

The capacity analysis results indicate that most intersections operate at acceptable LOS under Future – Phase 2 (2027) conditions; however, seven intersections have one or more approaches that operate at levels beyond acceptable thresholds in one or more peak hour:

- 1. Fairfax Boulevard & Eaton Place
  - Overall Intersection (PM peak hour)
  - Westbound Approach (AM peak hour)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)
  - Northeastbound Approach (all peak hours)

- 2. Fairfax Boulevard & University Drive
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 3. Fairfax Boulevard & Chain Bridge Road
  - Overall Intersection (AM and PM peak hour)
  - Westbound Approach (AM peak hour)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 4. Fairfax Boulevard & Farr Avenue
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 5. Fairfax Boulevard & Warwick Lane/McLean Avenue
  - Eastbound Approach (all peak hours)
  - Northbound Approach (all peak hours)

- 6. Chain Bridge Road & Orchard Street
  - Eastbound Approach (all peak hours)

- 7. Chain Bridge Road & Eaton Place (main node)
  - Overall Intersection (AM and SAT peak hours)
  - Eastbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

- 7a. Chain Bridge Road & Eaton Place (east node)
  - Overall Intersection (AM and PM peak hours)
  - Westbound Approach (all peak hours)
  - Northbound Approach (all peak hours)
  - Southbound Approach (all peak hours)

The 95th percentile queues at most lane groups at study area intersections do not exceed their available storage length in the Future – Phase 2 (2027) conditions; however, two intersections do have at least one movement with 95th percentile queues that exceed the available storage length in one or more peak hour:

- 3. Fairfax Boulevard & Chain Bridge Road
  - Northbound Left (PM and SAT peak hour)
  - Southbound Right (SAT peak hour)

- 7. Chain Bridge Road & Eaton Place (main node)
  - Southbound left/U (all peak hours)

The queueing analysis indicates that the 95th percentile queues remain comparable to the Background 2027 scenario.

Table 11: Intersection Capacity Analysis and Queuing Results – Future Phase 2 (2027) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
1	**Fairfax Blvd & Eaton Pl**										
	Overall Intersection (Signalized)		**C**	**34.2**		**E**	**62.1**		**C**	**30.8**	
	Eastbound Approach		***B***	***11.3***		***A***	***8.6***		***C***	***26.3***	
	Eastbound Left	130	A	5.3	m16	E	57.4	m8	D	41.3	m21
	Eastbound TR		B	11.4	#1211	A	8.1	194	C	26.2	#576
	Westbound Approach		***E***	***63.3***		***C***	***22.7***		***C***	***26.4***	
	Westbound Left	80	E	58.9	m4	B	13.9	m3	A	7.0	m2
	Westbound Thru		D	45.0	439	C	25.6	#1828	C	28.4	#1236
	Westbound Right		F	112.2	211	B	11.5	188	C	21.5	671
	Northbound Approach		***F***	***93.7***		***F***	***110.2***		***E***	***76.3***	
	Northbound LTR		F	93.7	9	F	110.2	33	E	76.3	22
	Southbound Approach		***F***	***118.2***		***F***	***468.3***		***F***	***93.4***	
	Southbound Left		F	120.4	m417	F	370.8	m#956	F	101.9	#365
	Southbound TR		E	61.0	m0	F	811.9	m94	D	54.1	28
	Northeastbound Approach		***F***	***89.5***		***F***	***104.2***		***E***	***68.2***	
	Northeastbound LTR		F	89.5	22	F	104.2	53	E	68.2	34
1	**Fairfax Blvd & Eaton Pl**										
	Overall Intersection (Signalized) (MIT: Restripe SBTR to a SBLTR. Adjust signal timings during the PM peak hour by 1 second from Phases 2 and 6 to Phase 3.)		**C**	**34.6**		**E**	**63.9**		**C**	**31.5**	
	Eastbound Approach		***B***	***11.0***		***A***	***8.8***		***C***	***26.5***	
	Eastbound Left	130	A	5.2	m16	E	56.9	m9	D	41.3	m21
	Eastbound TR		B	11.2	#1211	A	8.3	212	C	26.3	#576
	Westbound Approach		***E***	***64.8***		***C***	***23.6***		***C***	***26.6***	
	Westbound Left	80	E	60.3	m4	B	14.5	m3	A	7.1	m2
	Westbound Thru		D	45.9	439	C	26.6	#1841	C	28.7	#1236
	Westbound Right		F	115.2	211	B	12.0	194	C	21.7	671
	Northbound Approach		***F***	***93.7***		***F***	***110.2***		***E***	***76.3***	
	Northbound LTR		F	93.7	9	F	110.2	33	E	76.3	22
	Southbound Approach		***F***	***120.3***		***F***	***480.9***		***F***	***100.0***	
	Southbound Left		F	122.6	m449	F	383.1	m#1012	F	110.1	#400
	Southbound LTR		E	60.2	m0	F	826.0	m102	D	53.9	31
	Northeastbound Approach		***F***	***89.5***		***F***	***104.2***		***E***	***68.2***	
	Northeastbound LTR		F	89.5	22	F	104.2	53	E	68.2	34
2	**Fairfax Blvd & University Drive**										
	Overall Intersection (Signalized)		**C**	**22.5**		**C**	**35.0**		**C**	**23.1**	
	Eastbound Approach		***A***	***9.9***		***C***	***24.4***		***B***	***16.9***	
	Eastbound Left	450	A	3.2	m12	F	97.4	206	D	51.5	m138
	Eastbound TR		B	10.1	247	B	17.5	538	B	13.1	906
	Westbound Approach		***B***	***15.2***		***C***	***21.0***		***B***	***14.6***	
	Westbound Left	150	F	101.3	138	D	41.5	m133	D	53.7	m139
	Westbound TR		A	4.8	56	B	19.0	348	B	10.5	249
	Northbound Approach		***F***	***93.7***		***F***	***119.3***		***E***	***66.1***	
	Northbound LT		F	122.6	277	F	163.6	#482	E	77.5	204
	Northbound Right		E	69.3	96	E	67.4	71	D	50.7	50
	Southbound Approach		***E***	***73.4***		***E***	***77.4***		***E***	***66.7***	
	Southbound Left	120	E	68.3	24	E	68.0	61	D	53.1	75
	Southbound TR		E	73.7	194	E	78.3	406	E	69.0	305
3	**Fairfax Blvd & Chain Bridge Road**										
	Overall Intersection (Signalized)		**E**	**67.7**		**E**	**65.7**		**D**	**50.3**	
	Eastbound Approach		***D***	***41.4***		***D***	***45.3***		***D***	***45.0***	
	Eastbound Left	600	F	106.6	208	F	142.3	#244	F	82.0	200
	Eastbound Thru		C	30.2	712	C	22.9	278	D	36.3	598
	Eastbound Right	500	B	16.4	m0	A	0.6	0	C	21.4	m5
	Westbound Approach		***F***	***82.5***		***D***	***37.1***		***D***	***35.8***	
	Westbound Left	450	F	305.1	#399	F	111.1	m#276	F	83.1	m#273
	Westbound Thru		C	21.9	246	C	32.0	1315	C	31.6	539
	Westbound Right	350	B	12.2	m13	B	13.5	m42	B	11.5	m17
	Northbound Approach		***F***	***80.1***		***F***	***133.3***		***E***	***64.6***	
	Northbound Left	200	F	95.6	112	F	294.1	#509	F	115.2	#311
	Northbound Thru		F	84.1	#530	F	98.1	484	E	57.9	334
	Northbound Right	225	D	50.9	59	E	59.9	67	D	36.9	56
	Southbound Approach		***F***	***95.0***		***F***	***85.2***		***E***	***63.0***	
	Southbound Left	300	F	128.5	m#175	F	142.9	m197	F	87.3	156
	Southbound Thru		F	105.0	488	F	93.6	366	E	73.2	381
	Southbound Right	200	D	48.5	m107	D	41.2	171	C	34.7	246

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

Table 11: Intersection Capacity Analysis and Queuing Results – Future Phase 2 (2027) Conditions (Continued)

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
3	**Fairfax Blvd & Chain Bridge Road**										
	Overall Intersection (Signalized) (MIT: Adjust signal timings during all peak hours. AM peak: 2 seconds from Phases 2 and 6 to Phases 4 and 7, respectively. PM peak: 1 second from Phase 2 to Phase 3; 2 second from Phase 2 to Phase 4; 3 seconds from Phase 6 to Phase 7; and 4 seconds from Phase 8 to Phase 7. SAT peak: 1 second from Phase 6 to Phase 5; 6 seconds from Phase 8 to Phase 7.)		**E**	**67.7**		**E**	**61.0**		**D**	**49.0**	
	Eastbound Approach		***D***	***42.6***		***D***	***47.2***		***D***	***47.3***	
	Eastbound Left	600	F	107.3	209	F	143.8	#244	F	85.1	200
	Eastbound Thru		C	31.6	732	C	25.0	287	D	38.2	602
	Eastbound Right	500	B	16.5	m0	A	0.6	0	C	25.9	5
	Westbound Approach		***F***	***83.3***		***D***	***39.4***		***D***	***36.2***	
	Westbound Left	450	F	304.3	#399	F	108.4	m#276	F	83.1	m#273
	Westbound Thru		C	23.0	257	C	34.9	1325	C	32.1	539
	Westbound Right	350	B	15.0	m17	B	14.2	m42	B	11.7	m17
	Northbound Approach		***E***	***77.0***		***F***	***98.0***		***E***	***55.2***	
	Northbound Left	200	F	91.8	111	F	155.6	#436	E	74.8	239
	Northbound Thru		F	80.7	505	F	88.6	478	E	55.2	334
	Northbound Right	225	D	50.1	58	E	56.8	67	D	35.6	52
	Southbound Approach		***F***	***94.7***		***F***	***84.3***		***E***	***61.1***	
	Southbound Left	300	F	127.3	#176	F	141.3	198	F	90.2	155
	Southbound Thru		F	106.4	488	F	93.8	365	E	71.8	365
	Southbound Right	200	D	45.0	100	D	38.9	169	C	29.8	418
4	**Fairfax Blvd & Farr Ave**										
	Overall Intersection (Signalized)		**A**	**7.6**		**A**	**8.3**		**A**	**7.4**	
	Eastbound Approach		***A***	***7.1***		***B***	***10.8***		***A***	***9.0***	
	Eastbound Left	200	A	5.5	m63	A	4.8	m#149	A	6.6	m80
	Eastbound TR		A	5.4	114	A	4.8	110	A	6.6	252
	Westbound Approach		***A***	***1.7***		***A***	***2.5***		***A***	***2.1***	
	Westbound Left	80	F	99.3	m38	F	107.8	m43	E	72.2	m36
	Westbound TR		A	0.4	98	A	1.4	m217	A	1.0	326
	Northbound Approach		***F***	***94.5***		***F***	***108.7***		***E***	***73.6***	
	Northbound LTR		F	94.5	18	F	108.7	69	E	73.6	26
	Southbound Approach		***F***	***94.4***		***F***	***105.6***		***E***	***74.8***	
	Southbound LTR		F	94.4	10	F	105.6	53	E	74.8	30
4	**Fairfax Blvd & Farr Ave Overall Intersection (Signalized) (MIT: Convert EBL and WBL from Pt phasing to Pm+Pt operation.)**		**A**	**6.1**		**A**	**5.5**		**A**	**5.7**	
	Eastbound Approach		***A***	***5.4***		***A***	***4.7***		***A***	***6.5***	
	Eastbound Left	200	A	5.5	m5	A	4.8	m25	A	6.6	m18
	Eastbound TR		A	5.4	113	A	4.8	110	A	6.6	252
	Westbound Approach		***A***	***0.4***		***A***	***1.4***		***A***	***1.1***	
	Westbound Left	80	A	3.5	m5	A	2.7	m3	A	3.9	m6
	Westbound TR		A	0.4	84	A	1.4	246	A	1.0	316
	Northbound Approach		***F***	***94.5***		***F***	***108.7***		***E***	***73.6***	
	Northbound LTR		F	94.5	18	F	108.7	69	E	73.6	26
	Southbound Approach		***F***	***94.4***		***F***	***105.6***		***E***	***74.8***	
	Southbound LTR		F	94.4	10	F	105.6	53	E	74.8	30
5	**Fairfax Blvd & Warwick Ln/McLean Ave**										
	Overall Intersection (Signalized)		**B**	**13.7**		**B**	**17.7**		**A**	**8.2**	
	Eastbound Approach		***F***	***107.6***		***F***	***123.0***		***E***	***69.0***	
	Eastbound LTR		F	107.6	#247	F	123.0	#350	E	69.0	158
	Northbound Approach		***F***	***89.8***		***F***	***102.5***		***E***	***69.4***	
	Northbound LTR		F	89.8	9	F	102.5	88	E	69.4	0
	Northeastbound Approach		***A***	***3.6***		***A***	***2.7***		***A***	***6.3***	
	Northeastbound TR		A	3.6	148	A	2.7	84	A	6.2	327
	Southwestbound Approach		***A***	***4.6***		***B***	***14.4***		***A***	***5.0***	
	Southwestbound Left	150	B	12.2	13	A	9.5	m13	A	4.1	m2
	Southwestbound TR		A	4.4	112	B	14.4	545	A	5.0	291

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

Table 11: Intersection Capacity Analysis and Queuing Results – Future Phase 2 (2027) Conditions (Continued)

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)	LOS	Delay [2] (s/veh)	95th % Queue [3][4] (ft.)
6	**Chain Bridge Rd & Orchard St**										
	Overall Intersection (Signalized)		**A**	**7.2**		**A**	**9.5**		**A**	**5.7**	
	Eastbound Approach		***F***	***124.2***		***F***	***133.6***		***E***	***79.4***	
	Eastbound Left/Right		F	124.2	#245	F	133.6	#295	E	79.4	209
	Southbound Approach		***A***	***1.9***		***A***	***2.0***		***A***	***1.1***	
	Southbound TR		A	1.9	m63	A	2.0	64	A	1.1	27
6	**Chain Bridge Rd & Orchard St**										
	Overall Intersection (Signalized)										
	(MIT: Install EBR turn lane. Adjust signal timings duirng the PM peak hour by 1 second from Phase 2 to Phase 4.)		**A**	**5.3**		**A**	**7.3**		**A**	**4.9**	
	Eastbound Approach		***F***	***89.3***		***F***	***103.1***		***E***	***67.5***	
	Eastbound Left		F	94.0	132	F	109.4	152	E	71.3	134
	Eastbound Right	150	F	84.2	51	F	97.6	62	E	63.6	52
	Southbound Approach		***A***	***1.6***		***A***	***1.5***		***A***	***1.0***	
	Southbound TR		A	1.6	m63	A	1.5	67	A	1.0	27
7	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)		**E**	**58.5**		**D**	**54.5**		**E**	**69.5**	
	Eastbound Approach		***F***	***143.5***		***F***	***118.3***		***E***	***61.3***	
	Eastbound LTR		F	143.5	#486	F	118.3	#244	E	61.3	98
	Westbound Approach		***B***	***19.9***		***B***	***11.7***		***C***	***20.7***	
	Westbound LTR		A	1.6	m0	A	6.5	m50	A	0.7	0
	Westbound Right		C	34.2	m60	B	17.0	m55	C	31.8	117
	Northbound Approach		***D***	***48.1***		***C***	***25.7***		***D***	***50.9***	
	Northbound Left/U	135	F	143.4	m44	F	141.4	m89	F	89.1	m59
	Northbound TR		D	47.0	#587	C	22.0	134	D	50.0	278
	Southbound Approach		***E***	***70.1***		***F***	***92.5***		***F***	***96.4***	
	Southbound Left/U	470	F	138.3	#733	F	210.7	#975	F	259.4	#843
	Southbound TR		D	45.6	460	D	43.3	498	D	44.0	#560
7a	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)		**E**	**71.3**		**F**	**92.1**		**D**	**37.3**	
	Eastbound Approach		***A***	***0.7***		***A***	***1.4***		***A***	***2.8***	
	Eastbound LTR		A	0.7	m3	A	1.4	m7	A	2.8	m10
	Westbound Approach		***F***	***86.7***		***F***	***147.3***		***E***	***65.8***	
	Westbound LTR		F	86.7	396	F	147.3	#862	E	65.8	292
	Northbound Approach		***F***	***88.8***		***F***	***103.0***		***E***	***69.0***	
	Northbound LTR		F	88.8	0	F	103.0	55	E	69.0	35
	Southbound Approach		***F***	***216.3***		***F***	***134.4***		***E***	***69.3***	
	Southbound LTR		F	216.3	#393	F	134.4	#246	E	69.3	0
7	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)										
	(MIT: Adjust signal timings during the PM peak hour by 4 seconds from Phase 2 to Phase 1. Adjust signal timings during the SAT peak hour by 2 seconds from Phase 2 to Phase 1.)					**D**	**52.7**		**E**	**65.4**	
	Eastbound Approach					***F***	***118.3***		***E***	***61.3***	
	Eastbound LTR					F	118.3	#244	E	61.3	98
	Westbound Approach					***B***	***13.4***		***C***	***21.1***	
	Westbound LTR					A	6.5	m50	A	0.7	0
	Westbound Right					C	20.5	m55	C	32.4	117
	Northbound Approach					***C***	***29.3***		***E***	***55.5***	
	Northbound Left/U	135				F	142.1	93	F	86.8	61
	Northbound TR					C	25.7	137	D	54.7	294
	Southbound Approach					***F***	***85.4***		***F***	***85.3***	
	Southbound Left/U	470				F	186.4	#964	F	213.9	#815
	Southbound TR					D	43.3	498	D	44.0	#560
7a	**Chain Bridge Rd & Eaton Pl**										
	Overall Intersection (Signalized)										
	(MIT: Adjust signal timings during the PM peak hour by 4 seconds from Phase 2 to Phase 1. Adjust signal timings during the SAT peak hour by 2 seconds from Phase 2 to Phase 1.)					**F**	**92.0**		**D**	**37.7**	
	Eastbound Approach					***A***	***1.3***		***A***	***2.5***	
	Eastbound LTR					A	1.3	m7	A	2.5	m10
	Westbound Approach					***F***	***147.1***		***E***	***67.0***	
	Westbound LTR					F	147.1	#862	E	67.0	292
	Northbound Approach					***F***	***103.0***		***E***	***69.0***	
	Northbound LTR					F	103.0	55	E	69.0	35
	Southbound Approach					***F***	***134.4***		***E***	***69.3***	
	Southbound LTR					F	134.4	#246	E	69.3	0

NOTES:

[1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.

[2] $: Delays (reported from Synchro) exceed 300 seconds.

[3] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

[4] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.

2027 Mitigations

An intersection was considered to have an impact if it met any of the following criteria:

- The overall intersection or any movement operates at LOS E or LOS F in the future conditions with the proposed development where one does not exist in the background conditions without the proposed development;
- The overall intersection or any movement operates at LOS E or LOS F during the background condition and the delay increases by more than 10 percent in the future conditions with the proposed development; or
- There is an increase in the 95th percentile queues along a movement where queues exceed available storage in the future conditions with the proposed development where one does not exist in background conditions without the proposed development.

Following these guidelines, there are impacts to five study area intersections as a result of Phase 2 of the proposed development. The following mitigations are recommended:

- 1. Fairfax Boulevard & Eaton Place
  - Restripe southbound approach from a L, TR configuration to a L, LTR configuration.
  - PM peak hour:
    - Adjust signal timings by 1 second from Phases 2 and 6 to Phase 3.

- 3. Fairfax Boulevard & Chain Bridge Road
  - AM peak hour:
    - Adjust signal timings by 2 seconds from Phase 2 to Phase 4.
    - Adjust signal timings by 6 seconds from Phase 2 to Phase 7.
  - PM peak hour:
    - Adjust signal timings by 1 second from Phase 2 to Phase 3.
    - Adjust signal timings by 2 seconds from Phase 2 to Phase 4.
    - Adjust signal timings by 3 second from Phase 6 to Phase 7.
    - Adjust signal timings by 4 second from Phase 8 to Phase 7.
  - SAT peak hour:
    - Adjust signal timings by 1 second from Phase 6 to Phase 5.
    - Adjust signal timings by 6 seconds from Phase 8 to Phase 7.

- 4. Fairfax Boulevard & Farr Avenue
  - Operate the eastbound and westbound left turns under permitted and protected operation.

- 6. Chain Bridge Road & Orchard Street
  - Install an eastbound right turn bay.
  - PM peak hour:
    - Adjust signal timings by 1 second from Phase 2 to Phase 4.
  - (Alternative) Operate the signal with a half-cycle length (not shown in this study). This mitigation could be assessed during the application of Phase 2 and would likely require an assessment of the Fairfax Boulevard and Change Bridge Road corridors.

- 7. Chain Bridge Road & Eaton Place (main node)
  - PM peak hour:
    - Adjust signal timings by 4 seconds from Phase 2 to Phase 1.
  - SAT peak hour:
    - Adjust signal timings by 2 seconds from Phase 2 to Phase 1.

- 7a. Chain Bridge Road & Eaton Place (east node)
  - PM peak hour:
    - Adjust signal timings by 4 seconds from Phase 2 to Phase 1.
  - SAT peak hour:
    - Adjust signal timings by 2 seconds from Phase 2 to Phase 1.

With the recommended improvements in place, it is anticipated that the 2027 Future Phase 2 road network conditions would operate similarly to the Background 2027 scenario. Thus, the development will have a negligible impact to the surrounding transportation and roadway network under 2027 conditions.

TRAFFIC SIMULATIONS

This chapter provides a summary of the anticipated queues for the existing and future conditions within the study area.

The purpose of the queuing analysis is to:

- Assess possible saturated conditions within the vicinity of the site for planning purposes;
- Identify potential queuing issues in greater detail as compared to what was discussed in the *Traffic Operations* chapter of this report;
- Provide an alternative assessment of how potential improvements and mitigation measures would accommodate the additional vehicular trips with the proposed development in place.

The queuing analysis focuses on the weekday morning (AM), weekday afternoon (PM), and Saturday midday (SAT) peak hours, as determined by the existing traffic volumes in the study area.

The following conclusions are reached within this chapter:

- Multiple study intersections experience saturated conditions during the analyzed peak hours, with or without the development in-place.
- Multiple movements exceed the capacity of existing and future turn bays.
- Overall, this report concludes that the project will have a negligible impact to the surrounding transportation network.

STUDY AREA & METHODOLOGY

The general methodology of the analysis follows Section 7.6 of VDOT's *Traffic Operations and Safety Analysis Manual* (TOSAM).

Queuing Analysis Scenarios

The queuing analyses were performed in order to assess possible saturated conditions within the study area under existing and future conditions. Queueing analyses were performed using *SimTraffic*, Version 10, using the same *Synchro* network models that were used in the intersection capacity analyses and based on the identical geometric and operations assumptions.

For the purposes of the analyses, each simulation was seeded, and each scenario was analyzed based on the average of a 10 simulation runs with any simulation, which experienced glitches, excluded from the average.

Identical to the capacity analysis, the queuing analysis examined the following scenarios:

1. 2019 Existing Conditions
2. 2023 Future Conditions without the Development (2023 Background)
3. 2023 Future Conditions with Phase 1 of the Development (2023 Total Future – Phase 1)
4. 2027 Future Conditions without the Development (2027 Background)
5. 2027 Future Conditions with Phase 1 and Phase 2 of the Development (2027 Total Future – Phase 2)

Study Area

The study area of the analysis includes intersections most likely to have potential impacts or require changes to traffic operations to accommodate the proposed development. Based on the projected future trip generation and the location of the site access points, the following intersections were chosen for analysis:

1. Fairfax Boulevard and Eaton Place;
2. Fairfax Boulevard and University Drive;
3. Chain Bridge Road and Fairfax Boulevard;
4. Fairfax Boulevard, Farr Avenue, and Future Site Access;
5. Fairfax Boulevard, Warwick Lane, and McLean Avenue;
6. Chain Bridge Road and Orchard Street;
7. Chain Bridge Road and Eaton Place; and
8. Chain Bridge Road and Right-in Only Site Access (2027 Total Future scenario only).

This study area was discussed and agreed to in a scoping meeting with the City. In addition to the study area, the *Synchro* network models included a majority of the City's roadway network.

SIMULATION RESULTS

Existing (2019) Conditions Results

The results of the queuing analyses for the Existing (2019) conditions are expressed in maximum queues per lane group/ movement are shown in Table 12. Detailed analysis worksheets are included in the Appendix F.

The queuing analysis results indicate that five of the seven existing study intersections operate with maximum queues that exceed the capacity of existing effective storage bays for dedicated turn lanes:

- 1. Fairfax Boulevard & Eaton Place
  - Eastbound Left (AM peak hour)
- 2. Fairfax Boulevard & University Drive
  - Westbound Left (PM and SAT peak hours)
- 3. Fairfax Boulevard & Chain Bridge Road
  - Westbound Left (all peak hours)
  - Westbound Right (PM peak hour)
  - Northbound Left (all peak hours)
  - Northbound Right (AM and PM peak hours)
  - Southbound Right (all peak hours)
- 5. Fairfax Boulevard & Warwick Lane/McLean Avenue
  - Southwestbound Left (PM and SAT peak hours)
- 7. Chain Bridge Road & Eaton Place (main node)
  - Northbound Left (SAT peak hour)
  - Southbound Left (PM peak Hour)

Table 12: Simulation Queuing Results – Existing (2019) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.)	AM Peak Max Queue (ft.)	PM Peak Max Queue (ft.)	SAT Peak Max Queue (ft.)
1	**Fairfax Blvd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	130	134	110	124
	Eastbound TR		329	232	304
	Westbound Approach				
	Westbound Left	80	20	46	61
	Westbound Thru		433	956	486
	Westbound Right		80	376	162
	Northbound Approach				
	Northbound LTR		21	52	44
	Southbound Approach				
	Southbound Left		433	1291	328
	Southbound TR		51	906	126
	Northeastbound Approach				
	Northeastbound LTR		37	60	49
2	**Fairfax Blvd & University Drive**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	165	18	77	87
	Eastbound TR		248	155	175
	Westbound Approach				
	Westbound Left	150	146	157	163
	Westbound TR		150	170	193
	Northbound Approach				
	Northbound LT		164	285	139
	Northbound Right		218	127	105
	Southbound Approach				
	Southbound Left	120	38	45	72
	Southbound TR		39	72	99
3	**Fairfax Blvd & Chain Bridge Road**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	600	228	198	181
	Eastbound Thru		394	234	353
	Eastbound Right	500	26	33	55
	Westbound Approach				
	Westbound Left	200	224	224	224
	Westbound Thru		586	604	422
	Westbound Right	350	182	375	210
	Northbound Approach				
	Northbound Left	200	225	225	214
	Northbound Thru		500	475	331
	Northbound Right	225	250	250	218
	Southbound Approach				
	Southbound Left	300	181	189	145
	Southbound Thru		356	354	352
	Southbound Right	200	225	225	225
4	**Fairfax Blvd & Farr Ave**				
	Overall Intersection (TWSC)				
	Northbound Approach				
	Northbound LTR		7	26	25
	Southbound Approach				
	Southbound LTR		17	43	39

Table 12: Simulation Queuing Results – Existing (2019) Conditions (Continued)

No.	Intersection (Movement)	Effective Storage Length (ft.)	AM Peak Max Queue (ft.)	PM Peak Max Queue (ft.)	SAT Peak Max Queue (ft.)
5	**Fairfax Blvd & Warwick Ln/McLean Ave**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		233	208	158
	Westbound Approach				
	Westbound LTR		81	127	93
	Northbound Approach				
	Northbound LTR		141	214	92
	Southbound Approach				
	Southbound Left	175	113	66	37
	Southbound TR		36	37	27
	Northeastbound Approach				
	Northeastbound Left		0	37	72
	Northeastbound TR		385	211	286
	Southwestbound Approach				
	Southwestbound Left	150	120	164	163
	Southwestbound TR		309	402	367
6	**Chain Bridge Rd & Orchard St**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left/Right		31	43	35
	Southbound Approach				
	Southbound TR		170	252	282
7	**Chain Bridge Rd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		453	254	130
	Westbound Approach				
	Westbound LTR		56	56	66
	Westbound Right		67	57	52
	Northbound Approach				
	Northbound Left/U	135	112	91	500
	Northbound TR		382	166	630
	Southbound Approach				
	Southbound Left/U	470	421	480	420
	Southbound TR		406	693	463
7a	**Chain Bridge Rd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		53	63	48
	Westbound Approach				
	Westbound LTR		348	1104	213
	Northbound Approach				
	Northbound LTR		97	76	47
	Southbound Approach				
	Southbound LTR		319	289	156

Background (2023) Conditions Results

The results of the queuing analyses for the Future without Development (2023) conditions ("Background 2023") conditions are expressed in maximum queues per lane group/ movement are shown in Table 13. Detailed analysis worksheets are included in the Appendix G.

The queuing analysis results indicate that five of the seven existing study intersections operate with maximum queues that exceed the capacity of future effective storage bays for dedicated turn lanes:

- 1. Fairfax Boulevard & Eaton Place
  - Eastbound Left (SAT peak hour)
- 2. Fairfax Boulevard & University Drive
  - Westbound Left (all peak hours)
  - Southbound Left (PM and SAT peak hours)
- 3. Fairfax Boulevard & Chain Bridge Road
  - Westbound Left (AM and PM peak hours)
  - Westbound Right (PM and SAT peak hours)
  - Northbound Left (all peak hours)
  - Northbound Right (AM and PM peak hours)
  - Southbound Right (all peak hours)
- 5. Fairfax Boulevard & Warwick Lane/McLean Avenue
  - Southwestbound Left (PM and SAT peak hours)
- 7. Chain Bridge Road & Eaton Place (main node)
  - Northbound Left (AM peak hour)
  - Southbound Left (all peak hours)

Table 13: Simulation Queuing Results – Background (2023) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.)	AM Peak Max Queue (ft.)	PM Peak Max Queue (ft.)	SAT Peak Max Queue (ft.)
1	**Fairfax Blvd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	130	78	47	154
	Eastbound TR		342	162	401
	Westbound Approach				
	Westbound Left	80	6	50	60
	Westbound Thru		538	1255	646
	Westbound Right		136	1212	234
	Northbound Approach				
	Northbound LTR		20	50	40
	Southbound Approach				
	Southbound Left		391	1326	296
	Southbound TR		42	948	99
	Northeastbound Approach				
	Northeastbound LTR		33	59	49
2	**Fairfax Blvd & University Drive**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	450	74	219	221
	Eastbound TR		242	327	347
	Westbound Approach				
	Westbound Left	150	153	174	174
	Westbound TR		368	393	484
	Northbound Approach				
	Northbound LT		430	411	230
	Northbound Right		262	145	116
	Southbound Approach				
	Southbound Left	120	101	144	145
	Southbound TR		242	283	236
3	**Fairfax Blvd & Chain Bridge Road**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	600	229	189	184
	Eastbound Thru		466	249	421
	Eastbound Right	500	26	31	46
	Westbound Approach				
	Westbound Left	450	475	474	406
	Westbound Thru		956	748	684
	Westbound Right	350	92	375	375
	Northbound Approach				
	Northbound Left	200	212	225	222
	Northbound Thru		500	489	308
	Northbound Right	225	250	256	217
	Southbound Approach				
	Southbound Left	300	171	155	146
	Southbound Thru		355	344	352
	Southbound Right	200	225	225	225
4	**Fairfax Blvd & Farr Ave**				
	Overall Intersection (TWSC)				
	Northbound Approach				
	Northbound Right		23	24	23
	Southbound Approach				
	Southbound Right		21	52	39

Table 13: Simulation Queuing Results – Background (2023) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.)	AM Peak Max Queue (ft.)	PM Peak Max Queue (ft.)	SAT Peak Max Queue (ft.)
5	**Fairfax Blvd & Warwick Ln/McLean Ave**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		228	206	162
	Westbound Approach				
	Westbound LTR		89	105	88
	Northbound Approach				
	Northbound LTR		132	210	89
	Southbound Approach				
	Southbound Left	175	95	71	37
	Southbound TR		42	43	18
	Northeastbound Approach				
	Northeastbound Left		0	22	70
	Northeastbound TR		490	293	355
	Southwestbound Approach				
	Southwestbound Left	150	141	173	174
	Southwestbound TR		299	400	368
6	**Chain Bridge Rd & Orchard St**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left/Right		32	42	36
	Southbound Approach				
	Southbound TR		112	133	174
7	**Chain Bridge Rd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		460	265	135
	Westbound Approach				
	Westbound LTR		64	61	68
	Westbound Right		65	53	62
	Northbound Approach				
	Northbound Left/U	135	267	80	109
	Northbound TR		404	156	231
	Southbound Approach				
	Southbound Left/U	470	494	495	495
	Southbound TR		848	1004	1001
7a	**Chain Bridge Rd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		50	67	52
	Westbound Approach				
	Westbound LTR		555	1215	266
	Northbound Approach				
	Northbound LTR		81	79	46
	Southbound Approach				
	Southbound LTR		319	301	196

Future – Phase 1 (2023) Conditions Results

The results of the queuing analyses for the Future with Development – Phase 1 (2023) conditions ("Future – Phase 1") conditions with the recommended roadway improvement implemented are expressed in maximum queues per lane group/ movement are shown in Table 14. Detailed analysis worksheets are included in the Appendix H.

The queuing analysis results indicate that four of the seven existing study intersections operate with maximum queues that exceed the capacity of future effective storage bays for dedicated turn lanes:

- 2. Fairfax Boulevard & University Drive
  - Westbound Left (PM and SAT peak hours)
  - Southbound Left (PM and SAT peak hours)
- 3. Fairfax Boulevard & Chain Bridge Road
  - Westbound Left (AM peak hours)
  - Westbound Right (PM and SAT peak hours)
  - Northbound Left (all peak hours)
  - Northbound Right (all peak hours)
  - Southbound Right (all peak hours)
- 5. Fairfax Boulevard & Warwick Lane/McLean Avenue
  - Southwestbound Left (PM and SAT peak hours)
- 7. Chain Bridge Road & Eaton Place (main node)
  - Northbound Left (AM and PM peak hours)
  - Southbound Left (all peak hours)

The queueing analysis indicates that the queues remain comparable to the 2023 Background Condition scenario.

Table 14: Simulation Queuing Results – Future Phase 1 (2023) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.)	AM Peak Max Queue (ft.)	PM Peak Max Queue (ft.)	SAT Peak Max Queue (ft.)
1	**Fairfax Blvd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	130	91	50	110
	Eastbound TR		415	145	452
	Westbound Approach				
	Westbound Left	80	18	39	73
	Westbound Thru		486	1252	837
	Westbound Right		66	1215	296
	Northbound Approach				
	Northbound LTR		18	58	41
	Southbound Approach				
	Southbound Left		400	1255	291
	Southbound TR		48	927	90
	Northeastbound Approach				
	Northeastbound LTR		36	51	51
2	**Fairfax Blvd & University Drive**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	450	79	217	204
	Eastbound TR		255	314	380
	Westbound Approach				
	Westbound Left	150	146	166	174
	Westbound TR		268	402	468
	Northbound Approach				
	Northbound LT		431	432	225
	Northbound Right		248	126	133
	Southbound Approach				
	Southbound Left	120	102	145	144
	Southbound TR		257	283	240
3	**Fairfax Blvd & Chain Bridge Road**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	600	232	208	204
	Eastbound Thru		456	240	434
	Eastbound Right	500	31	34	46
	Westbound Approach				
	Westbound Left	450	475	430	380
	Westbound Thru		917	761	674
	Westbound Right	350	69	375	375
	Northbound Approach				
	Northbound Left	200	225	225	224
	Northbound Thru		452	450	298
	Northbound Right	225	250	250	235
	Southbound Approach				
	Southbound Left	300	190	158	130
	Southbound Thru		357	345	343
	Southbound Right	200	225	225	225
4	**Fairfax Blvd & Farr Ave**				
	Overall Intersection (TWSC)				
	Northbound Approach				
	Northbound Right		20	24	29
	Southbound Approach				
	Southbound Right		31	76	48

Table 14: Simulation Queuing Results – Future Phase 1 (2023) Conditions (Continued)

No.	Intersection (Movement)	Effective Storage Length (ft.)	AM Peak Max Queue (ft.)	PM Peak Max Queue (ft.)	SAT Peak Max Queue (ft.)
5	**Fairfax Blvd & Warwick Ln/McLean Ave**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		216	204	151
	Westbound Approach				
	Westbound LTR		87	121	90
	Northbound Approach				
	Northbound LTR		121	240	86
	Southbound Approach				
	Southbound Left	175	110	73	38
	Southbound TR		44	46	25
	Northeastbound Approach				
	Northeastbound Left		0	46	32
	Northeastbound TR		499	281	414
	Southwestbound Approach				
	Southwestbound Left	150	146	174	174
	Southwestbound TR		305	405	380
6	**Chain Bridge Rd & Orchard St**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left/Right		95	115	96
	Southbound Approach				
	Southbound TR		145	190	105
7	**Chain Bridge Rd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		470	262	132
	Westbound Approach				
	Westbound LTR		53	64	78
	Westbound Right		56	65	59
	Northbound Approach				
	Northbound Left/U	135	285	117	149
	Northbound TR		447	150	261
	Southbound Approach				
	Southbound Left/U	470	495	495	495
	Southbound TR		791	1000	997
7a	**Chain Bridge Rd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		55	69	53
	Westbound Approach				
	Westbound LTR		533	1311	256
	Northbound Approach				
	Northbound LTR		88	90	55
	Southbound Approach				
	Southbound LTR		319	303	183

Background (2027) Conditions Results

The results of the queuing analyses for the Future without Development (2027) conditions ("Background 2027") conditions are expressed in maximum queues per lane group/ movement are shown in Table 15. Detailed analysis worksheets are included in the Appendix I.

The queuing analysis results indicate that four of the seven existing study intersections operate with maximum queues that exceed the capacity of future effective storage bays for dedicated turn lanes:

- 2. Fairfax Boulevard & University Drive
  - Westbound Left (all peak hours)
  - Southbound Left (PM and SAT peak hours)
- 3. Fairfax Boulevard & Chain Bridge Road
  - Westbound Left (AM and PM peak hours)
  - Westbound Right (PM peak hour)
  - Northbound Left (PM and SAT peak hours)
  - Northbound Right (all peak hours)
  - Southbound Right (all peak hours)
- 4. Fairfax Boulevard & Farr Avenue
  - Westbound Left (PM and SAT peak hours)
- 7. Chain Bridge Road & Eaton Place (main node)
  - Northbound Left (AM peak hour)
  - Southbound Left (all peak hours)

Table 15: Simulation Queuing Results – Background (2027) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.)	AM Peak Max Queue (ft.)	PM Peak Max Queue (ft.)	SAT Peak Max Queue (ft.)
1	**Fairfax Blvd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	130	74	61	123
	Eastbound TR		359	244	445
	Westbound Approach				
	Westbound Left	80	12	50	58
	Westbound Thru		367	1252	947
	Westbound Right		51	1251	666
	Northbound Approach				
	Northbound LTR		18	48	39
	Southbound Approach				
	Southbound Left		393	988	418
	Southbound TR		41	576	205
	Northeastbound Approach				
	Northeastbound LTR		46	62	60
2	**Fairfax Blvd & University Drive**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	450	63	217	238
	Eastbound TR		308	396	384
	Westbound Approach				
	Westbound Left	150	162	174	164
	Westbound TR		292	470	607
	Northbound Approach				
	Northbound LT		394	430	218
	Northbound Right		249	153	149
	Southbound Approach				
	Southbound Left	120	96	126	143
	Southbound TR		252	283	242
3	**Fairfax Blvd & Chain Bridge Road**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	600	213	206	212
	Eastbound Thru		535	342	503
	Eastbound Right	500	29	34	74
	Westbound Approach				
	Westbound Left	450	475	474	437
	Westbound Thru		955	802	921
	Westbound Right	350	84	375	340
	Northbound Approach				
	Northbound Left	200	186	225	225
	Northbound Thru		599	587	415
	Northbound Right	225	338	325	321
	Southbound Approach				
	Southbound Left	300	173	169	166
	Southbound Thru		356	347	355
	Southbound Right	200	225	225	225
4	**Fairfax Blvd & Farr Ave**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	200	0	0	0
	Eastbound TR		163	221	188
	Westbound Approach				
	Westbound Left	80	62	84	93
	Westbound TR		81	291	254
	Northbound Approach				
	Northbound LTR		86	136	110
	Southbound Approach				
	Southbound LTR		29	47	42

Table 15: Simulation Queuing Results – Background (2027) Conditions (Continued)

No.	Intersection (Movement)	Effective Storage Length (ft.)	AM Peak Max Queue (ft.)	PM Peak Max Queue (ft.)	SAT Peak Max Queue (ft.)
5	**Fairfax Blvd & Warwick Ln/McLean Ave**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		86	66	64
	Northbound Approach				
	Northbound LTR		128	210	94
	Northeastbound Approach				
	Northeastbound Left	120	0	30	28
	Northeastbound TR		202	163	214
	Southwestbound Approach				
	Southwestbound Left	150	53	92	75
	Southwestbound TR		142	198	221
6	**Chain Bridge Rd & Orchard St**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left/Right		35	38	36
	Southbound Approach				
	Southbound TR		136	143	242
7	**Chain Bridge Rd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		451	249	121
	Westbound Approach				
	Westbound LTR		56	53	60
	Westbound Right		56	57	57
	Northbound Approach				
	Northbound Left/U	135	218	93	105
	Northbound TR		386	151	301
	Southbound Approach				
	Southbound Left/U	470	494	495	495
	Southbound TR		811	1002	992
7a	**Chain Bridge Rd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		62	61	50
	Westbound Approach				
	Westbound LTR		518	1181	261
	Northbound Approach				
	Northbound LTR		84	61	47
	Southbound Approach				
	Southbound LTR		316	292	172

Future – Phase 2 (2027) Conditions Results

The results of the queuing analyses for the Future with Development – Phase 2 (2027) conditions ("Future – Phase 2") conditions with the recommended roadway improvement implemented are expressed in maximum queues per lane group/ movement are shown in Table 16. Detailed analysis worksheets are included in the Appendix J.

The queuing analysis results indicate that four of the seven existing study intersections operate with maximum queues that exceed the capacity of future effective storage bays for dedicated turn lanes:

- 2. Fairfax Boulevard & University Drive
  - Westbound Left (all peak hours)
  - Southbound Left (PM and SAT peak hours)
- 3. Fairfax Boulevard & Chain Bridge Road
  - Westbound Left (all peak hours)
  - Westbound Right (PM and SAT peak hours)
  - Northbound Left (all peak hours)
  - Northbound Right (all peak hours)
  - Southbound Right (all peak hours)
- 4. Fairfax Boulevard & Farr Avenue
  - Westbound Left (SAT peak hours)
- 7. Chain Bridge Road & Eaton Place (main node)
  - Southbound Left (all peak hours)

The queueing analysis indicates that the queues remain comparable to the 2027 Background Condition scenario.

Table 16: Simulation Queuing Results – Future Phase 2 (2027) Conditions

No.	Intersection (Movement)	Effective Storage Length (ft.)	AM Peak Max Queue (ft.)	PM Peak Max Queue (ft.)	SAT Peak Max Queue (ft.)
1	**Fairfax Blvd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	130	86	39	111
	Eastbound TR		265	207	403
	Westbound Approach				
	Westbound Left	80	7	49	58
	Westbound Thru		388	1268	1021
	Westbound Right		82	1262	769
	Northbound Approach				
	Northbound LTR		25	52	46
	Southbound Approach				
	Southbound Left		214	310	171
	Southbound LTR		228	334	192
	Northeastbound Approach				
	Northeastbound LTR		36	63	44
2	**Fairfax Blvd & University Drive**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	450	61	250	206
	Eastbound TR		319	348	253
	Westbound Approach				
	Westbound Left	150	155	174	175
	Westbound TR		424	467	783
	Northbound Approach				
	Northbound LT		418	382	222
	Northbound Right		222	143	144
	Southbound Approach				
	Southbound Left	120	94	144	145
	Southbound TR		261	283	232
3	**Fairfax Blvd & Chain Bridge Road**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	600	220	210	259
	Eastbound Thru		558	349	529
	Eastbound Right	500	82	45	207
	Westbound Approach				
	Westbound Left	450	475	475	475
	Westbound Thru		951	775	1006
	Westbound Right	350	89	375	375
	Northbound Approach				
	Northbound Left	200	225	225	225
	Northbound Thru		492	825	356
	Northbound Right	225	250	250	248
	Southbound Approach				
	Southbound Left	300	201	160	136
	Southbound Thru		306	294	262
	Southbound Right	200	225	225	225
4	**Fairfax Blvd & Farr Ave**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left	200	51	115	80
	Eastbound TR		145	177	185
	Westbound Approach				
	Westbound Left	80	43	58	93
	Westbound TR		120	345	316
	Northbound Approach				
	Northbound LTR		98	132	98
	Southbound Approach				
	Southbound LTR		79	112	102

Table 16: Simulation Queuing Results – Future Phase 2 (2027) Conditions (Continued)

No.	Intersection (Movement)	Effective Storage Length (ft.)	AM Peak Max Queue (ft.)	PM Peak Max Queue (ft.)	SAT Peak Max Queue (ft.)
5	**Fairfax Blvd & Warwick Ln/McLean Ave**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		90	65	67
	Northbound Approach				
	Northbound LTR		140	209	81
	Northeastbound Approach				
	Northeastbound Left	120	0	28	36
	Northeastbound TR		179	138	208
	Southwestbound Approach				
	Southwestbound Left	150	68	105	64
	Southwestbound TR		144	195	223
6	**Chain Bridge Rd & Orchard St**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound Left		152	163	178
	Eastbound Right	150	113	125	144
	Southbound Approach				
	Southbound TR		221	244	563
7	**Chain Bridge Rd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		428	260	128
	Westbound Approach				
	Westbound LTR		56	60	56
	Westbound Right		58	54	58
	Northbound Approach				
	Northbound Left/U	135	115	100	129
	Northbound TR		440	199	327
	Southbound Approach				
	Southbound Left/U	470	494	495	495
	Southbound TR		853	999	1001
7a	**Chain Bridge Rd & Eaton Pl**				
	Overall Intersection (Signalized)				
	Eastbound Approach				
	Eastbound LTR		53	59	52
	Westbound Approach				
	Westbound LTR		501	1197	254
	Northbound Approach				
	Northbound LTR		91	72	58
	Southbound Approach				
	Southbound LTR		320	292	183

TRANSPORTATION MANAGEMENT PLAN

Transportation Demand Management (TDM) is the establishment of measures to influence travel behavior by mode, frequency, time, route, or trip length in order to achieve a maximally efficient use of transportation facilities. The Northfax development is well connected via Fairfax Boulevard (Route 50) and Chain Bridge Road (Route 123), which are regional arterials that provide direct connections to I-66 and the Capital Beltway (I-495). The proposed Northfax development is located approximately 3.6 miles away from the Vienna/Fairfax-GMU Metrorail Station. The site is served by two bus systems, with three routes adjacent to the site.

The guidelines contained herein provide a variety of strategies that can be incorporated into a Transportation Demand Management (TDM) plan for the site. The TDM plan will have many components that are tailored to accommodate the Northfax site. Once implemented, the TDM program will be monitored and adjusted as needed to continually create opportunities to reduce the amount of traffic generated by the site.

A TDM plan, specific for the Northfax development site, will be submitted to the City of Fairfax as a separate document.

Major components of carrying out a TDM plan include (1) Metrorail/Metrobus/CUE Bus promotion, (2) ridesharing promotion, (3) parking management, (4) on-site construction measures, (5) lease agreements, and (6) monitoring and compliance.

The site's location in relation to the Vienna/Fairfax-GMU Metrorail Station and three existing Metrobus/CUE Bus routes lot allows for a TDM program that may include, but not be limited to, the following strategies:

PARTICIPATION AND FUNDING

1) Designate a member of the Northfax building management or leasing office to serve as the TMP coordinator. The TMP coordinator will function as the primary point of contact with the City and undertake the implementing, coordinating, and managing of all TDM obligations. Additionally, the TMP coordinator will oversee the enforcement and monitoring of the strategies included in the TDM plan.

FACILITIES AND IMPROVEMENTS

1) Bicycle racks will be installed across the site for the use of retail shoppers, residents and visitors. The bicycle racks for retail customers and visitors shall be located to provide convenient access to the retail store fronts or residential entrances as appropriate and may be located on the sidewalks and on the ground level of the garages as appropriate. The racks for residents may be located in bicycle storage areas inside the building.

2) Pedestrians will experience increased mobility with the proposed redevelopment due to the street pattern of smaller street blocks.

3) Provide in the lobby or lobbies, a transportation information display(s), the number, content, design, and location of which will be approved by the City of Fairfax.

PROMOTIONS, SERVICES, POLICIES

1) The TMP coordinator will serve as the focal point for all commuter transportation initiatives. The transportation coordinator's name and contact information are posted in employee break areas, the rental leasing company website, and other locations within the Northfax buildings. Additionally, the transportation coordinator establishes a calendar of events, provides regular employee and renter communications, conducts targeted vanpool and transit marketing and other outreach to keep commuting at the forefront of the resident environment. The TMP coordinator supports bicycling efforts by sponsoring events such as "Bike to Work" and participate in "Air Quality Action Days".

2) As appropriate, the TMP coordinator can sponsor development of a website that provides commuting information, linked to external transportation services. Additionally, they can provide links to websites, such as http://www.commuterconnections.org, which will serve as the platform in which the residents can interact for the purpose of setting up carpools. The website may act as a central carpooling organizer for residents in the building, where residents can login to post destination inquiries and carpool requests. Links

to websites for the local transit opportunities, such as Metro (http://www.wmata.com) will be provided.

3) Transit subsidy programs may include the regional Metrorail/Metrobus and CUE Bus systems. The property management company and retail tenants with employees who either ride transit or vanpool are encouraged to enroll in a *SmartBenefits* pre-tax benefits program to help them take advantage of available automated and convenient tax savings on their transit costs. Also, a coordinated approach to transit opportunities will be explored in conjunction with other projects / developments / apartment buildings located in the vicinity of the site to potentially create a bus service providing direct access between each participating building and the Vienna/Fairfax-GMU Metrorail station.

4) Encourage and promote rideshare matching and incentives for car/vanpooling for both Northfax residents and (non-resident) employees. Strategies include transportation fares, distribution of ridesharing marketing material to residents and employees, and displaying information material, such as posters, brochures, etc., in common areas like hallways elevators, restrooms, water fountains, building management offices and public space notice boards.

A reason often cited to not participate in ridesharing arrangements is the need to have a personal vehicle at hand for emergency situations. A number of innovative programs have been developed which provide emergency transportation to one's home or child's school, daycare, etc. Programs include a limited taxi/bus fare subsidy, relaxed company vehicle policies, and the free Guaranteed Ride Home service provided by Commuter Connections.

Performance and Monitoring

1) Surveys are useful in determining commuting patterns, mode split, average commute distance and travel times, employee and resident attitudes, needs, and willingness to switch modes. In order to set objectives and monitor performance, resident and (non-resident) employee transportation surveys should be conducted on a bi-yearly basis. The data is useful in developing successful transportation programs, such as transit subsidies, and car and vanpool programs. In addition to the travel survey, the TMP coordinator will conduct counts of car and bicycle parking usage and deliver them to the City.

CRASH DATA ANALYSIS

Historical crash data was obtained from VDOT for the existing study intersections for a five-year period, from January 2014 to December 2018. Based on the available data, over the past five years, there were no fatal crashes at any of the study intersections. Of the 257 reported crashes at the study intersections, 83 resulted in injury and 174 crashes resulted in property damage only. The crash data for the existing study intersections are broken down in Table 17 to Table 23. The crash data from VDOT is provided in the Appendix K.

According to the Institute of Transportation Engineers' *Transportation Impact Analysis for Site Development*, a crash rate of 1.0 or higher is an indication that further study is required. One of the seven intersections in this study area meet this criterion. The Northfax development should be developed in a manner to help alleviate, or at minimum not add to, the conflicts at this intersection.

A rate over 1.0 does not necessarily mean there is a significant problem at an intersection, but rather it is a threshold used to identify which intersections may have higher crash rates due to operational, geometric, or other deficiencies. Additionally, the crash data does not provide detailed location information. In some cases, the crashes were located near the intersections and not necessarily within the intersection.

The intersection of Fairfax Boulevard and Chain Bridge Road was found to have a crash rate of 1.08 crashes per million entering vehicles (MEV) over the course of the five-year study period. Of the 75 crashes recorded over this period, 44 were classified as rear end collision.

Based on the descriptions of the crashes, the rear end collisions occurred due mostly to distracted driving. No one direction appeared to show a higher rate of rear end collisions than another. The presence of construction along the westbound and southbound directions was cited as a reason for the distraction of drivers.

Table 17: Crash Data for the Intersection of Fairfax Blvd and Eaton Pl (2014 – 2018)

Intersection	Int	Crash Data for the Intersection of Fairfax Blvd and Eaton Pl (2014 – 2018)						
		2014	2015	2016	2017	2018	Total	Relative Frequency
Crash Severity								
Fatal Collision								0.00%
Injury Collision			1	4	3	1	9	31.03%
Type A					*2*		*2*	
Type B			*1*	*2*		*1*	*4*	
Type C				*2*	*1*		*3*	
Property Damage Only		4	7	1	5	3	20	68.97%
TOTAL		4	8	5	8	4	29	100.00%
Crash Type								
Fixed Object/ Single-Vehicle Crash								0.00%
Head-On				1	1		2	6.90%
Sideswipe / Same Direction			1				1	3.45%
Sideswipe / Opposite Direction								0.00%
Rear-End Collision		3	4	3	5	2	17	58.62%
Angle Collision		1	3	1	2	2	9	31.03%
Backed Into								0.00%
Pedestrian Collision								0.00%
Deer/Animal								0.00%
Other								0.00%
TOTAL		4	8	5	8	4	29	100.00%
Other Factors								
Distracted Driver		1	2	4	2	1	10	34.48%
Alcohol Related								0.00%
Work-Zone Related					1		1	3.45%
Inclement Weather (Non-Dry)		4	8	5	8	4	29	100.00%
Speeding								0.00%
Disregard of Traffic Control Device								0.00%
Pedestrian Injury								N/A
CALCULATED CRASH RATE							***0.40***	***Crashes per MEV***

Table 18: Crash Data for the Intersection of Fairfax Blvd and University Dr (2014 – 2018)

Intersection	Int	Crash Data for the Intersection of Fairfax Blvd and University Dr (2014 – 2018)						
		2014	2015	2016	2017	2018	Total	Relative Frequency
Crash Severity								
Fatal Collision								0.00%
Injury Collision		5	2	1			8	24.24%
Type A			*1*				*1*	
Type B		*5*		*1*			*6*	
Type C			*1*				*1*	
Property Damage Only		8	4	7	6		25	75.76%
TOTAL		13	6	8	6		33	100.00%
Crash Type								
Fixed Object/ Single-Vehicle Crash		1					1	3.03%
Head-On								0.00%
Sideswipe / Same Direction			2	1	1		4	12.12%
Sideswipe / Opposite Direction								0.00%
Rear-End Collision		9	1	3	4		17	51.52%
Angle Collision		2	2	4	1		9	27.27%
Backed Into								0.00%
Pedestrian Collision			1				1	3.03%
Deer/Animal								0.00%
Other		1					1	3.03%
TOTAL		13	6	8	6	0	33	100.00%
Other Factors								
Distracted Driver		2	1	2	1		6	18.18%
Alcohol Related								0.00%
Work-Zone Related								0.00%
Inclement Weather (Non-Dry)		13	6	8	6		33	100.00%
Speeding								0.00%
Disregard of Traffic Control Device								0.00%
Pedestrian Injury								N/A
CALCULATED CRASH RATE							***0.45***	***Crashes per MEV***

Table 19: Crash Data for the Intersection of Fairfax Blvd and Chain Bridge Road (2014 – 2018)

Intersection	Int	Crash Data for the Intersection of Fairfax Blvd and Chain Bridge Road (2014 – 2018)						
		2014	2015	2016	2017	2018	Total	Relative Frequency
Crash Severity								
Fatal Collision								0.00%
Injury Collision		7	6	9	1	5	28	37.33%
Type A			*1*	*1*			*2*	
Type B		*4*	*4*	*5*		*2*	*15*	
Type C		*3*	*1*	*3*	*1*	*3*	*11*	
Property Damage Only		10	6	15	12	4	47	62.67%
TOTAL		17	12	24	13	9	75	100.00%
Crash Type								
Fixed Object/ Single-Vehicle Crash								0.00%
Head-On		1					1	1.33%
Sideswipe / Same Direction		1	1	3			5	6.67%
Sideswipe / Opposite Direction								0.00%
Rear-End Collision		10	7	14	7	6	44	58.67%
Angle Collision		5	4	7	6	3	25	33.33%
Backed Into								0.00%
Pedestrian Collision								0.00%
Deer/Animal								0.00%
Other								0.00%
TOTAL		17	12	24	13	9	75	100.00%
Other Factors								
Distracted Driver		3	2	3	4	1	13	17.33%
Alcohol Related								0.00%
Work-Zone Related					5		5	6.67%
Inclement Weather (Non-Dry)		17	12	24	13	9	75	100.00%
Speeding								0.00%
Disregard of Traffic Control Device								0.00%
Pedestrian Injury								N/A
CALCULATED CRASH RATE							***1.08***	***Crashes per MEV***

Table 20: Crash Data for the Intersection of Fairfax Blvd and Farr Ave (2014 – 2018)

Intersection	Int	Crash Data for the Intersection of Fairfax Blvd and Farr Ave (2014 – 2018)						
		2014	2015	2016	2017	2018	Total	Relative Frequency
Crash Severity								
Fatal Collision								0.00%
Injury Collision					2		2	33.33%
Type A								
Type B					*1*		*1*	
Type C					*1*		*1*	
Property Damage Only			1		2	1	4	66.67%
TOTAL			1		4	1	6	100.00%
Crash Type								
Fixed Object/ Single-Vehicle Crash								0.00%
Head-On								0.00%
Sideswipe / Same Direction					1		1	16.67%
Sideswipe / Opposite Direction								0.00%
Rear-End Collision					2		2	33.33%
Angle Collision			1		1	1	3	50.00%
Backed Into								0.00%
Pedestrian Collision								0.00%
Deer/Animal								0.00%
Other								0.00%
TOTAL		0	1	0	4	1	6	100.00%
Other Factors								
Distracted Driver					1		1	16.67%
Alcohol Related								0.00%
Work-Zone Related								0.00%
Inclement Weather (Non-Dry)			1		4	1	6	100.00%
Speeding								0.00%
Disregard of Traffic Control Device								0.00%
Pedestrian Injury								N/A
CALCULATED CRASH RATE							***0.09***	***Crashes per MEV***

Table 21: Crash Data for the Intersection of Fairfax Blvd and McLean Ave (2014 – 2018)

Intersection	Int	Crash Data for the Intersection of Fairfax Blvd and McLean Ave (2014 – 2018)						
		2014	2015	2016	2017	2018	Total	Relative Frequency
Crash Severity								
Fatal Collision								0.00%
Injury Collision		1	1		1		3	25.00%
Type A					*1*		*1*	
Type B		*1*					*1*	
Type C			*1*				*1*	
Property Damage Only		2		1	2	4	9	75.00%
TOTAL		3	1	1	3	4	12	100.00%
Crash Type								
Fixed Object/ Single-Vehicle Crash								0.00%
Head-On								0.00%
Sideswipe / Same Direction					1		1	8.33%
Sideswipe / Opposite Direction								0.00%
Rear-End Collision		2		1	2	2	7	58.33%
Angle Collision			1			2	3	25.00%
Backed Into								0.00%
Pedestrian Collision								0.00%
Deer/Animal								0.00%
Other		1					1	8.33%
TOTAL		3	1	1	3	4	12	100.00%
Other Factors								
Distracted Driver		1	1		1	1	4	33.33%
Alcohol Related								0.00%
Work-Zone Related								0.00%
Inclement Weather (Non-Dry)		3	1	1	3	4	12	100.00%
Speeding								0.00%
Disregard of Traffic Control Device								0.00%
Pedestrian Injury								N/A
CALCULATED CRASH RATE							***0.18***	***Crashes per MEV***

Table 22: Crash Data for the Intersection of Chain Bridge Road and Orchard St (2014 – 2018)

Intersection	Int	Crash Data for the Intersection of Chain Bridge Road and Orchard St (2014 – 2018)						
		2014	2015	2016	2017	2018	Total	Relative Frequency
Crash Severity								
Fatal Collision								0.00%
Injury Collision		3	3	2	2	1	11	32.35%
Type A								
Type B		*3*	*2*			*1*	*6*	
Type C			*1*	*2*	*2*		*5*	
Property Damage Only		2	5	7	5	4	23	67.65%
TOTAL		5	8	9	7	5	34	100.00%
Crash Type								
Fixed Object/ Single-Vehicle Crash								0.00%
Head-On						1	1	2.94%
Sideswipe / Same Direction								0.00%
Sideswipe / Opposite Direction								0.00%
Rear-End Collision		1	1	1	1		4	11.76%
Angle Collision		4	7	7	5	3	26	76.47%
Backed Into								0.00%
Pedestrian Collision								0.00%
Deer/Animal								0.00%
Other				1	1	1	3	8.82%
TOTAL		5	8	9	7	5	34	100.00%
Other Factors								
Distracted Driver		2		1	3	2	8	23.53%
Alcohol Related								0.00%
Work-Zone Related					3		3	8.82%
Inclement Weather (Non-Dry)		5	8	9	7	5	34	100.00%
Speeding								0.00%
Disregard of Traffic Control Device								0.00%
Pedestrian Injury								N/A
CALCULATED CRASH RATE							***0.49***	***Crashes per MEV***

Table 23: Crash Data for the Intersection of Chain Bridge Road and Eaton Pl (2014 – 2018)

Intersection	Int	Crash Data for the Intersection of Chain Bridge Road and Eaton Place (2014 – 2018)						
		2014	2015	2016	2017	2018	Total	Relative Frequency
Crash Severity								
Fatal Collision								0.00%
Injury Collision		5	7	3	3	4	22	32.35%
Type A			*1*	*2*		*1*	*4*	
Type B		*4*	*2*	*1*			*7*	
Type C		*1*	*4*		*3*	*3*	*11*	
Property Damage Only		9	4	12	12	9	46	67.65%
TOTAL		14	11	15	15	13	68	100.00%
Crash Type								
Fixed Object/ Single-Vehicle Crash			1		1		2	2.94%
Head-On				1			1	1.47%
Sideswipe / Same Direction		1	1	2	7	4	15	22.06%
Sideswipe / Opposite Direction								0.00%
Rear-End Collision		2	1	3	1	3	10	14.71%
Angle Collision		11	8	8	6	6	39	57.35%
Backed Into								0.00%
Pedestrian Collision								0.00%
Deer/Animal								0.00%
Other				1			1	1.47%
TOTAL		14	11	15	15	13	68	100.00%
Other Factors								
Distracted Driver		3	1	3	3	3	13	19.12%
Alcohol Related								0.00%
Work-Zone Related				1			1	1.47%
Inclement Weather (Non-Dry)		14	11	15	15	13	68	100.00%
Speeding								0.00%
Disregard of Traffic Control Device								0.00%
Pedestrian Injury								N/A
CALCULATED CRASH RATE							***0.98***	***Crashes per MEV***

SUMMARY AND CONCLUSIONS

This report presents the findings of a Traffic Impact Study (TIS) for the Northfax development in the City of Fairfax, Virginia.

The purpose of this report is to review existing and future transportation facilities in the area surrounding the project site, project the transportation demand needed of the project, determine if the new transportation demand generated by the project would have negative impacts on the surrounding transportation network, and present recommendations to minimize the negative impacts from the proposed project.

This report concludes that the proposed development **will have a negligible impact** to the surrounding transportation and roadway network assuming that all planned site design elements are implemented.

Site Location and Study Area

The proposed development site is located in the City of Fairfax, Virginia. The vehicular study area consists of eight intersections along Fairfax Boulevard and Chain Bridge Road, including one future intersection providing access to the development.

Proposed Project

The proposed Northfax development is anticipated to be completed in two phases. Phase 1 focuses on residential development on the northern and western portions of the site, while Phase 2 includes a balance of the residential development and commercial development within the site.

It should be noted that the current application for the site only pertains to Phase 1. A separate application for Phase 2 will be submitted subsequently to the City of Fairfax. As such, the Phase 2 portion of the development described herein is for transportation planning purposes and is subject to change with the future application.

A description of each phase is presented below.

Phase 1: Phase 1 consists of 56 multi-family residential units and 200 continuing care retirement community units, which is anticipated to be completed and in operation by 2023. Access to the site is proposed to be provided via Orchard Street and via the proposed extension of Farr Avenue. Phase 1 will account for the planned extension of University Drive to join Eaton Place and the extension of Farr Avenue (by the City of Fairfax) to Orchard Street.

Phase 2: Phase 2 will include approximately 25,000 square feet of commercial uses (including retail space, office space, and restaurants) with approximately 180 residential dwelling units on the upper floors and a 140-room capacity hotel. Phase 2 is anticipated to be complete by 2027. In addition to Orchard Street, a right-in (RI) only access along Chain Bridge Road is proposed to provide access to the site. Phase 2 will account for the planned extension of University Drive to join Eaton Place; the extension of Farr Avenue to Orchard Street; signalization of Farr Avenue and Fairfax Boulevard; and Re-alignment of Warwick Avenue, Fairfax Boulevard, and McLean Avenue.

Of note, the development program for Phase 2 would be in addition to that of Phase 1.

Impacts and Recommendations

The analysis contained includes the following scenarios:

- Existing Conditions (2019),
- Future Conditions without Development – Phase 1 (2023),
- Future Conditions with Development – Phase 1 (2023),
- Future Conditions without Development – Phase 2 (2027), and
- Future Conditions with Development – Phase 2 (2027).

The analysis presented in this report supports the following major findings and recommendations:

Transit

The subject site is served by transit, including 13 bus stops within a quarter-mile of the site, as well as the Vienna/Fairfax-GMU Metrorail Station which is 3.6 miles from the site and accessible by bus.

It is anticipated that the proposed development will generate a small number of transit trips during the AM and PM peak hours and is not anticipated to significantly increase the current boardings and alightings at adjacent bus stops.

Pedestrian

While there are some existing pedestrian network deficiencies within a ¼ mile walk of the site, this project will reduce deficiencies by providing new ADA-compliant curb ramps at all site access points and an improved streetscape along Orchard Street and internal roadways.

Bicycle

The proposed site will include improvements to the bicycle network within the site. Further bicycle improvements near the proposed site are planned as part of the City of Fairfax's *Multimodal Transportation Plan*.

Vehicular

The site is well connected via Fairfax Boulevard and Chain Bridge Road, both classified as "Other Principal Arterials" by the Virginia Department of Transportation (VDOT).

Under Phase 1, the proposed development will generate 51 new vehicular trips in the weekday morning (AM) peak hour, 62 new vehicular trips during the weekday afternoon (PM) peak hour, and 77 new vehicular trips during the Saturday midday (SAT) peak hour. Ultimately, under Phase 2, the proposed development will generate approximately 264 new vehicular trips in the AM peak hour, 342 new vehicular trips in the PM peak hour, and 402 new vehicular trips in the Saturday peak hour.

A trip generation comparison between the proposed and by-right uses was evaluated, and the results indicate that the proposed development program would generate half of the peak hour traffic when compared to what is allowable by-right.

Under Phase 1 conditions, the increase in vehicular trips would attribute to an increase of less than 1.0% in peak hour traffic along Fairfax Boulevard and an increase of less than 1.1% in peak hour traffic along Chain Bridge Road. Under Phase 2 conditions, the increase in vehicular trips would attribute to an increase of less than 3.3% in peak hour traffic along Fairfax Boulevard and an increase of less than 3.2% in peak hour traffic along Chain Bridge Road.

In order to determine the impacts of the proposed development on this transportation network, this report projects future conditions with and without the proposed development and performs analyses of intersection delays.

All intersections within the study area have approaches that operate at levels beyond acceptable thresholds in one or more peak hour in one or more conditions scenario, with the exception of Chain Bridge Road & Future Site Access (Intersection 8).

As outlined in this report, under 2023 Future with Development Conditions, the intersection of Chain Bridge Road at Eaton Place (main node) (Intersection 7) begins to operate at a LOS E during the AM peak hour with an increase in delay of 0.3 seconds over the LOS D/E threshold. Additionally, the intersection of Fairfax Boulevard at Chain Bridge Road begins to experience slight increases in delays.

With slight increases in delays at these intersections, the impact of the proposed development is not anticipated to significantly alter driver's expectation at the signals. However, if necessary, the increases in delay can be mitigated with a slight change in the signal timings at these intersections.

Under 2027 Future with Development Conditions, five of the eight intersections are recommended to have improvements (geometric and/or adjustments to signal timings). The five intersection are as follows:

- Int 1: Fairfax Boulevard & Eaton Place
- Int 3: Fairfax Boulevard & Chain Bridge Road
- Int 4: Fairfax Boulevard & Farr Avenue/Future Site Access
- Int 6: Chain Bridge Road & Orchard Street
- Int 7: Chain Bridge Road & Eaton Place (main node)
- Int 7a: Chain Bridge Road & Eaton Place (east node)

Transportation Management Plan

Transportation Demand Management (TDM) is the implementation of measures to influence travel behavior by mode, frequency, time, route, or trip length in order to achieve a maximally efficient use of transportation facilities. The TDM plan will have many components that are tailored to accommodate the Northfax site.

TDM components and management/monitoring measures are outlined in the report.

Summary and Recommendations

This report concludes that the proposed development **will have a negligible impact** to the surrounding transportation and roadway network assuming that all planned site design elements are implemented.

TECHNICAL APPENDIX

Appendix A – Signed Scoping Document

Appendix B – Existing Turning Movement Counts

Appendix C – Northfax Development Trip Generation Comparison Documentation

Appendix D – Background Development Trip Generation

Appendix E – Vehicle Level of Service Definitions

Appendix F – Vehicular Capacity Analysis Worksheets – Existing (2019) Conditions

Appendix G – Vehicular Capacity Analysis Worksheets – Future (2023) Conditions without Development

Appendix H – Vehicular Capacity Analysis Worksheets – Future (2023) Conditions with Development Phase 1

Appendix I– Vehicular Capacity Analysis Worksheets – Future (2027) Conditions without Development

Appendix J – Vehicular Capacity Analysis Worksheets – Future (2027) Conditions with Development Phase 2

Appendix K – Crash Data

Appendix A

Signed Scoping Document

THIS IS NOT A CHAPTER 870 STUDY

VDOT Virginia Department of Transportation	PRE-SCOPE OF WORK MEETING FORM Information on the Project Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting the form to VDOT and the locality no less than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

Contact Information			
Consultant Name: Tele: E-mail:	Chad Baird, Gorove/Slade Associates, Inc. 571-248-0992 chad.baird@goroveslade.com		
Developer/Owner Name: Tele: E-mail:	Andrew Rosenberger, Madison Homes, LLC andrew@madisonhomesinc.com		
Project Information			
Project Name:	Northfax	Locality/County:	City of Fairfax
Project Location: (Attach regional and site specific location map)	The proposed Northfax development is planned to be situated along the western frontage of Chain Bridge Road (Rte. 123) and north of Fairfax Boulevard (Rte. 50), in the City of Fairfax, Virginia.		
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 proposed Northfax development is anticipated to be completed in two phases. Phase 1 would include the residential development at the back and Phase 2 would be the balance of the residential development and commercial developments. A brief description of each phase is presented below - Phase 1: Phase 1 would consist of 56 multi-family residential units and 200 continuing care retirement community units and is anticipated to be completed by 2023. Access to the site would be provided via one access from Orchard Street at Chain Bridge and one access from extended Farr Ave at Fairfax. This phase will also account for the planned extension of University Drive to Eaton Place Phase 2: This phase would include approximately 20,000 square feet of ground floor retail uses and 5,000 square feet of high turnover sit-down restaurant with approximately 180 residential dwelling units on the upper floors and a 140-room capacity hotel. Phase 2 is anticipated to be complete by 2027. In addition to the Orchard Street and Farr Ave access points, a right-in access only along Chain Bridge Road will provide access to the site under this scenario. The proposed development is planned to be situated on approximately 15.2 acres of land. The land parcels constituting the site can be identified in the City's Real Estate Assessment Database as ID 57-2-47-000A, 57-2-02-003, 005, 009, 010 and 57-2-02-017, 018, 019, 57-2-07-015B, 57-2-08-005, 006, 007, 008, 010, 011, 012, 013, 014.		

	The parcels fronting Fairfax Boulevard and Chain Bridge Road are currently zoned CR (Commercial Retail District), while the interior parcels are zoned RM (Residential Medium).			
Proposed Use(s): (Check all that apply; attach additional pages as necessary)	Residential ☐	Commercial ☐	Mixed Use ☒	Other ☐
	Residential Uses(s) Number of Units: 236 (56 units under phase 1 and 180 units under phase 2) ITE LU Code(s): 220 and 221 (Multifamily Housing (Apartments, Townhomes, Condo) Number of Units: 200 ITE LU Code(s): 255 (Continued Care Retirement Community)		**Retail Use(s)** ITE LU Code(s): 820 (Shopping Center) Square Ft or Other Variable: 20,000 square feet **Other Use(s)** ITE LU Code(s): 310 (Hotel) Square Ft or Other Variable: 140 rooms ITE LU Code(s): 932 (High-Turnover (Sit-down) Restaurant) Square Ft or Other Variable: 5,000 square feet	
Total Peak Hour Trip Projection:	Less than 100 ☐	100 – 499 ☒	500 – 999 ☐	1,000 or more ☐
Traffic Impact Analysis Assumptions				
Study Period	Existing Year: 2019	Phase 1 Build-out Year: 2023 Phase 2 Build-out Year: 2027	Design Year: N/A	
Study Area Boundaries (Attach map)	North: Eaton Place/Assembly Drive	South: Fairfax Boulevard (Rte. 50)		
	East: Chain Bridge Road (Rte. 123)	West: McLean Ave		
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	1. Extension of University Drive to meet Eaton Place 2. Extension of Farr Ave. to meet Orchard Street 3. Fairfax Boulevard and Warwick Ave./McLean Ave. Intersection Improvements 4. Crossover and Signalization of Farr Ave at Fairfax Boulevard (possible mitigation under Phase 1 development conditions; will be assumed constructed by 2027 with Warwick Improvements) 5. Whole Foods development along Fairfax Boulevard 6. Paul VI Redevelopment along Fairfax Boulevard			
Consistency With Comprehensive Plan (Land use, transportation plan)	Yes			

Available Traffic Data (Historical, forecasts)	VDOT Historical AADT Data		
Trip Distribution (Please refer to attached Figure 2 through Figure 6)	(Please refer to attached Figure 2 through Figure 6)		
Annual Vehicle Trip Growth Rate:	(2019-2023): 2% (2023-2027): 1%	Peak Period for Study (check all that apply)	☒ AM ☒ PM ☒ SAT
		Peak Hour of the Generator Trips	332 AM; 412 PM; 4,284 Weekday Daily, 380 SAT, 4,289 SAT Daily
		New Peak Hour of Adjacent Trips (Used in Study)	248 AM; 348 PM; 3,862 Weekday Daily, 367 SAT, 4,164 SAT Daily
Study Intersections and/or Road Segments (Attach additional sheets as necessary) Please refer to attached Figure 1	1. Fairfax Boulevard and Eaton Place		2. Fairfax Boulevard and University Drive
	3. Chain Bridge Road and Fairfax Boulevard		4. Fairfax Boulevard and Farr Ave/Future Extension
	5. Fairfax Boulevard and Warwick Lane/McLean Ave		6. Chain Bridge Road and Orchard Street
	7. Chain Bridge Road and Eaton Place		8. Chain Bridge Road and Right-in Site Access (future intersection)
Trip Adjustment Factors	Internal allowance Reduction: ☒ Yes ☐ No (5% between residential (multi-family) and retail (shopping center and restaurant))		Pass-by allowance Reduction: ☐ Yes ☒ No
Software Methodology	☒ Synchro ☐ HCS (v.2000/+) ☐ SIDRA ☐ CORSIM ☐ Other _____		
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	Existing traffic signals that could be affected: 1. Fairfax Boulevard and Eaton Place 2. Fairfax Boulevard and University Drive 3. Fairfax Boulevard and Chain Bridge Road 4. Fairfax Boulevard and Warwick Lane/McLean Ave 5. Chain Bridge Road and Eaton Place 6. Chain Bridge Road and Orchard Street Analysis Software: Synchro version 10 Results: HCM Methodology		
Improvement(s) Assumed or to be Considered	1. Signalization of Orchard Street at Chain Bridge Road 2. Extension of University Drive to meet Eaton Place 3. Extension of Farr Ave to meet Orchard Street 4. Signalization of Farr Avenue 5. Fairfax Boulevard and Warwick Ave./McLean Ave. Intersection Improvements		

Background Traffic Studies Considered	1. Whole Foods development proposed along Fairfax Boulevard 2. Paul VI Redevelopment
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 files/signal timings will be obtained from City of Fairfax.
2. The scenarios to be included in the study are Existing (2019), Future without Development-Phase 1 (2023), Future with Development-Phase 1 (2023), Future without Development-Phase 2 (2027), and Future with Development-Phase 2 (2027).
3. A 2.0% regional growth will be applied to all movements at the intersection of Fairfax Boulevard (Rte. 29) and Chain Bridge Road between 2019 and 2023, with 1.0% annual growth between 2023 and 2027. The growth volumes will be carried as through remaining study intersections.
4. Existing peak hour factors in the range of 0.85 to 1.00 will be used for existing scenarios. The default peak hour factor of 0.92 will be used for all future scenarios unless the existing peak hour factor is found to be higher.
5. Heavy vehicle percentages from the traffic counts will be utilized for major movements.
6. For any approach, LOS D or better would be considered as acceptable/desirable traffic operation condition. For all approaches, the projected future conditions without development LOS and delay will be maintained in the future with development condition. Will show intersection, approach, and movement LOS.
7. HCM 2010 methodology will be used where applicable. HCM 2000 methodology will be used elsewhere.
8. 95th percentile queues will be provided from Synchro.
9. TDM strategies for the development would be briefly discussed.

SIGNED: _____ DATE: 12/18/2019
Applicant or Consultant

PRINT NAME: Chad Baird
Applicant or Consultant

SIGNED: _____ DATE: _____
VDOT Representative

PRINT NAME: _____
VDOT Representative

SIGNED: Curt McCullough DATE: 12/20/19
Local Government Representative

PRINT NAME: Curt McCullough
Local Government Representative

Table 1: Historic Growth

Road Segment:	From:	To:	Published VDOT AADT					Growth Rate			
			2013	2014	2015	2016	2017	2013 - 2017	2014 - 2017	2015 - 2017	2016 - 2017
Lee Highway / Fairfax Blvd (SR 29/50)	US 50; SR 236 Main Street	SR 123 Chainbridge Road	36,000	36,000	35,000	36,000	36,000	0%	0%	1%	0%
Lee Highway / Fairfax Blvd (SR 29/50)	SR 123 Chainbridge Road	University Drive	35,000	35,000	34,000	35,000	35,000	0%	0%	1%	0%
Chainbridge Road (SR 123)	Kenmore Drive	US 29; US 50 Lee Highway	23,000	20,000	21,000	22,000	22,000	-1%	3%	2%	0%
Chainbridge Road (SR 123)	US 29; US 50 Lee Highway	I-66; NCL Fairfax	38,000	35,000	36,000	38,000	39,000	1%	4%	4%	3%

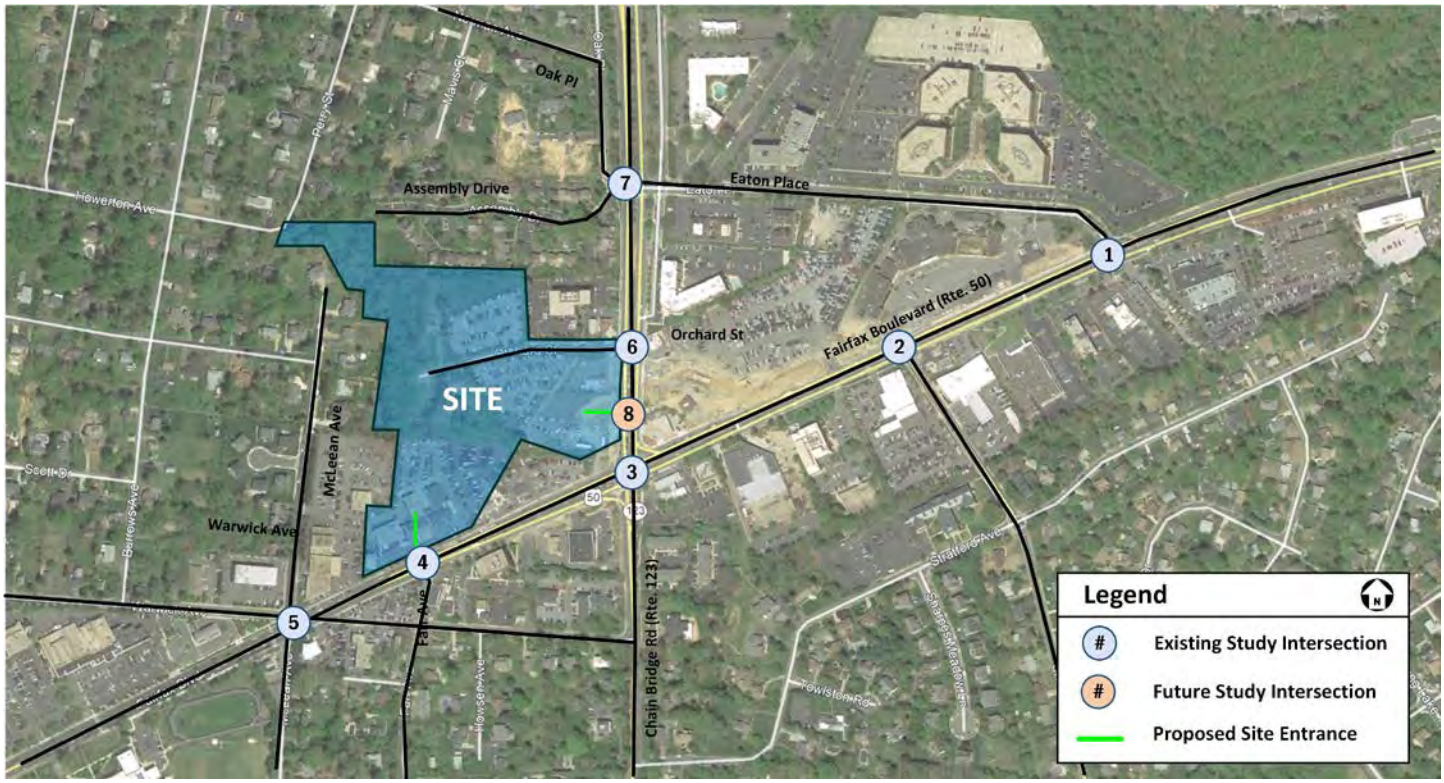


Figure 1: Existing Study Intersections

Figure 2: Direction of Approach for Residential Uses

Figure 3: Direction of Approach for Continued Care Retirement Facility

Figure 4: Direction of Approach for Hotel

Figure 5: Direction of Approach for Restaurant

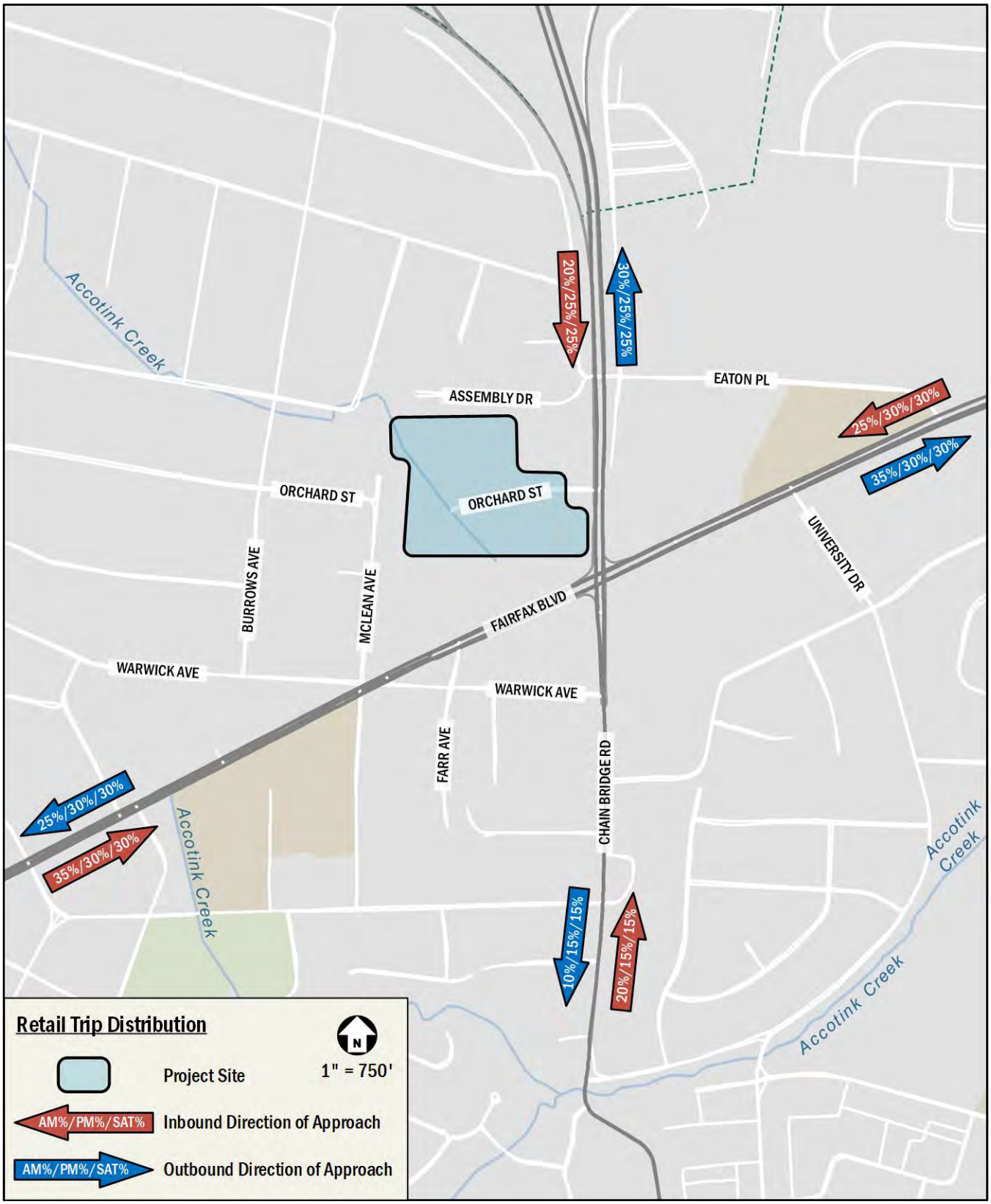


Figure 6: Direction of Approach for Retail (Shopping Center)

Table 2: Trip Generation – Peak Hour of Adjacent Street

Land Use	ITE Code	Size	------ Weekday ------							------ Weekend ------			
			AM Peak Hour			PM Peak Hour			Daily	Saturday Peak Hour			Sat Daily
			In	Out	Total	In	Out	Total	Total	In	Out	Total	Total
Existing Uses													
Single-Family Detached Housing	210	2 DU	2	4	6	1	1	2	28	11	9	20	25
Existing Trips			**2**	**4**	**6**	**1**	**1**	**2**	**28**	**11**	**9**	**20**	**25**
Proposed Uses													
Phase 1													
Multifamily Housing (Low-Rise)	220	56 DU	6	21	27	22	13	35	383	14	13	27	263
Continuing Care Retirement Community	255	200 Units	26	14	40	16	25	41	480	23	21	44	406
Phase 2													
Multifamily Housing (Mid-Rise) (Apartments, Townhomes, Condo; max	221	180 DU	16	45	61	48	30	78	979	40	42	82	964
Hotel	310	140 Rooms	39	27	66	43	41	84	890	57	44	101	1,147
High-Turnover (Sit-Down) Restaurant	932	5 ksf of GFA	28	22	50	30	19	49	561	29	27	56	612
Shopping Center	820	20 ksf of GLA	12	7	19	36	40	76	755	47	43	90	922
TDM/Transit Reduction		*5%*	*(2)*	*(4)*	*(6)*	*(4)*	*(3)*	*(8)*	*(92)*	*(4)*	*(4)*	*(8)*	*(82)*
Internal capture Between Residentail and Non-residential Uses [1]		*5%*	*(1)*	*(2)*	*(3)*	*(3)*	*(2)*	*(5)*	*(66)*	*(3)*	*(3)*	*(5)*	*(61)*
Development Trips with Reductions			**124**	**130**	**254**	**188**	**162**	**350**	**3,890**	**204**	**183**	**387**	**4,171**
Proposed New External Trips (Proposed Development Trips - Existing Trips)			**122**	**126**	**248**	**187**	**161**	**348**	**3,862**	**193**	**174**	**367**	**4,146**

Note:

1. Internal capture between residential (multifamily) and non-residentail uses (shopping center and high turnover (sit-down) restaurant) was based on a minimum of 5% for AM, PM and SAT peak hour trips.

Figure 7: Site Plan

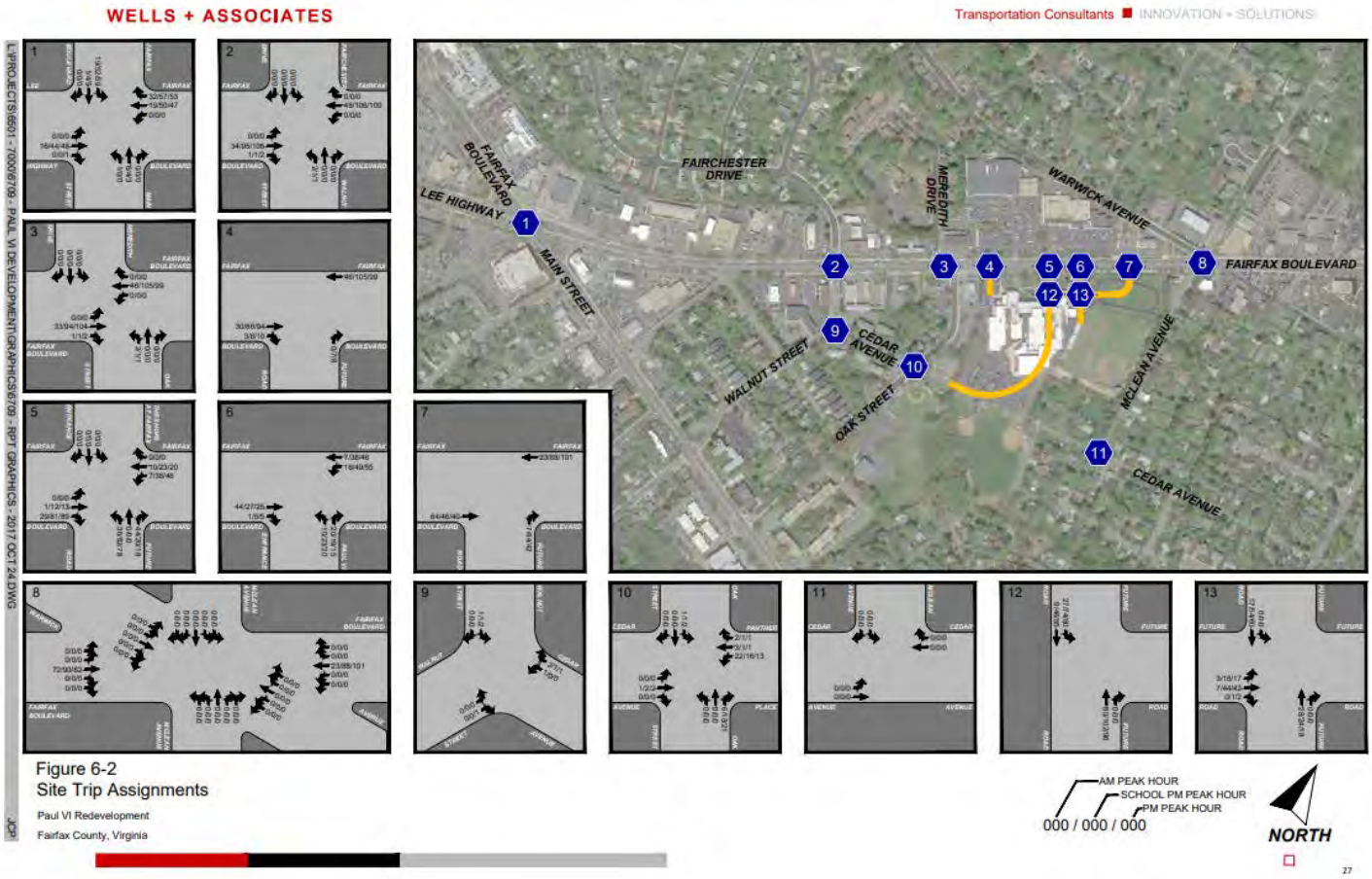


Figure 8: Site Trip Assignment for Paul VI Redevelopment (Excerpt from TIA titled, Paul VI Redevelopment Traffic Impact Study, dated November 15, 2017, conducted by Wells + Associates)

THIS IS NOT A CHAPTER 870 STUDY

VDOT Virginia Department of Transportation	PRE-SCOPE OF WORK MEETING FORM Information on the Project Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting the form to VDOT and the locality no less than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

Contact Information			
Consultant Name: Tele: E-mail:	Chad Baird, Gorove/Slade Associates, Inc. 571-248-0992 chad.baird@goroveslade.com		
Developer/Owner Name: Tele: E-mail:	Andrew Rosenberger, Madison Homes, LLC andrew@madisonhomesinc.com		
Project Information			
Project Name:	Northfax	Locality/County:	City of Fairfax
Project Location: (Attach regional and site specific location map)	The proposed Northfax development is planned to be situated along the western frontage of Chain Bridge Road (Rte. 123) and north of Fairfax Boulevard (Rte. 50), in the City of Fairfax, Virginia.		
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 proposed Northfax development is anticipated to be completed in two phases. Phase 1 would include the residential development at the back and Phase 2 would be the balance of the residential development and commercial developments. A brief description of each phase is presented below - Phase 1: Phase 1 would consist of 56 multi-family residential units and 200 continuing care retirement community units and is anticipated to be completed by 2023. Access to the site would be provided via one access from Orchard Street at Chain Bridge and one access from extended Farr Ave at Fairfax. This phase will also account for the planned extension of University Drive to Eaton Place Phase 2: This phase would include approximately 25,000 square feet of commercial uses (including office space, retail space, and restaurants) with approximately 180 residential dwelling units on the upper floors and a 140-room capacity hotel. Phase 2 is anticipated to be complete by 2027. In addition to the Orchard Street and Farr Ave access points, a right-in access only along Chain Bridge Road will provide access to the site under this scenario. The proposed development is planned to be situated on approximately 11.46 acres of land. The land parcels constituting the site can be identified in the City's Real Estate Assessment Database as ID 57-2-47-000A; 57-2-02-003, 005; 57-2-02-017, 018, 019, 020; 57-2-07-015B; 57-2-08-005, 006, 007, 008, 010, 011, 012, 013, and 014. The parcels fronting Fairfax Boulevard and Chain Bridge Road are currently zoned CR (Commercial Retail District), while the interior parcels are zoned RM (Residential Medium). Of note, the current application for the Northfax development pertains only to Phase 1. A separate application will be conducted for Phase 2. As such, the Phase 2 scenario should be considered for transportation planning purposes.		

Proposed Use(s): (Check all that apply; attach additional pages as necessary)	Residential ☐	Commercial ☐	Mixed Use ☒	Other ☐
	Residential Uses(s) Number of Units: 236 (56 units under phase 1 and 180 units under phase 2) ITE LU Code(s): 220 and 221 (Multifamily Housing (Apartments, Townhomes, Condo) Number of Units: 200 ITE LU Code(s): 255 (Continued Care Retirement Community) **Retail Use(s)** ITE LU Code(s): 820 (Shopping Center) Square Ft or Other Variable: 2,000 SF		**Other Use(s)** ITE LU Code(s): 310 (Hotel) Square Ft or Other Variable: 140 rooms ITE LU Code(s): 932 (High-Turnover (Sit-down) Restaurant) Square Ft or Other Variable: 5,000 SF ITE LU Code(s): 931 (Quality Restaurant) Square Ft or Other Variable: 8,000 SF ITE LU Code(s): 710 (General Office Building) Square Ft or Other Variable: 10,000 SF	
Total Peak Hour Trip Projection:	Less than 100 ☐	100 – 499 ☒	500 – 999 ☐	1,000 or more ☐

Traffic Impact Analysis Assumptions

Study Period	Existing Year: 2019	Phase 1 Build-out Year: 2023 Phase 2 Build-out Year: 2027	Design Year: N/A
Study Area Boundaries (Attach map)	North: Eaton Place/Assembly Drive	South: Fairfax Boulevard (Rte. 50)	
	East: Chain Bridge Road (Rte. 123)	West: McLean Ave	
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	1. Extension of University Drive to meet Eaton Place 2. Extension of Farr Ave. to meet Orchard Street 3. Fairfax Boulevard and Warwick Ave./McLean Ave. Intersection Improvements 4. Crossover and Signalization of Farr Ave at Fairfax Boulevard (possible mitigation under Phase 1 development conditions; will be assumed constructed by 2027 with Warwick Improvements) 5. Whole Foods development along Fairfax Boulevard 6. Paul VI Redevelopment along Fairfax Boulevard		
Consistency With Comprehensive Plan (Land use, transportation plan)	Yes		
Available Traffic Data (Historical, forecasts)	VDOT Historical AADT Data		

Trip Distribution (Please refer to attached Figure 2 through Figure 6)	(Please refer to attached Figure 2 through Figure 6)		
Annual Vehicle Trip Growth Rate:	(2019-2023): 2% (2023-2027): 1%	Peak Period for Study (check all that apply)	☒ AM ☒ PM ☒ SAT
		New Peak Hour of Adjacent Trips (Used in Study; With Reductions)	264 AM; 342 PM; 4,255 Weekday Daily, 402 SAT, 3,995 SAT Daily
Study Intersections and/or Road Segments (Attach additional sheets as necessary) Please refer to attached Figure 1	1. Fairfax Boulevard and Eaton Place		2. Fairfax Boulevard and University Drive
	3. Chain Bridge Road and Fairfax Boulevard		4. Fairfax Boulevard and Farr Ave/Future Extension
	5. Fairfax Boulevard and Warwick Lane/McLean Ave		6. Chain Bridge Road and Orchard Street
	7. Chain Bridge Road and Eaton Place		8. Chain Bridge Road and Right-in Site Access (future intersection)
Trip Adjustment Factors	Internal allowance Reduction: ☒ Yes ☐ No (5% between residential (multi-family) and commercial)		Pass-by allowance Reduction: ☐ Yes ☒ No
Software Methodology	☒ Synchro ☐ HCS (v.2000/+) ☐ SIDRA ☐ CORSIM ☐ Other _____		
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	Existing traffic signals that could be affected: 1. Fairfax Boulevard and Eaton Place 2. Fairfax Boulevard and University Drive 3. Fairfax Boulevard and Chain Bridge Road 4. Fairfax Boulevard and Warwick Lane/McLean Ave 5. Chain Bridge Road and Eaton Place 6. Chain Bridge Road and Orchard Street Analysis Software: Synchro version 10 Results: HCM Methodology		
Improvement(s) Assumed or to be Considered	1. Signalization of Orchard Street at Chain Bridge Road 2. Extension of University Drive to meet Eaton Place 3. Extension of Farr Ave to meet Orchard Street 4. Signalization of Farr Avenue 5. Fairfax Boulevard and Warwick Ave./McLean Ave. Intersection Improvements		
Background Traffic Studies Considered	1. Whole Foods development proposed along Fairfax Boulevard 2. Paul VI Redevelopment		

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 files/signal timings will be obtained from City of Fairfax.
2. The scenarios to be included in the study are Existing (2019), Future without Development-Phase 1 (2023), Future with Development-Phase 1 (2023), Future without Development-Phase 2 (2027), and Future with Development-Phase 2 (2027).
3. A 2.0% regional growth will be applied to all movements at the intersection of Fairfax Boulevard (Rte. 29) and Chain Bridge Road between 2019 and 2023, with 1.0% annual growth between 2023 and 2027. The growth volumes will be carried as through remaining study intersections.
4. Existing peak hour factors in the range of 0.85 to 1.00 will be used for existing scenarios. The default peak hour factor of 0.92 will be used for all future scenarios unless the existing peak hour factor is found to be higher.
5. Heavy vehicle percentages from the traffic counts will be utilized for major movements.
6. For any approach, LOS D or better would be considered as acceptable/desirable traffic operation condition. For all approaches, the projected future conditions without development LOS will be maintained in the future with development condition. Will show intersection, approach, and movement LOS.
7. HCM 2010 methodology will be used where applicable. HCM 2000 methodology will be used elsewhere.
8. 95th percentile queues will be provided from Synchro. Max queues will be provided from SimTraffic for saturated intersections (identified in Synchro with "#"). Possible simulations of specific intersections and time periods will be conducted for planning purposes. Possible future mitigations will be based generally on Synchro results.
9. TDM strategies for the development would be briefly discussed.

SIGNED: _____ DATE: 4/22/2020
Applicant or Consultant

PRINT NAME: Chad A. Baird
Applicant or Consultant

SIGNED: _____ DATE: _____
VDOT Representative

PRINT NAME: _____
VDOT Representative

SIGNED: _____ DATE: _____
Local Government Representative

PRINT NAME: _____
Local Government Representative

Table 1: Historic Growth

Road Segment:	From:	To:	Published VDOT AADT					Growth Rate			
			2013	2014	2015	2016	2017	2013 - 2017	2014 - 2017	2015 - 2017	2016 - 2017
Lee Highway / Fairfax Blvd (SR 29/50)	US 50; SR 236 Main Street	SR 123 Chainbridge Road	36,000	36,000	35,000	36,000	36,000	0%	0%	1%	0%
Lee Highway / Fairfax Blvd (SR 29/50)	SR 123 Chainbridge Road	University Drive	35,000	35,000	34,000	35,000	35,000	0%	0%	1%	0%
Chainbridge Road (SR 123)	Kenmore Drive	US 29; US 50 Lee Highway	23,000	20,000	21,000	22,000	22,000	-1%	3%	2%	0%
Chainbridge Road (SR 123)	US 29; US 50 Lee Highway	I-66; NCL Fairfax	38,000	35,000	36,000	38,000	39,000	1%	4%	4%	3%

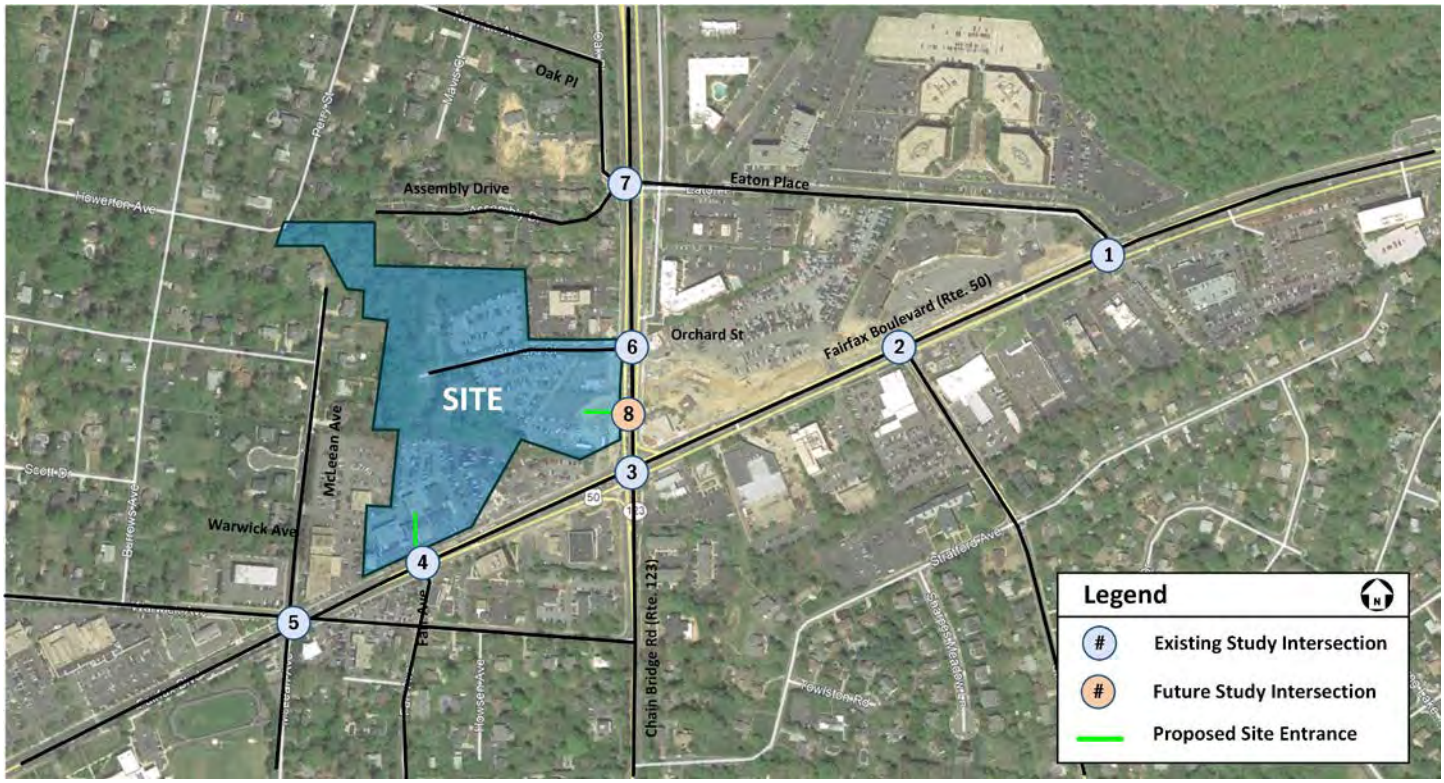


Figure 1: Existing Study Intersections

Figure 2: Direction of Approach for Residential Uses

Figure 3: Direction of Approach for Continued Care Retirement Facility

Figure 4: Direction of Approach for Hotel

Figure 5: Direction of Approach for Restaurant

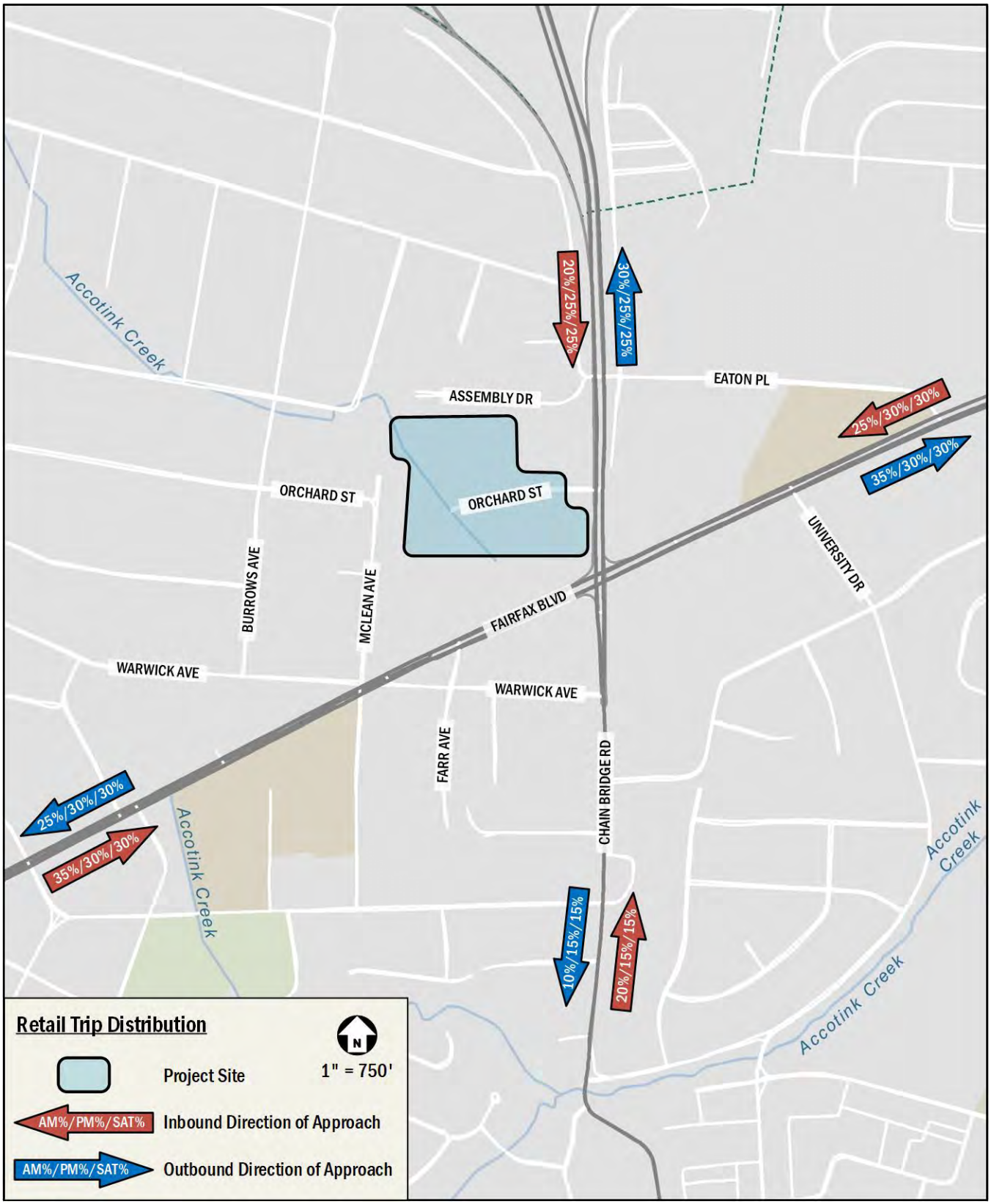


Figure 6: Direction of Approach for Commercial (Shopping Center and General Office)

Table 2: Trip Generation – Peak Hour of Adjacent Street

Land Use	ITE LUC	Size	DAILY	AM PEAK HOUR			PM PEAK HOUR			SATURDAY DAILY	SAT PEAK HOUR		
			TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	TOTAL	IN	OUT	TOTAL
Existing (to be removed)													
Single-Family Detached Homes	210	2 DU	19	0	1	1	1	1	2	19	1	1	2
Total Existing Trips (To Be Removed)			**19**	**0**	**1**	**1**	**1**	**1**	**2**	**19**	**1**	**1**	**2**
PHASE 1													
Multi-Family Housing (Low-Rise)	220	56 DU	383	6	21	27	22	13	35	263	21	18	39
Continuing Care	255	200 Units	480	18	10	28	12	20	32	406	23	21	44
Total Phase 1 Development Trips (without Reductions)			**863**	**24**	**31**	**55**	**34**	**33**	**67**	**669**	**44**	**39**	**83**
TDM/Transit Ructions		*5%*	*-43*	*-1*	*-2*	*-3*	*-2*	*-1*	*-3*	*-33*	*-2*	*-2*	*-4*
Total Phase 1 Development Trips (with Reductions)			**820**	**23**	**29**	**52**	**32**	**32**	**64**	**636**	**42**	**37**	**79**
Proposed New External Trips Under Phase 1 (Proposed Phase 1 Trips - Existing Trips)			**801**	**23**	**28**	**51**	**31**	**31**	**62**	**617**	**41**	**36**	**77**
PHASE 2													
Multi-Family Housing (Mid-Rise)	221	180 DU	979	16	45	61	48	30	78	884	39	40	79
Hotel	310	140 Rooms	1,170	38	27	65	40	39	79	1,147	56	45	101
Quality Restaurant	931	8 kSF	671	3	3	6	42	20	62	720	50	35	85
High-Turnover (Sit-Down) Restaurant	932	5 kSF	561	27	23	50	30	19	49	612	29	27	56
General Office Building	710	10 kSF	114	31	5	36	2	11	13	22	3	2	5
Shopping Center[2]	820	2 kSF	76	1	1	2	4	4	8	92	5	4	9
Total Phase 2 Development Trips (without Reductions)			**3,571**	**116**	**104**	**220**	**166**	**123**	**289**	**3,477**	**182**	**153**	**335**
Total Phase 1 + Phase 2 Development Trips (without Reductions)			**4,434**	**140**	**135**	**275**	**200**	**156**	**356**	**4,146**	**226**	**192**	**418**
*Internal Capture - Res and Non-Res**		*5%*	*-68*	*-1*	*-3*	*-4*	*-3*	*-2*	*-5*	*-57*	*-3*	*-3*	*-6*
TDM/Transit Ructions		*5%*	*-92*	*-2*	*-4*	*-6*	*-4*	*-3*	*-7*	*-75*	*-4*	*-4*	*-8*
Total Development Trips (with Reductions)			**4,274**	**137**	**128**	**265**	**193**	**151**	**344**	**4,014**	**219**	**185**	**404**
Proposed New External Trips at Ultimate Build-Out (Proposed Total Development Trips - Existing Trips)			**4,255**	**137**	**127**	**264**	**192**	**150**	**342**	**3,995**	**218**	**184**	**402**

Notes:

1. Internal capture between residential (multifamily) and non-residential uses (shopping center , quality restaurant, high turnover (sit-down) restaurant, and general office buidling) was based on a minimum of 5% for AM, PM and SAT peak hour trips.

2. For Shopping Center, the rates have been used as 2,000 sft of retail falls outside the data range.

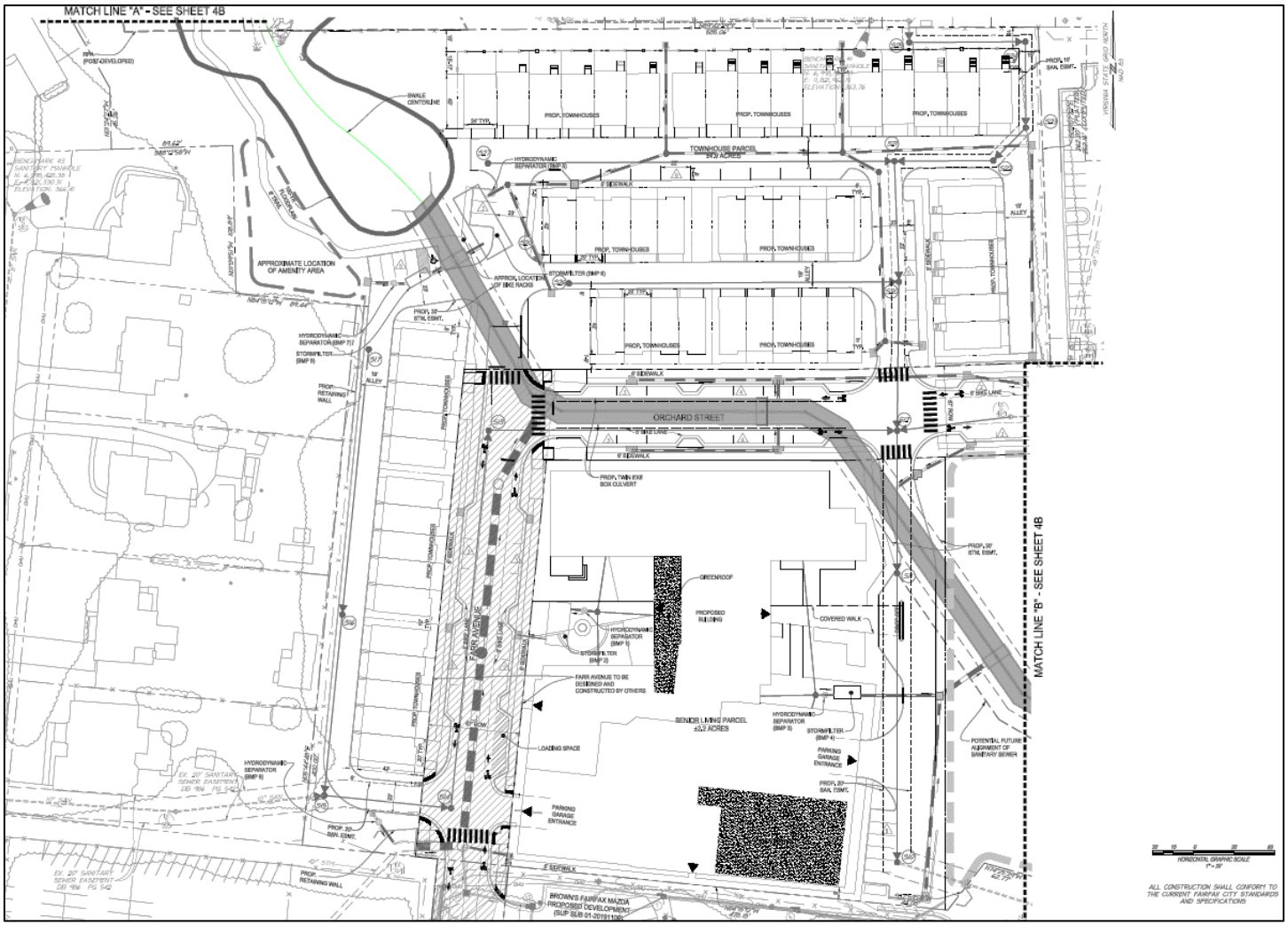


Figure 7: Master Development Plan (Christopher Consultants)

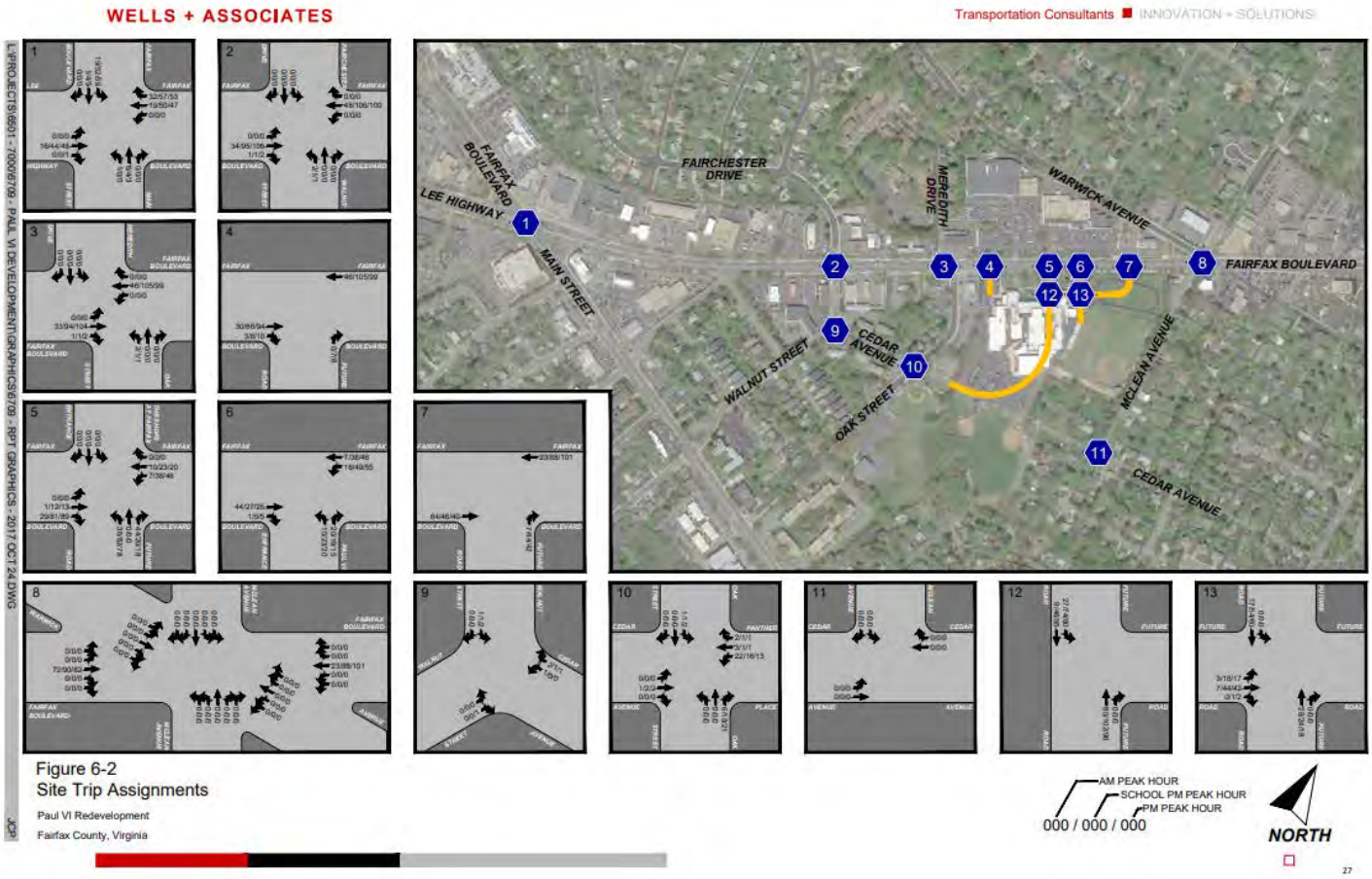


Figure 8: Site Trip Assignment for Paul VI Redevelopment (Excerpt from TIA titled, Paul VI Redevelopment Traffic Impact Study, dated November 15, 2017, conducted by Wells + Associates)

Steven Dauterman

From: Chad A. Baird
Sent: Wednesday, April 22, 2020 10:18 AM
To: Niraja Chandrapu; Kevin D. Sitzman; Steven Dauterman
Subject: Fwd: Northfax West TIS - Revised Trip Generation Table

Get Outlook for iOS

From: Sanford, Wendy Block <Wendy.Sanford@fairfaxva.gov>
Sent: Wednesday, April 22, 2020 10:15:02 AM
To: Chad A. Baird <cab@goroveslade.com>
Cc: Russell Rosenberger [russ@madisonhomesinc.com] <russ@madisonhomesinc.com>; Hardin, Brooke <Brooke.Hardin@fairfaxva.gov>; Sutphin, Jason <Jason.Sutphin@fairfaxva.gov>; McCullough, Curt <Curt.McCullough@fairfaxva.gov>; Frederick, Albert <Albert.Frederick@fairfaxva.gov>; Ritter, Chloe <Chloe.Ritter@fairfaxva.gov>; Summers, David <David.Summers@fairfaxva.gov>
Subject: Northfax West TIS - Revised Trip Generation Table

Chad,

We have completed the review of the TIA based on the revised trip generation table. The numbers you are showing are fine, and you may proceed with minor corrections: please update 1) hotel daily from 1,154 to 1,170 (average rate) and 2) quality restaurant daily from 669 to 671 (rounding issue)

In summary the new daily trips are:

Low-rise housing (56 DU) = 383
Continuing care facility (200 units) = 480
Mid-rise housing (1180 DU) = 979
Hotel (140 rooms) = 1170
Quality Restaurant (8K sf) = 671 (G-S had 669)
High-turnover Restaurant (5K sf) = 561
Shopping/retail (2K sf) = 76
General Office (10K sf) = 114

The daily total is 4,434 combined trips (increase of 4,415 over existing). The Saturday daily and weekday peak period numbers all look okay now for each proposed use.

Please going forward have all communications about the project go through CDP (Brooke, Jason and Fred) so that they can coordinate all reviewing disciplines.

Thanks,
Wendy

FOIA Disclaimer
You are hereby advised that, pursuant to the Virginia Freedom of Information Act, written correspondence (including, but not limited to, letters, e-mails and faxes) from and to the City of Fairfax and its officials and employees, and others acting on its behalf, may be subject to disclosure as being a public record. This includes the e-mail address(es) and other contact and identifying information for parties involved in the correspondence.

Appendix B

Existing Turning Movement Counts

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-001
Date: 3/20/2019

Total

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	83	6	0	28	64	0	0	12	3	2	0	1	1	22	0	222
6:15 AM	0	108	3	1	27	48	0	0	12	4	1	0	13	2	26	0	245
6:30 AM	0	176	6	1	25	51	2	0	13	9	1	0	9	3	41	0	337
6:45 AM	1	209	9	1	35	102	3	1	12	7	1	0	16	5	37	0	439
7:00 AM	0	248	4	0	44	115	1	1	22	12	6	0	16	4	47	0	520
7:15 AM	1	237	7	1	50	182	5	0	22	34	3	0	16	8	68	0	634
7:30 AM	1	251	4	0	70	186	5	0	26	29	4	0	20	6	83	0	685
7:45 AM	1	231	10	1	87	243	7	2	18	53	4	0	17	8	109	0	791
8:00 AM	3	236	9	1	62	186	1	2	19	17	11	0	12	14	105	0	678
8:15 AM	1	232	7	4	55	230	3	0	31	13	7	0	20	15	94	0	712
8:30 AM	0	252	8	1	71	234	6	0	17	16	3	0	12	6	87	0	713
8:45 AM	3	243	8	5	73	262	4	1	29	12	1	0	12	4	70	0	727
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	11	2506	81	16	627	1903	37	7	233	209	44	0	164	76	789	0	6703
APPROACH %'s :	0.42%	95.87%	3.10%	0.61%	24.36%	73.93%	1.44%	0.27%	47.94%	43.00%	9.05%	0.00%	15.94%	7.39%	76.68%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	5	951	34	7	275	893	17	4	85	99	25	0	61	43	395	0	2894
PEAK HR FACTOR :	0.417	0.943	0.850	0.438	0.790	0.919	0.607	0.500	0.685	0.467	0.568	0.000	0.763	0.717	0.906	0.000	0.915
	0.955				0.877				0.697				0.931				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	211	15	2	56	224	10	0	3	6	8	0	21	17	143	0	717
4:15 PM	3	180	14	5	74	223	10	0	8	6	3	0	22	19	130	0	697
4:30 PM	0	187	19	2	70	202	17	3	9	13	1	0	19	18	148	0	708
4:45 PM	2	199	16	2	86	218	14	1	7	9	5	0	23	19	126	0	727
5:00 PM	3	184	14	4	80	176	16	1	2	12	5	0	23	21	138	0	679
5:15 PM	7	224	13	2	89	236	22	0	11	11	3	0	20	28	134	0	800
5:30 PM	3	217	16	3	74	243	17	1	8	15	5	0	21	24	144	0	791
5:45 PM	4	197	22	3	89	251	21	0	6	7	5	0	23	25	148	0	801
6:00 PM	2	181	14	5	88	224	26	1	6	8	6	0	18	20	136	0	735
6:15 PM	1	169	11	0	90	207	16	2	10	11	2	0	15	17	156	0	707
6:30 PM	3	180	13	6	87	194	13	0	9	13	1	0	15	17	141	0	692
6:45 PM	2	157	22	2	67	187	15	1	5	10	3	0	21	20	99	0	611
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	31	2286	189	36	950	2585	197	10	84	121	47	0	241	245	1643	0	8665
APPROACH %'s :	1.22%	89.93%	7.44%	1.42%	25.39%	69.08%	5.26%	0.27%	33.33%	48.02%	18.65%	0.00%	11.32%	11.51%	77.17%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	17	822	65	12	332	906	76	2	27	45	18	0	87	98	564	0	3071
PEAK HR FACTOR :	0.607	0.917	0.739	0.750	0.933	0.902	0.864	0.500	0.614	0.750	0.900	0.000	0.946	0.875	0.953	0.000	0.958
	0.931				0.911				0.804				0.955				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-001
Date: 3/20/2019

Cars

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	81	5	0	27	56	0	0	12	3	2	0	1	1	22	0	210
6:15 AM	0	103	3	1	27	46	0	0	12	4	1	0	12	2	26	0	237
6:30 AM	0	170	4	1	24	48	1	0	13	9	0	0	8	2	41	0	321
6:45 AM	1	203	8	1	34	95	3	1	12	6	1	0	11	4	37	0	417
7:00 AM	0	240	4	0	44	109	1	1	22	12	5	0	14	4	47	0	503
7:15 AM	1	222	6	1	49	178	5	0	22	32	3	0	15	8	68	0	610
7:30 AM	0	238	1	0	67	176	4	0	26	27	4	0	19	6	83	0	651
7:45 AM	1	218	9	1	87	232	7	2	17	50	3	0	15	7	106	0	755
8:00 AM	2	231	8	1	61	181	1	2	18	16	11	0	12	9	102	0	655
8:15 AM	1	221	6	4	54	224	3	0	31	13	7	0	20	12	92	0	688
8:30 AM	0	242	7	1	69	229	6	0	17	16	3	0	9	5	86	0	690
8:45 AM	2	235	8	5	71	252	4	1	29	12	1	0	12	4	70	0	706
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	8	2404	69	16	614	1826	35	7	231	200	41	0	148	64	780	0	6443
APPROACH %'s :	0.32%	96.28%	2.76%	0.64%	24.74%	73.57%	1.41%	0.28%	48.94%	42.37%	8.69%	0.00%	14.92%	6.45%	78.63%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	4	912	30	7	271	866	17	4	83	95	24	0	56	33	386	0	2788
PEAK HR FACTOR :	0.50	0.942	0.833	0.438	0.779	0.933	0.607	0.500	0.669	0.475	0.545	0.000	0.700	0.688	0.910	0.000	0.923
	0.953				0.883				0.721				0.928				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	206	14	2	55	220	10	0	3	6	8	0	21	16	139	0	700
4:15 PM	3	174	13	5	73	219	10	0	8	6	3	0	22	18	129	0	683
4:30 PM	0	183	17	2	68	198	17	3	9	13	1	0	17	18	148	0	694
4:45 PM	2	197	16	2	84	216	14	1	7	9	5	0	23	19	125	0	720
5:00 PM	3	181	12	4	80	175	16	1	2	12	5	0	22	20	138	0	671
5:15 PM	7	220	12	2	89	231	22	0	11	11	3	0	19	28	134	0	789
5:30 PM	3	215	16	3	73	242	16	1	8	15	5	0	21	23	143	0	784
5:45 PM	4	196	21	3	88	245	21	0	6	7	5	0	22	25	148	0	791
6:00 PM	2	179	12	5	87	221	26	1	6	8	6	0	17	20	136	0	726
6:15 PM	1	163	10	0	88	202	16	2	10	11	2	0	15	17	154	0	691
6:30 PM	3	175	13	6	86	187	13	0	8	13	1	0	15	17	141	0	678
6:45 PM	2	154	21	2	67	185	15	1	5	10	3	0	20	20	97	0	602
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	30	2243	177	36	938	2541	196	10	83	121	47	0	234	241	1632	0	8529
APPROACH %'s :	1.21%	90.23%	7.12%	1.45%	25.45%	68.96%	5.32%	0.27%	33.07%	48.21%	18.73%	0.00%	11.11%	11.44%	77.46%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	17	812	61	12	330	893	75	2	27	45	18	0	84	96	563	0	3035
PEAK HR FACTOR :	0.61	0.923	0.726	0.750	0.927	0.911	0.852	0.500	0.614	0.750	0.900	0.000	0.955	0.857	0.951	0.000	0.959
	0.936				0.918				0.804				0.953				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-001
Date: 3/20/2019

HT

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	2	1	0	1	8	0	0	0	0	0	0	0	0	0	0	12
6:15 AM	0	5	0	0	0	2	0	0	0	0	0	0	1	0	0	0	8
6:30 AM	0	6	2	0	1	3	1	0	0	0	1	0	1	1	0	0	16
6:45 AM	0	6	1	0	1	7	0	0	0	1	0	0	5	1	0	0	22
7:00 AM	0	8	0	0	0	6	0	0	0	0	1	0	2	0	0	0	17
7:15 AM	0	15	1	0	1	4	0	0	0	2	0	0	1	0	0	0	24
7:30 AM	1	13	3	0	3	10	1	0	0	2	0	0	1	0	0	0	34
7:45 AM	0	13	1	0	0	11	0	0	1	3	1	0	2	1	3	0	36
8:00 AM	1	5	1	0	1	5	0	0	1	1	0	0	0	5	3	0	23
8:15 AM	0	11	1	0	1	6	0	0	0	0	0	0	0	3	2	0	24
8:30 AM	0	10	1	0	2	5	0	0	0	0	0	0	3	1	1	0	23
8:45 AM	1	8	0	0	2	10	0	0	0	0	0	0	0	0	0	0	21
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	102	12	0	13	77	2	0	2	9	3	0	16	12	9	0	260
APPROACH %'s :	2.56%	87.18%	10.26%	0.00%	14.13%	83.70%	2.17%	0.00%	14.29%	64.29%	21.43%	0.00%	43.24%	32.43%	24.32%	0.00%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	1	39	4	0	4	27	0	0	2	4	1	0	5	10	9	0	106
PEAK HR FACTOR :	0.250	0.750	1.000	0.000	0.500	0.614	0.000	0.000	0.500	0.333	0.250	0.000	0.417	0.500	0.750	0.000	0.736
	0.786				0.705				0.350				0.750				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	5	1	0	1	4	0	0	0	0	0	0	0	1	4	0	17
4:15 PM	0	6	1	0	1	4	0	0	0	0	0	0	0	1	1	0	14
4:30 PM	0	4	2	0	2	4	0	0	0	0	0	0	2	0	0	0	14
4:45 PM	0	2	0	0	2	2	0	0	0	0	0	0	0	0	1	0	7
5:00 PM	0	3	2	0	0	1	0	0	0	0	0	0	1	1	0	0	8
5:15 PM	0	4	1	0	0	5	0	0	0	0	0	0	1	0	0	0	11
5:30 PM	0	2	0	0	1	1	1	0	0	0	0	0	0	1	1	0	7
5:45 PM	0	1	1	0	1	6	0	0	0	0	0	0	1	0	0	0	10
6:00 PM	0	2	2	0	1	3	0	0	0	0	0	0	1	0	0	0	9
6:15 PM	0	6	1	0	2	5	0	0	0	0	0	0	0	0	2	0	16
6:30 PM	0	5	0	0	1	7	0	0	1	0	0	0	0	0	0	0	14
6:45 PM	0	3	1	0	0	2	0	0	0	0	0	0	1	0	2	0	9
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	43	12	0	12	44	1	0	1	0	0	0	7	4	11	0	136
APPROACH %'s :	1.79%	76.79%	21.43%	0.00%	21.05%	77.19%	1.75%	0.00%	100.00%	0.00%	0.00%	0.00%	31.82%	18.18%	50.00%	0.00%	
PEAK HR :	**05:00 PM - 06:00 PM**																TOTAL
PEAK HR VOL :	0	10	4	0	2	13	1	0	0	0	0	0	3	2	1	0	36
PEAK HR FACTOR :	0.00	0.625	0.500	0.000	0.500	0.542	0.250	0.000	0.000	0.000	0.000	0.000	0.750	0.500	0.250	0.000	0.818
	0.700				0.571								0.750				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-001
Date: 3/20/2019

Bikes

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
APPROACH %'s :													50.00%	50.00%	0.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
										0.250							

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr **Project ID:** 19-11036-001
City: Fairfax **Date:** 3/20/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Chain Bridge Rd		Chain Bridge Rd		Eaton Pl/Oak Pl/Assembly Dr		Eaton Pl/Oak Pl/Assembly Dr		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	0	1
8:30 AM	0	0	0	1	0	1	0	0	2
8:45 AM	0	0	0	1	0	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	2	2	0	1	0	0	5
APPROACH %'s :			50.00%	50.00%	0.00%	100.00%			
PEAK HR :	**07:45 AM - 08:45 AM**								TOTAL
PEAK HR VOL :	0	0	1	1	0	1	0	0	3
PEAK HR FACTOR :			0.250	0.250		0.250			0.375
			0.500		0.250				

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	2	0	0	0	0	2
4:30 PM	0	0	0	2	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	1	0	0	0	0	1
5:15 PM	0	0	1	0	0	0	0	0	1
5:30 PM	0	0	2	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	1	0	0	0	0	1
6:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	3	6	0	0	0	0	9
APPROACH %'s :			33.33%	66.67%					
PEAK HR :	**05:00 PM - 06:00 PM**								TOTAL
PEAK HR VOL :	0	0	3	1	0	0	0	0	4
PEAK HR FACTOR :			0.375	0.250					0.500
			0.500						

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Orchard St
City: Fairfax
Control: 1-Way Stop (EB)

Project ID: 19-11036-002
Date: 3/20/2019

Total

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Orchard St				Orchard St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	86	0	0	0	64	0	0	0	0	2	0	0	0	0	0	152
6:15 AM	0	106	0	0	0	65	0	0	0	0	1	0	0	0	0	0	172
6:30 AM	0	203	0	0	0	57	3	0	0	0	1	0	0	0	0	0	264
6:45 AM	0	214	0	0	0	112	0	0	0	0	3	0	0	0	0	0	329
7:00 AM	0	243	0	0	0	133	1	0	0	0	1	0	0	0	0	0	378
7:15 AM	0	262	0	0	0	190	1	0	0	0	1	0	0	0	0	0	454
7:30 AM	0	241	0	0	0	212	1	0	0	0	0	0	0	0	0	0	454
7:45 AM	0	244	0	0	0	249	0	0	0	0	1	0	0	0	0	0	494
8:00 AM	0	237	0	0	0	174	0	0	0	0	3	0	0	0	0	0	414
8:15 AM	0	259	0	0	0	250	1	0	0	0	0	0	0	0	0	0	510
8:30 AM	0	275	0	0	0	259	0	0	0	0	1	0	0	0	0	0	535
8:45 AM	0	239	0	0	0	271	0	0	0	0	1	0	0	0	0	0	511
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2609	0	0	0	2036	7	0	0	0	15	0	0	0	0	0	4667
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	99.66%	0.34%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	1015	0	0	0	932	1	0	0	0	5	0	0	0	0	0	1953
PEAK HR FACTOR :	0.000	0.923	0.000	0.000	0.000	0.900	0.250	0.000	0.000	0.000	0.417	0.000	0.000	0.000	0.000	0.000	0.913
		0.923				0.901				0.417							

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	232	0	0	0	250	0	0	0	0	5	0	0	0	0	0	487
4:15 PM	0	204	0	0	0	256	0	0	0	0	1	0	0	0	0	0	461
4:30 PM	0	210	0	0	0	238	1	0	0	0	7	0	0	0	0	0	456
4:45 PM	0	213	0	0	0	247	0	0	0	0	6	0	0	0	0	0	466
5:00 PM	0	216	0	0	0	238	0	0	0	0	5	0	0	0	0	0	459
5:15 PM	0	227	0	0	0	250	0	0	0	0	2	0	0	0	0	0	479
5:30 PM	0	225	0	0	0	260	2	0	0	0	7	0	0	0	0	0	494
5:45 PM	0	212	0	0	0	280	0	0	0	0	2	0	0	0	0	0	494
6:00 PM	0	209	0	0	0	255	2	0	0	0	7	0	0	0	0	0	473
6:15 PM	0	178	0	0	0	246	0	0	0	0	5	0	0	0	0	0	429
6:30 PM	0	209	0	0	0	223	2	0	0	0	1	0	0	0	0	0	435
6:45 PM	0	181	0	0	0	210	1	0	0	0	1	0	0	0	0	0	393
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2516	0	0	0	2953	8	0	0	0	49	0	0	0	0	0	5526
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	99.73%	0.27%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	**05:00 PM - 06:00 PM**																TOTAL
PEAK HR VOL :	0	880	0	0	0	1028	2	0	0	0	16	0	0	0	0	0	1926
PEAK HR FACTOR :	0.000	0.969	0.000	0.000	0.000	0.918	0.250	0.000	0.000	0.000	0.571	0.000	0.000	0.000	0.000	0.000	0.975
		0.969				0.920				0.571							

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Orchard St
City: Fairfax
Control: 1-Way Stop (EB)

Project ID: 19-11036-002
Date: 3/20/2019

Cars

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Orchard St				Orchard St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	83	0	0	0	57	0	0	0	0	0	0	0	0	0	0	140
6:15 AM	0	102	0	0	0	62	0	0	0	0	1	0	0	0	0	0	165
6:30 AM	0	193	0	0	0	53	2	0	0	0	1	0	0	0	0	0	249
6:45 AM	0	208	0	0	0	99	0	0	0	0	3	0	0	0	0	0	310
7:00 AM	0	235	0	0	0	125	1	0	0	0	1	0	0	0	0	0	362
7:15 AM	0	244	0	0	0	183	1	0	0	0	1	0	0	0	0	0	429
7:30 AM	0	226	0	0	0	202	1	0	0	0	0	0	0	0	0	0	429
7:45 AM	0	232	0	0	0	236	0	0	0	0	1	0	0	0	0	0	469
8:00 AM	0	231	0	0	0	169	0	0	0	0	3	0	0	0	0	0	403
8:15 AM	0	246	0	0	0	244	1	0	0	0	0	0	0	0	0	0	491
8:30 AM	0	263	0	0	0	251	0	0	0	0	1	0	0	0	0	0	515
8:45 AM	0	229	0	0	0	260	0	0	0	0	1	0	0	0	0	0	490
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2492	0	0	0	1941	6	0	0	0	13	0	0	0	0	0	4452
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	99.69%	0.31%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	972	0	0	0	900	1	0	0	0	5	0	0	0	0	0	1878
PEAK HR FACTOR :	0.00	0.924	0.000	0.000	0.000	0.896	0.250	0.000	0.000	0.000	0.417	0.000	0.000	0.000	0.000	0.000	0.912
		0.924				0.897				0.417							

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	224	0	0	0	246	0	0	0	0	5	0	0	0	0	0	475
4:15 PM	0	196	0	0	0	252	0	0	0	0	1	0	0	0	0	0	449
4:30 PM	0	205	0	0	0	234	1	0	0	0	7	0	0	0	0	0	447
4:45 PM	0	210	0	0	0	243	0	0	0	0	6	0	0	0	0	0	459
5:00 PM	0	213	0	0	0	236	0	0	0	0	5	0	0	0	0	0	454
5:15 PM	0	223	0	0	0	245	0	0	0	0	2	0	0	0	0	0	470
5:30 PM	0	222	0	0	0	258	2	0	0	0	7	0	0	0	0	0	489
5:45 PM	0	210	0	0	0	274	0	0	0	0	2	0	0	0	0	0	486
6:00 PM	0	205	0	0	0	250	2	0	0	0	7	0	0	0	0	0	464
6:15 PM	0	172	0	0	0	241	0	0	0	0	5	0	0	0	0	0	418
6:30 PM	0	203	0	0	0	216	2	0	0	0	1	0	0	0	0	0	422
6:45 PM	0	177	0	0	0	208	1	0	0	0	1	0	0	0	0	0	387
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2460	0	0	0	2903	8	0	0	0	49	0	0	0	0	0	5420
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	99.73%	0.27%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	**05:00 PM - 06:00 PM**																TOTAL
PEAK HR VOL :	0	868	0	0	0	1013	2	0	0	0	16	0	0	0	0	0	1899
PEAK HR FACTOR :	0.00	0.973	0.000	0.000	0.000	0.924	0.250	0.000	0.000	0.000	0.571	0.000	0.000	0.000	0.000	0.000	0.971
		0.973				0.926				0.571							

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Orchard St
City: Fairfax
Control: 1-Way Stop (EB)

Project ID: 19-11036-002
Date: 3/20/2019

HT

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Orchard St				Orchard St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	3	0	0	0	7	0	0	0	0	2	0	0	0	0	0	12
6:15 AM	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0	0	7
6:30 AM	0	10	0	0	0	4	1	0	0	0	0	0	0	0	0	0	15
6:45 AM	0	6	0	0	0	13	0	0	0	0	0	0	0	0	0	0	19
7:00 AM	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	16
7:15 AM	0	18	0	0	0	7	0	0	0	0	0	0	0	0	0	0	25
7:30 AM	0	15	0	0	0	10	0	0	0	0	0	0	0	0	0	0	25
7:45 AM	0	12	0	0	0	13	0	0	0	0	0	0	0	0	0	0	25
8:00 AM	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0	0	11
8:15 AM	0	13	0	0	0	6	0	0	0	0	0	0	0	0	0	0	19
8:30 AM	0	12	0	0	0	8	0	0	0	0	0	0	0	0	0	0	20
8:45 AM	0	10	0	0	0	11	0	0	0	0	0	0	0	0	0	0	21
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	117	0	0	0	95	1	0	0	0	2	0	0	0	0	0	215
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	98.96%	1.04%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	43	0	0	0	32	0	0	0	0	0	0	0	0	0	0	75
PEAK HR FACTOR :	0.000	0.827	0.000	0.000	0.000	0.615	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750
	0.827				0.615												

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	8	0	0	0	4	0	0	0	0	0	0	0	0	0	0	12
4:15 PM	0	8	0	0	0	4	0	0	0	0	0	0	0	0	0	0	12
4:30 PM	0	5	0	0	0	4	0	0	0	0	0	0	0	0	0	0	9
4:45 PM	0	3	0	0	0	4	0	0	0	0	0	0	0	0	0	0	7
5:00 PM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5
5:15 PM	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	9
5:30 PM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5
5:45 PM	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	8
6:00 PM	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	9
6:15 PM	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0	0	11
6:30 PM	0	6	0	0	0	7	0	0	0	0	0	0	0	0	0	0	13
6:45 PM	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	6
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	56	0	0	0	50	0	0	0	0	0	0	0	0	0	0	106
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%									
PEAK HR :	**05:00 PM - 06:00 PM**																TOTAL
PEAK HR VOL :	0	12	0	0	0	15	0	0	0	0	0	0	0	0	0	0	27
PEAK HR FACTOR :	0.00	0.750	0.000	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750
	0.750				0.625												

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Orchard St
City: Fairfax
Control: 1-Way Stop (EB)

Project ID: 19-11036-002
Date: 3/20/2019

Bikes

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Orchard St				Orchard St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
APPROACH %'s :					0.00%	100.00%	0.00%	0.00%									
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
						0.250											

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%													
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
PEAK HR FACTOR :	0.00	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
		0.250															

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Orchard St
City: Fairfax

Project ID: 19-11036-002
Date: 3/20/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Chain Bridge Rd		Chain Bridge Rd		Orchard St		Orchard St		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
6:00 AM	0	0	0	0	0	0	0	1	1
6:15 AM	0	0	0	0	0	0	0	1	1
6:30 AM	0	0	0	0	0	0	0	1	1
6:45 AM	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	1	1
8:30 AM	0	0	0	0	0	0	0	1	1
8:45 AM	1	0	0	0	0	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	1	0	0	0	0	0	0	5	6
APPROACH %'s :	100.00%	0.00%					0.00%	100.00%	
PEAK HR :	**07:45 AM - 08:45 AM**								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	2	2
PEAK HR FACTOR :								0.500	0.500
							0.500		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	2	0	2
5:30 PM	0	1	0	0	0	0	1	0	2
5:45 PM	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	2	0	0	0	0	2
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	1	0	2	0	0	3	0	6
APPROACH %'s :	0.00%	100.00%	0.00%	100.00%			100.00%	0.00%	
PEAK HR :	**05:00 PM - 06:00 PM**								TOTAL
PEAK HR VOL :	0	1	0	0	0	0	3	0	4
PEAK HR FACTOR :		0.250					0.375		0.500
	0.250						0.375		

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Fairfax Blvd
City: Fairfax
Control: Signalized

Project ID: 19-11036-003
Date: 3/20/2019

Total

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Fairfax Blvd				Fairfax Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	2	57	13	0	10	36	16	2	25	202	0	0	6	36	3	0	408
6:15 AM	4	85	24	0	10	29	29	0	34	301	1	0	3	37	7	0	564
6:30 AM	1	148	19	0	7	36	24	4	46	336	0	0	4	43	14	4	686
6:45 AM	5	121	13	0	16	45	42	1	48	377	2	0	2	64	11	3	750
7:00 AM	5	174	20	0	16	56	58	1	73	371	3	0	10	68	13	6	874
7:15 AM	4	184	20	0	23	94	93	0	83	329	1	0	18	72	26	2	949
7:30 AM	4	142	16	0	32	108	60	0	53	366	3	0	20	106	17	4	931
7:45 AM	6	140	24	0	37	123	64	2	54	390	0	0	22	133	21	5	1021
8:00 AM	4	183	24	0	28	123	49	1	57	361	2	0	19	150	28	7	1036
8:15 AM	8	173	24	0	43	167	56	3	76	300	6	0	23	124	20	4	1027
8:30 AM	8	146	12	0	28	153	57	1	74	312	1	0	27	108	21	5	953
8:45 AM	9	131	16	0	31	147	69	2	73	323	6	0	37	146	19	5	1014
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	60	1684	225	0	281	1117	617	17	696	3968	25	0	191	1087	200	45	10213
APPROACH %'s :	3.05%	85.53%	11.43%	0.00%	13.83%	54.97%	30.36%	0.84%	14.84%	84.62%	0.53%	0.00%	12.54%	71.37%	13.13%	2.95%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	26	642	84	0	136	566	226	7	261	1363	9	0	91	515	90	21	4037
PEAK HR FACTOR :	0.813	0.877	0.875	0.000	0.791	0.847	0.883	0.583	0.859	0.874	0.375	0.000	0.843	0.858	0.804	0.750	0.974
	0.891				0.869				0.919				0.879				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	20	131	19	0	26	126	87	3	51	179	7	0	26	314	41	5	1035
4:15 PM	21	106	21	0	30	136	70	4	59	175	8	0	30	336	30	6	1032
4:30 PM	25	122	11	0	34	144	69	7	47	168	6	0	16	331	26	4	1010
4:45 PM	17	150	12	0	44	168	64	3	47	187	10	0	18	326	26	3	1075
5:00 PM	21	139	22	0	35	130	82	6	55	212	9	0	22	316	30	3	1082
5:15 PM	25	145	16	0	38	136	85	2	54	180	4	0	14	307	38	5	1049
5:30 PM	28	136	11	0	32	136	82	8	58	164	8	0	13	289	36	2	1003
5:45 PM	19	111	15	0	41	143	72	5	42	182	5	1	24	341	28	2	1031
6:00 PM	25	124	20	0	37	150	58	4	42	175	14	0	18	349	16	9	1041
6:15 PM	10	111	14	0	30	132	75	3	37	192	3	0	22	315	34	3	981
6:30 PM	23	117	13	0	29	140	48	2	37	151	7	0	14	315	37	5	938
6:45 PM	19	107	18	0	34	139	68	3	45	135	6	0	29	254	27	6	890
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	253	1499	192	0	410	1680	860	50	574	2100	87	1	246	3793	369	53	12167
APPROACH %'s :	13.01%	77.11%	9.88%	0.00%	13.67%	56.00%	28.67%	1.67%	20.78%	76.03%	3.15%	0.04%	5.51%	85.03%	8.27%	1.19%	
PEAK HR :	**05:00 PM - 06:00 PM**																TOTAL
PEAK HR VOL :	93	531	64	0	146	545	321	21	209	738	26	1	73	1253	132	12	4165
PEAK HR FACTOR :	0.830	0.916	0.727	0.000	0.890	0.953	0.944	0.656	0.901	0.870	0.722	0.250	0.760	0.919	0.868	0.600	0.962
	0.925				0.989				0.882				0.930				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Fairfax Blvd
City: Fairfax
Control: Signalized

Project ID: 19-11036-003
Date: 3/20/2019

Cars

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Fairfax Blvd				Fairfax Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	2	55	13	0	9	34	12	2	25	199	0	0	5	33	2	0	391
6:15 AM	3	82	23	0	8	28	27	0	34	294	1	0	3	35	6	0	544
6:30 AM	1	144	18	0	6	33	23	4	45	328	0	0	4	42	10	4	662
6:45 AM	5	115	13	0	9	41	40	1	48	371	2	0	2	59	8	3	717
7:00 AM	5	170	19	0	12	55	57	1	72	357	1	0	10	62	12	6	839
7:15 AM	4	179	20	0	19	91	92	0	81	317	0	0	15	71	15	2	906
7:30 AM	4	137	15	0	27	105	58	0	51	350	3	0	19	101	9	4	883
7:45 AM	6	137	23	0	31	120	60	2	51	381	0	0	21	118	16	5	971
8:00 AM	4	181	22	0	26	119	49	1	54	353	2	0	15	142	25	7	1000
8:15 AM	8	170	23	0	39	167	54	3	73	293	5	0	23	120	12	4	994
8:30 AM	8	140	12	0	26	150	54	1	73	298	1	0	25	102	17	5	912
8:45 AM	9	130	14	0	27	145	65	2	70	313	6	0	35	142	13	5	976
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	59	1640	215	0	239	1088	591	17	677	3854	21	0	177	1027	145	45	9795
APPROACH %'s :	3.08%	85.68%	11.23%	0.00%	12.35%	56.23%	30.54%	0.88%	14.87%	84.67%	0.46%	0.00%	12.70%	73.67%	10.40%	3.23%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	26	628	80	0	122	556	217	7	251	1325	8	0	84	482	70	21	3877
PEAK HR FACTOR :	0.81	0.867	0.870	0.000	0.782	0.832	0.904	0.583	0.860	0.869	0.400	0.000	0.840	0.849	0.700	0.750	0.969
	0.886				0.857				0.917				0.869				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	19	130	19	0	24	125	86	3	50	175	7	0	26	310	35	5	1014
4:15 PM	21	104	20	0	28	135	70	4	58	172	8	0	29	328	25	6	1008
4:30 PM	24	120	11	0	33	141	68	7	47	165	6	0	16	325	24	4	991
4:45 PM	17	150	12	0	42	167	63	3	47	183	10	0	17	320	24	3	1058
5:00 PM	21	137	20	0	35	129	81	6	54	207	9	0	20	313	29	3	1064
5:15 PM	24	144	16	0	35	135	84	2	53	178	4	0	14	301	35	5	1030
5:30 PM	28	136	11	0	30	136	82	8	58	159	8	0	12	288	33	2	991
5:45 PM	19	110	15	0	38	142	70	5	42	179	5	1	24	337	26	2	1015
6:00 PM	25	122	20	0	36	146	58	4	42	173	14	0	18	344	15	9	1026
6:15 PM	10	109	14	0	28	130	74	3	37	191	3	0	22	312	30	3	966
6:30 PM	23	116	13	0	25	139	48	2	37	151	7	0	14	313	33	5	926
6:45 PM	19	104	18	0	31	138	68	3	45	134	6	0	29	252	25	6	878
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	250	1482	189	0	385	1663	852	50	570	2067	87	1	241	3743	334	53	11967
APPROACH %'s :	13.01%	77.15%	9.84%	0.00%	13.05%	56.37%	28.88%	1.69%	20.92%	75.85%	3.19%	0.04%	5.51%	85.63%	7.64%	1.21%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	92	527	62	0	138	542	317	21	207	723	26	1	70	1239	123	12	4100
PEAK HR FACTOR :	0.82	0.915	0.775	0.000	0.908	0.954	0.943	0.656	0.892	0.873	0.722	0.250	0.729	0.919	0.879	0.600	0.963
	0.925				0.994				0.886				0.928				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Fairfax Blvd
City: Fairfax
Control: Signalized

Project ID: 19-11036-003
Date: 3/20/2019

HT

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Fairfax Blvd				Fairfax Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	2	0	0	1	2	4	0	0	3	0	0	1	3	1	0	17
6:15 AM	1	3	1	0	2	1	2	0	0	7	0	0	0	2	1	0	20
6:30 AM	0	4	1	0	1	3	1	0	1	8	0	0	0	1	4	0	24
6:45 AM	0	6	0	0	7	4	2	0	0	6	0	0	0	5	3	0	33
7:00 AM	0	4	1	0	4	1	1	0	1	14	2	0	0	6	1	0	35
7:15 AM	0	5	0	0	4	3	1	0	2	12	1	0	3	1	11	0	43
7:30 AM	0	5	1	0	5	3	2	0	2	16	0	0	1	5	8	0	48
7:45 AM	0	3	1	0	6	3	4	0	3	9	0	0	1	15	5	0	50
8:00 AM	0	2	2	0	2	4	0	0	3	8	0	0	4	8	3	0	36
8:15 AM	0	3	1	0	4	0	2	0	3	7	1	0	0	4	8	0	33
8:30 AM	0	6	0	0	2	3	3	0	1	14	0	0	2	6	4	0	41
8:45 AM	0	1	2	0	4	2	4	0	3	10	0	0	2	4	6	0	38
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	44	10	0	42	29	26	0	19	114	4	0	14	60	55	0	418
APPROACH %'s :	1.82%	80.00%	18.18%	0.00%	43.30%	29.90%	26.80%	0.00%	13.87%	83.21%	2.92%	0.00%	10.85%	46.51%	42.64%	0.00%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	14	4	0	14	10	9	0	10	38	1	0	7	33	20	0	160
PEAK HR FACTOR :	0.000	0.583	0.500	0.000	0.583	0.625	0.563	0.000	0.833	0.679	0.250	0.000	0.438	0.550	0.625	0.000	0.800
	0.750				0.635				0.817				0.714				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	1	0	0	2	1	1	0	1	4	0	0	0	4	6	0	21
4:15 PM	0	2	1	0	2	1	0	0	1	3	0	0	1	8	5	0	24
4:30 PM	1	2	0	0	1	3	1	0	0	3	0	0	0	6	2	0	19
4:45 PM	0	0	0	0	2	1	1	0	0	4	0	0	1	6	2	0	17
5:00 PM	0	2	2	0	0	1	1	0	1	5	0	0	2	3	1	0	18
5:15 PM	1	1	0	0	3	1	1	0	1	2	0	0	0	6	3	0	19
5:30 PM	0	0	0	0	2	0	0	0	0	5	0	0	1	1	3	0	12
5:45 PM	0	1	0	0	3	1	2	0	0	3	0	0	0	4	2	0	16
6:00 PM	0	2	0	0	1	4	0	0	0	2	0	0	0	5	1	0	15
6:15 PM	0	2	0	0	2	2	1	0	0	1	0	0	0	3	4	0	15
6:30 PM	0	1	0	0	4	1	0	0	0	0	0	0	0	2	4	0	12
6:45 PM	0	3	0	0	3	1	0	0	0	1	0	0	0	2	2	0	12
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	17	3	0	25	17	8	0	4	33	0	0	5	50	35	0	200
APPROACH %'s :	13.04%	73.91%	13.04%	0.00%	50.00%	34.00%	16.00%	0.00%	10.81%	89.19%	0.00%	0.00%	5.56%	55.56%	38.89%	0.00%	
PEAK HR :	**05:00 PM - 06:00 PM**																TOTAL
PEAK HR VOL :	1	4	2	0	8	3	4	0	2	15	0	0	3	14	9	0	65
PEAK HR FACTOR :	0.25	0.500	0.250	0.000	0.667	0.750	0.500	0.000	0.500	0.750	0.000	0.000	0.375	0.583	0.750	0.000	0.855
	0.438				0.625				0.708				0.722				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Fairfax Blvd
City: Fairfax
Control: Signalized

Project ID: 19-11036-003
Date: 3/20/2019

Bikes

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Fairfax Blvd				Fairfax Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1	0	2	0	0	0	0	0	0	2	0	0	5
APPROACH %'s :					33.33%	0.00%	66.67%	0.00%					0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
					0.250												

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
6:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1	0	0	0	0	3	0	0	0	2	0	0	6
APPROACH %'s :					100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.500
										0.250				0.250			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Fairfax Blvd
City: Fairfax

Project ID: 19-11036-003
Date: 3/20/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Chain Bridge Rd		Chain Bridge Rd		Fairfax Blvd		Fairfax Blvd						
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		SCRAMBLE (NE/SW)		SCRAMBLE (NW/SE)		
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	1	0	0	0	3	0	0	0	0	0	4	8
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	1	1	0	0	0	1	1	0	0	4
8:30 AM	0	1	0	0	1	0	0	0	1	0	0	1	4
8:45 AM	0	0	0	0	0	2	0	0	0	0	0	2	4
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	2	0	2	2	5	0	0	2	1	0	7	21
APPROACH %'s :	0.00%	100.00%	0.00%	100.00%	28.57%	71.43%			66.67%	33.33%	0.00%	100.00%	
PEAK HR :	07:45 AM - 08:45 AM												TOTAL
PEAK HR VOL :	0	1	0	2	2	0	0	0	2	1	0	1	9
PEAK HR FACTOR :		0.250		0.500	0.500				0.500	0.250		0.250	0.563
	0.250		0.500		0.500				0.375		0.250		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		SCRAMBLE (NE/SW)		SCRAMBLE (NW/SE)		
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
4:00 PM	1	0	1	1	0	0	1	1	0	0	0	0	5
4:15 PM	0	0	0	0	1	2	0	0	1	0	0	2	6
4:30 PM	0	0	2	0	0	1	0	0	0	0	3	1	7
4:45 PM	0	0	0	0	0	2	0	0	0	0	0	2	4
5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	3	0	0	0	2	0	0	0	0	0	5	10
5:30 PM	0	0	0	0	1	2	1	0	1	0	1	2	8
5:45 PM	0	0	0	0	2	0	0	0	2	0	0	0	4
6:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	1
6:15 PM	2	1	0	0	0	0	0	0	2	0	0	1	6
6:30 PM	0	1	0	0	0	0	0	0	0	0	0	1	2
6:45 PM	0	0	0	0	0	2	0	0	0	0	0	2	4
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	3	6	3	1	4	11	2	1	7	0	4	16	58
APPROACH %'s :	33.33%	66.67%	75.00%	25.00%	26.67%	73.33%	66.67%	33.33%	100.00%	0.00%	20.00%	80.00%	
PEAK HR :	05:00 PM - 06:00 PM												TOTAL
PEAK HR VOL :	0	4	0	0	3	4	1	0	3	0	1	7	23
PEAK HR FACTOR :		0.333			0.375	0.500	0.250		0.375		0.250	0.350	0.575
	0.333				0.583		0.250		0.375		0.400		

National Data & Surveying Services

Intersection Turning Movement Count

Location: Farr Ave & Fairfax Blvd
City: Fairfax
Control: 1-Way Stop (NB)

Project ID: 19-11036-004
Date: 3/20/2019

Total

NS/EW Streets:	Farr Ave				Farr Ave				Fairfax Blvd				Fairfax Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	1	0	0	0	0	0	0	204	0	0	0	44	1	0	250
6:15 AM	0	0	0	0	0	0	0	0	0	344	0	0	0	77	0	0	421
6:30 AM	0	0	0	0	0	0	0	0	0	430	0	0	0	72	0	0	502
6:45 AM	0	0	1	0	0	0	0	0	0	403	0	0	0	98	0	0	502
7:00 AM	0	0	0	0	0	0	0	0	0	413	0	0	0	131	1	0	545
7:15 AM	0	0	2	0	0	0	1	0	0	456	0	0	0	171	0	0	630
7:30 AM	0	0	2	0	0	0	0	0	0	428	1	0	0	154	1	0	586
7:45 AM	0	0	2	0	0	0	0	0	0	405	1	0	0	195	0	0	603
8:00 AM	0	0	1	0	0	0	1	0	0	413	0	0	0	202	1	0	618
8:15 AM	0	0	2	0	0	0	1	0	0	411	0	0	0	197	1	0	612
8:30 AM	0	0	1	0	0	0	0	0	0	386	0	0	0	173	2	0	562
8:45 AM	0	0	2	0	0	0	0	0	0	382	0	0	0	210	0	0	594
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	14	0	0	0	3	0	0	4675	2	0	0	1724	7	0	6425
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	99.96%	0.04%	0.00%	0.00%	99.60%	0.40%	0.00%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	0	6	0	0	0	2	0	0	1615	1	0	0	767	4	0	2395
PEAK HR FACTOR :	0.000	0.000	0.750	0.000	0.000	0.000	0.500	0.000	0.000	0.978	0.250	0.000	0.000	0.949	0.500	0.000	0.969
	0.750				0.500				0.978				0.950				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	6	0	0	0	1	0	0	236	0	0	0	412	2	0	657
4:15 PM	0	0	5	1	0	0	2	0	0	237	0	0	0	432	0	0	677
4:30 PM	0	0	4	0	0	0	3	0	0	226	0	0	0	423	0	0	656
4:45 PM	0	0	3	0	0	0	1	0	0	242	0	0	0	403	1	0	650
5:00 PM	0	0	2	0	0	0	2	0	0	271	1	0	0	438	1	0	715
5:15 PM	0	0	1	0	0	0	0	0	0	229	0	0	0	421	0	0	651
5:30 PM	0	0	2	0	0	0	5	0	0	215	0	0	0	388	1	0	611
5:45 PM	0	0	3	0	0	0	3	0	0	216	0	0	0	448	0	0	670
6:00 PM	0	0	4	0	0	0	4	0	0	220	0	0	0	398	1	0	627
6:15 PM	0	0	1	0	0	0	0	0	0	231	0	0	0	391	0	0	623
6:30 PM	0	0	0	0	0	0	3	0	0	211	0	0	0	414	0	0	628
6:45 PM	0	0	1	0	0	0	2	0	0	193	0	0	0	379	0	0	575
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	32	1	0	0	26	0	0	2727	1	0	0	4947	6	0	7740
APPROACH %'s :	0.00%	0.00%	96.97%	3.03%	0.00%	0.00%	100.00%	0.00%	0.00%	99.96%	0.04%	0.00%	0.00%	99.88%	0.12%	0.00%	
PEAK HR :	**05:00 PM - 06:00 PM**																TOTAL
PEAK HR VOL :	0	0	8	0	0	0	10	0	0	931	1	0	0	1695	2	0	2647
PEAK HR FACTOR :	0.000	0.000	0.667	0.000	0.000	0.000	0.500	0.000	0.000	0.859	0.250	0.000	0.000	0.946	0.500	0.000	0.926
	0.667				0.500				0.857				0.947				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Farr Ave & Fairfax Blvd
City: Fairfax
Control: 1-Way Stop (NB)

Project ID: 19-11036-004
Date: 3/20/2019

Cars

NS/EW Streets:	Farr Ave				Farr Ave				Fairfax Blvd				Fairfax Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	202	0	0	0	38	1	0	241
6:15 AM	0	0	0	0	0	0	0	0	0	337	0	0	0	71	0	0	408
6:30 AM	0	0	0	0	0	0	0	0	0	421	0	0	0	70	0	0	491
6:45 AM	0	0	0	0	0	0	0	0	0	398	0	0	0	91	0	0	489
7:00 AM	0	0	0	0	0	0	0	0	0	397	0	0	0	124	1	0	522
7:15 AM	0	0	2	0	0	0	1	0	0	440	0	0	0	169	0	0	612
7:30 AM	0	0	2	0	0	0	0	0	0	408	1	0	0	147	1	0	559
7:45 AM	0	0	2	0	0	0	0	0	0	395	1	0	0	181	0	0	579
8:00 AM	0	0	1	0	0	0	1	0	0	404	0	0	0	189	1	0	596
8:15 AM	0	0	2	0	0	0	1	0	0	398	0	0	0	192	1	0	594
8:30 AM	0	0	0	0	0	0	0	0	0	372	0	0	0	168	2	0	542
8:45 AM	0	0	2	0	0	0	0	0	0	370	0	0	0	198	0	0	570
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	11	0	0	0	3	0	0	4542	2	0	0	1638	7	0	6203
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	99.96%	0.04%	0.00%	0.00%	99.57%	0.43%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	0	5	0	0	0	2	0	0	1569	1	0	0	730	4	0	2311
PEAK HR FACTOR :	0.00	0.000	0.625	0.000	0.000	0.000	0.500	0.000	0.000	0.971	0.250	0.000	0.000	0.951	0.500	0.000	0.969
	0.625				0.500				0.972				0.951				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	6	0	0	0	1	0	0	230	0	0	0	407	2	0	646
4:15 PM	0	0	5	1	0	0	2	0	0	234	0	0	0	426	0	0	668
4:30 PM	0	0	4	0	0	0	3	0	0	223	0	0	0	412	0	0	642
4:45 PM	0	0	3	0	0	0	1	0	0	238	0	0	0	397	1	0	640
5:00 PM	0	0	2	0	0	0	2	0	0	265	1	0	0	433	1	0	704
5:15 PM	0	0	1	0	0	0	0	0	0	226	0	0	0	416	0	0	643
5:30 PM	0	0	1	0	0	0	4	0	0	211	0	0	0	385	1	0	602
5:45 PM	0	0	3	0	0	0	3	0	0	212	0	0	0	444	0	0	662
6:00 PM	0	0	4	0	0	0	4	0	0	218	0	0	0	393	1	0	620
6:15 PM	0	0	1	0	0	0	0	0	0	230	0	0	0	386	0	0	617
6:30 PM	0	0	0	0	0	0	3	0	0	210	0	0	0	411	0	0	624
6:45 PM	0	0	1	0	0	0	2	0	0	192	0	0	0	377	0	0	572
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	31	1	0	0	25	0	0	2689	1	0	0	4887	6	0	7640
APPROACH %'s :	0.00%	0.00%	96.88%	3.13%	0.00%	0.00%	100.00%	0.00%	0.00%	99.96%	0.04%	0.00%	0.00%	99.88%	0.12%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	7	0	0	0	9	0	0	914	1	0	0	1678	2	0	2611
PEAK HR FACTOR :	0.00	0.000	0.583	0.000	0.000	0.000	0.563	0.000	0.000	0.862	0.250	0.000	0.000	0.945	0.500	0.000	0.927
	0.583				0.563				0.860				0.946				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Farr Ave & Fairfax Blvd
City: Fairfax
Control: 1-Way Stop (NB)

Project ID: 19-11036-004
Date: 3/20/2019

HT

NS/EW Streets:	Farr Ave				Farr Ave				Fairfax Blvd				Fairfax Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	1	0	0	0	0	0	0	2	0	0	0	6	0	0	9
6:15 AM	0	0	0	0	0	0	0	0	0	7	0	0	0	6	0	0	13
6:30 AM	0	0	0	0	0	0	0	0	0	9	0	0	0	2	0	0	11
6:45 AM	0	0	1	0	0	0	0	0	0	5	0	0	0	7	0	0	13
7:00 AM	0	0	0	0	0	0	0	0	0	16	0	0	0	7	0	0	23
7:15 AM	0	0	0	0	0	0	0	0	0	16	0	0	0	2	0	0	18
7:30 AM	0	0	0	0	0	0	0	0	0	20	0	0	0	7	0	0	27
7:45 AM	0	0	0	0	0	0	0	0	0	10	0	0	0	14	0	0	24
8:00 AM	0	0	0	0	0	0	0	0	0	9	0	0	0	13	0	0	22
8:15 AM	0	0	0	0	0	0	0	0	0	13	0	0	0	5	0	0	18
8:30 AM	0	0	1	0	0	0	0	0	0	14	0	0	0	5	0	0	20
8:45 AM	0	0	0	0	0	0	0	0	0	12	0	0	0	12	0	0	24
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	3	0	0	0	0	0	0	133	0	0	0	86	0	0	222
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	0	1	0	0	0	0	0	0	46	0	0	0	37	0	0	84
PEAK HR FACTOR :	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.821	0.000	0.000	0.000	0.661	0.000	0.000	0.875
	0.250								0.821				0.661				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	5	0	0	11
4:15 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	6	0	0	9
4:30 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	11	0	0	14
4:45 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	6	0	0	10
5:00 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	5	0	0	11
5:15 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	0	8
5:30 PM	0	0	1	0	0	0	1	0	0	4	0	0	0	3	0	0	9
5:45 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	8
6:00 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	5	0	0	7
6:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	5	0	0	6
6:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	4
6:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	0	1	0	0	38	0	0	0	60	0	0	100
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	**05:00 PM - 06:00 PM**																TOTAL
PEAK HR VOL :	0	0	1	0	0	0	1	0	0	17	0	0	0	17	0	0	36
PEAK HR FACTOR :	0.00	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.708	0.000	0.000	0.000	0.850	0.000	0.000	0.818
	0.250				0.250				0.708				0.850				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Farr Ave & Fairfax Blvd
City: Fairfax
Control: 1-Way Stop (NB)

Project ID: 19-11036-004
Date: 3/20/2019

Bikes

NS/EW Streets:	Farr Ave				Farr Ave				Fairfax Blvd				Fairfax Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
APPROACH %'s :													0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.375
													0.375				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
6:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	0	7
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	3
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.375
										0.250				0.250			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Farr Ave & Fairfax Blvd
City: Fairfax

Project ID: 19-11036-004
Date: 3/20/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Farr Ave		Farr Ave		Fairfax Blvd		Fairfax Blvd		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
6:00 AM	0	1	0	0	0	0	0	0	1
6:15 AM	0	1	0	0	0	0	0	0	1
6:30 AM	0	1	0	0	0	0	0	0	1
6:45 AM	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	2	2	0	0	0	0	4
8:30 AM	0	2	0	1	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	5	2	4	0	0	0	0	11
APPROACH %'s :	0.00%	100.00%	33.33%	66.67%					
PEAK HR :	**07:45 AM - 08:45 AM**								TOTAL
PEAK HR VOL :	0	2	2	3	0	0	0	0	7
PEAK HR FACTOR :		0.250	0.250	0.375					0.438
	0.250		0.313						

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	1	2	0	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	3	0	0	0	0	0	3
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	2	0	0	0	0	0	0	0	2
5:15 PM	0	2	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
6:00 PM	2	0	0	0	0	0	0	0	2
6:15 PM	0	1	0	0	0	0	0	0	1
6:30 PM	0	1	0	0	0	0	0	0	1
6:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	5	6	3	0	0	0	0	0	14
APPROACH %'s :	45.45%	54.55%	100.00%	0.00%					
PEAK HR :	**05:00 PM - 06:00 PM**								TOTAL
PEAK HR VOL :	2	2	0	0	0	0	0	0	4
PEAK HR FACTOR :	0.250	0.250							0.500
	0.500								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Mclean Ave/United Bank Dwy & Fairfax Blvd/Warwick Ave
City: Fairfax
Control: Signalized

Project ID: 19-11036-005
Date: 3/20/2019

Total

AM

NS/EW Streets:	Mclean Ave/United Bank Dwy							Mclean Ave/United Bank Dwy						
	NORTHBOUND							SOUTHBOUND						
	0	1	0	0	0	0	0	0	1	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
6:00 AM	0	0	1	0	0	0	0	0	0	1	0	2	0	0
6:15 AM	1	0	2	0	0	0	0	1	0	0	0	0	0	0
6:30 AM	0	0	3	0	0	0	0	2	0	0	0	0	0	0
6:45 AM	0	1	3	0	1	0	0	1	0	1	0	1	0	0
7:00 AM	4	1	12	0	5	0	0	1	1	0	0	0	0	0
7:15 AM	1	0	2	0	2	0	0	4	0	0	0	1	0	0
7:30 AM	1	3	7	0	1	0	0	13	1	0	0	1	0	0
7:45 AM	3	4	14	0	4	0	0	16	4	1	0	1	0	0
8:00 AM	2	1	9	0	4	0	0	8	2	1	0	2	0	0
8:15 AM	3	1	4	0	1	0	0	2	1	0	0	2	0	0
8:30 AM	1	1	4	0	1	0	0	2	3	1	0	2	0	0
8:45 AM	1	2	7	0	1	2	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
TOTAL VOLUMES :	17	14	68	0	20	2	0	50	12	5	0	12	0	0
APPROACH %'s :	14.05%	11.57%	56.20%	0.00%	16.53%	1.65%	0.00%	63.29%	15.19%	6.33%	0.00%	15.19%	0.00%	0.00%
PEAK HR :	07:45 AM - 08:45 AM													
PEAK HR VOL :	9	7	31	0	10	0	0	28	10	3	0	7	0	0
PEAK HR FACTOR :	0.750	0.438	0.554	0.000	0.625	0.000	0.000	0.438	0.625	0.750	0.000	0.875	0.000	0.000
				0.570							0.545			

NS/EW Streets:	Fairfax Blvd/Warwick Ave							Fairfax Blvd/Warwick Ave						
	EASTBOUND							WESTBOUND						
	1	2	0	0	0	0	0	1	2	0	0	0	0	0
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
6:00 AM	0	194	1	0	5	0	1	0	38	0	0	0	3	2
6:15 AM	0	343	1	0	7	0	0	3	68	1	0	0	3	1
6:30 AM	1	419	0	0	8	0	0	4	65	0	0	0	2	0
6:45 AM	0	384	2	0	9	0	0	3	87	0	0	0	9	2
7:00 AM	1	408	0	0	4	1	1	0	117	3	0	1	8	2
7:15 AM	1	407	1	0	10	0	0	4	151	2	0	0	12	4
7:30 AM	0	393	0	0	12	0	0	5	140	1	1	0	8	4
7:45 AM	0	342	3	0	9	1	0	7	170	2	0	0	11	4
8:00 AM	0	353	3	0	8	1	0	7	187	2	0	0	7	0
8:15 AM	0	369	4	0	8	1	0	4	164	1	0	0	17	1
8:30 AM	0	377	1	0	18	1	0	3	173	1	0	0	6	5
8:45 AM	1	349	3	0	19	3	1	5	187	2	0	0	5	7
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
TOTAL VOLUMES :	4	4338	19	0	117	8	3	45	1547	15	1	1	91	32
APPROACH %'s :	0.09%	96.64%	0.42%	0.00%	2.61%	0.18%	0.07%	2.60%	89.32%	0.87%	0.06%	0.06%	5.25%	1.85%
PEAK HR :														
PEAK HR VOL :	0	1441	11	0	43	4	0	21	694	6	0	0	41	10
PEAK HR FACTOR :	0.000	0.956	0.688	0.000	0.597	1.000	0.000	0.750	0.928	0.750	0.000	0.000	0.603	0.500
				0.944							0.951			

NS/EW Streets:														
	NORTHBOUND2													
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
6:00 AM	0	0	0	0	0	0	0	1	0	0	0	4	0	0
6:15 AM	0	0	0	0	0	0	0	2	0	0	0	6	1	0
6:30 AM	0	0	0	0	0	0	0	1	0	0	0	9	0	0
6:45 AM	0	0	0	0	0	0	0	3	0	0	0	8	0	0
7:00 AM	0	0	0	0	0	1	0	6	1	0	0	11	1	0
7:15 AM	0	0	0	0	0	0	0	11	0	0	0	24	1	0
7:30 AM	0	0	0	0	0	1	0	6	0	0	1	29	0	0
7:45 AM	0	0	0	0	0	1	0	6	0	3	0	49	0	0
8:00 AM	0	0	0	0	0	0	0	7	0	0	0	36	0	0
8:15 AM	0	1	0	0	0	1	0	10	0	0	1	18	0	3
8:30 AM	0	0	0	0	0	2	0	5	1	0	1	15	1	0
8:45 AM	0	0	0	0	0	0	0	7	0	0	0	12	1	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
TOTAL VOLUMES :	0	1	0	0	0	6	0	65	2	0	3	221	5	3
APPROACH %'s :	0.00%	14.29%	0.00%	0.00%	0.00%	85.71%	0.00%	21.74%	0.67%	0.00%	1.00%	73.91%	1.67%	1.00%
PEAK HR :														
PEAK HR VOL :	0	1	0	0	0	4	0	28	1	0	2	118	1	3
PEAK HR FACTOR :	0.000	0.250	0.000	0.000	0.000	0.500	0.000	0.700	0.250	0.000	0.500	0.602	0.250	0.250
				0.625										

NS/EW Streets:														
	WESTBOUND2													
	0	0	0	0	0	0	0							
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL						
6:00 AM	0	0	0	1	2	0	0	256						
6:15 AM	0	2	0	0	1	0	0	443						
6:30 AM	0	0	0	0	2	0	0	516						
6:45 AM	0	4	0	0	6	0	0	525						
7:00 AM	0	1	0	0	4	0	1	596						
7:15 AM	0	3	0	0	3	1	0	645						
7:30 AM	0	1	0	0	1	0	0	630						
7:45 AM	0	4	0	0	5	0	0	661						
8:00 AM	0	4	0	0	4	0	0	648						
8:15 AM	0	2	0	1	3	0	0	623						
8:30 AM	0	2	0	0	3	0	0	630						
8:45 AM	0	2	0	0	4	0	1	622						
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL						
TOTAL VOLUMES :	0	25	0	2	38	1	2	6795						
APPROACH %'s :	0.00%	36.76%	0.00%	2.94%	55.88%	1.47%	2.94%							
PEAK HR :								TOTAL						
PEAK HR VOL :	0	12	0	1	15	0	0	2562						
PEAK HR FACTOR :	0.000	0.750	0.000	0.250	0.750	0.000	0.000	0.969						
				0.778										

PM

NS/EW Streets:	Mclean Ave/United Bank Dwy							Mclean Ave/United Bank Dwy						
	NORTHBOUND							SOUTHBOUND						
	0	1	0	0	0	0	0	0	1	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
4:00 PM	4	0	1	0	5	0	0	2	0	1	0	0	0	0
4:15 PM	2	4	3	0	5	0	0	1	1	0	0	0	0	0
4:30 PM	6	1	2	0	1	0	0	2	1	1	0	0	0	0
4:45 PM	3	4	7	0	0	1	0	1	0	1	0	1	0	0
5:00 PM	3	2	9	0	7	0	0	6	3	0	0	1	0	0
5:15 PM	7	2	4	0	8	1	0	4	0	2	0	1	0	0
5:30 PM	9	7	5	0	8	0	0	5	0	0	0	0	0	2
5:45 PM	5	2	3	0	4	1	0	0	1	0	0	1	0	2
6:00 PM	6	2	3	0	7	0	0	7	1	0	0	1	0	0
6:15 PM	3	1	5	0	2	0	0	2	0	1	0	1	0	0
6:30 PM	1	1	7	0	2	0	0	1	1	0	0	2	0	0
6:45 PM	4	0	3	0	3	0	0	1	0	1	0	1	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
TOTAL VOLUMES :	53	26	52	0	52	3	0	32	8	7	0	9	0	4
APPROACH %'s :	28.49%	13.98%	27.96%	0.00%	27.96%	1.61%	0.00%	53.33%	13.33%	11.67%	0.00%	15.00%	0.00%	6.67%
PEAK HR :	05:00 PM - 06:00 PM													
PEAK HR VOL :	24	13	21	0	27	2	0	15	4	2	0	3	0	4
PEAK HR FACTOR :	0.667	0.464	0.583	0.000	0.844	0.500	0.000	0.625	0.333	0.250	0.000	0.750	0.000	0.500
				0.750							0.700			

NS/EW Streets:	Fairfax Blvd/Warwick Ave							Fairfax Blvd/Warwick Ave						
	EASTBOUND							WESTBOUND						
	1	2	0	0	0	0	0	1	2	0	0	0	0	0
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
4:00 PM	1	215	3	0	11	0	0	9	377	0	0	1	20	7
4:15 PM	3	204	5	0	17	0	0	4	401	1	0	0	17	8
4:30 PM	1	199	3	0	10	0	0	10	382	1	0	0	28	6
4:45 PM	0	229	7	0	17	0	2	6	356	1	0	0	30	4
5:00 PM	0	225	3	0	20	0	1	9	394	0	0	0	28	4
5:15 PM	0	196	1	0	16	1	1	2	364	2	0	0	29	6
5:30 PM	0	194	3	0	17	0	2	7	346	3	0	1	38	6
5:45 PM	0	194	2	0	20	0	2	6	415	2	0	0	33	6
6:00 PM	0	209	4	0	11	0	1	9	350	1	0	0	32	5
6:15 PM	0	207	5	0	7	0	1	10	360	2	0	0	38	1
6:30 PM	0	177	3	0	20	0	0	10	367	3	0	1	28	5
6:45 PM	2	183	0	0	12	0	1	6	353	1	0	1	14	8
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
TOTAL VOLUMES :	7	2432	39	0	178	1	11	88	4465	17	0	4	335	66
APPROACH %'s :	0.26%	91.15%	1.46%	0.00%	6.67%	0.04%	0.41%	1.77%	89.75%	0.34%	0.00%	0.08%	6.73%	1.33%
PEAK HR :														
PEAK HR VOL :	0	809	9	0	73	1	6	24	1519	7	0	1	128	22
PEAK HR FACTOR :	0.000	0.899	0.750	0.000	0.913	0.250	0.750	0.667	0.915	0.583	0.000	0.250	0.842	0.917
				0.902							0.920			

NS/EW Streets:														
	NORTHBOUND2													
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
4:00 PM	0	0	0	0	0	1	0	3	0	0	0	21	2	2
4:15 PM	0	0	0	0	0	1	0	7	0	0	0	18	1	2
4:30 PM	0	2	0	0	0	0	0	10	0	0	0	16	4	2
4:45 PM	1	1	0	1	0	1	0	10	0	0	1	12	1	0
5:00 PM	0	1	0	0	0	2	0	8	0	0	0	20	0	1
5:15 PM	0	0	0	0	0	2	0	15	0	0	0	23	0	0
5:30 PM	0	1	0	0	0	0	0	8	0	0	0	13	4	0
5:45 PM	0	0	0	0	0	1	0	13	0	0	0	20	0	1
6:00 PM	0	0	0	0	0	1	0	11	0	0	0	7	1	0
6:15 PM	0	0	0	0	0	0	0	4	0	0	0	17	3	0
6:30 PM	0	0	0	0	0	2	0	9	0	0	2	10	0	0
6:45 PM	0	0	0	1	0	0	0	8	0	0	0	15	2	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
TOTAL VOLUMES :	1	5	0	2	0	11	0	106	0	0	3	192	18	8
APPROACH %'s :	5.26%	26.32%	0.00%	10.53%	0.00%	57.89%	0.00%	32.42%	0.00%	0.00%	0.92%	58.72%	5.50%	2.45%
PEAK HR :														
PEAK HR VOL :	0	2	0	0	0	5	0	44	0	0	0	76	4	2
PEAK HR FACTOR :	0.000	0.500	0.000	0.000	0.000	0.625	0.000	0.733	0.000	0.000	0.000	0.826	0.250	0.500
				0.583										

NS/EW Streets:														
	WESTBOUND2													
	0	0	0	0	0	0	0							
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL						
4:00 PM	0	3	0	0	5	0	3	697						
4:15 PM	0	0	0	0	7	0	2	714						
4:30 PM	0	3	0	0	8	0	0	699						
4:45 PM	0	1	0	0	4	0	0	703						
5:00 PM	0	4	0	0	5	1	1	758						
5:15 PM	0	3	0	0	4	0	2	696						
5:30 PM	0	6	0	0	6	1	0	692						
5:45 PM	0	5	0	0	4	0	1	744						
6:00 PM	0	2	0	1	3	1	0	676						
6:15 PM	0	4	0	1	4	0	0	679						
6:30 PM	0	1	0	0	3	0	2	658						
6:45 PM	0	5	0	0	5	1	0	631						
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL						
TOTAL VOLUMES :	0	37	0	2	58	4	11	8347						
APPROACH %'s :	0.00%	33.04%	0.00%	1.79%	51.79%	3.57%	9.82%							
PEAK HR :								TOTAL						
PEAK HR VOL :	0	18	0	0	19	2	4	2890						
PEAK HR FACTOR :	0.000	0.750	0.000	0.000	0.792	0.500	0.500	0.953						
				0.827										

National Data & Surveying Services

Intersection Turning Movement Count

Location: Mclean Ave/United Bank Dwy & Fairfax Blvd/Warwick Ave
City: Fairfax
Control: Signalized

Project ID: 19-11036-005
Date: 3/20/2019

Cars

NS/EW Streets: Mclean Ave/United Bank Dwy; Mclean Ave/United Bank Dwy; Fairfax Blvd/Warwick Ave; Fairfax Blvd/Warwick Ave; NORTHBOUND2; WESTBOUND2

AM

	NORTHBOUND							SOUTHBOUND							EASTBOUND							WESTBOUND							NORTHBOUND2							WESTBOUND2							
	0	1	0	0	0	0	0	0	1	0	0	0	0	1	2	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
6:00 AM	0	0	1	0	0	0	0	0	0	1	0	2	0	0	0	191	1	0	4	0	1	0	35	0	0	0	2	2	0	0	0	0	0	0	0	1	0	0	4	0	0	0	0	0	0	2	0	0	247
6:15 AM	1	0	2	0	0	0	0	1	0	0	0	0	0	0	0	338	1	0	7	0	0	2	64	1	0	0	2	1	0	0	0	0	0	0	0	2	0	0	5	1	0	0	2	0	0	1	0	0	431
6:30 AM	0	0	3	0	0	0	0	2	0	0	0	0	0	0	1	410	0	0	8	0	0	4	64	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	2	0	0	504
6:45 AM	0	1	3	0	1	0	0	1	0	1	0	1	0	0	0	379	2	0	8	0	0	3	79	0	0	0	8	2	0	0	0	0	0	0	0	3	0	0	7	0	0	0	4	0	0	5	0	0	508
7:00 AM	4	1	11	0	5	0	0	1	1	0	0	0	0	0	1	395	0	0	4	1	1	0	112	2	0	1	7	2	0	0	0	0	0	1	0	6	1	0	8	1	0	0	1	0	0	4	0	1	572
7:15 AM	1	0	2	0	2	0	0	4	0	0	0	1	0	0	1	395	1	0	10	0	0	4	150	2	0	0	11	4	0	0	0	0	0	0	0	10	0	0	0	21	1	0	3	0	0	3	1	0	627
7:30 AM	1	3	7	0	1	0	0	13	1	0	0	1	0	0	0	375	0	0	11	0	0	5	135	1	1	0	6	4	0	0	0	0	0	1	0	6	0	0	1	26	0	0	0	1	0	1	0	0	601
7:45 AM	3	4	14	0	4	0	0	15	4	1	0	1	0	0	0	333	3	0	9	1	0	7	157	2	0	0	8	4	0	0	0	0	0	1	0	6	3	0	0	48	0	0	0	4	0	0	5	0	634
8:00 AM	1	1	9	0	4	0	0	7	2	1	0	1	0	0	0	342	3	0	8	1	0	6	176	2	0	0	7	0	0	0	0	0	0	0	0	7	0	0	0	36	0	0	0	4	0	0	4	0	622
8:15 AM	3	1	4	0	1	0	0	2	1	0	0	2	0	0	0	359	4	0	8	1	0	4	156	1	0	0	17	1	0	1	0	0	0	1	0	9	0	0	0	17	0	3	0	2	0	1	2	0	601
8:30 AM	1	1	4	0	1	0	0	2	3	1	0	2	0	0	0	366	1	0	18	1	0	3	167	1	0	0	6	5	0	0	0	0	0	0	0	5	1	0	1	13	1	0	0	2	0	0	3	0	611
8:45 AM	1	2	7	0	1	2	0	0	0	0	0	0	0	0	1	338	3	0	19	3	1	5	177	2	0	0	4	7	0	0	0	0	0	0	0	7	0	0	0	10	1	0	0	2	0	0	4	0	598
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
TOTAL VOLUMES :	16	14	67	0	20	2	0	48	12	5	0	11	0	0	4	4221	19	0	114	8	3	43	1472	14	1	1	80	32	0	1	0	0	0	6	0	62	2	0	2	203	5	3	0	25	0	1	36	1	2	6556
APPROACH %'s :	13.45%	11.76%	56.30%	0.00%	16.81%	1.68%	0.00%	63.16%	15.79%	6.58%	0.00%	14.47%	0.00%	0.00%	0.09%	96.61%	0.43%	0.00%	2.61%	0.18%	0.07%	2.62%	89.59%	0.85%	0.06%	0.06%	4.87%	1.95%	0.00%	14.29%	0.00%	0.00%	0.00%	85.71%	0.00%	22.38%	0.72%	0.00%	0.72%	73.29%	1.81%	1.08%	0.00%	38.46%	0.00%	1.54%	55.38%	1.54%	3.08%	
PEAK HR :	07:45 AM - 08:45 AM																																																	TOTAL
PEAK HR VOL :	8	7	31	0	10	0	0	26	10	3	0	6	0	0	0	1400	11	0	43	4	0	20	656	6	0	0	38	10	0	1	0	0	0	4	0	27	1	0	1	114	1	3	0	12	0	1	14	0	0	2468
PEAK HR FACTOR :	0.67	0.438	0.554	0.000	0.625	0.000	0.000	0.433	0.625	0.750	0.000	0.750	0.000	0.000	0.000	0.956	0.688	0.000	0.597	1.000	0.000	0.714	0.932	0.750	0.000	0.000	0.559	0.500	0.000	0.250	0.000	0.000	0.000	0.500	0.000	0.750	0.250	0.000	0.250	0.594	0.250	0.250	0.000	0.750	0.000	0.250	0.700	0.000	0.000	0.973
				0.560							0.536							0.944							0.955							0.625													0.750			

PM

	NORTHBOUND							SOUTHBOUND							EASTBOUND							WESTBOUND							NORTHBOUND2							WESTBOUND2							
	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
4:00 PM	4	0	1	0	5	0	0	2	0	1	0	0	0	0	1	210	3	0	11	0	0	9	372	0	0	1	20	7	0	0	0	0	0	1	0	3	0	0	0	20	2	2	0	3	0	0	5	0	3	686
4:15 PM	2	4	3	0	5	0	0	1	1	0	0	0	0	0	3	201	5	0	17	0	0	4	396	1	0	0	16	8	0	0	0	0	0	1	0	7	0	0	0	18	1	2	0	0	0	0	7	0	2	705
4:30 PM	6	1	2	0	1	0	0	2	1	1	0	0	0	0	1	197	3	0	10	0	0	10	372	1	0	0	27	6	0	2	0	0	0	0	0	10	0	0	0	16	4	2	0	3	0	0	8	0	0	686
4:45 PM	3	4	7	0	0	1	0	1	0	1	0	1	0	0	0	225	7	0	17	0	2	6	351	1	0	0	29	4	1	1	0	1	0	1	0	9	0	0	1	11	1	0	0	1	0	0	4	0	0	691
5:00 PM	3	2	9	0	7	0	0	6	3	0	0	1	0	0	0	220	3	0	20	0	1	9	389	0	0	0	28	4	0	1	0	0	0	2	0	8	0	0	0	19	0	1	0	4	0	0	5	1	1	747
5:15 PM	7	2	4	0	8	1	0	4	0	2	0	1	0	0	0	193	1	0	15	1	1	2	359	2	0	0	29	6	0	0	0	0	0	2	0	15	0	0	0	22	0	0	0	3	0	0	3	0	2	685
5:30 PM	9	6	5	0	8	0	0	5	0	0	0	0	0	2	0	189	3	0	16	0	2	7	343	3	0	1	37	6	0	1	0	0	0	0	0	8	0	0	0	13	4	0	0	5	0	0	6	1	0	680
5:45 PM	5	2	3	0	4	1	0	0	1	0	0	1	0	2	0	191	2	0	20	0	2	6	412	2	0	0	33	6	0	0	0	0	0	1	0	13	0	0	0	19	0	1	0	5	0	0	4	0	1	737
6:00 PM	6	2	2	0	7	0	0	7	1	0	0	1	0	0	0	208	4	0	11	0	1	8	345	1	0	0	31	5	0	0	0	0	0	1	0	11	0	0	0	7	1	0	0	2	0	1	3	1	0	667
6:15 PM	3	1	5	0	2	0	0	2	0	1	0	1	0	0	0	206	5	0	7	0	1	10	355	2	0	0	38	1	0	0	0	0	0	0	0	4	0	0	0	16	3	0	0	4	0	1	4	0	0	672
6:30 PM	1	1	7	0	2	0	0	1	1	0	0	2	0	0	0	177	2	0	20	0	0	10	364	3	0	1	27	5	0	0	0	0	0	2	0	9	0	0	2	10	0	0	0	1	0	0	3	0	2	653
6:45 PM	4	0	3	0	3	0	0	1	0	1	0	1	0	0	2	181	0	0	12	0	1	6	351	1	0	1	14	8	0	0	0	1	0	0	0	8	0	0	0	15	2	0	0	4	0	0	5	1	0	626
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
TOTAL VOLUMES :	53	25	51	0	52	3	0	32	8	7	0	9	0	4	7	2398	38	0	176	1	11	87	4409	17	0	4	329	66	1	5	0	2	0	11	0	105	0	0	3	186	18	8	0	35	0	2	57	4	11	8235
APPROACH %'s :	28.80%	13.59%	27.72%	0.00%	28.26%	1.63%	0.00%	53.33%	13.33%	11.67%	0.00%	15.00%	0.00%	6.67%	0.27%	91.14%	1.44%	0.00%	6.69%	0.04%	0.42%	1.77%	89.76%	0.35%	0.00%	0.08%	6.70%	1.34%	5.26%	26.32%	0.00%	10.53%	0.00%	57.89%	0.00%	32.81%	0.00%	0.00%	0.94%	58.13%	5.63%	2.50%	0.00%	32.11%	0.00%	1.83%	52.29%	3.67%	10.09%	
PEAK HR :	05:00 PM - 06:00 PM																																																	TOTAL
PEAK HR VOL :	24	12	21	0	27	2	0	15	4	2	0	3	0	4	0	793	9	0	71	1	6	24	1503	7	0	1	127	22	0	2	0	0	0	5	0	44	0	0	0	73	4	2	0	17	0	0	18	2	4	2849
PEAK HR FACTOR :	0.67	0.500	0.583	0.000	0.844	0.500	0.000	0.625	0.333	0.250	0.000	0.750	0.000	0.500	0.000	0.901	0.750	0.000	0.888	0.250	0.750	0.667	0.912	0.583	0.000	0.250	0.858	0.917	0.000	0.500	0.000	0.000	0.000	0.625	0.000	0.733	0.000	0.000	0.000	0.830	0.250	0.500	0.000	0.850	0.000	0.000	0.750	0.500	0.500	0.953
				0.768							0.700							0.902							0.917							0.583													0.854			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Mclean Ave/United Bank Dwy & Fairfax Blvd/Warwick Ave
City: Fairfax
Control: Signalized

Project ID: 19-11036-005
Date: 3/20/2019

HT

NS/EW Streets: Mclean Ave/United Bank Dwy | Mclean Ave/United Bank Dwy | Fairfax Blvd/Warwick Ave | Fairfax Blvd/Warwick Ave

AM

	NORTHBOUND							SOUTHBOUND							EASTBOUND							WESTBOUND							NORTHBOUND2							WESTBOUND2							
	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	1	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	12
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	12
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	0	8	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	17
7:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	5	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	24
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	18
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	1	0	0	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	29
7:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	9	0	0	0	0	0	0	13	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	27
8:00 AM	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	11	0	0	0	0	0	1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	22
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	19
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	24
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
TOTAL VOLUMES :	1	0	1	0	0	0	0	2	0	0	0	1	0	0	0	117	0	0	3	0	0	2	75	1	0	0	11	0	0	0	0	0	0	0	3	0	0	1	18	0	0	0	0	0	1	2	0	0	239
APPROACH %'s :	50.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	66.67%	0.00%	0.00%	0.00%	33.33%	0.00%	0.00%	0.00%	97.50%	0.00%	0.00%	2.50%	0.00%	0.00%	2.25%	84.27%	1.12%	0.00%	0.00%	12.36%	0.00%							13.64%	0.00%	0.00%	4.55%	81.82%	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%	66.67%	0.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																																																TOTAL
PEAK HR VOL :	1	0	0	0	0	0	0	2	0	0	0	1	0	0	0	41	0	0	0	0	0	1	38	0	0	0	3	0	0	0	0	0	0	0	1	0	0	1	4	0	0	0	0	0	0	1	0	0	94
PEAK HR FACTOR :	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.932	0.000	0.000	0.000	0.000	0.000	0.250	0.731	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.870
				0.250							0.375							0.932							0.656																				0.250			

PM

	NORTHBOUND							SOUTHBOUND							EASTBOUND							WESTBOUND							NORTHBOUND2							WESTBOUND2							
	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	11
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	5	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	12
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	11
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	11
5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	7
6:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	7
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
TOTAL VOLUMES :	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	34	1	0	2	0	0	1	56	0	0	0	6	0	0	0	0	0	0	0	1	0	0	0	5	0	0	0	2	0	0	1	0	0	112
APPROACH %'s :	0.00%	50.00%	50.00%	0.00%	0.00%	0.00%	0.00%								0.00%	91.89%	2.70%	0.00%	5.41%	0.00%	0.00%	1.59%	88.89%	0.00%	0.00%	0.00%	9.52%	0.00%								14.29%	0.00%	0.00%	0.00%	85.71%	0.00%	0.00%	0.00%	66.67%	0.00%	0.00%	33.33%	0.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																																																TOTAL
PEAK HR VOL :	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	2	0	0	0	16	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	1	0	0	41
PEAK HR FACTOR :	0.00	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.800	0.000	0.000	0.500	0.000	0.000	0.000	0.800	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.000	0.250	0.000	0.000	0.500	0.250	0.000	0.854
				0.250														0.750							0.850																							

National Data & Surveying Services

Intersection Turning Movement Count

Location: Mclean Ave/United Bank Dwy & Fairfax Blvd/Warwick Ave
City: Fairfax
Control: Signalized

Project ID: 19-11036-005
Date: 3/20/2019

Bikes

AM

NS/EW Streets:	Mclean Ave/United Bank Dwy							Mclean Ave/United Bank Dwy						
AM	NORTHBOUND							SOUTHBOUND						
	0	1	0	0	0	0	0	0	1	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
TOTAL VOLUMES :	3	0	0	0	0	0	0	0	1	0	0	0	0	0
APPROACH %'s :	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
PEAK HR :	07:45 AM - 08:45 AM													
PEAK HR VOL :	1	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
				0.250										

NS/EW Streets:	Fairfax Blvd/Warwick Ave							Fairfax Blvd/Warwick Ave						
AM	EASTBOUND							WESTBOUND						
	1	2	0	0	0	0	0	1	2	0	0	0	0	0
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	6	0	0	0	0	0
APPROACH %'s :								0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
PEAK HR VOL :	0	0	0	0	0	0	0	0	4	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000
											0.500			

AM	NORTHBOUND2													
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

AM	WESTBOUND2							
	0	0	0	0	0	0	0	
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
6:00 AM	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	1
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	10
								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	5
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625

PM

PM	NORTHBOUND							SOUTHBOUND						
	0	1	0	0	0	0	0	0	1	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
TOTAL VOLUMES :	0	0	0	0	2	0	0	0	1	0	0	0	0	1
APPROACH %'s :	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	50.00%
PEAK HR :	05:00 PM - 06:00 PM													
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PM	EASTBOUND							WESTBOUND						
	1	2	0	0	0	0	0	1	2	0	0	0	0	0
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
4:00 PM	0	0	2	0	0	0	0	0	3	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	2	0	0	0	0	0	1	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
TOTAL VOLUMES :	0	3	4	0	0	0	0	0	5	0	0	0	1	0
APPROACH %'s :	0.00%	42.86%	57.14%	0.00%	0.00%	0.00%	0.00%	0.00%	83.33%	0.00%	0.00%	0.00%	16.67%	0.00%
PEAK HR VOL :	0	1	0	0	0	0	0	0	0	0	0	0	1	0
PEAK HR FACTOR :	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000
				0.250							0.250			

PM	NORTHBOUND2													
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
TOTAL VOLUMES :	0	0	0	0	0	0	0	2	0	0	0	1	0	0
APPROACH %'s :								66.67%	0.00%	0.00%	0.00%	33.33%	0.00%	0.00%
PEAK HR VOL :	0	0	0	0	0	0	0	2	0	0	0	1	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000

PM	WESTBOUND2							
	0	0	0	0	0	0	0	
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
4:00 PM	0	0	0	0	0	0	0	5
4:15 PM	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	3
4:45 PM	0	0	0	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	3
5:30 PM	0	1	0	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	1
6:15 PM	0	0	0	0	0	0	0	2
6:30 PM	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
TOTAL VOLUMES :	0	1	0	0	0	0	0	21
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
								TOTAL
PEAK HR VOL :	0	1	0	0	0	0	0	6
PEAK HR FACTOR :	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.500
				0.250				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Mclean Ave/United Bank Dwy & Fairfax Blvd/Warwick Ave
City: Fairfax

Project ID: 19-11036-005
Date: 3/20/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Mclean Ave/United Bank Dwy		Mclean Ave/United Bank Dwy		Fairfax Blvd/Warwick Ave		Fairfax Blvd/Warwick Ave												
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		SOUTH LEG 2		EAST LEG 2		WEST LEG 2		SCRAMBLE (NE/SW)		SCRAMBLE (NW/SE)		
	EB	WB	EB	WB	NB	SB	NB	SB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
6:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	1	4	1	1	0	0	2	1	0	0	0	0	0	2	1	0	0	0	13
APPROACH %'s :	20.00%	80.00%	50.00%	50.00%			66.67%	33.33%					0.00%	100.00%	100.00%	0.00%			
PEAK HR :	07:45 AM - 08:45 AM																		TOTAL
PEAK HR VOL :	0	2	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	6
PEAK HR FACTOR :	0.250		0.250				0.250						0.250		0.250				0.500
	0.250		0.250																

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		SOUTH LEG 2		EAST LEG 2		WEST LEG 2		SCRAMBLE (NE/SW)		SCRAMBLE (NW/SE)		
	EB	WB	EB	WB	NB	SB	NB	SB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
4:00 PM	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	3	2	0	0	0	0	3	3	0	0	0	0	0	0	0	0	11
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:15 PM	0	2	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	5
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
6:00 PM	2	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5
6:15 PM	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
6:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	6	6	5	5	0	0	2	1	4	4	0	0	0	2	0	0	0	0	35
APPROACH %'s :	50.00%	50.00%	50.00%	50.00%			66.67%	33.33%	50.00%	50.00%			0.00%	100.00%					
PEAK HR :	05:00 PM - 06:00 PM																		TOTAL
PEAK HR VOL :	2	2	2	2	0	0	2	0	0	0	0	0	0	2	0	0	0	0	12
PEAK HR FACTOR :	0.250	0.250	0.250	0.250			0.500							0.250					0.600
	0.500		0.500				0.500						0.250						

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-101
Date: 3/20/2019

Total

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	3	0	14	0	0	0	0	0	0	0	0	0	1	0	18
6:15 AM	0	0	5	0	12	0	0	0	0	0	0	0	0	0	2	0	19
6:30 AM	0	0	1	0	22	0	0	0	0	0	0	0	0	0	5	0	28
6:45 AM	0	0	2	0	18	0	0	0	0	0	0	0	0	0	9	0	29
7:00 AM	0	2	7	0	34	2	0	0	0	0	0	0	0	0	5	0	50
7:15 AM	0	0	5	0	49	1	0	0	0	0	0	0	1	0	13	0	69
7:30 AM	0	0	8	0	58	1	0	0	0	0	0	0	1	0	11	0	79
7:45 AM	0	1	7	0	66	0	0	0	0	0	0	0	2	0	14	0	90
8:00 AM	0	1	9	0	37	0	0	0	0	0	0	0	3	0	15	0	65
8:15 AM	0	2	6	0	46	0	0	0	0	0	0	0	2	0	17	0	73
8:30 AM	0	1	4	0	31	2	0	0	0	0	0	0	2	0	10	0	50
8:45 AM	0	1	6	0	36	1	0	0	0	0	0	0	0	0	11	0	55
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	8	63	0	423	7	0	0	0	0	0	0	11	0	113	0	625
APPROACH %'s :	0.00%	11.27%	88.73%	0.00%	98.37%	1.63%	0.00%	0.00%					8.87%	0.00%	91.13%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	5	26	0	180	2	0	0	0	0	0	0	9	0	56	0	278
PEAK HR FACTOR :	0.000	0.625	0.722	0.000	0.682	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.824	0.000	0.772
	0.775				0.689								0.855				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	5	0	12	0	0	0	0	0	0	0	3	0	24	0	44
4:15 PM	0	3	2	0	15	0	0	0	0	0	0	0	4	0	29	0	53
4:30 PM	0	0	4	0	19	0	0	0	0	0	0	0	3	0	31	0	57
4:45 PM	0	1	2	0	14	2	0	0	0	0	0	0	5	0	32	0	56
5:00 PM	0	1	3	0	21	2	0	0	0	0	0	0	9	0	30	0	66
5:15 PM	0	0	0	0	23	1	0	0	0	0	0	0	7	0	50	0	81
5:30 PM	0	1	1	0	29	1	0	0	0	0	0	0	8	0	36	0	76
5:45 PM	0	4	4	0	13	0	0	0	0	0	0	0	6	0	43	1	71
6:00 PM	0	0	3	0	16	2	0	0	0	0	0	0	7	0	41	0	69
6:15 PM	0	1	2	0	18	1	0	0	0	0	0	0	6	0	28	0	56
6:30 PM	0	1	5	0	22	3	0	0	0	0	0	0	7	0	25	0	63
6:45 PM	0	0	4	0	14	2	0	0	0	0	0	0	4	0	34	0	58
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	12	35	0	216	14	0	0	0	0	0	0	69	0	403	1	750
APPROACH %'s :	0.00%	25.53%	74.47%	0.00%	93.91%	6.09%	0.00%	0.00%					14.59%	0.00%	85.20%	0.21%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	6	8	0	86	4	0	0	0	0	0	0	30	0	159	1	294
PEAK HR FACTOR :	0.000	0.375	0.500	0.000	0.741	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.833	0.000	0.795	0.250	0.907
	0.438				0.750								0.833				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-101
Date: 3/20/2019

Cars

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	3	0	14	0	0	0	0	0	0	0	0	0	1	0	18
6:15 AM	0	0	5	0	12	0	0	0	0	0	0	0	0	0	2	0	19
6:30 AM	0	0	1	0	21	0	0	0	0	0	0	0	0	0	3	0	25
6:45 AM	0	0	2	0	17	0	0	0	0	0	0	0	0	0	8	0	27
7:00 AM	0	2	7	0	33	2	0	0	0	0	0	0	0	0	5	0	49
7:15 AM	0	0	5	0	47	1	0	0	0	0	0	0	1	0	13	0	67
7:30 AM	0	0	8	0	56	1	0	0	0	0	0	0	1	0	9	0	75
7:45 AM	0	1	7	0	61	0	0	0	0	0	0	0	2	0	13	0	84
8:00 AM	0	1	9	0	35	0	0	0	0	0	0	0	3	0	9	0	57
8:15 AM	0	2	6	0	46	0	0	0	0	0	0	0	2	0	14	0	70
8:30 AM	0	1	4	0	31	2	0	0	0	0	0	0	2	0	9	0	49
8:45 AM	0	1	6	0	36	1	0	0	0	0	0	0	0	0	10	0	54
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	8	63	0	409	7	0	0	0	0	0	0	11	0	96	0	594
APPROACH %'s :	0.00%	11.27%	88.73%	0.00%	98.32%	1.68%	0.00%	0.00%					10.28%	0.00%	89.72%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	5	26	0	173	2	0	0	0	0	0	0	9	0	45	0	260
PEAK HR FACTOR :	0.00	0.625	0.722	0.000	0.709	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.804	0.000	0.774
	0.775				0.717								0.844				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	5	0	12	0	0	0	0	0	0	0	3	0	22	0	42
4:15 PM	0	3	2	0	15	0	0	0	0	0	0	0	4	0	28	0	52
4:30 PM	0	0	4	0	19	0	0	0	0	0	0	0	3	0	31	0	57
4:45 PM	0	1	2	0	14	2	0	0	0	0	0	0	5	0	32	0	56
5:00 PM	0	1	3	0	21	2	0	0	0	0	0	0	9	0	29	0	65
5:15 PM	0	0	0	0	23	1	0	0	0	0	0	0	7	0	50	0	81
5:30 PM	0	1	1	0	29	1	0	0	0	0	0	0	8	0	34	0	74
5:45 PM	0	4	4	0	13	0	0	0	0	0	0	0	6	0	43	1	71
6:00 PM	0	0	3	0	16	2	0	0	0	0	0	0	7	0	41	0	69
6:15 PM	0	1	2	0	18	1	0	0	0	0	0	0	6	0	28	0	56
6:30 PM	0	1	5	0	21	3	0	0	0	0	0	0	7	0	25	0	62
6:45 PM	0	0	4	0	14	2	0	0	0	0	0	0	4	0	34	0	58
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	12	35	0	215	14	0	0	0	0	0	0	69	0	397	1	743
APPROACH %'s :	0.00%	25.53%	74.47%	0.00%	93.89%	6.11%	0.00%	0.00%					14.78%	0.00%	85.01%	0.21%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	6	8	0	86	4	0	0	0	0	0	0	30	0	156	1	291
PEAK HR FACTOR :	0.00	0.375	0.500	0.000	0.741	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.833	0.000	0.780	0.250	0.898
	0.438				0.750								0.820				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-101
Date: 3/20/2019

HT

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	3
6:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2
7:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
7:30 AM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	4
7:45 AM	0	0	0	0	5	0	0	0	0	0	0	0	0	0	1	0	6
8:00 AM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	6	0	8
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	14	0	0	0	0	0	0	0	0	0	17	0	31
APPROACH %'s :					100.00%	0.00%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	0	0	0	7	0	0	0	0	0	0	0	0	0	11	0	18
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.350	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.458	0.000	0.563
					0.350								0.458				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6	0	7
APPROACH %'s :					100.00%	0.00%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	**05:00 PM - 06:00 PM**																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.375
													0.375				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-101
Date: 3/20/2019

Bikes

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
APPROACH %'s :													0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3
APPROACH %'s :					100.00%	0.00%	0.00%	0.00%									
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
					0.250												

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr **Project ID:** 19-11036-101
City: Fairfax **Date:** 3/20/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Chain Bridge Rd		Chain Bridge Rd		Eaton Pl/Oak Pl/Assembly Dr		Eaton Pl/Oak Pl/Assembly Dr		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	1	0	0	6	1	9
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	6	1	7
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	1	2
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	2	1	0	0	12	3	18
APPROACH %'s :			66.67%	33.33%			80.00%	20.00%	
PEAK HR :	**07:45 AM - 08:45 AM**								TOTAL
PEAK HR VOL :	0	0	1	0	0	0	6	2	9
PEAK HR FACTOR :			0.250				0.250	0.500	0.321
			0.250				0.286		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	2	2
4:15 PM	0	0	0	2	0	0	2	1	5
4:30 PM	0	0	0	2	0	0	3	1	6
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	2	0	2
5:30 PM	0	0	1	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	1	0	0	2	2	5
6:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	1	5	0	0	9	6	21
APPROACH %'s :			16.67%	83.33%			60.00%	40.00%	
PEAK HR :	**05:00 PM - 06:00 PM**								TOTAL
PEAK HR VOL :	0	0	1	0	0	0	2	0	3
PEAK HR FACTOR :			0.250				0.250		0.375
			0.250				0.250		

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-201
Date: 3/20/2019

Total

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	4	0	13	0	6	32	0	0	0	11	1	0	67
6:15 AM	0	0	0	0	4	0	21	0	6	24	1	0	0	20	3	0	79
6:30 AM	0	0	1	0	10	0	31	0	12	29	0	0	0	22	3	0	108
6:45 AM	0	0	1	0	5	0	29	0	15	35	3	0	0	28	5	0	121
7:00 AM	2	0	2	0	11	0	32	0	12	45	2	0	0	34	2	0	142
7:15 AM	0	0	0	0	17	0	33	0	7	75	1	0	0	59	6	0	198
7:30 AM	2	1	1	0	9	0	39	0	9	97	4	0	0	71	0	0	233
7:45 AM	2	0	5	0	11	0	30	0	16	134	1	0	0	96	5	0	300
8:00 AM	2	0	5	0	11	0	41	0	10	73	1	0	0	95	12	0	250
8:15 AM	4	0	2	0	9	0	43	0	9	63	1	0	0	83	3	0	217
8:30 AM	0	0	9	0	8	1	31	0	8	91	3	0	0	70	3	0	224
8:45 AM	1	0	3	0	8	0	34	0	8	84	0	0	0	50	3	0	191
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	13	1	29	0	107	1	377	0	118	782	17	0	0	639	46	0	2130
APPROACH %'s :	30.23%	2.33%	67.44%	0.00%	22.06%	0.21%	77.73%	0.00%	12.87%	85.28%	1.85%	0.00%	0.00%	93.28%	6.72%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	8	0	21	0	39	1	145	0	43	361	6	0	0	344	23	0	991
PEAK HR FACTOR :	0.500	0.000	0.583	0.000	0.886	0.250	0.843	0.000	0.672	0.674	0.500	0.000	0.000	0.896	0.479	0.000	0.826
	0.806				0.889				0.679				0.857				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	1	1	0	3	0	21	0	24	52	1	0	1	159	11	0	275
4:15 PM	0	0	3	0	6	0	27	0	30	63	0	0	0	147	10	0	286
4:30 PM	1	0	0	0	10	0	33	0	34	69	1	0	0	153	10	0	311
4:45 PM	1	0	0	0	11	0	21	0	28	77	3	0	0	143	11	0	295
5:00 PM	2	0	1	0	9	3	29	0	35	66	2	0	0	149	13	0	309
5:15 PM	3	2	0	0	6	0	30	0	34	76	4	0	0	150	12	0	317
5:30 PM	4	0	3	0	2	0	36	0	31	70	3	0	0	149	15	0	313
5:45 PM	0	1	3	0	5	0	29	0	41	78	2	0	0	168	11	0	338
6:00 PM	4	1	2	0	6	0	31	0	37	69	2	0	1	138	14	0	305
6:15 PM	0	0	0	0	3	0	36	0	36	77	2	0	0	150	8	0	312
6:30 PM	0	0	1	0	4	0	18	0	32	80	2	0	0	151	19	0	307
6:45 PM	1	3	2	0	5	0	23	0	40	58	1	0	0	121	14	0	268
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	17	8	16	0	70	3	334	0	402	835	23	0	2	1778	148	0	3636
APPROACH %'s :	41.46%	19.51%	39.02%	0.00%	17.20%	0.74%	82.06%	0.00%	31.90%	66.27%	1.83%	0.00%	0.10%	92.22%	7.68%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	9	3	7	0	22	3	124	0	141	290	11	0	0	616	51	0	1277
PEAK HR FACTOR :	0.563	0.375	0.583	0.000	0.611	0.250	0.861	0.000	0.860	0.929	0.688	0.000	0.000	0.917	0.850	0.000	0.945
	0.679				0.909				0.913				0.932				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-201
Date: 3/20/2019

Cars

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	4	0	13	0	6	30	0	0	0	11	1	0	65
6:15 AM	0	0	0	0	4	0	21	0	6	24	1	0	0	19	2	0	77
6:30 AM	0	0	1	0	9	0	30	0	10	28	0	0	0	21	3	0	102
6:45 AM	0	0	1	0	5	0	25	0	14	33	3	0	0	26	5	0	112
7:00 AM	1	0	0	0	11	0	32	0	12	45	2	0	0	33	2	0	138
7:15 AM	0	0	0	0	17	0	33	0	7	71	1	0	0	58	5	0	192
7:30 AM	2	1	1	0	8	0	38	0	6	93	3	0	0	71	0	0	223
7:45 AM	2	0	5	0	11	0	29	0	13	133	1	0	0	91	5	0	290
8:00 AM	2	0	5	0	10	0	36	0	8	72	1	0	0	92	12	0	238
8:15 AM	4	0	1	0	9	0	42	0	8	62	1	0	0	79	3	0	209
8:30 AM	0	0	8	0	8	1	28	0	8	88	3	0	0	68	3	0	215
8:45 AM	1	0	3	0	8	0	34	0	8	82	0	0	0	50	3	0	189
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	12	1	25	0	104	1	361	0	106	761	16	0	0	619	44	0	2050
APPROACH %'s :	31.58%	2.63%	65.79%	0.00%	22.32%	0.21%	77.47%	0.00%	12.00%	86.18%	1.81%	0.00%	0.00%	93.36%	6.64%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	8	0	19	0	38	1	135	0	37	355	6	0	0	330	23	0	952
PEAK HR FACTOR :	0.50	0.000	0.594	0.000	0.864	0.250	0.804	0.000	0.712	0.667	0.500	0.000	0.000	0.897	0.479	0.000	0.821
	0.844				0.853				0.677				0.849				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	1	1	0	3	0	20	0	24	50	1	0	1	155	11	0	268
4:15 PM	0	0	3	0	6	0	27	0	28	63	0	0	0	146	9	0	282
4:30 PM	1	0	0	0	10	0	31	0	34	65	1	0	0	152	10	0	304
4:45 PM	1	0	0	0	11	0	21	0	27	77	2	0	0	142	11	0	292
5:00 PM	2	0	1	0	8	3	28	0	33	66	2	0	0	148	12	0	303
5:15 PM	3	2	0	0	6	0	29	0	34	75	4	0	0	150	12	0	315
5:30 PM	4	0	3	0	2	0	35	0	31	70	2	0	0	148	15	0	310
5:45 PM	0	1	3	0	5	0	29	0	41	76	2	0	0	167	11	0	335
6:00 PM	4	1	2	0	6	0	31	0	35	68	2	0	1	137	14	0	301
6:15 PM	0	0	0	0	3	0	36	0	36	75	1	0	0	148	8	0	307
6:30 PM	0	0	1	0	4	0	18	0	31	80	2	0	0	151	19	0	306
6:45 PM	1	3	2	0	5	0	22	0	40	57	1	0	0	119	14	0	264
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	17	8	16	0	69	3	327	0	394	822	20	0	2	1763	146	0	3587
APPROACH %'s :	41.46%	19.51%	39.02%	0.00%	17.29%	0.75%	81.95%	0.00%	31.88%	66.50%	1.62%	0.00%	0.10%	92.26%	7.64%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	9	3	7	0	21	3	121	0	139	287	10	0	0	613	50	0	1263
PEAK HR FACTOR :	0.56	0.375	0.583	0.000	0.656	0.250	0.864	0.000	0.848	0.944	0.625	0.000	0.000	0.918	0.833	0.000	0.943
	0.679				0.929				0.916				0.931				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-201
Date: 3/20/2019

HT

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
6:30 AM	0	0	0	0	1	0	1	0	2	1	0	0	0	1	0	0	6
6:45 AM	0	0	0	0	0	0	4	0	1	2	0	0	0	2	0	0	9
7:00 AM	1	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	4
7:15 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	1	1	0	6
7:30 AM	0	0	0	0	1	0	1	0	3	4	1	0	0	0	0	0	10
7:45 AM	0	0	0	0	0	0	1	0	3	1	0	0	0	5	0	0	10
8:00 AM	0	0	0	0	1	0	5	0	2	1	0	0	0	3	0	0	12
8:15 AM	0	0	1	0	0	0	1	0	1	1	0	0	0	4	0	0	8
8:30 AM	0	0	1	0	0	0	3	0	0	3	0	0	0	2	0	0	9
8:45 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	0	4	0	3	0	16	0	12	21	1	0	0	20	2	0	80
APPROACH %'s :	20.00%	0.00%	80.00%	0.00%	15.79%	0.00%	84.21%	0.00%	35.29%	61.76%	2.94%	0.00%	0.00%	90.91%	9.09%	0.00%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	0	2	0	1	0	10	0	6	6	0	0	0	14	0	0	39
PEAK HR FACTOR :	0.000	0.000	0.500	0.000	0.250	0.000	0.500	0.000	0.500	0.500	0.000	0.000	0.000	0.700	0.000	0.000	0.813
	0.500				0.458				0.750				0.700				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	1	0	0	2	0	0	0	4	0	0	7
4:15 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	1	1	0	4
4:30 PM	0	0	0	0	0	0	2	0	0	4	0	0	0	1	0	0	7
4:45 PM	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	3
5:00 PM	0	0	0	0	1	0	1	0	2	0	0	0	0	1	1	0	6
5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	3
5:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	3
6:00 PM	0	0	0	0	0	0	0	0	2	1	0	0	0	1	0	0	4
6:15 PM	0	0	0	0	0	0	0	0	0	2	1	0	0	2	0	0	5
6:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
6:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	2	0	0	4
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1	0	7	0	8	13	3	0	0	15	2	0	49
APPROACH %'s :					12.50%	0.00%	87.50%	0.00%	33.33%	54.17%	12.50%	0.00%	0.00%	88.24%	11.76%	0.00%	
PEAK HR :	**05:00 PM - 06:00 PM**																TOTAL
PEAK HR VOL :	0	0	0	0	1	0	3	0	2	3	1	0	0	3	1	0	14
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.250	0.000	0.750	0.000	0.250	0.375	0.250	0.000	0.000	0.750	0.250	0.000	0.583
					0.500				0.750				0.500				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-201
Date: 3/20/2019

Bikes

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	3	1	0	0	0	0	0	0	1	0	0	5
APPROACH %'s :					0.00%	75.00%	25.00%	0.00%					0.00%	100.00%	0.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
					0.250				0.250								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1	0	0	0	1	0	0	2	1	0	0	0	0	0	0	5
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	66.67%	33.33%	0.00%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
									0.250								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr **Project ID:** 19-11036-201
City: Fairfax **Date:** 3/20/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Chain Bridge Rd		Chain Bridge Rd		Eaton Pl/Oak Pl/Assembly Dr		Eaton Pl/Oak Pl/Assembly Dr		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
6:00 AM	0	0	0	0	0	4	0	0	4
6:15 AM	0	0	0	0	0	2	0	0	2
6:30 AM	0	0	0	0	0	3	0	0	3
6:45 AM	0	0	0	0	0	1	0	0	1
7:00 AM	0	0	0	0	0	4	0	0	4
7:15 AM	0	0	0	0	0	2	0	0	2
7:30 AM	0	0	0	0	0	2	0	0	2
7:45 AM	0	0	0	0	0	1	0	0	1
8:00 AM	0	0	0	0	1	1	0	0	2
8:15 AM	0	0	0	0	0	2	0	0	2
8:30 AM	0	1	1	1	1	2	0	1	7
8:45 AM	0	0	0	0	0	1	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	1	1	1	2	25	0	1	31
APPROACH %'s :	0.00%	100.00%	50.00%	50.00%	7.41%	92.59%	0.00%	100.00%	
PEAK HR :	07:45 AM - 08:45 AM								TOTAL
PEAK HR VOL :	0	1	1	1	2	6	0	1	12
PEAK HR FACTOR :	0.250		0.250		0.667		0.250		0.429

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	2	0	0	0	2
4:15 PM	0	0	0	0	3	1	0	0	4
4:30 PM	0	0	0	1	2	1	0	0	4
4:45 PM	0	0	0	0	0	1	0	0	1
5:00 PM	0	0	0	0	0	2	0	0	2
5:15 PM	0	0	1	0	2	2	0	0	5
5:30 PM	0	0	1	0	2	2	0	0	5
5:45 PM	0	0	0	0	2	0	0	0	2
6:00 PM	0	0	0	0	2	0	0	0	2
6:15 PM	0	0	0	0	3	1	0	0	4
6:30 PM	0	0	0	2	1	2	0	0	5
6:45 PM	0	0	0	0	3	4	0	0	7
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	2	3	22	16	0	0	43
APPROACH %'s :			40.00%	60.00%	57.89%	42.11%			
PEAK HR :	05:00 PM - 06:00 PM								TOTAL
PEAK HR VOL :	0	0	2	0	6	6	0	0	14
PEAK HR FACTOR :			0.500		0.750				0.700

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-001
Date: 2019-03-23

Total

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	2	187	15	4	57	220	5	1	9	6	1	0	12	4	68	0	591
11:15 AM	3	206	13	7	64	218	7	0	10	6	5	0	20	4	60	0	623
11:30 AM	2	177	6	1	53	222	11	1	5	9	6	0	17	4	60	0	574
11:45 AM	1	198	11	2	81	213	9	2	6	11	11	0	16	12	53	0	626
12:00 PM	2	164	12	2	52	227	14	0	9	10	2	0	14	8	71	0	587
12:15 PM	5	184	14	6	61	223	8	0	9	6	5	0	14	6	56	0	597
12:30 PM	1	170	14	3	53	229	6	0	6	3	3	0	18	4	106	0	616
12:45 PM	3	174	12	3	71	256	6	0	8	2	3	0	14	7	66	1	626
1:00 PM	4	227	10	4	52	232	9	1	5	2	6	0	11	12	69	0	644
1:15 PM	1	223	19	3	59	267	9	2	8	4	2	0	23	6	61	0	687
1:30 PM	2	153	10	3	71	282	6	1	6	9	3	0	11	10	80	0	647
1:45 PM	6	205	5	2	74	266	8	1	6	8	3	0	13	11	82	0	690
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	32	2268	141	40	748	2855	98	9	87	76	50	0	183	88	832	1	7508
APPROACH %'s :	1.29%	91.41%	5.68%	1.61%	20.16%	76.95%	2.64%	0.24%	40.85%	35.68%	23.47%	0.00%	16.58%	7.97%	75.36%	0.09%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	13	808	44	12	256	1047	32	5	25	23	14	0	58	39	292	0	2668
PEAK HR FACTOR :	0.542	0.890	0.579	0.750	0.865	0.928	0.889	0.625	0.781	0.639	0.583	0.000	0.630	0.813	0.890	0.000	0.967
	0.891				0.931				0.861				0.917				

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-001
Date: 2019-03-23

Cars

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
NOON	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	2	186	15	4	57	214	5	1	9	6	1	0	11	4	67	0	582
11:15 AM	3	201	12	7	64	214	7	0	10	6	5	0	20	4	60	0	613
11:30 AM	1	175	6	1	51	220	11	1	5	9	6	0	16	4	58	0	564
11:45 AM	1	196	11	2	81	209	9	2	6	11	10	0	16	12	52	0	618
12:00 PM	2	161	12	2	51	225	13	0	9	10	2	0	14	8	69	0	578
12:15 PM	5	183	14	6	61	222	8	0	9	6	5	0	14	6	54	0	593
12:30 PM	1	168	13	3	52	227	6	0	6	3	3	0	18	4	104	0	608
12:45 PM	3	171	11	3	71	252	6	0	8	2	3	0	13	7	66	1	617
1:00 PM	4	225	10	4	52	228	9	1	5	2	6	0	11	12	67	0	636
1:15 PM	1	223	19	3	58	263	9	2	8	4	2	0	23	6	60	0	681
1:30 PM	2	150	9	3	69	275	6	1	6	9	3	0	11	10	80	0	634
1:45 PM	6	200	5	2	72	262	8	1	6	8	3	0	12	11	82	0	678
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	31	2239	137	40	739	2811	97	9	87	76	49	0	179	88	819	1	7402
APPROACH %'s :	1.27%	91.50%	5.60%	1.63%	20.21%	76.89%	2.65%	0.25%	41.04%	35.85%	23.11%	0.00%	16.47%	8.10%	75.34%	0.09%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	13	798	43	12	251	1028	32	5	25	23	14	0	57	39	289	0	2629
PEAK HR FACTOR :	0.54	0.887	0.566	0.750	0.872	0.935	0.889	0.625	0.781	0.639	0.583	0.000	0.620	0.813	0.881	0.000	0.965
	0.880				0.937				0.861				0.917				

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-001
Date: 2019-03-23

HT

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	1	0	0	0	6	0	0	0	0	0	0	1	0	1	0	9
11:15 AM	0	5	1	0	0	4	0	0	0	0	0	0	0	0	0	0	10
11:30 AM	1	2	0	0	2	2	0	0	0	0	0	0	1	0	2	0	10
11:45 AM	0	2	0	0	0	4	0	0	0	0	1	0	0	0	1	0	8
12:00 PM	0	3	0	0	1	2	1	0	0	0	0	0	0	0	2	0	9
12:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	0	4
12:30 PM	0	2	1	0	1	2	0	0	0	0	0	0	0	0	2	0	8
12:45 PM	0	3	1	0	0	4	0	0	0	0	0	0	1	0	0	0	9
1:00 PM	0	2	0	0	0	4	0	0	0	0	0	0	0	0	2	0	8
1:15 PM	0	0	0	0	1	4	0	0	0	0	0	0	0	0	1	0	6
1:30 PM	0	3	1	0	2	7	0	0	0	0	0	0	0	0	0	0	13
1:45 PM	0	5	0	0	2	4	0	0	0	0	0	0	1	0	0	0	12
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	29	4	0	9	44	1	0	0	0	1	0	4	0	13	0	106
APPROACH %'s :	2.94%	85.29%	11.76%	0.00%	16.67%	81.48%	1.85%	0.00%	0.00%	0.00%	100.00%	0.00%	23.53%	0.00%	76.47%	0.00%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	10	1	0	5	19	0	0	0	0	0	0	1	0	3	0	39
PEAK HR FACTOR :	0.00	0.500	0.250	0.000	0.625	0.679	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.375	0.000	0.750
		0.550				0.667								0.500			

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-001
Date: 2019-03-23

Bikes

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2.5	0.5	0	1	2	0	0	0	1	0	0	0.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :																	
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax

Project ID: 19-11036-001
Date: 2019-03-23

Pedestrians (Crosswalks)

NS/EW Streets:	Chain Bridge Rd		Chain Bridge Rd		Eaton Pl/Oak Pl/Assembly Dr		Eaton Pl/Oak Pl/Assembly Dr		
NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	1	0	0	0	0	0	0	1
11:45 AM	0	0	2	0	0	0	0	0	2
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	1	2	0	0	0	0	0	3
APPROACH %'s :	0.00%	100.00%	100.00%	0.00%					
PEAK HR :	**01:00 PM - 02:00 PM**								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Orchard St
City: Fairfax
Control: 1-Way Stop (EB)

Project ID: 19-11036-002
Date: 2019-03-23

Total

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Orchard St				Orchard St				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
NOON	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	193	0	0	0	229	3	0	0	0	4	0	0	0	0	0	429
11:15 AM	0	209	0	0	0	243	0	0	0	0	0	0	0	0	0	0	452
11:30 AM	0	199	0	0	0	248	0	0	0	0	3	0	0	0	0	0	450
11:45 AM	0	206	0	0	0	243	1	0	0	0	1	0	0	0	0	0	451
12:00 PM	0	183	0	0	0	247	1	0	0	0	5	0	0	0	0	0	436
12:15 PM	0	207	0	0	0	232	2	0	0	0	3	0	0	0	0	0	444
12:30 PM	0	175	0	0	0	261	0	0	0	0	3	0	0	0	0	0	439
12:45 PM	0	195	0	0	0	270	2	0	0	0	6	0	0	0	0	0	473
1:00 PM	0	248	0	0	0	242	2	0	0	0	4	0	0	0	0	0	496
1:15 PM	0	245	0	0	0	286	3	0	0	0	1	0	0	0	0	0	535
1:30 PM	0	173	0	0	0	296	0	0	0	0	1	0	0	0	0	0	470
1:45 PM	0	229	0	0	0	292	0	0	0	0	2	0	0	0	0	0	523
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2462	0	0	0	3089	14	0	0	0	33	0	0	0	0	0	5598
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	99.55%	0.45%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	895	0	0	0	1116	5	0	0	0	8	0	0	0	0	0	2024
PEAK HR FACTOR :	0.000	0.902	0.000	0.000	0.000	0.943	0.417	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.946
		0.902				0.947				0.500							

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Orchard St
City: Fairfax
Control: 1-Way Stop (EB)

Project ID: 19-11036-002
Date: 2019-03-23

Cars

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Orchard St				Orchard St				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
NOON	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	193	0	0	0	223	3	0	0	0	3	0	0	0	0	0	422
11:15 AM	0	202	0	0	0	239	0	0	0	0	0	0	0	0	0	0	441
11:30 AM	0	196	0	0	0	245	0	0	0	0	3	0	0	0	0	0	444
11:45 AM	0	203	0	0	0	238	1	0	0	0	1	0	0	0	0	0	443
12:00 PM	0	180	0	0	0	244	1	0	0	0	5	0	0	0	0	0	430
12:15 PM	0	207	0	0	0	231	2	0	0	0	3	0	0	0	0	0	443
12:30 PM	0	172	0	0	0	259	0	0	0	0	3	0	0	0	0	0	434
12:45 PM	0	191	0	0	0	266	2	0	0	0	6	0	0	0	0	0	465
1:00 PM	0	246	0	0	0	238	2	0	0	0	4	0	0	0	0	0	490
1:15 PM	0	245	0	0	0	282	3	0	0	0	1	0	0	0	0	0	531
1:30 PM	0	169	0	0	0	290	0	0	0	0	1	0	0	0	0	0	460
1:45 PM	0	223	0	0	0	286	0	0	0	0	1	0	0	0	0	0	510
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2427	0	0	0	3041	14	0	0	0	31	0	0	0	0	0	5513
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	99.54%	0.46%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	883	0	0	0	1096	5	0	0	0	7	0	0	0	0	0	1991
PEAK HR FACTOR :	0.00	0.897	0.000	0.000	0.000	0.945	0.417	0.000	0.000	0.000	0.438	0.000	0.000	0.000	0.000	0.000	0.937
		0.897				0.949				0.438							

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Orchard St
City: Fairfax
Control: 1-Way Stop (EB)

Project ID: 19-11036-002
Date: 2019-03-23

HT

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Orchard St				Orchard St				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
NOON	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	0	6	0	0	0	0	1	0	0	0	0	0	7
11:15 AM	0	7	0	0	0	4	0	0	0	0	0	0	0	0	0	0	11
11:30 AM	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	6
11:45 AM	0	3	0	0	0	5	0	0	0	0	0	0	0	0	0	0	8
12:00 PM	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	6
12:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:30 PM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5
12:45 PM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	8
1:00 PM	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0	0	6
1:15 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
1:30 PM	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0	0	10
1:45 PM	0	6	0	0	0	6	0	0	0	0	1	0	0	0	0	0	13
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	35	0	0	0	48	0	0	0	0	2	0	0	0	0	0	85
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	12	0	0	0	20	0	0	0	0	1	0	0	0	0	0	33
PEAK HR FACTOR :	0.00	0.500	0.000	0.000	0.000	0.833	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.635
		0.500				0.833				0.250							

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Orchard St
City: Fairfax
Control: 1-Way Stop (EB)

Project ID: 19-11036-002
Date: 2019-03-23

Bikes

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Orchard St				Orchard St				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
NOON	0	2	0	0	0	3	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
APPROACH %'s :					0.00%	100.00%	0.00%	0.00%									
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Orchard St
City: Fairfax

Project ID: 19-11036-002
Date: 2019-03-23

Pedestrians (Crosswalks)

NS/EW Streets:	Chain Bridge Rd		Chain Bridge Rd		Orchard St		Orchard St		
NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
11:00 AM	0	0	0	0	0	0	0	1	1
11:15 AM	0	0	0	0	0	0	1	0	1
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	1	0	0	1	2	4
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	2	0	2
1:15 PM	0	0	0	0	0	0	2	0	2
1:30 PM	0	0	0	0	0	0	0	0	0
1:45 PM	1	0	0	0	0	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	1	0	0	1	0	0	6	3	11
APPROACH %'s :	100.00%	0.00%	0.00%	100.00%			66.67%	33.33%	
PEAK HR :	**01:00 PM - 02:00 PM**								TOTAL
PEAK HR VOL :	1	0	0	0	0	0	4	0	5
PEAK HR FACTOR :	0.250						0.500		0.625
	0.250						0.500		

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Fairfax Blvd
City: Fairfax
Control: Signalized

Project ID: 19-11036-003
Date: 2019-03-23

Total

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Fairfax Blvd				Fairfax Blvd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	20	108	13	0	32	126	76	3	67	171	5	0	25	176	16	3	841
11:15 AM	20	102	20	0	22	99	109	4	80	148	4	1	23	171	20	2	825
11:30 AM	31	132	19	0	29	141	89	3	59	208	12	0	17	182	14	8	944
11:45 AM	22	115	17	0	30	123	74	0	63	175	8	0	16	167	22	11	843
12:00 PM	30	117	35	0	57	116	86	2	63	225	14	0	17	216	12	3	993
12:15 PM	33	122	22	0	27	122	87	1	63	215	8	0	13	204	13	7	937
12:30 PM	20	98	18	0	40	134	83	3	50	208	6	0	19	213	19	6	917
12:45 PM	23	117	35	0	36	132	114	3	64	207	15	2	24	196	22	6	996
1:00 PM	24	164	22	0	26	127	79	2	65	212	7	0	15	204	20	4	971
1:15 PM	20	165	21	0	39	152	103	1	55	212	7	0	16	230	12	4	1037
1:30 PM	20	95	22	0	44	145	105	3	60	223	8	0	18	191	18	4	956
1:45 PM	14	123	29	0	42	173	71	3	65	233	1	1	17	213	26	8	1019
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	277	1458	273	0	424	1590	1076	28	754	2437	95	4	220	2363	214	66	11279
APPROACH %'s :	13.79%	72.61%	13.60%	0.00%	13.60%	50.99%	34.51%	0.90%	22.92%	74.07%	2.89%	0.12%	7.68%	82.54%	7.47%	2.31%	
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	78	547	94	0	151	597	358	9	245	880	23	1	66	838	76	20	3983
PEAK HR FACTOR :	0.813	0.829	0.810	0.000	0.858	0.863	0.852	0.750	0.942	0.944	0.719	0.250	0.917	0.911	0.731	0.625	0.960
	0.856				0.939				0.958				0.947				

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Fairfax Blvd
City: Fairfax
Control: Signalized

Project ID: 19-11036-003
Date: 2019-03-23

Cars

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Fairfax Blvd				Fairfax Blvd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	20	108	13	0	30	124	73	3	67	169	5	0	25	175	16	3	831
11:15 AM	20	101	20	0	21	99	107	4	78	146	4	1	22	166	15	2	806
11:30 AM	30	131	19	0	27	139	88	3	59	207	12	0	17	181	13	8	934
11:45 AM	22	113	16	0	27	122	73	0	63	173	8	0	16	166	21	11	831
12:00 PM	30	115	35	0	55	115	86	2	63	222	14	0	17	213	12	3	982
12:15 PM	32	122	21	0	26	122	87	1	63	212	8	0	13	200	13	7	927
12:30 PM	20	97	18	0	39	134	82	3	50	207	6	0	19	212	17	6	910
12:45 PM	23	115	34	0	35	130	112	3	64	204	15	2	23	196	20	6	982
1:00 PM	24	163	21	0	23	127	79	2	64	211	6	0	15	203	20	4	962
1:15 PM	20	165	21	0	35	152	103	1	55	211	7	0	16	226	12	4	1028
1:30 PM	20	94	22	0	41	144	103	3	60	220	8	0	18	190	15	4	942
1:45 PM	14	120	29	0	39	171	70	3	65	233	1	1	17	213	23	8	1007
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	275	1444	269	0	398	1579	1063	28	751	2415	94	4	218	2341	197	66	11142
APPROACH %'s :	13.83%	72.64%	13.53%	0.00%	12.97%	51.47%	34.65%	0.91%	23.01%	73.99%	2.88%	0.12%	7.73%	82.96%	6.98%	2.34%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	78	542	93	0	138	594	355	9	244	875	22	1	66	832	70	20	3939
PEAK HR FACTOR :	0.81	0.821	0.802	0.000	0.841	0.868	0.862	0.750	0.938	0.939	0.688	0.250	0.917	0.920	0.761	0.625	0.958
	0.857				0.942				0.952				0.946				

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Fairfax Blvd
City: Fairfax
Control: Signalized

Project ID: 19-11036-003
Date: 2019-03-23

HT

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Fairfax Blvd				Fairfax Blvd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	2	2	3	0	0	2	0	0	0	1	0	0	10
11:15 AM	0	1	0	0	1	0	2	0	2	2	0	0	1	5	5	0	19
11:30 AM	1	1	0	0	2	2	1	0	0	1	0	0	0	1	1	0	10
11:45 AM	0	2	1	0	3	1	1	0	0	2	0	0	0	1	1	0	12
12:00 PM	0	2	0	0	2	1	0	0	0	3	0	0	0	3	0	0	11
12:15 PM	1	0	1	0	1	0	0	0	0	3	0	0	0	4	0	0	10
12:30 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	1	2	0	7
12:45 PM	0	2	1	0	1	2	2	0	0	3	0	0	1	0	2	0	14
1:00 PM	0	1	1	0	3	0	0	0	1	1	1	0	0	1	0	0	9
1:15 PM	0	0	0	0	4	0	0	0	0	1	0	0	0	4	0	0	9
1:30 PM	0	1	0	0	3	1	2	0	0	3	0	0	0	1	3	0	14
1:45 PM	0	3	0	0	3	2	1	0	0	0	0	0	0	0	3	0	12
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	2	14	4	0	26	11	13	0	3	22	1	0	2	22	17	0	137
APPROACH %'s :	10.00%	70.00%	20.00%	0.00%	52.00%	22.00%	26.00%	0.00%	11.54%	84.62%	3.85%	0.00%	4.88%	53.66%	41.46%	0.00%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	5	1	0	13	3	3	0	1	5	1	0	0	6	6	0	44
PEAK HR FACTOR :	0.00	0.417	0.250	0.000	0.813	0.375	0.375	0.000	0.250	0.417	0.250	0.000	0.000	0.375	0.500	0.000	0.786
		0.500				0.792				0.583				0.750			

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Fairfax Blvd
City: Fairfax
Control: Signalized

Project ID: 19-11036-003
Date: 2019-03-23

Bikes

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Fairfax Blvd				Fairfax Blvd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	1.5	1	0	1	1	1	0	1	1.5	0.5	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
APPROACH %'s :					0.00%	0.00%	100.00%	0.00%									
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Fairfax Blvd
City: Fairfax

Project ID: 19-11036-003
Date: 2019-03-23

Pedestrians (Crosswalks)

NS/EW Streets:	Chain Bridge Rd		Chain Bridge Rd		Fairfax Blvd		Fairfax Blvd						
NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		SCRAMBLE (NE/SW)		SCRAMBLE (NW/SE)		
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
11:00 AM	0	0	0	2	2	0	0	1	0	2	0	0	7
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	2
11:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
12:30 PM	2	6	0	0	1	0	4	0	0	0	0	0	13
12:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	2
1:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	1	0	1	0	0	1	0	3
1:45 PM	0	0	1	0	3	0	0	0	0	0	1	0	5
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	3	9	1	2	9	2	4	2	0	2	2	0	36
APPROACH %'s :	25.00%	75.00%	33.33%	66.67%	81.82%	18.18%	66.67%	33.33%	0.00%	100.00%	100.00%	0.00%	
PEAK HR :	**01:00 PM - 02:00 PM**												TOTAL
PEAK HR VOL :	1	0	1	0	3	1	0	1	0	0	2	0	9
PEAK HR FACTOR :	0.250		0.250		0.250	0.250		0.250			0.500		0.450
	0.250		0.250		0.333		0.250				0.500		

National Data & Surveying Services Intersection Turning Movement Count

Location: Farr Ave & Fairfax Blvd
City: Fairfax
Control: 1-Way Stop (NB)

Project ID: 19-11036-004
Date: 2019-03-23

Total

NS/EW Streets:	Farr Ave				Farr Ave				Fairfax Blvd				Fairfax Blvd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	2	0	0	0	1	0	0	235	0	0	0	277	1	0	516
11:15 AM	0	0	2	0	0	0	3	0	0	233	0	0	0	270	2	0	510
11:30 AM	0	0	1	0	0	0	8	0	0	276	0	0	0	316	1	0	602
11:45 AM	0	0	1	0	0	0	3	0	0	251	1	0	0	260	1	0	517
12:00 PM	0	0	4	0	0	0	4	0	0	292	0	0	0	323	2	0	625
12:15 PM	0	0	1	0	0	0	1	0	0	288	0	0	0	313	0	0	603
12:30 PM	0	0	1	0	0	0	6	0	0	272	0	0	0	332	1	0	612
12:45 PM	0	0	8	0	0	0	2	0	0	267	1	0	0	329	2	0	609
1:00 PM	0	0	6	0	0	0	3	0	0	281	2	0	0	316	3	0	611
1:15 PM	0	0	1	0	0	0	4	0	0	270	1	0	0	342	2	0	620
1:30 PM	0	0	3	0	0	0	2	0	0	285	0	0	0	342	0	0	632
1:45 PM	0	0	1	0	0	0	3	0	0	303	0	0	0	289	2	0	598
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	31	0	0	0	40	0	0	3253	5	0	0	3709	17	0	7055
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	99.85%	0.15%	0.00%	0.00%	99.54%	0.46%	0.00%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	0	11	0	0	0	12	0	0	1139	3	0	0	1289	7	0	2461
PEAK HR FACTOR :	0.000	0.000	0.458	0.000	0.000	0.000	0.750	0.000	0.000	0.940	0.375	0.000	0.000	0.942	0.583	0.000	0.973
	0.458				0.750				0.942				0.942				

National Data & Surveying Services Intersection Turning Movement Count

Location: Farr Ave & Fairfax Blvd
City: Fairfax
Control: 1-Way Stop (NB)

Project ID: 19-11036-004
Date: 2019-03-23

Cars

NS/EW Streets:	Farr Ave				Farr Ave				Fairfax Blvd				Fairfax Blvd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	2	0	0	0	1	0	0	233	0	0	0	273	1	0	510
11:15 AM	0	0	2	0	0	0	3	0	0	229	0	0	0	262	2	0	498
11:30 AM	0	0	1	0	0	0	8	0	0	275	0	0	0	314	1	0	599
11:45 AM	0	0	1	0	0	0	3	0	0	249	1	0	0	258	1	0	513
12:00 PM	0	0	4	0	0	0	4	0	0	289	0	0	0	320	2	0	619
12:15 PM	0	0	1	0	0	0	1	0	0	284	0	0	0	309	0	0	595
12:30 PM	0	0	1	0	0	0	6	0	0	271	0	0	0	328	1	0	607
12:45 PM	0	0	8	0	0	0	2	0	0	265	1	0	0	326	2	0	604
1:00 PM	0	0	6	0	0	0	3	0	0	278	2	0	0	315	3	0	607
1:15 PM	0	0	1	0	0	0	4	0	0	269	1	0	0	338	2	0	615
1:30 PM	0	0	3	0	0	0	2	0	0	283	0	0	0	339	0	0	627
1:45 PM	0	0	1	0	0	0	3	0	0	302	0	0	0	288	2	0	596
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	31	0	0	0	40	0	0	3227	5	0	0	3670	17	0	6990
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	99.85%	0.15%	0.00%	0.00%	99.54%	0.46%	0.00%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	0	11	0	0	0	12	0	0	1132	3	0	0	1280	7	0	2445
PEAK HR FACTOR :	0.00	0.000	0.458	0.000	0.000	0.000	0.750	0.000	0.000	0.937	0.375	0.000	0.000	0.944	0.583	0.000	0.975
			0.458				0.750				0.940				0.946		

National Data & Surveying Services Intersection Turning Movement Count

Location: Farr Ave & Fairfax Blvd
City: Fairfax
Control: 1-Way Stop (NB)

Project ID: 19-11036-004
Date: 2019-03-23

HT

NS/EW Streets:	Farr Ave				Farr Ave				Fairfax Blvd				Fairfax Blvd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0	0	6
11:15 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	8	0	0	12
11:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
11:45 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
12:00 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	6
12:15 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	8
12:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	5
12:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	0	5
1:00 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	4
1:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	5
1:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	0	5
1:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	26	0	0	0	39	0	0	65
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	7	0	0	0	9	0	0	16
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.583	0.000	0.000	0.000	0.563	0.000	0.000	0.800
										0.583				0.563			

National Data & Surveying Services Intersection Turning Movement Count

Location: Farr Ave & Fairfax Blvd
City: Fairfax
Control: 1-Way Stop (NB)

Project ID: 19-11036-004
Date: 2019-03-23

Bikes

NS/EW Streets:	Farr Ave				Farr Ave				Fairfax Blvd				Fairfax Blvd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
APPROACH %'s :													0.00%	100.00%	0.00%	0.00%	
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services Intersection Turning Movement Count

Location: Farr Ave & Fairfax Blvd
City: Fairfax

Project ID: 19-11036-004
Date: 2019-03-23

Pedestrians (Crosswalks)

NS/EW Streets:	Farr Ave		Farr Ave		Fairfax Blvd		Fairfax Blvd		
NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
11:00 AM	0	1	0	1	0	0	0	0	2
11:15 AM	0	3	0	0	0	0	0	0	3
11:30 AM	0	1	0	0	0	0	0	0	1
11:45 AM	0	1	0	0	0	0	0	0	1
12:00 PM	0	2	0	0	0	0	0	0	2
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	1	0	0	0	0	0	1
12:45 PM	0	4	0	1	0	0	0	0	5
1:00 PM	3	0	1	0	0	0	0	0	4
1:15 PM	2	0	0	0	0	0	0	0	2
1:30 PM	0	0	1	0	0	0	0	0	1
1:45 PM	0	0	1	0	0	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	5	12	4	2	0	0	0	0	23
APPROACH %'s :	29.41%	70.59%	66.67%	33.33%					
PEAK HR :	**01:00 PM - 02:00 PM**								TOTAL
PEAK HR VOL :	5	0	3	0	0	0	0	0	8
PEAK HR FACTOR :	0.417		0.750						0.500
	0.417		0.750						

National Data & Surveying Services Intersection Turning Movement Count

Location: Mclean Ave/United Bank Dwy & Fairfax Blvd/Warwick Ave
City: Fairfax
Control: Signalized

Project ID: 19-11036-005
Date: 2019-03-23

Total

NOON

NS/EW Streets:	Mclean Ave/United Bank Dwy							Mclean Ave/United Bank Dwy						
	NORTHBOUND							SOUTHBOUND						
	0	1	0	0	0	0	0	0	1	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
11:00 AM	3	0	6	0	2	0	0	2	1	1	0	0	0	1
11:15 AM	2	1	6	0	0	0	0	3	0	1	0	0	0	0
11:30 AM	6	0	3	0	1	0	0	3	0	1	0	1	0	0
11:45 AM	5	0	3	0	1	0	0	2	1	0	0	1	0	0
12:00 PM	3	1	5	0	1	0	0	1	1	0	0	1	0	0
12:15 PM	3	2	5	0	0	0	0	1	2	1	0	0	0	2
12:30 PM	4	2	7	0	1	0	0	0	0	0	0	1	0	0
12:45 PM	2	2	1	0	0	3	0	1	1	1	0	1	0	1
1:00 PM	3	1	4	0	2	0	0	0	0	0	0	0	0	1
1:15 PM	4	0	5	0	0	1	0	3	0	2	0	1	0	0
1:30 PM	2	3	5	0	1	0	0	4	0	1	0	1	0	1
1:45 PM	5	0	5	0	2	0	0	1	1	1	0	1	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
TOTAL VOLUMES :	42	12	55	0	11	4	0	21	7	9	0	8	0	6
APPROACH %'s :	33.87%	9.68%	44.35%	0.00%	8.87%	3.23%	0.00%	41.18%	13.73%	17.65%	0.00%	15.69%	0.00%	11.76%
PEAK HR :	01:00 PM - 02:00 PM													
PEAK HR VOL :	14	4	19	0	5	1	0	8	1	4	0	3	0	2
PEAK HR FACTOR :	0.700	0.333	0.950	0.000	0.625	0.250	0.000	0.500	0.250	0.500	0.000	0.750	0.000	0.500
				0.896							0.643			

NS/EW Streets:	Fairfax Blvd/Warwick Ave							Fairfax Blvd/Warwick Ave						
	EASTBOUND							WESTBOUND						
	1	2	0	0	0	0	0	1	2	0	0	0	0	0
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
11:00 AM	0	217	4	0	14	0	1	4	255	2	0	0	15	4
11:15 AM	2	218	3	0	21	2	0	7	247	0	1	1	6	5
11:30 AM	0	244	5	0	19	0	0	2	310	0	0	0	6	11
11:45 AM	2	223	4	0	11	0	1	0	236	0	0	1	14	5
12:00 PM	0	284	9	0	23	0	2	4	298	2	2	0	12	9
12:15 PM	2	267	6	0	22	1	1	1	295	0	0	2	7	5
12:30 PM	2	248	3	0	15	0	2	5	300	2	0	0	17	8
12:45 PM	0	258	4	1	18	0	1	2	307	0	2	0	11	7
1:00 PM	0	261	1	0	15	0	0	3	298	0	2	0	8	12
1:15 PM	3	238	5	0	28	0	1	5	324	1	0	0	17	2
1:30 PM	3	271	4	0	16	0	1	4	311	4	0	0	15	5
1:45 PM	0	274	4	0	18	1	0	2	273	0	0	0	12	8
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
TOTAL VOLUMES :	14	3003	52	1	220	4	10	39	3454	11	7	4	140	81
APPROACH %'s :	0.42%	90.89%	1.57%	0.03%	6.66%	0.12%	0.30%	1.04%	92.45%	0.29%	0.19%	0.11%	3.75%	2.17%
PEAK HR VOL :	6	1044	14	0	77	1	2	14	1206	5	2	0	52	27
PEAK HR FACTOR :	0.500	0.953	0.700	0.000	0.688	0.250	0.500	0.700	0.931	0.313	0.250	0.000	0.765	0.563
				0.963							0.936			

	NORTHBOUND2													
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
11:00 AM	0	0	0	0	0	0	0	3	0	0	0	17	0	1
11:15 AM	0	0	0	0	0	0	0	7	0	0	0	10	0	0
11:30 AM	0	2	0	1	0	2	0	6	0	0	0	9	0	1
11:45 AM	0	0	0	0	0	1	0	4	0	0	2	12	2	1
12:00 PM	0	0	0	0	0	1	0	4	0	0	0	8	0	0
12:15 PM	0	0	0	1	0	2	0	5	0	0	0	13	1	0
12:30 PM	0	1	0	0	0	0	0	4	0	0	0	12	0	0
12:45 PM	0	2	0	0	0	0	0	9	0	0	0	11	0	1
1:00 PM	0	0	0	0	0	1	0	7	0	0	0	8	0	0
1:15 PM	0	0	0	0	0	0	0	6	0	0	1	19	0	0
1:30 PM	0	0	0	0	0	0	0	3	0	0	0	21	0	1
1:45 PM	0	0	0	0	0	0	0	3	0	0	0	12	0	1
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
TOTAL VOLUMES :	0	5	0	2	0	7	0	61	0	0	3	152	3	6
APPROACH %'s :	0.00%	35.71%	0.00%	14.29%	0.00%	50.00%	0.00%	27.11%	0.00%	0.00%	1.33%	67.56%	1.33%	2.67%
PEAK HR VOL :	0	0	0	0	0	1	0	19	0	0	1	60	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.679	0.000	0.000	0.250	0.714	0.000	0.500
				0.250										

	WESTBOUND2							
	0	0	0	0	0	0	0	
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
11:00 AM	0	2	0	0	5	0	2	562
11:15 AM	1	1	0	0	5	2	1	553
11:30 AM	0	6	0	1	4	0	4	648
11:45 AM	0	2	0	0	10	0	0	544
12:00 PM	1	4	0	0	7	0	0	683
12:15 PM	0	2	0	1	8	1	1	660
12:30 PM	1	4	0	0	7	0	0	646
12:45 PM	0	2	0	0	9	0	1	659
1:00 PM	0	1	0	0	3	0	2	633
1:15 PM	1	1	0	0	11	0	0	679
1:30 PM	0	3	0	0	4	0	0	684
1:45 PM	0	2	0	0	6	1	1	634
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
TOTAL VOLUMES :	4	30	0	2	79	4	12	7585
APPROACH %'s :	3.05%	22.90%	0.00%	1.53%	60.31%	3.05%	9.16%	
								TOTAL
PEAK HR VOL :	1	7	0	0	24	1	3	2630
PEAK HR FACTOR :	0.250	0.583	0.000	0.000	0.545	0.250	0.375	0.961
				0.692				

National Data & Surveying Services Intersection Turning Movement Count

Location: Mclean Ave/United Bank Dwy & Fairfax Blvd/Warwick Ave
City: Fairfax
Control: Signalized

Project ID: 19-11036-005
Date: 2019-03-23

Cars

NS/EW Streets:	Mclean Ave/United Bank Dwy							Mclean Ave/United Bank Dwy							Fairfax Blvd/Warwick Ave						
	NORTHBOUND							SOUTHBOUND							EASTBOUND						
NOON	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2
11:00 AM	3	0	6	0	2	0	0	2	1	1	0	0	0	1	0	216	4	0	14	0	1
11:15 AM	2	1	6	0	0	0	0	3	0	1	0	0	0	0	2	216	3	0	21	2	0
11:30 AM	6	0	3	0	1	0	0	3	0	1	0	1	0	0	0	243	5	0	19	0	0
11:45 AM	5	0	3	0	1	0	0	2	1	0	0	1	0	0	2	221	4	0	11	0	1
12:00 PM	3	1	5	0	1	0	0	1	1	0	0	1	0	0	0	281	9	0	23	0	2
12:15 PM	3	2	5	0	0	0	0	1	2	1	0	0	0	2	2	264	6	0	22	1	1
12:30 PM	4	2	7	0	1	0	0	0	0	0	0	1	0	0	2	247	3	0	15	0	2
12:45 PM	2	2	0	0	0	2	0	1	1	1	0	1	0	1	0	256	4	1	18	0	1
1:00 PM	3	1	4	0	2	0	0	0	0	0	0	0	0	1	0	259	1	0	15	0	0
1:15 PM	4	0	5	0	0	1	0	3	0	2	0	1	0	0	3	238	5	0	28	0	1
1:30 PM	2	3	5	0	1	0	0	4	0	1	0	1	0	1	3	268	4	0	16	0	1
1:45 PM	5	0	5	0	2	0	0	1	1	1	0	1	0	0	0	273	4	0	18	1	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2
TOTAL VOLUMES :	42	12	54	0	11	3	0	21	7	9	0	8	0	6	14	2982	52	1	220	4	10
APPROACH %'s :	34.43%	9.84%	44.26%	0.00%	9.02%	2.46%	0.00%	41.18%	13.73%	17.65%	0.00%	15.69%	0.00%	11.76%	0.43%	90.83%	1.58%	0.03%	6.70%	0.12%	0.30%
PEAK HR :	01:00 PM - 02:00 PM																				
PEAK HR VOL :	14	4	19	0	5	1	0	8	1	4	0	3	0	2	6	1038	14	0	77	1	2
PEAK HR FACTOR :	0.70	0.333	0.950	0.000	0.625	0.250	0.000	0.500	0.250	0.500	0.000	0.750	0.000	0.500	0.500	0.951	0.700	0.000	0.688	0.250	0.500
				0.896							0.643							0.961			

NS/EW Streets:	Fairfax Blvd/Warwick Ave																																												
	WESTBOUND							NORTHBOUND2																																					
NOON	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
11:00 AM	4	250	2	0	0	15	4	0	0	0	0	0	0	0	3	0	0	0	16	0	1	0	2	0	0	5	0	2	555
11:15 AM	7	242	0	1	1	6	5	0	0	0	0	0	0	0	7	0	0	0	9	0	0	1	1	0	0	4	2	1	544
11:30 AM	2	306	0	0	0	6	11	0	2	0	1	0	2	0	6	0	0	0	9	0	1	0	6	0	1	4	0	4	643
11:45 AM	0	234	0	0	1	14	5	0	0	0	0	0	1	0	4	0	0	2	12	2	1	0	2	0	0	10	0	0	540
12:00 PM	4	296	1	2	0	12	9	0	0	0	0	0	1	0	4	0	0	0	8	0	0	1	4	0	0	7	0	0	677
12:15 PM	1	292	0	0	2	7	5	0	0	0	1	0	2	0	5	0	0	0	12	1	0	0	2	0	1	7	1	1	652
12:30 PM	5	296	2	0	0	17	8	0	1	0	0	0	0	0	4	0	0	0	12	0	0	1	4	0	0	7	0	0	641
12:45 PM	2	305	0	2	0	11	7	0	2	0	0	0	0	0	9	0	0	0	11	0	1	0	2	0	0	8	0	1	652
1:00 PM	3	297	0	2	0	8	12	0	0	0	0	0	1	0	7	0	0	0	7	0	0	0	1	0	0	3	0	2	629
1:15 PM	5	321	1	0	0	17	2	0	0	0	0	0	0	0	6	0	0	1	18	0	0	1	1	0	0	10	0	0	674
1:30 PM	4	308	4	0	0	15	5	0	0	0	0	0	0	0	3	0	0	0	21	0	1	0	3	0	0	4	0	0	678
1:45 PM	2	273	0	0	0	12	8	0	0	0	0	0	0	0	3	0	0	0	12	0	1	0	2	0	0	5	1	1	632
	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
TOTAL VOLUMES :	39	3420	10	7	4	140	81	0	5	0	2	0	7	0	61	0	0	3	147	3	6	4	30	0	2	74	4	12	7517
APPROACH %'s :	1.05%	92.41%	0.27%	0.19%	0.11%	3.78%	2.19%	0.00%	35.71%	0.00%	14.29%	0.00%	50.00%	0.00%	27.73%	0.00%	0.00%	1.36%	66.82%	1.36%	2.73%	3.17%	23.81%	0.00%	1.59%	58.73%	3.17%	9.52%	
PEAK HR :																													TOTAL
PEAK HR VOL :	14	1199	5	2	0	52	27	0	0	0	0	0	1	0	19	0	0	1	58	0	2	1	7	0	0	22	1	3	2613
PEAK HR FACTOR :	0.700	0.934	0.313	0.250	0.000	0.765	0.563	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.679	0.000	0.000	0.250	0.690	0.000	0.500	0.250	0.583	0.000	0.708	0.550	0.250	0.375	0.963
				0.939							0.250														0.000				

National Data & Surveying Services Intersection Turning Movement Count

Location: Mclean Ave/United Bank Dwy & Fairfax Blvd/Warwick Ave
City: Fairfax
Control: Signalized

Project ID: 19-11036-005
Date: 2019-03-23

HT

NS/EW Streets:	Mclean Ave/United Bank Dwy							Mclean Ave/United Bank Dwy							Fairfax Blvd/Warwick Ave							Fairfax Blvd/Warwick Ave																															
	NORTHBOUND							SOUTHBOUND							EASTBOUND							WESTBOUND							NORTHBOUND2																		WESTBOUND2							
NOON	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	7
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	9
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	8
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
12:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	7
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	5
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	21	0	0	0	0	0	0	34	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5	0	0	0	68
APPROACH %'s :	0.00%	0.00%	50.00%	0.00%	0.00%	50.00%	0.00%								0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	97.14%	2.86%	0.00%	0.00%	0.00%	0.00%								0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
PEAK HR :	01:00 PM - 02:00 PM																																																			TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	17
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.583	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.500	0.500	0.000	0.000	0.000	0.708

National Data & Surveying Services **Intersection Turning Movement Count**

Location: Mclean Ave/United Bank Dwy & Fairfax Blvd/Warwick Ave
City: Fairfax
Control: Signalized

Project ID: 19-11036-005
Date: 2019-03-23

Bikes

NS/EW Streets:	Mclean Ave/United Bank Dwy							Mclean Ave/United Bank Dwy						
NOON	NORTHBOUND							SOUTHBOUND						
	0	1	0	0	0	0	0	0	1	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	NL2	NR2	NU2	SL	ST	SR	SU	SL2	ST2	SR2
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :														
PEAK HR :	01:00 PM - 02:00 PM													
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NS/EW Streets:	Fairfax Blvd/Warwick Ave							Fairfax Blvd/Warwick Ave						
NOON	EASTBOUND							WESTBOUND						
	1	2	0	0	0	0	0	1	2	0	0	0	0	0
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	EL	ET	ER	EU	ET2	ER2	EU2	WL	WT	WR	WU	WL2	WT2	WU2
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	1	0	0	0	0	0
APPROACH %'s :								0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NS/EW Streets:														
NOON	NORTHBOUND2													
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N2L	N2R	N2U	N2L2	N2T2	N2R2	N2U2	E2T	E2R	E2U	E2L2	E2T2	E2R2	E2U2
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :														
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NS/EW Streets:								
NOON	WESTBOUND2							
	0	0	0	0	0	0	0	
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
11:00 AM	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0
	W2L	W2T	W2U	W2L2	W2T2	W2R2	W2U2	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	1
APPROACH %'s :								
PEAK HR :								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services Intersection Turning Movement Count

Location: Mclean Ave/United Bank Dwy & Fairfax Blvd/Warwick Ave
City: Fairfax

Project ID: 19-11036-005
Date: 2019-03-23

Pedestrians (Crosswalks)

NS/EW Streets:	Mclean Ave/United Bank Dwy		Mclean Ave/United Bank Dwy		Fairfax Blvd/Warwick Ave		Fairfax Blvd/Warwick Ave												
NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		SOUTH LEG 2		EAST LEG 2		WEST LEG 2		SCRAMBLE (NE/SW)		SCRAMBLE (NW/SE)		
	EB	WB	EB	WB	NB	SB	NB	SB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
11:00 AM	0	1	2	1	0	0	1	1	0	1	0	1	0	0	0	0	0	0	8
11:15 AM	0	4	2	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	9
11:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
11:45 AM	0	1	0	2	0	0	0	0	0	2	0	0	0	1	0	0	0	0	6
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	3
12:30 PM	3	0	2	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	10
12:45 PM	0	6	0	2	0	0	1	0	0	1	0	1	0	6	0	0	0	6	23
1:00 PM	1	0	1	0	0	0	2	0	1	0	1	0	0	0	0	0	0	0	6
1:15 PM	2	0	0	0	0	0	0	2	0	0	0	0	2	0	2	0	0	0	8
1:30 PM	0	0	1	1	0	0	2	0	0	0	0	0	1	0	0	0	0	0	5
1:45 PM	0	0	1	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	4
	EB	WB	EB	WB	NB	SB	NB	SB	EB	WB	NB	SB	NB	SB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	6	13	9	7	0	0	8	5	7	5	3	2	3	8	2	0	0	7	85
APPROACH %'s :	31.58%	68.42%	56.25%	43.75%			61.54%	38.46%	58.33%	41.67%	60.00%	40.00%	15.00%	40.00%	100.00%	0.00%	0.00%	100.00%	
PEAK HR :	01:00 PM - 02:00 PM																		TOTAL
PEAK HR VOL :	3	0	3	1	0	0	4	3	2	0	2	0	3	0	2	0	0	0	23
PEAK HR FACTOR :	0.375		0.750	0.250			0.500	0.375	0.500		0.500		0.375		0.250				0.719
	0.375		0.500				0.875		0.500		0.500		0.375		0.250				

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-101
Date: 2019-03-23

Total

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	1	0	15	1	0	0	0	0	0	0	3	0	8	0	28
11:15 AM	0	0	2	0	21	1	0	0	0	0	0	0	3	0	11	0	38
11:30 AM	0	1	5	0	13	2	0	0	0	0	0	0	2	0	15	0	38
11:45 AM	0	0	5	0	23	1	0	0	0	0	0	0	3	0	19	0	51
12:00 PM	0	2	4	0	17	1	0	0	0	0	0	0	5	0	19	0	48
12:15 PM	0	2	6	0	14	1	0	0	0	0	0	0	5	0	14	0	42
12:30 PM	0	0	1	0	11	1	0	0	0	0	0	0	3	0	8	0	24
12:45 PM	0	1	3	0	10	0	0	0	0	0	0	0	2	0	14	0	30
1:00 PM	0	0	3	0	10	1	0	0	0	0	0	0	3	0	22	0	39
1:15 PM	0	0	5	0	9	2	0	0	0	0	0	0	2	0	14	0	32
1:30 PM	0	0	1	0	17	1	0	0	0	0	0	0	4	0	14	0	37
1:45 PM	0	0	1	0	16	1	0	0	0	0	0	0	8	0	17	0	43
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	6	37	0	176	13	0	0	0	0	0	0	43	0	175	0	450
APPROACH %'s :	0.00%	13.95%	86.05%	0.00%	93.12%	6.88%	0.00%	0.00%					19.72%	0.00%	80.28%	0.00%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	0	10	0	52	5	0	0	0	0	0	0	17	0	67	0	151
PEAK HR FACTOR :	0.000	0.000	0.500	0.000	0.765	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.531	0.000	0.761	0.000	0.878
			0.500				0.792								0.840		

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-101
Date: 2019-03-23

Cars

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	1	0	15	1	0	0	0	0	0	0	3	0	8	0	28
11:15 AM	0	0	2	0	21	1	0	0	0	0	0	0	3	0	11	0	38
11:30 AM	0	1	5	0	13	2	0	0	0	0	0	0	2	0	14	0	37
11:45 AM	0	0	4	0	23	0	0	0	0	0	0	0	3	0	19	0	49
12:00 PM	0	2	4	0	17	1	0	0	0	0	0	0	5	0	18	0	47
12:15 PM	0	2	6	0	14	1	0	0	0	0	0	0	5	0	14	0	42
12:30 PM	0	0	1	0	11	1	0	0	0	0	0	0	3	0	8	0	24
12:45 PM	0	1	3	0	10	0	0	0	0	0	0	0	2	0	14	0	30
1:00 PM	0	0	3	0	10	1	0	0	0	0	0	0	3	0	22	0	39
1:15 PM	0	0	5	0	9	2	0	0	0	0	0	0	2	0	14	0	32
1:30 PM	0	0	1	0	17	1	0	0	0	0	0	0	4	0	14	0	37
1:45 PM	0	0	1	0	16	1	0	0	0	0	0	0	8	0	17	0	43
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	6	36	0	176	12	0	0	0	0	0	0	43	0	173	0	446
APPROACH %'s :	0.00%	14.29%	85.71%	0.00%	93.62%	6.38%	0.00%	0.00%					19.91%	0.00%	80.09%	0.00%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	0	10	0	52	5	0	0	0	0	0	0	17	0	67	0	151
PEAK HR FACTOR :	0.00	0.000	0.500	0.000	0.765	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.531	0.000	0.761	0.000	0.878
		0.500				0.792								0.840			

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-101
Date: 2019-03-23

HT

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
11:45 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	4
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-101
Date: 2019-03-23

Bikes

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :																	
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Project ID: 19-11036-101
Date: 2019-03-23

Pedestrians (Crosswalks)

NS/EW Streets:	Chain Bridge Rd		Chain Bridge Rd		Eaton Pl/Oak Pl/Assembly Dr		Eaton Pl/Oak Pl/Assembly Dr		
NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	2	1	0	0	0	0	3
11:45 AM	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	1	0	0	0	0	1
1:30 PM	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	1	0	0	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	3	2	0	0	0	0	5
APPROACH %'s :			60.00%	40.00%					
PEAK HR :	**01:00 PM - 02:00 PM**								TOTAL
PEAK HR VOL :	0	0	1	1	0	0	0	0	2
PEAK HR FACTOR :			0.250	0.250					0.500
			0.500						

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-201
Date: 2019-03-23

Total

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	1	1	0	0	7	0	27	0	24	49	0	0	0	64	2	0	175
11:15 AM	0	0	2	0	4	0	32	0	19	62	1	0	0	44	4	0	168
11:30 AM	0	0	0	0	4	0	28	0	17	57	0	0	0	57	5	0	168
11:45 AM	0	1	3	0	7	0	29	0	20	81	2	0	0	48	5	0	196
12:00 PM	1	0	1	0	4	0	32	0	23	44	0	0	0	64	12	0	181
12:15 PM	1	0	4	0	4	0	20	0	24	60	4	0	0	56	2	0	175
12:30 PM	1	0	1	0	10	0	32	0	21	46	3	0	0	89	7	0	210
12:45 PM	1	0	0	0	2	0	23	0	20	59	2	0	0	70	6	1	184
1:00 PM	4	0	2	0	3	0	15	0	16	47	3	0	0	68	7	0	165
1:15 PM	3	0	0	0	9	0	25	0	37	46	2	0	0	62	6	0	190
1:30 PM	1	0	2	0	7	0	28	0	18	69	1	0	0	74	7	0	207
1:45 PM	0	1	0	0	1	0	21	0	19	69	1	0	0	83	2	0	197
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	13	3	15	0	62	0	312	0	258	689	19	0	0	779	65	1	2216
APPROACH %'s :	41.94%	9.68%	48.39%	0.00%	16.58%	0.00%	83.42%	0.00%	26.71%	71.33%	1.97%	0.00%	0.00%	92.19%	7.69%	0.12%	
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	8	1	4	0	20	0	89	0	90	231	7	0	0	287	22	0	759
PEAK HR FACTOR :	0.500	0.250	0.500	0.000	0.556	0.000	0.795	0.000	0.608	0.837	0.583	0.000	0.000	0.864	0.786	0.000	0.917
	0.542				0.779				0.921				0.909				

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-201
Date: 2019-03-23

Cars

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	1	1	0	0	7	0	27	0	24	49	0	0	0	62	2	0	173
11:15 AM	0	0	2	0	4	0	32	0	19	61	1	0	0	44	4	0	167
11:30 AM	0	0	0	0	4	0	27	0	16	56	0	0	0	56	5	0	164
11:45 AM	0	1	3	0	7	0	29	0	20	81	2	0	0	46	5	0	194
12:00 PM	1	0	1	0	4	0	32	0	23	43	0	0	0	62	12	0	178
12:15 PM	1	0	4	0	4	0	20	0	24	60	4	0	0	56	2	0	175
12:30 PM	1	0	1	0	10	0	32	0	21	44	3	0	0	86	7	0	205
12:45 PM	1	0	0	0	2	0	23	0	19	59	2	0	0	68	6	1	181
1:00 PM	4	0	2	0	3	0	15	0	16	47	3	0	0	67	7	0	164
1:15 PM	2	0	0	0	8	0	25	0	37	45	2	0	0	61	6	0	186
1:30 PM	1	0	2	0	7	0	28	0	18	66	1	0	0	74	7	0	204
1:45 PM	0	1	0	0	1	0	21	0	19	67	1	0	0	82	2	0	194
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	12	3	15	0	61	0	311	0	256	678	19	0	0	764	65	1	2185
APPROACH %'s :	40.00%	10.00%	50.00%	0.00%	16.40%	0.00%	83.60%	0.00%	26.86%	71.14%	1.99%	0.00%	0.00%	92.05%	7.83%	0.12%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	7	1	4	0	19	0	89	0	90	225	7	0	0	284	22	0	748
PEAK HR FACTOR :	0.44	0.250	0.500	0.000	0.594	0.000	0.795	0.000	0.608	0.840	0.583	0.000	0.000	0.866	0.786	0.000	0.917
	0.500				0.771				0.925				0.911				

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-201
Date: 2019-03-23

HT

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
11:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	4
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
12:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	0	5
12:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	3
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
1:15 PM	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	4
1:30 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
1:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	3
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	0	0	0	1	0	1	0	2	11	0	0	0	15	0	0	31
APPROACH %'s :	100.00%	0.00%	0.00%	0.00%	50.00%	0.00%	50.00%	0.00%	15.38%	84.62%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	1	0	0	0	1	0	0	0	0	6	0	0	0	3	0	0	11
PEAK HR FACTOR :	0.25	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.750	0.000	0.000	0.688
	0.250				0.250				0.500				0.750				

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax
Control: Signalized

Project ID: 19-11036-201
Date: 2019-03-23

Bikes

NS/EW Streets:	Chain Bridge Rd				Chain Bridge Rd				Eaton Pl/Oak Pl/Assembly Dr				Eaton Pl/Oak Pl/Assembly Dr				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
NOON	0	1	0	0	0	1	0	0	0	2	0	0	0.5	1	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
11:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
APPROACH %'s :					0.00%	100.00%	0.00%	0.00%									
PEAK HR :	**01:00 PM - 02:00 PM**																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services Intersection Turning Movement Count

Location: Chain Bridge Rd & Eaton Pl/Oak Pl/Assembly Dr
City: Fairfax

Project ID: 19-11036-201
Date: 2019-03-23

Pedestrians (Crosswalks)

NS/EW Streets:	Chain Bridge Rd		Chain Bridge Rd		Eaton Pl/Oak Pl/Assembly Dr		Eaton Pl/Oak Pl/Assembly Dr		
NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
11:00 AM	0	0	0	0	1	1	0	0	2
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	3	0	2	0	0	5
11:45 AM	0	0	2	0	1	0	0	0	3
12:00 PM	0	0	0	0	0	2	0	0	2
12:15 PM	1	0	1	1	0	1	0	0	4
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	1	0	0	1
1:00 PM	0	0	0	0	2	0	0	0	2
1:15 PM	0	0	0	0	2	0	0	0	2
1:30 PM	0	0	0	0	0	1	0	0	1
1:45 PM	0	0	0	0	3	0	0	0	3
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	1	0	3	4	9	8	0	0	25
APPROACH %'s :	100.00%	0.00%	42.86%	57.14%	52.94%	47.06%			
PEAK HR :	**01:00 PM - 02:00 PM**								TOTAL
PEAK HR VOL :	0	0	0	0	7	1	0	0	8
PEAK HR FACTOR :					0.583	0.250			0.667
					0.667				

Appendix C

Northfax Development Trip Generation Comparison Documentation

TECHNICAL MEMORANDUM

To:	Wendy Block Sanford	Transportation Director, City of Fairfax
CC:	Russell Rosenberger	Madison Homes, Inc.
	Andrew Rosenberger	Madison Homes, Inc.
	Steve Marker	Brightview Senior Living
	Kathryn Taylor	Walsh, Colucci, Lubeley & Walsh, P.C.
	Lynne Strobel	Walsh, Colucci, Lubeley & Walsh, P.C.
From:	Steven Matthew Dauterman, EIT, RSP1	Gorove Slade Associates Inc.
	Niraja Chandrapu, PE, PTOE	Gorove Slade Associates Inc.
	Chad Baird	Gorove Slade Associates Inc.
Date:	April 22, 2020	
Subject:	Northfax Development – By-Right v. Proposed Development Program Trip Generation	

Introduction

This memorandum presents a trip generation comparison of the proposed development program of the Northfax property against a by-right development program.

Background

The Northfax development would be generally located in the northwest quadrant of the intersection of Route 123 and Fairfax Boulevard (Rte. 29/50). The proposed redevelopment of the site would require a rezoning of the property. The parcels fronting Fairfax Boulevard and Chain Bridge Road are currently zoned CR (Commercial Retail District), while the interior parcels along Orchard Street are zoned RM (Residential Medium); the Applicant is proposing to rezone the subject property from the CR and RM districts to a PD-M (Planned Development Mixed Use) district.

By-Right Program

The approximately 11.46-acre Northfax site is comprised of 17 parcels of land, located within the City of Fairfax. Currently, the parcels fronting Fairfax Boulevard and Chain Bridge Road are generally zoned CR (Commercial Retail District) with the interior parcels along Orchard Street being zoned RM (Residential Medium). Of the entire site, approximately 4 acres are zoned CR and approximately 7.3 acres are zoned RM.

Per the City's Zoning Ordinance, Commercial Retail zoning permits an allowable building coverage of 60%, a maximum building of height of 5 stores, and is intended for commercial and supporting retail uses (Section 3.6.2). CR zoning permits fast food restaurant (without drive-thru), medical office, and supermarket type uses, in addition to general retail and office. Given the conditions of the site, it is possible that a 5-story building could be constructed on the property and may be comprise of ground-floor retail (including a fast food restaurant) with office space above. Based on the size of the property and the allowable building coverage, the site could be constructed to include approximately 94.5 kSF of retail space and 378 kSF office space.

Per the City's Zoning Ordinance, Residential Medium zoning permits single-family detached homes (SFDH) with a minimum lot area of 7,500 SF (Section 3.6.1). Based on the minimum lot area, an approximate total of 42 SFDH could be developed by right.

In order to calculate the trips generated by a by-right development program, peak hour trip generation is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE's) Trip Generation Manual, 10th Edition. As illustrated in Table 1. Of note, no pass-by or internal trips reductions were assumed.

Table 1: By-Right Site Trip Generation (ITE 10: Peak Hour of the Adjacent Street)

Land Use	ITE Code	Size	------ Weekday ------							------ Weekend ------			
			AM Peak Hour			PM Peak Hour			Daily	Saturday Peak Hour			Sat Daily
			In	Out	Total	In	Out	Total	Total	In	Out	Total	Total
Single-Family Detached Housing	210	42 DU	9	26	35	28	16	44	468	29	24	53	434
General Office Building	710	378 ksf of GFA	329	53	382	64	339	403	3,854	108	92	200	835
Shopping Center	820	91.5 kSF of GLA	53	33	86	168	181	349	3,454	214	198	412	4,220
Fast-Food Restaurant without Drive-Thru Window	933	3 KSF of GFA	66	44	110	43	42	85	1039	80	84	164	2088
By-Right Trips			**457**	**156**	**613**	**303**	**578**	**881**	**8,815**	**431**	**398**	**829**	**7,577**

Proposed Program

The Northfax development is anticipated to be developed in two phases. Phase 1 is anticipated to be complete by 2023, and Phase 2 is anticipated to be complete by 2027. Phase 1 is planned to consist of 56 multi-family residential units and a 200-unit senior living (independent living and assisted living) facility. The current application for the site only pertains to Phase 1.

The current plans for Phase 2 anticipate approximately 25,000 square feet of commercial use (including retail space, office space, and restaurants) with approximately 180 residential dwelling units on the upper floors and a 140-room capacity hotel. A separate application would be submitted for Phase 2; as such, the Phase 2 portion of the development described herein is for transportation planning purposes and is subject to change with the future application. At the time that actual uses are selected, the trip generation analysis will be updated.

In order to calculate the trips generated by the proposed development program, peak hour trip generation is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE's) Trip Generation Manual, 10th Edition. As illustrated in Table 2. Of note, no pass-by or internal trips reductions were assumed.

Table 2: Proposed Site Trip Generation (ITE 10: Peak Hour of the Adjacent Street)

Land Use	ITE LUC	Size	AM PEAK HOUR			PM PEAK HOUR			DAILY	SAT PEAK HOUR			SATURDAY DAILY
			IN	OUT	TOTAL	IN	OUT	TOTAL	TOTAL	IN	OUT	TOTAL	TOTAL
Existing (to be removed)													
Single-Family Detached Homes	210	2 DU	0	1	1	1	1	2	19	1	1	2	19
Total Existing Trips (To Be Removed)			**0**	**1**	**1**	**1**	**1**	**2**	**19**	**1**	**1**	**2**	**19**
PHASE 1													
Multi-Family Housing (Low-Rise)	220	56 DU	6	21	27	22	13	35	383	21	18	39	263
Continuing Care	255	200 Units	18	10	28	12	20	32	480	23	21	44	406
Total Phase 1 Development Trips (without Reductions)			**24**	**31**	**55**	**34**	**33**	**67**	**863**	**44**	**39**	**83**	**669**
Proposed New External Trips Under Phase 1 (Proposed Phase 1 Trips - Existing Trips)			**24**	**30**	**54**	**33**	**32**	**65**	**844**	**43**	**38**	**81**	**650**
PHASE 2													
Multi-Family Housing (Mid-Rise)	221	180 DU	16	45	61	48	30	78	979	39	40	79	884
Hotel	310	140 Rooms	38	27	65	40	39	79	1,170	56	45	101	1,147
Quality Restaurant	931	8 kSF	3	3	6	42	20	62	671	50	35	85	720
High-Turnover (Sit-Down) Restaurant	932	5 kSF	27	23	50	30	19	49	561	29	27	56	612
General Office Building	710	10 kSF	31	5	36	2	11	13	114	3	2	5	22
Shopping Center[2]	820	2 kSF	1	1	2	4	4	8	76	5	4	9	92
Total Phase 2 Development Trips (without Reductions)			**116**	**104**	**220**	**166**	**123**	**289**	**3,571**	**182**	**153**	**335**	**3,477**
Total Phase 1 + Phase 2 Development Trips (without Reductions)			**140**	**135**	**275**	**200**	**156**	**356**	**4,434**	**226**	**192**	**418**	**4,146**
Proposed New External Trips at Ultimate Build-Out (Proposed Total Development Trips - Existing Trips)			**140**	**134**	**274**	**199**	**155**	**354**	**4,415**	**225**	**191**	**416**	**4,127**

Notes:

1. Internal capture between residential (multifamily) and non-residential uses (shopping center , quality restaurant, high turnover (sit-down) restaurant, and general office buidling) was based on a minimum of 5% for AM, PM and SAT peak hour trips.

2. For Shopping Center, the rates have been used as 2,000 sft of retail falls outside the data range.

A comparison of the proposed and by-right site trip generation is presented in Table 3.

Table 3: Proposed vs By Right Site Trip Generation Comparison

	------ Weekday ------							------ Weekend ------			
	AM Peak Hour			PM Peak Hour			Daily	Saturday Peak Hour			Sat Daily
	In	Out	Total	In	Out	Total	Total	In	Out	Total	Total
By-Right Trips	457	156	613	303	578	881	8,815	431	398	829	7,577
Proposed Development	140	134	274	199	155	354	4,415	225	191	416	4,127
Delta	**-317**	**-22**	**-339**	**-104**	**-423**	**-527**	**-4,400**	**-206**	**-207**	**-413**	**-3,450**

As can be seen in Table 3 above, the proposed development program for the Northfax site would generate less trips than allowable by-right with the current zoning.

Appendix D

Background Development Trip Generation

Memorandum

To: Wendy Block Sanford
Transportation Director
City of Fairfax, Virginia

Date: September 19, 2016

Project #: 38509.00

From: Daniel Lovas, PE
Senior Transportation Engineer

Re: Northfax University Drive Extension Traffic Evaluation
Fairfax, Virginia

Executive Summary

VHB completed a traffic study to evaluate the proposed University Drive extension between Fairfax Boulevard (Route 50) and Eaton Place, which is proposed to improve circulation in the Northfax region of the City of Fairfax. Rinker Design Associates produced a roadway layout concept for the University Drive extension, which provided the basis for developing traffic volume forecasts and completing the traffic analyses.

Traffic forecasts for the study are based on existing traffic volume data and a holistic understanding of traffic patterns in the study area. However, the traffic forecasting approach isn't designed to account for driver behavior in saturated traffic conditions. Drivers will seek routes to minimize delay and shorten travel times, incentivizing some drivers to follow new travel patterns. Future land use approvals will influence individual driver decisions and contribute to long-term equilibrium in traffic patterns for the study area.

Traffic forecasts indicate that peak period traffic volumes will generally decrease on Chain Bridge Road and increase on Eaton Place and University Drive. Peak hour traffic volume data for University Drive corridor, south of Fairfax Boulevard, indicates that traffic activity currently operates well below the roadway's vehicular capacity. The maximum vehicular capacity for roadways of similar functional class to University Drive is approximately 17,000-18,000 vehicles per day. Table 1 summarizes the traffic volume forecasts for University Drive, south of Fairfax Boulevard, under the Baseline and University Drive extension project conditions. The traffic volume diversion estimates for University Drive indicate an approximately 15-25 percent increase in overall traffic activity, which is equivalent to 1,000-1,500 additional vehicles per day or approximately one additional vehicle per minute in each direction during peak periods. This increase remains well within the road's maximum operational capacity.

Table 1: Peak Hour Traffic Volume on University Drive, south of Fairfax Boulevard

	2018 Baseline Condition		2018 University Drive Extension Condition		Traffic Volume Increase	
Direction	**Weekday AM Peak**	**Weekday PM Peak**	**Weekday AM Peak**	**Weekday PM Peak**	**Weekday AM Peak**	**Weekday PM Peak**
Northbound	369	392	433	456	+64	+63
Southbound	118	324	198	382	+80	+58
Total	487	716	631	838	+144	+121

Based on the traffic volume forecasts and intersection lane geometry, the planned Eaton Place/University Drive intersection will not meet minimum thresholds for a traffic signal. Future development and evolving traffic patterns will influence the ultimate traffic volume conditions in the study area. Additional traffic signal warrant analyses may be appropriate for the planned intersection in the future. For the purposes of the traffic evaluation, this intersection was analyzed as an unsignalized intersection with Stop sign control on University Drive.

The traffic operations analysis indicates that traffic along the Eaton Place and University Drive corridors, north of Fairfax Boulevard, will experience significant delay and queuing, particularly during the weekday evening peak period. Intersection capacity constraints at the Chain Bridge Road/Eaton Place intersection will contribute to elevated congestion for traffic using the planned University Drive extension.

The City of Fairfax has previously optimized traffic signal timings in the study area and additional timing modifications at the Chain Bridge Road/Eaton Place intersection will not provide significant improvement on the Eaton Place and University Drive corridors. Significant intersection modifications to provide additional capacity at Chain Bridge Road/Eaton Place intersection are necessary to improve overall operations on Eaton Place and the planned University Drive extension and reduce anticipated future congestion.

Introduction

The City of Fairfax, Virginia is in the process of planning for redevelopment to revitalize Fairfax Boulevard (Route 29/50) in the Northfax area near the intersection of Fairfax Boulevard and Chain Bridge Road (Route 123). Land uses in the Northfax area are traditionally suburban, characterized by strip shopping centers and low-density commercial uses. Increased developer interest in higher-density land uses in Northfax have led the city to assess transportation options to provide adequate access to future development and support overall regional transportation.

As part of this planning effort, the City of Fairfax is assessing the potential benefits of extending University Drive between Fairfax Boulevard and Eaton Place. An extension of University Drive could provide a more direct route for drivers traveling between the city center, Northfax area, and I-66 linking drives to the regional freeway system.

VHB has conducted a traffic operations evaluation of the potential roadway extension. The purpose of this evaluation is to provide a planning-level forecast of future traffic volumes and identify potential benefits and issues associated with the roadway extension. VHB has previously conducted traffic evaluations of the adequacy of the roadway network in the Northfax area, and the available data and analysis were used as a basis for evaluation of the potential roadway extension. VHB has prepared this memorandum to summarize the methodology and findings of the evaluation.

Study Area

The study area includes the key roadways and signalized intersections surrounding the Northfax development site, where the University. Drive extension would be constructed. The primary roadways included in the evaluation include Fairfax Boulevard (Route 29/50), Chain Bridge Road (Route 123), Eaton Place, and University Drive. A site location map showing the study area intersection locations is provided in Figure 1.

Figure 1
Study Area Map

Roadway and Intersection Network

The existing roadway network includes a combination of state routes providing regional access to the City of Fairfax and local roadways that provide local access to neighborhoods, employers, and other land uses in the city. The primary roadways comprising the study area include the following:

- *Fairfax Boulevard (Route 29/50)* is a four to six-lane divided arterial highway and major commuter route providing east-west connectivity between the city, neighboring communities, and several other major highways. The posted speed limit on Fairfax Boulevard is 35 miles per hour.
- *Chain Bridge Road (Route 123)* is a four to six-lane wide divided arterial highway providing generally north-south regional access to the City of Fairfax and direct access from Northfax to the city center and I-66. Chain Bridge Road transitions to a two-lane cross-section approximately 600 feet south of Fairfax Boulevard and maintains this configuration to the city center. The posted speed limit on Chain Bridge Road is 25 miles per hour south of Fairfax Boulevard and 30 mph north of Fairfax Boulevard.
- *Eaton Place* is a four-lane undivided east-west local collector roadway that connects Fairfax Boulevard (Route 50) to Chain Bridge Road (Route 123) and provides access to commercial and office properties in the Northfax area. The posted speed limit on Eaton Place is 25 miles per hour.
- *University Drive* is a two-lane undivided local roadway providing direct north-south access between Fairfax Boulevard (Route 50) and the city center.

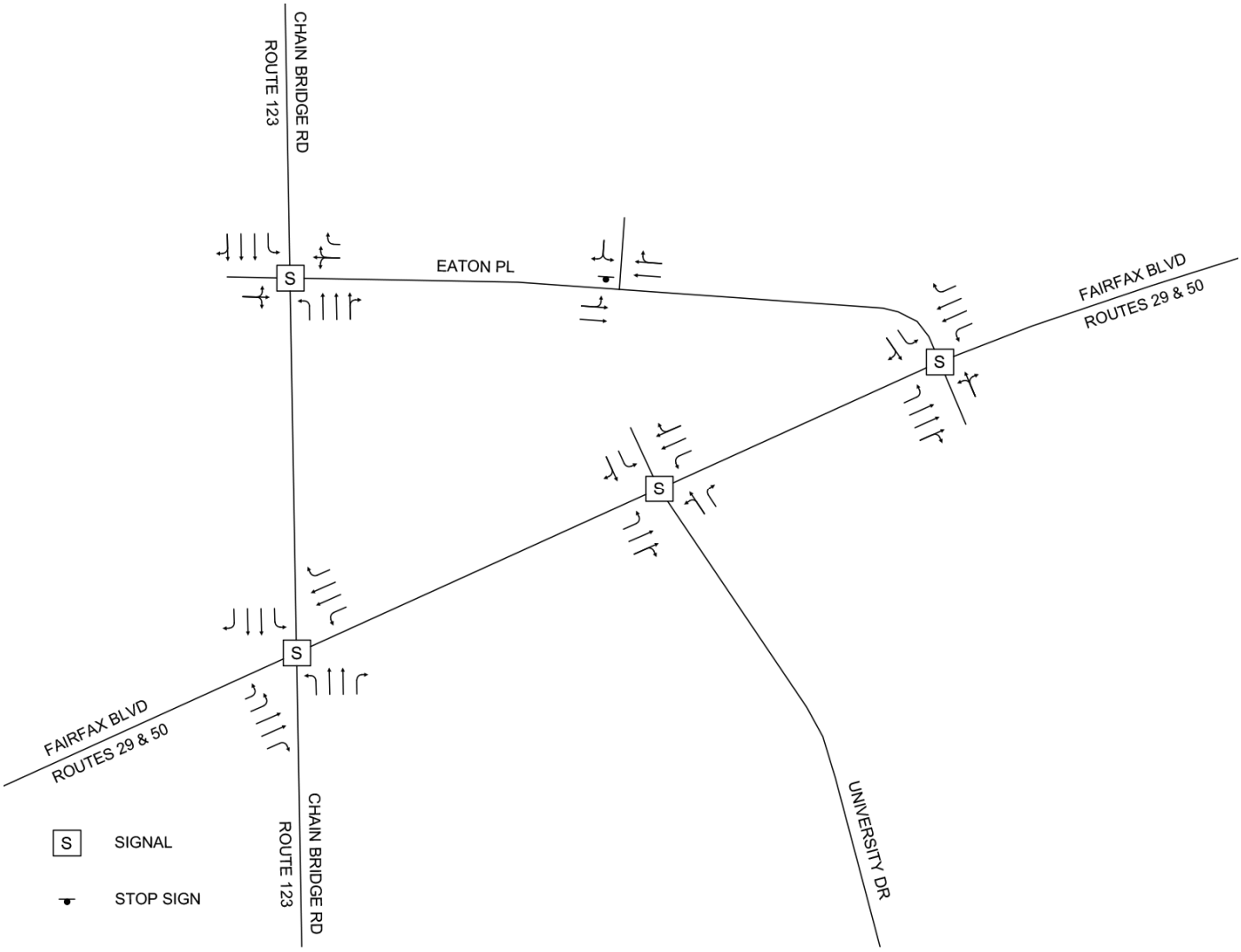
The Northfax study area includes a total of four existing intersections and one planned new intersection. All of the existing intersections are controlled by traffic signals. The following is a summary of the intersections included in the traffic evaluation:

- Fairfax Boulevard at Chain Bridge Road
- Fairfax Boulevard at University Drive
- Fairfax Boulevard at Eaton Place
- Chain Bridge Road at Eaton Place
- Eaton Place at University Drive extension (planned intersection)

Figure 2 summarizes the existing lane geometry at each of the study area intersections. The lane geometry at the planned Eaton Place/University Drive intersection, as well as the proposed University Drive north leg connection at Fairfax Boulevard, is based on preliminary concept plans for the University Drive extension by Rinker Design Associates for the city.

Figure 2

Existing Northfax Lane Geometry and Traffic Control



Planned Future Conditions

The purpose of the traffic evaluation is to analyze future traffic conditions at the Northfax study area intersections with and without the potential University Drive extension. A planning horizon of 2018 was selected for the potential roadway extensions and VHB used previous analysis data and information to develop baseline traffic volumes for the network.

VHB previously evaluated traffic operations in the Northfax study area and summarized the results of this traffic operations evaluation in the Northfax Road Improvements Traffic Analysis report, revised on September 4, 2014. The Future Build condition from the previous traffic evaluation, including planned development that is likely to be

constructed before the 2018 planning horizon. The 2014 study identified the following development projects that are included in the future conditions analysis:

- The former Home Depot Expo; a Wal-Mart store at the intersection of Lee Highway and Jermantown Road
- AutoZone/ Convenience Store/ Walgreens; a mix of retail stores at the intersection of Fairfax Boulevard, Lee Highway, and Main Street
- Boulevard Marketplace; a retail development along Fairfax Boulevard just west of Plantation Parkway

Baseline Traffic Volume Forecasts

The 2018 Baseline traffic volume forecasts for the University Drive extension study are based on the Future Build condition traffic volume projections developed in the 2014 Northfax Road Improvement Traffic Analysis study. Previous traffic forecasts for the study area applied separate growth rates, ranging from 0.36-1.40 percent, to various study area roadways. For the purposes of this evaluation, a unified annual growth rate of one percent was applied to the previous study's future traffic volume projections at all intersections to develop the 2018 Baseline traffic volume forecasts. Figures 3 and 4 summarize the 2018 Baseline traffic volume forecasts for the four existing intersections included in the study area.

Figure 3
2018 Baseline Weekday Morning Peak Hour Traffic Volumes

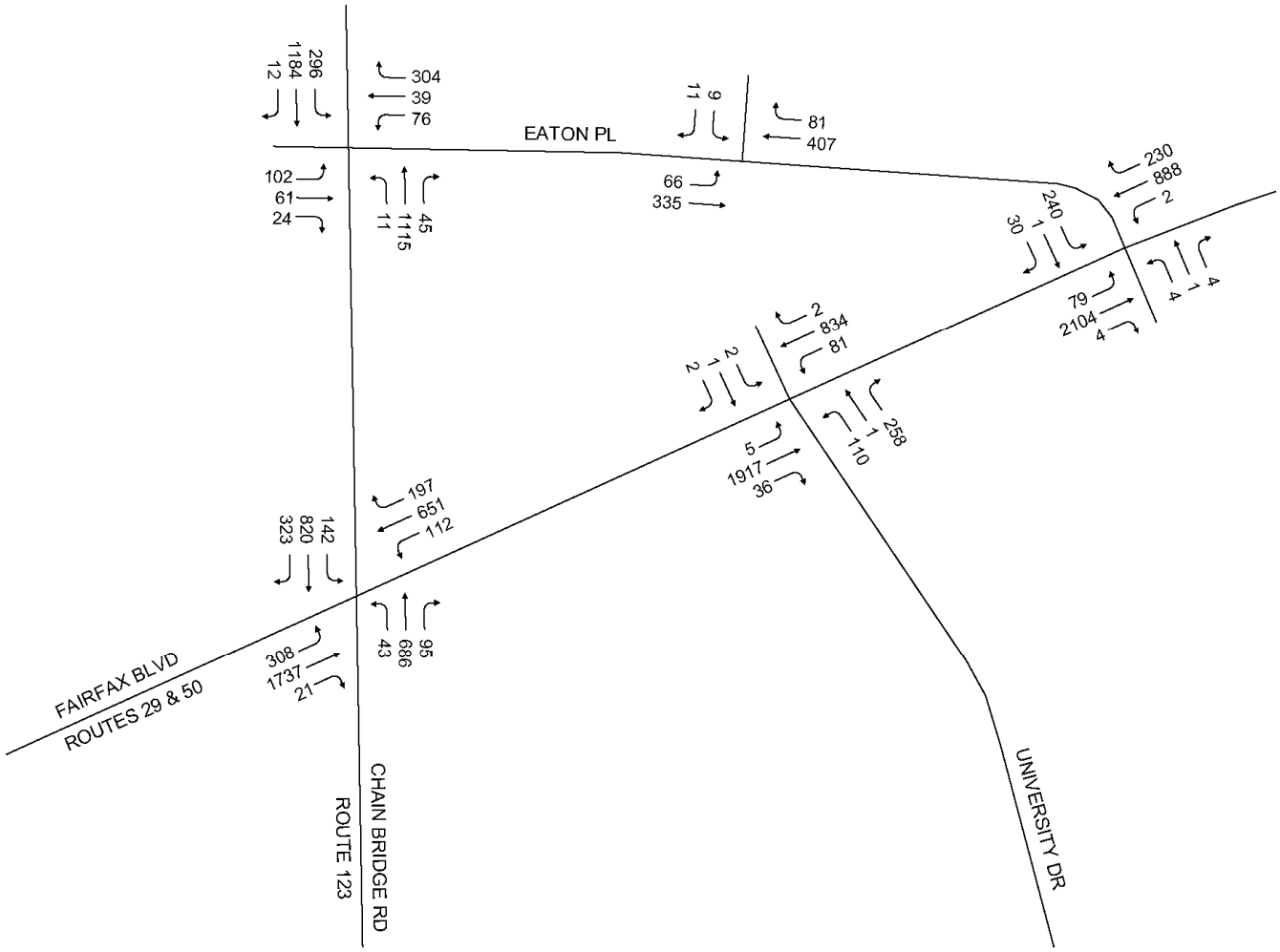
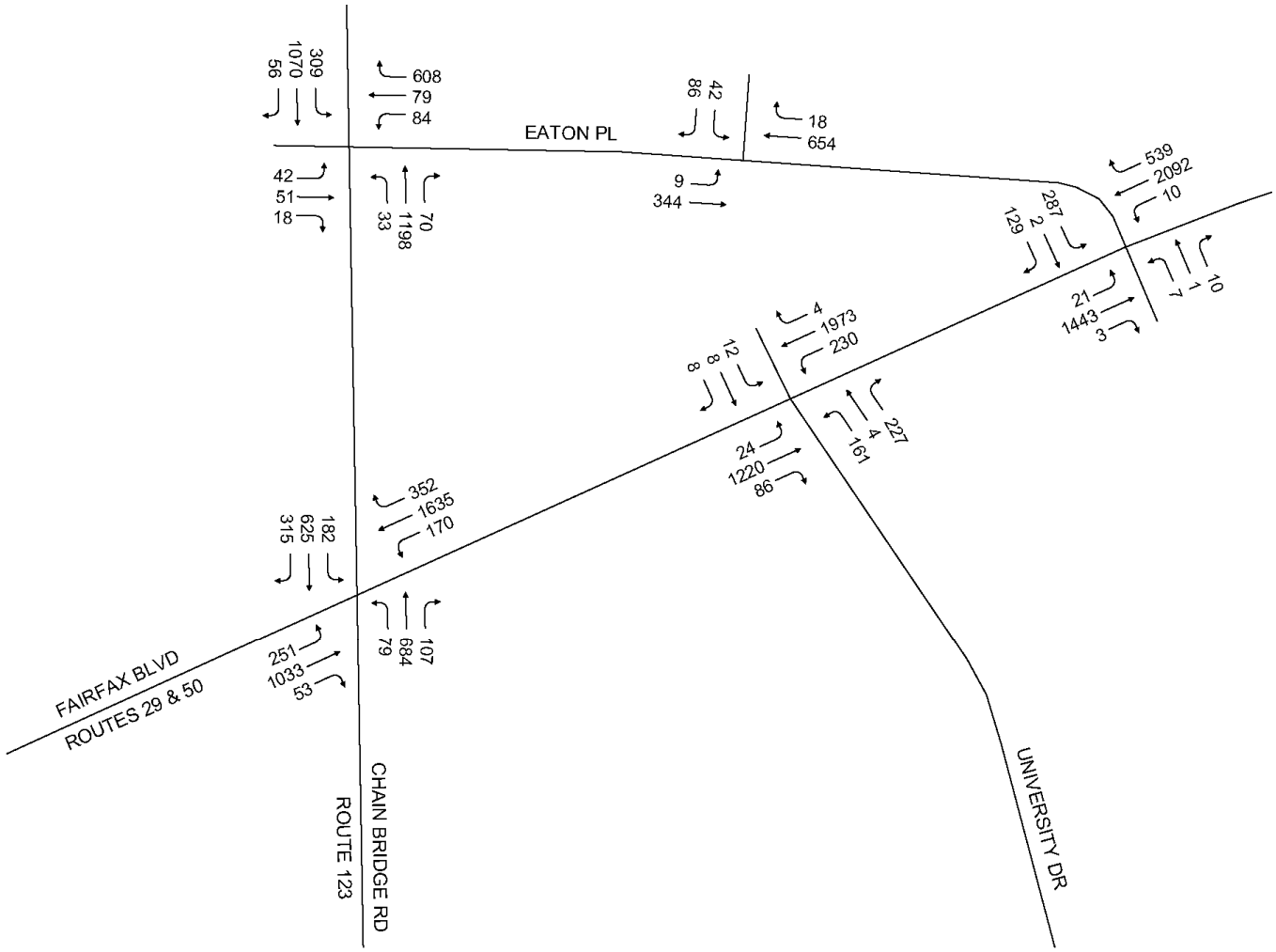


Figure 4
2018 Baseline Weekday Evening Peak Hour Traffic Volumes



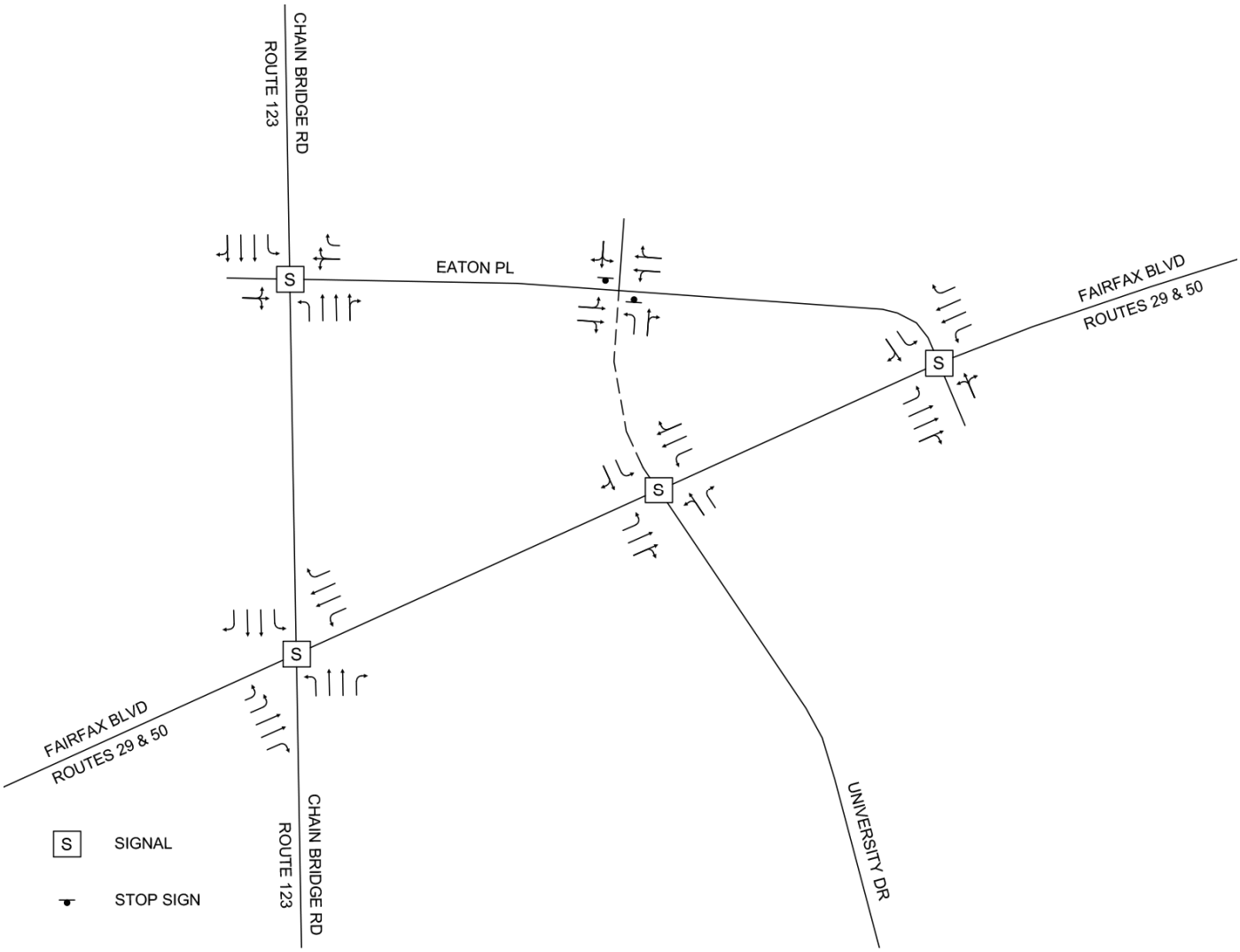
The Northfax site is the subject of preliminary planning for redevelopment with higher-density commercial and residential land uses. However, the planning, design, and permitting schedules for Northfax redevelopment are likely to exceed the 2018 planning horizon, and the purpose of this study is to evaluate the planned University Drive extension's impact on area traffic operations prior to Northfax redevelopment. Therefore, no additional planned development was identified for inclusion in the 2018 Baseline traffic volume forecasts.

University Drive Extension Plan

Based on roadway plans produced for the University Drive extension, the planned roadway would be constructed along an alignment from the north side of the Fairfax Boulevard/University Drive intersection to a new intersection on Eaton Place opposite an existing WillowWood Plaza driveway. The planned roadway alignment travels through portions of the existing Fairfax Shopping Center and car dealership properties and would support potential future redevelopment of these properties. A copy of the preliminary concept plan for the University Drive extension prepared by Rinker Design Associates is included in the Appendix. Figure 5 summarizes the anticipated future lane

geometry and traffic control at the study intersections after constructing the University Drive extension. The University Drive extension concept developed by Rinker Design Associates provides the planned lane geometry for University Drive, and traffic control for the planned Eaton Place/University Drive intersection is assumed to be Stop sign control on the University Drive approach to the intersection.

Figure 5
Future Northfax Lane Geometry and Traffic Control



Future Roadway Extension Traffic Volume Forecasts

The 2018 Future Roadway Extension traffic volume forecasts were developed to account for potential traffic diversions associated with the completion of the University Drive extension between Fairfax Boulevard and Eaton Place. The planned roadway extension is anticipated to attract traffic from several other existing in the study area.

VHB primarily relied on engineering judgement based on our understanding of the study area developed through multiple traffic evaluations in this area to develop the traffic diversion forecasts. VHB evaluated the existing traffic

patterns and compared peak period travel times in the study area to develop traffic diversion forecasts on study area roadways. Regional travel demand model data and analysis runs were not available for this evaluation.

There are two primary categories of traffic volume diversions that the University Drive extension is likely to enable: traffic diversions between University Drive and Chain Bridge Road and traffic diversions between Chain Bridge Road/Fairfax Boulevard and Eaton Place. The following sections summarize the anticipated proportion of traffic volume diversions.

Diversions between University Drive and Chain Bridge Road

Some north-south traffic that currently uses either Fairfax Boulevard or Eaton Place to travel between University Drive and Chain Bridge Road is likely to divert to the University Drive extension. The University Drive extension is likely to provide a more direct route for some of the traffic using these roadways. The following is a summary of the level of anticipated traffic diversions between University Drive and Chain Bridge Road:

- 50% of the northbound left turn traffic from University Drive to Fairfax Boulevard will divert to the northbound through on University Drive (to the planned extension), left on Eaton Place, and right on Chain Bridge Road
- 50% of eastbound right turn traffic from Fairfax Boulevard to University Drive will be diverted left from Chain Bridge Road at Eaton Place, right on University Drive (extension), and cross Fairfax Boulevard to continue south
- 2% of the northbound right turn traffic from University Drive to Fairfax Boulevard will divert to the northbound through on University Drive (to the planned extension), left on Eaton Place, and right on Chain Bridge Road
- 2% of the westbound left turn traffic from Fairfax Boulevard to University Drive will be diverted left from Chain Bridge Road at Eaton Place, right on University Drive (extension), and cross Fairfax Boulevard to continue south
- 10% of northbound through traffic on Chain Bridge Road at Fairfax Boulevard will divert to the northbound through on University Drive at Fairfax Boulevard, left on Eaton Place, and right on Chain Bridge Road
- 10% of southbound through traffic on Chain Bridge Road at Fairfax Boulevard will be diverted left from Chain Bridge Road to Eaton Place, right on University Drive (extension), and southbound through at Fairfax Boulevard to continue south

The University Drive extension will provide a more direct and attractive route for some traffic to use University Drive to travel between Fairfax Boulevard and the Old Town district of the city. This project is likely contribute to increased traffic diverted from Chain Bridge Road to University Drive south of Fairfax Boulevard. Table 2 summarizes the projected peak hour traffic diversions to University Drive, south of Fairfax Boulevard.

Table 2: Future Traffic Diversions to University Drive, south of Fairfax Boulevard

	Traffic Volume Increase		
Time Period	**Northbound**	**Southbound**	**Total**
Weekday AM Peak	64	80	144
Weekday PM Peak	63	58	121

South of Fairfax Boulevard, University Drive is a two-lane urban collector street. Daily traffic volume data for University Drive, south of Fairfax Boulevard, collected by the Virginia Department of Transportation[1] in 2014 indicates an average daily traffic volume of 6,100 vehicles per day. This level of traffic activity is well within the operational capacity for a two-lane collector roadway, which can approach approximately 17,000-18,000 vehicles per day at maximum capacity.

The additional traffic projected on University Drive represents an increase of approximately 1,000-1,500 daily vehicle trips on the corridor, which represents an approximately 15-25 percent increase in daily traffic volume or approximately one additional vehicle per minute in each direction during peak periods. A significant proportion of the traffic increase is comprised of traffic diverted to University Drive from the Chain Bridge Road (Route 123) corridor, which will contribute to some reduction in vehicle delay and congestion on Chain Bridge Road. The projected peak hour and daily traffic volumes on University Drive remain well below the roadway's operational capacity.

Diversions between Chain Bridge Road/Fairfax Boulevard and Eaton Place

Traffic originating from or destined to land uses on Eaton Place currently access Eaton Place directly from Chain Bridge Road or Fairfax Boulevard. The planned University Drive extension will provide a more direct route between both Chain Bridge Road and Fairfax Boulevard and some land uses on Eaton Place. The following is a summary of the anticipated traffic diversions between Chain Bridge Road or Fairfax Boulevard and Easton Place:

- 40% of northbound right turn traffic from Chain Bridge Road to Eaton Place will be diverted proportionally from Chain Bridge Road and Fairfax Boulevard, travel east along Fairfax Boulevard to the eastbound left at University Drive (extension), and turn right and left (equally) at Eaton Place
- 40% of westbound left turn traffic from Eaton Place to Chain Bridge Road will be diverted onto University Drive (extension), right onto Fairfax Boulevard, and allocated proportionally to Chain Bridge Road and Fairfax Boulevard
- 20% of eastbound left turn traffic from Fairfax Boulevard onto Eaton Place will divert to the eastbound left onto University Drive (extension) and right on Eaton Place.
- 20% of southbound right turn traffic from Eaton Place to Fairfax Boulevard will divert to the westbound left from Eaton Place onto University Drive (extension) and southbound right onto Fairfax Boulevard

Figures 6 and 7 summarize the anticipated traffic volume diversions described above. These figures include positive and negative values, which represent increasing or decreasing traffic volume forecasts at specific intersection movements.

[1] Virginia Department of Transportation Daily Traffic Volume Estimates, Special Locality Report 151, City of Fairfax; 2014. http://www.virginiadot.org/info/resources/Traffic_2014/AADT_151_Fairfax_2014.pdf

Figure 6
University Drive Extension Weekday Morning Peak Hour Traffic Volume Diversions

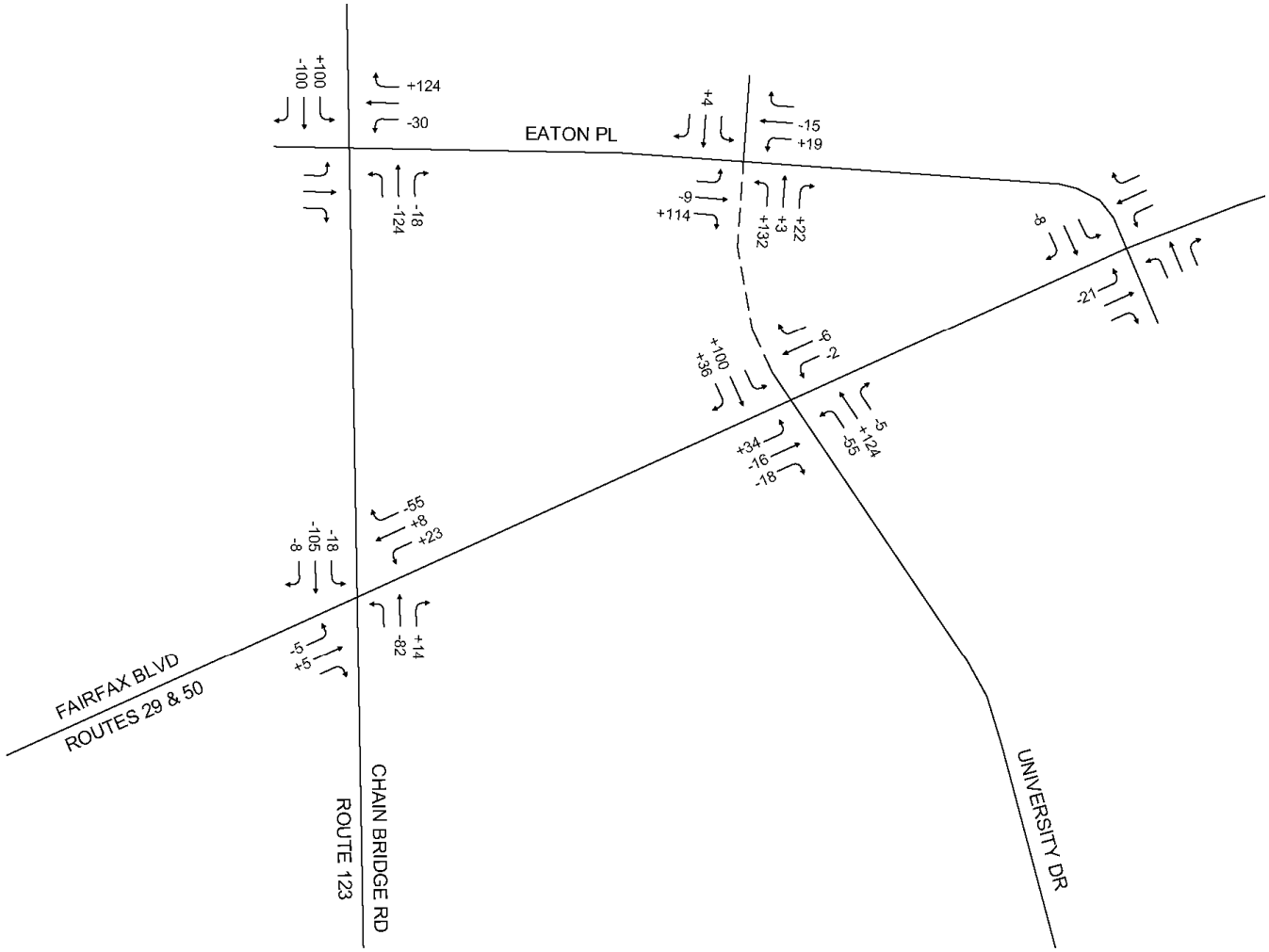
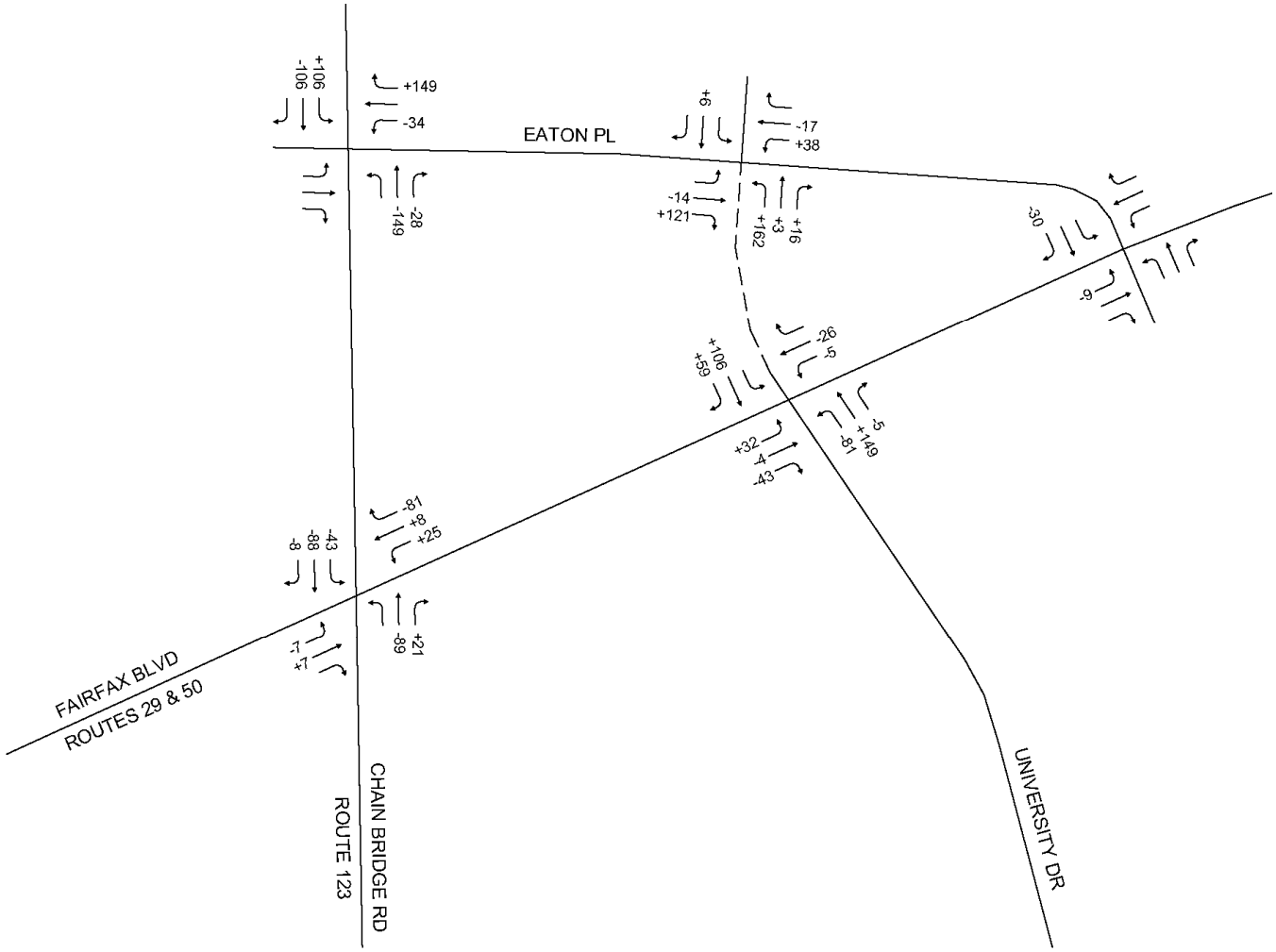


Figure 7
University Drive Extension Weekday Evening Peak Hour Traffic Volume Diversions



2018 Roadway Extension Traffic Volumes

The weekday morning and evening peak hour traffic volume diversions were applied to the 2018 Baseline peak hour traffic volumes to calculate the 2018 Roadway Extension peak hour traffic volumes. Figures 8 and 9 summarize the 2018 Roadway Extension peak hour traffic volumes.

Figure 8
2018 Roadway Extension Weekday Morning Peak Hour Traffic Volumes

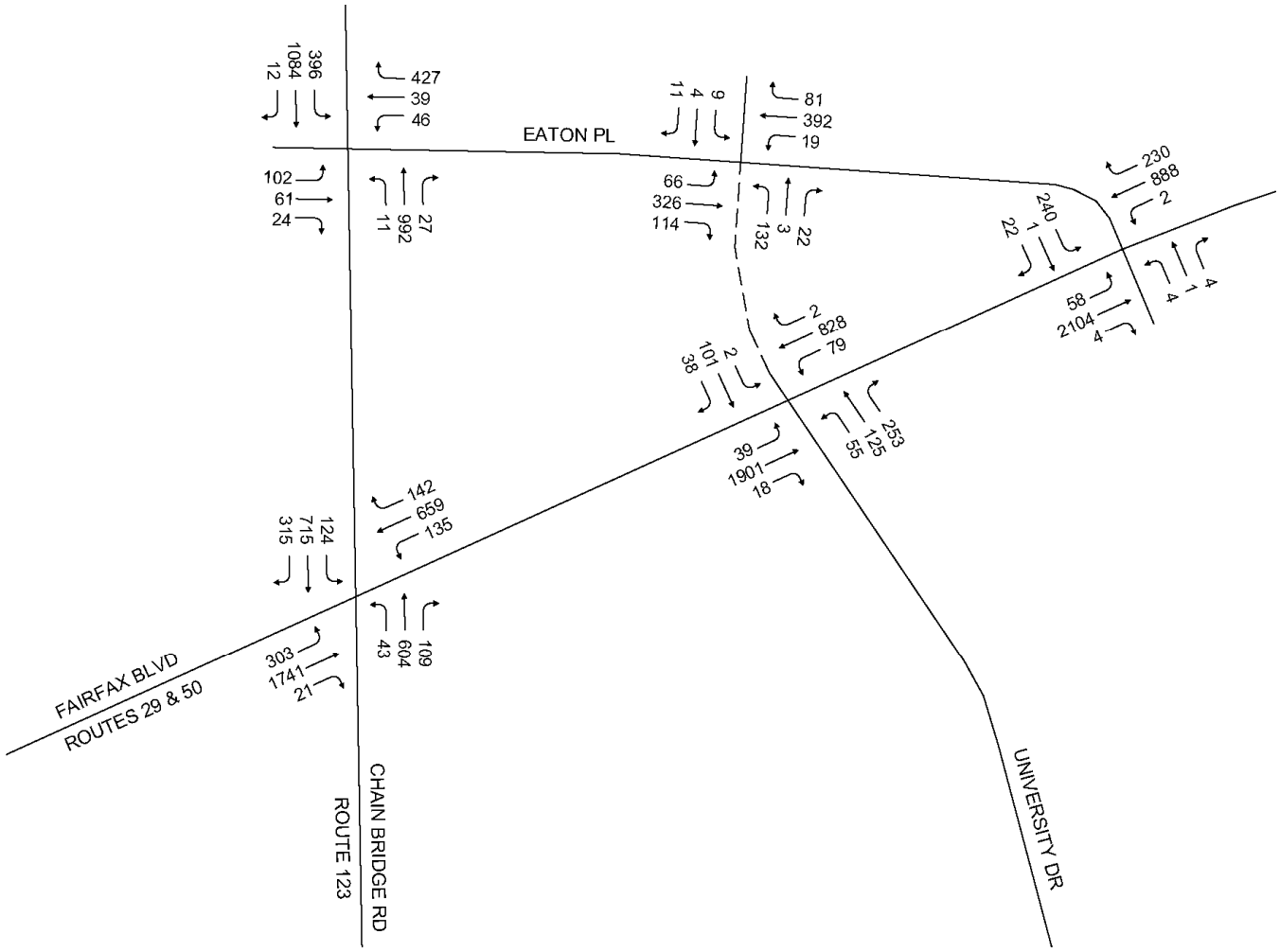
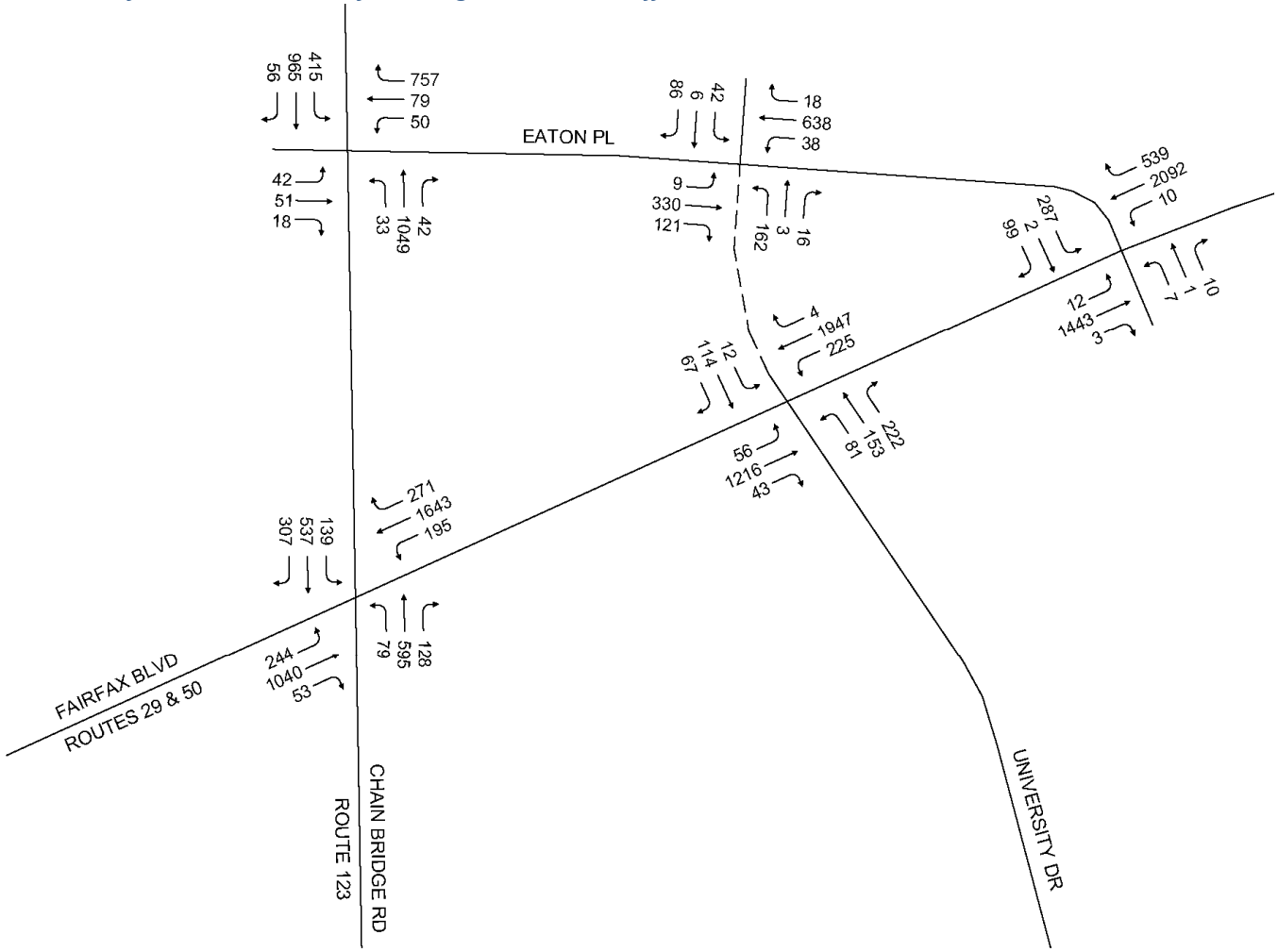


Figure 9
2018 Roadway Extension Weekday Evening Peak Hour Traffic Volumes



Planned Traffic Control

The Manual on Uniform Traffic Control Devices (MUTCD)[2] provides traffic signal warrant guidelines that represent the minimum standards to install a new traffic signal at an intersection. The Peak Hour traffic signal warrant thresholds were applied to the traffic volume projections for the planned Eaton Place/University Drive intersection. Based on the traffic volume forecasts and planned intersection lane geometry, the Eaton Place/University Drive intersection will not meet the minimum Peak Hour warrant thresholds for a traffic signal. This finding confirms that two-way Stop control is appropriate for the planned intersection.

Future land use development and traffic control strategies will influence traffic volumes in the study area. Additional analysis of the planned intersection's traffic control may be appropriate and should be conducted based on updated traffic volume projections for the intersection or actual traffic volumes after implementation.

[2] *Manual on Uniform Traffic Control Devices for Streets and Highways*, Federal Highway Administration, Washington, D.C. 2009

Future Conditions Intersection Capacity Analysis

The 2018 Baseline and 2018 Roadway Extension peak hour traffic volumes were used to analyze the capacity of the five study-area intersections. Consistent with traffic analysis methodology used by VHB for previous Northfax traffic studies, the VISSIM analysis model was used to analyze traffic operations in this evaluation.

The VISSIM traffic micro-simulation model provides a comprehensive tool for traffic analysis of high-volume urban and suburban roadway networks. VISSIM is a powerful microscopic, time-step, and driver behavior based traffic simulation model that uses a psycho-physical driver behavior model for each vehicle in the system. VISSIM is capable of modeling high-volume and high-speed traffic volume conditions, including the movements of variety users, including automobiles, trucks, bicycles, and pedestrians on a detailed network of streets.

Unlike static traffic analysis methodologies and tools, a microsimulation model like VISSIM is designed to accurately evaluate traffic network operations at a system level, including a range of driver behaviors and the influences of vehicle interactions and congestion on adjacent intersections. Static intersection-based traffic analysis tools evaluate intersection operations in isolation and cannot reflect the effects of upstream and downstream operations along a roadway corridor.

After initial coding of the network, multiple runs of the existing conditions VISSIM model with varying random seeds were conducted to introduce variation to vehicle loadings and the vehicle arrivals within the simulation environment. Calibration of the existing conditions VISSIM model was conducted and some model settings were adjusted during previous studies of the Northfax study area by VHB to provide accurate and realistic model operations. VHB retained the settings from previous VISSIM modeling for the Northfax study area in the University Drive extension evaluation. The analysis maintains existing traffic signal timing and phasing settings for both the 2018 Baseline and 2018 Roadway Extension conditions.

The output from the VISSIM model provides results indicating the level of service for each intersection in the study area. Level of Service (LOS) is a qualitative assessment of vehicle mobility along a roadway or through an intersection, and represents a metric of traffic performance and roadway/intersection capacity. LOS is represented by a rating designation between ''A'' and ''F'', with ''A'' representing little or no delay and ''F'' representing extreme congestion. For signalized intersections, the prevailing LOS depends on a number of factors including the approach green per cycle (g/ C) ratio, volume to capacity (v/ c) ratio and traffic progression. For two-way stop controlled intersections, the LOS depends primarily on the availability of gaps in the mainline traffic stream for side-street vehicles. The level of service for each type of intersection is defined in terms of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Table 3 summarizes the LOS thresholds defined in the Highway Capacity Manual (HCM)[3] for evaluating intersection operational performance.

[3] Transportation Research Board, Highway Capacity Manual, Washington, D.C., 2010

Table 3: Level of Service Thresholds

Level of Service	HCM Methodology (average control delay per vehicle in seconds)	
	Unsignalized Intersections	**Signalized Intersections**
A	< 10	< 10
B	10-15	10-20
C	15-25	20-35
D	25-35	35-55
E	35-50	55-80
F	> 50	> 80

Additionally, the VISSIM model provides vehicle queuing results for individual movements at each intersection based on dynamic simulation of vehicle progression between adjacent intersections. This evaluation focuses on the maximum queue results for each approach to the study intersections.

Capacity Analysis Results

The LOS for all intersections in the study area was determined based on these threshold values and the vehicular delays from the VISSIM microsimulation model. The traffic analysis LOS results are summarized in Table 4 and maximum queuing results are summarized in Table 5. Detailed summary tables including control delay, levels-of-service, and maximum vehicular queuing are included in the Appendix.

Table 4: Overall Intersection Level of Service Summary

Location	Time Period	2018 Baseline Condition		2018 Roadway Extension Condition	
		Delay (sec)	LOS	Delay (sec)	LOS
Fairfax Boulevard at Chain Bridge Road	Weekday AM Peak Hour	52.0	D	47.4	D
	Weekday PM Peak Hour	57.2	E	60.3	E
Fairfax Boulevard at University Drive	Weekday AM Peak Hour	11.9	B	18.9	B
	Weekday PM Peak Hour	16.1	B	45.3	D
Fairfax Boulevard at Eaton Place	Weekday AM Peak Hour	12.9	B	14.1	B
	Weekday PM Peak Hour	17.9	B	28.3	C
Chain Bridge Road at Eaton Place/Oak Lane	Weekday AM Peak Hour	66.4	E	56.3	E
	Weekday PM Peak Hour	87.5	F	87.4	F
Eaton Place at University Drive	Weekday AM Peak Hour	n/a	n/a	0.6	A
	Weekday PM Peak Hour	n/a	n/a	107.7	F

Table 5: Vehicle Queuing Summary

Location	Time Period	2018 Baseline Condition		2018 Roadway Extension Condition	
		Movement	Maximum Queue (feet)	Movement	Maximum Queue (feet)
Fairfax Boulevard at Chain Bridge Road	Weekday AM Peak Hour	EB T	975	EB T	1,006
		WB T	310	WB T	311
		NB T	1,012	NB T	715
		SB T	1,065	SB T	845
	Weekday PM Peak Hour	EB T	575	EB T	992
		WB T	1,133	WB T	1,123
		NB T	1,207	NB T	1,110
		SB T	1,154	SB T	1,037
Fairfax Boulevard at University Drive	Weekday AM Peak Hour	EB T	376	EB T	470
		WB T	161	WB T	312
		NB LT	471	NB LT	554
		SB L	21	SB T	277
	Weekday PM Peak Hour	EB T	372	EB L	1,098
		WB T	675	WB T	913
		NB LT	644	NB LT	710
		SB T	51	SB T	308
Fairfax Boulevard at Eaton Place	Weekday AM Peak Hour	EB T	605	EB T	834
		WB T	254	WB T	212
		NB LTR	28	NB LTR	28
		SB L	401	SB L	382
	Weekday PM Peak Hour	EB T	189	EB T	107
		WB T	921	WB T	1,376
		NB LTR	44	NB LTR	44
		SB L	729	SB L	480

Notes: EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, L = Left Turn, T = Through, and R = Right Turn

Table 5: (cont.): Vehicle Queuing Summary

Location	Time Period	2018 Baseline Condition		2018 Roadway Extension Condition	
		Movement	Maximum Queue (feet)	Movement	Maximum Queue (feet)
Chain Bridge Road at Eaton Place/Oak Lane	Weekday AM Peak Hour	EB LTR	307	EB LTR	307
		WB LTR	410	WB LTR	406
		NB TR	554	NB TR	546
		SB T	588	SB L	496
	Weekday PM Peak Hour	EB LTR	263	EB LTR	285
		WB LTR	1,442	WB LTR	1,212
		NB TR	633	NB TR	549
		SB T	591	SB L	626
Eaton Place at University Drive	Weekday AM Peak Hour	n/a	n/a	EB LTR	18
		n/a	n/a	WB LTR	0
		n/a	n/a	NB T	25
		n/a	n/a	SB T	0
	Weekday PM Peak Hour	n/a	n/a	EB LTR	33
		n/a	n/a	WB LTR	698
		n/a	n/a	NB T	667
		n/a	n/a	SB T	73

Notes: EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, L = Left Turn, T = Through, and R = Right Turn

The capacity analysis results indicate that the forecasted 2018 traffic volume forecasts for the roadway extension are anticipated to operate at similar or better LOS than the 2018 Baseline traffic volumes at all intersections during the weekday morning peak hour. The Eaton Place/University Drive intersection is expected to operate at LOS A during the weekday morning peak hour under the 2018 Roadway Extension condition. Queuing results for the weekday morning peak hour indicate that the 2018 Roadway Extension condition is likely to produce similar queuing levels to the 2018 Baseline condition, and may improve some localized queues, most notably on Chain Bridge Road at Fairfax Boulevard.

During the weekday evening peak hour, both of the existing intersections on Chain Bridge Road operate at LOS E or F under the 2018 Baseline conditions, which exceeds the city's standards for intersection performance. The LOS results indicate that several intersections are anticipated to experience significant increases in delay between the 2018 Baseline and 2018 Roadway Extension conditions. Vehicular delay is anticipated to increase significantly at three of the existing intersections and the planned Eaton Place/University Drive intersection is expected to operate at LOS F.

The maximum queuing results indicate that significant vehicular queuing on the westbound Eaton Place approach to Chain Bridge Road is present during the weekday evening peak hour under 2018 Baseline conditions. This queue is expected to extend well beyond the planned Eaton Place/University Drive intersection under the 2018 Roadway Extension condition, which will significantly impede traffic progression from northbound University Drive onto

westbound Eaton Place. The northbound queue on University Drive approaching Eaton Place is expected to extend the full length of the University Drive extension to Fairfax Boulevard and increase overall delay and congestion at the Fairfax Boulevard/University Drive intersection. Maximum queues at several intersections on Fairfax Boulevard are likely to exceed the available turning lane storage lengths, resulting in impacts to overall traffic progression during peak periods.

Traffic Signal Timing Modifications

The study indicates that traffic volume on Eaton Place will increase as a result of the University Drive extension project. Based on the initial capacity analysis results, VHB evaluated traffic signal timing modifications for the Chain Bridge Road/Eaton Place intersection during the weekday evening peak hour to improve overall traffic progression on Eaton Place and the University Drive extension. The traffic signal timing modifications involve transferring green time from Chain Bridge Road to the Eaton Place westbound approach to help improve vehicular progression and minimize queues on Eaton Place. However, increased traffic signal green time for Eaton Place will come at the expense of green time and vehicle progression on the currently congested Chain Bridge Road.

VHB performed an additional VISSIM analysis scenario based on the evening peak traffic signal timing modifications at this intersection. The results of this additional analysis scenario are included in Tables 6 and 7.

Table 6: Overall Intersection Level of Service Summary with Signal Timing Modifications

Location	Time Period	2018 Baseline Condition		2018 Roadway Extension Condition		2018 Roadway Extension with Signal Re-timing	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Fairfax Boulevard at Chain Bridge Road	Weekday PM Peak Hour	57.2	E	60.3	E	57.0	E
Fairfax Boulevard at University Drive	Weekday PM Peak Hour	16.1	B	45.3	D	32.0	C
Fairfax Boulevard at Eaton Place	Weekday PM Peak Hour	17.9	B	28.3	C	17.9	B
Chain Bridge Road at Eaton Place/Oak Lane	Weekday PM Peak Hour	87.5	F	87.4	F	81.1	F
Eaton Place at University Drive	Weekday PM Peak Hour	n/a	n/a	107.7	F	47.1	E

Table 7: Vehicle Queuing Summary with Signal Timing Modifications

Location	Time Period	2018 Baseline Condition		2018 Roadway Extension Condition		2018 Roadway Extension with Signal Re-timing	
		Movement	Maximum Queue (feet)	Movement	Maximum Queue (feet)	Movement	Maximum Queue (feet)
Fairfax Boulevard at Chain Bridge Road	Weekday PM Peak Hour	EB T	575	EB T	992	EB T	606
		WB T	1,133	WB T	1,123	WB T	1,120
		NB T	1,207	NB T	1,110	NB T	1,163
		SB T	1,154	SB T	1,037	SB T	984
Fairfax Boulevard at University Drive	Weekday PM Peak Hour	EB T	372	EB L	1,098	EB L	330
		WB T	675	WB T	913	WB T	906
		NB LT	644	NB LT	710	NB LT	719
		SB T	51	SB T	308	SB T	345
Fairfax Boulevard at Eaton Place	Weekday PM Peak Hour	EB T	189	EB T	107	EB T	120
		WB T	921	WB T	1,376	WB T	921
		NB LTR	44	NB LTR	44	NB LTR	44
		SB L	729	SB L	480	SB L	502
Chain Bridge Road at Eaton Place/Oak Lane	Weekday PM Peak Hour	EB LTR	263	EB LTR	285	EB LTR	269
		WB LTR	1,442	WB LTR	1,212	WB LTR	1,210
		NB TR	633	NB TR	549	NB L	865
		SB T	591	SB L	626	SB L	751
Eaton Place at University Drive	Weekday PM Peak Hour	n/a	n/a	EB LTR	33	EB LTR	13
		n/a	n/a	WB LTR	698	WB LTR	398
		n/a	n/a	NB LT	667	NB LT	550
		n/a	n/a	SB LTR	73	SB LTR	66

Notes: EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, L = Left Turn, T = Through, and R = Right Turn

The results in Tables 6 and 7 indicate that traffic signal timing modifications at the Chain Bridge Road/Eaton Place intersection could reduce the overall weekday evening peak hour delay and congestion anticipated under the 2018 Roadway Extension condition. With the traffic signal timing modifications, overall LOS at all existing intersections is projected to remain similar to 2018 Baseline condition. The planned Eaton Place/University Drive intersection is projected to operate at overall LOS E.

The vehicle queuing results indicate that the traffic signal timing modifications could mitigate weekday evening peak period queues on Eaton Place, University Drive, and Fairfax Boulevard below the levels projected for the 2018 Roadway Extension condition. By providing additional green time for Eaton Place traffic to progress onto Chain

Bridge Road, additional roadway capacity is provided for traffic using the University Drive extension to progress onto Eaton Place. However, most queue results remain similar to 2018 Baseline conditions, suggesting that the University Drive extension is likely to provide minimal improvement for other study intersections. As a consequence of the transfer of green time from Chain Bridge Road to Eaton Place, the northbound and southbound queues on Chain Bridge Road at Eaton Place are projected to increase. Additionally, the projected northbound queue on University Drive at Eaton Place is still anticipated to approach the full length of the street segment to Fairfax Boulevard. The City of Fairfax has completed previous traffic signal timing optimization studies for this area that suggest any signal timing modifications reducing green time on Chain Bridge Road are unacceptable.

Conclusion

Review of the projected intersection delay and queuing results, as well as the visual microsimulation output, indicate that both Eaton Place and University Drive will operate at or beyond saturated conditions during the 2018 Roadway Extension weekday evening peak period, exceeding the capacity of multiple intersections. The signal timings at the Chain Bridge Road/Eaton Place intersection do not provide sufficient green time for vehicles to progress from both Eaton Place and University Drive onto Chain Bridge Road. As a result, the mounting vehicular queues are anticipated to exacerbate congested conditions on Eaton Place and University Drive extension, north of Fairfax Boulevard. The traffic volume diversion estimates for University Drive, south of Fairfax Boulevard, indicate an approximately 15-25 percent increase in overall traffic volume, which remains well within the road's operational capacity and will provide some relief on the more congested Chain Bridge Road (Route 123).

The findings suggest that the ability of the University Drive extension to reduce vehicular delay and traffic congestion at other study area intersections is limited. While the planned roadway extension project may provide modest queuing improvements at some locations, such as the Fairfax Boulevard/Chain Bridge Road intersection, the project will not significantly improve traffic operations at any intersections and is likely to contribute to elevated peak period delay and queuing on Fairfax Boulevard, Eaton Place and University Drive, north of Fairfax Boulevard. Operational measures to minimize congestion on Eaton Place and University Drive would result in increased traffic queuing and congestion on Chain Bride Road (Route 123). Overall, the project will likely strain the limited roadway capacity on Eaton Place and contribute to persistent traffic congestion on the University Drive extension during the weekday evening peak period.

The City of Fairfax has already optimized traffic signal timings in the study area and timing modifications at the Chain Bridge Road/Eaton Place intersection will not provide complete improvement on the Eaton Place and University Drive corridors. Significant intersection modifications to provide additional capacity at Chain Bridge Road/Eaton Place intersection are necessary to improve overall operations on Eaton Place and the planned University Drive extension and reduce anticipated future congestion.

Future land use approvals and traffic management strategies will influence individual driver decisions and overall traffic volume. To avoid significant congestion, some of traffic forecasted to divert to University Drive will likely seek other routes to avoid long queues and will contribute to long-term equilibrium in traffic patterns for the study area. The long-term traffic balancing activity will moderate increases in traffic volume on Eaton Place and University Drive, but will also reduce the level of improvement in traffic operations at other intersections in the Northfax study area.

Northfax East Roadway Project
(University Drive Extension)

VDOT Project No.: U000-151-198
UPC: 109309
Federal Project: STP-5A01(763)

Public Hearing
Sept. 25, 2018

Public Hearing Objectives

- Project Overview & Design Presentation
- Discuss Right of Way Phase Process
- Answer Questions
- Invite Public Comment

Project Timeline

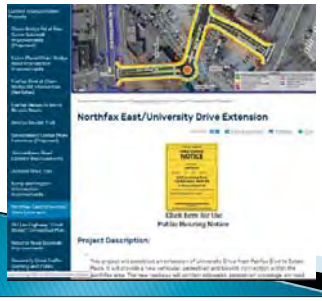
- July – Sept, 2015: Three City Council meetings to discuss Smart Scale (formerly HB2) process and potential projects
- September 29, 2015: Council adopted Resolution to approve the City's submission to VDOT
- June 24, 2016: VDOT approved City's SmartScale application
- November 1, 2016: Public Outreach Meeting
- November, 2016:– May, 2017: Five City Council Meetings to discuss project and potential modifications
- June 13, 2017: Public Hearing and Council Action to Proceed with the project with an updated project design
- September 25, 2018: Design Public Hearing on 60% Plans

Public Hearing

- The Public Hearing is an opportunity for the project team to present the project to a public audience at the 60% stage
- Individuals have the opportunity to have their comments and questions recorded verbally or in writing
- All comments are recorded and entered into the Hearing record
- The record is held open for 10 days after the hearing for additional written comments to be submitted
- Staff will compile comments and address any outstanding issues prior to finalizing the plans
- Staff will provide responses to comments provided at the Public Hearing and note any changes in the plans

Public Hearing Notification

- Two notices in the newspaper
- Letters to adjacent property owners
- Posting of notice in the project area
- Emails to property owners
- Posting on project website



City of Fairfax, Virginia
10455 Armstrong Street • Fairfax, VA 22030-3630
703-385-7810 • www.fairfaxva.gov

NEW ROADWAY IN NORTHFAX (UNIVERSITY DRIVE EXTENSION PROJECT)
CITY OF FAIRFAX PUBLIC HEARING
SEPTEMBER 25, 2018, 7:00 PM
City Council Chambers
10455 Armstrong Street, Fairfax, VA 22030

Find out about the proposed new roadway in the Northfax area between Fairfax Boulevard and Eaton Place just north of University Drive in the City of Fairfax. The project length is approximately 830 feet and involves construction of a new road, a mini roundabout, turn lanes, some on-street parking, bicycle and pedestrian accommodations, traffic signal modifications, drainage improvements and landscaping.

Pursuant with the National Environmental Policy Act (NEPA) and 23 CFR 771, a Categorical Exclusion was prepared to evaluate potential environmental impacts. In compliance with the National Historic Preservation Act, Section 106 and 36 CFR Part 800, information concerning the potential effects of the proposed improvements on properties listed in or eligible for listing in the National Register of Historic Places is included with the NEPA documentation.

Review project plans, information about property impacts, right of way policies, the tentative construction schedule and environmental documents at the hearing. This information will also be available 10 days prior to the public hearing at 10455 Armstrong Street, Room 200, Fairfax, VA 22030.

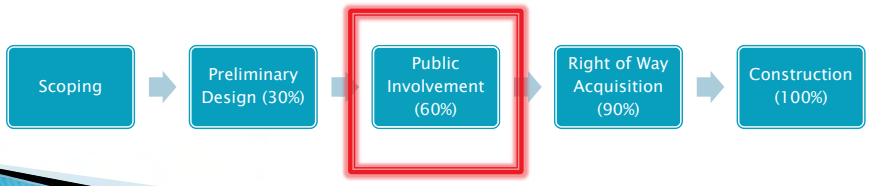
Give your written or oral comments at the hearing or submit them by Wednesday, October 10, 2018 to Wendy Sanford at the City of Fairfax Public Works Department, 10455 Armstrong Street, Room 200, Fairfax, Virginia 22030 or wendy.sanford@fairfaxva.gov.

The City of Fairfax ensures nondiscrimination and equal employment in all programs and activities in accordance with Title VI and Title VII of the Civil Rights Act of 1964. All City government offices can be contacted by dialing 711 for TTY service.

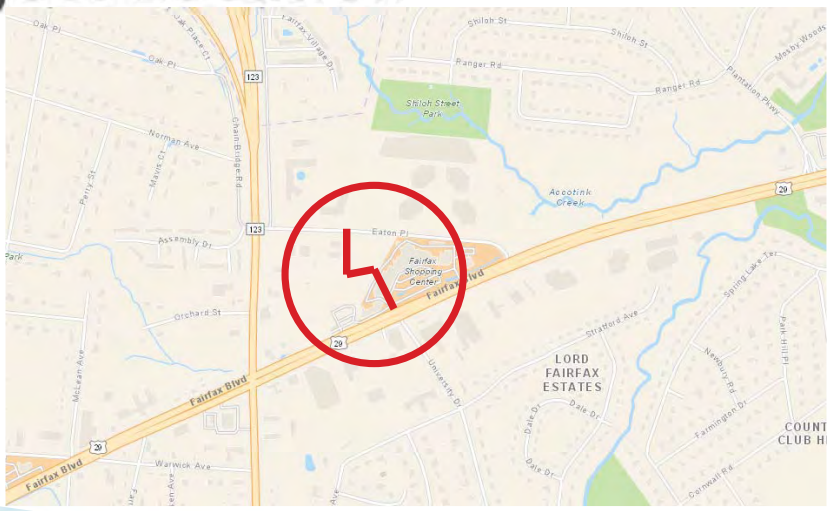
VDOT Project: U000-131-198
UPC: 109309

Project Status

- Design advanced to Public Hearing Phase Plans – 60% Complete
  - Roadway and Drainage Design
  - Establish Roundabout Criteria and Design
  - Bicycle and Pedestrian Accommodation Design
  - Landscaping and Aesthetics
  - Environmental Studies and National Environmental Policy Act (NEPA) Doc.
    - Categorical Exclusion (CE) Complete with FHWA Concurrence



Project Location



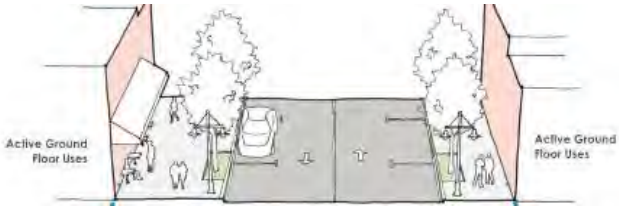
Project Objectives

- Improve Connectivity
  - Divide existing "Mega-Block" within the Northfax development area
- Reduce Congestion
  - Reduce traffic volumes at existing Fairfax Blvd – Chain Bridge Road Intersection
  - Provide alternate route from University Drive, south of Fairfax Blvd, to Eaton Place and beyond
- Promote Multimodal Travel
  - Implement City's "Active Street" corridor initiative
  - Bicycle and Pedestrian accommodations with landscaping and lighting

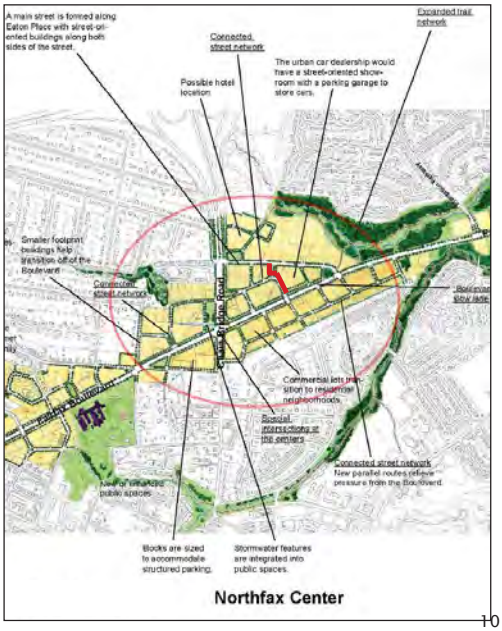
Project Description

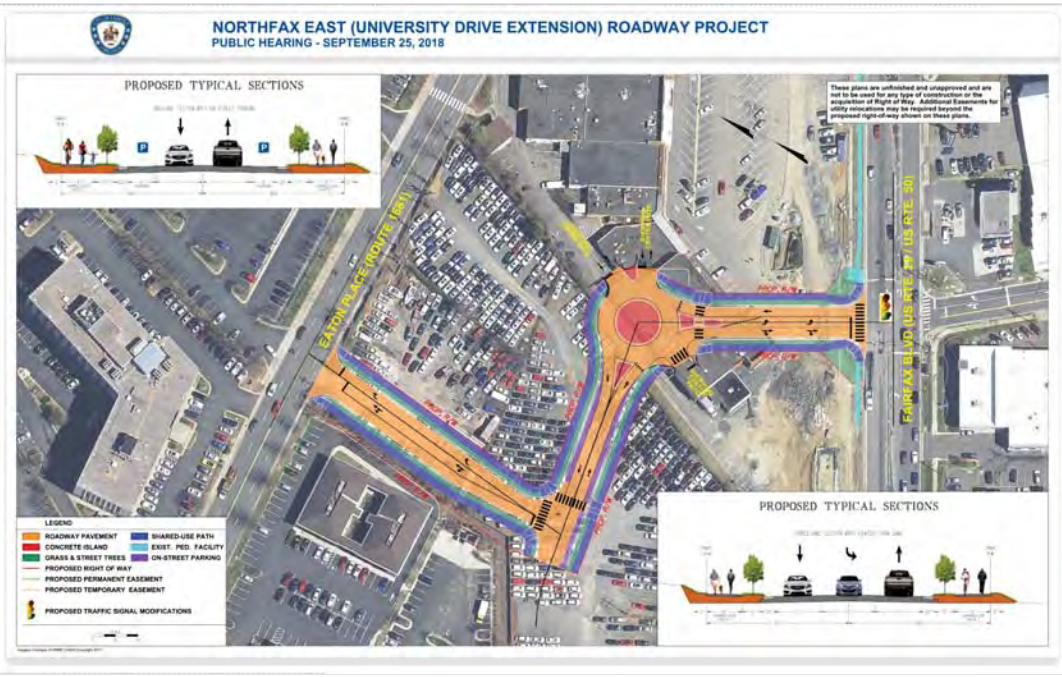
- New north-south roadway within the Northfax Area to connect University Drive at Fairfax Blvd to Eaton Place while providing infrastructure for future Northfax Redevelopment.
- Typical section varies from a three-lane configuration with center turn lane to a two-lane section with on-street parking, based on City's "Active Street" concept
- Mini-roundabout promotes lower speeds and reduces conflict points
- Shared-use path and landscaping treatments promote green, active streets
- Turn lanes and traffic signal upgrades to aid in congestion management
- Stub road for future western connection of proposed improvements to Chain Bridge Road

City Comprehensive Plan & Vision

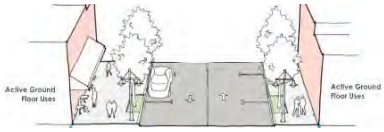


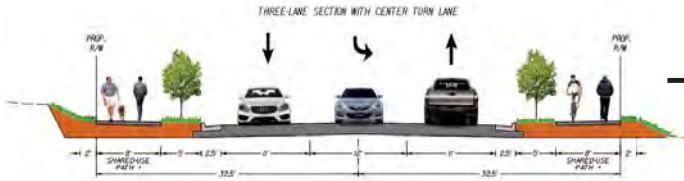
Active Streets Concept





Typical Sections





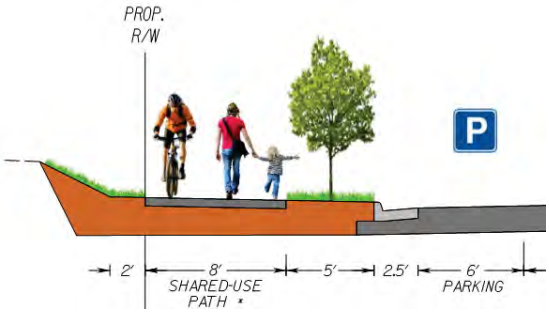
Mini-Roundabout

Proposed Northfax East Mini-Roundabout

Recently Completed Mini-Roundabout

Park St. & Locust St., Vienna, VA

Shared-Use Path & Landscaping



- Shared-Use Path Facilities
  - An 8' wide path, similar to a sidewalk, intended for use by pedestrians and cyclists
  - Provided on both sides of corridor with marked road crossings connects Fairfax Blvd to Eaton Pl.
  - Connects to and continues Fairfax Blvd Sidewalks
- Landscaping
  - A combination of street trees, grasses, and low-growth shrubs coordinated with surrounding City streetscapes
    - Grasses, Perennials, Ornamental Shrubs, Flowering & Shade Trees typical of Fairfax corridors
  - No trees or vegetation located on site today
  - Potential for additional landscaping outside of proposed right of way with future private development

Intersection Configurations

Intersection Turning Movements – Northfax East Roadway at Eaton Place

Right of Way Acquisition

- Five Impacted Properties
- Right of Way and Easements Required
  - Project designed to minimize impacts to properties and maximize potential development opportunities

Acquisition Process

- Incorporate Public Hearing and property owner feedback into design
- Develop Right of Way Plans for VDOT review & authorization
- Title research, appraisals, and property valuation
- Offer letters presented to affected property owners
- Property owner meetings to negotiate final terms for acquisition
- Execute acquisition documents, close on the property, distribute compensation

Project Schedule

- Public Hearing: September 25, 2018
- Right of Way Acquisition & Utility Relocation: Summer 2019
- Advertise for Construction: Spring 2021
- Construction: Fall 2021

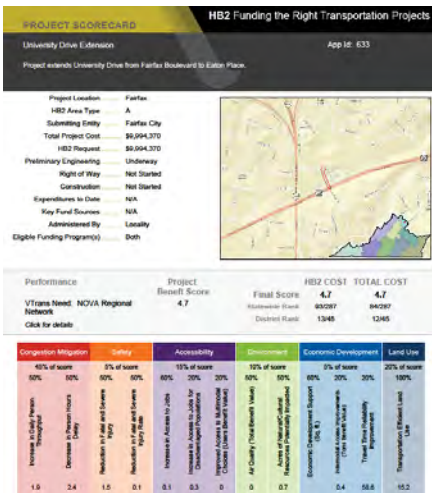
Project Budget

Project Estimates

Engineering (PE)	$ 259,000
Right of Way & Utilities (RW)	$ 7,343,000
Construction (CN)	$ 2,392,000
Total	**$ 9,994,000**

Project Funding

- 100% Federally Funded (HB2 – SmartScale)
  - Successful 2016 VDOT SmartScale Application by City to Secure Funding



Questions / Comments?

Contact information provided in project handout.
Comments must be received by October 10, 2018 to be included in Public Hearing Record.

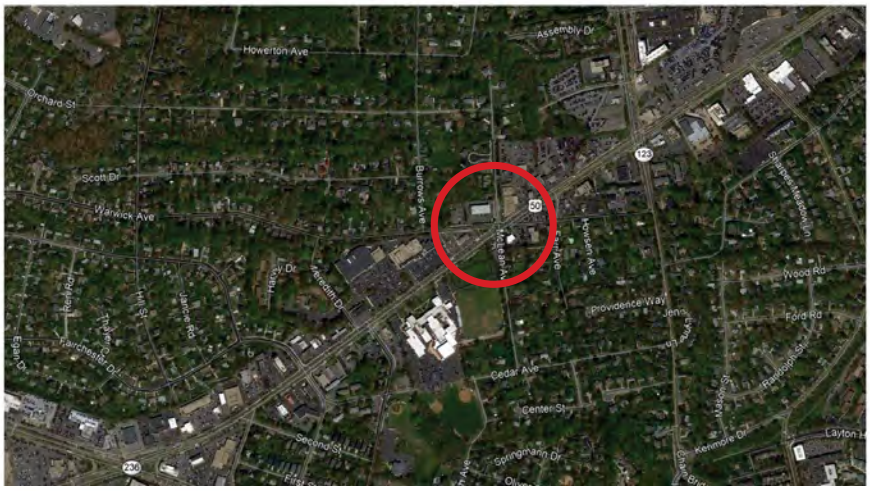
Fairfax Blvd. and Warwick Ave./McLean Ave. Intersection Improvements

City Council Work Session
May 8, 2018

Tonight's Agenda

- Project Overview by Staff
- Presentation of Improvement Alternatives
- City Council Discussion
- Discussion of Next Steps
- Public Outreach Overview

Site Location Map



Existing Intersection

- Six-legged intersection with five distinct signal phases
  - VDOT/MUTCD Compliance
  - Approx. 20 seconds of lost time per signal cycle
- Large imbalance in volumes
  - Fairfax Blvd. 36,000 ADT and 2,200 peak hour trips
  - McLean Ave. 115 peak hour trips/Warwick Ave. 175 peak hour trips.
  - Low mainline lefts (20 in any peak hour)
- Long delays/queuing in peak hours
  - Eastbound traffic blocks Warwick Avenue

Existing Intersection

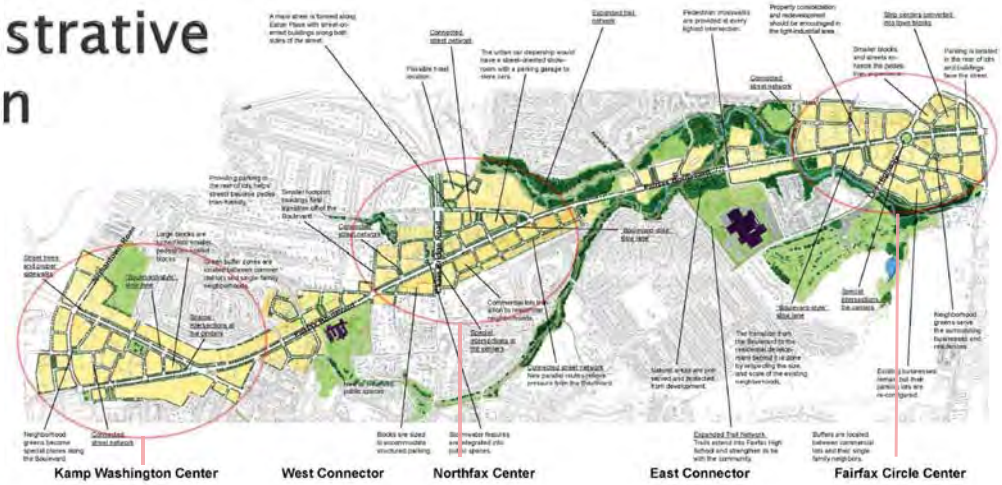
- Few pedestrian accommodations
- Significant crash history
  - 34 crashes at the intersection from 2011-2017
- Unconstrained commercial access points
  - More than 10 access points within 300' of intersection

Existing Intersection

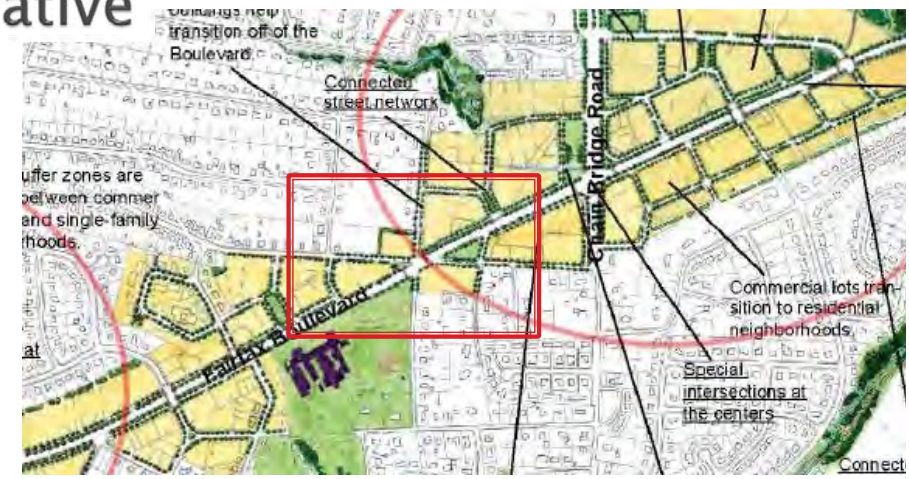
Project Timeline

- February 13, 2108 (CC work session): Discuss Smart Scale process and potential projects. Fairfax Blvd. and Warwick Ave./McLean Ave. included on list
- **May 8, 2018 (CC work session): Review/recommendation of improvement alternatives**
- May 24, 2018: Public Outreach Meeting to present the project/proposed improvements
- June 1, 2018: Smart Scale Pre-Application Due

Fairfax Boulevard Vision and Summary Illustrative Plan



Fairfax Boulevard Vision and Summary Illustrative Plan



Surrounding Area/Development

- CUE Bus Route along Warwick Ave.
  - CUE Transit Development Plan (TDP) recommended re-routing CUE to Fairfax Boulevard.
- Northfax
- I-66 Construction
- Future Development
  - Paul VI potential re-development
  - Brown's Mazda potential redevelopment
  - American Legion potential redevelopment

Project Goals

- Improve Traffic Flow and Safety
  - Reduce delay/queuing
  - Reduce intersection legs/traffic signal phases
  - Reduce conflict points
- Improve multi-modal mobility
- Protect adjacent neighborhoods
- Preserve redevelopment potential

Options Considered

- Started with 11 Options
  - Eliminate intersection legs
  - Change two way flow at certain intersection legs
  - Eliminate traffic signal
  - Convert intersection to roundabout
- Many Options Eliminated
  - Lack of operational benefits
  - Loss of access to roads/businesses
  - Perceived or actual negative impact to neighborhoods
  - Right-of-way impacts

Preferred Alternative: Option 1

Preferred Alternative: Option 1

- Realigns the intersection (squares it up)
  - Reduces pedestrian crossing distance
  - Reduces lost time (and therefore delay/queue)
  - Reduces conflict points/confusion
- Maintains majority of access
  - SB McLean Avenue could use Burrows (22 AM/19 PM)
  - WB Warwick could use Farr or Chain Bridge Road to Fairfax (26 AM/34 PM)

Alternative Option 2

Improvement Option #2

- Provides slip right turn for southbound McLean Ave.
- This movement would be stopped at Warwick Ave. and then be able to access the signal

Improvement Option #3

Improvement Option #3

- Provides un-signalized right-in/right-out access to McLean

Improvement Option #4

FAIRFAX BLVD / WARWICK AVE / MCLEAN AVE - OPTION 4

INTERSECTION IMPROVEMENTS - CITY OF FAIRFAX, VIRGINIA - May 1, 2018

LEGEND

TIMMONS GROUP

Improvement Option #4

- Provides on-street parking on McLean, improving safety/operations within functional area of intersection

Next Steps

- May 24, 2018: Public Outreach Meeting
- June 1, 2018: Smart Scale Pre-Application Due to VDOT
- Mid-June, 2018: Council and community re-engagement
- July, 2018: City Council Resolution of Support for Application
- August 1, 2018: Smart Scale Final Application Due to VDOT

Public Input Meeting

Warwick Ave./Fairfax Blvd./McLean Ave. Intersection Improvement

WHEN: Thursday, May 24, 7 p.m.

WHERE: Fairfax City Hall

WHY: Offer Input on Future Intersection Improvement!

FAIRFAX CITY

More info: FairfaxVA.Gov/Transportation

FAIRFAX BOULEVARD AND FARR AVENUE

CITY OF FAIRFAX, VIRGINIA

Signal Justification Report (SJR)
IIM-TE-387.0

July 22, 2018

COMMONWEALTH OF VIRGINIA
7/22/18
STEPHEN O. SCHMIDT
Lic. No. 049985
PROFESSIONAL ENGINEER

Prepared for:

The City of Fairfax

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Contact: Steve Schmidt, PE, PTOE

1001 Boulders Parkway, Suite 300 • Richmond, VA 23225
(804) 200-6500 phone • (804) 560-1436 fax
www.timmons.com

1 INTRODUCTION

In order to comprehensively address the introduction of new traffic signals on facilities included in the Arterial Preservation Network, VDOT initiated the Signal Justification Report (SJR) policies and procedures. The goal of the SJR process is to investigate intersection alternatives for the study location and determine the most appropriate solution.

This report presents the findings of the signal justification and intersection alternatives analysis for the intersection of US Route 50/29 (Fairfax Boulevard)/Farr Avenue in the City of Fairfax, Virginia.

This report was prepared in support of the City of Fairfax's (City) Smart Scale application for the Fairfax Boulevard/Warwick Avenue/McLean Avenue intersection.

1.1 BACKGROUND

The City of Fairfax is submitting a Smart Scale application for improvement to the Fairfax Boulevard/Warwick Avenue/McLean Avenue intersection. The intersection is a signalized, six-legged, skewed intersection with a history of crashes and capacity issues. The proposed improvements include reducing the number of intersection legs from six to four and realigning several of the approaches to a more standard intersection angle. With the improvements, Warwick Avenue to the east of the intersection will be removed from the signal and access will be restricted to right-in/right-out only. A schematic of the proposed plans is included in Appendix A.

As a result, all existing left turns in/out of Warwick will be rerouted to the Fairfax Boulevard/Farr Avenue intersection. Under existing conditions, this intersection is an unsignalized, full access intersection with Farr Avenue on the southern side and a commercial entrance (Brown's Auto) forming the fourth (northern) leg of the intersection.

Further, the City is planning to extend Farr Avenue (FY 2019 funding) to the north through the Brown's Auto site and connect with Orchard Street to the north. This extension will be in place prior to the improvements associated with the Smart Scale application. With the re-routing of the existing traffic and the future extension, the unsignalized intersection will not have adequate capacity for the side street traffic to enter/exit off Fairfax Boulevard.

It is important to note that the City maintains the roadways and traffic signals within the City limits and therefore this intersection would not typically be subjected to VDOT review for traffic signalization. However, since the traffic signal is proposed in conjunction with a Smart Scale application, a SJR is required.

This analysis looks at existing conditions and future conditions with the Smart Scale improvements. Based on the Smart Scale funding timeline and the project schedule included with the Smart Scale application, it is anticipated the improvements would be complete by 2027. Therefore, this analysis looks at future conditions in 2027.

1.2 SITE LOCATION AND STUDY AREA

The US Route 50/29 (Fairfax Boulevard)/Farr Avenue intersection is located in the City of Fairfax, approximately 550' east of the signalized Fairfax Boulevard/Warwick Avenue/McLean Avenue intersection.

At this location, Fairfax Boulevard is a 4-lane undivided roadway with a posted speed limit of 35 mph. Fairfax Boulevard is functionally classified as a principal arterial roadway in this area and carries approximately 36,000 vehicles per day through the study intersection.

South of Fairfax Boulevard, Farr Avenue is a two-lane undivided local street with no posted speed limit and provides access to residential and commercial properties. As noted above, with the intersection improvements to the Fairfax Boulevard/Warwick Avenue/McLean Avenue intersection, access to Warwick Avenue to the east will be restricted to right-in/right-out only. It is anticipated that existing left-in/left-out traffic will be redistributed to the Fairfax Boulevard/Farr Avenue intersection.

Further, the City is planning to extend Farr Avenue (FY 2019 funding) to the north through the Brown's Auto site and connect with Orchard Street to the north. This extension will be in place prior to the improvements associated with the Smart Scale application. With the re-routing of the existing traffic and the future extension, the unsignalized intersection will not have adequate capacity for the side street traffic to enter/exit off Fairfax Boulevard.

1.3 Study Parameters

In order to satisfy the requirements of VDOT IIM-TE-387.0, the following steps were taken to complete the signal justification and intersection alternatives analysis:

1. Data Collection – AM (6:00-9:00 AM) and PM (4:00-7:00 PM) peak hour directional turning movement (DTM) counts were collected at the US Route 50/29 (Fairfax Boulevard)/Farr Avenue intersection (and other adjacent intersections) on Thursday, April 5, 2018.

2. Existing Conditions Analysis – Using the existing volumes and intersection geometry, Timmons Group completed an existing conditions analysis of the study intersection to serve as the baseline for comparison of the alternative intersection geometries.

3. Future Traffic Projections – Timmons Group utilized a background traffic growth rate, redistributed traffic from the extension of Farr Avenue, and redistributed traffic from the Fairfax Boulevard/Warwick Avenue/McLean Avenue intersection to develop opening year (2027) traffic projections.

4. Intersection Alternatives Screening – Timmons Group utilized the VDOT Junction Screening Tool (VJuST) spreadsheet to identify potential/appropriate intersection alternatives for the study intersection.

5. Intersection Alternatives Analysis – Based on the results of the VJuST screening process, four (4) alternatives were selected and subsequently considered/analyzed.

2 ANALYSIS OF EXISTING CONDITIONS

Level of service calculations for the Fairfax Boulevard/Farr Avenue intersection were performed using SYNCHRO Version 9.2 to calculate delay based on techniques outlined in the 2000 Highway Capacity Manual. The study intersection was analyzed using the existing AM (8:00 – 9:00) and PM (5:00 – 6:00 PM) peak hour volumes and the existing geometry.

2.1 EXISTING TRAFFIC VOLUMES

Existing count data was obtained from the directional turning movement (DTM) count at the intersection which was collected on Thursday April 5, 2018. The DTM counts included heavy vehicles by movement and pedestrian counts.

The 2018 existing peak hour volumes are summarized in Table 2-1. The complete count data is provided in Appendix .

Table 2-1: 2018 Existing Volumes
Fairfax Boulevard/Farr Avenue

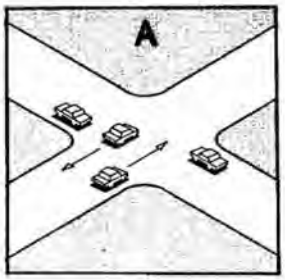
Time	MINOR SREET						MAJOR SREET					
	Farr Avenue - NB			Commercial Entrance			Fairfax Boulevard - EB			Fairfax Boulevard - WB		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
06:00-07:00	1	0	3	0	0	1	0	1324	1	3	274	1
07:00-08:00	0	2	5	2	0	1	0	1539	0	11	522	3
08:00-09:00	1	0	4	1	0	3	2	1601	1	65	713	3
16:00 - 17:00	0	0	10	4	0	4	0	914	1	43	1531	0
17:00 - 18:00	1	0	9	6	0	8	0	935	2	32	1523	3
18:00 - 19:00	1	0	10	5	0	4	0	782	1	51	1549	3

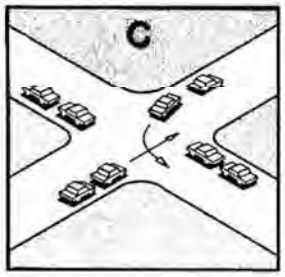
2.2 CAPACITY ANALYSES

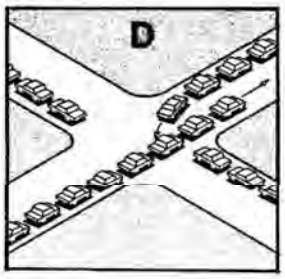
Capacity analysis allows traffic engineers to determine the impacts of traffic on the surrounding roadway network. The Highway Capacity Manual methodologies govern how the capacity analyses are conducted and how the results are interpreted. Levels of service (LOS) are determined for each part of the roadway network, with LOS A through D representing acceptable results and LOS E and F representing unacceptable results. Table 2-2 shows in detail how each of these levels of service are interpreted.

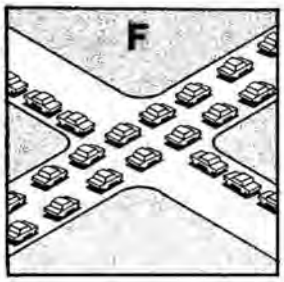
Table 2-2: Level of Service Definitions

Level of Service	Roadway Segments or Controlled Access Highways	Intersections
A	Free flow, low traffic density.	No vehicle waits longer than one signal indication.
B	Delay is not unreasonable, stable traffic flow.	On a rare occasion motorists wait through more than one signal indication.
C	Stable condition, movements somewhat restricted due to higher volumes, but not objectionable for motorists.	Intermittently drivers wait through more than one signal indication, and occasionally backups may develop behind left turning vehicles, traffic flow still stable and acceptable.
D	Movements more restricted, queues and delays may occur during short peaks, but lower demands occur often enough to permit clearing, thus preventing excessive backups.	Delays at intersections may become extensive with some, especially left-turning vehicles waiting two or more signal indications, but enough cycles with lower demand occur to permit periodic clearance, thus preventing excessive backups.
E	Actual capacity of the roadway invloves delay to all motorists due to congestion.	Very long queues may create lengthly delays, especially for left-turning vehicles.
F	Forced flow with demand volumes greater than capacity resulting in complete congestion. Volumes drop to zero in extreme cases.	Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a storage ares during part or all of an hour.









SOURCE: *"A Policy on Design of Design of Urban Highways and Arterial Streets"* - AASHTO, 1973 based upon material published in *"Highway Capacity Manual"*, National Academy of Sciences, 1965.

For both unsignalized and signalized intersections, level of service is defined in terms of delay, a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Table 2-3 summarizes the delay associated with each LOS category:

Table 2-3: Unsignalized and Signalized Intersection Level of Service Criteria

Signalized Intersections		Unsignalized Intersections	
Level of Service	Control Delay per Vehicle (sec/veh)	Level of Service	Average Control Delay (sec/veh)
A	≤ 10	A	0 to 10
B	> 10 to ≤ 20	B	> 10 to ≤ 15
C	> 20 to ≤ 35	C	> 15 to ≤ 25
D	> 35 to ≤ 55	D	> 25 to ≤ 35
E	> 55 to ≤ 80	E	> 35 to ≤ 50
F	> 80	F	> 50

Source: Exhibit 16-2 and Exhibit 17-2 from TRB's "Highway Capacity Manual 2000"

In addition to level of service and control delay, the volume to capacity (v/c) ratio was also utilized in this report. The v/c ratio is a measure that reflects mobility and quality of travel along a roadway or at an intersection; it compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). Table 2-4 summarizes the v/c ratio threshold descriptions:

Table 2-4: V/C Ratio Descriptions

Volume to Capacity (V/C) Ratio	Assessment
< 0.85	Intersection is operating under capacity. Excessive delays are not experienced.
0.85 – 0.95	Intersection is operating near its capacity. Higher delays may be expected, but continuously increasing queues should not occur.
0.95 – 1.00	Unstable flow results in a wide range of delay. Intersection improvements will be required soon to avoid excessive delays.
> 1.00	The demand exceeds the available capacity of the intersection. Excessive delays and queuing are anticipated.

Source: "Signalized Intersections: Informational Guide" – FHWA-HRT-04-091, 2004

The study intersection of Fairfax Boulevard/Farr Avenue was analyzed using the 2018 existing volumes shown in Table 2-1. The unsignalized intersection was analyzed using SYNCHRO Version 9.2 based on 2000 HCM methodologies with the following assumptions:

- 12-foot lane widths;
- No parking activity or bus stops;
- Peak hour factor (PHF) by total intersection as determined from the DTM counts, with a minimum PHF of 0.92; and
- Heavy vehicle (HV) percentages as determined from the DTM counts and available data.

2.3 2018 EXISTING VOLUMES (SYNCHRO)

Table 2-5 summarizes the 2018 existing intersection LOS, delay, v/c ratio, and queues based on the 2018 existing traffic volumes shown on Table 2-1 and the existing intersection geometry and traffic controls. The corresponding SYNCHRO worksheets are included in Appendix C.

At the unsignalized intersection of Fairfax Boulevard and Farr Avenue, the mainline left turn movements on Fairfax Boulevard operate at LOS C and B during the AM and PM peak hours, respectively. The northbound approach of Farr Avenue operates at LOS E during the AM peak hour and at LOS C during the PM peak hour. The southbound commercial entrance approach operates at LOS D and F during the AM and PM peak hours, respectively. There are no movements or approaches that operate with a v/c ratio above 0.48 during the AM peak or above 0.62 during the PM peak.

As indicated in Table 2-5, for the westbound left movement, the available turn lane storage (75') is not sufficient to accommodate the maximum queue length (83') during the PM peak hour.

Table 2-5: Intersection Level of Service, Delay, Queue, and V/C Ratio Summary
2018 Existing Traffic and Existing Geometry

Intersection and Type of Control	Movement and Approach	Number of Lanes	Turn Lane Storage (ft)	AM PEAK HOUR					PM PEAK HOUR				
				Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)	V/C Ratio	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)	V/C Ratio
1. Fairfax Boulevard (EB-WB) at	EB Thru-Left	1		0.1	A	0	25	0.00	0.0	A	0	1	0.00
Farr Avenue (NB)/	EB Thru-Right	1		†	†	†	†	0.48	†	†	†	4	0.29
Commercial Entrance (SB)	*EB Approach*			*†*	*†*	--	--	--	*†*	*†*	--	--	--
Unsignalized	WB Left	1	75	16.2	C	15	83	0.17	10.6	B	4	41	0.05
	WB Thru	1		†	†	†	111	0.29	†	†	†	†	0.62
	WB Thru-Right	1		†	†	†	68	0.14	†	†	†	†	0.31
	WB Approach			*1.3*	*A*	--	--	--	*†*	*†*	--	--	--
	NB L-T-R	1		46.3	E	4	20	0.05	20.0	C	3	20	0.04
	NB Approach			*46.3*	*E*	--	--	--	*20.0*	*C*	--	--	--
	SB L-T-R	1		27.0	D	2	20	0.02	92.9	F	22	49	0.26
	SB Approach			*27.0*	*D*	--	--	--	*92.9*	*F*	--	--	--

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

† SYNCHRO does not provide level of service or delay for unsignalized movements with no conflicting volumes.

3 2027 TRAFFIC PROJECTIONS

Opening year (2027) traffic projections were based on the existing traffic counts, a background traffic growth rate, traffic from the extension of Farr Avenue, and redistributed traffic from the Fairfax Boulevard/Warwick Avenue/McLean Avenue intersection.

3.1 BACKGROUND GROWTH RATE

According to the historic VDOT traffic counts, traffic along this section of Fairfax Boulevard has increased over the last three years from 35,000 vehicles per day (2015) to 36,000 vehicles per day (2017). This growth equates to an annual growth rate of 1.42%.

To be conservative, a 1.5% annual growth rate (compounded annually) was applied to all movements at the study intersection.

3.2 FARR AVENUE EXTENSION TRAFFIC

The extension of Farr Avenue will connect Fairfax Boulevard to the south with Orchard Street and Chain Bridge Route (Route 123) to the north. The extension will also provide access to commercial properties along its alignment and is anticipated to result in the redevelopment of those parcels. It is anticipated that up to 25% of traffic that currently makes an eastbound left or southbound right at the Fairfax Boulevard/Chain Bridge Road intersection will be redistributed to use the Orchard Street/Farr Avenue connection.

3.3 REDISTRIBUTED TRAFFIC FROM WARWICK AVENUE

With the improvements at the Fairfax Boulevard/Warwick Avenue/McLean Avenue intersection, Warwick Avenue to the east of the intersection will be removed from the signal and access will be restricted to right-in/right-out only. As a result, all existing left turns in/out of Warwick will be rerouted to the Fairfax Boulevard/Farr Avenue intersection.

3.4 2027 Total TRAFFIC FORECASTS

The growth rate detailed above was applied to the existing traffic shown on Table 2-1 and was the summed with the Farr Avenue Extension traffic and the redistributed traffic from Warwick Avenue to yield the 2027 Total Traffic Forecasts. These forecasts are show on Table 3-1.

Table 3-1: 2027 Total Traffic Forecasts

Time	MINOR SREET						MAJOR SREET					
	Farr Avenue - NB			Farr Avenue - SB			Fairfax Boulevard - EB			Fairfax Boulevard - WB		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
06:00-07:00	15	0	3	0	0	24	26	1513	1	11	314	1
07:00-08:00	31	2	5	2	0	39	51	1759	0	22	598	3
08:00-09:00	30	0	4	1	0	75	76	1831	1	98	815	3
16:00 - 17:00	14	0	10	4	0	79	53	1045	1	54	1750	0
17:00 - 18:00	55	0	9	7	0	84	55	1069	2	43	1741	3
18:00 - 19:00	25	0	11	5	0	74	34	894	1	77	1772	3

3.5 2027 CAPACITY ANALYSIS

Table 3-2 summarizes the 2027 existing intersection LOS, delay, v/c ratio, and queues based on the 2027 existing traffic volumes shown on Table 3-1 and the existing intersection geometry and traffic controls with the addition of an eastbound left turn lane. The corresponding SYNCHRO worksheets are included in Appendix D.

At shown in Table 3-2, with the background growth and redistributed traffic, the mainline left turn movements on Fairfax Boulevard operate at LOS C and B during the AM and PM peak hours, respectively. The northbound approach of Farr Avenue operates at LOS F during both peak hours with a calculated delay that exceeds the limitations of the software. The southbound Farr Avenue approach operates at LOS C and F during the AM and PM peak hours, respectively. The northbound approach has a v/c ratio above 5.0 in both peak hours which indicates the movement is well beyond capacity. The southbound approach has a v/c ratio of 1.01 in the PM peak hour; all other v/c ratios are less than 1.0.

As indicated in Table 2-5, for the eastbound and westbound left movement, the available turn lane storage (75') is not sufficient to accommodate the maximum queue length during one of the peak hours. Further the maximum queue on the northbound approach is 322' which would spill back into Warwick Avenue.

The analysis indicates that intersection of Fairfax Boulevard/Farr Avenue does not have adequate capacity as an unsignalized intersection.

Table 3-2: Intersection Level of Service, Delay, Queue, and V/C Ratio Summary
2027 Total Traffic and Existing Geometry

Intersection and Type of Control	Movement and Approach	Number of Lanes	Turn Lane Storage (ft)	AM PEAK HOUR					PM PEAK HOUR				
				Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)	V/C Ratio	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)	V/C Ratio
1. Fairfax Boulevard (EB-WB) at	EB Left	1	75	10.0	A	8	63	0.10	18.0	C	15	97	0.17
Farr Avenue (NB)/	EB Thru	1		†	†	†	49	0.73	†	†	†	2	0.44
Commercial Entrance (SB)	EB Thru-Right	1		†	†	†	49	0.37	†	†	†	2	0.22
Unsignalized	*EB Approach*			*0.4*	*A*	--	--	--	*0.9*	*A*	--	--	--
	WB Left	1	75	21.7	C	33	100	0.32	11.5	B	6	50	0.08
	WB Thru	1		†	†	†	486	0.33	†	†	†	4	0.71
	WB Thru-Right	1		†	†	†	456	0.16	†	†	†	4	0.36
	WB Approach			*2.3*	*A*	--	--	--	*0.3*	*A*	--	--	--
	NB L-T-R	1		Err	F	Err	318	5.19	Err	F	Err	322	5.03
	NB Approach			*Err*	*F*	--	--	--	*Err*	*F*	--	--	--
	SB L-T-R	1		15.3	C	17	133	0.18	178.5	F	151	295	1.01
	SB Approach			*15.3*	*C*	--	--	--	*178.5*	*F*	--	--	--

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

† SYNCHRO does not provide level of service or delay for unsignalized movements with no conflicting volumes.

Err indicates calculated delay exceeds the limitations of the software.

4 ALTERNATIVE INTERSECTION OPTIONS

Consistent with the requirements of VDOT IIM-TE-387.0, a review of potential alternative intersection options for the Fairfax Boulevard/Farr Avenue intersection was completed. The VDOT Junction Screening Tool (VJuST) was utilized to provide a high-level screening of possible options and remove any alternatives that are not compatible with the study intersection conditions. Four (4) intersection types were recommended for further analysis:

1. Conventional Signalized Intersection
2. Center Turn Overpass Intersection
3. Quadrant Roadway Intersection
4. Roundabout

The following sections discuss the four (4) recommended intersection types from the VJuST tool. A copy of the completed VJuST spreadsheet can be found in Appendix E.

4.1 CONVENTIONAL SIGNALIZED INTERSECTION

According to the VJuST tool, a conventional signalized intersection scores well in v/c ratio (0.68) but has a higher weighted conflict point result than the other options. In addition to the increased capacity, the primary benefit to a conventional signalized intersection at this location is the limited right-of-way impacts up and downstream of the intersection.

This section of Fairfax Boulevard has commercial properties lining both sides of the street with parking immediately adjacent to the back of curb/sidewalk.

A SYNCHRO analysis was completed to determine the capacity of a conventional signalized intersection. The analysis worksheets are included in Appendix F and the results are summarized in Table 4-1. The analysis utilized the existing cycle lengths in the corridor (190 seconds in the AM peak hour and 220 seconds in the PM peak hour.)

As shown in Table 4-1, the overall intersection would operate at LOC C and LOS B in the AM and PM peak hours, respectively. The mainline through movements would operate at LOS A or B in both peak hours.

The mainline lefts and side street approaches would operate at LOS F in both peak hours, but it is important to note that the delay is less than one cycle length. For example, the westbound left in the AM peak hour has an average delay of 97.1 seconds per vehicle. However, the overall cycle length is 190 seconds. On average, all westbound left traffic would clear the intersection within one cycle. The same is true for the eastbound lefts and side street approaches. The high delay is due to the high cycle length and is not indicative of the capacity of the signal.

Further, the v/c ratios for all approaches are 0.76 or lower which indicates the signal has adequate capacity for the projected traffic.

The eastbound and westbound left queues do spill back out of the available storage and may block through traffic on occasion. Again, this is due primarily to the high cycle length. It is recommended that the corridor be re-timed in 2027 to determine if a lower cycle length can be utilized.

Table 4-1: Total Traffic 2027 – Conventional Signalized Intersection

Intersection and Type of Control	Movement and Approach	Number of Lanes	Turn Lane Storage (ft)	AM PEAK HOUR					PM PEAK HOUR				
				Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)	V/C Ratio	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	SimTraffic Maximum Queue Length (ft)	V/C Ratio
1. Fairfax Boulevard (EB-WB) at	EB Left	1	75	96.7	F	160	373	0.64	108.4	F	139	148	0.57
Farr Avenue (NB)/	EB Thru	1		19.4	B	890	502	0.76	8.1	A	300	278	0.40
Commercial Entrance (SB)	EB Thru-Right	1		19.4	B	890	490	0.76	8.1	A	300	246	0.40
Signalized	*EB Approach*			*22.5*	*C*	--	--	--	*12.9*	*B*	--	--	--
	WB Left	1	75	97.1	F	193	99	0.68	125.7	F	119	99	0.66
	WB Thru	1		9.8	A	232	354	0.34	13.7	B	747	557	0.67
	WB Thru-Right	1		9.8	A	232	336	0.34	13.7	B	747	503	0.67
	WB Approach			*19.2*	*B*	--	--	--	*16.4*	*B*	--	--	--
	NB L-T-R	1		78.7	E	7	92	0.03	95.8	F	27	156	0.08
	NB Approach			*78.7*	*E*	--	--	--	*95.8*	*F*	--	--	--
	SB L-T-R	1		78.9	E	59	65	0.05	95.1	F	78	117	0.10
	SB Approach			*78.9*	*E*	--	--	--	*95.1*	*F*	--	--	--
	Overall			23.6	C	--	--	--	19.1	B	--	--	--

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

4.2 Center Turn Overpass Intersection

The second option returned by the VJuST tool was a center turn overpass intersection. This intersection is characterized by all four left-turn movements are relocated to a grade-separated intersection using narrow ramps within the median. The left-turn traffic would then descend back to ground level and merge with through traffic. The removal of the left turns allows both signals to operate under two-phase operations.

Fairfax Boulevard has a narrow median that cannot accommodate the ramps and there is insufficient right-of-way to allow for widening (see description of the corridor above). Further the cost of this option would greatly exceed the cost of a conventional signalized intersection.

A center turn overpass intersection configuration is unsuitable for this intersection.

4.3 Quadrant Roadway Intersection

The third option returned by the VJuST tool was a quadrant roadway intersection. This intersection reroutes all four left turns onto a connector roadway in one quadrant which allows the main intersection to operate under two-phase operations.

This option requires a significant amount of right-of-way for the connector road. Given the commercial development in the corridor, the cost of obtaining the necessary right-of-way would be exceedingly high. Further, this intersection would be detrimental to the character of the corridor and Fairfax City.

A quadrant roadway intersection configuration is unsuitable for this intersection.

4.4 ROUNDABOUT

VDOT policy, per the *Road Design Manual, Appendix F*, recognizes that roundabouts are capable of handling traffic volumes/flows better than other intersections types in both urban, suburban, and rural environments, and on high- and low-speed facilities. This being noted, a roundabout is to be considered when a project includes improving or constructing new intersections.

Given the character of Fairfax Boulevard and the 36,000 average daily traffic volume, a roundabout at this intersection would need to be two-lanes. As indicated above, there is limited right-of-way and the construction of a two-lane roundabout would be detrimental to the neighboring businesses and the character of the corridor.

Further, roundabouts operate best when there is a more balanced flow between the mainline and side streets. In this case, Fairfax Boulevard carries more than 18 times the traffic of Farr Avenue in the PM peak hour. The mainline movements are so heavy that there would not be any gaps for the Farr Avenue traffic to enter the intersection.

Further the cost of the right-of-way and construction of a roundabout would far exceed the cost of a conventional signalized intersection.

A roundabout configuration is unsuitable for this intersection.

5 CONCLUSIONS

In order to comprehensively address the introduction of new traffic signals on facilities included in the Arterial Preservation Network, VDOT initiated the Signal Justification Report (SJR) policies and procedures. The goal of the SJR process is to investigate intersection alternatives for the study location and determine the most appropriate solution.

This report presents the findings of the signal justification and intersection alternatives analysis for the intersection of Fairfax Boulevard and Farr Avenue in the City of Fairfax, VA.

The City of Fairfax is submitting a Smart Scale application for improvement to the Fairfax Boulevard/Warwick Avenue/McLean Avenue intersection. With the improvements, Warwick Avenue to the east of the intersection will be removed from the signal and access will be restricted to right-in/right-out only.

As a result, all existing left turns in/out of Warwick will be rerouted to the Fairfax Boulevard/Farr Avenue intersection. Under existing conditions, this intersection is an unsignalized, full access intersection with Farr Avenue on the southern side and a commercial entrance (Brown's Auto) forming the fourth (northern) leg of the intersection.

Further, the City is planning to extend Farr Avenue (FY 2019 funding) to the north through the Brown's Auto site and connect with Orchard Street to the north. This extension will be in place prior to the improvements associated with the Smart Scale application. With the re-routing of the existing traffic and the future extension, the unsignalized intersection will not have adequate capacity for the side street traffic to enter/exit off Fairfax Boulevard.

It is important to note that the City maintains the roadways and traffic signals within the City limits and therefore this intersection would not typically be subjected to VDOT review for traffic signalization. However, since the traffic signal is proposed in conjunction with a Smart Scale application, a SJR is required.

5.1 KEY FINDINGS

Under existing conditions, the side street approaches to the Fairfax Boulevard/Farr Avenue intersection operate at LOS E or F in at least one of the peak hours.

With the background growth and redistributed traffic from Warwick Avenue and Farr Avenue extension, the side street approaches would operate at LOS F in both peak hours with a calculated delay that exceeds the limitations of the software, v/c ratios over 5.0, and queues that extend through the available storage and/or block adjacent intersections.

Under future conditions. the analysis indicates that intersection of Fairfax Boulevard/Farr Avenue does not have adequate capacity as an unsignalized intersection.

Consistent with the requirements of VDOT IIM-TE-387.0, a review of potential alternative intersection options for the Fairfax Boulevard/Farr Avenue intersection was completed using the VJuST tool. This review culminated in the selection of the following four (4) potential intersection alternatives:

1. Conventional Signalized Intersection
2. Center Turn Overpass Intersection
3. Quadrant Roadway Intersection
4. Roundabout

As detailed above, the Center Turn Overpass Intersection and Quadrant Roadway Intersection are not suitable alternatives for this intersection due to a lack of right-of-way and/or median width.

A roundabout is also not suitable given the disparity in traffic flows and the right-of-way impacts to neighboring commercial uses.

A conventional signalized intersection would have limited right-of-way impacts up and adequate capacity to accommodate the future traffic volumes. As discussed above, the conventional signalized intersection would operate at an overall LOS C and B in the AM and PM peak hours, respectively. The mainline through movements would operate at LOS A or B in both peak hours. Further, the v/c ratios for all approaches are 0.76 or lower which indicates the signal has adequate capacity for the projected traffic.

5.2 RECOMMENDATIONS

In order to accommodate the projected increased traffic volumes associated with the improvements at the Fairfax Boulevard/Warwick Avenue/McLean Avenue intersection and the extension of Farr Avenue, the installation of a conventional signalized intersection is recommended at the Fairfax Boulevard/Farr Avenue intersection. As shown in the analysis, a conventional traffic signal would provide adequate operational benefits to the proposed development without harming the arterial through movement on Fairfax Boulevard.

ADJACENT STREET TRAFFIC DATA
CURRENT WITH 9th Ed.

Land Use	ITE Code	Amt	Units	------ Weekday ------							------ Weekend ------			
				AM Peak Hour			PM Peak Hour			Daily	Saturday Peak Hour			Daily
				In	Out	**Total**	In	Out	**Total**	**Total**	In	Out	**Total**	**Total**
Retail														
Shopping Center	820	48 kSF		62	38	**100**	177	191	**368**	**4,226**	284	261	**545**	**5,835**
Retail Total				**62**	**38**	**100**	**177**	**191**	**368**	**4,226**	**284**	**261**	**545**	**5,835**
TOTAL PROPOSED TRIPS				**62**	**38**	**100**	**177**	**191**	**368**	**4,226**	**284**	**261**	**545**	**5,835**

ATTACHMENT 6

WELLS + ASSOCIATES

MEMORANDUM

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To: Nathan Bath
Regency Centers

From: William F. Johnson, P.E.
August W. Steinhilber

Re: Fairfax Shopping Center Special Exceptions
City of Fairfax, Virginia

Subject: Trip Generation

Date: December 21, 2016

This memorandum provides the results of a trip generation analysis performed for the Fairfax Shopping Center site located in the City of Fairfax, Virginia. The site is specifically located north of Fairfax Boulevard (Route 29/50), south of Eaton Place, and east of Chain Bridge Road (Route 123). The site is currently developed by-right with a strip retail shopping center along with a restaurant pad use. The total approved by-right gross floor area (GFA) for the center is approximately 82,268 square feet (SF). Access to the site is currently provided via four curb cuts along Fairfax Boulevard: one full movement signalized intersection opposite University Drive, one full movement unsignalized median break, and two right-in/right-out entrances.

Regency Centers plans to raze and redevelop the site as a retail center consisting of up to approximately 48,200 gross SF. This proposed redevelopment represents a substantial decrease of the currently approved by-right GFA. To that end, special exceptions have been filed to address certain requirements in the Zoning Ordinance pertaining to the Statement of Justification dated December 21, 2016 attached hereto. However, the special exceptions do not pertain to any specific land use currently proposed. The retail uses proposed are permitted by-right and the applicant intends to submit a site plan in the near future to proceed with the proposed redevelopment.

Wells + Associates completed a trip generation analysis comparing the by-right potential of the property to the redevelopment proposed by the Applicant. The analysis was performed using standard Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition rates/equations. The results of the analysis are summarized in Table 1. As shown, the proposed redevelopment would *reduce* the trip generation potential of the site by 38 weekday AM peak hour, 159 weekday PM

peak hour, and 1,756 weekday daily trips.

Based on the results summarized herein, it can be concluded that the proposed redevelopment of the Fairfax Shopping Center would not result in any traffic impacts on the surrounding roadway network above and beyond the currently approved retail uses on the property.

If you have any questions on this analysis or require additional information, please contact Will Johnson at 703.365.9262 or wfjohnson@wellsandassociates.com.

Attachments: a/s

Table 1
Fairfax Shopping Center
Trip Generation Analysis [1]

Scenario	Land Use Code	Amount	Units	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Weekday Average Daily Trips
Existing Approved (By-Right)										
Shopping Center	820	82,268	GSF	86	52	138	252	274	526	5,982
Proposed Program										
Shopping Center	820	48,200	GSF	62	38	100	176	191	367	4,226
			Net New Trips	**-24**	**-14**	**-38**	**-76**	**-83**	**-159**	**-1,756**

Note(s):
(1) Trip generation based on the Institute of Transportation Engineers' Trip Generation, 9th Edition equations and/or rates.

ADJACENT STREET TRAFFIC DATA
CURRENT WITH 9th Ed.

Land Use	ITE Code	Amt	Units	------ Weekday ------							------ Weekend ------			
				AM Peak Hour			PM Peak Hour			Daily	Saturday Peak Hour			Daily
				In	Out	Total	In	Out	Total	Total	In	Out	Total	Total
Residential														
Residential Condominium/Townhouse	230	137	DU	12	55	**67**	53	25	**78**	**846**	45	38	**83**	**924**
High-Rise Residential Condominium/Townhouse	232	184	DU	16	67	**83**	49	30	**79**	**918**	37	48	**85**	**923**
Residential Total				**28**	**122**	**150**	**102**	**55**	**157**	**1,764**	**82**	**86**	**168**	**1,847**
Recreational														
Recreational Community Center	495	24	kSF	33	17	**50**	33	33	**66**	**812**	15	11	**26**	**219**
Recreational Total				**33**	**17**	**50**	**33**	**33**	**66**	**812**	**15**	**11**	**26**	**219**
Retail														
Shopping Center	820	20	kSF	37	22	**59**	98	106	**204**	**2,386**	161	147	**308**	**3,352**
Retail Total				**37**	**22**	**59**	**98**	**106**	**204**	**2,386**	**161**	**147**	**308**	**3,352**
TOTAL PROPOSED TRIPS				**98**	**161**	**259**	**233**	**194**	**427**	**4,962**	**258**	**244**	**502**	**5,418**
Existing To Be Removed														
Private High School			Actual Trips	671	334	**1005**	46	86	**132**		N/A	N/A	**N/A**	**N/A**
TOTAL NET NEW TRIPS				**-573**	**-173**	**0** **-746**	**187**	**108**	**295**	**4,962**	**258**	**244**	**502**	**5,418**

Transportation Consultants
INNOVATION + SOLUTIONS

WELLS + ASSOCIATES

Paul VI Redevelopment

Traffic Impact Study

April 18, 2017
Revised: November 15, 2017

SECTION 1
INTRODUCTION

This report presents the results of a traffic impact study conducted in support of the proposed redevelopment of the Paul VI Catholic High School (Paul VI) in the City of Fairfax, Virginia, and presents an evaluation of the existing and future transportation network.

This study was conducted in accordance with a scoping agreement developed with City of Fairfax staff. The study scope was determined with City staff based on a review of key study intersections and roadways that would potentially be affected by the implementation of the proposed redevelopment and the number of new trips expected to be generated.

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

The subject property is comprised of three parcels located at 10675 Fairfax Boulevard, 10600 Cedar Avenue, and 10606 Cedar Avenue, totaling 18.5 acres. The parcel located at 10675 Fairfax Boulevard is zoned CR (Commercial Retail) and the two Cedar Avenue parcels are zoned RM (Residential Medium Density).

The applicant, IDI Group Companies, proposes to develop the site with 184 residential condominium units, 137 town homes, 20,000 square feet (SF) of local serving retail and 24,000 SF of community center space. The site plan is shown on Figure 1-2.

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

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

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

1. Estimation of the net new vehicle trip ends generated by the planned land uses during the AM and PM commuter peak hours and during the PM school peak hour.

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

3. Identification of potential road and/or operational improvements necessary to accommodate the project.

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

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

2. A field review 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 counts obtained at the following study intersections:

   - Lee Highway/Fairfax Boulevard/Main Street
   - Fairfax Boulevard/Fairchester Drive, Walnut Street
   - Fairfax Boulevard/Meredith Drive/Oak Street
   - Fairfax Boulevard/The Shops at Fairfax Entrance-Future Site Entrance.
   - Fairfax Boulevard/Paul VI Entrance (Future Site Entrance)
   - Fairfax Boulevard/McLean Avenue/Warwick Avenue
   - Walnut Street/Cedar Avenue
   - Oak Street/Cedar Avenue
   - McLean Avenue/Cedar Avenue

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

5. Identification of the number of net new peak hour trips that would be generated by the proposed mixed-use development based on standard Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition equations less trips currently generated by the existing Paul VI Catholic High School determined from traffic counts.

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

7. Calculation of future levels of service with and without the proposed development at the key study intersections for a proposed build-out year of 2027.

Sources of data for this analysis include traffic counts conducted by Wells + Associates Inc., information obtained from the City of Fairfax, the Institute of Transportation Engineers (ITE), VDOT, the Highway Capacity Manual 2000 (Synchro software, version 9.1), IDI Companies Group, 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 Lee Highway/Fairfax Boulevard/Main Street intersection currently operates at or near capacity at level of service (LOS) "E" during each of the three (3) studied peak periods.

2. All other signalized intersections currently operate at an overall LOS D or better during each of the three (3) studied peak periods based on Highway Capacity Manual calculations, however, substantial queues were observed along Fairfax Boulevard during the peak periods. Specifically, substantial queues along eastbound Fairfax Boulevard were observed during the AM peak period and substantial westbound queues were observed during the PM peak period.

3. Historic VDOT traffic data indicates that average daily traffic counts along Fairfax Boulevard and Main Street have decreased by 0.7% to 1.7% per year between 2008 and 2016.

4. The Novus Fairfax Gateway and Mount Vineyard pipeline developments are anticipated to generate 395 AM commuter peak hour trips, 418 PM school peak hour trips, and 576 PM commuter peak hour trips at full buildout.

5. Under future 2027 traffic conditions, without redevelopment of the Paul VI site, minimal increases in delay at the study intersections are expected due to the trips generated by pipeline development in the vicinity of the site and overall levels of service would remain generally consistent with existing conditions.

6. The existing Paul VI Catholic High School currently generates 1,005 trips during the AM commuter peak hour, 563 trips during the PM school peak hour, and 132 trips during the PM commuter peak hour.

7. The Applicant proposes to redevelop the site with 184 residential condominium units, 137 town homes, 20,000 SF of local serving retail, and 24,000 SF of community center space.

8. The project is estimated to generate 789 ***fewer*** AM peak commuter hour trips, 148 ***fewer*** PM school peak hour trips, and 294 ***more*** PM peak commuter hour trips than are currently generated by the high school.

9. Under future 2027 traffic conditions, with the development of the subject site, intersection levels of service would remain generally consistent with existing and background conditions. The analyses show that the Lee Highway/Fairfax Boulevard/Main Street will continue to operate at LOS E during all three peak periods studied. All other intersections will operate at LOS D or better during each of the studied peak periods.

10. A full turning movement site driveway is proposed along Fairfax Boulevard to align with the existing Shops at Fairfax entrance. The full access signalized intersection would operate at an overall LOS "D" or better during each of the studied peak periods.

11. A full turning movement, side-street stop-controlled entrance is proposed along Fairfax Boulevard between the Shops at Fairfax intersection and McLean Avenue. This unsignalized intersection will operate at LOS "C" or better during each of the studied time periods.

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Figure 1-1
Site Location
Paul VI Redevelopment
City of Fairfax, Virginia

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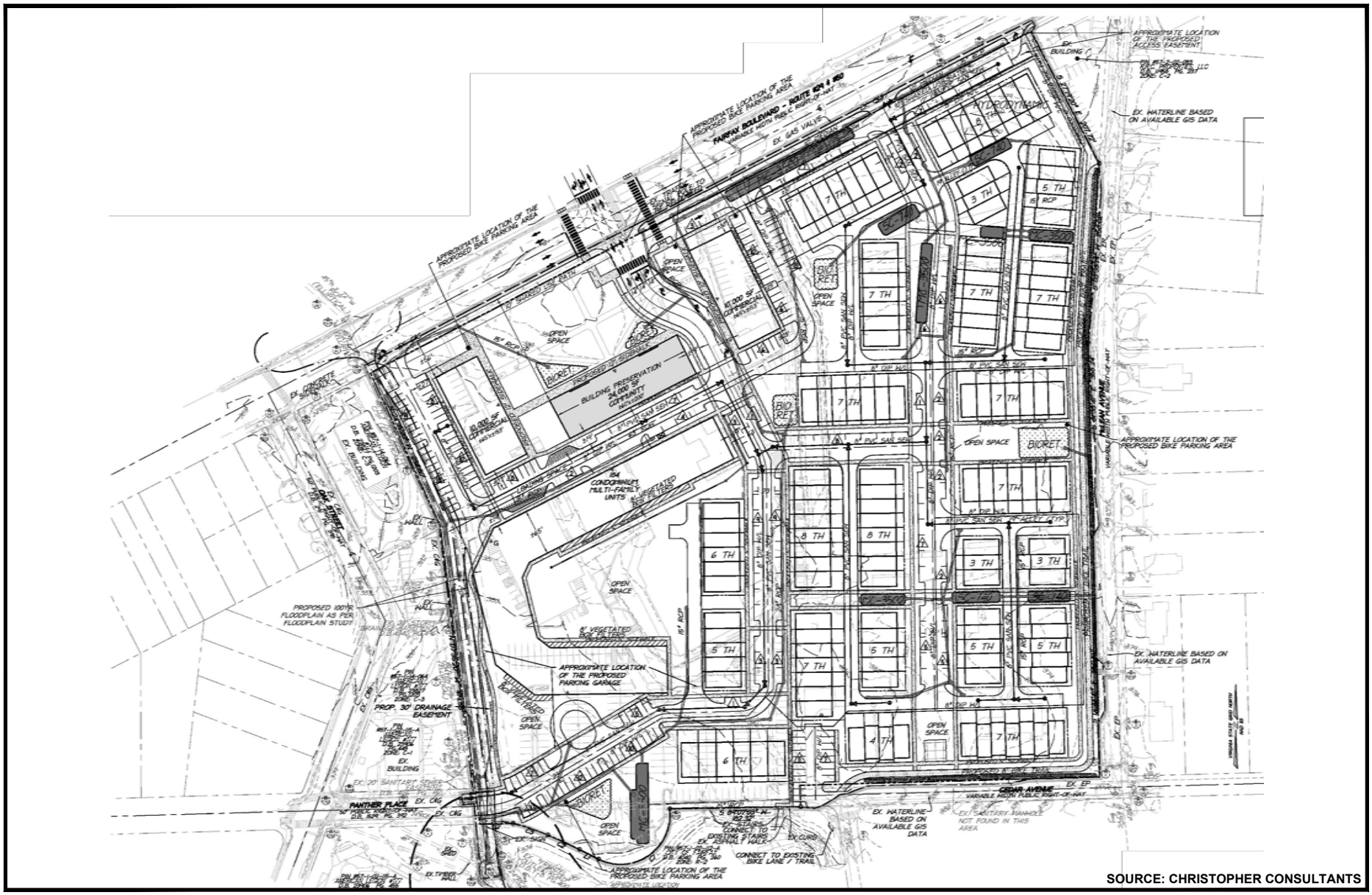

SOURCE: CHRISTOPHER CONSULTANTS

Figure 1-2
Site Plan
Paul VI Redevelopment
City of Fairfax, Virginia

NORTH

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SECTION 2
BACKGROUND INFORMATION

Location and Surrounding Uses

As shown in Figure 1-1, Paul VI is regionally located approximately ½ mile east of Main Street on Fairfax Boulevard in the City of Fairfax. Regional Access is provided by I-66 via Lee Jackson Memorial Highway/Main Street and Chain Bridge Road. Fairfax Boulevard/Arlington Boulevard provides access to/from I-495 (the Capital Beltway).

Properties immediately west and south of the site are generally residential in nature while commercial uses are predominant along Fairfax Boulevard. An existing McDonald's restaurant and a daycare facility are located immediately west of the site and south of Fairfax Boulevard.

Comprehensive Plan Land Use Recommendations

The City's Comprehensive Plan shows the subject parcels as institutional and residential on the Future Land Use Map.

Existing Transportation Network

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

Route 29/50 (Fairfax Boulevard). Fairfax Boulevard is classified as an arterial roadway according to the City of Fairfax Comprehensive Plan. Within the vicinity of the subject site, Fairfax Boulevard is constructed as a five-lane, undivided roadway with a center two-way left turn lane and a posted speed limit of 35 miles per hour. Traffic signals are provided at major cross-streets including Main Street, Fairchester Drive/Walnut Street, Meredith Drive/Oak Street, and McLean Avenue/Warwick Avenue. The intersection of Fairfax Boulevard and the driveway to The Shops at Fairfax is also signalized. The Lee Highway/Fairfax Boulevard/Main Street intersection (referred to as Kamp Washington) is a critical signalized intersection within the City of Fairfax. Based on 2016 VDOT average annual daily traffic (AADT) data, Fairfax Boulevard east of Main Street carries approximately 36,000 vehicles per day (vpd).

Route 236 (Main Street). Main Street is also classified by the Comprehensive Plan as an arterial roadway and is constructed as a four-lane, median-divided roadway with a posted speed limit of 35 miles per hour. Based on 2016 VDOT AADT data, Main Street east of the Kamp Washington intersection carries approximately 35,000 vpd.

Cedar Avenue. Cedar Avenue is a two-lane east-west discontinuous roadway. The section of Cedar Avenue west of Paul VI is approximately 30 feet in width, operates as a collector roadway, and provides access to the parking lot in the rear of Paul VI. The section of Cedar Avenue east of Paul VI operates as a residential street and does not provide access to or from the school.

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

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

McLean Avenue. McLean Avenue is a two-lane undivided north-south residential street that provides access between Fairfax Boulevard and Cedar Avenue, east of Paul VI Catholic High School.

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

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

Pedestrian Facilities. Concrete sidewalks are provided along both sides of Fairfax Boulevard and Oak Street, and along the north side of Cedar Avenue east of Oak Street. Marked crosswalks are provided across the north, south, and east legs of the Fairfax Boulevard/ Meredith Drive/Oak Street intersection; across the west leg of the Fairfax Boulevard/McLean Avenue/Warwick Avenue intersection; and across the east leg of the intersection of Fairfax Boulevard and The Shops at Fairfax driveway.

Future Transportation Network

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

The Comprehensive Plan recommends that Fairfax Boulevard be configured with landscaped medians, where possible, and enhanced streetscape features to encourage pedestrian activity. Slow lanes (with on-street parking), separated from the main travel lanes by landscaped medians should be considered within or adjacent to portions of the Kamp Washington and Northfax Centers if the nature of adjacent redevelopment activity is such that those features would be appropriate.

Based on the location of the site, adjacent to the Kamp Washington and Northfax Centers, and the Comprehensive Plan recommendations, a slow lane with on-street parking is proposed along a portion of the site frontage of Fairfax Boulevard.

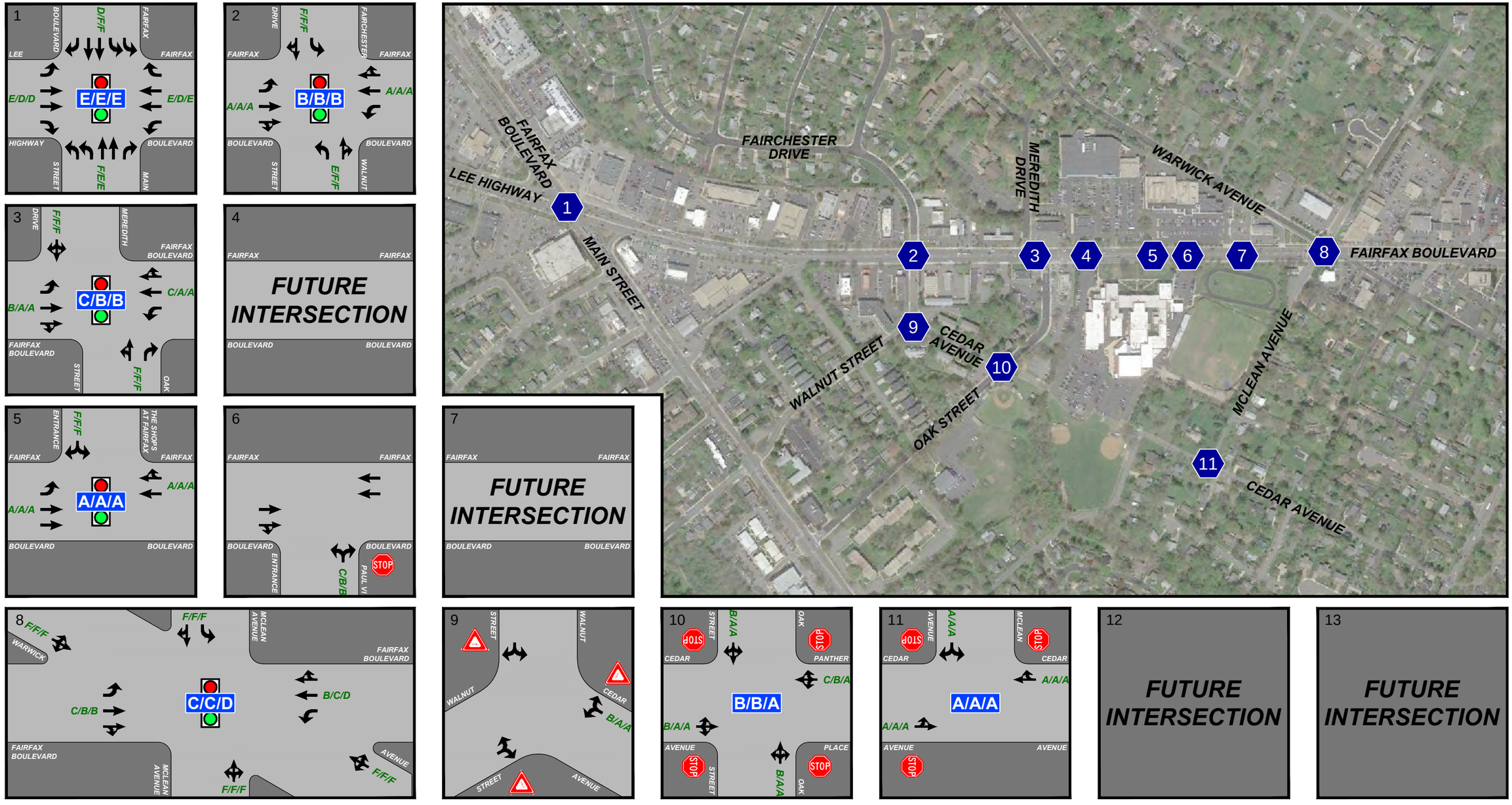

Figure 2-1
Existing Lane Use, Traffic Controls, and Levels of Service

Paul VI Redevelopment
Fairfax County, Virginia

X/X/X Approach Levels of Service

X/X/X Overall Intersection Levels of Service

Represents One Travel Lane
Signalized Intersection
Stop Sign
Yield Sign

NORTH

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SECTION 3
STUDY SCOPE AND ANALYSIS PARAMETERS

Overview

The subject site is located south of Fairfax Boulevard, east of Oak Street, and west of McLean Avenue in the City of Fairfax, Virginia. The subject property is comprised of three parcels located at 10675 Fairfax Boulevard, 10600 Cedar Avenue, and 10606 Cedar Avenue totaling 18.5 acres. The parcel located at 10675 Fairfax Boulevard is zoned CR and the two Cedar Avenue parcels are zoned RM.

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

This traffic study was conducted in accordance with the scoping document and discussions with Wells + Associates, City staff, and the Applicant. The traffic study scope was approved by the Applicant and City staff on January 12, 2017 and is provided in Appendix A.

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:

- Lee Highway/Fairfax Boulevard/Main Street
- Fairfax Boulevard/Fairchester Drive, Walnut Street
- Fairfax Boulevard/Meredith Drive/Oak Street
- Fairfax Boulevard/The Shops at Fairfax Entrance-Future Site Entrance.
- Fairfax Boulevard/Paul VI Entrance (Future Site Entrance)
- Fairfax Boulevard/McLean Avenue/Warwick Avenue
- Walnut Street/Cedar Avenue
- Oak Street/Cedar Avenue
- McLean Avenue/Cedar Avenue

Site Development Program

The Applicant proposes to develop the site with 184 residential condominium units, 137 town homes, 20,000 SF of local serving retail and 24,000 SF of community center space.

Analysis Study Periods

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

Existing Traffic Volumes

Existing AM commuter, school PM, and PM commuter peak hour turning movements and pedestrian counts were conducted on Wednesday, February 3, 2016, and Thursday, January 5, 2017, at the study intersections from 6:00 AM to 9:00 AM and from 2:00 PM to 7:00 PM.

The existing vehicular traffic volumes used in the analyses are provided on Figure 3-1. All existing count data are included in Appendix B.

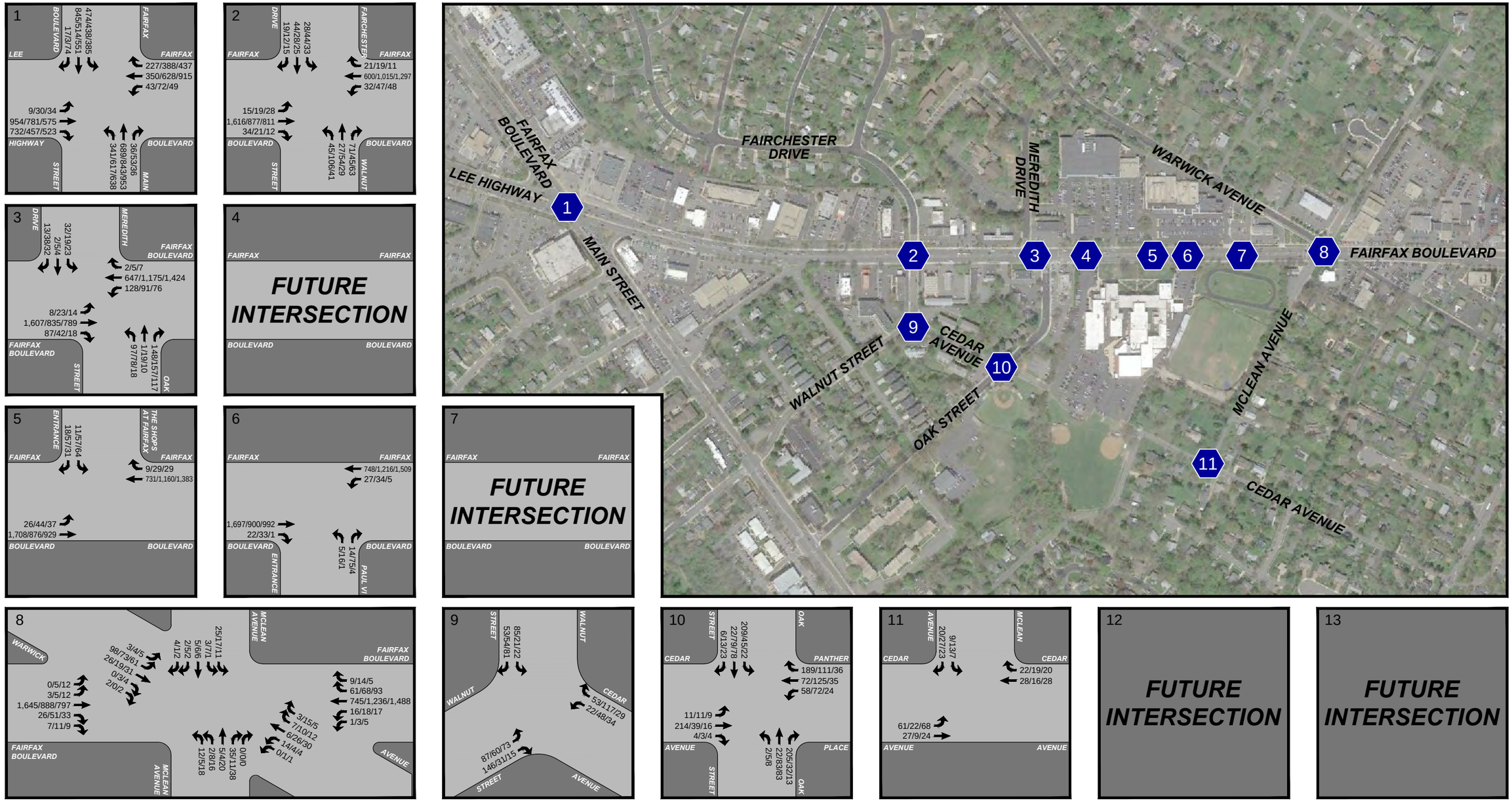

Figure 3-1
Existing Peak Hour Traffic Volumes

Paul VI Redevelopment

Fairfax County, Virginia

AM PEAK HOUR
SCHOOL PM PEAK HOUR
PM PEAK HOUR
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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 Figure 3-1, and the 2000 Highway Capacity Manual (HCM) analysis procedures for signalized and unsignalized intersections. The results are presented in Appendix C and summarized on Table 4-1.

The analyses show that the Lee Highway/Fairfax Boulevard/Main Street intersection currently operates at or near capacity at LOS "E" during each of the peak hours (AM commuter peak, School PM peak, and PM commuter peak) with an average delay per vehicle of between 62.3 and 71.5 seconds.

Other signalized intersections along Fairfax Boulevard in the vicinity of the site operate at adequate overall LOS "D" or better during each of the three peak periods studied. However, the side street approaches operate at LOS "E" and "F" with average delays between 76.1 seconds and 128.0 seconds. The volume-to-capacity (v/c) ratios for the side street approaches at intersections along Fairfax Boulevard east of Main Street are well below 1.0, indicating that the lengthy delays are the result of long cycle lengths (190 seconds during the AM commuter peak hour and 220 seconds during the PM school peak and PM commuter peak hours) and the assignment of the predominance of the green time to the Fairfax Boulevard approaches, rather than insufficient capacity.

All approaches at the unsignalized intersections of Walnut Street/Cedar Avenue, Oak Street/Cedar Avenue, and McLean Avenue/Cedar Avenue operate at LOS "C" or better during each of the peak periods.

Table 4-1

Paul VI Redevelopment

Existing Intersection Capacity Analysis Summary[1]

	Intersection	Intersection Control	Approach	Existing		
				AM Peak	PM School Peak	PM Peak
1.	Lee Highway & Fairfax Boulevard & Main Street[2]	Signal	EB Appr	D (54.0)	F (87.3)	F (91.3)
			WB Appr	F (96.0)	E (70.1)	E (76.3)
			NB Appr	E (74.9)	D (45.1)	D (39.1)
			SB Appr	E (57.4)	D (49.5)	E (71.5)
			Overall	**E (71.5)**	**E (62.3)**	**E (69.8)**
2.	Fairfax Boulevard & Fairchester Drive/Walnut Street	Signal	EB Appr	A (8.2)	A (1.4)	A (1.4)
			WB Appr	A (5.3)	A (2.6)	A (1.7)
			NB Appr	E (76.1)	F (87.5)	F (90.9)
			SB Appr	F (88.8)	F (93.7)	F (118.8)
			Overall	**B (14.1)**	**B (13.0)**	**B (10.1)**
3.	Fairfax Boulevard & Meredith Drive/Oak Street	Signal	EB Appr	B (15.7)	A (4.3)	A (3.3)
			WB Appr	C (23.3)	A (7.4)	A (8.3)
			NB Appr	F (83.8)	F (100.1)	F (100.0)
			SB Appr	F (89.5)	F (102.4)	F (102.5)
			Overall	**C (25.1)**	**B (18.1)**	**B (14.1)**
4.	Fairfax Boulevard & Site Entrance	Free	EB Appr	Future Intersection		
			NB Appr			
5.	Fairfax Boulevard & Shops at Fairfax Entrance/Site Entrance (Future)	Signal	EB Appr	A (2.0)	A (1.0)	A (1.4)
			WB Appr	A (0.6)	A (1.2)	A (0.5)
			NB Appr	Future Approach		
			SB Appr	F (84.1)	F (104.7)	F (103.9)
			Overall	**A (2.6)**	**A (6.4)**	**A (4.8)**
6.	Fairfax Boulevard & Paul VI Entrance	Stop	NB Appr	C (21.1)	B (13.6)	B (12.6)
7.	Fairfax Boulevard & Site Exit	Stop	NB Appr	Future Intersection		
8.	Fairfax Boulevard & McLean Avenue & Warwick Road[3]	Signal	EB Appr	F (115.4)	F (117.3)	F (128.0)
			WB Appr	F (90.4)	F (103.7)	F (103.2)
			NB Appr	F (88.2)	F (106.5)	F (115.4)
			SB Appr	F (85.3)	F (104.4)	F (93.1)
			NE Appr	C (21.9)	B (12.3)	B (11.5)
			SW Appr	B (19.7)	C (23.3)	D (39.1)
			Overall	**C (28.5)**	**C (26.6)**	**D (37.9)**
9.	Walnut Street & Cedar Avenue[4]	Stop	WB Appr	B (10.1)	A (9.4)	A (9.5)
10.	Oak Street & Cedar Avenue	Stop	EB Appr	B (13.9)	A (8.5)	A (7.8)
			WB Appr	C (15.6)	B (10.9)	A (8.0)
			NB Appr	B (12.6)	A (9.0)	A (8.0)
			SB Appr	B (14.8)	A (9.4)	A (8.1)
			Overall	**B (14.3)**	**B (10.0)**	**A (8.0)**
11.	Cedar Avenue & McLean Avenue	Stop	EB Appr	A (7.7)	A (7.4)	A (7.7)
			WB Appr	A (7.1)	A (6.9)	A (7.1)
			SB Appr	A (7.0)	A (6.9)	A (7.0)
			Overall	**A (7.4)**	**A (7.0)**	**A (7.4)**
12.	Internal Road & Frontage Road	Stop	NB Appr	Future Intersection		
13.	Internal Road & Frontage Road	Stop	NB Appr	Future Intersection		

Notes:
1. Capacity analysis based on Highway Capacity Manual methodology, using Synchro 9.1.
2. Fairfax Boulevard/Main Street analyzed as east-west road; Lee Highway/Fairfax Boulevard analyzed as north-south roadway.
3. Warwick Road analyzed as east-west road; McLean Avenue analyzed as north-south roadway; Fairfax Boulevard analyzed as northeast-southwest roadway.
4. Analyzed with northbound and southbound as free movements along Walnut Street, and westbound movements along Cedar Avenue as stop-controlled.

SECTION 5
ANALYSIS OF FUTURE CONDITIONS WITHOUT SITE DEVELOPMENT

Overview

Forecasts for traffic conditions without the redevelopment of Paul VI were estimated at the study intersections based on a composite of existing traffic and pipeline development trips as described in Section 3 of this report. Future levels of service under these forecasted conditions were evaluated at the study intersections.

Regional Traffic Growth

A review of VDOT AADT volumes along Fairfax Boulevard and Main Street in the vicinity of the site indicates a modest reduction in traffic volumes over the past eight (8) years. AADT volumes along Fairfax Boulevard east of Main Street fell from 38,000 vehicles in 2008 to 36,000 vehicles in 2016, an average annual decrease of approximately 0.7% per year. AADT volumes along Main Street south of Fairfax Boulevard fell from 40,000 vehicles in 2008 to 35,000 vehicles in 2016, an average annual decrease of approximately 1.7% per year.

In order to present a conservative (or worst case) analysis, no continuing decrease in regional traffic volumes was assumed in this analysis.

Traffic from Other Approved/Pending Developments

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

- Novus Fairfax Gateway
  - 4,000 SF Office
  - 5,000 SF Quality Restaurant
  - 7,400 SF High Turn-Over Sit-Down Restaurant
  - 12,600 SF Shopping Center
  - 395 Residential Apartments

- Mount Vineyard
  - 132 Residential Condominiums/Townhouses

As shown in Table 5-1, these pipeline developments are anticipated to generate 395 AM peak commuter hour trips, 418 PM school peak hour trips, and 576 PM commuter peak hour trips at full buildout.

Background Traffic Forecasts

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

Background Future Levels of Service

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

As shown on Table 5-2, the Lee Highway/Fairfax Boulevard/Main Street intersection will continue to operate at or near capacity at LOS "E" during each of the peak hours (AM commuter peak, School PM peak, and PM commuter peak). When compared to existing conditions, the average delay per vehicle at this intersection will increase to between 64.0 and 75.0 seconds during the peak hours, an increase of between 1.7 seconds per vehicle and 3.6 seconds per vehicle.

Other signalized intersections along Fairfax Boulevard in the vicinity of the site continue to operate at an adequate overall LOS "D" or better during each of the three peak periods studied. As with the existing conditions analysis, the side street approaches will continue to operate at LOS "E" and "F" due to the combination of long cycle lengths (190 seconds during the AM commuter peak hour and 220 seconds during the PM school peak and PM commuter peak hours) and the assignment of the predominance of the green time to the Fairfax Boulevard approaches. The side street approaches at signalized intersections east of Main Street will continue to operate with v/c ratios well below 1.0.

All approaches at the unsignalized intersections of Walnut Street/Cedar Avenue, Oak Street/ Cedar Avenue, and McLean Avenue/Cedar Avenue will continue to operate at LOS "C" or better during each of the peak hours.

Table 5-1

Paul VI Redevelopment

Pipeline Development Trip Generation

Development	ITE Land Use Code[1]	Amount	Units	AM Peak Hour			School PM Peak Hour			PM Peak Hour			Average Daily Trips
				In	Out	Total	In	Out	Total	In	Out	Total	
Novus Fairfax Gateway													
Office	710	4,000	SF	5	1	6	1	2	3	1	5	6	44
Quality Restaurant	931	5,000	SF	2	2	4	5	5	10	25	12	37	450
High Turnover Restaurant	932	7,400	SF	44	36	80	9	9	18	44	29	73	941
Shopping Center	820	12,600	SF	27	17	44	69	78	147	72	78	150	1,767
Apartments	220	395	DU	39	158	197	102	79	181	153	82	235	2,517
Total Novus Fairfax Gateway Trips				**117**	**214**	**331**	**186**	**173**	**359**	**295**	**206**	**501**	**5,719**
Mount Vineyard													
Condominiums/Townhomes	230	132	DU	**11**	**53**	**64**	**33**	**26**	**59**	**50**	**25**	**75**	**819**
Total Background Development Trips				**128**	**267**	**395**	**219**	**199**	**418**	**345**	**231**	**576**	**6,538**

Notes: 1. Institute of Transportation Engineer's (ITE), Trip Generation Manual, 9th Edition

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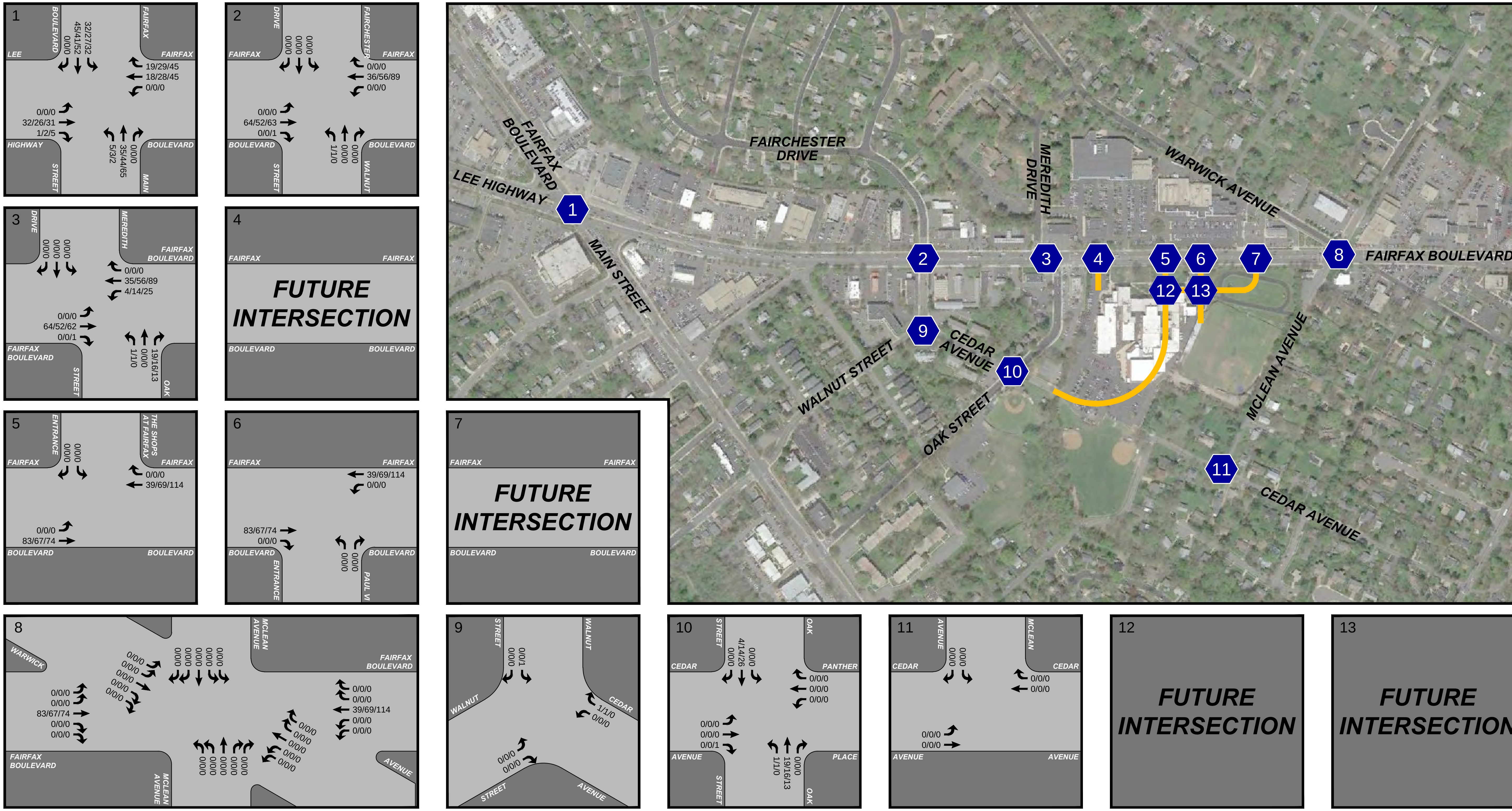

Figure 5-1
Pipeline Development Site Generated Traffic Assignments

Paul VI Redevelopment

Fairfax County, Virginia

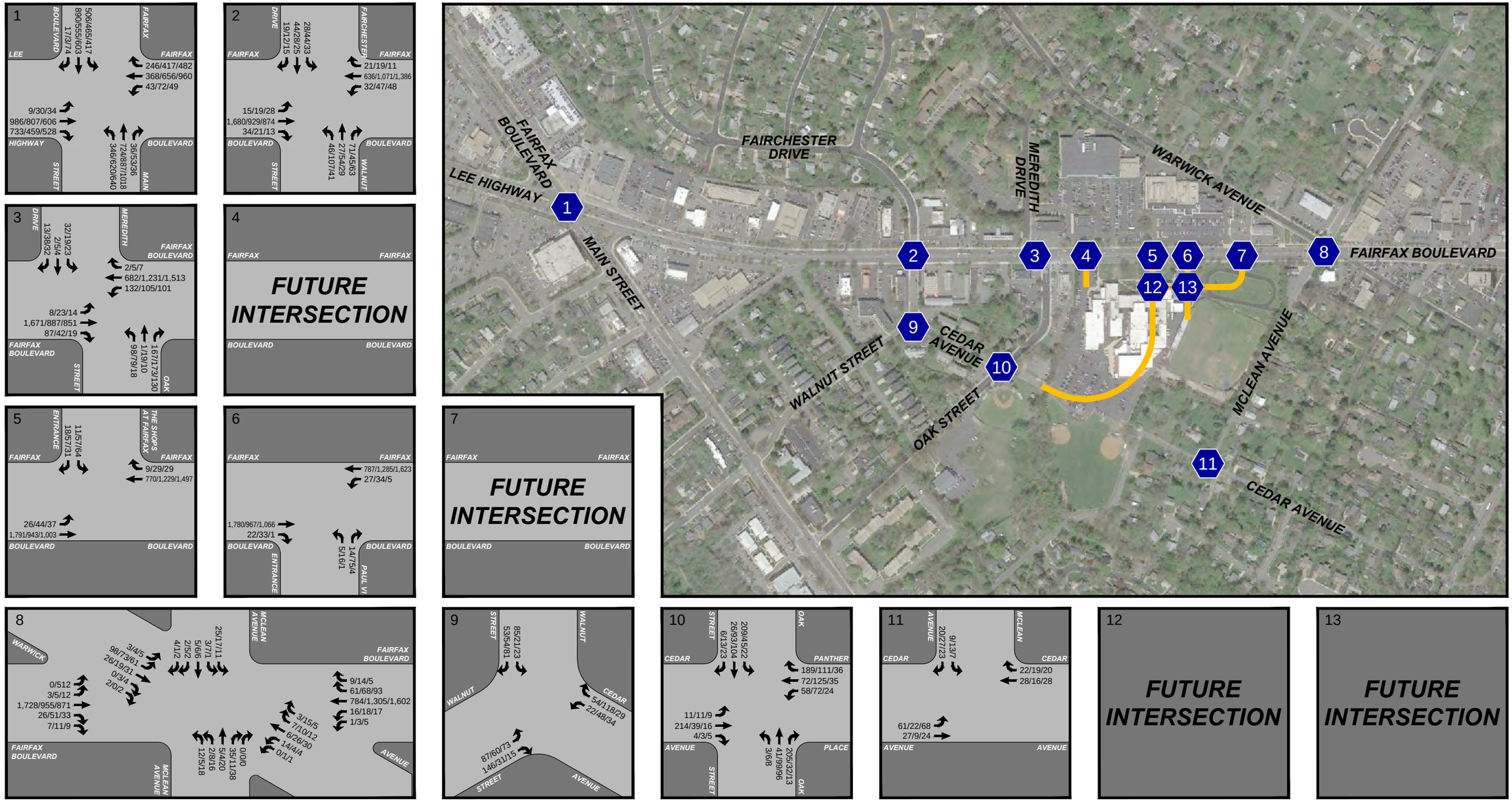

Figure 5-2
2027 Background Future Peak Hour Traffic Forecasts

Paul VI Redevelopment

Fairfax County, Virginia

AM PEAK HOUR
SCHOOL PM PEAK HOUR
PM PEAK HOUR
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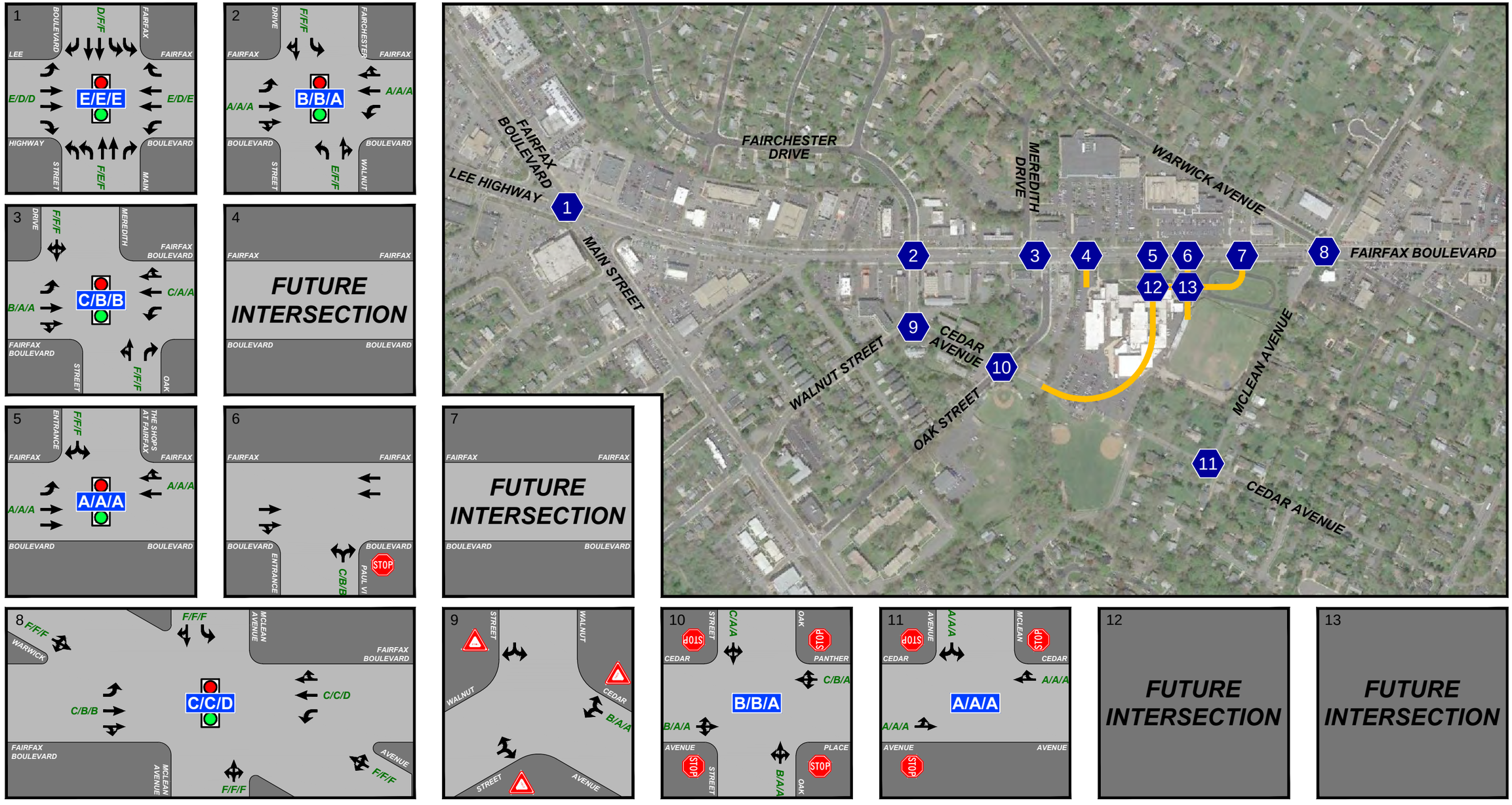

Figure 5-3
Existing Lane Use, Traffic Controls, and Background Future Levels of Service

Paul VI Redevelopment
Fairfax County, Virginia

X/X/X Approach Levels of Service

X/X/X Overall Intersection Levels of Service

Represents One Travel Lane
Signalized Intersection
Stop Sign
Yield Sign

NORTH

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Table 5-2

Paul VI Redevelopment

Background Future Intersection Capacity Analysis Summary[1]

	Intersection	Intersection Control	Approach	Existing			Background Future		
				AM Peak	PM School Peak	PM Peak	AM Peak	PM School Peak	PM Peak
1.	Lee Highway & Fairfax Boulevard & Main Street[2]	Signal	EB Appr	D (54.0)	F (87.3)	F (91.3)	D (54.8)	F (89.0)	F (95.6)
			WB Appr	F (96.0)	E (70.1)	E (76.3)	F (106.3)	E (72.0)	F (82.9)
			NB Appr	E (74.9)	D (45.1)	D (39.1)	E (78.4)	D (46.0)	D (40.0)
			SB Appr	E (57.4)	D (49.5)	E (71.5)	E (56.5)	D (51.1)	E (72.4)
			Overall	**E (71.5)**	**E (62.3)**	**E (69.8)**	**E (75.0)**	**E (64.0)**	**E (73.4)**
2.	Fairfax Boulevard & Fairchester Drive/Walnut Street	Signal	EB Appr	A (8.2)	A (1.4)	A (1.4)	A (9.0)	A (1.4)	A (1.5)
			WB Appr	A (5.3)	A (2.6)	A (1.7)	A (5.4)	A (2.6)	A (1.8)
			NB Appr	E (76.1)	F (87.5)	F (90.9)	E (76.0)	F (87.6)	F (90.9)
			SB Appr	F (88.8)	F (93.7)	F (118.8)	F (88.7)	F (93.6)	F (118.8)
			Overall	**B (14.1)**	**B (13.0)**	**B (10.1)**	**B (14.4)**	**B (12.6)**	**A (9.6)**
3.	Fairfax Boulevard & Meredith Drive/Oak Street	Signal	EB Appr	B (15.7)	A (4.3)	A (3.3)	B (19.2)	A (4.3)	A (3.4)
			WB Appr	C (23.3)	A (7.4)	A (8.3)	C (23.3)	A (7.5)	A (9.5)
			NB Appr	F (83.8)	F (100.1)	F (100.0)	F (83.7)	F (99.7)	F (99.8)
			SB Appr	F (89.5)	F (102.4)	F (102.5)	F (89.5)	F (102.4)	F (102.5)
			Overall	**C (25.1)**	**B (18.1)**	**B (14.1)**	**C (27.4)**	**B (18.1)**	**B (14.8)**
4.	Fairfax Boulevard & Site Entrance	Free	EB Appr	Future Intersection			Future Intersection		
			NB Appr						
5.	Fairfax Boulevard & Shops at Fairfax Entrance/Site Entrance (Future)	Signal	EB Appr	A (2.0)	A (1.0)	A (1.4)	A (2.4)	A (1.0)	A (1.4)
			WB Appr	A (0.6)	A (1.2)	A (0.5)	A (0.6)	A (1.3)	A (0.5)
			NB Appr	Future Approach			Future Approach		
			SB Appr	F (84.1)	F (104.7)	F (103.9)	F (84.1)	F (104.7)	F (103.9)
			Overall	**A (2.6)**	**A (6.4)**	**A (4.8)**	**A (2.8)**	**A (6.2)**	**A (4.5)**
6.	Fairfax Boulevard & Paul VI Entrance	Stop	NB Appr	C (21.1)	B (13.6)	B (12.6)	C (22.4)	B (14.2)	B (13.1)
7.	Fairfax Boulevard & Site Exit	Stop	NB Appr	Future Intersection			Future Intersection		
8.	Fairfax Boulevard & McLean Avenue & Warwick Road[3]	Signal	EB Appr	F (115.4)	F (117.3)	F (128.0)	F (115.4)	F (117.3)	F (128.0)
			WB Appr	F (90.4)	F (103.7)	F (103.2)	F (90.4)	F (103.7)	F (103.2)
			NB Appr	F (88.2)	F (106.5)	F (115.4)	F (88.2)	F (106.5)	F (115.4)
			SB Appr	F (85.3)	F (104.4)	F (93.1)	F (85.3)	F (104.4)	F (93.1)
			NE Appr	C (21.9)	B (12.3)	B (11.5)	C (24.2)	B (13.2)	B (12.6)
			SW Appr	B (19.7)	C (23.3)	D (39.1)	C (20.1)	C (24.3)	D (43.7)
			Overall	**C (28.5)**	**C (26.6)**	**D (37.9)**	**C (29.7)**	**C (27.1)**	**D (40.4)**
9.	Walnut Street & Cedar Avenue[4]	Stop	WB Appr	B (10.1)	A (9.4)	A (9.5)	B (10.1)	A (9.4)	A (9.5)
10.	Oak Street & Cedar Avenue	Stop	EB Appr	B (13.9)	A (8.5)	A (7.8)	B (14.3)	A (8.7)	A (7.9)
			WB Appr	C (15.6)	B (10.9)	A (8.0)	C (16.2)	B (11.2)	A (8.1)
			NB Appr	B (12.6)	A (9.0)	A (8.0)	B (13.6)	A (9.3)	A (8.2)
			SB Appr	B (14.8)	A (9.4)	A (8.1)	C (15.3)	A (9.7)	A (8.4)
			Overall	**B (14.3)**	**B (10.0)**	**A (8.0)**	**B (14.9)**	**B (10.2)**	**A (8.2)**
11.	Cedar Avenue & McLean Avenue	Stop	EB Appr	A (7.7)	A (7.4)	A (7.7)	A (7.7)	A (7.4)	A (7.7)
			WB Appr	A (7.1)	A (6.9)	A (7.1)	A (7.1)	A (6.9)	A (7.1)
			SB Appr	A (7.0)	A (6.9)	A (7.0)	A (7.0)	A (6.9)	A (7.0)
			Overall	**A (7.4)**	**A (7.0)**	**A (7.4)**	**A (7.4)**	**A (7.0)**	**A (7.4)**
12.	Internal Road & Frontage Road	Stop	NB Appr	Future Intersection			Future Intersection		
13.	Internal Road & Frontage Road	Stop	NB Appr	Future Intersection			Future Intersection		

Notes:
1. Capacity analysis based on Highway Capacity Manual methodology, using Synchro 9.1.
2. Fairfax Boulevard/Main Street analyzed as east-west road; Lee Highway/Fairfax Boulevard analyzed as north-south roadway.
3. Warwick Road analyzed as east-west road; McLean Avenue analyzed as north-south roadway; Fairfax Boulevard analyzed as northeast-southwest roadway.
4. Analyzed with northbound and southbound as free movements along Walnut Street, and westbound movements along Cedar Avenue as stop-controlled.

SECTION 6
SITE ANALYSIS

Overview

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

Existing Site Trips

As stated previously, the site is currently developed with the Paul VI Catholic High School. The redevelopment plan calls for the elimination of the school use and the construction of a mix of residential, retail, and community uses. Trips currently generated by the school were tabulated through existing traffic counts. As shown in Table 6-1, the Paul VI Catholic High School currently generates 1,005 trips during the AM commuter peak hour, 563 trips during the PM school peak hour, and 132 trips during the PM commuter peak hour.

A portion of the existing school will remain and will be repurposed as local serving retail and/or community use. Existing traffic volumes generated by the high school were eliminated from the existing traffic streams based on the existing driveway counts conducted at existing school access drives. The existing traffic volumes less the existing school trips removed at each of the study intersections are shown on Figure 6-1.

Proposed Site Access

The site plan provided on Figure 1-2 shows that a slow lane (with on-street parking), separated from the main travel lanes by a landscaped median is proposed along a portion of the Fairfax Boulevard site frontage. Access between the site and Fairfax Boulevard is proposed via two (2) full access driveways; one (1) will be located directly across Fairfax Boulevard from the existing signalized driveway to/from the Shops at Fairfax, and the other will be located approximately 570’ east of the existing signalized driveway to/from the Shops at Fairfax and approximately 260’ west of the Fairfax Boulevard/Mclean Avenue/Warwick Avenue intersection. A right-in/right-out driveway will be provided from Fairfax Boulevard west of the existing signalized driveway to/from the Shops at Fairfax. An additional right-in/right-out driveway will be provided from the proposed slow lane and access to/from the southern portion of the property will be provided via Cedar Avenue to/from the west. Access between the site and Cedar Avenue to/from the east is not proposed by the Applicant, however access to a new 22-space parking lot for the existing ball fields located south of the Paul VI property is proposed.

Trip Generation

Overview. Trip generation estimates for the AM and PM peak hours, as well as the average daily traffic, were derived from the standard Institute of Transportation Engineers (ITE) trip generation rates, as published in the Trip Generation Manual, 9th edition. The "Residential Condominium/ Townhouse" (230) land use code was used for the proposed townhomes units. The "High-Rise Residential Condominium/Townhouse" (232) land use code was used for the single family attached units as this building will be three (3) or more floors in height. The "Shopping Center" (820) land use code was used for the retail uses, and the "Recreational Community Center" (495) land use code was used for the community center use to be operated by the City of Fairfax.

Existing trips generated by Paul VI were determined through traffic counts at the existing site driveways. The trip generation analysis for the existing uses and the proposed uses is presented in Table 6-1.

Net Site Trips. The net vehicle trips that would be generated by the proposed development plan were determined by subtracting the current trip generation of Paul VI from the trips anticipated to be generated by the site after redevelopment. This comparison is shown in Table 6-1 and illustrates that the proposed site will generate 789 ***fewer*** AM peak commuter hour trips, 148 ***fewer*** PM school peak hour trips, and 294 ***more*** PM peak commuter hour trips than are currently generated by the high school.

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

Site Trip Distribution

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

- To/from the west on Lee Highway/Fairfax Boulevard: 35%
- To/from the northeast on Fairfax Boulevard: 50%
- To/from the southeast on Main Street: 15%

Site Trip Assignments

The assignments of the total vehicle trips generated upon the future build-out of the Paul VI redevelopment was based on the above distribution, and are depicted on Figure 6-2.

Table 6-1

Paul VI Redevelopment

Site Trip Generation Analysis

Development	ITE Land Use Code[1]	Amount	Units	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM School Peak (2:45-3:45) In	PM School Peak (2:45-3:45) Out	PM School Peak (2:45-3:45) Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Average Daily Trips
Existing													
Private High School[2,3]			Actual Trips	671	334	1,005	174	389	563	46	86	132	3,270
Proposed[4]													
Condominiums	232	184	DU	16	66	82	37	29	66	48	30	78	917
Townhomes	230	137	DU	11	55	66	44	38	82	52	26	78	846
Subtotal Residential		321	DU	27	121	148	81	67	148	100	56	156	1,763
Community Center	495	24,000	SF	32	17	49	28	41	69	32	34	66	812
Local Serving Retail	820	20,000	SF	12	7	19	93	105	198	98	106	204	2,386
Total Proposed Trips				**71**	**145**	**216**	**202**	**213**	**415**	**230**	**196**	**426**	**4,961**
Comparison													
Proposed vs. Existing				**-600**	**-189**	**-789**	**28**	**-176**	**-148**	**184**	**110**	**294**	**1,691**

Notes: 1. Institute of Transportation Engineer's (ITE), Trip Generation Manual, 9th Edition

2. Based on traffic counts completed on February 3, 2016.

3. Actual ADT estimated based on ITE ADT and PM school peak ratio.

4. PM School Peak trips based on residential and retail diurnal rates compiled from ITE and Wells + Associates files.

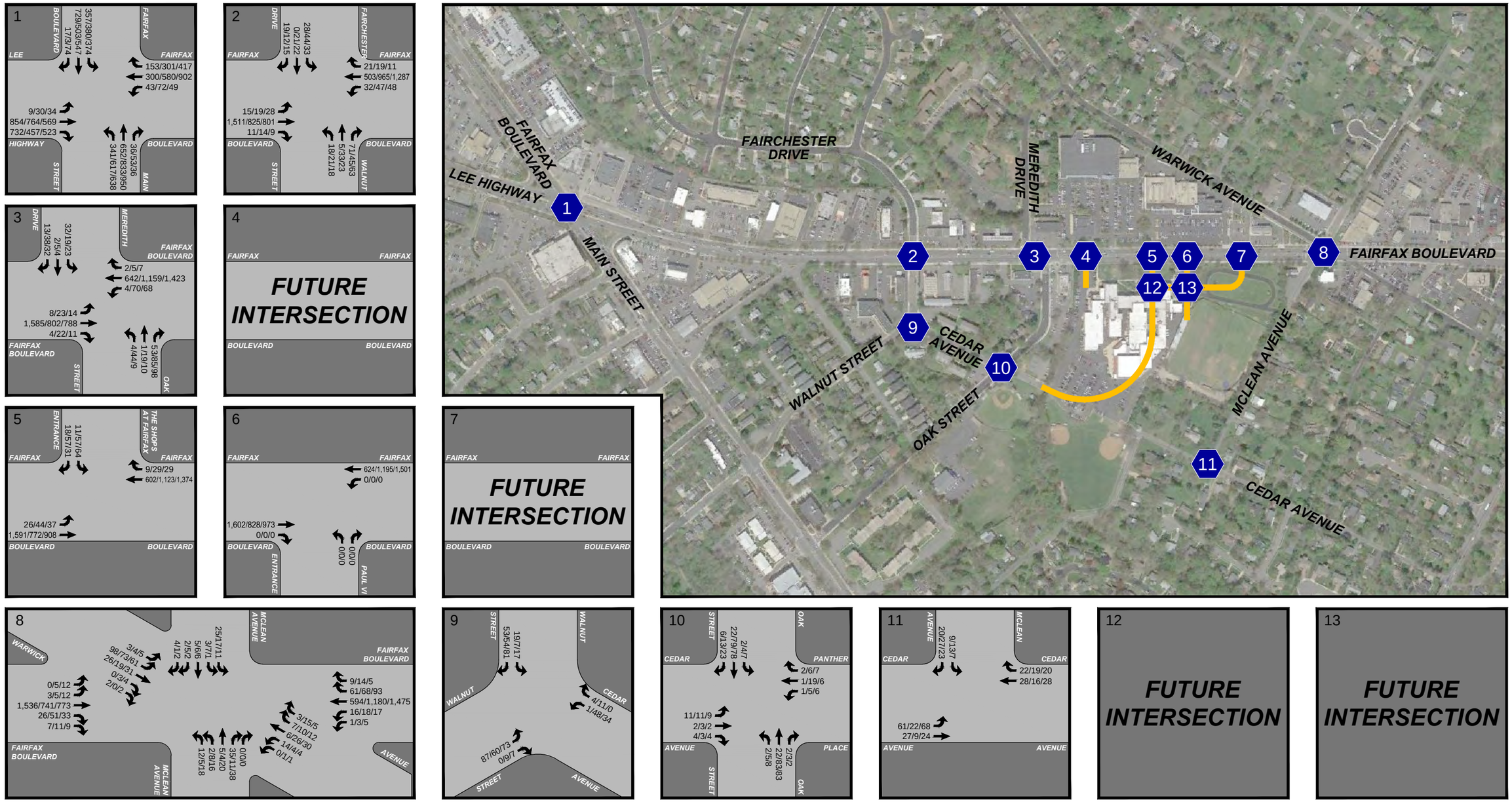

Figure 6-1
Existing Traffic Volumes Less Existing Site Trips

Paul VI Redevelopment

Fairfax County, Virginia

AM PEAK HOUR
SCHOOL PM PEAK HOUR
PM PEAK HOUR
000 / 000 / 000

NORTH

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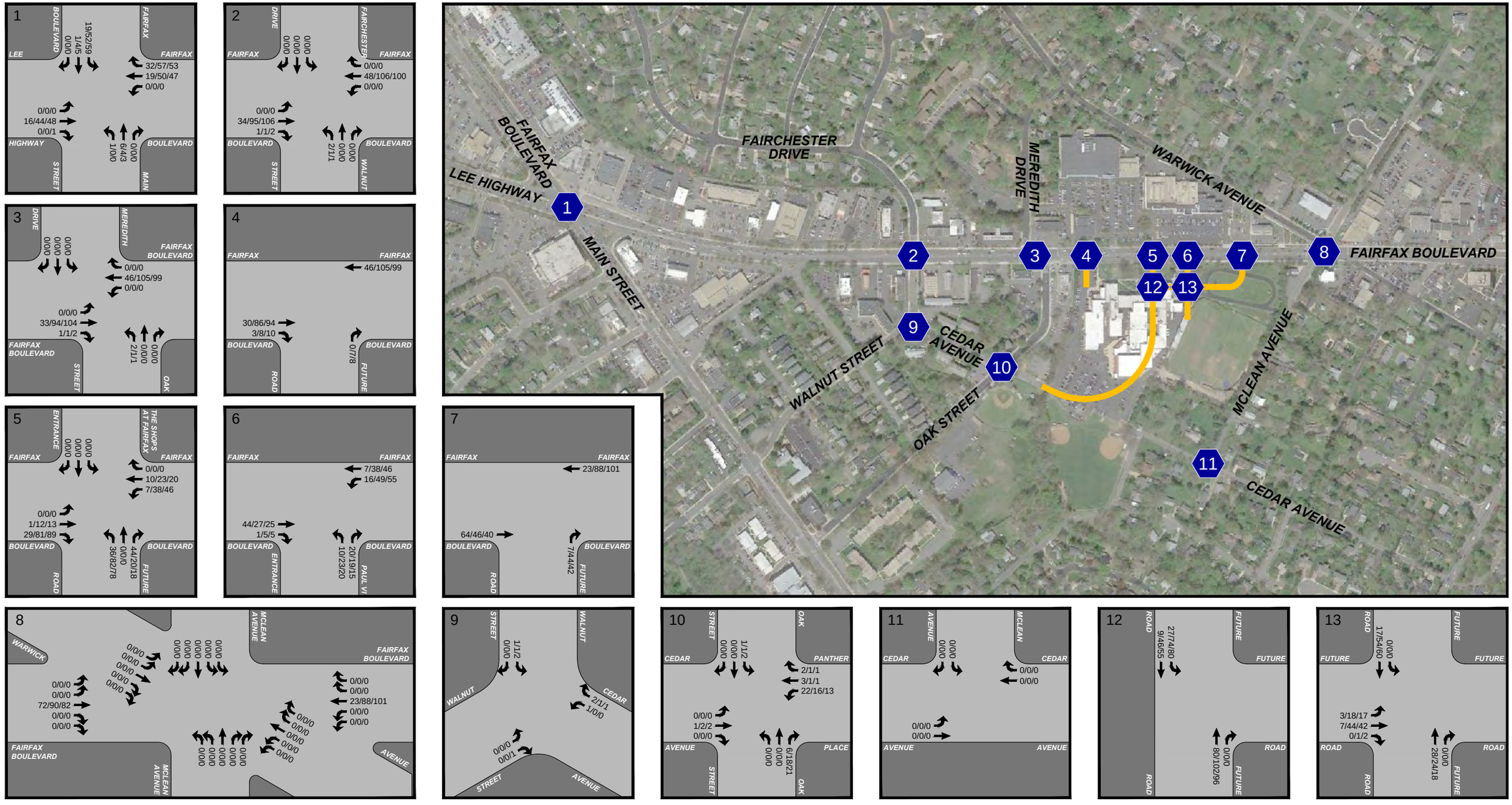

Figure 6-2
Site Trip Assignments

Paul VI Redevelopment

Fairfax County, Virginia

AM PEAK HOUR
SCHOOL PM PEAK HOUR
PM PEAK HOUR
000 / 000 / 000

NORTH

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SECTION 7
ANALYSIS OF FUTURE CONDITIONS WITH SITE DEVELOPMENT

Total Future Traffic Forecasts

Site trip assignments shown on Figure 6-2 were added to the existing traffic volumes less the existing site trips at each of the study intersections, shown on Figure 6-1, and pipeline trip assignments shown on Figure 5-2 to yield 2027 total future traffic forecasts, shown on Figure 7-1.

Proposed Improvements

Provision of a slow lane (with on-street parking), separated from the main travel lanes by landscaped medians is proposed along the portion of the Fairfax Boulevard site frontage east of the Fairfax Boulevard/The Shops at Fairfax signalized intersection. Access between the site and Fairfax Boulevard is proposed via two (2) full access driveways and one (1) right-in/right-out driveway. One of the proposed full access site driveways will form the fourth (south) leg at the Fairfax Boulevard/The Shops at Fairfax signalized intersection and will provide two northbound and one southbound lanes. The other full access driveway will be located along Fairfax Boulevard approximately 570' east of the existing signalized driveway to/from the Shops at Fairfax and approximately 260' west of the Fairfax Boulevard/Mclean Avenue intersection. A right-in/right-out driveway from Fairfax Boulevard will be provided west of the Fairfax Boulevard/The Shops at Fairfax signalized intersection.

Lane use and traffic control at each of the study intersections for 2027 total future conditions is shown on Figure 7-2.

Total Future Levels of Service with Proposed Development Plan

Future levels of service <u>with the proposed development plan</u> were estimated at the study intersections based on the future traffic volumes shown on Figure 7-1, future lane use and traffic control shown on Figure 7-2, and the 2000 HCM methodologies for signalized and unsignalized intersections. The results of these analyses are provided in Appendix E and summarized in Table 7-1.

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

The Lee Highway/Fairfax Boulevard/Main Street intersection will continue to operate at an overall LOS E during all three studied peak periods under total future conditions. When compared to background future conditions, the intersection will experience minor ***reductions*** in delay (0.3 – 5.8 seconds) during the AM, PM school peak period, and PM peak commuter periods.

When compared to background future conditions, the Fairfax Boulevard/Fairchester Drive, Walnut Street intersection will experience minor ***reductions*** in overall delay during each of the three peak periods.

When compared to background future conditions, the Fairfax Boulevard/Meredith Drive/Oak Street will experience a significant ***reduction*** (18.8 seconds) in delay during the AM commuter peak period and minor ***increases*** in delay during the PM school and PM commuter peak periods.

When compared to background future conditions, the Fairfax Boulevard/Shops at Fairfax Driveway/Site Driveway intersection will experience a decline in LOS due to the addition of a fourth (northbound) leg at this intersection. However, this intersection will operate at an acceptable LOS "D" or better during all three (3) peak periods studied.

When compared to background future conditions, the Fairfax Boulevard/McLean Avenue/Warwick Road intersection will experience a minor ***reduction*** in delay during the AM commuter peak period and minor ***increases*** in delay during the PM school and PM commuter peak periods.

All studied unsignalized intersections will operate at LOS "C" or better during each of the peak periods.

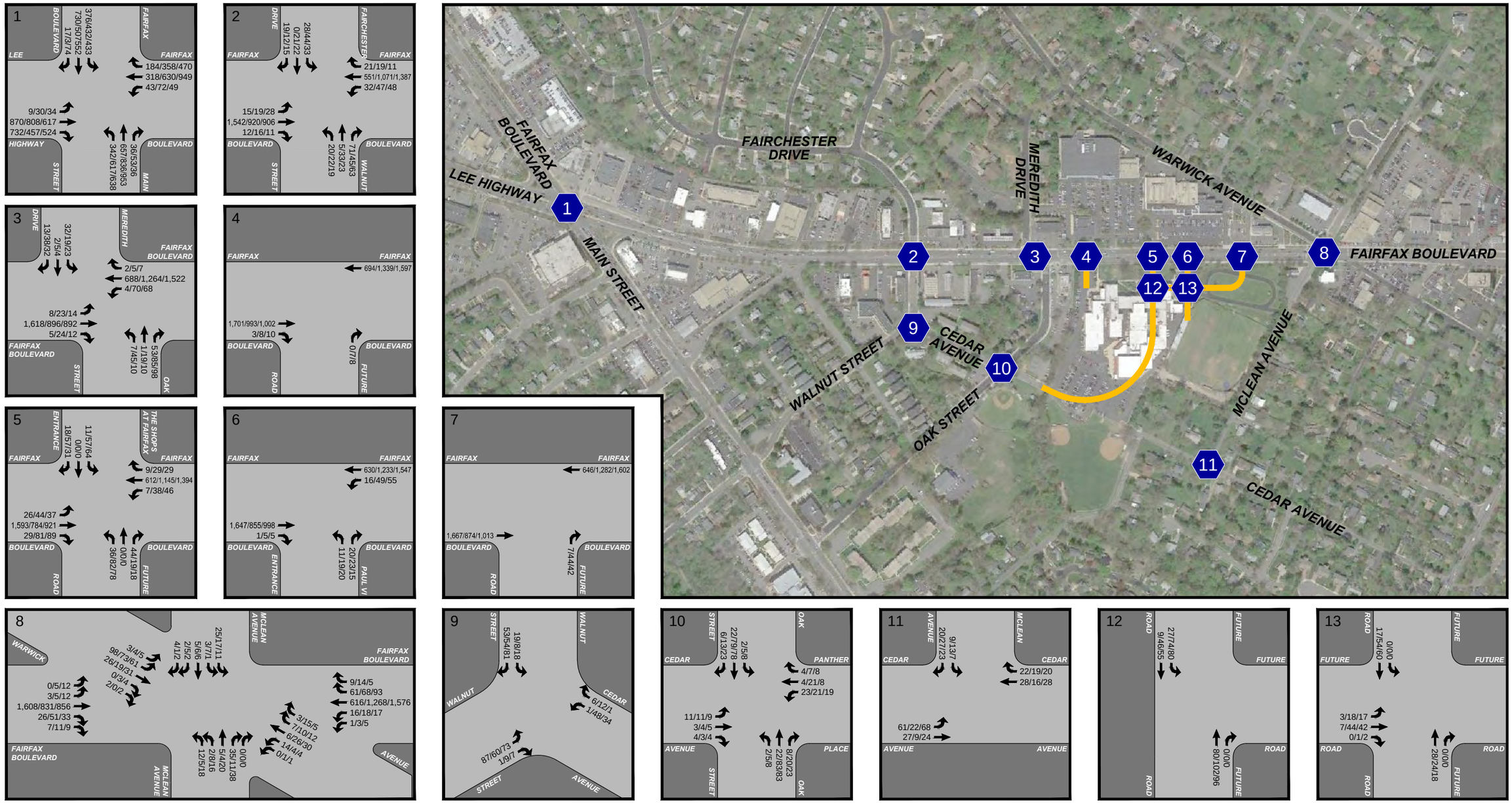

Figure 7-1
2027 Total Future Peak Hour Traffic Forecasts

Paul VI Redevelopment

Fairfax County, Virginia

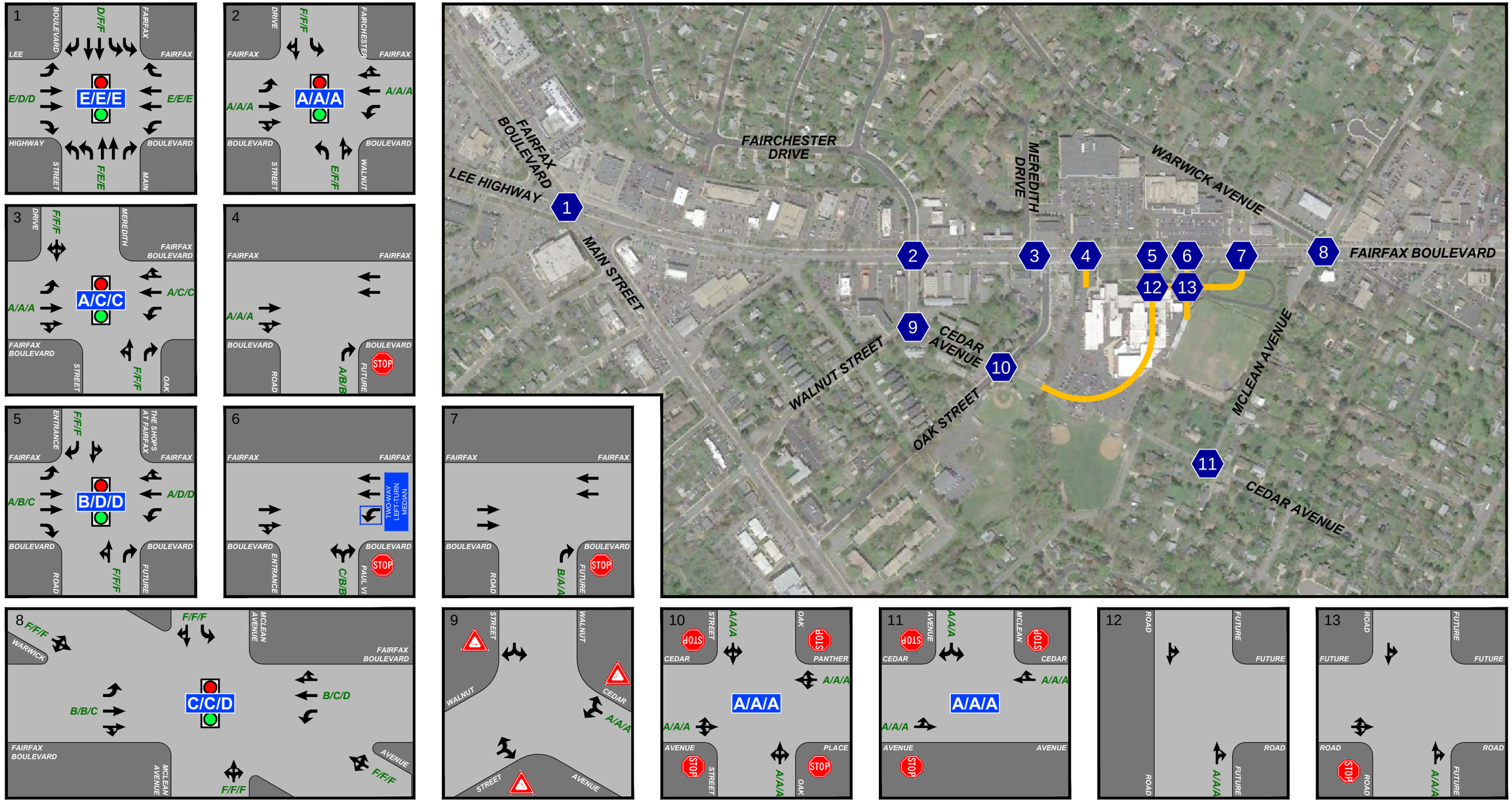

Figure 7-2
Total Future Lane Use, Traffic Controls, and Levels of Service

Paul VI Redevelopment

Fairfax County, Virginia

X/X/X Approach Levels of Service

X/X/X Overall Intersection Levels of Service

Represents One Travel Lane

Signalized Intersection

Stop Sign

Yield Sign

NORTH

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Table 7-1

Paul VI Redevelopment

Total Future Intersection Capacity Analysis Summary[1]

	Intersection	Intersection Control	Approach	Existing			Background Future			Total Future		
				AM Peak	PM School Peak	PM Peak	AM Peak	PM School Peak	PM Peak	AM Peak	PM School Peak	PM Peak
1.	Lee Highway & Fairfax Boulevard & Main Street[2]	Signal	EB Appr	D (54.0)	F (87.3)	F (91.3)	D (54.8)	F (89.0)	F (95.6)	D (52.0)	F (87.0)	F (91.8)
			WB Appr	F (96.0)	E (70.1)	E (76.3)	F (106.3)	E (72.0)	F (82.9)	F (88.4)	E (69.9)	E (76.3)
			NB Appr	E (74.9)	D (45.1)	D (39.1)	E (78.4)	D (46.0)	D (40.0)	E (69.6)	D (46.0)	D (40.3)
			SB Appr	E (57.4)	D (49.5)	E (71.5)	E (56.5)	D (51.1)	E (72.4)	E (71.7)	E (55.8)	E (62.5)
			Overall	**E (71.5)**	**E (62.3)**	**E (69.8)**	**E (75.0)**	**E (64.0)**	**E (73.4)**	**E (69.8)**	**E (63.7)**	**E (67.6)**
2.	Fairfax Boulevard & Fairchester Drive/Walnut Street	Signal	EB Appr	A (8.2)	A (1.4)	A (1.4)	A (9.0)	A (1.4)	A (1.5)	A (6.7)	A (1.3)	A (1.5)
			WB Appr	A (5.3)	A (2.6)	A (1.7)	A (5.4)	A (2.6)	A (1.8)	A (0.9)	A (1.2)	A (2.8)
			NB Appr	E (76.1)	F (87.5)	F (90.9)	E (76.0)	F (87.6)	F (90.9)	E (75.1)	F (88.8)	F (89.8)
			SB Appr	F (88.8)	F (93.7)	F (118.8)	F (88.7)	F (93.6)	F (118.8)	F (94.5)	F (111.4)	F (114.7)
			Overall	**B (14.1)**	**B (13.0)**	**B (10.1)**	**B (14.4)**	**B (12.6)**	**A (9.6)**	**A (9.8)**	**A (8.8)**	**A (9.0)**
3.	Fairfax Boulevard & Meredith Drive/Oak Street	Signal	EB Appr	B (15.7)	A (4.3)	A (3.3)	B (19.2)	A (4.3)	A (3.4)	A (5.0)	A (3.9)	A (3.1)
			WB Appr	C (23.3)	A (7.4)	A (8.3)	C (23.3)	A (7.5)	A (9.5)	A (4.4)	C (20.3)	C (23.4)
			NB Appr	F (83.8)	F (100.1)	F (100.0)	F (83.7)	F (99.7)	F (99.8)	F (86.3)	F (98.6)	F (100.4)
			SB Appr	F (89.5)	F (102.4)	F (102.5)	F (89.5)	F (102.4)	F (102.5)	F (89.5)	F (102.4)	F (102.5)
			Overall	**C (25.1)**	**B (18.1)**	**B (14.1)**	**C (27.4)**	**B (18.1)**	**B (14.8)**	**A (8.6)**	**C (20.8)**	**C (21.6)**
4.	Fairfax Boulevard & Site Entrance	Stop[3]	EB Appr	Future Intersection			Future Intersection			A (0.0)	A (0.0)	A (0.0)
			NB Appr							A (0.0)	B (10.2)	B (10.5)
5.	Fairfax Boulevard & Shops at Fairfax Entrance/Site Entrance	Signal	EB Appr	A (2.0)	A (1.0)	A (1.4)	A (2.4)	A (1.0)	A (1.4)	A (7.9)	B (17.6)	C (26.5)
			WB Appr	A (0.6)	A (1.2)	A (0.5)	A (0.6)	A (1.3)	A (0.5)	A (5.4)	D (42.5)	D (40.6)
			NB Appr	Future Approach			Future Approach			F (105.2)	F (96.0)	F (95.5)
			SB Appr	F (84.1)	F (104.7)	F (103.9)	F (84.1)	F (104.7)	F (103.9)	F (88.2)	F (93.9)	F (96.2)
			Overall	**A (2.6)**	**A (6.4)**	**A (4.8)**	**A (2.8)**	**A (6.2)**	**A (4.5)**	**B (11.5)**	**D (37.7)**	**D (39.1)**
6.	Fairfax Boulevard & Site Entrance	Stop	NB Appr	C (21.1)	B (13.6)	B (12.6)	C (22.4)	B (14.2)	B (13.1)	C (20.0)	B (12.5)	B (13.3)
7.	Fairfax Boulevard & Site Exit	Stop	NB Appr	Future Intersection			Future Intersection			B (11.4)	A (9.8)	A (9.8)
8.	Fairfax Boulevard & McLean Avenue & Warwick Road[4]	Signal	EB Appr	F (115.4)	F (117.3)	F (128.0)	F (115.4)	F (117.3)	F (128.0)	F (115.4)	F (117.3)	F (128.0)
			WB Appr	F (90.4)	F (103.7)	F (103.2)	F (90.4)	F (103.7)	F (103.2)	F (90.4)	F (103.7)	F (103.2)
			NB Appr	F (88.2)	F (106.5)	F (115.4)	F (88.2)	F (106.5)	F (115.4)	F (88.2)	F (106.5)	F (115.4)
			SB Appr	F (85.3)	F (104.4)	F (93.1)	F (85.3)	F (104.4)	F (93.1)	F (85.3)	F (104.4)	F (93.1)
			NE Appr	C (21.9)	B (12.3)	B (11.5)	C (24.2)	B (13.2)	B (12.6)	B (16.3)	B (15.2)	C (27.7)
			SW Appr	B (19.7)	C (23.3)	D (39.1)	C (20.1)	C (24.3)	D (43.7)	B (18.6)	C (23.8)	D (42.5)
			Overall	**C (28.5)**	**C (26.6)**	**D (37.9)**	**C (29.7)**	**C (27.1)**	**D (40.4)**	**C (25.2)**	**C (28.2)**	**D (44.6)**
9.	Walnut Street & Cedar Avenue[5]	Stop	WB Appr	B (10.1)	A (9.4)	A (9.5)	B (10.1)	A (9.4)	A (9.5)	A (8.9)	A (9.4)	A (9.9)
10.	Oak Street & Cedar Avenue	Stop	EB Appr	B (13.9)	A (8.5)	A (7.8)	B (14.3)	A (8.7)	A (7.9)	A (7.2)	A (7.6)	A (7.6)
			WB Appr	C (15.6)	B (10.9)	A (8.0)	C (16.2)	B (11.2)	A (8.1)	A (7.3)	A (7.8)	A (7.7)
			NB Appr	B (12.6)	A (9.0)	A (8.0)	B (13.6)	A (9.3)	A (8.2)	A (7.1)	A (7.7)	A (7.7)
			SB Appr	B (14.8)	A (9.4)	A (8.1)	C (15.3)	A (9.7)	A (8.4)	A (7.1)	A (7.7)	A (7.7)
			Overall	**B (14.3)**	**B (10.0)**	**A (8.0)**	**B (14.9)**	**B (10.2)**	**A (8.2)**	**A (7.2)**	**A (7.7)**	**A (7.7)**
11.	Cedar Avenue & McLean Avenue	Stop	EB Appr	A (7.7)	A (7.4)	A (7.7)	A (7.7)	A (7.4)	A (7.7)	A (7.7)	A (7.4)	A (7.7)
			WB Appr	A (7.1)	A (6.9)	A (7.1)	A (7.1)	A (6.9)	A (7.1)	A (7.1)	A (6.9)	A (7.1)
			SB Appr	A (7.0)	A (6.9)	A (7.0)	A (7.0)	A (6.9)	A (7.0)	A (7.0)	A (6.9)	A (7.0)
			Overall	**A (7.4)**	**A (7.0)**	**A (7.4)**	**A (7.4)**	**A (7.0)**	**A (7.4)**	**A (7.4)**	**A (7.0)**	**A (7.4)**
12.	Internal Road & Frontage Road	Stop	NB Appr	Future Intersection			Future Intersection			A (5.6)	A (4.8)	A (4.7)
13.	Internal Road & Frontage Road	Stop	NB Appr	Future Intersection			Future Intersection			A (9.2)	A (9.7)	A (9.7)

Notes:
1. Capacity analysis based on Highway Capacity Manual methodology, using Synchro 9.1.
2. Fairfax Boulevard/Main Street analyzed as east-west road; Lee Highway/Fairfax Boulevard analyzed as north-south roadway.
3. The eastbound right movement is neither signal nor stop-controlled.
4. Warwick Road analyzed as east-west road; McLean Avenue analyzed as north-south roadway; Fairfax Boulevard analyzed as northeast-southwest roadway.
5. Analyzed with northbound and southbound as free movements along Walnut Street, and westbound movements along Cedar Avenue as stop-controlled.

SECTION 8
TRANSPORTATION DEMAND MANAGEMENT

To take full advantage of the site's proximity to various transit facilities and services, a project sponsored Transportation Demand Management (TDM) program would encourage the use of transit, ridesharing, bicycling, and walking which would serve to decrease reliance on the single occupancy vehicles (SOV).

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 results. They can improve the transportation options available to consumers, provide an incentive to choose more efficient travel patterns, or 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. It is anticipated that after the for sell units are sold, the Home Owner's Association (HOA) would assume the TMC duties and would provide information regarding the TDM program at least once a year. The TMC functions may include the following:

    1. Assist residents and employees in making effective and efficient commuting choices.

    2. Disseminate Metrorail, Metrobus, ridesharing, and other relevant transit options to new residents and employees.

    3. Solicit support from the Metropolitan Washington Council of Governments Commuter Connections (MWCOGCC) program, the Washington Metropolitan Area Transit Authority, the City of Fairfax, etc.

    4. Provide on-site assistance to residents and employees in forming and maintaining carpools and vanpools.

    5. Disseminate park-and-ride lot information to prospective carpoolers and vanpoolers.

    6. Encourage carpool/vanpool participants, transit users, bicyclists, and walkers to register in MWCOGCC Guaranteed Ride Home (GRH) program.

    7. Encourage residents and employees to ride bikes or walk to work.

    8. Provide on-site facilities for bicycle parking and/or storage, including bike racks for visitors and bike storage lockers for residents.

9. Market and promote the TDM Program among residents and employees through printed materials obtained from the City, MWCOGCC, Metro and/or the projects' web site (if available).

B. Commuter Center.

1. Designate a centralized space on-site as a "Commuter Center".

2. Install display racks that would provide information on local transit options.

3. Promote transit and multi-modal options provided by the City.

C. Incentives to use transit, including:

1. Providing information on Metrorail, CUE Bus, Metrobus, and other public transportation facilities, services, routes, schedules, and fares.

2. Disseminating information to transit users regarding free guaranteed rides home in cases of emergency.

3. Providing safe, convenient, and attractive pedestrian connections on site that connect to off-site facilities.

D. Carpool programs, including:

1. Disseminating information to carpoolers regarding free guaranteed rides home in cases of emergency.

2. Reserve a number of conveniently-located, parking spaces for carpools only for commercial use with registration.

E. Parking management, including:

1. Reserving a number of conveniently-located, parking spaces for carpools, and/or hybrid vehicles.

2. Implementing a parking pass system in order to manage the number of vehicular parking spaces allotted per resident or dwelling unit.

3. Providing an on-street parking space for a car sharing service (i.e., Zip or Flex Car).

SECTION 9
CONCLUSIONS

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

1. The Lee Highway/Fairfax Boulevard/Main Street intersection currently operates at or near capacity at level of service (LOS) "E" during each of the three (3) studied peak periods.

2. All other signalized intersections currently operate at an overall LOS D or better during each of the three (3) studied peak periods based on Highway Capacity Manual calculations, however, substantial queues were observed along Fairfax Boulevard during the peak periods. Specifically, substantial queues along eastbound Fairfax Boulevard were observed during the AM peak period and substantial westbound queues were observed during the PM peak period.

3. Historic VDOT traffic data indicates that average daily traffic counts along Fairfax Boulevard and Main Street have decreased by 0.7% to 1.7% per year between 2008 and 2016.

4. The Novus Fairfax Gateway and Mount Vineyard pipeline developments are anticipated to generate 395 AM commuter peak hour trips, 418 PM school peak hour trips, and 576 PM commuter peak hour trips at full buildout.

5. Under future 2027 traffic conditions, without redevelopment of the Paul VI site, minimal increases in delay at the study intersections are expected due to the trips generated by pipeline development in the vicinity of the site and overall levels of service would remain generally consistent with existing conditions.

6. The existing Paul VI Catholic High School currently generates 1,005 trips during the AM commuter peak hour, 563 trips during the PM school peak hour, and 132 trips during the PM commuter peak hour.

7. The Applicant proposes to redevelop the site with 184 residential condominium units, 137 town homes, 20,000 SF of local serving retail, and 24,000 SF of community center space.

8. The project is estimated to generate 789 ***fewer*** AM peak commuter hour trips, 148 ***fewer*** PM school peak hour trips, and 294 ***more*** PM peak commuter hour trips than are currently generated by the high school.

9. Under future 2027 traffic conditions, with the development of the subject site, intersection levels of service would remain generally consistent with existing and background conditions. The analyses show that the Lee Highway/Fairfax Boulevard/Main Street will continue to operate at LOS E during all three peak periods studied. All other intersections will operate at LOS D or better during each of the studied peak periods.

10. A full turning movement site driveway is proposed along Fairfax Boulevard to align with the existing Shops at Fairfax entrance. The full access signalized intersection would operate at an overall LOS "D" or better during each of the studied peak periods.

11. A full turning movement, side-street stop-controlled entrance is proposed along Fairfax Boulevard between the Shops at Fairfax intersection and McLean Avenue. This unsignalized intersection will operate at LOS "C" or better during each of the studied time periods.

Appendix E

Vehicle Level of Service Definitions

15125 Washington Street
Suite 212
Haymarket, VA 20169
571.248.0992

LEVEL OF SERVICE DEFINITIONS

All capacity analyses are based on the procedures specified by the Transportation Research Board, Special Report 209: *Highway Capacity Manual (HCM)*, 2000. Levels of service (LOS) range from A to F. A brief description of each level of service for signalized and unsignalized intersections is provided below.

Signalized Intersections: Level of service is based upon the traffic volume present in each lane on the roadway, the capacity of each lane at the intersection and the delay associated with each directional movement. The levels of service for signalized intersections are defined below:

- Level of Service A describes operations with very low average delay per vehicle, i.e., less than 10.0 seconds. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop. Short signal cycle lengths may also contribute to low delay.
- Level of Service B describes operations with average delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
- Level of Service C describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level although many still pass through the intersection without stopping. This is generally considered the lower end of the range of the acceptable level of service in rural areas.
- Level of Service D describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and/or high traffic volumes as compared to the roadway capacity. Many vehicles are required to stop and the number of vehicles that do not have to stop declines. Individual signal cycle failures, where all waiting vehicles do not clear the intersection during a single green time, are noticeable. This is generally considered the lower end of the range of the acceptable level of service in urban areas.
- Level of Service E describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle. These higher delay values generally indicate poor progression, long cycle lengths, and high traffic volumes. Individual cycle failures are frequent occurrences. LOS E has been set as the limit of acceptable conditions.
- Level of Service F describes operations with average delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when traffic arrives at a flow rate that exceeds the capacity of the intersection. It may also occur at high volumes with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such delays.

Unsignalized Intersections: At an unsignalized intersection, the major street through traffic and right-turns are assumed to operate unimpeded and therefore receive no level of service rating. The level of service for the minor street and the major street left-turn traffic is dependent on the volume and capacity of the available lanes, and, the number and frequency of acceptable gaps in the major street traffic to make a conflicting turn. The level of service

grade is provided for each conflicting movement at an unsignalized intersection and is based on the total average delay experienced by each vehicle. The delay includes the time it takes a vehicle to move from the back of a queue through the intersection.

The unsignalized intersection level of service analysis does not account for variations in driver behavior or the effects of nearby traffic signals. Therefore, the results from this analysis usually indicate worse levels of service than may be experienced in the field. The unsignalized intersection level of service descriptions are provided below:

- Level of Service A. Describes operations where there is very little to no conflicting traffic for a minor side street movement, i.e., an average total delay of less than 10.0 seconds per vehicle.
- Level of Service B. Describes operations with average total delay in the range of 10.1 to 15.0 seconds per vehicle.
- Level of Service C. Describes operations with average total delay in the range of 15.1 to 25.0 second per vehicle.
- Level of Service D. Describes operations with average total delay in the range of 25.1 to 35.0 seconds per vehicle.
- Level of Service E. Describes operations with average total delay in the range of 35.1 to 50.0 seconds per vehicle.
- Level of Service F. Describes operations with average total delay of 50 seconds per vehicle. LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through or enter a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queuing on the minor approaches. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal driver behavior.

Appendix F

Vehicular Capacity Analysis Worksheets – Existing (2019) Conditions

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	54	2051	1	752	251	1	272	14	5
v/c Ratio	0.13	0.62	0.01	0.38	0.25	0.02	0.82	0.03	0.06
Control Delay	7.3	11.3	38.0	42.8	22.0	89.0	115.5	0.2	82.2
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	11.5	38.0	42.8	22.0	89.0	115.5	0.2	82.2
Queue Length 50th (ft)	4	164	1	383	114	1	298	0	6
Queue Length 95th (ft)	m28	#1034	m4	582	215	9	m389	m0	22
Internal Link Dist (ft)		810		1204		100		1669	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	454	3320	132	1972	1015	67	379	486	175
Starvation Cap Reductn	0	374	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.70	0.01	0.38	0.25	0.01	0.72	0.03	0.03

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	50	1886	1	1	0	692	231	1	0	250	1	12
Future Volume (vph)	50	1886	1	1	0	692	231	1	0	250	1	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0	6.3	6.3	
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00	1.00	1.00	
Frt	1.00	1.00			1.00	1.00	0.85		1.00	1.00	0.86	
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (prot)	1805	4987			1805	3223	1524		1805	1687	1635	
Flt Permitted	0.29	1.00			0.05	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (perm)	548	4987			96	3223	1524		1805	1687	1635	
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)	54	2050	1	1	0	752	251	1	0	272	1	13
RTOR Reduction (vph)	0	0	0	0	0	0	96	0	0	0	11	0
Lane Group Flow (vph)	54	2051	0	0	1	752	155	0	1	272	3	0
Heavy Vehicles (%)	0%	4%	0%	0%	0%	12%	6%	0%	0%	7%	0%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA	Split	NA	
Protected Phases	5	2		1	1	6		7	7	3	3	
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	115.1	108.5			104.3	103.1	103.1		1.3	36.3	36.3	
Effective Green, g (s)	117.1	110.5			106.3	105.1	105.1		2.3	37.3	37.3	
Actuated g/C Ratio	0.62	0.58			0.56	0.55	0.55		0.01	0.20	0.20	
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0	7.3	7.3	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	5.0	5.0	
Lane Grp Cap (vph)	388	2900			73	1782	843		21	331	320	
v/s Ratio Prot	c0.01	c0.41			0.00	0.23			c0.00	c0.16	0.00	
v/s Ratio Perm	0.08				0.01		0.10					
v/c Ratio	0.14	0.71			0.01	0.42	0.18		0.05	0.82	0.01	
Uniform Delay, d1	16.0	28.3			23.9	24.7	21.1		92.8	73.2	61.5	
Progression Factor	0.44	0.44			1.84	1.80	4.00		1.00	1.32	1.00	
Incremental Delay, d2	0.1	1.2			0.1	0.7	0.5		0.9	16.2	0.0	
Delay (s)	7.2	13.7			44.1	45.3	84.9		93.7	112.8	61.5	
Level of Service	A	B			D	D	F		F	F	E	
Approach Delay (s)		13.5				55.2			93.7		110.3	
Approach LOS		B				E			F		F	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NEL2	NEL	NER
Lane Configurations			
Traffic Volume (vph)	2	0	3
Future Volume (vph)	2	0	3
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)		5.6	
Lane Util. Factor		1.00	
Frt		0.92	
Flt Protected		0.98	
Satd. Flow (prot)		1427	
Flt Permitted		0.98	
Satd. Flow (perm)		1427	
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	2	0	3
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	5	0
Heavy Vehicles (%)	50%	0%	0%
Turn Type	Prot	Prot	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)		5.8	
Effective Green, g (s)		6.8	
Actuated g/C Ratio		0.04	
Clearance Time (s)		6.6	
Vehicle Extension (s)		3.0	
Lane Grp Cap (vph)		51	
v/s Ratio Prot		c0.00	
v/s Ratio Perm			
v/c Ratio		0.10	
Uniform Delay, d1		88.6	
Progression Factor		1.00	
Incremental Delay, d2		0.8	
Delay (s)		89.5	
Level of Service		F	
Approach Delay (s)		89.5	
Approach LOS		F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	3	1833	76	693	74	188	3	2
v/c Ratio	0.00	0.69	0.35	0.26	0.62	0.63	0.05	0.00
Control Delay	1.0	4.7	29.6	3.3	104.3	22.7	77.0	0.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.0	4.8	29.6	3.3	104.3	22.8	77.0	0.0
Queue Length 50th (ft)	0	152	32	8	91	19	4	0
Queue Length 95th (ft)	m1	185	114	110	149	104	16	0
Internal Link Dist (ft)		1037		810	420			120
Turn Bay Length (ft)	165		150				120	
Base Capacity (vph)	739	2656	306	2683	290	480	158	514
Starvation Cap Reductn	0	4	0	0	0	0	0	0
Spillback Cap Reductn	0	116	0	0	0	5	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.72	0.25	0.26	0.26	0.40	0.02	0.00

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	1661	26	70	637	1	66	2	173	3	0	2
Future Volume (vph)	3	1661	26	70	637	1	66	2	173	3	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3428		1805	3195			1754	1599	1081	1077	
Flt Permitted	0.39	1.00		0.08	1.00			0.73	1.00	0.65	1.00	
Satd. Flow (perm)	737	3428		158	3195			1345	1599	734	1077	
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)	3	1805	28	76	692	1	72	2	188	3	0	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	157	0	2	0
Lane Group Flow (vph)	3	1833	0	76	693	0	0	74	31	3	0	0
Heavy Vehicles (%)	0%	5%	10%	0%	13%	0%	2%	50%	1%	67%	0%	50%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	147.4	146.2		161.0	153.6			15.9	15.9	15.9	15.9	
Effective Green, g (s)	149.4	147.2		162.0	154.6			16.9	16.9	16.9	16.9	
Actuated g/C Ratio	0.79	0.77		0.85	0.81			0.09	0.09	0.09	0.09	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	591	2655		217	2599			119	142	65	95	
v/s Ratio Prot	0.00	c0.53		c0.02	0.22						0.00	
v/s Ratio Perm	0.00			0.28				c0.06	0.02	0.00		
v/c Ratio	0.01	0.69		0.35	0.27			0.62	0.22	0.05	0.00	
Uniform Delay, d1	4.3	10.4		11.7	4.2			83.5	80.4	79.2	78.9	
Progression Factor	0.30	0.30		9.95	0.84			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	1.2		0.9	0.2			9.7	0.8	0.3	0.0	
Delay (s)	1.3	4.3		117.0	3.8			93.2	81.2	79.5	78.9	
Level of Service	A	A		F	A			F	F	E	E	
Approach Delay (s)		4.3			14.9			84.6			79.2	
Approach LOS		A			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	269	1405	9	115	531	93	27	662	87	147	584	233
v/c Ratio	0.70	0.73	0.01	1.12	0.30	0.13	0.30	0.91	0.18	0.68	0.70	0.32
Control Delay	121.0	20.3	0.0	184.7	24.4	5.7	94.5	90.6	4.7	128.9	107.5	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.4
Total Delay	121.0	20.3	0.0	184.7	24.4	5.7	94.5	90.6	4.7	128.9	110.4	6.1
Queue Length 50th (ft)	182	235	0	~166	74	3	33	427	0	99	257	1
Queue Length 95th (ft)	m234	376	m0	#302	302	37	72	#525	30	143	472	74
Internal Link Dist (ft)		772			1037			554			381	
Turn Bay Length (ft)	600		500	200		350	200		225	300		200
Base Capacity (vph)	458	1924	964	103	1755	732	110	748	479	222	837	763
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	153	221
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.73	0.01	1.12	0.30	0.13	0.25	0.89	0.18	0.66	0.85	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	261	1363	9	112	515	90	26	642	84	143	566	226
Future Volume (vph)	261	1363	9	112	515	90	26	642	84	143	566	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	269	1405	9	115	531	93	27	662	87	147	584	233
RTOR Reduction (vph)	0	0	4	0	0	29	0	0	63	0	0	136
Lane Group Flow (vph)	269	1405	5	115	531	64	27	662	24	147	584	97
Confl. Peds. (#/hr)	1		2	2		1			2	2		
Heavy Vehicles (%)	2%	2%	2%	17%	2%	27%	2%	2%	4%	16%	5%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	19.9	100.5	107.6	11.2	91.5	103.6	7.1	38.9	50.1	12.1	44.8	64.7
Effective Green, g (s)	21.4	102.0	110.6	12.7	93.0	106.6	8.6	40.4	53.1	13.6	46.3	67.7
Actuated g/C Ratio	0.11	0.54	0.58	0.07	0.49	0.56	0.05	0.21	0.28	0.07	0.24	0.36
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	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	1899	908	103	1732	704	80	752	428	216	837	564
v/s Ratio Prot	0.08	c0.40	0.00	c0.07	0.15	0.01	0.02	c0.19	0.00	c0.05	c0.17	0.02
v/s Ratio Perm			0.00			0.04			0.01			0.04
v/c Ratio	0.70	0.74	0.01	1.12	0.31	0.09	0.34	0.88	0.06	0.68	0.70	0.17
Uniform Delay, d1	81.2	33.8	16.6	88.7	29.1	19.3	87.9	72.5	50.1	86.1	65.5	41.9
Progression Factor	1.41	0.56	1.00	0.81	0.82	0.81	1.00	1.00	1.00	1.31	1.55	0.74
Incremental Delay, d2	3.7	1.8	0.0	122.6	0.4	0.1	2.5	11.7	0.1	8.4	2.5	0.1
Delay (s)	118.4	20.6	16.6	194.8	24.4	15.7	90.4	84.1	50.2	121.0	103.8	31.0
Level of Service	F	C	B	F	C	B	F	F	D	F	F	C
Approach Delay (s)		36.2			49.8			80.6			88.8	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	59.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1615	1	0	767	4	0	0	6	0	0	2
Future Vol, veh/h	0	1615	1	0	767	4	0	0	6	0	0	2
Conflicting Peds, #/hr	2	0	5	5	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1665	1	0	791	4	0	0	6	0	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	797	0	0	1671	0	0	2067	2468	838	1628	2466	400
Stage 1	-	-	-	-	-	-	1671	1671	-	795	795	-
Stage 2	-	-	-	-	-	-	396	797	-	833	1671	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	821	-	-	380	-	-	31	30	309	68	30	600
Stage 1	-	-	-	-	-	-	100	151	-	347	398	-
Stage 2	-	-	-	-	-	-	601	397	-	329	151	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	820	-	-	378	-	-	31	30	308	67	30	599
Mov Cap-2 Maneuver	-	-	-	-	-	-	31	30	-	67	30	-
Stage 1	-	-	-	-	-	-	100	150	-	346	397	-
Stage 2	-	-	-	-	-	-	599	396	-	322	150	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	16.9	11
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	308	820	-	-	378	-	-	599
HCM Lane V/C Ratio	0.02	-	-	-	-	-	-	0.003
HCM Control Delay (s)	16.9	0	-	-	0	-	-	11
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Lane Group	EBT	WBT	NBT	SBL	SBT	NET	SWL	SWT
Lane Group Flow (vph)	158	27	63	36	13	1545	32	763
v/c Ratio	0.88	0.35	0.53	0.48	0.09	0.74	0.22	0.33
Control Delay	124.0	99.2	99.6	104.8	80.6	15.4	22.3	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	124.0	99.2	99.6	104.8	80.6	15.5	22.3	14.6
Queue Length 50th (ft)	197	33	77	44	15	735	10	134
Queue Length 95th (ft)	#334	72	132	87	41	294	35	187
Internal Link Dist (ft)	220	125	220		220	755		447
Turn Bay Length (ft)				175			150	
Base Capacity (vph)	187	147	138	88	163	2098	201	2299
Starvation Cap Reductn	0	0	0	0	0	42	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.18	0.46	0.41	0.08	0.75	0.16	0.33

Intersection Summary

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

Movement	EBL2	EBL	EBT	EBR	EBR2	WBL	WBT	NBL2	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	2	118	28	2	3	15	12	9	10	7	35	1
Future Volume (vph)	2	118	28	2	3	15	12	9	10	7	35	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.5				6.5			5.0		
Lane Util. Factor			1.00				1.00			1.00		
Frpb, ped/bikes			1.00				1.00			1.00		
Flpb, ped/bikes			1.00				1.00			1.00		
Frt			1.00				1.00			0.92		
Flt Protected			0.96				0.97			0.99		
Satd. Flow (prot)			1741				1812			1697		
Flt Permitted			0.96				0.97			0.90		
Satd. Flow (perm)			1741				1812			1546		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	2	122	29	2	3	15	12	9	10	7	36	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	158	0	0	0	27	0	0	63	0	0
Confl. Peds. (#/hr)	2			1	1	1		1	1			
Heavy Vehicles (%)	100%	2%	2%	100%	2%	2%	2%	0%	0%	0%	2%	2%
Turn Type	Split	Split	NA			Split	NA	Perm	Perm	NA		
Protected Phases	3	3	3			4	4			7		
Permitted Phases								7	7			
Actuated Green, G (s)			19.7				7.2			13.1		
Effective Green, g (s)			19.7				7.2			14.6		
Actuated g/C Ratio			0.10				0.04			0.08		
Clearance Time (s)			6.5				6.5			6.5		
Vehicle Extension (s)			3.0				3.0			3.0		
Lane Grp Cap (vph)			180				68			118		
v/s Ratio Prot			c0.09				c0.01					
v/s Ratio Perm										c0.04		
v/c Ratio			0.88				0.40			0.53		
Uniform Delay, d1			84.0				89.3			84.4		
Progression Factor			1.00				1.00			1.00		
Incremental Delay, d2			34.8				3.8			4.6		
Delay (s)			118.8				93.1			89.0		
Level of Service			F				F			F		
Approach Delay (s)			118.8				93.1			89.0		
Approach LOS			F				F			F		

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	32.2
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL2	SBL	SBT	SBR	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	28	7	10	3	0	1441	43	15	10	21	694	41
Future Volume (vph)	28	7	10	3	0	1441	43	15	10	21	694	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	5.0			7.1				7.1	7.1	
Lane Util. Factor		1.00	1.00			0.95				1.00	0.95	
Frpb, ped/bikes		1.00	1.00			1.00				1.00	1.00	
Flpb, ped/bikes		1.00	1.00			1.00				1.00	1.00	
Frt		1.00	0.97			0.99				1.00	0.99	
Flt Protected		0.95	1.00			1.00				0.95	1.00	
Satd. Flow (prot)		1770	1834			3519				1770	3501	
Flt Permitted		0.58	1.00			1.00				0.07	1.00	
Satd. Flow (perm)		1088	1834			3519				137	3501	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	29	7	10	3	0	1486	44	15	10	22	715	42
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	36	13	0	0	1545	0	0	0	32	763	0
Confl. Peds. (#/hr)					1							1
Heavy Vehicles (%)	2%	2%	0%	0%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA			pm+pt	pm+pt	NA	
Protected Phases			7		1	6			5	5	2	
Permitted Phases	7	7			6				2	2		
Actuated Green, G (s)		13.1	13.1			110.6				123.4	123.4	
Effective Green, g (s)		13.1	14.6			110.6				123.4	123.4	
Actuated g/C Ratio		0.07	0.08			0.58				0.65	0.65	
Clearance Time (s)		6.5	6.5			7.1				7.1	7.1	
Vehicle Extension (s)		3.0	3.0			4.0				3.0	4.0	
Lane Grp Cap (vph)		75	140			2048				137	2273	
v/s Ratio Prot			0.01			c0.44				0.01	c0.22	
v/s Ratio Perm		0.03								0.14		
v/c Ratio		0.48	0.09			0.75				0.23	0.34	
Uniform Delay, d1		85.2	81.5			29.6				24.5	14.9	
Progression Factor		1.00	1.00			0.43				1.35	0.91	
Incremental Delay, d2		4.8	0.3			2.3				0.9	0.4	
Delay (s)		89.9	81.8			15.1				33.8	14.0	
Level of Service		F	F			B				C	B	
Approach Delay (s)			87.8			15.1					14.8	
Approach LOS			F			B					B	

Intersection Summary

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	6
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	5	1115	1025
v/c Ratio	0.02	0.22	0.21
Control Delay	0.2	0.1	0.3
Queue Delay	0.0	0.0	0.0
Total Delay	0.2	0.1	0.3
Queue Length 50th (ft)	0	0	0
Queue Length 95th (ft)	0	0	m39
Internal Link Dist (ft)	220	381	521
Turn Bay Length (ft)			
Base Capacity (vph)	334	5085	4989
Starvation Cap Reductn	0	0	756
Spillback Cap Reductn	0	53	678
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.01	0.22	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	5	0	1015	932	1
Future Volume (vph)	0	5	0	1015	932	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			5.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.86			1.00	1.00	
Flt Protected	1.00			1.00	1.00	
Satd. Flow (prot)	1611			5085	5084	
Flt Permitted	1.00			1.00	1.00	
Satd. Flow (perm)	1611			5085	5084	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	5	0	1115	1024	1
RTOR Reduction (vph)	5	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1115	1025	0
Confl. Peds. (#/hr)			2			2
Turn Type	Prot			NA	NA	
Protected Phases	4			6	2	
Permitted Phases				4		
Actuated Green, G (s)	1.4			179.0	177.6	
Effective Green, g (s)	1.4			179.0	177.6	
Actuated g/C Ratio	0.01			0.94	0.93	
Clearance Time (s)	6.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	11			4924	4752	
v/s Ratio Prot	0.00			c0.21	0.20	
v/s Ratio Perm				0.01		
v/c Ratio	0.00			0.23	0.22	
Uniform Delay, d1	93.6			0.4	0.5	
Progression Factor	1.00			1.00	0.90	
Incremental Delay, d2	0.1			0.0	0.1	
Delay (s)	93.7			0.4	0.5	
Level of Service	F			A	A	
Approach Delay (s)	93.7			0.4	0.5	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	229	262	286	13	1082	306	1000
v/c Ratio	1.01	0.47	0.41	0.19	0.88	0.92	0.48
Control Delay	139.8	4.3	1.8	137.0	30.3	89.8	42.2
Queue Delay	0.0	3.5	5.1	0.0	0.7	0.0	0.0
Total Delay	139.8	7.8	6.8	137.0	31.0	89.8	42.2
Queue Length 50th (ft)	~291	0	12	17	389	327	313
Queue Length 95th (ft)	#488	m14	m0	45	468	#502	413
Internal Link Dist (ft)	420	47			521		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	227	548	692	161	1236	349	2062
Starvation Cap Reductn	0	198	334	0	30	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.75	0.80	0.08	0.90	0.88	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	99	25	61	43	395	7	5	951	34	4	275
Future Volume (vph)	85	99	25	61	43	395	7	5	951	34	4	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.98			0.92	0.85		1.00	0.99			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1770			1530	1475		1602	4942			1736
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.08
Satd. Flow (perm)		1770			1530	1475		1602	4942			138
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	93	109	27	67	47	434	8	5	1045	37	4	302
RTOR Reduction (vph)	0	3	0	0	25	188	0	0	0	0	0	0
Lane Group Flow (vph)	0	226	0	0	237	98	0	13	1082	0	0	306
Confl. Peds. (#/hr)			2	2						1		1
Heavy Vehicles (%)	0%	5%	8%	8%	13%	4%	0%	33%	4%	15%	0%	4%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		23.1			64.0	64.0		3.5	46.0			84.2
Effective Green, g (s)		24.1			65.0	65.0		4.5	47.5			85.2
Actuated g/C Ratio		0.13			0.34	0.34		0.02	0.25			0.45
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		224			523	504		37	1235			334
v/s Ratio Prot		c0.13			c0.15	0.07		0.01	0.22			c0.16
v/s Ratio Perm												c0.25
v/c Ratio		1.01			0.45	0.19		0.35	0.88			0.92
Uniform Delay, d1		83.0			48.7	44.0		91.3	68.4			61.5
Progression Factor		1.00			0.06	0.18		1.50	0.31			1.00
Incremental Delay, d2		62.9			0.9	0.3		5.6	8.8			28.7
Delay (s)		145.8			4.0	8.3		142.9	29.7			90.1
Level of Service		F			A	A		F	C			F
Approach Delay (s)		145.8			6.2				31.1			
Approach LOS		F			A				C			

Intersection Summary			
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	893	17
Future Volume (vph)	893	17
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	4930	
Flt Permitted	1.00	
Satd. Flow (perm)	4930	
Peak-hour factor, PHF	0.91	0.91
Adj. Flow (vph)	981	19
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1000	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	5%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	73.9	
Effective Green, g (s)	75.4	
Actuated g/C Ratio	0.40	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1956	
v/s Ratio Prot	0.20	
v/s Ratio Perm		
v/c Ratio	0.51	
Uniform Delay, d1	43.4	
Progression Factor	1.00	
Incremental Delay, d2	1.0	
Delay (s)	44.3	
Level of Service	D	
Approach Delay (s)	55.1	
Approach LOS	E	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	483	432	34	218
v/c Ratio	0.23	0.72	0.14	1.14
Control Delay	1.8	87.0	1.3	152.3
Queue Delay	9.6	0.1	0.0	0.0
Total Delay	11.4	87.1	1.3	152.3
Queue Length 50th (ft)	10	221	0	~241
Queue Length 95th (ft)	m13	323	0	#392
Internal Link Dist (ft)	47	1669	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2038	628	272	192
Starvation Cap Reductn	1515	0	0	0
Spillback Cap Reductn	0	10	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.92	0.70	0.13	1.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	361	6	0	344	23	8	0	21	39	1	145
Future Volume (vph)	43	361	6	0	344	23	8	0	21	39	1	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.90			0.89	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		3390			3351			1446			1346	
Flt Permitted		0.99			1.00			0.99			0.99	
Satd. Flow (perm)		3390			3351			1446			1346	
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)	51	425	7	0	405	27	9	0	25	46	1	171
RTOR Reduction (vph)	0	0	0	0	2	0	0	33	0	0	66	0
Lane Group Flow (vph)	0	483	0	0	430	0	0	1	0	0	152	0
Confl. Peds. (#/hr)	1		2	2		1	1		8	8		1
Heavy Vehicles (%)	12%	5%	0%	0%	7%	0%	0%	0%	13%	100%	0%	3%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		114.2			33.0			5.2			16.8	
Effective Green, g (s)		109.3			34.0			6.2			17.8	
Actuated g/C Ratio		0.58			0.18			0.03			0.09	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1950			599			47			126	
v/s Ratio Prot		c0.14			c0.13			c0.00			c0.11	
v/s Ratio Perm												
v/c Ratio		0.25			0.72			0.02			1.21	
Uniform Delay, d1		20.0			73.5			89.0			86.1	
Progression Factor		0.09			1.09			1.00			1.00	
Incremental Delay, d2		0.0			5.4			0.1			145.5	
Delay (s)		1.9			85.9			89.0			231.6	
Level of Service		A			F			F			F	
Approach Delay (s)		1.9			85.9			89.0			231.6	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	78.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	25	1246	4	1732	538	7	340	126	16
v/c Ratio	0.19	0.34	0.01	0.72	0.47	0.12	1.50	0.38	0.18
Control Delay	15.7	12.2	9.8	15.8	6.0	106.8	307.2	30.2	101.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	12.2	9.8	15.8	6.0	106.8	307.2	30.2	101.3
Queue Length 50th (ft)	8	150	1	352	152	10	~695	41	23
Queue Length 95th (ft)	m24	380	m2	383	92	33	m#928	m111	53
Internal Link Dist (ft)		810		1202		100		1641	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	139	3671	353	2412	1153	63	226	328	189
Starvation Cap Reductn	0	0	0	2	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.34	0.01	0.72	0.47	0.11	1.50	0.38	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	23	1144	3	4	0	1593	495	3	0	4	313	8
Future Volume (vph)	23	1144	3	4	0	1593	495	3	0	4	313	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.92		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98		0.95	1.00
Satd. Flow (prot)	1719	5084			1805	3539	1583		1717		1736	1635
Flt Permitted	0.06	1.00			0.19	1.00	1.00		0.98		0.95	1.00
Satd. Flow (perm)	113	5084			359	3539	1583		1717		1736	1635
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)	25	1243	3	4	0	1732	538	3	0	4	340	9
RTOR Reduction (vph)	0	0	0	0	0	0	84	0	0	0	0	110
Lane Group Flow (vph)	25	1246	0	0	4	1732	454	0	7	0	340	16
Heavy Vehicles (%)	5%	2%	0%	0%	0%	2%	2%	0%	0%	0%	4%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	148.9	143.6			140.7	139.5	139.5		3.0		27.7	27.7
Effective Green, g (s)	150.9	145.6			142.7	141.5	141.5		4.0		28.7	28.7
Actuated g/C Ratio	0.69	0.66			0.65	0.64	0.64		0.02		0.13	0.13
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	123	3364			247	2276	1018		31		226	213
v/s Ratio Prot	c0.01	c0.25			0.00	c0.49			c0.00		c0.20	0.01
v/s Ratio Perm	0.13				0.01		0.29					
v/c Ratio	0.20	0.37			0.02	0.76	0.45		0.23		1.50	0.08
Uniform Delay, d1	26.6	16.7			14.1	27.4	19.6		106.5		95.7	84.0
Progression Factor	1.05	0.86			0.71	0.54	0.45		1.00		1.07	2.82
Incremental Delay, d2	0.8	0.3			0.0	2.2	1.2		3.7		248.5	0.3
Delay (s)	28.8	14.7			10.1	16.9	10.1		110.2		351.2	237.1
Level of Service	C	B			B	B	B		F		F	F
Approach Delay (s)		15.0				15.3			110.2			320.3
Approach LOS		B				B			F			F

Intersection Summary			
HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	108	10	2	3
Future Volume (vph)	108	10	2	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.97	
Flt Protected			0.96	
Satd. Flow (prot)			1780	
Flt Permitted			0.96	
Satd. Flow (perm)			1780	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	11	2	3
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	16	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.6	
Effective Green, g (s)			8.6	
Actuated g/C Ratio			0.04	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			69	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.23	
Uniform Delay, d1			102.5	
Progression Factor			1.00	
Incremental Delay, d2			1.7	
Delay (s)			104.2	
Level of Service			F	
Approach Delay (s)			104.2	
Approach LOS			F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	33	1129	183	1572	137	178	10	20
v/c Ratio	0.14	0.42	0.45	0.56	0.93	0.53	0.13	0.10
Control Delay	3.3	5.1	3.8	1.5	150.2	16.0	93.1	51.7
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	3.3	5.1	3.8	1.6	150.2	16.0	93.1	51.7
Queue Length 50th (ft)	2	201	2	13	201	0	13	12
Queue Length 95th (ft)	5	218	14	7	#357	87	38	46
Internal Link Dist (ft)		1037		810	420			120
Turn Bay Length (ft)	165		150				120	
Base Capacity (vph)	262	2699	535	2813	150	335	78	200
Starvation Cap Reductn	0	0	0	407	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.42	0.34	0.65	0.91	0.53	0.13	0.10

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)	30	958	81	168	1440	6	120	6	164	9	8	10
Future Volume (vph)	30	958	81	168	1440	6	120	6	164	9	8	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1626	3503		1805	3537			1814	1615	1805	1743	
Flt Permitted	0.13	1.00		0.22	1.00			0.72	1.00	0.38	1.00	
Satd. Flow (perm)	227	3503		413	3537			1373	1615	721	1743	
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)	33	1041	88	183	1565	7	130	7	178	10	9	11
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	159	0	10	0
Lane Group Flow (vph)	33	1127	0	183	1572	0	0	137	19	10	10	0
Heavy Vehicles (%)	11%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	173.7	168.5		182.3	172.8			22.7	22.7	22.7	22.7	
Effective Green, g (s)	175.7	169.5		184.3	173.8			23.7	23.7	23.7	23.7	
Actuated g/C Ratio	0.80	0.77		0.84	0.79			0.11	0.11	0.11	0.11	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	220	2698		412	2794			147	173	77	187	
v/s Ratio Prot	0.00	0.32		c0.02	c0.44						0.01	
v/s Ratio Perm	0.12			0.35				c0.10	0.01	0.01		
v/c Ratio	0.15	0.42		0.44	0.56			0.93	0.11	0.13	0.05	
Uniform Delay, d1	6.8	8.5		5.3	8.7			97.4	88.6	88.8	88.1	
Progression Factor	0.66	0.53		0.42	0.10			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.5		0.5	0.6			53.9	0.3	0.8	0.1	
Delay (s)	4.8	5.0		2.8	1.5			151.3	88.9	89.6	88.2	
Level of Service	A	A		A	A			F	F	F	F	
Approach Delay (s)		5.0			1.6			116.0			88.7	
Approach LOS		A			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	219	769	27	89	1305	138	97	553	67	174	568	334
v/c Ratio	0.75	0.40	0.03	0.54	0.66	0.14	0.81	0.87	0.13	0.62	0.79	0.67
Control Delay	154.7	16.3	0.0	87.0	20.1	3.7	142.1	102.0	0.5	150.8	87.9	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	4.5	1.0
Total Delay	154.7	16.3	0.0	87.0	20.3	3.7	142.1	102.0	0.5	150.8	92.4	29.3
Queue Length 50th (ft)	172	147	0	131	642	35	142	414	0	135	268	80
Queue Length 95th (ft)	223	165	m0	m198	496	m16	#258	488	0	182	326	106
Internal Link Dist (ft)		774			1037			554			381	
Turn Bay Length (ft)	600		500	200		350	200		225	300		200
Base Capacity (vph)	300	1933	1021	166	1981	996	122	684	510	340	815	502
Starvation Cap Reductn	0	0	0	0	136	0	0	0	0	0	176	45
Spillback Cap Reductn	0	0	0	0	16	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.40	0.03	0.54	0.71	0.14	0.80	0.81	0.13	0.51	0.89	0.73

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	738	26	85	1253	132	93	531	64	167	545	321
Future Volume (vph)	210	738	26	85	1253	132	93	531	64	167	545	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	219	769	27	89	1305	138	97	553	67	174	568	334
RTOR Reduction (vph)	0	0	10	0	0	21	0	0	49	0	0	61
Lane Group Flow (vph)	219	769	17	89	1305	117	97	553	18	174	568	273
Confl. Peds. (#/hr)	4					4	1		7	7		1
Heavy Vehicles (%)	1%	2%	0%	2%	1%	5%	0%	2%	1%	3%	1%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	17.1	118.7	131.8	19.2	120.5	137.1	13.1	38.2	57.4	16.6	42.6	59.7
Effective Green, g (s)	18.6	120.2	134.8	20.7	122.0	140.1	14.6	39.7	60.4	18.1	44.1	62.7
Actuated g/C Ratio	0.08	0.55	0.61	0.09	0.55	0.64	0.07	0.18	0.27	0.08	0.20	0.29
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	293	1933	989	166	1981	961	119	638	431	279	716	451
v/s Ratio Prot	c0.06	0.22	0.00	0.05	c0.37	0.01	c0.05	c0.16	0.00	0.05	c0.16	0.05
v/s Ratio Perm			0.01			0.07			0.01			0.12
v/c Ratio	0.75	0.40	0.02	0.54	0.66	0.12	0.82	0.87	0.04	0.62	0.79	0.61
Uniform Delay, d1	98.4	28.9	16.7	95.1	34.4	15.7	101.4	87.6	58.6	97.7	83.6	68.0
Progression Factor	1.43	0.53	1.00	0.81	0.52	0.40	1.00	1.00	1.00	1.45	0.95	0.45
Incremental Delay, d2	9.1	0.6	0.0	2.7	1.4	0.0	33.2	11.9	0.0	4.2	6.0	2.3
Delay (s)	149.5	15.9	16.7	79.3	19.5	6.3	134.6	99.5	58.6	145.6	85.5	33.2
Level of Service	F	B	B	E	B	A	F	F	E	F	F	C
Approach Delay (s)		44.7			21.8			100.4			79.0	
Approach LOS		D			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	54.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	931	1	0	1695	2	0	0	8	0	0	10
Future Vol, veh/h	0	931	1	0	1695	2	0	0	8	0	0	10
Conflicting Peds, #/hr	4	0	0	0	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1001	1	0	1823	2	0	0	9	0	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1829	0	0	1002	0	0	1914	2831	501	2329	2830	917
Stage 1	-	-	-	-	-	-	1002	1002	-	1828	1828	-
Stage 2	-	-	-	-	-	-	912	1829	-	501	1002	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	330	-	-	687	-	-	41	17	515	20	17	274
Stage 1	-	-	-	-	-	-	260	318	-	79	126	-
Stage 2	-	-	-	-	-	-	295	126	-	521	318	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	329	-	-	687	-	-	39	17	515	20	17	273
Mov Cap-2 Maneuver	-	-	-	-	-	-	39	17	-	20	17	-
Stage 1	-	-	-	-	-	-	260	318	-	79	126	-
Stage 2	-	-	-	-	-	-	283	126	-	512	318	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12.1	18.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	515	329	-	-	687	-	-	273
HCM Lane V/C Ratio	0.017	-	-	-	-	-	-	0.039
HCM Control Delay (s)	12.1	0	-	-	0	-	-	18.7
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Lane Group	EBT	WBT	NBT	SBL	SBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	132	45	98	19	10	6	940	49	1741
v/c Ratio	0.74	0.44	0.71	0.18	0.06	0.05	0.45	0.21	0.77
Control Delay	120.2	112.9	122.2	95.7	91.0	6.3	9.0	14.8	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	120.2	112.9	122.2	95.7	91.0	6.3	9.1	14.8	20.5
Queue Length 50th (ft)	189	65	139	26	13	1	251	17	396
Queue Length 95th (ft)	274	116	#243	60	38	m3	131	m37	690
Internal Link Dist (ft)	220	220	220		220		755		445
Turn Bay Length (ft)				175		120		150	
Base Capacity (vph)	204	165	138	103	161	144	2101	236	2248
Starvation Cap Reductn	0	0	0	0	0	0	402	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.27	0.71	0.18	0.06	0.04	0.55	0.21	0.77

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	76	44	4	2	19	18	2	4	24	27	13	26
Future Volume (vph)	76	44	4	2	19	18	2	4	24	27	13	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0				5.0					5.0	
Lane Util. Factor		1.00				1.00					1.00	
Frpb, ped/bikes		1.00				0.99					1.00	
Flpb, ped/bikes		1.00				1.00					0.99	
Frt		0.99				0.98					0.96	
Flt Protected		0.97				0.98					0.97	
Satd. Flow (prot)		1798				1811					1709	
Flt Permitted		0.97				0.98					0.83	
Satd. Flow (perm)		1798				1811					1449	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	80	46	4	2	20	19	2	4	25	28	14	27
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	132	0	0	0	45	0	0	0	0	98	0
Confl. Peds. (#/hr)			4	2	2		4		2	2		
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%
Turn Type	Split	NA			Split	NA			Perm	Perm	NA	
Protected Phases	3	3			4	4					7	
Permitted Phases									7	7		
Actuated Green, G (s)		20.3				9.6					19.5	
Effective Green, g (s)		21.8				11.1					21.0	
Actuated g/C Ratio		0.10				0.05					0.10	
Clearance Time (s)		6.5				6.5					6.5	
Vehicle Extension (s)		3.0				3.0					3.0	
Lane Grp Cap (vph)		178				91					138	
v/s Ratio Prot		c0.07				c0.02						
v/s Ratio Perm											c0.07	
v/c Ratio		0.74				0.49					0.71	
Uniform Delay, d1		96.4				101.7					96.5	
Progression Factor		1.00				1.00					1.00	
Incremental Delay, d2		15.3				4.2					15.8	
Delay (s)		111.6				105.9					112.3	
Level of Service		F				F					F	
Approach Delay (s)		111.6				105.9					112.3	
Approach LOS		F				F					F	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	25.7
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBR2	SBL2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2	SWL2
Lane Configurations												
Traffic Volume (vph)	4	15	3	4	2	4	6	0	809	73	10	22
Future Volume (vph)	4	15	3	4	2	4	6	0	809	73	10	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0				5.6	5.1			
Lane Util. Factor			1.00	1.00				1.00	0.95			
Frpb, ped/bikes			1.00	0.98				1.00	1.00			
Flpb, ped/bikes			1.00	1.00				1.00	1.00			
Frt			1.00	0.91				1.00	0.99			
Flt Protected			0.95	1.00				0.95	1.00			
Satd. Flow (prot)			1691	1687				1805	3488			
Flt Permitted			0.61	1.00				0.06	1.00			
Satd. Flow (perm)			1079	1687				112	3488			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	16	3	4	2	4	6	0	852	77	11	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	19	10	0	0	0	6	940	0	0	0
Confl. Peds. (#/hr)					2	2	2				4	
Heavy Vehicles (%)	0%	8%	0%	0%	0%	0%	0%	0%	2%	0%	0%	100%
Turn Type		Perm	Perm	NA			custom	pm+pt	NA			pm+pt
Protected Phases				7				1	6			5
Permitted Phases		7	7				1	6				2
Actuated Green, G (s)			19.5	19.5				130.5	129.2			
Effective Green, g (s)			21.0	21.0				133.5	131.2			
Actuated g/C Ratio			0.10	0.10				0.61	0.60			
Clearance Time (s)			6.5	6.5				7.1	7.1			
Vehicle Extension (s)			3.0	3.0				3.0	4.0			
Lane Grp Cap (vph)			102	161				89	2080			
v/s Ratio Prot				0.01				0.00	0.27			
v/s Ratio Perm			0.02					0.04				
v/c Ratio			0.19	0.06				0.07	0.45			
Uniform Delay, d1			91.6	90.5				29.8	24.5			
Progression Factor			1.00	1.00				0.36	0.33			
Incremental Delay, d2			0.9	0.2				0.3	0.7			
Delay (s)			92.5	90.7				11.0	8.7			
Level of Service			F	F				B	A			
Approach Delay (s)				91.9					8.7			
Approach LOS				F					A			

Intersection Summary

Movement	SWL	SWT	SWR	SWR2
Lane Configurations				
Traffic Volume (vph)	25	1519	128	7
Future Volume (vph)	25	1519	128	7
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.6	5.1		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	1.00		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.99		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1228	3420		
Flt Permitted	0.23	1.00		
Satd. Flow (perm)	295	3420		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	1599	135	7
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	49	1741	0	0
Confl. Peds. (#/hr)	4		2	
Heavy Vehicles (%)	0%	4%	4%	25%
Turn Type	pm+pt	NA		
Protected Phases	5	2		
Permitted Phases	2			
Actuated Green, G (s)	143.3	135.6		
Effective Green, g (s)	145.5	137.6		
Actuated g/C Ratio	0.66	0.63		
Clearance Time (s)	7.1	7.1		
Vehicle Extension (s)	3.0	4.0		
Lane Grp Cap (vph)	234	2139		
v/s Ratio Prot	c0.01	c0.51		
v/s Ratio Perm	0.13			
v/c Ratio	0.21	0.81		
Uniform Delay, d1	16.2	31.4		
Progression Factor	0.87	0.62		
Incremental Delay, d2	0.3	2.8		
Delay (s)	14.5	22.3		
Level of Service	B	C		
Approach Delay (s)		22.1		
Approach LOS		C		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	16	907	1062
v/c Ratio	0.06	0.18	0.22
Control Delay	0.4	0.1	0.6
Queue Delay	0.0	0.0	0.1
Total Delay	0.4	0.1	0.7
Queue Length 50th (ft)	0	0	32
Queue Length 95th (ft)	0	0	35
Internal Link Dist (ft)	220	381	521
Turn Bay Length (ft)			
Base Capacity (vph)	344	5085	4849
Starvation Cap Reductn	0	0	2167
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.05	0.18	0.40

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	16	0	880	1028	2
Future Volume (vph)	0	16	0	880	1028	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.86			1.00	1.00	
Flt Protected	1.00			1.00	1.00	
Satd. Flow (prot)	1611			5085	5084	
Flt Permitted	1.00			1.00	1.00	
Satd. Flow (perm)	1611			5085	5084	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	16	0	907	1060	2
RTOR Reduction (vph)	16	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	907	1062	0
Confl. Peds. (#/hr)	1		3			3
Turn Type	Prot			NA	NA	
Protected Phases	4			6	2	
Permitted Phases				4		
Actuated Green, G (s)	4.2			210.0	205.8	
Effective Green, g (s)	4.2			210.0	205.8	
Actuated g/C Ratio	0.02			0.95	0.94	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	30			5085	4755	
v/s Ratio Prot	0.00			c0.17	c0.21	
v/s Ratio Perm				0.01		
v/c Ratio	0.01			0.18	0.22	
Uniform Delay, d1	105.9			0.3	0.6	
Progression Factor	1.00			1.00	0.89	
Incremental Delay, d2	0.1			0.0	0.1	
Delay (s)	106.0			0.3	0.6	
Level of Service	F			A	A	
Approach Delay (s)	106.0			0.3	0.6	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	1.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	428	353	31	924	348	1023
v/c Ratio	0.74	0.74	0.48	0.37	0.51	0.94	0.44
Control Delay	126.1	9.1	1.7	148.2	14.0	68.9	41.7
Queue Delay	0.0	25.7	9.1	0.0	0.7	0.0	0.0
Total Delay	126.1	34.8	10.8	148.2	14.7	68.9	41.7
Queue Length 50th (ft)	132	49	0	47	82	306	380
Queue Length 95th (ft)	#244	m68	m0	92	92	#523	435
Internal Link Dist (ft)	420	47			521		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	127	581	739	198	1813	370	2325
Starvation Cap Reductn	0	160	345	0	505	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.02	0.90	0.16	0.71	0.94	0.44

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	27	45	18	87	98	564	12	17	822	65	2	332
Future Volume (vph)	27	45	18	87	98	564	12	17	822	65	2	332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		0.99			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.97			0.92	0.85		1.00	0.99			1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1810			1629	1534		1805	4966			1787
Flt Permitted		0.99			0.99	1.00		0.95	1.00			0.18
Satd. Flow (perm)		1810			1629	1534		1805	4966			344
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.92	0.96	0.96	0.96	0.92	0.96
Adj. Flow (vph)	28	47	19	91	102	588	13	18	856	68	2	346
RTOR Reduction (vph)	0	4	0	0	21	213	0	0	0	0	0	0
Lane Group Flow (vph)	0	90	0	0	407	140	0	31	924	0	0	348
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	3%	7%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		14.1			73.5	73.5		8.1	78.8			113.7
Effective Green, g (s)		15.1			74.5	74.5		9.1	80.3			114.7
Actuated g/C Ratio		0.07			0.34	0.34		0.04	0.36			0.52
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		124			551	519		74	1812			370
v/s Ratio Prot		c0.05			c0.25	0.09		0.02	0.19			c0.12
v/s Ratio Perm												c0.37
v/c Ratio		0.73			0.74	0.27		0.42	0.51			0.94
Uniform Delay, d1		100.4			64.2	53.0		102.9	54.5			38.4
Progression Factor		1.00			0.10	0.13		1.35	0.24			1.00
Incremental Delay, d2		19.7			2.6	0.3		3.8	1.0			31.8
Delay (s)		120.1			8.8	7.4		142.6	13.9			70.2
Level of Service		F			A	A		F	B			E
Approach Delay (s)		120.1			8.1				18.1			
Approach LOS		F			A				B			

Intersection Summary			
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	906	76
Future Volume (vph)	906	76
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	5034	
Flt Permitted	1.00	
Satd. Flow (perm)	5034	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	944	79
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1023	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	98.8	
Effective Green, g (s)	100.3	
Actuated g/C Ratio	0.46	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2295	
v/s Ratio Prot	0.20	
v/s Ratio Perm		
v/c Ratio	0.45	
Uniform Delay, d1	40.9	
Progression Factor	1.00	
Incremental Delay, d2	0.6	
Delay (s)	41.5	
Level of Service	D	
Approach Delay (s)	48.8	
Approach LOS	D	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	471	709	20	158
v/c Ratio	0.22	0.95	0.30	0.87
Control Delay	1.5	92.7	85.8	82.4
Queue Delay	3.0	11.5	0.0	0.4
Total Delay	4.5	104.2	85.8	82.7
Queue Length 50th (ft)	6	513	19	101
Queue Length 95th (ft)	m9	#658	55	#246
Internal Link Dist (ft)	47	1641	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2109	749	80	190
Starvation Cap Reductn	1505	0	0	0
Spillback Cap Reductn	0	46	0	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.78	1.01	0.25	0.84

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	290	11	0	616	51	9	3	7	22	3	124
Future Volume (vph)	141	290	11	0	616	51	9	3	7	22	3	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.96			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.95			0.89	
Flt Protected		0.98			1.00			0.98			0.99	
Satd. Flow (prot)		3448			3531			1697			1642	
Flt Permitted		0.98			1.00			0.98			0.99	
Satd. Flow (perm)		3448			3531			1697			1642	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	150	309	12	0	655	54	10	3	7	23	3	132
RTOR Reduction (vph)	0	1	0	0	3	0	0	7	0	0	84	0
Lane Group Flow (vph)	0	470	0	0	706	0	0	13	0	0	74	0
Confl. Peds. (#/hr)			2	2					12	12		
Heavy Vehicles (%)	2%	3%	0%	0%	1%	2%	0%	0%	0%	13%	0%	0%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		134.7			45.5			6.8			12.2	
Effective Green, g (s)		129.8			46.5			7.8			13.2	
Actuated g/C Ratio		0.59			0.21			0.04			0.06	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		2034			746			60			98	
v/s Ratio Prot		c0.14			c0.20			c0.01			c0.05	
v/s Ratio Perm												
v/c Ratio		0.23			0.95			0.22			0.76	
Uniform Delay, d1		21.4			85.5			103.1			101.8	
Progression Factor		0.07			0.85			1.00			1.00	
Incremental Delay, d2		0.0			20.7			0.7			25.3	
Delay (s)		1.6			93.2			103.8			127.1	
Level of Service		A			F			F			F	
Approach Delay (s)		1.6			93.2			103.8			127.1	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	65.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

2019 Existing SAT Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	29	1418	8	1317	627	6	218	66	14
v/c Ratio	0.14	0.43	0.04	0.61	0.56	0.07	0.80	0.16	0.12
Control Delay	16.8	16.3	7.9	20.4	11.4	69.3	103.1	7.5	63.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	16.3	7.9	20.4	11.4	69.3	103.1	7.5	63.7
Queue Length 50th (ft)	12	222	1	641	375	6	225	6	13
Queue Length 95th (ft)	m22	311	m3	#863	627	22	#331	30	34
Internal Link Dist (ft)		810		1202		100		1657	220
Turn Bay Length (ft)	130		80		600				
Base Capacity (vph)	218	3281	222	2167	1117	94	282	419	264
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.43	0.04	0.61	0.56	0.06	0.77	0.16	0.05

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	27	1301	4	6	1	1212	577	4	0	2	201	2
Future Volume (vph)	27	1301	4	6	1	1212	577	4	0	2	201	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.95		1.00	0.85
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97		0.95	1.00
Satd. Flow (prot)	1805	5034			1621	3539	1583		1756		1787	1624
Flt Permitted	0.11	1.00			0.14	1.00	1.00		0.97		0.95	1.00
Satd. Flow (perm)	203	5034			231	3539	1583		1756		1787	1624
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)	29	1414	4	7	1	1317	627	4	0	2	218	2
RTOR Reduction (vph)	0	0	0	0	0	0	177	0	0	0	0	56
Lane Group Flow (vph)	29	1418	0	0	8	1317	450	0	6	0	218	10
Heavy Vehicles (%)	0%	3%	0%	13%	0%	2%	2%	0%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	85.1	81.1			79.9	78.5	78.5		1.5		21.8	21.8
Effective Green, g (s)	87.1	83.1			81.9	80.5	80.5		2.5		22.8	22.8
Actuated g/C Ratio	0.58	0.55			0.55	0.54	0.54		0.02		0.15	0.15
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	171	2788			148	1899	849		29		271	246
v/s Ratio Prot	c0.01	c0.28			0.00	c0.37			c0.00		c0.12	0.01
v/s Ratio Perm	0.09				0.03		0.28					
v/c Ratio	0.17	0.51			0.05	0.69	0.53		0.21		0.80	0.04
Uniform Delay, d1	19.2	20.8			16.7	25.6	22.5		72.8		61.4	54.3
Progression Factor	1.11	0.94			0.48	0.83	1.03		1.00		1.34	1.00
Incremental Delay, d2	0.4	0.6			0.1	1.9	2.1		3.5		17.6	0.1
Delay (s)	21.7	20.2			8.2	23.1	25.3		76.3		99.7	54.4
Level of Service	C	C			A	C	C		E		F	D
Approach Delay (s)		20.2				23.7			76.3			89.2
Approach LOS		C				C			E			F

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	59	3	1	9
Future Volume (vph)	59	3	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.90	
Flt Protected			0.99	
Satd. Flow (prot)			1693	
Flt Permitted			0.99	
Satd. Flow (perm)			1693	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	3	1	10
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	14	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.3	
Effective Green, g (s)			8.3	
Actuated g/C Ratio			0.06	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			93	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.15	
Uniform Delay, d1			67.5	
Progression Factor			1.00	
Incremental Delay, d2			0.8	
Delay (s)			68.2	
Level of Service			E	
Approach Delay (s)			68.2	
Approach LOS			E	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	62	1280	154	1126	74	108	24	38
v/c Ratio	0.15	0.51	0.41	0.42	0.53	0.43	0.19	0.21
Control Delay	3.4	7.0	16.6	0.6	76.8	15.1	62.9	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	7.0	16.6	0.6	76.8	15.1	62.9	33.9
Queue Length 50th (ft)	10	127	27	4	70	0	22	15
Queue Length 95th (ft)	m18	158	109	3	119	57	50	50
Internal Link Dist (ft)		1037		810	420			173
Turn Bay Length (ft)	165		150				120	
Base Capacity (vph)	637	2510	559	2674	415	537	377	510
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.51	0.28	0.42	0.18	0.20	0.06	0.07

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1111	66	142	1026	10	54	14	99	22	15	20
Future Volume (vph)	57	1111	66	142	1026	10	54	14	99	22	15	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3509		1805	3535			1827	1568	1719	1685	
Flt Permitted	0.23	1.00		0.17	1.00			0.74	1.00	0.71	1.00	
Satd. Flow (perm)	443	3509		318	3535			1413	1568	1283	1685	
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)	62	1208	72	154	1115	11	59	15	108	24	16	22
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	97	0	20	0
Lane Group Flow (vph)	62	1279	0	154	1126	0	0	74	11	24	18	0
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	0%	3%	5%	7%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	111.9	106.2		121.9	111.2			13.8	13.8	13.8	13.8	
Effective Green, g (s)	113.9	107.2		123.9	112.2			14.8	14.8	14.8	14.8	
Actuated g/C Ratio	0.76	0.71		0.83	0.75			0.10	0.10	0.10	0.10	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	397	2507		378	2644			139	154	126	166	
v/s Ratio Prot	0.01	c0.36		c0.03	0.32						0.01	
v/s Ratio Perm	0.11			0.30				c0.05	0.01	0.02		
v/c Ratio	0.16	0.51		0.41	0.43			0.53	0.07	0.19	0.11	
Uniform Delay, d1	4.8	9.6		5.9	7.0			64.3	61.3	62.1	61.6	
Progression Factor	0.79	0.58		4.76	0.03			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.7		0.6	0.4			3.9	0.2	0.7	0.3	
Delay (s)	3.9	6.3		28.8	0.6			68.2	61.5	62.8	61.9	
Level of Service	A	A		C	A			E	E	E	E	
Approach Delay (s)		6.1			4.0			64.2			62.3	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	256	917	24	90	873	79	81	570	98	167	622	373
v/c Ratio	0.64	0.56	0.03	0.55	0.57	0.09	0.53	0.77	0.18	0.52	0.79	0.62
Control Delay	91.6	29.9	0.5	66.0	24.3	1.5	78.0	63.2	2.1	99.0	61.5	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1
Total Delay	91.6	29.9	0.5	66.0	24.3	1.5	78.0	63.2	2.1	99.0	61.9	17.4
Queue Length 50th (ft)	136	170	0	80	85	1	77	278	0	88	159	74
Queue Length 95th (ft)	186	370	m1	132	314	5	135	334	15	129	314	358
Internal Link Dist (ft)		798			1037			554			381	
Turn Bay Length (ft)	600		500	200		350	200		225	300		200
Base Capacity (vph)	431	1639	890	164	1544	874	177	855	530	411	948	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	71	9
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.56	0.03	0.55	0.57	0.09	0.46	0.67	0.18	0.41	0.71	0.62

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	880	23	86	838	76	78	547	94	160	597	358
Future Volume (vph)	246	880	23	86	838	76	78	547	94	160	597	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1535	1805	3539	1536	1787	3539	1519	3433	3539	1569
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1535	1805	3539	1536	1787	3539	1519	3433	3539	1569
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	256	917	24	90	873	79	81	570	98	167	622	373
RTOR Reduction (vph)	0	0	11	0	0	37	0	0	69	0	0	82
Lane Group Flow (vph)	256	917	13	90	873	42	81	570	29	167	622	291
Confl. Peds. (#/hr)	1		1	1		1	1		4	4		1
Heavy Vehicles (%)	2%	2%	4%	0%	2%	4%	1%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	15.9	67.9	79.3	12.2	63.9	76.6	11.4	29.9	42.1	12.7	32.1	48.0
Effective Green, g (s)	17.4	69.4	82.3	13.7	65.4	79.6	12.9	31.4	45.1	14.2	33.6	51.0
Actuated g/C Ratio	0.12	0.46	0.55	0.09	0.44	0.53	0.09	0.21	0.30	0.09	0.22	0.34
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	398	1637	842	164	1543	815	153	740	456	324	792	533
v/s Ratio Prot	0.07	c0.26	0.00	0.05	c0.25	0.00	0.05	0.16	0.01	c0.05	c0.18	0.06
v/s Ratio Perm			0.01			0.02			0.01			0.12
v/c Ratio	0.64	0.56	0.02	0.55	0.57	0.05	0.53	0.77	0.06	0.52	0.79	0.55
Uniform Delay, d1	63.3	29.2	15.4	65.2	31.7	17.0	65.6	55.9	37.4	64.6	54.8	40.1
Progression Factor	1.35	0.94	1.00	0.82	0.68	0.38	1.00	1.00	1.00	1.45	0.99	0.54
Incremental Delay, d2	3.0	1.2	0.0	3.5	1.4	0.0	3.3	5.0	0.1	1.4	5.1	1.1
Delay (s)	88.2	28.7	15.4	57.2	23.1	6.5	68.9	60.9	37.5	95.3	59.3	22.6
Level of Service	F	C	B	E	C	A	E	E	D	F	E	C
Approach Delay (s)		41.1			24.8			58.7			52.7	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1139	3	0	1289	7	0	0	11	0	0	12
Future Vol, veh/h	0	1139	3	0	1289	7	0	0	11	0	0	12
Conflicting Peds, #/hr	5	0	3	3	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1174	3	0	1329	7	0	0	11	0	0	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1341	0	0	1180	0	0	1844	2520	592	1925	2518	673
Stage 1	-	-	-	-	-	-	1179	1179	-	1338	1338	-
Stage 2	-	-	-	-	-	-	665	1341	-	587	1180	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	510	-	-	588	-	-	46	28	449	40	28	398
Stage 1	-	-	-	-	-	-	202	262	-	161	220	-
Stage 2	-	-	-	-	-	-	416	219	-	463	262	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	508	-	-	587	-	-	44	28	448	39	28	396
Mov Cap-2 Maneuver	-	-	-	-	-	-	44	28	-	39	28	-
Stage 1	-	-	-	-	-	-	202	261	-	160	219	-
Stage 2	-	-	-	-	-	-	403	218	-	451	261	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13.2	14.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	448	508	-	-	587	-	-	396
HCM Lane V/C Ratio	0.025	-	-	-	-	-	-	0.031
HCM Control Delay (s)	13.2	0	-	-	0	-	-	14.4
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Lane Group	EBT	WBT	NBT	SBL	SBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	86	39	46	11	7	8	1184	43	1315
v/c Ratio	0.51	0.32	0.41	0.10	0.06	0.03	0.58	0.16	0.58
Control Delay	74.8	72.6	75.8	64.5	63.0	18.2	25.9	17.0	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	72.6	75.8	64.5	63.0	18.2	25.9	17.0	18.5
Queue Length 50th (ft)	82	37	44	10	6	0	413	16	285
Queue Length 95th (ft)	138	76	86	31	23	m8	358	m35	465
Internal Link Dist (ft)	220	220	220		220		755		420
Turn Bay Length (ft)				175		120		150	
Base Capacity (vph)	219	180	166	161	177	317	2039	326	2259
Starvation Cap Reductn	0	0	0	0	0	0	66	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.22	0.28	0.07	0.04	0.03	0.60	0.13	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL2	EBL	EBT	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT
Lane Configurations												
Traffic Volume (vph)	1	60	19	2	3	24	7	1	3	14	5	4
Future Volume (vph)	1	60	19	2	3	24	7	1	3	14	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0				5.0					5.0
Lane Util. Factor			1.00				1.00					1.00
Frpb, ped/bikes			1.00				1.00					0.98
Flpb, ped/bikes			1.00				1.00					0.97
Frt			1.00				0.99					0.94
Flt Protected			0.96				0.97					0.98
Satd. Flow (prot)			1825				1801					1658
Flt Permitted			0.96				0.97					0.86
Satd. Flow (perm)			1825				1801					1451
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	62	20	2	3	25	7	1	3	15	5	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	86	0	0	0	39	0	0	0	0	46
Confl. Peds. (#/hr)				7	4			3		7	3	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	Split	NA		Perm	Split	NA			Perm	Perm	NA
Protected Phases		3	3			4	4					7
Permitted Phases	3				4					7	7	
Actuated Green, G (s)			12.4				7.6					8.9
Effective Green, g (s)			13.9				9.1					10.4
Actuated g/C Ratio			0.09				0.06					0.07
Clearance Time (s)			6.5				6.5					6.5
Vehicle Extension (s)			3.0				3.0					3.0
Lane Grp Cap (vph)			169				109					100
v/s Ratio Prot			c0.05				c0.02					
v/s Ratio Perm												c0.03
v/c Ratio			0.51				0.36					0.46
Uniform Delay, d1			64.8				67.6					67.1
Progression Factor			1.00				1.00					1.00
Incremental Delay, d2			2.4				2.0					3.3
Delay (s)			67.2				69.7					70.4
Level of Service			E				E					E
Approach Delay (s)			67.2				69.7					70.4
Approach LOS			E				E					E

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.7
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2
Lane Configurations												
Traffic Volume (vph)	20	1	8	3	1	4	2	2	6	1044	77	15
Future Volume (vph)	20	1	8	3	1	4	2	2	6	1044	77	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0				5.6	5.1		
Lane Util. Factor				1.00	1.00				1.00	0.95		
Frpb, ped/bikes				1.00	0.92				1.00	1.00		
Flpb, ped/bikes				0.99	1.00				1.00	1.00		
Frt				1.00	0.87				1.00	0.99		
Flt Protected				0.95	1.00				0.95	1.00		
Satd. Flow (prot)				1784	1527				1805	3495		
Flt Permitted				0.76	1.00				0.14	1.00		
Satd. Flow (perm)				1420	1527				259	3495		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	1	8	3	1	4	2	2	6	1088	80	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	11	7	0	0	0	8	1184	0	0
Confl. Peds. (#/hr)		2		2		7	3	3	3		2	4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%
Turn Type			Perm	Perm	NA			custom	pm+pt	NA		
Protected Phases					7				1	6		
Permitted Phases			7	7				1	6			
Actuated Green, G (s)				8.9	8.9				82.7	81.4		
Effective Green, g (s)				10.4	10.4				85.7	83.4		
Actuated g/C Ratio				0.07	0.07				0.57	0.56		
Clearance Time (s)				6.5	6.5				7.1	7.1		
Vehicle Extension (s)				3.0	3.0				3.0	4.0		
Lane Grp Cap (vph)				98	105				176	1943		
v/s Ratio Prot					0.00				0.00	0.34		
v/s Ratio Perm				0.01					0.03			
v/c Ratio				0.11	0.07				0.05	0.61		
Uniform Delay, d1				65.5	65.3				16.7	22.4		
Progression Factor				1.00	1.00				1.29	1.01		
Incremental Delay, d2				0.5	0.3				0.1	1.3		
Delay (s)				66.0	65.5				21.6	24.0		
Level of Service				E	E				C	C		
Approach Delay (s)					65.8					24.0		
Approach LOS					E					C		

Intersection Summary

Movement	SWL2	SWL	SWT	SWR	SWR2
Lane Configurations					
Traffic Volume (vph)	27	14	1206	52	5
Future Volume (vph)	27	14	1206	52	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	5.1		
Lane Util. Factor		1.00	0.95		
Frpb, ped/bikes		1.00	1.00		
Flpb, ped/bikes		1.00	1.00		
Frt		1.00	0.99		
Flt Protected		0.95	1.00		
Satd. Flow (prot)		1805	3515		
Flt Permitted		0.14	1.00		
Satd. Flow (perm)		273	3515		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	15	1256	54	5
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	43	1315	0	0
Confl. Peds. (#/hr)	2	4			3
Heavy Vehicles (%)	0%	0%	2%	0%	0%
Turn Type	pm+pt	pm+pt	NA		
Protected Phases	5	5	2		
Permitted Phases	2	2			
Actuated Green, G (s)		92.1	86.1		
Effective Green, g (s)		95.1	88.1		
Actuated g/C Ratio		0.63	0.59		
Clearance Time (s)		7.1	7.1		
Vehicle Extension (s)		3.0	4.0		
Lane Grp Cap (vph)		249	2064		
v/s Ratio Prot		c0.01	c0.37		
v/s Ratio Perm		0.10			
v/c Ratio		0.17	0.64		
Uniform Delay, d1		14.8	20.4		
Progression Factor		1.21	0.90		
Incremental Delay, d2		0.3	1.3		
Delay (s)		18.2	19.6		
Level of Service		B	B		
Approach Delay (s)			19.6		
Approach LOS			B		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	8	942	1180
v/c Ratio	0.04	0.19	0.24
Control Delay	0.2	0.1	0.2
Queue Delay	0.0	0.0	0.0
Total Delay	0.2	0.1	0.2
Queue Length 50th (ft)	0	0	0
Queue Length 95th (ft)	0	0	12
Internal Link Dist (ft)	220	381	521
Turn Bay Length (ft)			
Base Capacity (vph)	350	5085	4965
Starvation Cap Reductn	0	0	535
Spillback Cap Reductn	0	0	28
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.02	0.19	0.27

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	8	0	895	1116	5
Future Volume (vph)	0	8	0	895	1116	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.86			1.00	1.00	
Flt Protected	1.00			1.00	1.00	
Satd. Flow (prot)	1611			5085	5082	
Flt Permitted	1.00			1.00	1.00	
Satd. Flow (perm)	1611			5085	5082	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	8	0	942	1175	5
RTOR Reduction (vph)	8	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	942	1180	0
Confl. Peds. (#/hr)	1		4			4
Turn Type	Prot			NA	NA	
Protected Phases	4			6	2	
Permitted Phases				4		
Actuated Green, G (s)	1.4			140.0	138.6	
Effective Green, g (s)	1.4			140.0	138.6	
Actuated g/C Ratio	0.01			0.93	0.92	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	15			5085	4695	
v/s Ratio Prot	0.00			c0.17	c0.23	
v/s Ratio Perm				0.01		
v/c Ratio	0.00			0.19	0.25	
Uniform Delay, d1	73.6			0.4	0.6	
Progression Factor	1.00			1.00	0.30	
Incremental Delay, d2	0.1			0.0	0.1	
Delay (s)	73.7			0.4	0.3	
Level of Service	E			A	A	
Approach Delay (s)	73.7			0.4	0.3	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	169	232	26	878	269	1112
v/c Ratio	0.37	0.33	0.37	0.25	0.65	0.64	0.51
Control Delay	62.4	4.5	2.8	87.3	41.4	35.0	34.7
Queue Delay	0.0	1.1	1.1	0.0	0.0	0.0	0.0
Total Delay	62.4	5.6	3.9	87.3	41.4	35.0	34.7
Queue Length 50th (ft)	53	9	22	26	134	152	300
Queue Length 95th (ft)	100	20	51	61	210	#398	422
Internal Link Dist (ft)	420	47			521		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	187	554	667	165	1345	423	2199
Starvation Cap Reductn	0	212	247	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.49	0.55	0.16	0.65	0.64	0.51

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	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	25	23	14	58	39	292	12	13	808	44	5	256
Future Volume (vph)	25	23	14	58	39	292	12	13	808	44	5	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frt		0.97			0.94	0.85		1.00	0.99			1.00
Flt Protected		0.98			0.98	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1807			1562	1504		1752	5049			1787
Flt Permitted		0.98			0.98	1.00		0.95	1.00			0.14
Satd. Flow (perm)		1807			1562	1504		1752	5049			269
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.97	0.97	0.97	0.92	0.97
Adj. Flow (vph)	26	24	14	60	40	301	13	13	833	45	5	264
RTOR Reduction (vph)	0	6	0	0	20	160	0	0	0	0	0	0
Lane Group Flow (vph)	0	58	0	0	149	72	0	26	878	0	0	269
Heavy Vehicles (%)	0%	0%	0%	3%	20%	2%	0%	6%	2%	1%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		Prot	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases												6
Actuated Green, G (s)		12.8			45.5	45.5		5.4	38.4			73.0
Effective Green, g (s)		13.8			46.5	46.5		6.4	39.9			74.0
Actuated g/C Ratio		0.09			0.31	0.31		0.04	0.27			0.49
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		166			484	466		74	1343			424
v/s Ratio Prot		c0.03			c0.10	0.05		0.01	0.17			c0.12
v/s Ratio Perm												c0.19
v/c Ratio		0.35			0.31	0.15		0.35	0.65			0.63
Uniform Delay, d1		63.9			39.5	37.5		69.8	48.9			26.4
Progression Factor		1.00			0.09	0.33		1.22	0.79			1.00
Incremental Delay, d2		1.5			0.8	0.4		2.8	2.5			3.1
Delay (s)		65.4			4.5	12.6		87.9	41.3			29.5
Level of Service		E			A	B		F	D			C
Approach Delay (s)		65.4			9.2				42.6			
Approach LOS		E			A				D			

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1047	32
Future Volume (vph)	1047	32
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5066	
Flt Permitted	1.00	
Satd. Flow (perm)	5066	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	1079	33
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1112	0
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	60.8	
Effective Green, g (s)	62.3	
Actuated g/C Ratio	0.42	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2104	
v/s Ratio Prot	0.22	
v/s Ratio Perm		
v/c Ratio	0.53	
Uniform Delay, d1	32.8	
Progression Factor	1.00	
Incremental Delay, d2	1.0	
Delay (s)	33.8	
Level of Service	C	
Approach Delay (s)	33.0	
Approach LOS	C	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	357	336	14	119
v/c Ratio	0.16	0.54	0.17	0.47
Control Delay	2.1	69.6	59.0	6.3
Queue Delay	1.8	0.1	0.0	0.0
Total Delay	3.8	69.7	59.0	6.3
Queue Length 50th (ft)	8	158	10	0
Queue Length 95th (ft)	13	220	35	0
Internal Link Dist (ft)	47	1657	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2151	825	137	299
Starvation Cap Reductn	1603	0	0	0
Spillback Cap Reductn	0	40	0	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.43	0.10	0.40

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	231	7	0	287	22	8	1	4	20	0	89
Future Volume (vph)	90	231	7	0	287	22	8	1	4	20	0	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.96			0.89	
Flt Protected		0.99			1.00			0.97			0.99	
Satd. Flow (prot)		3524			3475			1738			1649	
Flt Permitted		0.99			1.00			0.97			0.99	
Satd. Flow (perm)		3524			3475			1738			1649	
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)	98	251	8	0	312	24	9	1	4	22	0	97
RTOR Reduction (vph)	0	1	0	0	4	0	0	4	0	0	114	0
Lane Group Flow (vph)	0	356	0	0	332	0	0	10	0	0	5	0
Confl. Peds. (#/hr)									8	8		
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		92.7			25.7			5.8			5.0	
Effective Green, g (s)		87.8			26.7			6.8			6.0	
Actuated g/C Ratio		0.59			0.18			0.05			0.04	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		2062			618			78			65	
v/s Ratio Prot		c0.10			c0.10			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio		0.17			0.54			0.13			0.07	
Uniform Delay, d1		14.3			56.0			68.8			69.3	
Progression Factor		0.16			1.23			1.00			1.00	
Incremental Delay, d2		0.0			1.6			0.3			0.2	
Delay (s)		2.3			70.3			69.0			69.5	
Level of Service		A			E			E			E	
Approach Delay (s)		2.3			70.3			69.0			69.5	
Approach LOS		A			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	134	322	329	225	20	417	433	80	21	433	51	37
Average Queue (ft)	15	121	125	112	1	196	208	7	1	261	11	4
95th Queue (ft)	64	264	266	225	13	372	392	41	11	390	38	21
Link Distance (ft)		764	764			1199	1199	1199	114	1675	1675	213
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		7	2	1		23						
Queuing Penalty (veh)		4	10	9		0						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	18	248	246	146	150	138	164	218	38	39
Average Queue (ft)	1	81	89	62	31	30	71	104	3	3
95th Queue (ft)	10	201	216	132	138	133	137	181	19	20
Link Distance (ft)		978	978		764	764	447	447		149
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	165			150					120	
Storage Blk Time (%)		2		1	1					
Queuing Penalty (veh)		0		4	1					

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	210	228	391	394	26	224	586	552	182	225	490	498
Average Queue (ft)	118	137	229	245	2	179	281	237	35	40	307	307
95th Queue (ft)	188	206	352	366	14	278	709	654	166	157	459	467
Link Distance (ft)			732	732			978	978			514	514
Upstream Blk Time (%)							1	1			0	0
Queuing Penalty (veh)							4	4			0	0
Storage Bay Dist (ft)	600	600			500	200			350	200		
Storage Blk Time (%)						40	3	4	0	0	34	25
Queuing Penalty (veh)						102	4	4	0	0	9	21

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	B127	SB	SB	SB	SB	SB
Directions Served	R	T	L	L	T	T	R
Maximum Queue (ft)	250	2	175	181	347	356	225
Average Queue (ft)	92	0	80	81	246	255	115
95th Queue (ft)	270	2	150	147	352	373	285
Link Distance (ft)		697		340	340	340	
Upstream Blk Time (%)					6	10	
Queuing Penalty (veh)					19	30	
Storage Bay Dist (ft)	225		300				200
Storage Blk Time (%)	0					39	0
Queuing Penalty (veh)	0					88	1

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	EB	WB	NB	SB
Directions Served	TR	TR	LTR	LTR
Maximum Queue (ft)	4	7	17	24
Average Queue (ft)	0	0	2	2
95th Queue (ft)	4	2	12	14
Link Distance (ft)	391	732	254	91
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	SW	SW	SW
Directions Served	<LTR>	LTR	<LTR>	<L	TR	T	TR>	<L	T	TR>
Maximum Queue (ft)	233	81	141	113	36	379	385	120	273	309
Average Queue (ft)	173	26	48	35	5	164	168	26	120	141
95th Queue (ft)	250	64	109	94	22	306	315	78	238	265
Link Distance (ft)	188	107	225		231	713	713		391	391
Upstream Blk Time (%)	29	0							0	0
Queuing Penalty (veh)	0	0							0	0
Storage Bay Dist (ft)				175				150		
Storage Blk Time (%)				0		22		0	7	
Queuing Penalty (veh)				0		0		1	2	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	LR	T	T	T	T	T	TR
Maximum Queue (ft)	31	67	64	85	54	147	170
Average Queue (ft)	5	6	6	7	3	15	21
95th Queue (ft)	24	42	44	50	27	85	101
Link Distance (ft)	242	340	340	340	526	526	526
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	UL	T	T	TR
Maximum Queue (ft)	453	56	67	112	331	382	380	421	406	399	361
Average Queue (ft)	336	24	42	17	154	182	190	239	199	234	219
95th Queue (ft)	529	55	67	65	305	348	343	391	347	359	330
Link Distance (ft)	434	38	38		526	526	526		958	958	958
Upstream Blk Time (%)	26	12	48								
Queuing Penalty (veh)	0	30	120								
Storage Bay Dist (ft)				135				470			
Storage Blk Time (%)				0	11			0	0		
Queuing Penalty (veh)				0	1			1	0		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	53	49	348	343	97	319
Average Queue (ft)	25	9	200	193	28	280
95th Queue (ft)	46	34	318	308	71	349
Link Distance (ft)	38	38	1675	1675	158	259
Upstream Blk Time (%)	4	2				84
Queuing Penalty (veh)	9	3				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 482

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	110	232	208	182	46	869	956	376	52	1291	906	60
Average Queue (ft)	16	100	91	77	3	443	462	23	10	996	392	11
95th Queue (ft)	58	210	191	166	24	905	930	185	35	1393	934	38
Link Distance (ft)		765	765			1192	1192	1192	111	1634	1634	213
Upstream Blk Time (%)						0	0			0		
Queuing Penalty (veh)						1	1			0		
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		6	0	0		25						
Queuing Penalty (veh)		1	1	0		1						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	77	142	155	157	170	126	285	127	45	72
Average Queue (ft)	21	39	38	66	20	18	152	58	10	22
95th Queue (ft)	58	106	104	133	92	70	256	101	35	59
Link Distance (ft)		978	978		765	765	447	447		149
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	165			150					120	
Storage Blk Time (%)		0		1	0					
Queuing Penalty (veh)		0		11	0					

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	184	198	230	234	33	224	572	604	375	225	469	465
Average Queue (ft)	87	108	106	114	4	90	279	306	97	151	276	265
95th Queue (ft)	160	175	202	203	21	205	539	571	340	266	434	428
Link Distance (ft)			740	740			978	978			513	513
Upstream Blk Time (%)											0	0
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)	600	600			500	200			350	200		
Storage Blk Time (%)						0	15	9	0	7	25	18
Queuing Penalty (veh)						0	13	11	0	18	24	12

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	B127	SB	SB	SB	SB	SB
Directions Served	R	T	L	L	T	T	R
Maximum Queue (ft)	250	6	174	189	333	354	225
Average Queue (ft)	57	0	88	99	197	223	142
95th Queue (ft)	223	8	155	166	325	370	275
Link Distance (ft)		697		340	340	340	
Upstream Blk Time (%)					3	7	
Queuing Penalty (veh)					12	25	
Storage Bay Dist (ft)	225		300				200
Storage Blk Time (%)	0					23	8
Queuing Penalty (veh)	0					73	22

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	WB	WB	NB	SB
Directions Served	T	TR	LTR	LTR
Maximum Queue (ft)	266	286	26	43
Average Queue (ft)	57	70	6	11
95th Queue (ft)	191	214	24	35
Link Distance (ft)	740	740	126	77
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)	7			
Queuing Penalty (veh)	0			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	NE	SW	SW	SW
Directions Served	LTR>	LTR>	<LTR>	<L	TR>	<L	T	TR>	<L	T	TR>
Maximum Queue (ft)	208	127	214	66	37	37	207	211	164	392	402
Average Queue (ft)	143	43	99	16	5	4	74	77	35	288	306
95th Queue (ft)	228	97	193	51	23	17	166	168	116	473	479
Link Distance (ft)	189	146	225		232		713	713		354	354
Upstream Blk Time (%)	12	0	1							13	16
Queuing Penalty (veh)	0	0	0							110	136
Storage Bay Dist (ft)				175		120			150		
Storage Blk Time (%)							6		1	27	
Queuing Penalty (veh)							0		4	13	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	LR	T	T	T	T	T	TR
Maximum Queue (ft)	43	97	112	103	77	194	252
Average Queue (ft)	13	7	8	10	5	17	31
95th Queue (ft)	39	44	51	56	35	90	140
Link Distance (ft)	242	340	340	340	526	526	526
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	UL	T	T	TR
Maximum Queue (ft)	254	56	57	91	133	146	166	480	693	648	578
Average Queue (ft)	113	23	40	30	51	73	95	347	300	315	305
95th Queue (ft)	224	54	63	74	118	134	155	545	704	630	491
Link Distance (ft)	434	38	38		526	526	526		958	958	958
Upstream Blk Time (%)	0	13	47						0	0	
Queuing Penalty (veh)	0	48	175						0	0	
Storage Bay Dist (ft)				135				470			
Storage Blk Time (%)				0	0			13	0		
Queuing Penalty (veh)				1	0			40	0		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	63	47	1101	1104	76	289
Average Queue (ft)	25	12	746	744	23	235
95th Queue (ft)	52	38	1188	1200	59	338
Link Distance (ft)	38	38	1634	1634	158	259
Upstream Blk Time (%)	5	3				61
Queuing Penalty (veh)	11	6				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 769

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	124	304	294	216	61	467	486	162	44	328	126	49
Average Queue (ft)	15	150	139	118	5	161	174	26	8	195	47	10
95th Queue (ft)	62	252	239	198	32	387	398	100	30	294	98	33
Link Distance (ft)		764	764			1190	1190	1190	109	1661	1661	213
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		11	2	1		17						
Queuing Penalty (veh)		3	7	3		1						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	87	168	175	163	193	134	139	105	72	99
Average Queue (ft)	31	58	71	76	16	13	60	46	22	35
95th Queue (ft)	68	133	150	150	93	67	117	84	60	81
Link Distance (ft)		981	981		764	764	447	447		205
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	165			150					120	
Storage Blk Time (%)		0		2	0				0	0
Queuing Penalty (veh)		0		12	0				0	0

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	169	181	342	353	55	224	407	422	210	214	324	331
Average Queue (ft)	93	111	195	203	9	76	201	210	28	69	187	178
95th Queue (ft)	156	166	304	310	36	193	361	367	147	163	278	273
Link Distance (ft)			769	769			981	981			515	515
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	600	600			500	200			350	200		
Storage Blk Time (%)						0	9	2	0	0	7	3
Queuing Penalty (veh)						1	8	1	0	0	6	3

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	218	129	145	346	352	225
Average Queue (ft)	29	55	65	159	170	104
95th Queue (ft)	134	110	122	314	336	252
Link Distance (ft)			340	340	340	
Upstream Blk Time (%)				2	3	
Queuing Penalty (veh)				6	11	
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0				12	3
Queuing Penalty (veh)	0				44	9

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	WB	WB	NB	SB
Directions Served	T	TR	LTR	LTR
Maximum Queue (ft)	38	55	25	39
Average Queue (ft)	2	4	6	11
95th Queue (ft)	18	27	21	36
Link Distance (ft)	769	769	135	122
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)	0			
Queuing Penalty (veh)	0			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	NE	SW	SW	SW
Directions Served	<LTR>	<LTR>	<LTR>	<L	TR>	<L	T	TR>	<L	T	TR>
Maximum Queue (ft)	158	93	92	37	27	72	286	277	163	359	367
Average Queue (ft)	67	30	25	7	3	7	135	131	28	219	247
95th Queue (ft)	133	73	67	27	17	37	231	221	114	359	384
Link Distance (ft)	188	154	225		229		713	713		328	328
Upstream Blk Time (%)	0									1	3
Queuing Penalty (veh)	0									8	20
Storage Bay Dist (ft)				175		120			150		
Storage Blk Time (%)							14		0	18	
Queuing Penalty (veh)							1		0	8	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	LR	T	T	T	T	T	TR
Maximum Queue (ft)	35	72	85	82	123	207	282
Average Queue (ft)	8	4	5	6	6	18	28
95th Queue (ft)	30	32	36	39	66	111	146
Link Distance (ft)	242	340	340	340	526	526	526
Upstream Blk Time (%)					0	0	
Queuing Penalty (veh)					0	0	
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	UL	T	T	TR
Maximum Queue (ft)	130	66	52	116	228	246	275	384	356	420	463
Average Queue (ft)	50	23	29	23	127	144	162	188	186	239	267
95th Queue (ft)	103	60	62	71	204	221	243	333	312	369	417
Link Distance (ft)	434	38	38		526	526	526		958	958	958
Upstream Blk Time (%)		10	15								
Queuing Penalty (veh)		18	29								
Storage Bay Dist (ft)				135				470			
Storage Blk Time (%)					17			0			
Queuing Penalty (veh)					4			1			

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	48	39	199	213	47	156
Average Queue (ft)	23	11	118	124	12	70
95th Queue (ft)	46	34	187	199	38	133
Link Distance (ft)	38	38	1661	1661	158	259
Upstream Blk Time (%)	4	1				
Queuing Penalty (veh)	6	2				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 212

Appendix G

Vehicular Capacity Analysis Worksheets – Future (2023) Conditions without Development

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

2023 Future Background AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	40	2208	1	833	251	1	272	11	5
v/c Ratio	0.10	0.67	0.01	0.42	0.25	0.02	0.82	0.02	0.06
Control Delay	8.8	12.1	39.0	44.8	24.5	89.0	123.2	0.1	82.2
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	12.3	39.0	44.8	24.5	89.0	123.2	0.1	82.2
Queue Length 50th (ft)	5	97	1	440	125	1	314	0	6
Queue Length 95th (ft)	m19	#1178	m4	641	229	9	m402	m0	22
Internal Link Dist (ft)		810		1204		100		1665	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	420	3320	119	1980	1011	67	379	487	175
Starvation Cap Reductn	0	381	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.75	0.01	0.42	0.25	0.01	0.72	0.02	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	37	2030	1	1	0	766	231	1	0	250	1	9
Future Volume (vph)	37	2030	1	1	0	766	231	1	0	250	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0	6.3	6.3	
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00	1.00	1.00	
Frt	1.00	1.00			1.00	1.00	0.85		1.00	1.00	0.86	
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (prot)	1805	4987			1805	3223	1524		1805	1687	1641	
Flt Permitted	0.26	1.00			0.04	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (perm)	490	4987			73	3223	1524		1805	1687	1641	
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)	40	2207	1	1	0	833	251	1	0	272	1	10
RTOR Reduction (vph)	0	0	0	0	0	0	86	0	0	0	9	0
Lane Group Flow (vph)	40	2208	0	0	1	833	165	0	1	272	2	0
Heavy Vehicles (%)	0%	4%	0%	0%	0%	12%	6%	0%	0%	7%	0%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA	Split	NA	
Protected Phases	5	2		1	1	6		7	7	3	3	
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	114.6	108.5			104.8	103.6	103.6		1.3	36.3	36.3	
Effective Green, g (s)	116.6	110.5			106.8	105.6	105.6		2.3	37.3	37.3	
Actuated g/C Ratio	0.61	0.58			0.56	0.56	0.56		0.01	0.20	0.20	
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0	7.3	7.3	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	5.0	5.0	
Lane Grp Cap (vph)	349	2900			61	1791	847		21	331	322	
v/s Ratio Prot	c0.00	c0.44			0.00	0.26			c0.00	c0.16	0.00	
v/s Ratio Perm	0.07				0.01		0.11					
v/c Ratio	0.11	0.76			0.02	0.47	0.19		0.05	0.82	0.01	
Uniform Delay, d1	16.4	29.8			25.9	25.3	21.0		92.8	73.2	61.4	
Progression Factor	0.54	0.45			1.87	1.85	3.59		1.00	1.43	1.00	
Incremental Delay, d2	0.1	1.3			0.1	0.9	0.5		0.9	16.2	0.0	
Delay (s)	8.9	14.6			48.7	47.7	75.9		93.7	120.5	61.5	
Level of Service	A	B			D	D	E		F	F	E	
Approach Delay (s)		14.5				54.2			93.7		118.2	
Approach LOS		B				D			F		F	

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NEL2	NEL	NER
Lane Configurations			
Traffic Volume (vph)	2	0	3
Future Volume (vph)	2	0	3
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)		5.6	
Lane Util. Factor		1.00	
Frt		0.92	
Flt Protected		0.98	
Satd. Flow (prot)		1427	
Flt Permitted		0.98	
Satd. Flow (perm)		1427	
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	2	0	3
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	5	0
Heavy Vehicles (%)	50%	0%	0%
Turn Type	Prot	Prot	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)		5.8	
Effective Green, g (s)		6.8	
Actuated g/C Ratio		0.04	
Clearance Time (s)		6.6	
Vehicle Extension (s)		3.0	
Lane Grp Cap (vph)		51	
v/s Ratio Prot		c0.00	
v/s Ratio Perm			
v/c Ratio		0.10	
Uniform Delay, d1		88.6	
Progression Factor		1.00	
Incremental Delay, d2		0.8	
Delay (s)		89.5	
Level of Service		F	
Approach Delay (s)		89.5	
Approach LOS		F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	51	1973	75	765	153	185	7	123
v/c Ratio	0.10	0.81	0.49	0.33	0.92	0.57	0.09	0.49
Control Delay	3.4	10.3	59.7	3.6	127.5	43.2	67.3	71.1
Queue Delay	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	11.2	59.7	3.6	127.5	43.3	67.3	71.1
Queue Length 50th (ft)	7	176	47	40	190	110	8	127
Queue Length 95th (ft)	m10	193	119	6	#301	196	25	197
Internal Link Dist (ft)		1037		810	420			201
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	552	2441	163	2326	202	376	99	303
Starvation Cap Reductn	0	220	0	0	0	0	0	0
Spillback Cap Reductn	0	153	0	0	0	4	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.89	0.46	0.33	0.76	0.50	0.07	0.41

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1802	13	69	703	1	33	108	170	6	75	38
Future Volume (vph)	47	1802	13	69	703	1	33	108	170	6	75	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3433		1805	3195			1354	1599	1081	1547	
Flt Permitted	0.34	1.00		0.05	1.00			0.78	1.00	0.46	1.00	
Satd. Flow (perm)	646	3433		97	3195			1067	1599	525	1547	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	1959	14	75	764	1	36	117	185	7	82	41
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	76	0	10	0
Lane Group Flow (vph)	51	1973	0	75	765	0	0	153	109	7	113	0
Heavy Vehicles (%)	0%	5%	10%	0%	13%	0%	2%	50%	1%	67%	0%	50%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	139.8	134.1		143.8	136.1			28.9	28.9	28.9	28.9	
Effective Green, g (s)	141.8	135.1		145.8	137.1			29.9	29.9	29.9	29.9	
Actuated g/C Ratio	0.75	0.71		0.77	0.72			0.16	0.16	0.16	0.16	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	522	2441		152	2305			167	251	82	243	
v/s Ratio Prot	0.00	c0.57		c0.02	0.24						0.07	
v/s Ratio Perm	0.07			0.36				c0.14	0.07	0.01		
v/c Ratio	0.10	0.81		0.49	0.33			0.92	0.43	0.09	0.46	
Uniform Delay, d1	6.5	18.6		26.8	9.7			78.8	72.4	68.4	72.8	
Progression Factor	0.58	0.40		3.94	0.32			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	2.2		2.3	0.4			45.6	1.2	0.5	1.4	
Delay (s)	3.8	9.6		107.9	3.4			124.4	73.6	68.8	74.2	
Level of Service	A	A		F	A			F	E	E	E	
Approach Delay (s)		9.5			12.8			96.6			73.9	
Approach LOS		A			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	285	1551	10	141	597	72	29	637	113	153	557	240
v/c Ratio	0.71	0.80	0.01	1.37	0.34	0.10	0.32	0.89	0.24	0.71	0.68	0.32
Control Delay	119.7	22.4	0.0	262.9	23.0	6.4	95.1	88.8	9.0	132.7	109.5	4.8
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.5
Total Delay	119.7	22.6	0.0	262.9	23.0	6.4	95.1	88.8	9.0	132.7	112.0	5.3
Queue Length 50th (ft)	192	251	0	~236	70	0	36	408	10	104	241	0
Queue Length 95th (ft)	m238	412	m0	m#383	338	m38	76	488	54	147	452	76
Internal Link Dist (ft)		772			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	458	1934	968	103	1753	731	110	748	474	222	825	768
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	155	223
Spillback Cap Reductn	0	56	0	0	0	0	0	0	1	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.83	0.01	1.37	0.34	0.10	0.26	0.85	0.24	0.69	0.83	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	276	1504	10	137	579	70	28	618	110	148	540	233
Future Volume (vph)	276	1504	10	137	579	70	28	618	110	148	540	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	285	1551	10	141	597	72	29	637	113	153	557	240
RTOR Reduction (vph)	0	0	4	0	0	29	0	0	72	0	0	147
Lane Group Flow (vph)	285	1551	6	141	597	43	29	637	41	153	557	93
Confl. Peds. (#/hr)	1		2	2		1			2	2		
Heavy Vehicles (%)	2%	2%	2%	17%	2%	27%	2%	2%	4%	16%	5%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	20.6	101.1	108.3	11.2	91.4	103.6	7.2	38.2	49.4	12.2	44.1	64.7
Effective Green, g (s)	22.1	102.6	111.3	12.7	92.9	106.6	8.7	39.7	52.4	13.7	45.6	67.7
Actuated g/C Ratio	0.12	0.54	0.59	0.07	0.49	0.56	0.05	0.21	0.28	0.07	0.24	0.36
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	399	1911	913	103	1730	704	81	739	423	217	825	564
v/s Ratio Prot	0.08	c0.44	0.00	c0.09	0.17	0.00	0.02	c0.18	0.01	c0.05	c0.16	0.02
v/s Ratio Perm			0.00			0.03			0.02			0.04
v/c Ratio	0.71	0.81	0.01	1.37	0.35	0.06	0.36	0.86	0.10	0.71	0.68	0.17
Uniform Delay, d1	80.9	35.8	16.4	88.7	29.8	19.0	87.9	72.5	51.2	86.2	65.5	41.8
Progression Factor	1.41	0.57	1.00	0.79	0.75	1.35	1.00	1.00	1.00	1.33	1.59	0.74
Incremental Delay, d2	3.6	2.3	0.0	214.0	0.5	0.0	2.7	10.1	0.1	9.9	2.2	0.1
Delay (s)	117.4	22.7	16.4	284.4	22.9	25.7	90.6	82.7	51.3	124.7	106.1	31.2
Level of Service	F	C	B	F	C	C	F	F	D	F	F	C
Approach Delay (s)		37.2			68.7			78.4			90.1	
Approach LOS		D			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	61.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1772	1	0	840	4	0	0	6	0	0	2
Future Vol, veh/h	0	1772	1	0	840	4	0	0	6	0	0	2
Conflicting Peds, #/hr	2	0	5	5	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1827	1	0	866	4	0	0	6	0	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	919	-	-	437
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	273	0	0	567
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	272	-	-	566
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	18.5	11.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	272	-	-	-	-	566
HCM Lane V/C Ratio	0.023	-	-	-	-	0.004
HCM Control Delay (s)	18.5	-	-	-	-	11.4
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0

Lane Group	EBT	WBT	NBT	SBL	SBT	NET	SWL	SWT
Lane Group Flow (vph)	158	27	63	36	13	1706	32	839
v/c Ratio	0.88	0.35	0.53	0.48	0.09	0.81	0.28	0.36
Control Delay	124.0	99.2	99.6	104.8	80.6	25.2	32.4	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	124.0	99.2	99.6	104.8	80.6	25.4	32.4	15.1
Queue Length 50th (ft)	197	33	77	44	15	885	11	158
Queue Length 95th (ft)	#334	72	132	87	41	593	50	196
Internal Link Dist (ft)	220	125	220		220	755		447
Turn Bay Length (ft)				175			150	
Base Capacity (vph)	187	147	138	88	163	2101	170	2299
Starvation Cap Reductn	0	0	0	0	0	41	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.18	0.46	0.41	0.08	0.83	0.19	0.36

Intersection Summary

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

Movement	EBL2	EBL	EBT	EBR	EBR2	WBL	WBT	NBL2	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	2	118	28	2	3	15	12	9	10	7	35	1
Future Volume (vph)	2	118	28	2	3	15	12	9	10	7	35	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.5				6.5			5.0		
Lane Util. Factor			1.00				1.00			1.00		
Frpb, ped/bikes			1.00				1.00			1.00		
Flpb, ped/bikes			1.00				1.00			1.00		
Frt			1.00				1.00			0.92		
Flt Protected			0.96				0.97			0.99		
Satd. Flow (prot)			1741				1812			1697		
Flt Permitted			0.96				0.97			0.90		
Satd. Flow (perm)			1741				1812			1546		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	2	122	29	2	3	15	12	9	10	7	36	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	158	0	0	0	27	0	0	63	0	0
Confl. Peds. (#/hr)	2			1	1	1		1	1			
Heavy Vehicles (%)	100%	2%	2%	100%	2%	2%	2%	0%	0%	0%	2%	2%
Turn Type	Split	Split	NA			Split	NA	Perm	Perm	NA		
Protected Phases	3	3	3			4	4			7		
Permitted Phases								7	7			
Actuated Green, G (s)			19.7				7.2			13.1		
Effective Green, g (s)			19.7				7.2			14.6		
Actuated g/C Ratio			0.10				0.04			0.08		
Clearance Time (s)			6.5				6.5			6.5		
Vehicle Extension (s)			3.0				3.0			3.0		
Lane Grp Cap (vph)			180				68			118		
v/s Ratio Prot			c0.09				c0.01					
v/s Ratio Perm										c0.04		
v/c Ratio			0.88				0.40			0.53		
Uniform Delay, d1			84.0				89.3			84.4		
Progression Factor			1.00				1.00			1.00		
Incremental Delay, d2			34.8				3.8			4.6		
Delay (s)			118.8				93.1			89.0		
Level of Service			F				F			F		
Approach Delay (s)			118.8				93.1			89.0		
Approach LOS			F				F			F		

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	32.2
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL2	SBL	SBT	SBR	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	28	7	10	3	0	1598	43	15	10	21	767	41
Future Volume (vph)	28	7	10	3	0	1598	43	15	10	21	767	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	5.0			7.1				7.1	7.1	
Lane Util. Factor		1.00	1.00			0.95				1.00	0.95	
Frpb, ped/bikes		1.00	1.00			1.00				1.00	1.00	
Flpb, ped/bikes		1.00	1.00			1.00				1.00	1.00	
Frt		1.00	0.97			0.99				1.00	0.99	
Flt Protected		0.95	1.00			1.00				0.95	1.00	
Satd. Flow (prot)		1770	1834			3521				1770	3505	
Flt Permitted		0.58	1.00			1.00				0.05	1.00	
Satd. Flow (perm)		1088	1834			3521				86	3505	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	29	7	10	3	0	1647	44	15	10	22	791	42
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	36	13	0	0	1706	0	0	0	32	839	0
Confl. Peds. (#/hr)					1							1
Heavy Vehicles (%)	2%	2%	0%	0%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA			pm+pt	pm+pt	NA	
Protected Phases			7		1	6			5	5	2	
Permitted Phases	7	7			6				2	2		
Actuated Green, G (s)		13.1	13.1			110.6				123.4	123.4	
Effective Green, g (s)		13.1	14.6			110.6				123.4	123.4	
Actuated g/C Ratio		0.07	0.08			0.58				0.65	0.65	
Clearance Time (s)		6.5	6.5			7.1				7.1	7.1	
Vehicle Extension (s)		3.0	3.0			4.0				3.0	4.0	
Lane Grp Cap (vph)		75	140			2049				106	2276	
v/s Ratio Prot			0.01			c0.48				0.01	c0.24	
v/s Ratio Perm		0.03								0.19		
v/c Ratio		0.48	0.09			0.83				0.30	0.37	
Uniform Delay, d1		85.2	81.5			32.2				30.6	15.3	
Progression Factor		1.00	1.00			0.66				1.89	0.91	
Incremental Delay, d2		4.8	0.3			3.5				1.5	0.4	
Delay (s)		89.9	81.8			24.8				59.3	14.5	
Level of Service		F	F			C				E	B	
Approach Delay (s)			87.8			24.8					16.1	
Approach LOS			F			C					B	

Intersection Summary

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	6
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	5	1072	999
v/c Ratio	0.02	0.21	0.20
Control Delay	0.2	0.1	0.3
Queue Delay	0.0	0.0	0.0
Total Delay	0.2	0.1	0.3
Queue Length 50th (ft)	0	0	0
Queue Length 95th (ft)	0	0	m39
Internal Link Dist (ft)	220	381	265
Turn Bay Length (ft)			
Base Capacity (vph)	343	5085	4989
Starvation Cap Reductn	0	0	763
Spillback Cap Reductn	0	25	669
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.01	0.21	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	5	0	986	918	1
Future Volume (vph)	0	5	0	986	918	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.86			1.00	1.00	
Flt Protected	1.00			1.00	1.00	
Satd. Flow (prot)	1611			5085	5084	
Flt Permitted	1.00			1.00	1.00	
Satd. Flow (perm)	1611			5085	5084	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	5	0	1072	998	1
RTOR Reduction (vph)	5	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1072	999	0
Confl. Peds. (#/hr)			2			2
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	1.4			190.0	177.6	
Effective Green, g (s)	1.4			190.0	177.6	
Actuated g/C Ratio	0.01			1.00	0.93	
Clearance Time (s)	6.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	11			5085	4752	
v/s Ratio Prot	0.00			0.21	0.20	
v/s Ratio Perm						
v/c Ratio	0.00			0.21	0.21	
Uniform Delay, d1	93.6			0.0	0.5	
Progression Factor	1.00			1.00	0.93	
Incremental Delay, d2	0.1			0.1	0.1	
Delay (s)	93.7			0.1	0.6	
Level of Service	F			A	A	
Approach Delay (s)	93.7			0.1	0.6	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	227	273	362	13	1039	390	1000
v/c Ratio	1.00	0.48	0.49	0.19	0.87	1.11	0.48
Control Delay	138.3	2.0	3.9	138.0	29.9	136.8	42.2
Queue Delay	0.0	5.0	19.7	0.0	0.8	0.0	0.0
Total Delay	138.3	6.9	23.7	138.0	30.7	136.8	42.2
Queue Length 50th (ft)	285	0	75	17	364	~505	313
Queue Length 95th (ft)	#486	m0	m62	45	423	#735	413
Internal Link Dist (ft)	420	47			176		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	227	561	743	161	1193	350	2062
Starvation Cap Reductn	0	219	372	0	33	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.80	0.98	0.08	0.90	1.11	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	99	25	37	43	504	7	5	936	20	4	355
Future Volume (vph)	85	99	25	37	43	504	7	5	936	20	4	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.98			0.90	0.85		1.00	1.00			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1770			1516	1475		1602	4959			1736
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.08
Satd. Flow (perm)		1770			1516	1475		1602	4959			143
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)	92	108	27	40	47	548	8	5	1017	22	4	386
RTOR Reduction (vph)	0	3	0	0	41	238	0	0	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	232	124	0	13	1039	0	0	390
Confl. Peds. (#/hr)			2	2						1		1
Heavy Vehicles (%)	0%	5%	8%	8%	13%	4%	0%	33%	4%	15%	0%	4%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		23.1			64.0	64.0		3.5	44.2			84.2
Effective Green, g (s)		24.1			65.0	65.0		4.5	45.7			85.2
Actuated g/C Ratio		0.13			0.34	0.34		0.02	0.24			0.45
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		224			518	504		37	1192			350
v/s Ratio Prot		c0.13			c0.15	0.08		0.01	0.21			c0.20
v/s Ratio Perm												c0.30
v/c Ratio		1.00			0.45	0.25		0.35	0.87			1.11
Uniform Delay, d1		83.0			48.6	44.9		91.3	69.3			63.8
Progression Factor		1.00			0.01	0.77		1.52	0.30			1.00
Incremental Delay, d2		60.6			0.8	0.3		5.6	8.8			82.6
Delay (s)		143.5			1.4	34.8		144.0	29.7			146.4
Level of Service		F			A	C		F	C			F
Approach Delay (s)		143.5			20.5				31.1			
Approach LOS		F			C				C			

Intersection Summary			
HCM 2000 Control Delay	54.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	903	17
Future Volume (vph)	903	17
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	4931	
Flt Permitted	1.00	
Satd. Flow (perm)	4931	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	982	18
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1000	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	5%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	73.9	
Effective Green, g (s)	75.4	
Actuated g/C Ratio	0.40	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1956	
v/s Ratio Prot	0.20	
v/s Ratio Perm		
v/c Ratio	0.51	
Uniform Delay, d1	43.4	
Progression Factor	1.00	
Incremental Delay, d2	1.0	
Delay (s)	44.3	
Level of Service	D	
Approach Delay (s)	73.0	
Approach LOS	E	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	518	491	32	201
v/c Ratio	0.25	0.79	0.14	1.09
Control Delay	0.6	88.5	1.2	138.8
Queue Delay	26.9	2.2	0.0	2.2
Total Delay	27.4	90.6	1.2	141.0
Queue Length 50th (ft)	2	254	0	~193
Queue Length 95th (ft)	m3	390	0	#393
Internal Link Dist (ft)	47	1665	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2058	629	272	184
Starvation Cap Reductn	1550	0	0	0
Spillback Cap Reductn	0	55	3	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.02	0.86	0.12	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	427	6	0	429	23	8	0	21	39	1	145
Future Volume (vph)	43	427	6	0	429	23	8	0	21	39	1	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.90			0.89	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		3396			3355			1456			1347	
Flt Permitted		1.00			1.00			0.99			0.99	
Satd. Flow (perm)		3396			3355			1456			1347	
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)	47	464	7	0	466	25	9	0	23	42	1	158
RTOR Reduction (vph)	0	0	0	0	2	0	0	31	0	0	68	0
Lane Group Flow (vph)	0	518	0	0	489	0	0	1	0	0	133	0
Confl. Peds. (#/hr)	1		2	2		1	1		8	8		1
Heavy Vehicles (%)	12%	5%	0%	0%	7%	0%	0%	0%	13%	100%	0%	3%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		114.2			34.1			5.4			15.5	
Effective Green, g (s)		109.3			35.1			6.4			16.5	
Actuated g/C Ratio		0.58			0.18			0.03			0.09	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1953			619			49			116	
v/s Ratio Prot		c0.15			c0.15			c0.00			c0.10	
v/s Ratio Perm												
v/c Ratio		0.27			0.79			0.02			1.15	
Uniform Delay, d1		20.2			73.9			88.8			86.8	
Progression Factor		0.03			1.07			1.00			1.00	
Incremental Delay, d2		0.0			7.9			0.1			129.6	
Delay (s)		0.6			86.7			88.8			216.3	
Level of Service		A			F			F			F	
Approach Delay (s)		0.6			86.7			88.8			216.3	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	71.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

2023 Future Background PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	16	1395	4	1921	538	7	340	99	16
v/c Ratio	0.15	0.38	0.02	0.78	0.46	0.12	1.50	0.30	0.18
Control Delay	12.5	7.7	11.5	17.0	6.1	106.8	307.7	32.1	101.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	7.7	11.5	17.0	6.1	106.8	307.7	32.1	101.3
Queue Length 50th (ft)	3	106	1	388	134	10	~694	44	23
Queue Length 95th (ft)	m9	230	m2	#1596	136	33	m#928	m91	53
Internal Link Dist (ft)		810		1202		100		1650	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	109	3671	310	2459	1165	63	226	328	189
Starvation Cap Reductn	0	594	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.45	0.01	0.78	0.46	0.11	1.50	0.30	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	1281	3	4	0	1767	495	3	0	4	313	8
Future Volume (vph)	15	1281	3	4	0	1767	495	3	0	4	313	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.92		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98		0.95	1.00
Satd. Flow (prot)	1719	5084			1805	3539	1583		1717		1736	1641
Flt Permitted	0.04	1.00			0.15	1.00	1.00		0.98		0.95	1.00
Satd. Flow (perm)	69	5084			294	3539	1583		1717		1736	1641
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)	16	1392	3	4	0	1921	538	3	0	4	340	9
RTOR Reduction (vph)	0	0	0	0	0	0	75	0	0	0	0	86
Lane Group Flow (vph)	16	1395	0	0	4	1921	463	0	7	0	340	13
Heavy Vehicles (%)	5%	2%	0%	0%	0%	2%	2%	0%	0%	0%	4%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	147.5	143.6			142.1	140.9	140.9		3.0		27.7	27.7
Effective Green, g (s)	149.5	145.6			144.1	142.9	142.9		4.0		28.7	28.7
Actuated g/C Ratio	0.68	0.66			0.65	0.65	0.65		0.02		0.13	0.13
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	83	3364			207	2298	1028		31		226	214
v/s Ratio Prot	c0.00	c0.27			0.00	c0.54			c0.00		c0.20	0.01
v/s Ratio Perm	0.13				0.01		0.29					
v/c Ratio	0.19	0.41			0.02	0.84	0.45		0.23		1.50	0.06
Uniform Delay, d1	33.9	17.3			14.1	29.6	19.1		106.5		95.7	83.8
Progression Factor	0.78	0.51			0.83	0.53	0.45		1.00		1.09	9.21
Incremental Delay, d2	1.0	0.3			0.0	3.3	1.2		3.7		248.1	0.2
Delay (s)	27.4	9.3			11.7	18.9	9.8		110.2		352.8	772.7
Level of Service	C	A			B	B	A		F		F	F
Approach Delay (s)		9.5				16.9			110.2			447.5
Approach LOS		A				B			F			F

Intersection Summary			
HCM 2000 Control Delay	58.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	83	10	2	3
Future Volume (vph)	83	10	2	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.97	
Flt Protected			0.96	
Satd. Flow (prot)			1780	
Flt Permitted			0.96	
Satd. Flow (perm)			1780	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	11	2	3
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	16	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.6	
Effective Green, g (s)			8.6	
Actuated g/C Ratio			0.04	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			69	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.23	
Uniform Delay, d1			102.5	
Progression Factor			1.00	
Incremental Delay, d2			1.7	
Delay (s)			104.2	
Level of Service			F	
Approach Delay (s)			104.2	
Approach LOS			F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	122	1221	179	1740	203	175	25	254
v/c Ratio	0.66	0.54	0.57	0.79	1.06	0.35	0.14	0.62
Control Delay	61.2	20.4	22.0	16.3	159.0	9.0	66.9	74.9
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	61.2	20.5	22.0	16.7	159.0	9.0	66.9	74.9
Queue Length 50th (ft)	101	355	32	208	298	0	29	300
Queue Length 95th (ft)	174	570	m134	322	#478	71	61	403
Internal Link Dist (ft)		1037		810	420			236
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	212	2251	370	2205	217	542	208	464
Starvation Cap Reductn	0	72	0	126	0	0	0	0
Spillback Cap Reductn	0	0	0	127	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.56	0.48	0.84	0.94	0.32	0.12	0.55

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	1084	40	165	1594	6	60	127	161	23	111	122
Future Volume (vph)	112	1084	40	165	1594	6	60	127	161	23	111	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1626	3523		1805	3537			1870	1615	1805	1751	
Flt Permitted	0.05	1.00		0.17	1.00			0.45	1.00	0.43	1.00	
Satd. Flow (perm)	94	3523		324	3537			854	1615	817	1751	
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)	122	1178	43	179	1733	7	65	138	175	25	121	133
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	136	0	19	0
Lane Group Flow (vph)	122	1220	0	179	1740	0	0	203	39	25	235	0
Heavy Vehicles (%)	11%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	155.5	139.6		148.7	136.2			48.6	48.6	48.6	48.6	
Effective Green, g (s)	157.5	140.6		150.7	137.2			49.6	49.6	49.6	49.6	
Actuated g/C Ratio	0.72	0.64		0.68	0.62			0.23	0.23	0.23	0.23	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	184	2251		312	2205			192	364	184	394	
v/s Ratio Prot	c0.05	0.35		0.04	c0.49						0.13	
v/s Ratio Perm	0.42			0.36				c0.24	0.02	0.03		
v/c Ratio	0.66	0.54		0.57	0.79			1.06	0.11	0.14	0.60	
Uniform Delay, d1	50.9	21.9		17.0	30.7			85.2	67.6	68.1	76.3	
Progression Factor	1.29	0.84		1.62	0.44			1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.2	0.9		1.6	1.9			80.9	0.1	0.3	2.4	
Delay (s)	74.0	19.4		29.1	15.3			166.1	67.8	68.4	78.7	
Level of Service	E	B		C	B			F	E	E	E	
Approach Delay (s)		24.3			16.6			120.6			77.8	
Approach LOS		C			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	223	901	29	145	1491	111	105	525	114	169	534	343
v/c Ratio	0.74	0.46	0.03	0.87	0.75	0.11	0.86	0.85	0.23	0.61	0.78	0.70
Control Delay	152.4	15.9	0.0	113.9	27.3	6.6	148.7	101.0	5.2	153.4	91.9	30.6
Queue Delay	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	2.4	1.1
Total Delay	152.4	15.9	0.0	113.9	32.6	6.6	148.7	101.0	5.2	153.4	94.3	31.7
Queue Length 50th (ft)	175	164	0	216	912	40	154	393	0	131	265	85
Queue Length 95th (ft)	#229	181	m0	m#306	1186	m40	#285	462	37	178	302	208
Internal Link Dist (ft)		774			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	308	1955	1030	166	1994	1001	122	678	503	340	815	495
Starvation Cap Reductn	0	0	0	0	439	0	0	0	0	0	166	39
Spillback Cap Reductn	0	0	0	0	77	0	0	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.46	0.03	0.87	0.96	0.11	0.86	0.77	0.23	0.50	0.82	0.75

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	865	28	139	1431	107	101	504	109	162	513	329
Future Volume (vph)	214	865	28	139	1431	107	101	504	109	162	513	329
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1584
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	223	901	29	145	1491	111	105	525	114	169	534	343
RTOR Reduction (vph)	0	0	11	0	0	21	0	0	83	0	0	61
Lane Group Flow (vph)	223	901	18	145	1491	90	105	525	31	169	534	282
Confl. Peds. (#/hr)	4					4	1		7	7		1
Heavy Vehicles (%)	1%	2%	0%	2%	1%	5%	0%	2%	1%	3%	1%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	17.7	120.1	133.5	19.2	121.3	137.6	13.4	37.1	56.3	16.3	40.9	58.6
Effective Green, g (s)	19.2	121.6	136.5	20.7	122.8	140.6	14.9	38.6	59.3	17.8	42.4	61.6
Actuated g/C Ratio	0.09	0.55	0.62	0.09	0.56	0.64	0.07	0.18	0.27	0.08	0.19	0.28
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	302	1956	1002	166	1994	965	122	620	423	275	688	443
v/s Ratio Prot	c0.06	0.25	0.00	0.08	c0.42	0.01	c0.06	c0.15	0.01	0.05	c0.15	0.06
v/s Ratio Perm			0.01			0.05			0.01			0.12
v/c Ratio	0.74	0.46	0.02	0.87	0.75	0.09	0.86	0.85	0.07	0.61	0.78	0.64
Uniform Delay, d1	98.0	29.5	16.0	98.4	36.9	15.2	101.5	87.8	59.9	97.8	84.3	69.4
Progression Factor	1.43	0.50	1.00	0.87	0.67	0.89	1.00	1.00	1.00	1.48	1.00	0.47
Incremental Delay, d2	8.0	0.7	0.0	24.9	1.6	0.0	42.2	10.4	0.1	4.0	5.4	3.0
Delay (s)	147.8	15.4	16.0	110.8	26.4	13.7	143.8	98.2	59.9	148.3	89.7	35.6
Level of Service	F	B	B	F	C	B	F	F	E	F	F	D
Approach Delay (s)		41.0			32.6			98.8			81.4	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	56.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1064	1	0	1889	2	0	0	8	0	0	10
Future Vol, veh/h	0	1064	1	0	1889	2	0	0	8	0	0	10
Conflicting Peds, #/hr	4	0	0	0	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1144	1	0	2031	2	0	0	9	0	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	573	-	-	1021
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	463	0	0	234
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	463	-	-	233
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12.9	21.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	463	-	-	-	-	233
HCM Lane V/C Ratio	0.019	-	-	-	-	0.046
HCM Control Delay (s)	12.9	-	-	-	-	21.2
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

5: Fairfax Blvd & McLean Avenue & Warwick Road

2023 Future Background PM Peak Hour

Lane Group	EBT	WBT	NBT	SBL	SBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	132	45	98	19	10	6	1080	49	1945
v/c Ratio	0.74	0.44	0.71	0.18	0.06	0.06	0.51	0.25	0.86
Control Delay	120.2	112.9	122.2	95.7	91.0	9.7	10.8	18.4	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	120.2	112.9	122.2	95.7	91.0	9.7	11.0	18.4	27.3
Queue Length 50th (ft)	189	65	139	26	13	1	280	20	594
Queue Length 95th (ft)	274	116	#243	60	38	m4	190	m38	#1638
Internal Link Dist (ft)	220	220	220		220		755		445
Turn Bay Length (ft)				175		120		150	
Base Capacity (vph)	204	165	138	103	161	112	2105	201	2251
Starvation Cap Reductn	0	0	0	0	0	0	311	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.27	0.71	0.18	0.06	0.05	0.60	0.24	0.86

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	76	44	4	2	19	18	2	4	24	27	13	26
Future Volume (vph)	76	44	4	2	19	18	2	4	24	27	13	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0				5.0					5.0	
Lane Util. Factor		1.00				1.00					1.00	
Frpb, ped/bikes		1.00				0.99					1.00	
Flpb, ped/bikes		1.00				1.00					0.99	
Frt		0.99				0.98					0.96	
Flt Protected		0.97				0.98					0.97	
Satd. Flow (prot)		1798				1811					1709	
Flt Permitted		0.97				0.98					0.83	
Satd. Flow (perm)		1798				1811					1449	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	80	46	4	2	20	19	2	4	25	28	14	27
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	132	0	0	0	45	0	0	0	0	98	0
Confl. Peds. (#/hr)			4	2	2		4		2	2		
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%
Turn Type	Split	NA			Split	NA			Perm	Perm	NA	
Protected Phases	3	3			4	4					7	
Permitted Phases									7	7		
Actuated Green, G (s)		20.3				9.6					19.5	
Effective Green, g (s)		21.8				11.1					21.0	
Actuated g/C Ratio		0.10				0.05					0.10	
Clearance Time (s)		6.5				6.5					6.5	
Vehicle Extension (s)		3.0				3.0					3.0	
Lane Grp Cap (vph)		178				91					138	
v/s Ratio Prot		c0.07				c0.02						
v/s Ratio Perm											c0.07	
v/c Ratio		0.74				0.49					0.71	
Uniform Delay, d1		96.4				101.7					96.5	
Progression Factor		1.00				1.00					1.00	
Incremental Delay, d2		15.3				4.2					15.8	
Delay (s)		111.6				105.9					112.3	
Level of Service		F				F					F	
Approach Delay (s)		111.6				105.9					112.3	
Approach LOS		F				F					F	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	25.7
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBR2	SBL2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2	SWL2
Lane Configurations												
Traffic Volume (vph)	4	15	3	4	2	4	6	0	942	73	10	22
Future Volume (vph)	4	15	3	4	2	4	6	0	942	73	10	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0				5.6	5.1			
Lane Util. Factor			1.00	1.00				1.00	0.95			
Frpb, ped/bikes			1.00	0.98				1.00	1.00			
Flpb, ped/bikes			1.00	1.00				1.00	1.00			
Frt			1.00	0.91				1.00	0.99			
Flt Protected			0.95	1.00				0.95	1.00			
Satd. Flow (prot)			1691	1687				1805	3495			
Flt Permitted			0.61	1.00				0.03	1.00			
Satd. Flow (perm)			1079	1687				58	3495			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	16	3	4	2	4	6	0	992	77	11	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	19	10	0	0	0	6	1080	0	0	0
Confl. Peds. (#/hr)					2	2	2				4	
Heavy Vehicles (%)	0%	8%	0%	0%	0%	0%	0%	0%	2%	0%	0%	100%
Turn Type		Perm	Perm	NA			custom	pm+pt	NA			pm+pt
Protected Phases				7				1	6			5
Permitted Phases		7	7				1	6				2
Actuated Green, G (s)			19.5	19.5				130.5	129.2			
Effective Green, g (s)			21.0	21.0				133.5	131.2			
Actuated g/C Ratio			0.10	0.10				0.61	0.60			
Clearance Time (s)			6.5	6.5				7.1	7.1			
Vehicle Extension (s)			3.0	3.0				3.0	4.0			
Lane Grp Cap (vph)			102	161				57	2084			
v/s Ratio Prot				0.01				0.00	0.31			
v/s Ratio Perm			0.02					0.06				
v/c Ratio			0.19	0.06				0.11	0.52			
Uniform Delay, d1			91.6	90.5				39.1	25.9			
Progression Factor			1.00	1.00				0.55	0.37			
Incremental Delay, d2			0.9	0.2				0.8	0.9			
Delay (s)			92.5	90.7				22.2	10.5			
Level of Service			F	F				C	B			
Approach Delay (s)				91.9					10.5			
Approach LOS				F					B			

Intersection Summary

Movement	SWL	SWT	SWR	SWR2
Lane Configurations				
Traffic Volume (vph)	25	1713	128	7
Future Volume (vph)	25	1713	128	7
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.6	5.1		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	1.00		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.99		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1228	3425		
Flt Permitted	0.18	1.00		
Satd. Flow (perm)	238	3425		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	1803	135	7
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	49	1945	0	0
Confl. Peds. (#/hr)	4		2	
Heavy Vehicles (%)	0%	4%	4%	25%
Turn Type	pm+pt	NA		
Protected Phases	5	2		
Permitted Phases	2			
Actuated Green, G (s)	143.3	135.6		
Effective Green, g (s)	145.5	137.6		
Actuated g/C Ratio	0.66	0.63		
Clearance Time (s)	7.1	7.1		
Vehicle Extension (s)	3.0	4.0		
Lane Grp Cap (vph)	198	2142		
v/s Ratio Prot	c0.01	c0.57		
v/s Ratio Perm	0.15			
v/c Ratio	0.25	0.91		
Uniform Delay, d1	17.7	35.7		
Progression Factor	1.09	0.73		
Incremental Delay, d2	0.5	5.1		
Delay (s)	19.7	31.2		
Level of Service	B	C		
Approach Delay (s)		31.0		
Approach LOS		C		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	16	858	1033
v/c Ratio	0.06	0.17	0.21
Control Delay	0.4	0.1	0.6
Queue Delay	0.0	0.0	0.1
Total Delay	0.4	0.1	0.7
Queue Length 50th (ft)	0	0	32
Queue Length 95th (ft)	0	0	36
Internal Link Dist (ft)	220	381	265
Turn Bay Length (ft)			
Base Capacity (vph)	353	5085	4849
Starvation Cap Reductn	0	0	2183
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.05	0.17	0.39

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	16	0	832	1000	2
Future Volume (vph)	0	16	0	832	1000	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.86			1.00	1.00	
Flt Protected	1.00			1.00	1.00	
Satd. Flow (prot)	1611			5085	5084	
Flt Permitted	1.00			1.00	1.00	
Satd. Flow (perm)	1611			5085	5084	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	16	0	858	1031	2
RTOR Reduction (vph)	16	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	858	1033	0
Confl. Peds. (#/hr)	1		3			3
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	4.2			220.0	205.8	
Effective Green, g (s)	4.2			220.0	205.8	
Actuated g/C Ratio	0.02			1.00	0.94	
Clearance Time (s)	5.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	30			5085	4755	
v/s Ratio Prot	0.00			0.17	c0.20	
v/s Ratio Perm						
v/c Ratio	0.01			0.17	0.22	
Uniform Delay, d1	105.9			0.0	0.6	
Progression Factor	1.00			1.00	0.93	
Incremental Delay, d2	0.1			0.1	0.1	
Delay (s)	106.0			0.1	0.6	
Level of Service	F			A	A	
Approach Delay (s)	106.0			0.1	0.6	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	1.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	450	441	31	874	475	1030
v/c Ratio	0.73	0.77	0.60	0.37	0.49	1.23	0.45
Control Delay	124.2	5.4	4.9	151.9	12.4	155.8	42.0
Queue Delay	0.0	46.6	53.5	0.0	0.7	0.0	0.0
Total Delay	124.2	52.0	58.3	151.9	13.1	155.8	42.0
Queue Length 50th (ft)	132	74	89	48	68	~643	383
Queue Length 95th (ft)	#244	m41	m57	92	79	#895	439
Internal Link Dist (ft)	420	47			176		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	129	589	742	198	1785	386	2313
Starvation Cap Reductn	0	173	339	0	529	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	1.08	1.09	0.16	0.70	1.23	0.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	27	45	18	52	98	706	12	17	800	39	2	454
Future Volume (vph)	27	45	18	52	98	706	12	17	800	39	2	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		0.99			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.97			0.90	0.85		1.00	0.99			1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1810			1613	1534		1805	4991			1787
Flt Permitted		0.99			0.99	1.00		0.95	1.00			0.20
Satd. Flow (perm)		1810			1613	1534		1805	4991			371
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	47	19	54	102	735	12	18	833	41	2	473
RTOR Reduction (vph)	0	4	0	0	32	215	0	0	0	0	0	0
Lane Group Flow (vph)	0	90	0	0	418	226	0	31	874	0	0	475
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	3%	7%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		14.4			73.7	73.7		8.1	77.2			113.2
Effective Green, g (s)		15.4			74.7	74.7		9.1	78.7			114.2
Actuated g/C Ratio		0.07			0.34	0.34		0.04	0.36			0.52
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		126			547	520		74	1785			386
v/s Ratio Prot		c0.05			c0.26	0.15		0.02	0.18			c0.17
v/s Ratio Perm												c0.47
v/c Ratio		0.72			0.76	0.44		0.42	0.49			1.23
Uniform Delay, d1		100.2			64.8	56.3		102.9	55.0			40.8
Progression Factor		1.00			0.08	0.32		1.39	0.21			1.00
Incremental Delay, d2		18.1			0.7	0.1		3.8	1.0			124.5
Delay (s)		118.3			5.7	18.2		146.4	12.4			165.3
Level of Service		F			A	B		F	B			F
Approach Delay (s)		118.3			11.9				17.0			
Approach LOS		F			B				B			

Intersection Summary			
HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	913	76
Future Volume (vph)	913	76
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	5034	
Flt Permitted	1.00	
Satd. Flow (perm)	5034	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	951	79
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1030	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	98.3	
Effective Green, g (s)	99.8	
Actuated g/C Ratio	0.45	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2283	
v/s Ratio Prot	0.20	
v/s Ratio Perm		
v/c Ratio	0.45	
Uniform Delay, d1	41.3	
Progression Factor	1.00	
Incremental Delay, d2	0.6	
Delay (s)	41.9	
Level of Service	D	
Approach Delay (s)	80.9	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	573	823	20	158
v/c Ratio	0.27	1.10	0.28	0.89
Control Delay	1.4	131.3	83.8	85.5
Queue Delay	17.0	1.0	0.0	0.4
Total Delay	18.4	132.3	83.8	85.9
Queue Length 50th (ft)	8	~700	19	102
Queue Length 95th (ft)	m8	#844	55	#246
Internal Link Dist (ft)	47	1650	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2130	749	80	187
Starvation Cap Reductn	1548	0	0	0
Spillback Cap Reductn	0	60	0	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.98	1.19	0.25	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	386	11	0	723	51	9	3	7	22	3	124
Future Volume (vph)	141	386	11	0	723	51	9	3	7	22	3	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.96			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.95			0.89	
Flt Protected		0.99			1.00			0.98			0.99	
Satd. Flow (prot)		3458			3537			1702			1642	
Flt Permitted		0.99			1.00			0.98			0.99	
Satd. Flow (perm)		3458			3537			1702			1642	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	150	411	12	0	769	54	10	3	7	23	3	132
RTOR Reduction (vph)	0	1	0	0	2	0	0	7	0	0	84	0
Lane Group Flow (vph)	0	572	0	0	821	0	0	13	0	0	74	0
Confl. Peds. (#/hr)			2	2					12	12		
Heavy Vehicles (%)	2%	3%	0%	0%	1%	2%	0%	0%	0%	13%	0%	0%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		134.5			45.5			7.5			11.7	
Effective Green, g (s)		129.6			46.5			8.5			12.7	
Actuated g/C Ratio		0.59			0.21			0.04			0.06	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		2037			747			65			94	
v/s Ratio Prot		c0.17			c0.23			c0.01			c0.05	
v/s Ratio Perm												
v/c Ratio		0.28			1.10			0.20			0.79	
Uniform Delay, d1		22.3			86.8			102.5			102.3	
Progression Factor		0.07			0.90			1.00			1.00	
Incremental Delay, d2		0.0			62.7			0.6			32.1	
Delay (s)		1.5			140.6			103.0			134.4	
Level of Service		A			F			F			F	
Approach Delay (s)		1.5			140.6			103.0			134.4	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	88.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

2023 Future Background SAT Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	22	1606	8	1499	627	6	218	50	14
v/c Ratio	0.14	0.49	0.05	0.69	0.57	0.07	0.80	0.12	0.12
Control Delay	25.4	25.3	6.9	22.4	11.8	69.3	101.0	6.7	63.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	25.3	6.9	22.4	11.8	69.3	101.0	6.7	63.7
Queue Length 50th (ft)	8	291	2	817	433	6	226	4	13
Queue Length 95th (ft)	m28	506	m2	#1063	650	22	#338	24	34
Internal Link Dist (ft)		810		1202		100		1655	220
Turn Bay Length (ft)	130		80		600				
Base Capacity (vph)	171	3281	187	2170	1100	94	282	419	264
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.49	0.04	0.69	0.57	0.06	0.77	0.12	0.05

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	1474	4	6	1	1379	577	4	0	2	201	2
Future Volume (vph)	20	1474	4	6	1	1379	577	4	0	2	201	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.95		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97		0.95	1.00
Satd. Flow (prot)	1805	5034			1621	3539	1583		1756		1787	1626
Flt Permitted	0.07	1.00			0.10	1.00	1.00		0.97		0.95	1.00
Satd. Flow (perm)	126	5034			173	3539	1583		1756		1787	1626
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)	22	1602	4	7	1	1499	627	4	0	2	218	2
RTOR Reduction (vph)	0	0	0	0	0	0	155	0	0	0	0	42
Lane Group Flow (vph)	22	1606	0	0	8	1499	472	0	6	0	218	8
Heavy Vehicles (%)	0%	3%	0%	13%	0%	2%	2%	0%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	85.0	81.1			80.0	78.6	78.6		1.5		21.8	21.8
Effective Green, g (s)	87.0	83.1			82.0	80.6	80.6		2.5		22.8	22.8
Actuated g/C Ratio	0.58	0.55			0.55	0.54	0.54		0.02		0.15	0.15
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	127	2788			117	1901	850		29		271	247
v/s Ratio Prot	c0.01	0.32			0.00	c0.42			c0.00		c0.12	0.00
v/s Ratio Perm	0.09				0.04		0.30					
v/c Ratio	0.17	0.58			0.07	0.79	0.56		0.21		0.80	0.03
Uniform Delay, d1	22.6	21.9			17.5	27.9	22.9		72.8		61.4	54.2
Progression Factor	1.68	1.39			0.41	0.85	0.91		1.00		1.30	1.00
Incremental Delay, d2	0.5	0.7			0.2	2.9	2.2		3.5		17.5	0.1
Delay (s)	38.3	31.3			7.4	26.5	23.1		76.3		97.6	54.3
Level of Service	D	C			A	C	C		E		F	D
Approach Delay (s)		31.4				25.4			76.3			89.5
Approach LOS		C				C			E			F

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	44	3	1	9
Future Volume (vph)	44	3	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.90	
Flt Protected			0.99	
Satd. Flow (prot)			1693	
Flt Permitted			0.99	
Satd. Flow (perm)			1693	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	3	1	10
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	14	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.3	
Effective Green, g (s)			8.3	
Actuated g/C Ratio			0.06	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			93	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.15	
Uniform Delay, d1			67.5	
Progression Factor			1.00	
Incremental Delay, d2			0.8	
Delay (s)			68.2	
Level of Service			E	
Approach Delay (s)			68.2	
Approach LOS			E	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	176	1429	151	1284	140	105	46	267
v/c Ratio	0.52	0.65	0.52	0.59	0.78	0.28	0.25	0.79
Control Delay	19.6	12.2	32.6	16.3	85.4	9.8	53.5	66.8
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	19.6	12.2	32.6	16.9	85.4	9.8	53.5	66.8
Queue Length 50th (ft)	21	313	56	700	132	0	39	220
Queue Length 95th (ft)	78	760	m144	775	202	50	75	305
Internal Link Dist (ft)		1037		810	420			173
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	418	2196	382	2191	250	476	257	457
Starvation Cap Reductn	0	0	0	458	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.65	0.40	0.74	0.56	0.22	0.18	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	1282	33	139	1171	10	27	102	97	42	116	130
Future Volume (vph)	162	1282	33	139	1171	10	27	102	97	42	116	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3526		1805	3535			1881	1568	1719	1694	
Flt Permitted	0.15	1.00		0.12	1.00			0.52	1.00	0.56	1.00	
Satd. Flow (perm)	281	3526		221	3535			988	1568	1011	1694	
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)	176	1393	36	151	1273	11	29	111	105	46	126	141
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	86	0	29	0
Lane Group Flow (vph)	176	1428	0	151	1284	0	0	140	19	46	238	0
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	0%	3%	5%	7%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	104.8	92.4		104.0	92.0			26.3	26.3	26.3	26.3	
Effective Green, g (s)	106.8	93.4		106.0	93.0			27.3	27.3	27.3	27.3	
Actuated g/C Ratio	0.71	0.62		0.71	0.62			0.18	0.18	0.18	0.18	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	336	2195		293	2191			179	285	184	308	
v/s Ratio Prot	c0.05	c0.41		0.04	0.36						0.14	
v/s Ratio Perm	0.33			0.32				c0.14	0.01	0.05		
v/c Ratio	0.52	0.65		0.52	0.59			0.78	0.07	0.25	0.77	
Uniform Delay, d1	12.0	18.0		14.2	17.0			58.5	50.8	52.6	58.4	
Progression Factor	2.17	0.54		3.30	0.82			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	1.3		1.1	0.8			19.6	0.1	0.7	11.3	
Delay (s)	27.2	11.0		47.9	14.7			78.1	50.9	53.3	69.7	
Level of Service	C	B		D	B			E	D	D	E	
Approach Delay (s)		12.8			18.2			66.5			67.3	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	268	1091	26	150	1039	92	88	546	160	183	593	392
v/c Ratio	0.65	0.66	0.03	0.91	0.67	0.11	0.56	0.77	0.31	0.54	0.77	0.66
Control Delay	89.7	34.7	0.8	103.8	33.0	3.6	79.4	63.9	7.5	95.8	78.7	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
Total Delay	89.7	34.7	0.8	103.8	33.0	3.6	79.4	63.9	7.5	95.8	79.0	29.5
Queue Length 50th (ft)	143	252	0	133	212	0	83	267	17	96	260	269
Queue Length 95th (ft)	192	454	m1	#284	438	25	145	320	53	139	340	446
Internal Link Dist (ft)		798			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	438	1651	895	164	1543	874	177	854	520	411	948	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	61	9
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.66	0.03	0.91	0.67	0.11	0.50	0.64	0.31	0.45	0.67	0.66

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	257	1047	25	144	997	88	84	524	154	176	569	376
Future Volume (vph)	257	1047	25	144	997	88	84	524	154	176	569	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1535	1805	3539	1536	1787	3539	1519	3433	3539	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1535	1805	3539	1536	1787	3539	1519	3433	3539	1570
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	268	1091	26	150	1039	92	88	546	160	183	593	392
RTOR Reduction (vph)	0	0	12	0	0	39	0	0	90	0	0	82
Lane Group Flow (vph)	268	1091	14	150	1039	53	88	546	70	183	593	310
Confl. Peds. (#/hr)	1		1	1		1	1		4	4		1
Heavy Vehicles (%)	2%	2%	4%	0%	2%	4%	1%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	16.5	68.5	80.2	12.2	63.9	77.2	11.7	28.7	40.9	13.3	31.2	47.7
Effective Green, g (s)	18.0	70.0	83.2	13.7	65.4	80.2	13.2	30.2	43.9	14.8	32.7	50.7
Actuated g/C Ratio	0.12	0.47	0.55	0.09	0.44	0.53	0.09	0.20	0.29	0.10	0.22	0.34
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	411	1651	851	164	1543	821	157	712	444	338	771	530
v/s Ratio Prot	0.08	c0.31	0.00	c0.08	c0.29	0.01	0.05	0.15	0.01	c0.05	c0.17	0.07
v/s Ratio Perm			0.01			0.03			0.03			0.13
v/c Ratio	0.65	0.66	0.02	0.91	0.67	0.07	0.56	0.77	0.16	0.54	0.77	0.58
Uniform Delay, d1	63.0	30.8	15.0	67.6	33.8	16.8	65.6	56.6	39.3	64.4	55.1	41.0
Progression Factor	1.33	1.02	1.00	0.88	0.87	0.79	1.00	1.00	1.00	1.40	1.31	0.97
Incremental Delay, d2	2.9	1.6	0.0	40.1	1.9	0.0	4.5	5.0	0.2	1.7	4.6	1.6
Delay (s)	86.6	33.1	15.0	99.7	31.3	13.3	70.1	61.5	39.5	92.1	76.8	41.3
Level of Service	F	C	B	F	C	B	E	E	D	F	E	D
Approach Delay (s)		43.1			38.1			58.0			67.3	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	50.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1319	3	0	1472	7	0	0	11	0	0	12
Future Vol, veh/h	0	1319	3	0	1472	7	0	0	11	0	0	12
Conflicting Peds, #/hr	5	0	3	3	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1360	3	0	1518	7	0	0	11	0	0	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	685	-	-	768
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	391	0	0	344
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	390	-	-	343
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	14.5	15.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	390	-	-	-	-	343
HCM Lane V/C Ratio	0.029	-	-	-	-	0.036
HCM Control Delay (s)	14.5	-	-	-	-	15.9
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

Lane Group	EBT	WBT	NBT	SBL	SBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	86	39	46	11	7	8	1371	43	1506
v/c Ratio	0.51	0.32	0.41	0.10	0.06	0.04	0.67	0.20	0.67
Control Delay	74.8	72.6	75.8	64.5	63.0	19.9	29.1	20.9	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	72.6	75.8	64.5	63.0	19.9	29.1	20.9	25.8
Queue Length 50th (ft)	82	37	44	10	6	0	466	20	395
Queue Length 95th (ft)	138	76	86	31	23	m8	443	m35	#617
Internal Link Dist (ft)	220	220	220		220		755		420
Turn Bay Length (ft)				175		120		150	
Base Capacity (vph)	219	180	166	161	177	269	2041	277	2261
Starvation Cap Reductn	0	0	0	0	0	0	23	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.22	0.28	0.07	0.04	0.03	0.68	0.16	0.67

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL2	EBL	EBT	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT
Lane Configurations												
Traffic Volume (vph)	1	60	19	2	3	24	7	1	3	14	5	4
Future Volume (vph)	1	60	19	2	3	24	7	1	3	14	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0				5.0					5.0
Lane Util. Factor			1.00				1.00					1.00
Frpb, ped/bikes			1.00				1.00					0.98
Flpb, ped/bikes			1.00				1.00					0.97
Frt			1.00				0.99					0.94
Flt Protected			0.96				0.97					0.98
Satd. Flow (prot)			1825				1801					1658
Flt Permitted			0.96				0.97					0.86
Satd. Flow (perm)			1825				1801					1451
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	62	20	2	3	25	7	1	3	15	5	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	86	0	0	0	39	0	0	0	0	46
Confl. Peds. (#/hr)				7	4			3		7	3	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	Split	NA		Perm	Split	NA			Perm	Perm	NA
Protected Phases		3	3			4	4					7
Permitted Phases	3				4					7	7	
Actuated Green, G (s)			12.4				7.6					8.9
Effective Green, g (s)			13.9				9.1					10.4
Actuated g/C Ratio			0.09				0.06					0.07
Clearance Time (s)			6.5				6.5					6.5
Vehicle Extension (s)			3.0				3.0					3.0
Lane Grp Cap (vph)			169				109					100
v/s Ratio Prot			c0.05				c0.02					
v/s Ratio Perm												c0.03
v/c Ratio			0.51				0.36					0.46
Uniform Delay, d1			64.8				67.6					67.1
Progression Factor			1.00				1.00					1.00
Incremental Delay, d2			2.4				2.0					3.3
Delay (s)			67.2				69.7					70.4
Level of Service			E				E					E
Approach Delay (s)			67.2				69.7					70.4
Approach LOS			E				E					E

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.7
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2
Lane Configurations												
Traffic Volume (vph)	20	1	8	3	1	4	2	2	6	1224	77	15
Future Volume (vph)	20	1	8	3	1	4	2	2	6	1224	77	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0				5.6	5.1		
Lane Util. Factor				1.00	1.00				1.00	0.95		
Frpb, ped/bikes				1.00	0.92				1.00	1.00		
Flpb, ped/bikes				0.99	1.00				1.00	1.00		
Frt				1.00	0.87				1.00	0.99		
Flt Protected				0.95	1.00				0.95	1.00		
Satd. Flow (prot)				1784	1527				1805	3501		
Flt Permitted				0.76	1.00				0.09	1.00		
Satd. Flow (perm)				1420	1527				174	3501		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	1	8	3	1	4	2	2	6	1275	80	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	11	7	0	0	0	8	1371	0	0
Confl. Peds. (#/hr)		2		2		7	3	3	3		2	4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%
Turn Type			Perm	Perm	NA			custom	pm+pt	NA		
Protected Phases					7				1	6		
Permitted Phases			7	7				1	6			
Actuated Green, G (s)				8.9	8.9				82.7	81.4		
Effective Green, g (s)				10.4	10.4				85.7	83.4		
Actuated g/C Ratio				0.07	0.07				0.57	0.56		
Clearance Time (s)				6.5	6.5				7.1	7.1		
Vehicle Extension (s)				3.0	3.0				3.0	4.0		
Lane Grp Cap (vph)				98	105				129	1946		
v/s Ratio Prot					0.00				0.00	0.39		
v/s Ratio Perm				0.01					0.03			
v/c Ratio				0.11	0.07				0.06	0.70		
Uniform Delay, d1				65.5	65.3				19.0	24.3		
Progression Factor				1.00	1.00				1.40	1.04		
Incremental Delay, d2				0.5	0.3				0.2	1.9		
Delay (s)				66.0	65.5				26.8	27.1		
Level of Service				E	E				C	C		
Approach Delay (s)					65.8					27.1		
Approach LOS					E					C		

Intersection Summary

Movement	SWL2	SWL	SWT	SWR	SWR2
Lane Configurations					
Traffic Volume (vph)	27	14	1389	52	5
Future Volume (vph)	27	14	1389	52	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	5.1		
Lane Util. Factor		1.00	0.95		
Frpb, ped/bikes		1.00	1.00		
Flpb, ped/bikes		1.00	1.00		
Frt		1.00	0.99		
Flt Protected		0.95	1.00		
Satd. Flow (prot)		1805	3518		
Flt Permitted		0.10	1.00		
Satd. Flow (perm)		186	3518		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	15	1447	54	5
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	43	1506	0	0
Confl. Peds. (#/hr)	2	4			3
Heavy Vehicles (%)	0%	0%	2%	0%	0%
Turn Type	pm+pt	pm+pt	NA		
Protected Phases	5	5	2		
Permitted Phases	2	2			
Actuated Green, G (s)		92.1	86.1		
Effective Green, g (s)		95.1	88.1		
Actuated g/C Ratio		0.63	0.59		
Clearance Time (s)		7.1	7.1		
Vehicle Extension (s)		3.0	4.0		
Lane Grp Cap (vph)		198	2066		
v/s Ratio Prot		c0.01	c0.43		
v/s Ratio Perm		0.13			
v/c Ratio		0.22	0.73		
Uniform Delay, d1		17.6	22.3		
Progression Factor		1.47	1.17		
Incremental Delay, d2		0.4	1.8		
Delay (s)		26.3	27.9		
Level of Service		C	C		
Approach Delay (s)			27.8		
Approach LOS			C		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	8	942	1187
v/c Ratio	0.04	0.19	0.24
Control Delay	0.2	0.1	0.2
Queue Delay	0.0	0.0	0.0
Total Delay	0.2	0.1	0.2
Queue Length 50th (ft)	0	0	0
Queue Length 95th (ft)	0	0	6
Internal Link Dist (ft)	220	381	241
Turn Bay Length (ft)			
Base Capacity (vph)	348	5085	4965
Starvation Cap Reductn	0	0	585
Spillback Cap Reductn	0	0	44
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.02	0.19	0.27

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	8	0	895	1123	5
Future Volume (vph)	0	8	0	895	1123	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.86			1.00	1.00	
Flt Protected	1.00			1.00	1.00	
Satd. Flow (prot)	1611			5085	5082	
Flt Permitted	1.00			1.00	1.00	
Satd. Flow (perm)	1611			5085	5082	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	8	0	942	1182	5
RTOR Reduction (vph)	8	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	942	1187	0
Confl. Peds. (#/hr)	1		4			4
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	1.4			150.0	138.6	
Effective Green, g (s)	1.4			150.0	138.6	
Actuated g/C Ratio	0.01			1.00	0.92	
Clearance Time (s)	5.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	15			5085	4695	
v/s Ratio Prot	0.00			0.19	c0.23	
v/s Ratio Perm						
v/c Ratio	0.00			0.19	0.25	
Uniform Delay, d1	73.6			0.0	0.6	
Progression Factor	1.00			1.00	0.32	
Incremental Delay, d2	0.1			0.1	0.1	
Delay (s)	73.7			0.1	0.3	
Level of Service	E			A	A	
Approach Delay (s)	73.7			0.1	0.3	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	174	326	25	879	407	1143
v/c Ratio	0.30	0.31	0.44	0.25	0.66	1.27	0.60
Control Delay	56.7	1.2	4.4	93.6	42.2	177.0	42.1
Queue Delay	0.0	1.0	1.9	0.0	0.0	0.2	0.0
Total Delay	56.7	2.2	6.3	93.6	42.2	177.2	42.1
Queue Length 50th (ft)	52	0	68	25	142	~439	354
Queue Length 95th (ft)	98	0	118	60	213	#788	456
Internal Link Dist (ft)	420	47			200		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	217	613	769	165	1339	320	1911
Starvation Cap Reductn	0	251	294	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	5	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.48	0.69	0.15	0.66	1.29	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	25	23	14	35	39	411	12	13	826	26	5	390
Future Volume (vph)	25	23	14	35	39	411	12	13	826	26	5	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frt		0.97			0.92	0.85		1.00	1.00			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1807			1538	1504		1750	5063			1787
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.14
Satd. Flow (perm)		1807			1538	1504		1750	5063			266
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	24	14	36	40	424	12	13	852	27	5	402
RTOR Reduction (vph)	0	6	0	0	36	214	0	0	0	0	0	0
Lane Group Flow (vph)	0	58	0	0	138	112	0	25	879	0	0	407
Heavy Vehicles (%)	0%	0%	0%	3%	20%	2%	0%	6%	2%	1%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		16.3			50.5	50.5		5.3	38.2			64.5
Effective Green, g (s)		17.3			51.5	51.5		6.3	39.7			65.5
Actuated g/C Ratio		0.12			0.34	0.34		0.04	0.26			0.44
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		208			528	516		73	1340			324
v/s Ratio Prot		c0.03			c0.09	0.07		0.01	0.17			c0.17
v/s Ratio Perm												c0.38
v/c Ratio		0.28			0.26	0.22		0.34	0.66			1.26
Uniform Delay, d1		60.6			35.5	34.9		69.8	49.1			38.9
Progression Factor		1.00			0.00	0.90		1.32	0.81			1.00
Incremental Delay, d2		0.9			0.6	0.5		2.8	2.5			138.0
Delay (s)		61.5			0.6	31.9		94.7	42.0			176.9
Level of Service		E			A	C		F	D			F
Approach Delay (s)		61.5			21.0				43.5			
Approach LOS		E			C				D			

Intersection Summary			
HCM 2000 Control Delay	57.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1077	32
Future Volume (vph)	1077	32
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5066	
Flt Permitted	1.00	
Satd. Flow (perm)	5066	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	1110	33
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1143	0
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	52.4	
Effective Green, g (s)	53.9	
Actuated g/C Ratio	0.36	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1820	
v/s Ratio Prot	0.23	
v/s Ratio Perm		
v/c Ratio	0.63	
Uniform Delay, d1	39.8	
Progression Factor	1.00	
Incremental Delay, d2	1.7	
Delay (s)	41.4	
Level of Service	D	
Approach Delay (s)	77.0	
Approach LOS	E	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	347	7	0	383	22	8	1	4	20	0	89
Future Volume (vph)	90	347	7	0	383	22	8	1	4	20	0	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.96			0.89	
Flt Protected		0.99			1.00			0.97			0.99	
Satd. Flow (prot)		3537			3482			1738			1649	
Flt Permitted		0.99			1.00			0.97			0.99	
Satd. Flow (perm)		3537			3482			1738			1649	
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)	98	377	8	0	416	24	9	1	4	22	0	97
RTOR Reduction (vph)	0	1	0	0	3	0	0	4	0	0	114	0
Lane Group Flow (vph)	0	482	0	0	437	0	0	10	0	0	5	0
Confl. Peds. (#/hr)									8	8		
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		87.7			30.5			5.8			5.2	
Effective Green, g (s)		82.8			31.5			6.8			6.2	
Actuated g/C Ratio		0.55			0.21			0.05			0.04	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1952			731			78			68	
v/s Ratio Prot		c0.14			c0.13			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio		0.25			0.60			0.13			0.07	
Uniform Delay, d1		17.4			53.5			68.8			69.1	
Progression Factor		0.16			1.17			1.00			1.00	
Incremental Delay, d2		0.0			1.9			0.3			0.2	
Delay (s)		2.7			64.6			69.0			69.3	
Level of Service		A			E			E			E	
Approach Delay (s)		2.7			64.6			69.0			69.3	
Approach LOS		A			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	78	338	342	223	6	532	538	136	20	391	42	33
Average Queue (ft)	10	125	126	111	0	229	236	13	1	257	10	4
95th Queue (ft)	47	262	267	216	5	503	512	100	12	370	35	19
Link Distance (ft)		764	764			1199	1199	1199	114	1671	1671	213
Upstream Blk Time (%)						0	0					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		9	2	1		26						
Queuing Penalty (veh)		3	12	6		0						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	74	232	242	153	366	368	430	262	101	242
Average Queue (ft)	20	101	106	67	128	114	215	124	12	119
95th Queue (ft)	54	209	220	150	482	454	371	226	59	221
Link Distance (ft)		982	982		764	764	447	447		235
Upstream Blk Time (%)					3	1	0			2
Queuing Penalty (veh)					11	4	0			0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				0	15				0	17
Queuing Penalty (veh)				1	11				0	1

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	223	229	445	466	26	475	953	956	92	212	480	500
Average Queue (ft)	121	140	254	269	1	425	565	406	17	36	292	290
95th Queue (ft)	198	209	402	418	12	558	1232	1068	60	137	447	454
Link Distance (ft)			732	732			982	982			514	514
Upstream Blk Time (%)							14	3			0	0
Queuing Penalty (veh)							55	11			0	0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)				0		58	4	0		0	32	22
Queuing Penalty (veh)				0		168	6	0		0	9	24

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	250	171	155	343	355	225
Average Queue (ft)	103	81	80	237	249	114
95th Queue (ft)	278	144	141	351	374	278
Link Distance (ft)			340	340	340	
Upstream Blk Time (%)				5	9	
Queuing Penalty (veh)				17	28	
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0				37	1
Queuing Penalty (veh)	0				87	2

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	WB	NB	SB
Directions Served	TR	R	R
Maximum Queue (ft)	4	23	21
Average Queue (ft)	0	3	2
95th Queue (ft)	4	15	12
Link Distance (ft)	732	254	92
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	SW	SW	SW
Directions Served	<LTR>	LTR	<LTR>	<L	TR	T	TR>	<L	T	TR>
Maximum Queue (ft)	228	89	132	95	42	459	490	141	277	299
Average Queue (ft)	163	26	45	32	7	215	227	24	128	150
95th Queue (ft)	249	65	104	77	29	397	416	77	260	281
Link Distance (ft)	188	107	225		231	713	713		391	391
Upstream Blk Time (%)	25	0								0
Queuing Penalty (veh)	0	0								0
Storage Bay Dist (ft)				175				150		
Storage Blk Time (%)						29			9	
Queuing Penalty (veh)						0			3	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB	B9	B9
Directions Served	LR	T	T	TR	T	T
Maximum Queue (ft)	32	17	73	96	8	16
Average Queue (ft)	5	1	6	12	0	1
95th Queue (ft)	23	9	39	63	6	10
Link Distance (ft)	235	284	284	284	184	184
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B9	B9	B9	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	T	UL	T
Maximum Queue (ft)	460	64	65	132	259	263	269	99	131	135	494	848
Average Queue (ft)	328	17	43	21	154	182	187	6	18	19	400	427
95th Queue (ft)	518	51	62	82	275	314	308	42	75	75	582	939
Link Distance (ft)	434	37	37		184	184	184	284	284	284		958
Upstream Blk Time (%)	20	5	55		4	7	9					6
Queuing Penalty (veh)	0	16	159		14	25	31					0
Storage Bay Dist (ft)				135							470	
Storage Blk Time (%)					10						26	0
Queuing Penalty (veh)					1						78	0

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	782	522
Average Queue (ft)	370	258
95th Queue (ft)	782	475
Link Distance (ft)	958	958
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	49	50	555	541	81	319
Average Queue (ft)	25	8	354	341	26	287
95th Queue (ft)	44	35	560	554	63	322
Link Distance (ft)	37	37	1671	1671	158	259
Upstream Blk Time (%)	3	7				96
Queuing Penalty (veh)	8	16				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 809

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	47	162	151	129	50	1255	1249	1212	50	1326	948	59
Average Queue (ft)	7	51	52	41	4	949	978	510	11	934	333	13
95th Queue (ft)	27	128	122	102	25	1478	1496	1446	37	1493	914	42
Link Distance (ft)		764	764			1192	1192	1192	111	1656	1656	213
Upstream Blk Time (%)						6	10	2		0		
Queuing Penalty (veh)						43	75	16		0		
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		1	0			28						
Queuing Penalty (veh)		0	0			1						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	219	327	319	174	393	388	411	145	144	283
Average Queue (ft)	94	142	146	83	184	190	238	61	35	223
95th Queue (ft)	182	286	290	166	352	353	414	118	110	331
Link Distance (ft)		982	982		764	764	447	447		268
Upstream Blk Time (%)							5			13
Queuing Penalty (veh)							0			0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)		0		1	22				0	46
Queuing Penalty (veh)		0		6	37				0	11

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	184	189	249	243	31	474	719	748	375	225	483	470
Average Queue (ft)	95	113	130	133	5	188	347	377	118	173	278	264
95th Queue (ft)	168	181	227	225	23	385	683	721	384	273	455	441
Link Distance (ft)			740	740			982	982			513	513
Upstream Blk Time (%)											0	0
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)						0	6	14	0	22	21	16
Queuing Penalty (veh)						0	9	15	0	56	21	18

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	B127	SB	SB	SB	SB	SB
Directions Served	R	T	L	L	T	T	R
Maximum Queue (ft)	250	6	147	155	312	344	225
Average Queue (ft)	80	0	66	73	162	187	148
95th Queue (ft)	259	6	127	134	279	327	261
Link Distance (ft)		697		340	340	340	
Upstream Blk Time (%)					1	3	
Queuing Penalty (veh)					2	10	
Storage Bay Dist (ft)	225		300				200
Storage Blk Time (%)	0					14	9
Queuing Penalty (veh)	0					46	23

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	WB	WB	NB	SB
Directions Served	T	TR	R	R
Maximum Queue (ft)	386	404	24	52
Average Queue (ft)	147	166	5	17
95th Queue (ft)	380	408	21	53
Link Distance (ft)	740	740	126	77
Upstream Blk Time (%)				6
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	NE	SW	SW	SW
Directions Served	LTR>	LTR>	<LTR>	<L	TR>	<L	T	TR>	<L	T	TR>
Maximum Queue (ft)	206	105	210	71	43	22	293	277	173	390	400
Average Queue (ft)	140	40	102	19	6	3	123	119	42	333	341
95th Queue (ft)	230	90	197	52	25	14	244	236	132	471	474
Link Distance (ft)	189	146	225		232		713	713		354	354
Upstream Blk Time (%)	12	0	2							20	23
Queuing Penalty (veh)	0	0	0							191	216
Storage Bay Dist (ft)				175		120			150		
Storage Blk Time (%)							14		1	31	
Queuing Penalty (veh)							1		12	15	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB	B10	B10
Directions Served	LR	T	T	TR	T	T
Maximum Queue (ft)	42	3	70	128	4	5
Average Queue (ft)	11	0	4	8	0	0
95th Queue (ft)	34	3	42	65	4	5
Link Distance (ft)	236	284	284	284	184	184
Upstream Blk Time (%)				0		
Queuing Penalty (veh)				0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	UL	T	T	TR
Maximum Queue (ft)	265	61	53	80	120	150	156	495	1004	982	970
Average Queue (ft)	130	18	40	27	42	53	73	490	918	727	396
95th Queue (ft)	265	49	61	66	100	114	134	535	1225	1290	927
Link Distance (ft)	434	37	37		184	184	184		958	958	958
Upstream Blk Time (%)		7	52			0	0		72	8	1
Queuing Penalty (veh)		30	221			0	0		0	0	0
Storage Bay Dist (ft)				135				470			
Storage Blk Time (%)					0			82	1		
Queuing Penalty (veh)					0			248	3		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	67	58	1211	1215	79	301
Average Queue (ft)	26	15	962	970	21	251
95th Queue (ft)	53	45	1281	1301	61	332
Link Distance (ft)	37	37	1656	1656	158	259
Upstream Blk Time (%)	8	14				70
Queuing Penalty (veh)	22	38				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1386

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	154	401	398	225	60	646	645	234	40	296	99	49
Average Queue (ft)	18	213	200	162	7	221	228	26	8	167	37	10
95th Queue (ft)	85	347	334	248	34	521	520	130	29	258	79	32
Link Distance (ft)		764	764			1190	1190	1190	109	1662	1662	213
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		18	6	3	0	21						
Queuing Penalty (veh)		4	29	16	0	1						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	221	309	347	174	458	484	230	116	145	236
Average Queue (ft)	107	108	119	96	179	191	107	48	51	178
95th Queue (ft)	193	230	251	180	383	400	184	91	128	257
Link Distance (ft)		981	981		764	764	447	447		205
Upstream Blk Time (%)										15
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				3	7				0	37
Queuing Penalty (veh)				16	10				0	16

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	165	184	417	421	46	406	645	684	375	222	308	305
Average Queue (ft)	93	112	265	272	8	174	334	349	103	71	176	168
95th Queue (ft)	153	169	387	393	32	381	631	647	346	160	262	258
Link Distance (ft)			769	769			981	981			515	515
Upstream Blk Time (%)							0	0				
Queuing Penalty (veh)							0	0				
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)				0		0	6	18	0	0	6	2
Queuing Penalty (veh)				0		1	9	16	0	0	5	3

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	217	131	146	342	352	225
Average Queue (ft)	40	61	64	155	166	114
95th Queue (ft)	128	116	122	299	323	255
Link Distance (ft)			340	340	340	
Upstream Blk Time (%)				1	2	
Queuing Penalty (veh)				3	7	
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0				12	4
Queuing Penalty (veh)	0				44	12

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	WB	WB	NB	SB
Directions Served	T	TR	R	R
Maximum Queue (ft)	72	94	23	39
Average Queue (ft)	6	11	6	11
95th Queue (ft)	37	54	20	34
Link Distance (ft)	769	769	135	122
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	NE	SW	SW	SW
Directions Served	<LTR>	<LTR>	<LTR>	<L	TR>	<L	T	TR>	<L	T	TR>
Maximum Queue (ft)	162	88	89	37	18	70	355	354	174	358	368
Average Queue (ft)	69	26	24	6	2	7	175	175	37	262	284
95th Queue (ft)	134	67	63	25	11	37	293	296	136	386	400
Link Distance (ft)	188	154	225		229		713	713		328	328
Upstream Blk Time (%)	0									3	7
Queuing Penalty (veh)	0									23	51
Storage Bay Dist (ft)				175		120			150		
Storage Blk Time (%)							23		0	22	
Queuing Penalty (veh)							2		0	9	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB	B9	B9	B9
Directions Served	LR	T	T	TR	T	T	T
Maximum Queue (ft)	36	21	112	157	3	3	17
Average Queue (ft)	7	1	5	9	0	0	1
95th Queue (ft)	29	21	54	67	3	3	18
Link Distance (ft)	242	260	260	260	209	209	209
Upstream Blk Time (%)			0	0			
Queuing Penalty (veh)			0	0			
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B9	B9	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	UL	T	T
Maximum Queue (ft)	135	68	62	101	198	223	244	7	8	495	1001	979
Average Queue (ft)	54	17	35	22	114	133	158	0	1	482	869	817
95th Queue (ft)	110	53	65	64	176	205	228	8	11	565	1244	1213
Link Distance (ft)	434	37	37		209	209	209	260	260		958	958
Upstream Blk Time (%)		5	19		0	1	6				50	11
Queuing Penalty (veh)		12	47		1	4	17				0	0
Storage Bay Dist (ft)				135						470		
Storage Blk Time (%)					13					78	0	
Queuing Penalty (veh)					3					280	1	

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	SB
Directions Served	TR
Maximum Queue (ft)	972
Average Queue (ft)	585
95th Queue (ft)	1063
Link Distance (ft)	958
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	52	39	262	266	46	196
Average Queue (ft)	29	9	156	163	12	77
95th Queue (ft)	46	32	239	244	37	156
Link Distance (ft)	37	37	1662	1662	158	259
Upstream Blk Time (%)	4	1				0
Queuing Penalty (veh)	10	2				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 654

Appendix H

Vehicular Capacity Analysis Worksheets – Future (2023) Conditions with Development Phase 1

Queues

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2023 TF AM

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	40	2214	1	836	251	1	274	11	5
v/c Ratio	0.10	0.67	0.01	0.42	0.25	0.02	0.83	0.02	0.06
Control Delay	9.0	12.2	39.0	45.0	24.7	89.0	122.7	0.1	82.2
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	12.4	39.0	45.0	24.7	89.0	122.7	0.1	82.2
Queue Length 50th (ft)	5	98	1	443	125	1	313	0	6
Queue Length 95th (ft)	m19	#1184	m4	643	230	9	m406	m0	22
Internal Link Dist (ft)		810		1204		100		1637	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	417	3316	119	1977	1009	67	379	487	175
Starvation Cap Reductn	0	379	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.75	0.01	0.42	0.25	0.01	0.72	0.02	0.03

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	37	2036	1	1	0	769	231	1	0	252	1	9
Future Volume (vph)	37	2036	1	1	0	769	231	1	0	252	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0	6.3	6.3	
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00	1.00	1.00	
Frt	1.00	1.00			1.00	1.00	0.85		1.00	1.00	0.86	
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (prot)	1805	4987			1805	3223	1524		1805	1687	1641	
Flt Permitted	0.26	1.00			0.04	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (perm)	487	4987			73	3223	1524		1805	1687	1641	
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)	40	2213	1	1	0	836	251	1	0	274	1	10
RTOR Reduction (vph)	0	0	0	0	0	0	86	0	0	0	9	0
Lane Group Flow (vph)	40	2214	0	0	1	836	165	0	1	274	2	0
Heavy Vehicles (%)	0%	4%	0%	0%	0%	12%	6%	0%	0%	7%	0%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA	Split	NA	
Protected Phases	5	2		1	1	6		7	7	3	3	
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	114.4	108.3			104.6	103.4	103.4		1.3	36.5	36.5	
Effective Green, g (s)	116.4	110.3			106.6	105.4	105.4		2.3	37.5	37.5	
Actuated g/C Ratio	0.61	0.58			0.56	0.55	0.55		0.01	0.20	0.20	
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0	7.3	7.3	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	5.0	5.0	
Lane Grp Cap (vph)	347	2895			61	1787	845		21	332	323	
v/s Ratio Prot	c0.00	c0.44			0.00	0.26			c0.00	c0.16	0.00	
v/s Ratio Perm	0.07				0.01		0.11					
v/c Ratio	0.12	0.76			0.02	0.47	0.20		0.05	0.83	0.01	
Uniform Delay, d1	16.5	30.1			26.2	25.4	21.1		92.8	73.1	61.3	
Progression Factor	0.55	0.45			1.88	1.85	3.57		1.00	1.42	1.00	
Incremental Delay, d2	0.1	1.3			0.1	0.9	0.5		0.9	16.4	0.0	
Delay (s)	9.1	14.7			49.3	48.0	76.0		93.7	120.0	61.3	
Level of Service	A	B			D	D	E		F	F	E	
Approach Delay (s)		14.6				54.5			93.7		117.7	
Approach LOS		B				D			F		F	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NEL2	NEL	NER
Lane Configurations			
Traffic Volume (vph)	2	0	3
Future Volume (vph)	2	0	3
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)		5.6	
Lane Util. Factor		1.00	
Frt		0.92	
Flt Protected		0.98	
Satd. Flow (prot)		1427	
Flt Permitted		0.98	
Satd. Flow (perm)		1427	
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	2	0	3
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	5	0
Heavy Vehicles (%)	50%	0%	0%
Turn Type	Prot	Prot	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)		5.8	
Effective Green, g (s)		6.8	
Actuated g/C Ratio		0.04	
Clearance Time (s)		6.6	
Vehicle Extension (s)		3.0	
Lane Grp Cap (vph)		51	
v/s Ratio Prot		c0.00	
v/s Ratio Perm			
v/c Ratio		0.10	
Uniform Delay, d1		88.6	
Progression Factor		1.00	
Incremental Delay, d2		0.8	
Delay (s)		89.5	
Level of Service		F	
Approach Delay (s)		89.5	
Approach LOS		F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	52	1979	75	767	153	185	7	123
v/c Ratio	0.10	0.81	0.50	0.33	0.92	0.57	0.09	0.49
Control Delay	3.5	10.6	60.7	3.6	127.5	43.2	67.3	71.1
Queue Delay	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.5	11.5	60.7	3.6	127.5	43.3	67.3	71.1
Queue Length 50th (ft)	7	181	47	42	190	110	8	127
Queue Length 95th (ft)	m10	197	120	6	#301	196	25	197
Internal Link Dist (ft)		1037		810	420			201
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	550	2441	162	2326	202	376	99	303
Starvation Cap Reductn	0	219	0	0	0	0	0	0
Spillback Cap Reductn	0	155	0	0	0	4	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.89	0.46	0.33	0.76	0.50	0.07	0.41

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	1808	13	69	705	1	33	108	170	6	75	38
Future Volume (vph)	48	1808	13	69	705	1	33	108	170	6	75	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3433		1805	3195			1354	1599	1081	1547	
Flt Permitted	0.34	1.00		0.05	1.00			0.78	1.00	0.46	1.00	
Satd. Flow (perm)	645	3433		95	3195			1067	1599	525	1547	
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)	52	1965	14	75	766	1	36	117	185	7	82	41
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	76	0	10	0
Lane Group Flow (vph)	52	1979	0	75	767	0	0	153	109	7	113	0
Heavy Vehicles (%)	0%	5%	10%	0%	13%	0%	2%	50%	1%	67%	0%	50%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	139.8	134.1		143.8	136.1			28.9	28.9	28.9	28.9	
Effective Green, g (s)	141.8	135.1		145.8	137.1			29.9	29.9	29.9	29.9	
Actuated g/C Ratio	0.75	0.71		0.77	0.72			0.16	0.16	0.16	0.16	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	522	2441		151	2305			167	251	82	243	
v/s Ratio Prot	0.00	c0.58		c0.02	0.24						0.07	
v/s Ratio Perm	0.07			0.36				c0.14	0.07	0.01		
v/c Ratio	0.10	0.81		0.50	0.33			0.92	0.43	0.09	0.46	
Uniform Delay, d1	6.5	18.7		27.2	9.7			78.8	72.4	68.4	72.8	
Progression Factor	0.59	0.41		3.74	0.32			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	2.2		2.4	0.4			45.6	1.2	0.5	1.4	
Delay (s)	3.9	9.9		104.2	3.4			124.4	73.6	68.8	74.2	
Level of Service	A	A		F	A			F	E	E	E	
Approach Delay (s)		9.7			12.4			96.6			73.9	
Approach LOS		A			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	1552	10	141	599	72	37	637	113	159	564	241
v/c Ratio	0.72	0.80	0.01	1.37	0.34	0.10	0.39	0.89	0.24	0.73	0.69	0.32
Control Delay	119.5	22.5	0.0	263.0	23.2	6.4	97.8	88.8	9.0	130.9	118.5	6.0
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.5
Total Delay	119.5	22.7	0.0	263.0	23.2	6.4	97.8	88.8	9.0	130.9	120.9	6.4
Queue Length 50th (ft)	193	251	0	~236	77	0	45	408	10	107	379	0
Queue Length 95th (ft)	m241	412	m0	m#383	340	m38	91	488	54	#154	456	82
Internal Link Dist (ft)		772			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	458	1932	968	103	1749	730	110	748	474	222	819	764
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	142	221
Spillback Cap Reductn	0	57	0	0	0	0	0	0	1	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.83	0.01	1.37	0.34	0.10	0.34	0.85	0.24	0.72	0.83	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	1505	10	137	581	70	36	618	110	154	547	234
Future Volume (vph)	279	1505	10	137	581	70	36	618	110	154	547	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	288	1552	10	141	599	72	37	637	113	159	564	241
RTOR Reduction (vph)	0	0	4	0	0	29	0	0	72	0	0	145
Lane Group Flow (vph)	288	1552	6	141	599	43	37	637	41	159	564	96
Confl. Peds. (#/hr)	1		2	2		1			2	2		
Heavy Vehicles (%)	2%	2%	2%	17%	2%	27%	2%	2%	4%	16%	5%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	20.8	100.9	108.6	11.2	91.0	103.2	7.7	38.4	49.6	12.2	43.8	64.6
Effective Green, g (s)	22.3	102.4	111.6	12.7	92.5	106.2	9.2	39.9	52.6	13.7	45.3	67.6
Actuated g/C Ratio	0.12	0.54	0.59	0.07	0.49	0.56	0.05	0.21	0.28	0.07	0.24	0.36
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	402	1907	916	103	1722	702	85	743	424	217	819	563
v/s Ratio Prot	0.08	c0.44	0.00	c0.09	0.17	0.00	0.02	c0.18	0.01	c0.05	c0.16	0.02
v/s Ratio Perm			0.00			0.03			0.02			0.04
v/c Ratio	0.72	0.81	0.01	1.37	0.35	0.06	0.44	0.86	0.10	0.73	0.69	0.17
Uniform Delay, d1	80.8	36.0	16.2	88.7	30.1	19.1	87.9	72.3	51.0	86.4	65.9	42.0
Progression Factor	1.41	0.57	1.00	0.80	0.76	1.36	1.00	1.00	1.00	1.30	1.70	0.89
Incremental Delay, d2	3.5	2.3	0.0	214.0	0.5	0.0	3.5	9.6	0.1	11.9	2.4	0.1
Delay (s)	117.1	22.8	16.2	284.5	23.3	26.0	91.4	81.9	51.1	124.0	114.8	37.6
Level of Service	F	C	B	F	C	C	F	F	D	F	F	D
Approach Delay (s)		37.5			68.9			78.0			97.0	
Approach LOS		D			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	63.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1776	1	0	841	14	0	0	6	0	0	6
Future Vol, veh/h	0	1776	1	0	841	14	0	0	6	0	0	6
Conflicting Peds, #/hr	2	0	5	5	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1831	1	0	867	14	0	0	6	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	921	-	-	443
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	273	0	0	562
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	272	-	-	561
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	18.5	11.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	272	-	-	-	-	561
HCM Lane V/C Ratio	0.023	-	-	-	-	0.011
HCM Control Delay (s)	18.5	-	-	-	-	11.5
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0

Lane Group	EBT	WBT	NBT	SBL	SBT	NET	SWL	SWT
Lane Group Flow (vph)	158	27	63	36	13	1711	32	844
v/c Ratio	0.88	0.35	0.53	0.48	0.09	0.81	0.28	0.37
Control Delay	124.0	99.2	99.6	104.8	80.6	25.5	32.9	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	124.0	99.2	99.6	104.8	80.6	25.6	32.9	15.7
Queue Length 50th (ft)	197	33	77	44	15	890	13	177
Queue Length 95th (ft)	#334	72	132	87	41	613	50	206
Internal Link Dist (ft)	220	125	220		220	755		447
Turn Bay Length (ft)				175			150	
Base Capacity (vph)	187	147	138	88	163	2101	169	2299
Starvation Cap Reductn	0	0	0	0	0	40	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.18	0.46	0.41	0.08	0.83	0.19	0.37

Intersection Summary

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

Movement	EBL2	EBL	EBT	EBR	EBR2	WBL	WBT	NBL2	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	2	118	28	2	3	15	12	9	10	7	35	1
Future Volume (vph)	2	118	28	2	3	15	12	9	10	7	35	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.5				6.5			5.0		
Lane Util. Factor			1.00				1.00			1.00		
Frpb, ped/bikes			1.00				1.00			1.00		
Flpb, ped/bikes			1.00				1.00			1.00		
Frt			1.00				1.00			0.92		
Flt Protected			0.96				0.97			0.99		
Satd. Flow (prot)			1741				1812			1697		
Flt Permitted			0.96				0.97			0.90		
Satd. Flow (perm)			1741				1812			1546		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	2	122	29	2	3	15	12	9	10	7	36	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	158	0	0	0	27	0	0	63	0	0
Confl. Peds. (#/hr)	2			1	1	1		1	1			
Heavy Vehicles (%)	100%	2%	2%	100%	2%	2%	2%	0%	0%	0%	2%	2%
Turn Type	Split	Split	NA			Split	NA	Perm	Perm	NA		
Protected Phases	3	3	3			4	4			7		
Permitted Phases								7	7			
Actuated Green, G (s)			19.7				7.2			13.1		
Effective Green, g (s)			19.7				7.2			14.6		
Actuated g/C Ratio			0.10				0.04			0.08		
Clearance Time (s)			6.5				6.5			6.5		
Vehicle Extension (s)			3.0				3.0			3.0		
Lane Grp Cap (vph)			180				68			118		
v/s Ratio Prot			c0.09				c0.01					
v/s Ratio Perm										c0.04		
v/c Ratio			0.88				0.40			0.53		
Uniform Delay, d1			84.0				89.3			84.4		
Progression Factor			1.00				1.00			1.00		
Incremental Delay, d2			34.8				3.8			4.6		
Delay (s)			118.8				93.1			89.0		
Level of Service			F				F			F		
Approach Delay (s)			118.8				93.1			89.0		
Approach LOS			F				F			F		

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	32.2
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL2	SBL	SBT	SBR	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	28	7	10	3	0	1602	43	15	10	21	772	41
Future Volume (vph)	28	7	10	3	0	1602	43	15	10	21	772	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	5.0			7.1				7.1	7.1	
Lane Util. Factor		1.00	1.00			0.95				1.00	0.95	
Frpb, ped/bikes		1.00	1.00			1.00				1.00	1.00	
Flpb, ped/bikes		1.00	1.00			1.00				1.00	1.00	
Frt		1.00	0.97			0.99				1.00	0.99	
Flt Protected		0.95	1.00			1.00				0.95	1.00	
Satd. Flow (prot)		1770	1834			3521				1770	3505	
Flt Permitted		0.58	1.00			1.00				0.05	1.00	
Satd. Flow (perm)		1088	1834			3521				85	3505	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	29	7	10	3	0	1652	44	15	10	22	796	42
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	36	13	0	0	1711	0	0	0	32	844	0
Confl. Peds. (#/hr)					1							1
Heavy Vehicles (%)	2%	2%	0%	0%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA			pm+pt	pm+pt	NA	
Protected Phases			7		1	6			5	5	2	
Permitted Phases	7	7			6				2	2		
Actuated Green, G (s)		13.1	13.1			110.6				123.4	123.4	
Effective Green, g (s)		13.1	14.6			110.6				123.4	123.4	
Actuated g/C Ratio		0.07	0.08			0.58				0.65	0.65	
Clearance Time (s)		6.5	6.5			7.1				7.1	7.1	
Vehicle Extension (s)		3.0	3.0			4.0				3.0	4.0	
Lane Grp Cap (vph)		75	140			2049				105	2276	
v/s Ratio Prot			0.01			c0.49				0.01	c0.24	
v/s Ratio Perm		0.03								0.19		
v/c Ratio		0.48	0.09			0.83				0.30	0.37	
Uniform Delay, d1		85.2	81.5			32.3				30.8	15.4	
Progression Factor		1.00	1.00			0.67				1.92	0.95	
Incremental Delay, d2		4.8	0.3			3.5				1.6	0.4	
Delay (s)		89.9	81.8			25.0				60.8	15.1	
Level of Service		F	F			C				E	B	
Approach Delay (s)			87.8			25.0					16.8	
Approach LOS			F			C					B	

Intersection Summary

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	6
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	32	1075	1014
v/c Ratio	0.36	0.21	0.22
Control Delay	53.6	0.1	1.0
Queue Delay	0.0	0.0	0.1
Total Delay	53.7	0.1	1.2
Queue Length 50th (ft)	14	0	35
Queue Length 95th (ft)	56	0	m50
Internal Link Dist (ft)	220	381	224
Turn Bay Length (ft)			
Base Capacity (vph)	142	5085	4663
Starvation Cap Reductn	0	0	2203
Spillback Cap Reductn	2	33	649
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.21	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	19	0	989	918	15
Future Volume (vph)	10	19	0	989	918	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.91			1.00	1.00	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1669			5085	5072	
Flt Permitted	0.98			1.00	1.00	
Satd. Flow (perm)	1669			5085	5072	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	21	0	1075	998	16
RTOR Reduction (vph)	20	0	0	0	1	0
Lane Group Flow (vph)	12	0	0	1075	1013	0
Confl. Peds. (#/hr)			2			2
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	6.5			190.0	172.5	
Effective Green, g (s)	6.5			190.0	172.5	
Actuated g/C Ratio	0.03			1.00	0.91	
Clearance Time (s)	6.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	57			5085	4604	
v/s Ratio Prot	0.01			0.21	c0.20	
v/s Ratio Perm						
v/c Ratio	0.21			0.21	0.22	
Uniform Delay, d1	89.2			0.0	1.0	
Progression Factor	1.00			1.00	0.91	
Incremental Delay, d2	1.8			0.1	0.1	
Delay (s)	91.0			0.1	1.0	
Level of Service	F			A	A	
Approach Delay (s)	91.0			0.1	1.0	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	1.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	227	274	362	16	1050	390	1009
v/c Ratio	1.00	0.49	0.49	0.22	0.88	1.11	0.51
Control Delay	138.3	2.0	4.0	141.2	31.6	136.8	44.7
Queue Delay	0.0	5.1	20.3	0.0	0.9	0.0	0.0
Total Delay	138.3	7.2	24.2	141.2	32.5	136.8	44.7
Queue Length 50th (ft)	285	0	75	21	369	~505	363
Queue Length 95th (ft)	#486	m0	m63	53	430	#735	420
Internal Link Dist (ft)	420	47			217		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	227	559	743	165	1192	350	1984
Starvation Cap Reductn	0	218	373	0	31	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.80	0.98	0.10	0.90	1.11	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	99	25	38	43	504	10	5	944	22	4	355
Future Volume (vph)	85	99	25	38	43	504	10	5	944	22	4	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.98			0.90	0.85		1.00	1.00			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1770			1516	1475		1636	4957			1736
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.08
Satd. Flow (perm)		1770			1516	1475		1636	4957			143
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)	92	108	27	41	47	548	11	5	1026	24	4	386
RTOR Reduction (vph)	0	3	0	0	40	238	0	0	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	234	124	0	16	1050	0	0	390
Confl. Peds. (#/hr)			2	2						1		1
Heavy Vehicles (%)	0%	5%	8%	8%	13%	4%	0%	33%	4%	15%	0%	4%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		23.1			64.0	64.0		5.1	44.2			84.2
Effective Green, g (s)		24.1			65.0	65.0		6.1	45.7			85.2
Actuated g/C Ratio		0.13			0.34	0.34		0.03	0.24			0.45
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		224			518	504		52	1192			350
v/s Ratio Prot		c0.13			c0.15	0.08		0.01	0.21			c0.20
v/s Ratio Perm												c0.30
v/c Ratio		1.00			0.45	0.25		0.31	0.88			1.11
Uniform Delay, d1		83.0			48.6	44.9		89.9	69.5			63.8
Progression Factor		1.00			0.01	0.77		1.55	0.32			1.00
Incremental Delay, d2		60.6			0.8	0.3		3.3	9.4			82.6
Delay (s)		143.5			1.4	35.0		142.3	31.3			146.5
Level of Service		F			A	C		F	C			F
Approach Delay (s)		143.5			20.5				33.0			
Approach LOS		F			C				C			

Intersection Summary			
HCM 2000 Control Delay	55.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	912	17
Future Volume (vph)	912	17
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	4931	
Flt Permitted	1.00	
Satd. Flow (perm)	4931	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	991	18
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1009	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	5%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	72.3	
Effective Green, g (s)	73.8	
Actuated g/C Ratio	0.39	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1915	
v/s Ratio Prot	0.20	
v/s Ratio Perm		
v/c Ratio	0.53	
Uniform Delay, d1	44.7	
Progression Factor	1.00	
Incremental Delay, d2	1.0	
Delay (s)	45.7	
Level of Service	D	
Approach Delay (s)	73.8	
Approach LOS	E	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	520	492	32	201
v/c Ratio	0.25	0.79	0.14	1.09
Control Delay	0.6	88.5	1.2	139.2
Queue Delay	26.8	2.3	0.0	2.2
Total Delay	27.4	90.7	1.2	141.4
Queue Length 50th (ft)	2	261	0	~194
Queue Length 95th (ft)	m3	391	0	#393
Internal Link Dist (ft)	47	1637	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2060	628	272	184
Starvation Cap Reductn	1550	0	0	0
Spillback Cap Reductn	0	55	3	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.02	0.86	0.12	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	429	6	0	430	23	8	0	21	39	1	145
Future Volume (vph)	43	429	6	0	430	23	8	0	21	39	1	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.90			0.89	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		3396			3355			1456			1347	
Flt Permitted		1.00			1.00			0.99			0.99	
Satd. Flow (perm)		3396			3355			1456			1347	
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)	47	466	7	0	467	25	9	0	23	42	1	158
RTOR Reduction (vph)	0	0	0	0	2	0	0	31	0	0	68	0
Lane Group Flow (vph)	0	520	0	0	490	0	0	1	0	0	133	0
Confl. Peds. (#/hr)	1		2	2		1	1		8	8		1
Heavy Vehicles (%)	12%	5%	0%	0%	7%	0%	0%	0%	13%	100%	0%	3%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		114.2			34.1			5.4			15.5	
Effective Green, g (s)		109.3			35.1			6.4			16.5	
Actuated g/C Ratio		0.58			0.18			0.03			0.09	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1953			619			49			116	
v/s Ratio Prot		c0.15			c0.15			c0.00			c0.10	
v/s Ratio Perm												
v/c Ratio		0.27			0.79			0.02			1.15	
Uniform Delay, d1		20.2			74.0			88.8			86.8	
Progression Factor		0.03			1.06			1.00			1.00	
Incremental Delay, d2		0.0			8.1			0.1			129.6	
Delay (s)		0.6			86.7			88.8			216.3	
Level of Service		A			F			F			F	
Approach Delay (s)		0.6			86.7			88.8			216.3	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	71.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2023 TF PM

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	16	1401	4	1925	538	7	342	99	16
v/c Ratio	0.15	0.38	0.02	0.78	0.46	0.12	1.51	0.30	0.18
Control Delay	12.4	7.6	11.5	17.1	6.2	106.8	311.1	32.2	101.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	7.7	11.5	17.1	6.2	106.8	311.1	32.2	101.3
Queue Length 50th (ft)	3	106	1	390	134	10	~701	45	23
Queue Length 95th (ft)	m9	228	m2	#1601	136	33	m#934	m91	53
Internal Link Dist (ft)		810		1202		100		1646	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	109	3671	308	2459	1165	63	226	328	189
Starvation Cap Reductn	0	593	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.46	0.01	0.78	0.46	0.11	1.51	0.30	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	1286	3	4	0	1771	495	3	0	4	315	8
Future Volume (vph)	15	1286	3	4	0	1771	495	3	0	4	315	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.92		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98		0.95	1.00
Satd. Flow (prot)	1719	5084			1805	3539	1583		1717		1736	1641
Flt Permitted	0.04	1.00			0.15	1.00	1.00		0.98		0.95	1.00
Satd. Flow (perm)	68	5084			292	3539	1583		1717		1736	1641
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)	16	1398	3	4	0	1925	538	3	0	4	342	9
RTOR Reduction (vph)	0	0	0	0	0	0	74	0	0	0	0	86
Lane Group Flow (vph)	16	1401	0	0	4	1925	464	0	7	0	342	13
Heavy Vehicles (%)	5%	2%	0%	0%	0%	2%	2%	0%	0%	0%	4%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	147.5	143.6			142.1	140.9	140.9		3.0		27.7	27.7
Effective Green, g (s)	149.5	145.6			144.1	142.9	142.9		4.0		28.7	28.7
Actuated g/C Ratio	0.68	0.66			0.65	0.65	0.65		0.02		0.13	0.13
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	82	3364			206	2298	1028		31		226	214
v/s Ratio Prot	c0.00	c0.28			0.00	c0.54			c0.00		c0.20	0.01
v/s Ratio Perm	0.13				0.01		0.29					
v/c Ratio	0.20	0.42			0.02	0.84	0.45		0.23		1.51	0.06
Uniform Delay, d1	34.1	17.4			14.1	29.6	19.1		106.5		95.7	83.8
Progression Factor	0.77	0.51			0.83	0.53	0.45		1.00		1.10	9.26
Incremental Delay, d2	1.0	0.3			0.0	3.3	1.2		3.7		251.8	0.2
Delay (s)	27.4	9.2			11.7	19.0	9.8		110.2		356.7	776.8
Level of Service	C	A			B	B	A		F		F	F
Approach Delay (s)		9.4				17.0			110.2			451.0
Approach LOS		A				B			F			F

Intersection Summary			
HCM 2000 Control Delay	59.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	83	10	2	3
Future Volume (vph)	83	10	2	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.97	
Flt Protected			0.96	
Satd. Flow (prot)			1780	
Flt Permitted			0.96	
Satd. Flow (perm)			1780	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	11	2	3
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	16	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.6	
Effective Green, g (s)			8.6	
Actuated g/C Ratio			0.04	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			69	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.23	
Uniform Delay, d1			102.5	
Progression Factor			1.00	
Incremental Delay, d2			1.7	
Delay (s)			104.2	
Level of Service			F	
Approach Delay (s)			104.2	
Approach LOS			F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	124	1227	179	1744	203	175	25	254
v/c Ratio	0.67	0.55	0.58	0.79	1.06	0.35	0.14	0.62
Control Delay	62.7	20.6	22.4	16.5	159.0	9.0	66.9	74.9
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	62.7	20.6	22.4	17.0	159.0	9.0	66.9	74.9
Queue Length 50th (ft)	106	361	33	247	298	0	29	300
Queue Length 95th (ft)	176	574	m135	323	#478	71	61	403
Internal Link Dist (ft)		1037		810	420			236
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	211	2251	368	2202	217	542	208	464
Starvation Cap Reductn	0	70	0	124	0	0	0	0
Spillback Cap Reductn	0	0	0	143	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.56	0.49	0.85	0.94	0.32	0.12	0.55

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	1089	40	165	1598	6	60	127	161	23	111	122
Future Volume (vph)	114	1089	40	165	1598	6	60	127	161	23	111	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1626	3523		1805	3537			1870	1615	1805	1751	
Flt Permitted	0.05	1.00		0.17	1.00			0.45	1.00	0.43	1.00	
Satd. Flow (perm)	92	3523		321	3537			854	1615	817	1751	
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)	124	1184	43	179	1737	7	65	138	175	25	121	133
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	136	0	19	0
Lane Group Flow (vph)	124	1226	0	179	1744	0	0	203	39	25	235	0
Heavy Vehicles (%)	11%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	155.7	139.6		148.5	136.0			48.6	48.6	48.6	48.6	
Effective Green, g (s)	157.7	140.6		150.5	137.0			49.6	49.6	49.6	49.6	
Actuated g/C Ratio	0.72	0.64		0.68	0.62			0.23	0.23	0.23	0.23	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	185	2251		310	2202			192	364	184	394	
v/s Ratio Prot	c0.05	0.35		0.04	c0.49						0.13	
v/s Ratio Perm	0.43			0.36				c0.24	0.02	0.03		
v/c Ratio	0.67	0.54		0.58	0.79			1.06	0.11	0.14	0.60	
Uniform Delay, d1	52.7	22.0		17.1	30.9			85.2	67.6	68.1	76.3	
Progression Factor	1.25	0.85		1.64	0.44			1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.6	0.9		1.7	1.9			80.9	0.1	0.3	2.4	
Delay (s)	74.4	19.5		29.7	15.5			166.1	67.8	68.4	78.7	
Level of Service	E	B		C	B			F	E	E	E	
Approach Delay (s)		24.5			16.8			120.6			77.8	
Approach LOS		C			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	228	903	29	145	1494	111	115	525	114	174	544	344
v/c Ratio	0.75	0.46	0.03	0.87	0.75	0.11	0.94	0.85	0.23	0.62	0.78	0.69
Control Delay	152.1	16.0	0.0	113.7	27.7	6.6	164.2	100.9	5.1	152.5	93.8	30.8
Queue Delay	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	2.8	1.0
Total Delay	152.1	16.0	0.0	113.7	33.5	6.6	164.2	100.9	5.1	152.5	96.7	31.8
Queue Length 50th (ft)	179	164	0	217	938	40	170	393	0	135	277	87
Queue Length 95th (ft)	#236	181	m0	m#302	1188	m40	#318	462	37	182	321	134
Internal Link Dist (ft)		774			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	310	1951	1028	166	1987	998	122	678	503	340	815	498
Starvation Cap Reductn	0	0	0	0	437	0	0	0	0	0	168	39
Spillback Cap Reductn	0	0	0	0	80	0	0	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.46	0.03	0.87	0.96	0.11	0.94	0.77	0.23	0.51	0.84	0.75

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	867	28	139	1434	107	110	504	109	167	522	330
Future Volume (vph)	219	867	28	139	1434	107	110	504	109	167	522	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1584
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	228	903	29	145	1494	111	115	525	114	174	544	344
RTOR Reduction (vph)	0	0	11	0	0	21	0	0	83	0	0	61
Lane Group Flow (vph)	228	903	18	145	1494	90	115	525	31	174	544	283
Confl. Peds. (#/hr)	4					4	1		7	7		1
Heavy Vehicles (%)	1%	2%	0%	2%	1%	5%	0%	2%	1%	3%	1%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	17.9	119.7	133.1	19.2	120.7	137.3	13.4	37.2	56.4	16.6	41.3	59.2
Effective Green, g (s)	19.4	121.2	136.1	20.7	122.2	140.3	14.9	38.7	59.4	18.1	42.8	62.2
Actuated g/C Ratio	0.09	0.55	0.62	0.09	0.56	0.64	0.07	0.18	0.27	0.08	0.19	0.28
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	305	1949	999	166	1985	962	122	622	424	279	695	447
v/s Ratio Prot	c0.07	0.26	0.00	0.08	c0.42	0.01	c0.06	c0.15	0.01	0.05	c0.15	0.06
v/s Ratio Perm			0.01			0.05			0.01			0.12
v/c Ratio	0.75	0.46	0.02	0.87	0.75	0.09	0.94	0.84	0.07	0.62	0.78	0.63
Uniform Delay, d1	97.9	29.8	16.2	98.4	37.4	15.4	102.1	87.7	59.8	97.7	84.2	68.9
Progression Factor	1.42	0.50	1.00	0.87	0.68	0.90	1.00	1.00	1.00	1.46	1.02	0.48
Incremental Delay, d2	8.5	0.7	0.0	24.8	1.6	0.0	63.4	10.2	0.1	4.2	5.7	2.9
Delay (s)	148.0	15.6	16.2	110.6	26.9	13.8	165.5	97.9	59.9	147.3	91.4	35.9
Level of Service	F	B	B	F	C	B	F	F	E	F	F	D
Approach Delay (s)		41.6			33.0			102.5			82.6	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	57.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1070	1	0	1890	14	0	0	8	0	0	14
Future Vol, veh/h	0	1070	1	0	1890	14	0	0	8	0	0	14
Conflicting Peds, #/hr	4	0	0	0	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1151	1	0	2032	15	0	0	9	0	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	576	-	-	1028
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	460	0	0	231
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	460	-	-	230
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13	21.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	460	-	-	-	-	230
HCM Lane V/C Ratio	0.019	-	-	-	-	0.065
HCM Control Delay (s)	13	-	-	-	-	21.7
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.2

Lane Group	EBT	WBT	NBT	SBL	SBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	132	45	98	19	10	6	1086	49	1950
v/c Ratio	0.74	0.44	0.71	0.18	0.06	0.06	0.52	0.25	0.87
Control Delay	120.2	112.9	122.2	95.7	91.0	10.0	11.0	18.6	27.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	120.2	112.9	122.2	95.7	91.0	10.0	11.2	18.6	27.6
Queue Length 50th (ft)	189	65	139	26	13	1	282	21	607
Queue Length 95th (ft)	274	116	#243	60	38	m4	194	m39	#1645
Internal Link Dist (ft)	220	220	220		220		755		445
Turn Bay Length (ft)				175		120		150	
Base Capacity (vph)	204	165	138	103	161	112	2105	199	2251
Starvation Cap Reductn	0	0	0	0	0	0	307	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.27	0.71	0.18	0.06	0.05	0.60	0.25	0.87

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	76	44	4	2	19	18	2	4	24	27	13	26
Future Volume (vph)	76	44	4	2	19	18	2	4	24	27	13	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0				5.0					5.0	
Lane Util. Factor		1.00				1.00					1.00	
Frpb, ped/bikes		1.00				0.99					1.00	
Flpb, ped/bikes		1.00				1.00					0.99	
Frt		0.99				0.98					0.96	
Flt Protected		0.97				0.98					0.97	
Satd. Flow (prot)		1798				1811					1709	
Flt Permitted		0.97				0.98					0.83	
Satd. Flow (perm)		1798				1811					1449	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	80	46	4	2	20	19	2	4	25	28	14	27
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	132	0	0	0	45	0	0	0	0	98	0
Confl. Peds. (#/hr)			4	2	2		4		2	2		
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%
Turn Type	Split	NA			Split	NA			Perm	Perm	NA	
Protected Phases	3	3			4	4					7	
Permitted Phases									7	7		
Actuated Green, G (s)		20.3				9.6					19.5	
Effective Green, g (s)		21.8				11.1					21.0	
Actuated g/C Ratio		0.10				0.05					0.10	
Clearance Time (s)		6.5				6.5					6.5	
Vehicle Extension (s)		3.0				3.0					3.0	
Lane Grp Cap (vph)		178				91					138	
v/s Ratio Prot		c0.07				c0.02						
v/s Ratio Perm											c0.07	
v/c Ratio		0.74				0.49					0.71	
Uniform Delay, d1		96.4				101.7					96.5	
Progression Factor		1.00				1.00					1.00	
Incremental Delay, d2		15.3				4.2					15.8	
Delay (s)		111.6				105.9					112.3	
Level of Service		F				F					F	
Approach Delay (s)		111.6				105.9					112.3	
Approach LOS		F				F					F	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	25.7
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBR2	SBL2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2	SWL2
Lane Configurations												
Traffic Volume (vph)	4	15	3	4	2	4	6	0	948	73	10	22
Future Volume (vph)	4	15	3	4	2	4	6	0	948	73	10	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0				5.6	5.1			
Lane Util. Factor			1.00	1.00				1.00	0.95			
Frpb, ped/bikes			1.00	0.98				1.00	1.00			
Flpb, ped/bikes			1.00	1.00				1.00	1.00			
Frt			1.00	0.91				1.00	0.99			
Flt Protected			0.95	1.00				0.95	1.00			
Satd. Flow (prot)			1691	1687				1805	3495			
Flt Permitted			0.61	1.00				0.03	1.00			
Satd. Flow (perm)			1079	1687				58	3495			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	16	3	4	2	4	6	0	998	77	11	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	19	10	0	0	0	6	1086	0	0	0
Confl. Peds. (#/hr)					2	2	2				4	
Heavy Vehicles (%)	0%	8%	0%	0%	0%	0%	0%	0%	2%	0%	0%	100%
Turn Type		Perm	Perm	NA			custom	pm+pt	NA			pm+pt
Protected Phases				7				1	6			5
Permitted Phases		7	7				1	6				2
Actuated Green, G (s)			19.5	19.5				130.5	129.2			
Effective Green, g (s)			21.0	21.0				133.5	131.2			
Actuated g/C Ratio			0.10	0.10				0.61	0.60			
Clearance Time (s)			6.5	6.5				7.1	7.1			
Vehicle Extension (s)			3.0	3.0				3.0	4.0			
Lane Grp Cap (vph)			102	161				57	2084			
v/s Ratio Prot				0.01				0.00	0.31			
v/s Ratio Perm			0.02					0.06				
v/c Ratio			0.19	0.06				0.11	0.52			
Uniform Delay, d1			91.6	90.5				39.4	26.0			
Progression Factor			1.00	1.00				0.56	0.38			
Incremental Delay, d2			0.9	0.2				0.8	0.9			
Delay (s)			92.5	90.7				22.9	10.7			
Level of Service			F	F				C	B			
Approach Delay (s)				91.9					10.7			
Approach LOS				F					B			

Intersection Summary

Movement	SWL	SWT	SWR	SWR2
Lane Configurations				
Traffic Volume (vph)	25	1718	128	7
Future Volume (vph)	25	1718	128	7
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.6	5.1		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	1.00		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.99		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1228	3425		
Flt Permitted	0.18	1.00		
Satd. Flow (perm)	236	3425		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	1808	135	7
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	49	1950	0	0
Confl. Peds. (#/hr)	4		2	
Heavy Vehicles (%)	0%	4%	4%	25%
Turn Type	pm+pt	NA		
Protected Phases	5	2		
Permitted Phases	2			
Actuated Green, G (s)	143.3	135.6		
Effective Green, g (s)	145.5	137.6		
Actuated g/C Ratio	0.66	0.63		
Clearance Time (s)	7.1	7.1		
Vehicle Extension (s)	3.0	4.0		
Lane Grp Cap (vph)	197	2142		
v/s Ratio Prot	c0.01	c0.57		
v/s Ratio Perm	0.15			
v/c Ratio	0.25	0.91		
Uniform Delay, d1	17.8	35.8		
Progression Factor	1.09	0.74		
Incremental Delay, d2	0.5	5.2		
Delay (s)	19.9	31.6		
Level of Service	B	C		
Approach Delay (s)		31.3		
Approach LOS		C		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	45	863	1053
v/c Ratio	0.48	0.17	0.22
Control Delay	56.4	0.1	0.9
Queue Delay	0.0	0.0	0.1
Total Delay	56.4	0.1	1.0
Queue Length 50th (ft)	19	0	33
Queue Length 95th (ft)	71	0	53
Internal Link Dist (ft)	220	381	220
Turn Bay Length (ft)			
Base Capacity (vph)	180	5085	4722
Starvation Cap Reductn	0	0	2104
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.25	0.17	0.40

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	13	31	0	837	1000	21
Future Volume (vph)	13	31	0	837	1000	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.90			1.00	1.00	
Flt Protected	0.99			1.00	1.00	
Satd. Flow (prot)	1660			5085	5067	
Flt Permitted	0.99			1.00	1.00	
Satd. Flow (perm)	1660			5085	5067	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	13	32	0	863	1031	22
RTOR Reduction (vph)	31	0	0	0	1	0
Lane Group Flow (vph)	14	0	0	863	1052	0
Confl. Peds. (#/hr)	1		3			3
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	7.0			220.0	203.0	
Effective Green, g (s)	7.0			220.0	203.0	
Actuated g/C Ratio	0.03			1.00	0.92	
Clearance Time (s)	5.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	52			5085	4675	
v/s Ratio Prot	0.01			0.17	c0.21	
v/s Ratio Perm						
v/c Ratio	0.27			0.17	0.23	
Uniform Delay, d1	104.0			0.0	0.8	
Progression Factor	1.00			1.00	0.90	
Incremental Delay, d2	2.8			0.1	0.1	
Delay (s)	106.8			0.1	0.8	
Level of Service	F			A	A	
Approach Delay (s)	106.8			0.1	0.8	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	2.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	452	441	36	888	475	1043
v/c Ratio	0.72	0.78	0.60	0.40	0.50	1.24	0.45
Control Delay	124.1	5.6	4.9	152.2	13.4	160.9	42.6
Queue Delay	0.0	48.3	53.5	0.0	0.7	0.0	0.0
Total Delay	124.1	53.9	58.3	152.2	14.1	160.9	42.6
Queue Length 50th (ft)	132	77	89	55	74	~655	391
Queue Length 95th (ft)	#244	m43	m57	105	85	#906	448
Internal Link Dist (ft)	420	47			221		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	130	588	741	198	1785	383	2303
Starvation Cap Reductn	0	172	338	0	528	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.09	1.09	0.18	0.71	1.24	0.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	27	45	18	54	98	706	17	17	811	41	2	454
Future Volume (vph)	27	45	18	54	98	706	17	17	811	41	2	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		0.99			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.97			0.90	0.85		1.00	0.99			1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1810			1613	1534		1805	4990			1787
Flt Permitted		0.99			0.99	1.00		0.95	1.00			0.19
Satd. Flow (perm)		1810			1613	1534		1805	4990			361
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	47	19	56	102	735	18	18	845	43	2	473
RTOR Reduction (vph)	0	4	0	0	31	213	0	0	0	0	0	0
Lane Group Flow (vph)	0	90	0	0	421	228	0	36	888	0	0	475
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	3%	7%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		14.4			73.7	73.7		8.6	77.2			113.2
Effective Green, g (s)		15.4			74.7	74.7		9.6	78.7			114.2
Actuated g/C Ratio		0.07			0.34	0.34		0.04	0.36			0.52
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		126			547	520		78	1785			383
v/s Ratio Prot		c0.05			c0.26	0.15		0.02	0.18			c0.17
v/s Ratio Perm												c0.47
v/c Ratio		0.72			0.77	0.44		0.46	0.50			1.24
Uniform Delay, d1		100.2			65.0	56.4		102.7	55.2			41.9
Progression Factor		1.00			0.08	0.32		1.38	0.22			1.00
Incremental Delay, d2		18.1			0.8	0.1		4.3	1.0			128.5
Delay (s)		118.3			5.9	18.0		146.2	13.4			170.4
Level of Service		F			A	B		F	B			F
Approach Delay (s)		118.3			11.9				18.6			
Approach LOS		F			B				B			

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	925	76
Future Volume (vph)	925	76
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	5035	
Flt Permitted	1.00	
Satd. Flow (perm)	5035	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	964	79
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1043	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	97.8	
Effective Green, g (s)	99.3	
Actuated g/C Ratio	0.45	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2272	
v/s Ratio Prot	0.21	
v/s Ratio Perm		
v/c Ratio	0.46	
Uniform Delay, d1	41.8	
Progression Factor	1.00	
Incremental Delay, d2	0.7	
Delay (s)	42.4	
Level of Service	D	
Approach Delay (s)	82.5	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	575	825	20	158
v/c Ratio	0.27	1.10	0.28	0.89
Control Delay	1.4	132.1	83.8	85.5
Queue Delay	17.7	0.5	0.0	0.4
Total Delay	19.1	132.6	83.8	85.9
Queue Length 50th (ft)	8	~702	19	102
Queue Length 95th (ft)	m8	#846	55	#246
Internal Link Dist (ft)	47	1646	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2130	749	80	187
Starvation Cap Reductn	1548	0	0	0
Spillback Cap Reductn	0	60	0	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.99	1.20	0.25	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	388	11	0	725	51	9	3	7	22	3	124
Future Volume (vph)	141	388	11	0	725	51	9	3	7	22	3	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.96			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.95			0.89	
Flt Protected		0.99			1.00			0.98			0.99	
Satd. Flow (prot)		3458			3537			1702			1642	
Flt Permitted		0.99			1.00			0.98			0.99	
Satd. Flow (perm)		3458			3537			1702			1642	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	150	413	12	0	771	54	10	3	7	23	3	132
RTOR Reduction (vph)	0	1	0	0	2	0	0	7	0	0	84	0
Lane Group Flow (vph)	0	574	0	0	823	0	0	13	0	0	74	0
Confl. Peds. (#/hr)			2	2					12	12		
Heavy Vehicles (%)	2%	3%	0%	0%	1%	2%	0%	0%	0%	13%	0%	0%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		134.5			45.5			7.5			11.7	
Effective Green, g (s)		129.6			46.5			8.5			12.7	
Actuated g/C Ratio		0.59			0.21			0.04			0.06	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		2037			747			65			94	
v/s Ratio Prot		c0.17			c0.23			c0.01			c0.05	
v/s Ratio Perm												
v/c Ratio		0.28			1.10			0.20			0.79	
Uniform Delay, d1		22.3			86.8			102.5			102.3	
Progression Factor		0.07			0.90			1.00			1.00	
Incremental Delay, d2		0.0			63.7			0.6			32.1	
Delay (s)		1.5			141.6			103.0			134.4	
Level of Service		A			F			F			F	
Approach Delay (s)		1.5			141.6			103.0			134.4	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	89.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2023 TF SAT

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	22	1611	8	1504	628	6	220	50	14
v/c Ratio	0.14	0.49	0.05	0.69	0.57	0.07	0.81	0.12	0.12
Control Delay	25.6	25.3	6.9	22.4	11.9	69.3	101.3	6.8	63.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	25.3	6.9	22.4	11.9	69.3	101.3	6.8	63.7
Queue Length 50th (ft)	8	290	2	820	434	6	228	4	13
Queue Length 95th (ft)	m28	508	m2	#1068	652	22	#343	24	34
Internal Link Dist (ft)		810		1202		100		1665	220
Turn Bay Length (ft)	130		80		600				
Base Capacity (vph)	170	3280	186	2169	1099	94	282	419	264
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.49	0.04	0.69	0.57	0.06	0.78	0.12	0.05

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	1478	4	6	1	1384	578	4	0	2	202	2
Future Volume (vph)	20	1478	4	6	1	1384	578	4	0	2	202	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.95		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97		0.95	1.00
Satd. Flow (prot)	1805	5034			1621	3539	1583		1756		1787	1626
Flt Permitted	0.07	1.00			0.10	1.00	1.00		0.97		0.95	1.00
Satd. Flow (perm)	124	5034			171	3539	1583		1756		1787	1626
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)	22	1607	4	7	1	1504	628	4	0	2	220	2
RTOR Reduction (vph)	0	0	0	0	0	0	155	0	0	0	0	42
Lane Group Flow (vph)	22	1611	0	0	8	1504	473	0	6	0	220	8
Heavy Vehicles (%)	0%	3%	0%	13%	0%	2%	2%	0%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	84.9	81.0			79.9	78.5	78.5		1.5		21.9	21.9
Effective Green, g (s)	86.9	83.0			81.9	80.5	80.5		2.5		22.9	22.9
Actuated g/C Ratio	0.58	0.55			0.55	0.54	0.54		0.02		0.15	0.15
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	126	2785			116	1899	849		29		272	248
v/s Ratio Prot	c0.01	0.32			0.00	c0.42			c0.00		c0.12	0.00
v/s Ratio Perm	0.10				0.04		0.30					
v/c Ratio	0.17	0.58			0.07	0.79	0.56		0.21		0.81	0.03
Uniform Delay, d1	22.7	22.0			17.5	28.0	23.0		72.8		61.4	54.1
Progression Factor	1.69	1.39			0.41	0.84	0.91		1.00		1.30	1.00
Incremental Delay, d2	0.5	0.7			0.2	3.0	2.3		3.5		17.8	0.1
Delay (s)	39.0	31.4			7.4	26.6	23.1		76.3		97.7	54.2
Level of Service	D	C			A	C	C		E		F	D
Approach Delay (s)		31.5				25.5			76.3			89.6
Approach LOS		C				C			E			F

Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	44	3	1	9
Future Volume (vph)	44	3	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.90	
Flt Protected			0.99	
Satd. Flow (prot)			1693	
Flt Permitted			0.99	
Satd. Flow (perm)			1693	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	3	1	10
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	14	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.3	
Effective Green, g (s)			8.3	
Actuated g/C Ratio			0.06	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			93	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.15	
Uniform Delay, d1			67.5	
Progression Factor			1.00	
Incremental Delay, d2			0.8	
Delay (s)			68.2	
Level of Service			E	
Approach Delay (s)			68.2	
Approach LOS			E	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	178	1434	151	1289	140	105	46	267
v/c Ratio	0.53	0.65	0.52	0.59	0.78	0.28	0.25	0.79
Control Delay	20.8	12.3	33.1	16.6	85.4	9.8	53.5	66.8
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	20.8	12.3	33.1	17.1	85.4	9.8	53.5	66.8
Queue Length 50th (ft)	23	318	56	703	132	0	39	220
Queue Length 95th (ft)	82	763	m144	777	202	50	75	305
Internal Link Dist (ft)		1037		810	420			173
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	415	2194	380	2186	250	476	257	457
Starvation Cap Reductn	0	0	0	455	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.65	0.40	0.74	0.56	0.22	0.18	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	1286	33	139	1176	10	27	102	97	42	116	130
Future Volume (vph)	164	1286	33	139	1176	10	27	102	97	42	116	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3526		1805	3535			1881	1568	1719	1694	
Flt Permitted	0.15	1.00		0.12	1.00			0.52	1.00	0.56	1.00	
Satd. Flow (perm)	276	3526		219	3535			988	1568	1011	1694	
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)	178	1398	36	151	1278	11	29	111	105	46	126	141
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	86	0	29	0
Lane Group Flow (vph)	178	1433	0	151	1289	0	0	140	19	46	238	0
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	0%	3%	5%	7%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	105.1	92.4		103.7	91.7			26.3	26.3	26.3	26.3	
Effective Green, g (s)	107.1	93.4		105.7	92.7			27.3	27.3	27.3	27.3	
Actuated g/C Ratio	0.71	0.62		0.70	0.62			0.18	0.18	0.18	0.18	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	336	2195		291	2184			179	285	184	308	
v/s Ratio Prot	c0.05	c0.41		0.04	0.36						0.14	
v/s Ratio Perm	0.33			0.32				c0.14	0.01	0.05		
v/c Ratio	0.53	0.65		0.52	0.59			0.78	0.07	0.25	0.77	
Uniform Delay, d1	12.2	18.0		14.3	17.2			58.5	50.8	52.6	58.4	
Progression Factor	2.25	0.54		3.27	0.82			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	1.3		1.1	0.9			19.6	0.1	0.7	11.3	
Delay (s)	28.7	11.1		47.9	15.0			78.1	50.9	53.3	69.7	
Level of Service	C	B		D	B			E	D	D	E	
Approach Delay (s)		13.0			18.5			66.5			67.3	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	274	1093	26	150	1044	92	100	546	160	188	603	394
v/c Ratio	0.66	0.67	0.03	0.91	0.68	0.11	0.62	0.76	0.31	0.55	0.78	0.66
Control Delay	90.3	35.0	0.8	104.2	33.6	3.8	82.3	63.1	7.4	93.2	85.9	29.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
Total Delay	90.3	35.0	0.8	104.2	33.6	3.8	82.3	63.1	7.4	93.2	86.2	29.3
Queue Length 50th (ft)	146	254	0	133	216	0	95	265	17	99	264	263
Queue Length 95th (ft)	195	455	m1	#282	443	26	161	320	53	142	356	449
Internal Link Dist (ft)		798			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	441	1639	890	164	1526	867	177	854	524	411	948	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	63	12
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.67	0.03	0.91	0.68	0.11	0.56	0.64	0.31	0.46	0.68	0.66

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	1049	25	144	1002	88	96	524	154	180	579	378
Future Volume (vph)	263	1049	25	144	1002	88	96	524	154	180	579	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1535	1805	3539	1536	1787	3539	1519	3433	3539	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1535	1805	3539	1536	1787	3539	1519	3433	3539	1570
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	274	1093	26	150	1044	92	100	546	160	188	603	394
RTOR Reduction (vph)	0	0	12	0	0	39	0	0	89	0	0	82
Lane Group Flow (vph)	274	1093	14	150	1044	53	100	546	71	188	603	312
Confl. Peds. (#/hr)	1		1	1		1	1		4	4		1
Heavy Vehicles (%)	2%	2%	4%	0%	2%	4%	1%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	16.7	68.0	80.1	12.2	63.2	76.6	12.1	29.1	41.3	13.4	31.3	48.0
Effective Green, g (s)	18.2	69.5	83.1	13.7	64.7	79.6	13.6	30.6	44.3	14.9	32.8	51.0
Actuated g/C Ratio	0.12	0.46	0.55	0.09	0.43	0.53	0.09	0.20	0.30	0.10	0.22	0.34
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	416	1639	850	164	1526	815	162	721	448	341	773	533
v/s Ratio Prot	0.08	c0.31	0.00	0.08	c0.29	0.01	c0.06	0.15	0.01	0.05	c0.17	0.07
v/s Ratio Perm			0.01			0.03			0.03			0.13
v/c Ratio	0.66	0.67	0.02	0.91	0.68	0.07	0.62	0.76	0.16	0.55	0.78	0.59
Uniform Delay, d1	62.9	31.3	15.1	67.6	34.4	17.1	65.7	56.2	39.1	64.4	55.2	40.8
Progression Factor	1.34	1.02	1.00	0.89	0.87	0.81	1.00	1.00	1.00	1.36	1.43	0.97
Incremental Delay, d2	2.9	1.7	0.0	40.0	2.0	0.0	6.8	4.6	0.2	1.9	5.0	1.6
Delay (s)	87.1	33.5	15.1	100.1	32.0	13.9	72.5	60.8	39.2	89.5	84.2	41.0
Level of Service	F	C	B	F	C	B	E	E	D	F	F	D
Approach Delay (s)		43.7			38.6			57.9			70.7	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	51.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1327	3	0	1474	24	0	0	11	0	0	17
Future Vol, veh/h	0	1327	3	0	1474	24	0	0	11	0	0	17
Conflicting Peds, #/hr	5	0	3	3	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1368	3	0	1520	25	0	0	11	0	0	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	689	-	-	778
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	388	0	0	339
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	387	-	-	338
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	14.6	16.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	387	-	-	-	-	338
HCM Lane V/C Ratio	0.029	-	-	-	-	0.052
HCM Control Delay (s)	14.6	-	-	-	-	16.2
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.2

Lane Group	EBT	WBT	NBT	SBL	SBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	86	39	46	11	7	8	1379	43	1513
v/c Ratio	0.51	0.32	0.41	0.10	0.06	0.04	0.67	0.20	0.67
Control Delay	74.8	72.6	75.8	64.5	63.0	20.1	29.2	21.0	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	72.6	75.8	64.5	63.0	20.1	29.3	21.0	25.6
Queue Length 50th (ft)	82	37	44	10	6	0	472	20	394
Queue Length 95th (ft)	138	76	86	31	23	m7	447	m35	#627
Internal Link Dist (ft)	220	220	220		220		755		420
Turn Bay Length (ft)				175		120		150	
Base Capacity (vph)	219	180	166	161	177	268	2043	275	2261
Starvation Cap Reductn	0	0	0	0	0	0	21	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.22	0.28	0.07	0.04	0.03	0.68	0.16	0.67

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL2	EBL	EBT	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT
Lane Configurations												
Traffic Volume (vph)	1	60	19	2	3	24	7	1	3	14	5	4
Future Volume (vph)	1	60	19	2	3	24	7	1	3	14	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0				5.0					5.0
Lane Util. Factor			1.00				1.00					1.00
Frpb, ped/bikes			1.00				1.00					0.98
Flpb, ped/bikes			1.00				1.00					0.97
Frt			1.00				0.99					0.94
Flt Protected			0.96				0.97					0.98
Satd. Flow (prot)			1825				1801					1658
Flt Permitted			0.96				0.97					0.86
Satd. Flow (perm)			1825				1801					1451
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	62	20	2	3	25	7	1	3	15	5	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	86	0	0	0	39	0	0	0	0	46
Confl. Peds. (#/hr)				7	4			3		7	3	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	Split	NA		Perm	Split	NA			Perm	Perm	NA
Protected Phases		3	3			4	4					7
Permitted Phases	3				4					7	7	
Actuated Green, G (s)			12.4				7.6					8.9
Effective Green, g (s)			13.9				9.1					10.4
Actuated g/C Ratio			0.09				0.06					0.07
Clearance Time (s)			6.5				6.5					6.5
Vehicle Extension (s)			3.0				3.0					3.0
Lane Grp Cap (vph)			169				109					100
v/s Ratio Prot			c0.05				c0.02					
v/s Ratio Perm												c0.03
v/c Ratio			0.51				0.36					0.46
Uniform Delay, d1			64.8				67.6					67.1
Progression Factor			1.00				1.00					1.00
Incremental Delay, d2			2.4				2.0					3.3
Delay (s)			67.2				69.7					70.4
Level of Service			E				E					E
Approach Delay (s)			67.2				69.7					70.4
Approach LOS			E				E					E

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.7
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2
Lane Configurations												
Traffic Volume (vph)	20	1	8	3	1	4	2	2	6	1232	77	15
Future Volume (vph)	20	1	8	3	1	4	2	2	6	1232	77	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0				5.6	5.1		
Lane Util. Factor				1.00	1.00				1.00	0.95		
Frpb, ped/bikes				1.00	0.92				1.00	1.00		
Flpb, ped/bikes				0.99	1.00				1.00	1.00		
Frt				1.00	0.87				1.00	0.99		
Flt Protected				0.95	1.00				0.95	1.00		
Satd. Flow (prot)				1784	1527				1805	3501		
Flt Permitted				0.76	1.00				0.09	1.00		
Satd. Flow (perm)				1420	1527				171	3501		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	1	8	3	1	4	2	2	6	1283	80	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	11	7	0	0	0	8	1379	0	0
Confl. Peds. (#/hr)		2		2		7	3	3	3		2	4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%
Turn Type			Perm	Perm	NA			custom	pm+pt	NA		
Protected Phases					7				1	6		
Permitted Phases			7	7				1	6			
Actuated Green, G (s)				8.9	8.9				82.7	81.4		
Effective Green, g (s)				10.4	10.4				85.7	83.4		
Actuated g/C Ratio				0.07	0.07				0.57	0.56		
Clearance Time (s)				6.5	6.5				7.1	7.1		
Vehicle Extension (s)				3.0	3.0				3.0	4.0		
Lane Grp Cap (vph)				98	105				128	1946		
v/s Ratio Prot					0.00				0.00	0.39		
v/s Ratio Perm				0.01					0.03			
v/c Ratio				0.11	0.07				0.06	0.71		
Uniform Delay, d1				65.5	65.3				19.1	24.4		
Progression Factor				1.00	1.00				1.42	1.04		
Incremental Delay, d2				0.5	0.3				0.2	2.0		
Delay (s)				66.0	65.5				27.4	27.3		
Level of Service				E	E				C	C		
Approach Delay (s)					65.8					27.3		
Approach LOS					E					C		

Intersection Summary

Movement	SWL2	SWL	SWT	SWR	SWR2
Lane Configurations					
Traffic Volume (vph)	27	14	1396	52	5
Future Volume (vph)	27	14	1396	52	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	5.1		
Lane Util. Factor		1.00	0.95		
Frpb, ped/bikes		1.00	1.00		
Flpb, ped/bikes		1.00	1.00		
Frt		1.00	0.99		
Flt Protected		0.95	1.00		
Satd. Flow (prot)		1805	3518		
Flt Permitted		0.10	1.00		
Satd. Flow (perm)		183	3518		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	15	1454	54	5
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	43	1513	0	0
Confl. Peds. (#/hr)	2	4			3
Heavy Vehicles (%)	0%	0%	2%	0%	0%
Turn Type	pm+pt	pm+pt	NA		
Protected Phases	5	5	2		
Permitted Phases	2	2			
Actuated Green, G (s)		92.1	86.1		
Effective Green, g (s)		95.1	88.1		
Actuated g/C Ratio		0.63	0.59		
Clearance Time (s)		7.1	7.1		
Vehicle Extension (s)		3.0	4.0		
Lane Grp Cap (vph)		197	2066		
v/s Ratio Prot		c0.01	c0.43		
v/s Ratio Perm		0.13			
v/c Ratio		0.22	0.73		
Uniform Delay, d1		17.8	22.4		
Progression Factor		1.47	1.16		
Incremental Delay, d2		0.4	1.8		
Delay (s)		26.6	27.7		
Level of Service		C	C		
Approach Delay (s)			27.6		
Approach LOS			C		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	41	948	1214
v/c Ratio	0.37	0.19	0.27
Control Delay	43.3	0.1	0.5
Queue Delay	0.0	0.0	0.1
Total Delay	43.3	0.1	0.6
Queue Length 50th (ft)	15	0	7
Queue Length 95th (ft)	57	0	8
Internal Link Dist (ft)	220	381	215
Turn Bay Length (ft)			
Base Capacity (vph)	245	5085	4572
Starvation Cap Reductn	0	0	1461
Spillback Cap Reductn	0	0	39
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.17	0.19	0.39

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	15	24	0	901	1123	30
Future Volume (vph)	15	24	0	901	1123	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.92			1.00	1.00	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1677			5085	5062	
Flt Permitted	0.98			1.00	1.00	
Satd. Flow (perm)	1677			5085	5062	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	25	0	948	1182	32
RTOR Reduction (vph)	24	0	0	0	1	0
Lane Group Flow (vph)	17	0	0	948	1213	0
Confl. Peds. (#/hr)	1		4			4
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	6.5			150.0	133.5	
Effective Green, g (s)	6.5			150.0	133.5	
Actuated g/C Ratio	0.04			1.00	0.89	
Clearance Time (s)	5.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	72			5085	4505	
v/s Ratio Prot	0.01			0.19	c0.24	
v/s Ratio Perm						
v/c Ratio	0.24			0.19	0.27	
Uniform Delay, d1	69.4			0.0	1.2	
Progression Factor	1.00			1.00	0.33	
Incremental Delay, d2	1.7			0.1	0.1	
Delay (s)	71.1			0.1	0.5	
Level of Service	E			A	A	
Approach Delay (s)	71.1			0.1	0.5	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	1.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	177	326	33	894	407	1160
v/c Ratio	0.30	0.31	0.44	0.30	0.67	1.30	0.65
Control Delay	56.7	1.2	4.4	94.9	43.2	188.4	45.1
Queue Delay	0.0	1.0	1.9	0.0	0.0	0.2	0.0
Total Delay	56.7	2.3	6.3	94.9	43.2	188.7	45.1
Queue Length 50th (ft)	52	0	67	33	150	~447	364
Queue Length 95th (ft)	98	0	115	72	220	#796	#487
Internal Link Dist (ft)	420	47			226		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	217	614	770	166	1339	313	1790
Starvation Cap Reductn	0	248	295	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	6	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.48	0.69	0.20	0.67	1.33	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	25	23	14	38	39	411	19	13	840	27	5	390
Future Volume (vph)	25	23	14	38	39	411	19	13	840	27	5	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frt		0.97			0.92	0.85		1.00	1.00			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1807			1540	1504		1763	5063			1787
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.14
Satd. Flow (perm)		1807			1540	1504		1763	5063			256
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	24	14	39	40	424	20	13	866	28	5	402
RTOR Reduction (vph)	0	6	0	0	35	213	0	0	0	0	0	0
Lane Group Flow (vph)	0	58	0	0	142	113	0	33	894	0	0	407
Heavy Vehicles (%)	0%	0%	0%	3%	20%	2%	0%	6%	2%	1%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		16.3			50.8	50.8		7.3	38.2			64.2
Effective Green, g (s)		17.3			51.8	51.8		8.3	39.7			65.2
Actuated g/C Ratio		0.12			0.35	0.35		0.06	0.26			0.43
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		208			531	519		97	1340			317
v/s Ratio Prot		c0.03			c0.09	0.07		0.02	0.18			c0.17
v/s Ratio Perm												c0.39
v/c Ratio		0.28			0.27	0.22		0.34	0.67			1.28
Uniform Delay, d1		60.6			35.4	34.7		68.2	49.3			39.5
Progression Factor		1.00			0.00	0.89		1.32	0.82			1.00
Incremental Delay, d2		0.9			0.6	0.5		2.1	2.6			149.7
Delay (s)		61.5			0.6	31.3		92.4	43.0			189.2
Level of Service		E			A	C		F	D			F
Approach Delay (s)		61.5			20.5				44.8			
Approach LOS		E			C				D			

Intersection Summary			
HCM 2000 Control Delay	60.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1093	32
Future Volume (vph)	1093	32
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5066	
Flt Permitted	1.00	
Satd. Flow (perm)	5066	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	1127	33
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1160	0
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	50.1	
Effective Green, g (s)	51.6	
Actuated g/C Ratio	0.34	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1742	
v/s Ratio Prot	0.23	
v/s Ratio Perm		
v/c Ratio	0.67	
Uniform Delay, d1	41.9	
Progression Factor	1.00	
Incremental Delay, d2	2.0	
Delay (s)	43.9	
Level of Service	D	
Approach Delay (s)	81.6	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	484	444	14	119
v/c Ratio	0.23	0.60	0.17	0.47
Control Delay	2.4	64.6	59.0	6.2
Queue Delay	51.9	0.3	0.0	0.0
Total Delay	54.3	64.9	59.0	6.2
Queue Length 50th (ft)	10	185	10	0
Queue Length 95th (ft)	m11	285	35	0
Internal Link Dist (ft)	47	1665	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2065	827	137	299
Starvation Cap Reductn	1621	0	0	0
Spillback Cap Reductn	0	70	0	3
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.09	0.59	0.10	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	348	7	0	386	22	8	1	4	20	0	89
Future Volume (vph)	90	348	7	0	386	22	8	1	4	20	0	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.96			0.89	
Flt Protected		0.99			1.00			0.97			0.99	
Satd. Flow (prot)		3537			3482			1738			1649	
Flt Permitted		0.99			1.00			0.97			0.99	
Satd. Flow (perm)		3537			3482			1738			1649	
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)	98	378	8	0	420	24	9	1	4	22	0	97
RTOR Reduction (vph)	0	1	0	0	3	0	0	4	0	0	114	0
Lane Group Flow (vph)	0	483	0	0	441	0	0	10	0	0	5	0
Confl. Peds. (#/hr)									8	8		
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		87.4			30.8			5.8			5.2	
Effective Green, g (s)		82.5			31.8			6.8			6.2	
Actuated g/C Ratio		0.55			0.21			0.05			0.04	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1945			738			78			68	
v/s Ratio Prot		c0.14			c0.13			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio		0.25			0.60			0.13			0.07	
Uniform Delay, d1		17.6			53.3			68.8			69.1	
Progression Factor		0.16			1.17			1.00			1.00	
Incremental Delay, d2		0.0			1.8			0.3			0.2	
Delay (s)		2.7			64.5			69.0			69.3	
Level of Service		A			E			E			E	
Approach Delay (s)		2.7			64.5			69.0			69.3	
Approach LOS		A			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	96	383	379	224	16	436	463	63	23	401	52	34
Average Queue (ft)	12	147	145	127	1	227	233	7	2	260	8	4
95th Queue (ft)	57	310	305	240	12	416	426	39	13	375	34	20
Link Distance (ft)		764	764			1199	1199	1199	114	1638	1638	213
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		12	3	2		23						
Queuing Penalty (veh)		4	20	16		0						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	82	259	242	166	294	254	413	277	103	250
Average Queue (ft)	23	109	112	66	69	59	210	122	13	121
95th Queue (ft)	59	227	228	140	222	197	383	236	62	223
Link Distance (ft)		982	982		764	764	447	447		235
Upstream Blk Time (%)							1	0		2
Queuing Penalty (veh)							0	0		0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				1	6				0	19
Queuing Penalty (veh)				3	4				0	1

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	232	275	478	498	125	475	994	1002	160	225	422	428
Average Queue (ft)	130	150	276	288	7	410	555	423	17	57	277	278
95th Queue (ft)	207	232	419	432	80	583	1222	1082	79	182	401	411
Link Distance (ft)			732	732			982	982			514	514
Upstream Blk Time (%)							9	2				
Queuing Penalty (veh)							34	7				
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)			0	0		57	3	0	0	0	29	20
Queuing Penalty (veh)			0	0		165	4	0	0	0	11	22

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	250	170	168	346	358	225
Average Queue (ft)	110	84	82	237	249	121
95th Queue (ft)	283	151	149	345	368	284
Link Distance (ft)			340	340	340	
Upstream Blk Time (%)				5	9	
Queuing Penalty (veh)				16	28	
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0				39	0
Queuing Penalty (veh)	0				91	1

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	19	28
Average Queue (ft)	3	6
95th Queue (ft)	13	23
Link Distance (ft)	254	92
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	SW	SW	SW
Directions Served	<LTR>	LTR	<LTR>	<L	TR	T	TR>	<L	T	TR>
Maximum Queue (ft)	232	83	162	104	35	455	453	154	272	295
Average Queue (ft)	179	27	52	32	5	226	239	29	137	161
95th Queue (ft)	248	64	127	76	19	401	418	91	259	283
Link Distance (ft)	188	107	225		231	713	713		391	391
Upstream Blk Time (%)	36	0	0							
Queuing Penalty (veh)	0	0	0							
Storage Bay Dist (ft)				175				150		
Storage Blk Time (%)						30			10	
Queuing Penalty (veh)						0			3	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB	B9
Directions Served	LR	T	T	TR	T
Maximum Queue (ft)	89	69	113	142	3
Average Queue (ft)	28	8	21	28	0
95th Queue (ft)	68	39	78	99	3
Link Distance (ft)	235	243	243	243	226
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B9	B9	B9	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	T	UL	T
Maximum Queue (ft)	461	51	61	150	300	304	307	67	101	98	495	889
Average Queue (ft)	356	18	43	21	177	202	209	4	11	11	419	466
95th Queue (ft)	541	49	62	80	303	338	342	30	55	53	589	971
Link Distance (ft)	434	37	37		226	226	226	243	243	243		958
Upstream Blk Time (%)	28	8	53		3	6	7					6
Queuing Penalty (veh)	0	23	155		11	20	23					0
Storage Bay Dist (ft)				135							470	
Storage Blk Time (%)				0	15						30	0
Queuing Penalty (veh)				0	2						92	0

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	843	624
Average Queue (ft)	399	267
95th Queue (ft)	826	487
Link Distance (ft)	958	958
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	54	41	443	434	93	318
Average Queue (ft)	26	5	274	262	28	286
95th Queue (ft)	47	24	430	424	70	324
Link Distance (ft)	37	37	1638	1638	158	259
Upstream Blk Time (%)	5	1				96
Queuing Penalty (veh)	12	2				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 771

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	53	189	179	153	38	1252	1251	1259	44	1311	813	63
Average Queue (ft)	11	58	60	47	3	973	999	538	11	891	268	14
95th Queue (ft)	36	141	142	119	20	1485	1486	1487	36	1487	796	45
Link Distance (ft)		765	765			1192	1192	1192	111	1639	1639	213
Upstream Blk Time (%)						6	10	2		0		
Queuing Penalty (veh)						49	77	19		1		
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		2	0	0		28						
Queuing Penalty (veh)		0	0	0		1						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	236	321	316	174	409	432	402	134	145	283
Average Queue (ft)	93	137	140	86	175	187	227	56	34	220
95th Queue (ft)	186	281	286	170	348	361	384	105	108	323
Link Distance (ft)		980	980		765	765	447	447		268
Upstream Blk Time (%)							1			12
Queuing Penalty (veh)							0			0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				2	21					46
Queuing Penalty (veh)				16	35					10

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	178	188	237	249	33	474	705	747	375	225	486	466
Average Queue (ft)	94	115	130	136	5	205	354	390	123	178	293	274
95th Queue (ft)	160	174	229	232	24	440	708	758	394	275	454	437
Link Distance (ft)			740	740			980	980			513	513
Upstream Blk Time (%)											0	0
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)						0	6	15	0	20	24	17
Queuing Penalty (veh)						0	9	16	0	50	27	19

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	B127	SB	SB	SB	SB	SB
Directions Served	R	T	L	L	T	T	R
Maximum Queue (ft)	250	10	135	150	316	322	225
Average Queue (ft)	93	0	62	67	178	200	159
95th Queue (ft)	281	8	123	128	297	334	267
Link Distance (ft)		697		340	340	340	
Upstream Blk Time (%)					1	4	
Queuing Penalty (veh)					5	14	
Storage Bay Dist (ft)	225		300				200
Storage Blk Time (%)	0					20	9
Queuing Penalty (veh)	0					65	23

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	WB	WB	NB	SB
Directions Served	T	TR	R	R
Maximum Queue (ft)	472	442	24	75
Average Queue (ft)	179	196	6	27
95th Queue (ft)	402	414	23	63
Link Distance (ft)	740	740	126	77
Upstream Blk Time (%)	0			7
Queuing Penalty (veh)	0			0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	NE	SW	SW	SW
Directions Served	LTR>	LTR>	<LTR>	<L	TR>	<L	T	TR>	<L	T	TR>
Maximum Queue (ft)	209	125	198	70	36	63	289	293	174	384	407
Average Queue (ft)	149	41	96	15	5	6	139	139	40	342	350
95th Queue (ft)	232	99	176	47	22	40	254	258	125	459	462
Link Distance (ft)	189	146	225		232		713	713		354	354
Upstream Blk Time (%)	16	0	0							22	25
Queuing Penalty (veh)	0	0	0							212	240
Storage Bay Dist (ft)				175		120			150		
Storage Blk Time (%)							18		1	32	
Queuing Penalty (veh)							1		7	15	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB
Directions Served	LR	T	T	TR
Maximum Queue (ft)	102	70	176	207
Average Queue (ft)	38	4	22	36
95th Queue (ft)	87	27	93	133
Link Distance (ft)	235	239	239	239
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B10	SB	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	UL	T	T	TR
Maximum Queue (ft)	223	62	58	90	121	158	164	7	495	1010	980	965
Average Queue (ft)	106	16	42	33	54	56	75	0	494	962	764	402
95th Queue (ft)	192	45	59	78	116	117	138	6	499	1113	1318	937
Link Distance (ft)	434	37	37		230	230	230	239		958	958	958
Upstream Blk Time (%)		3	55			0				80	11	1
Queuing Penalty (veh)		15	236			0				0	0	0
Storage Bay Dist (ft)				135					470			
Storage Blk Time (%)					0				86	0		
Queuing Penalty (veh)					0				265	1		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	55	49	1152	1166	72	299
Average Queue (ft)	27	11	981	994	22	244
95th Queue (ft)	50	36	1180	1203	56	339
Link Distance (ft)	37	37	1639	1639	158	259
Upstream Blk Time (%)	8	2				60
Queuing Penalty (veh)	23	6				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1456

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	127	454	452	225	58	732	719	515	40	314	102	42
Average Queue (ft)	11	206	196	156	6	234	250	46	8	173	37	9
95th Queue (ft)	57	354	349	248	32	587	618	277	29	266	81	30
Link Distance (ft)		764	764			1190	1190	1190	109	1672	1672	213
Upstream Blk Time (%)						0	0					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		16	6	4	0	20						
Queuing Penalty (veh)		3	30	18	0	1						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	206	286	314	174	423	426	212	126	145	238
Average Queue (ft)	98	105	117	89	161	174	106	52	48	177
95th Queue (ft)	175	227	243	174	374	386	191	100	131	258
Link Distance (ft)		980	980		764	764	447	447		205
Upstream Blk Time (%)										14
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				1	7				0	34
Queuing Penalty (veh)				8	10				1	15

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	175	190	417	427	37	371	660	685	375	224	326	317
Average Queue (ft)	103	120	260	264	6	141	314	330	95	83	183	176
95th Queue (ft)	161	172	381	387	27	332	578	599	337	173	271	268
Link Distance (ft)			769	769			980	980			515	515
Upstream Blk Time (%)							0	0				
Queuing Penalty (veh)							0	0				
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)				0			5	17	0	0	7	3
Queuing Penalty (veh)				0			7	15	0	0	7	4

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	249	147	145	312	347	225
Average Queue (ft)	49	61	65	152	169	116
95th Queue (ft)	157	124	126	284	319	251
Link Distance (ft)			340	340	340	
Upstream Blk Time (%)				0	2	
Queuing Penalty (veh)				1	8	
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0				10	4
Queuing Penalty (veh)	0				38	12

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	WB	WB	NB	SB
Directions Served	T	TR	R	R
Maximum Queue (ft)	79	86	32	57
Average Queue (ft)	7	13	6	17
95th Queue (ft)	42	56	23	46
Link Distance (ft)	769	769	135	122
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	NE	SW	SW	SW
Directions Served	<LTR>	<LTR>	<LTR>	<L	TR>	<L	T	TR>	<L	T	TR>
Maximum Queue (ft)	149	86	90	47	20	81	369	375	174	368	372
Average Queue (ft)	67	26	28	8	2	7	174	172	29	265	285
95th Queue (ft)	128	65	71	29	12	42	290	296	115	409	415
Link Distance (ft)	188	154	225		229		713	713		328	328
Upstream Blk Time (%)	0									4	7
Queuing Penalty (veh)	0									28	50
Storage Bay Dist (ft)				175		120			150		
Storage Blk Time (%)							23			22	
Queuing Penalty (veh)							2			9	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB	B9	B9
Directions Served	LR	T	T	TR	T	T
Maximum Queue (ft)	81	18	121	139	6	36
Average Queue (ft)	31	1	6	10	0	1
95th Queue (ft)	66	10	50	52	4	26
Link Distance (ft)	235	234	234	234	235	235
Upstream Blk Time (%)			0	0		0
Queuing Penalty (veh)			0	0		0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B9	B9	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	UL	T	T
Maximum Queue (ft)	133	69	57	128	223	241	256	5	4	495	996	989
Average Queue (ft)	52	18	33	32	130	143	164	0	0	478	844	809
95th Queue (ft)	106	54	64	89	199	213	232	5	4	564	1289	1258
Link Distance (ft)	434	37	37		235	235	235	234	234		958	958
Upstream Blk Time (%)		5	18		1	1	2				60	15
Queuing Penalty (veh)		12	44		2	4	7				0	0
Storage Bay Dist (ft)				135						470		
Storage Blk Time (%)				0	20					74	1	
Queuing Penalty (veh)				1	7					269	2	

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	SB
Directions Served	TR
Maximum Queue (ft)	971
Average Queue (ft)	580
95th Queue (ft)	1069
Link Distance (ft)	958
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	52	36	276	284	53	167
Average Queue (ft)	29	9	161	170	16	72
95th Queue (ft)	46	31	254	264	44	143
Link Distance (ft)	37	37	1672	1672	158	259
Upstream Blk Time (%)	5	1				
Queuing Penalty (veh)	10	2				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 626

Queues

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2023 TF AM MIT

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	40	2214	1	836	251	1	274	11	5
v/c Ratio	0.10	0.67	0.01	0.42	0.25	0.02	0.83	0.02	0.06
Control Delay	9.0	12.2	39.0	45.0	24.7	89.0	122.4	0.1	82.2
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	12.4	39.0	45.0	24.7	89.0	122.4	0.1	82.2
Queue Length 50th (ft)	5	98	1	443	125	1	313	0	6
Queue Length 95th (ft)	m19	#1184	m4	643	230	9	m406	m0	22
Internal Link Dist (ft)		810		1204		100		1637	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	417	3316	119	1977	1009	67	379	487	175
Starvation Cap Reductn	0	379	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.75	0.01	0.42	0.25	0.01	0.72	0.02	0.03

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	37	2036	1	1	0	769	231	1	0	252	1	9
Future Volume (vph)	37	2036	1	1	0	769	231	1	0	252	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0	6.3	6.3	
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00	1.00	1.00	
Frt	1.00	1.00			1.00	1.00	0.85		1.00	1.00	0.86	
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (prot)	1805	4987			1805	3223	1524		1805	1687	1641	
Flt Permitted	0.26	1.00			0.04	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (perm)	487	4987			73	3223	1524		1805	1687	1641	
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)	40	2213	1	1	0	836	251	1	0	274	1	10
RTOR Reduction (vph)	0	0	0	0	0	0	86	0	0	0	9	0
Lane Group Flow (vph)	40	2214	0	0	1	836	165	0	1	274	2	0
Heavy Vehicles (%)	0%	4%	0%	0%	0%	12%	6%	0%	0%	7%	0%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA	Split	NA	
Protected Phases	5	2		1	1	6		7	7	3	3	
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	114.4	108.3			104.6	103.4	103.4		1.3	36.5	36.5	
Effective Green, g (s)	116.4	110.3			106.6	105.4	105.4		2.3	37.5	37.5	
Actuated g/C Ratio	0.61	0.58			0.56	0.55	0.55		0.01	0.20	0.20	
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0	7.3	7.3	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	5.0	5.0	
Lane Grp Cap (vph)	347	2895			61	1787	845		21	332	323	
v/s Ratio Prot	c0.00	c0.44			0.00	0.26			c0.00	c0.16	0.00	
v/s Ratio Perm	0.07				0.01		0.11					
v/c Ratio	0.12	0.76			0.02	0.47	0.20		0.05	0.83	0.01	
Uniform Delay, d1	16.5	30.1			26.2	25.4	21.1		92.8	73.1	61.3	
Progression Factor	0.55	0.45			1.88	1.85	3.57		1.00	1.41	1.00	
Incremental Delay, d2	0.1	1.3			0.1	0.9	0.5		0.9	16.4	0.0	
Delay (s)	9.1	14.7			49.3	48.0	76.0		93.7	119.7	61.3	
Level of Service	A	B			D	D	E		F	F	E	
Approach Delay (s)		14.6				54.5			93.7		117.5	
Approach LOS		B				D			F		F	

Intersection Summary			
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NEL2	NEL	NER
Lane Configurations			
Traffic Volume (vph)	2	0	3
Future Volume (vph)	2	0	3
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)		5.6	
Lane Util. Factor		1.00	
Frt		0.92	
Flt Protected		0.98	
Satd. Flow (prot)		1427	
Flt Permitted		0.98	
Satd. Flow (perm)		1427	
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	2	0	3
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	5	0
Heavy Vehicles (%)	50%	0%	0%
Turn Type	Prot	Prot	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)		5.8	
Effective Green, g (s)		6.8	
Actuated g/C Ratio		0.04	
Clearance Time (s)		6.6	
Vehicle Extension (s)		3.0	
Lane Grp Cap (vph)		51	
v/s Ratio Prot		c0.00	
v/s Ratio Perm			
v/c Ratio		0.10	
Uniform Delay, d1		88.6	
Progression Factor		1.00	
Incremental Delay, d2		0.8	
Delay (s)		89.5	
Level of Service		F	
Approach Delay (s)		89.5	
Approach LOS		F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	52	1979	75	767	153	185	7	123
v/c Ratio	0.10	0.81	0.50	0.33	0.92	0.57	0.09	0.49
Control Delay	3.5	10.6	60.7	3.7	127.5	43.2	67.3	71.1
Queue Delay	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.5	11.5	60.7	3.7	127.5	43.3	67.3	71.1
Queue Length 50th (ft)	7	181	47	42	190	110	8	127
Queue Length 95th (ft)	m10	197	121	7	#301	196	25	197
Internal Link Dist (ft)		1037		810	420			201
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	550	2441	162	2326	202	376	99	303
Starvation Cap Reductn	0	219	0	0	0	0	0	0
Spillback Cap Reductn	0	155	0	0	0	4	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.89	0.46	0.33	0.76	0.50	0.07	0.41

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	1808	13	69	705	1	33	108	170	6	75	38
Future Volume (vph)	48	1808	13	69	705	1	33	108	170	6	75	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3433		1805	3195			1354	1599	1081	1547	
Flt Permitted	0.34	1.00		0.05	1.00			0.78	1.00	0.46	1.00	
Satd. Flow (perm)	645	3433		95	3195			1067	1599	525	1547	
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)	52	1965	14	75	766	1	36	117	185	7	82	41
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	76	0	10	0
Lane Group Flow (vph)	52	1979	0	75	767	0	0	153	109	7	113	0
Heavy Vehicles (%)	0%	5%	10%	0%	13%	0%	2%	50%	1%	67%	0%	50%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	139.8	134.1		143.8	136.1			28.9	28.9	28.9	28.9	
Effective Green, g (s)	141.8	135.1		145.8	137.1			29.9	29.9	29.9	29.9	
Actuated g/C Ratio	0.75	0.71		0.77	0.72			0.16	0.16	0.16	0.16	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	522	2441		151	2305			167	251	82	243	
v/s Ratio Prot	0.00	c0.58		c0.02	0.24						0.07	
v/s Ratio Perm	0.07			0.36				c0.14	0.07	0.01		
v/c Ratio	0.10	0.81		0.50	0.33			0.92	0.43	0.09	0.46	
Uniform Delay, d1	6.5	18.7		27.2	9.7			78.8	72.4	68.4	72.8	
Progression Factor	0.59	0.41		3.75	0.32			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	2.2		2.4	0.4			45.6	1.2	0.5	1.4	
Delay (s)	3.9	9.9		104.3	3.5			124.4	73.6	68.8	74.2	
Level of Service	A	A		F	A			F	E	E	E	
Approach Delay (s)		9.7			12.5			96.6			73.9	
Approach LOS		A			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	1552	10	141	599	72	37	637	113	159	564	241
v/c Ratio	0.72	0.80	0.01	1.37	0.34	0.10	0.39	0.89	0.24	0.73	0.69	0.32
Control Delay	119.5	22.5	0.0	263.0	23.3	6.4	97.8	88.8	9.0	130.9	118.5	6.0
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.5
Total Delay	119.5	22.7	0.0	263.0	23.3	6.4	97.8	88.8	9.0	130.9	120.9	6.4
Queue Length 50th (ft)	193	251	0	~236	77	0	45	408	10	107	379	0
Queue Length 95th (ft)	m241	412	m0	m#382	341	m38	91	488	54	#154	456	82
Internal Link Dist (ft)		772			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	458	1932	968	103	1749	730	110	748	474	222	819	764
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	142	221
Spillback Cap Reductn	0	57	0	0	0	0	0	0	1	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.83	0.01	1.37	0.34	0.10	0.34	0.85	0.24	0.72	0.83	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	1505	10	137	581	70	36	618	110	154	547	234
Future Volume (vph)	279	1505	10	137	581	70	36	618	110	154	547	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	288	1552	10	141	599	72	37	637	113	159	564	241
RTOR Reduction (vph)	0	0	4	0	0	29	0	0	72	0	0	145
Lane Group Flow (vph)	288	1552	6	141	599	43	37	637	41	159	564	96
Confl. Peds. (#/hr)	1		2	2		1			2	2		
Heavy Vehicles (%)	2%	2%	2%	17%	2%	27%	2%	2%	4%	16%	5%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	20.8	100.9	108.6	11.2	91.0	103.2	7.7	38.4	49.6	12.2	43.8	64.6
Effective Green, g (s)	22.3	102.4	111.6	12.7	92.5	106.2	9.2	39.9	52.6	13.7	45.3	67.6
Actuated g/C Ratio	0.12	0.54	0.59	0.07	0.49	0.56	0.05	0.21	0.28	0.07	0.24	0.36
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	402	1907	916	103	1722	702	85	743	424	217	819	563
v/s Ratio Prot	0.08	c0.44	0.00	c0.09	0.17	0.00	0.02	c0.18	0.01	c0.05	c0.16	0.02
v/s Ratio Perm			0.00			0.03			0.02			0.04
v/c Ratio	0.72	0.81	0.01	1.37	0.35	0.06	0.44	0.86	0.10	0.73	0.69	0.17
Uniform Delay, d1	80.8	36.0	16.2	88.7	30.1	19.1	87.9	72.3	51.0	86.4	65.9	42.0
Progression Factor	1.41	0.57	1.00	0.80	0.76	1.36	1.00	1.00	1.00	1.30	1.70	0.89
Incremental Delay, d2	3.5	2.3	0.0	214.0	0.5	0.0	3.5	9.6	0.1	11.9	2.4	0.1
Delay (s)	117.1	22.8	16.2	284.6	23.3	26.1	91.4	81.9	51.1	124.0	114.8	37.6
Level of Service	F	C	B	F	C	C	F	F	D	F	F	D
Approach Delay (s)		37.5			69.0			78.0			97.0	
Approach LOS		D			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	63.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1776	1	0	841	14	0	0	6	0	0	6
Future Vol, veh/h	0	1776	1	0	841	14	0	0	6	0	0	6
Conflicting Peds, #/hr	2	0	5	5	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1831	1	0	867	14	0	0	6	0	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	921	-	-	443
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	273	0	0	562
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	272	-	-	561
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	18.5	11.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	272	-	-	-	-	561
HCM Lane V/C Ratio	0.023	-	-	-	-	0.011
HCM Control Delay (s)	18.5	-	-	-	-	11.5
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0

Lane Group	EBT	WBT	NBT	SBL	SBT	NET	SWL	SWT
Lane Group Flow (vph)	158	27	63	36	13	1711	32	844
v/c Ratio	0.88	0.35	0.53	0.48	0.09	0.81	0.28	0.37
Control Delay	124.0	99.2	99.6	104.8	80.6	25.5	32.9	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	124.0	99.2	99.6	104.8	80.6	25.6	32.9	15.7
Queue Length 50th (ft)	197	33	77	44	15	890	13	177
Queue Length 95th (ft)	#334	72	132	87	41	613	50	206
Internal Link Dist (ft)	220	125	220		220	755		447
Turn Bay Length (ft)				175			150	
Base Capacity (vph)	187	147	138	88	163	2101	169	2299
Starvation Cap Reductn	0	0	0	0	0	40	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.18	0.46	0.41	0.08	0.83	0.19	0.37

Intersection Summary

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

Movement	EBL2	EBL	EBT	EBR	EBR2	WBL	WBT	NBL2	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	2	118	28	2	3	15	12	9	10	7	35	1
Future Volume (vph)	2	118	28	2	3	15	12	9	10	7	35	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.5				6.5			5.0		
Lane Util. Factor			1.00				1.00			1.00		
Frpb, ped/bikes			1.00				1.00			1.00		
Flpb, ped/bikes			1.00				1.00			1.00		
Frt			1.00				1.00			0.92		
Flt Protected			0.96				0.97			0.99		
Satd. Flow (prot)			1741				1812			1697		
Flt Permitted			0.96				0.97			0.90		
Satd. Flow (perm)			1741				1812			1546		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	2	122	29	2	3	15	12	9	10	7	36	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	158	0	0	0	27	0	0	63	0	0
Confl. Peds. (#/hr)	2			1	1	1		1	1			
Heavy Vehicles (%)	100%	2%	2%	100%	2%	2%	2%	0%	0%	0%	2%	2%
Turn Type	Split	Split	NA			Split	NA	Perm	Perm	NA		
Protected Phases	3	3	3			4	4			7		
Permitted Phases								7	7			
Actuated Green, G (s)			19.7				7.2			13.1		
Effective Green, g (s)			19.7				7.2			14.6		
Actuated g/C Ratio			0.10				0.04			0.08		
Clearance Time (s)			6.5				6.5			6.5		
Vehicle Extension (s)			3.0				3.0			3.0		
Lane Grp Cap (vph)			180				68			118		
v/s Ratio Prot			c0.09				c0.01					
v/s Ratio Perm										c0.04		
v/c Ratio			0.88				0.40			0.53		
Uniform Delay, d1			84.0				89.3			84.4		
Progression Factor			1.00				1.00			1.00		
Incremental Delay, d2			34.8				3.8			4.6		
Delay (s)			118.8				93.1			89.0		
Level of Service			F				F			F		
Approach Delay (s)			118.8				93.1			89.0		
Approach LOS			F				F			F		

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	32.2
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL2	SBL	SBT	SBR	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	28	7	10	3	0	1602	43	15	10	21	772	41
Future Volume (vph)	28	7	10	3	0	1602	43	15	10	21	772	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.5	5.0			7.1				7.1	7.1	
Lane Util. Factor		1.00	1.00			0.95				1.00	0.95	
Frpb, ped/bikes		1.00	1.00			1.00				1.00	1.00	
Flpb, ped/bikes		1.00	1.00			1.00				1.00	1.00	
Frt		1.00	0.97			0.99				1.00	0.99	
Flt Protected		0.95	1.00			1.00				0.95	1.00	
Satd. Flow (prot)		1770	1834			3521				1770	3505	
Flt Permitted		0.58	1.00			1.00				0.05	1.00	
Satd. Flow (perm)		1088	1834			3521				85	3505	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	29	7	10	3	0	1652	44	15	10	22	796	42
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	36	13	0	0	1711	0	0	0	32	844	0
Confl. Peds. (#/hr)					1							1
Heavy Vehicles (%)	2%	2%	0%	0%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	Perm	NA		pm+pt	NA			pm+pt	pm+pt	NA	
Protected Phases			7		1	6			5	5	2	
Permitted Phases	7	7			6				2	2		
Actuated Green, G (s)		13.1	13.1			110.6				123.4	123.4	
Effective Green, g (s)		13.1	14.6			110.6				123.4	123.4	
Actuated g/C Ratio		0.07	0.08			0.58				0.65	0.65	
Clearance Time (s)		6.5	6.5			7.1				7.1	7.1	
Vehicle Extension (s)		3.0	3.0			4.0				3.0	4.0	
Lane Grp Cap (vph)		75	140			2049				105	2276	
v/s Ratio Prot			0.01			c0.49				0.01	c0.24	
v/s Ratio Perm		0.03								0.19		
v/c Ratio		0.48	0.09			0.83				0.30	0.37	
Uniform Delay, d1		85.2	81.5			32.3				30.8	15.4	
Progression Factor		1.00	1.00			0.67				1.92	0.95	
Incremental Delay, d2		4.8	0.3			3.5				1.6	0.4	
Delay (s)		89.9	81.8			25.0				60.8	15.1	
Level of Service		F	F			C				E	B	
Approach Delay (s)			87.8			25.0					16.8	
Approach LOS			F			C					B	

Intersection Summary

Movement	SWR2
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	6
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	32	1075	1014
v/c Ratio	0.36	0.21	0.22
Control Delay	53.6	0.1	1.0
Queue Delay	0.0	0.0	0.1
Total Delay	53.7	0.1	1.2
Queue Length 50th (ft)	14	0	35
Queue Length 95th (ft)	56	0	m50
Internal Link Dist (ft)	220	381	224
Turn Bay Length (ft)			
Base Capacity (vph)	142	5085	4663
Starvation Cap Reductn	0	0	2203
Spillback Cap Reductn	2	42	649
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.21	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	19	0	989	918	15
Future Volume (vph)	10	19	0	989	918	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.91			1.00	1.00	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1669			5085	5072	
Flt Permitted	0.98			1.00	1.00	
Satd. Flow (perm)	1669			5085	5072	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	21	0	1075	998	16
RTOR Reduction (vph)	20	0	0	0	1	0
Lane Group Flow (vph)	12	0	0	1075	1013	0
Confl. Peds. (#/hr)			2			2
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	6.5			190.0	172.5	
Effective Green, g (s)	6.5			190.0	172.5	
Actuated g/C Ratio	0.03			1.00	0.91	
Clearance Time (s)	6.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	57			5085	4604	
v/s Ratio Prot	0.01			0.21	c0.20	
v/s Ratio Perm						
v/c Ratio	0.21			0.21	0.22	
Uniform Delay, d1	89.2			0.0	1.0	
Progression Factor	1.00			1.00	0.91	
Incremental Delay, d2	1.8			0.1	0.1	
Delay (s)	91.0			0.1	1.0	
Level of Service	F			A	A	
Approach Delay (s)	91.0			0.1	1.0	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	1.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	227	274	362	16	1050	390	1009
v/c Ratio	1.00	0.49	0.49	0.22	0.90	1.08	0.51
Control Delay	138.3	2.0	4.0	141.2	34.3	127.0	44.7
Queue Delay	0.0	5.1	20.3	0.0	0.6	0.0	0.0
Total Delay	138.3	7.2	24.2	141.2	34.8	127.0	44.7
Queue Length 50th (ft)	285	0	75	21	369	~493	363
Queue Length 95th (ft)	#486	m0	m63	53	447	#723	420
Internal Link Dist (ft)	420	47			217		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	227	559	743	165	1166	360	1984
Starvation Cap Reductn	0	218	373	0	16	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.80	0.98	0.10	0.91	1.08	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	99	25	38	43	504	10	5	944	22	4	355
Future Volume (vph)	85	99	25	38	43	504	10	5	944	22	4	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.98			0.90	0.85		1.00	1.00			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1770			1516	1475		1636	4957			1736
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.08
Satd. Flow (perm)		1770			1516	1475		1636	4957			146
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)	92	108	27	41	47	548	11	5	1026	24	4	386
RTOR Reduction (vph)	0	3	0	0	40	238	0	0	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	234	124	0	16	1050	0	0	390
Confl. Peds. (#/hr)			2	2						1		1
Heavy Vehicles (%)	0%	5%	8%	8%	13%	4%	0%	33%	4%	15%	0%	4%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		23.1			64.0	64.0		5.1	43.2			84.2
Effective Green, g (s)		24.1			65.0	65.0		6.1	44.7			85.2
Actuated g/C Ratio		0.13			0.34	0.34		0.03	0.24			0.45
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		224			518	504		52	1166			360
v/s Ratio Prot		c0.13			c0.15	0.08		0.01	0.21			c0.20
v/s Ratio Perm												c0.28
v/c Ratio		1.00			0.45	0.25		0.31	0.90			1.08
Uniform Delay, d1		83.0			48.6	44.9		89.9	70.5			63.8
Progression Factor		1.00			0.01	0.77		1.55	0.32			1.00
Incremental Delay, d2		60.6			0.8	0.3		3.3	11.1			71.6
Delay (s)		143.5			1.4	35.0		142.3	33.8			135.3
Level of Service		F			A	C		F	C			F
Approach Delay (s)		143.5			20.5				35.4			
Approach LOS		F			C				D			

Intersection Summary			
HCM 2000 Control Delay	54.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	912	17
Future Volume (vph)	912	17
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	4931	
Flt Permitted	1.00	
Satd. Flow (perm)	4931	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	991	18
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1009	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	5%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	72.3	
Effective Green, g (s)	73.8	
Actuated g/C Ratio	0.39	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1915	
v/s Ratio Prot	0.20	
v/s Ratio Perm		
v/c Ratio	0.53	
Uniform Delay, d1	44.7	
Progression Factor	1.00	
Incremental Delay, d2	1.0	
Delay (s)	45.7	
Level of Service	D	
Approach Delay (s)	70.7	
Approach LOS	E	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	520	492	32	201
v/c Ratio	0.25	0.79	0.14	1.09
Control Delay	0.6	88.5	1.2	139.2
Queue Delay	22.5	2.3	0.0	2.2
Total Delay	23.1	90.7	1.2	141.4
Queue Length 50th (ft)	2	261	0	~194
Queue Length 95th (ft)	m3	391	0	#393
Internal Link Dist (ft)	47	1637	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2060	628	272	184
Starvation Cap Reductn	1542	0	0	0
Spillback Cap Reductn	0	55	3	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.00	0.86	0.12	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	429	6	0	430	23	8	0	21	39	1	145
Future Volume (vph)	43	429	6	0	430	23	8	0	21	39	1	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.90			0.89	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		3396			3355			1456			1347	
Flt Permitted		1.00			1.00			0.99			0.99	
Satd. Flow (perm)		3396			3355			1456			1347	
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)	47	466	7	0	467	25	9	0	23	42	1	158
RTOR Reduction (vph)	0	0	0	0	2	0	0	31	0	0	68	0
Lane Group Flow (vph)	0	520	0	0	490	0	0	1	0	0	133	0
Confl. Peds. (#/hr)	1		2	2		1	1		8	8		1
Heavy Vehicles (%)	12%	5%	0%	0%	7%	0%	0%	0%	13%	100%	0%	3%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		114.2			34.1			5.4			15.5	
Effective Green, g (s)		109.3			35.1			6.4			16.5	
Actuated g/C Ratio		0.58			0.18			0.03			0.09	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1953			619			49			116	
v/s Ratio Prot		c0.15			c0.15			c0.00			c0.10	
v/s Ratio Perm												
v/c Ratio		0.27			0.79			0.02			1.15	
Uniform Delay, d1		20.2			74.0			88.8			86.8	
Progression Factor		0.03			1.06			1.00			1.00	
Incremental Delay, d2		0.0			8.1			0.1			129.6	
Delay (s)		0.6			86.7			88.8			216.3	
Level of Service		A			F			F			F	
Approach Delay (s)		0.6			86.7			88.8			216.3	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	71.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2023 TF PM MIT

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	16	1401	4	1925	538	7	342	99	16
v/c Ratio	0.15	0.38	0.02	0.78	0.46	0.12	1.51	0.30	0.18
Control Delay	12.5	7.6	11.5	17.1	6.2	106.8	311.1	32.2	101.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	7.6	11.5	17.1	6.2	106.8	311.1	32.2	101.3
Queue Length 50th (ft)	3	105	1	390	134	10	~701	45	23
Queue Length 95th (ft)	m9	227	m2	#1601	136	33	m#934	m91	53
Internal Link Dist (ft)		810		1202		100		1646	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	109	3671	308	2459	1165	63	226	328	189
Starvation Cap Reductn	0	593	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.46	0.01	0.78	0.46	0.11	1.51	0.30	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	1286	3	4	0	1771	495	3	0	4	315	8
Future Volume (vph)	15	1286	3	4	0	1771	495	3	0	4	315	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.92		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98		0.95	1.00
Satd. Flow (prot)	1719	5084			1805	3539	1583		1717		1736	1641
Flt Permitted	0.04	1.00			0.15	1.00	1.00		0.98		0.95	1.00
Satd. Flow (perm)	68	5084			292	3539	1583		1717		1736	1641
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)	16	1398	3	4	0	1925	538	3	0	4	342	9
RTOR Reduction (vph)	0	0	0	0	0	0	74	0	0	0	0	86
Lane Group Flow (vph)	16	1401	0	0	4	1925	464	0	7	0	342	13
Heavy Vehicles (%)	5%	2%	0%	0%	0%	2%	2%	0%	0%	0%	4%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	147.5	143.6			142.1	140.9	140.9		3.0		27.7	27.7
Effective Green, g (s)	149.5	145.6			144.1	142.9	142.9		4.0		28.7	28.7
Actuated g/C Ratio	0.68	0.66			0.65	0.65	0.65		0.02		0.13	0.13
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	82	3364			206	2298	1028		31		226	214
v/s Ratio Prot	c0.00	c0.28			0.00	c0.54			c0.00		c0.20	0.01
v/s Ratio Perm	0.13				0.01		0.29					
v/c Ratio	0.20	0.42			0.02	0.84	0.45		0.23		1.51	0.06
Uniform Delay, d1	34.1	17.4			14.1	29.6	19.1		106.5		95.7	83.8
Progression Factor	0.78	0.51			0.83	0.53	0.45		1.00		1.10	9.26
Incremental Delay, d2	1.0	0.3			0.0	3.3	1.2		3.7		251.8	0.2
Delay (s)	27.6	9.2			11.7	19.0	9.8		110.2		356.7	776.8
Level of Service	C	A			B	B	A		F		F	F
Approach Delay (s)		9.4				17.0			110.2			451.0
Approach LOS		A				B			F			F

Intersection Summary			
HCM 2000 Control Delay	59.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	83	10	2	3
Future Volume (vph)	83	10	2	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.97	
Flt Protected			0.96	
Satd. Flow (prot)			1780	
Flt Permitted			0.96	
Satd. Flow (perm)			1780	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	11	2	3
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	16	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.6	
Effective Green, g (s)			8.6	
Actuated g/C Ratio			0.04	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			69	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.23	
Uniform Delay, d1			102.5	
Progression Factor			1.00	
Incremental Delay, d2			1.7	
Delay (s)			104.2	
Level of Service			F	
Approach Delay (s)			104.2	
Approach LOS			F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	124	1227	179	1744	203	175	25	254
v/c Ratio	0.67	0.55	0.58	0.79	1.06	0.35	0.14	0.62
Control Delay	62.4	20.7	22.4	16.5	159.0	9.0	66.9	74.9
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	62.4	20.7	22.4	17.0	159.0	9.0	66.9	74.9
Queue Length 50th (ft)	106	364	33	247	298	0	29	300
Queue Length 95th (ft)	176	580	m135	323	#478	71	61	403
Internal Link Dist (ft)		1037		810	420			236
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	211	2251	368	2202	217	542	208	464
Starvation Cap Reductn	0	71	0	124	0	0	0	0
Spillback Cap Reductn	0	0	0	143	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.56	0.49	0.85	0.94	0.32	0.12	0.55

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	1089	40	165	1598	6	60	127	161	23	111	122
Future Volume (vph)	114	1089	40	165	1598	6	60	127	161	23	111	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1626	3523		1805	3537			1870	1615	1805	1751	
Flt Permitted	0.05	1.00		0.17	1.00			0.45	1.00	0.43	1.00	
Satd. Flow (perm)	92	3523		321	3537			854	1615	817	1751	
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)	124	1184	43	179	1737	7	65	138	175	25	121	133
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	136	0	19	0
Lane Group Flow (vph)	124	1226	0	179	1744	0	0	203	39	25	235	0
Heavy Vehicles (%)	11%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	155.7	139.6		148.5	136.0			48.6	48.6	48.6	48.6	
Effective Green, g (s)	157.7	140.6		150.5	137.0			49.6	49.6	49.6	49.6	
Actuated g/C Ratio	0.72	0.64		0.68	0.62			0.23	0.23	0.23	0.23	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	185	2251		310	2202			192	364	184	394	
v/s Ratio Prot	c0.05	0.35		0.04	c0.49						0.13	
v/s Ratio Perm	0.43			0.36				c0.24	0.02	0.03		
v/c Ratio	0.67	0.54		0.58	0.79			1.06	0.11	0.14	0.60	
Uniform Delay, d1	52.7	22.0		17.1	30.9			85.2	67.6	68.1	76.3	
Progression Factor	1.24	0.85		1.64	0.44			1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.6	0.9		1.7	1.9			80.9	0.1	0.3	2.4	
Delay (s)	74.0	19.6		29.7	15.5			166.1	67.8	68.4	78.7	
Level of Service	E	B		C	B			F	E	E	E	
Approach Delay (s)		24.6			16.8			120.6			77.8	
Approach LOS		C			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	228	903	29	145	1494	111	115	525	114	174	544	344
v/c Ratio	0.75	0.46	0.03	0.87	0.75	0.11	0.88	0.84	0.24	0.62	0.80	0.70
Control Delay	152.2	16.1	0.0	113.7	27.9	6.6	150.1	100.3	10.8	152.5	95.1	31.3
Queue Delay	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	3.0	1.0
Total Delay	152.2	16.1	0.0	113.7	33.9	6.6	150.1	100.3	10.8	152.5	98.1	32.2
Queue Length 50th (ft)	179	164	0	217	938	40	169	393	18	135	277	87
Queue Length 95th (ft)	#236	181	m0	m#302	1188	m40	#305	462	63	182	321	134
Internal Link Dist (ft)		774			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	310	1947	1020	166	1984	997	130	678	483	340	799	492
Starvation Cap Reductn	0	0	0	0	437	0	0	0	0	0	157	35
Spillback Cap Reductn	0	0	0	0	80	0	0	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.46	0.03	0.87	0.97	0.11	0.88	0.77	0.24	0.51	0.85	0.75

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	867	28	139	1434	107	110	504	109	167	522	330
Future Volume (vph)	219	867	28	139	1434	107	110	504	109	167	522	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1584
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	228	903	29	145	1494	111	115	525	114	174	544	344
RTOR Reduction (vph)	0	0	11	0	0	21	0	0	69	0	0	61
Lane Group Flow (vph)	228	903	18	145	1494	90	115	525	45	174	544	283
Confl. Peds. (#/hr)	4					4	1		7	7		1
Heavy Vehicles (%)	1%	2%	0%	2%	1%	5%	0%	2%	1%	3%	1%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	17.9	119.5	133.9	19.2	120.5	137.1	14.4	37.4	56.6	16.6	40.5	58.4
Effective Green, g (s)	19.4	121.0	136.9	20.7	122.0	140.1	15.9	38.9	59.6	18.1	42.0	61.4
Actuated g/C Ratio	0.09	0.55	0.62	0.09	0.55	0.64	0.07	0.18	0.27	0.08	0.19	0.28
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	305	1946	1004	166	1981	961	130	625	425	279	682	442
v/s Ratio Prot	c0.07	0.26	0.00	0.08	c0.42	0.01	c0.06	0.15	0.01	0.05	c0.15	0.06
v/s Ratio Perm			0.01			0.05			0.02			0.12
v/c Ratio	0.75	0.46	0.02	0.87	0.75	0.09	0.88	0.84	0.11	0.62	0.80	0.64
Uniform Delay, d1	97.9	29.9	15.9	98.4	37.5	15.4	101.1	87.5	60.2	97.7	84.9	69.6
Progression Factor	1.43	0.50	0.00	0.87	0.68	0.90	1.00	1.00	1.00	1.46	1.01	0.48
Incremental Delay, d2	8.5	0.7	0.0	24.8	1.7	0.0	45.6	9.7	0.1	4.2	6.4	3.0
Delay (s)	148.0	15.7	0.0	110.6	27.1	13.9	146.8	97.2	60.3	147.3	92.6	36.1
Level of Service	F	B	A	F	C	B	F	F	E	F	F	D
Approach Delay (s)		41.3			33.1			99.2			83.2	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	56.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1070	1	0	1890	14	0	0	8	0	0	14
Future Vol, veh/h	0	1070	1	0	1890	14	0	0	8	0	0	14
Conflicting Peds, #/hr	4	0	0	0	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1151	1	0	2032	15	0	0	9	0	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	576	-	-	1028
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	460	0	0	231
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	460	-	-	230
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13	21.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	460	-	-	-	-	230
HCM Lane V/C Ratio	0.019	-	-	-	-	0.065
HCM Control Delay (s)	13	-	-	-	-	21.7
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.2

Lane Group	EBT	WBT	NBT	SBL	SBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	132	45	98	19	10	6	1086	49	1950
v/c Ratio	0.74	0.44	0.71	0.18	0.06	0.06	0.52	0.25	0.87
Control Delay	120.2	112.9	122.2	95.7	91.0	10.0	11.0	18.5	27.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	120.2	112.9	122.2	95.7	91.0	10.0	11.2	18.5	27.6
Queue Length 50th (ft)	189	65	139	26	13	1	282	21	607
Queue Length 95th (ft)	274	116	#243	60	38	m4	194	m39	#1645
Internal Link Dist (ft)	220	220	220		220		755		445
Turn Bay Length (ft)				175		120		150	
Base Capacity (vph)	204	165	138	103	161	112	2105	199	2251
Starvation Cap Reductn	0	0	0	0	0	0	307	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.27	0.71	0.18	0.06	0.05	0.60	0.25	0.87

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	76	44	4	2	19	18	2	4	24	27	13	26
Future Volume (vph)	76	44	4	2	19	18	2	4	24	27	13	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0				5.0					5.0	
Lane Util. Factor		1.00				1.00					1.00	
Frpb, ped/bikes		1.00				0.99					1.00	
Flpb, ped/bikes		1.00				1.00					0.99	
Frt		0.99				0.98					0.96	
Flt Protected		0.97				0.98					0.97	
Satd. Flow (prot)		1798				1811					1709	
Flt Permitted		0.97				0.98					0.83	
Satd. Flow (perm)		1798				1811					1449	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	80	46	4	2	20	19	2	4	25	28	14	27
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	132	0	0	0	45	0	0	0	0	98	0
Confl. Peds. (#/hr)			4	2	2		4		2	2		
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%
Turn Type	Split	NA			Split	NA			Perm	Perm	NA	
Protected Phases	3	3			4	4					7	
Permitted Phases									7	7		
Actuated Green, G (s)		20.3				9.6					19.5	
Effective Green, g (s)		21.8				11.1					21.0	
Actuated g/C Ratio		0.10				0.05					0.10	
Clearance Time (s)		6.5				6.5					6.5	
Vehicle Extension (s)		3.0				3.0					3.0	
Lane Grp Cap (vph)		178				91					138	
v/s Ratio Prot		c0.07				c0.02						
v/s Ratio Perm											c0.07	
v/c Ratio		0.74				0.49					0.71	
Uniform Delay, d1		96.4				101.7					96.5	
Progression Factor		1.00				1.00					1.00	
Incremental Delay, d2		15.3				4.2					15.8	
Delay (s)		111.6				105.9					112.3	
Level of Service		F				F					F	
Approach Delay (s)		111.6				105.9					112.3	
Approach LOS		F				F					F	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	25.7
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBR2	SBL2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2	SWL2
Lane Configurations												
Traffic Volume (vph)	4	15	3	4	2	4	6	0	948	73	10	22
Future Volume (vph)	4	15	3	4	2	4	6	0	948	73	10	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0				5.6	5.1			
Lane Util. Factor			1.00	1.00				1.00	0.95			
Frpb, ped/bikes			1.00	0.98				1.00	1.00			
Flpb, ped/bikes			1.00	1.00				1.00	1.00			
Frt			1.00	0.91				1.00	0.99			
Flt Protected			0.95	1.00				0.95	1.00			
Satd. Flow (prot)			1691	1687				1805	3495			
Flt Permitted			0.61	1.00				0.03	1.00			
Satd. Flow (perm)			1079	1687				58	3495			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	16	3	4	2	4	6	0	998	77	11	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	19	10	0	0	0	6	1086	0	0	0
Confl. Peds. (#/hr)					2	2	2				4	
Heavy Vehicles (%)	0%	8%	0%	0%	0%	0%	0%	0%	2%	0%	0%	100%
Turn Type		Perm	Perm	NA			custom	pm+pt	NA			pm+pt
Protected Phases				7				1	6			5
Permitted Phases		7	7				1	6				2
Actuated Green, G (s)			19.5	19.5				130.5	129.2			
Effective Green, g (s)			21.0	21.0				133.5	131.2			
Actuated g/C Ratio			0.10	0.10				0.61	0.60			
Clearance Time (s)			6.5	6.5				7.1	7.1			
Vehicle Extension (s)			3.0	3.0				3.0	4.0			
Lane Grp Cap (vph)			102	161				57	2084			
v/s Ratio Prot				0.01				0.00	0.31			
v/s Ratio Perm			0.02					0.06				
v/c Ratio			0.19	0.06				0.11	0.52			
Uniform Delay, d1			91.6	90.5				39.4	26.0			
Progression Factor			1.00	1.00				0.56	0.38			
Incremental Delay, d2			0.9	0.2				0.8	0.9			
Delay (s)			92.5	90.7				22.9	10.7			
Level of Service			F	F				C	B			
Approach Delay (s)				91.9					10.7			
Approach LOS				F					B			

Intersection Summary

Movement	SWL	SWT	SWR	SWR2
Lane Configurations				
Traffic Volume (vph)	25	1718	128	7
Future Volume (vph)	25	1718	128	7
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.6	5.1		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	1.00		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.99		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1228	3425		
Flt Permitted	0.18	1.00		
Satd. Flow (perm)	236	3425		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	1808	135	7
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	49	1950	0	0
Confl. Peds. (#/hr)	4		2	
Heavy Vehicles (%)	0%	4%	4%	25%
Turn Type	pm+pt	NA		
Protected Phases	5	2		
Permitted Phases	2			
Actuated Green, G (s)	143.3	135.6		
Effective Green, g (s)	145.5	137.6		
Actuated g/C Ratio	0.66	0.63		
Clearance Time (s)	7.1	7.1		
Vehicle Extension (s)	3.0	4.0		
Lane Grp Cap (vph)	197	2142		
v/s Ratio Prot	c0.01	c0.57		
v/s Ratio Perm	0.15			
v/c Ratio	0.25	0.91		
Uniform Delay, d1	17.8	35.8		
Progression Factor	1.09	0.74		
Incremental Delay, d2	0.5	5.2		
Delay (s)	19.9	31.6		
Level of Service	B	C		
Approach Delay (s)		31.3		
Approach LOS		C		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	45	863	1052
v/c Ratio	0.48	0.17	0.22
Control Delay	56.4	0.1	0.9
Queue Delay	0.0	0.0	0.1
Total Delay	56.4	0.1	1.0
Queue Length 50th (ft)	19	0	33
Queue Length 95th (ft)	71	0	53
Internal Link Dist (ft)	220	381	220
Turn Bay Length (ft)			
Base Capacity (vph)	180	5085	4722
Starvation Cap Reductn	0	0	2104
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.25	0.17	0.40

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	13	31	0	837	1000	20
Future Volume (vph)	13	31	0	837	1000	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.90			1.00	1.00	
Flt Protected	0.99			1.00	1.00	
Satd. Flow (prot)	1660			5085	5068	
Flt Permitted	0.99			1.00	1.00	
Satd. Flow (perm)	1660			5085	5068	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	13	32	0	863	1031	21
RTOR Reduction (vph)	31	0	0	0	1	0
Lane Group Flow (vph)	14	0	0	863	1051	0
Confl. Peds. (#/hr)	1		3			3
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	7.0			220.0	203.0	
Effective Green, g (s)	7.0			220.0	203.0	
Actuated g/C Ratio	0.03			1.00	0.92	
Clearance Time (s)	5.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	52			5085	4676	
v/s Ratio Prot	0.01			0.17	c0.21	
v/s Ratio Perm						
v/c Ratio	0.27			0.17	0.22	
Uniform Delay, d1	104.0			0.0	0.8	
Progression Factor	1.00			1.00	0.90	
Incremental Delay, d2	2.8			0.1	0.1	
Delay (s)	106.8			0.1	0.8	
Level of Service	F			A	A	
Approach Delay (s)	106.8			0.1	0.8	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	2.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	452	441	36	888	475	1042
v/c Ratio	0.72	0.78	0.60	0.40	0.50	1.24	0.45
Control Delay	124.1	5.6	4.9	152.2	13.4	160.9	42.6
Queue Delay	0.0	48.3	53.5	0.0	0.7	0.0	0.0
Total Delay	124.1	53.9	58.3	152.2	14.1	160.9	42.6
Queue Length 50th (ft)	132	77	89	55	74	~655	391
Queue Length 95th (ft)	#244	m43	m57	105	85	#906	447
Internal Link Dist (ft)	420	47			221		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	130	588	741	198	1785	383	2303
Starvation Cap Reductn	0	172	338	0	528	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.09	1.09	0.18	0.71	1.24	0.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	27	45	18	54	98	706	17	17	811	41	2	454
Future Volume (vph)	27	45	18	54	98	706	17	17	811	41	2	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		0.99			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.97			0.90	0.85		1.00	0.99			1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1810			1613	1534		1805	4990			1787
Flt Permitted		0.99			0.99	1.00		0.95	1.00			0.19
Satd. Flow (perm)		1810			1613	1534		1805	4990			361
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	47	19	56	102	735	18	18	845	43	2	473
RTOR Reduction (vph)	0	4	0	0	31	213	0	0	0	0	0	0
Lane Group Flow (vph)	0	90	0	0	421	228	0	36	888	0	0	475
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	3%	7%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		14.4			73.7	73.7		8.6	77.2			113.2
Effective Green, g (s)		15.4			74.7	74.7		9.6	78.7			114.2
Actuated g/C Ratio		0.07			0.34	0.34		0.04	0.36			0.52
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		126			547	520		78	1785			383
v/s Ratio Prot		c0.05			c0.26	0.15		0.02	0.18			c0.17
v/s Ratio Perm												c0.47
v/c Ratio		0.72			0.77	0.44		0.46	0.50			1.24
Uniform Delay, d1		100.2			65.0	56.4		102.7	55.2			41.9
Progression Factor		1.00			0.08	0.32		1.38	0.22			1.00
Incremental Delay, d2		18.1			0.8	0.1		4.3	1.0			128.5
Delay (s)		118.3			5.9	17.9		146.2	13.4			170.4
Level of Service		F			A	B		F	B			F
Approach Delay (s)		118.3			11.9				18.6			
Approach LOS		F			B				B			

Intersection Summary			
HCM 2000 Control Delay	47.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	924	76
Future Volume (vph)	924	76
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	5035	
Flt Permitted	1.00	
Satd. Flow (perm)	5035	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	962	79
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1042	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	97.8	
Effective Green, g (s)	99.3	
Actuated g/C Ratio	0.45	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2272	
v/s Ratio Prot	0.21	
v/s Ratio Perm		
v/c Ratio	0.46	
Uniform Delay, d1	41.8	
Progression Factor	1.00	
Incremental Delay, d2	0.7	
Delay (s)	42.4	
Level of Service	D	
Approach Delay (s)	82.5	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	575	825	20	158
v/c Ratio	0.27	1.10	0.28	0.89
Control Delay	1.4	132.1	83.8	85.5
Queue Delay	17.7	0.5	0.0	0.4
Total Delay	19.1	132.6	83.8	85.9
Queue Length 50th (ft)	8	~703	19	102
Queue Length 95th (ft)	m8	#846	55	#246
Internal Link Dist (ft)	47	1646	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2130	749	80	187
Starvation Cap Reductn	1548	0	0	0
Spillback Cap Reductn	0	60	0	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.99	1.20	0.25	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	388	11	0	725	51	9	3	7	22	3	124
Future Volume (vph)	141	388	11	0	725	51	9	3	7	22	3	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.96			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.95			0.89	
Flt Protected		0.99			1.00			0.98			0.99	
Satd. Flow (prot)		3458			3537			1702			1642	
Flt Permitted		0.99			1.00			0.98			0.99	
Satd. Flow (perm)		3458			3537			1702			1642	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	150	413	12	0	771	54	10	3	7	23	3	132
RTOR Reduction (vph)	0	1	0	0	2	0	0	7	0	0	84	0
Lane Group Flow (vph)	0	574	0	0	823	0	0	13	0	0	74	0
Confl. Peds. (#/hr)			2	2					12	12		
Heavy Vehicles (%)	2%	3%	0%	0%	1%	2%	0%	0%	0%	13%	0%	0%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		134.5			45.5			7.5			11.7	
Effective Green, g (s)		129.6			46.5			8.5			12.7	
Actuated g/C Ratio		0.59			0.21			0.04			0.06	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		2037			747			65			94	
v/s Ratio Prot		c0.17			c0.23			c0.01			c0.05	
v/s Ratio Perm												
v/c Ratio		0.28			1.10			0.20			0.79	
Uniform Delay, d1		22.3			86.8			102.5			102.3	
Progression Factor		0.07			0.90			1.00			1.00	
Incremental Delay, d2		0.0			63.7			0.6			32.1	
Delay (s)		1.5			141.6			103.0			134.4	
Level of Service		A			F			F			F	
Approach Delay (s)		1.5			141.6			103.0			134.4	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	89.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2023 TF SAT

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	22	1611	8	1504	628	6	220	50	14
v/c Ratio	0.14	0.49	0.05	0.69	0.57	0.07	0.81	0.12	0.12
Control Delay	25.6	25.2	6.9	22.4	11.9	69.3	101.3	6.8	63.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	25.2	6.9	22.4	11.9	69.3	101.3	6.8	63.7
Queue Length 50th (ft)	8	282	2	820	434	6	228	4	13
Queue Length 95th (ft)	m28	508	m2	#1068	652	22	#343	24	34
Internal Link Dist (ft)		810		1202		100		1665	220
Turn Bay Length (ft)	130		80		600				
Base Capacity (vph)	170	3280	186	2169	1099	94	282	419	264
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.49	0.04	0.69	0.57	0.06	0.78	0.12	0.05

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	1478	4	6	1	1384	578	4	0	2	202	2
Future Volume (vph)	20	1478	4	6	1	1384	578	4	0	2	202	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.95		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97		0.95	1.00
Satd. Flow (prot)	1805	5034			1621	3539	1583		1756		1787	1626
Flt Permitted	0.07	1.00			0.10	1.00	1.00		0.97		0.95	1.00
Satd. Flow (perm)	124	5034			171	3539	1583		1756		1787	1626
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)	22	1607	4	7	1	1504	628	4	0	2	220	2
RTOR Reduction (vph)	0	0	0	0	0	0	155	0	0	0	0	42
Lane Group Flow (vph)	22	1611	0	0	8	1504	473	0	6	0	220	8
Heavy Vehicles (%)	0%	3%	0%	13%	0%	2%	2%	0%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	84.9	81.0			79.9	78.5	78.5		1.5		21.9	21.9
Effective Green, g (s)	86.9	83.0			81.9	80.5	80.5		2.5		22.9	22.9
Actuated g/C Ratio	0.58	0.55			0.55	0.54	0.54		0.02		0.15	0.15
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	126	2785			116	1899	849		29		272	248
v/s Ratio Prot	c0.01	0.32			0.00	c0.42			c0.00		c0.12	0.00
v/s Ratio Perm	0.10				0.04		0.30					
v/c Ratio	0.17	0.58			0.07	0.79	0.56		0.21		0.81	0.03
Uniform Delay, d1	22.7	22.0			17.5	28.0	23.0		72.8		61.4	54.1
Progression Factor	1.69	1.39			0.41	0.84	0.91		1.00		1.30	1.00
Incremental Delay, d2	0.5	0.7			0.2	3.0	2.3		3.5		17.8	0.1
Delay (s)	39.0	31.3			7.4	26.6	23.1		76.3		97.7	54.2
Level of Service	D	C			A	C	C		E		F	D
Approach Delay (s)		31.4				25.5			76.3			89.6
Approach LOS		C				C			E			F

Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	44	3	1	9
Future Volume (vph)	44	3	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.90	
Flt Protected			0.99	
Satd. Flow (prot)			1693	
Flt Permitted			0.99	
Satd. Flow (perm)			1693	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	3	1	10
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	14	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.3	
Effective Green, g (s)			8.3	
Actuated g/C Ratio			0.06	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			93	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.15	
Uniform Delay, d1			67.5	
Progression Factor			1.00	
Incremental Delay, d2			0.8	
Delay (s)			68.2	
Level of Service			E	
Approach Delay (s)			68.2	
Approach LOS			E	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	178	1434	151	1289	140	105	46	267
v/c Ratio	0.53	0.65	0.52	0.59	0.78	0.28	0.25	0.79
Control Delay	21.1	12.5	33.1	16.6	85.4	9.8	53.5	66.8
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	21.1	12.5	33.1	17.1	85.4	9.8	53.5	66.8
Queue Length 50th (ft)	24	327	56	703	132	0	39	220
Queue Length 95th (ft)	82	768	m144	777	202	50	75	305
Internal Link Dist (ft)		1037		810	420			173
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	415	2194	380	2186	250	476	257	457
Starvation Cap Reductn	0	0	0	455	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.65	0.40	0.74	0.56	0.22	0.18	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	1286	33	139	1176	10	27	102	97	42	116	130
Future Volume (vph)	164	1286	33	139	1176	10	27	102	97	42	116	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3526		1805	3535			1881	1568	1719	1694	
Flt Permitted	0.15	1.00		0.12	1.00			0.52	1.00	0.56	1.00	
Satd. Flow (perm)	276	3526		219	3535			988	1568	1011	1694	
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)	178	1398	36	151	1278	11	29	111	105	46	126	141
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	86	0	29	0
Lane Group Flow (vph)	178	1433	0	151	1289	0	0	140	19	46	238	0
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	0%	3%	5%	7%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	105.1	92.4		103.7	91.7			26.3	26.3	26.3	26.3	
Effective Green, g (s)	107.1	93.4		105.7	92.7			27.3	27.3	27.3	27.3	
Actuated g/C Ratio	0.71	0.62		0.70	0.62			0.18	0.18	0.18	0.18	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	336	2195		291	2184			179	285	184	308	
v/s Ratio Prot	c0.05	c0.41		0.04	0.36						0.14	
v/s Ratio Perm	0.33			0.32				c0.14	0.01	0.05		
v/c Ratio	0.53	0.65		0.52	0.59			0.78	0.07	0.25	0.77	
Uniform Delay, d1	12.2	18.0		14.3	17.2			58.5	50.8	52.6	58.4	
Progression Factor	2.29	0.55		3.27	0.82			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	1.3		1.1	0.9			19.6	0.1	0.7	11.3	
Delay (s)	29.2	11.2		47.9	15.0			78.1	50.9	53.3	69.7	
Level of Service	C	B		D	B			E	D	D	E	
Approach Delay (s)		13.2			18.5			66.5			67.3	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	274	1093	26	150	1044	92	100	546	160	188	603	394
v/c Ratio	0.66	0.68	0.03	0.85	0.68	0.11	0.62	0.76	0.30	0.55	0.78	0.66
Control Delay	90.3	36.4	0.8	91.9	33.6	3.8	82.3	63.1	7.2	93.3	85.8	29.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
Total Delay	90.3	36.4	0.8	91.9	33.6	3.8	82.3	63.1	7.2	93.3	86.2	29.3
Queue Length 50th (ft)	146	263	0	130	216	0	95	265	17	99	264	263
Queue Length 95th (ft)	195	464	m1	#270	443	26	161	320	52	142	356	449
Internal Link Dist (ft)		798			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	441	1615	880	176	1526	867	177	854	533	411	948	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	63	12
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.68	0.03	0.85	0.68	0.11	0.56	0.64	0.30	0.46	0.68	0.66

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	1049	25	144	1002	88	96	524	154	180	579	378
Future Volume (vph)	263	1049	25	144	1002	88	96	524	154	180	579	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1535	1805	3539	1536	1787	3539	1520	3433	3539	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1535	1805	3539	1536	1787	3539	1520	3433	3539	1570
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	274	1093	26	150	1044	92	100	546	160	188	603	394
RTOR Reduction (vph)	0	0	12	0	0	39	0	0	89	0	0	82
Lane Group Flow (vph)	274	1093	14	150	1044	53	100	546	71	188	603	312
Confl. Peds. (#/hr)	1		1	1		1	1		4	4		1
Heavy Vehicles (%)	2%	2%	4%	0%	2%	4%	1%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	16.7	67.0	79.1	13.2	63.2	76.6	12.1	29.1	42.3	13.4	31.3	48.0
Effective Green, g (s)	18.2	68.5	82.1	14.7	64.7	79.6	13.6	30.6	45.3	14.9	32.8	51.0
Actuated g/C Ratio	0.12	0.46	0.55	0.10	0.43	0.53	0.09	0.20	0.30	0.10	0.22	0.34
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	416	1616	840	176	1526	815	162	721	459	341	773	533
v/s Ratio Prot	0.08	c0.31	0.00	0.08	c0.29	0.01	c0.06	0.15	0.02	0.05	c0.17	0.07
v/s Ratio Perm			0.01			0.03			0.03			0.13
v/c Ratio	0.66	0.68	0.02	0.85	0.68	0.07	0.62	0.76	0.16	0.55	0.78	0.59
Uniform Delay, d1	62.9	32.0	15.5	66.6	34.4	17.1	65.7	56.2	38.3	64.4	55.2	40.8
Progression Factor	1.34	1.03	1.00	0.89	0.87	0.81	1.00	1.00	1.00	1.36	1.43	0.97
Incremental Delay, d2	2.9	1.8	0.0	26.2	2.0	0.0	6.8	4.6	0.2	1.9	5.0	1.6
Delay (s)	87.1	34.8	15.5	85.7	32.0	13.9	72.5	60.8	38.5	89.6	84.2	41.0
Level of Service	F	C	B	F	C	B	E	E	D	F	F	D
Approach Delay (s)		44.7			37.0			57.8			70.7	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	51.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1327	3	0	1474	24	0	0	11	0	0	17
Future Vol, veh/h	0	1327	3	0	1474	24	0	0	11	0	0	17
Conflicting Peds, #/hr	5	0	3	3	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1368	3	0	1520	25	0	0	11	0	0	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	689	-	-	778
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	388	0	0	339
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	387	-	-	338
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	14.6	16.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	387	-	-	-	-	338
HCM Lane V/C Ratio	0.029	-	-	-	-	0.052
HCM Control Delay (s)	14.6	-	-	-	-	16.2
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.2

Lane Group	EBT	WBT	NBT	SBL	SBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	86	39	46	11	7	8	1379	43	1513
v/c Ratio	0.51	0.32	0.41	0.10	0.06	0.04	0.67	0.20	0.67
Control Delay	74.8	72.6	75.8	64.5	63.0	20.1	29.2	21.0	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	72.6	75.8	64.5	63.0	20.1	29.3	21.0	25.6
Queue Length 50th (ft)	82	37	44	10	6	0	472	20	394
Queue Length 95th (ft)	138	76	86	31	23	m7	447	m35	#627
Internal Link Dist (ft)	220	220	220		220		755		420
Turn Bay Length (ft)				175		120		150	
Base Capacity (vph)	219	180	166	161	177	268	2043	275	2261
Starvation Cap Reductn	0	0	0	0	0	0	21	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.22	0.28	0.07	0.04	0.03	0.68	0.16	0.67

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL2	EBL	EBT	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT
Lane Configurations												
Traffic Volume (vph)	1	60	19	2	3	24	7	1	3	14	5	4
Future Volume (vph)	1	60	19	2	3	24	7	1	3	14	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0				5.0					5.0
Lane Util. Factor			1.00				1.00					1.00
Frpb, ped/bikes			1.00				1.00					0.98
Flpb, ped/bikes			1.00				1.00					0.97
Frt			1.00				0.99					0.94
Flt Protected			0.96				0.97					0.98
Satd. Flow (prot)			1825				1801					1658
Flt Permitted			0.96				0.97					0.86
Satd. Flow (perm)			1825				1801					1451
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	62	20	2	3	25	7	1	3	15	5	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	86	0	0	0	39	0	0	0	0	46
Confl. Peds. (#/hr)				7	4			3		7	3	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	Split	NA		Perm	Split	NA			Perm	Perm	NA
Protected Phases		3	3			4	4					7
Permitted Phases	3				4					7	7	
Actuated Green, G (s)			12.4				7.6					8.9
Effective Green, g (s)			13.9				9.1					10.4
Actuated g/C Ratio			0.09				0.06					0.07
Clearance Time (s)			6.5				6.5					6.5
Vehicle Extension (s)			3.0				3.0					3.0
Lane Grp Cap (vph)			169				109					100
v/s Ratio Prot			c0.05				c0.02					
v/s Ratio Perm												c0.03
v/c Ratio			0.51				0.36					0.46
Uniform Delay, d1			64.8				67.6					67.1
Progression Factor			1.00				1.00					1.00
Incremental Delay, d2			2.4				2.0					3.3
Delay (s)			67.2				69.7					70.4
Level of Service			E				E					E
Approach Delay (s)			67.2				69.7					70.4
Approach LOS			E				E					E

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.7
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	NEL2	NEL	NET	NER	NER2
Lane Configurations												
Traffic Volume (vph)	20	1	8	3	1	4	2	2	6	1232	77	15
Future Volume (vph)	20	1	8	3	1	4	2	2	6	1232	77	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0				5.6	5.1		
Lane Util. Factor				1.00	1.00				1.00	0.95		
Frpb, ped/bikes				1.00	0.92				1.00	1.00		
Flpb, ped/bikes				0.99	1.00				1.00	1.00		
Frt				1.00	0.87				1.00	0.99		
Flt Protected				0.95	1.00				0.95	1.00		
Satd. Flow (prot)				1784	1527				1805	3501		
Flt Permitted				0.76	1.00				0.09	1.00		
Satd. Flow (perm)				1420	1527				171	3501		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	1	8	3	1	4	2	2	6	1283	80	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	11	7	0	0	0	8	1379	0	0
Confl. Peds. (#/hr)		2		2		7	3	3	3		2	4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%
Turn Type			Perm	Perm	NA			custom	pm+pt	NA		
Protected Phases					7				1	6		
Permitted Phases			7	7				1	6			
Actuated Green, G (s)				8.9	8.9				82.7	81.4		
Effective Green, g (s)				10.4	10.4				85.7	83.4		
Actuated g/C Ratio				0.07	0.07				0.57	0.56		
Clearance Time (s)				6.5	6.5				7.1	7.1		
Vehicle Extension (s)				3.0	3.0				3.0	4.0		
Lane Grp Cap (vph)				98	105				128	1946		
v/s Ratio Prot					0.00				0.00	0.39		
v/s Ratio Perm				0.01					0.03			
v/c Ratio				0.11	0.07				0.06	0.71		
Uniform Delay, d1				65.5	65.3				19.1	24.4		
Progression Factor				1.00	1.00				1.42	1.04		
Incremental Delay, d2				0.5	0.3				0.2	2.0		
Delay (s)				66.0	65.5				27.4	27.3		
Level of Service				E	E				C	C		
Approach Delay (s)					65.8					27.3		
Approach LOS					E					C		

Intersection Summary

Movement	SWL2	SWL	SWT	SWR	SWR2
Lane Configurations					
Traffic Volume (vph)	27	14	1396	52	5
Future Volume (vph)	27	14	1396	52	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	5.1		
Lane Util. Factor		1.00	0.95		
Frpb, ped/bikes		1.00	1.00		
Flpb, ped/bikes		1.00	1.00		
Frt		1.00	0.99		
Flt Protected		0.95	1.00		
Satd. Flow (prot)		1805	3518		
Flt Permitted		0.10	1.00		
Satd. Flow (perm)		183	3518		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	15	1454	54	5
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	43	1513	0	0
Confl. Peds. (#/hr)	2	4			3
Heavy Vehicles (%)	0%	0%	2%	0%	0%
Turn Type	pm+pt	pm+pt	NA		
Protected Phases	5	5	2		
Permitted Phases	2	2			
Actuated Green, G (s)		92.1	86.1		
Effective Green, g (s)		95.1	88.1		
Actuated g/C Ratio		0.63	0.59		
Clearance Time (s)		7.1	7.1		
Vehicle Extension (s)		3.0	4.0		
Lane Grp Cap (vph)		197	2066		
v/s Ratio Prot		c0.01	c0.43		
v/s Ratio Perm		0.13			
v/c Ratio		0.22	0.73		
Uniform Delay, d1		17.8	22.4		
Progression Factor		1.47	1.16		
Incremental Delay, d2		0.4	1.8		
Delay (s)		26.6	27.7		
Level of Service		C	C		
Approach Delay (s)			27.7		
Approach LOS			C		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	41	948	1213
v/c Ratio	0.37	0.19	0.27
Control Delay	43.3	0.1	0.5
Queue Delay	0.0	0.0	0.1
Total Delay	43.3	0.1	0.6
Queue Length 50th (ft)	15	0	7
Queue Length 95th (ft)	57	0	8
Internal Link Dist (ft)	220	381	215
Turn Bay Length (ft)			
Base Capacity (vph)	245	5085	4572
Starvation Cap Reductn	0	0	1461
Spillback Cap Reductn	0	0	39
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.17	0.19	0.39

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	15	24	0	901	1123	29
Future Volume (vph)	15	24	0	901	1123	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.92			1.00	1.00	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1677			5085	5063	
Flt Permitted	0.98			1.00	1.00	
Satd. Flow (perm)	1677			5085	5063	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	25	0	948	1182	31
RTOR Reduction (vph)	24	0	0	0	1	0
Lane Group Flow (vph)	17	0	0	948	1212	0
Confl. Peds. (#/hr)	1		4			4
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	6.5			150.0	133.5	
Effective Green, g (s)	6.5			150.0	133.5	
Actuated g/C Ratio	0.04			1.00	0.89	
Clearance Time (s)	5.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	72			5085	4506	
v/s Ratio Prot	0.01			0.19	c0.24	
v/s Ratio Perm						
v/c Ratio	0.24			0.19	0.27	
Uniform Delay, d1	69.4			0.0	1.2	
Progression Factor	1.00			1.00	0.33	
Incremental Delay, d2	1.7			0.1	0.1	
Delay (s)	71.1			0.1	0.5	
Level of Service	E			A	A	
Approach Delay (s)	71.1			0.1	0.5	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	1.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	177	326	33	894	407	1159
v/c Ratio	0.30	0.31	0.44	0.30	0.67	1.30	0.65
Control Delay	56.7	1.2	4.4	94.9	43.2	188.4	45.1
Queue Delay	0.0	1.0	1.9	0.0	0.0	0.2	0.0
Total Delay	56.7	2.3	6.3	94.9	43.2	188.7	45.1
Queue Length 50th (ft)	52	0	67	33	150	~447	363
Queue Length 95th (ft)	98	0	115	72	220	#796	#486
Internal Link Dist (ft)	420	47			226		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	217	614	770	166	1339	313	1790
Starvation Cap Reductn	0	248	295	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	6	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.48	0.69	0.20	0.67	1.33	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	25	23	14	38	39	411	19	13	840	27	5	390
Future Volume (vph)	25	23	14	38	39	411	19	13	840	27	5	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frt		0.97			0.92	0.85		1.00	1.00			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1807			1540	1504		1763	5063			1787
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.14
Satd. Flow (perm)		1807			1540	1504		1763	5063			256
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	24	14	39	40	424	20	13	866	28	5	402
RTOR Reduction (vph)	0	6	0	0	35	213	0	0	0	0	0	0
Lane Group Flow (vph)	0	58	0	0	142	113	0	33	894	0	0	407
Heavy Vehicles (%)	0%	0%	0%	3%	20%	2%	0%	6%	2%	1%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		16.3			50.8	50.8		7.3	38.2			64.2
Effective Green, g (s)		17.3			51.8	51.8		8.3	39.7			65.2
Actuated g/C Ratio		0.12			0.35	0.35		0.06	0.26			0.43
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		208			531	519		97	1340			317
v/s Ratio Prot		c0.03			c0.09	0.07		0.02	0.18			c0.17
v/s Ratio Perm												c0.39
v/c Ratio		0.28			0.27	0.22		0.34	0.67			1.28
Uniform Delay, d1		60.6			35.4	34.7		68.2	49.3			39.5
Progression Factor		1.00			0.00	0.89		1.32	0.82			1.00
Incremental Delay, d2		0.9			0.6	0.5		2.1	2.6			149.7
Delay (s)		61.5			0.6	31.3		92.4	43.0			189.2
Level of Service		E			A	C		F	D			F
Approach Delay (s)		61.5			20.5				44.8			
Approach LOS		E			C				D			

Intersection Summary			
HCM 2000 Control Delay	60.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1092	32
Future Volume (vph)	1092	32
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5066	
Flt Permitted	1.00	
Satd. Flow (perm)	5066	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	1126	33
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1159	0
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	50.1	
Effective Green, g (s)	51.6	
Actuated g/C Ratio	0.34	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1742	
v/s Ratio Prot	0.23	
v/s Ratio Perm		
v/c Ratio	0.67	
Uniform Delay, d1	41.9	
Progression Factor	1.00	
Incremental Delay, d2	2.0	
Delay (s)	43.9	
Level of Service	D	
Approach Delay (s)	81.6	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	484	444	14	119
v/c Ratio	0.23	0.60	0.17	0.47
Control Delay	2.4	64.6	59.0	6.2
Queue Delay	51.9	0.3	0.0	0.0
Total Delay	54.3	64.9	59.0	6.2
Queue Length 50th (ft)	10	185	10	0
Queue Length 95th (ft)	m11	285	35	0
Internal Link Dist (ft)	47	1665	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2065	827	137	299
Starvation Cap Reductn	1621	0	0	0
Spillback Cap Reductn	0	70	0	3
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.09	0.59	0.10	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	348	7	0	386	22	8	1	4	20	0	89
Future Volume (vph)	90	348	7	0	386	22	8	1	4	20	0	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.96			0.89	
Flt Protected		0.99			1.00			0.97			0.99	
Satd. Flow (prot)		3537			3482			1738			1649	
Flt Permitted		0.99			1.00			0.97			0.99	
Satd. Flow (perm)		3537			3482			1738			1649	
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)	98	378	8	0	420	24	9	1	4	22	0	97
RTOR Reduction (vph)	0	1	0	0	3	0	0	4	0	0	114	0
Lane Group Flow (vph)	0	483	0	0	441	0	0	10	0	0	5	0
Confl. Peds. (#/hr)									8	8		
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		87.4			30.8			5.8			5.2	
Effective Green, g (s)		82.5			31.8			6.8			6.2	
Actuated g/C Ratio		0.55			0.21			0.05			0.04	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1945			738			78			68	
v/s Ratio Prot		c0.14			c0.13			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio		0.25			0.60			0.13			0.07	
Uniform Delay, d1		17.6			53.3			68.8			69.1	
Progression Factor		0.16			1.17			1.00			1.00	
Incremental Delay, d2		0.0			1.8			0.3			0.2	
Delay (s)		2.7			64.5			69.0			69.3	
Level of Service		A			E			E			E	
Approach Delay (s)		2.7			64.5			69.0			69.3	
Approach LOS		A			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	91	381	415	225	18	486	486	66	18	400	48	36
Average Queue (ft)	11	140	141	119	1	215	220	6	2	258	9	4
95th Queue (ft)	51	301	305	231	9	422	424	35	12	374	33	20
Link Distance (ft)		764	764			1199	1199	1199	114	1638	1638	213
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		11	3	2		22						
Queuing Penalty (veh)		4	22	16		0						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	79	248	255	146	268	253	431	248	102	257
Average Queue (ft)	23	110	118	66	60	53	200	119	13	121
95th Queue (ft)	60	231	240	135	251	220	358	213	56	223
Link Distance (ft)		982	982		764	764	447	447		235
Upstream Blk Time (%)							1			2
Queuing Penalty (veh)							0			0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				1	6				0	19
Queuing Penalty (veh)				2	4				0	1

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	228	232	436	456	31	475	917	896	69	225	445	452
Average Queue (ft)	128	146	268	280	3	414	422	316	16	59	287	285
95th Queue (ft)	204	217	400	418	16	548	1061	899	50	186	417	424
Link Distance (ft)			732	732			982	982			514	514
Upstream Blk Time (%)							5	1			0	0
Queuing Penalty (veh)							21	5			0	0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)				0		42	2	0		0	30	21
Queuing Penalty (veh)				0		121	3	0		0	11	23

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	250	190	182	346	357	225
Average Queue (ft)	106	91	87	245	258	122
95th Queue (ft)	283	169	165	351	377	284
Link Distance (ft)			340	340	340	
Upstream Blk Time (%)				6	10	
Queuing Penalty (veh)				21	32	
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0				40	0
Queuing Penalty (veh)	0				94	0

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	WB	NB	SB
Directions Served	TR	R	R
Maximum Queue (ft)	3	20	31
Average Queue (ft)	0	3	5
95th Queue (ft)	3	13	23
Link Distance (ft)	732	254	92
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	SW	SW	SW
Directions Served	<LTR>	LTR	<LTR>	<L	TR	T	TR>	<L	T	TR>
Maximum Queue (ft)	216	87	121	110	44	494	499	146	296	305
Average Queue (ft)	166	25	49	33	6	220	224	30	142	165
95th Queue (ft)	240	70	105	83	26	405	420	93	269	291
Link Distance (ft)	188	107	225		231	713	713		391	391
Upstream Blk Time (%)	22	1								
Queuing Penalty (veh)	0	0								
Storage Bay Dist (ft)				175				150		
Storage Blk Time (%)				0		29			10	
Queuing Penalty (veh)				0		0			3	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	NB	NB	SB	SB	SB	B9
Directions Served	LR	T	T	T	T	TR	T
Maximum Queue (ft)	95	9	2	54	116	141	4
Average Queue (ft)	27	0	0	5	21	26	0
95th Queue (ft)	68	9	2	29	81	98	0
Link Distance (ft)	235	340	340	243	243	243	226
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B9	B9	B9	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	T	UL	T
Maximum Queue (ft)	470	53	56	145	300	307	306	88	125	140	495	791
Average Queue (ft)	376	17	42	23	183	210	219	8	17	19	389	400
95th Queue (ft)	542	46	62	85	313	352	352	52	80	85	565	901
Link Distance (ft)	434	37	37		226	226	226	243	243	243		958
Upstream Blk Time (%)	39	5	52		4	7	10			0		5
Queuing Penalty (veh)	0	13	153		14	23	33			0		0
Storage Bay Dist (ft)				135							470	
Storage Blk Time (%)					17						22	0
Queuing Penalty (veh)					3						68	0

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	721	561
Average Queue (ft)	374	267
95th Queue (ft)	781	494
Link Distance (ft)	958	958
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	55	43	533	520	88	319
Average Queue (ft)	28	5	341	329	27	286
95th Queue (ft)	46	26	588	574	69	316
Link Distance (ft)	37	37	1638	1638	158	259
Upstream Blk Time (%)	6	1			0	98
Queuing Penalty (veh)	14	3			0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 709

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	50	143	145	128	39	1252	1248	1215	58	1255	927	51
Average Queue (ft)	11	54	60	46	2	831	872	358	11	841	241	11
95th Queue (ft)	35	125	129	111	19	1397	1437	1212	38	1325	713	36
Link Distance (ft)		765	765			1192	1192	1192	111	1639	1639	213
Upstream Blk Time (%)						4	7	1				
Queuing Penalty (veh)						33	50	10				
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		1				26						
Queuing Penalty (veh)		0				1						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	217	297	314	166	396	402	432	126	145	283
Average Queue (ft)	101	137	140	87	186	194	226	60	36	227
95th Queue (ft)	191	273	280	170	350	360	395	105	113	326
Link Distance (ft)		980	980		765	765	447	447		268
Upstream Blk Time (%)							2			14
Queuing Penalty (veh)							0			0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				1	22				0	46
Queuing Penalty (veh)				12	37				0	11

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	199	208	240	238	34	430	761	760	375	225	427	450
Average Queue (ft)	110	125	120	124	5	188	346	383	109	168	273	256
95th Queue (ft)	179	190	211	217	24	399	701	742	367	271	420	411
Link Distance (ft)			740	740			980	980			513	513
Upstream Blk Time (%)												0
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)						0	6	15	0	17	21	17
Queuing Penalty (veh)						0	8	16	0	43	24	19

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	250	150	158	324	345	225
Average Queue (ft)	100	69	75	170	193	137
95th Queue (ft)	293	133	141	282	317	248
Link Distance (ft)			340	340	340	
Upstream Blk Time (%)				1	4	
Queuing Penalty (veh)				4	12	
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0				14	8
Queuing Penalty (veh)	0				47	20

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	WB	WB	NB	SB
Directions Served	T	TR	R	R
Maximum Queue (ft)	563	576	24	76
Average Queue (ft)	170	191	5	20
95th Queue (ft)	432	461	20	58
Link Distance (ft)	740	740	126	77
Upstream Blk Time (%)	0	0		7
Queuing Penalty (veh)	0	0		0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	NE	SW	SW	SW
Directions Served	LTR>	LTR>	<LTR>	<L	TR>	<L	T	TR>	<L	T	TR>
Maximum Queue (ft)	204	121	240	73	46	46	261	281	174	396	405
Average Queue (ft)	131	44	106	20	6	4	141	134	34	336	344
95th Queue (ft)	224	99	201	55	26	27	259	252	111	470	461
Link Distance (ft)	189	146	225		232		713	713		354	354
Upstream Blk Time (%)	9	0	1							21	24
Queuing Penalty (veh)	0	0	0							202	225
Storage Bay Dist (ft)				175		120			150		
Storage Blk Time (%)							18		0	33	
Queuing Penalty (veh)							1		0	15	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB
Directions Served	LR	T	T	TR
Maximum Queue (ft)	115	55	145	190
Average Queue (ft)	42	5	21	31
95th Queue (ft)	94	33	84	117
Link Distance (ft)	235	239	239	239
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	UL	T	T	TR
Maximum Queue (ft)	262	64	65	117	150	127	142	495	1000	981	967
Average Queue (ft)	135	23	43	35	58	62	81	494	958	713	397
95th Queue (ft)	249	53	62	84	125	120	135	496	1071	1304	958
Link Distance (ft)	434	37	37		230	230	230		958	958	958
Upstream Blk Time (%)		8	56						78	10	0
Queuing Penalty (veh)		34	239						0	0	0
Storage Bay Dist (ft)				135				470			
Storage Blk Time (%)				0	2			86	1		
Queuing Penalty (veh)				0	1			264	3		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	69	68	1300	1311	90	303
Average Queue (ft)	25	13	987	993	22	258
95th Queue (ft)	52	43	1276	1296	63	333
Link Distance (ft)	37	37	1639	1639	158	259
Upstream Blk Time (%)	7	4				74
Queuing Penalty (veh)	19	11				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1360

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	110	443	452	225	73	796	837	296	41	291	90	51
Average Queue (ft)	11	220	207	161	7	256	269	28	7	167	38	9
95th Queue (ft)	56	376	367	251	38	608	635	176	28	269	79	34
Link Distance (ft)		764	764			1190	1190	1190	109	1672	1672	213
Upstream Blk Time (%)							0					
Queuing Penalty (veh)							0					
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)	0	17	7	4	0	21						
Queuing Penalty (veh)	0	3	33	18	0	2						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	204	347	380	174	468	467	225	133	144	240
Average Queue (ft)	102	107	123	102	189	200	111	51	50	176
95th Queue (ft)	177	244	271	182	409	420	200	100	132	260
Link Distance (ft)		980	980		764	764	447	447		205
Upstream Blk Time (%)										15
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)		0		2	8				0	35
Queuing Penalty (veh)		0		12	12				1	15

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	179	204	426	434	46	380	657	674	375	224	295	298
Average Queue (ft)	102	122	267	276	8	153	350	368	115	84	178	171
95th Queue (ft)	162	181	387	398	32	338	629	647	369	183	264	270
Link Distance (ft)			769	769			980	980			515	515
Upstream Blk Time (%)							0	0				
Queuing Penalty (veh)							0	0				
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)				0			6	20	0	0	6	2
Queuing Penalty (veh)				0			8	17	0	1	6	4

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	235	128	130	328	343	225
Average Queue (ft)	55	54	59	156	170	120
95th Queue (ft)	170	106	112	300	326	258
Link Distance (ft)			340	340	340	
Upstream Blk Time (%)				1	2	
Queuing Penalty (veh)				4	9	
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0				12	5
Queuing Penalty (veh)	0				45	14

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	WB	WB	NB	SB
Directions Served	T	TR	R	R
Maximum Queue (ft)	78	82	29	48
Average Queue (ft)	10	14	7	15
95th Queue (ft)	47	56	23	41
Link Distance (ft)	769	769	135	122
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	WB	NB	SB	SB	NE	NE	NE	SW	SW	SW
Directions Served	<LTR>	<LTR>	<LTR>	<L	TR>	<L	T	TR>	<L	T	TR>
Maximum Queue (ft)	151	90	86	38	25	32	414	410	174	368	380
Average Queue (ft)	72	26	25	6	2	5	182	181	33	277	295
95th Queue (ft)	136	66	63	24	12	35	333	330	128	405	409
Link Distance (ft)	188	154	225		229		713	713		328	328
Upstream Blk Time (%)	0	0								4	7
Queuing Penalty (veh)	0	0								33	55
Storage Bay Dist (ft)				175		120			150		
Storage Blk Time (%)							22		0	22	
Queuing Penalty (veh)							2		0	9	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB	B9	B9
Directions Served	LR	T	T	TR	T	T
Maximum Queue (ft)	96	26	69	98	3	7
Average Queue (ft)	33	2	5	10	0	0
95th Queue (ft)	73	15	40	59	3	6
Link Distance (ft)	235	234	234	234	235	235
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B9	B9	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	UL	T	T
Maximum Queue (ft)	132	78	59	137	230	249	267	9	12	495	997	983
Average Queue (ft)	52	20	35	28	135	154	177	0	1	474	792	752
95th Queue (ft)	104	59	64	78	211	230	253	6	8	571	1295	1249
Link Distance (ft)	434	37	37		235	235	235	234	234		958	958
Upstream Blk Time (%)		6	20		1	2	4				51	12
Queuing Penalty (veh)		14	48		3	5	11				0	0
Storage Bay Dist (ft)				135						470		
Storage Blk Time (%)				0	21					72	0	
Queuing Penalty (veh)				1	7					261	1	

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	SB
Directions Served	TR
Maximum Queue (ft)	974
Average Queue (ft)	566
95th Queue (ft)	1050
Link Distance (ft)	958
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	53	35	256	254	55	183
Average Queue (ft)	29	9	160	166	14	79
95th Queue (ft)	45	32	237	244	45	161
Link Distance (ft)	37	37	1672	1672	158	259
Upstream Blk Time (%)	4	1				0
Queuing Penalty (veh)	10	2				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 665

Appendix I

Vehicular Capacity Analysis Worksheets – Future (2027) Conditions without Development

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

2027 Future Background AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	40	2222	1	662	251	1	272	11	5
v/c Ratio	0.08	0.67	0.01	0.33	0.24	0.02	0.82	0.02	0.06
Control Delay	5.5	9.8	44.0	41.5	21.6	89.0	122.8	0.1	82.2
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	10.1	44.0	41.5	21.6	89.0	122.8	0.1	82.2
Queue Length 50th (ft)	3	54	1	321	114	1	311	0	6
Queue Length 95th (ft)	m16	#1189	m5	516	227	9	m402	m0	22
Internal Link Dist (ft)		810		1204		100		1631	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	503	3320	119	1980	1030	67	379	487	175
Starvation Cap Reductn	0	365	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.75	0.01	0.33	0.24	0.01	0.72	0.02	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	37	2043	1	1	0	609	231	1	0	250	1	9
Future Volume (vph)	37	2043	1	1	0	609	231	1	0	250	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0	6.3	6.3	
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00	1.00	1.00	
Frt	1.00	1.00			1.00	1.00	0.85		1.00	1.00	0.86	
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (prot)	1805	4987			1805	3223	1524		1805	1687	1641	
Flt Permitted	0.33	1.00			0.04	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (perm)	627	4987			73	3223	1524		1805	1687	1641	
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)	40	2221	1	1	0	662	251	1	0	272	1	10
RTOR Reduction (vph)	0	0	0	0	0	0	108	0	0	0	9	0
Lane Group Flow (vph)	40	2222	0	0	1	662	143	0	1	272	2	0
Heavy Vehicles (%)	0%	4%	0%	0%	0%	12%	6%	0%	0%	7%	0%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA	Split	NA	
Protected Phases	5	2		1	1	6		7	7	3	3	
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	114.6	108.5			104.8	103.6	103.6		1.3	36.3	36.3	
Effective Green, g (s)	116.6	110.5			106.8	105.6	105.6		2.3	37.3	37.3	
Actuated g/C Ratio	0.61	0.58			0.56	0.56	0.56		0.01	0.20	0.20	
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0	7.3	7.3	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	5.0	5.0	
Lane Grp Cap (vph)	428	2900			61	1791	847		21	331	322	
v/s Ratio Prot	c0.00	c0.45			0.00	0.21			c0.00	c0.16	0.00	
v/s Ratio Perm	0.05				0.01		0.09					
v/c Ratio	0.09	0.77			0.02	0.37	0.17		0.05	0.82	0.01	
Uniform Delay, d1	15.5	30.0			26.2	23.6	20.7		92.8	73.2	61.4	
Progression Factor	0.33	0.33			2.16	1.84	5.91		1.00	1.42	1.00	
Incremental Delay, d2	0.1	1.3			0.1	0.6	0.4		0.9	16.2	0.0	
Delay (s)	5.2	11.3			56.6	44.0	122.7		93.7	120.1	61.5	
Level of Service	A	B			E	D	F		F	F	E	
Approach Delay (s)		11.2				65.6			93.7		117.8	
Approach LOS		B				E			F		F	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NEL2	NEL	NER
Lane Configurations			
Traffic Volume (vph)	2	0	3
Future Volume (vph)	2	0	3
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)		5.6	
Lane Util. Factor		1.00	
Frt		0.92	
Flt Protected		0.98	
Satd. Flow (prot)		1427	
Flt Permitted		0.98	
Satd. Flow (perm)		1427	
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	2	0	3
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	5	0
Heavy Vehicles (%)	50%	0%	0%
Turn Type	Prot	Prot	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)		5.8	
Effective Green, g (s)		6.8	
Actuated g/C Ratio		0.04	
Clearance Time (s)		6.6	
Vehicle Extension (s)		3.0	
Lane Grp Cap (vph)		51	
v/s Ratio Prot		c0.00	
v/s Ratio Perm			
v/c Ratio		0.10	
Uniform Delay, d1		88.6	
Progression Factor		1.00	
Incremental Delay, d2		0.8	
Delay (s)		89.5	
Level of Service		F	
Approach Delay (s)		89.5	
Approach LOS		F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	51	1987	75	594	156	185	7	126
v/c Ratio	0.08	0.83	0.47	0.26	0.91	0.47	0.08	0.49
Control Delay	2.8	10.8	61.9	4.7	126.6	15.0	65.3	70.3
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.8	11.5	61.9	4.7	126.6	15.1	65.3	70.3
Queue Length 50th (ft)	8	190	47	43	195	19	8	132
Queue Length 95th (ft)	m12	235	135	39	277	94	24	194
Internal Link Dist (ft)		1037		810	420			201
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	726	2405	246	2315	230	476	112	345
Starvation Cap Reductn	0	3	0	0	0	0	0	0
Spillback Cap Reductn	0	145	0	0	0	7	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.88	0.30	0.26	0.68	0.39	0.06	0.37

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1815	13	69	546	1	33	110	170	6	78	38
Future Volume (vph)	47	1815	13	69	546	1	33	110	170	6	78	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3433		1805	3195			1352	1599	1081	1554	
Flt Permitted	0.42	1.00		0.05	1.00			0.78	1.00	0.46	1.00	
Satd. Flow (perm)	796	3433		87	3195			1067	1599	522	1554	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	1973	14	75	593	1	36	120	185	7	85	41
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	140	0	10	0
Lane Group Flow (vph)	51	1987	0	75	594	0	0	156	45	7	116	0
Heavy Vehicles (%)	0%	5%	10%	0%	13%	0%	2%	50%	1%	67%	0%	50%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	137.8	132.1		144.6	135.5			29.5	29.5	29.5	29.5	
Effective Green, g (s)	139.8	133.1		146.6	136.5			30.5	30.5	30.5	30.5	
Actuated g/C Ratio	0.74	0.70		0.77	0.72			0.16	0.16	0.16	0.16	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	621	2404		158	2295			171	256	83	249	
v/s Ratio Prot	0.00	c0.58		c0.03	0.19						0.07	
v/s Ratio Perm	0.06			0.34				c0.15	0.03	0.01		
v/c Ratio	0.08	0.83		0.47	0.26			0.91	0.18	0.08	0.47	
Uniform Delay, d1	6.8	20.2		30.2	9.3			78.4	68.9	67.9	72.4	
Progression Factor	0.44	0.35		3.42	0.44			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	2.5		2.2	0.3			44.2	0.3	0.4	1.4	
Delay (s)	3.1	9.6		105.6	4.3			122.6	69.2	68.3	73.7	
Level of Service	A	A		F	A			F	E	E	E	
Approach Delay (s)		9.5			15.7			93.7			73.4	
Approach LOS		A			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	269	1554	7	146	426	76	19	664	118	159	579	251
v/c Ratio	0.70	0.81	0.01	1.42	0.24	0.10	0.22	0.91	0.25	0.73	0.64	0.33
Control Delay	109.9	29.4	0.0	282.0	22.1	3.6	92.3	90.7	9.9	133.5	105.3	6.3
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.4
Total Delay	109.9	29.9	0.0	282.0	22.1	3.6	92.3	90.7	9.9	133.5	106.8	6.7
Queue Length 50th (ft)	175	474	0	~249	65	1	23	429	13	108	256	2
Queue Length 95th (ft)	208	704	m0	#400	230	m14	55	#530	59	#153	468	90
Internal Link Dist (ft)		798			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	458	1920	962	103	1751	731	110	748	479	222	899	798
Starvation Cap Reductn	0	103	0	0	0	0	0	0	0	0	161	219
Spillback Cap Reductn	0	58	0	0	0	0	0	0	1	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.86	0.01	1.42	0.24	0.10	0.17	0.89	0.25	0.72	0.78	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	261	1507	7	142	413	74	18	644	114	154	562	243
Future Volume (vph)	261	1507	7	142	413	74	18	644	114	154	562	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1559	1543	3539	1256	1770	3539	1534	3019	3438	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1559	1543	3539	1256	1770	3539	1534	3019	3438	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	269	1554	7	146	426	76	19	664	118	159	579	251
RTOR Reduction (vph)	0	0	3	0	0	29	0	0	71	0	0	143
Lane Group Flow (vph)	269	1554	4	146	426	47	19	664	47	159	579	108
Confl. Peds. (#/hr)	1		2	2		1			2	2		
Heavy Vehicles (%)	2%	2%	2%	17%	2%	27%	2%	2%	4%	16%	5%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	19.9	98.9	104.2	11.2	89.9	102.1	5.3	40.4	51.6	12.2	48.2	68.1
Effective Green, g (s)	21.4	100.4	107.2	12.7	91.4	105.1	6.8	41.9	54.6	13.7	49.7	71.1
Actuated g/C Ratio	0.11	0.53	0.56	0.07	0.48	0.55	0.04	0.22	0.29	0.07	0.26	0.37
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	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	1870	879	103	1702	694	63	780	440	217	899	592
v/s Ratio Prot	0.08	c0.44	0.00	c0.09	0.12	0.00	0.01	c0.19	0.01	c0.05	c0.17	0.02
v/s Ratio Perm			0.00			0.03			0.02			0.05
v/c Ratio	0.70	0.83	0.00	1.42	0.25	0.07	0.30	0.85	0.11	0.73	0.64	0.18
Uniform Delay, d1	81.2	37.7	18.1	88.7	29.1	19.7	89.3	71.1	49.8	86.4	62.3	39.9
Progression Factor	1.26	0.73	1.00	0.81	0.77	0.66	1.00	1.00	1.00	1.33	1.60	0.91
Incremental Delay, d2	4.5	3.7	0.0	234.2	0.3	0.0	2.7	8.9	0.1	11.9	1.6	0.1
Delay (s)	106.6	31.0	18.1	305.9	22.7	13.1	92.0	79.9	49.9	126.6	101.3	36.4
Level of Service	F	C	B	F	C	B	F	E	D	F	F	D
Approach Delay (s)		42.1			85.4			75.8			88.9	
Approach LOS		D			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	65.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	1812	10	689	34	2
v/c Ratio	0.59	0.15	0.22	0.30	0.00
Control Delay	1.9	97.5	1.4	13.3	0.0
Queue Delay	0.1	0.0	0.0	0.0	0.0
Total Delay	1.9	97.5	1.4	13.3	0.0
Queue Length 50th (ft)	72	13	20	0	0
Queue Length 95th (ft)	116	39	61	18	0
Internal Link Dist (ft)	217		798	247	105
Turn Bay Length (ft)		80			
Base Capacity (vph)	3097	75	3189	217	519
Starvation Cap Reductn	171	0	0	0	0
Spillback Cap Reductn	37	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.13	0.22	0.16	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1757	1	10	664	4	27	0	6	0	0	2
Future Volume (veh/h)	0	1757	1	10	664	4	27	0	6	0	0	2
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	0	1811	1	10	685	4	28	0	6	0	0	2
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	3110	2	27	3240	19	69	0	7	0	0	48
Arrive On Green	0.00	0.86	0.86	0.03	1.00	1.00	0.03	0.00	0.03	0.00	0.00	0.03
Sat Flow, veh/h	1774	3630	2	1774	3608	21	1136	0	243	0	0	1583
Grp Volume(v), veh/h	0	883	929	10	336	353	34	0	0	0	0	2
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1859	1379	0	0	0	0	1583
Q Serve(g_s), s	0.0	27.1	27.1	1.1	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.0	27.1	27.1	1.1	0.0	0.0	4.7	0.0	0.0	0.0	0.0	0.2
Prop In Lane	1.00		0.00	1.00		0.01	0.82		0.18	0.00		1.00
Lane Grp Cap(c), veh/h	1	1516	1595	27	1589	1669	76	0	0	0	0	48
V/C Ratio(X)	0.00	0.58	0.58	0.37	0.21	0.21	0.44	0.00	0.00	0.00	0.00	0.04
Avail Cap(c_a), veh/h	75	1516	1595	75	1589	1669	211	0	0	0	0	196
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	3.9	3.9	91.2	0.0	0.0	91.7	0.0	0.0	0.0	0.0	89.4
Incr Delay (d2), s/veh	0.0	1.6	1.6	8.2	0.3	0.3	4.0	0.0	0.0	0.0	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.7	14.4	0.6	0.1	0.1	1.9	0.0	0.0	0.0	0.0	0.1
LnGrp Delay(d),s/veh	0.0	5.5	5.5	99.4	0.3	0.3	95.7	0.0	0.0	0.0	0.0	89.8
LnGrp LOS		A	A	F	A	A	F					F
Approach Vol, veh/h		1812			699			34			2	
Approach Delay, s/veh		5.5			1.7			95.7			89.8	
Approach LOS		A			A			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.9	169.9		12.3	0.0	177.7		12.3
Change Period (Y+Rc), s	5.0	7.1		6.5	5.0	7.1		6.5
Max Green Setting (Gmax), s	8.0	139.9		23.5	8.0	139.9		23.5
Max Q Clear Time (g_c+I1), s	3.1	29.1		6.7	0.0	2.0		2.2
Green Ext Time (p_c), s	0.0	51.0		0.1	0.0	7.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	5.7
HCM 2010 LOS	A

Lane Group	EBL	NBT	NET	SWL	SWT
Lane Group Flow (vph)	205	64	1691	22	696
v/c Ratio	0.86	0.43	0.65	0.12	0.26
Control Delay	73.9	10.7	3.4	6.3	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.2
Total Delay	73.9	10.7	3.5	6.3	4.7
Queue Length 50th (ft)	130	0	37	3	43
Queue Length 95th (ft)	#247	9	136	13	111
Internal Link Dist (ft)	50	220	755		123
Turn Bay Length (ft)				150	
Base Capacity (vph)	270	223	2599	240	2712
Starvation Cap Reductn	0	0	76	0	1163
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.29	0.67	0.09	0.45

Intersection Summary

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

Movement	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	NEL2	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	181	12	6	9	17	0	36	0	1626	15	21	616
Future Volume (vph)	181	12	6	9	17	0	36	0	1626	15	21	616
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5					6.5			7.1		7.1	7.1
Lane Util. Factor	1.00					1.00			0.95		1.00	0.95
Frpb, ped/bikes	1.00					1.00			1.00		1.00	1.00
Flpb, ped/bikes	1.00					1.00			1.00		1.00	1.00
Frt	0.99					0.92			1.00		1.00	0.99
Flt Protected	0.96					0.98			1.00		0.95	1.00
Satd. Flow (prot)	1664					1696			3535		1770	3486
Flt Permitted	0.96					0.98			1.00		0.09	1.00
Satd. Flow (perm)	1664					1696			3535		170	3486
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	187	12	6	9	18	0	37	0	1676	15	22	635
RTOR Reduction (vph)	93	0	0	0	0	62	0	0	0	0	0	0
Lane Group Flow (vph)	112	0	0	0	0	2	0	0	1691	0	22	696
Confl. Peds. (#/hr)		1	1	1	1			1				
Heavy Vehicles (%)	2%	100%	2%	0%	0%	2%	2%	0%	2%	2%	2%	2%
Turn Type	Prot			Perm	Split	NA		pm+pt	NA		pm+pt	NA
Protected Phases	3				7	7		1	6		5	2
Permitted Phases				7				6			2	
Actuated Green, G (s)	16.5					5.7			136.8		147.7	147.7
Effective Green, g (s)	16.5					5.7			136.8		147.7	147.7
Actuated g/C Ratio	0.09					0.03			0.72		0.78	0.78
Clearance Time (s)	6.5					6.5			7.1		7.1	7.1
Vehicle Extension (s)	3.0					3.0			4.0		3.0	4.0
Lane Grp Cap (vph)	144					50			2545		164	2709
v/s Ratio Prot	c0.07					c0.00			c0.48		0.00	c0.20
v/s Ratio Perm											0.10	
v/c Ratio	0.78					0.04			0.66		0.13	0.26
Uniform Delay, d1	84.9					89.5			14.3		12.5	5.9
Progression Factor	1.00					1.00			0.16		0.90	0.69
Incremental Delay, d2	22.6					0.3			1.2		0.4	0.2
Delay (s)	107.6					89.8			3.5		11.6	4.3
Level of Service	F					F			A		B	A
Approach Delay (s)	107.6					89.8			3.5			4.5
Approach LOS	F					F			A			A

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	27.2
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR	SWR2
Lane Configurations		
Traffic Volume (vph)	53	6
Future Volume (vph)	53	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frpb, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	55	6
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)	1	
Heavy Vehicles (%)	2%	2%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	5	1088	1040
v/c Ratio	0.02	0.21	0.21
Control Delay	0.2	0.1	0.3
Queue Delay	0.0	0.0	0.0
Total Delay	0.2	0.1	0.3
Queue Length 50th (ft)	0	0	0
Queue Length 95th (ft)	0	0	m41
Internal Link Dist (ft)	220	381	225
Turn Bay Length (ft)			
Base Capacity (vph)	328	5085	4989
Starvation Cap Reductn	0	0	762
Spillback Cap Reductn	0	36	695
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.02	0.22	0.25

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	5	0	1001	956	1
Future Volume (vph)	0	5	0	1001	956	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.86			1.00	1.00	
Flt Protected	1.00			1.00	1.00	
Satd. Flow (prot)	1611			5085	5084	
Flt Permitted	1.00			1.00	1.00	
Satd. Flow (perm)	1611			5085	5084	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	5	0	1088	1039	1
RTOR Reduction (vph)	5	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1088	1040	0
Confl. Peds. (#/hr)			2			2
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	1.4			190.0	177.6	
Effective Green, g (s)	1.4			190.0	177.6	
Actuated g/C Ratio	0.01			1.00	0.93	
Clearance Time (s)	6.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	11			5085	4752	
v/s Ratio Prot	0.00			0.21	0.20	
v/s Ratio Perm						
v/c Ratio	0.00			0.21	0.22	
Uniform Delay, d1	93.6			0.0	0.5	
Progression Factor	1.00			1.00	0.93	
Incremental Delay, d2	0.1			0.1	0.1	
Delay (s)	93.7			0.1	0.6	
Level of Service	F			A	A	
Approach Delay (s)	93.7			0.1	0.6	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	227	274	363	13	1056	393	1041
v/c Ratio	1.00	0.49	0.49	0.19	0.89	1.12	0.50
Control Delay	138.3	2.0	4.0	136.3	31.3	139.4	42.7
Queue Delay	0.0	5.1	20.2	0.0	1.0	0.0	0.0
Total Delay	138.3	7.1	24.2	136.3	32.3	139.4	42.7
Queue Length 50th (ft)	285	0	76	17	383	~513	330
Queue Length 95th (ft)	#486	m0	m63	46	440	#745	434
Internal Link Dist (ft)	420	47			216		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	227	560	744	161	1193	350	2062
Starvation Cap Reductn	0	219	373	0	33	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.80	0.98	0.08	0.91	1.12	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	99	25	37	43	506	7	5	951	20	4	358
Future Volume (vph)	85	99	25	37	43	506	7	5	951	20	4	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.98			0.90	0.85		1.00	1.00			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1770			1516	1475		1602	4959			1736
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.08
Satd. Flow (perm)		1770			1516	1475		1602	4959			143
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)	92	108	27	40	47	550	8	5	1034	22	4	389
RTOR Reduction (vph)	0	3	0	0	41	239	0	0	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	233	124	0	13	1056	0	0	393
Confl. Peds. (#/hr)			2	2						1		1
Heavy Vehicles (%)	0%	5%	8%	8%	13%	4%	0%	33%	4%	15%	0%	4%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		23.1			64.0	64.0		3.5	44.2			84.2
Effective Green, g (s)		24.1			65.0	65.0		4.5	45.7			85.2
Actuated g/C Ratio		0.13			0.34	0.34		0.02	0.24			0.45
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		224			518	504		37	1192			350
v/s Ratio Prot		c0.13			c0.15	0.08		0.01	0.21			c0.20
v/s Ratio Perm												c0.30
v/c Ratio		1.00			0.45	0.25		0.35	0.89			1.12
Uniform Delay, d1		83.0			48.6	44.9		91.3	69.6			63.8
Progression Factor		1.00			0.01	0.77		1.50	0.31			1.00
Incremental Delay, d2		60.6			0.8	0.3		5.6	9.7			85.6
Delay (s)		143.5			1.4	35.0		142.3	31.0			149.5
Level of Service		F			A	C		F	C			F
Approach Delay (s)		143.5			20.5				32.4			
Approach LOS		F			C				C			

Intersection Summary			
HCM 2000 Control Delay	55.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	941	17
Future Volume (vph)	941	17
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	4931	
Flt Permitted	1.00	
Satd. Flow (perm)	4931	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	1023	18
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1041	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	5%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	73.9	
Effective Green, g (s)	75.4	
Actuated g/C Ratio	0.40	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1956	
v/s Ratio Prot	0.21	
v/s Ratio Perm		
v/c Ratio	0.53	
Uniform Delay, d1	43.8	
Progression Factor	1.00	
Incremental Delay, d2	1.0	
Delay (s)	44.9	
Level of Service	D	
Approach Delay (s)	73.5	
Approach LOS	E	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	521	493	32	201
v/c Ratio	0.25	0.79	0.14	1.09
Control Delay	0.5	87.4	1.2	139.2
Queue Delay	29.2	2.2	0.0	2.2
Total Delay	29.7	89.7	1.2	141.4
Queue Length 50th (ft)	2	303	0	~193
Queue Length 95th (ft)	m3	390	0	#393
Internal Link Dist (ft)	47	1631	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2060	628	272	184
Starvation Cap Reductn	1553	0	0	0
Spillback Cap Reductn	0	54	3	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	0.86	0.12	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	430	6	0	431	23	8	0	21	39	1	145
Future Volume (vph)	43	430	6	0	431	23	8	0	21	39	1	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.90			0.89	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		3397			3355			1456			1347	
Flt Permitted		1.00			1.00			0.99			0.99	
Satd. Flow (perm)		3397			3355			1456			1347	
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)	47	467	7	0	468	25	9	0	23	42	1	158
RTOR Reduction (vph)	0	0	0	0	2	0	0	31	0	0	68	0
Lane Group Flow (vph)	0	521	0	0	491	0	0	1	0	0	133	0
Confl. Peds. (#/hr)	1		2	2		1	1		8	8		1
Heavy Vehicles (%)	12%	5%	0%	0%	7%	0%	0%	0%	13%	100%	0%	3%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		114.2			34.1			5.4			15.5	
Effective Green, g (s)		109.3			35.1			6.4			16.5	
Actuated g/C Ratio		0.58			0.18			0.03			0.09	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1954			619			49			116	
v/s Ratio Prot		c0.15			c0.15			c0.00			c0.10	
v/s Ratio Perm												
v/c Ratio		0.27			0.79			0.02			1.15	
Uniform Delay, d1		20.2			74.0			88.8			86.8	
Progression Factor		0.03			1.05			1.00			1.00	
Incremental Delay, d2		0.0			8.1			0.1			129.6	
Delay (s)		0.6			85.6			88.8			216.3	
Level of Service		A			F			F			F	
Approach Delay (s)		0.6			85.6			88.8			216.3	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	71.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

1: Lobster Ln & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2027 FB PM

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	16	1441	4	2042	538	7	340	99	16
v/c Ratio	0.18	0.39	0.02	0.83	0.46	0.12	1.50	0.30	0.18
Control Delay	18.9	6.8	12.5	20.6	7.1	106.8	307.8	32.7	101.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	6.9	12.5	20.6	7.1	106.8	307.8	32.7	101.3
Queue Length 50th (ft)	2	67	1	413	118	10	~695	46	23
Queue Length 95th (ft)	m9	216	m3	#1775	174	33	m#929	m91	53
Internal Link Dist (ft)		810		1202		100		1664	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	97	3671	299	2459	1161	63	226	328	189
Starvation Cap Reductn	0	591	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.47	0.01	0.83	0.46	0.11	1.50	0.30	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	1323	3	4	0	1879	495	3	0	4	313	8
Future Volume (vph)	15	1323	3	4	0	1879	495	3	0	4	313	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.92		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98		0.95	1.00
Satd. Flow (prot)	1719	5084			1805	3539	1583		1717		1736	1641
Flt Permitted	0.03	1.00			0.15	1.00	1.00		0.98		0.95	1.00
Satd. Flow (perm)	50	5084			277	3539	1583		1717		1736	1641
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)	16	1438	3	4	0	2042	538	3	0	4	340	9
RTOR Reduction (vph)	0	0	0	0	0	0	70	0	0	0	0	86
Lane Group Flow (vph)	16	1441	0	0	4	2042	468	0	7	0	340	13
Heavy Vehicles (%)	5%	2%	0%	0%	0%	2%	2%	0%	0%	0%	4%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	147.5	143.6			142.1	140.9	140.9		3.0		27.7	27.7
Effective Green, g (s)	149.5	145.6			144.1	142.9	142.9		4.0		28.7	28.7
Actuated g/C Ratio	0.68	0.66			0.65	0.65	0.65		0.02		0.13	0.13
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	71	3364			196	2298	1028		31		226	214
v/s Ratio Prot	c0.01	c0.28			0.00	c0.58			c0.00		c0.20	0.01
v/s Ratio Perm	0.15				0.01		0.30					
v/c Ratio	0.23	0.43			0.02	0.89	0.46		0.23		1.50	0.06
Uniform Delay, d1	41.6	17.6			14.3	32.0	19.2		106.5		95.7	83.8
Progression Factor	1.22	0.45			0.89	0.60	0.51		1.00		1.10	9.41
Incremental Delay, d2	1.4	0.3			0.0	4.7	1.2		3.7		248.1	0.2
Delay (s)	52.1	8.2			12.8	23.9	11.0		110.2		353.0	788.7
Level of Service	D	A			B	C	B		F		F	F
Approach Delay (s)		8.7				21.2			110.2			451.3
Approach LOS		A				C			F			F

Intersection Summary			
HCM 2000 Control Delay	59.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	83	10	2	3
Future Volume (vph)	83	10	2	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.97	
Flt Protected			0.96	
Satd. Flow (prot)			1780	
Flt Permitted			0.96	
Satd. Flow (perm)			1780	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	11	2	3
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	16	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.6	
Effective Green, g (s)			8.6	
Actuated g/C Ratio			0.04	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			69	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.23	
Uniform Delay, d1			102.5	
Progression Factor			1.00	
Incremental Delay, d2			1.7	
Delay (s)			104.2	
Level of Service			F	
Approach Delay (s)			104.2	
Approach LOS			F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	122	1267	179	1861	205	175	25	256
v/c Ratio	0.73	0.57	0.60	0.85	1.05	0.35	0.14	0.61
Control Delay	82.4	18.1	25.7	19.6	156.0	8.9	66.7	74.6
Queue Delay	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0
Total Delay	82.4	18.1	25.7	34.6	156.0	8.9	66.7	74.6
Queue Length 50th (ft)	120	357	44	616	300	0	29	302
Queue Length 95th (ft)	198	514	m129	342	#482	71	61	406
Internal Link Dist (ft)		1037		810	420			236
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	192	2239	353	2189	219	542	207	464
Starvation Cap Reductn	0	38	0	115	0	0	0	0
Spillback Cap Reductn	0	0	0	361	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.51	1.02	0.94	0.32	0.12	0.55

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	1126	40	165	1706	6	60	129	161	23	113	122
Future Volume (vph)	112	1126	40	165	1706	6	60	129	161	23	113	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1626	3524		1805	3537			1870	1615	1805	1752	
Flt Permitted	0.04	1.00		0.16	1.00			0.45	1.00	0.43	1.00	
Satd. Flow (perm)	61	3524		299	3537			859	1615	815	1752	
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)	122	1224	43	179	1854	7	65	140	175	25	123	133
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	135	0	19	0
Lane Group Flow (vph)	122	1266	0	179	1861	0	0	205	40	25	237	0
Heavy Vehicles (%)	11%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	155.1	138.8		148.1	135.3			49.1	49.1	49.1	49.1	
Effective Green, g (s)	157.1	139.8		150.1	136.3			50.1	50.1	50.1	50.1	
Actuated g/C Ratio	0.71	0.64		0.68	0.62			0.23	0.23	0.23	0.23	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	166	2239		298	2191			195	367	185	398	
v/s Ratio Prot	c0.06	0.36		0.04	c0.53						0.14	
v/s Ratio Perm	0.47			0.37				c0.24	0.02	0.03		
v/c Ratio	0.73	0.57		0.60	0.85			1.05	0.11	0.14	0.60	
Uniform Delay, d1	70.0	22.8		18.2	33.6			85.0	67.3	67.7	75.9	
Progression Factor	1.10	0.71		1.91	0.47			1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.5	1.0		1.9	2.5			78.6	0.1	0.3	2.4	
Delay (s)	91.5	17.1		36.7	18.4			163.6	67.4	68.0	78.3	
Level of Service	F	B		D	B			F	E	E	E	
Approach Delay (s)		23.7			20.0			119.3			77.4	
Approach LOS		C			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	232	934	30	149	1597	118	129	547	117	176	557	357
v/c Ratio	0.77	0.48	0.03	0.90	0.81	0.12	1.06	0.86	0.23	0.63	0.78	0.71
Control Delay	145.2	23.0	0.0	114.1	31.2	6.7	187.7	101.6	5.5	153.7	90.5	32.1
Queue Delay	0.0	0.2	0.0	0.0	22.2	0.0	0.0	0.0	0.0	0.0	3.8	1.3
Total Delay	145.2	23.2	0.0	114.1	53.4	6.7	187.7	101.6	5.5	153.7	94.2	33.4
Queue Length 50th (ft)	182	254	0	223	1195	46	~204	410	0	136	267	85
Queue Length 95th (ft)	#244	276	0	m#281	1282	m43	#372	484	40	184	321	233
Internal Link Dist (ft)		798			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	307	1934	1021	166	1973	992	122	683	509	340	815	503
Starvation Cap Reductn	0	315	0	0	432	0	0	0	0	0	175	42
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.58	0.03	0.90	1.04	0.12	1.06	0.80	0.23	0.52	0.87	0.77

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	897	29	143	1533	113	124	525	112	169	535	343
Future Volume (vph)	223	897	29	143	1533	113	124	525	112	169	535	343
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	232	934	30	149	1597	118	129	547	117	176	557	357
RTOR Reduction (vph)	0	0	12	0	0	21	0	0	85	0	0	61
Lane Group Flow (vph)	232	934	18	149	1597	97	129	547	32	176	557	296
Confl. Peds. (#/hr)	4					4	1		7	7		1
Heavy Vehicles (%)	1%	2%	0%	2%	1%	5%	0%	2%	1%	3%	1%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	17.7	118.7	132.1	19.2	119.9	136.6	13.4	38.1	57.3	16.7	42.3	60.0
Effective Green, g (s)	19.2	120.2	135.1	20.7	121.4	139.6	14.9	39.6	60.3	18.2	43.8	63.0
Actuated g/C Ratio	0.09	0.55	0.61	0.09	0.55	0.63	0.07	0.18	0.27	0.08	0.20	0.29
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	302	1933	991	166	1972	958	122	637	430	281	711	453
v/s Ratio Prot	c0.07	0.26	0.00	0.08	c0.45	0.01	c0.07	c0.15	0.01	0.05	c0.16	0.06
v/s Ratio Perm			0.01			0.06			0.01			0.13
v/c Ratio	0.77	0.48	0.02	0.90	0.81	0.10	1.06	0.86	0.07	0.63	0.78	0.65
Uniform Delay, d1	98.2	30.8	16.6	98.6	39.9	15.7	102.5	87.5	59.2	97.6	83.6	68.9
Progression Factor	1.33	0.70	1.00	0.87	0.71	0.85	1.00	1.00	1.00	1.48	0.99	0.49
Incremental Delay, d2	10.5	0.8	0.0	26.1	2.0	0.0	97.7	11.1	0.1	4.3	5.6	3.3
Delay (s)	141.0	22.5	16.6	112.2	30.3	13.3	200.2	98.6	59.2	148.4	88.1	36.9
Level of Service	F	C	B	F	C	B	F	F	E	F	F	D
Approach Delay (s)		45.3			35.7			109.3			81.0	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	59.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	1186	24	2159	55	11
v/c Ratio	0.40	0.38	0.68	0.52	0.08
Control Delay	3.1	129.1	3.0	46.8	1.2
Queue Delay	0.2	0.0	0.2	1.5	0.0
Total Delay	3.2	129.1	3.3	48.4	1.2
Queue Length 50th (ft)	287	35	59	15	0
Queue Length 95th (ft)	113	m46	m142	68	0
Internal Link Dist (ft)	199		798	108	109
Turn Bay Length (ft)		100			
Base Capacity (vph)	2990	63	3160	182	224
Starvation Cap Reductn	778	0	335	0	0
Spillback Cap Reductn	0	0	130	49	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.38	0.76	0.41	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1102	1	22	2006	2	39	0	12	0	0	10
Future Volume (veh/h)	0	1102	1	22	2006	2	39	0	12	0	0	10
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	0	1185	1	24	2157	2	42	0	13	0	0	11
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	3047	3	43	3218	3	78	2	16	0	0	81
Arrive On Green	0.00	0.84	0.84	0.05	1.00	1.00	0.05	0.00	0.05	0.00	0.00	0.05
Sat Flow, veh/h	1774	3629	3	1774	3628	3	955	46	310	0	0	1583
Grp Volume(v), veh/h	0	578	608	24	1052	1107	55	0	0	0	0	11
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1862	1311	0	0	0	0	1583
Q Serve(g_s), s	0.0	17.1	17.1	2.9	0.0	0.0	7.9	0.0	0.0	0.0	0.0	1.5
Cycle Q Clear(g_c), s	0.0	17.1	17.1	2.9	0.0	0.0	9.3	0.0	0.0	0.0	0.0	1.5
Prop In Lane	1.00		0.00	1.00		0.00	0.76		0.24	0.00		1.00
Lane Grp Cap(c), veh/h	1	1486	1564	43	1570	1652	96	0	0	0	0	81
V/C Ratio(X)	0.00	0.39	0.39	0.55	0.67	0.67	0.57	0.00	0.00	0.00	0.00	0.14
Avail Cap(c_a), veh/h	56	1486	1564	56	1570	1652	169	0	0	0	0	162
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.49	0.49	0.49	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	4.2	4.2	103.4	0.0	0.0	103.9	0.0	0.0	0.0	0.0	99.7
Incr Delay (d2), s/veh	0.0	0.8	0.7	5.2	1.1	1.1	5.3	0.0	0.0	0.0	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.5	8.9	1.5	0.5	0.5	3.5	0.0	0.0	0.0	0.0	0.7
LnGrp Delay(d),s/veh	0.0	5.0	4.9	108.7	1.1	1.1	109.2	0.0	0.0	0.0	0.0	100.5
LnGrp LOS		A	A	F	A	A	F					F
Approach Vol, veh/h		1186			2183			55			11	
Approach Delay, s/veh		4.9			2.3			109.2			100.5	
Approach LOS		A			A			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.4	191.9		17.8	0.0	202.2		17.8
Change Period (Y+Rc), s	5.0	7.1		6.5	5.0	7.1		6.5
Max Green Setting (Gmax), s	7.0	171.9		22.5	7.0	171.9		22.5
Max Q Clear Time (g_c+I1), s	4.9	19.1		11.3	0.0	2.0		3.5
Green Ext Time (p_c), s	0.0	18.7		0.1	0.0	94.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	5.2
HCM 2010 LOS	A

Lane Group	EBL	NBT	NEL2	NET	SWL	SWT
Lane Group Flow (vph)	157	99	6	1124	26	2132
v/c Ratio	0.84	0.61	0.05	0.44	0.07	0.81
Control Delay	128.9	37.8	2.2	2.8	7.1	11.7
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	128.9	37.8	2.2	2.9	7.1	11.7
Queue Length 50th (ft)	226	16	0	76	6	331
Queue Length 95th (ft)	#350	88	m1	83	m14	682
Internal Link Dist (ft)	48	220		755		141
Turn Bay Length (ft)			120		150	
Base Capacity (vph)	198	213	134	2578	365	2625
Starvation Cap Reductn	0	0	0	446	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.46	0.04	0.53	0.07	0.81

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	NEL2	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	138	8	4	24	40	0	30	6	1057	10	25	1871
Future Volume (vph)	138	8	4	24	40	0	30	6	1057	10	25	1871
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0					5.0		5.6	5.1		5.6	5.1
Lane Util. Factor	1.00					1.00		1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Frt	0.99					0.96		1.00	1.00		1.00	0.99
Flt Protected	0.96					0.97		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1745					1708		1805	3534		1805	3423
Flt Permitted	0.96					0.97		0.04	1.00		0.21	1.00
Satd. Flow (perm)	1745					1708		79	3534		396	3423
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	145	8	4	25	42	0	32	6	1113	11	26	1969
RTOR Reduction (vph)	0	0	0	0	0	84	0	0	0	0	0	0
Lane Group Flow (vph)	157	0	0	0	0	15	0	6	1124	0	26	2132
Confl. Peds. (#/hr)		4	2	2	2			2		4	4	
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	9%	0%	2%	0%	0%	4%
Turn Type	Prot			Perm	Split	NA		pm+pt	NA		pm+pt	NA
Protected Phases	3				7	7		1	6		5	2
Permitted Phases				7				6			2	
Actuated Green, G (s)	22.2					8.4		158.2	157.0		166.2	161.0
Effective Green, g (s)	23.7					9.9		161.2	159.0		169.2	163.0
Actuated g/C Ratio	0.11					0.05		0.73	0.72		0.77	0.74
Clearance Time (s)	6.5					6.5		7.1	7.1		7.1	7.1
Vehicle Extension (s)	3.0					3.0		3.0	4.0		3.0	4.0
Lane Grp Cap (vph)	187					76		79	2554		347	2536
v/s Ratio Prot	c0.09					c0.01		0.00	0.32		c0.00	c0.62
v/s Ratio Perm								0.05			0.06	
v/c Ratio	0.84					0.20		0.08	0.44		0.07	0.84
Uniform Delay, d1	96.3					101.2		25.0	12.4		7.9	19.6
Progression Factor	1.00					1.00		0.21	0.18		1.06	0.53
Incremental Delay, d2	26.8					1.3		0.4	0.5		0.1	2.7
Delay (s)	123.0					102.5		5.7	2.7		8.5	13.1
Level of Service	F					F		A	A		A	B
Approach Delay (s)	123.0					102.5			2.7			13.0
Approach LOS	F					F			A			B

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR	SWR2
Lane Configurations		
Traffic Volume (vph)	146	9
Future Volume (vph)	146	9
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frpb, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	154	9
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)	2	
Heavy Vehicles (%)	4%	25%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	16	895	1077
v/c Ratio	0.06	0.18	0.22
Control Delay	0.4	0.1	0.6
Queue Delay	0.0	0.0	0.1
Total Delay	0.4	0.1	0.7
Queue Length 50th (ft)	0	0	34
Queue Length 95th (ft)	0	0	38
Internal Link Dist (ft)	220	381	225
Turn Bay Length (ft)			
Base Capacity (vph)	340	5085	4849
Starvation Cap Reductn	0	0	2116
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.05	0.18	0.39

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	16	0	868	1043	2
Future Volume (vph)	0	16	0	868	1043	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.86			1.00	1.00	
Flt Protected	1.00			1.00	1.00	
Satd. Flow (prot)	1611			5085	5084	
Flt Permitted	1.00			1.00	1.00	
Satd. Flow (perm)	1611			5085	5084	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	16	0	895	1075	2
RTOR Reduction (vph)	16	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	895	1077	0
Confl. Peds. (#/hr)	1		3			3
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	4.2			220.0	205.8	
Effective Green, g (s)	4.2			220.0	205.8	
Actuated g/C Ratio	0.02			1.00	0.94	
Clearance Time (s)	5.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	30			5085	4755	
v/s Ratio Prot	0.00			0.18	c0.21	
v/s Ratio Perm						
v/c Ratio	0.01			0.18	0.23	
Uniform Delay, d1	105.9			0.0	0.6	
Progression Factor	1.00			1.00	0.93	
Incremental Delay, d2	0.1			0.1	0.1	
Delay (s)	106.0			0.1	0.6	
Level of Service	F			A	A	
Approach Delay (s)	106.0			0.1	0.6	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	1.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	451	443	31	912	477	1075
v/c Ratio	0.72	0.77	0.60	0.37	0.51	1.27	0.46
Control Delay	124.1	5.4	5.0	151.5	13.3	171.8	42.6
Queue Delay	0.0	47.5	54.3	0.0	0.8	0.0	0.0
Total Delay	124.1	52.9	59.2	151.5	14.1	171.8	42.6
Queue Length 50th (ft)	132	75	92	48	73	~678	404
Queue Length 95th (ft)	#244	m41	m60	92	83	#930	461
Internal Link Dist (ft)	420	47			216		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	130	589	739	198	1785	377	2315
Starvation Cap Reductn	0	173	335	0	516	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.08	1.10	0.16	0.72	1.27	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	27	45	18	52	98	708	12	17	836	39	2	456
Future Volume (vph)	27	45	18	52	98	708	12	17	836	39	2	456
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		0.99			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.97			0.90	0.85		1.00	0.99			1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1810			1612	1534		1805	4993			1787
Flt Permitted		0.99			0.99	1.00		0.95	1.00			0.18
Satd. Flow (perm)		1810			1612	1534		1805	4993			345
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	47	19	54	102	738	12	18	871	41	2	475
RTOR Reduction (vph)	0	4	0	0	32	211	0	0	0	0	0	0
Lane Group Flow (vph)	0	90	0	0	419	232	0	31	912	0	0	477
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	3%	7%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	pm+pt	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases							2				6	6
Actuated Green, G (s)		14.4			73.7	73.7		8.1	77.2			113.2
Effective Green, g (s)		15.4			74.7	74.7		9.1	78.7			114.2
Actuated g/C Ratio		0.07			0.34	0.34		0.04	0.36			0.52
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		126			547	520		74	1786			377
v/s Ratio Prot		c0.05			c0.26	0.15		0.02	0.18			c0.17
v/s Ratio Perm												c0.48
v/c Ratio		0.72			0.77	0.45		0.42	0.51			1.27
Uniform Delay, d1		100.2			64.9	56.5		102.9	55.5			43.6
Progression Factor		1.00			0.08	0.31		1.38	0.22			1.00
Incremental Delay, d2		18.1			0.7	0.1		3.8	1.0			138.9
Delay (s)		118.3			5.8	17.6		146.0	13.2			182.6
Level of Service		F			A	B		F	B			F
Approach Delay (s)		118.3			11.7				17.6			
Approach LOS		F			B				B			

Intersection Summary			
HCM 2000 Control Delay	49.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	956	76
Future Volume (vph)	956	76
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	5036	
Flt Permitted	1.00	
Satd. Flow (perm)	5036	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	996	79
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1075	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	98.3	
Effective Green, g (s)	99.8	
Actuated g/C Ratio	0.45	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2284	
v/s Ratio Prot	0.21	
v/s Ratio Perm		
v/c Ratio	0.47	
Uniform Delay, d1	41.8	
Progression Factor	1.00	
Incremental Delay, d2	0.7	
Delay (s)	42.4	
Level of Service	D	
Approach Delay (s)	85.5	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	575	825	20	158
v/c Ratio	0.27	1.10	0.28	0.89
Control Delay	1.4	133.1	83.8	85.5
Queue Delay	21.8	0.5	0.0	0.4
Total Delay	23.1	133.6	83.8	85.9
Queue Length 50th (ft)	8	~703	19	102
Queue Length 95th (ft)	m7	#847	55	#246
Internal Link Dist (ft)	47	1664	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2130	749	80	187
Starvation Cap Reductn	1558	0	0	0
Spillback Cap Reductn	0	62	0	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.01	1.20	0.25	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	388	11	0	725	51	9	3	7	22	3	124
Future Volume (vph)	141	388	11	0	725	51	9	3	7	22	3	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.96			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.95			0.89	
Flt Protected		0.99			1.00			0.98			0.99	
Satd. Flow (prot)		3458			3537			1702			1642	
Flt Permitted		0.99			1.00			0.98			0.99	
Satd. Flow (perm)		3458			3537			1702			1642	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	150	413	12	0	771	54	10	3	7	23	3	132
RTOR Reduction (vph)	0	1	0	0	2	0	0	7	0	0	84	0
Lane Group Flow (vph)	0	574	0	0	823	0	0	13	0	0	74	0
Confl. Peds. (#/hr)			2	2					12	12		
Heavy Vehicles (%)	2%	3%	0%	0%	1%	2%	0%	0%	0%	13%	0%	0%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		134.5			45.5			7.5			11.7	
Effective Green, g (s)		129.6			46.5			8.5			12.7	
Actuated g/C Ratio		0.59			0.21			0.04			0.06	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		2037			747			65			94	
v/s Ratio Prot		c0.17			c0.23			c0.01			c0.05	
v/s Ratio Perm												
v/c Ratio		0.28			1.10			0.20			0.79	
Uniform Delay, d1		22.3			86.8			102.5			102.3	
Progression Factor		0.07			0.91			1.00			1.00	
Incremental Delay, d2		0.0			63.7			0.6			32.1	
Delay (s)		1.5			142.8			103.0			134.4	
Level of Service		A			F			F			F	
Approach Delay (s)		1.5			142.8			103.0			134.4	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	90.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

2027 Future Background SAT Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	22	1727	8	1617	627	6	218	50	14
v/c Ratio	0.15	0.53	0.05	0.75	0.58	0.07	0.80	0.12	0.12
Control Delay	23.1	20.5	6.3	22.5	11.8	69.3	101.4	7.3	63.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	20.5	6.3	22.5	11.8	69.3	101.4	7.3	63.7
Queue Length 50th (ft)	7	233	1	883	432	6	226	5	13
Queue Length 95th (ft)	m21	542	m2	#1191	660	22	#336	26	34
Internal Link Dist (ft)		810		1202		100		1663	220
Turn Bay Length (ft)	130		80		600				
Base Capacity (vph)	152	3281	169	2170	1090	94	282	419	264
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.53	0.05	0.75	0.58	0.06	0.77	0.12	0.05

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	1585	4	6	1	1488	577	4	0	2	201	2
Future Volume (vph)	20	1585	4	6	1	1488	577	4	0	2	201	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.95		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97		0.95	1.00
Satd. Flow (prot)	1805	5035			1621	3539	1583		1756		1787	1626
Flt Permitted	0.05	1.00			0.08	1.00	1.00		0.97		0.95	1.00
Satd. Flow (perm)	93	5035			141	3539	1583		1756		1787	1626
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)	22	1723	4	7	1	1617	627	4	0	2	218	2
RTOR Reduction (vph)	0	0	0	0	0	0	143	0	0	0	0	42
Lane Group Flow (vph)	22	1727	0	0	8	1617	484	0	6	0	218	8
Heavy Vehicles (%)	0%	3%	0%	13%	0%	2%	2%	0%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	85.0	81.1			80.0	78.6	78.6		1.5		21.8	21.8
Effective Green, g (s)	87.0	83.1			82.0	80.6	80.6		2.5		22.8	22.8
Actuated g/C Ratio	0.58	0.55			0.55	0.54	0.54		0.02		0.15	0.15
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	109	2789			100	1901	850		29		271	247
v/s Ratio Prot	c0.01	0.34			0.00	c0.46			c0.00		c0.12	0.00
v/s Ratio Perm	0.11				0.04		0.31					
v/c Ratio	0.20	0.62			0.08	0.85	0.57		0.21		0.80	0.03
Uniform Delay, d1	25.7	22.7			18.2	29.6	23.1		72.8		61.4	54.2
Progression Factor	1.49	1.10			0.37	0.79	0.83		1.00		1.31	1.00
Incremental Delay, d2	0.7	0.8			0.3	4.2	2.3		3.5		17.5	0.1
Delay (s)	39.0	25.8			7.1	27.6	21.6		76.3		98.0	54.3
Level of Service	D	C			A	C	C		E		F	D
Approach Delay (s)		26.0				25.8			76.3			89.9
Approach LOS		C				C			E			F

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	44	3	1	9
Future Volume (vph)	44	3	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.90	
Flt Protected			0.99	
Satd. Flow (prot)			1693	
Flt Permitted			0.99	
Satd. Flow (perm)			1693	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	3	1	10
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	14	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.3	
Effective Green, g (s)			8.3	
Actuated g/C Ratio			0.06	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			93	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.15	
Uniform Delay, d1			67.5	
Progression Factor			1.00	
Incremental Delay, d2			0.8	
Delay (s)			68.2	
Level of Service			E	
Approach Delay (s)			68.2	
Approach LOS			E	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	176	1550	151	1402	143	105	46	269
v/c Ratio	0.53	0.71	0.57	0.67	0.78	0.28	0.25	0.79
Control Delay	35.0	13.9	47.8	10.6	84.7	9.7	53.1	65.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	13.9	47.8	10.6	84.7	9.7	53.1	65.8
Queue Length 50th (ft)	57	164	80	69	135	0	39	221
Queue Length 95th (ft)	m138	884	m139	231	204	50	75	305
Internal Link Dist (ft)		1037		810	420			173
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	469	2188	455	2104	292	535	294	523
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.71	0.33	0.67	0.49	0.20	0.16	0.51

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	1393	33	139	1280	10	27	105	97	42	118	130
Future Volume (vph)	162	1393	33	139	1280	10	27	105	97	42	118	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3527		1805	3536			1881	1568	1719	1694	
Flt Permitted	0.11	1.00		0.09	1.00			0.52	1.00	0.55	1.00	
Satd. Flow (perm)	205	3527		179	3536			996	1568	1001	1694	
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)	176	1514	36	151	1391	11	29	114	105	46	128	141
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	86	0	30	0
Lane Group Flow (vph)	176	1549	0	151	1402	0	0	143	19	46	239	0
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	0%	3%	5%	7%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	107.8	92.0		100.4	88.3			26.6	26.6	26.6	26.6	
Effective Green, g (s)	109.8	93.0		102.4	89.3			27.6	27.6	27.6	27.6	
Actuated g/C Ratio	0.73	0.62		0.68	0.60			0.18	0.18	0.18	0.18	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	329	2186		264	2105			183	288	184	311	
v/s Ratio Prot	c0.06	c0.44		0.05	0.40						0.14	
v/s Ratio Perm	0.33			0.34				c0.14	0.01	0.05		
v/c Ratio	0.53	0.71		0.57	0.67			0.78	0.07	0.25	0.77	
Uniform Delay, d1	16.6	19.3		17.7	20.3			58.3	50.6	52.3	58.2	
Progression Factor	2.88	0.57		2.88	0.42			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	1.6		2.0	1.1			19.2	0.1	0.7	10.8	
Delay (s)	49.3	12.5		52.9	9.6			77.5	50.7	53.1	69.0	
Level of Service	D	B		D	A			E	D	D	E	
Approach Delay (s)		16.3			13.8			66.1			66.7	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	318	1195	52	154	1145	95	118	568	165	191	618	408
v/c Ratio	0.72	0.74	0.06	0.94	0.78	0.12	0.70	0.76	0.31	0.56	0.79	0.66
Control Delay	84.2	34.0	0.9	102.4	30.8	3.2	87.8	62.8	7.9	95.2	78.2	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1
Total Delay	84.2	34.0	0.9	102.4	30.8	3.2	87.8	62.8	7.9	95.2	78.6	28.5
Queue Length 50th (ft)	169	356	1	141	166	0	113	277	20	101	260	275
Queue Length 95th (ft)	199	626	m5	#293	472	m18	#195	334	56	144	356	466
Internal Link Dist (ft)		798			1037			554			381	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	455	1614	880	164	1472	845	177	854	533	411	948	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	71	9
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.74	0.06	0.94	0.78	0.11	0.67	0.67	0.31	0.46	0.70	0.67

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	1147	50	148	1099	91	113	545	158	183	593	392
Future Volume (vph)	305	1147	50	148	1099	91	113	545	158	183	593	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1535	1805	3539	1536	1787	3539	1519	3433	3539	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1535	1805	3539	1536	1787	3539	1519	3433	3539	1570
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	318	1195	52	154	1145	95	118	568	165	191	618	408
RTOR Reduction (vph)	0	0	23	0	0	40	0	0	89	0	0	80
Lane Group Flow (vph)	318	1195	29	154	1145	55	118	568	76	191	618	328
Confl. Peds. (#/hr)	1		1	1		1	1		4	4		1
Heavy Vehicles (%)	2%	2%	4%	0%	2%	4%	1%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	17.9	67.0	79.6	12.2	61.0	74.5	12.6	30.0	42.2	13.5	31.8	49.7
Effective Green, g (s)	19.4	68.5	82.6	13.7	62.5	77.5	14.1	31.5	45.2	15.0	33.3	52.7
Actuated g/C Ratio	0.13	0.46	0.55	0.09	0.42	0.52	0.09	0.21	0.30	0.10	0.22	0.35
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	444	1616	845	164	1474	793	167	743	457	343	785	551
v/s Ratio Prot	0.09	c0.34	0.00	0.09	c0.32	0.01	c0.07	0.16	0.02	0.06	c0.17	0.08
v/s Ratio Perm			0.02			0.03			0.03			0.13
v/c Ratio	0.72	0.74	0.03	0.94	0.78	0.07	0.71	0.76	0.17	0.56	0.79	0.59
Uniform Delay, d1	62.7	33.4	15.4	67.7	37.7	18.2	65.9	55.8	38.5	64.3	55.0	39.9
Progression Factor	1.21	0.90	1.25	0.81	0.70	0.64	1.00	1.00	1.00	1.39	1.29	0.94
Incremental Delay, d2	4.7	2.7	0.0	43.8	3.1	0.0	12.8	4.7	0.2	1.9	5.2	1.7
Delay (s)	80.6	32.6	19.3	98.8	29.4	11.6	78.7	60.5	38.7	91.4	76.3	39.1
Level of Service	F	C	B	F	C	B	E	E	D	F	E	D
Approach Delay (s)		41.9			35.9			58.8			66.2	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	1538	28	1648	50	12
v/c Ratio	0.53	0.31	0.53	0.35	0.06
Control Delay	5.1	62.7	3.8	13.3	0.6
Queue Delay	0.1	0.0	0.1	0.0	0.0
Total Delay	5.2	62.7	3.8	13.3	0.6
Queue Length 50th (ft)	134	27	151	0	0
Queue Length 95th (ft)	258	m38	268	26	0
Internal Link Dist (ft)	171		798	125	94
Turn Bay Length (ft)		80			
Base Capacity (vph)	2914	90	3096	265	334
Starvation Cap Reductn	237	0	230	0	0
Spillback Cap Reductn	0	0	151	2	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.57	0.31	0.58	0.19	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1489	3	27	1592	7	35	0	14	0	0	12
Future Volume (veh/h)	0	1489	3	27	1592	7	35	0	14	0	0	12
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	0	1535	3	28	1641	7	36	0	14	0	0	12
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	2882	6	57	3111	13	84	3	18	0	0	77
Arrive On Green	0.00	0.80	0.80	0.06	1.00	1.00	0.05	0.00	0.05	0.00	0.00	0.05
Sat Flow, veh/h	1774	3624	7	1774	3614	15	884	70	371	0	0	1583
Grp Volume(v), veh/h	0	749	789	28	803	845	50	0	0	0	0	12
Grp Sat Flow(s),veh/h/ln	1774	1770	1861	1774	1770	1860	1325	0	0	0	0	1583
Q Serve(g_s), s	0.0	22.6	22.6	2.3	0.0	0.0	4.6	0.0	0.0	0.0	0.0	1.1
Cycle Q Clear(g_c), s	0.0	22.6	22.6	2.3	0.0	0.0	5.7	0.0	0.0	0.0	0.0	1.1
Prop In Lane	1.00		0.00	1.00		0.01	0.72		0.28	0.00		1.00
Lane Grp Cap(c), veh/h	1	1407	1480	57	1523	1601	106	0	0	0	0	77
V/C Ratio(X)	0.00	0.53	0.53	0.49	0.53	0.53	0.47	0.00	0.00	0.00	0.00	0.16
Avail Cap(c_a), veh/h	83	1407	1480	83	1523	1601	252	0	0	0	0	238
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.59	0.59	0.59	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	5.4	5.5	69.0	0.0	0.0	70.9	0.0	0.0	0.0	0.0	68.4
Incr Delay (d2), s/veh	0.0	1.4	1.4	3.8	0.8	0.7	3.3	0.0	0.0	0.0	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.4	12.0	1.2	0.3	0.3	2.2	0.0	0.0	0.0	0.0	0.5
LnGrp Delay(d),s/veh	0.0	6.9	6.8	72.8	0.8	0.7	74.1	0.0	0.0	0.0	0.0	69.3
LnGrp LOS		A	A	E	A	A	E					E
Approach Vol, veh/h		1538			1676			50			12	
Approach Delay, s/veh		6.9			2.0			74.1			69.3	
Approach LOS		A			A			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.8	126.4		13.8	0.0	136.2		13.8
Change Period (Y+Rc), s	5.0	7.1		6.5	5.0	7.1		6.5
Max Green Setting (Gmax), s	7.0	101.9		22.5	7.0	101.9		22.5
Max Q Clear Time (g_c+I1), s	4.3	24.6		7.7	0.0	2.0		3.1
Green Ext Time (p_c), s	0.0	30.8		0.1	0.0	36.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	5.6
HCM 2010 LOS	A

Lane Group	EBL	NBT	NEL2	NET	SWL	SWT
Lane Group Flow (vph)	101	46	8	1551	18	1692
v/c Ratio	0.57	0.23	0.04	0.61	0.08	0.64
Control Delay	76.7	2.5	5.1	5.8	3.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.7	2.5	5.1	5.8	3.4	6.0
Queue Length 50th (ft)	96	0	1	90	3	198
Queue Length 95th (ft)	158	0	m4	298	m2	376
Internal Link Dist (ft)	53	220		755		169
Turn Bay Length (ft)			120		150	
Base Capacity (vph)	215	310	291	2528	310	2644
Starvation Cap Reductn	0	0	0	36	0	22
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.15	0.03	0.62	0.06	0.65

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	NEL2	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	90	1	6	14	9	0	21	8	1474	15	17	1560
Future Volume (vph)	90	1	6	14	9	0	21	8	1474	15	17	1560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0					5.0		5.6	5.1		5.6	5.1
Lane Util. Factor	1.00					1.00		1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Frt	0.99					0.94		1.00	1.00		1.00	0.99
Flt Protected	0.96					0.97		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1794					1732		1805	3534		1805	3518
Flt Permitted	0.96					0.97		0.09	1.00		0.11	1.00
Satd. Flow (perm)	1794					1732		177	3534		205	3518
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	94	1	6	15	9	0	22	8	1535	16	18	1625
RTOR Reduction (vph)	0	0	0	0	0	44	0	0	0	0	0	0
Lane Group Flow (vph)	101	0	0	0	0	2	0	8	1551	0	18	1692
Confl. Peds. (#/hr)			7	7	3			3		4	4	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%
Turn Type	Prot			Perm	Split	NA		pm+pt	NA		pm+pt	NA
Protected Phases	3				7	7		1	6		5	2
Permitted Phases				7				6			2	
Actuated Green, G (s)	13.3					4.5		102.5	101.3		107.5	103.8
Effective Green, g (s)	14.8					6.0		105.5	103.3		110.5	105.8
Actuated g/C Ratio	0.10					0.04		0.70	0.69		0.74	0.71
Clearance Time (s)	6.5					6.5		7.1	7.1		7.1	7.1
Vehicle Extension (s)	3.0					3.0		3.0	4.0		3.0	4.0
Lane Grp Cap (vph)	177					69		153	2433		206	2481
v/s Ratio Prot	c0.06					c0.00		0.00	0.44		c0.00	c0.48
v/s Ratio Perm								0.04			0.06	
v/c Ratio	0.57					0.03		0.05	0.64		0.09	0.68
Uniform Delay, d1	64.6					69.2		11.0	13.0		9.9	12.5
Progression Factor	1.00					1.00		0.88	0.37		0.52	0.46
Incremental Delay, d2	4.4					0.2		0.1	1.1		0.2	1.4
Delay (s)	69.0					69.4		9.8	5.9		5.3	7.1
Level of Service	E					E		A	A		A	A
Approach Delay (s)	69.0					69.4			5.9			7.1
Approach LOS	E					E			A			A

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR	SWR2
Lane Configurations		
Traffic Volume (vph)	59	6
Future Volume (vph)	59	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frpb, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	61	6
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)		3
Heavy Vehicles (%)	0%	0%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	8	1018	1237
v/c Ratio	0.04	0.20	0.25
Control Delay	0.4	0.1	0.4
Queue Delay	0.0	0.0	0.0
Total Delay	0.4	0.1	0.4
Queue Length 50th (ft)	0	0	0
Queue Length 95th (ft)	0	0	6
Internal Link Dist (ft)	220	381	237
Turn Bay Length (ft)			
Base Capacity (vph)	337	5085	4965
Starvation Cap Reductn	0	0	585
Spillback Cap Reductn	0	0	44
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.02	0.20	0.28

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	8	0	967	1170	5
Future Volume (vph)	0	8	0	967	1170	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.86			1.00	1.00	
Flt Protected	1.00			1.00	1.00	
Satd. Flow (prot)	1611			5085	5082	
Flt Permitted	1.00			1.00	1.00	
Satd. Flow (perm)	1611			5085	5082	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	8	0	1018	1232	5
RTOR Reduction (vph)	8	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1018	1237	0
Confl. Peds. (#/hr)	1		4			4
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	1.4			150.0	138.6	
Effective Green, g (s)	1.4			150.0	138.6	
Actuated g/C Ratio	0.01			1.00	0.92	
Clearance Time (s)	5.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	15			5085	4695	
v/s Ratio Prot	0.00			0.20	c0.24	
v/s Ratio Perm						
v/c Ratio	0.00			0.20	0.26	
Uniform Delay, d1	73.6			0.0	0.6	
Progression Factor	1.00			1.00	0.88	
Incremental Delay, d2	0.1			0.1	0.1	
Delay (s)	73.7			0.1	0.6	
Level of Service	E			A	A	
Approach Delay (s)	73.7			0.1	0.6	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	174	329	25	953	409	1192
v/c Ratio	0.30	0.30	0.45	0.25	0.71	1.36	0.63
Control Delay	56.6	1.2	4.5	92.0	46.7	214.0	42.8
Queue Delay	0.0	1.0	2.0	0.0	0.0	0.3	0.0
Total Delay	56.6	2.2	6.5	92.0	46.7	214.3	42.8
Queue Length 50th (ft)	52	0	69	26	164	~479	375
Queue Length 95th (ft)	98	0	121	60	243	#819	#498
Internal Link Dist (ft)	420	47			204		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	218	615	772	165	1340	301	1900
Starvation Cap Reductn	0	254	296	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	8	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.48	0.69	0.15	0.71	1.40	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	25	23	14	35	39	414	12	13	898	26	5	392
Future Volume (vph)	25	23	14	35	39	414	12	13	898	26	5	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frt		0.97			0.92	0.85		1.00	1.00			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1807			1538	1504		1750	5065			1787
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.11
Satd. Flow (perm)		1807			1538	1504		1750	5065			215
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	24	14	36	40	427	12	13	926	27	5	404
RTOR Reduction (vph)	0	6	0	0	36	215	0	0	0	0	0	0
Lane Group Flow (vph)	0	58	0	0	138	114	0	25	953	0	0	409
Heavy Vehicles (%)	0%	0%	0%	3%	20%	2%	0%	6%	2%	1%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		16.4			50.8	50.8		5.3	38.1			64.1
Effective Green, g (s)		17.4			51.8	51.8		6.3	39.6			65.1
Actuated g/C Ratio		0.12			0.35	0.35		0.04	0.26			0.43
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		209			531	519		73	1337			305
v/s Ratio Prot		c0.03			c0.09	0.08		0.01	0.19			c0.18
v/s Ratio Perm												c0.40
v/c Ratio		0.28			0.26	0.22		0.34	0.71			1.34
Uniform Delay, d1		60.6			35.3	34.8		69.8	50.0			42.9
Progression Factor		1.00			0.00	0.93		1.29	0.87			1.00
Incremental Delay, d2		0.9			0.6	0.5		2.8	3.2			173.9
Delay (s)		61.4			0.6	32.6		93.0	46.6			216.9
Level of Service		E			A	C		F	D			F
Approach Delay (s)		61.4			21.5				47.8			
Approach LOS		E			C				D			

Intersection Summary			
HCM 2000 Control Delay	63.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1124	32
Future Volume (vph)	1124	32
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5067	
Flt Permitted	1.00	
Satd. Flow (perm)	5067	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	1159	33
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1192	0
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	52.0	
Effective Green, g (s)	53.5	
Actuated g/C Ratio	0.36	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1807	
v/s Ratio Prot	0.24	
v/s Ratio Perm		
v/c Ratio	0.66	
Uniform Delay, d1	40.6	
Progression Factor	1.00	
Incremental Delay, d2	1.9	
Delay (s)	42.5	
Level of Service	D	
Approach Delay (s)	87.0	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	485	444	14	119
v/c Ratio	0.23	0.60	0.17	0.47
Control Delay	2.4	65.6	59.0	6.2
Queue Delay	56.0	0.3	0.0	0.0
Total Delay	58.4	65.9	59.0	6.2
Queue Length 50th (ft)	10	187	10	0
Queue Length 95th (ft)	m10	286	35	0
Internal Link Dist (ft)	47	1663	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2065	827	137	299
Starvation Cap Reductn	1636	0	0	0
Spillback Cap Reductn	0	73	0	3
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.13	0.59	0.10	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	349	7	0	386	22	8	1	4	20	0	89
Future Volume (vph)	90	349	7	0	386	22	8	1	4	20	0	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.96			0.89	
Flt Protected		0.99			1.00			0.97			0.99	
Satd. Flow (prot)		3537			3482			1738			1649	
Flt Permitted		0.99			1.00			0.97			0.99	
Satd. Flow (perm)		3537			3482			1738			1649	
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)	98	379	8	0	420	24	9	1	4	22	0	97
RTOR Reduction (vph)	0	1	0	0	3	0	0	4	0	0	114	0
Lane Group Flow (vph)	0	484	0	0	441	0	0	10	0	0	5	0
Confl. Peds. (#/hr)									8	8		
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		87.4			30.8			5.8			5.2	
Effective Green, g (s)		82.5			31.8			6.8			6.2	
Actuated g/C Ratio		0.55			0.21			0.05			0.04	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1945			738			78			68	
v/s Ratio Prot		c0.14			c0.13			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio		0.25			0.60			0.13			0.07	
Uniform Delay, d1		17.6			53.3			68.8			69.1	
Progression Factor		0.15			1.19			1.00			1.00	
Incremental Delay, d2		0.0			1.8			0.3			0.2	
Delay (s)		2.7			65.5			69.0			69.3	
Level of Service		A			E			E			E	
Approach Delay (s)		2.7			65.5			69.0			69.3	
Approach LOS		A			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	74	359	349	225	12	367	365	51	18	393	41	46
Average Queue (ft)	12	117	117	97	0	172	171	4	1	246	8	4
95th Queue (ft)	44	268	266	203	5	330	330	27	10	363	30	25
Link Distance (ft)		766	766			1199	1199	1199	114	1617	1617	213
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		7	2	1		21						
Queuing Penalty (veh)		3	11	5		0						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	63	302	308	162	292	249	394	249	96	252
Average Queue (ft)	18	130	143	65	82	68	201	109	13	121
95th Queue (ft)	50	261	277	134	316	280	355	201	57	222
Link Distance (ft)		982	982		766	766	447	447		235
Upstream Blk Time (%)					0	0	1			2
Queuing Penalty (veh)					1	1	0			0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)		0		1	9				0	17
Queuing Penalty (veh)		0		2	6				0	1

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	199	213	527	535	29	475	955	912	84	186	511	504
Average Queue (ft)	106	127	311	333	2	421	519	260	22	23	325	326
95th Queue (ft)	176	191	478	500	15	566	1171	814	65	109	505	512
Link Distance (ft)			774	774			982	982			515	515
Upstream Blk Time (%)							11	1			1	2
Queuing Penalty (veh)							34	3			0	0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)			0	1		56	3	0		0	37	28
Queuing Penalty (veh)			0	0		116	4	0		0	7	32

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	B127	SB	SB	SB	SB	SB
Directions Served	R	T	L	L	T	T	R
Maximum Queue (ft)	250	88	173	160	344	356	225
Average Queue (ft)	122	7	81	81	244	254	127
95th Queue (ft)	300	92	151	142	359	380	295
Link Distance (ft)		697		340	340	340	
Upstream Blk Time (%)					6	11	
Queuing Penalty (veh)					19	34	
Storage Bay Dist (ft)	225		300				200
Storage Blk Time (%)	0					38	0
Queuing Penalty (veh)	1					93	1

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	154	163	62	56	81	86	29
Average Queue (ft)	51	55	13	10	13	27	2
95th Queue (ft)	136	144	43	39	48	67	15
Link Distance (ft)	160	160		774	774	254	128
Upstream Blk Time (%)	0	0					
Queuing Penalty (veh)	3	3					
Storage Bay Dist (ft)			80				
Storage Blk Time (%)	0		1	0			
Queuing Penalty (veh)	0		2	0			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	NB	NE	NE	SW	SW	SW
Directions Served	<LR>	<LTR	T	TR	L	T	TR>
Maximum Queue (ft)	86	128	194	202	53	129	142
Average Queue (ft)	54	46	49	56	13	40	58
95th Queue (ft)	76	106	140	148	37	105	131
Link Distance (ft)	43	226	747	747		126	126
Upstream Blk Time (%)	88					0	2
Queuing Penalty (veh)	176					2	6
Storage Bay Dist (ft)					150		
Storage Blk Time (%)			1			0	
Queuing Penalty (veh)			0			0	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB	B8
Directions Served	LR	T	T	TR	T
Maximum Queue (ft)	35	14	75	126	10
Average Queue (ft)	5	0	7	11	0
95th Queue (ft)	25	8	41	63	6
Link Distance (ft)	235	244	244	244	226
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B8	B8	B8	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	T	UL	T
Maximum Queue (ft)	451	56	56	138	295	301	306	38	76	80	494	811
Average Queue (ft)	308	19	44	18	163	187	196	1	7	8	382	399
95th Queue (ft)	501	51	61	78	285	329	329	15	44	46	567	854
Link Distance (ft)	434	38	38		226	226	226	244	244	244		958
Upstream Blk Time (%)	16	7	56		2	4	5					4
Queuing Penalty (veh)	0	21	163		7	15	18					0
Storage Bay Dist (ft)				135							470	
Storage Blk Time (%)				0	11						21	0
Queuing Penalty (veh)				0	1						64	1

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	756	564
Average Queue (ft)	368	255
95th Queue (ft)	743	454
Link Distance (ft)	958	958
Upstream Blk Time (%)	1	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	62	45	518	502	84	316
Average Queue (ft)	27	6	329	319	25	283
95th Queue (ft)	47	28	545	533	64	330
Link Distance (ft)	38	38	1617	1617	158	259
Upstream Blk Time (%)	5	1				92
Queuing Penalty (veh)	12	3				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 872

Intersection: 1: Lobster Ln & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	61	244	237	144	50	1252	1248	1251	48	988	576	62
Average Queue (ft)	8	74	72	55	3	928	954	628	10	665	161	11
95th Queue (ft)	36	202	199	128	24	1593	1614	1583	36	1049	496	38
Link Distance (ft)		765	765			1192	1192	1192	111	1663	1663	213
Upstream Blk Time (%)		0	0			7	11	3				
Queuing Penalty (veh)		3	3			53	90	24				
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)	0	3	1	1		24						
Queuing Penalty (veh)	1	0	4	4		1						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	217	396	384	174	448	470	430	153	126	283
Average Queue (ft)	91	144	150	82	186	197	227	61	32	219
95th Queue (ft)	177	301	296	172	391	410	392	116	107	330
Link Distance (ft)		980	980		765	765	447	447		268
Upstream Blk Time (%)		0	0				2			13
Queuing Penalty (veh)		0	0				0			0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)		0		1	22					46
Queuing Penalty (veh)		0		8	36					10

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	203	206	342	340	34	474	775	802	375	225	512	494
Average Queue (ft)	108	126	193	199	7	178	349	386	110	198	336	305
95th Queue (ft)	183	195	323	324	28	407	743	785	373	269	528	485
Link Distance (ft)			774	774			980	980			515	515
Upstream Blk Time (%)											5	1
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)						0	7	14	0	44	18	19
Queuing Penalty (veh)						0	10	15	1	116	23	21

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	B127	SB	SB	SB	SB	SB
Directions Served	R	T	L	L	T	T	R
Maximum Queue (ft)	250	75	153	169	309	347	225
Average Queue (ft)	92	29	67	73	175	207	159
95th Queue (ft)	276	247	130	137	291	345	275
Link Distance (ft)		697		340	340	340	
Upstream Blk Time (%)		2			1	4	
Queuing Penalty (veh)		0			3	15	
Storage Bay Dist (ft)	225		300				200
Storage Blk Time (%)	0					18	12
Queuing Penalty (veh)	0					62	32

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	221	211	84	254	291	136	47
Average Queue (ft)	76	71	27	58	67	60	10
95th Queue (ft)	205	196	68	172	196	122	34
Link Distance (ft)	204	204		774	774	125	133
Upstream Blk Time (%)	1	1				3	
Queuing Penalty (veh)	4	3				0	
Storage Bay Dist (ft)			100				
Storage Blk Time (%)	1		1	5			
Queuing Penalty (veh)	0		6	1			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	NB	NE	NE	NE	SW	SW	SW
Directions Served	<LR>	<LTR	<	T	TR	L	T	TR>
Maximum Queue (ft)	66	210	30	163	147	92	188	198
Average Queue (ft)	49	98	5	55	54	11	137	140
95th Queue (ft)	60	189	22	133	127	51	238	235
Link Distance (ft)	46	226		747	747		160	160
Upstream Blk Time (%)	78	1				0	16	18
Queuing Penalty (veh)	116	0				0	161	181
Storage Bay Dist (ft)			120			150		
Storage Blk Time (%)				2		0	17	
Queuing Penalty (veh)				0		0	4	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB	B8	B8
Directions Served	LR	T	T	TR	T	T
Maximum Queue (ft)	38	22	100	134	3	9
Average Queue (ft)	13	1	6	12	0	0
95th Queue (ft)	38	10	49	71	3	9
Link Distance (ft)	235	245	245	245	223	223
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	UL	T	T	TR
Maximum Queue (ft)	249	53	57	93	130	130	151	495	1002	976	966
Average Queue (ft)	125	17	41	30	45	54	75	494	966	791	442
95th Queue (ft)	242	47	59	74	109	114	137	497	1039	1308	1022
Link Distance (ft)	433	36	36		223	223	223		958	958	958
Upstream Blk Time (%)		9	54						79	11	0
Queuing Penalty (veh)		38	232						0	0	0
Storage Bay Dist (ft)				135				470			
Storage Blk Time (%)				0	0			86	0		
Queuing Penalty (veh)				0	0			275	1		

Intersection: 51: Warwick Road & McLean Ave

Movement	EB	WB	SB
Directions Served	T	T	LR
Maximum Queue (ft)	136	3	142
Average Queue (ft)	101	0	66
95th Queue (ft)	163	3	165
Link Distance (ft)	116	46	202
Upstream Blk Time (%)	25		8
Queuing Penalty (veh)	0		0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	61	49	1177	1181	61	292
Average Queue (ft)	28	11	969	980	19	258
95th Queue (ft)	52	36	1224	1243	54	323
Link Distance (ft)	36	36	1663	1663	158	259
Upstream Blk Time (%)	30	13				74
Queuing Penalty (veh)	82	34				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1674

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	123	445	443	225	58	912	947	666	39	418	205	60
Average Queue (ft)	12	243	231	173	7	381	400	117	6	207	53	14
95th Queue (ft)	57	464	459	257	35	963	997	575	26	579	263	52
Link Distance (ft)		764	764			1190	1190	1190	109	1668	1668	213
Upstream Blk Time (%)		4	4			0	1	0		1		
Queuing Penalty (veh)		29	30			3	5	1		2		
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		22	11	8	0	25						
Queuing Penalty (veh)		4	61	43	0	2						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	238	370	384	164	602	607	218	149	143	242
Average Queue (ft)	101	153	161	105	255	267	106	60	49	183
95th Queue (ft)	202	438	440	203	668	683	190	164	125	263
Link Distance (ft)		980	980		764	764	447	447		205
Upstream Blk Time (%)		3	3		1	2		2		16
Queuing Penalty (veh)		24	24		11	14		0		0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)		4		3	21				2	34
Queuing Penalty (veh)		6		18	30				6	14

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	200	212	496	503	74	437	914	921	340	225	336	344
Average Queue (ft)	111	127	315	324	17	268	599	615	189	98	186	188
95th Queue (ft)	182	196	503	504	52	585	1138	1155	483	202	294	325
Link Distance (ft)			769	769			980	980			515	515
Upstream Blk Time (%)			3	3			1	1				2
Queuing Penalty (veh)			20	20			8	9				0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)			3	3		1	32	44	0	1	7	3
Queuing Penalty (veh)			8	1		8	48	40	1	4	8	4

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	B127	SB	SB	SB	SB	SB
Directions Served	R	T	L	L	T	T	R
Maximum Queue (ft)	250	71	158	166	343	355	225
Average Queue (ft)	60	14	66	74	158	171	114
95th Queue (ft)	185	175	149	164	300	326	254
Link Distance (ft)		697		340	340	340	
Upstream Blk Time (%)		2		2	1	2	
Queuing Penalty (veh)		0		8	5	8	
Storage Bay Dist (ft)	225		300				200
Storage Blk Time (%)	3		0	2		10	4
Queuing Penalty (veh)	7		0	2		40	13

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	182	188	93	227	254	110	42
Average Queue (ft)	108	103	26	92	111	33	10
95th Queue (ft)	197	195	71	196	225	82	34
Link Distance (ft)	174	174		769	769	134	122
Upstream Blk Time (%)	4	4				0	
Queuing Penalty (veh)	32	30				0	
Storage Bay Dist (ft)			80				
Storage Blk Time (%)	4		1	7			
Queuing Penalty (veh)	0		8	2			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	NB	NE	NE	NE	SW	SW	SW
Directions Served	<LR>	<LTR	<	T	TR	L	T	TR>
Maximum Queue (ft)	64	94	28	214	219	75	201	221
Average Queue (ft)	48	23	3	81	80	8	118	138
95th Queue (ft)	66	62	17	263	262	41	231	242
Link Distance (ft)	51	226		747	747		186	186
Upstream Blk Time (%)	46			2	2	0	3	4
Queuing Penalty (veh)	45			15	15	0	21	33
Storage Bay Dist (ft)			120			150		
Storage Blk Time (%)				4			5	
Queuing Penalty (veh)				0			1	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB	B14	B14	B14
Directions Served	LR	T	T	TR	T	T	T
Maximum Queue (ft)	36	57	159	206	17	34	36
Average Queue (ft)	6	5	9	16	1	0	1
95th Queue (ft)	27	66	75	108	18	14	20
Link Distance (ft)	235	256	256	256	213	213	213
Upstream Blk Time (%)		1	0	0		0	
Queuing Penalty (veh)		4	1	2		0	
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B14	B14	B14	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	T	UL	T
Maximum Queue (ft)	121	60	57	105	230	265	278	3	18	23	495	992
Average Queue (ft)	50	18	34	20	142	160	181	0	1	1	466	765
95th Queue (ft)	101	51	64	70	219	243	264	3	12	11	586	1277
Link Distance (ft)	434	37	37		213	213	213	256	256	256		958
Upstream Blk Time (%)		5	20		2	4	10					43
Queuing Penalty (veh)		12	47		7	13	31					0
Storage Bay Dist (ft)				135							470	
Storage Blk Time (%)					26						66	0
Queuing Penalty (veh)					7						248	0

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	976	901
Average Queue (ft)	716	530
95th Queue (ft)	1236	997
Link Distance (ft)	958	958
Upstream Blk Time (%)	10	1
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 51: Warwick Road & McLean Ave

Movement	EB	WB	SB
Directions Served	T	T	LR
Maximum Queue (ft)	135	9	56
Average Queue (ft)	40	0	17
95th Queue (ft)	104	7	48
Link Distance (ft)	127	51	251
Upstream Blk Time (%)	2	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	50	36	261	255	47	172
Average Queue (ft)	29	10	149	155	14	70
95th Queue (ft)	44	33	252	257	42	137
Link Distance (ft)	37	37	1668	1668	158	259
Upstream Blk Time (%)	5	1				
Queuing Penalty (veh)	11	2				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1174

Appendix J

Vehicular Capacity Analysis Worksheets – Future (2027) Conditions with Development Phase 2

Queues

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2027 TF AM

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	40	2247	1	687	258	1	280	11	5
v/c Ratio	0.09	0.68	0.01	0.35	0.25	0.02	0.83	0.02	0.06
Control Delay	5.5	9.9	45.0	42.2	22.3	89.0	123.2	0.1	82.2
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	10.2	45.0	42.2	22.3	89.0	123.2	0.1	82.2
Queue Length 50th (ft)	3	55	1	339	117	1	321	0	6
Queue Length 95th (ft)	m16	#1211	m4	439	211	9	m417	m0	22
Internal Link Dist (ft)		810		1204		100		1665	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	487	3305	119	1971	1025	67	379	487	175
Starvation Cap Reductn	0	360	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.76	0.01	0.35	0.25	0.01	0.74	0.02	0.03

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	37	2066	1	1	0	632	237	1	0	258	1	9
Future Volume (vph)	37	2066	1	1	0	632	237	1	0	258	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0	6.3	6.3	
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00	1.00	1.00	
Frt	1.00	1.00			1.00	1.00	0.85		1.00	1.00	0.86	
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (prot)	1805	4987			1805	3223	1524		1805	1687	1641	
Flt Permitted	0.32	1.00			0.04	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (perm)	604	4987			73	3223	1524		1805	1687	1641	
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)	40	2246	1	1	0	687	258	1	0	280	1	10
RTOR Reduction (vph)	0	0	0	0	0	0	108	0	0	0	9	0
Lane Group Flow (vph)	40	2247	0	0	1	687	150	0	1	280	2	0
Heavy Vehicles (%)	0%	4%	0%	0%	0%	12%	6%	0%	0%	7%	0%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA	Split	NA	
Protected Phases	5	2		1	1	6		7	7	3	3	
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	114.0	107.9			104.2	103.0	103.0		1.3	36.9	36.9	
Effective Green, g (s)	116.0	109.9			106.2	105.0	105.0		2.3	37.9	37.9	
Actuated g/C Ratio	0.61	0.58			0.56	0.55	0.55		0.01	0.20	0.20	
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0	7.3	7.3	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	5.0	5.0	
Lane Grp Cap (vph)	413	2884			60	1781	842		21	336	327	
v/s Ratio Prot	c0.00	c0.45			0.00	0.21			c0.00	c0.17	0.00	
v/s Ratio Perm	0.06				0.01		0.10					
v/c Ratio	0.10	0.78			0.02	0.39	0.18		0.05	0.83	0.01	
Uniform Delay, d1	15.9	30.7			27.0	24.2	21.1		92.8	73.0	61.0	
Progression Factor	0.33	0.33			2.18	1.83	5.30		1.00	1.41	1.00	
Incremental Delay, d2	0.1	1.4			0.1	0.6	0.5		0.9	17.2	0.0	
Delay (s)	5.3	11.4			58.9	45.0	112.2		93.7	120.4	61.0	
Level of Service	A	B			E	D	F		F	F	E	
Approach Delay (s)		11.3				63.3			93.7		118.2	
Approach LOS		B				E			F		F	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NEL2	NEL	NER
Lane Configurations			
Traffic Volume (vph)	2	0	3
Future Volume (vph)	2	0	3
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)		5.6	
Lane Util. Factor		1.00	
Frt		0.92	
Flt Protected		0.98	
Satd. Flow (prot)		1427	
Flt Permitted		0.98	
Satd. Flow (perm)		1427	
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	2	0	3
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	5	0
Heavy Vehicles (%)	50%	0%	0%
Turn Type	Prot	Prot	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)		5.8	
Effective Green, g (s)		6.8	
Actuated g/C Ratio		0.04	
Clearance Time (s)		6.6	
Vehicle Extension (s)		3.0	
Lane Grp Cap (vph)		51	
v/s Ratio Prot		c0.00	
v/s Ratio Perm			
v/c Ratio		0.10	
Uniform Delay, d1		88.6	
Progression Factor		1.00	
Incremental Delay, d2		0.8	
Delay (s)		89.5	
Level of Service		F	
Approach Delay (s)		89.5	
Approach LOS		F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	51	2012	75	619	156	185	7	126
v/c Ratio	0.08	0.84	0.49	0.27	0.91	0.47	0.08	0.49
Control Delay	2.9	11.3	63.6	5.2	126.6	15.3	65.3	70.3
Queue Delay	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.9	12.1	63.6	5.2	126.6	15.3	65.3	70.3
Queue Length 50th (ft)	8	202	48	45	195	21	8	132
Queue Length 95th (ft)	m12	247	138	56	277	96	24	194
Internal Link Dist (ft)		1037		810	420			201
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	710	2405	243	2315	230	475	112	345
Starvation Cap Reductn	0	3	0	0	0	0	0	0
Spillback Cap Reductn	0	150	0	0	0	7	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.89	0.31	0.27	0.68	0.40	0.06	0.37

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1838	13	69	569	1	33	110	170	6	78	38
Future Volume (vph)	47	1838	13	69	569	1	33	110	170	6	78	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3433		1805	3195			1352	1599	1081	1554	
Flt Permitted	0.41	1.00		0.04	1.00			0.78	1.00	0.46	1.00	
Satd. Flow (perm)	774	3433		81	3195			1067	1599	522	1554	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	1998	14	75	618	1	36	120	185	7	85	41
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	139	0	10	0
Lane Group Flow (vph)	51	2012	0	75	619	0	0	156	46	7	116	0
Heavy Vehicles (%)	0%	5%	10%	0%	13%	0%	2%	50%	1%	67%	0%	50%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	137.8	132.1		144.6	135.5			29.5	29.5	29.5	29.5	
Effective Green, g (s)	139.8	133.1		146.6	136.5			30.5	30.5	30.5	30.5	
Actuated g/C Ratio	0.74	0.70		0.77	0.72			0.16	0.16	0.16	0.16	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	605	2404		154	2295			171	256	83	249	
v/s Ratio Prot	0.00	c0.59		c0.03	0.19						0.07	
v/s Ratio Perm	0.06			0.35				c0.15	0.03	0.01		
v/c Ratio	0.08	0.84		0.49	0.27			0.91	0.18	0.08	0.47	
Uniform Delay, d1	6.9	20.6		32.2	9.3			78.4	68.9	67.9	72.4	
Progression Factor	0.46	0.36		3.07	0.49			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	2.6		2.3	0.3			44.2	0.3	0.4	1.4	
Delay (s)	3.2	10.1		101.3	4.8			122.6	69.3	68.3	73.7	
Level of Service	A	B		F	A			F	E	E	E	
Approach Delay (s)		9.9			15.2			93.7			73.4	
Approach LOS		A			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	269	1562	7	146	449	76	49	664	118	174	605	257
v/c Ratio	0.70	0.82	0.01	1.42	0.26	0.10	0.49	0.91	0.25	0.79	0.73	0.35
Control Delay	109.9	29.7	0.0	281.5	21.9	3.5	102.9	90.7	9.9	133.7	108.9	8.9
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.5
Total Delay	109.9	30.3	0.0	281.5	21.9	3.5	102.9	90.7	9.9	133.7	111.8	9.4
Queue Length 50th (ft)	175	482	0	~249	69	1	60	429	13	118	284	1
Queue Length 95th (ft)	208	712	m0	#399	246	m13	112	#530	59	m#175	488	m107
Internal Link Dist (ft)		798			1037			554			265	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	458	1916	960	103	1747	730	110	748	479	222	828	768
Starvation Cap Reductn	0	101	0	0	0	0	0	0	0	0	129	208
Spillback Cap Reductn	0	64	0	0	0	0	0	0	1	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.86	0.01	1.42	0.26	0.10	0.45	0.89	0.25	0.78	0.87	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	261	1515	7	142	436	74	48	644	114	169	587	249
Future Volume (vph)	261	1515	7	142	436	74	48	644	114	169	587	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	269	1562	7	146	449	76	49	664	118	174	605	257
RTOR Reduction (vph)	0	0	3	0	0	29	0	0	72	0	0	145
Lane Group Flow (vph)	269	1562	4	146	449	47	49	664	46	174	605	112
Confl. Peds. (#/hr)	1		2	2		1			2	2		
Heavy Vehicles (%)	2%	2%	2%	17%	2%	27%	2%	2%	4%	16%	5%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	19.9	100.1	108.1	11.2	91.1	103.5	8.0	39.0	50.2	12.4	44.3	64.2
Effective Green, g (s)	21.4	101.6	111.1	12.7	92.6	106.5	9.5	40.5	53.2	13.9	45.8	67.2
Actuated g/C Ratio	0.11	0.53	0.58	0.07	0.49	0.56	0.05	0.21	0.28	0.07	0.24	0.35
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	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	1892	912	103	1724	704	88	754	429	220	828	559
v/s Ratio Prot	0.08	c0.44	0.00	c0.09	0.13	0.00	0.03	c0.19	0.01	c0.06	c0.18	0.02
v/s Ratio Perm			0.00			0.03			0.02			0.05
v/c Ratio	0.70	0.83	0.00	1.42	0.26	0.07	0.56	0.88	0.11	0.79	0.73	0.20
Uniform Delay, d1	81.2	36.8	16.4	88.7	28.6	19.1	88.2	72.4	50.8	86.6	66.4	42.7
Progression Factor	1.26	0.72	1.00	0.80	0.76	0.64	1.00	1.00	1.00	1.29	1.53	1.13
Incremental Delay, d2	4.5	3.5	0.0	234.1	0.4	0.0	7.4	11.7	0.1	17.0	3.3	0.2
Delay (s)	106.6	30.2	16.4	305.1	21.9	12.2	95.6	84.1	50.9	128.5	105.0	48.5
Level of Service	F	C	B	F	C	B	F	F	D	F	F	D
Approach Delay (s)		41.4			82.5			80.1			95.0	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	67.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	32	1812	10	750	34	29
v/c Ratio	0.40	0.59	0.15	0.25	0.30	0.24
Control Delay	107.8	1.9	93.0	3.2	13.3	8.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	107.8	1.9	93.0	3.2	13.3	8.2
Queue Length 50th (ft)	42	71	13	43	0	0
Queue Length 95th (ft)	m63	114	m38	98	18	10
Internal Link Dist (ft)		217		798	247	105
Turn Bay Length (ft)	200		80			
Base Capacity (vph)	82	3097	75	2943	218	236
Starvation Cap Reductn	0	207	0	0	0	0
Spillback Cap Reductn	0	34	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.63	0.13	0.25	0.16	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	1757	1	10	670	57	27	0	6	8	0	20
Future Volume (veh/h)	31	1757	1	10	670	57	27	0	6	8	0	20
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	32	1811	1	10	691	59	28	0	6	8	0	21
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	53	3113	2	27	2781	237	74	0	8	35	3	36
Arrive On Green	0.03	0.86	0.86	0.03	1.00	1.00	0.03	0.00	0.03	0.03	0.00	0.03
Sat Flow, veh/h	1774	3630	2	1774	3300	282	1337	0	286	353	113	1222
Grp Volume(v), veh/h	32	883	929	10	370	380	34	0	0	29	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1812	1623	0	0	1688	0	0
Q Serve(g_s), s	3.4	26.9	26.9	1.1	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.4	26.9	26.9	1.1	0.0	0.0	3.7	0.0	0.0	3.1	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.16	0.82		0.18	0.28		0.72
Lane Grp Cap(c), veh/h	53	1518	1597	27	1491	1527	82	0	0	74	0	0
V/C Ratio(X)	0.60	0.58	0.58	0.37	0.25	0.25	0.41	0.00	0.00	0.39	0.00	0.00
Avail Cap(c_a), veh/h	75	1518	1597	75	1491	1527	216	0	0	218	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	91.0	3.8	3.8	91.2	0.0	0.0	91.2	0.0	0.0	91.0	0.0	0.0
Incr Delay (d2), s/veh	10.4	1.6	1.6	8.1	0.4	0.4	3.3	0.0	0.0	3.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	13.7	14.4	0.6	0.2	0.2	1.9	0.0	0.0	1.6	0.0	0.0
LnGrp Delay(d),s/veh	101.4	5.5	5.4	99.3	0.4	0.4	94.5	0.0	0.0	94.4	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	F			F		
Approach Vol, veh/h		1844			760			34			29	
Approach Delay, s/veh		7.1			1.7			94.5			94.4	
Approach LOS		A			A			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.9	170.0		12.1	10.7	167.2		12.1
Change Period (Y+Rc), s	5.0	7.1		6.5	5.0	7.1		6.5
Max Green Setting (Gmax), s	8.0	139.9		23.5	8.0	139.9		23.5
Max Q Clear Time (g_c+I1), s	3.1	28.9		5.7	5.4	2.0		5.1
Green Ext Time (p_c), s	0.0	51.1		0.1	0.0	8.7		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	7.6
HCM 2010 LOS	A

Lane Group	EBL	NBT	NET	SWL	SWT
Lane Group Flow (vph)	205	64	1723	22	721
v/c Ratio	0.86	0.43	0.66	0.13	0.27
Control Delay	73.9	10.7	3.5	6.4	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.2
Total Delay	73.9	10.7	3.6	6.4	4.7
Queue Length 50th (ft)	130	0	33	3	47
Queue Length 95th (ft)	#247	9	148	13	112
Internal Link Dist (ft)	50	220	755		123
Turn Bay Length (ft)				150	
Base Capacity (vph)	270	223	2599	233	2712
Starvation Cap Reductn	0	0	65	0	1064
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.29	0.68	0.09	0.44

Intersection Summary

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

Movement	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	NEL2	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	181	12	6	9	17	0	36	0	1657	15	21	640
Future Volume (vph)	181	12	6	9	17	0	36	0	1657	15	21	640
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5					6.5			7.1		7.1	7.1
Lane Util. Factor	1.00					1.00			0.95		1.00	0.95
Frpb, ped/bikes	1.00					1.00			1.00		1.00	1.00
Flpb, ped/bikes	1.00					1.00			1.00		1.00	1.00
Frt	0.99					0.92			1.00		1.00	0.99
Flt Protected	0.96					0.98			1.00		0.95	1.00
Satd. Flow (prot)	1664					1696			3535		1770	3488
Flt Permitted	0.96					0.98			1.00		0.09	1.00
Satd. Flow (perm)	1664					1696			3535		161	3488
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	187	12	6	9	18	0	37	0	1708	15	22	660
RTOR Reduction (vph)	93	0	0	0	0	62	0	0	0	0	0	0
Lane Group Flow (vph)	112	0	0	0	0	2	0	0	1723	0	22	721
Confl. Peds. (#/hr)		1	1	1	1			1				
Heavy Vehicles (%)	2%	100%	2%	0%	0%	2%	2%	0%	2%	2%	2%	2%
Turn Type	Prot			Perm	Split	NA		pm+pt	NA		pm+pt	NA
Protected Phases	3				7	7		1	6		5	2
Permitted Phases				7				6			2	
Actuated Green, G (s)	16.5					5.7			136.8		147.7	147.7
Effective Green, g (s)	16.5					5.7			136.8		147.7	147.7
Actuated g/C Ratio	0.09					0.03			0.72		0.78	0.78
Clearance Time (s)	6.5					6.5			7.1		7.1	7.1
Vehicle Extension (s)	3.0					3.0			4.0		3.0	4.0
Lane Grp Cap (vph)	144					50			2545		157	2711
v/s Ratio Prot	c0.07					c0.00			c0.49		0.00	c0.21
v/s Ratio Perm											0.11	
v/c Ratio	0.78					0.04			0.68		0.14	0.27
Uniform Delay, d1	84.9					89.5			14.5		13.2	5.9
Progression Factor	1.00					1.00			0.16		0.89	0.69
Incremental Delay, d2	22.6					0.3			1.2		0.4	0.2
Delay (s)	107.6					89.8			3.6		12.2	4.4
Level of Service	F					F			A		B	A
Approach Delay (s)	107.6					89.8			3.6			4.6
Approach LOS	F					F			A			A

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	27.2
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR	SWR2
Lane Configurations		
Traffic Volume (vph)	53	6
Future Volume (vph)	53	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frpb, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	55	6
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)	1	
Heavy Vehicles (%)	2%	2%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	116	1088	1100
v/c Ratio	0.85	0.21	0.25
Control Delay	117.4	0.1	1.8
Queue Delay	44.1	0.0	0.1
Total Delay	161.5	0.1	2.0
Queue Length 50th (ft)	123	0	56
Queue Length 95th (ft)	#245	0	m63
Internal Link Dist (ft)	220	36	226
Turn Bay Length (ft)			
Base Capacity (vph)	141	5085	4402
Starvation Cap Reductn	0	0	1818
Spillback Cap Reductn	30	83	644
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	1.05	0.22	0.43

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	56	51	0	1001	971	41
Future Volume (vph)	56	51	0	1001	971	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.94			1.00	0.99	
Flt Protected	0.97			1.00	1.00	
Satd. Flow (prot)	1699			5085	5050	
Flt Permitted	0.97			1.00	1.00	
Satd. Flow (perm)	1699			5085	5050	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	55	0	1088	1055	45
RTOR Reduction (vph)	17	0	0	0	2	0
Lane Group Flow (vph)	99	0	0	1088	1098	0
Confl. Peds. (#/hr)			2			2
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	13.4			190.0	165.6	
Effective Green, g (s)	13.4			190.0	165.6	
Actuated g/C Ratio	0.07			1.00	0.87	
Clearance Time (s)	6.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	119			5085	4401	
v/s Ratio Prot	c0.06			0.21	c0.22	
v/s Ratio Perm						
v/c Ratio	0.83			0.21	0.25	
Uniform Delay, d1	87.2			0.0	2.0	
Progression Factor	1.00			1.00	0.87	
Incremental Delay, d2	37.0			0.1	0.1	
Delay (s)	124.2			0.1	1.9	
Level of Service	F			A	A	
Approach Delay (s)	124.2			0.1	1.9	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	35.1%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	227	281	363	13	1116	393	1094
v/c Ratio	1.00	0.50	0.49	0.19	0.96	1.09	0.53
Control Delay	138.3	2.2	3.9	137.4	47.6	129.4	43.4
Queue Delay	0.0	5.4	20.8	0.0	1.7	0.0	0.0
Total Delay	138.3	7.6	24.7	137.4	49.3	129.4	43.4
Queue Length 50th (ft)	285	0	74	17	412	~501	351
Queue Length 95th (ft)	#486	m0	m60	m44	#587	#733	460
Internal Link Dist (ft)	420	47			215		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	227	558	744	161	1165	360	2064
Starvation Cap Reductn	0	213	374	0	16	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.81	0.98	0.08	0.97	1.09	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	99	25	43	43	506	7	5	999	28	4	358
Future Volume (vph)	85	99	25	43	43	506	7	5	999	28	4	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.98			0.90	0.85		1.00	1.00			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1770			1518	1475		1602	4951			1736
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.08
Satd. Flow (perm)		1770			1518	1475		1602	4951			146
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)	92	108	27	47	47	550	8	5	1086	30	4	389
RTOR Reduction (vph)	0	3	0	0	38	239	0	0	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	243	124	0	13	1116	0	0	393
Confl. Peds. (#/hr)			2	2						1		1
Heavy Vehicles (%)	0%	5%	8%	8%	13%	4%	0%	33%	4%	15%	0%	4%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		23.1			64.0	64.0		3.5	43.2			84.2
Effective Green, g (s)		24.1			65.0	65.0		4.5	44.7			85.2
Actuated g/C Ratio		0.13			0.34	0.34		0.02	0.24			0.45
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		224			519	504		37	1164			360
v/s Ratio Prot		c0.13			c0.16	0.08		0.01	0.23			c0.20
v/s Ratio Perm												c0.29
v/c Ratio		1.00			0.47	0.25		0.35	0.96			1.09
Uniform Delay, d1		83.0			49.0	44.9		91.3	71.7			63.9
Progression Factor		1.00			0.02	0.75		1.51	0.40			1.00
Incremental Delay, d2		60.6			0.8	0.3		5.6	17.9			74.3
Delay (s)		143.5			1.6	34.2		143.4	47.0			138.3
Level of Service		F			A	C		F	D			F
Approach Delay (s)		143.5			19.9				48.1			
Approach LOS		F			B				D			

Intersection Summary			
HCM 2000 Control Delay	58.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	990	17
Future Volume (vph)	990	17
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	4932	
Flt Permitted	1.00	
Satd. Flow (perm)	4932	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	1076	18
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1094	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	5%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	73.9	
Effective Green, g (s)	75.4	
Actuated g/C Ratio	0.40	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1957	
v/s Ratio Prot	0.22	
v/s Ratio Perm		
v/c Ratio	0.56	
Uniform Delay, d1	44.4	
Progression Factor	1.00	
Incremental Delay, d2	1.2	
Delay (s)	45.6	
Level of Service	D	
Approach Delay (s)	70.1	
Approach LOS	E	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	530	500	32	201
v/c Ratio	0.26	0.80	0.14	1.10
Control Delay	0.7	88.7	1.2	140.3
Queue Delay	24.3	2.4	0.0	0.7
Total Delay	25.0	91.1	1.2	141.0
Queue Length 50th (ft)	3	284	0	~194
Queue Length 95th (ft)	m3	396	0	#393
Internal Link Dist (ft)	47	1665	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2061	628	272	183
Starvation Cap Reductn	1537	0	0	0
Spillback Cap Reductn	0	52	2	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.01	0.87	0.12	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	438	6	0	437	23	8	0	21	39	1	145
Future Volume (vph)	43	438	6	0	437	23	8	0	21	39	1	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.90			0.89	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		3397			3356			1456			1347	
Flt Permitted		1.00			1.00			0.99			0.99	
Satd. Flow (perm)		3397			3356			1456			1347	
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)	47	476	7	0	475	25	9	0	23	42	1	158
RTOR Reduction (vph)	0	0	0	0	2	0	0	31	0	0	68	0
Lane Group Flow (vph)	0	530	0	0	498	0	0	1	0	0	133	0
Confl. Peds. (#/hr)	1		2	2		1	1		8	8		1
Heavy Vehicles (%)	12%	5%	0%	0%	7%	0%	0%	0%	13%	100%	0%	3%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		114.2			34.2			5.4			15.4	
Effective Green, g (s)		109.3			35.2			6.4			16.4	
Actuated g/C Ratio		0.58			0.19			0.03			0.09	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1954			621			49			116	
v/s Ratio Prot		c0.16			c0.15			c0.00			c0.10	
v/s Ratio Perm												
v/c Ratio		0.27			0.80			0.02			1.15	
Uniform Delay, d1		20.3			74.1			88.8			86.8	
Progression Factor		0.04			1.05			1.00			1.00	
Incremental Delay, d2		0.0			8.6			0.1			129.5	
Delay (s)		0.7			86.7			88.8			216.3	
Level of Service		A			F			F			F	
Approach Delay (s)		0.7			86.7			88.8			216.3	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	71.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues
1: Lobster Ln & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2027 TF PM

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	16	1466	4	2077	547	7	349	99	16
v/c Ratio	0.18	0.40	0.02	0.84	0.47	0.12	1.54	0.30	0.18
Control Delay	19.5	6.7	13.5	21.7	7.4	106.8	323.1	33.6	101.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	6.7	13.5	21.7	7.4	106.8	323.1	33.6	101.3
Queue Length 50th (ft)	2	66	1	420	114	10	~722	49	23
Queue Length 95th (ft)	m8	194	m3	#1828	188	33	m#956	m94	53
Internal Link Dist (ft)		810		1202		100		1663	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	97	3670	293	2459	1161	63	226	328	189
Starvation Cap Reductn	0	590	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.48	0.01	0.84	0.47	0.11	1.54	0.30	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	1346	3	4	0	1911	503	3	0	4	321	8
Future Volume (vph)	15	1346	3	4	0	1911	503	3	0	4	321	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.92		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98		0.95	1.00
Satd. Flow (prot)	1719	5084			1805	3539	1583		1717		1736	1641
Flt Permitted	0.03	1.00			0.14	1.00	1.00		0.98		0.95	1.00
Satd. Flow (perm)	50	5084			268	3539	1583		1717		1736	1641
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)	16	1463	3	4	0	2077	547	3	0	4	349	9
RTOR Reduction (vph)	0	0	0	0	0	0	70	0	0	0	0	86
Lane Group Flow (vph)	16	1466	0	0	4	2077	477	0	7	0	349	13
Heavy Vehicles (%)	5%	2%	0%	0%	0%	2%	2%	0%	0%	0%	4%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	147.5	143.6			142.1	140.9	140.9		3.0		27.7	27.7
Effective Green, g (s)	149.5	145.6			144.1	142.9	142.9		4.0		28.7	28.7
Actuated g/C Ratio	0.68	0.66			0.65	0.65	0.65		0.02		0.13	0.13
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	71	3364			190	2298	1028		31		226	214
v/s Ratio Prot	c0.01	c0.29			0.00	c0.59			c0.00		c0.20	0.01
v/s Ratio Perm	0.15				0.01		0.30					
v/c Ratio	0.23	0.44			0.02	0.90	0.46		0.23		1.54	0.06
Uniform Delay, d1	44.0	17.7			14.3	32.7	19.3		106.5		95.7	83.8
Progression Factor	1.27	0.44			0.97	0.62	0.53		1.00		1.10	9.68
Incremental Delay, d2	1.4	0.4			0.0	5.4	1.2		3.7		265.1	0.2
Delay (s)	57.4	8.1			13.9	25.6	11.5		110.2		370.8	811.9
Level of Service	E	A			B	C	B		F		F	F
Approach Delay (s)		8.6				22.7			110.2			468.3
Approach LOS		A				C			F			F

Intersection Summary			
HCM 2000 Control Delay	62.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	83	10	2	3
Future Volume (vph)	83	10	2	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.97	
Flt Protected			0.96	
Satd. Flow (prot)			1780	
Flt Permitted			0.96	
Satd. Flow (perm)			1780	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	11	2	3
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	16	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.6	
Effective Green, g (s)			8.6	
Actuated g/C Ratio			0.04	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			69	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.23	
Uniform Delay, d1			102.5	
Progression Factor			1.00	
Incremental Delay, d2			1.7	
Delay (s)			104.2	
Level of Service			F	
Approach Delay (s)			104.2	
Approach LOS			F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	122	1292	179	1896	205	175	25	256
v/c Ratio	0.76	0.58	0.61	0.87	1.05	0.35	0.14	0.61
Control Delay	91.5	18.5	27.9	20.3	156.0	8.9	66.7	74.6
Queue Delay	0.0	0.0	0.0	37.6	0.0	0.0	0.0	0.0
Total Delay	91.5	18.5	27.9	57.9	156.0	8.9	66.7	74.6
Queue Length 50th (ft)	130	381	50	644	300	0	29	302
Queue Length 95th (ft)	206	538	m133	348	#482	71	61	406
Internal Link Dist (ft)		1037		810	420			236
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	186	2236	347	2189	219	542	207	464
Starvation Cap Reductn	0	30	0	113	0	0	0	0
Spillback Cap Reductn	0	0	0	431	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.59	0.52	1.08	0.94	0.32	0.12	0.55

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	1149	40	165	1738	6	60	129	161	23	113	122
Future Volume (vph)	112	1149	40	165	1738	6	60	129	161	23	113	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1626	3524		1805	3538			1870	1615	1805	1752	
Flt Permitted	0.03	1.00		0.15	1.00			0.45	1.00	0.43	1.00	
Satd. Flow (perm)	53	3524		286	3538			859	1615	815	1752	
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)	122	1249	43	179	1889	7	65	140	175	25	123	133
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	135	0	19	0
Lane Group Flow (vph)	122	1291	0	179	1896	0	0	205	40	25	237	0
Heavy Vehicles (%)	11%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	154.9	138.6		148.3	135.3			49.1	49.1	49.1	49.1	
Effective Green, g (s)	156.9	139.6		150.3	136.3			50.1	50.1	50.1	50.1	
Actuated g/C Ratio	0.71	0.63		0.68	0.62			0.23	0.23	0.23	0.23	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	161	2236		292	2191			195	367	185	398	
v/s Ratio Prot	c0.06	0.37		0.04	c0.54						0.14	
v/s Ratio Perm	0.48			0.38				c0.24	0.02	0.03		
v/c Ratio	0.76	0.58		0.61	0.87			1.05	0.11	0.14	0.60	
Uniform Delay, d1	74.6	23.2		18.9	34.3			85.0	67.3	67.7	75.9	
Progression Factor	1.08	0.71		2.09	0.47			1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.0	1.0		2.1	2.8			78.6	0.1	0.3	2.4	
Delay (s)	97.4	17.5		41.5	19.0			163.6	67.4	68.0	78.3	
Level of Service	F	B		D	B			F	E	E	E	
Approach Delay (s)		24.4			21.0			119.3			77.4	
Approach LOS		C			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	232	943	30	149	1630	118	173	547	117	193	591	366
v/c Ratio	0.77	0.49	0.03	0.90	0.83	0.12	1.33	0.85	0.24	0.66	0.83	0.73
Control Delay	146.4	23.4	0.1	112.8	33.0	6.7	259.8	101.0	11.8	148.1	95.8	35.6
Queue Delay	0.0	0.2	0.0	0.0	33.8	0.0	0.0	0.0	0.0	0.0	7.6	1.3
Total Delay	146.4	23.6	0.1	112.8	66.8	6.7	259.8	101.0	11.8	148.1	103.4	36.9
Queue Length 50th (ft)	182	256	0	223	1221	46	~323	410	22	149	301	107
Queue Length 95th (ft)	#244	278	0	m#276	1315	m42	#509	484	67	m197	366	171
Internal Link Dist (ft)		798			1037			554			265	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	305	1917	1006	166	1956	986	130	680	488	340	799	503
Starvation Cap Reductn	0	308	0	0	429	0	0	0	0	0	168	38
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.59	0.03	0.90	1.07	0.12	1.33	0.80	0.24	0.57	0.94	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	905	29	143	1565	113	166	525	112	185	567	351
Future Volume (vph)	223	905	29	143	1565	113	166	525	112	185	567	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3539	1615	1770	3574	1510	1805	3539	1571	3400	3574	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	232	943	30	149	1630	118	173	547	117	193	591	366
RTOR Reduction (vph)	0	0	12	0	0	21	0	0	67	0	0	61
Lane Group Flow (vph)	232	943	18	149	1630	97	173	547	50	193	591	305
Confl. Peds. (#/hr)	4					4	1		7	7		1
Heavy Vehicles (%)	1%	2%	0%	2%	1%	5%	0%	2%	1%	3%	1%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	17.6	117.7	132.1	19.2	119.0	136.5	14.4	38.3	57.5	17.5	42.3	59.9
Effective Green, g (s)	19.1	119.2	135.1	20.7	120.5	139.5	15.9	39.8	60.5	19.0	43.8	62.9
Actuated g/C Ratio	0.09	0.54	0.61	0.09	0.55	0.63	0.07	0.18	0.28	0.09	0.20	0.29
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	300	1917	991	166	1957	957	130	640	432	293	711	452
v/s Ratio Prot	c0.07	0.27	0.00	0.08	c0.46	0.01	c0.10	0.15	0.01	0.06	c0.17	0.06
v/s Ratio Perm			0.01			0.06			0.02			0.13
v/c Ratio	0.77	0.49	0.02	0.90	0.83	0.10	1.33	0.85	0.12	0.66	0.83	0.68
Uniform Delay, d1	98.3	31.5	16.6	98.6	41.4	15.7	102.0	87.3	59.7	97.4	84.6	69.5
Progression Factor	1.34	0.70	0.03	0.87	0.72	0.86	1.00	1.00	1.00	1.41	1.01	0.54
Incremental Delay, d2	11.0	0.8	0.0	25.3	2.2	0.0	192.0	10.8	0.1	5.1	8.0	3.9
Delay (s)	142.3	22.9	0.6	111.1	32.0	13.5	294.1	98.1	59.9	142.9	93.6	41.2
Level of Service	F	C	A	F	C	B	F	F	E	F	F	D
Approach Delay (s)		45.3			37.1			133.3			85.2	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	65.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	46	1186	24	2248	55	47
v/c Ratio	0.55	0.40	0.38	0.78	0.56	0.42
Control Delay	141.5	2.9	124.8	5.2	50.2	33.9
Queue Delay	0.0	0.2	0.0	0.8	1.9	1.0
Total Delay	141.5	3.1	124.8	6.1	52.1	34.9
Queue Length 50th (ft)	63	284	36	126	15	3
Queue Length 95th (ft)	m#149	110	m43	m217	69	53
Internal Link Dist (ft)		199		798	108	109
Turn Bay Length (ft)	200		100			
Base Capacity (vph)	83	2990	63	2893	168	199
Starvation Cap Reductn	0	774	0	329	0	0
Spillback Cap Reductn	0	0	0	114	45	55
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.54	0.38	0.88	0.45	0.33

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	1102	1	22	2014	76	39	0	12	8	0	35
Future Volume (veh/h)	43	1102	1	22	2014	76	39	0	12	8	0	35
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	46	1185	1	24	2166	82	42	0	13	9	0	38
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	3056	3	43	2903	109	79	2	16	30	6	67
Arrive On Green	0.03	0.84	0.84	0.05	1.00	1.00	0.05	0.00	0.05	0.05	0.00	0.05
Sat Flow, veh/h	1774	3629	3	1774	3478	131	1027	34	329	210	115	1373
Grp Volume(v), veh/h	46	578	608	24	1095	1153	55	0	0	47	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1839	1390	0	0	1698	0	0
Q Serve(g_s), s	5.7	16.8	16.9	2.9	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.7	16.8	16.9	2.9	0.0	0.0	8.6	0.0	0.0	6.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.07	0.76		0.24	0.19		0.81
Lane Grp Cap(c), veh/h	56	1490	1568	43	1477	1535	97	0	0	103	0	0
V/C Ratio(X)	0.81	0.39	0.39	0.55	0.74	0.75	0.57	0.00	0.00	0.46	0.00	0.00
Avail Cap(c_a), veh/h	56	1490	1568	56	1477	1535	172	0	0	185	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.40	0.40	0.40	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	105.9	4.1	4.1	103.4	0.0	0.0	103.6	0.0	0.0	102.4	0.0	0.0
Incr Delay (d2), s/veh	58.5	0.8	0.7	4.3	1.4	1.4	5.1	0.0	0.0	3.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	8.5	8.9	1.5	0.6	0.6	3.5	0.0	0.0	2.9	0.0	0.0
LnGrp Delay(d),s/veh	164.4	4.8	4.8	107.8	1.4	1.4	108.7	0.0	0.0	105.6	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	F			F		
Approach Vol, veh/h		1232			2272			55			47	
Approach Delay, s/veh		10.8			2.5			108.7			105.6	
Approach LOS		B			A			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.4	192.4		17.3	12.0	190.7		17.3
Change Period (Y+Rc), s	5.0	7.1		6.5	5.0	7.1		6.5
Max Green Setting (Gmax), s	7.0	171.9		22.5	7.0	171.9		22.5
Max Q Clear Time (g_c+I1), s	4.9	18.9		10.6	7.7	2.0		8.0
Green Ext Time (p_c), s	0.0	18.7		0.1	0.0	105.9		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Lane Group	EBL	NBT	NEL2	NET	SWL	SWT
Lane Group Flow (vph)	157	99	6	1169	26	2167
v/c Ratio	0.84	0.61	0.05	0.45	0.08	0.83
Control Delay	128.9	37.8	2.2	2.8	7.6	13.0
Queue Delay	0.0	0.0	0.0	0.1	0.0	1.1
Total Delay	128.9	37.8	2.2	2.9	7.6	14.0
Queue Length 50th (ft)	226	16	0	77	7	410
Queue Length 95th (ft)	#350	88	m1	84	m13	545
Internal Link Dist (ft)	48	220		755		141
Turn Bay Length (ft)			120		150	
Base Capacity (vph)	198	213	128	2578	350	2626
Starvation Cap Reductn	0	0	0	401	0	228
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.46	0.05	0.54	0.07	0.90

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	NEL2	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	138	8	4	24	40	0	30	6	1100	10	25	1904
Future Volume (vph)	138	8	4	24	40	0	30	6	1100	10	25	1904
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0					5.0		5.6	5.1		5.6	5.1
Lane Util. Factor	1.00					1.00		1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Frt	0.99					0.96		1.00	1.00		1.00	0.99
Flt Protected	0.96					0.97		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1745					1708		1805	3534		1805	3424
Flt Permitted	0.96					0.97		0.04	1.00		0.20	1.00
Satd. Flow (perm)	1745					1708		72	3534		373	3424
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	145	8	4	25	42	0	32	6	1158	11	26	2004
RTOR Reduction (vph)	0	0	0	0	0	84	0	0	0	0	0	0
Lane Group Flow (vph)	157	0	0	0	0	15	0	6	1169	0	26	2167
Confl. Peds. (#/hr)		4	2	2	2			2		4	4	
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	9%	0%	2%	0%	0%	4%
Turn Type	Prot			Perm	Split	NA		pm+pt	NA		pm+pt	NA
Protected Phases	3				7	7		1	6		5	2
Permitted Phases				7				6			2	
Actuated Green, G (s)	22.2					8.4		158.2	157.0		166.2	161.0
Effective Green, g (s)	23.7					9.9		161.2	159.0		169.2	163.0
Actuated g/C Ratio	0.11					0.05		0.73	0.72		0.77	0.74
Clearance Time (s)	6.5					6.5		7.1	7.1		7.1	7.1
Vehicle Extension (s)	3.0					3.0		3.0	4.0		3.0	4.0
Lane Grp Cap (vph)	187					76		74	2554		330	2536
v/s Ratio Prot	c0.09					c0.01		0.00	0.33		c0.00	c0.63
v/s Ratio Perm								0.06			0.06	
v/c Ratio	0.84					0.20		0.08	0.46		0.08	0.85
Uniform Delay, d1	96.3					101.2		26.8	12.6		8.2	20.1
Progression Factor	1.00					1.00		0.20	0.17		1.15	0.59
Incremental Delay, d2	26.8					1.3		0.4	0.6		0.1	2.6
Delay (s)	123.0					102.5		5.8	2.7		9.5	14.4
Level of Service	F					F		A	A		A	B
Approach Delay (s)	123.0					102.5			2.7			14.4
Approach LOS	F					F			A			B

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR	SWR2
Lane Configurations		
Traffic Volume (vph)	146	9
Future Volume (vph)	146	9
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frpb, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	154	9
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)	2	
Heavy Vehicles (%)	4%	25%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	138	895	1156
v/c Ratio	0.86	0.18	0.26
Control Delay	124.7	0.1	2.0
Queue Delay	0.0	0.0	0.1
Total Delay	124.7	0.1	2.1
Queue Length 50th (ft)	171	0	58
Queue Length 95th (ft)	#295	0	64
Internal Link Dist (ft)	220	36	242
Turn Bay Length (ft)			
Base Capacity (vph)	172	5085	4396
Starvation Cap Reductn	0	0	1741
Spillback Cap Reductn	0	0	14
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.80	0.18	0.44

Intersection Summary

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

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	62	72	0	868	1064	57
Future Volume (vph)	62	72	0	868	1064	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.93			1.00	0.99	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1689			5085	5046	
Flt Permitted	0.98			1.00	1.00	
Satd. Flow (perm)	1689			5085	5046	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	64	74	0	895	1097	59
RTOR Reduction (vph)	19	0	0	0	2	0
Lane Group Flow (vph)	119	0	0	895	1154	0
Confl. Peds. (#/hr)	1		3			
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	18.4			220.0	191.6	
Effective Green, g (s)	18.4			220.0	191.6	
Actuated g/C Ratio	0.08			1.00	0.87	
Clearance Time (s)	5.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	141			5085	4394	
v/s Ratio Prot	c0.07			0.18	c0.23	
v/s Ratio Perm						
v/c Ratio	0.84			0.18	0.26	
Uniform Delay, d1	99.4			0.0	2.4	
Progression Factor	1.00			1.00	0.79	
Incremental Delay, d2	34.2			0.1	0.1	
Delay (s)	133.6			0.1	2.0	
Level of Service	F			A	A	
Approach Delay (s)	133.6			0.1	2.0	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	460	443	31	976	477	1146
v/c Ratio	0.72	0.79	0.61	0.37	0.55	1.32	0.49
Control Delay	123.7	6.2	5.0	147.0	22.1	196.6	43.4
Queue Delay	0.0	53.1	55.3	0.0	1.0	0.0	0.0
Total Delay	123.7	59.3	60.4	147.0	23.2	196.6	43.4
Queue Length 50th (ft)	132	90	94	46	120	~724	439
Queue Length 95th (ft)	#244	m50	m55	m89	134	#975	498
Internal Link Dist (ft)	420	47			199		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	130	587	735	198	1783	362	2316
Starvation Cap Reductn	0	170	332	0	514	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.10	1.10	0.16	0.77	1.32	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	27	45	18	60	98	708	12	17	890	47	2	456
Future Volume (vph)	27	45	18	60	98	708	12	17	890	47	2	456
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		0.99			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.97			0.90	0.85		1.00	0.99			1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1810			1614	1534		1805	4988			1787
Flt Permitted		0.99			0.99	1.00		0.95	1.00			0.16
Satd. Flow (perm)		1810			1614	1534		1805	4988			306
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	47	19	62	102	738	12	18	927	49	2	475
RTOR Reduction (vph)	0	4	0	0	30	207	0	0	0	0	0	0
Lane Group Flow (vph)	0	90	0	0	430	236	0	31	976	0	0	477
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	3%	7%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	pm+pt	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases							2				6	6
Actuated Green, G (s)		14.4			73.7	73.7		8.1	77.3			113.2
Effective Green, g (s)		15.4			74.7	74.7		9.1	78.8			114.2
Actuated g/C Ratio		0.07			0.34	0.34		0.04	0.36			0.52
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		126			548	520		74	1786			361
v/s Ratio Prot		c0.05			c0.27	0.15		0.02	0.20			c0.18
v/s Ratio Perm												c0.50
v/c Ratio		0.72			0.79	0.45		0.42	0.55			1.32
Uniform Delay, d1		100.2			65.4	56.7		102.9	56.3			47.9
Progression Factor		1.00			0.09	0.30		1.34	0.37			1.00
Incremental Delay, d2		18.1			0.8	0.1		3.8	1.2			162.8
Delay (s)		118.3			6.5	17.0		141.4	22.0			210.7
Level of Service		F			A	B		F	C			F
Approach Delay (s)		118.3			11.7				25.7			
Approach LOS		F			B				C			

Intersection Summary			
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1024	76
Future Volume (vph)	1024	76
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	5040	
Flt Permitted	1.00	
Satd. Flow (perm)	5040	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1067	79
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1146	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	98.3	
Effective Green, g (s)	99.8	
Actuated g/C Ratio	0.45	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2286	
v/s Ratio Prot	0.23	
v/s Ratio Perm		
v/c Ratio	0.50	
Uniform Delay, d1	42.5	
Progression Factor	1.00	
Incremental Delay, d2	0.8	
Delay (s)	43.3	
Level of Service	D	
Approach Delay (s)	92.5	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	583	834	20	158
v/c Ratio	0.27	1.11	0.28	0.89
Control Delay	1.3	136.7	83.8	85.5
Queue Delay	28.8	0.5	0.0	0.4
Total Delay	30.0	137.2	83.8	85.9
Queue Length 50th (ft)	7	~717	19	102
Queue Length 95th (ft)	m7	#862	55	#246
Internal Link Dist (ft)	47	1663	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2130	749	80	187
Starvation Cap Reductn	1564	0	0	0
Spillback Cap Reductn	0	61	0	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	1.21	0.25	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	396	11	0	733	51	9	3	7	22	3	124
Future Volume (vph)	141	396	11	0	733	51	9	3	7	22	3	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.96			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.95			0.89	
Flt Protected		0.99			1.00			0.98			0.99	
Satd. Flow (prot)		3459			3537			1702			1642	
Flt Permitted		0.99			1.00			0.98			0.99	
Satd. Flow (perm)		3459			3537			1702			1642	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	150	421	12	0	780	54	10	3	7	23	3	132
RTOR Reduction (vph)	0	1	0	0	2	0	0	7	0	0	84	0
Lane Group Flow (vph)	0	582	0	0	832	0	0	13	0	0	74	0
Confl. Peds. (#/hr)			2	2					12	12		
Heavy Vehicles (%)	2%	3%	0%	0%	1%	2%	0%	0%	0%	13%	0%	0%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		134.5			45.5			7.5			11.7	
Effective Green, g (s)		129.6			46.5			8.5			12.7	
Actuated g/C Ratio		0.59			0.21			0.04			0.06	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		2037			747			65			94	
v/s Ratio Prot		c0.17			c0.24			c0.01			c0.05	
v/s Ratio Perm												
v/c Ratio		0.29			1.11			0.20			0.79	
Uniform Delay, d1		22.3			86.8			102.5			102.3	
Progression Factor		0.06			0.91			1.00			1.00	
Incremental Delay, d2		0.0			68.1			0.6			32.1	
Delay (s)		1.4			147.3			103.0			134.4	
Level of Service		A			F			F			F	
Approach Delay (s)		1.4			147.3			103.0			134.4	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	92.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2027 TF SAT

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	22	1758	8	1659	637	6	229	50	14
v/c Ratio	0.15	0.54	0.05	0.77	0.59	0.07	0.84	0.12	0.12
Control Delay	23.1	20.6	6.1	22.6	12.0	69.3	104.9	7.6	63.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	20.6	6.1	22.6	12.0	69.3	104.9	7.6	63.7
Queue Length 50th (ft)	7	224	1	906	439	6	237	6	13
Queue Length 95th (ft)	m21	#576	m2	#1236	671	22	#365	28	34
Internal Link Dist (ft)		810		1202		100		1665	220
Turn Bay Length (ft)	130		80		600				
Base Capacity (vph)	152	3274	164	2165	1087	94	282	419	264
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.54	0.05	0.77	0.59	0.06	0.81	0.12	0.05

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	1614	4	6	1	1526	586	4	0	2	211	2
Future Volume (vph)	20	1614	4	6	1	1526	586	4	0	2	211	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		0.95		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97		0.95	1.00
Satd. Flow (prot)	1805	5035			1621	3539	1583		1756		1787	1626
Flt Permitted	0.05	1.00			0.08	1.00	1.00		0.97		0.95	1.00
Satd. Flow (perm)	93	5035			134	3539	1583		1756		1787	1626
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)	22	1754	4	7	1	1659	637	4	0	2	229	2
RTOR Reduction (vph)	0	0	0	0	0	0	142	0	0	0	0	42
Lane Group Flow (vph)	22	1758	0	0	8	1659	495	0	6	0	229	8
Heavy Vehicles (%)	0%	3%	0%	13%	0%	2%	2%	0%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	84.8	80.9			79.8	78.4	78.4		1.5		22.0	22.0
Effective Green, g (s)	86.8	82.9			81.8	80.4	80.4		2.5		23.0	23.0
Actuated g/C Ratio	0.58	0.55			0.55	0.54	0.54		0.02		0.15	0.15
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	109	2782			96	1896	848		29		274	249
v/s Ratio Prot	c0.01	0.35			0.00	c0.47			c0.00		c0.13	0.00
v/s Ratio Perm	0.11				0.04		0.31					
v/c Ratio	0.20	0.63			0.08	0.88	0.58		0.21		0.84	0.03
Uniform Delay, d1	27.1	23.1			18.5	30.4	23.5		72.8		61.7	54.0
Progression Factor	1.50	1.10			0.36	0.77	0.81		1.00		1.31	1.00
Incremental Delay, d2	0.7	0.8			0.3	5.0	2.4		3.5		20.9	0.1
Delay (s)	41.3	26.2			7.0	28.4	21.5		76.3		101.9	54.1
Level of Service	D	C			A	C	C		E		F	D
Approach Delay (s)		26.3				26.4			76.3			93.4
Approach LOS		C				C			E			F

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	44	3	1	9
Future Volume (vph)	44	3	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.90	
Flt Protected			0.99	
Satd. Flow (prot)			1693	
Flt Permitted			0.99	
Satd. Flow (perm)			1693	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	3	1	10
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	14	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.3	
Effective Green, g (s)			8.3	
Actuated g/C Ratio			0.06	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			93	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.15	
Uniform Delay, d1			67.5	
Progression Factor			1.00	
Incremental Delay, d2			0.8	
Delay (s)			68.2	
Level of Service			E	
Approach Delay (s)			68.2	
Approach LOS			E	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	176	1582	151	1444	143	105	46	269
v/c Ratio	0.55	0.72	0.59	0.69	0.78	0.28	0.25	0.79
Control Delay	39.1	14.6	50.7	11.6	84.7	9.7	53.1	65.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	14.6	50.7	11.6	84.7	9.7	53.1	65.8
Queue Length 50th (ft)	70	175	83	69	135	0	39	221
Queue Length 95th (ft)	m138	906	m139	249	204	50	75	305
Internal Link Dist (ft)		1037		810	420			173
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	460	2188	449	2104	292	535	294	523
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.72	0.34	0.69	0.49	0.20	0.16	0.51

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	1422	33	139	1318	10	27	105	97	42	118	130
Future Volume (vph)	162	1422	33	139	1318	10	27	105	97	42	118	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3527		1805	3536			1881	1568	1719	1694	
Flt Permitted	0.10	1.00		0.09	1.00			0.52	1.00	0.55	1.00	
Satd. Flow (perm)	188	3527		167	3536			996	1568	1001	1694	
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)	176	1546	36	151	1433	11	29	114	105	46	128	141
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	86	0	30	0
Lane Group Flow (vph)	176	1581	0	151	1444	0	0	143	19	46	239	0
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	0%	3%	5%	7%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	107.8	92.0		100.4	88.3			26.6	26.6	26.6	26.6	
Effective Green, g (s)	109.8	93.0		102.4	89.3			27.6	27.6	27.6	27.6	
Actuated g/C Ratio	0.73	0.62		0.68	0.60			0.18	0.18	0.18	0.18	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	318	2186		257	2105			183	288	184	311	
v/s Ratio Prot	c0.06	c0.45		0.05	0.41						0.14	
v/s Ratio Perm	0.34			0.35				c0.14	0.01	0.05		
v/c Ratio	0.55	0.72		0.59	0.69			0.78	0.07	0.25	0.77	
Uniform Delay, d1	18.3	19.6		19.0	20.8			58.3	50.6	52.3	58.2	
Progression Factor	2.72	0.58		2.72	0.45			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	1.7		2.2	1.2			19.2	0.1	0.7	10.8	
Delay (s)	51.5	13.1		53.7	10.5			77.5	50.7	53.1	69.0	
Level of Service	D	B		D	B			E	D	D	E	
Approach Delay (s)		16.9			14.6			66.1			66.7	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	318	1205	52	154	1184	95	165	568	165	210	657	419
v/c Ratio	0.73	0.78	0.06	0.88	0.83	0.12	0.93	0.73	0.30	0.59	0.80	0.67
Control Delay	85.8	37.4	1.0	88.7	32.7	3.1	117.7	60.2	7.4	91.4	75.2	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1
Total Delay	85.8	37.4	1.0	88.7	32.7	3.1	117.7	60.2	7.4	91.4	75.9	26.1
Queue Length 50th (ft)	169	376	1	138	187	0	163	273	19	111	271	39
Queue Length 95th (ft)	200	598	m5	m#273	539	m17	#311	334	56	156	381	246
Internal Link Dist (ft)		798			1037			554			265	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	447	1540	850	176	1430	827	177	854	556	411	948	629
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	86	11
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.78	0.06	0.88	0.83	0.11	0.93	0.67	0.30	0.51	0.76	0.68

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	1157	50	148	1137	91	158	545	158	202	631	402
Future Volume (vph)	305	1157	50	148	1137	91	158	545	158	202	631	402
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1536	1805	3539	1536	1787	3539	1519	3433	3539	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1536	1805	3539	1536	1787	3539	1519	3433	3539	1570
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	318	1205	52	154	1184	95	165	568	165	210	657	419
RTOR Reduction (vph)	0	0	24	0	0	41	0	0	87	0	0	80
Lane Group Flow (vph)	318	1205	28	154	1184	54	165	568	78	210	657	339
Confl. Peds. (#/hr)	1		1	1		1	1		4	4		1
Heavy Vehicles (%)	2%	2%	4%	0%	2%	4%	1%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	17.6	63.8	77.2	13.2	59.1	73.3	13.4	31.5	44.7	14.2	33.2	50.8
Effective Green, g (s)	19.1	65.3	80.2	14.7	60.6	76.3	14.9	33.0	47.7	15.7	34.7	53.8
Actuated g/C Ratio	0.13	0.44	0.53	0.10	0.40	0.51	0.10	0.22	0.32	0.10	0.23	0.36
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	437	1540	821	176	1429	781	177	778	483	359	818	563
v/s Ratio Prot	0.09	c0.34	0.00	0.09	c0.33	0.01	c0.09	0.16	0.02	0.06	c0.19	0.08
v/s Ratio Perm			0.01			0.03			0.04			0.14
v/c Ratio	0.73	0.78	0.03	0.88	0.83	0.07	0.93	0.73	0.16	0.58	0.80	0.60
Uniform Delay, d1	62.9	36.3	16.5	66.7	40.0	18.8	67.0	54.4	36.8	64.0	54.4	39.4
Progression Factor	1.22	0.90	1.29	0.83	0.68	0.61	1.00	1.00	1.00	1.33	1.24	0.84
Incremental Delay, d2	5.2	3.5	0.0	27.9	4.3	0.0	48.2	3.5	0.2	2.3	5.5	1.8
Delay (s)	82.0	36.3	21.4	83.1	31.6	11.5	115.2	57.9	36.9	87.3	73.2	34.7
Level of Service	F	D	C	F	C	B	F	E	D	F	E	C
Approach Delay (s)		45.0			35.8			64.6			63.0	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	50.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	48	1538	28	1745	50	53
v/c Ratio	0.47	0.53	0.31	0.62	0.34	0.34
Control Delay	75.1	5.0	60.3	8.3	12.8	14.5
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	75.1	5.1	60.3	8.3	12.8	14.5
Queue Length 50th (ft)	48	133	27	198	0	0
Queue Length 95th (ft)	m80	252	m36	326	26	30
Internal Link Dist (ft)		171		798	125	94
Turn Bay Length (ft)	200		80			
Base Capacity (vph)	102	2913	90	2805	274	290
Starvation Cap Reductn	0	282	0	63	0	0
Spillback Cap Reductn	0	0	0	54	1	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.58	0.31	0.64	0.18	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	1489	3	27	1602	90	35	0	14	10	0	42
Future Volume (veh/h)	47	1489	3	27	1602	90	35	0	14	10	0	42
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	48	1535	3	28	1652	93	36	0	14	10	0	43
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	72	2900	6	57	2698	151	90	1	19	38	4	60
Arrive On Green	0.04	0.80	0.80	0.06	1.00	1.00	0.04	0.00	0.04	0.04	0.00	0.04
Sat Flow, veh/h	1774	3624	7	1774	3407	191	1106	32	442	224	94	1366
Grp Volume(v), veh/h	48	749	789	28	853	892	50	0	0	53	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1861	1774	1770	1828	1580	0	0	1683	0	0
Q Serve(g_s), s	4.0	22.0	22.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.0	22.0	22.0	2.3	0.0	0.0	4.5	0.0	0.0	4.5	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.10	0.72		0.28	0.19		0.81
Lane Grp Cap(c), veh/h	72	1416	1489	57	1401	1448	110	0	0	102	0	0
V/C Ratio(X)	0.67	0.53	0.53	0.49	0.61	0.62	0.45	0.00	0.00	0.52	0.00	0.00
Avail Cap(c_a), veh/h	83	1416	1489	83	1401	1448	261	0	0	266	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.50	0.50	0.50	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	71.0	5.2	5.2	69.0	0.0	0.0	70.7	0.0	0.0	70.8	0.0	0.0
Incr Delay (d2), s/veh	15.8	1.4	1.4	3.2	1.0	1.0	2.9	0.0	0.0	4.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	11.2	11.7	1.2	0.4	0.4	2.1	0.0	0.0	2.3	0.0	0.0
LnGrp Delay(d),s/veh	86.8	6.6	6.6	72.2	1.0	1.0	73.6	0.0	0.0	74.8	0.0	0.0
LnGrp LOS	F	A	A	E	A	A	E			E		
Approach Vol, veh/h		1586			1773			50			53	
Approach Delay, s/veh		9.0			2.1			73.6			74.8	
Approach LOS		A			A			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.8	127.1		13.1	11.1	125.9		13.1
Change Period (Y+Rc), s	5.0	7.1		6.5	5.0	7.1		6.5
Max Green Setting (Gmax), s	7.0	101.9		22.5	7.0	101.9		22.5
Max Q Clear Time (g_c+I1), s	4.3	24.0		6.5	6.0	2.0		6.5
Green Ext Time (p_c), s	0.0	30.8		0.1	0.0	42.7		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.4
HCM 2010 LOS	A

Lane Group	EBL	NBT	NEL2	NET	SWL	SWT
Lane Group Flow (vph)	101	46	8	1600	18	1734
v/c Ratio	0.57	0.23	0.04	0.63	0.08	0.66
Control Delay	76.7	2.5	5.2	6.1	2.6	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	76.7	2.5	5.2	6.1	2.6	4.2
Queue Length 50th (ft)	96	0	1	90	1	46
Queue Length 95th (ft)	158	0	m4	327	m2	291
Internal Link Dist (ft)	53	220		755		169
Turn Bay Length (ft)			120		150	
Base Capacity (vph)	215	310	282	2528	299	2644
Starvation Cap Reductn	0	0	0	36	0	104
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.15	0.03	0.64	0.06	0.68

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	NEL2	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	90	1	6	14	9	0	21	8	1521	15	17	1600
Future Volume (vph)	90	1	6	14	9	0	21	8	1521	15	17	1600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0					5.0		5.6	5.1		5.6	5.1
Lane Util. Factor	1.00					1.00		1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Frt	0.99					0.94		1.00	1.00		1.00	0.99
Flt Protected	0.96					0.97		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1794					1732		1805	3534		1805	3518
Flt Permitted	0.96					0.97		0.09	1.00		0.10	1.00
Satd. Flow (perm)	1794					1732		164	3534		189	3518
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	94	1	6	15	9	0	22	8	1584	16	18	1667
RTOR Reduction (vph)	0	0	0	0	0	44	0	0	0	0	0	0
Lane Group Flow (vph)	101	0	0	0	0	2	0	8	1600	0	18	1734
Confl. Peds. (#/hr)			7	7	3			3		4	4	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%
Turn Type	Prot			Perm	Split	NA		pm+pt	NA		pm+pt	NA
Protected Phases	3				7	7		1	6		5	2
Permitted Phases				7				6			2	
Actuated Green, G (s)	13.3					4.5		102.5	101.3		107.5	103.8
Effective Green, g (s)	14.8					6.0		105.5	103.3		110.5	105.8
Actuated g/C Ratio	0.10					0.04		0.70	0.69		0.74	0.71
Clearance Time (s)	6.5					6.5		7.1	7.1		7.1	7.1
Vehicle Extension (s)	3.0					3.0		3.0	4.0		3.0	4.0
Lane Grp Cap (vph)	177					69		144	2433		195	2481
v/s Ratio Prot	c0.06					c0.00		0.00	0.45		c0.00	c0.49
v/s Ratio Perm								0.04			0.06	
v/c Ratio	0.57					0.03		0.06	0.66		0.09	0.70
Uniform Delay, d1	64.6					69.2		11.6	13.3		10.5	12.8
Progression Factor	1.00					1.00		0.89	0.38		0.37	0.28
Incremental Delay, d2	4.4					0.2		0.1	1.2		0.2	1.4
Delay (s)	69.0					69.4		10.5	6.2		4.1	5.0
Level of Service	E					E		B	A		A	A
Approach Delay (s)	69.0					69.4			6.3			5.0
Approach LOS	E					E			A			A

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR	SWR2
Lanes, Configurations		
Traffic Volume (vph)	59	6
Future Volume (vph)	59	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frpb, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	61	6
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)		3
Heavy Vehicles (%)	0%	0%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		

Intersection Summary

Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	161	1018	1331
v/c Ratio	0.77	0.20	0.32
Control Delay	77.1	0.1	1.2
Queue Delay	0.1	0.0	0.1
Total Delay	77.2	0.1	1.2
Queue Length 50th (ft)	129	0	10
Queue Length 95th (ft)	209	0	27
Internal Link Dist (ft)	220	36	223
Turn Bay Length (ft)			
Base Capacity (vph)	249	5085	4155
Starvation Cap Reductn	0	0	1126
Spillback Cap Reductn	1	0	258
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.65	0.20	0.44

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	78	75	0	967	1195	69
Future Volume (vph)	78	75	0	967	1195	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			4.0	5.0	
Lane Util. Factor	1.00			0.91	0.91	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.93			1.00	0.99	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1696			5085	5037	
Flt Permitted	0.98			1.00	1.00	
Satd. Flow (perm)	1696			5085	5037	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	82	79	0	1018	1258	73
RTOR Reduction (vph)	24	0	0	0	4	0
Lane Group Flow (vph)	137	0	0	1018	1327	0
Confl. Peds. (#/hr)	1		4			4
Turn Type	Prot			NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases						
Actuated Green, G (s)	16.4			150.0	123.6	
Effective Green, g (s)	16.4			150.0	123.6	
Actuated g/C Ratio	0.11			1.00	0.82	
Clearance Time (s)	5.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	185			5085	4150	
v/s Ratio Prot	c0.08			0.20	c0.26	
v/s Ratio Perm						
v/c Ratio	0.74			0.20	0.32	
Uniform Delay, d1	64.7			0.0	3.2	
Progression Factor	1.00			1.00	0.30	
Incremental Delay, d2	14.7			0.1	0.2	
Delay (s)	79.4			0.1	1.1	
Level of Service	E			A	A	
Approach Delay (s)	79.4			0.1	1.1	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	183	329	25	1033	409	1274
v/c Ratio	0.29	0.32	0.44	0.25	0.77	1.44	0.68
Control Delay	56.4	1.3	4.4	88.2	50.3	250.8	44.1
Queue Delay	0.0	1.0	2.0	0.0	0.0	0.4	0.0
Total Delay	56.4	2.4	6.4	88.2	50.3	251.3	44.1
Queue Length 50th (ft)	51	0	67	25	201	~514	412
Queue Length 95th (ft)	98	0	117	m59	278	#843	#560
Internal Link Dist (ft)	420	47			218		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	220	615	773	165	1339	284	1887
Starvation Cap Reductn	0	244	296	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	10	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.49	0.69	0.15	0.77	1.49	0.68

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	25	23	14	44	39	414	12	13	966	36	5	392
Future Volume (vph)	25	23	14	44	39	414	12	13	966	36	5	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frt		0.97			0.92	0.85		1.00	0.99			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1807			1544	1504		1750	5060			1787
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.09
Satd. Flow (perm)		1807			1544	1504		1750	5060			169
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	24	14	45	40	427	12	13	996	37	5	404
RTOR Reduction (vph)	0	6	0	0	32	215	0	0	0	0	0	0
Lane Group Flow (vph)	0	58	0	0	151	114	0	25	1033	0	0	409
Heavy Vehicles (%)	0%	0%	0%	3%	20%	2%	0%	6%	2%	1%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		16.5			50.9	50.9		5.3	38.3			63.9
Effective Green, g (s)		17.5			51.9	51.9		6.3	39.8			64.9
Actuated g/C Ratio		0.12			0.35	0.35		0.04	0.27			0.43
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		210			534	520		73	1342			286
v/s Ratio Prot		c0.03			c0.10	0.08		0.01	0.20			c0.19
v/s Ratio Perm												c0.43
v/c Ratio		0.28			0.28	0.22		0.34	0.77			1.43
Uniform Delay, d1		60.5			35.6	34.7		69.8	50.9			46.9
Progression Factor		1.00			0.00	0.90		1.24	0.90			1.00
Incremental Delay, d2		0.8			0.6	0.5		2.8	4.2			212.6
Delay (s)		61.3			0.7	31.8		89.1	50.0			259.4
Level of Service		E			A	C		F	D			F
Approach Delay (s)		61.3			20.7				50.9			
Approach LOS		E			C				D			

Intersection Summary			
HCM 2000 Control Delay	69.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1204	32
Future Volume (vph)	1204	32
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5068	
Flt Permitted	1.00	
Satd. Flow (perm)	5068	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	1241	33
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1274	0
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	51.8	
Effective Green, g (s)	53.3	
Actuated g/C Ratio	0.36	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1800	
v/s Ratio Prot	0.25	
v/s Ratio Perm		
v/c Ratio	0.71	
Uniform Delay, d1	41.6	
Progression Factor	1.00	
Incremental Delay, d2	2.4	
Delay (s)	44.0	
Level of Service	D	
Approach Delay (s)	96.4	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	496	453	14	119
v/c Ratio	0.24	0.61	0.17	0.47
Control Delay	2.4	65.9	59.0	6.1
Queue Delay	56.2	0.3	0.0	0.0
Total Delay	58.6	66.1	59.0	6.2
Queue Length 50th (ft)	10	192	10	0
Queue Length 95th (ft)	m10	292	35	0
Internal Link Dist (ft)	47	1665	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2059	827	137	299
Starvation Cap Reductn	1637	0	0	0
Spillback Cap Reductn	0	71	0	3
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.18	0.60	0.10	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	359	7	0	395	22	8	1	4	20	0	89
Future Volume (vph)	90	359	7	0	395	22	8	1	4	20	0	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.96			0.89	
Flt Protected		0.99			1.00			0.97			0.99	
Satd. Flow (prot)		3538			3482			1738			1649	
Flt Permitted		0.99			1.00			0.97			0.99	
Satd. Flow (perm)		3538			3482			1738			1649	
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)	98	390	8	0	429	24	9	1	4	22	0	97
RTOR Reduction (vph)	0	1	0	0	3	0	0	4	0	0	114	0
Lane Group Flow (vph)	0	495	0	0	450	0	0	10	0	0	5	0
Confl. Peds. (#/hr)									8	8		
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		87.3			30.9			5.8			5.2	
Effective Green, g (s)		82.4			31.9			6.8			6.2	
Actuated g/C Ratio		0.55			0.21			0.05			0.04	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1943			740			78			68	
v/s Ratio Prot		c0.14			c0.13			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio		0.25			0.61			0.13			0.07	
Uniform Delay, d1		17.7			53.4			68.8			69.1	
Progression Factor		0.16			1.20			1.00			1.00	
Incremental Delay, d2		0.0			1.9			0.3			0.2	
Delay (s)		2.8			65.8			69.0			69.3	
Level of Service		A			E			E			E	
Approach Delay (s)		2.8			65.8			69.0			69.3	
Approach LOS		A			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	128	399	425	224	22	443	523	74	19	436	45	35
Average Queue (ft)	13	132	137	113	1	206	209	6	1	270	8	4
95th Queue (ft)	66	303	314	223	13	421	437	35	9	393	31	21
Link Distance (ft)		764	764			1199	1199	1199	114	1669	1669	213
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		10	3	2		25						
Queuing Penalty (veh)		4	23	17		0						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	56	260	264	171	366	349	425	287	119	251
Average Queue (ft)	18	114	119	75	123	106	213	125	14	126
95th Queue (ft)	47	240	245	161	453	427	389	245	64	229
Link Distance (ft)		984	984		764	764	447	447		235
Upstream Blk Time (%)					3	3	3	1		2
Queuing Penalty (veh)					9	8	0	0		0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				1	16				1	19
Queuing Penalty (veh)				3	11				1	1

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	203	223	517	525	23	475	940	930	75	225	513	529
Average Queue (ft)	117	137	322	337	3	422	534	319	18	83	338	332
95th Queue (ft)	184	203	476	488	15	568	1222	947	55	218	528	528
Link Distance (ft)			774	774			984	984			515	515
Upstream Blk Time (%)							16	2			4	4
Queuing Penalty (veh)							53	8			0	0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)				1		54	6			0	39	30
Queuing Penalty (veh)				0		118	8			1	19	34

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	B127	SB	SB	SB	SB	SB
Directions Served	R	T	L	L	T	T	R
Maximum Queue (ft)	250	118	190	210	291	296	225
Average Queue (ft)	120	37	98	111	245	252	141
95th Queue (ft)	300	239	180	198	325	332	300
Link Distance (ft)		697		229	229	229	
Upstream Blk Time (%)			0	1	33	33	1
Queuing Penalty (veh)			0	2	113	113	0
Storage Bay Dist (ft)	225		300				200
Storage Blk Time (%)	0		0	1		43	0
Queuing Penalty (veh)	0		0	1		108	1

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	85	163	158	51	96	125	94	75
Average Queue (ft)	35	58	61	13	26	35	25	21
95th Queue (ft)	75	146	151	39	78	97	67	56
Link Distance (ft)		160	160		774	774	254	128
Upstream Blk Time (%)		1	0					
Queuing Penalty (veh)		5	4					
Storage Bay Dist (ft)	200			80				
Storage Blk Time (%)		1		0	1			
Queuing Penalty (veh)		0		0	0			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	NB	NE	NE	SW	SW	SW
Directions Served	<LR>	<LTR	T	TR	L	T	TR>
Maximum Queue (ft)	91	134	179	176	42	130	142
Average Queue (ft)	54	41	48	50	11	49	65
95th Queue (ft)	78	101	128	131	32	119	140
Link Distance (ft)	43	226	747	747		126	126
Upstream Blk Time (%)	88					1	2
Queuing Penalty (veh)	176					3	7
Storage Bay Dist (ft)					150		
Storage Blk Time (%)			1			1	
Queuing Penalty (veh)			0			0	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	NB	NB	NB	SB	SB	SB	B15	B15
Directions Served	LR	T	T	T	T	T	TR	T	T
Maximum Queue (ft)	232	8	10	14	105	179	218	3	4
Average Queue (ft)	130	1	1	2	18	49	69	0	0
95th Queue (ft)	242	11	16	22	62	133	175	3	4
Link Distance (ft)	241	67	67	67	244	244	244	225	225
Upstream Blk Time (%)	9	0	0	0		0	1		
Queuing Penalty (veh)	0	0	0	1		0	2		
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B15	B15	B15	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	T	UL	T
Maximum Queue (ft)	452	67	59	111	300	309	311	138	183	191	494	831
Average Queue (ft)	332	19	43	16	212	230	238	25	37	40	396	400
95th Queue (ft)	512	51	61	65	341	360	364	118	144	149	563	878
Link Distance (ft)	433	37	37		225	225	225	244	244	244		958
Upstream Blk Time (%)	18	6	52		10	12	15	0	0	1		5
Queuing Penalty (veh)	0	19	153		37	43	51	1	1	2		0
Storage Bay Dist (ft)				135							470	
Storage Blk Time (%)					29						22	0
Queuing Penalty (veh)					4						74	0

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	761	554
Average Queue (ft)	376	295
95th Queue (ft)	751	497
Link Distance (ft)	958	958
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	56	52	527	533	87	318
Average Queue (ft)	26	6	332	320	25	287
95th Queue (ft)	46	32	596	584	64	317
Link Distance (ft)	37	37	1669	1669	158	259
Upstream Blk Time (%)	4	2				96
Queuing Penalty (veh)	9	4				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1251

Intersection: 1: Lobster Ln & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	93	157	148	129	52	1266	1256	1262	50	1240	637	60
Average Queue (ft)	8	65	65	55	4	1079	1098	777	10	803	217	15
95th Queue (ft)	45	148	146	126	27	1483	1492	1695	34	1300	663	44
Link Distance (ft)		764	764			1192	1192	1192	111	1666	1666	213
Upstream Blk Time (%)						9	16	5				
Queuing Penalty (veh)						70	132	37				
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)	0	2				28						
Queuing Penalty (veh)	0	0				1						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	234	320	333	174	440	452	428	121	145	283
Average Queue (ft)	93	145	145	89	198	211	235	58	35	219
95th Queue (ft)	187	294	300	176	364	371	408	108	119	333
Link Distance (ft)		982	982		764	764	447	447		268
Upstream Blk Time (%)							4			13
Queuing Penalty (veh)							0			0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				1	25					44
Queuing Penalty (veh)				5	41					10

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	197	202	337	326	42	475	795	830	375	225	586	588
Average Queue (ft)	116	130	190	193	10	168	392	428	114	220	550	303
95th Queue (ft)	181	192	334	331	34	366	769	820	377	230	620	667
Link Distance (ft)			774	774			982	982			515	515
Upstream Blk Time (%)											65	4
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)							7	16	0	95	6	18
Queuing Penalty (veh)							11	18	1	248	9	20

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	B127	SB	SB	SB	SB	SB
Directions Served	R	T	L	L	T	T	R
Maximum Queue (ft)	250	736	181	186	293	293	225
Average Queue (ft)	57	533	79	87	199	221	173
95th Queue (ft)	215	1010	150	163	298	324	280
Link Distance (ft)		697		229	229	229	
Upstream Blk Time (%)		52	0	0	13	18	4
Queuing Penalty (veh)		0	0	0	47	66	0
Storage Bay Dist (ft)	225		300				200
Storage Blk Time (%)	0		0	0		22	12
Queuing Penalty (veh)	0		0	0		76	33

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	160	218	211	83	358	349	129	99
Average Queue (ft)	49	80	78	28	91	110	56	36
95th Queue (ft)	110	210	206	68	257	275	114	81
Link Distance (ft)		204	204		774	774	125	133
Upstream Blk Time (%)	0	1	1				3	0
Queuing Penalty (veh)	0	5	5				0	0
Storage Bay Dist (ft)	200			100				
Storage Blk Time (%)	0	1		1	8			
Queuing Penalty (veh)	0	0		8	2			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	NB	NE	NE	NE	SW	SW	SW
Directions Served	<LR>	<LTR	<	T	TR	L	T	TR>
Maximum Queue (ft)	70	200	31	174	161	70	192	197
Average Queue (ft)	50	87	4	53	51	10	142	143
95th Queue (ft)	65	177	20	126	124	39	236	234
Link Distance (ft)	46	226		747	747		160	160
Upstream Blk Time (%)	82	1				0	17	19
Queuing Penalty (veh)	122	0				0	178	196
Storage Bay Dist (ft)			120			150		
Storage Blk Time (%)				1		0	18	
Queuing Penalty (veh)				0		0	5	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB
Directions Served	LR	T	T	TR
Maximum Queue (ft)	266	82	192	221
Average Queue (ft)	160	13	60	82
95th Queue (ft)	275	51	165	207
Link Distance (ft)	241	260	260	260
Upstream Blk Time (%)	8			0
Queuing Penalty (veh)	0			0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	UL	T	T	TR
Maximum Queue (ft)	223	52	58	114	162	168	198	495	997	973	971
Average Queue (ft)	112	18	42	33	88	87	99	494	965	781	404
95th Queue (ft)	209	47	62	83	147	146	174	497	1051	1317	913
Link Distance (ft)	434	38	38		209	209	209		958	958	958
Upstream Blk Time (%)		9	54			0	0		77	9	0
Queuing Penalty (veh)		41	235			0	1		0	0	0
Storage Bay Dist (ft)				135				470			
Storage Blk Time (%)					4			86	1		
Queuing Penalty (veh)					1			293	3		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	51	47	1191	1183	76	296
Average Queue (ft)	23	8	964	968	20	250
95th Queue (ft)	46	31	1258	1281	59	336
Link Distance (ft)	38	38	1666	1666	158	259
Upstream Blk Time (%)	5	2				69
Queuing Penalty (veh)	15	4				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1941

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	TR>	<LR
Maximum Queue (ft)	118	463	467	225	59	962	1031	652	46	312	103	50
Average Queue (ft)	12	252	241	182	6	381	398	103	9	181	39	10
95th Queue (ft)	58	407	405	261	29	914	936	562	32	284	82	34
Link Distance (ft)		764	764			1190	1190	1190	109	1669	1669	213
Upstream Blk Time (%)						1	1	0				
Queuing Penalty (veh)						4	6	2				
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		21	10	6	0	28						
Queuing Penalty (veh)		4	52	32	0	2						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	225	372	394	175	777	780	259	133	145	242
Average Queue (ft)	103	111	123	130	390	403	110	52	55	182
95th Queue (ft)	190	248	261	217	776	789	211	105	139	260
Link Distance (ft)		981	981		764	764	447	447		205
Upstream Blk Time (%)					2	2				17
Queuing Penalty (veh)					12	15				0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				2	37				1	39
Queuing Penalty (veh)				13	52				2	16

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	221	222	524	519	110	475	1008	1005	375	225	447	400
Average Queue (ft)	114	129	324	333	18	331	774	788	242	183	277	233
95th Queue (ft)	187	193	474	483	76	626	1196	1201	525	272	464	374
Link Distance (ft)			769	769			981	981			515	515
Upstream Blk Time (%)							2	2			1	
Queuing Penalty (veh)							14	18			0	
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)			0	0		1	46	58	0	37	6	5
Queuing Penalty (veh)			0	0		4	68	53	1	100	9	8

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	250	134	143	239	252	225
Average Queue (ft)	74	62	71	148	160	126
95th Queue (ft)	217	119	131	255	272	254
Link Distance (ft)			229	229	229	
Upstream Blk Time (%)				5	7	1
Queuing Penalty (veh)				20	31	0
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0				11	4
Queuing Penalty (veh)	0				44	13

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	127	188	192	99	307	329	100	106
Average Queue (ft)	42	110	109	26	183	211	34	39
95th Queue (ft)	98	193	190	68	303	318	79	83
Link Distance (ft)		174	174		769	769	134	122
Upstream Blk Time (%)	0	2	2				0	1
Queuing Penalty (veh)	0	17	14				0	0
Storage Bay Dist (ft)	200			80				
Storage Blk Time (%)	0	2		1	17			
Queuing Penalty (veh)	0	1		8	5			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	NB	NE	NE	NE	SW	SW	SW
Directions Served	<LR>	<LTR	<	T	TR	L	T	TR>
Maximum Queue (ft)	66	90	31	175	174	64	206	212
Average Queue (ft)	48	28	6	70	70	9	87	107
95th Queue (ft)	68	71	24	142	139	39	182	197
Link Distance (ft)	51	226		747	747		186	186
Upstream Blk Time (%)	47						1	2
Queuing Penalty (veh)	46						8	13
Storage Bay Dist (ft)			120			150		
Storage Blk Time (%)				2			2	
Queuing Penalty (veh)				0			0	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	SB	SB	SB	B16	B16
Directions Served	LR	T	T	TR	T	T
Maximum Queue (ft)	244	34	172	257	33	94
Average Queue (ft)	124	5	17	33	1	4
95th Queue (ft)	221	23	84	135	23	49
Link Distance (ft)	241	240	240	240	227	227
Upstream Blk Time (%)	1		0	0		0
Queuing Penalty (veh)	0		0	2		0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B16	B16	B16	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	T	UL	T
Maximum Queue (ft)	119	73	65	142	279	278	293	7	14	24	495	983
Average Queue (ft)	50	22	35	25	182	187	199	0	0	1	489	878
95th Queue (ft)	102	57	65	85	260	263	276	4	8	12	542	1229
Link Distance (ft)	434	37	37		227	227	227	240	240	240		958
Upstream Blk Time (%)		5	19		7	9	14					60
Queuing Penalty (veh)		12	47		23	31	49					0
Storage Bay Dist (ft)				135							470	
Storage Blk Time (%)				0	42						79	0
Queuing Penalty (veh)				0	10						317	0

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	979	972
Average Queue (ft)	838	601
95th Queue (ft)	1218	1076
Link Distance (ft)	958	958
Upstream Blk Time (%)	16	1
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	53	32	289	288	47	188
Average Queue (ft)	29	7	167	171	12	74
95th Queue (ft)	45	28	254	256	38	154
Link Distance (ft)	37	37	1669	1669	158	259
Upstream Blk Time (%)	4	0				0
Queuing Penalty (veh)	9	1				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1212

Queues

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2027 TF AM MIT

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	40	2247	1	687	258	1	280	11	5
v/c Ratio	0.09	0.69	0.01	0.35	0.25	0.02	0.85	0.03	0.06
Control Delay	5.3	9.7	45.0	42.7	22.5	89.0	124.9	0.1	82.2
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	9.9	45.0	42.7	22.5	89.0	124.9	0.1	82.2
Queue Length 50th (ft)	3	49	1	344	117	1	332	0	6
Queue Length 95th (ft)	m16	#1211	m4	439	211	9	m449	m0	22
Internal Link Dist (ft)		810		1204		100		1665	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	482	3279	119	1953	1018	67	360	469	175
Starvation Cap Reductn	0	351	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.77	0.01	0.35	0.25	0.01	0.78	0.02	0.03

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	37	2066	1	1	0	632	237	1	0	258	1	9
Future Volume (vph)	37	2066	1	1	0	632	237	1	0	258	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0	6.3	6.3	
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00	0.95	0.95	
Frt	1.00	1.00			1.00	1.00	0.85		1.00	1.00	0.86	
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (prot)	1805	4987			1805	3223	1524		1805	1603	1559	
Flt Permitted	0.32	1.00			0.04	1.00	1.00		0.95	0.95	1.00	
Satd. Flow (perm)	601	4987			74	3223	1524		1805	1603	1559	
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)	40	2246	1	1	0	687	258	1	0	280	1	10
RTOR Reduction (vph)	0	0	0	0	0	0	109	0	0	0	9	0
Lane Group Flow (vph)	40	2247	0	0	1	687	149	0	1	280	2	0
Heavy Vehicles (%)	0%	4%	0%	0%	0%	12%	6%	0%	0%	7%	0%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA	Split	NA	
Protected Phases	5	2		1	1	6		7	7	3	3	
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	113.0	106.9			103.2	102.0	102.0		1.3	37.9	37.9	
Effective Green, g (s)	115.0	108.9			105.2	104.0	104.0		2.3	38.9	38.9	
Actuated g/C Ratio	0.61	0.57			0.55	0.55	0.55		0.01	0.20	0.20	
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0	7.3	7.3	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	5.0	5.0	
Lane Grp Cap (vph)	408	2858			61	1764	834		21	328	319	
v/s Ratio Prot	c0.00	c0.45			0.00	0.21			c0.00	c0.17	0.00	
v/s Ratio Perm	0.06				0.01		0.10					
v/c Ratio	0.10	0.79			0.02	0.39	0.18		0.05	0.85	0.01	
Uniform Delay, d1	16.3	31.5			27.7	24.7	21.6		92.8	72.8	60.2	
Progression Factor	0.31	0.31			2.18	1.83	5.32		1.00	1.41	1.00	
Incremental Delay, d2	0.1	1.4			0.1	0.6	0.5		0.9	19.9	0.0	
Delay (s)	5.2	11.2			60.3	45.9	115.2		93.7	122.6	60.2	
Level of Service	A	B			E	D	F		F	F	E	
Approach Delay (s)		11.0				64.8			93.7		120.3	
Approach LOS		B				E			F		F	

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NEL2	NEL	NER
Lane Configurations			
Traffic Volume (vph)	2	0	3
Future Volume (vph)	2	0	3
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)		5.6	
Lane Util. Factor		1.00	
Frt		0.92	
Flt Protected		0.98	
Satd. Flow (prot)		1427	
Flt Permitted		0.98	
Satd. Flow (perm)		1427	
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	2	0	3
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	5	0
Heavy Vehicles (%)	50%	0%	0%
Turn Type	Prot	Prot	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)		5.8	
Effective Green, g (s)		6.8	
Actuated g/C Ratio		0.04	
Clearance Time (s)		6.6	
Vehicle Extension (s)		3.0	
Lane Grp Cap (vph)		51	
v/s Ratio Prot		c0.00	
v/s Ratio Perm			
v/c Ratio		0.10	
Uniform Delay, d1		88.6	
Progression Factor		1.00	
Incremental Delay, d2		0.8	
Delay (s)		89.5	
Level of Service		F	
Approach Delay (s)		89.5	
Approach LOS		F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	51	2012	75	619	156	185	7	126
v/c Ratio	0.08	0.84	0.49	0.27	0.91	0.47	0.08	0.49
Control Delay	3.1	11.6	63.6	5.2	126.6	15.3	65.3	70.3
Queue Delay	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	12.4	63.6	5.2	126.6	15.3	65.3	70.3
Queue Length 50th (ft)	8	202	49	45	195	21	8	132
Queue Length 95th (ft)	m12	247	137	54	277	96	24	194
Internal Link Dist (ft)		1037		810	420			201
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	710	2405	243	2315	230	475	112	345
Starvation Cap Reductn	0	37	0	0	0	0	0	0
Spillback Cap Reductn	0	150	0	0	0	7	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.89	0.31	0.27	0.68	0.40	0.06	0.37

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1838	13	69	569	1	33	110	170	6	78	38
Future Volume (vph)	47	1838	13	69	569	1	33	110	170	6	78	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3433		1805	3195			1352	1599	1081	1554	
Flt Permitted	0.41	1.00		0.04	1.00			0.78	1.00	0.46	1.00	
Satd. Flow (perm)	774	3433		81	3195			1067	1599	522	1554	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	1998	14	75	618	1	36	120	185	7	85	41
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	139	0	10	0
Lane Group Flow (vph)	51	2012	0	75	619	0	0	156	46	7	116	0
Heavy Vehicles (%)	0%	5%	10%	0%	13%	0%	2%	50%	1%	67%	0%	50%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	137.8	132.1		144.6	135.5			29.5	29.5	29.5	29.5	
Effective Green, g (s)	139.8	133.1		146.6	136.5			30.5	30.5	30.5	30.5	
Actuated g/C Ratio	0.74	0.70		0.77	0.72			0.16	0.16	0.16	0.16	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	605	2404		154	2295			171	256	83	249	
v/s Ratio Prot	0.00	c0.59		c0.03	0.19						0.07	
v/s Ratio Perm	0.06			0.35				c0.15	0.03	0.01		
v/c Ratio	0.08	0.84		0.49	0.27			0.91	0.18	0.08	0.47	
Uniform Delay, d1	6.9	20.6		32.2	9.3			78.4	68.9	67.9	72.4	
Progression Factor	0.49	0.37		3.07	0.48			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	2.6		2.3	0.3			44.2	0.3	0.4	1.4	
Delay (s)	3.4	10.3		101.3	4.8			122.6	69.3	68.3	73.7	
Level of Service	A	B		F	A			F	E	E	E	
Approach Delay (s)		10.1			15.2			93.7			73.4	
Approach LOS		B			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	269	1562	7	146	449	76	49	664	118	174	605	257
v/c Ratio	0.70	0.82	0.01	1.42	0.26	0.11	0.45	0.89	0.24	0.79	0.73	0.35
Control Delay	110.6	31.1	0.0	281.2	23.1	4.3	98.6	87.2	9.6	132.5	110.4	8.3
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.5
Total Delay	110.6	31.6	0.0	281.2	23.1	4.3	98.6	87.2	9.6	132.5	113.9	8.8
Queue Length 50th (ft)	175	538	0	~248	70	1	60	423	13	118	280	2
Queue Length 95th (ft)	209	732	m0	#399	257	m17	111	505	58	#176	488	100
Internal Link Dist (ft)		798			1037			554			265	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	458	1897	968	103	1728	723	129	786	488	222	831	769
Starvation Cap Reductn	0	96	0	0	0	0	0	0	0	0	142	211
Spillback Cap Reductn	0	63	0	0	0	0	0	0	1	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.87	0.01	1.42	0.26	0.11	0.38	0.84	0.24	0.78	0.88	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	261	1515	7	142	436	74	48	644	114	169	587	249
Future Volume (vph)	261	1515	7	142	436	74	48	644	114	169	587	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1560	1543	3539	1256	1770	3539	1534	3019	3438	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	269	1562	7	146	449	76	49	664	118	174	605	257
RTOR Reduction (vph)	0	0	3	0	0	29	0	0	71	0	0	145
Lane Group Flow (vph)	269	1562	4	146	449	47	49	664	47	174	605	112
Confl. Peds. (#/hr)	1		2	2		1			2	2		
Heavy Vehicles (%)	2%	2%	2%	17%	2%	27%	2%	2%	4%	16%	5%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	19.9	99.0	107.9	11.2	90.0	102.4	8.9	40.1	51.3	12.4	44.5	64.4
Effective Green, g (s)	21.4	100.5	110.9	12.7	91.5	105.4	10.4	41.6	54.3	13.9	46.0	67.4
Actuated g/C Ratio	0.11	0.53	0.58	0.07	0.48	0.55	0.05	0.22	0.29	0.07	0.24	0.35
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	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	1871	910	103	1704	696	96	774	438	220	832	561
v/s Ratio Prot	0.08	c0.44	0.00	c0.09	0.13	0.00	0.03	c0.19	0.01	c0.06	c0.18	0.02
v/s Ratio Perm			0.00			0.03			0.02			0.05
v/c Ratio	0.70	0.83	0.00	1.42	0.26	0.07	0.51	0.86	0.11	0.79	0.73	0.20
Uniform Delay, d1	81.2	37.7	16.5	88.7	29.2	19.6	87.3	71.4	50.0	86.6	66.2	42.6
Progression Factor	1.27	0.74	1.00	0.79	0.77	0.76	1.00	1.00	1.00	1.27	1.56	1.05
Incremental Delay, d2	4.5	3.8	0.0	234.1	0.4	0.0	4.5	9.3	0.1	17.1	3.1	0.2
Delay (s)	107.3	31.6	16.5	304.3	23.0	15.0	91.8	80.7	50.1	127.3	106.4	45.0
Level of Service	F	C	B	F	C	B	F	F	D	F	F	D
Approach Delay (s)		42.6			83.3			77.0			94.7	
Approach LOS		D			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	67.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	32	1812	10	750	34	29
v/c Ratio	0.05	0.58	0.04	0.25	0.30	0.24
Control Delay	1.0	1.8	2.0	2.8	13.3	8.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	1.0	1.9	2.0	2.8	13.3	8.2
Queue Length 50th (ft)	2	71	1	41	0	0
Queue Length 95th (ft)	m5	113	m5	84	18	10
Internal Link Dist (ft)		217		798	247	105
Turn Bay Length (ft)	200		80			
Base Capacity (vph)	639	3103	244	2972	218	236
Starvation Cap Reductn	0	208	0	0	0	0
Spillback Cap Reductn	0	54	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.63	0.04	0.25	0.16	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	1757	1	10	670	57	27	0	6	8	0	20
Future Volume (veh/h)	31	1757	1	10	670	57	27	0	6	8	0	20
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	32	1811	1	10	691	59	28	0	6	8	0	21
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	688	3113	2	249	2781	237	74	0	8	35	3	36
Arrive On Green	0.03	0.86	0.86	0.03	1.00	1.00	0.03	0.00	0.03	0.03	0.00	0.03
Sat Flow, veh/h	1774	3630	2	1774	3300	282	1337	0	286	353	113	1222
Grp Volume(v), veh/h	32	883	929	10	370	380	34	0	0	29	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1812	1623	0	0	1688	0	0
Q Serve(g_s), s	0.4	26.9	26.9	0.2	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	26.9	26.9	0.2	0.0	0.0	3.7	0.0	0.0	3.1	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.16	0.82		0.18	0.28		0.72
Lane Grp Cap(c), veh/h	688	1518	1597	249	1491	1527	82	0	0	74	0	0
V/C Ratio(X)	0.05	0.58	0.58	0.04	0.25	0.25	0.41	0.00	0.00	0.39	0.00	0.00
Avail Cap(c_a), veh/h	710	1518	1597	297	1491	1527	216	0	0	218	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.6	3.8	3.8	3.5	0.0	0.0	91.2	0.0	0.0	91.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.6	1.6	0.1	0.4	0.4	3.3	0.0	0.0	3.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	13.7	14.4	0.1	0.2	0.2	1.9	0.0	0.0	1.6	0.0	0.0
LnGrp Delay(d),s/veh	1.6	5.5	5.4	3.5	0.4	0.4	94.5	0.0	0.0	94.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	F			F		
Approach Vol, veh/h		1844			760			34			29	
Approach Delay, s/veh		5.4			0.4			94.5			94.4	
Approach LOS		A			A			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.9	170.0		12.1	10.7	167.2		12.1
Change Period (Y+Rc), s	5.0	7.1		6.5	5.0	7.1		6.5
Max Green Setting (Gmax), s	8.0	139.9		23.5	8.0	139.9		23.5
Max Q Clear Time (g_c+I1), s	2.2	28.9		5.7	2.4	2.0		5.1
Green Ext Time (p_c), s	0.0	51.1		0.1	0.0	8.7		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	6.1
HCM 2010 LOS	A

Lane Group	EBL	NBT	NET	SWL	SWT
Lane Group Flow (vph)	205	64	1723	22	721
v/c Ratio	0.86	0.43	0.66	0.13	0.27
Control Delay	73.9	10.7	3.5	6.4	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.2
Total Delay	73.9	10.7	3.6	6.4	4.8
Queue Length 50th (ft)	130	0	33	3	48
Queue Length 95th (ft)	#247	9	148	13	112
Internal Link Dist (ft)	50	220	755		123
Turn Bay Length (ft)				150	
Base Capacity (vph)	270	223	2599	233	2712
Starvation Cap Reductn	0	0	65	0	1077
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.29	0.68	0.09	0.44

Intersection Summary

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

Movement	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	NEL2	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	181	12	6	9	17	0	36	0	1657	15	21	640
Future Volume (vph)	181	12	6	9	17	0	36	0	1657	15	21	640
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5					6.5			7.1		7.1	7.1
Lane Util. Factor	1.00					1.00			0.95		1.00	0.95
Frpb, ped/bikes	1.00					1.00			1.00		1.00	1.00
Flpb, ped/bikes	1.00					1.00			1.00		1.00	1.00
Frt	0.99					0.92			1.00		1.00	0.99
Flt Protected	0.96					0.98			1.00		0.95	1.00
Satd. Flow (prot)	1664					1696			3535		1770	3488
Flt Permitted	0.96					0.98			1.00		0.09	1.00
Satd. Flow (perm)	1664					1696			3535		161	3488
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	187	12	6	9	18	0	37	0	1708	15	22	660
RTOR Reduction (vph)	93	0	0	0	0	62	0	0	0	0	0	0
Lane Group Flow (vph)	112	0	0	0	0	2	0	0	1723	0	22	721
Confl. Peds. (#/hr)		1	1	1	1			1				
Heavy Vehicles (%)	2%	100%	2%	0%	0%	2%	2%	0%	2%	2%	2%	2%
Turn Type	Prot			Perm	Split	NA		pm+pt	NA		pm+pt	NA
Protected Phases	3				7	7		1	6		5	2
Permitted Phases				7				6			2	
Actuated Green, G (s)	16.5					5.7			136.8		147.7	147.7
Effective Green, g (s)	16.5					5.7			136.8		147.7	147.7
Actuated g/C Ratio	0.09					0.03			0.72		0.78	0.78
Clearance Time (s)	6.5					6.5			7.1		7.1	7.1
Vehicle Extension (s)	3.0					3.0			4.0		3.0	4.0
Lane Grp Cap (vph)	144					50			2545		157	2711
v/s Ratio Prot	c0.07					c0.00			c0.49		0.00	c0.21
v/s Ratio Perm											0.11	
v/c Ratio	0.78					0.04			0.68		0.14	0.27
Uniform Delay, d1	84.9					89.5			14.5		13.2	5.9
Progression Factor	1.00					1.00			0.16		0.89	0.70
Incremental Delay, d2	22.6					0.3			1.2		0.4	0.2
Delay (s)	107.6					89.8			3.6		12.1	4.4
Level of Service	F					F			A		B	A
Approach Delay (s)	107.6					89.8			3.6			4.6
Approach LOS	F					F			A			A

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	27.2
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR	SWR2
Lane Configurations		
Traffic Volume (vph)	53	6
Future Volume (vph)	53	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frpb, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	55	6
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)	1	
Heavy Vehicles (%)	2%	2%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		

Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	61	55	1088	1100
v/c Ratio	0.58	0.37	0.21	0.25
Control Delay	107.0	24.8	0.1	1.6
Queue Delay	0.0	1.2	0.0	0.1
Total Delay	107.0	26.0	0.1	1.8
Queue Length 50th (ft)	76	0	0	55
Queue Length 95th (ft)	132	51	0	m63
Internal Link Dist (ft)	220		36	226
Turn Bay Length (ft)		150		
Base Capacity (vph)	130	167	5085	4455
Starvation Cap Reductn	0	0	0	1852
Spillback Cap Reductn	0	33	74	650
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.47	0.41	0.22	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	56	51	0	1001	971	41
Future Volume (vph)	56	51	0	1001	971	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		5085	5050	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1770	1583		5085	5050	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	55	0	1088	1055	45
RTOR Reduction (vph)	0	52	0	0	2	0
Lane Group Flow (vph)	61	3	0	1088	1098	0
Confl. Peds. (#/hr)			2			2
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases		4				
Actuated Green, G (s)	11.5	11.5		190.0	167.5	
Effective Green, g (s)	11.5	11.5		190.0	167.5	
Actuated g/C Ratio	0.06	0.06		1.00	0.88	
Clearance Time (s)	6.0	6.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0	
Lane Grp Cap (vph)	107	95		5085	4451	
v/s Ratio Prot	c0.03			0.21	c0.22	
v/s Ratio Perm		0.00				
v/c Ratio	0.57	0.04		0.21	0.25	
Uniform Delay, d1	86.8	84.0		0.0	1.7	
Progression Factor	1.00	1.00		1.00	0.88	
Incremental Delay, d2	7.1	0.2		0.1	0.1	
Delay (s)	94.0	84.2		0.1	1.6	
Level of Service	F	F		A	A	
Approach Delay (s)	89.3			0.1	1.6	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	227	281	363	13	1116	393	1094
v/c Ratio	1.00	0.50	0.49	0.19	0.94	1.12	0.53
Control Delay	138.3	2.2	3.9	136.3	45.3	139.4	43.4
Queue Delay	0.0	5.4	20.8	0.0	2.4	0.0	0.0
Total Delay	138.3	7.6	24.7	136.3	47.7	139.4	43.4
Queue Length 50th (ft)	285	0	74	17	412	~513	351
Queue Length 95th (ft)	#486	m0	m60	m44	#540	#745	460
Internal Link Dist (ft)	420	47			215		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	227	558	744	161	1191	350	2064
Starvation Cap Reductn	0	213	374	0	31	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.81	0.98	0.08	0.96	1.12	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	99	25	43	43	506	7	5	999	28	4	358
Future Volume (vph)	85	99	25	43	43	506	7	5	999	28	4	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.98			0.90	0.85		1.00	1.00			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1770			1518	1475		1602	4951			1736
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.08
Satd. Flow (perm)		1770			1518	1475		1602	4951			143
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)	92	108	27	47	47	550	8	5	1086	30	4	389
RTOR Reduction (vph)	0	3	0	0	38	239	0	0	0	0	0	0
Lane Group Flow (vph)	0	224	0	0	243	124	0	13	1116	0	0	393
Confl. Peds. (#/hr)			2	2						1		1
Heavy Vehicles (%)	0%	5%	8%	8%	13%	4%	0%	33%	4%	15%	0%	4%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		23.1			64.0	64.0		3.5	44.2			84.2
Effective Green, g (s)		24.1			65.0	65.0		4.5	45.7			85.2
Actuated g/C Ratio		0.13			0.34	0.34		0.02	0.24			0.45
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		224			519	504		37	1190			350
v/s Ratio Prot		c0.13			c0.16	0.08		0.01	0.23			c0.20
v/s Ratio Perm												c0.30
v/c Ratio		1.00			0.47	0.25		0.35	0.94			1.12
Uniform Delay, d1		83.0			49.0	44.9		91.3	70.8			64.0
Progression Factor		1.00			0.02	0.75		1.50	0.43			1.00
Incremental Delay, d2		60.6			0.8	0.3		5.6	14.7			85.6
Delay (s)		143.5			1.6	34.2		142.3	44.9			149.6
Level of Service		F			A	C		F	D			F
Approach Delay (s)		143.5			19.9				46.0			
Approach LOS		F			B				D			

Intersection Summary			
HCM 2000 Control Delay	59.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	990	17
Future Volume (vph)	990	17
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	4932	
Flt Permitted	1.00	
Satd. Flow (perm)	4932	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	1076	18
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1094	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	5%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	73.9	
Effective Green, g (s)	75.4	
Actuated g/C Ratio	0.40	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1957	
v/s Ratio Prot	0.22	
v/s Ratio Perm		
v/c Ratio	0.56	
Uniform Delay, d1	44.4	
Progression Factor	1.00	
Incremental Delay, d2	1.2	
Delay (s)	45.6	
Level of Service	D	
Approach Delay (s)	73.1	
Approach LOS	E	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	530	500	32	201
v/c Ratio	0.26	0.80	0.14	1.10
Control Delay	0.6	88.7	1.2	140.3
Queue Delay	28.8	2.4	0.0	0.7
Total Delay	29.5	91.1	1.2	141.0
Queue Length 50th (ft)	2	273	0	~194
Queue Length 95th (ft)	m3	396	0	#393
Internal Link Dist (ft)	47	1665	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2061	628	272	183
Starvation Cap Reductn	1545	0	0	0
Spillback Cap Reductn	0	52	2	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	0.87	0.12	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	438	6	0	437	23	8	0	21	39	1	145
Future Volume (vph)	43	438	6	0	437	23	8	0	21	39	1	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.94			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.90			0.89	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		3397			3356			1456			1347	
Flt Permitted		1.00			1.00			0.99			0.99	
Satd. Flow (perm)		3397			3356			1456			1347	
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)	47	476	7	0	475	25	9	0	23	42	1	158
RTOR Reduction (vph)	0	0	0	0	2	0	0	31	0	0	68	0
Lane Group Flow (vph)	0	530	0	0	498	0	0	1	0	0	133	0
Confl. Peds. (#/hr)	1		2	2		1	1		8	8		1
Heavy Vehicles (%)	12%	5%	0%	0%	7%	0%	0%	0%	13%	100%	0%	3%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		114.2			34.2			5.4			15.4	
Effective Green, g (s)		109.3			35.2			6.4			16.4	
Actuated g/C Ratio		0.58			0.19			0.03			0.09	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1954			621			49			116	
v/s Ratio Prot		c0.16			c0.15			c0.00			c0.10	
v/s Ratio Perm												
v/c Ratio		0.27			0.80			0.02			1.15	
Uniform Delay, d1		20.3			74.1			88.8			86.8	
Progression Factor		0.04			1.05			1.00			1.00	
Incremental Delay, d2		0.0			8.6			0.1			129.5	
Delay (s)		0.7			86.7			88.8			216.3	
Level of Service		A			F			F			F	
Approach Delay (s)		0.7			86.7			88.8			216.3	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	71.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

1: Lobster Ln & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2027 TF PM MIT

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	16	1466	4	2077	547	7	349	99	16
v/c Ratio	0.18	0.40	0.02	0.85	0.47	0.12	1.57	0.31	0.18
Control Delay	19.4	6.9	14.0	22.3	7.8	106.8	334.0	34.2	101.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	6.9	14.0	22.3	7.8	106.8	334.0	34.2	101.3
Queue Length 50th (ft)	2	69	1	427	115	10	~765	54	23
Queue Length 95th (ft)	m9	212	m3	#1841	194	33	m#1012	m102	53
Internal Link Dist (ft)		810		1202		100		1663	220
Turn Bay Length (ft)	130		80						
Base Capacity (vph)	97	3647	290	2443	1154	63	222	324	189
Starvation Cap Reductn	0	583	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.48	0.01	0.85	0.47	0.11	1.57	0.31	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	1346	3	4	0	1911	503	3	0	4	321	8
Future Volume (vph)	15	1346	3	4	0	1911	503	3	0	4	321	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		0.95	0.95
Frt	1.00	1.00			1.00	1.00	0.85		0.92		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98		0.95	1.00
Satd. Flow (prot)	1719	5084			1805	3539	1583		1717		1649	1559
Flt Permitted	0.03	1.00			0.14	1.00	1.00		0.98		0.95	1.00
Satd. Flow (perm)	50	5084			266	3539	1583		1717		1649	1559
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)	16	1463	3	4	0	2077	547	3	0	4	349	9
RTOR Reduction (vph)	0	0	0	0	0	0	70	0	0	0	0	86
Lane Group Flow (vph)	16	1466	0	0	4	2077	477	0	7	0	349	13
Heavy Vehicles (%)	5%	2%	0%	0%	0%	2%	2%	0%	0%	0%	4%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	146.5	142.6			141.1	139.9	139.9		3.0		28.7	28.7
Effective Green, g (s)	148.5	144.6			143.1	141.9	141.9		4.0		29.7	29.7
Actuated g/C Ratio	0.68	0.66			0.65	0.65	0.65		0.02		0.13	0.13
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	70	3341			188	2282	1021		31		222	210
v/s Ratio Prot	c0.01	c0.29			0.00	c0.59			c0.00		c0.21	0.01
v/s Ratio Perm	0.15				0.01		0.30					
v/c Ratio	0.23	0.44			0.02	0.91	0.47		0.23		1.57	0.06
Uniform Delay, d1	45.0	18.2			14.7	33.6	19.8		106.5		95.2	83.0
Progression Factor	1.23	0.44			0.98	0.62	0.54		1.00		1.11	9.95
Incremental Delay, d2	1.4	0.4			0.0	5.8	1.3		3.7		277.5	0.3
Delay (s)	56.9	8.3			14.5	26.6	12.0		110.2		383.1	826.0
Level of Service	E	A			B	C	B		F		F	F
Approach Delay (s)		8.8				23.6			110.2			480.9
Approach LOS		A				C			F			F

Intersection Summary			
HCM 2000 Control Delay	63.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	83	10	2	3
Future Volume (vph)	83	10	2	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.97	
Flt Protected			0.96	
Satd. Flow (prot)			1780	
Flt Permitted			0.96	
Satd. Flow (perm)			1780	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	11	2	3
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	16	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.6	
Effective Green, g (s)			8.6	
Actuated g/C Ratio			0.04	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			69	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.23	
Uniform Delay, d1			102.5	
Progression Factor			1.00	
Incremental Delay, d2			1.7	
Delay (s)			104.2	
Level of Service			F	
Approach Delay (s)			104.2	
Approach LOS			F	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	122	1292	179	1896	205	175	25	256
v/c Ratio	0.76	0.58	0.61	0.87	1.05	0.35	0.14	0.61
Control Delay	88.4	18.3	27.9	20.0	156.0	8.9	66.7	74.6
Queue Delay	0.0	0.0	0.0	41.5	0.0	0.0	0.0	0.0
Total Delay	88.4	18.3	27.9	61.5	156.0	8.9	66.7	74.6
Queue Length 50th (ft)	124	372	49	644	300	0	29	302
Queue Length 95th (ft)	201	525	m131	337	#482	71	61	406
Internal Link Dist (ft)		1037		810	420			236
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	186	2236	347	2189	219	542	207	464
Starvation Cap Reductn	0	27	0	113	0	0	0	0
Spillback Cap Reductn	0	0	0	446	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.58	0.52	1.09	0.94	0.32	0.12	0.55

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	1149	40	165	1738	6	60	129	161	23	113	122
Future Volume (vph)	112	1149	40	165	1738	6	60	129	161	23	113	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1626	3524		1805	3538			1870	1615	1805	1752	
Flt Permitted	0.03	1.00		0.15	1.00			0.45	1.00	0.43	1.00	
Satd. Flow (perm)	53	3524		286	3538			859	1615	815	1752	
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)	122	1249	43	179	1889	7	65	140	175	25	123	133
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	135	0	19	0
Lane Group Flow (vph)	122	1291	0	179	1896	0	0	205	40	25	237	0
Heavy Vehicles (%)	11%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	154.9	138.6		148.3	135.3			49.1	49.1	49.1	49.1	
Effective Green, g (s)	156.9	139.6		150.3	136.3			50.1	50.1	50.1	50.1	
Actuated g/C Ratio	0.71	0.63		0.68	0.62			0.23	0.23	0.23	0.23	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	161	2236		292	2191			195	367	185	398	
v/s Ratio Prot	c0.06	0.37		0.04	c0.54						0.14	
v/s Ratio Perm	0.48			0.38				c0.24	0.02	0.03		
v/c Ratio	0.76	0.58		0.61	0.87			1.05	0.11	0.14	0.60	
Uniform Delay, d1	74.6	23.2		18.9	34.3			85.0	67.3	67.7	75.9	
Progression Factor	1.03	0.70		2.10	0.47			1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.9	1.0		2.1	2.7			78.6	0.1	0.3	2.4	
Delay (s)	93.7	17.3		41.7	18.7			163.6	67.4	68.0	78.3	
Level of Service	F	B		D	B			F	E	E	E	
Approach Delay (s)		23.9			20.7			119.3			77.4	
Approach LOS		C			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	232	943	30	149	1630	118	173	547	117	193	591	366
v/c Ratio	0.77	0.51	0.03	0.90	0.86	0.13	0.97	0.77	0.23	0.65	0.86	0.75
Control Delay	148.1	25.4	0.1	111.2	35.6	6.9	153.3	91.6	11.4	146.2	96.3	34.7
Queue Delay	0.0	0.2	0.0	0.0	42.2	0.0	0.0	0.0	0.0	0.0	12.7	1.2
Total Delay	148.1	25.6	0.1	111.2	77.9	6.9	153.3	91.6	11.4	146.2	109.0	35.8
Queue Length 50th (ft)	182	264	0	223	1227	47	255	400	22	150	291	91
Queue Length 95th (ft)	#244	287	0	m#276	1325	m42	#436	478	67	198	365	169
Internal Link Dist (ft)		798			1037			554			265	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	304	1847	1018	166	1887	964	179	718	515	355	750	492
Starvation Cap Reductn	0	289	0	0	390	0	0	0	0	0	145	30
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.61	0.03	0.90	1.09	0.12	0.97	0.76	0.23	0.54	0.98	0.79

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	905	29	143	1565	113	166	525	112	185	567	351
Future Volume (vph)	223	905	29	143	1565	113	166	525	112	185	567	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3539	1615	1770	3574	1510	1805	3539	1570	3400	3574	1584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3539	1615	1770	3574	1510	1805	3539	1570	3400	3574	1584
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	232	943	30	149	1630	118	173	547	117	193	591	366
RTOR Reduction (vph)	0	0	11	0	0	22	0	0	64	0	0	61
Lane Group Flow (vph)	232	943	19	149	1630	96	173	547	53	193	591	305
Confl. Peds. (#/hr)	4					4	1		7	7		1
Heavy Vehicles (%)	1%	2%	0%	2%	1%	5%	0%	2%	1%	3%	1%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	17.6	113.2	133.6	19.3	114.6	132.3	20.4	42.5	61.8	17.7	40.7	58.3
Effective Green, g (s)	19.1	114.7	136.6	20.8	116.1	135.3	21.9	44.0	64.8	19.2	42.2	61.3
Actuated g/C Ratio	0.09	0.52	0.62	0.09	0.53	0.62	0.10	0.20	0.29	0.09	0.19	0.28
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	300	1845	1002	167	1886	928	179	707	462	296	685	441
v/s Ratio Prot	c0.07	0.27	0.00	0.08	c0.46	0.01	c0.10	0.15	0.01	0.06	c0.17	0.06
v/s Ratio Perm			0.01			0.05			0.02			0.13
v/c Ratio	0.77	0.51	0.02	0.89	0.86	0.10	0.97	0.77	0.11	0.65	0.86	0.69
Uniform Delay, d1	98.3	34.4	16.0	98.5	45.1	17.4	98.7	83.3	56.7	97.2	86.1	70.9
Progression Factor	1.35	0.70	0.04	0.85	0.71	0.81	1.00	1.00	1.00	1.40	0.97	0.48
Incremental Delay, d2	11.0	1.0	0.0	24.5	2.9	0.0	56.9	5.3	0.1	5.0	10.7	4.5
Delay (s)	143.8	25.0	0.6	108.4	34.9	14.2	155.6	88.6	56.8	141.3	93.8	38.9
Level of Service	F	C	A	F	C	B	F	F	E	F	F	D
Approach Delay (s)		47.2			39.4			98.0			84.3	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	61.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	46	1186	24	2248	55	47
v/c Ratio	0.32	0.39	0.06	0.75	0.56	0.42
Control Delay	14.4	2.5	0.8	5.0	50.2	33.9
Queue Delay	0.0	0.2	0.0	0.6	1.9	1.0
Total Delay	14.4	2.6	0.8	5.6	52.1	34.9
Queue Length 50th (ft)	5	238	1	142	15	3
Queue Length 95th (ft)	m25	110	m3	246	69	53
Internal Link Dist (ft)		199		798	108	109
Turn Bay Length (ft)	200		100			
Base Capacity (vph)	144	3005	411	2985	168	199
Starvation Cap Reductn	0	777	0	348	0	0
Spillback Cap Reductn	0	0	0	110	45	55
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.53	0.06	0.85	0.45	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	1102	1	22	2014	76	39	0	12	8	0	35
Future Volume (veh/h)	43	1102	1	22	2014	76	39	0	12	8	0	35
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	46	1185	1	24	2166	82	42	0	13	9	0	38
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	226	3056	3	436	2910	109	79	2	16	30	6	67
Arrive On Green	0.03	0.84	0.84	0.05	1.00	1.00	0.05	0.00	0.05	0.05	0.00	0.05
Sat Flow, veh/h	1774	3629	3	1774	3478	131	1027	34	329	210	115	1373
Grp Volume(v), veh/h	46	578	608	24	1095	1153	55	0	0	47	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1839	1390	0	0	1698	0	0
Q Serve(g_s), s	0.8	16.8	16.9	0.4	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	16.8	16.9	0.4	0.0	0.0	8.6	0.0	0.0	6.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.07	0.76		0.24	0.19		0.81
Lane Grp Cap(c), veh/h	226	1490	1568	436	1480	1539	97	0	0	103	0	0
V/C Ratio(X)	0.20	0.39	0.39	0.06	0.74	0.75	0.57	0.00	0.00	0.46	0.00	0.00
Avail Cap(c_a), veh/h	230	1490	1568	449	1480	1539	172	0	0	185	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.41	0.41	0.41	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.0	4.1	4.1	2.7	0.0	0.0	103.6	0.0	0.0	102.4	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.8	0.7	0.0	1.4	1.4	5.1	0.0	0.0	3.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	8.5	8.9	0.2	0.6	0.6	3.5	0.0	0.0	2.9	0.0	0.0
LnGrp Delay(d),s/veh	2.4	4.8	4.8	2.7	1.4	1.4	108.7	0.0	0.0	105.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	F			F		
Approach Vol, veh/h		1232			2272			55			47	
Approach Delay, s/veh		4.7			1.4			108.7			105.6	
Approach LOS		A			A			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.4	192.4		17.3	11.6	191.2		17.3
Change Period (Y+Rc), s	5.0	7.1		6.5	5.0	7.1		6.5
Max Green Setting (Gmax), s	7.0	171.9		22.5	7.0	171.9		22.5
Max Q Clear Time (g_c+I1), s	2.4	18.9		10.6	2.8	2.0		8.0
Green Ext Time (p_c), s	0.0	18.7		0.1	0.0	105.9		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	5.5
HCM 2010 LOS	A

Lane Group	EBL	NBT	NEL2	NET	SWL	SWT
Lane Group Flow (vph)	157	99	6	1169	26	2167
v/c Ratio	0.84	0.61	0.05	0.45	0.08	0.83
Control Delay	128.9	37.8	2.2	2.8	7.7	12.9
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.7
Total Delay	128.9	37.8	2.2	2.9	7.7	13.6
Queue Length 50th (ft)	226	16	0	77	7	403
Queue Length 95th (ft)	#350	88	m1	84	m14	532
Internal Link Dist (ft)	48	220		755		141
Turn Bay Length (ft)			120		150	
Base Capacity (vph)	198	213	128	2578	350	2626
Starvation Cap Reductn	0	0	0	401	0	176
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.46	0.05	0.54	0.07	0.88

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	NEL2	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	138	8	4	24	40	0	30	6	1100	10	25	1904
Future Volume (vph)	138	8	4	24	40	0	30	6	1100	10	25	1904
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0					5.0		5.6	5.1		5.6	5.1
Lane Util. Factor	1.00					1.00		1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Frt	0.99					0.96		1.00	1.00		1.00	0.99
Flt Protected	0.96					0.97		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1745					1708		1805	3534		1805	3424
Flt Permitted	0.96					0.97		0.04	1.00		0.20	1.00
Satd. Flow (perm)	1745					1708		72	3534		373	3424
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	145	8	4	25	42	0	32	6	1158	11	26	2004
RTOR Reduction (vph)	0	0	0	0	0	84	0	0	0	0	0	0
Lane Group Flow (vph)	157	0	0	0	0	15	0	6	1169	0	26	2167
Confl. Peds. (#/hr)		4	2	2	2			2		4	4	
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	9%	0%	2%	0%	0%	4%
Turn Type	Prot			Perm	Split	NA		pm+pt	NA		pm+pt	NA
Protected Phases	3				7	7		1	6		5	2
Permitted Phases				7				6			2	
Actuated Green, G (s)	22.2					8.4		158.2	157.0		166.2	161.0
Effective Green, g (s)	23.7					9.9		161.2	159.0		169.2	163.0
Actuated g/C Ratio	0.11					0.05		0.73	0.72		0.77	0.74
Clearance Time (s)	6.5					6.5		7.1	7.1		7.1	7.1
Vehicle Extension (s)	3.0					3.0		3.0	4.0		3.0	4.0
Lane Grp Cap (vph)	187					76		74	2554		330	2536
v/s Ratio Prot	c0.09					c0.01		0.00	0.33		c0.00	c0.63
v/s Ratio Perm								0.06			0.06	
v/c Ratio	0.84					0.20		0.08	0.46		0.08	0.85
Uniform Delay, d1	96.3					101.2		26.8	12.6		8.2	20.1
Progression Factor	1.00					1.00		0.20	0.17		1.16	0.58
Incremental Delay, d2	26.8					1.3		0.4	0.6		0.1	2.7
Delay (s)	123.0					102.5		5.8	2.7		9.6	14.4
Level of Service	F					F		A	A		A	B
Approach Delay (s)	123.0					102.5			2.7			14.3
Approach LOS	F					F			A			B

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR	SWR2
Lane Configurations		
Traffic Volume (vph)	146	9
Future Volume (vph)	146	9
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frpb, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	154	9
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)	2	
Heavy Vehicles (%)	4%	25%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		

Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	64	74	895	1156
v/c Ratio	0.60	0.45	0.18	0.26
Control Delay	122.5	24.9	0.1	1.5
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	122.5	24.9	0.1	1.7
Queue Length 50th (ft)	93	0	0	58
Queue Length 95th (ft)	152	62	0	67
Internal Link Dist (ft)	220		36	242
Turn Bay Length (ft)		150		
Base Capacity (vph)	168	218	5085	4512
Starvation Cap Reductn	0	0	0	1872
Spillback Cap Reductn	0	0	0	29
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.38	0.34	0.18	0.44

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	62	72	0	868	1064	57
Future Volume (vph)	62	72	0	868	1064	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		5085	5046	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1770	1583		5085	5046	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	64	74	0	895	1097	59
RTOR Reduction (vph)	0	70	0	0	2	0
Lane Group Flow (vph)	64	4	0	895	1154	0
Confl. Peds. (#/hr)	1		3			
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases		4				
Actuated Green, G (s)	13.3	13.3		220.0	196.7	
Effective Green, g (s)	13.3	13.3		220.0	196.7	
Actuated g/C Ratio	0.06	0.06		1.00	0.89	
Clearance Time (s)	5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0	
Lane Grp Cap (vph)	107	95		5085	4511	
v/s Ratio Prot	c0.04			0.18	c0.23	
v/s Ratio Perm		0.00				
v/c Ratio	0.60	0.05		0.18	0.26	
Uniform Delay, d1	100.7	97.4		0.0	1.6	
Progression Factor	1.00	1.00		1.00	0.85	
Incremental Delay, d2	8.7	0.2		0.1	0.1	
Delay (s)	109.4	97.6		0.1	1.5	
Level of Service	F	F		A	A	
Approach Delay (s)	103.1			0.1	1.5	
Approach LOS	F			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	460	443	31	976	477	1146
v/c Ratio	0.72	0.79	0.59	0.37	0.58	1.25	0.49
Control Delay	123.7	6.2	5.0	147.7	25.8	172.2	43.4
Queue Delay	0.0	53.1	54.3	0.0	1.2	0.0	0.0
Total Delay	123.7	59.3	59.3	147.7	27.0	172.2	43.4
Queue Length 50th (ft)	132	90	94	46	154	~712	439
Queue Length 95th (ft)	#244	m50	m55	93	137	#964	498
Internal Link Dist (ft)	420	47			199		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	130	587	750	198	1692	382	2316
Starvation Cap Reductn	0	170	346	0	457	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.10	1.10	0.16	0.79	1.25	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	27	45	18	60	98	708	12	17	890	47	2	456
Future Volume (vph)	27	45	18	60	98	708	12	17	890	47	2	456
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frpb, ped/bikes		0.99			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00			1.00
Frt		0.97			0.90	0.85		1.00	0.99			1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1810			1614	1534		1805	4988			1787
Flt Permitted		0.99			0.99	1.00		0.95	1.00			0.15
Satd. Flow (perm)		1810			1614	1534		1805	4988			288
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	47	19	62	102	738	12	18	927	49	2	475
RTOR Reduction (vph)	0	4	0	0	30	222	0	0	0	0	0	0
Lane Group Flow (vph)	0	90	0	0	430	221	0	31	976	0	0	477
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	3%	7%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	pm+pt	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases							2				6	6
Actuated Green, G (s)		14.4			73.7	73.7		8.1	73.3			113.2
Effective Green, g (s)		15.4			74.7	74.7		9.1	74.8			114.2
Actuated g/C Ratio		0.07			0.34	0.34		0.04	0.34			0.52
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		126			548	520		74	1695			381
v/s Ratio Prot		c0.05			c0.27	0.14		0.02	0.20			c0.19
v/s Ratio Perm												c0.45
v/c Ratio		0.72			0.79	0.43		0.42	0.58			1.25
Uniform Delay, d1		100.2			65.4	56.1		102.9	59.6			53.1
Progression Factor		1.00			0.09	0.36		1.34	0.41			1.00
Incremental Delay, d2		18.1			0.8	0.1		3.8	1.4			133.3
Delay (s)		118.3			6.5	20.5		142.1	25.7			186.4
Level of Service		F			A	C		F	C			F
Approach Delay (s)		118.3			13.4				29.3			
Approach LOS		F			B				C			

Intersection Summary			
HCM 2000 Control Delay	52.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1024	76
Future Volume (vph)	1024	76
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	5040	
Flt Permitted	1.00	
Satd. Flow (perm)	5040	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1067	79
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1146	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	98.3	
Effective Green, g (s)	99.8	
Actuated g/C Ratio	0.45	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	2286	
v/s Ratio Prot	0.23	
v/s Ratio Perm		
v/c Ratio	0.50	
Uniform Delay, d1	42.5	
Progression Factor	1.00	
Incremental Delay, d2	0.8	
Delay (s)	43.3	
Level of Service	D	
Approach Delay (s)	85.4	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	583	834	20	158
v/c Ratio	0.27	1.11	0.28	0.89
Control Delay	1.2	136.5	83.8	85.5
Queue Delay	20.7	0.5	0.0	0.4
Total Delay	21.9	137.1	83.8	85.9
Queue Length 50th (ft)	7	~717	19	102
Queue Length 95th (ft)	m7	#862	55	#246
Internal Link Dist (ft)	47	1663	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2130	749	80	187
Starvation Cap Reductn	1548	0	0	0
Spillback Cap Reductn	0	62	0	1
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.00	1.21	0.25	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	396	11	0	733	51	9	3	7	22	3	124
Future Volume (vph)	141	396	11	0	733	51	9	3	7	22	3	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.96			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.95			0.89	
Flt Protected		0.99			1.00			0.98			0.99	
Satd. Flow (prot)		3459			3537			1702			1642	
Flt Permitted		0.99			1.00			0.98			0.99	
Satd. Flow (perm)		3459			3537			1702			1642	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	150	421	12	0	780	54	10	3	7	23	3	132
RTOR Reduction (vph)	0	1	0	0	2	0	0	7	0	0	84	0
Lane Group Flow (vph)	0	582	0	0	832	0	0	13	0	0	74	0
Confl. Peds. (#/hr)			2	2					12	12		
Heavy Vehicles (%)	2%	3%	0%	0%	1%	2%	0%	0%	0%	13%	0%	0%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		134.5			45.5			7.5			11.7	
Effective Green, g (s)		129.6			46.5			8.5			12.7	
Actuated g/C Ratio		0.59			0.21			0.04			0.06	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		2037			747			65			94	
v/s Ratio Prot		c0.17			c0.24			c0.01			c0.05	
v/s Ratio Perm												
v/c Ratio		0.29			1.11			0.20			0.79	
Uniform Delay, d1		22.3			86.8			102.5			102.3	
Progression Factor		0.06			0.91			1.00			1.00	
Incremental Delay, d2		0.0			68.1			0.6			32.1	
Delay (s)		1.3			147.1			103.0			134.4	
Level of Service		A			F			F			F	
Approach Delay (s)		1.3			147.1			103.0			134.4	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	92.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	220.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Timing Plan: 2027 TF SAT MIT

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	NEL
Lane Group Flow (vph)	22	1758	8	1659	637	6	229	50	14
v/c Ratio	0.15	0.54	0.05	0.77	0.59	0.07	0.87	0.12	0.12
Control Delay	23.0	20.6	6.1	22.6	12.0	69.3	111.8	7.7	63.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	20.6	6.1	22.6	12.0	69.3	111.8	7.7	63.7
Queue Length 50th (ft)	7	224	1	906	439	6	250	5	13
Queue Length 95th (ft)	m21	#576	m2	#1236	671	22	#400	31	34
Internal Link Dist (ft)		810		1202		100		1665	220
Turn Bay Length (ft)	130		80		600				
Base Capacity (vph)	151	3266	164	2159	1085	94	268	406	264
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.54	0.05	0.77	0.59	0.06	0.85	0.12	0.05

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	1614	4	6	1	1526	586	4	0	2	211	2
Future Volume (vph)	20	1614	4	6	1	1526	586	4	0	2	211	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0	6.0		6.0		6.3	6.3
Lane Util. Factor	1.00	0.91			1.00	0.95	1.00		1.00		0.95	0.95
Frt	1.00	1.00			1.00	1.00	0.85		0.95		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97		0.95	1.00
Satd. Flow (prot)	1805	5035			1621	3539	1583		1756		1698	1545
Flt Permitted	0.05	1.00			0.08	1.00	1.00		0.97		0.95	1.00
Satd. Flow (perm)	93	5035			133	3539	1583		1756		1698	1545
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)	22	1754	4	7	1	1659	637	4	0	2	229	2
RTOR Reduction (vph)	0	0	0	0	0	0	143	0	0	0	0	42
Lane Group Flow (vph)	22	1758	0	0	8	1659	494	0	6	0	229	8
Heavy Vehicles (%)	0%	3%	0%	13%	0%	2%	2%	0%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Split	NA		Split	NA
Protected Phases	5	2		1	1	6		7	7		3	3
Permitted Phases	2			6	6		6					
Actuated Green, G (s)	84.5	80.6			79.5	78.1	78.1		1.5		22.3	22.3
Effective Green, g (s)	86.5	82.6			81.5	80.1	80.1		2.5		23.3	23.3
Actuated g/C Ratio	0.58	0.55			0.54	0.53	0.53		0.02		0.16	0.16
Clearance Time (s)	8.0	8.0			8.0	8.0	8.0		7.0		7.3	7.3
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0		5.0	5.0
Lane Grp Cap (vph)	109	2772			96	1889	845		29		263	239
v/s Ratio Prot	c0.01	0.35			0.00	c0.47			c0.00		c0.13	0.01
v/s Ratio Perm	0.11				0.04		0.31					
v/c Ratio	0.20	0.63			0.08	0.88	0.58		0.21		0.87	0.03
Uniform Delay, d1	27.3	23.3			18.6	30.7	23.7		72.8		61.9	53.8
Progression Factor	1.49	1.09			0.36	0.77	0.81		1.00		1.35	1.00
Incremental Delay, d2	0.7	0.9			0.3	5.2	2.4		3.5		26.8	0.1
Delay (s)	41.3	26.3			7.1	28.7	21.7		76.3		110.1	53.9
Level of Service	D	C			A	C	C		E		F	D
Approach Delay (s)		26.5				26.6			76.3			100.0
Approach LOS		C				C			E			F

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.9
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NEL2	NEL	NER
Lane Configurations				
Traffic Volume (vph)	44	3	1	9
Future Volume (vph)	44	3	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			5.6	
Lane Util. Factor			1.00	
Frt			0.90	
Flt Protected			0.99	
Satd. Flow (prot)			1693	
Flt Permitted			0.99	
Satd. Flow (perm)			1693	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	3	1	10
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	14	0
Heavy Vehicles (%)	0%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		4	4	
Permitted Phases				
Actuated Green, G (s)			7.3	
Effective Green, g (s)			8.3	
Actuated g/C Ratio			0.06	
Clearance Time (s)			6.6	
Vehicle Extension (s)			3.0	
Lane Grp Cap (vph)			93	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.15	
Uniform Delay, d1			67.5	
Progression Factor			1.00	
Incremental Delay, d2			0.8	
Delay (s)			68.2	
Level of Service			E	
Approach Delay (s)			68.2	
Approach LOS			E	

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	176	1582	151	1444	143	105	46	269
v/c Ratio	0.55	0.72	0.59	0.69	0.78	0.28	0.25	0.79
Control Delay	39.6	14.2	50.6	11.6	84.7	9.7	53.1	65.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	14.2	50.6	11.6	84.7	9.7	53.1	65.8
Queue Length 50th (ft)	75	175	83	80	135	0	39	221
Queue Length 95th (ft)	m134	907	m138	271	204	50	75	305
Internal Link Dist (ft)		1037		810	420			173
Turn Bay Length (ft)	450		150				120	
Base Capacity (vph)	460	2188	449	2104	292	535	294	523
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.72	0.34	0.69	0.49	0.20	0.16	0.51

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	1422	33	139	1318	10	27	105	97	42	118	130
Future Volume (vph)	162	1422	33	139	1318	10	27	105	97	42	118	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.9	5.9	5.9	5.9	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3527		1805	3536			1881	1568	1719	1694	
Flt Permitted	0.10	1.00		0.09	1.00			0.52	1.00	0.55	1.00	
Satd. Flow (perm)	188	3527		167	3536			996	1568	1001	1694	
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)	176	1546	36	151	1433	11	29	114	105	46	128	141
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	86	0	30	0
Lane Group Flow (vph)	176	1581	0	151	1444	0	0	143	19	46	239	0
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	0%	3%	5%	7%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)	107.8	92.0		100.4	88.3			26.6	26.6	26.6	26.6	
Effective Green, g (s)	109.8	93.0		102.4	89.3			27.6	27.6	27.6	27.6	
Actuated g/C Ratio	0.73	0.62		0.68	0.60			0.18	0.18	0.18	0.18	
Clearance Time (s)	6.2	6.2		6.2	6.2			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	
Lane Grp Cap (vph)	318	2186		257	2105			183	288	184	311	
v/s Ratio Prot	c0.06	c0.45		0.05	0.41						0.14	
v/s Ratio Perm	0.34			0.35				c0.14	0.01	0.05		
v/c Ratio	0.55	0.72		0.59	0.69			0.78	0.07	0.25	0.77	
Uniform Delay, d1	18.3	19.6		19.0	20.8			58.3	50.6	52.3	58.2	
Progression Factor	2.77	0.56		2.71	0.45			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	1.6		2.2	1.2			19.2	0.1	0.7	10.8	
Delay (s)	52.4	12.7		53.6	10.5			77.5	50.7	53.1	69.0	
Level of Service	D	B		D	B			E	D	D	E	
Approach Delay (s)		16.7			14.6			66.1			66.7	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.3
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	318	1205	52	154	1184	95	165	568	165	210	657	419
v/c Ratio	0.77	0.80	0.06	0.88	0.84	0.12	0.74	0.69	0.29	0.59	0.86	0.70
Control Delay	89.1	39.3	1.0	88.6	33.2	3.1	82.4	57.4	6.5	94.3	74.1	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.1
Total Delay	89.1	39.3	1.0	88.6	33.2	3.1	82.4	57.4	6.5	94.3	75.8	23.9
Queue Length 50th (ft)	170	378	1	138	245	0	156	261	15	110	213	40
Queue Length 95th (ft)	200	602	5	m#273	539	m17	239	334	52	155	365	418
Internal Link Dist (ft)		798			1037			554			265	
Turn Bay Length (ft)	600		500	450		350	200		225	300		200
Base Capacity (vph)	423	1498	891	176	1413	821	248	865	576	411	807	603
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	53	7
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.80	0.06	0.88	0.84	0.12	0.67	0.66	0.29	0.51	0.87	0.70

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	1157	50	148	1137	91	158	545	158	202	631	402
Future Volume (vph)	305	1157	50	148	1137	91	158	545	158	202	631	402
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	4.2	5.1	6.3	4.2	6.0	5.1	4.8	6.3	6.0	4.8	6.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1536	1805	3539	1536	1787	3539	1519	3433	3539	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1536	1805	3539	1536	1787	3539	1519	3433	3539	1570
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	318	1205	52	154	1184	95	165	568	165	210	657	419
RTOR Reduction (vph)	0	0	23	0	0	41	0	0	89	0	0	87
Lane Group Flow (vph)	318	1205	29	154	1184	54	165	568	76	210	657	332
Confl. Peds. (#/hr)	1		1	1		1	1		4	4		1
Heavy Vehicles (%)	2%	2%	4%	0%	2%	4%	1%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	16.5	62.0	79.4	13.2	58.4	72.6	17.4	33.3	46.5	14.2	31.0	47.5
Effective Green, g (s)	18.0	63.5	82.4	14.7	59.9	75.6	18.9	34.8	49.5	15.7	32.5	50.5
Actuated g/C Ratio	0.12	0.42	0.55	0.10	0.40	0.50	0.13	0.23	0.33	0.10	0.22	0.34
Clearance Time (s)	8.1	5.7	6.6	7.8	5.7	7.5	6.6	6.3	7.8	7.5	6.3	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	411	1498	843	176	1413	774	225	821	501	359	766	528
v/s Ratio Prot	0.09	c0.34	0.00	0.09	c0.33	0.01	c0.09	0.16	0.01	0.06	c0.19	0.08
v/s Ratio Perm			0.01			0.03			0.04			0.14
v/c Ratio	0.77	0.80	0.03	0.88	0.84	0.07	0.73	0.69	0.15	0.58	0.86	0.63
Uniform Delay, d1	64.0	37.8	15.5	66.7	40.7	19.1	63.1	52.7	35.4	64.0	56.5	41.9
Progression Factor	1.21	0.90	1.66	0.83	0.68	0.61	1.00	1.00	1.00	1.37	1.11	0.66
Incremental Delay, d2	7.7	4.1	0.0	27.9	4.6	0.0	11.7	2.5	0.1	2.4	9.1	2.3
Delay (s)	85.1	38.2	25.9	83.1	32.1	11.7	74.8	55.2	35.6	90.2	71.8	29.8
Level of Service	F	D	C	F	C	B	E	E	D	F	E	C
Approach Delay (s)		47.3			36.2			55.2			61.1	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	48	1538	28	1745	50	53
v/c Ratio	0.20	0.53	0.09	0.61	0.34	0.34
Control Delay	4.0	4.9	2.7	7.5	12.8	14.5
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	4.0	5.0	2.7	7.6	12.8	14.5
Queue Length 50th (ft)	3	133	2	180	0	0
Queue Length 95th (ft)	m18	252	m6	316	26	30
Internal Link Dist (ft)		171		798	125	94
Turn Bay Length (ft)	200		80			
Base Capacity (vph)	241	2928	298	2842	274	290
Starvation Cap Reductn	0	295	0	114	0	0
Spillback Cap Reductn	0	0	0	56	1	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.58	0.09	0.64	0.18	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	1489	3	27	1602	90	35	0	14	10	0	42
Future Volume (veh/h)	47	1489	3	27	1602	90	35	0	14	10	0	42
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	48	1535	3	28	1652	93	36	0	14	10	0	43
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	337	2900	6	324	2698	151	90	1	19	38	4	60
Arrive On Green	0.04	0.80	0.80	0.06	1.00	1.00	0.04	0.00	0.04	0.04	0.00	0.04
Sat Flow, veh/h	1774	3624	7	1774	3407	191	1106	32	442	224	94	1366
Grp Volume(v), veh/h	48	749	789	28	853	892	50	0	0	53	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1861	1774	1770	1828	1580	0	0	1683	0	0
Q Serve(g_s), s	0.7	22.0	22.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	22.0	22.0	0.4	0.0	0.0	4.5	0.0	0.0	4.5	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.10	0.72		0.28	0.19		0.81
Lane Grp Cap(c), veh/h	337	1416	1489	324	1401	1448	110	0	0	102	0	0
V/C Ratio(X)	0.14	0.53	0.53	0.09	0.61	0.62	0.45	0.00	0.00	0.52	0.00	0.00
Avail Cap(c_a), veh/h	349	1416	1489	350	1401	1448	261	0	0	266	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.51	0.51	0.51	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.2	5.2	5.2	3.8	0.0	0.0	70.7	0.0	0.0	70.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	1.4	1.4	0.1	1.0	1.0	2.9	0.0	0.0	4.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	11.2	11.7	0.2	0.4	0.4	2.1	0.0	0.0	2.3	0.0	0.0
LnGrp Delay(d),s/veh	2.4	6.6	6.6	3.9	1.0	1.0	73.6	0.0	0.0	74.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E			E		
Approach Vol, veh/h		1586			1773			50			53	
Approach Delay, s/veh		6.5			1.1			73.6			74.8	
Approach LOS		A			A			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.8	127.1		13.1	11.1	125.9		13.1
Change Period (Y+Rc), s	5.0	7.1		6.5	5.0	7.1		6.5
Max Green Setting (Gmax), s	7.0	101.9		22.5	7.0	101.9		22.5
Max Q Clear Time (g_c+I1), s	2.4	24.0		6.5	2.7	2.0		6.5
Green Ext Time (p_c), s	0.0	30.8		0.1	0.0	42.7		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	5.7
HCM 2010 LOS	A

Lane Group	EBL	NBT	NEL2	NET	SWL	SWT
Lane Group Flow (vph)	101	46	8	1600	18	1734
v/c Ratio	0.57	0.23	0.04	0.63	0.08	0.66
Control Delay	76.7	2.5	5.2	6.1	2.6	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	76.7	2.5	5.2	6.1	2.6	4.5
Queue Length 50th (ft)	96	0	1	90	1	213
Queue Length 95th (ft)	158	0	m4	327	m2	310
Internal Link Dist (ft)	53	220		755		169
Turn Bay Length (ft)			120		150	
Base Capacity (vph)	215	310	282	2528	299	2644
Starvation Cap Reductn	0	0	0	36	0	104
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.15	0.03	0.64	0.06	0.68

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	NEL2	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	90	1	6	14	9	0	21	8	1521	15	17	1600
Future Volume (vph)	90	1	6	14	9	0	21	8	1521	15	17	1600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0					5.0		5.6	5.1		5.6	5.1
Lane Util. Factor	1.00					1.00		1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00					1.00		1.00	1.00		1.00	1.00
Frt	0.99					0.94		1.00	1.00		1.00	0.99
Flt Protected	0.96					0.97		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1794					1732		1805	3534		1805	3518
Flt Permitted	0.96					0.97		0.09	1.00		0.10	1.00
Satd. Flow (perm)	1794					1732		164	3534		189	3518
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	94	1	6	15	9	0	22	8	1584	16	18	1667
RTOR Reduction (vph)	0	0	0	0	0	44	0	0	0	0	0	0
Lane Group Flow (vph)	101	0	0	0	0	2	0	8	1600	0	18	1734
Confl. Peds. (#/hr)			7	7	3			3		4	4	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%
Turn Type	Prot			Perm	Split	NA		pm+pt	NA		pm+pt	NA
Protected Phases	3				7	7		1	6		5	2
Permitted Phases				7				6			2	
Actuated Green, G (s)	13.3					4.5		102.5	101.3		107.5	103.8
Effective Green, g (s)	14.8					6.0		105.5	103.3		110.5	105.8
Actuated g/C Ratio	0.10					0.04		0.70	0.69		0.74	0.71
Clearance Time (s)	6.5					6.5		7.1	7.1		7.1	7.1
Vehicle Extension (s)	3.0					3.0		3.0	4.0		3.0	4.0
Lane Grp Cap (vph)	177					69		144	2433		195	2481
v/s Ratio Prot	c0.06					c0.00		0.00	0.45		c0.00	c0.49
v/s Ratio Perm								0.04			0.06	
v/c Ratio	0.57					0.03		0.06	0.66		0.09	0.70
Uniform Delay, d1	64.6					69.2		11.6	13.3		10.5	12.8
Progression Factor	1.00					1.00		0.89	0.38		0.38	0.31
Incremental Delay, d2	4.4					0.2		0.1	1.2		0.2	1.4
Delay (s)	69.0					69.4		10.5	6.2		4.2	5.3
Level of Service	E					E		B	A		A	A
Approach Delay (s)	69.0					69.4			6.3			5.3
Approach LOS	E					E			A			A

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SWR	SWR2
Lane Configurations		
Traffic Volume (vph)	59	6
Future Volume (vph)	59	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frpb, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	61	6
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)		3
Heavy Vehicles (%)	0%	0%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		

Intersection Summary

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	82	79	1018	1331
v/c Ratio	0.57	0.39	0.20	0.31
Control Delay	80.7	17.9	0.1	1.0
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	80.7	17.9	0.1	1.1
Queue Length 50th (ft)	79	0	0	8
Queue Length 95th (ft)	134	52	0	27
Internal Link Dist (ft)	220		36	223
Turn Bay Length (ft)		150		
Base Capacity (vph)	236	279	5085	4292
Starvation Cap Reductn	0	0	0	1265
Spillback Cap Reductn	0	0	0	28
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.28	0.20	0.44

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	78	75	0	967	1195	69
Future Volume (vph)	78	75	0	967	1195	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		5085	5037	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1770	1583		5085	5037	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	82	79	0	1018	1258	73
RTOR Reduction (vph)	0	73	0	0	3	0
Lane Group Flow (vph)	82	6	0	1018	1328	0
Confl. Peds. (#/hr)	1		4			4
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4!			Free!	2	
Permitted Phases		4				
Actuated Green, G (s)	12.3	12.3		150.0	127.7	
Effective Green, g (s)	12.3	12.3		150.0	127.7	
Actuated g/C Ratio	0.08	0.08		1.00	0.85	
Clearance Time (s)	5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0	
Lane Grp Cap (vph)	145	129		5085	4288	
v/s Ratio Prot	c0.05			0.20	c0.26	
v/s Ratio Perm		0.00				
v/c Ratio	0.57	0.05		0.20	0.31	
Uniform Delay, d1	66.3	63.5		0.0	2.3	
Progression Factor	1.00	1.00		1.00	0.37	
Incremental Delay, d2	5.0	0.2		0.1	0.1	
Delay (s)	71.3	63.6		0.1	1.0	
Level of Service	E	E		A	A	
Approach Delay (s)	67.5			0.1	1.0	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	183	329	25	1033	409	1274
v/c Ratio	0.29	0.32	0.44	0.25	0.81	1.33	0.68
Control Delay	56.4	1.3	4.5	86.0	55.2	204.1	44.1
Queue Delay	0.0	1.0	2.0	0.0	0.0	0.3	0.0
Total Delay	56.4	2.4	6.4	86.0	55.2	204.3	44.1
Queue Length 50th (ft)	51	0	70	25	212	~491	412
Queue Length 95th (ft)	98	0	117	61	294	#815	#560
Internal Link Dist (ft)	420	47			218		920
Turn Bay Length (ft)				135		470	
Base Capacity (vph)	220	615	773	165	1272	308	1887
Starvation Cap Reductn	0	244	296	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	7	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.49	0.69	0.15	0.81	1.36	0.68

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	25	23	14	44	39	414	12	13	966	36	5	392
Future Volume (vph)	25	23	14	44	39	414	12	13	966	36	5	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			3.5	3.5		5.8	5.3			5.8
Lane Util. Factor		1.00			0.95	0.95		1.00	0.91			1.00
Frt		0.97			0.92	0.85		1.00	0.99			1.00
Flt Protected		0.98			0.99	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1807			1544	1504		1750	5060			1787
Flt Permitted		0.98			0.99	1.00		0.95	1.00			0.09
Satd. Flow (perm)		1807			1544	1504		1750	5060			175
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	24	14	45	40	427	12	13	996	37	5	404
RTOR Reduction (vph)	0	6	0	0	32	215	0	0	0	0	0	0
Lane Group Flow (vph)	0	58	0	0	151	114	0	25	1033	0	0	409
Heavy Vehicles (%)	0%	0%	0%	3%	20%	2%	0%	6%	2%	1%	0%	1%
Turn Type	Split	NA		Split	NA	Prot	Prot	Prot	NA		pm+pt	pm+pt
Protected Phases	3	3		4 7 8	4 7 8	4 7 8	5	5	2		1	1
Permitted Phases											6	6
Actuated Green, G (s)		16.5			50.9	50.9		5.3	36.3			63.9
Effective Green, g (s)		17.5			51.9	51.9		6.3	37.8			64.9
Actuated g/C Ratio		0.12			0.35	0.35		0.04	0.25			0.43
Clearance Time (s)		6.9						6.8	6.8			6.8
Vehicle Extension (s)		3.5						3.0	3.0			3.0
Lane Grp Cap (vph)		210			534	520		73	1275			309
v/s Ratio Prot		c0.03			c0.10	0.08		0.01	0.20			c0.19
v/s Ratio Perm												c0.38
v/c Ratio		0.28			0.28	0.22		0.34	0.81			1.32
Uniform Delay, d1		60.5			35.6	34.7		69.8	52.7			47.4
Progression Factor		1.00			0.00	0.92		1.20	0.93			1.00
Incremental Delay, d2		0.8			0.6	0.5		2.8	5.6			166.5
Delay (s)		61.3			0.7	32.4		86.8	54.7			213.9
Level of Service		E			A	C		F	D			F
Approach Delay (s)		61.3			21.1				55.5			
Approach LOS		E			C				E			

Intersection Summary			
HCM 2000 Control Delay	65.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1204	32
Future Volume (vph)	1204	32
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5068	
Flt Permitted	1.00	
Satd. Flow (perm)	5068	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	1241	33
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1274	0
Heavy Vehicles (%)	2%	0%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	51.8	
Effective Green, g (s)	53.3	
Actuated g/C Ratio	0.36	
Clearance Time (s)	6.8	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1800	
v/s Ratio Prot	0.25	
v/s Ratio Perm		
v/c Ratio	0.71	
Uniform Delay, d1	41.6	
Progression Factor	1.00	
Incremental Delay, d2	2.4	
Delay (s)	44.0	
Level of Service	D	
Approach Delay (s)	85.3	
Approach LOS	F	

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	496	453	14	119
v/c Ratio	0.24	0.61	0.17	0.47
Control Delay	2.2	67.0	59.0	6.1
Queue Delay	55.7	0.3	0.0	0.0
Total Delay	57.9	67.3	59.0	6.2
Queue Length 50th (ft)	10	198	10	0
Queue Length 95th (ft)	m10	292	35	0
Internal Link Dist (ft)	47	1665	120	220
Turn Bay Length (ft)				
Base Capacity (vph)	2059	827	137	299
Starvation Cap Reductn	1616	0	0	0
Spillback Cap Reductn	0	72	0	3
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.12	0.60	0.10	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	359	7	0	395	22	8	1	4	20	0	89
Future Volume (vph)	90	359	7	0	395	22	8	1	4	20	0	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.8			3.5			3.5			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.96			0.89	
Flt Protected		0.99			1.00			0.97			0.99	
Satd. Flow (prot)		3538			3482			1738			1649	
Flt Permitted		0.99			1.00			0.97			0.99	
Satd. Flow (perm)		3538			3482			1738			1649	
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)	98	390	8	0	429	24	9	1	4	22	0	97
RTOR Reduction (vph)	0	1	0	0	3	0	0	4	0	0	114	0
Lane Group Flow (vph)	0	495	0	0	450	0	0	10	0	0	5	0
Confl. Peds. (#/hr)									8	8		
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Split	NA			NA		Split	NA		Split	NA	
Protected Phases	1 2 3	1 2 3			4		7	7		8	8	
Permitted Phases				4								
Actuated Green, G (s)		87.3			30.9			5.8			5.2	
Effective Green, g (s)		82.4			31.9			6.8			6.2	
Actuated g/C Ratio		0.55			0.21			0.05			0.04	
Clearance Time (s)					4.5			4.5			5.0	
Vehicle Extension (s)					5.5			2.0			2.0	
Lane Grp Cap (vph)		1943			740			78			68	
v/s Ratio Prot		c0.14			c0.13			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio		0.25			0.61			0.13			0.07	
Uniform Delay, d1		17.7			53.4			68.8			69.1	
Progression Factor		0.14			1.22			1.00			1.00	
Incremental Delay, d2		0.0			1.9			0.3			0.2	
Delay (s)		2.5			67.0			69.0			69.3	
Level of Service		A			E			E			E	
Approach Delay (s)		2.5			67.0			69.0			69.3	
Approach LOS		A			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	30.5
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	LTR>	<LR
Maximum Queue (ft)	86	258	265	210	7	385	388	82	25	214	228	36
Average Queue (ft)	8	81	84	78	0	144	145	7	1	130	150	4
95th Queue (ft)	41	198	199	178	5	314	316	40	12	196	210	20
Link Distance (ft)		764	764			1199	1199	1199	114	1669	1669	213
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		4	0	0		16						
Queuing Penalty (veh)		2	3	2		0						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	61	319	301	155	424	417	418	222	94	261
Average Queue (ft)	18	135	144	65	119	100	195	104	14	124
95th Queue (ft)	47	275	284	150	429	387	349	186	59	233
Link Distance (ft)		984	984		764	764	447	447		235
Upstream Blk Time (%)					1	1	0			2
Queuing Penalty (veh)					3	2	0			0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				1	16				0	21
Queuing Penalty (veh)				2	11				0	1

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	199	220	540	558	82	475	942	951	89	225	489	492
Average Queue (ft)	110	130	322	345	4	401	512	318	20	85	301	301
95th Queue (ft)	183	195	490	505	59	588	1173	929	62	220	450	448
Link Distance (ft)			774	774			984	984			515	515
Upstream Blk Time (%)							15	4			0	0
Queuing Penalty (veh)							47	12			0	0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)			0	1		54	6			0	33	23
Queuing Penalty (veh)			0	0		119	8			0	16	26

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	250	180	201	306	296	225
Average Queue (ft)	116	94	100	250	254	140
95th Queue (ft)	291	169	182	332	333	298
Link Distance (ft)			229	229	229	
Upstream Blk Time (%)		0	1	36	34	1
Queuing Penalty (veh)		0	2	122	116	0
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0	0	1		44	0
Queuing Penalty (veh)	0	0	0		109	1

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	51	145	144	43	93	120	98	79
Average Queue (ft)	13	49	48	9	23	33	28	24
95th Queue (ft)	37	128	128	33	67	92	71	59
Link Distance (ft)		160	160		774	774	254	128
Upstream Blk Time (%)		0	0					
Queuing Penalty (veh)		1	1					
Storage Bay Dist (ft)	200			80				
Storage Blk Time (%)		0		0	0			
Queuing Penalty (veh)		0		0	0			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	NB	NE	NE	SW	SW	SW
Directions Served	<LR>	<LTR	T	TR	L	T	TR>
Maximum Queue (ft)	90	140	169	179	68	134	144
Average Queue (ft)	53	48	51	56	11	46	62
95th Queue (ft)	74	110	125	136	40	119	141
Link Distance (ft)	43	226	747	747		126	126
Upstream Blk Time (%)	88	0			0	1	2
Queuing Penalty (veh)	176	0			0	2	8
Storage Bay Dist (ft)					150		
Storage Blk Time (%)			1		0	1	
Queuing Penalty (veh)			0		0	0	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	EB	SB	SB	SB	B15	B15	B15
Directions Served	L	R	T	T	TR	T	T	T
Maximum Queue (ft)	152	113	71	169	209	5	10	12
Average Queue (ft)	57	37	12	42	56	0	0	0
95th Queue (ft)	116	83	45	113	145	5	7	7
Link Distance (ft)	241		244	244	244	225	225	225
Upstream Blk Time (%)					0			
Queuing Penalty (veh)					0			
Storage Bay Dist (ft)		150						
Storage Blk Time (%)	1	0						
Queuing Penalty (veh)	0	0						

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B15	B15	B15	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	T	UL	T
Maximum Queue (ft)	428	56	58	115	299	303	308	106	132	116	494	853
Average Queue (ft)	327	17	42	16	208	224	227	11	23	23	398	401
95th Queue (ft)	522	47	62	66	332	362	362	58	85	84	572	885
Link Distance (ft)	433	37	37		225	225	225	244	244	244		958
Upstream Blk Time (%)	27	6	53		6	9	10					4
Queuing Penalty (veh)	0	18	156		21	30	34					0
Storage Bay Dist (ft)				135							470	
Storage Blk Time (%)					23						23	0
Queuing Penalty (veh)					3						78	1

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	819	605
Average Queue (ft)	373	298
95th Queue (ft)	768	522
Link Distance (ft)	958	958
Upstream Blk Time (%)	1	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	53	52	501	466	91	320
Average Queue (ft)	26	9	293	282	25	287
95th Queue (ft)	46	34	475	459	68	320
Link Distance (ft)	37	37	1669	1669	158	259
Upstream Blk Time (%)	4	2				98
Queuing Penalty (veh)	9	5				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1149

Intersection: 1: Lobster Ln & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	LTR>	<LR
Maximum Queue (ft)	39	192	207	183	49	1268	1258	1262	52	310	334	63
Average Queue (ft)	6	64	63	52	5	1041	1059	799	12	230	249	14
95th Queue (ft)	25	155	152	131	29	1571	1588	1702	39	304	321	44
Link Distance (ft)		764	764			1192	1192	1192	111	1666	1666	213
Upstream Blk Time (%)						10	16	4				
Queuing Penalty (veh)						78	131	32				
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		3	0	0		27						
Queuing Penalty (veh)		0	1	0		1						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	250	318	348	174	450	467	382	143	144	283
Average Queue (ft)	100	145	154	81	175	192	215	61	32	221
95th Queue (ft)	201	281	299	166	360	374	370	110	105	331
Link Distance (ft)		982	982		764	764	447	447		268
Upstream Blk Time (%)							1			12
Queuing Penalty (veh)							0			0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				1	21				0	45
Queuing Penalty (veh)				11	35				0	10

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	192	210	349	343	45	475	756	775	375	225	545	537
Average Queue (ft)	96	117	199	205	6	204	376	422	115	210	393	324
95th Queue (ft)	170	184	328	334	28	445	752	790	380	255	591	532
Link Distance (ft)			774	774			982	982			515	515
Upstream Blk Time (%)											10	1
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)						0	8	15	0	56	15	22
Queuing Penalty (veh)						0	12	17	0	147	25	24

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	B127	SB	SB	SB	SB	SB
Directions Served	R	T	L	L	T	T	R
Maximum Queue (ft)	250	280	142	160	289	294	225
Average Queue (ft)	100	68	79	88	205	225	172
95th Queue (ft)	285	370	136	148	299	320	276
Link Distance (ft)		697		229	229	229	
Upstream Blk Time (%)		3			15	21	3
Queuing Penalty (veh)		0			56	77	0
Storage Bay Dist (ft)	225		300				200
Storage Blk Time (%)	0					26	10
Queuing Penalty (veh)	0					91	28

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	115	177	168	58	345	335	132	112
Average Queue (ft)	39	48	43	12	90	101	59	45
95th Queue (ft)	89	141	131	43	246	262	127	97
Link Distance (ft)		204	204		774	774	125	133
Upstream Blk Time (%)		0	0				6	2
Queuing Penalty (veh)		1	1				0	0
Storage Bay Dist (ft)	200			100				
Storage Blk Time (%)		0			8			
Queuing Penalty (veh)		0			2			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	NB	NE	NE	NE	SW	SW	SW
Directions Served	<LR>	<LTR	<	T	TR	L	T	TR>
Maximum Queue (ft)	65	209	28	138	162	105	195	192
Average Queue (ft)	48	94	5	53	52	12	140	140
95th Queue (ft)	58	184	21	121	124	51	241	238
Link Distance (ft)	46	226		747	747		160	160
Upstream Blk Time (%)	77	1				0	17	20
Queuing Penalty (veh)	114	0				0	180	205
Storage Bay Dist (ft)			120			150		
Storage Blk Time (%)				1		0	18	
Queuing Penalty (veh)				0		0	5	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	EB	SB	SB	SB
Directions Served	L	R	T	T	TR
Maximum Queue (ft)	163	125	62	187	244
Average Queue (ft)	72	43	9	50	76
95th Queue (ft)	139	86	38	149	204
Link Distance (ft)	241		260	260	260
Upstream Blk Time (%)	0				0
Queuing Penalty (veh)	0				0
Storage Bay Dist (ft)		150			
Storage Blk Time (%)	1	0			
Queuing Penalty (veh)	1	0			

Intersection: 7: Chain Bridge Road & CBR West Service/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	UL	T	T	TR
Maximum Queue (ft)	260	60	54	100	180	199	196	495	999	986	973
Average Queue (ft)	142	18	42	33	94	94	104	491	935	777	436
95th Queue (ft)	290	48	61	79	163	169	184	521	1178	1290	966
Link Distance (ft)	434	38	38		209	209	209		958	958	958
Upstream Blk Time (%)	0	5	53		0	0	0		68	7	0
Queuing Penalty (veh)	0	21	232		0	0	1		0	0	0
Storage Bay Dist (ft)				135				470			
Storage Blk Time (%)					4			81	0		
Queuing Penalty (veh)					1			277	0		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	59	50	1197	1192	72	292
Average Queue (ft)	24	12	967	971	19	245
95th Queue (ft)	48	37	1250	1264	55	338
Link Distance (ft)	38	38	1666	1666	158	259
Upstream Blk Time (%)	6	2				71
Queuing Penalty (veh)	16	6				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1841

Intersection: 1: Red Lobster & Autobody/Eaton Place & Fairfax Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	NE
Directions Served	L	T	T	TR	<L	T	T	R	LTR	L	LTR>	<LR
Maximum Queue (ft)	111	397	403	225	58	1007	1021	769	46	171	192	44
Average Queue (ft)	11	228	218	174	5	486	496	241	7	100	122	9
95th Queue (ft)	52	358	352	258	35	1174	1181	961	28	157	179	31
Link Distance (ft)		764	764			1190	1190	1190	109	1669	1669	213
Upstream Blk Time (%)						3	4	2				
Queuing Penalty (veh)						23	29	12				
Storage Bay Dist (ft)	130			200	80							
Storage Blk Time (%)		18	7	4		32						
Queuing Penalty (veh)		3	39	20		2						

Intersection: 2: University Drive/University Plaza & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	L	TR
Maximum Queue (ft)	206	253	247	175	771	783	222	144	145	232
Average Queue (ft)	99	121	129	126	421	433	106	54	46	176
95th Queue (ft)	183	207	214	213	893	899	190	110	121	256
Link Distance (ft)		981	981		764	764	447	447		205
Upstream Blk Time (%)					5	7				14
Queuing Penalty (veh)					43	54				0
Storage Bay Dist (ft)	450			150					120	
Storage Blk Time (%)				2	41				0	33
Queuing Penalty (veh)				17	58				1	14

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	T
Maximum Queue (ft)	208	259	525	529	207	475	1006	1005	375	225	356	345
Average Queue (ft)	120	139	356	359	21	316	758	770	228	139	190	180
95th Queue (ft)	191	225	501	503	125	630	1198	1202	516	234	296	283
Link Distance (ft)			769	769			981	981			515	515
Upstream Blk Time (%)							3	3				
Queuing Penalty (veh)							19	24				
Storage Bay Dist (ft)	600	600			500	450			350	200		
Storage Blk Time (%)			0	1	0	0	44	58	0	4	6	3
Queuing Penalty (veh)			0	0	0	0	65	53	1	11	10	4

Intersection: 3: Chain Bridge Road & Fairfax Blvd

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	248	128	136	242	262	225
Average Queue (ft)	49	64	72	162	173	137
95th Queue (ft)	148	115	125	265	280	262
Link Distance (ft)			229	229	229	
Upstream Blk Time (%)				8	11	1
Queuing Penalty (veh)				31	45	0
Storage Bay Dist (ft)	225	300				200
Storage Blk Time (%)	0				16	4
Queuing Penalty (veh)	0				63	12

Intersection: 4: Farr Ave & Fairfax Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	80	181	185	93	289	316	98	102
Average Queue (ft)	22	93	95	18	148	184	33	35
95th Queue (ft)	56	180	180	56	260	295	78	79
Link Distance (ft)		174	174		769	769	134	122
Upstream Blk Time (%)		1	1				0	0
Queuing Penalty (veh)		9	9				0	0
Storage Bay Dist (ft)	200			80				
Storage Blk Time (%)		1		0	13			
Queuing Penalty (veh)		1		0	4			

Intersection: 5: Fairfax Blvd & McLean Avenue & Warwick Road

Movement	EB	NB	NE	NE	NE	SW	SW	SW
Directions Served	<LR>	<LTR	<	T	TR	L	T	TR>
Maximum Queue (ft)	67	81	36	208	204	64	208	223
Average Queue (ft)	48	26	6	68	66	10	104	125
95th Queue (ft)	67	64	25	151	141	36	212	223
Link Distance (ft)	51	226		747	747		186	186
Upstream Blk Time (%)	47					0	2	3
Queuing Penalty (veh)	46					0	15	21
Storage Bay Dist (ft)			120			150		
Storage Blk Time (%)				2			3	
Queuing Penalty (veh)				0			1	

Intersection: 6: Chain Bridge Road & Orchard Street

Movement	EB	EB	NB	SB	SB	SB	B16	B16	B16
Directions Served	L	R	T	T	T	TR	T	T	T
Maximum Queue (ft)	178	144	2	56	253	310	36	82	171
Average Queue (ft)	73	50	0	5	37	56	2	7	12
95th Queue (ft)	138	102	2	34	160	208	36	67	99
Link Distance (ft)	241		55	240	240	240	227	227	227
Upstream Blk Time (%)	0			0	1	2	0	0	1
Queuing Penalty (veh)	0			0	4	8	0	1	2
Storage Bay Dist (ft)		150							
Storage Blk Time (%)	0	1							
Queuing Penalty (veh)	0	0							

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	EB	WB	WB	NB	NB	NB	NB	B16	B16	B16	SB	SB
Directions Served	LTR	LTR	R	UL	T	T	TR	T	T	T	UL	T
Maximum Queue (ft)	128	56	58	129	292	292	299	22	17	28	495	1001
Average Queue (ft)	53	16	34	27	204	210	222	2	1	2	464	753
95th Queue (ft)	106	49	63	91	281	284	299	16	8	17	583	1259
Link Distance (ft)	434	37	37		227	227	227	240	240	240		958
Upstream Blk Time (%)		4	18		12	15	22					43
Queuing Penalty (veh)		10	44		43	53	75					0
Storage Bay Dist (ft)				135							470	
Storage Blk Time (%)					50						64	0
Queuing Penalty (veh)					13						257	1

Intersection: 7: Chain Bridge Road & Norman Avenue/Eaton Place

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	977	972
Average Queue (ft)	718	554
95th Queue (ft)	1213	1007
Link Distance (ft)	958	958
Upstream Blk Time (%)	11	1
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 71: Marriott/NE Service Rd & Eaton Place

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	52	34	254	246	58	183
Average Queue (ft)	29	9	157	164	15	74
95th Queue (ft)	46	32	236	237	45	147
Link Distance (ft)	37	37	1669	1669	158	259
Upstream Blk Time (%)	3	1				
Queuing Penalty (veh)	8	2				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1281

Appendix K

Crash Data

Crash Data for the Intersection of Fairfax Blvd and Eaton Pl (2014 - 2018)

Document Number	Date	Crash Severity	Collsion Type	Pedestrain Injury	Persons Injured	Fatalities	Direction of Travel	Work Zone Related	Adverse Weather Conditions	Distracted Driver	Description
140565132	2/21/2014	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	yes	no	VEHICLE 2 WAS STOPPED IN THE #2 TRAFFIC LANE OF WESTBOUND FAIRFAX BLVD NEAR THE INTERSECTION OF EATON PLACE. VEHICLE 1 WAS ALSO IN THE #2 TRAFFIC LANE AND WAS FOLLOWING TOO CLOSE TO VEHICLE 2. VEHICLE 1 STRUCK THE REAR END OF VEHICLE 2. THERE WERE NO INJURIES REPORTED ON SCENE. NO VEHICLES WERE TOWED FROM THE SCENE.
141435164	5/20/2014	PDO.Property Damage Only	1. Rear End	0	0	0	East,East,East	no	no	yes	Vehicles 2 and 3 were starting from a stopped position in the left east bound lane of Fairfax Blvd prior to Eaton Place when vehicle #1 struck vehicle #2 in the rear. The impact between vehicles 1 and 2 forced #2 into the rear of #3. Vehicle #1 was traveling in the left east bound lane of Fairfax Blvd at the time of the incident.Driver's Ac. on (P1) #37 "Other" is, Fail to Pay Full Time & Attention
141845162	7/2/2014	PDO.Property Damage Only	2. Angle	0	0	0	West,East	no	no	no	On 07-02-14 at 0758 hours, Vehicle #2 was headed eastbound on Fairfax Blvd. Vehicle #1 was headed westbound on Fairfax Blvd. At the intersection of Fairfax Blvd and Eaton Place, Vehicle #1 attempted to pull into the parking lot of 10325 Fairfax Blvd, by making a left turn, but failed to yield the right of way. Vehicle #1 was struck Vehcile #2 (POI#1)
142335061	8/13/2014	PDO.Property Damage Only	1. Rear End	0	0	0	West,West,West	no	no	no	Vehicles 2 and 3 were stopped for traffic in the left west bound lane of Fairfax Blvd prior to Eaton Place when vehicle #1 struck vehicle #2 in the rear. The impact between vehicles 1 and 2, forced #2 into the rear of #3. Vehicle #1 was traveling in the left west bound lane of Fairfax Blvd at the time of the incident.
150555131	2/21/2015	PDO.Property Damage Only	2. Angle	0	0	0	West,East	no	yes	no	The Driver of Vehicle 2 stated she was East bound on Eaton Place stopped in the left turn lane at Fairfax Blvd. V2's drvier stated that a vehicle west bound on Fairfax Blvd. made a right turn from Fairfax Blvd onto west bound Eaton Place and drove into her vehicle. V2's driver stated the left front corner of her car was impacted by the front of the other vehicle. V2's driver stated she was not injured.The Driver of Vehicle 1 stated she was west bound Fairfax Blvd. in the right turn lane to turn right onto west bound Eaton Place. V1's driver stated that as she made her turn her car skidded into the stopped vehicle in the left turn lane from Eaton Place onto Fairfax Blvd. impacting the left front corner of V2 with the front of her vehicle. V1's driver stated she was not injured.
150705166	2/24/2015	PDO.Property Damage Only	1. Rear End	0	0	0	East,East,East	no	no	yes	Vehicles 1, 2, and 3. were traveling eastbound on Fairfax Blvd just prior to Eaton Place in the left through lane. Vehicle 3 was slowing due to a red light and so was vehicle 2. The light turned green and both vehicles 2 and 3 began to move again. Vehicle 1 misjudged the speeds of vehicles 2 and 3 and subsequently struck vehicle 2 in the rear. Vehicle 2 subsequently struck vehicle 3 in the rear.
150935114	3/26/2015	PDO.Property Damage Only	2. Angle	0	0	0	North,East	no	yes	no	Vehicle #1 was turning left onto east bound Fairfax Blvd from the left turn lane of south bound Easton Place when it was struck by vehicle #2. Vehicle #2 was traveling in the left east bound lane of Fairfax Blvd at Eaton Place at the time of the incident. The intersection of Fairfax Blvd and Eaton Place was working on flash at the time of the incident.
151685141	6/9/2015	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	yes	Vehicles one and two were traveling east on Fairfax Blvd in lane two(left through lane) prior to Eaton Place. Prior to approaching the light at Eaton Place vehicle one collided with the rear end of vehicle two. Vehicle two was traveling at a lower speed do to slower traffic ahead. Driver of vehicle one stated that he was looking to the roadside in an attempt to locate a potential businesses to apply for work.Driver/Vehicle Info; Driver's Actions (P1); Other 37-Failure to pay full time and attention (98-14).
151875118	7/2/2015	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	no	Both vehicles were traveling in the right westbound lane of Fairfax Blvd, west of Eaton Pl. The driver of vehicle 1 failed to see vehicle 2 stopping to the front, causing vehicle 1 to strike the rear of vehicle 2.
152515356	9/7/2015	PDO.Property Damage Only	2. Angle	0	0	0	East,South	no	no	no	Vehicle #1 was turning left onto eastbound Eaton Pl from southbound Chain Bridge Rd. Vehicle #2 was traveling in the center northbound lane of Chain Bridge Rd. Vehicle #2 struck Vehicle #1 after Vehicle #1 failed to yield the right of way.
160115305	12/13/2015	B.Visible Injury	4. Sideswipe - Same Direction	0	1	0	West,West	no	no	no	VEHICLE ONE AND VEHICLE TWO WERE TRAVELING WEST ON FAIRFAX BLVD APPROACHING EATON PLACE. VEHICLE TWO WAS IN THE RIGHT TURN LANE WHEN VEHICLE ONE ATTEMPTED TO CHANGE LANES FROM THE CENTER LANE INTO THE RIGHT LANE STRIKING VEHICLE TWO IN THE FRONT DRIVER SIDE (POI 1).

160045325	12/29/2015	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	yes	VEHICLE #1 AND #2 WERE TRAVELING WESTBOUND ON FAIRFAX BLVD. AS VEHICLE #2 WAS SLOWING FOR A RED LIGHT, VEHICLE #1 STRUCK VEHICLE #2. #37: FAIL TO PAY FULL TIME AND ATTENTION
160405230	2/2/2016	B.Visible Injury	3. Head On	0	1	0	West	no	no	no	VEHICLE 1 WAS TRAVELING IN THE #2 LANE OF FAIRFAX BLVD NEARING THE INTERSECTION OF EATON PLACE. VEHICLE 1 WAS DRIVING IN A RECKLESS MANNER AND AT A REPORTEDLY HIGH RATE OF SPEED. VEHICLE 1 THEN LOST CONTROL AND LEFT THE ROADWAY WITHIN THE INTERSECTION OF FAIRFAX BLVD AT EATON PLACE. VEHICLE 1 STRUCK A GUARDRAIL WHERE THE VEHICLE CAME TO REST. VEHICLE 1, PRIOR TO THIS INCIDENT, HAD BEEN STOPPED BY FAIRFAX COUNTY POLICE AND FLED THE SCENE OF THE TRAFFIC STOP. FAIRFAX COUNTY POLICE WAS ACTIVELY SEEKING VEHICLE 1 AT THE TIME OF THE CRASH. DRIVER ACTION-RECKLESS DRIVING
161555122	6/2/2016	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	no	VEHICLE #2 WAS TRAVELING IN THE RIGHT WESTBOUND LANE ON EATON PLACE WHEN VEHICLE #1 WAS PULLING OUT OF THE PARKING LOT AND SIDESWIPED VEHICLE #2.
161735361	6/16/2016	B.Visible Injury	1. Rear End	0	2	0	West,West,West	no	yes	yes	V1, V2, AND V3 WERE ALL TRAVELING WESTBOUND ON FAIRFAX BLVD. V1 AND V2 WERE IN THE MIDDLE THROUGH LANE AND V3 WAS IN THE RIGHT LANE JUST EAST OF EATON PL ON FAIRFAX BLVD. DRIVER OF V3 MADE AN UNSAFE LANE CHANGE AND SLOWED IN THE INTERSECTION OF FAIRFAX BLVD AND EATON PL CAUSING V2 TO QUICKLY STOP AND ATTEMPT TO SWERVE AROUND V3 TO AVOID A COLLISION. V1, WHICH WAS BEHIND V2, WAS FOLLOWING TOO CLOSE TO V2 AND STRUCK V2 AFTER V3 MADE THE UNSAFE LANE CHANGE.
163135736	9/13/2016	C.Non-visible Injury	1. Rear End	0	1	0	West,West,West,West	no	no	yes	Vehicle 1 was traveling West on Fairfax Blvd in the #2 lane, when it struck the rear of vehicle 2. Vehicle 1 driver stated he was daydreaming and didn't notice vehicle 2 stopping. Vehicle 2 was coming to a stop when it was struck by vehicle 1. Vehicle 2 then struck the rear of vehicle 3 due to the impact. Vehicle 3 was stopped in traffic, when it was struck by vehicle 2. Vehicle 3 then struck the rear of vehicle 4 due to the impact. Vehicle 4 was stopped in traffic, when it was struck by vehicle 3. Vehicle 3 driver was transported to the hospital with a complaint of injuries.
162955155	10/10/2016	C.Non-visible Injury	2. Angle	0	1	0	South,West	no	no	no	VEHICLE #1 WAS TRAVELING EASTBOUND IN THE LEFT TURN LANE OF FAIRFAX BLVD. VEHICLE #2 WAS TRAVELING IN THE LEFT WESTBOUND LANE OF FAIRFAX BLVD. VEHICLE #1 ATTEMPTED TO MAKE A LEFT TURN FROM FAIRFAX BLVD ONTO NORTHBOUND EATON PLACE. WHILE DOING, VEHICLE #1 FAILED TO YIELD THE RIGHT OF WAY TO VEHICLE #2 WHICH RESULTED IN VEHICLE #2 STRIKING VEHICLE #1.
170125229	1/3/2017	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	yes	no	Vehicle 1 was traveling East on Fairfax Blvd, when it struck the rear of vehicle 2. Vehicle 1 driver stated she was about 1 car length behind vehicle 2, when it came to a stop. Vehicle 2 was coming to a stop on Fairfax Blvd and Eaton Pl for the traffic light, when vehicle 1 struck it from the rear. No injuries were reported at the time of the crash.
170685140	2/28/2017	C.Non-visible Injury	2. Angle	0	1	0	East,East	yes	no	no	Both vehicles were turning left from Eaton Place onto eastbound Fairfax Boulevard. Vehicle one changed lanes into the side of vehicle two just as both vehicles were coming out of the turn.
171925210	3/24/2017	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	no	VEHICLES 1 AND 2 WERE IN THE #1 TRAFFIC LANE OF FAIRFAX BLVD NEAR 10287. VEHICLE 1 WAS DIRECTLY BEHIND VEHICLE 2. VEHICLE 1 ATTEMPTED TO BRAKE AND HIT AND GAS PEDAL AND REAR ENDED VEHICLE 2.
171355001	5/3/2017	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	no	VEHICLES 1 AND 2 WERE TRAVELING IN THE LEFT EASTBOUND LANE OF EATON PL. VEHICLE 1 DID NOT SEE THAT VEHICLE 2 HAD COME TO A STOP AND STRUCK VEHICLE 2 IN THE REAR.
172235262	5/30/2017	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	yes	VEHICLE 1 AND VEHICLE 2 WERE TRAVELING IN THE LEFT WESTBOUND LANE OF FAIRFAX BLVD. VEHICLE 2 BEGAN SLOWING FOR TRAFFIC CONDITIONS THAT WERE YIELDING FOR AN EMERGENCY VEHICLE. VEHICLE 1 THEN STRUCK VEHICLE 2 IN THE REAR. VEHICLE 2 DRIVER WAS OPERATING THE VEHICLE AS PART OF A SERVICE

172215247	7/21/2017	A.Ambulatory Injury	2. Angle	0	2	0	West,North	no	no	no	Vehicle one was traveling west on Fairfax Blvd making a left turn at Eaton Place under a red traffic signal. Vehicle two was traveling south on Eaton Place making a left turn onto Fairfax Blvd through a green traffic signal. Vehicle one failed to obey the red traffic signal, crossed the center median and struck vehicle two. Prior to the collision, vehicle one struck a median sign within the median.
172285218	8/3/2017	PDO.Property Damage Only	1. Rear End	0	0	0	East,East,East	no	no	no	VEHICLES 1, 2 AND 3 WERE ALL IN THE #1, LEFT TURN LANE OF FAIRFAX BLVD CLOSE TO THE INTERSECTION OF EATON PLACE. VEHICLE 1 STRUCK THE REAR END OF VEHICLE 2. VEHICLE 2 THEN STRUCK THE REAR END OF VEHICLE 3.
172275320	8/6/2017	A.Ambulatory Injury	3. Head On	0	2	0	South,West	no	no	no	V1 was attempting to turn left from the left turn lane of eastbound Fairfax Blvd onto Eaton Place. V2 was traveling in the left westbound lane of Fairfax Blvd at Eaton Place. Both vehicle collided in the intersection. Each driver gave conflicting statements.
182405355	8/20/2018	PDO.Property Damage Only	2. Angle	0	0	0	West,West	no	no	no	V1 and V2 were westbound on Fairfax Boulevard approaching the intersection with Boulevard Marketplace and stopped at a red light. V1 began merging left from the right turn lane into the right center through lane. V1 merged into V2's blind spot. The traffic signal turned green and V1 accelerated in front of V2 to finish merging into the lane. V2 had begun accelerating once the traffic signal turned green. V1's rear driver's side bumper made contact with V2's passenger side bumper.
182615318	9/7/2018	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	no	V2 was traveling in the right lane of westbound Fairfax Blvd. just west of Eaton Pl. V2 slowed with traffic. V1 was traveling in the right lane of westbound Fairfax Blvd. just west of Eaton Pl. V1 did not stop in time and rear ended V2.
182715178	9/25/2018	B.Visible Injury	2. Angle	0	2	0	South,West	no	no	no	VEHICLE #1 WAS TRAVELING EASTBOUND ON FAIRFAX BLVD ATTEMPTING TO MAKE A LEFT TURN ON TO EATON PLACE. VEHICLE #2 WAS TRAVELING IN THE RIGHT WESTBOUND LANE OF FAIRFAX BLVD. VEHICLE #1 FAILED TO YIELD THE RIGHT OF WAY TO VEHICLE #2. VEHICLE #2 STRUCK VEHICLE #1. VEHICLE #2 OCCUPANTS WERE TRANSPORTED TO THE HOSPITAL WITH MINOR INJURIES.
183055204	11/1/2018	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	no	VEHICLE 2 WAS STOPPED IN THE #1 LANE OF FAIRFAX BLVD JUST EAST OF EATON PLACE. VEHICLE 1 WAS DIRECTLY BEHIND VEHICLE 2 AND ATTEMPTING TO MAKE A LANE CHANGE IN THE #2LANE. VEHICLE 1 WAS FOLLOWING TOO CLOSELY AND STRUCK THE REAR END OF VEHICLE 2 WHEN VEHICLE 2 STOPPED IN THE TRAFFIC LANE.

Crash Data for the Intersection of Fairfax Blvd and University Dr (2014 - 2018)

Document Number	Date	Crash Severity	Collsion Type	Pedestrain Injury	Persons Injured	Fatalities	Direction of Travel	Work Zone Related	Adverse Weather Conditions	Distracted Driver	Description
140525059	2/14/2014	PDO.Property Damage Only	2. Angle	0	0	0	North,East	no	no	no	Vehicle one was turning left from west bound Fairfax Blvd onto south bound University Dr. Vehicle two was traveling east on Fairfax Blvd approaching University Drive. Vehicle one failed to yield when making a left and entered into the path of vehicle two causing the crash. Vehicle one was proceeding through the intersection under a steady green light without the left turn arrow. Vehicle two was proceeding straight through the intersec. on under a green light.
140555061	2/21/2014	B.Visible Injury	1. Rear End	0	2	0	East,East,East	no	no	no	All vehs were east on Fairfax Blvd in the 10300 blk of Fairfax Blvd. Vehs # 2 & 3 were stopped for heat traffic in front of them. The driver of Veh#1 observed Veh#2 stopped in traffic. The driver of Veh#1 applied the brakes to his veh, but could not stop in time. Veh #1 struck the rear of Veh #2 which in turn struck Veh#3.No independent witnesses.
140565199	2/24/2014	B.Visible Injury	1. Rear End	0	1	0	South,South	no	no	no	VEHICLE 2 WAS MAKING A RIGHT TURN FROM NORTHBOUND UNIVERSITY DR INTO A GAS STATION PARKING LOT (10383 FAIRFAX BLVD). VEHICLE 2 MADE A SUDDEN STOP HALFWAY THROUGH THE TURN. VEHICLE 1 WAS DIRECTLY BEHIND VEHICLE 2 AND WAS UNABLE TO STOP IN TIME AND STRUCK THE LEFT REAR CORNER OF VEHICLE 2. THE DRIVER OF VEHICLE 2 INITIALLY REFUSED MEDICAL ATTENTION AND TOWARDS THE END OF MY INVESTIGATION, DRIVER 2 COMPLAINED OF LOWER BACK PAIN. SHE WAS TRANSPORTED TO A LOCAL MEDICAL FACILITY. VEHICLE 2 WAS TOWED FROM THE SCENE. DRIVER'S ACTION VEHICLE 1 IS #37-OTHER-FAIL TO PAY FULL TIME AND ATTENTION
141055079	4/9/2014	B.Visible Injury	1. Rear End	0	1	0	West,West	no	no	no	VEH 2 WAS TRAVELLING WEST ON FAIRFAX BLVD AND WAS SLOWING FOR TRAFFIC. DRIVER OF VEH 1 WAS DRIVING WEST ON FAIRFAX BLVD AND STATED SHE WAS UNABLE TO STOP BEFORE MAKING CONTACT WITH VEH 2, WHICH WAS SLOWING/STOPPING FOR TRAFFIC.
141295053	5/8/2014	PDO.Property Damage Only	6. Fixed Object in Road	0	0	0	East	no	no	no	On 05-08-14 at 1630 hours, vehicle # 1 was east bound on Fairfax Blvd. At the intersection of Fairfax Blvd and University Driver, Vehicle #1 attempted to turn left into the University Shopping Center. During that turn, Vehicle # 1 struck a traffic sign that was posted in the median POI#1).
141545128	5/27/2014	PDO.Property Damage Only	1. Rear End	0	0	0	West,West,West	no	no	no	Vehicle # 1, Vehicle # 2, and Vehicle # 3 were westbound on Fairfax Blvd approaching University Drive. Vehicle # 1 and Vehicle # 2 stopped in traffic. Driver of Vehicle # 3 did not see Vehicle # 1 and Vehicle # 2 stop and struck Vehicle # 2 in the rear, pushing Vehicle # 2 into Vehicle # 1.
141615046	6/3/2014	B.Visible Injury	1. Rear End	0	1	0	West,West	no	no	no	Both vehicles were traveling west on Fairfax Blvd in the right through lane. Vehicle #1 advised that they were stopping for the traffic light that was turning red at University Dr.Vehicle #2 a motorcycle advised that the vehicles were stopping abruptly and that he tried to stop and was unable to, as he applied his brakes the motorcycle laid down on the left side. Vehicle #2 slid on its left side, striking the rear of vehicle #1 with the right side of his motorcycle as well as his right shoulder and arm.The roads were wet from an earlier rain.Vehicle #1 suffered minor damage to the rear corner bumper, and quarter panel.Vehicle #2 suffered damage to the left side, shifter, foot peg, handle bar, turn signal front and rear, damage to the right side brake pedal, foot peg.Vehicle #2, POI #1 was the roadway.Vehicle #2 was transported to Fairfax Hospital by Medic #433.
142095160	6/17/2014	PDO.Property Damage Only	1. Rear End	0	0	0	East,West	no	no	yes	Vehicle #1 was traveling eastbound on Fairfax Blvd and made a U-turn onto westbound Fairfax Blvd at the intersection of University Dr. Vehicle #2 was traveling westbound on Fairfax Blvd and had the right of way. The front of Vehicle #2 struck the rear of Vehicle #1. Vehicle #1 then struck the signal pole at the north west corner of this intersection. Driver #1 was issued a summons for 98-14 Fail to pay full time and attention.
141915299	7/2/2014	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	no	Vehicles one and two were traveling west on Fairfax Blvd in lane two (right lane). Vehicle two came to a stop with traffic and was struck by vehicle one in the rear end. Driver of vehicle one stated that the traffic was heavy and was stop and go. Driver one advised that as traffic came to a stop he was unable to stop in time striking vehicle two in the rear end.
142675186	9/23/2014	PDO.Property Damage Only	9. Fixed Object - Off Road	0	0	0	East,Not Provided	no	no	no	Vehicle 1 was traveling NB on University Drive approaching Fairfax Boulevard. Vehicle 1 made a right turn onto Fairfax Boulevard (EB). Vehicle 1 lost control and entered gas station located at 10383 Fairfax Boulevard. Vehicle 1 struck a gas pump (POI 1) then struck vehicle 2 (POI 2) which was parked.Vehicle 1 had front end and fire damage estimated at $3,000.00. Vehicle 2 had left side damage estimated at $2,500.00. A gas pump was struck with damage estimated at $25,000.00.
142695103	9/24/2014	B.Visible Injury	1. Rear End	0	1	0	West,West	no	no	no	Vehicle 1 was traveling WB on Fairfax Blvd. Vehicle 2 was stopped in traffic WB on Fairfax Blvd. Vehicle 1 collided with rear of Vehicle 2 causing the accident.

143105281	11/3/2014	PDO.Property Damage Only	1. Rear End	0	0	0	West,West,West	no	no	no	Vehicle one was westbound on Fairfax Blvd. Vehicles two and three were westbound on Fairfax Blvd. stopped in traffic approaching University Blvd. Driver one stated that the brakes in his vehicle were not working as they should causing him to strike vehicle two subsequently causing vehicle two to move forward striking vehicle three. Driver one advised that he had been aware of the problems with the brakes prior to the crash.
143435283	11/21/2014	PDO.Property Damage Only	2. Angle	0	0	0	South,East	no	no	no	Vehicle #1 was traveling north in the right turn lane on University Dr. Vehicle #2 was south on University Dr, making a left turn into the Sunoco station.The traffic in the left lane was stopped on the north bound side, and had left enough room for vehicle #2 to turn. Vehicle #2 never saw vehicle #1 approaching, and struck him in the driver side door.Vehicle #1sustained damage to the driver and rear side door.Vehicle #2 sustained damage to the front bumper, grill.Vehicle #2 had just been repaired at Collision Specialists of Fairfax and was being transported to be cleaned for the owner.
151325154	5/7/2015	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	no	VEHICLE 1 WAS TRAVELING WEST ON FAIRFAX BLVD, JUST PAST UNIVERSITY DR, WHEN IT STRUCK THE REAR OF VEHICLE 2. VEHICLE 1 DRIVER STATED HE LOOKED IN HIS MIRROR TO CHANGE LANES FROM THE #2 TO THE #1 LANE, WHEN HE STRUCK VEHICLE 2.VEHICLE 2 WAS STOPPED IN THE STRAIGHT TRAVEL LANE OF FAIRFAX BLVD, WHEN IT WAS STRUCK BY VEHICLE 1.NO INJURIES WERE REPORTED AT THE TIME OF THE CRASH. VEHICLE 1 IS AT FAULT FOR THE CRASH.
151335231	5/12/2015	C.Non-visible Injury	2. Angle	0	1	0	East,West	no	no	no	Vehicle 1 was traveling East on Fairfax Blvd and attempted a right turn to the parking lot at University Dr. Vehicle 1 made the left turn and struck vehicle 2.Vehicle 2 was traveling West on Fairfax Blvd and had a green light. Vehicle 2 was then struck by vehicle 1.Vehicle 1 made the left turn in front of vehicle 2.Vehicle 1 was issued a summons for fail to yield the right of way. Vehicle 2 driver was transported to the hospital with minor injures.
151815190	6/24/2015	A.Ambulatory Injury	12. Ped	1	1	0	East	no	no	yes	Vehicle one was traveling eastbound on Fairfax Blvd. Pedestrian one was crossing the intersection northbound across Fairfax Blvd. Vehicle one subsequently struck pedestrian one. After striking the pedestrian, the vehicle applied the brakes and left approximately thirty nine feet of skid marks.
152655277	8/20/2015	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	South,East	no	no	no	Vehicle 1 was stopped at the red light of University Dr and Fairfax Blvd, when the driver moved the vehicle forward to observe East Fairfax Blvd for traffic. When the vehicle moved forward, vehicle 2 struck it. Vehicle 1 driver stated that vehicle 2 was a large truck. Vehicle 1 driver could not provide any further information on vehicle 2.Vehicle 2 was traveling East on Fairfax Blvd and struck vehicle 1. Vehicle 2 did have the right of way when the crash occurred. Vehicle 2 then fled the scene East on Fairfax Blvd and did not report the crash. Vehicle 2 information is unknown at this time.There is no further information at this point.
153085158	11/2/2015	PDO.Property Damage Only	2. Angle	0	0	0	South,West	no	no	yes	VEHICLE #2 WAS TRAVELING WESTBOUND ON FAIRFAX BLVD. VEHICLE #1 WAS TRAVELING EASTBOUND ON FAIRFAX BLVD AND MADE A LEFT TURN INTO A SHOPPING COMPLEX FROM A LEFT TURN LANE. VEHICLE #1 FAILED TO YIELD THE RIGHT OF WAY TO VEHICLE #2 WHILE TURNING LEFT. VEHICLE #2 STRUCK VEHICLE #1.
153145152	11/5/2015	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	no	Vehicle 1 was traveling in the left westbound lane on Fairfax Blvd approaching University Dr when a vehicle in the right westbound lane swerved into the lane in front of vehicle 1. The driver swerved to the left to avoid the vehicle, striking vehicle 2 in the process. Vehicle 2 was stopped at the traffic signal in the left-turn lane westbound on Fairfax Blvd at University Drive at the time of the incident.
160215205	1/20/2016	PDO.Property Damage Only	2. Angle	0	0	0	East,East	no	no	no	VEHICLE 2 WAS TRAVELING EAST BOUND ON FAIRFAX BLVD IN THE FAR RIGHT LANE. VEHICLE 1 WAS TRAVELING NORTHBOUND ON UNIVERSITY DR ATTEMPTING TO MAKE A RIGHT TURN ON TO FAIRFAX BLVD EASTBOUND. AS VEHICLE 2 CONTINUED THROUGH THE GREEN LIGHT, VEHICLE 1 MADE A RIGHT TURN IN TO THE FAR RIGHT LANE ONTO EASTBOUND FAIRFAX BLVD, STRIKING THE RIGHT REAR CORNER OF VEHICLE 2.
160885170	3/25/2016	B.Visible Injury	1. Rear End	0	1	0	East,East	no	no	yes	VEHICLE 2 WAS STOPPED IN THE FAR LEFT THROUGH LANE OF FAIRFAX BLVD EASTBOUND. VEHICLE 1 WAS TRAVELING EASTBOUND IN THE SAME LANE. VEHICLE 1 DID NOT SEE VEHICLE 2 STOPPED IN THE LANE AND STRUCK VEHICLE 2 IN THE REAR.
161245279	4/29/2016	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	South,South	no	no	no	V1 was traveling north on University Drive in the left lane. V2 was starting from a stopped position in the right lane of northbound University Drive/Fairfax Boulevard. The vehicles in front of V1 stopped suddenly, despite having a green light, because traffic on Fairfax Boulevard was blocking the intersection. V1 braked hard and drifted into the right lane, subsequently striking V2.

161895244	7/6/2016	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	no	V1 was traveling east on Fairfax Blvd at University Dr. V1 was slowing for a light that was changing to red. V1 was traveling at approximatly 5mph when it was struck from behind from V2. V2 is an unidentified vehicle who struck V1 from the rear at the intersection of Fairfax Blvd and University Dr. while traveling east on Fairfax Blvd.
162365171	8/2/2016	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	yes	V2 WAS STOPPED IN THE RIGHT WESTBOUND LANE OF FAIRFAX BLVD FOR HEAVY TRAFFIC CONDITIONS. V1 FAILED TO MAINTAIN PROPER CONTROL AND STRUCK THE REAR OF V2.
162235209	8/4/2016	PDO.Property Damage Only	2. Angle	0	0	0	East,East	no	no	no	Vehicle one was northbound on University Drive stopped at the red light at Fairfax Blvd. Vehicle two was eastbound on Fairfax Blvd. in the left lane. Vehicle one attempted to make a right turn on red to go eastbound on Fairfax Blvd. Vehicle one made the right turn and went wide into the left lane encroaching on vehicle two subsequently striking it.
162665205	9/18/2016	PDO.Property Damage Only	2. Angle	0	0	0	East,East	no	no	no	VEHICLE 2 WAS TRAVELING IN THE LEFT EASTBOUND LANE OF FAIRFAX BLVD AT UNIVERSITY DR WHEN IT WAS STRUCK BY VEHICLE 1. VEHICLE 1 WAS TURNING RIGHT (WIDE TURN) ONTO EASTBOUND FAIRFAX BLVD FROM THE RIGHT TURN LANE OF NORTHBOUND UNIVERSITY DR AT THE TIME OF THE INCIDENT.
163125304	11/4/2016	PDO.Property Damage Only	2. Angle	0	0	0	South,East	no	no	no	VEHICLE 2 WAS TRAVELING EAST ON FAIRFAX BLVD WITH A GREEN LIGHT. VEHICLE 1 ATTEMPTED TO TURN RIGHT FROM UNIVERSITY DR ONTO FAIRFAX BLVD. VEHICLE 2 STRUCK VEHICLE 1. VEHICLE 1 DID NOT HAVE THE RIGHT OF WAY.
170605226	1/26/2017	PDO.Property Damage Only	2. Angle	0	0	0	East,North	no	no	no	Vehicle one was traveling east in lane two, right through lane, on Fairfax Blvd at University Dr. Vehicle two was turning left onto University Driver from west bound Fairfax Blvd. As vehicle two made the left turn onto University Drive vehicle one struck the right rear quarter panel. Vehicle one and vehicle two both claimed to have a green traffic signals with vehicle two's signal being a left green arrow. A witness, Matthew Johnson, stated he was traveling in the same direction as vehicle one and indicated that the light had just changed to red for vehicle one when the accident occurred. After observing the light cycles, I found that the traffic signals for both east and west bound Fairfax Blvd change to red before cycling to green for University Drive. This cycle takes place before the green left turn arrow for east bound Fairfax Blvd. Therefore, I could not determine who was at fault.
171395245	2/13/2017	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	yes	yes	VEHICLES 1 AND 2 WERE TRAVELING IN THE LEFT EASTBOUND LANE OF FAIRFAX BLVD. VEHICLE 2 SLOWED TO A STOP FOR A RED LIGHT AND VEHICLE 1 STRUCK VEHICLE 2 IN THE REAR.
172115260	4/4/2017	PDO.Property Damage Only	1. Rear End	0	0	0	East,East,East	no	no	yes	VEHICLES 1, 2 AND 3 WERE TRAVELING IN THE LEFT EASTBOUND LANE OF FAIRFAX BLVD. ALL VEHICLES WERE STOPPED AT A RED TRAFFIC SIGNAL. AS THE LIGHT TURNED GREEN, VEHICLE 3 (INCLUDING A TRAILER) BEGAN TO ACCELERATE FROM A STOPPED POSITION. VEHICLE 2 DID THE SAME. WHILE DOING SO, VEHICLE 1 STRUCK VEHICLE 2, WHICH CAUSED VEHICLE 2 DRIVER TO PRESS THE ACCELERATOR. THIS CAUSED VEHICLE 2 TO STRIKE VEHICLE 3.
172275316	8/4/2017	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	no	VEHICLE 1 AND 2 WERE TRAVELING IN THE LEFT EASTBOUND LANE OF FAIRFAX BLVD. VEHICLE 2 WAS STOPPED FOR TRAFFIC CONDITIONS WHEN VEHICLE 1 REAR ENDED VEHICLE 2 IN THE REAR.
173125365	8/25/2017	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	yes	VEHICLE 1 AND VEHICLE 2 WERE TRAVELING IN THE RIGHT WESTBOUND LANE OF FAIRFAX BLVD. VEHICLE 2 CAME TO A STOP FOR TRAFFIC CONDITIONS WHEN VEHICLE 1 STRUCK VEHICLE 2 IN THE REAR.
180225302	12/8/2017	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	no	Vehicle one was westbound on Fairfax Blvd in the left straight through lane approaching University Drive. Vehicle two was westbound in the right straight through lane. Vehicle two had crossed over the lane markings into the left lane striking vehicle one. Vehicle two then continued on without stopping and reporting the crash. Only information on vehicle two was it was described as a "little black car."

Crash Data for the Intersection of Fairfax Blvd and Chain Bridge Road (2014 - 2018)

Document Number	Date	Crash Severity	Collsion Type	Pedestrain Injury	Persons Injured	Fatalities	Direction of Travel	Work Zone Related	Adverse Weather Conditions	Distracted Driver	Description
140165082	1/9/2014	PDO.Property Damage Only	2. Angle	0	0	0	West,West	no	no	no	Veh #1 was west on Fairfax Blvd in the right through lane. Veh #2 was west on Fairfax Blvd in the left through lane. The driver of Veh #1 came upon a stopped utility truck, which was occupying the right through lane. The driver of Veh #1 attempted to change lanes and get into the left through lane. The driver of Veh #1 made an unsafe lane change subsequently striking Veh #2 in the right front corner.No witnesses.
140165086	1/14/2014	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	yes	yes	Both vehicles were traveling west on Fairfax Blvd, in the left through lane. Vehicle #1 advises that he was going about 30 mph when he was struck from the back side of his truck. Vehicle #2 advised that he has not slept much in the past couple of days, and that when he looked up he was unable to stop. Vehicle #2 advised that he was unsure of how fast he was traveling.Inves. gation revealed that vehicle #2 never hit his brakes, when he rear ended vehicle #1. Vehicle #1 advised that someone told him that the other driver was looking to the left and never hit his brakes.Vehicle #1 suffered damage to the metal step bumper. Vehicle #2 suffered extensive damage to the front end, plus both front air bags deployed.No injuries reported.
140525063	2/18/2014	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	yes	Both vehicles were in the left through lane east on Fairfax Blvd. Vehicle #1 advises that she was stopped and was just starting to go when she was struck. Vehicle #2 advises that she was not paying attention, because her purse had fell onto the floor, and she tried to retrieve it.Vehicle #2 struck vehicle #1 in the rear bumper.Vehicle #1 suffered minor damage to the rear bumper.Vehicle #2 suffered damage to the front bumper, grill, and hood.Vehicle #1 advised at the end of the accident that she was sore in the chest and shoulder area, refusing Rescue.
140915039	3/31/2014	B.Visible Injury	1. Rear End	0	1	0	South,South	no	no	no	Vehicle #1 was starting from a stop in the right turn lane of north bound Chain Bridge Road at Fairfax Blvd when it struck vehicle #2 in the rear. Vehicle #2 was stopped in the right turn lane of north bound Chain Bridge Road at the time of the incident. Light was red at the time of the incident. Driver's Action (P1) #37 "Other" is, Fail to Pay Full Time & Attention
141605124	6/6/2014	B.Visible Injury	1. Rear End	0	1	0	West,West	no	no	no	Vehicle's #1 and #2 were both traveling westbound on Fairfax Boulevard. Vehicle #2 had stopped for traffic. The driver of vehicle #1 momentarily fell asleep, which caused vehicle #1 to strike vehicle #2, in the rear. Driver
141605127	6/7/2014	C.Non-visible Injury	1. Rear End	0	1	0	West,West	no	no	no	VEHICLE 1 WAS TRAVELING WEST ON FAIRFAX BLVD, APPROACHING CHAIN BRIDGE RD WHEN TRAFFIC CAME TO A STOP DUE TO A RED LIGHT. VEHICLE 1 THEN STRUCK THE REAR OF VEHICLE 2. VEHICLE 1 DRIVER STATED "MY VEHICLE SLID" WHEN THE BRAKES WERE APPLIED. VEHICLE 1 DRIVER STATED SHE WAS NOT DISTRACTED AND WAS TWO CAR LENGTHS AWAY FROM VEHICLE 2 WHEN IT BEGAN TO BRAKE.VEHICLE 2 WAS STOPPED IN THE TRAVEL LANE DUE TO A RED LIGHT AT CHAIN BRIDGE RD.VEHICLE 2 DRIVER WAS TRANSPORTED TO THE HOSPITAL WITH A POSSIBLE BACK INJURY.VEHICLE 1 IS THE AT FAULT VEHICLE.
141985071	7/12/2014	PDO.Property Damage Only	2. Angle	0	0	0	West,North	no	no	no	Vehicle 1 was traveling West bound on Fairfax Blvd. as Vehicle 2 was traveling South bound on Chain Bridge Road. Each driver claimed to have a green light as they proceeded through the intersection where Vehicle 2's front impacted the passenger rear area of Vehicle 1. I attempted to obtain video surveillance of the intersection however the camera was not oriented on that area of the intersection at the time of the crash. I am unable to determine which Driver is responsible for the crash.
142115102	7/24/2014	B.Visible Injury	3. Head On	0	3	0	West,North,North	no	no	no	V1 was traveling west bound in the left through lane when it disregarded a red light at Fairfax Boulevard and Chain Bridge Road. V2 and V3 were traveling south bound on Chain Bridge Road and had a green light at the intersection of Chain Bridge Road and Fairfax Boulevard. V1 struck V2 on the left front side. V1 then struck V3 on the front left side. After V1 struck V2, the right front of V2 struck the left side of V3 at an angle.
142245198	7/25/2014	PDO.Property Damage Only	1. Rear End	0	0	0	West,West,West	no	no	no	VEHICLES 1,2,3 WERE ALL IN THE #3 LANE OF WESTBOUND FAIRFAX BLVD NEARING THE INTERSECTION WITH CHAIN BRIDGE RD. VEHICLES 2 AND 3 WERE STOPPED IN THE TRAFFIC LANE AWAITING TRAFFIC TO CLEAR. VEHICLE 1 WAS BEHIND VEHICLE 2 AND STRUCK THE REAR END OF VEHICLE 2. AS A RESULT, VEHICLE 2 THEN STRUCK THE REAR END OF VEHICLE 3. DRIVERS ACTION-OTHER-FAIL TO PAY FULL TIME AND ATTENTION
142095097	7/25/2014	C.Non-visible Injury	1. Rear End	0	1	0	West,West	no	no	no	Vehicle # 1 and Vehicle # 2 were westbound on Fairfax Blvd. stopped in traffic for a red traffic signal at Chain Bridge Rd. The signal rotated to green and Vehicle # 2 accelerated while Vehicle # 1 was still stopped, striking Vehicle # 1 in the rear creating a rear end collision.
142465121	8/20/2014	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	North,North	no	no	no	Vehicles one an two were traveling south on Chain Bridge Road approaching Fairfax Blvd. Vehicle one was changing lanes from lane one(left through lane) to the left turn lane, lane one. Vehicle two traveling adjacent to
142475217	8/27/2014	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	no	Vehicles one and two were traveling west on Fairfax Blvd in lane three(right through lane). Vehicle two came to a stop with traffic and was struck from behind by vehicle one. Driver of vehicle one stated that she was preparing to change lanes from lane three to lane four(right turn lane) and was unable to stop in time. Vehicle ones left front corner struck vehicle two in the right rear corner.
142805132	10/2/2014	B.Visible Injury	1. Rear End	0	1	0	North,North	no	no	yes	Vehicles 1 and 2 were stopped at a red light in the right lane of south bound Chain Bridge Road at Fairfax Blvd when vehicle #1 rolled forward into the rear of vehicle #2.
142955239	10/18/2014	PDO.Property Damage Only	1. Rear End	0	0	0	North,North	no	no	no	Vehicle 1 was stopped behind Vehicle 2 on south bound Chain Bridge Road prior to Fairfax Blvd. The traffic signal controlling the south bound traffic was red however Vehicle 1 accelerated, from a stop, and hit Vehicle 2 in its rear. The Driver of Vehicle 1 was issued a VUS for failing to maintain proper control of her vehicle.

143425202	10/30/2014	C.Non-visible Injury	2. Angle	0	2	0	West,West	no	no	no	Vehicle 2 was in the northbound, left turn lane of Chain Bridge Rd. with a green light. Vehicle 2 made a left turn into the left lane of westbound Fairfax Blvd. Vehicle 1 was in the right turn lane of southbound Chain Bridge Rd. with a red light. Vehicle 1 stated she stopped at the red light. Vehicle 1 turned westbound onto Fairfax Blvd. failing to yield to vehicle 2. The vehicles collided pushing vehicle 2 onto the median.
143445220	12/3/2014	PDO.Property Damage Only	2. Angle	0	0	0	North,East	no	no	no	Vehicle 2's driver stated she was East bound Fairfax Blvd stopped at the light for Chain Bridge Road and that there was an SUV in the lane next to her. V2's driver stated the light turned green and she proceeded East bound into the intersection and did not see the car South bound on Chain Bridge Road until it drove in front of her. V2's driver stated she impacted the right side of V1 with the front of her car causing her right side and front side airbags to deploy. V2's driver stated she was not injured.Vehicles 1's driver stated he was South bound Chain Bridge Road at Fairfax Blvd. and entered the intersection at Fairfax Blvd. while the light was yellow. V1's vehicle was struck by V2 in the right side. V1's driver stated he was not injured.
150135110	12/30/2014	PDO.Property Damage Only	2. Angle	0	0	0	West,West	no	no	no	VEHICLE 1 WAS MAKING A RIGHT TURN FROM THE PARKING LOT OF 10480 FAIRFAX BLVD ONTO WESTBOUND FAIRFAX BLVD. VEHICLE 1 WAS ATTEMPTING TO GET INTO THE LEFT TURN LANE WHILE MAKING THE RIGHT TURN. VEHICLE 2 WAS TRAVELING WEST ON FAIRFAX BOULEVARD IN THE LEFT TURN LANE COMING TO A STOP AT THE RED LIGHT. VEHICLE 1 TURNED INTO THE LANE WHILE VEHICLE 2 WAS TRAVELING WITHIN IT AND STRUCK IT AT AN ANGLE (POI 1).
150505220	2/16/2015	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	yes	The Driver of Vehicle 2 stated he was East bound Fairfax Blvd. in the left lane, before Chain Bridge Road, stopped for traffic when he was struck from behind by Vehicle 1. V2's driver stated he was not injured. The Driver of Vehicle 1 stated she was East bound Fairfax Blvd. in the left lane when she observed what appeared to be a disabled vehicle in the right lane. V1's driver stated she looked over at the stopped vehicle in the right lane, than looked forward and observed the vehicle in front of her was stopped. V1's driver stated she impacted the rear of V2 with the front of her vehicle. V2's driver stated she was not injured.
150855059	3/12/2015	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	no	VEHICLE 2 WAS STOPPED IN THE #3 TRAFFIC LANE OF EASTBOUND FAIRFAX BLVD NEAR THE INTERSECTION OF CHAIN BRIDGE RD AT A RED LIGHT. VEHICLE 1 WAS DIRECTLY BEHIND VEHICLE 2. THE DRIVER OF VEHICLE 1 SAW THE VEHICLES TO HER LEFT START TO MOVE DUE TO THE LEFT TURN LANE HAVING THE GREEN LIGHT. DRIVER1 ANTICIPATED VEHICLE 2 MOVING AND BEGAN TO MOVE AND THE STRUCK THE REAR END OF VEHICLE 2. DRIVERS ACTION-OTHER-FAIL TO PAY FULL TIME AND ATTENTION
150935104	3/27/2015	B.Visible Injury	2. Angle	0	1	0	North,East	no	no	no	Vehicle # 2 was traveling eastbound along Fairfax Blvd on the sidewalk. Vehicle # 1 was traveling southbound on Chain Bridge Road. Vehicle #1 attempted to make a right turn on red without yielding the right of way to vehicle #2 who had the cross symbol and a green light. Vehicle #1 subsequently pulled in front of vehicle # 2 and caused the crash.
151135211	4/15/2015	A.Ambulatory Injury	2. Angle	0	1	0	East,West,South	no	no	no	Vehicle 1 was traveling East on Fairfax Blvd approaching the intersection of Chain Bridge Rd, when the traffic light changed from green to yellow to red. Vehicle 1 was traveling in the #3 lane of Fairfax Blvd and violated the red traffic light, striking vehicle 2. Vehicle 1 driver stated "I think I ran the red light". Vehicle 1 driver stated the light changed from green to yellow and he accelerated to attempt to make the intersection before it changed to red. Vehicle 1 then drove off the roadway and struck a light pole. Vehicle 1 came to rest in a parking lot at the intersection.Vehicle 2 was making a left turn from the #1 turn lane on West Fairfax Blvd onto South Chain Bridge Rd, when it was struck by vehicle 1. Vehicle 1 driver stated he just received the left green arrow to make the turn before being struck by vehicle 1. Vehicle 2 then spun after being struck by vehicle 1 and struck the traffic sign in the median. Vehicle 2 then struck vehicle 3 after striking the sign.Vehicle 3 was stopped in the #1 left turn lane of North Chain Bridge Rd and Fairfax Blvd on a red light, when it was struck by vehicle 2.Vehicle 2 driver was transported to Fairfax Hospital with major injuries. Vehicle 1 driver was placed into critical care at the hospital and was conscious and alert. Vehicle 1 driver sustained several broken bones and possible internal injuries/bleeding.Vehicle 1 driver is at fault for the crash and no further injuries were reported at the time of the crash. All vehicles were towed from the scene.
151475154	5/26/2015	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	yes	Vehicles one and two were eastbound in the left turn of Fairfax Blvd. preparing to turn left onto Chainbridge Road. Vehicle two slowed for the yellow light and was struck in the rear by vehicle one.

152045132	7/15/2015	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	no	Vehicle 1 was traveling West on Fairfax Blvd, past Chain Bridge Rd when the driver attempted a lane change to the left. Vehicle 1 then struck vehicle 2. Vehicle 1 was then pushed into the curb, due to the crash. Vehicle 1 came to rest on the opposite side of Fairfax Blvd.Vehicle 2 was traveling straight on Fairfax Blvd in the left lane, when it was struck by vehicle 1.Vehicle 1 driver was issued a summons for the crash and no injuries were reported by either vehicles.
152515182	8/19/2015	B.Visible Injury	2. Angle	0	1	0	West,North	no	no	no	Vehicle 2 was stopped at a red light in the left turn lane of south bound Chain Bridge Road at Fairfax Blvd when it was struck by vehicle 1. Vehicle 1 was traveling at a high rate of speed in the right turn lane of west bound Fairfax Blvd attempting to turn right onto north bound Chain Bridge Road when it lost control and struck vehicle 2. Vehicle 1 then left the scene north bound on Chain Bridge Road without identifying himself.
152385148	8/21/2015	B.Visible Injury	1. Rear End	0	3	0	West,West,West	no	no	no	Vehicle # 1, Vehicle # 2, and Vehicle # 3 were westbound on Fairfax Blvd. Vehicle # 1 and Vehicle # 2 were stopped in traffic. Driver of Vehicle # 3 observed the brake lights and attempted to stop but it was too late. Vehicle # 3 struck Vehicle # 2 in the rear, shoving Vehicle # 2 into the rear of Vehicle # 1.
152475165	9/2/2015	B.Visible Injury	2. Angle	0	1	0	North,North	no	no	no	Vehicle two was stopped at a red light southbound on Rt. 123 in left turn lane to go to Rt. 50. Vehicle one was stopped at a red light southbound on Rt. 123 in straight through lane attempting to cut over into the left turn lane. When the light turned green for left turns from southbound Rt. 123 to eastbound Rt. 50, both vehicles proceeded to make the turn. Vehicle one got partially in front of vehicle two making the turn. Due to the size of vehicle two, the driver was unable to see the vehicle trying to get in front of him subsequently striking vehicle one.
152745170	9/30/2015	PDO.Property Damage Only	1. Rear End	0	0	0	North,North	no	no	no	V2 was stopped at south bound Chain Bridge Road at the intersection with Fairfax Boulevard. The light for Chain Bridge Road was red. V2 was going to make a right turn onto west bound Fairfax Boulevard and came to a stop to yield to west bound traffic. V1's driver did not pay full time and attention and rear ended V2.
152785256	10/2/2015	C.Non-visible Injury	1. Rear End	0	2	0	West,West	no	yes	no	On 10-02-15 at 1707 hours, while traveling west on Fairfax Blvd, the driver of Vehicle #2 stopped for the traffic ahead due to the red traffic signal on Fairfax Blvd / Rt. 123. The driver of Vehicle #1 failed to maintain proper control and drove into the rear of Vehicle #2. (POI #1) The driver of Vehicle #1 was charged with Failing to Maintain Proper Control.
153345423	11/27/2015	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	yes	Vehicle one and two were both traveling eastbound on Fairfax Blvd. Both vehicle passed through the intersection of Fairfax Blvd/123. As they reached the east side of the intersection of Fairfax Blvd/123 a vehicle in front of vehicle two slowed down to turn into the parking lot of 10485 Fairfax Blvd. Vehicle two slowed down, driver one was talking with the passenger and didn't realize that vehicle two slowed down and struck vehicle two from behind.
160215229	1/6/2016	PDO.Property Damage Only	1. Rear End	0	0	0	South,South	no	no	no	VEHICLES 1 AND 2 WERE BOTH TRAVELING IN THE #2 NORTHBOUND LANE OF CHAIN BRIDGE RD JUST NORTH OF FAIRFAX BLVD. VEHICLE 2 CAME TO A STOP QUICKLY AND VEHICLE 1 WAS UNABLE TO STOP IN TIME AND STRUCK THE REAR END OF VEHICLE 2.
160505262	2/10/2016	PDO.Property Damage Only	2. Angle	0	0	0	West,South	no	no	no	Vehicle 1 was attempting to make a left turn from the parking lot of 10485 Fairfax Blvd onto Chain Bridge Rd, when it struck vehicle 2. Vehicle 1 driver stated he didn't see vehicle 2 due to stopped vehicles on Chain Bridge Rd.Vehicle 2 was traveling straight on Chain Bridge Rd, when it was struck by vehicle 1.No injuries were reported at the time of the crash.
160605197	2/19/2016	C.Non-visible Injury	1. Rear End	0	2	0	South,South	no	no	no	Vehicle 2 was stopped at a red light on Chain Bridge Rd. at the intersection with Fairfax Blvd. heading north bound in the right lane. Vehicle 1 was headed north bound on Chain Bridge Rd. in the right lane approaching the red light. Vehicle 1 failed to stop his truck at the traffic signal and made contact with the rear end of Vehicle 2 at the red light.Neither driver stated they were injured as a result of the accident. The driver of Vehicle 1 was issued a summons for Failure to Pay Full Time and Attention (98-14).
160635197	2/19/2016	B.Visible Injury	1. Rear End	0	2	0	North,North	no	no	yes	Vehicle one and two were traveling south on Chain Bridge Road from Fairfax Blvd in lane one(left lane). Vehicle two came to a stop with traffic prior to Warwick Ave. Vehicle one, unable to stop in time, struck vehicle two in the rear end.
160575079	2/23/2016	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	North,North	no	yes	no	VEHICLE #2 WAS TRAVELING IN THE LEFT TURN LANE OF SOUTHBOUND CHAIN BRIDGE RD. VEHICLE #1 WAS IN THE LEFT THROUGH LANE OF SOUTHBOUND CHAIN BRIDGE RD. VEHICLE #1 ATTEMPTED TO CHANGE LANES FROM THE THROUGH LANE TO THE TURN LANE. WHILE ATTEMPTING TO CHANGE LANES, VEHICLE #1 STRUCK VEHICLE #2.
160645211	3/2/2016	B.Visible Injury	1. Rear End	0	1	0	West,West	no	no	yes	V1 AND V2 WERE TRAVELING IN THE CENTER WESTBOUND LANE OF FAIRFAX BLVD. BOTH VEHICLES WERE STOPPED IN THE TRAFFIC LANE AT A RED LIGHT. AS THE LIGHT CHANGED FROM RED TO GREEN, V1 ACCELERATED AND STRUCK V2. V1 DRIVER WAS CITED.V1 (P1): FAIL TO PAY FULL TIME AND ATTENTION
160965104	3/31/2016	B.Visible Injury	1. Rear End	0	1	0	West,West	no	no	yes	VEHICLES 1 AND 2 WERE TURNING RIGHT ONTO WESTBOUND FAIRFAX BLVD FROM SOUTHBOUND CHAIN BRIDGE RD. VEHICLE 1 THOUGHT THAT VEHICLE 2 BEGAN TO TURN AND STRUCK VEHICLE 2 IN THE LEFT REAR CORNER.
161115221	4/18/2016	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	no	V1: A 2016 Freightliner M2 106 Medium Truck V2 was in the right lane of west bound Fairfax Boulevard approaching the intersection of Fairfax Boulevard and Chain Bridge Road. Traffic was reported by V1's driver to have slowed and she was moving at an estimated 26 MPH rate of speed. V2 reported that V1 rear ended the vehicle. V1's driver stated that sun glare made it difficult to see and that he rear ended V2. V1's driver reported that V2 may have been stopped in the roadway. A citation was issued to V1's driver for failure to pay full time and attention.
161205243	4/25/2016	PDO.Property Damage Only	2. Angle	0	0	0	West,South	no	no	no	VEHICLE #1 WAS TRAVELING IN THE LEFT WESTBOUND LANE OF FAIRFAX BLVD AND MADE A LEFT TURN ONTO SOUTHBOUND CHAIN BRIDGE RD. VEHICLE #2 WAS STOPPED IN THE LEFT TURN LANE OF NORTHBOUND CHAIN BRIDGE RD. WHEN THE LIGHT CHANGED TO A GREEN SIGNAL, VEHICLE #2 ENTERED THE INTERSECTION AND STRUCK VEHICLE #1.

161465155	5/18/2016	B.Visible Injury	2. Angle	0	1	0	West,West	no	no	no	Vehicles one and two were traveling west on Fairfax Blvd approaching Chain Bridge Road. Vehicle one was stationary in the left turn lane (lane one) and vehicle two in the right through lane (lane two). Vehicle one changed lanes from the left turn lane and into the path of vehicle two traveling in lane two. Vehicle two, unable to avoid the collision, struck vehicle one in the right front passenger door.
161825162	6/22/2016	PDO.Property Damage Only	1. Rear End	0	0	0	North,North	no	no	yes	VEHICLES ONE AND TWO WERE TRAVELING SOUTH ON CHAIN BRIDGE RD. VEHICLE TWO STOPPED FOR RED TRAFFIC SIGNAL PRIOR TO TURNING RIGHT. THE DRIVER OF VEHICLE ONE DID NOT NOTICE VEHICLE TWO HAD STOPPED AND STRUCK VEHICLE TWO IN THE REAR BUMPER.
162005335	6/30/2016	PDO.Property Damage Only	1. Rear End	0	0	0	North,North,North	no	no	yes	VEHICLES 1, 2 AND 3 WERE STOPPED IN TRAFFIC IN THE LEFT SOUTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLE 1 DRIVER THOUGHT THAT TRAFFIC WAS MOVING AND QUICKLY ACCELERATED. VEHICLE 2 HAD NOT STARTED MOVING YET AND VEHICLE 1 STRUCK VEHICLE 2. AS A RESULT OF THAT IMPACT, VEHICLE 2 STRUCK VEHICLE 3.
162175116	7/13/2016	PDO.Property Damage Only	1. Rear End	0	0	0	South,South,South	no	yes	no	Vehicles 1, 2 and 3 were traveling northbound on Chain Bridge Rd and attempting to make a left onto westbound Fairfax Blvd. Vehicle 3 stopped as the light turned red. Vehicle 2 stopped behind 3, Vehicle 1 struck Vehicle 2 in the rear, causing Vehicle 2 to strike Vehicle 3 in the rear.
162235230	7/27/2016	C.Non-visible Injury	1. Rear End	0	1	0	West,West	no	no	no	V2 as traveling westbound on Fairfax Boulevard in the far right straight lane. V1 was traveling behind V2. The driver of V1 looked down at her lunch and collided with the rear of V2.
162520117	8/25/2016	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	no	Veh 2 was traveling east on RT29/Lee Hwy and came to a stop for the red light at RT123/Jermantown Rd. Veh 1 was slowing behind Veh 2 when an insect flew in the window causing Veh 1 to lose control and strike Veh 2.
162875139	9/30/2016	PDO.Property Damage Only	1. Rear End	0	0	0	South,South	no	no	no	VEHICLE #1 WAS TRAVELING IN THE LEFT NORTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLE #2 WAS STOPPED IN THE LEFT NORTHBOUND LANE OF CHAIN BRIDGE RD. AS VEHICLE #1 BEGAN TO SLOW DOWN FOR TRAFFIC CONDITIONS, VEHICLE #1 DRIVER'S FOOT SLIPPED OFF THE BRAKE AND HIT THE ACCELERATOR, WHICH CAUSED VEHICLE #1 TO STRIKE VEHICLE #2 IN THE REAR.
162875146	10/4/2016	PDO.Property Damage Only	2. Angle	0	0	0	West,South	no	no	no	Vehicle 1 was making a left turn from the parking lot of 10485 Fairfax Blvd to Chain Bridge Rd, when it struck vehicle 2. Vehicle 1 driver stated he couldn't see vehicle 2 because of stopped vehicles. Vehicle 2 was traveling in the left turn lane, when vehicle 1 struck it. No injuries were reported at the time of the crash.
163055255	10/25/2016	PDO.Property Damage Only	2. Angle	0	0	0	West,South	no	no	no	Vehicle 1 was making a right turn to get into the left lane from 10485 Fairfax Blvd to Chain Bridge Rd. Vehicle 1 driver stated he could not see anyone in the left turn lane of Chain Bridge Rd, he then went forward and made contact with vehicle 2. Vehicle 2 possibly crossed over the double yellow solid line to get into the left turn lane on Chain Bridge Rd, before the lane started. Vehicle 2 was then struck by vehicle 1. I was unable to determine if vehicle 2 crossed the double yellow line to get into the left turn lane, although it didn't appear there was enough space in the left turn lane based off the location of the crash. Vehicle 1 driver stated he didn't see vehicle 2 in the left turn lane when he attempted to get into it. Neither driver was issued a summons because of conflicting statements and not able to determine if vehicle 2 crossed the double yellow line to get into the left turn lane early.
163215226	10/27/2016	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	South,South	no	no	no	Vehicle 2 was stopped in the traffic lane, in the left north bound through lane of Chain Bridge Rd, prior to Fairfax Blvd. Vehicle 1 was traveling north bound on Chain Bridge Rd, when it struck Vehicle 2 (Point of Impact), while attempting to change into the left turning lane of Chain Bridge Rd south of Fairfax Blvd.
163215205	11/4/2016	B.Visible Injury	1. Rear End	0	3	0	West,West,West,West	no	no	no	Vehicle 1 was approaching the intersection of Fairfax Blvd and Chain Bridge Rd, when it struck the rear of vehicle 2. Vehicle 1 driver stated she was "close" to vehicle 2 and couldn't stop in time. Vehicle 2 was stopped in the right lane of Fairfax Blvd, when it was struck by vehicle 1. Vehicle 2 then struck the rear of vehicle 3 due to the impact. Vehicle 3 was stopped in the right lane of Fairfax Blvd, when it was struck by vehicle 2. Vehicle 3 then struck the rear of vehicle 4 due to the impact. Vehicle 4 was stopped in the right lane of Fairfax Blvd for a traffic light, when it was stuck from the rear by vehicle 3. Vehicle 1, vehicle 2 and vehicle 3 driver's were transported to the hospital with injuries.
163345261	11/16/2016	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	South,South	no	no	no	VEHICLE #1 WAS TRAVELING IN THE LEFT NORTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLE #2 WAS TRAVELING IN THE CENTER NORTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLE #1 CONDUCTED AN UNSAFE LANE CHANGE AND STRUCK VEHICLE #2.
163415338	11/18/2016	C.Non-visible Injury	1. Rear End	0	1	0	North,North	no	no	no	VEHICLE #1 WAS TRAVELING IN THE LEFT SOUTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLE #2 WAS TRAVELING IN THE LEFT SOUTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLE #2 STOPPED FOR TRAFFIC CONDITIONS WHEN VEHICLE #1 REAR ENDED VEHICLE #2. VEHICLE #1 DRIVER WAS ATTEMPTING TO CHANGE LANES JUST PRIOR TO THE ACCIDENT.
163355246	11/18/2016	A.Ambulatory Injury	2. Angle	0	1	0	North,North,South	no	no	yes	VEHICLE #1 WAS TRAVELING SOUTHBOUND ON CHAIN BRIDGE RD. VEHICLE #2 WAS TRAVELING EASTBOUND ON FAIRFAX BLVD. VEHICLE #3 WAS STOPPED AT A RED TRAFFIC SIGNAL IN THE LEFT TURN LANE OF NORTHBOUND CHAIN BRIDGE RD WAITING TO TURN LEFT ONTO WESTBOUND FAIRFAX BLVD. VEHICLE #1 RAN THE RED TRAFFIC SIGNAL AS VEHICLE #2 BEGAN TO ACCELERATE FROM A STOPPED POSITION. VEHICLE #1 STRUCK VEHICLE #2. AFTER STRIKING VEHICLE #2, VEHICLE #1 CONTINUED FORWARD AND STRUCK VEHICLE #3. VEHICLE #1 DRIVER STATED THAT SHE HAD MISSED A PREVIOUS TURN AND THEREFORE WAS LOOKING AT HER GPS ON HER PHONE JUST PRIOR TO THE ACCIDENT.
163365377	11/19/2016	PDO.Property Damage Only	2. Angle	0	0	0	South,West	no	no	no	Vehicle 2 was traveling westbound at 10470 Fairfax Blvd. in the right turn lane. Vehicle 1 had exited the Toyota Dealership at 10441 Fairfax Blvd. and proceeded northbound across Fairfax Blvd. attempting to get into the same right turn lane as vehicle 2. The vehicles of the two thru lanes of westbound Fairfax Blvd. waived vehicle 1 across the lanes. The driver of vehicle 1 advised that she did not see vehicle 2 traveling in the right lane. Vehicle 1 collided with vehicle 2, as vehicle 1 attempted to enter the right turn lane.
180315408	1/20/2017	PDO.Property Damage Only	2. Angle	0	0	0	West,North	no	yes	no	Vehicle one was traveling west bound on Fairfax Blvd and ran the red light at the intersection with Chain Bridge Rd, striking vehicle two. Vehicle two was making a left from Chain Bridge Rd onto Fairfax Blvd when it was struck by vehicle one.

171365201	4/8/2017	PDO.Property Damage Only	2. Angle	0	0	0	North,North,North	yes	no	yes	VEHICLE ONE WAS TRAVELING SOUTH BOUND CHAIN BRIDGE RD. AFTER STOPPING THE DRIVER REALIZED HE WAS IN A LEFT TURN LANE ONLY. HE THEN PLACED HIS RIGHT TURN SIGNAL ON AND PROCEEDED TO CHANGE LANES. DRIVER STATED HE DID NOT SEE THE VEHICLE IN THE THROUGH LANE. HE WAS STRUCK IN THE FRONT RIGHT QUARTER PANEL BY VEHICLE THREE WHICH LEFT THE SCENE OF THE ACCIDENT. WHEN VEHICLE ONE WAS STRUCK IN THE FRONT RIGHT QUARTER PANEL IT WAS FORCED INTO THE RIGHT REAR QUARTER PANEL OF VEHICLE TWO WHICH WAS IN THE LEFT TURN LANE STOPPED IN TRAFFIC.
180305338	4/8/2017	PDO.Property Damage Only	1. Rear End	0	0	0	North,North	no	no	yes	Vehicle 2 was in the right lane of southbound Chain Bridge Rd. attempting to make a right turn onto westbound Fairfax Blvd. Driver of vehicle 2 stated that the light was red and she was sitting still when her vehicle was struck from behind. Vehicle 1 was in the right lane of Chain Bridge Rd. approaching Fairfax Blvd., where she was going to make a right turn. Driver of vehicle 1 stated that she saw that vehicle 2 was attempting to make the right hand turn, so she turned to look at westbound traffic, but when she looked forward vehicle 2 was still stopped. She advised that she thought the traffic light was red. No report of injuries. Vehicle 1 was towed by Henrys. Vehicle 1 was issued a summons for failing to pay full time and attention.
171975194	4/10/2017	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	no	VEHICLE 2 WAS STOPPED IN THE #2 TRAFFIC LANE OF FAIRFAX BLVD JUST W OF CHAIN BRIDGE RD. VEHICLE 1 WAS DIRECTLY BEHIND VEHICLE 2. VEHICLE 1 WAS NOT PAYING ATTENTION AND STRUCK THE REAR END OF VEHICLE 2. DRIVERS ACTION-OTHER-FAIL TO PAY FULL TIME AND ATTENTION
171955169	4/29/2017	PDO.Property Damage Only	2. Angle	0	0	0	East,East	yes	no	no	171955169 Vehicle one was traveling north on Chain Bridge Road at the red traffic signal for Fairfax Blvd. Vehicle two was traveling south on Chain Bridge Road proceeding to turn left onto Fairfax Blvd under a green traffic signal. Vehicle one made the right turn from Chain Bridge Road onto Fairfax Blvd under the red traffic signal after stopping. In doing so vehicle one failed to yield to vehicle two resulting in a crash.
172415350	5/17/2017	PDO.Property Damage Only	2. Angle	0	0	0	East,East	yes	no	no	Vehicle 2 was traveling eastbound on Fairfax Blvd with a straight green light. Vehicle 1 was traveling northbound on 123 and making a right turn eastbound onto chain bridge with a solid red light. Vehicle 1 did not see vehicle 2 and they collided in the intersection.
172615314	6/2/2017	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	yes	no	yes	VEHICLES 1 AND 2 WERE TRAVELING IN THE RIGHT WESTBOUND LANE OF FAIRFAX BLVD. VEHICLE 1 DRIVER WAS DISTRACTED BY CONSTRUCTION IN THE AREA AND STRUCK VEHICLE 2 IN THE REAR.
180225276	6/21/2017	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	no	V2 was stopped in the left travel lane on east bound Route 50 at the intersection with Route 123 due to a red light. V1 did not stop in time for the red light/traffic conditions and rear ended V2.
172615203	7/3/2017	PDO.Property Damage Only	2. Angle	0	0	0	South,East	no	no	no	VEHICLE 1 WAS TURNING RIGHT FROM NORTHBOUND CHAIN BRIDG RD ONTO EASTBOUND FAIRFAX BLVD. VEHICLE 2 WAS IN THE #1 LANE OF FAIRFAX BLVD JUST PASSING THE INTERSECTION OF CHAIN BRIDGE RD. VEHICLE 1 DID NOT YIELD RIGHT OF WAY AND TURNED IN THE #1 LANE OF FAIRFAX BLVD.
172005210	7/17/2017	C.Non-visible Injury	1. Rear End	0	1	0	North,North	no	no	yes	The driver of vehicle 1 was looking at traffic while turning right onto west bound Fairfax Blvd and failed to observe vehicle 2 stopped in front of her. Vehicle 1 struck the rear of vehicle 2 as a result.
172555192	8/30/2017	PDO.Property Damage Only	1. Rear End	0	0	0	North,North	no	no	yes	V2 was traveling south bound on Chain Bridge Rd and stopped at the red light at Fairfax Blvd, attempting to make a right turn. V1 was traveling in the same direction but rear-ended V2. V1 stated he was looking at west bound traffic so that he could make a right turn onto Fairfax Blvd, but collided with V2. V1 stated that it was his fault and he is sorry. Information was exchanged between the two parties.
172625220	9/14/2017	PDO.Property Damage Only	2. Angle	0	0	0	West,West	no	no	no	The Driver of Vehicle 2 stated that she was westbound in the left lane of Fairfax Blvd. just past Chain Bridge Road. V2's driver stated that V1 merged into her lane striking the middle right side of her car. V2 stated that she was not injured. The Driver of Vehicle 1 stated that she was southbound Chain Bridge Road and made a right turn on red onto westbound Fairfax Blvd. V1's driver stated that she went to change lanes into the left westbound lane when V2's vehicle struck the left side of her car. V1 stated that she was not injured.
173205189	11/6/2017	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	yes	no	no	Veh s 1 and 2 were west on Fairfax Blvd approaching Chain Bridge rd. Veh 1 was stopped for traffic, the driver of Veh 2 saw Veh 1 stopped but couldn't stop in time and struck her in the rear.
180525104	2/5/2018	B.Visible Injury	1. Rear End	0	3	0	South,South,South	no	no	no	Vehicle one was traveling northbound on Chain Bridge Road approaching backed up traffic from a red light. Vehicles two and three were stopped in the traffic northbound on Chain Bridge Road. Driver of vehicle one stated she was suffering from multiple health related issues and felt a spasm in her leg and when she thought she was hitting the brake, it was not working. Vehicle one had then struck vehicle two, driving that into vehicle three.
180545349	2/14/2018	PDO.Property Damage Only	1. Rear End	0	0	0	East,East,East	no	no	no	VEHICLES #1, #2 AND #3 WERE TRAVELING IN THE RIGHT EASTBOUND LANE OF FAIRFAX BLVD. VEHICLE #2 AND #3 BEGAN SLOWING/STOPPING FOR A TRAFFIC SIGNAL THAT WAS CHANGING TO RED. VEHICLE #1 THEN STRUCK VEHICLE #2 IN THE REAR. VEHICLE #2 STRUCK VEHICLE #3 IN THE REAR.
181025220	4/9/2018	C.Non-visible Injury	1. Rear End	0	1	0	East,East	no	yes	yes	V1 AND V2 WERE TRAVELING EASTBOUND ON FAIRFAX BLVD IN THE FAR RIGHT LANE. V2 WAS STOPPED FOR A RED LIGHT. V1 WAS NOT PAYING ATTENTION AND STRUCK V2 IN THE REAR.
181065197	4/15/2018	C.Non-visible Injury	2. Angle	0	1	0	South,East	no	no	no	Vehicle #1 was turning left onto westbound Fairfax Blvd from the parking lot of 10485 Fairfax Blvd when it was struck by vehicle #2. Vehicle #2 was traveling in the left eastbound lane of Fairfax Blvd east of Chain Bridge Rd at the time of the incident.
182045309	4/20/2018	PDO.Property Damage Only	2. Angle	0	0	0	South,East	no	no	no	Vehicle one was leaving the parking lot of 10485 Fairfax Blvd attempting to turn into the left lane of travel. Vehicle two was traveling eastbound on Fairfax Blvd in the right lane. As vehicle one entered the roadway, it struck vehicle two in the passenger side.
181385231	5/16/2018	B.Visible Injury	2. Angle	0	3	0	West,South,East	no	yes	yes	Vehicle 1 was traveling WB on Fairfax Blvd. As vehicle 1 was nearing the intersection at Chain Bridge Rd, driver failed to obey a steady red traffic signal and struck vehicle 2 at an angle collision in the middle of the intersection. Vehicle 2 was traveling NB on Chain Bridge Rd on a green traffic signal. After that collision, vehicle 1 continued WB on Fairfax Blvd before the driver failed to maintain proper control, striking the center median and crossing over into the EB lanes. Vehicle 1 then struck vehicle 3 head on near the left turn lane. Vehicle 1 had significant front end damage.

182365271	8/20/2018	PDO.Property Damage Only	1. Rear End	0	0	0	East,East,East	no	no	no	Vehicle one was traveling eastbound on Fairfax Blvd in the left lane. Vehicle two was traveling eastbound on Fairfax Blvd in the left lane. Vehicle three was traveling eastbound on Fairfax Blvd in the right lane. All three vehicles were eastbound approaching Chain Bridge Road. The traffic signal for Fairfax Blvd changed to yellow. Vehicles two and three began to slow and stop for the red light. Driver of vehicle one stated that he wanted to go and started accelerating. Driver of vehicle one stated he attempted to go between the two vehicles that were stopped and thought it might create less damage. Vehicle one then struck vehicle two and vehicle three simultaneously.
190115135	10/24/2018	C.Non-visible Injury	1. Rear End	0	1	0	East,East,East	no	no	no	Vehicle 3 (V3) was stopped as the first vehicle in line in the left thru lane on eastbound Fairfax Blvd. at the intersection of Chain Bridge Rd. Vehicle 2 (V2) was directly behind V3 and Vehicle 1 (V1) was directly behind V2. As the traffic light turned green, V3 hesitated because it appeared that another vehicle was going to enter the intersection from northbound Chain Bridge Rd. V1 proceeded straight, rear-ending V2. As V2 was struck, it was pushed into the back of V3.
190025191	12/3/2018	PDO.Property Damage Only	1. Rear End	0	0	0	South,South,South	no	no	no	V1 AND V2 WAS STOPPED AT A RED LIGHT NORTHBOUND CHAIN BRIDGE AT FAIRFAX BLVD WHEN V3 STRUCK V1. V1 THEN STRUCK V2. V3 FLED THE SCENE

Crash Data for the Intersection of Fairfax Blvd and Farr Ave (2014 - 2018)

Document Number	Date	Crash Severity	Collsion Type	Pedestrain Injury	Persons Injured	Fatalities	Direction of Travel	Work Zone Related	Adverse Weather Conditions	Distracted Driver	Description
151135202	4/22/2015	PDO.Property Damage Only	2. Angle	0	0	0	West,West	no	no	yes	Vehicle 2 was stopped with traffic in the right west bound lane in front of 10570 Fairfax Blvd. Vehicle 1 was traveling west bound in the left lane, when the driver failed to maintain proper control of the vehicle, striking vehicle 2. Vehicle 1 then crossed the east bound lanes and struck bushes in front of 10579 Fairfax Blvd.
180275210	2/2/2017	PDO.Property Damage Only	2. Angle	0	0	0	North,East	no	no	no	VEHICLE 1 WAS PULLING OUT OF A PRIVATE PARKING LOT (10570 FAIRFAX BLVD). VEHICLE 2 WAS TRAVELING IN THE LEFT EASTBOUND LANE OF FAIRFAX BLVD. VEHICLE 1 WAS ATTEMPTING TO MAKE A LEFT TURN ONTO EASTBOUND FAIRFAX BLVD. AS VEHICLE 1 PULLED INTO THE CENTER OF THE HIGHWAY, VEHICLE 1 STRUCK VEHICLE 2. THIS CAUSED VEHICLE 1 TO STRIKE THE CENTER MEDIAN, THEN A FAIRFAX CITY STREET SIGN BEFORE COMING TO REST CENTERED ON THE MEDIAN.
172305246	8/10/2017	C.Non-visible Injury	1. Rear End	0	3	0	West,West,West	no	no	yes	VEHICLES 2 AND 3 WERE STOPPED IN THE LEFT WESTBOUND LANE OF FAIRFAX BLVD. VEHICLE 1 WAS TRAVELING IN THE LEFT WESTBOUND LANE OF FAIRFAX BLVD WHEN IT STRUCK VEHICLE 2. THIS CAUSED VEHICLE 2 TO STRIKE VEHICLE 3.
172975134	10/10/2017	B.Visible Injury	1. Rear End	0	2	0	East,East,East	no	no	no	VEHICLES 1,2 AND 3 WERE ALL IN THE #1 EASTBOUND LANE OF FAIRFAX BLVD NEAR FARR AVE. VEHICLE 3 WAS STOPPED IN THE TRAFFIC LANE. VEHICLE 2 CAME TO A QUICK STOP DIRECTLY BEHIND VEHICLE 3. VEHICLE 1 WAS DIRECTLY BEHIND VEHICLE 2 AND WAS UNABLE TO COME TO A STOP. VEHICLE 1 CRASHED INTO THE REAR OF VEHICLE 2. VEHICLE 2 THEN CRASHED INTO THE REAR OF VEHICLE 3.
180035244	11/21/2017	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	no	Trailer Information: Power Unit Damage $00. Towed Unit Damage $500.00 Richard Harvey, 2017 Appalachian TL, XKN6603 (PA) VIN: 541FC4232HM000725 Vehicle 1 was parked unoccupied in the right through lane, in front of 10570 Fairfax Blvd. Vehicle 2 was traveling west bound on Fairfax Blvd, when it struck Vehicle 1 in rear left corner of the attached trailer unit. (Point of Impact). The driver of vehicle 2 fled the area westbound on Fairfax Blvd, making no attempt to identify themselves.
182575230	8/29/2018	PDO.Property Damage Only	2. Angle	0	0	0	North,East	no	no	no	Vehicle one was entering Warwick Avenue from the 10601 Fairfax Blvd. Vehicle two was traveling eastbound on Warwick Avenue. Driver of vehicle one stated when he looked there was no traffic and proceeded to go straight across the road to the parking lot of 10595 Warwick Avenue. Vehicle one then struck vehicle two as it was proceeding down the street.

Crash Data for the Intersection of Fairfax Blvd and McLean Ave (2014 - 2018)

Document Number	Date	Crash Severity	Collsion Type	Pedestrain Injury	Persons Injured	Fatalities	Direction of Travel	Work Zone Related	Adverse Weather Conditions	Distracted Driver	Description
141845107	6/29/2014	B.Visible Injury	1. Rear End	0	3	0	West,West,West	no	no	yes	On 06-29-14 at 1430 hours, Vehicle #3, Vehicle #2 and Vehicle #1 were all headed west bound on Fairfax Blvd. The traffic signal on Fairfax Blvd at Warwick Ave, changed from green, to yellow and then to red. Vehicle #3 and Vehicle #2 both slowed down and stopped for the red traffic signal, directly behind each other. The driver of Vehicle #1 fell asleep and drove directly into Vehicle #2 (POI #1), causing Vehicle #2 to drive into Vehicle #3. (POI #2).This accident occurred just prior to the intersec. on of Fairfax Blvd and Warwick Ave, infront of 10620 Fairfax Blvd.
141895058	7/4/2014	PDO.Property Damage Only	14. Motorcyclist	0	0	0	East,West	no	no	no	Vehicle one was eastbound on Fairfax Blvd. Vehicle two was westbound on Fairfax Blvd. Vehicle one attempted to make a left turn onto McLean Ave. Driver one stated a westbound vehicle on Fairfax Blvd. was turning left to go southbound on McLean Ave. which blocked his vision of vehicle two. When vehicle one attempted the turn, the vehicle was in front of vehicle two which subsequently caused vehicle two to strike vehicle one.
141975262	7/14/2014	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	yes	Both vehicles were traveling in the left through lane, west on Fairfax Blvd. Vehicle #1 advised that as she approached the traffic light at Warwick Ave the light was yellow and she came to a stop, so as not to run a red light. Vehicle #2 advised that he had taken his eyes off the road to check his mirrors and when he looked back, was when he saw that vehicle #1 had stopped for the traffic light.Vehicle #2 then hit vehicle #1, pushing her into the intersection.
153085172	10/24/2015	C.Non-visible Injury	2. Angle	0	2	0	West,South	no	no	no	Vehicle 1 was traveling West bound in the left through lane on Fairfax Blvd, when it mad contact with Vehicle 2, which was traveling North on Warwick Ave, approaching Fairfax Blvd. Both Drivers advised that they were proceeding with green lights.
163485245	10/27/2016	PDO.Property Damage Only	1. Rear End	0	0	0	East,East,East	no	yes	yes	Vehicle 1 was traveling East on Fairfax Blvd at Mclean Ave, when it struck the rear of vehicle 2. Vehicle 1 driver stated he went to pick something off the floor and struck vehicle 2. Vehicle 2 was stopped for traffic on Fairfax Blvd and was struck by vehicle 1. Vehicle 2 then struck vehicle 3 due to the impact. Vehicle 3 was stopped for traffic on Fairfax Blvd and was struck by vehicle 2. No injuries were reported at the time of the crash.
173065400	10/25/2017	PDO.Property Damage Only	1. Rear End	0	0	0	West,West	no	no	yes	Vehicle 1 rear ended Vehicle 2.
173415312	11/5/2017	A.Ambulatory Injury	1. Rear End	0	2	0	West,West	no	no	yes	Vehicle 1 rear ended Vehicle 2. Vehicle 1 was DUI (Case # 17-16969).
180035255	11/16/2017	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	no	Vehicle one and two were traveling west on Fairfax Blvd at Warwick Ave. Vehicle one was traveling in lane two, the left through lane, and vehicle two was traveling in lane one, the left turn lane. Vehicle one attempted to change lanes from lane two to lane one and struck vehicle two already occupying lane one.
181435331	1/19/2018	PDO.Property Damage Only	1. Rear End	0	0	0	West,East	no	no	no	Vehicles one and two were traveling east on Fairfax Blvd in the area of Mclean Ave in lane two. Vehicle two came to a stop with traffic prior to Mclean Ave. Vehicle one, failing to maintain proper control, rear ended vehicle two.
182495309	8/30/2018	PDO.Property Damage Only	2. Angle	0	0	0	East,East	no	no	no	Vehicle one was traveling eastbound on Fairfax Blvd. in the left lane. Vehicle two was traveling eastbound on Fairfax Blvd. in the left turn lane at the intersection of McLean Ave. and Warwick Ave. Vehicle one had stopped for the red light traffic and the driver decided she needed to make a left turn. Driver of vehicle one stated she looked but vehicle two entered her blind spot when she attempted to turn and change lanes. Vehicle one then struck vehicle two in the passenger side.
183245179	11/6/2018	PDO.Property Damage Only	1. Rear End	0	0	0	East,East	no	no	no	V2 WAS STOPPED IN THE RIGHT EASTBOUND LANE OF FAIRFAX BLVD. V1 WAS TRAVELING IN THE RIGHT EASTBOUND LANE OF FAIRFAX BLVD. V1 FAILED TO MAINTAIN PROPER CONTROL AND STRUCK V2 IN THE REAR. V1 DRIVER MAY HAVE BEEN TRAVELING TOO FAST FOR ROADWAY CONDITIONS (WET ROADS) WHICH MAY HAVE CONTRIBUTED TO THE CRASH.
183375381	11/28/2018	PDO.Property Damage Only	2. Angle	0	0	0	East,East	no	no	no	V2 WAS TRAVELING EAST BOUND FAIRFAX BLVD PASSING THE INTERSECTION OF WARWICK WHEN V1 TURNED LEFT FROM A PARKING LOT STRIKING V2. V2 WAS TOWED.

Crash Data for the Intersection of Chain Bridge Road and Orchard St (2014 - 2018)

Document Number	Date	Crash Severity	Collsion Type	Pedestrain Injury	Persons Injured	Fatalities	Direction of Travel	Work Zone Related	Adverse Weather Conditions	Distracted Driver	Description
140315073	1/28/2014	PDO.Property Damage Only	2. Angle	0	0	0	North,North,North	no	no	no	Vehicle #2 was traveling in the middle south bound lane of Chain Bridge Road prior to Orchard Street when vehicle #1 changed lanes from the left south bound lane to the middle lane in front of vehicle #2. Vehicle #2 made an evasive move to the right to keep from crashing into vehicle #1. Vehicle #2's evasive move caused it to strike vehicle #3. Vehicle #3 was traveling in the right south bound lane of Chain Bridge Road at the time of the incident.Vehicle #2, Vehicle Maneuver (V1) #15, "Other" is, Avoiding Other Vehicle
140525079	2/19/2014	PDO.Property Damage Only	2. Angle	0	0	0	North,South	no	no	no	Vehicle 1 was traveling south on Chain Bridge Road at the intersection with Orchard St. Vehicle 2 was traveling north on Chain Bridge Road. Vehicle 2 turned left in front of Vehicle 1 and struck Vehicle 1 in the front bumper. Vehicle 2 then fled the scene. Vehicle 2 failed to yield to Vehicle 1 when making a left turn, subsequently causing the crash. The driver, tag number, and make/model of Vehicle 2 are unknown.
140525074	2/19/2014	B.Visible Injury	2. Angle	0	1	0	West,North,North,North	no	yes	no	Vehicle #2 was traveling in the right south bound lane of Chain Bridge Road at Orchard Street when it was struck by vehicle #1. The impact between vehicles 1 and 2 forced #2 into #3 and #3 into #4. Vehicle #2 was turning left from the left turn lane of north bound Chain Bridge Road onto Orchard Street at the time of the incident. Vehicles 3 and 4 were stopped in the middle south bound lane of Chain Bridge Road at the time of the incident.
142235147	8/4/2014	B.Visible Injury	2. Angle	0	3	0	West,North	no	no	no	VEHICLE #1 WAS TURNING LEFT FROM NORTH BOUND CHAIN BRIDGE ROAD TO ORCHARD STREET. VEHICLES FROM SOUTH BOUND CHAIN BRIDGE ROAD HAD STOPPED TO ALLOW VEHICLES TO EXIT OR ENTER ORCHARD STREET. VEHICLE #2 WAS IN THE FAR RIGHT CURB LANE TRAVELING SOUTH ON CHAIN BRIDGE ROAD. VEHICLE #1 TURNED LEFT IN FRONT OF VEHICLE #2.
143445128	12/1/2014	B.Visible Injury	1. Rear End	0	1	0	South,South	no	yes	no	Vehicle # 2 was stopped facing northbound on Chain Bridge Road at a red light. Vehicle # 1 was traveling northbound on Chain Bridge Road. Driver # 1 advised he was having difficulty seeing and did not see vehicle # 2 stopped. Vehicle # 1 subsequently struck vehicle # 2 in the rear.
151245268	5/1/2015	B.Visible Injury	2. Angle	0	1	0	East,South	no	no	no	VEHICLE 1 WAS TURNING LEFT INTO 10485 FAIRFAX BLVD FROM THE LEFT SOUTH BOUND LANE OF CHAIN BRIDGE ROAD WHEN IT STRUCK VEHICLE 2. VEHICLE 2 WAS TRAVELING IN THE RIGHT TURN LANE OF NORTH BOUND CHAIN BRIDGE ROAD AT THE TIME OF THE INCIDNT.
151835213	6/22/2015	PDO.Property Damage Only	2. Angle	0	0	0	South,North	no	no	no	Vehicle 1 was making a left turn from Chain Bridge Rd to Orchard St, when it struck vehicle 2. Vehicle 1 driver stated that the #1 and #3 lanes of South Chain Bridge Rd had come to a stop, leaving the #2 lane open. Vehicle 1 then made the left turn from North Chain Bridge Rd and struck vehicle 2 in the #2 lane.Vehicle 2 was traveling South on Chain Bridge Rd in the #2 lane, when vehicle 1 turned in front of it causing the crash.No injuries were reported at the time of the crash. Vehicle 1 driver was issued a summons for the crash.
151835206	6/22/2015	PDO.Property Damage Only	2. Angle	0	0	0	East,North	no	no	no	Vehicle 1 was leaving Orchard St to make a left turn onto Chain Bridge Rd, when it struck vehicle #2. Vehicle #1 driver stated that the #1 and #3 lanes came to a stop and vehicle #2 did not stop in the #2 lane.Vehicle #2 was traveling South on Chain Bridge Rd in the #2 lane, when vehicle #1 pulled in front of it causing the crash.No injuries were reported at the time of the crash. Vehicle #1 driver was issued a summons for the crash.
152385159	8/25/2015	PDO.Property Damage Only	2. Angle	0	0	0	West,North	no	no	no	V2 was south bound on Chain Bridge Road in the center lane. V1 was in the left turn lane at north bound Chain Bridge Road and Orchard Street.V1's driver reported that a van had stopped prior to the intersec. on and waved him forward to turn west from Chain Bridge Road onto Orchard Street. V1 stated he did not see V2 (obstructed view of the roadway) as it was traveling south and V1 struck the front driver's side of V2. V2's driver advised she did not see V1 turn. There were skid marks at the approximate location of the point of impact from the left side tires.V1 did not yield the right of way while making a left turn to oncoming south bound traffic.
152475186	9/3/2015	C.Non-visible Injury	2. Angle	0	1	0	West,North	no	no	no	Vehicle #1 was turning left from northbound Chain Bridge Rd. on to Orchard St. Vehicle #2 was traveling in the right southbound lane of Chain Bridge Rd when Vehicle #2 struck Vehicle #1. Vehicle #1 failed to yield the right of way to Vehicle #2 at the time of the incident.

152595288	9/14/2015	PDO.Property Damage Only	2. Angle	0	0	0	West,North	no	no	no	Vehicle 1 was making a left turn from Chain Bridge Rd to Orchard St, when it struck vehicle 2. Vehicle 1 driver stated that the left two lanes of Chain Bridge Rd came to a stop and she attempted the left turn. Vehicle 2 then came in the right lane of Chain Bridge Rd, where the collision occurred.Vehicle 2 was traveling straight on Chain Bridge Rd in the right lane, when it was struck by vehicle 1.No injuries were reported at the time of the crash.
152815214	9/28/2015	PDO.Property Damage Only	1. Rear End	0	0	0	West,North	no	no	no	Vehicle one was turning left onto Orchard Street from north bound Chain Bridge Road through stationary traffic. Vehicle two was traveling south on Chain Bridge Road in lane three (far right lane) towards Fairfax Blvd. Vehicle one failed to yield when turning left and entered the path of vehicle two. Vehicle two, unable to stop in time, struck vehicle one in the right front corner.
152755191	10/1/2015	B.Visible Injury	2. Angle	0	1	0	West,North	no	no	no	Vehicle one was northbound on Chain Bridge Road preparing to make a left turn onto Orchard Street. Vehicle two was southbound on Chain Bridge Road. Two other lanes of traffic waved vehicle one to make the left turn and the driver began to make a left turn. While vehicle two was southbound, the vehicles in the two left lanes blocked the view of vehicle one turning until it was directly in front of vehicle two. Vehicle two then subsequently struck vehicle one.
170265231	8/31/2016	PDO.Property Damage Only	1. Rear End	0	0	0	South,South	no	no	no	Vehicles one and two were traveling north on Chain Bridge Road in lane one. Vehicle two came to a stop with traffic prior to Eaton Place. Vehicle one, unable to stop in time, struck vehicle two in the rear end.
162925739	9/1/2016	PDO.Property Damage Only	2. Angle	0	0	0	West,North	no	no	no	VEHICLE 1 ATTEMPTED TO MAKE A LEFT TURN FROM CHAIN BRIDGE RD ONTO ORCHARD ST IN BETWEEN STOPPED TRAFFIC. VEHICLE 2 WAS TRAVELING SOUTH ON CHAIN BRIDGE RD IN THE FAR RIGHT LANE. VEHICLE 1 STRUCK VEHICLE 2 WHEN VEHICLE 1 ENTERED VEHICLE 2'S LANE OF TRAVEL.
162885217	9/28/2016	C.Non-visible Injury	2. Angle	0	1	0	West,North	no	yes	no	The driver of Vehicle 2 stated that she was South bound on Chain Bridge Road at Orchard Street. V2's driver stated that V1 turned in front of her causing the left front of her vehicle to impact the right front of V1. V2's driver complained of pain in her right breast area and lower left abdomen. V2's driver was transported to Fairfax Hospital. The driver of Vehicle 1 stated that she was North bound Chain Bridge Road in the left turn lane onto West bound Orchard Street. V1's driver stated that two lanes of South Chain Bridge Road were stopped in traffic and left an opening so that she could turn left onto Orchard Street. V1's driver stated that she slowly started making her left turn and entered into the curb lane when she was struck by V2. V1's driver stated that the right front of her vehicle impacted the left front of V2. V1's driver stated that the impact forced her off the road in between a utility pole and fire hydrant. V1's driver stated that she was not injured but since she was 31 weeks pregnant it was advised for her to be transported to Fairfax Hospital and examined.
162875142	10/3/2016	PDO.Property Damage Only	2. Angle	0	0	0	West,North	no	no	no	VEHICLE #2 WAS TRAVELING IN THE RIGHT SOUTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLE #1 WAS TRAVELING NORTHBOUND ON CHAIN BRIDGE RD ATTEMPTING TO MAKE A LEFT TURN ON WESTBOUND ORCHARD ST. VEHICLE #2 DRIVER WAS STOPPED AND ALLOWED A VEHICLE TO TURN LEFT BEFORE CONTINUING ON CHAIN BRIDGE RD. VEHICLE #1 DRIVER FAILED TO YIELD THE RIGHT OF WAY WHILE TURNING LEFT TO VEHICLE #1 WHICH CAUSED THE TWO VEHICLE TO STRIKE EACH OTHER.
162955199	10/11/2016	PDO.Property Damage Only	2. Angle	0	0	0	West,North	no	no	no	VEHICLE #1 WAS TRAVELING NORTHBOUND ON CHAIN BRIDGE RD. IN THE LEFT TURN LANE. VEHICLE #2 WAS TRAVELING IN THE RIGHT SOUTHBOUND LANE OF CHAIN BRIDGE RD. AS VEHICLE #1 MADE A LEFT TURN ONTO WESTBOUND ORCHARD ST., VEHICLE #1 FAILED TO YIELD THE RIGHT OF WAY TO VEHICLE #2. THIS CAUSED VEHICLE #2 TO STRIKE VEHICLE #1.
163215178	11/2/2016	PDO.Property Damage Only	2. Angle	0	0	0	West,North	no	no	no	Vehicle 1 was making a left turn to Orchard St from Chain Bridge Rd, when it struck vehicle 2. Vehicle 1 driver stated he couldn't see vehicle 2 due to a stopped vehicle letting him make the left. Vehicle 2 was traveling straight in the middle lane, when it was struck by vehicle 1. No injuries were reported at the time of the crash.
163135657	11/7/2016	C.Non-visible Injury	16. Other	0	2	0	West,North	no	no	no	Vehicle 1 made a left hand turn from the north bound lane of Chain Bridge Road. Vehicle 2 was traveling south bound on Chain Bridge Road. Vehicle 1 made a left turn and crossed into North Bound traffic. Vehicle 2 collided with Vehicle 1 in the intersection.
163405366	11/15/2016	PDO.Property Damage Only	2. Angle	0	0	0	North,West	no	no	no	Driver of vehicle # 2 was turning left onto Orchard st from Chain Bridge rd. The Vehicles in two of the three lanes of Chain Bridge were stopped due to traffic. Driver of vehicle # 2 didn t see vehicle # 1, who was in the right lane of Chain Bridge rd south and pulled into her path causing a collision.
170185204	11/29/2016	PDO.Property Damage Only	2. Angle	0	0	0	North,West	no	yes	no	Veh 1 was traveling south in the right lane of Chain Bridge rd. Veh 2 was making a left off of Chain Bridge rd onto Orchard st. Driver of veh 2 didn t see Veh 1 due to stopped traffic and pulled into the path of veh 1 causing a collision.

180255282	2/15/2017	C.Non-visible Injury	2. Angle	0	1	0	East,North	no	no	no	Vehicle one was turning left from Orchard Street onto north bound Chain Bridge Road. Vehicle two was traveling south on Chain Bridge Road in lane one, far left lane, approaching Orchard Street. Vehicle one failed to see vehicle two as vehicle one proceeded across Chain Bridge Road through stopped traffic, entering into the path of vehicle two. Vehicle two unable to avoid the collision, struck vehicle one on the left front corner. Drivers Actions (P1); Other (37) - Fail to pay full time and attention.
172615197	2/22/2017	PDO.Property Damage Only	2. Angle	0	0	0	East,North	no	no	no	Vehicle one was turning left from Orchard Street onto north bound Chain Bridge Road, through stopped traffic. Vehicle two was traveling south on Chain Bridge Road towards Fairfax Blvd in lane two (middle though lane). Vehicle one failed to yield to vehicle two when entering the highway from a stop sign, resulting in the crash. Driver of vehicle one stated that he did not see vehicle two through stationary traffic in lane three (right turn lane).
180325090	4/24/2017	C.Non-visible Injury	2. Angle	0	2	0	North,East	yes	no	no	VEHICLE 1 WAS TRAVELING IN THE LEFT SOUTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLE 2 WAS ATTEMPTING TO MAKE A LEFT TURN ONTO NORTHBOUND CHAIN BRIDGE RD FROM ORCHARD ST. VEHICLE 2 FAILED TO YIELD TO VEHICLE 1. VEHICLE 2 DRIVER WAS UNABLE TO SEE VEHICLE 1 WHO WAS TRAVELING FASTER THAN THE POSTED SPEED LIMIT PRIOR TO IMPACT.
180235414	4/25/2017	PDO.Property Damage Only	2. Angle	0	0	0	East,North	yes	yes	no	VEHICLE 1 WAS ATTEMPTING TO MAKE A RIGHT TURN FROM ORCHARD ST ONTO SOUTHBOUND CHAIN BRIDGE RD. VEHICLE 2 WAS TRAVELING IN THE LEFT SOUTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLE 1 FAILED TO YIELD TO VEHICLE 2 AND VEHICLE 2 STRUCK VEHICLE 1.
172235198	5/11/2017	PDO.Property Damage Only	16. Other	0	0	0	North,North	no	yes	no	VEHICLE 2 WAS TRAVELING SOUTH IN THE RIGHT LANE. VEHICLE 1 ATTEMPTED TO TURN RIGHT IN FRONT OF VEHICLE 1. VEHICLE 1 STRUCK VEHICLE 2 WHILE ATTEMPTING TO TURN INTO THE GAS STATION.
172155119	7/11/2017	PDO.Property Damage Only	2. Angle	0	0	0	East,North	no	no	no	Vehicle one was exiting the parking lot of 3570 Chain Bridge Road attempting to make a right turn into the far left lane. Vehicle two was driving southbound on Chain Bridge Road in the far left lane. Traffic southbound on Chain Bridge Road in the middle lane was backed up from a red traffic light. Driver 1 attempted to make the turn into the far left lane without being able to see the traffic coming subsequently striking vehicle two.
172585180	8/31/2017	PDO.Property Damage Only	1. Rear End	0	0	0	North,North,North	yes	no	yes	VEHICLES 1, 2, AND 3 WERE TRAVELING IN THE MIDDLE SOUTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLES 2 AND 3 SLOWED FOR TRAFFIC CONDITIONS. VEHICLE 1 DRIVER WAS ATTEMPTING TO CHANGE TO THE LEFT SOUTHBOUND LANE OF CHAIN BRIDGE RD. AS VEHICLE 1 DRIVER LOOKED OVER HIS SHOULDER, VEHICLES 2 AND 3 CAME TO A STOP. VEHICLE 1 THEN STRUCK VEHICLE 2 WHICH CAUSED VEHICLE 2 TO STRIKE VEHICLE 3.
182365269	8/21/2018	B.Visible Injury	16. Other	0	1	0	West,North	no	no	no	Vehicle 1 (V1) was traveling northbound on Chain Bridge Rd. and attempted to make a left turn onto Orchard St. The driver of V1 advised the vehicles in the first two lanes of southbound Chain Bridge Rd. were stopped. As V1 attempted to turn onto Orchard St., Vehicle 2 (V2) was traveling southbound in the third lane of Chain Bridge Rd. and struck V1. The driver of V1 stated that he did not see V2 approaching. The driver of V1 was issued a summons for Fail to Pay Full Time and Attention (98-14).
183485277	8/27/2018	PDO.Property Damage Only	2. Angle	0	0	0	North,West	no	no	no	Veh 1 was south on Chain Bridge Rd in the right lane. Veh 2 was north on Chain Bridge making a left onto Orchard St. Neither veh saw each other due to stopped cars and veh 2 crossed into the path of veh 1 causing a collision.
182575176	8/27/2018	PDO.Property Damage Only	2. Angle	0	0	0	North,North,West	no	no	no	Veh 2 was south on Chain Bridge rd in the right lane. Veh 3 was north on Chain Bridge making a left onto Orchard st. Neither veh 2 or 3 could see each other due to stopped traffic. Veh 3 crossed into the path of veh 2, veh 2 swerved to avoid hitting veh 3 and in doing so struck veh 1 which was sitting in traffic on Chain Bridge rd south. There was no collision involving veh 3.
183395149	12/3/2018	PDO.Property Damage Only	3. Head On	0	0	0	West,North	no	no	no	V1 was traveling Northbound on Chain bridge Rd. V2 was traveling Southbound on Chain bridge Rd. V1 made a left turn onto Orchard St through stopped traffic. V2 was traveling at normal speed in the third right turn lane and struck V1 as it traveled across the roadway.
183515302	12/7/2018	PDO.Property Damage Only	2. Angle	0	0	0	West,South	no	no	no	VEHICLE ONE WAS TRAVELING NORTHBOUND ON CHAIN BRIDGE ROAD MAKING A LEFT ONTO ORCHARD STREET. VEHICLE TWO WAS TRAVELING SOUTHBOUND ON CHAIN BRIDGE ROAD IN THE RIGHT LANE. STOPPED VEHICLES IN THE MIDDLE AND LEFT LANE WERE BLOCKING THE VIEWS OF EACH VEHICLE. VEHICLE ONE BEGAN TO MAKE THE LEFT TURN AND SUBSEQUENTLY STRUCK VEHICLE TWO. AFTER THE INITIAL COLLISION, VEHICLE TWO WAS PUSHED TO THE RIGHT OFF PARTIALLY OFF THE ROADWAY AND VEHICLE ONE ROLLED INTO THE BACK OF IT STRIKING IT AGAIN.

Crash Data for the Intersection of Chain Bridge Road and Eaton Place (2014 - 2018)

Document Number	Date	Crash Severity	Collsion Type	Pedestrain Injury	Persons Injured	Fatalities	Direction of Travel	Work Zone Related	Adverse Weather Conditions	Distracted Driver	Description
140495149	1/22/2014	PDO.Property Damage Only	2. Angle	0	0	0	East,South	no	no	no	Vehicle one was traveling south on Chain Bridge Road turning left onto Eaton Place. Vehicle two was traveling north on Chain Bridge Road in lane three(middle thru lane) approaching Eaton Place. Vehicle one turned left through the intersection and into the path of vehicle two causing the crash. Vehicle one and vehicle two both were proceeding through the intersection under a green light, however vehicle one did not have the left turn arrow and was required to yield to oncoming traffic.
140785230	3/15/2014	PDO.Property Damage Only	2. Angle	0	0	0	North,South	no	no	no	Vehicle #1 was traveling south bound Chain Bridge Road. Vehicle #2 was traveling north bound on Chain Bridge Road. Vehicle #1 attempted to turn left onto eastbound Eaton Place. Vehicle #1 failed to see Vehicle #2 and struck it in the intersec. on.
141215184	4/28/2014	PDO.Property Damage Only	1. Rear End	0	0	0	South,South	no	yes	no	Vehicle 1 was traveling northbound on Chainbridge Rd when the driver failed to see vehicle 2 stopped in the lane of travel. As a result, vehicle 1 struck the rear of vehicle 2.
150540003	5/7/2014	B.Visible Injury	2. Angle	0	1	0	North,East	no	yes	no	VEHICLE #1 A PETERBILT DUMP TRUCK WAS NORTH ON CHAIN BRIDGE RD IN THE RIGHT THROUGH LANE. VEHICLE #2 A MINI COOPER WAS SOUTH ON CHAIN BRIDGE IN THE LEFT TURN LANE ATTEPTING TO PROCEED WEST ONTO EATON PL. VEHICLE #1 ADVISES THAT WHEN HE APPROACHED THE INTERSECTION HE BELIEVED THE TRAFFIC LIGHT WAS YELLOW. VEHICLE #2 ADVISED THAT SHE THOUGHT THE TRUCK WAS STOPPING FOR THE RED LIGHT WHEN SHE PROCEEDED THROUGH THE INTERSECTION. SCOTT (703) 627-8189 WITNESS DIRECTLY BEHIND PETERBILT DUMP TRUCK, ADVISED THAT HE SAW THE RED LIGHT AND WAS WONDERING WHY THE TRUCK WASN'T STOPPING OR ATTEMPTING TO STOP. LESLIE (703) 786-4275 WITNESS BEHIND MINI COOPER, ADVISES THAT SHE SAW THE CAR BEHIND THE STOP LINE WHEN THE LIGHT CHANGED FROM GREEN TO YELLOW AND POSSIBLE RED. SHE OBSERVED THE TRUCK NOT STOPPING, AND WAS SCREAMING AT AT THE CAR IN FRONT AS SHE SAW HER PROCEEDING THROUGH THE INTERSECTION. VEHICLE #2 WAS TRANSPORTED TO FAIR OAKS HOSPITAL BY RESCUE #433 WITH MINOR INJURIES.
141325157	5/9/2014	C.Non-visible Injury	2. Angle	0	1	0	East,South	no	no	no	VEH 1 TRAVELING SOUTH BOUND CHAIN BRIDGE RD MADE A LEFT TURN ONTO EATON PL. DRIVER DID NOT SEE VEH 2 AND WAS STRUCK BY THE VEH 2. VEH 2 WAS TRAVELING NORTH BOUND CHAIN BRIDGE RD AND STRUCK VEH 1 AS IT TURNED IN FRONT OF VEH 2. VEH 1 SUSTAINED DAMAGE TO THE RIGHT PASSENGER SIDE REAR DOOR. THE DRIVER OF VEH 1 WAS TRANSPORTED FOR EVALUATION AFTER COMPLAINING OF PAIN TO THE NECK AND BACK. VEH 2 SUSTAINED DAMAGE TO THE FRONT AND WAS TOWED FROM THE SCENE.
141715162	6/17/2014	B.Visible Injury	1. Rear End	0	1	0	North,North,North	no	no	yes	Vehicles 2 and 3 were stopped for traffic/red light in the left south bound lane of Chain Bridge Road prior to Eaton Place when vehicle #1 struck #2 in the rear. The impact between vehicles 1 and 2 forced #2 into the rear of vehicle #3. Vehicle #1 was traveling in the left south bound lane of Chain Bridge Road at the time of the incident.Driver's Action (P1) #37 "Other" is, Fail to Pay Full Time & Attention
141705085	6/18/2014	PDO.Property Damage Only	2. Angle	0	0	0	East,South	no	no	no	Driver of Veh 1 stated that he had a green light and was attempting to make a left turn from southbound Chain bridge Rd. onto eastbound Eaton Pl. Driver of Veh 2 stated that her light turned green and she proceeded to drive through the intersection when Veh 1 crossed in front of her. Driver of Veh 2 stated that she was unable to stop prior to making contact with Veh 1. Witness was driving behind Veh 2 and stated that they had the green light.
141835094	6/30/2014	PDO.Property Damage Only	2. Angle	0	0	0	South,South	no	no	no	VEHICLE 2 WAS TRAVELING IN THE #4 LANE OF CHAIN BRIDGE RD AT THE INTERSECTION OF EATON PLACE. VEHICLE 1 WAS IN THE #3 LANE OF NORTHBOUND CHAIN BRIDGE RD. VEHICLE 1 THEN ATTEMPTED TO MAKE A RIGHT TURN. VEHICLE 1'S PASSENGER SIDE STRUCK THE FRONT LEFT CORNER OF VEHICLE 2. THERE WERE NO INJURIES REPORTED AT THE CRASH SCENE. VEHICLE 1 WAS TOWED FROM THE SCENE.
142205118	8/5/2014	B.Visible Injury	2. Angle	0	1	0	South,East	no	no	no	Vehicle #1 was traveling in the right through lane north on Chain Bridge Rd, approaching Eaton Pl. Vehicle #2 was traveling south on Chain Bridge Rd attempting to turn left onto east bound Eaton Pl. Chain Bridge Rd had a green light for both North and South bound lanes.Vehicle #2 advised that she observed the vehicle in front of her turn left, and she felt that she could make it as well.Vehicle #2 turned in front of vehicle #1 and was struck in the passenger side middle of the vehicle causing vehicle #2 to slide into the curb and flipping onto its driver side then rolling over onto its roof.Vehicle #1 suffered damage to the front end.Vehicle #2 totaled.
142385150	8/19/2014	PDO.Property Damage Only	2. Angle	0	0	0	South,North,West	no	no	no	Vehicle one was northbound on Chainbridge Road. Vehicle two was turning left from southbound Chainbridge Road onto eastbound Eaton Place. Vehicle three was stopped westbound on Eaton Place at Chainbridge Road. Vehicle one struck vehicle two causing vehicle two to spin around and strike vehicle three. Both vehicle one and two entered the intersection on a yellow traffic signal.
142385104	8/22/2014	B.Visible Injury	2. Angle	0	1	0	East,South	no	no	no	VEHICLE 1 WAS TRAVELING SOUTH ON CHAIN BRIDGE ROAD APPROACHING THE INTERSECTION WITH EATON PLACE. VEHICLE 1 ADVISED SHE HAD A GREEN ARROW AND MADE A LEFT TURN TO TRAVEL EAST ON EATON PLACE. VEHICLE 2 WAS AT A RED LIGHT ON CHAIN BRIDGE ROAD FACING SOUTH AT THE INTERSECTION WITH EATON PLACE. VEHICLE 2 PROCEEDED INTO THE INTERSECTION WHEN HIS LIGHT TURNED GREEN AND WAS STRUCK BY VEHICLE 1 ON THE LEFT FRONT CORNER (POI 1). BOTH PARTIES ADVISED THEY HAD THE RIGHT OF WAY. VEHICLE 3 WAS SEVERAL CARS BACK BEHIND VEHICLE 2 AND CONFIRMED THAT VEHICLE 2 DID IN FACT HAVE A GREEN LIGHT AND HAD THE RIGHT OF WAY IN THE INTERSECTION.

150075139	9/25/2014	PDO.Property Damage Only	2. Angle	0	0	0	South,North,North,North	no	yes	no	Vehicle 1 made a left turn onto Chain Bridge Rd from Eaton Pl, when the driver failed to maintain proper control. Vehicle 1 struck the left rear of Vehicle 2, then struck Vehicle 3 head-on. The force of the impact on Vehicle 3 caused it to travel backwards and strike the front left of Vehicle 4.
143435282	11/21/2014	PDO.Property Damage Only	2. Angle	0	0	0	East,North	no	no	no	Both vehicles were traveling on Chain Bridge Rd in the right through lane south bound. Vehicle #1 had turned right onto Chain Bridge service Rd and had made a legal U turn to proceed onto Eaton Pl. Vehicle #2 had made the right turn to proceed into Assembly Dr. Vehicle #2 advised that she thought vehicle #1 was continuing onto the service road and she headed for Assembly Dr and was unable to stop.Vehicle #1 sustained damage to the driver side front quarter panel, and door.Vehicle #2 sustained damage to the passenger side front corner bumper, quarter panel.No injuries reported.
143525271	12/1/2014	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	North,North	no	yes	no	Both Vehicle # 1 and # 2 were traveling southbound on Chain Bridge Road. Vehicle # 1 was in the middle straight lane and vehicle # 2 was in the right (#3) lane. Vehicle # 1 changed lanes without checking for other vehicles and struck vehicle # 2 on its drivers side.
150145208	1/1/2015	PDO.Property Damage Only	2. Angle	0	0	0	North,South	no	no	no	Vehicle 1 was headed south on Chainbridge Rd. and was turning left on to Eaton Pl. Vehicle 2 was headed north on Chainbridge Rd. Both vehicles had a yellow traffic signal. Vehicle 1 turned in front of the path of vehicle 2. The right front of vehicle 2 struck the right rear side of vehicle 1.
150145164	1/9/2015	B.Visible Injury	1. Rear End	0	1	0	North,North	no	no	yes	Both vehicles were in the left turn lane southbound on Chainbridge Road. Vehicle two was stopped for traffic when vehicle one struck vehicle two in the rear. Vehicle one left the area without providing any information.
150835173	3/21/2015	PDO.Property Damage Only	2. Angle	0	0	0	East,South	no	no	no	Vehicle 1 was turning left from the left turn lane of south bound Chain Bridge Road onto east bound Eaton Place when it was struck by vehicle 2. Vehicle 2 was traveling in the left north bound lane of Chain Bridge Road at Eaton Place at the time of the incident. Both vehicles were traveling on a green light at the time of the incident. Vehicle 1 was towing a vehicle vin# 1HGCR2F53EA069110.
151485175	5/19/2015	PDO.Property Damage Only	2. Angle	0	0	0	North,South	no	no	no	Vehicle 1 was traveling South on Chain Bridge Rd and attempted a left turn to Eaton Pl. Vehicle 1 then struck vehicle 2 in the intersection. Vehicle 1 driver stated "I thought I had enough time" when making the left turn. Vehicle 2 was traveling North on Chain Bridge Rd with a steady green light, when it was struck by vehicle 1.No injuries were reported at the time of the crash and vehicle 1 driver was issued a summons for fail to yield the right of way.
151825137	7/1/2015	A.Ambulatory Injury	9. Fixed Object - Off Road	0	1	0	North	no	yes	yes	Vehicle 1 was traveling southbound on Chain Bridge Rd. at the intersection of Assembly Dr. Vehicle 1 was traveling at an unknown speed in rainy conditions when it entered the intersection and veered to the left. Vehicle 1 then jumped the center median, striking a road sign and then a tree. The driver stated that she blinked and the next thing she knew was the cabin was filled with smoke, she was in pain and attempting to get out of the vehicle. She advised that she was in the process of moving and has not slept since "yesterday". There were no signs of alcohol. Rescue 433 transported to Fairfax Hospital. Fairfax Towing towed the Uhual.
152055089	7/23/2015	B.Visible Injury	2. Angle	0	1	0	East,South	no	no	no	Vehicle one was southbound on Chain Bridge Road attempting to make a left turn westbound on Eaton Place. Vehicle two was northbound on Chain Bridge Road. The driver of vehicle one stated that he saw the north/south traffic light turn yellow and it appeared the vehicle in the left lane was stopping so that vehicle proceeded. Vehicle two continued through the intersection on the yellow light. As vehicle one was turning, it struck vehicle two as it was going through the intersection. The driver of vehicle one stated that he did not see another vehicle past the one that was in the left straight through lane.
152125084	7/30/2015	C.Non-visible Injury	2. Angle	0	2	0	East,South	no	no	no	VEHICLE 1 WAS TURNING LEFT ONTO EAST BOUND EATON PLACE FROM THE LEFT TURN LANE OF SOUTH BOUND CHAIN BRIDGE ROAD WHEN IT WAS STRUCK BY VEHICLE 2. VEHICLE 2 WAS TRAVELING IN THE RIGHT NORTHBOUND LANE OF CHAIN BRIDGE ROAD AT THE TIME OF THE INCIDENT. BOTH VEHICLES WERE TRAVELING ON A GREEN LIGHT AT THE TIME OF THE INCIDENT.
152185274	7/31/2015	C.Non-visible Injury	4. Sideswipe - Same Direction	0	1	0	North,North	no	no	no	Vehicle 1 was traveling South on Chain Bridge Rd, when the driver attempted a lane change to the right. Vehicle 1 then struck vehicle 2 inside the intersection of Eaton Place.Vehicle 2 was traveling straight in the right lane of Chain Bridge Rd, when it was struck by vehicle 1. Vehicle 2 driver was checked out by EMS and refused transportation to the hospital with a minor/possible injury to neck and shoulder.Vehicle 1 driver was issued a summons for the crash.

152245127	8/6/2015	C.Non-visible Injury	2. Angle	0	1	0	East,South	no	no	no	Vehicle #2 was traveling in the right northbound lane of Chain Bridge Rd. Vehicle #1 had made a left turn from southbound Chain Bridge Rd onto eastbound Eaton Pl. Vehicle #1 did not yield the right of way and was unable to clear the intersection before Vehicle #2 struck Vehicle #1.
152755187	10/1/2015	C.Non-visible Injury	2. Angle	0	2	0	North,South	no	yes	no	Vehicle 2 was traveling northbound on Chain Bridge Road, in the far right through lane, when it was struck by Vehicle 1, as it was making a left turn onto Eaton Place.
153095122	11/1/2015	PDO.Property Damage Only	2. Angle	0	0	0	South,South	no	no	no	Vehicle one was northbound in the middle lane of Chainbridge Road. Vehicle two was northbound in the right lane of Chainbridge Road. Vehicle one changed lanes into the right lane and struck vehicle two.
160125198	1/9/2016	PDO.Property Damage Only	2. Angle	0	0	0	East,South	no	yes	no	Vehicle 1 was turning left from the left turn lane of northbound Chain Bridge Road onto eastbound Eaton Place when it was struck by vehicle 2. Vehicle 2 was traveling in the left southbound lane of Chain Bridge Road at Eaton Place at the time of the incident. Both vehicles were traveling on a green light at the time of the incident.
160345195	2/2/2016	B.Visible Injury	16. Other	0	2	0	North,West	no	no	no	V1 was traveling south on Chain Bridge Rd. at Eaton Pl in the middle lane when it ran the red light at Eaton Pl. Vehicle 2 was traveling west on Eaton Pl. at Chain Bridge Rd. in the left lane on a green light. Vehicle 1 was struck on the left side by the front of vehicle 2.
160555255	2/23/2016	PDO.Property Damage Only	1. Rear End	0	0	0	North,North	yes	yes	yes	Vehicle #1 was in the No #2 lane of southbound Chain Bridge Rd. approaching Eaton Place. Vehicle #2 was directly behind Vehicle #1. Driver #2 looked down at the car radio and when he looked back up, he struck Vehicle # 1 in the rear, creating a rear end collision.
160895172	3/18/2016	A.Ambulatory Injury	2. Angle	0	2	0	East,South	no	no	no	Vehicle 1 attempted to make a left turn from the left southbound lane of Chain Bridge Rd onto Eaton Pl. Vehicle 1 had a solid green light and did not have the right of way. Vehicle 2 was traveling in the center north bound lane of Chain Bridge Rd. Vehicle 1 made the left turn, striking vehicle 2.
160895170	3/28/2016	PDO.Property Damage Only	2. Angle	0	0	0	North,North	no	no	yes	Vehicle one was stopped in the right lane of Chainbridge Road southbound at the intersection of Assembly Drive for the red traffic signal. Vehicle two was stopped in the middle lane of Chainbridge Road southbound at the intersection of Assembly Drive for the red traffic signal. Both drivers were alerted by an emergency vehicle approaching from behind them with emergency equipment activated. Vehicle two moved forward and to the right partially into the right lane in the intersection in order to let the emergency vehicle pass. Vehicle one also moved forward into the intersection. Driver one was looking in the rear view mirror for the emergency vehicle and failed to see vehicle two stopped ahead in the right lane. The left front corner of vehicle one struck the right side of vehicle two.
161805199	6/13/2016	PDO.Property Damage Only	2. Angle	0	0	0	North,West	no	no	no	VEHICLE 1 WAS ATTEMPTING TO MAKE A LEFT TURN FROM 3535 CHAIN BRIDGE RD ONTO EASTBOUND EATON PL. VEHICLE 2 WAS IN THE #1 LANE OF WESTBOUND EATON PL. VEHICLE 1'S FRONT END STRUCK THE PASSENGER SIDE OF VEHICLE 2.
162175169	7/21/2016	PDO.Property Damage Only	2. Angle	0	0	0	North,West	no	no	no	V1 was traveling south on Chain Bridge Rd. in the right lane approaching the intersection with Eaton Pl. V2 was traveling west on Eaton Pl. approaching Chain Bridge Rd., attempting to turn left onto Chain Bridge Rd. south bound. Both drivers stated that they had a green light upon entering the intersection. V1 and V2 collided in the middle of the intersection between Chain Bridge Rd. and Eaton Pl. Both drivers stated that they may have been at fault. After my on scene investigation and after not being able to obtain conclusive video footage of the incident, neither driver was issued a citation as a result of the incident.
162365089	8/10/2016	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	no	VEHICLES #1 AND #2 WERE TRAVELING WESTBOUND ON EATON PL. AS THE VEHICLES SIMULTANEOUSLY MADE A RIGHT TURN ON TO NORTHBOUND CHAIN BRIDGE RD, VEHICLES #1 AND #2 SIDESWIPED EACH OTHER.
162935188	9/14/2016	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	no	VEHICLES #1 AND #2 WERE TRAVELING WESTBOUND ON EATON PLACE. AS BOTH VEHICLES MADE A RIGHT TURN ONTO NORTHBOUND CHAIN BRIDGE RD, VEHICLES #1 AND #2 STRUCK EACH OTHER.
162805263	9/23/2016	PDO.Property Damage Only	2. Angle	0	0	0	North,South,South	no	no	no	Vehicle 1 made a left from Chain Bridge Rd to Eaton Place and was struck by vehicle 2. Vehicle 1 did not have the right of way when making the left. Vehicle 2 was in the middle lane of Chain Bridge Rd, when it struck the left turning vehicle 1. Vehicle 2 was then struck from behind by vehicle 3. Vehicle 3 was behind vehicle 2 on Chain Bridge Rd, when it struck the rear of vehicle 2. Vehicle 3 did not have enough time to stop due to the crash between vehicle 1 and vehicle 2.
162875149	9/28/2016	PDO.Property Damage Only	2. Angle	0	0	0	East,South	no	yes	no	VEHICLE 2 WAS TRAVELING NORTHBOUND ON CHAIN BRIDGE RD IN THE #3 LANE OF CHAIN BRIDGE RD AT THE INTERSECTION OF EATON PL. VEHICLE 1 WAS MAKING A LEFT TURN FROM SOUTHBOUND CHAIN BRIDGE RD ONTO EATON PLACE. VEHICLE 1 DID NOT SEE VEHICLE 2 AND CRASHED INTO VEHICLE 2 WHILE MAKING THE TURN.
163475355	10/3/2016	PDO.Property Damage Only	3. Head On	0	0	0	South,East	no	no	no	VEHICLE ONE WAS TRAVELING NORTH BOUND ON CHAIN BRIDGE RD. DRIVER STATED HE WAS FOLLOWING BEHIND A LARGE TRUCK AND THEN HIT IN THE FRONT LEFT DRIVER'S SIDE. THE DRIVER STATED HE DID NOT RECALL WHAT COLOR THE LIGHT WAS WHEN HE WENT THROUGH THE INTERSECTION. THE DRIVER STATED HE ASSUMED IT WAS GREEN BECAUSE OTHER CARS WERE TRAVELING IN THE SAME DIRECTION. VEHCILE TWO WAS TRAVELING SOUTH BOUND CHAIN BRIDGE RD. AND ATTEMPTING TO MAKE A LEFT TURN AT THE INTERSECTION OF CHAIN BRIDGE RD. AND EATON PLACE. THE DRIVER OF VEHICLE TWO STATED HE HAD A GREEN LIGHT AND NORTH BOUND TRAFFIC HAD A RED LIGHT. THE DRIVER OF VEHICLE TWO STATED HE COULD NOT REMEMBER IF HE HAD A GREEN ARROW OR GREEN LIGHT. I REVIEWED VIDEO FOOTAGE FROM THE TRAFFIC CAMERAL LOCATED AT THE INTERSECTION. I DETERMINED VEHICLE ONE RAN A RED TRAFFIC LIGHT WHICH CAUSED THE ACCIDENT. I WILL SEEK A MAGISTRATE SUMMONS FOR THE DRIVER OF VEHICLE ONE.
163155121	11/9/2016	PDO.Property Damage Only	1. Rear End	0	0	0	North,North	no	no	no	Vehicle 2 was stopped at a steady red traffic signal, In the left, south bound through lane of Chain Bridge road, at Eaton Place. Vehicle 1 was traveling south bound in the left through lane of Chain Bridge Road, when it disregarded the traffic signal at Eaton Place and struck Vehicle 2 in the rear(Point of Impact). Drivers Action #37 Other is Driver not paying attention.

163205184	11/12/2016	A.Ambulatory Injury	2. Angle	0	1	0	North,South	no	no	no	V1 WAS IN THE LEFT TURN LANE TO TURN EASTBOUND ON EATON PLACE FROM SOUTHBOUND CHAIN BRIDGE WHEN IT PULLED OUT IN FRONT OF V2 WHICH WAS TRAVELING NORTH BOUND ON CHAIN BRIDGE RD.
163375240	11/20/2016	PDO.Property Damage Only	1. Rear End	0	0	0	North,North	no	no	yes	Vehicle 1 was stopped at a steady red traffic signal, in the left through lane of Chain Bridge Road, at Eaton Place. Vehicle 2 was traveling south bound in the left through lane of Chain Bridge Road, at Eaton Place. Vehicle 2 disregarded the traffic signal and struck Vehicle 1 in the rear Point of Impact). Vehicle 2 fled the scene, traveling north bound on Chain Bridge Road, making no attempty to identify themselves.
170965114	3/13/2017	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	North,North,North	no	yes	no	V2 and V3 were traveling south bound on Chain Bridge Road at the intersection of Eaton Place. V2 was in the third lane and V3 was in the fourth lane. V2 and V3 were stopped at the red light, V1 attempted to drive in-between V2 and V3 striking both vehicles.
180325099	3/27/2017	C.Non-visible Injury	4. Sideswipe - Same Direction	0	2	0	West,South	no	no	no	V1 WAS IN THE FAR RIGHT TURN ONLY LANE AT EATON PL ATTEMPTING TO GO STRAIGHT ACROSS THE INTERSECTION. V2 WAS IN THE LEFT RIGHT TURN LANE ATTEMPTING TO TURN NORTHBOUND ON CHAIN BRIDGE RD FROM EATON PL. V1 DID NOT SEE THE RIGHT TURN ONLY SIGN AND CONTINUED STRAIGHT CAUSING V1 TO STRIKE V2 WITH THEIR LEFT FRONT TIRE AND BUMPER.
172115262	4/6/2017	PDO.Property Damage Only	2. Angle	0	0	0	South,South	no	no	no	VEHICLE 1 WAS IN THE RIGHT WESTBOUND LANE OF EATON PL. VEHICLE 2 WAS IN THE LEFT WESTBOUND LANE OF EATON PL. BOTH VEHICLES WERE MAKING A RIGHT TURN ONTO NORTHBOUND CHAIN BRIDGE RD. VEHICLE 1 DRIVER ATTEMPTED TO CHANGE TO LANES TO THE FAR LEFT LANE OF CHAIN BRIDGE RD. WHILE DOING SO, SHE STRUCK VEHICLE 2.
180305314	4/19/2017	C.Non-visible Injury	9. Fixed Object - Off Road	0	1	0	South	no	no	no	VEHICLE 1 WAS DRIVING WESTBOUND ON EATON PL ATTEMPTING TO MAKE A RIGHT TURN ONTO NORTHBOUND CHAIN BRIDGE RD. DUE TO BEING UNFAMILIAR WITH THE AREA, VEHICLE 1 DRIVER WAS UNSURE OF WHERE TO GO. THIS CAUSED HER TO BEGIN TO PANIC, AND IN THE PROCESS OF DOING SO, LOST CONTROL OF HER VEHICLE AND STRUCK A TREE. P2: DRIVER WAS HAVING A MENTAL HEALTH EMERGENCY
171725147	4/25/2017	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	South,South	no	no	no	Vehicle one and two were traveling west on Eaton Place at Chain Bridge Road. Vehicle one was in lane one making a right turn onto Chain Bridge Road and vehicle two was making a right turn onto Chain Bridge Road from lane two. At some point during the turn both vehicles collided. Both drivers stated that they were stationary and the other vehicle encroached on their lane. Video footage from the traffic camera at Chain Bridge and Eaton did not capture the accident or the events that lead up to it. Unable to determine fault due to conflicting statements and a lack of witnesses.
173205395	8/30/2017	PDO.Property Damage Only	2. Angle	0	0	0	South,South	no	no	no	V1 was in the right turn lane facing west on Eaton Place. V2 was in the far left turn lane facing West on Eaton Place. The far left lane has the ability to turn left, go straight ahead, or make a right turn. V2 and V1 both made right turns onto north Chain Bridge Road. V1 made a wide right turn and it's driver's side corner struck the front passenger side door of V2.
172625304	9/3/2017	PDO.Property Damage Only	2. Angle	0	0	0	North,East	no	no	no	Vehicle one was traveling south on Chain Bridge Road approaching Eaton Place in lane two, the left through lane. Vehicle two was traveling east across Chain Bridge Road to Eaton Place under the direction of a green traffic signal. Driver of vehicle one stated that he observed his light cycle from green to red but was unable to stop in time to avoid colliding with vehicle two.
172935280	9/19/2017	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	South,South	no	no	no	VEH 1 AND VEH 2 WERE DRIVING SIDE BY SIDE IN THE RIGHT TURN LANES OF EATON PLACE. BOTH VEHICLES MADE A RIGHT TURN FROM EATON PLACE ONTO CHAIN BRIDGE RD NORTH BOUND. WHILE TURNING IN THE INTERSECTION, VEH 1 AND VEH 2 MADE CONTACT. BOTH DRIVERS CLAIMED THE OTHER ENTERED THEIR LANE OF TRAVEL. AFTER ATTEMPTING TO REVIEW TRAFFIC CAMERAS OF THE INTERSECTION, I AM UNABLE TO DETERMINE WHICH VEHICLE IS AT FAULT.
172635147	9/20/2017	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	South,South	no	no	no	V2 WAS TRAVELLING SOUTH BOUND ON RT123 IN THE AREA OF RT66 WHEN IT WAS SIDE SWIPPED BY V1. V1 WAS EXITING EAST BOUND RT66 TO CONTINUE SOUTH BOUND ON RT123 WHEN IT CROSSED OVER THE SOLID WHITE LANE MARKINGS INTO V2'S LANE OF TRAVEL CAUSING THE COLLISION.
172925241	9/22/2017	C.Non-visible Injury	1. Rear End	0	1	0	North,North	no	no	no	Vehicles one and two were traveling south in lane three (middle through lane). Vehicle two came to a stop with traffic prior to the light at 123 and Eaton Place. Vehicle one failed to stop in time striking vehicle two in the rear end.
173475337	9/30/2017	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	no	Vehicle 2 was traveling west bound on Eaton Place in the left west bound lane. Vehicle 1 was traveling west bound on Eaton Place in the right west bound lane. Vehicle 2 was making a Right Turn onto North Bound Chain Bridge Rd. Vehicle 1 proceeded straight in the right turn only lane, striking Vehicle 2 (Point of Impact). Trailer Unit Information Damage to Power Unit $00 Damage to Towed Unit $3000 Vehicle Owner Name: Heil Trailer International Co 2015 Heil Trailer International, Co Heil Trailer International Co VIN: 5HTAB4323D7H77898 Tag Number 419033TL (Virginia)
173205195	11/1/2017	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	yes	Vehicle 2 proceeded west bound on Eaton Place, in the straight/right option lane, prior to Chain Bridge Road. Vehicle 1 proceeded west bound in the far right turn lane of Eaton Place, prior to Chain Bridge Rd. Vehicle 2 made the right turn onto Chain Bridge Road and proceeded into the middle through lane of North Bound Chain Bridge Road, side swiping Vehicle 2 (Point of Impact).
173205191	11/2/2017	PDO.Property Damage Only	2. Angle	0	0	0	North,South	no	no	no	Vehicle 2 was traveling North bound in the right through lane of Chain Bridge Rd, prior to Eaton Place. Vehicle 1 was traveling South bound, in the left turn lane of Chain Bridge Rd, prior to Eaton Place. Vehicle 1 failed to yield the right of way while turning left on a solid green traffic signal and was struck by Vehicle 2 (Point of Impact).

180195243	11/17/2017	PDO.Property Damage Only	2. Angle	0	0	0	North,South	no	no	yes	Vehicle one was traveling south on Chain Bridge Road, making a left onto Eaton Place under a solid green light without the left turn arrow. Vehicle two was traveling north on Chain Bridge Road in lane two, continuing through the intersection under a green light. Vehicle one failed to yield to vehicle two when making the left turn causing the crash.
180315400	11/30/2017	PDO.Property Damage Only	2. Angle	0	0	0	North,South	no	no	no	Vehicle one was traveling southbound on Chain Bridge Road preparing to make a left turn onto Eaton Pl. Vehicle two was traveling northbound on Chain Bridge Road in the right straight through lane. Vehicle one started to make the turn and did not yield the right of way to vehicle two subsequently striking it. Vehicle one then rolled to the north east corner of the intersection where it struck the curb and came to rest. Driver of vehicle one only had a learner's permit in her possession and no licensed driver in the vehicle.
180465194	2/5/2018	C.Non-visible Injury	1. Rear End	0	1	0	North,North	no	no	no	Vehicles one and two were traveling southbound on the Chain Bridge Road service road approaching the red light at Eaton Place. Vehicle two had stopped for the red light and vehicle one had subsequently struck the rear of the vehicle two. Driver of vehicle one had stated she was hit from behind by another vehicle causing her to strike the rear of the bus. There was some paint transfer on the rear bumper of the vehicle and possibly a broken license plate frame. The front of vehicle one had extensive damage from striking vehicle two. The reporting officer also witnessed vehicle one striking vehicle two, but there was not a prior collision beforehand. Only one collision was heard as well as being seen. The damage to vehicle one does not correlate with chain reaction rear end crash where it would be the middle vehicle.
180755256	2/26/2018	PDO.Property Damage Only	2. Angle	0	0	0	East,West	no	no	no	V1 was exiting the parking lot of 3535 Chain Bridge Rd. and attempting to make a left turn onto eastbound Eaton Pl. V2 was traveling westbound in the left lane of Eaton Pl. attempting to make a left turn into the parking lot of 3545 Chain Bridge Rd. V1 entered the highway after a vehicle in the right lane of westbound Eaton Pl. waived him to proceed. V1 struck V2 in the left lane of westbound Eaton Pl.
180685182	3/2/2018	A.Ambulatory Injury	1. Rear End	0	1	0	South,South,South	no	no	no	Vehicle 1 was traveling northbound on Chain Bridge Rd. Driver stated that he became light headed and blacked out. Vehicle 1 hit the rear end of vehicle 2 near the intersection of Eaton Pl. Vehicle 1 then to continued northbound on Chain Bridge Rd and rammed into the back of vehicle 3 and proceeded to strike a tree as it went over the median and into the southbound lanes. Vehicle 1 then went back over the median, struck another tree and rolled over in the northbound lanes.
180935126	4/2/2018	PDO.Property Damage Only	2. Angle	0	0	0	East,North	no	yes	no	Veh 1 was traveling east on Eaton Pl. Veh 2 was pulling out of a driveway to go east on Eaton Pl. The driver of veh 2 didn't see veh 1 due to stopped traffic and pulled into it's path causing a collision.
181495394	5/16/2018	PDO.Property Damage Only	2. Angle	0	0	0	East,South,West	no	yes	no	VEHICLE #1 WAS MAKING A LEFT TURN FROM SOUTHBOUND CHAIN BRIDGE RD ONTO EASTBOUND EATON PL. VEHICLE #2 WAS TRAVELING IN THE RIGHT NORTHBOUND LANE OF CHAIN BRIDGE RD. VEHICLE #3 WAS STOPPED AT A RED TRAFFIC SIGNAL ON WESTBOUND EATON PL. VEHICLE #1 MADE A LEFT TURN AND FAILED TO YIELD THE RIGHT OF WAY TO VEHICLE #2. VEHICLE #2 THEN STRUCK VEHICLE #1. THIS CAUSED VEHICLE #1 TO STRIKE VEHICLE #3.
182065274	6/8/2018	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	South,South	no	no	no	VEHICLE 2 WAS NORTHBOUND ON CHAIN BRIDGE RD (SERVICE ROAD) WITH THE INTERSECTION OF EATON PLACE GOING STRAIGHT. VEHICLE 1 WAS DIRECTLY BEHIND VEHICLE 2. VEHICLE 1 WAS IN A HURRY AND PASSED VEHICLE 2 ON THE LEFT AND THEN ATTEMPTED TO MAKE A RIGHT TURN IN FRONT OF VEHICLE 2. VEHICLE 1 THEN STRUCK VEHICLE 2.
182695288	6/27/2018	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	South,South	no	no	no	Vehicle 2 was traveling north bound in the right through lane of Chain Bridge Road, prior to Eaton Place. Vehicle 1 was traveling north bound in the left through lane of Chain Bridge Road, prior to Eaton Place. Vehicle 1 proceeded to change traffic lanes, striking Vehicle 2 (Point of Impact).
181905199	6/29/2018	C.Non-visible Injury	2. Angle	0	1	0	West,North	no	no	no	The driver of Vehicle 2 stated that she was South bound on the Chain Bridge Road Service Road at Eaton Place. V2's driver stated that she had a green light and was making a right turn from Chain Bridge Road onto East bound Eaton Place. V2's driver stated that as she was entering the intersection V1 impacted her vehicle from the left striking the left rear quarter panel of her car. V2's driver initially stated she was not injured but than complained of neck and back pain. V2's driver declined my offer to have rescue respond to the scene. The driver of Vehicle 1 stated that she was West bound on Eaton place in the number 1 lane at Chain Bridge Road. V1's driver stated that as she neared the intersection she did not see the first stop bar before the service road or the "Stop here on red sign" at the service road intersection. V1's driver stated that she also did not see the first set of red lights and was focused on the set of lights that were green at the main intersection of Chain Bridge Road. V1's driver and passenger both stated that they were not injured.
182705178	9/7/2018	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	no	VEHICLES ONE AND TWO WERE TURNING RIGHT FROM EATON PLACE ONTO CHAIN BRIDGE ROAD. VEHICLE ONE WAS TURNING FROM LANE ONE, THE LEFT, THROUGH OR RIGHT TURN LANE, AND VEHICLE TWO WAS TURNING FROM LANE TWO, THE RIGHT TURN ONLY LANE. DRIVERS OF VEHICLE ONE AND TWO BOTH STATED THAT THEY WERE ATTEMPTING TO TURN INTO THE SAME LANE, LANE TWO(MIDDLE LANE) OF NORTH BOUND CHAIN BRIDGE ROAD.

182705237	9/26/2018	PDO.Property Damage Only	2. Angle	0	0	0	South,North	no	no	no	VEHICLE ONE WAS TRAVELING SOUTHBOUND ON CHAIN BRIDGE ROAD AND IN THE LEFT TURN LANE FOR EATON PLACE. VEHICLE TWO WAS TRAVELING NORTHBOUND ON CHAIN BRIDGE ROAD IN THE LEFT LANE. THE TRAFFIC LIGHT FOR THE SOUTHBOUND TRAFFIC HAD THE GREEN ARROW AND THEN TURNED TO JUST THE GREEN BALL. THE NORTHBOUND CHAIN BRIDGE ROAD TRAFFIC THEN RECEIVED THE GREEN LIGHT AND VEHICLE TWO PROCEEDED TO GO STRAIGHT THROUGH THE INTERSECTION. DRIVER OF VEHICLE ONE STATED SHE JUST TRIED TO FOLLOW THE TURNING TRAFFIC AND DID NOT LOOK TO SEE IF THE GREEN ARROW WAS STILL THERE. VEHICLE ONE THEN ENTERED THE PATH OF VEHICLE TWO SUBSEQUENTLY CAUSING THEM TO COLLIDE.
182885453	9/30/2018	C.Non-visible Injury	1. Rear End	0	2	0	North,North	no	no	no	BOTH VEHICLE ONE AND TWO WERE STOPPED AT LIGHT AT THE INTERSECTION OF CHAIN BRIDGE RD AND EATON PL. THE DRIVER OF VEHICLE ONE STATED HER FOOT SLIPPED OFF THE BRAKE AND SHE STRUCK VEHICLE TWO IN THE REAR BUMPER. THE ONLY DAMAGE WAS PAINT TRANSFER FROM THE FRONT LICENSE PLATE OF VEHICLE ONE. THE DRIVER AND PASSENGER OF VEHICLE TWO COMPLAINED OF NECK PAIN AND THEN REFUSED TREATMENT FROM RESCUE.
183195332	10/26/2018	PDO.Property Damage Only	2. Angle	0	0	0	South,North	no	yes	no	VEH 1 WAS FACED SOUTHBOUND CHAIN BRIDGE ROAD AT EATON PLACE, AT THE TRAFFIC SIGNAL TO TURN LEFT ONTO EATON PLACE. VEH 2 WAS FACED NORTHBOUND CHAIN BRIDGE ROAD, IN THE FAR RIGHT LANE. VEH 1 MADE A LEFT HAND TURN FROM SB CHAIN BRIDGE ROAD ONTO EATON PLACE WHILE HAVING A YELLOW LIGHT, FAILING TO YIELD THE RIGHT OF WAY FOR NORTHBOUND CHAIN BRIDGE RD TRAFFIC, ULTIMATELY CAUSING VEH 2 TO STRIKE VEH 1 IN THE MIDDLE OF THE INTERSECTION. VEH 1 WAS ISSUED A SUMMONS FOR F-T-Y-T-R-O-W WHILE TURNING LEFT (46.2-825). NO INJURIES WERE REPORTED ON SCENE.
183465410	12/10/2018	PDO.Property Damage Only	4. Sideswipe - Same Direction	0	0	0	West,West	no	no	no	Vehicle (V1) was in the westbound lane of Eaton Pl. to make a right turn onto northbound Chain Bridge Rd. in the right turn lane. Vehicle 2 (V2) was in the westbound lane of Eaton Pl. to make a right turn onto northbound Chain Bridge Rd. in the lane to the left of V1 (drivers can make a left turn, right turn, or continue straight while in this lane). As V1 and V2 made the right turn, V1 made a wide right turn, striking V2.

Attachment 12

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

January 2, 2019

City of Fairfax City Council
City Hall
10455 Armstrong Street
Fairfax, Virginia 22030

SENT VIA EMAIL: Mayor&Council@fairfaxva.gov

RE: Joint Permit Application Number 18-1003
Northfax, City of Fairfax, Virginia
Notification of Public Notice of Draft Permit

To Whom It May Concern:

The Department of Environmental Quality (DEQ) has received an application for a Virginia Water Protection (VWP) individual permit for the above-referenced project. Attached is a copy of the Public Notice for the proposed permit action for your review pursuant to Section 62.1-44.15:01 of the Code of Virginia. Notice of the proposed action will also be published in a newspaper circulated in the vicinity of the project site. The publication will establish a 30-calendar day public comment period for this proposal. If you wish to comment on this proposed action, please respond to DEQ at the above address.

If no response is received within the 30-day public comment period, DEQ will assume that you have no objections to the proposed action. If you have any questions, please contact me by phone at 703-583-3871 or by email at Wynn.Prusaczyk@deq.virginia.gov.

Respectfully,

Wynn Prusaczyk
VWP Permit Writer

Enclosure: Public Notice

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the filling of a stream for a mixed-use development in City of Fairfax, Virginia.
PUBLIC COMMENT PERIOD: For 30 days, starting from the day after the notice is in the newspaper: **MONTH DAY, YEAR** to **MONTH DAY, YEAR**
PERMIT NAME: Virginia Water Protection Permit issued by DEQ, under the authority of the State Water Control Board
APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Northfax JV LLC; 3900 Jermantown Road, Suite 300, Fairfax, Virginia 22030; VWPP No. 18-1003
PROJECT DESCRIPTION: Northfax JV LLC has applied for a new permit for the Northfax development. The project is located northeast of the intersection of Chain Bridge Road (VA-123) and Fairfax Boulevard (US-50) in the City of Fairfax. The permit will allow the applicant to pipe a stream channel. The proposed activity would affect 1,646 linear feet of stream channel. The activity proposed in the permit will affect unnamed tributaries in the Accotink Creek watershed. A watershed is the land area drained by a river and its incoming streams. To compensate for the affected area, the applicant would purchase 1,675 stream credits or 4,761 Stream Condition Units from a DEQ approved mitigation bank. DEQ's preliminary decision is to issue the permit.
HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, hand delivery, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.
CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: Wynn Prusaczyk; Northern Regional Office, 13901 Crown Court, Woodbridge, Virginia 22193; Phone: (703) 583-3871; E-mail: Wynn.Prusaczyk@deq.virginia.gov; Fax: (703) 583-3821. The public may review the draft permit and application at the DEQ office named above by appointment or may request copies of the documents from the contact person listed below.

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

VWP Individual Permit Number 18-1003
Effective Date: March 5, 2019
Expiration Date: March 4, 2034

VIRGINIA WATER PROTECTION PERMIT ISSUED PURSUANT TO THE STATE WATER CONTROL LAW AND SECTION 401 OF THE CLEAN WATER ACT

In compliance with § 401 of the Clean Water Act, as amended (33 USC § 1341) and the State Water Control Law and regulations adopted pursuant thereto, the board has determined that there is a reasonable assurance that this VWP permit, if complied with, will protect instream beneficial uses, will not violate applicable water quality standards, and will not cause or contribute to a significant impairment of state waters or fish and wildlife resources. In issuing this VWP permit, the board has not taken into consideration the structural stability of any proposed activities.

Permittee: Northfax JV LLC

Address: 3900 Jermantown Road, Suite 300, Fairfax, Virginia 22030

Activity Location: The project is located northeast of the intersection of Chain Bridge Road (VA-123) and Fairfax Boulevard (US-50) in the City of Fairfax, Virginia.

Activity Description: The permittee proposes to construct a mixed-use development and associated infrastructure on an approximately 10.6 acre development area known as "Northfax." Permitted activities shall be conducted as described in the Joint Permit Application dated June 22, 2018, received on June 25, 2018, and supplemental materials, revisions and clarifications received through December 11, 2018.

Authorized Surface Water Impacts:

This permit authorizes the total permanent impact of 0.50 acre (1,646 linear feet) of stream channel. Authorized surface water impacts shall be as depicted on the impacts map entitled *Stream Impact Exhibit* dated August 9, 2018, with latest revision date of August 21, 2018, and received September 12, 2018.

Approved Compensation:

The permittee shall compensate for the authorized surface water impacts through the following:

1. Compensation for permanent stream impacts shall be provided through the purchase of 1,675 stream credits or 4,761 Stream Condition Units from a DEQ approved mitigation bank, in-lieu fee

fund, or a combination thereof that is authorized and approved by DEQ to sell credits in the area in which the impacts will occur and has credits available (as released by DEQ).

2. Mitigation bank credits shall be purchased prior to the purchase of in-lieu fee program credits in accordance with 9VAC25-210-116.C.2.

3. The credit sale shall be in accordance with the approved Mitigation Banking Instrument for the mitigation bank.

The permitted activity shall be in accordance with this Permit Cover Page, Part I - Special Conditions, and Part II - General Conditions.

Thomas A. Faha, Regional Director

March 5, 2019
Date

Part I – Special Conditions

A. Authorized Activities

1. This permit authorizes the total impact permanent impact of 0.50 acre (1,646 linear feet) of stream channel. Authorized surface water impacts described under this condition shall be as depicted on the impacts map entitled *Stream Impact Exhibit* dated August 9, 2018, with latest revision date of August 21, 2018, and received September 12, 2018.

2. The permittee shall conduct authorized activities as described in the Joint Permit Application dated June 22, 2018, and received June 25, 2018, and supplemental materials, revisions and clarifications received through December 11, 2018. Any changes to the authorized activities or impacts map that affect permitted areas shall be submitted to DEQ immediately upon determination that changes are necessary, and DEQ approval shall be required prior to implementing the changes.

3. The permittee shall notify the DEQ of any changes in authorized impacts to surface waters or any changes to the design or type of construction activities in surface waters authorized by this permit. DEQ approval shall be required prior to implementing the changes. Any additional impacts, modifications, or changes shall be subject to individual permit review and/or modification of this permit.

B. Permit Term

1. This permit is valid for **fifteen (15) years** from the date of issuance. A new permit may be necessary for the continuance of the authorized activities, or any permit requirement that has not been completed, including compensation provisions.

2. The permittee shall notify DEQ in writing at least 120 calendar days prior to the expiration of this permit if reissuance will be requested.

C. Standard Project Conditions

1. The activities authorized by this permit shall be executed in such a manner that any impacts to beneficial uses are minimized. As defined in § 62.1-10(b) of the Code, "beneficial use" means both instream and offstream uses. Instream beneficial uses include, but are not limited to, the protection of fish and wildlife habitat, maintenance of waste assimilation, recreation, navigation, and cultural and aesthetic values. The preservation of instream flows for purposes of the protection of navigation, maintenance of waste assimilation capacity, the protection of fish and wildlife resources and habitat, recreation, cultural and aesthetic values is an instream beneficial use of Virginia's waters. Offstream beneficial uses include, but are not limited to, domestic uses (including public water supply), agricultural uses, electric power generation, commercial uses, and industrial uses. Public water supply uses for human consumption shall be considered the highest priority.

2. No activity shall substantially disrupt the movement of aquatic life indigenous to the water body, including those species which normally migrate through the area, unless the primary purpose of the activity is to impound water.

3. Flows downstream of the project area shall be maintained to protect all uses.

4. No activity shall cause more than minimal adverse effect on navigation, and no activity shall block more than half of the width of the stream at any given time.

5. The activity shall not impede the passage of normal or expected high flows, and any associated structure shall withstand expected high flows.

6. Continuous flow of perennial springs shall be maintained by the installation of spring boxes, French drains, or other similar structures.

7. All excavation, dredging, or filling in surface waters shall be accomplished in a manner that minimizes bottom disturbance and turbidity.

8. All in-stream activities shall be conducted during low-flow conditions whenever practicable.

9. All construction, construction access, and demolition activities associated with this project shall be accomplished in a manner that minimizes construction materials or waste materials from entering surface waters, unless authorized by this permit. Wet, excess, or waste concrete shall be prohibited from entering surface waters.

10. All fill material placed in surface waters shall be clean and free of contaminants in toxic concentrations or amounts in accordance with all applicable laws and regulations.

11. Measures shall be employed at all times to prevent and contain spills of fuels, lubricants, or other pollutants into surface waters.

12. Machinery or heavy equipment in temporarily impacted wetlands shall be placed on mats or geotextile fabric, or other suitable means shall be implemented, to minimize soil disturbance to the maximum extent practical. Mats, fabrics, or other measures shall be removed as soon as the work is complete in the temporarily impacted wetland.

13. Stream channel restoration activities shall be conducted in the dry or during low flow conditions. When site conditions prohibit access from the streambank or upon prior authorization from the Department of Environmental Quality, heavy equipment may be authorized for use within the stream channel. The equipment shall be stationed on cobble bars.

14. Temporary disturbances to wetlands, stream channels, and/or stream banks during project construction activities shall be avoided and minimized to the maximum extent practicable.

15. All temporarily disturbed wetland areas shall be restored to preconstruction conditions within 30 calendar days of completing work in the areas, which shall include re-establishing pre-

construction contours, and planting or seeding with appropriate wetland vegetation according to cover type (emergent, scrub/shrub, or forested), except for invasive species identified on DCR's Virginia Invasive Plant Species List. The permittee shall take all appropriate measures to promote and maintain the revegetation of temporarily disturbed surface waters through the second year post-disturbance.

16. All temporarily impacted streams and stream banks shall be restored to their original elevations and contours within 30 calendar days following the construction at that stream segment, and the banks shall be seeded or planted with the same vegetative cover type originally present along the banks, including supplemental erosion control grasses if necessary but not including invasive species identified on DCR's Virginia Invasive Plant Species List.

17. All materials (including fill, construction debris, excavated materials, and woody materials, that are temporarily placed in wetlands, in stream channels, or on stream banks) shall be placed on mats or geotextile fabric, shall be immediately stabilized to prevent the material or leachate from entering surface waters, and shall be entirely removed within 30 calendar days following completion of that construction activity. After removal, disturbed areas shall be returned to original contours, shall be stabilized, and shall be restored to the original vegetated state within 30 calendar days.

18. Temporary in-stream construction features such as cofferdams shall be made of non-erodible materials.

19. Virginia Water Quality Standards shall not be violated in any surface waters as a result of the project activities.

20. All non-impacted surface waters that are within the project or right-of-way limits, and that are within fifty feet of any project activities, shall be clearly flagged or demarcated for the life of the construction activity within that area. The permittee shall notify all contractors and subcontractors that *no activities are to occur in these marked areas*.

21. All required notifications and submittals shall include project name and permit number and be submitted electronically to vwp.nro@deq.virginia.gov or mailed to the DEQ office stated below, to the attention of the VWP permit manager, unless directed in writing by DEQ subsequent to the issuance of this permit: Department of Environmental Quality- Northern Regional Office, 13901 Crown Court, Woodbridge, Virginia 22193.

22. All reports required by this permit and other information requested by DEQ shall be signed by the permittee or a person acting in the permittee's behalf, with the authority to bind the permittee. A person is a duly authorized representative only if *both* criteria below are met. If a representative authorization is no longer valid because of a change in responsibility for the overall operation of the facility, a new authorization shall be immediately submitted to DEQ.

    a. The authorization is made in writing by the permittee.

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

23. All submittals shall contain the following signed certification statement:

    "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

24. Any fish kills or spills of fuels or oils shall be reported to DEQ immediately upon discovery at (703) 583-3800. If DEQ cannot be reached, the spill shall be reported to the Virginia Department of Emergency Management (DEM) at 1-800-468-8892 or the National Response Center (NRC) at 1-800-424-8802.

25. DEQ shall be notified in writing within 24 hours or as soon as possible on the next business day when potential environmentally threatening conditions are encountered which require debris removal or involve potentially toxic substances. Measures to remove the obstruction, material, or toxic substance or to change the location of any structure are prohibited until approved by DEQ.

D. Stream Modifications, Including Intake/Outfall Structures

1. Redistribution of existing stream substrate for erosion control purposes is prohibited.

2. Material removed from the stream bottom shall not be deposited into surface waters unless otherwise authorized in this permit.

3. Riprap apron for all outfalls shall be designed in accordance with Virginia Erosion and Sediment Control Handbook, Third Edition, 1992, or the most recent version in effect at the time of construction.

4. For streambank protection activities, structures and backfill shall be placed as close to the streambank as practical, while still avoiding and minimizing impacts to surface waters to the maximum extent practical. No material shall be placed in excess of the minimum necessary for erosion protection.

5. Asphalt and materials containing asphalt or other toxic substances shall not be used in the construction of submerged sills, breakwaters, dams, or weirs.

E. Installation of Utilities

1. All utility line work in surface waters shall be performed in a manner that minimizes disturbance in each area. Temporarily disturbed surface waters shall be restored in accordance with Part I.C.15, C.16, and C.17, unless otherwise authorized by this permit.

2. Material resulting from trench excavation may be temporarily sidecast into wetlands not to exceed a total of 90 calendar days, provided the material is not placed in a manner such that it is dispersed by currents or other forces.

3. The trench for a utility line cannot be constructed in a manner that drains wetlands (e.g., backfilling with extensive gravel layers creating a French drain effect).

F. Road Crossings

1. Access roads authorized by this permit shall be constructed to minimize the adverse effects on surface waters to the maximum extent practicable and to follow as near as possible pre-construction contours and elevations.

2. Installation of pipes and road crossings shall occur in the dry via the implementation of cofferdams, sheetpiling, stream diversions or other similar structures.

3. All surface waters temporarily affected by a road crossing shall be restored to their original elevations immediately following the removal of that particular temporary crossing. Temporary access roads shall be removed entirely following activity completion.

4. At crossings of streams, pipes and culverts must be installed to maintain low flow conditions and shall be countersunk at both inlet and outlet ends of the pipe or culvert, unless otherwise specifically approved by the Department of Environmental Quality on a case-by-case basis, and as follows: The requirement to countersink does not apply to extensions or maintenance of existing pipes and culverts that are not countersunk, floodplain pipes and culverts being placed above ordinary high water, pipes and culverts being placed on bedrock, or pipes and culverts required to be placed on slopes 5.0% or greater. Bedrock encountered during construction must be identified and approved in advance of a design change where the countersunk condition cannot be met. Pipes and culverts 24 inches or less in diameter shall be countersunk three inches below the natural stream bed elevations, and pipes and culverts greater than 24 inches shall be countersunk at least six inches below the natural stream bed elevations. Hydraulic capacity shall be determined based on the reduced capacity due to the countersunk position. In all stream crossings appropriate measures shall be implemented to minimize any disruption of aquatic life movement.

5. Stream bottom elevations at road crossings shall be measured at the inlet and outlet of the proposed structure and recorded prior to construction and within one week after the completion of construction to ensure that the design elevations were met. This information shall be recorded on the *Monthly VWP Permit Inspection Checklist (Attachment 2)* completed after the crossing is installed.

G. Stormwater Management Structures

1. The outfall and overflow structure shall be constructed and maintained to prevent downstream sediment deposition, erosion, or scour that may be associated with normal flow and any expected storm flows. Construction shall include the use of an appropriately sized riprap outlet protection apron at the outfall site.

2. Draining of a stormwater management facility shall be performed by a method that prevents downstream sediment deposition, erosion, or scour.

H. Project Construction Monitoring and Submittals (Impact Sites)

1. The permittee shall submit written notification at least **ten (10) calendar days** prior to the initiation of land disturbance or construction activities in permitted areas. The notification shall include a projected schedule for initiating and completing work at each permitted impact area.

2. Site inspections shall be conducted **once every calendar month** and recorded on the *Monthly VWP Permit Inspection Checklist* (*Attachment 2)* by the permittee or the permittee's qualified designee during active construction within authorized surface water impact areas. Monthly inspections shall be conducted in the following areas: all authorized permanent and temporary impact areas; all avoided surface waters, including wetlands, stream channels, and open water; surface water areas within 50 feet of any land disturbing activity; and all on-site areas designated for permanent preservation. The *Monthly VWP Permit Inspection Checklist* (*Attachment 2)* shall be completed in its entirety for each monthly inspection and shall be kept on-site and made available for review by DEQ staff upon request during normal business hours.

3. The *VWP Permit Construction Status Update Form* (*Attachment 1)* enclosed with this permit shall be completed in June and December of every year for the duration of this permit. The *VWP Permit Construction Status Update Form* (*Attachment 1)* shall include reference to the VWP permit authorization number and one of the following statements for each authorized surface water impact location:

   a. Construction activities not yet started;

   b. Construction activities started;

   c. Construction activities started but are currently inactive, or;

   d. Construction activities complete.

4. The *VWP Permit Construction Status Update Form* (*Attachment 2)* shall be submitted and must be received by DEQ no later than January 10 and July 10 of every year.

5. The permittee shall notify DEQ within 24 hours of discovering impacts to surface waters including wetlands, stream channels, and open water that are not authorized by this permit. The

notification shall include photographs, estimated acreage and/or linear footage of impacts, and a description of the impacts.

6. The permittee shall submit written notification of completion within 30 calendar days after the completion of all activities in all permitted impact areas authorized under this permit.

I. Compensatory Mitigation

1. The permittee shall compensate for permanent stream impacts through the purchase of 1,675 stream credits or 4,761 Stream Condition Units (SCUs) from a DEQ approved mitigation bank, in-lieu fee fund, or a combination thereof that is authorized and approved by DEQ to sell credits in the area in which the impacts will occur and has credits available (as released by DEQ). Mitigation bank credits shall be purchased prior to the purchase of in-lieu fee program credits in accordance with 9VAC25-210-116.C.2. The credit sale shall be in accordance with the approved Mitigation Banking Instrument for the mitigation bank.

2. The permittee shall submit documentation to DEQ prior to initiating work in permitted impact areas that 1,675 stream credits or 4,761 SCUs were acquired and debited from the ledger of a DEQ approved mitigation bank, in-lieu fee fund, or a combination thereof to satisfy the requirement of Part I.I.1.

Part II – General Conditions

A. Duty to Comply

The permittee shall comply with all conditions and limitations of the VWP permit. Nothing in this chapter shall be construed to relieve the permittee of the duty to comply with all applicable federal and state statutes, regulations, toxic standards, and prohibitions. Any VWP permit violation or noncompliance is a violation of the Clean Water Act and State Water Control Law and is grounds for enforcement action, VWP permit termination, VWP permit revocation, VWP permit modification, or denial of an application for a VWP permit extension or reissuance.

Nothing in this VWP permit shall be construed to relieve the permittee from civil and criminal penalties for noncompliance.

B. Duty to Cease or Confine Activity

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the activity for which a VWP permit has been granted in order to maintain compliance with the conditions of the VWP permit.

C. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any impacts in violation of the VWP permit that may have a reasonable likelihood of adversely affecting human health or the environment.

D. VWP Permit Actions

A VWP permit may be modified in whole or in part, revoked and reissued, extended, transferred, or terminated in accordance with 9 VAC 25-210-180.

1. During the drafting and authorization of a permit modification, only those conditions to be modified shall be addressed with preparing a draft modified permit. VWP permit terms and conditions of the existing permit shall remain in full force and effect during the modification of the permit.

2. This VWP permit may be modified upon the request of the permittee or upon board initiative when any of the following developments occur:

    a. When new information becomes available about the project or activity covered by the VWP permit, including project additions or alterations, that was not available at VWP permit issuance and would have justified the application of different VWP permit conditions at the time of VWP permit issuance;

b. When a change is made in the promulgated standards or regulations on which the VWP permit was based;

c. When changes occur that are subject to "reopener clauses" in the VWP permit; or

d. When developments applicable to surface water withdrawals as specified in 9VAC25-210-380 occur.

3. When this VWP permit authorizes surface water withdrawals, it may be modified when any of the following developments occur:

   a. When the board determines that minimum instream flow levels resulting directly from the permittee's withdrawal of surface water are detrimental to the instream beneficial use, existing at the time of permit issuance, and the withdrawal of surface water should be subject to further net limitations or when an area is declared a surface water management area pursuant to §§ 62.1-242 through 62.1-253 of the Code of Virginia, during the term of the VWP permit.

   b. Significant changes to the location of the surface water withdrawal system are proposed such that the Department of Environmental Quality determines a new review is warranted due to the potential effect of the surface water withdrawal to existing beneficial uses of the new location.

   c. Changes to the permitted project or the surface water withdrawal, including increasing the storage capacity for the surface water withdrawal, that propose an increase in the maximum permitted withdrawal volumes or rate of withdrawal or that cause more than a minimal change to the instream flow requirements with potential to result in a detrimental effect to existing beneficial uses.

   d. A revision to the purpose of the surface water withdrawal that proposes to include a new use or uses that were not identified in the permit application or a modification of the existing authorized use or uses such that the use description in the permit application and permit is no longer applicable. Examples of uses include, but are not limited to agricultural irrigation, golf course irrigation, public water supply, manufacturing, and electricity generation.

4. When the permittee has submitted a timely and complete application for reissuance of an existing VWP individual permit, but through no fault of the permittee, the board does not reissue or reissue with conditions a VWP individual permit or the board does not provide notice of its tentative decision to deny the application before an existing VWP individual permit expires, the conditions of the expiring VWP individual permit shall be administratively continued in full force and effect until the effective date of a reissued permit or the date on which the board denies the application. Timely application shall be a minimum of 180 days for an individual permit or a minimum of 270 days for an individual permit for a surface water withdrawal, unless otherwise specified in the existing permit.

5. Any permittee desiring to continue a previously permitted activity after the expiration date of this VWP permit shall apply for and obtain a new permit or, if applicable, shall request an extension in

accordance with 9VAC25-210-180. Any permittee with an effective VWP permit for an activity that is expected to continue after the expiration date of the VWP permit, without any change in the activity authorized by the VWP permit other than as may be allowed under 9VAC25-210-180, shall submit written notification requesting an extension. The permittee must file the request 90 days prior to the expiration date of the VWP permit. VWP permit modifications shall not be used to extend the term of a VWP permit beyond 15 years from the date of original issuance. When a permit term, other than that of an Emergency Virginia Water Protection Permit, is less than 15 years, an extension of the permit terms and conditions may be granted in accordance with 9VAC25-210-180. Emergency Virginia Water Protection Permits shall not exceed a duration of one year or shall expire upon the issuance of a regular Virginia Water Protection Permit, whichever comes first.

6. This VWP permit may be transferred to a new permittee only by modification to reflect the transfer, by revoking and reissuing the permit, or by automatic transfer. Automatic transfer to a new permittee shall occur if the current permittee: a) Notifies the board of the proposed transfer of the permit and provides a written agreement between the current and proposed permittees containing the date of transfer of VWP permit responsibility, authorization, and liability to the new permittee; and b) the board does not within 15 days notify the existing permittee of its intent to modify the VWP permit.

7. After notice and opportunity for a formal hearing pursuant to § 62.1-44.15:02 of the Code of Virginia, a VWP permit can be terminated for cause. Reasons for termination for cause are as follows:

   a. Noncompliance by the permittee with any condition of the VWP permit;

   b. The permittee's failure in the application or during the VWP permit process to disclose fully all relevant facts or the permittee's misrepresentation of any relevant facts at any time;

   c. The permittee's violation of a special or judicial order;

   d. A determination by the board that the permitted activity endangers human health or the environment and can be regulated to acceptable levels by VWP permit modification or termination;

   e. A change in any condition that requires either a temporary or permanent reduction or elimination of any activity controlled by the VWP permit; and

   f. A determination that the permitted activity has ceased and that the compensation for unavoidable adverse impacts has been successfully completed.

8. The board may terminate this permit without cause when the permittee is no longer a legal entity due to death, dissolution, or when a company is no longer authorized to conduct business in the Commonwealth. The termination shall be effective 30 days after notice of the proposed

termination is sent to the last known address of the permittee or registered agent, unless the permittee objects within that time. If the permittee does object during that period, the board shall follow the applicable procedures for termination under § 62.1-44.15:25 of the Code of Virginia and 9VAC25-230.

9. This VWP permit may be terminated by consent, as initiated by the permittee. The permittee shall submit a request for termination by consent within 30 days of completing or canceling all permitted activities and all required compensatory mitigation requirements. When submitted for project completion, the request for termination by consent shall constitute a notice of project completion. The director may accept this termination on behalf of the board. The permittee shall submit the following information:

   a. Name, mailing address, and telephone number;

   b. Name and location of the activity;

   c. The VWP permit number; and

   d. One of the following certifications:

      i. For project completion: "I certify under penalty of law that all activities and any required compensatory mitigation authorized by a VWP permit have been completed. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit."

      ii. For project cancellation: "I certify under penalty of law that the activities and any required compensatory mitigation authorized by this VWP permit will not occur. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit, nor does it allow me to resume the permitted activities without reapplication and issuance of another permit."

      iii. For events beyond permittee control, the permittee shall provide a detailed explanation of the events, to be approved by DEQ, and the following certification statement: "I certify under penalty of law that the activities or the required compensatory mitigation authorized by this VWP permit have changed as the result of events beyond my control (see attached). I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that

performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit, nor does it allow me to resume the permitted activities without reapplication and issuance of another permit.

E. Inspection and Entry

Upon presentation of credentials, the permittee shall allow the board or any duly authorized agent of the board, at reasonable times and under reasonable circumstances, to conduct the actions listed in this section. For the purpose of this section, the time for inspection shall be deemed reasonable during regular business hours. Nothing contained herein shall make an inspection time unreasonable during an emergency.

1. Enter upon any permittee's property, public or private, and have access to, inspect and copy any records that must be kept as part of the VWP permit conditions;

2. Inspect any facilities, operations or practices (including monitoring and control equipment) regulated or required under the VWP permit; and

3. Sample or monitor any substance, parameter, or activity for the purpose of ensuring compliance with the conditions of the VWP permit or as otherwise authorized by law.

F. Duty to Provide Information

The board may request (i) such plans, specifications, and other pertinent information as may be necessary to determine the effect of an applicant's discharge on the quality of state waters or (ii) such other information as may be necessary to accomplish the purposes of this chapter. Any owner, permittee, or person applying for a VWP permit or general permit coverage shall provide the information requested by the board.

G. Monitoring and Records Requirements

1. Monitoring of parameters, other than pollutants, shall be conducted according to approved analytical methods as specified in the VWP permit. Analysis of pollutants will be conducted according to 40 CFR Part 136 (2000), Guidelines Establishing Test Procedures for the Analysis of Pollutants.

2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

3. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart or electronic recordings for continuous monitoring instrumentation, copies of all reports required by the VWP permit, and records of all data used to

complete the application for the VWP permit, for a period of at least three years from the date of permit expiration. This period may be extended by request of the board at any time.

4. Records of monitoring information shall include:

   a. The date, exact place and time of sampling or measurements;

   b. The name of the individuals who performed the sampling or measurements;

   c. The date and time the analyses were performed;

   d. The name of the individuals who performed the analyses;

   e. The analytical techniques or methods supporting the information such as observations, readings, calculations and bench data used;

   f. The results of such analyses; and

   g. Chain of custody documentation.

H. Property rights

The issuance of a VWP permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize injury to private property or any invasion of personal rights or any infringement of federal, state or local laws or regulations.

I. Reopener

This VWP permit may be reopened for the purpose of modifying the conditions of the VWP permit to meet new regulatory standards duly adopted by the board. Cause for reopening VWP permits includes, but is not limited to when the circumstances on which the previous VWP permit was based have materially and substantially changed, or special studies conducted by the board or the permittee show material and substantial change, since the time the VWP permit was issued and thereby constitute cause for VWP permit modification or revocation and reissuance.

J. Compliance with State and Federal Law

As to the permitted activity(ies), compliance with a VWP permit constitutes compliance with the VWP permit requirements of the Law and regulations. .

K. Severability

The provisions of this VWP permit are severable.

L. Oil and Hazardous Substance Liability

Nothing in this VWP permit shall be construed to preclude the institution of legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under § 311 of the Clean Water Act or §§ 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law.

M. Unauthorized Discharge of Pollutants

Except in compliance with a VWP permit, unless the activity is otherwise exempted or excluded, no person shall dredge, fill, or discharge any pollutant into, or adjacent to surface waters; withdraw surface water; otherwise alter the physical, chemical, or biological properties of state waters regulated under this chapter and make them detrimental to the public health, to animal or aquatic life, or to the uses of such waters for domestic or industrial consumption, for recreation, or for other uses; excavate in wetlands; or on or after October 1, 2001, conduct the following activities in a wetland:

1. New activities to cause draining that significantly alters or degrades existing wetland acreage or functions;

2. Filling or dumping;

3. Permanent flooding or impounding; or

4. New activities that cause significant alteration or degradation of existing wetland acreage or functions.

Attachment 1: VWP PERMIT CONSTRUCTION STATUS UPDATE FORM

Attached to VWP Individual Permit Number 18-1003

Permit Issuance March 5, 2019

Date (check one):

☐ June____, _____

☐ December _____, _____

VWP Individual Permit Number: 18-1003

Project Name and Location: Northfax, City of Fairfax

Status within each authorized surface water impact location, as identified on *Stream Impact Exhibit*, dated August 9, 2018, with latest revision date of August 21, 2018, and received September 12, 2018: (check one of the following status options for each impact number/location. Attach additional sheet(s) if needed.)

Authorized impact number	Construction activities not started	Construction activities started	Construction activities started but currently not active	Does this impact involve culvert(s)[1]?	Construction activities complete[2]
A1					
B1					
A2					
C1					

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Authorized Signature: _____

Print Name: _____

Title: _____ Phone: _____

Date: _____ Email: _____

[1] Provide spot elevations of the stream bottom within the thalweg at the beginning and end of the pipe or culvert, extending to a minimum of 10 feet beyond the limits of the impact, with completion of all culvert installations.

[2] If all construction activities and compensatory mitigation requirements are complete, the permittee completes and signs the Termination Agreement section below within 30 days of last authorized activity and/or compensation completion. A completed and signed Agreement serves as Notice of Project Completion (9VAC25-210-130 F).

TERMINATION AGREEMENT BY CONSENT – PROJECT COMPLETION

Permittee Name: _____

Permittee Mailing Address: _____

Permittee Phone: _____

I hereby consent to the termination of coverage for VWP Individual Permit Number 18-1003.

"I certify under penalty of law that all activities and any required compensatory mitigation authorized by a VWP permit have been completed. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit."

Permittee Signature: _____

Attachment 2: MONTHLY VWP PERMIT INSPECTION CHECKLIST

An inspection of all permitted impact areas, avoided waters and wetlands, and permanently preserved waters, wetlands and upland areas must be conducted at least once every month during active construction activities. Maintain this record on-site and available for inspection by DEQ staff.

Project Name	Northfax	**VWP Permit #**	18-1003	**Inspection Date**	
Inspector Name & Affiliation		**Phone # & Email Address**			

Based on reading of VWP permit No. 18-1003 including authorized impacts map entitled "Stream Impact Exhibit" dated August 9, 2018, with latest revision date of August 21, 2018, and received September 12, 2018, and my inspection on the date referenced above, to the best of my knowledge this project (____is in compliance / ____ is not in compliance) with the VWP Permit.

I certify that the information contained in this report is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Inspector _____ Date _____

REVIEWED DURING SITE INSPECTION	Yes	No	N/A	Notes & Corrective Action Taken / Date Completed (use back of page if necessary)
Unauthorized impacts to surface waters, including wetlands, or upland preservation areas **have occurred**.* *(This includes sedimentation impacts due to inadequate or failed erosion controls.)*	☐	☐		
Non-impacted wetlands, streams and preservations areas within 50 feet of construction are clearly marked to prevent unpermitted impacts.	☐	☐	☐	
Temporary impacts are being restored to original contours, stabilized, and allowed to re-establish with wetland vegetation.	☐	☐	☐	
Construction activities are **not** substantially disrupting aquatic life movement.	☐	☐	☐	
E&S controls are present, properly maintained, and functioning.	☐	☐	☐	
In-stream work is being performed in the dry with the appropriate use of cofferdams, sheetpiling, etc., to minimize stream bottom disturbance and turbidity.	☐	☐	☐	
Pipes and/or culverts for road crossings are countersunk to provide for the re-establishment of low flow fish passage and/or a natural stream bottom, unless otherwise authorized.	☐	☐	☐	
Time-of-year restrictions regarding impacts to surface waters are being adhered to.	☐	☐	☐	
Water quality monitoring is being conducted during stream impacts.	☐	☐	☐	
Streams and wetlands are free from any sheen or discoloration that may indicate a spill of oil, lubricants, concrete or other pollutants. **	☐	☐	☐	
Heavy equipment is placed on mats or geotextile fabric when working in wetlands.	☐	☐	☐	
Exposed slopes/stream banks are stabilized immediately upon completion of work in each impact area.	☐	☐	☐	

* If unauthorized impacts have occurred, you **must** email or fax a copy of this report to DEQ within 24 hours of discovery. Email: vwp.nro@deq.virginia.gov Fax: 703-583-3821

** Any fish kills, or spills of fuels or oils must be reported to DEQ **immediately upon discovery** at 703-583-3864. If DEQ cannot be reached, the spill or fish kill shall be reported to the Virginia Department of Emergency Management (VDEM) at 1-800-468-8892 or the National Response Center (NRC) at 1-800-424-8802. Any spill of oil as defined in § 62.1-44.34:14 of the Code of Virginia that is less than 25 gallons and that reaches, or that is expected to reach, land only is not reportable, if recorded per § 62.1-44.34:19.2 of the Code of Virginia and if properly cleaned up.

Notes

March 5, 2019

FACT SHEET
Virginia Water Protection Individual Permit No. 18-1003
Northfax, City of Fairfax

DEQ has reviewed the application for the Virginia Water Protection (VWP) Individual Permit Number 18-1003 and has determined that the project qualifies for an individual permit.

The following details the application review process and summarizes relevant information for developing the Part I - Special Conditions for permit issuance.

1. Contact Information:

Permittee Legal Name and Address:

Northfax JV LLC
3900 Jermantown Road, Suite 300
Fairfax, Virginia 22030
Mr. John E. Napolitano, Manager
703-934-4600

Agent Legal Name and Address:

Apex Companies, LLC c/o
9700 Capital Court, Suite 100
Manassas, Virginia 20110
Mr. Jason Franti
703-396-6730

2. Processing Dates:

Received Application:	June 25, 2018
Received VMRC Number:	June 25, 2018
Application Complete:	September 12, 2018
Permit Fee Deposited by Accounting:	August 27, 2018
Application Suspended:	September 26, 2018
Application Reinstated:	December 11, 2018
Processing Deadline (120 days from Complete Application):	March 27, 2019
1st Request for Additional Information Sent:	July 3, 2018
Final Request for Additional Information Received:	September 12, 2018
Section 106 SPGP Coordination Initiated:	August 13, 2018
Section 7 SPGP Coordination Initiated:	August 13, 2018
Request for comments sent to USACE, USEPA and USFWS:	August 13, 2018
Completion of SPGP coordination:	October 31, 2018
Notification of JPA sent to Local Government(s):	June 28, 2018
Commissioner of Revenue Contacted:	*N/A*
Request for comments sent to VDH, VDGIF, VDCR, VMRC:	June 28, 2018
Letters sent to Riparian Land Owners:	July 11, 2018
Draft Permit Package Issued:	January 2, 2019
Copy of Public Notice sent to DEQ Central Office:	January 2, 2019
Copy of Public Notice sent to Local Gov't and Planning District:	January 2, 2019
Application Suspended Pending Public Notice:	January 17, 2019
Public Notice Published:	January 18, 2019
Application Reinstated:	January 18, 2019
End of 30-Day Public Comment Period:	February 18, 2019
Received Verification of Publication:	January 22, 2019
Permit Issued:	March 5, 2019

3. Project Location:

The project site is located northeast of the intersection of Chain Bridge Road (VA-123) and Fairfax Boulevard (US-50) in the City of Fairfax, Virginia.

City/County:	City of Fairfax
Waterbody:	Accotink Creek, UT
Basin:	Potomac
Subbasin:	Middle Potomac
Section:	7
Class:	III
Special Standards:	b
HUC:	02070010
Latitude & Longitude:	38.859417, -77.309689
U.S.G.S. Quadrangle:	Fairfax
State Watershed No.:	VAN-A15R

4. Project Description:

The permittee proposes to construct a mixed-use development with associated infrastructure, on an approximately 10.6 acre development site, known as "Northfax."

5. Avoidance and Minimization Efforts:

Avoidance and minimization efforts have been documented by the applicant in the JPA as well as subsequent submittals. The purpose and need of the project is a mixed-use development. However, the purpose and need cannot be met without flood control. A perennial stream channel bisects the property and the development site has been known historically to flood. Complete and partial avoidance was considered by the applicant, however due to the flood conditions and the location of surface waters onsite, completely avoiding or partially piping the channel would result in minimizing the developable area to around fifty-percent of the original design with flooding concerns further minimizing the developable area.

Complete avoidance was considered and deemed infeasible to meet the projects purpose and need as it would reduce the developable land to 4.40 acres thus reducing the Annualized Cost on Return (IRR) to well below the target. In addition, the flood elevations would still render approximately fifty-percent of the developable land area in an unusable condition due to the presence of RPA and flood zones. A historic trolley bridge is located just off-site over the intermittent channel, downstream of the confluence of the two channels, which causes back watering due to its limiting size. Discharge at the confluence of the stream channels during the 100-year storm creates a significant back-water situation thus further limiting developable area due to flood concerns.

A partial stream piping scenario was also considered, in which approximately 500 linear feet of stream channel would be piped leaving most of the perennial stream and all the intermittent stream intact. In this scenario Orchard Road would be still constructed in order to access the western portion of the property. As the stream channel bisects the 10.6 acre development site, the use of Orchard Road would necessitate significant alteration to the flood zones through the installation of a culverted road crossing, thus constricting flood flows and increasing flooding to the northern portion of the property. The back-water flooding associated with the historic trolley bridge would still be a limiting factor for developable land. Flood elevations will allow development of approximately fifty-percent of the total developable area rendering the IRR for the alternative well below the target, thus this alternative was deemed infeasible to meet the projects purpose and need.

For additional information, see page 4-5 of the JPA dated June 22, 2018, the additional information response dated August 10, 2018, and the response to EPA comments dated October 16, 2018.

Based upon staff review, the applicant has demonstrated that the proposed plan represents the least environmentally damaging and practicable alternative and all unavoidable permanent impacts will be adequately mitigated through the proposed compensation plan.

6. Project Impacts:

This permit authorizes the total permanent impact to 0.50 acre (1,646 linear feet) of stream channel. Authorized surface water impacts shall be as depicted on the impacts map entitled Stream Impact Exhibit dated August 9, 2018, with latest revision date of August 21, 2018, and received September 12, 2018.

7. Compensation for Unavoidable Impacts:

The permittee shall compensate for permanent stream impacts through the purchase of 1,675 stream credits or 4,761 Stream Condition Units from a DEQ approved mitigation bank, in-lieu fee fund, or a combination thereof that is authorized and approved by DEQ to sell credits in the area in which the impacts will occur and has credits available (as released by DEQ). The credit sale shall be in accordance with the approved Mitigation Banking Instrument for the mitigation bank. Purchase of required mitigation credits shall occur first through the purchase of available released credits followed by the purchase of advance credits.

The compensation package conforms with the preference hierarchy of the 2008 Compensatory Mitigation Rule issued by the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers (USACE) and DEQ's Guidance Memorandum No. 09-2004 (Applying Compensatory Mitigation Preferences Provided in the EPA Mitigation Rule to Virginia Water Protection Permitting).

8. Site Inspection:

A site visit was conducted on July 23, 2018. The site visit confirmed the site description provided in the applications materials accurately characterized the surface waters on the site. A summary of the site inspection is located in VWP Permit File No. 18-1003.

9. Relevant Regulatory Agency Comments:

As part of the application review process, DEQ contacted the appropriate state regulatory agencies and coordinated with various federal regulatory agencies, including the U.S. Army Corps of Engineers (USACE). No comments received required a change to VWP individual permit Part I - Special Conditions. Therefore, the staff anticipates no adverse effect on water quality and fish and wildlife resources provided the applicant adheres to the permit conditions.

a. <u>Summary of State Agency Comments and Actions</u>

By email/letter dated June 28, 2018, comments were requested from the following state agencies: Virginia Department of Game and Inland Fisheries (DGIF), Virginia Department of Conservation and Recreation (DCR), Virginia Marine Resources Commission (VMRC), and

Virginia Department of Health (VDH). Failure to provide comments within 45 calendar days of the DEQ request for comments infers that the agency has no comments on the project activities.

DCR

DCR provided the following comments in a memorandum dated and transmitted by email on August 10, 2018:

- Recommends the implementation of the following USFWS voluntary measures for the conservation of the Rusty patched bumble bee (*Bombus affinis*): avoid pesticide use, avoid herbicide use, and plant native flowers that bloom throughout the spring and summer to support pollinator habitat.

The measures will not be included in the permit as they are listed as voluntary.

DGIF

DGIF provided comments to DEQ by email dated August 10, 2018.

- Recommended conducting any in-stream activities during low or no-flow conditions, using non-erodible cofferdams or turbidity curtains to isolate the construction area, blocking no more than 50% of the streamflow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas with native vegetation, and implementing strict erosion and sediment control measures.

  The special conditions of the permit address these activities.

- Recommend coordination with DCR's Department of Natural Heritage as the project is located within 2 miles of a documented occurrence of a state or federal threatened or endangered plant or insect species and/or other Natural Heritage coordination species.

Staff requested comments from DCR on the proposed project on June 28, 2018.

- Recommend that the permittee avoid and minimize impacts to undisturbed forest, wetlands, and streams to the fullest extent practicable to minimize overall impacts to wildlife and our natural resources. DGIF also recommended maintaining undisturbed naturally vegetated buffers of at least 100 feet in width around all on-site wetlands and on both sides of all perennial and intermittent streams.

  Staff reviewed the proposed impacts to surface waters and determined those proposed have been minimized to the maximum extent practicable.

- Recommended that the stormwater controls for this project be designed to replicate and maintain the hydrographic condition of the site prior to the change in landscape.

  Oversight of stormwater management and erosion and sediment control measures is the responsibility of DEQ-Stormwater Management or the locality, if such responsibility has

been delegated. Any such requirements will be implemented under the oversight of that program.

- Recommended that all tree removal and ground clearing adhere to a time of year restriction protective of resident and migratory songbird nesting from March 15 through August 15 of any year.

  This time of year restriction was not included in the permit as it's not associated with a threatened or endangered species. The recommendation was forwarded to the permittee for their consideration.

- Recommended adherence to erosion and sediment controls during ground disturbance.

  Oversight of stormwater management and erosion and sediment control measures is the responsibility of DEQ-Stormwater Management or the locality, if such responsibility has been delegated. Any such requirements will be implemented under the oversight of that program.

VDH
VDH provided comments in a memorandum dated July 12, 2018, and received on July 16, 2018, that no public raw water intakes were found, in the commonwealth, downstream from the proposed construction site.

VMRC
VMRC provided comments in a letter dated and transmitted by email on August 7, 2018, stating that the project is not within the purview of the agency and the Commission has no objection to DEQ's issuance of a VWP individual permit. A "No Permit Necessary" letter was issued on June 6, 2018.

b. Summary of Federal Agency Comments and Actions

The project is being reviewed by DEQ for a State Programmatic General Permit (SPGP). By letter dated July 13, 2018, comments were requested from the following federal agencies: Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), and U.S. Fish and Wildlife (FWS).

Section 106
USACE provided comments to DEQ by email transmitted October 30, 2018 stating the Department of Historic Resources concurs with the Corps' determination that there will be "No Historic Properties Affected" by the proposed project.

Section 7
FWS responded to the request for Section 7 comments by email transmitted on August 14, 2018 requesting a Self-Certification Letter. DEQ responded on August 24, 2018, with the Self-Certification Letter. No response was received within 30 days of the latest transmittal.

Federal Review
EPA responded to the request for Federal Review by email transmitted on August 28, 2018, requesting more information on avoidance and minimization. The applicant responded to the comments, and the response was forwarded to EPA on October 16, 2018. No response was received within 15 days of the latest transmittal. No project comments were received from FWS or USACE.

10. Riparian Landowner Notification:

Staff notified riparian landowners located adjacent to the impact area by letter dated July 11, 2018. The impacted stream channel is piped starting at the edge of the property continuing offsite, therefore downstream landowners were not notified.

Notifications of riparian and adjacent landowners were conducted in accordance with DEQ's Guidance Memorandum No. 11-2005 (Revised Local Government, Riparian Property Owner, Adjacent Property Owner or Resident, and General Public Notification Procedures for VPDES, VPSA and VWP Permit Applications and Draft Permits).

No significant responses were received.

11. Changes in Permit Part I - Special Conditions Due to Public Comments:

The public notice was published in Fairfax County Times Friday-Sunday, January 18-20, 2019, on January 18, 2019. The public comment period ran from January 19, 2019, to February 18, 2019.

One public comment letter was received. However, no substantial or disputed issues were presented that warranted revisions to the draft conditions of the permit.

12. Special Conditions:

The following conditions were developed to protect instream beneficial uses, to ensure compliance with applicable water quality standards, to prevent significant impairment of state waters or fish and wildlife resources, to provide for no net loss of wetland acreage, and to provide no net loss of functions in all surface waters through compensatory mitigation and monitoring and reporting.

Section A Authorized Activities

Nos. 1-3 addresses the activities authorized by this permit, including impact types and limits.

Section B Permit Term

Nos. 1-2 addresses the permit term and re-issuance process to ensure that all permit conditions are completed.

Section C Standard Project Conditions

No. 1 addresses the requirement for the minimization of adverse impacts to instream beneficial uses.
No. 2 ensures that the project will be executed in a manner that limits the disruption of the movement of aquatic life.
No. 3 ensures that downstream flows will be maintained to protect both instream and off-stream beneficial uses
No. 4 ensures the minimization of adverse effects on navigation.
No. 5 ensures the passage of high flows.
No. 6 requires maintenance of continuous flow of perennial springs for the protection of instream beneficial use.
No. 7 ensures that dredging and filling operations will minimizes stream bottom disturbances and turbidity.
No. 8 requires instream activities to be conducted during low-flow conditions to protect instream beneficial uses.
Nos. 9 through 11 provide requirements and limitations on the entry of various materials (including concrete, fill, construction and waste material, fuels, lubricants, and untreated stormwater runoff) into state waters.
Nos. 12 and 13 limit the use of machinery and equipment in surface waters to protect beneficial uses
Nos. 14 through 18 require temporary disturbances to surface waters during construction to be avoided and minimized to the maximum extent practicable and the restoration of such temporary disturbances.
No. 19 prohibits the violation of Water Quality Standards in surface waters as a result of project activities
No. 20 requires the identification of all non-impacted surface waters in the vicinity of the proposed activity to prevent unpermitted impacts
Nos. 21 through 25 set forth all reporting requirements concerning construction, monitoring, compensation, and restoration as required by current law and regulations.

Section D Stream Modifications, Including Intake/Outfall Structures

No. 1 prohibits the use of stream substrate for erosion control to avoid additional impacts to state waters.
No. 2 requires upland disposal of material removed from stream substrate to avoid unpermitted impacts to surface waters.
No. 3 ensures riprap placement conforms to current law and regulation.
Nos. 4 and 5 direct the placement and contents of materials for the construction of submerged structures, and on-bank storage and staging of materials, to protect water quality and fish and wildlife resources.

Section E Installation of Utilities

No. 1 requires the minimization of disturbance to surface waters and restoration to preconstruction conditions following utility line installation.

No. 2 sets a 90-day time limit for temporary sidecasting during trench excavation to minimize impacts to surface waters.
No. 3 provides the requirements for trench construction to avoid the drainage of surface waters.

Section F Road Crossings

No. 1 provides specifications for access road construction to minimize adverse effects to surface waters.
No. 2 ensures pipes and culvert construction is conducted in the dry to protect water quality and wildlife habitat.
No. 3 requires that temporary impacts be restored immediately following construction to minimize impacts to water quality and fish and wildlife resources.
No. 4 summarizes requirements for pipe and culvert placement and countersinking to provide for the re-establishment of a natural stream bottom and low flow channel to maintain instream beneficial uses
No. 5 requires measurement of stream bottom elevations at road crossings to ensure for the re-establishment of a natural stream bottom and low flow channel to maintain instream beneficial uses. The intent of this condition is to maintain a hydrologic connection and enable the stream bottom to reestablish in the culvert. The stream crossing(s) to which this condition pertains is identified in the condition.

Section G Stormwater Management Facilities

No. 1 defines the general requirements for stormwater management facility construction to minimize adverse effects to aquatic resources and provide for long-term aquatic resources protection and enhancement.
No. 2 provides limits and guidance for maintenance excavation to avoid unpermitted impacts to surface waters.

Section H Project Construction Monitoring and Submittals (Impact Site)

Nos. 1 through 6 address monitoring and submittals required for pre-construction, during construction and post-construction for the impact areas on site.

Section I Compensatory Mitigation

No. 1 describe the compensatory mitigation required to mitigate for the permitted impacts.
No. 2 describes the documentation requirement for the purchase of the required amount of credits.

13. General Conditions:

The general conditions specified in the effective VWP Permit Program Regulation 9VAC25-210 apply to all VWP individual permits.

14. General Criteria (9VAC25-260-20 A):

State waters, including wetlands, shall be free from substances attributable to sewage, industrial waste, or other waste in concentrations, amounts, or combinations which contravene established standards or interfere directly or indirectly with designated uses of such water or which are inimical or harmful to human, animal, plant, or aquatic life.

Specific substances to be controlled include, but are not limited to: floating debris, oil, scum, and other floating materials; toxic substances (including those which bioaccumulate); substances that produce color, tastes, turbidity, odors, or settle to form sludge deposits; and substances which nourish undesirable or nuisance aquatic plant life. Effluents which tend to raise the temperature of the receiving water will also be controlled. Conditions within mixing zones established according to 9VAC25-260-20 B do not violate the provisions of this subsection.

15. Staff Findings and Recommendations:

- In compliance with § 401 of the Clean Water Act, as amended (33 USC § 1341) and the State Water Control Law and regulations adopted pursuant thereto, the board has determined that there is a reasonable assurance that this VWP permit, if complied with, will protect instream beneficial uses, will not violate applicable water quality standards, and will not cause or contribute to a significant impairment of state waters or fish and wildlife resources. In issuing this VWP permit, the board has not taken into consideration the structural stability of any proposed activities.

- The proposed permit conditions address no net loss of wetland acreage and no net loss of functions in all surface waters, through the avoidance and minimization of wetland impacts to the maximum extent practicable; compensatory mitigation; and compensation monitoring and reporting. Permitted wetland impacts have been inventoried in evaluating this proposed permit.

- The draft permit reflects the required consultation with and full consideration of the written recommendations of VMRC, VDH, DCR and DGIF.

Staff recommends VWP Individual Permit Number 18-1003 be issued as proposed.

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703)583-3800
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director
(804) 698-4000

Thomas A. Faha
Regional Director

March 5, 2019

Mr. John E. Napolitano, Manager
Northfax JV LLC
3900 Jermantown Road, Suite 300
Fairfax, Virginia 22030

SENT VIA E-MAIL: john@lann.com
RECEIPT CONFIRMATION REQUESTED

RE: State Program General Permit (17-SPGP-01) Authorization
Permit Number: 18-1003
Northfax, City of Fairfax, Virginia

Dear Mr. Napolitano:

The Virginia Department of Environmental Quality (DEQ) has received and completed technical review of your application request dated June 22, 2018, and received June 25, 2018. Based on DEQ's technical review, DEQ has determined the proposed project satisfies the terms and conditions contained in the USACE's, Norfolk District State Program General Permit (17-SPGP-01). You are required to adhere to all terms and conditions contained within the attached 17-SPGP-01 and any Special Conditions listed below. Your 17-SPGP-01 verification is effective as of the date on this letter and remains effective until **May 31, 2022**.

The impacts are associated with the construction of a mixed-use development and associated infrastructure on an approximately 10.6 acre development site.

The applicant is hereby authorized to permanently impact 0.50 acre (1,646 linear feet) of stream channel.

The conceptual mitigation plan submitted with your application indicated that mitigation will include the purchase of 1,675 stream credits or 4,761 Stream Condition Units. This mitigation shall be completed and documentation shall be submitted to DEQ prior to commencement of project impacts.

This letter shall serve as verification to proceed with the project as proposed. The permittee shall be responsible for contacting DEQ to revise this verification, including provisions for compensatory mitigation, if the location or amount of the impacts changes.

Please contact Wynn Prusaczyk by phone at (703) 583-3871 or email at Wynn.Prusaczyk@deq.virginia.gov if you have any questions or concerns regarding the information contained herein.

Respectfully,

Trisha M. Beasley

Trisha M. Beasley, Regional VWPP Program Manager

Attachments: 17-SPGP-01

Cc (via E-mail):

Mr. Jason Franti, Apex Companies, LLC
Mr. Jim Irre, Apex Companies, LLC
Ms. Theresita Crockett-Augustine, USACE, Northern VA Field Office

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

CENAO-WRR STATE PROGRAMMATIC GENERAL PERMIT 17-SPGP-01

Effective Date: June 29, 2017 Expiration Date: May 31, 2022

I. AUTHORITIES:

A. 17-SPGP-01 authorizes the discharge of dredged or fill material in non-tidal waters, of the United States, including wetlands, associated with certain residential, commercial, and institutional developments and linear transportation projects within the geographical limits of the Commonwealth of Virginia and under the regulatory jurisdiction of the U.S. Army Corps of Engineers, Norfolk District (Corps or Norfolk District). These projects must have no more than minimal individual and cumulative impacts and must meet all the terms and conditions outlined herein. The use of 17-SPGP-01 is restricted to those projects that have avoided and minimized impacts to waters of the U.S., including wetlands, to the maximum extent practicable.

B. The people of the Commonwealth of Virginia (Virginia or "the Commonwealth") are hereby authorized by the Secretary of the Army and the Chief of Engineers, under Section 404 of the Clean Water Act (CWA) (33 U.S.C. § 1344), to perform the aforementioned work in non-tidal waters and wetlands of the Commonwealth as described herein. The Corps' authority and guidance to develop general permits is contained in 33 U.S.C. § 1344(e), 33 C.F.R. § 325.2(e)(2), 33 C.F.R. § 325.3(b), and Corps Regulatory Guidance Letter (RGL) 83-7.

II. PROCEDURES:

A. Delineation Confirmations: Prior to the submission of an application for any Residential, Commercial, or Institutional Development Activity or Linear Transportation Activity covered by 17-SPGP-01, a proponent must first obtain a Corps confirmed delineation that is approved for use with a permit application (Preliminary JD) or a confirmed jurisdictional determination that includes the limits of all waters of the U.S., including wetlands that are located within the project boundaries (Approved JD). The applicant will contact the Corps to obtain a delineation confirmation/jurisdictional determination. When appropriate, a separate delineation confirmation may also be required from the Environmental Protection Agency (EPA).

B. Application: The application must be submitted to the Virginia Marine Resource Commission (VMRC) and clearly marked 17-SPGP-01. The following information must be submitted as part of the complete application package:
   1) A completed and signed Standard Joint Permit Application (JPA). The applicant must utilize the most recent version.

http://www.nao.usace.army.mil/Missions/Regulatory/

2) A completed SPGP Complete Application Checklist. The applicant must utilize the most recent version.
3) A Corps confirmed delineation that is approved for use with a permit application OR a confirmed jurisdictional determination that includes the limits of all waters of the U.S., including wetlands that are located within the project boundaries.

This information listed above will be required to render an application complete for 17-SPGP-01 purposes. The application package must be submitted to the Virginia Marine Resource Commission (VMRC) and clearly marked 17-SPGP-01. The VMRC will forward a copy of the application to the applicable VDEQ office. Once the VDEQ has deemed the application complete the VDEQ will forward the complete application to the appropriate federal agency when coordination is required.

For purposes of 17-SPGP-01, the VDEQ is the agency responsible for ensuring permit applications meet the informational and technical requirements of 17-SPGP-01 and for issuance of 17-SPGP-01 verification letters for qualifying Residential, Commercial, and Institutional and Linear Transportation projects.

C. State Approvals: In order for 17-SPGP-01 to be valid, permittees must obtain the following state approvals prior to commencement of work in waters of the U.S.:

1) Virginia Department of Environmental Quality (VDEQ) Virginia Water Protection (VWP) permit
2) VMRC permit, when required
3) VDEQ informal resolution, letter of agreement, executive compliance agreement or consent order when the 17-SPGP-01 is utilized for resolution of non-compliance and/or enforcement (at Corps discretion).

The 17-SPGP-01 may also be used for activities excluded from State VWP permitting when those activities are associated with a larger residential, commercial, institutional development and/or linear transportation project that requires state approval..

III. **DEFINITIONS**:

A. Loss of waters of the United States: Waters of the United States (WOUS), including wetlands that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage/linear footage of the loss of WOUS is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for 17-SPGP-01; it is not a net threshold that is

calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services.

1) The loss of stream bed includes the linear feet of stream bed that is filled or excavated. WOUS temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of WOUS. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of WOUS.
2) Per Norfolk District Pipe Repair Guidelines: pipe repair and replacement is considered a permanent impact
3) The length of any box culvert, pipe, or bridge that is being removed and replaced, whether in the same location or not, is considered a permanent impact. However, if a pipe/culvert/bridge is left in place and is extended or rip-rapped, then only the length and area of the extension or rip-rap is considered a permanent impact. [Based on Norfolk District letter guidance May 5, 2009 to VDOT]

B. Natural stream design: a stream channel design that mimics the dimension, pattern, and profile of a representative reference stream reach.

C. Permittee: the responsible party in receipt of the 17-SPGP-01 verification from the VDEQ. The permittee will be the responsible party for complying with all 17-SPGP-01 general conditions as well as any additional special conditions required of each project.

D. Residential developments: construction or expansion of a multiple unit residential development or a residential subdivision including the construction of building foundations, building pads and attendant features that are necessary for the use of the residence or residential development. Attendant features may include but are not limited to roads, parking lots, garages, yards, utility lines, storm water management facilities, septic fields, and recreation facilities such as playgrounds, playing fields, and golf courses (provided the golf course is an integral part of the residential development).

E. Commercial and Institutional Developments: construction or expansion of commercial and institutional building foundations, building pads, and attendant features that are necessary for the use and maintenance of the structures. Attendant features may include, but are not limited to, roads, parking lots, garages, yards, utility lines, storm water management facilities, and recreation facilities such as playgrounds and playing fields. Examples of commercial developments include retail stores, industrial facilities, restaurants, business parks, and shopping centers. Examples of institutional developments include schools, fire stations, government office buildings, judicial buildings, public works buildings, libraries, hospitals, and places of worship.

F. Linear transportation: the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxi ways).

IV. AUTHORIZED ACTIVITIES

A. Residential, Commercial, and Institutional Development Activities Eligibility Criteria:

1) Activities are subject to Corps regulations;

2) Activities involve the discharge of dredged/fill material associated with residential, commercial, and institutional projects and propose:
   a. the TOTAL permanent loss of not more than 1 acre of non-tidal waters of the US, to include stream channel, wetlands and open waters.
      AND
   b. the permanent loss of not more than 2,000 linear feet of stream channel;

3) Activities meet the general and special conditions of 17-SPGP-01 listed in this document and any special conditions required of each project-specific verification;

4) Compensatory mitigation is provided in accordance with the mitigation standards and general conditions listed in this document.

5) Activities have received and completed all applicable federal review as listed in the general conditions of this document.

****The following activities are NOT authorized under the 17-SPGP-01:**

- The Construction of one stand-alone single family home and/or its attendant features.
- Golf courses that are not an integral part of a residential development.
- The construction of new ski areas.

B. Linear Transportation Activities Eligibility Criteria:

1) Activities are subject to Corps regulations;

2) Activities involve the discharge of dredged/ fill material associated with the construction, expansion, modification, or improvement of linear transportation projects that are single and complete with independent utility and propose:

a. the TOTAL permanent loss of not more than ½ acre of non-tidal waters of the US, to include stream channel, wetlands and open waters
AND
b. the permanent loss of not more than 1,000 linear feet of stream channel at any single impact site with independent utility.

3) Activities meet all general conditions of 17-SPGP-01 listed in this document and any special conditions required of each project-specific verification;

4) Compensatory mitigation is provided in accordance with the mitigation standards and general conditions listed in this document.

5) Activities have received and completed all applicable federal review as listed in the general conditions of this document.

6) Construction and/or relocation of utility lines by the applicant and within the right-of- way/easements of the project and performed in direct relation with the project are included in the project impact totals.

V. GENERAL CONDITIONS:

The following conditions apply to all activities authorized under 17-SPGP-01. Work that does not meet one or more of the terms or general conditions of 17-SPGP-01, including work that has been determined to be more than minimal in nature (at any impact level), will require consideration under a different type of Corps permit.

1) Other permits: Authorization does not obviate the need to obtain other Federal, state, or local authorizations required by law or to comply with all Federal, state, or local laws.

2) Minimal effects: Projects authorized shall have no more than minimal individual or cumulative adverse environmental impacts.

3) Discretionary authority: The Corps District Commander retains discretionary authority to require processing of an individual permit based on concerns for the aquatic environment or for any other factor of the public interest (33 C.F.R. § 320.4(a)). This authority is exercised on a case-by-case basis.

4) Single and complete projects: The activity must be a single and complete project.
   a. For non-linear projects: the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other

association of owners/developers. A single and complete non-linear project must have independent utility (see "independent utility" as defined in these general conditions). Single and complete non-linear projects may not be "piecemealed" to avoid the limits in a17-SPGP-01 authorization.

b. For linear transportation: For projects with multiple crossings or encroachments a determination of "single and complete" will typically apply to each crossing or encroachment of waters that occurs (i.e., single waterbody and/or wetlands) at separate and distinct locations and with independent utility. However, in cases where there are many crossings in close proximity, numerous crossings of the same waterbody, multiple crossings, or multiple encroachments that otherwise may have more than minimal individual or cumulative impacts; the Corps has the discretion to consider all the crossings cumulatively as one single and complete project.

5) Independent utility: A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. A phase of a project that would be constructed even if the other phases were not built can be considered as a separate, single and complete project with independent utility. For a linear transportation project, separate impact areas on a new location roadway are not considered to have independent utility and thus impacts would be considered cumulatively and eligible for a single 17-SPGP-01 verification. However, separate impact areas on a roadway that is being widened or where pipes are being replaced at multiple crossings are considered to have independent utility, and each crossing would be considered eligible for a separate 17-SPGP-01 verification. Although such impacts are not considered cumulatively for permitting purposes, they are considered cumulatively when assessing the need for federal review.

6) Multiple general permit authorizations.: The 17-SPGP-01 may be combined with other Corps general permits (including Nationwide, Regional or Letters of Permission) as long as the impacts are considered cumulatively and do not exceed the acreage limit or linear footage limits of the 17-SPGP-01. Two separate activities (e.g. Residential and Linear, within 17-SPGP-01, may be combined as long as they do not exceed the acreage or linear footage threshold of the activity with the highest specified acreage or linear footage threshold).

7) Permit on-site: The permittee shall ensure that a copy of 17-SPGP-01 and the accompanying authorization letter are at the work site at all times. These copies must be made available to any regulatory representative upon request. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be expected to comply with all conditions of any 17-SPGP-01 verification.

8) Historic Properties: In cases where the Corps determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the District Engineer with the appropriate documentation to demonstrate compliance with those requirements. The District Engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the 17-SPGP-01 activity or whether additional section 106 consultation is necessary.

Non-federal permittees shall not begin work on the activity until Section 106 review and/or coordination has been completed AND they have received their 17-SPGP verification letter from the VDEQ.

Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such permit or assistance despite the adverse effect created or allowed by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

Discovery of Previously Unknown Remains and Artifacts: If a permittee discovers any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, the permittee must immediately notify the District Engineer of what has been found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The District Engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

Tribal Rights: No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

9) Federal Lands: Authorized activities shall not impinge upon the value of any National Wildlife Refuge, National Forest, National Park, or any other area administered by the United States Fish and Wildlife Service (USFWS), U.S. Forest Service, or National Park Service unless approval from the applicable land management agency is provided with the permit application.

10) Endangered Species: No activity is authorized under any 17-SPGP-01 which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any 17-SPGP-01 which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the District Engineer with the appropriate documentation to demonstrate compliance with those requirements. The District Engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the 17-SPGP-01 activity, or whether additional ESA consultation is necessary.

Non-federal permittees shall not begin work on the activity until Section 7 review and/or consultation has been completed AND they have received their 17-SPGP verification letter from the VDEQ.

Authorization of an activity by a 17-SPGP-01 does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the USFWS or the National Marine Fisheries Service (NMFS), The Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS and NMFS or their World Wide Web

pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.noaa.gov/fisheries.html respectively.

11) Migratory Birds and Bald and Golden Eagles: The permittee is responsible for obtaining any "take" permits required under the USFWS regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the USFWS to determine if such "take" permits are required for a particular activity. As of the issuance date of the 17-SPGP the current contact, concerning this matter, is at the U.S. Fish and Wildlife Service, Thomas Wittig at 413-253-8577 or Thomas_wittig@fws.gov. Information on active bald eagle nests in the project area can be obtained via The Center for Conservation Biology (CCB) Virginia Eagles Nest Locator: http://www.ccb-wm.org/virginiaeagles/index.htm.

12) Wild and Scenic Rivers: Currently, there are no designated Wild and Scenic Rivers in Virginia. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river has determined, in writing, that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service (NPS), U.S. Forest Service (USFS), Bureau of Land Management (BLM), USFWS). Impacts that occur in these resource areas will require coordination with the appropriate Federal agency.

13) Department of Defense (DOD) Siting Clearinghouse Coordination: For all commercial and institutional development projects that include the construction of wind energy generating structures, solar towers, or overhead powerlines the VDEQ must notify the DOD Clearinghouse of the permitted project. The VDEQ will send a copy of the joint permit application and SPGP verification letter to the following address: DoD Clearinghouse, Attn: David Blalock, 101 Marietta St. NW, Suite 3120, Atlanta, Georgia 30303 or david.c.blalock2.civ@mail.mil

14) Navigation: No authorized activity may cause more than a minimal adverse effect on navigation.

The permittee understands and agrees that if future operations by the United States require the removal, relocation, or other alteration of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his/her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United

States. No claim shall be made against the United States on account of any such removal or alteration.

15) Floodplains: The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

16) 408 Certification: Under 33 USC 408, no activity may temporarily or permanently alter or make use of a U.S. Army Corps of Engineers civil works project unless reviewed and permitted by the Secretary of the Army. The Corps may grant this permission if the work does not impair the usefulness of the project and is not injurious to the public interest.

17) Environmental justice: Activities authorized under 17-SPGP-01 must comply with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations".

18) Federal liability: In issuing 17-SPGP-01, the Federal government does not assume any liability for the following: (a) damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes; (b) damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest; (c) damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by 17-SPGP-01; (d) design or construction deficiencies associated with the permitted work; (e) damage claims associated with any future modification, suspension, or revocation of this permit.

19) Avoidance and minimization: Except as provided under section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.(40 CFR 230.l0(a)-(d) Section 404 (b)(l) Guidelines).

20) Compensatory Mitigation: Mitigation will be required for all permanent impacts, on a project site, once the compensatory mitigation threshold has been exceeded for waters OR wetland impacts.

    a. Wetland mitigation: will generally be required for all residential, commercial, and institutional development projects where the total permanent impacts exceed 1/10 acre AND for all wetland impacts on linear transportation projects that are funded in part or in total by local, state or federal funds.

Generally, the minimum required wetland mitigation ratios will be as follows:

- 2:1 for forested wetlands
- 1.5:1 for scrub-shrub wetlands
- 1:1 for herbaceous emergent wetlands
- 0.5:1 for permanent loss of open waters
- 1:1 for conversion of forested wetlands to herbaceous emergent wetlands.

Compensatory mitigation may be required on a case-by-case basis to ensure impacts are minimal for:

- permanent or temporary conversion of one wetland type to another
- wetland impacts totaling less than 1/10 acre
- at mitigation ratios beyond the generally recommend ratios

All wetland mitigation will comply with the Mitigation Rule [Corps-EPA Compensatory Mitigation for Losses of Aquatic Resources, dated April 10, 2008, 33 CFR 325 and 332/40 CFR 230].

b. Stream mitigation: will generally be required for all residential, commercial, institutional developments AND linear transportation projects where the total permanent stream channel impacts exceed 300 linear feet.

Minimum stream mitigation requirements will be determined using the current Corps and VDEQ endorsed assessment methodology.

Stream mitigation that exceeds the assessment methodology recommendation and mitigation for impacts totaling less the 300 linear feet may be required on a case-by-case basis to ensure impacts are minimal.

All stream mitigation will comply with Mitigation Rule [Corps-EPA Compensatory Mitigation for Losses of Aquatic Resources dated April 10, 2008 33 CFR 325 and 332; 40 CFR 230].

Where local zoning ordinances provide for riparian and floodplain protection pursuant to the Chesapeake Bay Preservation Act (Virginia Code 10.1-2100 et seq.) and the Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 1-20 et seq.), the use of buffers as a form of compensatory mitigation shall be allowed only:

- where the extent of the buffer exceeds the lateral extent already required by local ordinances pursuant to the Act and the regulations
- where the quality of the existing protected buffer area is enhanced to provide greater water quality protection benefits
- where the proposed compensatory mitigation is undertaken in

compliance with the Mitigation Rule [Corps-EPA Compensatory Mitigation for Losses of Aquatic Resources: Final Rule dated April 10, 2008 33 CFR 332.4(c)(2)-(14) and 33 CFR 332.3(h)]

21) Heavy Equipment: Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.

22) Temporary fills: All temporarily disturbed waters and wetlands must be restored to their pre-construction contours within 12 months of commencing the temporary impact's construction. Impacts that will not be restored within 12 months (calculated from the start of the temporary impacts construction) will be considered permanent unless otherwise approved by the Corps, and compensatory mitigation may be required. Once restored to their natural contours, soil in these temporarily disturbed areas must be mechanically loosened to a depth of 12 inches and wetland areas must be seeded or sprigged with appropriate native vegetation.

23) Sedimentation and erosion control: Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

24) Countersinking of Pipes and Culverts: Following consultation with the Virginia Department of Game and Inland Fisheries (VDGIF), the Norfolk District assumes there are fish and other aquatic organisms present in any stream being crossed, in the absence of site-specific evidence to the contrary. Although prospective permittees have the option of providing such evidence, extensive efforts to collect such information is not encouraged, since countersinking will in most cases be required except as outlined in the conditions below:

   a. All pipes and culverts placed in streams will be countersunk at both the inlet and outlet ends, unless indicated otherwise by the VDEQ on a case-by-case basis (see below). Pipes that are 24" or less in diameter shall be countersunk 3" below the natural stream bottom. Pipes that are greater than 24" in diameter shall be countersunk at least 6" below the natural stream bottom. The countersinking requirement does not apply to bottomless pipes/culverts or pipe arches. All single pipes or culverts (with bottoms) shall be depressed (countersunk) below the natural streambed at both the inlet and outlet of the structure. In sets of multiple pipes or culverts (with bottoms) at least one pipe or culvert shall be depressed (countersunk) at both the inlet and outlet to convey low flows.
   b. When countersinking culverts, permittees must ensure reestablishment of a surface water channel (within 15 days post

construction) that allows for the movement of aquatic organisms and maintains the same hydrologic regime that was present pre-construction (i.e. the depth of surface water through the permit area should match the upstream and downstream depths). This may require the addition of finer materials to choke the larger stone and/or placement of riprap to allow for a low flow channel.

c. Exemption for extensions and certain maintenance: The requirement to countersink does not apply to extensions of existing pipes or culverts that are not countersunk, or to maintenance to pipes/culverts that does not involve replacing the pipe/culvert (such as repairing cracks, adding material to prevent/correct scour, etc.).

d. Floodplain pipes: The placement of pipes/culverts above ordinary high water, such as those placed to allow for flood plain flows, is not jurisdictional (provided no fill is discharged into wetlands).

e. Hydraulic opening: Pipes should be adequately sized to allow for the passage of ordinary high water with the countersinking and invert restrictions taken into account.

f. Pipes on bedrock or above existing utility lines: Different procedures will be followed for pipes or culverts to be placed on bedrock or above existing buried utility lines where it is not practicable to relocate the lines, depending on whether the work is for replacement of an existing pipe/culvert or a new pipe/culvert:

    i. Replacement of an existing pipe/culvert: Countersinking is not required provided the elevations of the inlet and outlet ends of the replacement pipe/culvert are no higher above the stream bottom than those of the existing pipe/culvert. Documentation (photographic or other evidence) must be maintained in the permittee's records showing the bedrock condition and the existing inlet and outlet elevations. That documentation will be available to the Norfolk District upon request, but notification or coordination with the Norfolk District is not otherwise required.

    ii. A pipe/culvert is being placed in a new location: If the prospective permittee determines that bedrock or an existing buried utility line that is not practicable to relocate prevents countersinking, they should evaluate the use of a bottomless pipe/culvert, bottomless utility vault, span (bridge) or other bottomless structure to cross the waterway, and also evaluate alternative locations for the new pipe/culvert that will allow for countersinking. If the prospective permittee determines that neither a bottomless structure nor an alternative location is practicable, then they must submit supporting documentation in the JPA. The prospective permittee must provide documentation of measures evaluated to minimize disruption of the movement of aquatic

life as well as documentation of the cost, engineering factors, and site conditions that prohibit countersinking the pipe/culvert. Options that must be considered include partial countersinking (such as less than 3" of countersinking, or countersinking of one end of the pipe), and constructing stone step pools, low rock weirs downstream, or other measures to provide for the movement of aquatic organisms. The permit application must also include photographs documenting site conditions. The prospective permittee may find it helpful to contact his/her regional fishery biologist for the VDGIF, for recommendations about the measures to be taken to allow for fish movements. When seeking advice from VDGIF, the prospective permittee should provide the VDGIF biologist with all available information such as location, flow rates, stream bottom features, description of proposed pipe(s), slopes, etc. Any recommendations from VDGIF should be included in the JPA. The VDEQ will notify the prospective permittee whether the proposed work qualifies for the 17-SPGP-01. NOTE: Blasting of stream bottoms through the use of explosives is not acceptable as a means of providing for countersinking of pipes on bedrock.

g. Pipes on steep terrain: Pipes being placed on steep terrain (slope of 5% or greater) must be countersunk in accordance with the conditions above. It is recommended that on slopes greater than 5%, a larger pipe than required be installed to allow for the passage of ordinary high water in order to increase the likelihood that natural velocities can be maintained. There may be situations where countersinking both the inlet and outlet may result in a slope in the pipe that results in flow velocities that cause excessive scour at the outlet and/or prohibit some fish movement. This type of situation could occur on the side of a mountain where falls and drop pools occur along a stream. Should this be the case, or should the prospective permittee not want to countersink the pipe/culvert for other reasons, they must provide documentation of measures evaluated to minimize disruption of the movement of aquatic life as well as documentation of the cost, engineering factors, and site conditions that prohibit countersinking the pipe/culvert. The prospective permittee should design the pipe to be placed at a slope as steep as stream characteristics allow, countersink the inlet 3-6", and implement measures to minimize any disruption of fish movement. These measures can include constructing a stone step/pool structure, preferably using river rock/native stone rather than riprap, constructing low rock weirs to create a pool or pools, or other structures to allow for fish movements in both directions. Stone structures should be designed with sufficient-sized stone to prevent

erosion or washout and should include keying-in as appropriate. These structures should be designed both to allow for fish passage and to minimize scour at the outlet. The quantities of fill discharged below ordinary high water necessary to comply with these requirements (i.e., the cubic yards of stone, riprap or other fill placed below the plane of ordinary high water) must be included in project totals. The prospective permittee may find it helpful to contact the regional fishery biologist for the VDGIF, for recommendations about the measures to be taken to allow for fish movements. When seeking advice from VDGIF, the applicant should provide the VDGIF biologist with all available information such as location, flow rates, stream bottom features, description of proposed pipe(s), slopes, etc. Any recommendations from DGIF should be included in the permit application. The VDEQ will notify the prospective permittee whether the proposed work qualifies for the 17-SPGP-01.

h. Problems encountered during construction: When a pipe/culvert is being replaced, and the design calls for countersinking at both ends of the pipe/culvert, and during construction it is found that the streambed/banks are on bedrock, a utility line, or other documentable obstacle, then the permittee must stop work and contact the VDEQ (contact by telephone and/or email is acceptable). The permittee must provide the VDEQ with specific information concerning site conditions and limitations on countersinking. The VDEQ will work with the permittee to determine an acceptable plan, taking into consideration the information provided by the permittee, but the permittee should recognize that the VDEQ and/or Corps could determine that the work will not qualify for a 17-SPGP-01 authorization.

i. Emergency pipe replacements: In the case of an emergency situation, such as when a pipe/culvert washes out during a flood, a permittee is encouraged to countersink the replacement pipe at the time of replacement, in accordance with the conditions above. However, if conditions or timeframes do not allow for countersinking, then the pipe can be replaced as it was before the washout, but the permittee will have to come back and replace the pipe/culvert and countersink it in accordance with the guidance above. In other words, the replacement of the washed out pipe is viewed as a temporary repair, and a countersunk replacement should be made at the earliest possible date. The VDEQ must be notified of all pipes/culverts that are replaced without countersinking at the time that it occurs, and must provide the permittee's planned schedule for installing a countersunk replacement (it is acceptable to submit such notification by email). The permittee should anticipate whether bedrock or steep terrain will limit countersinking and, if so, should follow the procedures outlined in (g) and/or (h) above.

25) Discharge of pollutants: All authorized activities involving any discharge of pollutants into waters of the United States shall be consistent with applicable water quality standards, effluent limitations, standards of performance, prohibitions, and pretreatment standards and management practices established pursuant to the CWA (33 U.S.C. § 1251 et seq.) and applicable state and local laws.

26) Suitable Material: No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

27) Obstruction of high flows: Discharges of dredged or fill material must not permanently restrict or impede the passage of normal or expected high flows.

28) Aquatic Life Movements: No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.

29) Spawning Areas: Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

30) Migratory Bird Breeding Areas: Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

31) Native trout and anadromous fishes: Authorizations for discharges of dredged or fill material into native trout waters or anadromous fish spawning areas are conditioned to limit in-stream work within the timeframes recommended by the DGIF. http://206.16.194.16/environmental-programs/files/VDGIF-Time-of-Year-Restrictions-Table.pdf

32) Water supply intakes: No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization

33) Invasive Species: Plant species on the most current Virginia Department of Conservation and Recreation's Invasive Plant Species List shall not be used for replanting activities authorized by the SPGP. The list of invasive plants in Virginia

may be found at: http://www.dcr.virginia.gov/natural-heritage/document/nh-invasive-plant-list-2014.pdf

34) Inspections: The permittee understands and agrees that the Corps and/or the VDEQ are permitted and allowed to make periodic inspections at any time the Corps or VDEQ deems necessary in order to assure that the activities being performed under authority of this permit are in accordance with the terms and conditions prescribed herein. The Corps reserves the right to require post-construction engineering drawings and/or surveys of any work authorized under 17- SPGP-01, as deemed necessary on a case-by-case basis.

35) Maintenance: The permittee shall maintain the work authorized herein in good condition and in conformance with all terms and conditions of this permit. All fills shall be properly maintained to ensure public safety.

36) Property rights: 17-SPGP-01 does not convey any property rights, either in real estate or material, or convey any exclusive privileges, nor does it authorize any injury to property or invasion of rights or any infringement of Federal, state, or local laws or regulations. If real estate rights are needed from the Corps, you must contact the Corps Real Estate Office at (757) 201-7735 or at the address listed on the front page of this permit.

37) Suspension and revocation: 17-SPGP-01 and individual verifications under 17-SPGP-01 maybe either suspended or revoked in whole or in part pursuant to the policies and procedures of 33 C.F.R. § 325.7. Any such action shall not be the basis for any claim for damages against the United States.

38) Restoration directive: The permittee, upon receipt of a restoration directive, shall restore the waters of the United States to their former conditions without expense to the United States and as directed by the Secretary of the Army or his/her authorized representative. If the permittee fails to comply with such a directive, the Secretary or his/her designee, may restore the waters of the United States to their former conditions, by contract or otherwise, and recover the cost from the permittee.

39) Special conditions: The Corps may impose other special conditions on a project verified pursuant to 17-SPGP-01 that are determined necessary to minimize adverse navigational and/or environmental effects or based on any other factor of the public interest. Failure to comply with all conditions of the authorization/verification, including special conditions, constitutes a permit violation and may subject the permittee, or his/her contractor, to criminal, civil, or administrative penalties and/or restoration.

40) False or incomplete information: In granting authorization pursuant to this permit, the Corps has relied upon information and data provided by the permittee. If,

subsequent to notification by the Corps or the VDEQ that a project qualifies for this permit, such information and data prove to be materially false or materially incomplete, the Corps may suspend or revoke authorization, in whole or in part, and/or the United States or Corps may institute appropriate legal proceedings.

41) Abandonment: If the permittee decides to abandon the activity authorized under I7-SPGP-01, unless such abandonment is merely the transfer of property to a third party, they may be required to restore the area to the satisfaction of the Corps.

42) Transfer of verification: In order to transfer verification under 17-SPGP-01, the transferee and permittee must supply the Corps and the VDEQ with a written and signed, by all appropriate parties, request to make such a transfer. Such transfer is not effective until written approval has been granted by the Corps or the VDEQ.

43) Binding effect. The provisions of the permit authorization shall be binding on any assignee or successor in interest of the original permittee.

44) Expiration of 17-SPGP-01: Unless further suspended or revoked the 17-SPGP-01 will be in effect until May 31, 2022. Activities which have commenced (i.e., are under construction) or are under contract to commence construction in reliance upon 17-SPGP-01 will remain authorized provided the activity is completed within twelve months of the date of this 17-SPGP-01's expiration of May 31, 2022, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 325.7(a-e).

Jason E. Kelly, PMP
Colonel, U.S. Army
Commanding

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703)583-3800
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director
(804) 698-4000

Thomas A. Faha
Regional Director

March 5, 2019

By e-mail: john@lann.com
Receipt Confirmation Requested

Mr. John E. Napolitano, Manager
Northfax JV LLC
3900 Jermantown Road, Suite 300
Fairfax, Virginia 22030

Re: Virginia Water Protection (VWP) Individual Permit Number 18-1003
Northfax, City of Fairfax, Virginia
Final VWP Individual Permit

Dear Mr. Napolitano:

Pursuant to the VWP Permit Program Regulation 9 VAC 25-210 and § 401 of the Clean Water Act Amendments of 1977, Public Law 95-217, the Department of Environmental Quality has enclosed the VWP Individual Permit for the "Northfax" project.

This permit is valid for 15 years from the date of issuance. An extension of the permit may not occur as the permit term cannot exceed the maximum of 15 years. A new permit may be necessary if any portion of the authorized activities or any permit requirement (including compensatory mitigation provisions) is not complete at the end of the 15 year permit term.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have **30 calendar days** from the date of service (the date you actually received this decision or the date it was e-mailed to you, whichever occurred first) within which to appeal this decision by filing a notice of appeal in accordance with the Rules of the Supreme Court of Virginia with the Director, Department of Environmental Quality. In the event that this decision is served on you by mail, three days are added to that period. Refer to Part 2A of the Rules of the Supreme Court of Virginia for additional requirements governing appeals from administrative agencies.

Alternatively, an owner may request a formal hearing for the formal taking of evidence upon relevant fact issues under Section 2.2-4020 of the Administrative Process Act. A petition for a formal hearing must meet the requirements set forth in 9VAC25-230 of the Virginia Administrative Code. In cases involving

actions of the board, such petition must be filed within 30 calendar days after notice of such action is sent to such owner by certified mail.

The work authorized by this permit also satisfies the terms and conditions contained in the Norfolk District, Corps of Engineers' State Program General Permit (17- SPGP-01) and the special conditions, if any, attached to 17-SPGP-01. No additional authorization from the Corps is required. Your 17-SPGP-01 authorization is effective as of the date on this letter and remains effective until May 31, 2022.

If you have any questions, please contact Wynn Prusaczyk by phone at (703) 583-3871 or by email at Wynn.Prusaczyk@deq.virginia.gov.

Respectfully,

Trisha M. Beasley

Trisha M. Beasley
Regional VWPP Program Manager

Enclosures: Permit Cover Page, Part I - Special Conditions, Part II - General Conditions, Monthly VWP Permit Inspection Checklist, VWP Permit Construction Status Update Form, 17-SPGP-01 Verification Letter, and 17-SPGP-01

Cc (by e-mail):
Mr. Jason Franti, Apex Companies, LLC
Mr. Jim Irre, Apex Companies, LLC
Ms. Theresita Crockett-Augustine, U.S. Army Corps of Engineers, Northern VA Field Office

Attachment 13

Federal Emergency Management Agency

Washington, D.C. 20472

April 1, 2019

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CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 18-03-2239R

Mr. Robert A. Stalzer
Manager, City of Fairfax
10455 Armstrong Street, Room 316
Fairfax, VA 22030

Community Name: City of Fairfax, Virginia
Community No.: 515524

104

Dear Mr. Stalzer:

We are providing our comments with the enclosed Conditional Letter of Map Revision (CLOMR) on a proposed project within your community that, if constructed as proposed, could revise the effective Flood Insurance Study (FIS) report and Flood Insurance Rate Map (FIRM) for your community.

If you have any questions regarding the floodplain management regulations for your community, the National Flood Insurance Program (NFIP) in general, or technical questions regarding this CLOMR, please contact the Director, Mitigation Division of the Federal Emergency Management Agency (FEMA) Regional Office in Philadelphia, Pennsylvania, at (215) 931-5512, or the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at https://www.fema.gov/national-flood-insurance-program.

Sincerely,

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Enclosure:
Conditional Letter of Map Revision Comment Document

cc: Ms. Michelle Coleman
Zoning Administrator
City of Fairfax

Mr. David Hodgkins
Assistant City Manager and Finance Director
City of Fairfax

Mr. William R. Zink, P.E.
President
christopher consultants, ltd.

 Issue Date: April 1, 2019 | Case No.: 18-03-2239R | CLOMR-APP

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CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT

COMMUNITY INFORMATION		PROPOSED PROJECT DESCRIPTION	BASIS OF CONDITIONAL REQUEST
COMMUNITY	City of Fairfax (Independent City) Virginia	CHANNELIZATION CULVERT GRADING	HYDRAULIC ANALYSIS UPDATED TOPOGRAPHIC DATA
	COMMUNITY NO.: 515524		
IDENTIFIER	NORTHFAX	APPROXIMATE LATITUDE AND LONGITUDE: 38.859, -77.310 SOURCE: Precision Mapping Streets DATUM: NAD 83	

AFFECTED MAP PANEL			
TYPE: FIRM*	NO.: 5155240002D	DATE: June 2, 2006	* FIRM - Flood Insurance Rate Map

FLOODING SOURCE AND REACH DESCRIPTION

North Fork Accotink Creek – from just upstream of Chain Bridge Road to approximately 1,670 feet upstream of Chain Bridge Road

PROPOSED PROJECT DESCRIPTION

Flooding Source	Proposed Project	Location of Proposed Project
North Fork Accotink Creek	New Twin 8'x8' Box Culvert Extension	From approximately 80 feet upstream of Chain Bridge Road to approximately 1,050 feet upstream of Chain Bridge Road.
	Channelization	From approximately 1,050 feet upstream of Chain Bridge Road to approximately 1,200 feet upstream of Chain Bridge Road.
	Grading	From just upstream of Chain Bridge Road to approximately 1,200 feet upstream of Chain Bridge Road.

SUMMARY OF IMPACTS TO FLOOD HAZARD DATA

Flooding Source	Effective Flooding	Proposed Flooding	Increases	Decreases
North Fork Accotink Creek	Zone AE	Zone AE	Yes	Yes
	BFEs*	BFEs	Yes	Yes
	Zone X (shaded)	Zone X (shaded)	Yes	Yes

* BFEs - Base (1-percent-annual-chance) Flood Elevations

COMMENT

This document provides the Federal Emergency Management Agency's (FEMA's) comment regarding a request for a CLOMR for the project described above. This document is not a final determination; it only provides our comment on the proposed project in relation to the flood hazard information shown on the effective National Flood Insurance Program (NFIP) map. We reviewed the submitted data and the data used to prepare the effective flood hazard information for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. Your community is responsible for approving all floodplain development and for ensuring that all permits required by Federal or State/Commonwealth law have been received. State/Commonwealth, county, and community officials, based on their knowledge of local conditions and in the interest of safety, may set higher standards for construction in the Special Flood Hazard Area (SFHA), the area subject to inundation by the base flood). If the State/Commonwealth, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

To determine the changes in flood hazards that will be caused by the proposed project, we compared the hydraulic modeling reflecting the proposed project (referred to as the proposed conditions model) to the hydraulic modeling used to prepare the Flood Insurance Study (FIS) (referred to as the effective model). If the effective model does not provide enough detail to evaluate the effects of the proposed project, an existing conditions model must be developed to provide this detail. This existing conditions model is then compared to the effective model and the proposed conditions model to differentiate the increases or decreases in flood hazards caused by more detailed modeling from the increases or decreases in flood hazards that will be caused by the proposed project.

The table below shows the changes in the BFEs:

BFE Comparison Table

Flooding Source: North Fork Accotink Creek		BFE Change (feet)	Location of maximum change
Existing vs. Effective	Maximum increase	2.6	Approximately 1,090 feet upstream of Chain Bridge Road
	Maximum decrease	2.1	Approximately 270 feet upstream of Chain Bridge Road
Proposed vs. Existing	Maximum increase	0.6	Approximately 1,450 feet upstream of Chain Bridge Road
	Maximum decrease	7.1	Approximately 1,000 feet upstream of Chain Bridge Road
Proposed vs. Effective	Maximum increase	0.6	Approximately 1,450 feet upstream of Chain Bridge Road
	Maximum decrease	7.1	Approximately 1,040 feet upstream of Chain Bridge Road

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

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Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

DATA REQUIRED FOR FOLLOW-UP LOMR

Upon completion of the project, your community must submit the data listed below and request that we make a final determination on revising the effective FIRM and FIS report. If the project is built as proposed and the data below are received, a revision to the FIRM and FIS report would be warranted.

• Detailed application and certification forms must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1, entitled "Overview and Concurrence Form," must be included. A copy of this form may be accessed at https://www.fema.gov/media-library/assets/documents/1343.

• The detailed application and certification forms listed below may be required if as-built conditions differ from the proposed plans. If required, please submit new forms, which may be accessed at https://www.fema.gov/media-library/assets/documents/1343, or annotated copies of the previously submitted forms showing the revised information.

Form 2, entitled "Riverine Hydrology and Hydraulics Form." Hydraulic analyses for as-built conditions of the base flood, the 10-percent, 2-percent, and 0.2-percent-annual-chance floods must be submitted with Form 2.

Form 3, entitled "Riverine Structures Form."

• A certified topographic work map showing the revised and effective base and 0.2-percent-annual-chance floodplain boundaries. Please ensure that the revised information ties in with the current effective information at the downstream and upstream ends of the revised reach and any tributaries.

• An annotated copy of the FIRM, at the scale of the effective FIRM, that shows the revised base and 0.2-percent-annual-chance floodplain boundary delineations shown on the submitted work map and how they tie-in to the base and 0.2-percent-annual-chance floodplain boundary delineations shown on the current effective FIRM at the downstream and upstream ends of the revised reach, as well as any tributaries.

• As-built plans, certified by a registered Professional Engineer, of all proposed project elements.

• Documentation of the individual legal notices sent to property owners who will be affected by any widening or shifting of the base floodplain and/or any BFE increases along North Fork Accotink Creek.

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Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

DATA REQUIRED FOR FOLLOW-UP LOMR (continued)

• FEMA's fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps may be accessed at https://www.fema.gov/forms-documents-and-software/flood-map-related-fees. The fee at the time of the map revision submittal must be received before we can begin processing the request. Payment of this fee can be made through a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card (Visa or MasterCard only). Please either forward the payment, along with the revision application, to the following address:

LOMC Clearinghouse
Attention: LOMR Manager
3601 Eisenhower Avenue, Suite 500
Alexandria, Virginia 22304-6426

or submit the LOMR and fee using the Online LOMC portal at: https://hazards.fema.gov/femaportal/onlinelomc/signin

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM and FIS report. Because the flood hazard information (i.e., base flood elevations, base flood depths, SFHAs, zone designations, and/or regulatory floodways) will change as a result of the project, a 90-day appeal period will be initiated for the revision, during which community officials and interested persons may appeal the revised flood hazard information based on scientific or technical data.

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Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

COMMUNITY REMINDERS

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Janice Barlow
Director, Mitigation Division
Federal Emergency Management Agency, Region III
One Independence Mall, Sixth Floor
615 Chestnut Street
Philadelphia, PA 19106-4404
(215) 931-5512

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This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Attachment 14

APEX COMPANIES, LLC

Major Water Quality Impact Assessment

Northfax West
10510 Orchard Street
Fairfax, Virginia 22030

PREPARED FOR:

Northfax JV LLC c/o The Lann Companies
3900 Jermantown Route, Suite 300
Fairfax, Virginia 22030

January 28, 2020

Apex Companies, LLC
203 Wylderose Court
Midlothian, Virginia 23113

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1.0 Introduction

The City of Fairfax (the City) 2019 Zoning Ordinance documents Chesapeake Bay Preservation Area (CBPA) ordinances designed to protect local waterways in the Chesapeake Bay watershed from nonpoint source pollution generated from urban development. As with other municipalities in the watershed, the City's CBPA ordinance has been approved by the Virginia Department of Environmental Quality (DEQ) to implement the requirements of the Code of Virginia needed to comply with the federal Chesapeake Bay Preservation Act. Examples of CBPA features in the City include the Resource Protection Area (RPA) and the Resource Management Area (RMA). To better define the extent and location of these features, the City adopted a CBPA Map in November 25, 2003. The City ordinance codifies the regulations that apply to the CBPA in order to prevent development projects from compromising water quality.

Section 4.18 of the Zoning Ordinance mandates that a Water Quality Impact Assessment (WQIA) must be submitted for any proposed land disturbance, development or redevelopment within the RPA including any buffer area modification or reduction. The ordinance provides criteria for approving, denying or modifying requests to rezone, subdivide, use, develop and /or redevelop land in a CBPA. The City provides for two levels of water quality impact assessment: a minor assessment and a major assessment. Typically, a Major WQIA is required for developments that exceeds 5,000 square feet land disturbance or propose encroachment onto the waterward 50 feet of the 100-foot RPA buffer.

Based on the proposed development activities for the Northfax West project, Apex Companies LLC (Apex) performed a Major WQIA based on a request by and in accordance with the City's ordinance. The WQIA Application form is provided in Appendix A of this report. Information in the application is consistent with the Preliminary Jurisdiction Determination (PJD) issued by the U.S. Army Corps of Engineers (USACE) in 2018 and Section 401/404 Clean Water Act (CWA) permits authorized by the DEQ and USACE in 2019 (Appendix B). The report herein presents the purpose of the WQIA, the methods used by Apex to investigate hydrogeological and landscape elements of the assessment, and data documenting the results of the Major WQIA. The report meets the standards set forth in the City's Chesapeake Bay Preservation ordinance (Section 4.18) for a Major WQIA and is intended to supplement the project's site plan and be reviewed with the site plan during the application review process.

2.0 Purpose

The City's Chesapeake Bay Preservation ordinance states that the purpose of a WQIA is to identify the impacts of proposed development on water quality and lands within the City's approved RPA boundary. Moreover, in areas where redevelopment does take place within the RPA, a WQIA is needed to ensure project activities are located and implemented to be the least disruptive of the RPA's natural water quality functions. When the functions of the RPA must be disrupted, the WQIA is used to determine mitigation measures that address water quality protection and compensate for impacts approved by the City.

The Northfax West project as proposed will impact water quality and lands within the City's approved RPA. Therefore, the purpose of this Major WQIA is to identify the extent of those impacts, minimize disruptions to the natural water quality functions of the RPA, and outline compensatory mitigation for unavoidable impacts to the RPA and potential impacts to water quality.

3.0 Project Description

The Northfax West project is part of a comprehensive strategy for the growth and redevelopment of the Fairfax

Boulevard corridor through the City, as demonstrated by the City of Fairfax 2035 Comprehensive Plan. In accordance with this plan the project will create a mix of residential and commercial uses in a highly urbanized setting, serving the needs of the community, while attracting those who would otherwise just pass through the area. The project will occur in an area which has not seen significant improvement in many years and will allow residents to work near where they live, reducing traffic congestion on area roads. The project envisions the revitalization of the area through the construction of residential homes, potentially a mix of townhouses, condominiums and a senior living facility, to maximize living space, while also providing commercial space for businesses.

3.1 Location

The Northfax West project is located in the northwest quadrant at the intersection of Fairfax Boulevard (Route 50) and Chain Bridge Road (Route 123) (Figure 1). The project site consists of an assemblage of 17 parcels with an aggregate area of approximately 11.32 acres, which has historically been used for residential and commercial purposes. The project area is part of the Accotink Creek watershed and located within the Middle Potomac River drainage area identified by Hydrologic Unit Code (HUC) 02070010.

3.2 Existing Conditions

The existing conditions for the Northfax West project are presented on the project plans in Appendix C and Appendix D. The project area currently consists of two single family homes with mowed grass yards, two parking lots (approx. 3 acres) constructed of rolled stone over fabric, and approximately 4 acres of woods. Orchard Street is located within the project limits and dead ends in a cul-de-sac. The 4-acre wooded area is composed of a mixed hardwood vegetation community surrounding perennial and intermittent streams that flow through the site.

The perennial stream enters the site at the northwest corner and flows southeast before entering a culvert that conveys water under Route 123, near the intersection of Route 123 and Route 50. The intermittent stream begins at a culvert outlet near the southwest corner of the project site and flows easterly to its confluence with the perennial stream. The perennial stream is a culvert to culvert system with little connection to upstream or downstream components of a typical stream system (e.g. floodplain, buffers, or other stream corridor features).

A wetland delineation was performed in 2017 and a Preliminary Jurisdictional Determination (PJD) was issued by the USACE on February 5, 2018 (Appendix B). The PJD documented the limits of perennial and intermittent stream channels and the absence of non-tidal wetlands within the project boundaries. The flow regime of each stream was verified in 2017 in a site-specific RPA determination, the results of which concurred with the City's RPA map (Figure 3). Under USACE permit NAO-2014-1871(Appendix B), the eastern extent of the perennial stream was later redirected to the north, into new 8-foot box culverts installed under Chain Bridge Road to improve drainage and reduce flooding. As a result, the RPA buffer associated with the stream also shifted to the north of its previous location, as shown in Figure 4.

4.0 Methods

Apex conducted a Major WQIA in accordance with Section 4.18 titled "Chesapeake Bay Preservation" of the City's ordinance for Site Development Standards (Chapter 110, Article 4). The City's Chesapeake Bay Preservation ordinance states that a Major WQIA is required for any development that exceeds 5,000 square feet land disturbance or that encroaches onto the seaward 50 feet of the 100-foot RPA buffer area; or is located in the RMA and is deemed necessary by the Zoning Administrator. The City's requirements for a Major WQIA application are provided as follows:

- Location of the components of any RPA, including the 100-foot buffer area;
- Location and nature of proposed improvements, including:
    - Type of paving material;
    - Areas of clearing or grading;
    - Location of any structures, drives, or other impervious cover; and
    - Sewage disposal systems or reserve drain field sites;
- Type and location of proposed best management practices to meet the required general performance standards specified in §110-4.18.7;
- Location of existing vegetation on site, including the number and type of trees and other vegetation to be removed to accommodate the encroachment or modification; and
- A revegetation plan that supplements the existing buffer vegetation in a manner that provides for pollutant removal, erosion and runoff control.
- Certification of all required information as complete and accurate by a Class IIIB certified land surveyor and professional wetlands delineator.
- Hydrogeological element that describes
    - Existing topography;
    - Estimates of soil characteristics and potential for erosion;
    - Hydrology of the area;
    - Impacts on wetlands and streams;
    - Proposed mitigation measures; and
    - A listing of requisite permits with permit or application status.
- Landscape element that fully describes:
    - Existing trees required to be identified as part of a Tree Management Plan in accordance with subsection §110-4.5.9.D.1;
    - Limits of clearing and grading;
    - Trees and indigenous vegetation that are to be preserved within the disturbed area;
    - Measures to be taken to protect vegetation, proposed plantings and other vegetative measures used to enhance water quality; and
    - A proposed construction schedule that includes all activities related to clearing, grading and proposed plantings.
- Such other measures as deemed necessary by the Zoning Administrator to ensure the impact to water quality can be accurately predicted.

Information in the WQIA relies on previous investigations performed by Apex including a Waters of the U.S. (WOTUS) delineation and a site-specific RPA determination from 2017. These investigations were conducted using standard methods required by the USACE, DEQ, and the City. Results were provided as supporting documentation in the Joint Permit Application (JPA) submitted to regulatory agencies on June 22, 2018, which satisfied the terms and conditions contained in the USACE Norfolk District State Program General Permit (17-SPGP-01) and remains effective until May 31, 2022. DEQ found the JPA compliant with the Virginia Water Protection (VWP) Program and issued VWP Individual Permit Number 18-1003 on March 5, 2019, which remains effective until March 5, 2034. Other measures used to assess water quality included Bank Erosion Hazard Index (BEHI) and Near Bank Stress (NBS) investigations performed by Apex on December 16, 2019. The methods for these investigations are provided in Apex's BEHI and NBS report found in Appendix E.

5.0 Results

Location of the components of any RPA: The PJD issued by the USACE in 2018 (Appendix B) documented the limits of perennial and intermittent stream channels within the project area. The flow regime of each stream was verified in 2017 in a site-specific RPA determination that concurred with the City's CBPA map (Figure 3). Under USACE permit NAO-2014-1871(Appendix B), the eastern extent of the perennial stream was later redirected to the north into new 8-foot box culverts installed under Chain Bridge Road. As a result, the RPA buffer associated with the perennial stream also shifted to the north of its previous location (Figure 4).

Proposed improvements: Construction of the Northfax West project will include the piping and redirection of stream channel flow using twin box culverts to reduce the risk of flooding and tie into the 8-foot box culverts previously installed by the City and the Virginia Department of Transportation (VDOT). In addition to reducing the risk of flooding and controlling stream flow, the Northfax West project will create a mix of residential and commercial uses that serves the needs of the community and the City of Fairfax 2035 Comprehensive Plan, providing revitalization of the area. The project is in an area that has lacked significant economic improvement and will create opportunities for residents to work near where they live and reduce traffic congestion on area roads. The Northfax West project proposes the development of residential homes with a mix of townhouses, condominiums, and a senior living facility, as well as commercial space for businesses and visitors.

The Master Development Plan filed with the City on January 6, 2020 as part of the project's rezoning application is provided in Appendix D.

Best management practices: USACE and DEQ permit conditions require best management practices that protect water quality during and after construction. Permit conditions are included in the agency documentation provided in Appendix B.

Location and type of existing vegetation on site: The project area currently consists of two single family homes with mowed grass yards, two parking lots (approx. 3 acres) constructed of rolled stone over fabric, and approximately 4 acres of woodlands along the western project boundary (Figure 2). The 4-acre wooded area is composed of a mixed hardwood vegetation community located on upland landforms along existing stream channels. Native vegetation in the forest overstory includes tulip tree (*Liriodendron tulipifera*), red maple (*Acer rubrum*), eastern red cedar (*Juniperus virginiana*), and American sycamore (*Platanus occidentalis*). Understory species include American elm (*Ulmus americana*), American holly (*Ilex opaca*), spice bush (*Lindera benzoin*), and immature trees from the canopy. The understory is also infested with populations of non-native invasive species including Tatarian honeysuckle (*Lonicera tatarica*), multiflora rose (*Rosa multiflora*), Chinese privet (*Ligustrum sinense*), Oriental bittersweet (*Celastrus orbiculatus*), Japanese honeysuckle (*Lonicera japonica*), and English ivy (*Hedera helix*), among others.

The specific location and type of existing trees on the site was documented in the Tree Management Plan submitted as part of the project's Master Development Plan (Appendix D), which was officially filed with the City on January 6, 2020 as part of the owner's rezoning application.

Revegetation plan: Project improvements require that woodlands in the western portion of the project area be removed in order to support the purpose and need of the project. No revegetation within the onsite CBPA features is being proposed, because compensatory mitigation will be provided for stream and riparian buffer impacts via the purchase of 1,675 stream credits or 4,761 Stream Condition Units from a DEQ approved mitigation bank and/or in-lieu fee fund. The stream credits include a 100-foot riparian buffer that extends from the banks of the stream being credited as compensation for this project. Therefore, no net loss of RPA functions, values or area will occur. In

addition, the plans will adhere to the Total Maximum Daily Load (TMDL) requirements, where a development project's post-development nutrient loading cannot exceed its pre-development nutrient loading.

Certifications: Information has been determined complete and accurate by a Class IIIB certified land surveyor and professional wetlands delineator. Certification information for the project is provided below.

- Certified Land Surveyor: Christopher Consultants; Christopher Fillmore, LS; License Number # 2607
- Professional Wetland Delineator: Apex Companies, LLC; John H. Brooks, III, PWD; Certification # 3402000003

5.1 Hydrogeologic Elements

Existing Topography: As shown on Figure 1, the topography within the project area generally slopes to the southeast and along an unnamed tributary of Accotink Creek. Undeveloped portions of the project area that surround the tributary slope gradually toward the tributary. Developed areas are mostly flat due to asphalt pavement in parking lots. Existing topographic contours and elevations are also shown on project plans in Appendix C and Appendix D.

Soil Characteristics and Potential for Erosion: As stated in the *Description and Interpretive Guide to Soils in Fairfax County* (2013), erosion potential is a metric that applies to soils under construction site conditions and includes ratings of low, moderate, and high. Soil characteristics related to erosion potential are summarized below:

- Low: Soils are not highly erodible except on steep unprotected cuts. Erosion of less than 0.05 inches from sheet-flow runoff can be expected on unprotected soils during a severe storm.
- Moderate: Soils are moderately erodible on B slopes and highly erodible on C slopes or greater. Erosion of 0.05 to 0.25 inches from sheet-flow runoff plus rill and shallow gully erosion can be expected on unprotected soils during a severe storm.
- High: Soils which are highly erodible even on B slopes. Soil loss in excess of 0.25 inches from sheet-flow runoff erosion and the formation of numerous gullies can be expected on unprotected soils in a severe storm.

The Soil Survey of the City of Fairfax, accessed through the Web Soil Survey on the Natural Resources Conservation Service (NRCS) website, shows five soil maps units within the project area. Each soil map unit and its corresponding erosion potential are depicted in Table 1.

Table 1: Northfax West Project Soil Erosion Potential Summary

Map Unit	Map Unit Name	Erosion Potential
95	Urban Land	NA
101	Urban land – Wheaton complex	High
103A	Wheaton-Cordorus complex, 0-2% slopes	Low
105B	Wheaton-Glenelg complex, 2-7% slopes	High
107B	Wheaton-Meadow complex, 2-7% slopes	Medium

Source: Description and Interpretive Guide to Soils in Fairfax County (2013)

The results of site-specific assessments for stream bank erosion potential conducted by Apex using the BEHI protocol are presented in Section 5.3.

Hydrology of the Area: Evidence of hydrologic activity is confined primarily to the banks of the stream channels on site. The primary drainage through the site is to the southeast in an unnamed tributary of Accotink Creek. One other

channel along the south side of the site carries flow from a storm drain system to the primary channel. Overland runoff and groundwater discharge provide a minimal amount of input. Two streams were identified as containing potentially jurisdictional waters. Stream "A" (perennial) is centrally located on the property and carries flow in a southeasterly direction. Stream "B" (intermittent) is located along the southern property boundary and has an onsite confluence with Stream "A".

The site has a history of flooding near the intersection of Fairfax Boulevard (Route 50) and Chain Bridge Road (Route 123) caused by undersized culverts and increased impervious area from offsite development. The drainage area reported in the JPA for the Northfax West project was 260.2 acres. Maps depicting stream locations and watershed hydrology are provided in Appendix C.

Impacts on Wetlands and Streams: No wetlands were identified within the project area, and stream impacts permitted by the USACE and DEQ are listed in Table 2.

Table 2: Permitted Impacts to Surface Waters for the Northfax West Project

Impact #	Impact Type	Stream Type	Impact Amount
A1	Permanent – Fill	R3 (Perennial)	797 LF (11,096 SF/0.25 Ac)
A2	Permanent – Fill	R3 (Perennial)	312 LF (3,780 SF/0.09 Ac)
A3	Permanent – Fill	R3 (Perennial)	295 LF (2,989 SF/0.07 Ac)
B1	Permanent – Fill	R4 (Intermittent)	345 LF (4,488 SF/0.10 Ac)
		Total:	**1,749 LF (22,353 SF/0.51 Ac)**

Each impact area is visually depicted on project plans found in Appendix C and summarized below:

- Impact A1, from the upstream end down to the confluence with Segment B1, will result in redirection of the perennial stream from its current location into twin 8-foot box culverts. The culverts will traverse the site as shown on the attached grading plan and join with existing twin 8-foot box culverts on the west side of Route 123. Fill material will be placed in the abandoned stream channel.
- Impact A2, from the confluence with Segments A1/B1, will result in redirection of the perennial stream from its current location into twin 8-foot box culverts. The culverts will traverse the site as shown on the attached grading plan and join with existing twin 8-foot box culverts on the west side of Route 123. Fill material will be placed in the abandoned stream channel.
- Impact A3, will result in removal of the newly constructed riprap inlet structure prior to joining the proposed twin 8-foot box culverts to the existing culverts. Fill material will be placed in the abandoned channel.
- Impact B1 will result in connecting the existing 42-inch RCP with a proposed 72-inch RCP that will discharge into the proposed box culverts. Fill material will be placed in the abandoned stream channel.

Proposed Mitigation Measures. According to the JPA and agency permits (Appendix B), lack of suitable buffer area for preservation prevents the reduction of required mitigation through onsite preservation. As such, the DEQ permit states that the permittee will "compensate for permanent stream impacts through the purchase of 1,675 stream credits or 4,761 Stream Condition Units from a DEQ approved mitigation bank, in-lieu fee fund, or a combination thereof that is authorized and approved by DEQ to sell credits in the area in which the impacts will occur and has credits available (as released by DEQ)." The purchase of stream credits provides mitigation for the impacts to the stream, as well as impacts to the riparian buffer (including the RPA buffer).

Existing Permits: A Joint Permit Application was submitted on June 22, 2018. The Northfax West project was permitted via VWP Individual Permit Number 18-1003 from the DEQ on March 5, 2019, and satisfied the terms and

conditions contained in the USACE's, Norfolk District State Program General Permit (17-SPGP-01), which remains effective until May 31, 2022. The Site Plan Application, Virginia Stormwater Management Program (VSMP) application, and Tree Removal Permit Application are in the process of being submitted. Agency documentation for state and federal permits is provided in Appendix B.

5.2 Landscape Elements

Existing Trees and Tree Management: The woodlands onsite can be characterized as an early successional tulip tree forest association with a mixed overstory composition of tulip tree, red maple, and American elm. Understory species include tulip tree, American elm, eastern red cedar, spice bush, Tatarian honeysuckle, multiflora rose, and Chinese privet. Tree and shrubs are also commonly found with woody vine populations composed of dense infestations of invasive species such as oriental bittersweet, Japanese honeysuckle, and English ivy.

Per the JPA submitted in June 2018 and the resulting USACE and DEQ permits, the preservation of existing trees was considered infeasible to meet the purpose and need of the project. However, compensatory mitigation will be provided for all stream and riparian buffer impacts via the purchase of stream and buffer credits from an approved mitigation bank. The stream credits include a 100-foot riparian buffer that extends from the banks of the stream being credited as compensation for this project. Therefore, no net loss of RPA functions, values, or area will occur.

The Tree Management Plan from the project's Master Development Plan is included in Appendix D. The plan shows trees proposed for preservation and removal throughout the project area. Invasive species management will be achieved through the removal of non-native invasive shrub and vine species found in existing woodlands onsite.

Limits of Clearing and Grading: Project plans (Appendix C and Appendix D) depict the limits of clearing and grading for the proposed project.

Trees and indigenous Vegetation Preservation: The Tree Management Plan for the Northfax West project is provided on Sheet 3 through Sheet 3D of the Master Development Plan (Appendix D). The plan identifies all trees proposed for preservation and removal, a tree management schedule, and details for standard tree protection. Invasive species management will be achieved through the removal of non-native invasive shrub and vine species found throughout the existing woodlands onsite.

Vegetative Measures Used to Enhance Water Quality: New plantings will occur as part of the proposed development in accordance with City landscaping requirements.

Construction Schedule: A proposed construction schedule that includes all activities related to clearing, grading and proposed plantings will accompany the site plan application for the Northfax West project. Additional details of project construction are shown on the project plans (Appendix C and Appendix D).

5.3 Other Measures

Apex performed a BEHI and NBS study on December 16, 2019 for the streams in the project area. The full results of the study, including maps of stream locations and assessment points, is provided in Appendix E. For BEHI assessment each stream bank was evaluated for the degree of erosion potential (e.g., extreme, very high, high, moderate, or low). Table 3 provides a summary of the BEHI results for Stream A1 and Stream A2.

Table 3: Summary of BEHI Results for the Northfax West Project

Stream ID	Erosion Hazard Potential			
	Extreme	Very High	High	Low
Stream A1	321 LF	1,192 LF	434 LF	735 LF
Stream A2	217 LF	311 LF	290 LF	0 LF
Total	538 LF	1,503 LF	724 LF	735 LF

The NBS data collected for each stream was assessed to predict potential sediment and nutrient loading caused by near bank stress associated with the BEHI assessed bank conditions. Apex estimated the potential for approximately 3,036 tons/year (or 6,072,860 lbs/year) of Total Suspended Sediment (TSS), 0.13 tons/year (or 260 lbs/year) of Total Nitrogen (TN), and 0.12 tons/year (or 240 lbs/year) of Total Phosphorus (TP) caused by stream erosion. Apex anticipates that the sediment and nutrient loads resulting from the stream bank erosion will continue to occur until action is taken to reduce the flow and the associated NBS. The redirection of flow and piping of the base flow and stormwater associated with the stream will eliminate the stream bank erosion and thus the associated sediment and nutrient inputs.

6.0 Conclusions and Recommendations

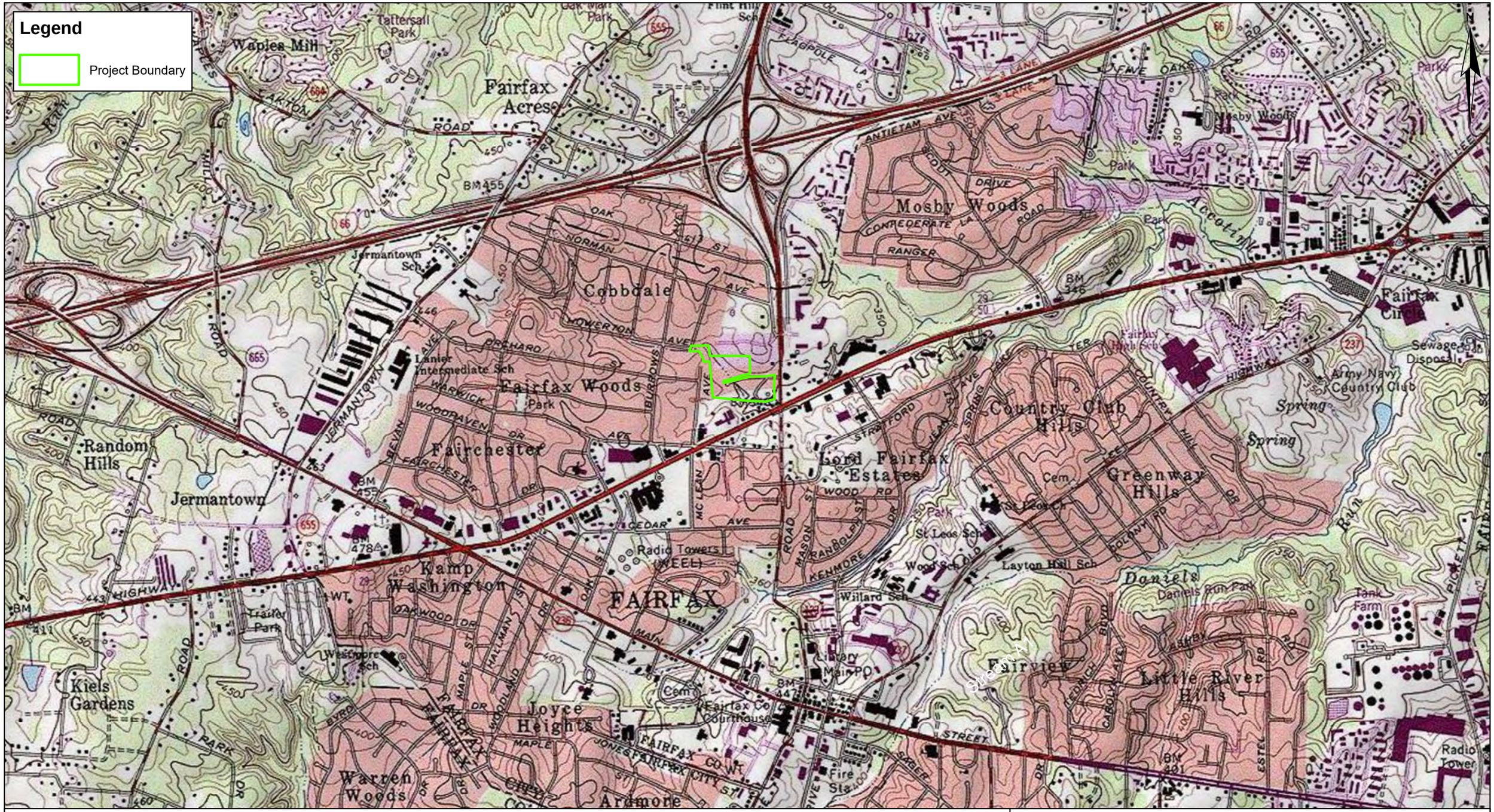
Based on the City's Chesapeake Bay Preservation ordinance, this report satisfies the City's review and evaluation requirements in Section 4.18 of the Zoning Ordinance for a Major WQIA. Upon the completed review of a WQIA application, the City's Zoning Administrator will determine if the Northfax West development is consistent with the purpose and intent of Section 4.16 of the Zoning Ordinance based upon the following criteria:

- The disturbance of any wetlands is minimized;
- The development will not result in significant disruption of the hydrology of the site;
- The development will not result in significant degradation to aquatic life;
- The development will not result in unnecessary destruction of plant materials on site;
- Proposed erosion and sediment control concepts are adequate to achieve the reductions in runoff and prevent off site sedimentation;
- Proposed stormwater-management measures are adequate to control the stormwater runoff to achieve the required performance standard for pollutant control;
- Proposed revegetation of disturbed areas will provide optimum erosion and sediment control benefits;
- The development, as proposed, is consistent with the purpose and intent of §4.16;
- The cumulative impact of the proposed development, when considered in relation to other development in the vicinity, both existing and proposed, will not result in a significant degradation of water quality.

In summary, the Northfax West project proposes to impact perennial and intermittent streams by piping them under the proposed mixed-use development to tie into the existing twin box culverts near Route 123 (installed by the City and VDOT). Based on Apex's onsite assessments to determine erosion potential, the Northfax West project pipe system will eliminate potential sources of stream bank erosion to include the extreme and very high erosion along existing stream channels. The pipe system will also help to control flooding and reduce the adverse effects of uncontrolled stormwater discharge including a reduction of TSS, TN, and TP transported from the project area to downstream waters within the Chesapeake Bay watershed. Due to the compensatory mitigation provided under USACE and DEQ permits, no net loss of RPA functions, values, or area will occur. In addition, the plans will adhere to the Total Maximum Daily Load (TMDL) requirements, where a development project's post-development nutrient loading cannot exceed its pre-development nutrient loading.

The completed WQIA Application provided in Appendix A documents that each of the City's criteria for a Major WQIA have been satisfied. Considering the water quality investigations conducted by Apex for the Northfax West project, the Section 404/401 water quality permits authorized by the USACE and DEQ, and the results presented in this WQIA report, it is Apex's opinion that the Northfax West project will improve water quality in the Chesapeake Bay.

Figures



Apex Companies, LLC
203 Wylderose Ct, Midlothian, VA 23113
Phone: 804-897-2718
www.apexcos.com

Northfax West
City of Fairfax, Virginia

Figure 1
Project Location Map

0 0.25 0.5 1 Miles

Drawn By: Rob LaPosa
01/16/2020

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

38°5'33.44"N
77°18'36.93"W

Apex Companies, LLC
203 Wylderose Ct, Midlothian, VA 23113
Phone: 804-897-2718
www.apexcos.com

Northfax West
City of Fairfax, Virginia

Figure 2
Project Vicinity Map

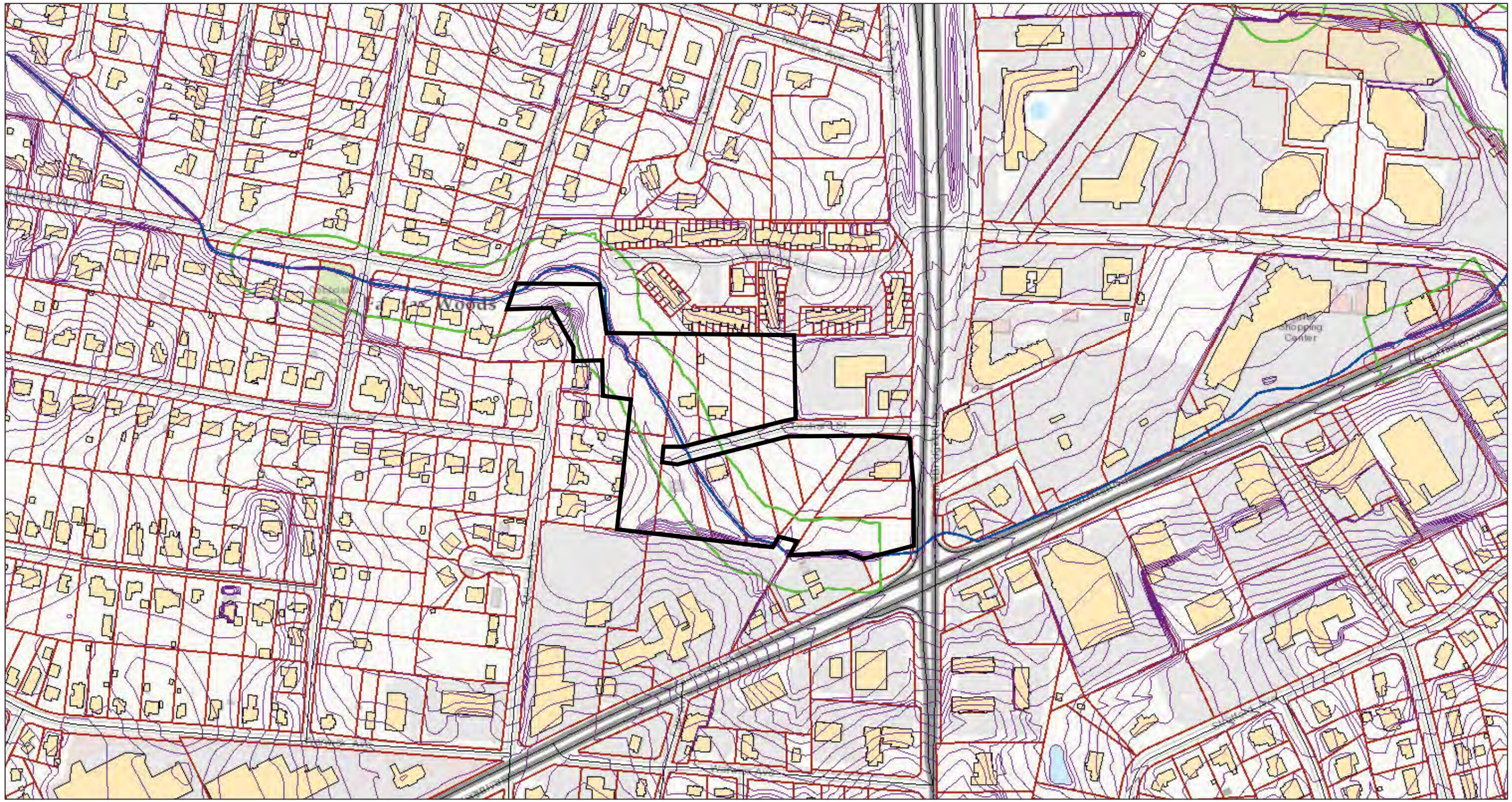
0 0.025 0.05 0.1 Miles

Drawn By: Rob LaPosa
01/16/2020

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

38°5'33.44"N
77°18'36.93"W

Figure 3: City of Fairfax RPA Map



October 25, 2016

1:4,514

- Contour Lines (2 foot intervals)
- Parcels
- Streets
- Streams
- Buildings
- Resource Protection Areas
- City Limits

0 0.05 0.1 0.2 mi

0 0.075 0.15 0.3 km

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

City of Fairfax

County of Fairfax, County of Prince William, VITA, Esri, HERE, DeLorme, INCREMENT P, Intermap, USGS, EPA, USDA |

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Northfax West
City of Fairfax, Virginia

Figure 4
Resource Protection Area Map

0 175 350 700 Feet

Drawn By: Rob LaPosa (01/17/2020)
Reviewed By: John Brooks (1/28/2020)

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

38°5'33.44"N
77°18'36.93"W

Appendices

Appendix A – WQIA Application

City of Fairfax – Community Development and Planning
10455 Armstrong Street #207A Fairfax, VA 22030
Phone: 703-385-7820 Fax: 703-385-7824

Application #:_____

WATER QUALITY IMPACT ASSESSMENT (WQIA) APPLICATION

☐ Single Family Residential $ 115.00 / ☐ Other: $ 350.00

- NON REFUNDABLE FEE -

1. JOB LOCATION INFORMATION:

Job Location Address __10510 Orchard St. Fairfax, Virginia 22030_____

Project Name _ _Northfax Project_____

Tax Map #__See attached document for list of tax map #'s_____ _____

2. APPLICANT INFORMATION:

Name _Northfax JV LLC c/o The Lann Companies_____

Address _3900 Jermantown Rd., Suite 300, Fairfax VA, 22030 _____

Phone _(703) 934-4600_____Email_ _john@lann.com

3. PROPERTY OWNER INFORMATION: (Same as Applicant ☐)

Name __Northfax JV, LLC c/o The Lann Companies_____

Address _ 3900 Jermantown Rd., Suite 300, Fairfax VA, 22030_ _____ _

Phone___(703) 934-4600_____Email____john@lann.com_____

4. LAND SURVEYOR: (Same as Applicant ☐)

Name ___Christopher Consultants; Attn: Christopher Fillmore, LS; License No. 2607

Address___9900 Main St., Suite 400, Fairfax, VA, 22031_____

Phone ____(703) 273-6820_____Email___chrisfillmore@ccl-eng.com_____

5. WETLANDS EXPERT: (Same as Applicant ☐)

Name ___Apex Companies, LLC; Attn: John Brooks, III, PWD; Certification No. 3402000003

Address__203 Wylderose Ct., Midlothian, VA 23113_____

Phone ___(804) 897-2718_____Email__John.Brooks@apexcos.com_____

-Continued on Next Page-

The City of Fairfax is committed to the letter and spirit of the Americans with Disabilities Act. To request a reasonable accommodation for any type of disability, please call 703-385-7930, (TTY 711)

The Water Quality Impact Assessment is conducted to identify the impacts of proposed development on water quality and lands within resource protection and resource management areas; to ensure that where development does take place it is located on those portions of a site and in a manner that is least disruptive to the natural functions of the land and to specify mitigation measures to address water quality protection.

The applicant shall submit a WQIA in accordance with §110-4.18.8.B for:

1. Any proposed land disturbance , development or redevelopment within a resource protection area including any buffer area modification or reduction as provided for in §110-4.18.7; or
2. Any proposed development or redevelopment in the resource management area that may significantly impact water quality due to the unique characteristics of the site or intensity of the proposed use or development, as determined by the zoning administrator in accordance with §110-4.18 and §110-4.18.4.D

I. <u>Development Characteristics</u>

You must submit either a minor or major WQIA for your project unless you receive a waiver. The below conditions will determine whether you submit a major or minor WQIA.

Submit a **Minor WQIA** if you answer "Yes" to either of these development characteristics (§110-4.18.8.C)

_____ 5,000 square feet of disturbance or less

_____ Encroachment onto the landward 50 feet of the 100-foot buffer area **(Skip to**

<u>Section III, Minor WQIA Requirements</u>)

Submit a **Major WQIA** if you answer "Yes" to any of these development characteristics (§110-4.18.8.D)

YES Over 5,000 square feet of disturbance

YES Encroachment onto the seaward 50 feet of the 100-foot RPA buffer area

_____ Location in the resource management area and is deemed necessary by the Zoning Administrator.

(Skip to Sec<u>tion IV, Major WQIA Requirements</u>)

II. WQIA Waivers

_____ Check here if you plan to submit a WQIA waiver request.

To submit a WQIA waiver request, attach a report detailing how the proposed development or redevelopment does not significantly impact water quality.

III. Minor WQIA Requirements (§110-4.18.8.C)

The minor WQIA calculations will demonstrate that the remaining buffer area and best management practices will result in removal of no less than 75 percent of sediments and 40 percent of nutrients from post development stormwater runoff.

Requirements for a minor WQIA scaled site drawing include:

1) Location of the components of any RPA, including the 100 foot buffer area;
2) Location and nature of proposed improvements, including:
    a. Type of paving material;
    b. Areas of clearing or grading;
    c. Location of any structures, drives, or other impervious cover; and
    d. Sewage disposal systems or reserve drain field sites;
3) Type and location of proposed best management practices to meet the required general performance standards specified in §110-4.18.7;
4) Location of existing vegetation on site, including the number and type of trees and other vegetation to be removed to accommodate the encroachment or modification; and
5) A revegetation plan that supplements the existing buffer vegetation in a manner that provides for pollutant removal, erosion and runoff control.
6) Certification of all required information as complete and accurate by a Class IIIB certified land surveyor and professional wetlands delineator.

IV. Major WQIA Requirements (§110-4.18.8.D)

Requirements for a major WQIA include:

1) All of the information required in a minor WQIA (Section III above);
2) Hydrological element that describes:
    a. Existing topography;
    b. Estimates of soil characteristics and potential for erosion;
    c. Hydrology of the area;
    d. Impacts on wetlands and streams;
    e. Proposed mitigation measures; and
    f. A listing of requisite permits with permit or application status.

3) Landscape element that fully describes:
    a. Existing trees required to be identified as part of a Tree Management Plan in accordance with subsection §110-4.5.9.D.1;
    b. Limits of clearing and grading;
    c. Trees and indigenous vegetation that are to be preserved within the disturbed area;
    d. Measures to be taken to protect vegetation, proposed plantings and other vegetative measures used to enhance water quality; and
    e. A proposed construction schedule that includes all activities related to clearing, grading and proposed plantings.

4) Such other measures as deemed necessary by the Zoning Administrator to ensure the impact to water quality can be accurately predicted; and
5) Certification of all required information as complete and accurate by a Class IIIB certified land surveyor and professional wetlands delineator.

V. <u>Evaluation Procedure (§110-4.18.8.F)</u>

Minor WQIA

The Zoning Administrator shall determine if any proposed modification or reduction to the buffer area is consistent with the provisions of this division and make a finding based upon the following criteria:

4.18.8.F.1	Minor WQIA Criteria	Satisfied (Y/N)
a.	The proposed encroachment is necessary and there is no other location on site to place improvements without disturbing the buffer area.	
b.	The impervious surface is minimized.	
c.	The proposed best management practices, where required, achieve the requisite reductions in pollutant loadings.	
d.	The development, as proposed, meets the purpose and intent of §110-4.18	
e.	The cumulative impact of the proposed development, when considered in relation to other development in the vicinity, both existing and proposed, will not result in a significant degradation of water quality.	
f.	Any other information deemed necessary by the Zoning Administrator.	

Major WQIA

The Zoning Administrator shall determine if the proposed development is consistent with the purpose and intent of this division and make a finding based upon the following criteria:

4.18.8.F.2	Major Water Quality Criteria	Satisfied (Y/N)
a.	The disturbance of any wetlands is minimized.	Y
b.	The development will not result in significant disruption of the hydrology of the site.	Y
c.	The development will not result in significant degradation to aquatic life.	Y
d.	The development will not result in unnecessary destruction of plant materials on site.	Y
e.	Proposed erosion and sediment control concepts are adequate to achieve the reductions in runoff and prevent off site sedimentation.	Y
f.	Proposed stormwater-management measures are adequate to control the stormwater runoff to achieve the required performance standard for pollutant control.	Y
g.	Proposed revegetation of disturbed areas will provide optimum erosion and sediment control benefits.	Y
h.	The design and location of any proposed drain field will be in accordance with the general performance standards outlined in §110-4.18.7.	N/A
i.	The development, as proposed, is consistent with the purpose and intent of §110-4.16.	Y
j.	The cumulative impact of the proposed development, when considered in relation to other development in the vicinity, both existing and proposed, will not result in a significant degradation of water quality.	Y

OFFICE USE ONLY

Receipt # _____ ☐ $115.00 ☐ $350.00

*** OFFICE APPROVAL SIGNATURE***

This Application is Approved By_____Date_____

Special Projects Engineer

Tax Map #'s

57 2 08 005
57 2 08 006
57 2 08 007
57 2 08 008
57 2 08 010
57 2 08 011
57 2 08 012
57 2 08 013
57 2 08 014
57 2 07 015 B
57 2 47 000 A
57 2 02 003
57 2 02 005
57 2 02 017
57 2 02 018
57 2 02 019
57 2 02 020

Appendix B – Agency Documentation

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

February 5, 2018

PRELIMINARY JURISDICTIONAL DETERMINATION

Northern Virginia Regulatory Section
NAO-2017-02192 (Northfax Project)

Northfax JV LLC
c/o The Lann Companies
Attn: Mr. John Napolitano
3900 Jermantown Road, Suite 300
Fairfax, Virginia 22030

Dear Mr. Napolitano:

This letter is in regard to your request for a verification of a preliminary jurisdictional determination for waters of the U.S. (including wetlands) on property known as the Northfax Project, located on 16 parcels on approximately 10.3 acres, northwest quadrant at the intersection of Chain Bridge Road (Route 123) and Fairfax Boulevard (U.S. Routes 29/50) in the City of Fairfax, Virginia.

The map entitled "Northfax Project", by Christopher Consultants and submitted by Apex Companies, LLC dated December 4, 2017 and revised January 19, 2018 (*copy enclosed)* provides the location of waters and/or wetlands on the property listed above. The basis for this delineation includes the presence of an ordinary high water mark. This letter is not confirming the Cowardin classifications of these aquatic resources.

Discharges of dredged or fill material, including those associated with mechanized landclearing, into waters and/or wetlands on this site may require a Department of the Army permit and authorization by state and local authorities including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC) and/or a permit from your local wetlands board. This letter is a confirmation of the Corps preliminary jurisdiction for the waters and/or wetlands on the subject property and does not authorize any work in these areas. Please obtain all required permits before starting work in the delineated waters/wetland areas.

This is a preliminary jurisdictional determination and is therefore not a legally binding determination regarding whether Corps jurisdiction applies to the waters or wetlands in question. Accordingly, you may either consent to jurisdiction as set out in this preliminary jurisdictional determination and the attachments hereto if you agree with the determination, or you may request and obtain an approved jurisdictional determination.

"This preliminary jurisdictional determination and associated wetland delineation map may be submitted with a permit application."

Enclosed is a copy of the "Preliminary Jurisdictional Determination Form". Please review the document, sign, and return one copy to Ms. Theresita Crockett-Augustine either via email (**theresita.m.crockett-augustine@usace.army.mil**) or via standard mail to US Army Corps of Engineers, Northern Virginia Field Office at 18139 Triangle Plaza, Suite 213, Dumfries, Virginia 22026 within 30 days of receipt and keep one for your records. This delineation of waters and/or wetlands is valid for a period of five years from the date of this letter unless new information warrants revision prior to the expiration date.

If you have any questions, please contact Ms. Theresita Crockett-Augustine at (703) 221-9736 or **theresita.m.crockett-augustine@usace.army.mil**.

Sincerely,

Theresita Crockett-Augustine
Environmental Scientist
Northern Virginia Regulatory Section

Enclosures

AUGUSTINE.THERESITA.CROCKETT.1230827040

Digitally signed by AUGUSTINE.THERESITA.CROCKETT.1230827040
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=AUGUSTINE.THERESITA.CROCKETT.1230827040
Date: 2018.02.05 16:42:10 -05'00'

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION:

A. REPORT COMPLETION DATE FOR PJD: February 5, 2018

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:
Northfax JV LLC
c/o The Lann Companies
Attn: Mr. John Napolitano
3900 Jermantown Road, Suite 300
Fairfax, Virginia 22030

DISTRICT OFFICE, FILE NAME, AND NUMBER: NAO, **Northfax Project**, 2017-02192

C. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: (USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)

State: **VIRGINIA** County/parish/borough: Fairfax City: Fairfax

Center coordinates of site (lat/long in degree decimal format):

Latitude: 38.859 ° N Longitude: - 77.309 ° W

Universal Transverse Mercator:

Name of nearest waterbody: UT to Accotink Creek

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☐ Office (Desk) Determination. Date:
☒ Field Determination. Date(s): 01/19/18

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
1			2,064 LF	RPW	Section 404
2					
3					

1. The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre- construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "may be" waters of the U.S. and/or that there "may be" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items.

☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map:

☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.

☒ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report. Rationale:

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☐ U.S. Geological Survey Hydrologic Atlas: USGS

☐ NHD data.

☐ USGS 8 and 12 digit HUC maps.

☒ U.S. Geological Survey map(s). Cite scale & quad name:

☒ Natural Resources Conservation Service Soil Survey. Citation:

☒ National wetlands inventory map(s). Cite name:

☒ State/Local wetland inventory map(s):

☐ FEMA/FIRM maps:

☐ 100-year Floodplain Elevation: (National Geodetic Vertical Datum of 1929)

☒ Photographs ☒ Aerial (Name & Date):

or ☒ Other (Name & Date):

☐ Previous determination(s):

File no. and date of response letter:

☐ Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

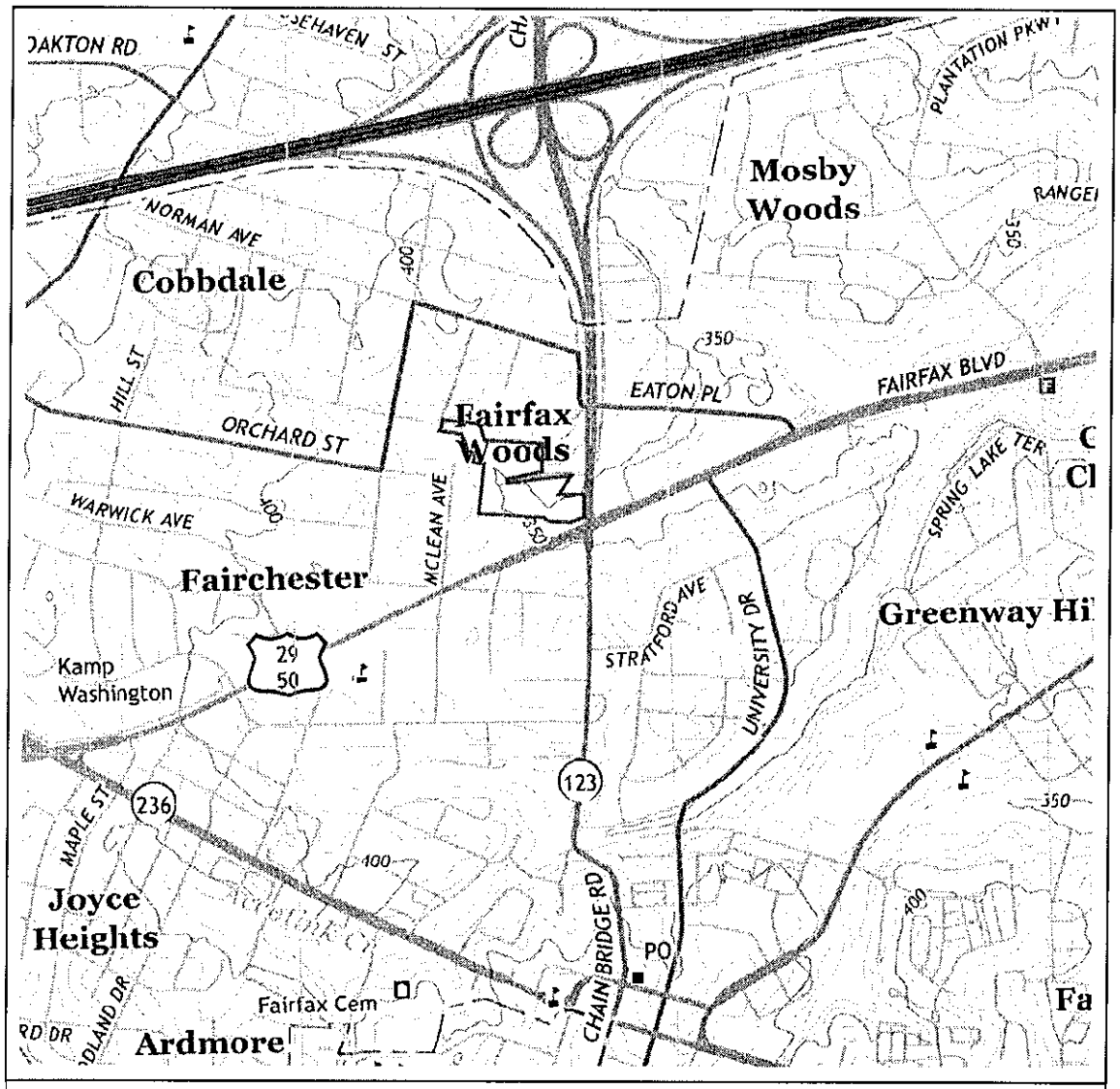
AUGUSTINE.THERESITA.CROCKETT.1230827040

Digitally signed by AUGUSTINE.THERESITA.CROCKETT.1230827040
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=AUGUSTINE.THERESITA.CROCKETT.1230827040
Date: 2018.02.05 16:41:37 -05'00'

Signature and date of Regulatory staff member completing PJD

Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

1 Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.



Scale: Not to Scale

Date: USGS Quadrangle 2013

Apex Companies LLC.
8854 Rixlew Lane
Manassas, VA 20109

APEX

© Apex Companies LLC

USGS Quadrangle Map
Northfax
38.859309 N/ -77.310054 W
Fairfax USGS Quadrangle
Fairfax County, VA

Prepared for:
Northfax JV LLC c/o The Lann Companies
3900 Jermantown Road – Suite 300
Fairfax, VA 22030

Scale: Metric Scale

Date: USGS Quadrangle 2012

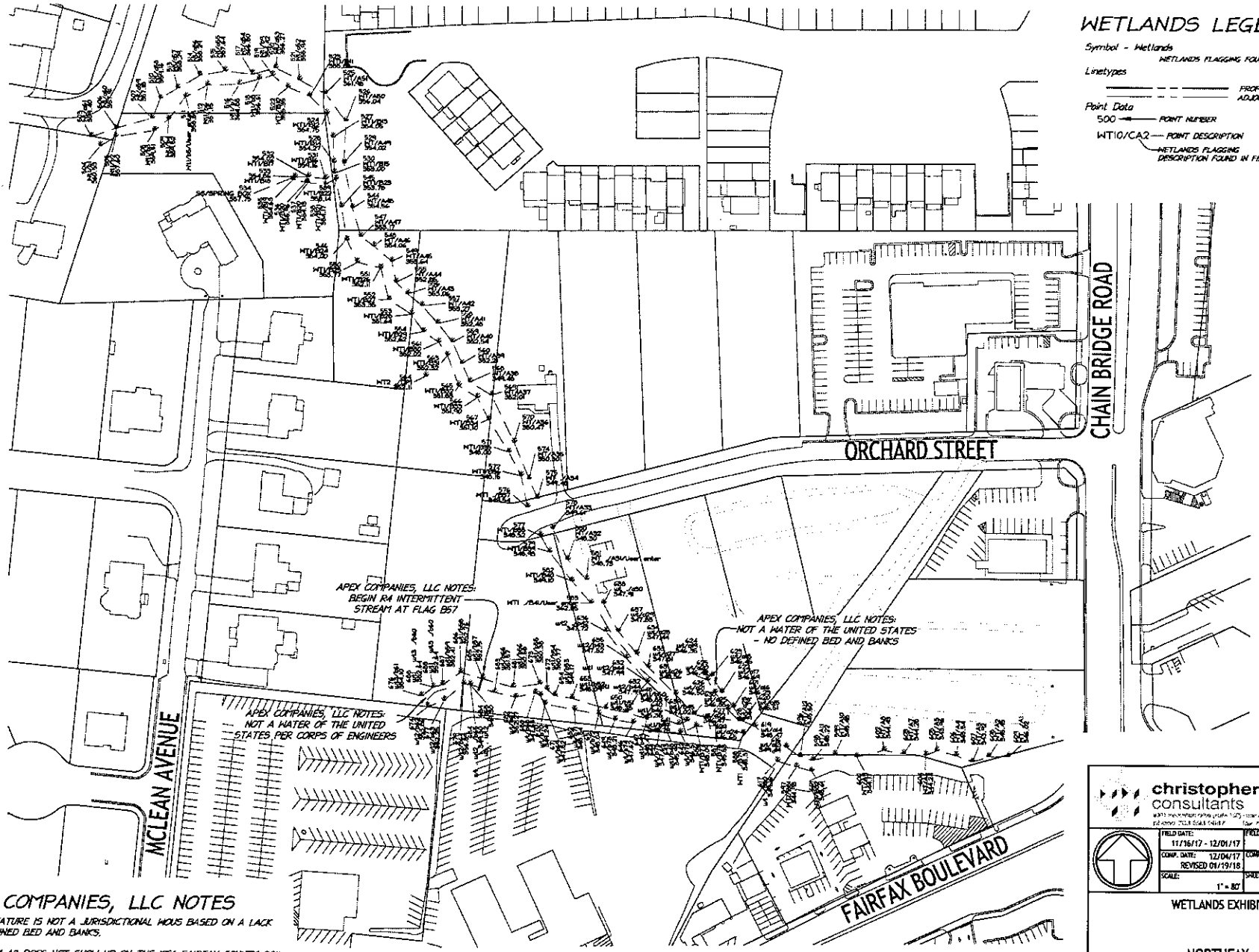
Apex Companies LLC.
8554 Rieker Lane
Manassas, VA 20109

APEX

© Apex Companies LLC

USGS Aerial Map
Northfax
Section 10 (Portions of)
Fairfax USGS Quadrangle
Fairfax County, VA

Prepared for:
Northfax IV LLC c/o The Lane Companies
2900 Jermantown Road – Suite 200
Fairfax, VA 22030



APEX COMPANIES, LLC NOTES

1. THIS FEATURE IS NOT A JURISDICTIONAL WOUS BASED ON A LACK OF DEFINED BED AND BANKS.
2. STREAM A2 DOES NOT SHOW UP ON THE 1986 FAIRFAX COUNTY SOIL SURVEY AND IT IS SUSPECTED THAT THE CHANNEL WAS CUT BY STORMWATER RUNOFF DISCHARGED BY THE CITY STORMWATER SYSTEM.

LEGEND:
STAKED POINT LOCATION (SEE STAKED POINT LEGEND BELOW)
6,000 — STAKED POINT NUMBER (DESCRIPTION)
300.00 — STAKED POINT ELEVATION (STAKE ELEV.)
BLD — STAKED POINT DESCRIPTION

THIS EXHIBIT IS FOR GRAPHICALLY DEPICTING THE STAKEOUT LOCATIONS ONLY.
THIS EXHIBIT MAY NOT SHOW ALL DESIGN INFORMATION.
PLEASE REFERENCE THE FOLLOWING CONSTRUCTION PLAN FOR ALL PERTINENT DESIGN INFORMATION:
DESIGN PLAN: WETLANDS EXHIBIT
PLAN DATE: 11/15/17
COUNTY #: N/A
APPROVED ON: N/A
DESIGNED BY: APEX COMPANIES, LLC

christopher consultants
EX-01

FIELD DATE: 11/16/17 - 12/01/17	FIELD CREW: W. OSBURN
COMP. DATE: 12/04/17 REVISED 01/19/18	COMP. BY: M. SMITH R. CEBRICK
SCALE: 1" = 80'	SHEET: 1 OF 1

WETLANDS EXHIBIT

NORTHFAX

CITY OF FAIRFAX, VIRGINIA

F:\Projects\31230006\05\SURVEY\5\Topo\-Archived\5\Topo NAD83 NOV2019 - HS.dwg, 1/19/2018 12:45:08 PM, richardson.h, 1:1, christopher consultants, inc.

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703)583-3800
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director
(804) 698-4000

Thomas A. Faha
Regional Director

March 5, 2019

Mr. John E. Napolitano, Manager
Northfax JV LLC
3900 Jermantown Road, Suite 300
Fairfax, Virginia 22030

SENT VIA E-MAIL: john@lann.com
RECEIPT CONFIRMATION REQUESTED

RE: State Program General Permit (17-SPGP-01) Authorization
Permit Number: 18-1003
Northfax, City of Fairfax, Virginia

Dear Mr. Napolitano:

The Virginia Department of Environmental Quality (DEQ) has received and completed technical review of your application request dated June 22, 2018, and received June 25, 2018. Based on DEQ's technical review, DEQ has determined the proposed project satisfies the terms and conditions contained in the USACE's, Norfolk District State Program General Permit (17-SPGP-01). You are required to adhere to all terms and conditions contained within the attached 17-SPGP-01 and any Special Conditions listed below. Your 17-SPGP-01 verification is effective as of the date on this letter and remains effective until **May 31, 2022**.

The impacts are associated with the construction of a mixed-use development and associated infrastructure on an approximately 10.6 acre development site.

The applicant is hereby authorized to permanently impact 0.50 acre (1,646 linear feet) of stream channel.

The conceptual mitigation plan submitted with your application indicated that mitigation will include the purchase of 1,675 stream credits or 4,761 Stream Condition Units. This mitigation shall be completed and documentation shall be submitted to DEQ prior to commencement of project impacts.

This letter shall serve as verification to proceed with the project as proposed. The permittee shall be responsible for contacting DEQ to revise this verification, including provisions for compensatory mitigation, if the location or amount of the impacts changes.

Please contact Wynn Prusaczyk by phone at (703) 583-3871 or email at Wynn.Prusaczyk@deq.virginia.gov if you have any questions or concerns regarding the information contained herein.

Respectfully,

Trisha M. Beasley

Trisha M. Beasley, Regional VWPP Program Manager

Attachments: 17-SPGP-01

Cc (via E-mail):

Mr. Jason Franti, Apex Companies, LLC
Mr. Jim Irre, Apex Companies, LLC
Ms. Theresita Crockett-Augustine, USACE, Northern VA Field Office

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

CENAO-WRR STATE PROGRAMMATIC GENERAL PERMIT 17-SPGP-01

Effective Date: June 29, 2017 Expiration Date: May 31, 2022

I. **AUTHORITIES**:

A. 17-SPGP-01 authorizes the discharge of dredged or fill material in non-tidal waters, of the United States, including wetlands, associated with certain residential, commercial, and institutional developments and linear transportation projects within the geographical limits of the Commonwealth of Virginia and under the regulatory jurisdiction of the U.S. Army Corps of Engineers, Norfolk District (Corps or Norfolk District). These projects must have no more than minimal individual and cumulative impacts and must meet all the terms and conditions outlined herein. The use of 17-SPGP-01 is restricted to those projects that have avoided and minimized impacts to waters of the U.S., including wetlands, to the maximum extent practicable.

B. The people of the Commonwealth of Virginia (Virginia or "the Commonwealth") are hereby authorized by the Secretary of the Army and the Chief of Engineers, under Section 404 of the Clean Water Act (CWA) (33 U.S.C. § 1344), to perform the aforementioned work in non-tidal waters and wetlands of the Commonwealth as described herein. The Corps' authority and guidance to develop general permits is contained in 33 U.S.C. § 1344(e), 33 C.F.R. § 325.2(e)(2), 33 C.F.R. § 325.3(b), and Corps Regulatory Guidance Letter (RGL) 83-7.

II. **PROCEDURES**:

A. Delineation Confirmations: Prior to the submission of an application for any Residential, Commercial, or Institutional Development Activity or Linear Transportation Activity covered by 17-SPGP-01, a proponent must first obtain a Corps confirmed delineation that is approved for use with a permit application (Preliminary JD) or a confirmed jurisdictional determination that includes the limits of all waters of the U.S., including wetlands that are located within the project boundaries (Approved JD). The applicant will contact the Corps to obtain a delineation confirmation/jurisdictional determination. When appropriate, a separate delineation confirmation may also be required from the Environmental Protection Agency (EPA).

B. Application: The application must be submitted to the Virginia Marine Resource Commission (VMRC) and clearly marked 17-SPGP-01. The following information must be submitted as part of the complete application package:
   1) A completed and signed Standard Joint Permit Application (JPA). The applicant must utilize the most recent version.

http://www.nao.usace.army.mil/Missions/Regulatory/

2) A completed SPGP Complete Application Checklist. The applicant must utilize the most recent version.
3) A Corps confirmed delineation that is approved for use with a permit application OR a confirmed jurisdictional determination that includes the limits of all waters of the U.S., including wetlands that are located within the project boundaries.

This information listed above will be required to render an application complete for 17-SPGP-01 purposes. The application package must be submitted to the Virginia Marine Resource Commission (VMRC) and clearly marked 17-SPGP-01. The VMRC will forward a copy of the application to the applicable VDEQ office. Once the VDEQ has deemed the application complete the VDEQ will forward the complete application to the appropriate federal agency when coordination is required.

For purposes of 17-SPGP-01, the VDEQ is the agency responsible for ensuring permit applications meet the informational and technical requirements of 17-SPGP-01 and for issuance of 17-SPGP-01 verification letters for qualifying Residential, Commercial, and Institutional and Linear Transportation projects.

C. State Approvals: In order for 17-SPGP-01 to be valid, permittees must obtain the following state approvals prior to commencement of work in waters of the U.S.:

1) Virginia Department of Environmental Quality (VDEQ) Virginia Water Protection (VWP) permit
2) VMRC permit, when required
3) VDEQ informal resolution, letter of agreement, executive compliance agreement or consent order when the 17-SPGP-01 is utilized for resolution of non-compliance and/or enforcement (at Corps discretion).

The 17-SPGP-01 may also be used for activities excluded from State VWP permitting when those activities are associated with a larger residential, commercial, institutional development and/or linear transportation project that requires state approval..

III. **DEFINITIONS**:

A. Loss of waters of the United States: Waters of the United States (WOUS), including wetlands that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage/linear footage of the loss of WOUS is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for 17-SPGP-01; it is not a net threshold that is

calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services.

1) The loss of stream bed includes the linear feet of stream bed that is filled or excavated. WOUS temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of WOUS. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of WOUS.
2) Per Norfolk District Pipe Repair Guidelines: pipe repair and replacement is considered a permanent impact
3) The length of any box culvert, pipe, or bridge that is being removed and replaced, whether in the same location or not, is considered a permanent impact. However, if a pipe/culvert/bridge is left in place and is extended or rip-rapped, then only the length and area of the extension or rip-rap is considered a permanent impact. [Based on Norfolk District letter guidance May 5, 2009 to VDOT]

B. Natural stream design: a stream channel design that mimics the dimension, pattern, and profile of a representative reference stream reach.

C. Permittee: the responsible party in receipt of the 17-SPGP-01 verification from the VDEQ. The permittee will be the responsible party for complying with all 17-SPGP-01 general conditions as well as any additional special conditions required of each project.

D. Residential developments: construction or expansion of a multiple unit residential development or a residential subdivision including the construction of building foundations, building pads and attendant features that are necessary for the use of the residence or residential development. Attendant features may include but are not limited to roads, parking lots, garages, yards, utility lines, storm water management facilities, septic fields, and recreation facilities such as playgrounds, playing fields, and golf courses (provided the golf course is an integral part of the residential development).

E. Commercial and Institutional Developments: construction or expansion of commercial and institutional building foundations, building pads, and attendant features that are necessary for the use and maintenance of the structures. Attendant features may include, but are not limited to, roads, parking lots, garages, yards, utility lines, storm water management facilities, and recreation facilities such as playgrounds and playing fields. Examples of commercial developments include retail stores, industrial facilities, restaurants, business parks, and shopping centers. Examples of institutional developments include schools, fire stations, government office buildings, judicial buildings, public works buildings, libraries, hospitals, and places of worship.

F. Linear transportation: the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxi ways).

IV. AUTHORIZED ACTIVITIES

A. Residential, Commercial, and Institutional Development Activities Eligibility Criteria:

1) Activities are subject to Corps regulations;

2) Activities involve the discharge of dredged/fill material associated with residential, commercial, and institutional projects and propose:
   a. the TOTAL permanent loss of not more than 1 acre of non-tidal waters of the US, to include stream channel, wetlands and open waters.
      AND
   b. the permanent loss of not more than 2,000 linear feet of stream channel;

3) Activities meet the general and special conditions of 17-SPGP-01 listed in this document and any special conditions required of each project-specific verification;

4) Compensatory mitigation is provided in accordance with the mitigation standards and general conditions listed in this document.

5) Activities have received and completed all applicable federal review as listed in the general conditions of this document.

****The following activities are NOT authorized under the 17-SPGP-01:**

- The Construction of one stand-alone single family home and/or its attendant features.
- Golf courses that are not an integral part of a residential development.
- The construction of new ski areas.

B. Linear Transportation Activities Eligibility Criteria:

1) Activities are subject to Corps regulations;

2) Activities involve the discharge of dredged/ fill material associated with the construction, expansion, modification, or improvement of linear transportation projects that are single and complete with independent utility and propose:

a. the TOTAL permanent loss of not more than ½ acre of non-tidal waters of the US, to include stream channel, wetlands and open waters
AND
b. the permanent loss of not more than 1,000 linear feet of stream channel at any single impact site with independent utility.

3) Activities meet all general conditions of 17-SPGP-01 listed in this document and any special conditions required of each project-specific verification;

4) Compensatory mitigation is provided in accordance with the mitigation standards and general conditions listed in this document.

5) Activities have received and completed all applicable federal review as listed in the general conditions of this document.

6) Construction and/or relocation of utility lines by the applicant and within the right-of- way/easements of the project and performed in direct relation with the project are included in the project impact totals.

V. GENERAL CONDITIONS:

The following conditions apply to all activities authorized under 17-SPGP-01. Work that does not meet one or more of the terms or general conditions of 17-SPGP-01, including work that has been determined to be more than minimal in nature (at any impact level), will require consideration under a different type of Corps permit.

1) Other permits: Authorization does not obviate the need to obtain other Federal, state, or local authorizations required by law or to comply with all Federal, state, or local laws.

2) Minimal effects: Projects authorized shall have no more than minimal individual or cumulative adverse environmental impacts.

3) Discretionary authority: The Corps District Commander retains discretionary authority to require processing of an individual permit based on concerns for the aquatic environment or for any other factor of the public interest (33 C.F.R. § 320.4(a)). This authority is exercised on a case-by-case basis.

4) Single and complete projects: The activity must be a single and complete project.
   a. For non-linear projects: the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other

association of owners/developers. A single and complete non-linear project must have independent utility (see "independent utility" as defined in these general conditions). Single and complete non-linear projects may not be "piecemealed" to avoid the limits in a17-SPGP-01 authorization.

b. For linear transportation: For projects with multiple crossings or encroachments a determination of "single and complete" will typically apply to each crossing or encroachment of waters that occurs (i.e., single waterbody and/or wetlands) at separate and distinct locations and with independent utility. However, in cases where there are many crossings in close proximity, numerous crossings of the same waterbody, multiple crossings, or multiple encroachments that otherwise may have more than minimal individual or cumulative impacts; the Corps has the discretion to consider all the crossings cumulatively as one single and complete project.

5) Independent utility: A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. A phase of a project that would be constructed even if the other phases were not built can be considered as a separate, single and complete project with independent utility. For a linear transportation project, separate impact areas on a new location roadway are not considered to have independent utility and thus impacts would be considered cumulatively and eligible for a single 17-SPGP-01 verification. However, separate impact areas on a roadway that is being widened or where pipes are being replaced at multiple crossings are considered to have independent utility, and each crossing would be considered eligible for a separate 17-SPGP-01 verification. Although such impacts are not considered cumulatively for permitting purposes, they are considered cumulatively when assessing the need for federal review.

6) Multiple general permit authorizations.: The 17-SPGP-01 may be combined with other Corps general permits (including Nationwide, Regional or Letters of Permission) as long as the impacts are considered cumulatively and do not exceed the acreage limit or linear footage limits of the 17-SPGP-01. Two separate activities (e.g. Residential and Linear, within 17-SPGP-01, may be combined as long as they do not exceed the acreage or linear footage threshold of the activity with the highest specified acreage or linear footage threshold).

7) Permit on-site: The permittee shall ensure that a copy of 17-SPGP-01 and the accompanying authorization letter are at the work site at all times. These copies must be made available to any regulatory representative upon request. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be expected to comply with all conditions of any 17-SPGP-01 verification.

8) Historic Properties: In cases where the Corps determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the District Engineer with the appropriate documentation to demonstrate compliance with those requirements. The District Engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the 17-SPGP-01 activity or whether additional section 106 consultation is necessary.

Non-federal permittees shall not begin work on the activity until Section 106 review and/or coordination has been completed AND they have received their 17-SPGP verification letter from the VDEQ.

Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such permit or assistance despite the adverse effect created or allowed by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

Discovery of Previously Unknown Remains and Artifacts: If a permittee discovers any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, the permittee must immediately notify the District Engineer of what has been found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The District Engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

Tribal Rights: No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

9) Federal Lands: Authorized activities shall not impinge upon the value of any National Wildlife Refuge, National Forest, National Park, or any other area administered by the United States Fish and Wildlife Service (USFWS), U.S. Forest Service, or National Park Service unless approval from the applicable land management agency is provided with the permit application.

10) Endangered Species: No activity is authorized under any 17-SPGP-01 which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any 17-SPGP-01 which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

    Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the District Engineer with the appropriate documentation to demonstrate compliance with those requirements. The District Engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the 17-SPGP-01 activity, or whether additional ESA consultation is necessary.

    Non-federal permittees shall not begin work on the activity until Section 7 review and/or consultation has been completed AND they have received their 17-SPGP verification letter from the VDEQ.

    Authorization of an activity by a 17-SPGP-01 does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the USFWS or the National Marine Fisheries Service (NMFS), The Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS and NMFS or their World Wide Web

pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.noaa.gov/fisheries.html respectively.

11) Migratory Birds and Bald and Golden Eagles: The permittee is responsible for obtaining any "take" permits required under the USFWS regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the USFWS to determine if such "take" permits are required for a particular activity. As of the issuance date of the 17-SPGP the current contact, concerning this matter, is at the U.S. Fish and Wildlife Service, Thomas Wittig at 413-253-8577 or Thomas_wittig@fws.gov. Information on active bald eagle nests in the project area can be obtained via The Center for Conservation Biology (CCB) Virginia Eagles Nest Locator: http://www.ccb-wm.org/virginiaeagles/index.htm.

12) Wild and Scenic Rivers: Currently, there are no designated Wild and Scenic Rivers in Virginia. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river has determined, in writing, that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service (NPS), U.S. Forest Service (USFS), Bureau of Land Management (BLM), USFWS). Impacts that occur in these resource areas will require coordination with the appropriate Federal agency.

13) Department of Defense (DOD) Siting Clearinghouse Coordination: For all commercial and institutional development projects that include the construction of wind energy generating structures, solar towers, or overhead powerlines the VDEQ must notify the DOD Clearinghouse of the permitted project. The VDEQ will send a copy of the joint permit application and SPGP verification letter to the following address: DoD Clearinghouse, Attn: David Blalock, 101 Marietta St. NW, Suite 3120, Atlanta, Georgia 30303 or david.c.blalock2.civ@mail.mil

14) Navigation: No authorized activity may cause more than a minimal adverse effect on navigation.

The permittee understands and agrees that if future operations by the United States require the removal, relocation, or other alteration of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his/her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United

States. No claim shall be made against the United States on account of any such removal or alteration.

15) Floodplains: The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

16) 408 Certification: Under 33 USC 408, no activity may temporarily or permanently alter or make use of a U.S. Army Corps of Engineers civil works project unless reviewed and permitted by the Secretary of the Army. The Corps may grant this permission if the work does not impair the usefulness of the project and is not injurious to the public interest.

17) Environmental justice: Activities authorized under 17-SPGP-01 must comply with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations".

18) Federal liability: In issuing 17-SPGP-01, the Federal government does not assume any liability for the following: (a) damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes; (b) damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest; (c) damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by 17-SPGP-01; (d) design or construction deficiencies associated with the permitted work; (e) damage claims associated with any future modification, suspension, or revocation of this permit.

19) Avoidance and minimization: Except as provided under section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.(40 CFR 230.l0(a)-(d) Section 404 (b)(l) Guidelines).

20) Compensatory Mitigation: Mitigation will be required for all permanent impacts, on a project site, once the compensatory mitigation threshold has been exceeded for waters OR wetland impacts.

    a. Wetland mitigation: will generally be required for all residential, commercial, and institutional development projects where the total permanent impacts exceed 1/10 acre AND for all wetland impacts on linear transportation projects that are funded in part or in total by local, state or federal funds.

Generally, the minimum required wetland mitigation ratios will be as follows:

- 2:1 for forested wetlands
- 1.5:1 for scrub-shrub wetlands
- 1:1 for herbaceous emergent wetlands
- 0.5:1 for permanent loss of open waters
- 1:1 for conversion of forested wetlands to herbaceous emergent wetlands.

Compensatory mitigation may be required on a case-by-case basis to ensure impacts are minimal for:

- permanent or temporary conversion of one wetland type to another
- wetland impacts totaling less than 1/10 acre
- at mitigation ratios beyond the generally recommend ratios

All wetland mitigation will comply with the Mitigation Rule [Corps-EPA Compensatory Mitigation for Losses of Aquatic Resources, dated April 10, 2008, 33 CFR 325 and 332/40 CFR 230].

b. Stream mitigation: will generally be required for all residential, commercial, institutional developments AND linear transportation projects where the total permanent stream channel impacts exceed 300 linear feet.

Minimum stream mitigation requirements will be determined using the current Corps and VDEQ endorsed assessment methodology.

Stream mitigation that exceeds the assessment methodology recommendation and mitigation for impacts totaling less the 300 linear feet may be required on a case-by-case basis to ensure impacts are minimal.

All stream mitigation will comply with Mitigation Rule [Corps-EPA Compensatory Mitigation for Losses of Aquatic Resources dated April 10, 2008 33 CFR 325 and 332; 40 CFR 230].

Where local zoning ordinances provide for riparian and floodplain protection pursuant to the Chesapeake Bay Preservation Act (Virginia Code 10.1-2100 et seq.) and the Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 1-20 et seq.), the use of buffers as a form of compensatory mitigation shall be allowed only:

- where the extent of the buffer exceeds the lateral extent already required by local ordinances pursuant to the Act and the regulations
- where the quality of the existing protected buffer area is enhanced to provide greater water quality protection benefits
- where the proposed compensatory mitigation is undertaken in

compliance with the Mitigation Rule [Corps-EPA Compensatory Mitigation for Losses of Aquatic Resources: Final Rule dated April 10, 2008 33 CFR 332.4(c)(2)-(14) and 33 CFR 332.3(h)]

21) Heavy Equipment: Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.

22) Temporary fills: All temporarily disturbed waters and wetlands must be restored to their pre-construction contours within 12 months of commencing the temporary impact's construction. Impacts that will not be restored within 12 months (calculated from the start of the temporary impacts construction) will be considered permanent unless otherwise approved by the Corps, and compensatory mitigation may be required. Once restored to their natural contours, soil in these temporarily disturbed areas must be mechanically loosened to a depth of 12 inches and wetland areas must be seeded or sprigged with appropriate native vegetation.

23) Sedimentation and erosion control: Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

24) Countersinking of Pipes and Culverts: Following consultation with the Virginia Department of Game and Inland Fisheries (VDGIF), the Norfolk District assumes there are fish and other aquatic organisms present in any stream being crossed, in the absence of site-specific evidence to the contrary. Although prospective permittees have the option of providing such evidence, extensive efforts to collect such information is not encouraged, since countersinking will in most cases be required except as outlined in the conditions below:

   a. All pipes and culverts placed in streams will be countersunk at both the inlet and outlet ends, unless indicated otherwise by the VDEQ on a case-by-case basis (see below). Pipes that are 24" or less in diameter shall be countersunk 3" below the natural stream bottom. Pipes that are greater than 24" in diameter shall be countersunk at least 6" below the natural stream bottom. The countersinking requirement does not apply to bottomless pipes/culverts or pipe arches. All single pipes or culverts (with bottoms) shall be depressed (countersunk) below the natural streambed at both the inlet and outlet of the structure. In sets of multiple pipes or culverts (with bottoms) at least one pipe or culvert shall be depressed (countersunk) at both the inlet and outlet to convey low flows.
   b. When countersinking culverts, permittees must ensure reestablishment of a surface water channel (within 15 days post

construction) that allows for the movement of aquatic organisms and maintains the same hydrologic regime that was present pre-construction (i.e. the depth of surface water through the permit area should match the upstream and downstream depths). This may require the addition of finer materials to choke the larger stone and/or placement of riprap to allow for a low flow channel.

c. Exemption for extensions and certain maintenance: The requirement to countersink does not apply to extensions of existing pipes or culverts that are not countersunk, or to maintenance to pipes/culverts that does not involve replacing the pipe/culvert (such as repairing cracks, adding material to prevent/correct scour, etc.).

d. Floodplain pipes: The placement of pipes/culverts above ordinary high water, such as those placed to allow for flood plain flows, is not jurisdictional (provided no fill is discharged into wetlands).

e. Hydraulic opening: Pipes should be adequately sized to allow for the passage of ordinary high water with the countersinking and invert restrictions taken into account.

f. Pipes on bedrock or above existing utility lines: Different procedures will be followed for pipes or culverts to be placed on bedrock or above existing buried utility lines where it is not practicable to relocate the lines, depending on whether the work is for replacement of an existing pipe/culvert or a new pipe/culvert:

    i. Replacement of an existing pipe/culvert: Countersinking is not required provided the elevations of the inlet and outlet ends of the replacement pipe/culvert are no higher above the stream bottom than those of the existing pipe/culvert. Documentation (photographic or other evidence) must be maintained in the permittee's records showing the bedrock condition and the existing inlet and outlet elevations. That documentation will be available to the Norfolk District upon request, but notification or coordination with the Norfolk District is not otherwise required.

    ii. A pipe/culvert is being placed in a new location: If the prospective permittee determines that bedrock or an existing buried utility line that is not practicable to relocate prevents countersinking, they should evaluate the use of a bottomless pipe/culvert, bottomless utility vault, span (bridge) or other bottomless structure to cross the waterway, and also evaluate alternative locations for the new pipe/culvert that will allow for countersinking. If the prospective permittee determines that neither a bottomless structure nor an alternative location is practicable, then they must submit supporting documentation in the JPA. The prospective permittee must provide documentation of measures evaluated to minimize disruption of the movement of aquatic

life as well as documentation of the cost, engineering factors, and site conditions that prohibit countersinking the pipe/culvert. Options that must be considered include partial countersinking (such as less than 3" of countersinking, or countersinking of one end of the pipe), and constructing stone step pools, low rock weirs downstream, or other measures to provide for the movement of aquatic organisms. The permit application must also include photographs documenting site conditions. The prospective permittee may find it helpful to contact his/her regional fishery biologist for the VDGIF, for recommendations about the measures to be taken to allow for fish movements. When seeking advice from VDGIF, the prospective permittee should provide the VDGIF biologist with all available information such as location, flow rates, stream bottom features, description of proposed pipe(s), slopes, etc. Any recommendations from VDGIF should be included in the JPA. The VDEQ will notify the prospective permittee whether the proposed work qualifies for the 17-SPGP-01. NOTE: Blasting of stream bottoms through the use of explosives is not acceptable as a means of providing for countersinking of pipes on bedrock.

g. Pipes on steep terrain: Pipes being placed on steep terrain (slope of 5% or greater) must be countersunk in accordance with the conditions above. It is recommended that on slopes greater than 5%, a larger pipe than required be installed to allow for the passage of ordinary high water in order to increase the likelihood that natural velocities can be maintained. There may be situations where countersinking both the inlet and outlet may result in a slope in the pipe that results in flow velocities that cause excessive scour at the outlet and/or prohibit some fish movement. This type of situation could occur on the side of a mountain where falls and drop pools occur along a stream. Should this be the case, or should the prospective permittee not want to countersink the pipe/culvert for other reasons, they must provide documentation of measures evaluated to minimize disruption of the movement of aquatic life as well as documentation of the cost, engineering factors, and site conditions that prohibit countersinking the pipe/culvert. The prospective permittee should design the pipe to be placed at a slope as steep as stream characteristics allow, countersink the inlet 3-6", and implement measures to minimize any disruption of fish movement. These measures can include constructing a stone step/pool structure, preferably using river rock/native stone rather than riprap, constructing low rock weirs to create a pool or pools, or other structures to allow for fish movements in both directions. Stone structures should be designed with sufficient-sized stone to prevent

erosion or washout and should include keying-in as appropriate. These structures should be designed both to allow for fish passage and to minimize scour at the outlet. The quantities of fill discharged below ordinary high water necessary to comply with these requirements (i.e., the cubic yards of stone, riprap or other fill placed below the plane of ordinary high water) must be included in project totals. The prospective permittee may find it helpful to contact the regional fishery biologist for the VDGIF, for recommendations about the measures to be taken to allow for fish movements. When seeking advice from VDGIF, the applicant should provide the VDGIF biologist with all available information such as location, flow rates, stream bottom features, description of proposed pipe(s), slopes, etc. Any recommendations from DGIF should be included in the permit application. The VDEQ will notify the prospective permittee whether the proposed work qualifies for the 17-SPGP-01.

h. Problems encountered during construction: When a pipe/culvert is being replaced, and the design calls for countersinking at both ends of the pipe/culvert, and during construction it is found that the streambed/banks are on bedrock, a utility line, or other documentable obstacle, then the permittee must stop work and contact the VDEQ (contact by telephone and/or email is acceptable). The permittee must provide the VDEQ with specific information concerning site conditions and limitations on countersinking. The VDEQ will work with the permittee to determine an acceptable plan, taking into consideration the information provided by the permittee, but the permittee should recognize that the VDEQ and/or Corps could determine that the work will not qualify for a 17-SPGP-01 authorization.

i. Emergency pipe replacements: In the case of an emergency situation, such as when a pipe/culvert washes out during a flood, a permittee is encouraged to countersink the replacement pipe at the time of replacement, in accordance with the conditions above. However, if conditions or timeframes do not allow for countersinking, then the pipe can be replaced as it was before the washout, but the permittee will have to come back and replace the pipe/culvert and countersink it in accordance with the guidance above. In other words, the replacement of the washed out pipe is viewed as a temporary repair, and a countersunk replacement should be made at the earliest possible date. The VDEQ must be notified of all pipes/culverts that are replaced without countersinking at the time that it occurs, and must provide the permittee's planned schedule for installing a countersunk replacement (it is acceptable to submit such notification by email). The permittee should anticipate whether bedrock or steep terrain will limit countersinking and, if so, should follow the procedures outlined in (g) and/or (h) above.

25) Discharge of pollutants: All authorized activities involving any discharge of pollutants into waters of the United States shall be consistent with applicable water quality standards, effluent limitations, standards of performance, prohibitions, and pretreatment standards and management practices established pursuant to the CWA (33 U.S.C. § 1251 et seq.) and applicable state and local laws.

26) Suitable Material: No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

27) Obstruction of high flows: Discharges of dredged or fill material must not permanently restrict or impede the passage of normal or expected high flows.

28) Aquatic Life Movements: No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.

29) Spawning Areas: Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

30) Migratory Bird Breeding Areas: Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

31) Native trout and anadromous fishes: Authorizations for discharges of dredged or fill material into native trout waters or anadromous fish spawning areas are conditioned to limit in-stream work within the timeframes recommended by the DGIF. http://206.16.194.16/environmental-programs/files/VDGIF-Time-of-Year-Restrictions-Table.pdf

32) Water supply intakes: No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization

33) Invasive Species: Plant species on the most current Virginia Department of Conservation and Recreation's Invasive Plant Species List shall not be used for replanting activities authorized by the SPGP. The list of invasive plants in Virginia

may be found at: http://www.dcr.virginia.gov/natural-heritage/document/nh-invasive-plant-list-2014.pdf

34) Inspections: The permittee understands and agrees that the Corps and/or the VDEQ are permitted and allowed to make periodic inspections at any time the Corps or VDEQ deems necessary in order to assure that the activities being performed under authority of this permit are in accordance with the terms and conditions prescribed herein. The Corps reserves the right to require post-construction engineering drawings and/or surveys of any work authorized under 17- SPGP-01, as deemed necessary on a case-by-case basis.

35) Maintenance: The permittee shall maintain the work authorized herein in good condition and in conformance with all terms and conditions of this permit. All fills shall be properly maintained to ensure public safety.

36) Property rights: 17-SPGP-01 does not convey any property rights, either in real estate or material, or convey any exclusive privileges, nor does it authorize any injury to property or invasion of rights or any infringement of Federal, state, or local laws or regulations. If real estate rights are needed from the Corps, you must contact the Corps Real Estate Office at (757) 201-7735 or at the address listed on the front page of this permit.

37) Suspension and revocation: 17-SPGP-01 and individual verifications under 17-SPGP-01 maybe either suspended or revoked in whole or in part pursuant to the policies and procedures of 33 C.F.R. § 325.7. Any such action shall not be the basis for any claim for damages against the United States.

38) Restoration directive: The permittee, upon receipt of a restoration directive, shall restore the waters of the United States to their former conditions without expense to the United States and as directed by the Secretary of the Army or his/her authorized representative. If the permittee fails to comply with such a directive, the Secretary or his/her designee, may restore the waters of the United States to their former conditions, by contract or otherwise, and recover the cost from the permittee.

39) Special conditions: The Corps may impose other special conditions on a project verified pursuant to 17-SPGP-01 that are determined necessary to minimize adverse navigational and/or environmental effects or based on any other factor of the public interest. Failure to comply with all conditions of the authorization/verification, including special conditions, constitutes a permit violation and may subject the permittee, or his/her contractor, to criminal, civil, or administrative penalties and/or restoration.

40) False or incomplete information: In granting authorization pursuant to this permit, the Corps has relied upon information and data provided by the permittee. If,

subsequent to notification by the Corps or the VDEQ that a project qualifies for this permit, such information and data prove to be materially false or materially incomplete, the Corps may suspend or revoke authorization, in whole or in part, and/or the United States or Corps may institute appropriate legal proceedings.

41) Abandonment: If the permittee decides to abandon the activity authorized under I7-SPGP-01, unless such abandonment is merely the transfer of property to a third party, they may be required to restore the area to the satisfaction of the Corps.

42) Transfer of verification: In order to transfer verification under 17-SPGP-01, the transferee and permittee must supply the Corps and the VDEQ with a written and signed, by all appropriate parties, request to make such a transfer. Such transfer is not effective until written approval has been granted by the Corps or the VDEQ.

43) Binding effect. The provisions of the permit authorization shall be binding on any assignee or successor in interest of the original permittee.

44) Expiration of 17-SPGP-01: Unless further suspended or revoked the 17-SPGP-01 will be in effect until May 31, 2022. Activities which have commenced (i.e., are under construction) or are under contract to commence construction in reliance upon 17-SPGP-01 will remain authorized provided the activity is completed within twelve months of the date of this 17-SPGP-01's expiration of May 31, 2022, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 325.7(a-e).

Jason E. Kelly, PMP
Colonel, U.S. Army
Commanding

March 5, 2019

FACT SHEET
Virginia Water Protection Individual Permit No. 18-1003
Northfax, City of Fairfax

DEQ has reviewed the application for the Virginia Water Protection (VWP) Individual Permit Number 18-1003 and has determined that the project qualifies for an individual permit.

The following details the application review process and summarizes relevant information for developing the Part I - Special Conditions for permit issuance.

1. Contact Information:

Permittee Legal Name and Address:

Northfax JV LLC
3900 Jermantown Road, Suite 300
Fairfax, Virginia 22030
Mr. John E. Napolitano, Manager
703-934-4600

Agent Legal Name and Address:

Apex Companies, LLC c/o
9700 Capital Court, Suite 100
Manassas, Virginia 20110
Mr. Jason Franti
703-396-6730

2. Processing Dates:

Received Application:	June 25, 2018
Received VMRC Number:	June 25, 2018
Application Complete:	September 12, 2018
Permit Fee Deposited by Accounting:	August 27, 2018
Application Suspended:	September 26, 2018
Application Reinstated:	December 11, 2018
Processing Deadline (120 days from Complete Application):	March 27, 2019
1st Request for Additional Information Sent:	July 3, 2018
Final Request for Additional Information Received:	September 12, 2018
Section 106 SPGP Coordination Initiated:	August 13, 2018
Section 7 SPGP Coordination Initiated:	August 13, 2018
Request for comments sent to USACE, USEPA and USFWS:	August 13, 2018
Completion of SPGP coordination:	October 31, 2018
Notification of JPA sent to Local Government(s):	June 28, 2018
Commissioner of Revenue Contacted:	*N/A*
Request for comments sent to VDH, VDGIF, VDCR, VMRC:	June 28, 2018
Letters sent to Riparian Land Owners:	July 11, 2018
Draft Permit Package Issued:	January 2, 2019
Copy of Public Notice sent to DEQ Central Office:	January 2, 2019
Copy of Public Notice sent to Local Gov't and Planning District:	January 2, 2019
Application Suspended Pending Public Notice:	January 17, 2019
Public Notice Published:	January 18, 2019
Application Reinstated:	January 18, 2019
End of 30-Day Public Comment Period:	February 18, 2019
Received Verification of Publication:	January 22, 2019
Permit Issued:	March 5, 2019

3. Project Location:

The project site is located northeast of the intersection of Chain Bridge Road (VA-123) and Fairfax Boulevard (US-50) in the City of Fairfax, Virginia.

City/County:	City of Fairfax
Waterbody:	Accotink Creek, UT
Basin:	Potomac
Subbasin:	Middle Potomac
Section:	7
Class:	III
Special Standards:	b
HUC:	02070010
Latitude & Longitude:	38.859417, -77.309689
U.S.G.S. Quadrangle:	Fairfax
State Watershed No.:	VAN-A15R

4. Project Description:

The permittee proposes to construct a mixed-use development with associated infrastructure, on an approximately 10.6 acre development site, known as "Northfax."

5. Avoidance and Minimization Efforts:

Avoidance and minimization efforts have been documented by the applicant in the JPA as well as subsequent submittals. The purpose and need of the project is a mixed-use development. However, the purpose and need cannot be met without flood control. A perennial stream channel bisects the property and the development site has been known historically to flood. Complete and partial avoidance was considered by the applicant, however due to the flood conditions and the location of surface waters onsite, completely avoiding or partially piping the channel would result in minimizing the developable area to around fifty-percent of the original design with flooding concerns further minimizing the developable area.

Complete avoidance was considered and deemed infeasible to meet the projects purpose and need as it would reduce the developable land to 4.40 acres thus reducing the Annualized Cost on Return (IRR) to well below the target. In addition, the flood elevations would still render approximately fifty-percent of the developable land area in an unusable condition due to the presence of RPA and flood zones. A historic trolley bridge is located just off-site over the intermittent channel, downstream of the confluence of the two channels, which causes back watering due to its limiting size. Discharge at the confluence of the stream channels during the 100-year storm creates a significant back-water situation thus further limiting developable area due to flood concerns.

A partial stream piping scenario was also considered, in which approximately 500 linear feet of stream channel would be piped leaving most of the perennial stream and all the intermittent stream intact. In this scenario Orchard Road would be still constructed in order to access the western portion of the property. As the stream channel bisects the 10.6 acre development site, the use of Orchard Road would necessitate significant alteration to the flood zones through the installation of a culverted road crossing, thus constricting flood flows and increasing flooding to the northern portion of the property. The back-water flooding associated with the historic trolley bridge would still be a limiting factor for developable land. Flood elevations will allow development of approximately fifty-percent of the total developable area rendering the IRR for the alternative well below the target, thus this alternative was deemed infeasible to meet the projects purpose and need.

For additional information, see page 4-5 of the JPA dated June 22, 2018, the additional information response dated August 10, 2018, and the response to EPA comments dated October 16, 2018.

Based upon staff review, the applicant has demonstrated that the proposed plan represents the least environmentally damaging and practicable alternative and all unavoidable permanent impacts will be adequately mitigated through the proposed compensation plan.

6. Project Impacts:

This permit authorizes the total permanent impact to 0.50 acre (1,646 linear feet) of stream channel. Authorized surface water impacts shall be as depicted on the impacts map entitled Stream Impact Exhibit dated August 9, 2018, with latest revision date of August 21, 2018, and received September 12, 2018.

7. Compensation for Unavoidable Impacts:

The permittee shall compensate for permanent stream impacts through the purchase of 1,675 stream credits or 4,761 Stream Condition Units from a DEQ approved mitigation bank, in-lieu fee fund, or a combination thereof that is authorized and approved by DEQ to sell credits in the area in which the impacts will occur and has credits available (as released by DEQ). The credit sale shall be in accordance with the approved Mitigation Banking Instrument for the mitigation bank. Purchase of required mitigation credits shall occur first through the purchase of available released credits followed by the purchase of advance credits.

The compensation package conforms with the preference hierarchy of the 2008 Compensatory Mitigation Rule issued by the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers (USACE) and DEQ's Guidance Memorandum No. 09-2004 (Applying Compensatory Mitigation Preferences Provided in the EPA Mitigation Rule to Virginia Water Protection Permitting).

8. Site Inspection:

A site visit was conducted on July 23, 2018. The site visit confirmed the site description provided in the applications materials accurately characterized the surface waters on the site. A summary of the site inspection is located in VWP Permit File No. 18-1003.

9. Relevant Regulatory Agency Comments:

As part of the application review process, DEQ contacted the appropriate state regulatory agencies and coordinated with various federal regulatory agencies, including the U.S. Army Corps of Engineers (USACE). No comments received required a change to VWP individual permit Part I - Special Conditions. Therefore, the staff anticipates no adverse effect on water quality and fish and wildlife resources provided the applicant adheres to the permit conditions.

a. <u>Summary of State Agency Comments and Actions</u>

By email/letter dated June 28, 2018, comments were requested from the following state agencies: Virginia Department of Game and Inland Fisheries (DGIF), Virginia Department of Conservation and Recreation (DCR), Virginia Marine Resources Commission (VMRC), and

Virginia Department of Health (VDH). Failure to provide comments within 45 calendar days of the DEQ request for comments infers that the agency has no comments on the project activities.

DCR
DCR provided the following comments in a memorandum dated and transmitted by email on August 10, 2018:

- Recommends the implementation of the following USFWS voluntary measures for the conservation of the Rusty patched bumble bee (*Bombus affinis*): avoid pesticide use, avoid herbicide use, and plant native flowers that bloom throughout the spring and summer to support pollinator habitat.

The measures will not be included in the permit as they are listed as voluntary.

DGIF
DGIF provided comments to DEQ by email dated August 10, 2018.

- Recommended conducting any in-stream activities during low or no-flow conditions, using non-erodible cofferdams or turbidity curtains to isolate the construction area, blocking no more than 50% of the streamflow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas with native vegetation, and implementing strict erosion and sediment control measures.

  The special conditions of the permit address these activities.

- Recommend coordination with DCR's Department of Natural Heritage as the project is located within 2 miles of a documented occurrence of a state or federal threatened or endangered plant or insect species and/or other Natural Heritage coordination species.

Staff requested comments from DCR on the proposed project on June 28, 2018.

- Recommend that the permittee avoid and minimize impacts to undisturbed forest, wetlands, and streams to the fullest extent practicable to minimize overall impacts to wildlife and our natural resources. DGIF also recommended maintaining undisturbed naturally vegetated buffers of at least 100 feet in width around all on-site wetlands and on both sides of all perennial and intermittent streams.

  Staff reviewed the proposed impacts to surface waters and determined those proposed have been minimized to the maximum extent practicable.

- Recommended that the stormwater controls for this project be designed to replicate and maintain the hydrographic condition of the site prior to the change in landscape.

  Oversight of stormwater management and erosion and sediment control measures is the responsibility of DEQ-Stormwater Management or the locality, if such responsibility has

been delegated. Any such requirements will be implemented under the oversight of that program.

- Recommended that all tree removal and ground clearing adhere to a time of year restriction protective of resident and migratory songbird nesting from March 15 through August 15 of any year.

  This time of year restriction was not included in the permit as it's not associated with a threatened or endangered species. The recommendation was forwarded to the permittee for their consideration.

- Recommended adherence to erosion and sediment controls during ground disturbance.

  Oversight of stormwater management and erosion and sediment control measures is the responsibility of DEQ-Stormwater Management or the locality, if such responsibility has been delegated. Any such requirements will be implemented under the oversight of that program.

VDH
VDH provided comments in a memorandum dated July 12, 2018, and received on July 16, 2018, that no public raw water intakes were found, in the commonwealth, downstream from the proposed construction site.

VMRC
VMRC provided comments in a letter dated and transmitted by email on August 7, 2018, stating that the project is not within the purview of the agency and the Commission has no objection to DEQ's issuance of a VWP individual permit. A "No Permit Necessary" letter was issued on June 6, 2018.

b. Summary of Federal Agency Comments and Actions

The project is being reviewed by DEQ for a State Programmatic General Permit (SPGP). By letter dated July 13, 2018, comments were requested from the following federal agencies: Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), and U.S. Fish and Wildlife (FWS).

Section 106
USACE provided comments to DEQ by email transmitted October 30, 2018 stating the Department of Historic Resources concurs with the Corps' determination that there will be "No Historic Properties Affected" by the proposed project.

Section 7
FWS responded to the request for Section 7 comments by email transmitted on August 14, 2018 requesting a Self-Certification Letter. DEQ responded on August 24, 2018, with the Self-Certification Letter. No response was received within 30 days of the latest transmittal.

Federal Review
EPA responded to the request for Federal Review by email transmitted on August 28, 2018, requesting more information on avoidance and minimization. The applicant responded to the comments, and the response was forwarded to EPA on October 16, 2018. No response was received within 15 days of the latest transmittal. No project comments were received from FWS or USACE.

10. Riparian Landowner Notification:

Staff notified riparian landowners located adjacent to the impact area by letter dated July 11, 2018. The impacted stream channel is piped starting at the edge of the property continuing offsite, therefore downstream landowners were not notified.

Notifications of riparian and adjacent landowners were conducted in accordance with DEQ's Guidance Memorandum No. 11-2005 (Revised Local Government, Riparian Property Owner, Adjacent Property Owner or Resident, and General Public Notification Procedures for VPDES, VPSA and VWP Permit Applications and Draft Permits).

No significant responses were received.

11. Changes in Permit Part I - Special Conditions Due to Public Comments:

The public notice was published in Fairfax County Times Friday-Sunday, January 18-20, 2019, on January 18, 2019. The public comment period ran from January 19, 2019, to February 18, 2019.

One public comment letter was received. However, no substantial or disputed issues were presented that warranted revisions to the draft conditions of the permit.

12. Special Conditions:

The following conditions were developed to protect instream beneficial uses, to ensure compliance with applicable water quality standards, to prevent significant impairment of state waters or fish and wildlife resources, to provide for no net loss of wetland acreage, and to provide no net loss of functions in all surface waters through compensatory mitigation and monitoring and reporting.

Section A Authorized Activities

Nos. 1-3 addresses the activities authorized by this permit, including impact types and limits.

Section B Permit Term

Nos. 1-2 addresses the permit term and re-issuance process to ensure that all permit conditions are completed.

Section C Standard Project Conditions

No. 1 addresses the requirement for the minimization of adverse impacts to instream beneficial uses.
No. 2 ensures that the project will be executed in a manner that limits the disruption of the movement of aquatic life.
No. 3 ensures that downstream flows will be maintained to protect both instream and off-stream beneficial uses
No. 4 ensures the minimization of adverse effects on navigation.
No. 5 ensures the passage of high flows.
No. 6 requires maintenance of continuous flow of perennial springs for the protection of instream beneficial use.
No. 7 ensures that dredging and filling operations will minimizes stream bottom disturbances and turbidity.
No. 8 requires instream activities to be conducted during low-flow conditions to protect instream beneficial uses.
Nos. 9 through 11 provide requirements and limitations on the entry of various materials (including concrete, fill, construction and waste material, fuels, lubricants, and untreated stormwater runoff) into state waters.
Nos. 12 and 13 limit the use of machinery and equipment in surface waters to protect beneficial uses
Nos. 14 through 18 require temporary disturbances to surface waters during construction to be avoided and minimized to the maximum extent practicable and the restoration of such temporary disturbances.
No. 19 prohibits the violation of Water Quality Standards in surface waters as a result of project activities
No. 20 requires the identification of all non-impacted surface waters in the vicinity of the proposed activity to prevent unpermitted impacts
Nos. 21 through 25 set forth all reporting requirements concerning construction, monitoring, compensation, and restoration as required by current law and regulations.

Section D Stream Modifications, Including Intake/Outfall Structures

No. 1 prohibits the use of stream substrate for erosion control to avoid additional impacts to state waters.
No. 2 requires upland disposal of material removed from stream substrate to avoid unpermitted impacts to surface waters.
No. 3 ensures riprap placement conforms to current law and regulation.
Nos. 4 and 5 direct the placement and contents of materials for the construction of submerged structures, and on-bank storage and staging of materials, to protect water quality and fish and wildlife resources.

Section E Installation of Utilities

No. 1 requires the minimization of disturbance to surface waters and restoration to preconstruction conditions following utility line installation.

No. 2 sets a 90-day time limit for temporary sidecasting during trench excavation to minimize impacts to surface waters.
No. 3 provides the requirements for trench construction to avoid the drainage of surface waters.

Section F Road Crossings

No. 1 provides specifications for access road construction to minimize adverse effects to surface waters.
No. 2 ensures pipes and culvert construction is conducted in the dry to protect water quality and wildlife habitat.
No. 3 requires that temporary impacts be restored immediately following construction to minimize impacts to water quality and fish and wildlife resources.
No. 4 summarizes requirements for pipe and culvert placement and countersinking to provide for the re-establishment of a natural stream bottom and low flow channel to maintain instream beneficial uses
No. 5 requires measurement of stream bottom elevations at road crossings to ensure for the re-establishment of a natural stream bottom and low flow channel to maintain instream beneficial uses. The intent of this condition is to maintain a hydrologic connection and enable the stream bottom to reestablish in the culvert. The stream crossing(s) to which this condition pertains is identified in the condition.

Section G Stormwater Management Facilities

No. 1 defines the general requirements for stormwater management facility construction to minimize adverse effects to aquatic resources and provide for long-term aquatic resources protection and enhancement.
No. 2 provides limits and guidance for maintenance excavation to avoid unpermitted impacts to surface waters.

Section H Project Construction Monitoring and Submittals (Impact Site)

Nos. 1 through 6 address monitoring and submittals required for pre-construction, during construction and post-construction for the impact areas on site.

Section I Compensatory Mitigation

No. 1 describe the compensatory mitigation required to mitigate for the permitted impacts.
No. 2 describes the documentation requirement for the purchase of the required amount of credits.

13. General Conditions:

The general conditions specified in the effective VWP Permit Program Regulation 9VAC25-210 apply to all VWP individual permits.

14. General Criteria (9VAC25-260-20 A):

State waters, including wetlands, shall be free from substances attributable to sewage, industrial waste, or other waste in concentrations, amounts, or combinations which contravene established standards or interfere directly or indirectly with designated uses of such water or which are inimical or harmful to human, animal, plant, or aquatic life.

Specific substances to be controlled include, but are not limited to: floating debris, oil, scum, and other floating materials; toxic substances (including those which bioaccumulate); substances that produce color, tastes, turbidity, odors, or settle to form sludge deposits; and substances which nourish undesirable or nuisance aquatic plant life. Effluents which tend to raise the temperature of the receiving water will also be controlled. Conditions within mixing zones established according to 9VAC25-260-20 B do not violate the provisions of this subsection.

15. Staff Findings and Recommendations:

- In compliance with § 401 of the Clean Water Act, as amended (33 USC § 1341) and the State Water Control Law and regulations adopted pursuant thereto, the board has determined that there is a reasonable assurance that this VWP permit, if complied with, will protect instream beneficial uses, will not violate applicable water quality standards, and will not cause or contribute to a significant impairment of state waters or fish and wildlife resources. In issuing this VWP permit, the board has not taken into consideration the structural stability of any proposed activities.

- The proposed permit conditions address no net loss of wetland acreage and no net loss of functions in all surface waters, through the avoidance and minimization of wetland impacts to the maximum extent practicable; compensatory mitigation; and compensation monitoring and reporting. Permitted wetland impacts have been inventoried in evaluating this proposed permit.

- The draft permit reflects the required consultation with and full consideration of the written recommendations of VMRC, VDH, DCR and DGIF.

Staff recommends VWP Individual Permit Number 18-1003 be issued as proposed.

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703)583-3800
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director
(804) 698-4000

Thomas A. Faha
Regional Director

March 5, 2019

By e-mail: john@lann.com
Receipt Confirmation Requested

Mr. John E. Napolitano, Manager
Northfax JV LLC
3900 Jermantown Road, Suite 300
Fairfax, Virginia 22030

Re: Virginia Water Protection (VWP) Individual Permit Number 18-1003
Northfax, City of Fairfax, Virginia
Final VWP Individual Permit

Dear Mr. Napolitano:

Pursuant to the VWP Permit Program Regulation 9 VAC 25-210 and § 401 of the Clean Water Act Amendments of 1977, Public Law 95-217, the Department of Environmental Quality has enclosed the VWP Individual Permit for the "Northfax" project.

This permit is valid for 15 years from the date of issuance. An extension of the permit may not occur as the permit term cannot exceed the maximum of 15 years. A new permit may be necessary if any portion of the authorized activities or any permit requirement (including compensatory mitigation provisions) is not complete at the end of the 15 year permit term.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have **30 calendar days** from the date of service (the date you actually received this decision or the date it was e-mailed to you, whichever occurred first) within which to appeal this decision by filing a notice of appeal in accordance with the Rules of the Supreme Court of Virginia with the Director, Department of Environmental Quality. In the event that this decision is served on you by mail, three days are added to that period. Refer to Part 2A of the Rules of the Supreme Court of Virginia for additional requirements governing appeals from administrative agencies.

Alternatively, an owner may request a formal hearing for the formal taking of evidence upon relevant fact issues under Section 2.2-4020 of the Administrative Process Act. A petition for a formal hearing must meet the requirements set forth in 9VAC25-230 of the Virginia Administrative Code. In cases involving

actions of the board, such petition must be filed within 30 calendar days after notice of such action is sent to such owner by certified mail.

The work authorized by this permit also satisfies the terms and conditions contained in the Norfolk District, Corps of Engineers' State Program General Permit (17- SPGP-01) and the special conditions, if any, attached to 17-SPGP-01. No additional authorization from the Corps is required. Your 17-SPGP-01 authorization is effective as of the date on this letter and remains effective until May 31, 2022.

If you have any questions, please contact Wynn Prusaczyk by phone at (703) 583-3871 or by email at Wynn.Prusaczyk@deq.virginia.gov.

Respectfully,

Trisha M. Beasley

Trisha M. Beasley
Regional VWPP Program Manager

Enclosures: Permit Cover Page, Part I - Special Conditions, Part II - General Conditions, Monthly VWP Permit Inspection Checklist, VWP Permit Construction Status Update Form, 17-SPGP-01 Verification Letter, and 17-SPGP-01

Cc (by e-mail):
Mr. Jason Franti, Apex Companies, LLC
Mr. Jim Irre, Apex Companies, LLC
Ms. Theresita Crockett-Augustine, U.S. Army Corps of Engineers, Northern VA Field Office

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

VWP Individual Permit Number 18-1003
Effective Date: March 5, 2019
Expiration Date: March 4, 2034

VIRGINIA WATER PROTECTION PERMIT ISSUED PURSUANT TO THE STATE WATER CONTROL LAW AND SECTION 401 OF THE CLEAN WATER ACT

In compliance with § 401 of the Clean Water Act, as amended (33 USC § 1341) and the State Water Control Law and regulations adopted pursuant thereto, the board has determined that there is a reasonable assurance that this VWP permit, if complied with, will protect instream beneficial uses, will not violate applicable water quality standards, and will not cause or contribute to a significant impairment of state waters or fish and wildlife resources. In issuing this VWP permit, the board has not taken into consideration the structural stability of any proposed activities.

Permittee: Northfax JV LLC

Address: 3900 Jermantown Road, Suite 300, Fairfax, Virginia 22030

Activity Location: The project is located northeast of the intersection of Chain Bridge Road (VA-123) and Fairfax Boulevard (US-50) in the City of Fairfax, Virginia.

Activity Description: The permittee proposes to construct a mixed-use development and associated infrastructure on an approximately 10.6 acre development area known as "Northfax." Permitted activities shall be conducted as described in the Joint Permit Application dated June 22, 2018, received on June 25, 2018, and supplemental materials, revisions and clarifications received through December 11, 2018.

Authorized Surface Water Impacts:

This permit authorizes the total permanent impact of 0.50 acre (1,646 linear feet) of stream channel. Authorized surface water impacts shall be as depicted on the impacts map entitled *Stream Impact Exhibit* dated August 9, 2018, with latest revision date of August 21, 2018, and received September 12, 2018.

Approved Compensation:

The permittee shall compensate for the authorized surface water impacts through the following:

1. Compensation for permanent stream impacts shall be provided through the purchase of 1,675 stream credits or 4,761 Stream Condition Units from a DEQ approved mitigation bank, in-lieu fee

fund, or a combination thereof that is authorized and approved by DEQ to sell credits in the area in which the impacts will occur and has credits available (as released by DEQ).

2. Mitigation bank credits shall be purchased prior to the purchase of in-lieu fee program credits in accordance with 9VAC25-210-116.C.2.

3. The credit sale shall be in accordance with the approved Mitigation Banking Instrument for the mitigation bank.

The permitted activity shall be in accordance with this Permit Cover Page, Part I - Special Conditions, and Part II - General Conditions.

Thomas A. Faha

Thomas A. Faha, Regional Director

March 5, 2019

Date

Part I – Special Conditions

A. Authorized Activities

1. This permit authorizes the total impact permanent impact of 0.50 acre (1,646 linear feet) of stream channel. Authorized surface water impacts described under this condition shall be as depicted on the impacts map entitled *Stream Impact Exhibit* dated August 9, 2018, with latest revision date of August 21, 2018, and received September 12, 2018.

2. The permittee shall conduct authorized activities as described in the Joint Permit Application dated June 22, 2018, and received June 25, 2018, and supplemental materials, revisions and clarifications received through December 11, 2018. Any changes to the authorized activities or impacts map that affect permitted areas shall be submitted to DEQ immediately upon determination that changes are necessary, and DEQ approval shall be required prior to implementing the changes.

3. The permittee shall notify the DEQ of any changes in authorized impacts to surface waters or any changes to the design or type of construction activities in surface waters authorized by this permit. DEQ approval shall be required prior to implementing the changes. Any additional impacts, modifications, or changes shall be subject to individual permit review and/or modification of this permit.

B. Permit Term

1. This permit is valid for **fifteen (15) years** from the date of issuance. A new permit may be necessary for the continuance of the authorized activities, or any permit requirement that has not been completed, including compensation provisions.

2. The permittee shall notify DEQ in writing at least 120 calendar days prior to the expiration of this permit if reissuance will be requested.

C. Standard Project Conditions

1. The activities authorized by this permit shall be executed in such a manner that any impacts to beneficial uses are minimized. As defined in § 62.1-10(b) of the Code, "beneficial use" means both instream and offstream uses. Instream beneficial uses include, but are not limited to, the protection of fish and wildlife habitat, maintenance of waste assimilation, recreation, navigation, and cultural and aesthetic values. The preservation of instream flows for purposes of the protection of navigation, maintenance of waste assimilation capacity, the protection of fish and wildlife resources and habitat, recreation, cultural and aesthetic values is an instream beneficial use of Virginia's waters. Offstream beneficial uses include, but are not limited to, domestic uses (including public water supply), agricultural uses, electric power generation, commercial uses, and industrial uses. Public water supply uses for human consumption shall be considered the highest priority.

2. No activity shall substantially disrupt the movement of aquatic life indigenous to the water body, including those species which normally migrate through the area, unless the primary purpose of the activity is to impound water.

3. Flows downstream of the project area shall be maintained to protect all uses.

4. No activity shall cause more than minimal adverse effect on navigation, and no activity shall block more than half of the width of the stream at any given time.

5. The activity shall not impede the passage of normal or expected high flows, and any associated structure shall withstand expected high flows.

6. Continuous flow of perennial springs shall be maintained by the installation of spring boxes, French drains, or other similar structures.

7. All excavation, dredging, or filling in surface waters shall be accomplished in a manner that minimizes bottom disturbance and turbidity.

8. All in-stream activities shall be conducted during low-flow conditions whenever practicable.

9. All construction, construction access, and demolition activities associated with this project shall be accomplished in a manner that minimizes construction materials or waste materials from entering surface waters, unless authorized by this permit. Wet, excess, or waste concrete shall be prohibited from entering surface waters.

10. All fill material placed in surface waters shall be clean and free of contaminants in toxic concentrations or amounts in accordance with all applicable laws and regulations.

11. Measures shall be employed at all times to prevent and contain spills of fuels, lubricants, or other pollutants into surface waters.

12. Machinery or heavy equipment in temporarily impacted wetlands shall be placed on mats or geotextile fabric, or other suitable means shall be implemented, to minimize soil disturbance to the maximum extent practical. Mats, fabrics, or other measures shall be removed as soon as the work is complete in the temporarily impacted wetland.

13. Stream channel restoration activities shall be conducted in the dry or during low flow conditions. When site conditions prohibit access from the streambank or upon prior authorization from the Department of Environmental Quality, heavy equipment may be authorized for use within the stream channel. The equipment shall be stationed on cobble bars.

14. Temporary disturbances to wetlands, stream channels, and/or stream banks during project construction activities shall be avoided and minimized to the maximum extent practicable.

15. All temporarily disturbed wetland areas shall be restored to preconstruction conditions within 30 calendar days of completing work in the areas, which shall include re-establishing pre-

construction contours, and planting or seeding with appropriate wetland vegetation according to cover type (emergent, scrub/shrub, or forested), except for invasive species identified on DCR's Virginia Invasive Plant Species List. The permittee shall take all appropriate measures to promote and maintain the revegetation of temporarily disturbed surface waters through the second year post-disturbance.

16. All temporarily impacted streams and stream banks shall be restored to their original elevations and contours within 30 calendar days following the construction at that stream segment, and the banks shall be seeded or planted with the same vegetative cover type originally present along the banks, including supplemental erosion control grasses if necessary but not including invasive species identified on DCR's Virginia Invasive Plant Species List.

17. All materials (including fill, construction debris, excavated materials, and woody materials, that are temporarily placed in wetlands, in stream channels, or on stream banks) shall be placed on mats or geotextile fabric, shall be immediately stabilized to prevent the material or leachate from entering surface waters, and shall be entirely removed within 30 calendar days following completion of that construction activity. After removal, disturbed areas shall be returned to original contours, shall be stabilized, and shall be restored to the original vegetated state within 30 calendar days.

18. Temporary in-stream construction features such as cofferdams shall be made of non-erodible materials.

19. Virginia Water Quality Standards shall not be violated in any surface waters as a result of the project activities.

20. All non-impacted surface waters that are within the project or right-of-way limits, and that are within fifty feet of any project activities, shall be clearly flagged or demarcated for the life of the construction activity within that area. The permittee shall notify all contractors and subcontractors that *no activities are to occur in these marked areas*.

21. All required notifications and submittals shall include project name and permit number and be submitted electronically to vwp.nro@deq.virginia.gov or mailed to the DEQ office stated below, to the attention of the VWP permit manager, unless directed in writing by DEQ subsequent to the issuance of this permit: Department of Environmental Quality- Northern Regional Office, 13901 Crown Court, Woodbridge, Virginia 22193.

22. All reports required by this permit and other information requested by DEQ shall be signed by the permittee or a person acting in the permittee's behalf, with the authority to bind the permittee. A person is a duly authorized representative only if *both* criteria below are met. If a representative authorization is no longer valid because of a change in responsibility for the overall operation of the facility, a new authorization shall be immediately submitted to DEQ.

    a. The authorization is made in writing by the permittee.

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

23. All submittals shall contain the following signed certification statement:

    "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

24. Any fish kills or spills of fuels or oils shall be reported to DEQ immediately upon discovery at (703) 583-3800. If DEQ cannot be reached, the spill shall be reported to the Virginia Department of Emergency Management (DEM) at 1-800-468-8892 or the National Response Center (NRC) at 1-800-424-8802.

25. DEQ shall be notified in writing within 24 hours or as soon as possible on the next business day when potential environmentally threatening conditions are encountered which require debris removal or involve potentially toxic substances. Measures to remove the obstruction, material, or toxic substance or to change the location of any structure are prohibited until approved by DEQ.

D. Stream Modifications, Including Intake/Outfall Structures

1. Redistribution of existing stream substrate for erosion control purposes is prohibited.

2. Material removed from the stream bottom shall not be deposited into surface waters unless otherwise authorized in this permit.

3. Riprap apron for all outfalls shall be designed in accordance with Virginia Erosion and Sediment Control Handbook, Third Edition, 1992, or the most recent version in effect at the time of construction.

4. For streambank protection activities, structures and backfill shall be placed as close to the streambank as practical, while still avoiding and minimizing impacts to surface waters to the maximum extent practical. No material shall be placed in excess of the minimum necessary for erosion protection.

5. Asphalt and materials containing asphalt or other toxic substances shall not be used in the construction of submerged sills, breakwaters, dams, or weirs.

E. Installation of Utilities

1. All utility line work in surface waters shall be performed in a manner that minimizes disturbance in each area. Temporarily disturbed surface waters shall be restored in accordance with Part I.C.15, C.16, and C.17, unless otherwise authorized by this permit.

2. Material resulting from trench excavation may be temporarily sidecast into wetlands not to exceed a total of 90 calendar days, provided the material is not placed in a manner such that it is dispersed by currents or other forces.

3. The trench for a utility line cannot be constructed in a manner that drains wetlands (e.g., backfilling with extensive gravel layers creating a French drain effect).

F. Road Crossings

1. Access roads authorized by this permit shall be constructed to minimize the adverse effects on surface waters to the maximum extent practicable and to follow as near as possible pre-construction contours and elevations.

2. Installation of pipes and road crossings shall occur in the dry via the implementation of cofferdams, sheetpiling, stream diversions or other similar structures.

3. All surface waters temporarily affected by a road crossing shall be restored to their original elevations immediately following the removal of that particular temporary crossing. Temporary access roads shall be removed entirely following activity completion.

4. At crossings of streams, pipes and culverts must be installed to maintain low flow conditions and shall be countersunk at both inlet and outlet ends of the pipe or culvert, unless otherwise specifically approved by the Department of Environmental Quality on a case-by-case basis, and as follows: The requirement to countersink does not apply to extensions or maintenance of existing pipes and culverts that are not countersunk, floodplain pipes and culverts being placed above ordinary high water, pipes and culverts being placed on bedrock, or pipes and culverts required to be placed on slopes 5.0% or greater. Bedrock encountered during construction must be identified and approved in advance of a design change where the countersunk condition cannot be met. Pipes and culverts 24 inches or less in diameter shall be countersunk three inches below the natural stream bed elevations, and pipes and culverts greater than 24 inches shall be countersunk at least six inches below the natural stream bed elevations. Hydraulic capacity shall be determined based on the reduced capacity due to the countersunk position. In all stream crossings appropriate measures shall be implemented to minimize any disruption of aquatic life movement.

5. Stream bottom elevations at road crossings shall be measured at the inlet and outlet of the proposed structure and recorded prior to construction and within one week after the completion of construction to ensure that the design elevations were met. This information shall be recorded on the *Monthly VWP Permit Inspection Checklist (Attachment 2)* completed after the crossing is installed.

G. Stormwater Management Structures

1. The outfall and overflow structure shall be constructed and maintained to prevent downstream sediment deposition, erosion, or scour that may be associated with normal flow and any expected storm flows. Construction shall include the use of an appropriately sized riprap outlet protection apron at the outfall site.

2. Draining of a stormwater management facility shall be performed by a method that prevents downstream sediment deposition, erosion, or scour.

H. Project Construction Monitoring and Submittals (Impact Sites)

1. The permittee shall submit written notification at least **ten (10) calendar days** prior to the initiation of land disturbance or construction activities in permitted areas. The notification shall include a projected schedule for initiating and completing work at each permitted impact area.

2. Site inspections shall be conducted **once every calendar month** and recorded on the *Monthly VWP Permit Inspection Checklist* (*Attachment 2)* by the permittee or the permittee's qualified designee during active construction within authorized surface water impact areas. Monthly inspections shall be conducted in the following areas: all authorized permanent and temporary impact areas; all avoided surface waters, including wetlands, stream channels, and open water; surface water areas within 50 feet of any land disturbing activity; and all on-site areas designated for permanent preservation. The *Monthly VWP Permit Inspection Checklist* (*Attachment 2)* shall be completed in its entirety for each monthly inspection and shall be kept on-site and made available for review by DEQ staff upon request during normal business hours.

3. The *VWP Permit Construction Status Update Form* (*Attachment 1)* enclosed with this permit shall be completed in June and December of every year for the duration of this permit. The *VWP Permit Construction Status Update Form* (*Attachment 1)* shall include reference to the VWP permit authorization number and one of the following statements for each authorized surface water impact location:

   a. Construction activities not yet started;

   b. Construction activities started;

   c. Construction activities started but are currently inactive, or;

   d. Construction activities complete.

4. The *VWP Permit Construction Status Update Form* (*Attachment 2)* shall be submitted and must be received by DEQ no later than January 10 and July 10 of every year.

5. The permittee shall notify DEQ within 24 hours of discovering impacts to surface waters including wetlands, stream channels, and open water that are not authorized by this permit. The

notification shall include photographs, estimated acreage and/or linear footage of impacts, and a description of the impacts.

6. The permittee shall submit written notification of completion within 30 calendar days after the completion of all activities in all permitted impact areas authorized under this permit.

I. Compensatory Mitigation

1. The permittee shall compensate for permanent stream impacts through the purchase of 1,675 stream credits or 4,761 Stream Condition Units (SCUs) from a DEQ approved mitigation bank, in-lieu fee fund, or a combination thereof that is authorized and approved by DEQ to sell credits in the area in which the impacts will occur and has credits available (as released by DEQ). Mitigation bank credits shall be purchased prior to the purchase of in-lieu fee program credits in accordance with 9VAC25-210-116.C.2. The credit sale shall be in accordance with the approved Mitigation Banking Instrument for the mitigation bank.

2. The permittee shall submit documentation to DEQ prior to initiating work in permitted impact areas that 1,675 stream credits or 4,761 SCUs were acquired and debited from the ledger of a DEQ approved mitigation bank, in-lieu fee fund, or a combination thereof to satisfy the requirement of Part I.I.1.

Part II – General Conditions

A. Duty to Comply

The permittee shall comply with all conditions and limitations of the VWP permit. Nothing in this chapter shall be construed to relieve the permittee of the duty to comply with all applicable federal and state statutes, regulations, toxic standards, and prohibitions. Any VWP permit violation or noncompliance is a violation of the Clean Water Act and State Water Control Law and is grounds for enforcement action, VWP permit termination, VWP permit revocation, VWP permit modification, or denial of an application for a VWP permit extension or reissuance.

Nothing in this VWP permit shall be construed to relieve the permittee from civil and criminal penalties for noncompliance.

B. Duty to Cease or Confine Activity

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the activity for which a VWP permit has been granted in order to maintain compliance with the conditions of the VWP permit.

C. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any impacts in violation of the VWP permit that may have a reasonable likelihood of adversely affecting human health or the environment.

D. VWP Permit Actions

A VWP permit may be modified in whole or in part, revoked and reissued, extended, transferred, or terminated in accordance with 9 VAC 25-210-180.

1. During the drafting and authorization of a permit modification, only those conditions to be modified shall be addressed with preparing a draft modified permit. VWP permit terms and conditions of the existing permit shall remain in full force and effect during the modification of the permit.

2. This VWP permit may be modified upon the request of the permittee or upon board initiative when any of the following developments occur:

    a. When new information becomes available about the project or activity covered by the VWP permit, including project additions or alterations, that was not available at VWP permit issuance and would have justified the application of different VWP permit conditions at the time of VWP permit issuance;

b. When a change is made in the promulgated standards or regulations on which the VWP permit was based;

c. When changes occur that are subject to "reopener clauses" in the VWP permit; or

d. When developments applicable to surface water withdrawals as specified in 9VAC25-210-380 occur.

3. When this VWP permit authorizes surface water withdrawals, it may be modified when any of the following developments occur:

   a. When the board determines that minimum instream flow levels resulting directly from the permittee's withdrawal of surface water are detrimental to the instream beneficial use, existing at the time of permit issuance, and the withdrawal of surface water should be subject to further net limitations or when an area is declared a surface water management area pursuant to §§ 62.1-242 through 62.1-253 of the Code of Virginia, during the term of the VWP permit.

   b. Significant changes to the location of the surface water withdrawal system are proposed such that the Department of Environmental Quality determines a new review is warranted due to the potential effect of the surface water withdrawal to existing beneficial uses of the new location.

   c. Changes to the permitted project or the surface water withdrawal, including increasing the storage capacity for the surface water withdrawal, that propose an increase in the maximum permitted withdrawal volumes or rate of withdrawal or that cause more than a minimal change to the instream flow requirements with potential to result in a detrimental effect to existing beneficial uses.

   d. A revision to the purpose of the surface water withdrawal that proposes to include a new use or uses that were not identified in the permit application or a modification of the existing authorized use or uses such that the use description in the permit application and permit is no longer applicable. Examples of uses include, but are not limited to agricultural irrigation, golf course irrigation, public water supply, manufacturing, and electricity generation.

4. When the permittee has submitted a timely and complete application for reissuance of an existing VWP individual permit, but through no fault of the permittee, the board does not reissue or reissue with conditions a VWP individual permit or the board does not provide notice of its tentative decision to deny the application before an existing VWP individual permit expires, the conditions of the expiring VWP individual permit shall be administratively continued in full force and effect until the effective date of a reissued permit or the date on which the board denies the application. Timely application shall be a minimum of 180 days for an individual permit or a minimum of 270 days for an individual permit for a surface water withdrawal, unless otherwise specified in the existing permit.

5. Any permittee desiring to continue a previously permitted activity after the expiration date of this VWP permit shall apply for and obtain a new permit or, if applicable, shall request an extension in

accordance with 9VAC25-210-180. Any permittee with an effective VWP permit for an activity that is expected to continue after the expiration date of the VWP permit, without any change in the activity authorized by the VWP permit other than as may be allowed under 9VAC25-210-180, shall submit written notification requesting an extension. The permittee must file the request 90 days prior to the expiration date of the VWP permit. VWP permit modifications shall not be used to extend the term of a VWP permit beyond 15 years from the date of original issuance. When a permit term, other than that of an Emergency Virginia Water Protection Permit, is less than 15 years, an extension of the permit terms and conditions may be granted in accordance with 9VAC25-210-180. Emergency Virginia Water Protection Permits shall not exceed a duration of one year or shall expire upon the issuance of a regular Virginia Water Protection Permit, whichever comes first.

6. This VWP permit may be transferred to a new permittee only by modification to reflect the transfer, by revoking and reissuing the permit, or by automatic transfer. Automatic transfer to a new permittee shall occur if the current permittee: a) Notifies the board of the proposed transfer of the permit and provides a written agreement between the current and proposed permittees containing the date of transfer of VWP permit responsibility, authorization, and liability to the new permittee; and b) the board does not within 15 days notify the existing permittee of its intent to modify the VWP permit.

7. After notice and opportunity for a formal hearing pursuant to § 62.1-44.15:02 of the Code of Virginia, a VWP permit can be terminated for cause. Reasons for termination for cause are as follows:

   a. Noncompliance by the permittee with any condition of the VWP permit;

   b. The permittee's failure in the application or during the VWP permit process to disclose fully all relevant facts or the permittee's misrepresentation of any relevant facts at any time;

   c. The permittee's violation of a special or judicial order;

   d. A determination by the board that the permitted activity endangers human health or the environment and can be regulated to acceptable levels by VWP permit modification or termination;

   e. A change in any condition that requires either a temporary or permanent reduction or elimination of any activity controlled by the VWP permit; and

   f. A determination that the permitted activity has ceased and that the compensation for unavoidable adverse impacts has been successfully completed.

8. The board may terminate this permit without cause when the permittee is no longer a legal entity due to death, dissolution, or when a company is no longer authorized to conduct business in the Commonwealth. The termination shall be effective 30 days after notice of the proposed

termination is sent to the last known address of the permittee or registered agent, unless the permittee objects within that time. If the permittee does object during that period, the board shall follow the applicable procedures for termination under § 62.1-44.15:25 of the Code of Virginia and 9VAC25-230.

9. This VWP permit may be terminated by consent, as initiated by the permittee. The permittee shall submit a request for termination by consent within 30 days of completing or canceling all permitted activities and all required compensatory mitigation requirements. When submitted for project completion, the request for termination by consent shall constitute a notice of project completion. The director may accept this termination on behalf of the board. The permittee shall submit the following information:

    a. Name, mailing address, and telephone number;

    b. Name and location of the activity;

    c. The VWP permit number; and

    d. One of the following certifications:

        i. For project completion: "I certify under penalty of law that all activities and any required compensatory mitigation authorized by a VWP permit have been completed. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit."

        ii. For project cancellation: "I certify under penalty of law that the activities and any required compensatory mitigation authorized by this VWP permit will not occur. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit, nor does it allow me to resume the permitted activities without reapplication and issuance of another permit."

        iii. For events beyond permittee control, the permittee shall provide a detailed explanation of the events, to be approved by DEQ, and the following certification statement: "I certify under penalty of law that the activities or the required compensatory mitigation authorized by this VWP permit have changed as the result of events beyond my control (see attached). I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that

performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit, nor does it allow me to resume the permitted activities without reapplication and issuance of another permit.

E. Inspection and Entry

Upon presentation of credentials, the permittee shall allow the board or any duly authorized agent of the board, at reasonable times and under reasonable circumstances, to conduct the actions listed in this section. For the purpose of this section, the time for inspection shall be deemed reasonable during regular business hours. Nothing contained herein shall make an inspection time unreasonable during an emergency.

1. Enter upon any permittee's property, public or private, and have access to, inspect and copy any records that must be kept as part of the VWP permit conditions;

2. Inspect any facilities, operations or practices (including monitoring and control equipment) regulated or required under the VWP permit; and

3. Sample or monitor any substance, parameter, or activity for the purpose of ensuring compliance with the conditions of the VWP permit or as otherwise authorized by law.

F. Duty to Provide Information

The board may request (i) such plans, specifications, and other pertinent information as may be necessary to determine the effect of an applicant's discharge on the quality of state waters or (ii) such other information as may be necessary to accomplish the purposes of this chapter. Any owner, permittee, or person applying for a VWP permit or general permit coverage shall provide the information requested by the board.

G. Monitoring and Records Requirements

1. Monitoring of parameters, other than pollutants, shall be conducted according to approved analytical methods as specified in the VWP permit. Analysis of pollutants will be conducted according to 40 CFR Part 136 (2000), Guidelines Establishing Test Procedures for the Analysis of Pollutants.

2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

3. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart or electronic recordings for continuous monitoring instrumentation, copies of all reports required by the VWP permit, and records of all data used to

complete the application for the VWP permit, for a period of at least three years from the date of permit expiration. This period may be extended by request of the board at any time.

4. Records of monitoring information shall include:

   a. The date, exact place and time of sampling or measurements;

   b. The name of the individuals who performed the sampling or measurements;

   c. The date and time the analyses were performed;

   d. The name of the individuals who performed the analyses;

   e. The analytical techniques or methods supporting the information such as observations, readings, calculations and bench data used;

   f. The results of such analyses; and

   g. Chain of custody documentation.

H. Property rights

The issuance of a VWP permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize injury to private property or any invasion of personal rights or any infringement of federal, state or local laws or regulations.

I. Reopener

This VWP permit may be reopened for the purpose of modifying the conditions of the VWP permit to meet new regulatory standards duly adopted by the board. Cause for reopening VWP permits includes, but is not limited to when the circumstances on which the previous VWP permit was based have materially and substantially changed, or special studies conducted by the board or the permittee show material and substantial change, since the time the VWP permit was issued and thereby constitute cause for VWP permit modification or revocation and reissuance.

J. Compliance with State and Federal Law

As to the permitted activity(ies), compliance with a VWP permit constitutes compliance with the VWP permit requirements of the Law and regulations. .

K. Severability

The provisions of this VWP permit are severable.

L. Oil and Hazardous Substance Liability

Nothing in this VWP permit shall be construed to preclude the institution of legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under § 311 of the Clean Water Act or §§ 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law.

M. Unauthorized Discharge of Pollutants

Except in compliance with a VWP permit, unless the activity is otherwise exempted or excluded, no person shall dredge, fill, or discharge any pollutant into, or adjacent to surface waters; withdraw surface water; otherwise alter the physical, chemical, or biological properties of state waters regulated under this chapter and make them detrimental to the public health, to animal or aquatic life, or to the uses of such waters for domestic or industrial consumption, for recreation, or for other uses; excavate in wetlands; or on or after October 1, 2001, conduct the following activities in a wetland:

1. New activities to cause draining that significantly alters or degrades existing wetland acreage or functions;

2. Filling or dumping;

3. Permanent flooding or impounding; or

4. New activities that cause significant alteration or degradation of existing wetland acreage or functions.

Attachment 1: VWP PERMIT CONSTRUCTION STATUS UPDATE FORM

Attached to VWP Individual Permit Number 18-1003

Permit Issuance March 5, 2019

Date (check one):

☐ June____, _____

☐ December _____, _____

VWP Individual Permit Number: 18-1003

Project Name and Location: Northfax, City of Fairfax

Status within each authorized surface water impact location, as identified on *Stream Impact Exhibit*, dated August 9, 2018, with latest revision date of August 21, 2018, and received September 12, 2018: (check one of the following status options for each impact number/location. Attach additional sheet(s) if needed.)

Authorized impact number	Construction activities not started	Construction activities started	Construction activities started but currently not active	Does this impact involve culvert(s)[1]?	Construction activities complete[2]
A1					
B1					
A2					
C1					

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Authorized Signature: _____

Print Name: _____

Title: _____ Phone: _____

Date: _____ Email: _____

[1] Provide spot elevations of the stream bottom within the thalweg at the beginning and end of the pipe or culvert, extending to a minimum of 10 feet beyond the limits of the impact, with completion of all culvert installations.

[2] If all construction activities and compensatory mitigation requirements are complete, the permittee completes and signs the Termination Agreement section below within 30 days of last authorized activity and/or compensation completion. A completed and signed Agreement serves as Notice of Project Completion (9VAC25-210-130 F).

TERMINATION AGREEMENT BY CONSENT – PROJECT COMPLETION

Permittee Name: _____

Permittee Mailing Address: _____

Permittee Phone: _____

I hereby consent to the termination of coverage for VWP Individual Permit Number 18-1003.

"I certify under penalty of law that all activities and any required compensatory mitigation authorized by a VWP permit have been completed. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit."

Permittee Signature: _____

Attachment 2: MONTHLY VWP PERMIT INSPECTION CHECKLIST

An inspection of all permitted impact areas, avoided waters and wetlands, and permanently preserved waters, wetlands and upland areas must be conducted at least once every month during active construction activities. Maintain this record on-site and available for inspection by DEQ staff.

Project Name	Northfax	**VWP Permit #**	18-1003	**Inspection Date**	
Inspector Name & Affiliation		**Phone # & Email Address**			

Based on reading of VWP permit No. 18-1003 including authorized impacts map entitled "Stream Impact Exhibit" dated August 9, 2018, with latest revision date of August 21, 2018, and received September 12, 2018, and my inspection on the date referenced above, to the best of my knowledge this project (____is in compliance / ____ is not in compliance) with the VWP Permit.

I certify that the information contained in this report is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ Signature of Inspector

_____ Date

REVIEWED DURING SITE INSPECTION	Yes	No	N/A	Notes & Corrective Action Taken / Date Completed (use back of page if necessary)
Unauthorized impacts to surface waters, including wetlands, or upland preservation areas **have occurred**.* *(This includes sedimentation impacts due to inadequate or failed erosion controls.)*	☐	☐		
Non-impacted wetlands, streams and preservations areas within 50 feet of construction are clearly marked to prevent unpermitted impacts.	☐	☐	☐	
Temporary impacts are being restored to original contours, stabilized, and allowed to re-establish with wetland vegetation.	☐	☐	☐	
Construction activities are **not** substantially disrupting aquatic life movement.	☐	☐	☐	
E&S controls are present, properly maintained, and functioning.	☐	☐	☐	
In-stream work is being performed in the dry with the appropriate use of cofferdams, sheetpiling, etc., to minimize stream bottom disturbance and turbidity.	☐	☐	☐	
Pipes and/or culverts for road crossings are countersunk to provide for the re-establishment of low flow fish passage and/or a natural stream bottom, unless otherwise authorized.	☐	☐	☐	
Time-of-year restrictions regarding impacts to surface waters are being adhered to.	☐	☐	☐	
Water quality monitoring is being conducted during stream impacts.	☐	☐	☐	
Streams and wetlands are free from any sheen or discoloration that may indicate a spill of oil, lubricants, concrete or other pollutants. **	☐	☐	☐	
Heavy equipment is placed on mats or geotextile fabric when working in wetlands.	☐	☐	☐	
Exposed slopes/stream banks are stabilized immediately upon completion of work in each impact area.	☐	☐	☐	

* If unauthorized impacts have occurred, you **must** email or fax a copy of this report to DEQ within 24 hours of discovery. Email: vwp.nro@deq.virginia.gov Fax: 703-583-3821

** Any fish kills, or spills of fuels or oils must be reported to DEQ **immediately upon discovery** at 703-583-3864. If DEQ cannot be reached, the spill or fish kill shall be reported to the Virginia Department of Emergency Management (VDEM) at 1-800-468-8892 or the National Response Center (NRC) at 1-800-424-8802. Any spill of oil as defined in § 62.1-44.34:14 of the Code of Virginia that is less than 25 gallons and that reaches, or that is expected to reach, land only is not reportable, if recorded per § 62.1-44.34:19.2 of the Code of Virginia and if properly cleaned up.

Notes

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1096

NOVEMBER 24, 2014

Reply to
Attention of

Special Projects Regulatory Section
NAO-2014-1871 (N. Fk. Accotink Creek)

City of Fairfax
ATTN: Ms. Wendy Block-Sandford
Transportation Department
10455 Armstrong Street, Room 200A
Fairfax, VA 22030

Dear Ms. Block-Sandford:

This is in regard to your Department of the Army permit application number NAO-2014-1871 to impact approximately 2147 linear feet of stream. You propose to make improvements to the Route 123/50/29 intersection, including widening of portions of Route 123 and Route 29/50 and improving the drainage system, along with some realignment of Route 123. As part of the work, you will construct a new 2,101 linear foot, twin 8 foot by 8 foot box culvert to convey the North Fork Accotink Creek; approximately 1,564 linear feet of the stream is already contained within an existing culvert which will be replaced with the new culvert. You will also install riprap in an additional 46 linear feet of channel. The work will occur at the City of Fairfax, Virginia. These impacts are detailed on the enclosed drawings entitled "Nationwide Permit PCN, Route 29.50/123 Intersection, Proposed Roadway & Drainage Improvements," dated June 2012 and date stamped as received by this office on October 3, 2014, prepared and submitted on behalf of the applicant by Rinker Design Associates, P.C. (attached).

Your proposed work as outlined above satisfies the criteria contained in the Corps Nationwide Permits 23, attached. The Corps Nationwide Permits were published in the February 21, 2012 Federal Register notice (77 FR 10184) and the regulations governing their use can be found in 33 CFR 330 published in Volume 56, Number 226 of the Federal Register dated November 22, 1991.

This nationwide permit verification is contingent upon the following project specific condition:

You have indicated that mitigation for the proposed impacts would be accomplished by purchasing credits from an approved mitigation bank that includes the impact area in its geographic service area. As compensation for impacting 583 linear feet of stream, a total of 343 credits (based on the application of the Unified Stream Methodology) will be debited from an approved bank. Prior to purchasing the credits, you must submit to the Corps of Engineers (USACE) your proposed mitigation bank for acceptance. Once USACE has agreed to your proposed bank, you may proceed to acquire the

required credits. Evidence that you have purchased these credits must be provided to USACE prior to commencing the authorized activities in jurisdictional waters.

Provided the project specific condition (above) and the Nationwide Permit General Conditions (enclosed) are met, an individual Department of the Army Permit will not be required. *You should note Regional Condition 9 which requires countersinking of culverts and insure compliance with this condition.*

In addition, the Virginia Department of Environmental Quality has provided an unconditional §401 Water Quality Certification for Nationwide Permit Number 23. A permit may be required from the Virginia Marine Resources Commission and/or your local wetlands board, and this verification is not valid until you obtain their approval, if necessary. This authorization does not relieve your responsibility to comply with local requirements pursuant to the Chesapeake Bay Preservation Act (CBPA), nor does it supersede local government authority and responsibilities pursuant to the Act. Before you begin work, you should find out how the CBPA applies to your project.

Enclosed is a "compliance certification" form, which must be signed and returned within 30 days of completion of the project, including any required mitigation. Your signature on this form certifies that you have completed the work in accordance with the nationwide permit terms and conditions.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2017. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 330.4(e) and 33 CFR 330.5 (c) or (d). Project specific conditions listed in this letter continue to remain in effect after the NWP verification expires, unless the district engineer removes those conditions. Activities completed under the authorization of an NWP which was in effect at the time the activity was completed continue to be authorized by that NWP.

If you have any questions, please contact Alice Allen-Grimes at (757) 201-7219 or alice.w.allen-grimes@usace.army.mil.

Sincerely,

Kimberly A. Prisco-Baggett

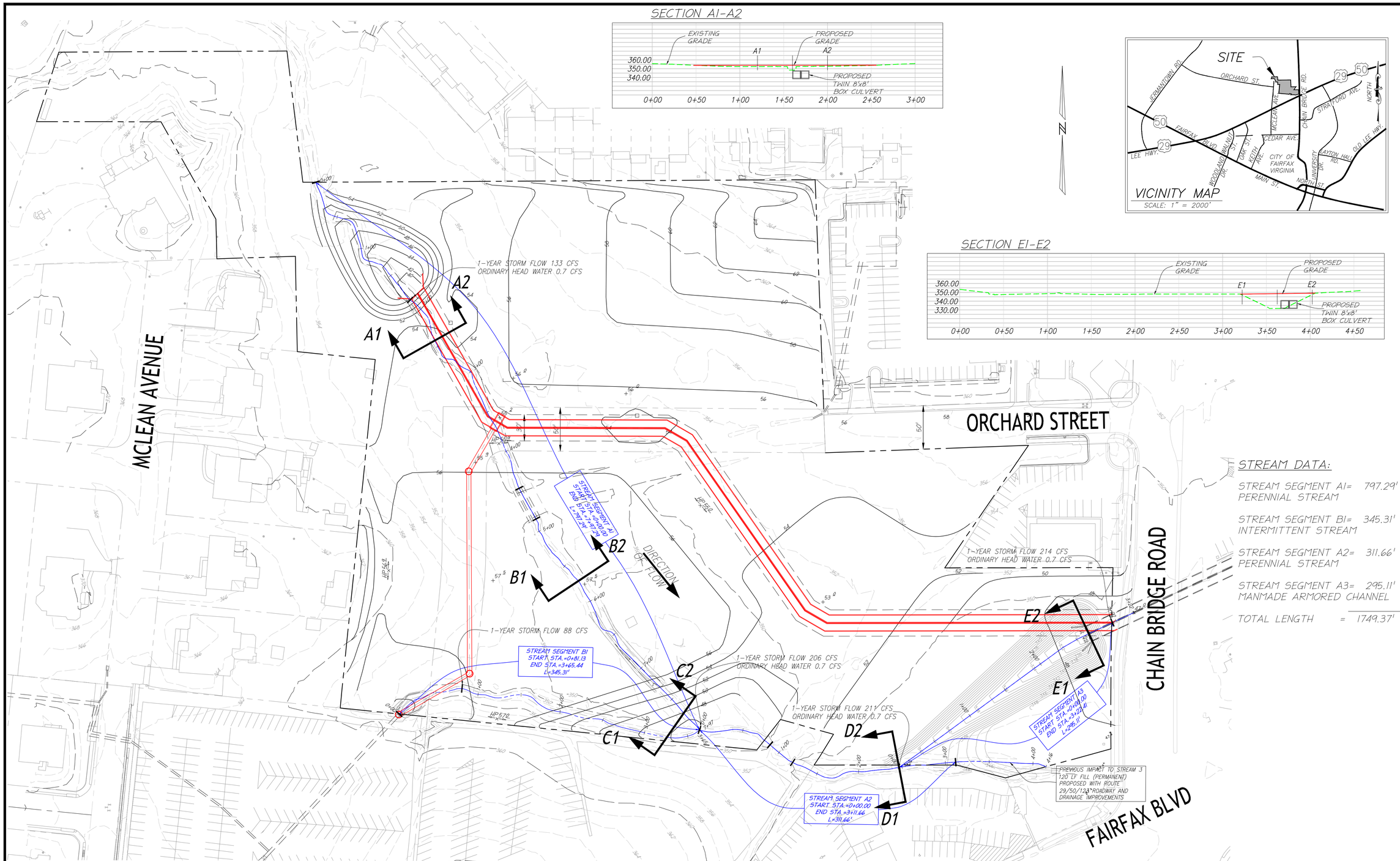
Kimberly A. Prisco-Baggett, MBA
Chief, Special Projects Section

Enclosures

Copies furnished (w/o encl.):

Virginia Marine Resources Commission, Newport News
Rinker Design Associates, PC, Manassas

Appendix C – JPA Exhibits



STREAM DATA:

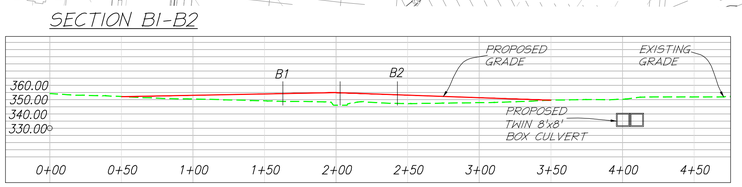
STREAM SEGMENT A1= 797.29'
PERENNIAL STREAM

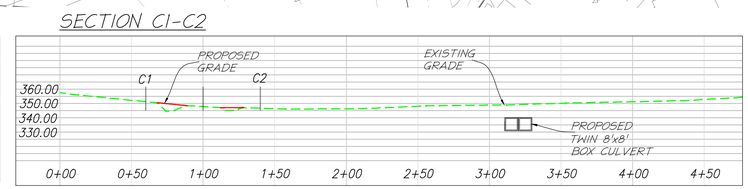
STREAM SEGMENT B1= 345.31'
INTERMITTENT STREAM

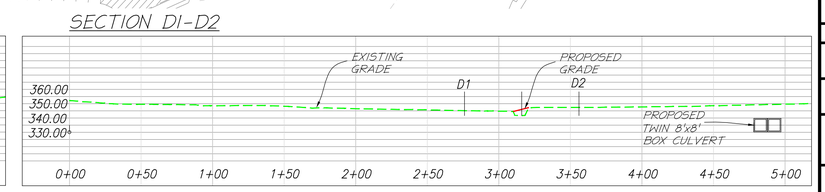
STREAM SEGMENT A2= 311.66'
PERENNIAL STREAM

STREAM SEGMENT A3= 295.11'
MANMADE ARMORED CHANNEL

TOTAL LENGTH = 1749.37'







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STREAM IMPACT EXHIBIT

NORTHFAX AREA
CITY OF FAIRFAX

PROJECT NO:	13139.004.00
SCALE:	1"=50'
DATE:	06/15/2018
DESIGN:	EJ
DRAWN:	JS
CHECKED:	KMW
SHEET No.	1 OF 5

108133

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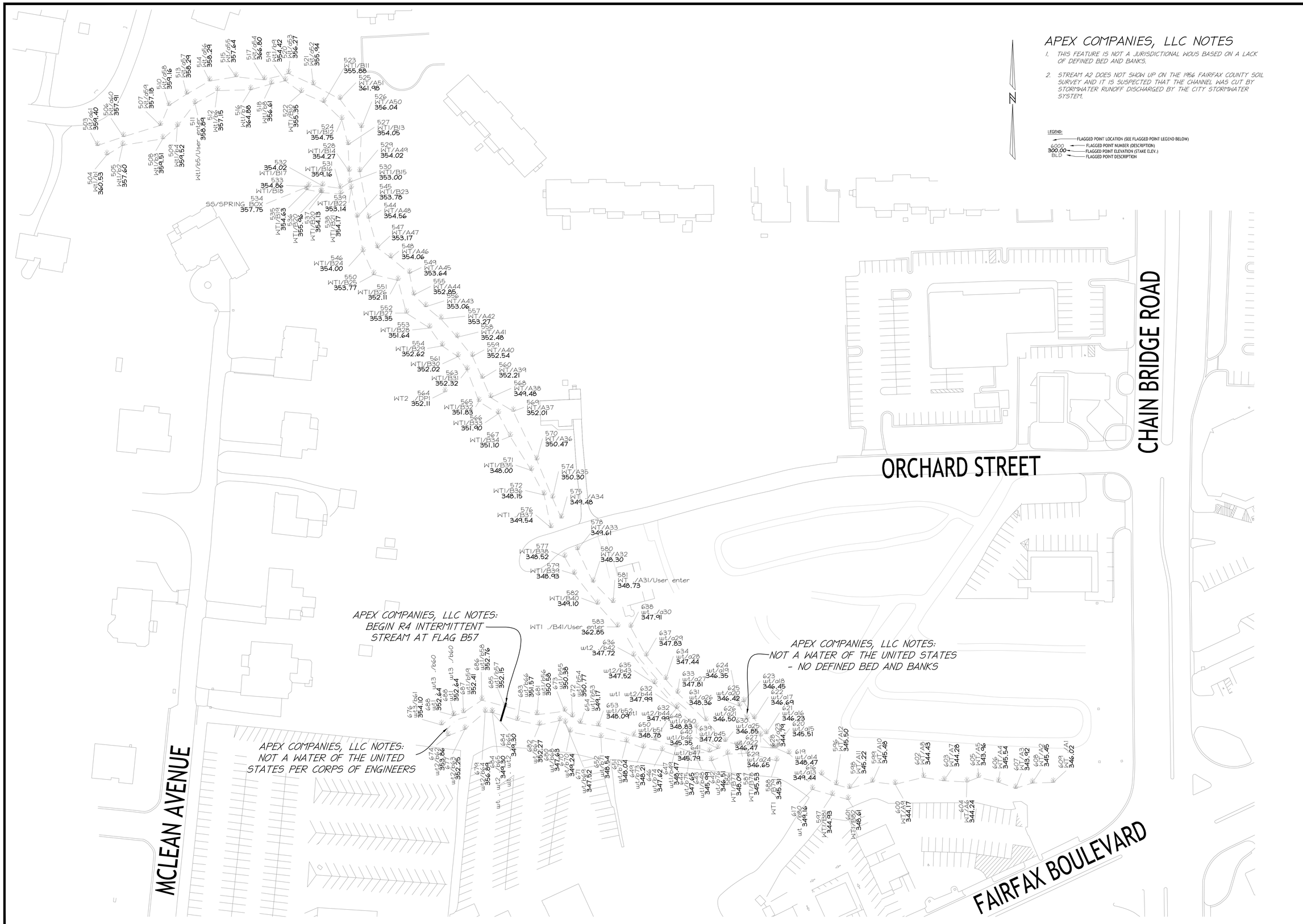

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WETLAND EXHIBIT

NORTHFAX AREA
CITY OF FAIRFAX

PROJECT NO: 13139.004.00

SCALE: 1"=50'

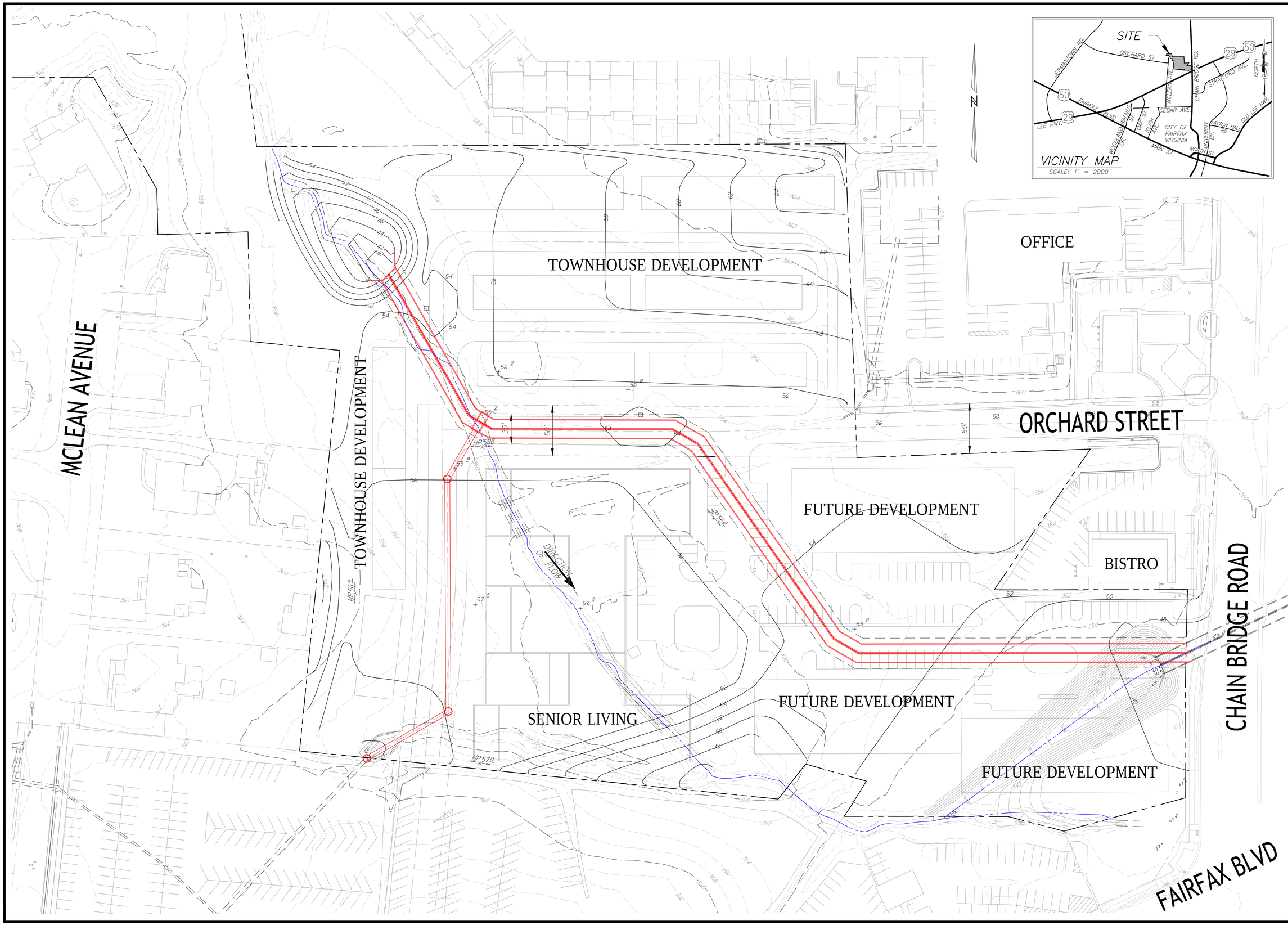
DATE: 06/08/2018

DESIGN: EJ
DRAWN: JS
CHECKED: KMW

SHEET No. 2 OF 5

108133

P:\Projects\13139\004\00\EXHIBITS\108133 Wetland Concept Exhibit\Wetland Site Topo N\108133 NG\D229 - MS.dwg, 6/15/2018 9:22:58 AM, 1:1



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GRADING EXHIBIT

NORTHFAX AREA
CITY OF FAIRFAX

PROJECT NO: 13139.004.00
SCALE: 1"=40'
DATE: 06/15/2018
DESIGN: EJ
DRAWN: JS
CHECKED: KMW
SHEET No.
3 OF 5

108133

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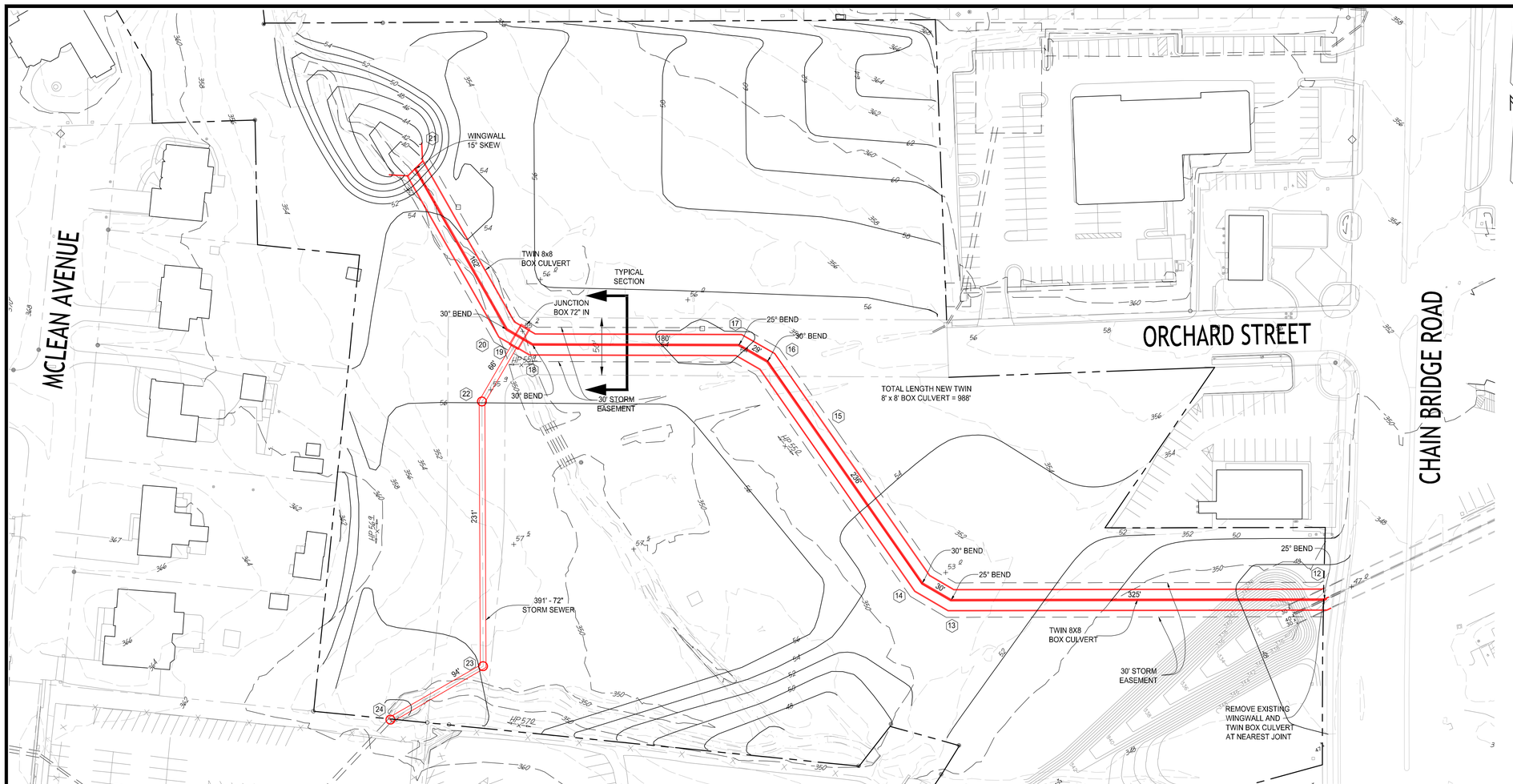
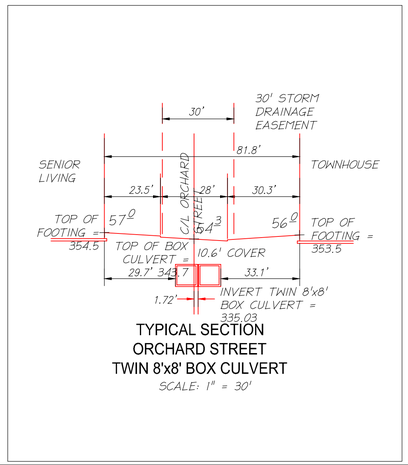
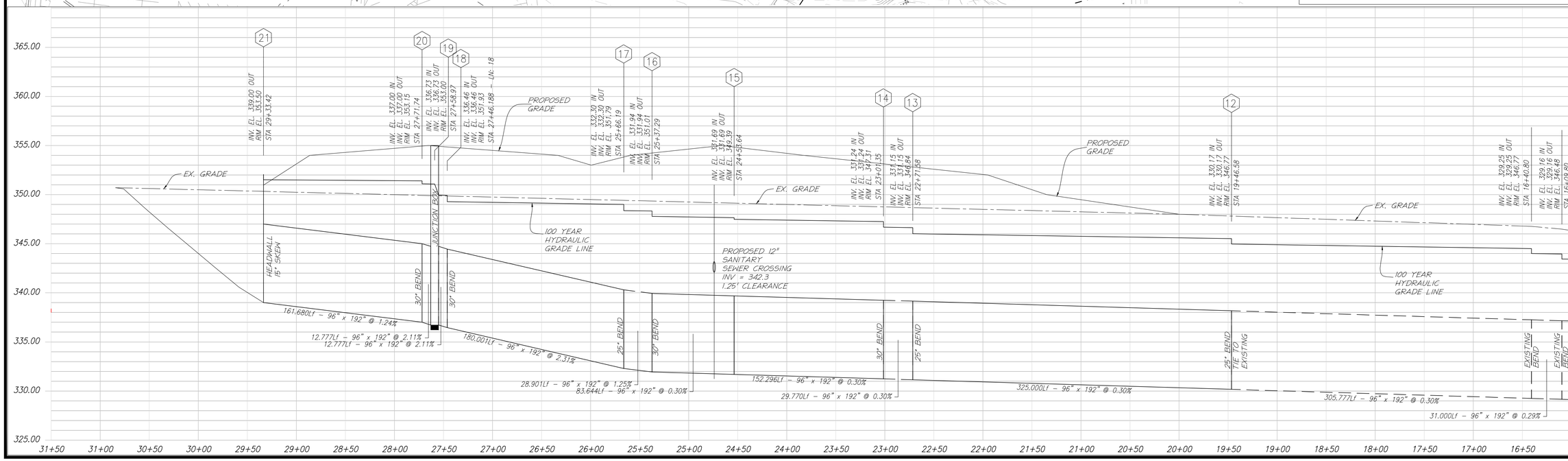




TYPICAL SECTION
ORCHARD STREET
TWIN 8'x8' BOX CULVERT
SCALE: 1" = 30'



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PLAN & PROFILE
STORM SEWER

NORTHFAX AREA
CITY OF FAIRFAX

PROJECT NO: 13139.004.00
SCALE:
1"=50' HORZ 1" =5' VERT
DATE:
06/15/2018
DESIGN: EJ
DRAWN: JS
CHECKED: KMW
SHEET No.
4 OF 5

108133

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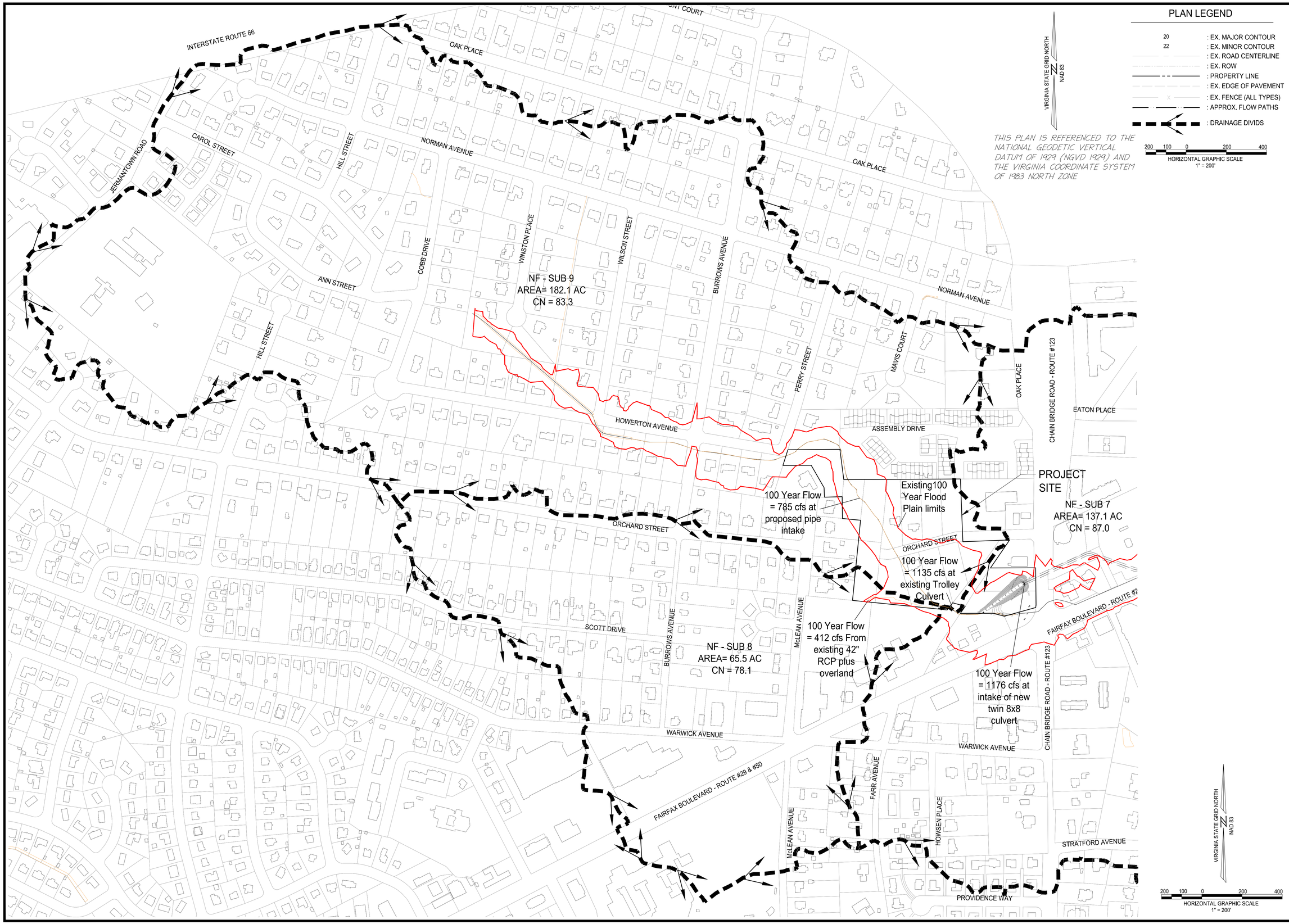

THIS PLAN IS REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 1929) AND THE VIRGINIA COORDINATE SYSTEM OF 1983 NORTH ZONE

PLAN LEGEND

20	: EX. MAJOR CONTOUR
22	: EX. MINOR CONTOUR
	: EX. ROAD CENTERLINE
	: EX. ROW
	: PROPERTY LINE
	: EX. EDGE OF PAVEMENT
	: EX. FENCE (ALL TYPES)
	: APPROX. FLOW PATHS
	: DRAINAGE DIVIDS

200 100 0 200 400
HORIZONTAL GRAPHIC SCALE
1" = 200'

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DRAINAGE EXHIBIT

NORTHFAX AREA
CITY OF FAIRFAX

PROJECT NO: 13139.004.00
SCALE: 1"=200'
DATE: 06/15/2018
DESIGN: EJ
DRAWN: JS
CHECKED: KMW
SHEET No. 5 OF 5

108133

P:\Projects\13139\004\00\EXHIBITS\108133 Wetland Concept Exhibit\C-4.0 Drainage Exhibit.dwg, 6/15/2018 9:20:45 AM, 1:1

STORM SEWER DESIGN
COMPUTATIONS

NORTHFAX
PROPOSED STORM COMPUTATIONS

06/12/2018 EJ

FROM POINT	TO POINT	DRAIN. AREA	RUNOFF COEFF.	CA		INLET TIME	RAINFALL INTENSITY	RUNOFF Q100yr	INVERT ELEVATIONS (ft)		LENGTH	SLOPE	DIA.	n	CAPACITY	VELOCITY	FLOW TIME				NOTES
		ACRES	C	INCREM.	ACCUM.	MIN.	IN./HR.	C.F.S.	UPPER	LOWER	ft	ft/ft	IN.		C.F.S.	FPS	SEC.	Q/Qfull	V/Vfull	Vfull	
24	23	100 YEAR RUNOFF PER FEMA EFFECTIVE HYDROLOGIC MODEL						411.69	346.50	344.72	93.40	0.0191	72	0.013	584.66	22.2	4.2	0.70	1.07	20.68	PROP. 72" RCP STORM
23	22							411.69	344.47	340.04	231.01	0.0192	72	0.013	586.47	22.2	10.4	0.70	1.07	20.74	PROP. 72" RCP STORM
22	21							411.69	339.79	338.54	65.43	0.0191	72	0.013	585.36	22.2	2.9	0.70	1.07	20.70	PROP. 72" RCP STORM
21	20	100 YEAR RUNOFF PER FEMA EFFECTIVE HYDROLOGIC MODEL						785.80	339.00	337.00	161.68	0.0124	146.5	0.013	3131.33	22.2	7.3	0.25	0.83	26.75	PROP. TWIN 8"x 8" BOX CULVERT
20	19							785.80	337.00	336.73	12.78	0.0211	146.5	0.013	4092.70	26.1	0.5	0.19	0.75	34.96	PROP. TWIN 8"x 8" BOX CULVERT
19	18							1135.30	336.73	336.46	12.78	0.0211	146.5	0.013	4092.70	29.9	0.4	0.28	0.86	34.96	PROP. TWIN 8"x 8" BOX CULVERT
18	17							1135.30	336.46	332.30	180.00	0.0231	146.5	0.013	4280.08	30.4	5.9	0.27	0.83	36.56	PROP. TWIN 8"x 8" BOX CULVERT
17	16							1163.96	332.30	331.97	28.90	0.0114	146.5	0.013	3008.45	23.7	1.2	0.39	0.92	25.70	PROP. TWIN 8"x 8" BOX CULVERT
16	15							1163.96	331.97	331.71	83.64	0.0031	146.5	0.013	1569.68	14.7	5.7	0.74	1.09	13.41	PROP. TWIN 8"x 8" BOX CULVERT
15	14							1167.48	331.71	331.24	152.30	0.0031	146.5	0.013	1564.04	14.6	10.4	0.75	1.09	13.36	PROP. TWIN 8"x 8" BOX CULVERT
14	13							1167.78	331.24	331.15	29.77	0.0030	146.5	0.013	1548.01	14.5	2.1	0.75	1.09	13.22	PROP. TWIN 8"x 8" BOX CULVERT
13	12							1175.85	331.15	330.17	325.00	0.0030	146.5	0.013	1546.02	14.5	22.5	0.76	1.09	13.21	PROP. TWIN 8"x 8" BOX CULVERT

THE PIPE CAPACITIES SHOWN ARE BASED ON GRAVITY FLOW. THIS SYSTEM WILL OPERATE UNDER PRESSURE FLOW BASED ON DOWNSTREAM HYDRAULIC CONDITIONS.

Appendix D – Master Development Plan

MASTER DEVELOPMENT PLAN/ PRELIMINARY PLAT
NORTHFAX WEST
CITY OF FAIRFAX, VIRGINIA

GENERAL NOTES:

1. THE SUBJECT PROPERTY SHOWN HEREON IS RECORDED IN THE LAND RECORDS OF FAIRFAX CITY, VIRGINIA AS FOLLOWS:

PARCEL ID	OWNER	ADDRESS	ACREAGE	EXISTING ZONING
57-02-02-017	ARG II, LLC	3590 CHAIN BRIDGE ROAD	0.92	CR (COMMERCIAL RETAIL)
57-02-02-018	ARG II, LLC	3580 CHAIN BRIDGE ROAD	0.59	CR (COMMERCIAL RETAIL)
57-02-02-019	ARG II, LLC	10505 ORCHARD STREET	0.41	CR (COMMERCIAL RETAIL)
57-02-02-020	NORTHFAX JV LLC	3570 CHAIN BRIDGE ROAD	0.54	CR (COMMERCIAL RETAIL)
57-02-08-011	ARG II, LLC	10507 ORCHARD STREET	0.51	RM (RESIDENTIAL MEDIUM)
57-02-08-012	ARG II, LLC	10509 ORCHARD STREET	0.57	RM (RESIDENTIAL MEDIUM)
57-02-08-013	ARG II, LLC	10511 ORCHARD STREET	0.69	RM (RESIDENTIAL MEDIUM)
57-02-08-014	ARG II, LLC	10513 ORCHARD STREET	0.82	RM (RESIDENTIAL MEDIUM)
57-02-08-010	ORCHARD RE INVESTMENTS, LLC	10515 ORCHARD STREET	0.73	RM (RESIDENTIAL MEDIUM)
57-02-02-005	ORCHARD RE INVESTMENTS, LLC	10517 ORCHARD STREET	0.82	RM (RESIDENTIAL MEDIUM)
57-02-08-005	ORCHARD RE INVESTMENTS, LLC	10508 ORCHARD STREET	0.62	RM (RESIDENTIAL MEDIUM)
57-02-08-006	ORCHARD RE INVESTMENTS, LLC	10510 ORCHARD STREET	0.67	RM (RESIDENTIAL MEDIUM)
57-02-08-007	ORCHARD RE INVESTMENTS, LLC	10512 ORCHARD STREET	0.73	RM (RESIDENTIAL MEDIUM)
57-02-08-008	ORCHARD RE INVESTMENTS, LLC	10514 ORCHARD STREET	0.68	RM (RESIDENTIAL MEDIUM)
57-02-02-003	ORCHARD RE INVESTMENTS, LLC	10516 ORCHARD STREET	0.84	RM (RESIDENTIAL MEDIUM)
57-02-07-015B	ORCHARD RE INVESTMENTS, LLC	NONE	0.45	RM (RESIDENTIAL MEDIUM)
57-02-47-000-A	ORCHARD RE INVESTMENTS, LLC	NONE	0.93	RM (RESIDENTIAL MEDIUM)
		TOTAL =	11.32	

2. THIS MDP SUBMISSION IS AN APPLICATION TO REZONE THE SUBJECT PROPERTIES FROM CR (COMMERCIAL RETAIL) AND RM (RESIDENTIAL MEDIUM) TO PD-M (PLANNED DEVELOPMENT MIXED USE) DISTRICT. THE CURRENT SITE CONSISTS OF 17 PARCELS THAT WILL BE CONSOLIDATED AND THEN SUBDIVIDED INTO THREE PARCELS FOR DEVELOPMENT. THE THREE PARCELS WILL CONSISTS OF A PARCEL FOR TOWNHOUSES, A PARCEL FOR A SENIOR LIVING BUILDING AND A FUTURE DEVELOPMENT PARCEL WITH USES THAT HAVE YET TO BE DETERMINED. THIS MDP SUBMISSION SERVES AS A PRELIMINARY PLAT AND IS IN CONFORMANCE WITH ZONING ORDINANCE SECTION 6.6.5.B. AND THE SUBDIVISION ORDINANCE.

3. THE BOUNDARY AND PHYSICAL IMPROVEMENTS SHOWN HEREON ARE BASED UPON AN ARIEAL TOPOGRAPHIC SURVEY PERFORMED BY McKENZIE SNYDER, INC. FLOWN APRIL 6, 2015 AND COMPILED NOVEMBER 14, 2017. THIS DATA HAS BEEN SUPPLEMENTED BY CONVENTIONAL METHODS BY THIS FIRM BETWEEN THE DATES OF NOVEMBER 16 AND DECEMBER 5, 2017 AND JANUARY 2 AND JANUARY 3, 2018 AND FURTHER SUPPLEMENTED BETWEEN THE DATES OF APRIL 9 AND APRIL 17, 2019. CONTOUR INTERVAL FOR TOPOGRAPHIC SURVEY IS 2 FEET.

4. THE FOLLOWING DATUM WERE USED:
   A. HORIZONTAL DATUM SHOWN HEREON IS REFERENCED TO THE VIRGINIA COORDINATE SYSTEM (VCS) 1983 - NORTH AS ESTABLISHED FROM A GPS SURVEY.
   B. THE VERTICAL DATUM SHOWN HEREON IS REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29) AS ESTABLISHED FROM A CURRENT GPS SURVEY.

5. THE AREA SHOWN HEREON IS LOCATED ON THE FLOOD INSURANCE RATE MAPS (FIRM), COMMUNITY PANEL NO. 5155240002 D, WITH AN EFFECTIVE DATE OF JUNE 2, 2006.

   BY GRAPHICAL DEPICTION ONLY, THE PROPERTY IS SHOWN IN:

   - FLOOD ZONE "AE" (SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD) BASE FLOOD ELEVATIONS DETERMINED.

   A FIELD SURVEY HAS BEEN PERFORMED TO DETERMINE THE FLOOD ZONES LISTED HEREON. A CLOMR (PLAN # 18-03-2239R) HAS BEEN SUBMITTED AND APPROVED BY THE CITY OF FAIRFAX AND FEMA TO ADJUST THE FLOODPLAIN BOUNDARIES AROUND THE PROPERTY BASED ON THE PROPOSED SITE IMPROVEMENTS. REFER TO SHEET 18 FOR THE PRE-DEVELOPED FLOODPLAIN BOUNDARY AND SHEET 18A FOR THE POST-DEVELOPED FLOOD PLAIN BOUNDARY.

6. A TITLE REPORT WAS PROVIDED BY FIRST AMERICAN TITLE INSURANCE COMPANY, COMMITMENT NO. A1401113-TD WITH AN EFFECTIVE DATE OF NOVEMBER 18, 2014 AND REVISED JANUARY 6, 2015. ALL EASEMENTS, SERVITUDES AND OTHER MATTERS OF TITLE REFERENCED THEREIN ARE SHOWN ON THIS PLAN.

7. THE SUBJECT PROPERTY IS CURRENTLY SERVED BY PUBLIC WATER AND PUBLIC SEWER PROVIDED BY CITY OF FAIRFAX AND FAIRFAX WATER.

8. DURING THE PROCESS OF THE PHYSICAL SURVEY CONDUCTED BY CHRISTOPHER CONSULTATNS, LTD. NO INDICATIONS OF A CEMETERY WERE FOUND. NO FURTHER INSPECTION OF THESE PROPERTIES HAVE BEEN MADE FOR POSSIBLE CEMETERIES. THE SUBJECT PROPERTY IS NOT LISTED UNDER THE NATIONAL REGISTER OF HISTORIC PLACES.

9. NO GEOTECHNICAL FIELD REVIEWS, RESEARCH, GOVERNMENTAL RECORD REVIEWS, OR OTHER INVESTIGATIONS HAVE BEEN MADE FOR THE PURPOSE OF LOCATING, OR DETERMINING THE EXISTENCE OF HAZARDOUS MATERIALS, OR OTHER ENVIRONMENTAL CONCERNS ON THIS SITE. A PRELIMINARY JURISDICTIONAL DETERMINATION HAS BEEN SUBMITTED TO THE ARMY CORPS OF ENGINEERS TO DELINEATE THE RPA.

10. THIS DEVELOPMENT PROPOSAL IS COMPATIBLE WITH THE EXISTING DEVELOPMENT IN THE VICINITY OF THIS SITE. NO ADVERSE EFFECTS TO NEIGHBORING PROPERTIES ARE ANTICIPATED WITH THIS PROJECT.

11. NOTWITHSTANDING THE IMPROVEMENTS AND TABULATIONS SHOWN ON THIS PLAN, THE APPLICANT RESERVES THE RIGHT TO MAKE MODIFICATIONS TO THE FINAL DESIGN TO COMPLY WITH FINAL ENGINEERING AND NEW CRITERIA AND REGULATIONS WHICH MAY BE ADOPTED BY THE CITY OF FAIRFAX SUBSEQUENT TO THE SUBMISSION OF THIS APPLICATION, PROVIDED THAT SUCH MODIFICATIONS ARE SUBSTANTIALLY CONSISTENT WITH THE APPROVED DEVELOPMENT PLAN.

12. THE PROPOSED BUILDING FOOTPRINTS AND SITE IMPROVEMENTS SHOWN HEREIN ARE PRELIMINARY. THE PROPOSED SQUARE FOOTAGE FOR THE PROPOSED BUILDINGS IS APPROXIMATE ONLY AND MAY BE SUBJECT TO REVISIONS AT THE TIME OF SITE PLAN, SUBJECT TO MARKET CONDITIONS, BUT SUBSTANTIALLY CONSISTENT WITH THE APPROVED DEVELOPMENT PLAN.

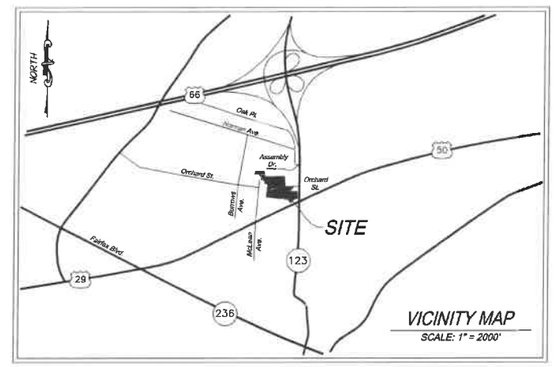
13. ALL EXISTING UTILITY EASEMENTS HAVING A WIDTH GREATER THAN 25 FEET ARE SHOWN ON THE EXISTING CONDITIONS PLAN.

14. SITE LIGHTING WITHIN THE PROJECT SITE AREA (I.E. ALONG SIDEWALKS AND PATHWAYS) WILL BE DETERMINED DURING FINAL SITE PLAN REVIEW AND SHALL BE IN GENERAL CONFORMANCE WITH SECTION 4.8 OF THE ZONING ORDINANCE AND SECTION 2.10 OF THE PUBLIC FACILITIES MANUAL.

15. ONSITE STORMWATER MANAGEMENT AND BEST MANAGEMENT PRACTICES SHALL BE PROVIDED AS REQUIRED BY CITY REGULATIONS AT THE TIME OF FINAL SITE PLAN. DETENTION TO PROVIDE THE REQUIRED STORMWATER QUANTITY CONTROLS AND ONSITE BEST MANAGEMENT PRACTICES (BMPs) TO MEET THE STORMWATER QUALITY REQUIREMENTS ARE SHOWN ON SHEETS 4 AND 4A.

16. ALL SIGNAGE WILL BE IN CONFORMANCE WITH SECTION 4.6 OF THE ZONING ORDINANCE.

17. TO THE BEST KNOWLEDGE OF THE ENGINEER AND APPLICANT, THIS DEVELOPMENT PLAN CONFORMS TO ALL APPLICABLE ORDINANCES, REGULATIONS AND ADOPTED STANDARDS, WITH THE FOLLOWING MODIFICATIONS, WAIVERS, AND SPECIAL USE PERMIT:
   A. A MODIFICATION HAS BEEN REQUESTED OF SECTION 4.5.5.C.2.b.2. OF THE ZONING ORDINANCE FOR THE PERIMETER BUFFER TRANSITIONAL YARD (TY3).
   B. A MODIFICATION HAS BEEN REQUESTED OF SECTION 4.5.6.B. OF THE ZONING ORDINANCE FOR THE STREET TREE SPACING. THE APPLICANT PROPOSES NO STREET TREES ALONG ALL PRIVATE ALLEYWAYS.
   C. SUPPORT FOR A WAIVER HAS BEEN REQUESTED OF SECTION 401-01 OF THE FAIRFAX PFM FOR THE TYPICAL CURB AND GUTTER STREET SECTION ON PRIVATE ACCESSWAYS THAT ARE LESS THAN 30 FEET FROM FACE OF CURB TO FACE OF CURB OR EDGE OF PAVEMENT.
   D. SUPPORT FOR A WAIVER HAS BEEN REQUESTED OF SECTION 2.4.5.3 THAT BLOCKS SHALL NOT BE LESS THAN 300 FEET IN LENGTH.
   E. A MODIFICATION HAS BEEN REQUESTED OF SECTION 4.5.7.D. OF THE ZONING ORDINANCE FOR INTERIOR PARKING LANDSCAPE ISLANDS.
   F. A MODIFICATION HAS BEEN REQUESTED OF SECTION 4.4.4.A.1. OF THE ZONING ORDINANCE. THE APPLICANT PROPOSES NO SIDEWALKS ALONG ALL PRIVATE ALLEYWAYS.
   G. A MODIFICATION HAS BEEN REQUESTED OF SECTION 3.5.1.C.2. OF THE ZONING ORDINANCE THAT REQUIRES NO MORE THAN ONE OF ANY THREE TO FIVE ABUTTING DWELLING UNITS HAVE THE SAME FRONT YARD SETBACKS.
   H. A MODIFICATION HAS BEEN REQUESTED OF SECTION 4.2.3.E. OF THE ZONING ORDINANCE FOR THE PARKING RATIO REQUIREMENTS.
   I. A SPECIAL USE PERMIT HAS BEEN REQUESTED OF SECTION 4.15.7.C. OF THE ZONING ORDINANCE FOR DISTURBANCE IN THE FLOODPLAIN.



VICINITY MAP
SCALE: 1" = 2000'

PROJECT TEAM:

OWNER / APPLICANT
NORTHFAX JV LLC c/o THE LANN COMPANIES
3900 JERMANTOWN ROAD, SUITE 300
FAIRFAX, VA 22030

CONTRACT PURCHASERS
MHI-NORTHFAX, LLC c/o MADISON HOMES, INC.
1950 OLD GALLOWS ROAD, SUITE 200
TYSONS CORNER, VA 22181

BRIGHTVIEW SENIOR LIVING DEVELOPMENT, LLC
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BALTIMORE, MD 21201

ATTORNEY
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ARLINGTON, VA 22201

ARCHITECTS
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ENGINEER
christopher consultants
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FAIRFAX, VA 22031

TRANSPORTATION ENGINEER
GOROVE / SLADE
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WASHINGTON, DC 20036

ENVIRONMENTAL AND GEOTECH CONSULTANTS
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9700 CAPITAL COURT, SUITE 100
MANASSAS, VA 20110

HILLIS-CARNES ENGINEERING ASSOCIATES, INC.
14155 SULLYFIELD CIRCLE, SUITE A
CHANTILLY, VA 20151

SHEET INDEX

1	COVER SHEET
2	EXISTING CONDITIONS PLAN
2A	EXISTING CONDITIONS PLAN
3	TREE MANAGEMENT PLAN
3A	TREE MANAGEMENT PLAN
3B	TREE MANAGEMENT SCHEDULE
3C	TREE MANAGEMENT SCHEDULE
3D	TREE MANAGEMENT NOTES & DETAILS
4	MASTER DEVELOPMENT PLAN
4A	MASTER DEVELOPMENT PLAN
4B	STREET SECTIONS AND TYPICAL TOWNHOUSE YARDS
5	PRELIMINARY GRADING PLAN
5A	PRELIMINARY GRADING PLAN
6	CONCEPTUAL LANDSCAPE PLAN
6A	CONCEPTUAL LANDSCAPE PLAN
7	OPEN SPACE PLAN
8	SANITARY SEWER OFF-SITE MAP
9	SANITARY SEWER ANALYSIS
10-15	SIGHT DISTANCE
16	TURNING MOVEMENTS
17	FIRE SERVICE PLAN
18	FLOODPLAIN AND RPA PRE-DEVELOPED
18A	FLOODPLAIN AND RPA POST-DEVELOPED

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COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
01/03/2020
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

COVER SHEET

SHEET No.

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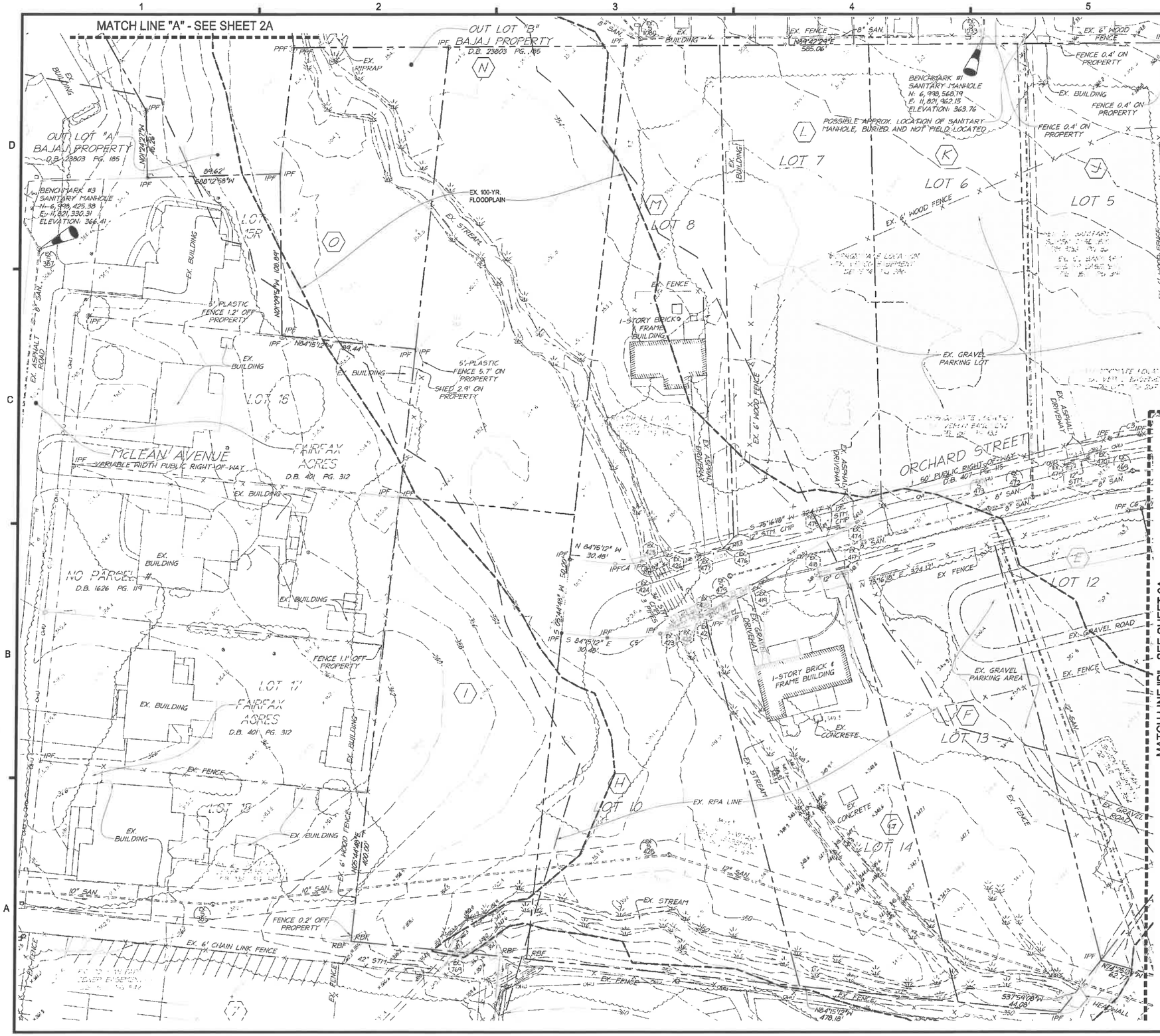
SCALE: 1"=30'



LEGEND

Utilities - Storm
- STORM MANHOLE
- STORM CULVERT

Utilities - Sanitary
- SANITARY MANHOLE

Utilities - Water
- WATER VALVE
- WATER METER
- FIRE HYDRANT
- WATER MANHOLE

Utilities - Electric
- LIGHT POLE
- UTILITY POLE
- LAMP POST
- GUY WIRE

Utilities - Communication
- TELEPHONE PEDESTAL/POST

Misc. Structures
- SPOT SHOT
- SIGN
- TREE
- BUSH
- FLAG POLE
- UNIDENTIFIED UTILITY

Abbreviations

EX.	EXISTING
CONC.	CONCRETE
C&G	CURB AND GUTTER
EP	EDGE OF PAVEMENT
IPF	IRON PIPE FOUND
IPS	IRON PIPE SET
RBF	REBAR FOUND
PPF	PINCH PIPE FOUND
CMF	CONCRETE MONUMENT FOUND
NS	NOT SET

Linetypes
- INDEX CONTOUR (5')
- INT. CONTOUR (1')
- FENCE
- OVERHEAD UTILITY WIRE
- VEGETATION LINE

NOTES:
1. SEE SHEET 2A FOR OWNERSHIP TABLE.
2. SEE SHEET 2A FOR STORM AND THIS SHEET FOR SANITARY AS-BUILT INFORMATION.

SANITARY STRUCTURE DATA

- 376: RIM EL. = 370.31; INV IN (8" DIP FROM SOUTH) = 361.58; INV OUT (8" DIP TO 379) = 361.54
- 379: RIM EL. = 365.73; INV IN (8" DIP FROM 376) = 357.00; INV OUT (8" DIP TO 381) = 356.96
- 380: RIM EL. = 367.08; INV OUT (8" PVC TO 381) = 358.53
- 381: RIM EL. = 363.64; INV IN (8" PVC FROM 369) = 355.24; INV IN (8" DIP FROM 379) = 354.92; INV OUT (8" DIP TO 384) = 354.83
- 21: RIM EL. = 364.95; INV IN (8" DIP FROM NW) = 357.15; INV OUT (8" DIP TO 384) = 357.13
- 382: RIM EL. = 362.55; INV IN (8" PVC FROM WEST) = 357.68; INV IN (8" DIP FROM NORTHEAST) = 358.00; INV OUT (8" DIP TO 387) = 357.63
- 383: RIM EL. = 368.42; INV IN (8" DIP FROM 1019) = 356.10; INV OUT (8" DIP TO 386) = 356.07
- 384: RIM EL. = 367.74; INV IN (8" DIP FROM 387) = 355.17; INV OUT (8" DIP TO 384) = 355.11
- 385: RIM EL. = 363.37; INV IN (8" DIP FROM 381) = 354.04; INV IN (8" DIP FROM 371) = 354.06; INV IN (8" DIP FROM 386) = 353.92; INV OUT (10" DIP TO 385) = 353.88
- 386: RIM EL. = 360.45; INV IN (10" DIP FROM 384) = 352.05; INV OUT (10" DIP TO 428) = 351.91
- 387: RIM EL. = 354.14; INV IN (10" DIP FROM 385) = 344.80; INV OUT (12" DIP TO 615) = 344.66
- 388: RIM EL. = 369.90; INV OUT (8" DIP TO 1013) = 363.86
- 389: RIM EL. = 360.71; INV IN (8" DIP FROM 541) = 355.01; INV OUT (8" DIP TO 1012) = 354.79
- 390: RIM EL. = 358.29; INV IN (8" DIP FROM 465) = 344.68; INV OUT (8" DIP TO 469) = 344.34
- 391: RIM EL. = 355.00; INV IN (8" DIP FROM 468) = 343.18; INV OUT (8" DIP TO 472) = 343.12
- 392: RIM EL. = 353.21; INV IN (8" DIP FROM NORTH) = 343.04; INV IN (8" DIP FROM 469) = 342.73; INV OUT (8" DIP TO 473) = 342.71
- 393: RIM EL. = 350.55; INV OUT (8" DIP TO 473) = 343.05
- 394: RIM EL. = 352.85; INV IN (8" DIP FROM 472) = 342.43; INV IN (8" DIP FROM 479) = 342.31; INV OUT (8" DIP TO 615) = 342.20
- 395: RIM EL. = 350.94; INV IN (8" DIP FROM 473) = 337.11; INV IN (12" DIP FROM 428) = 337.15; INV OUT (12" DIP TO 1008) = 336.89
- 396: RIM EL. = 356.99; INV IN (8" DIP FROM NORTHWEST) = 350.34; INV OUT (8" DIP TO 1033) = 350.29
- 23: RIM EL. = 353.76; INV IN (8" DIP FROM NORTH) = 348.95; INV IN (8" DIP FROM 1080) = 348.99; INV OUT (8" DIP TO EAST) = 348.92

HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
01/03/2020
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

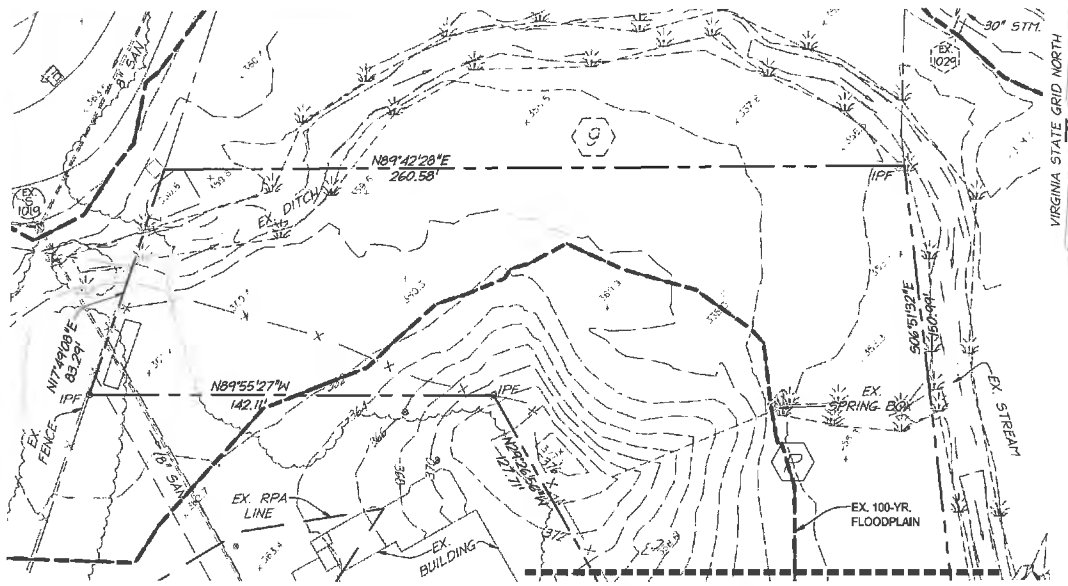
PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

EXISTING CONDITIONS PLAN

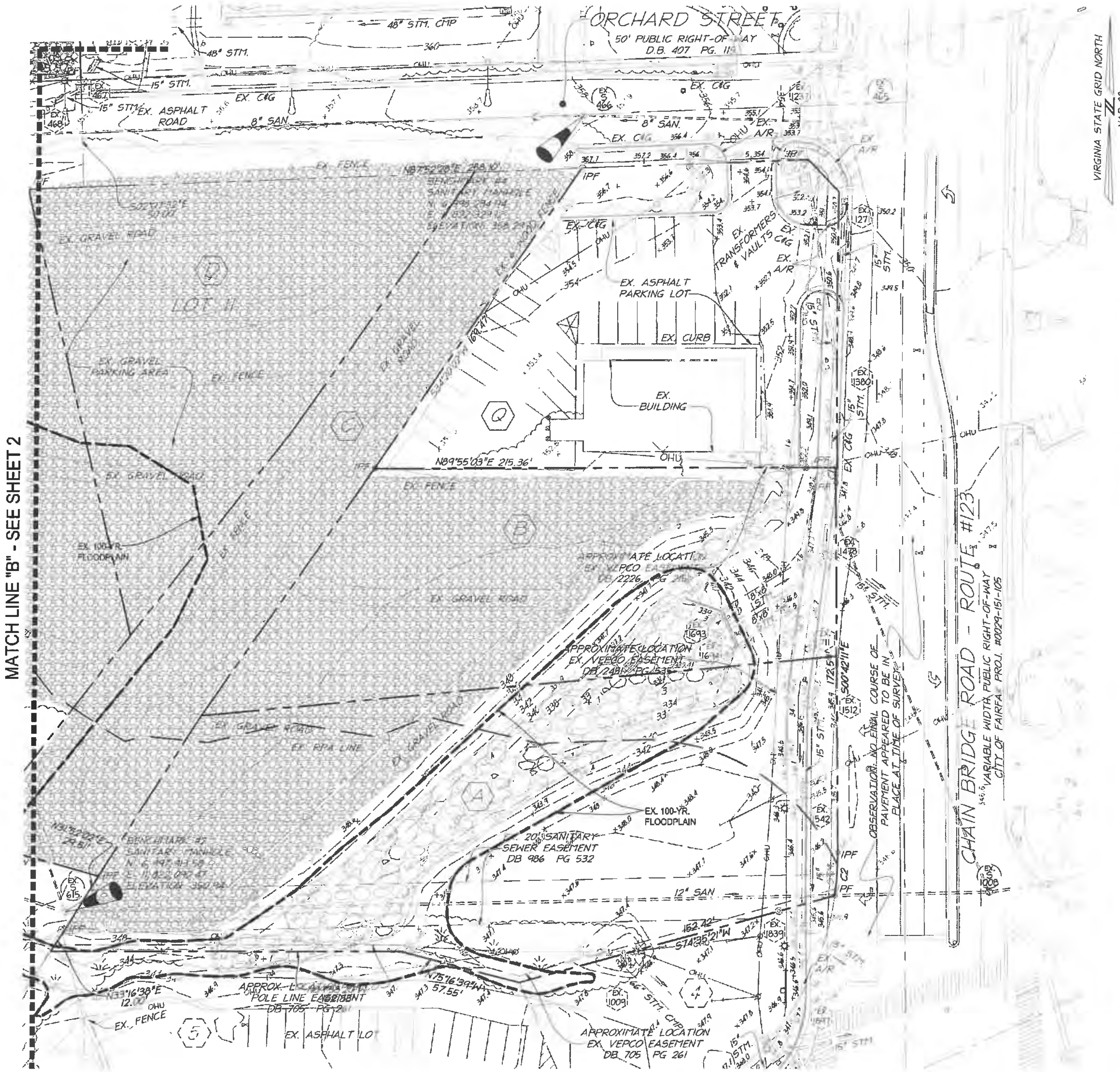
SHEET No.
2

SCALE: 1"=30'



MATCH LINE "A" - SEE SHEET 2

MATCH LINE "B" - SEE SHEET 2



OWNERSHIP TABLE

A	MAP #57-2-02-017 #3590 CHAIN BRIDGE ROAD ARG II, LLC D.B. 13408 PG. 1070 D.B. 15230 PG. 1182 ZONED: COMMERCIAL RETAIL
B	MAP #57-2-02-018 #3580 CHAIN BRIDGE ROAD ARG II, LLC D.B. 13408 PG. 1070 D.B. 15230 PG. 1182 ZONED: COMMERCIAL RETAIL
C	MAP #57-2-02-019 #10505 ORCHARD STREET ARG II, LLC D.B. 13408 PG. 1070 D.B. 15230 PG. 1182 ZONED: COMMERCIAL RETAIL
D	MAP #57-2-08-011 #10507 ORCHARD STREET ARG II, LLC D.B. 13408 PG. 1070 D.B. 15230 PG. 1182 ZONED: RESIDENTIAL MEDIUM
E	MAP #57-2-08-012 #10509 ORCHARD STREET ARG II, LLC D.B. 15339 PG. 102 ZONED: RESIDENTIAL MEDIUM
F	MAP #57-2-08-013 #10511 ORCHARD STREET ARG II, LLC D.B. 15339 PG. 102 ZONED: RESIDENTIAL MEDIUM
G	MAP #57-2-08-014 #10513 ORCHARD STREET ARG II, LLC D.B. 16739 PG. 1026 ZONED: RESIDENTIAL MEDIUM
H	MAP #57-2-08-010 #10515 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 18823 PG. 1535 ZONED: RESIDENTIAL MEDIUM
I	MAP #57-2-02-005 #10517 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 19218 PG. 1148 ZONED: RESIDENTIAL MEDIUM
J	MAP #57-2-08-005 #10508 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 17602 PG. 631 ZONED: RESIDENTIAL MEDIUM
K	MAP #57-2-08-006 #10510 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 19837 PG. 1921 ZONED: RESIDENTIAL MEDIUM
L	MAP #57-2-08-007 #10512 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 17434 PG. 444 ZONED: RESIDENTIAL MEDIUM
M	MAP #57-2-08-008 #10514 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 18388 PG. 265 ZONED: RESIDENTIAL MEDIUM
N	MAP #57-2-02-003 #10516 ORCHARD STREET ORCHARD RE INVESTMENTS D.B. 20060 PG. 1218 ZONED: RESIDENTIAL MEDIUM
O	MAP #57-2-07-015B NO ADDRESS ORCHARD RE INVESTMENTS D.B. 23812 PG. 493 ZONED: RESIDENTIAL MEDIUM
P	MAP #57-2-47-000A NO ADDRESS ORCHARD RE INVESTMENTS D.B. 23812 PG. 479 ZONED: RESIDENTIAL MEDIUM
Q	MAP #57-2-02-020 #3570 CHAIN BRIDGE ROAD NORTHFAX JV LLC D.B. 8904 PG. 1517 ZONED: COMMERCIAL RETAIL
1	MAP #57-2-18-001A THE ASSEMBLY D.B. 3161 PG. 508 ZONED: RESIDENTIAL TOWNHOUSE
2	MAP #57-2-08-004A ELE N.A., LLC D.B. 24268 PG. 1935 ZONED: COMMERCIAL OFFICE
3	MAP #57-2-08-003A PMG NORTHERN VIRGINIA, LLC D.B. 20769 PG. 1728 ZONED: COMMERCIAL RETAIL
4	MAP #57-2-02-016 CITY OF FAIRFAX D.B. 18684 PG. 857 ZONED: COMMERCIAL RETAIL
5	MAP #57-2-02-015 GLASCOCK & SONS, LP D.B. 9172 PG. 571 ZONED: COMMERCIAL RETAIL
6	MAP #57-2-02-010 SCHUILING T. ALPINE, INC. D.B. 8871 PG. 1815 ZONED: COMMERCIAL RETAIL
7	MAP #57-2-02-006 BRANCH AVENUE ASSOCIATES, LLC D.B. 14796 PG. 1326 ZONED: COMMERCIAL RETAIL
8	MAP #57-2-47-001 SANJAY BAJAJ D.B. 23803 PG. 185 ZONED: RESIDENTIAL MEDIUM
9	MAP #57-2-02-001A RONALD & BARBARA FOWLER D.B. 5923 PG. 1416 ZONED: RESIDENTIAL MEDIUM

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 87°52'28" W	26.01'

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	BEARING	CHORD
C1	5761.58'	7.14'	0°04'15"	3.57'	S 00°40'03" E	7.14'
C2	133.14'	20.03'	8°37'11"	10.03'	S 03°36'25" W	20.01'
C3	90.75'	19.96'	12°36'07"	10.02'	S 81°34'25" W	19.92'
C4	50.00'	17.87'	20°28'30"	9.03'	S 85°30'33" W	17.77'
C5	100.00'	35.74'	20°28'30"	18.06'	N 85°30'33" E	35.55'
C6	40.75'	8.96'	12°36'07"	4.50'	N 81°34'25" E	8.94'

STORM STRUCTURE DATA

STRUCTURE	DATA
EX. 373	RIM EL. = 370.32 INV IN (15" RCP FROM 376) = 367.56 INV OUT (15" RCP TO 374) = 365.31
EX. 374	RIM EL. = 370.40 INV IN (30" RCP FROM 373) = 365.43 INV IN (15" RCP FROM WEST) = 363.28 INV OUT (30" RCP TO 356) = 363.26
EX. 355	INV OUT (21" RCP TO 356) = 362.44
EX. 356	RIM EL. = 365.40 INV IN (30" RCP FROM 374) = 361.65 INV IN (21" RCP FROM 355) = 361.82 INV OUT (30" RCP TO 357) = 361.60
EX. 360	RIM EL. = 366.13 INV OUT (15" RCP TO 361) = 359.51
EX. 362	RIM EL. = 364.62 INV OUT (15" RCP TO 361) = 359.72
EX. 361	RIM EL. = 365.77 INV IN (15" RCP FROM 360) = 359.31 INV IN (15" RCP FROM 362) = 359.37 INV OUT (18" RCP TO 357) = 359.23
EX. 357	RIM EL. = 365.55 INV IN (30" RCP FROM 356) = 360.89 INV IN (18" RCP FROM 361) = 358.97 INV OUT (42" RCP TO 358) = 358.94
EX. 383	RIM EL. = 362.61 INV OUT (12" RCP TO 382) = 360.26
EX. 382	RIM EL. = 362.68 INV IN (12" RCP FROM 383) = 359.81 INV OUT (12" RCP TO 364) = 359.78
EX. 370	RIM EL. = 366.82 INV OUT (29"x45" ERCP TO 364) = 362.34
EX. 364	RIM EL. = 362.16 INV IN (29"x45" ERCP FROM 370) = 358.26 INV IN (12" RCP FROM 382) = 359.11 INV OUT (19"x30" ERCP TO 363A) = 358.08 INV OUT (19"x30" ERCP TO 363B) = 358.06
EX. 363	RIM EL. = 361.88 INV IN (19"x30" ERCP FROM 364A) = 357.64 INV IN (19"x30" ERCP FROM 364B) = 357.71 INV OUT (19"x30" ERCP TO 365A) = 357.58 INV OUT (19"x30" ERCP TO 365B) = 357.60
EX. 365	RIM EL. = 361.96 INV IN (19"x30" RCP FROM 363A) = 357.54 INV IN (19"x30" RCP FROM 363B) = 357.60 INV OUT (24" RCP TO 359) = 357.32
EX. 359	RIM EL. = 360.24 INV IN (24" RCP FROM 365) = 354.69 INV OUT (24" RCP TO DOGHOUSE) = 354.55
EX. 358	RIM EL. = 360.07 INV IN (42" RCP FROM 357) = 354.43 INV OUT (42" RCP TO 769) = 354.40
EX. 769	INV IN (42" RCP FROM 358) = 348.74
EX. 1009	INV OUT (66" CMP TO SOUTHEAST) = 340.78
EX. 1030	INV IN (40"x31" CMPA FROM NORTH) = 357.03
EX. 424	INV OUT (36" CMP TO 423) = 346.12
* EX. 423	INV IN (36" CMP FROM 424)
** EX. 425	INV OUT (36" CMP TO 422) = 346.17
** EX. 422	INV IN (36" CMP FROM 425) = 346.19
EX. 426	INV OUT (36" CMP TO 421) = 346.18
EX. 421	INV IN (36" CMP FROM 426) = 346.12
EX. 419	INV OUT (15" CPP TO 420) = 348.33
EX. 420	INV IN (15" CPP FROM 419) = 347.48
EX. 476	INV OUT (12" CMP TO 477) = 348.81
EX. 477	INV IN (12" CMP FROM 476) = 348.87
EX. 474	INV OUT (12" CMP TO 475) = 349.80
EX. 475	INV IN (12" CMP FROM 474) = 349.70
EX. 417	INV OUT (12" CMP TO 418) = 348.69
EX. 418	INV IN (12" CMP FROM 417) = 348.63
EX. 470	INV OUT (12" RCP TO 471) = 352.72
EX. 471	INV IN (12" RCP FROM 470) = 352.24
EX. 446	RIM EL. = 360.36 INV OUT (48" CMP TO 447) = 353.31
EX. 447	RIM EL. = 360.07 INV IN (48" CMP FROM 446) = 353.06 INV OUT (48" RCP TO 448) = 353.04
EX. 448	RIM EL. = 360.00 INV IN (48" RCP FROM 447) = 353.11 INV IN (48" CMP FROM SWM) = 353.12 OUT - UNDERGROUND SWM STRUCTURE WITH WEIR WALL INV OUT (15" RCP TO 467) = 353.08
EX. 467	RIM EL. = 355.85 INV IN (15" RCP FROM 449) = 352.98 INV OUT (15" RCP TO 468) = 352.95
EX. 468	INV IN (15" RCP FROM 467) = 352.82
EX. 1014	RIM EL. = 364.55 INV OUT (15" RCP TO EAST) = 359.98
EX. 2574	RIM EL. = 357.80 INV IN (15" RCP FROM NORTH) = 354.16 INV OUT (15" RCP TO 2538) = 354.12
EX. 2538	RIM EL. = 359.17 INV IN (15" RCP TO 2574) = 354.26
EX. 2537	RIM EL. = 359.14 INV OUT (30" RCP TO 488) = 354.14
EX. 488	RIM EL. = 360.97 INV IN (30" RCP FROM 2537) = 356.52 INV OUT (42"x29" CMPA FROM 489 VIA NORTH) = 356.49 INV OUT (42"x29" CMPA TO 489 VIA WEST) = 356.53
EX. 489	RIM EL. = 360.24 INV IN (42"x29" CMPA FROM 488) = 354.61 INV IN (42"x29" CMPA FROM 488) = 354.70 INV OUT (42"x29" CMPA TO SWM) = 354.60
EX. 1693	TOP OF WALL = 340.05 INV OUT (8'x8' BOX CULVERT TO EAST) = 330.35
EX. 1694	TOP OF WALL = 339.98 INV OUT (8'x8' BOX CULVERT TO EAST) = 330.27
EX. 1237	RIM EL. = 353.15 INV OUT (15" RCP TO 1380) = 347.65
EX. 1271	RIM EL. = 350.70 INV OUT (15" RCP TO 1380) = 344.50
EX. 1380	RIM EL. = 349.05 INV IN (15" RCP FROM 1271) = 343.25 INV OUT (15" RCP FROM 1237) = 343.15 INV OUT (15" RCP TO 1478) = 343.05
EX. 1478	RIM EL. = 347.12 INV IN (15" RCP FROM 1380) = 340.12 INV OUT (15" RCP TO SE) = 335.32
EX. 1512	RIM EL. = 346.18 INV OUT (15" RCP TO 1542) = 341.88
EX. 1542	RIM EL. = 346.10 INV IN (15" RCP FROM 1512) = 341.50 INV OUT (15" RCP TO 1839) = 341.40
EX. 1839	RIM EL. = 346.21 INV IN (15" RCP FROM 1542) = 340.81 INV OUT (15" RCP TO STRUCTURE IN ROAD) = 340.61
EX. 1940	RIM EL. = 348.09 INV OUT (15" RCP TO 1897) = 342.89
EX. 1897	RIM EL. = 342.62 INV IN (15" RCP FROM 1940) = 342.22 INV OUT (15" RCP TO STRUCTURE IN ROAD) = 336.92

* UNABLE TO OBTAIN INVERTS - STRUCTURE FULL OF DEBRIS

** REVERSE FLOW

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
01/03/2020
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

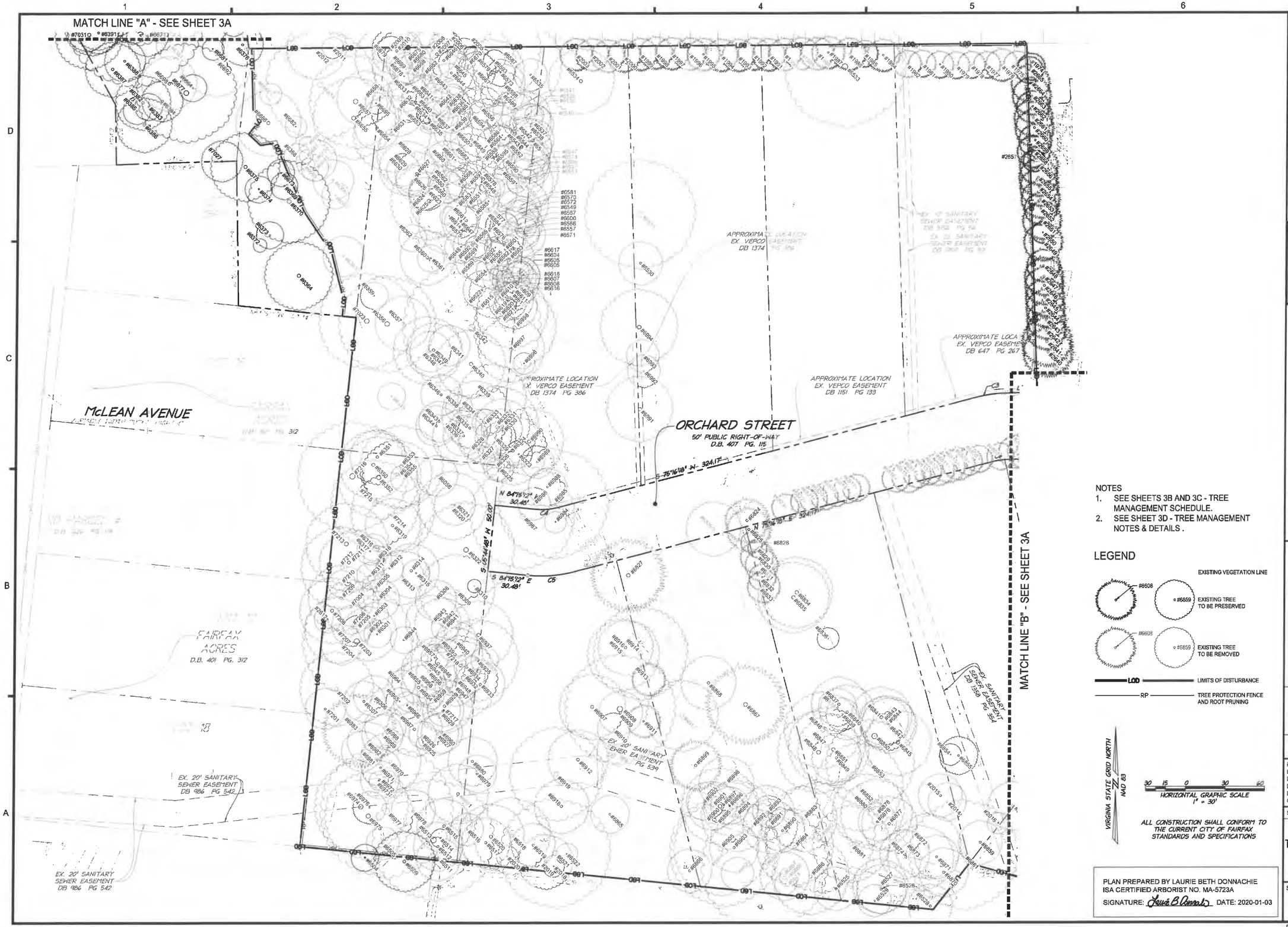
MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:
EXISTING CONDITIONS PLAN

SHEET No.
2A

SCALE: 1"=30'



NOTES

1. SEE SHEETS 3B AND 3C - TREE MANAGEMENT SCHEDULE.
2. SEE SHEET 3D - TREE MANAGEMENT NOTES & DETAILS .

LEGEND

- EXISTING VEGETATION LINE
- #6608 — EXISTING TREE TO BE PRESERVED
- #6608 — EXISTING TREE TO BE REMOVED
- LOD — LIMITS OF DISTURBANCE
- RP — TREE PROTECTION FENCE AND ROOT PRUNING

VIRGINIA STATE GRID NORTH NAD 83

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE 1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

PLAN PREPARED BY LAURIE BETH DONNACHIE
ISA CERTIFIED ARBORIST NO. MA-5723A
SIGNATURE: Laurie B Donnachie DATE: 2020-01-03

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COMMONWEALTH OF VIRGINIA
LAURIE B. DONNACHIE
Lic. No. 0406001880
2020-01-03
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

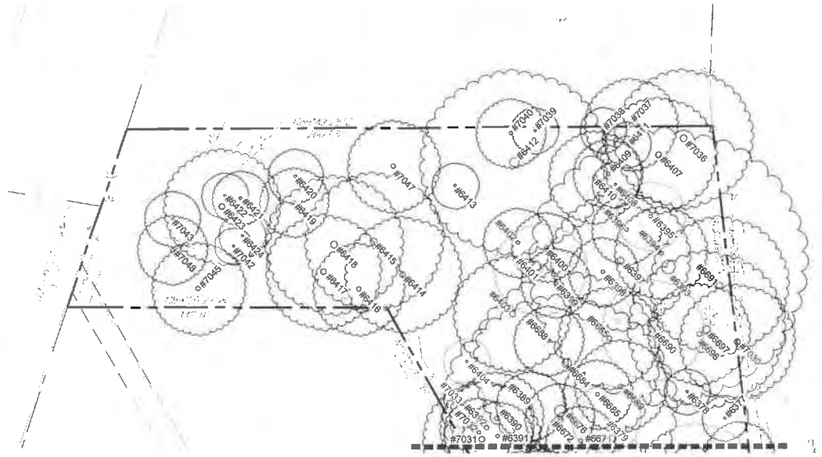
PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

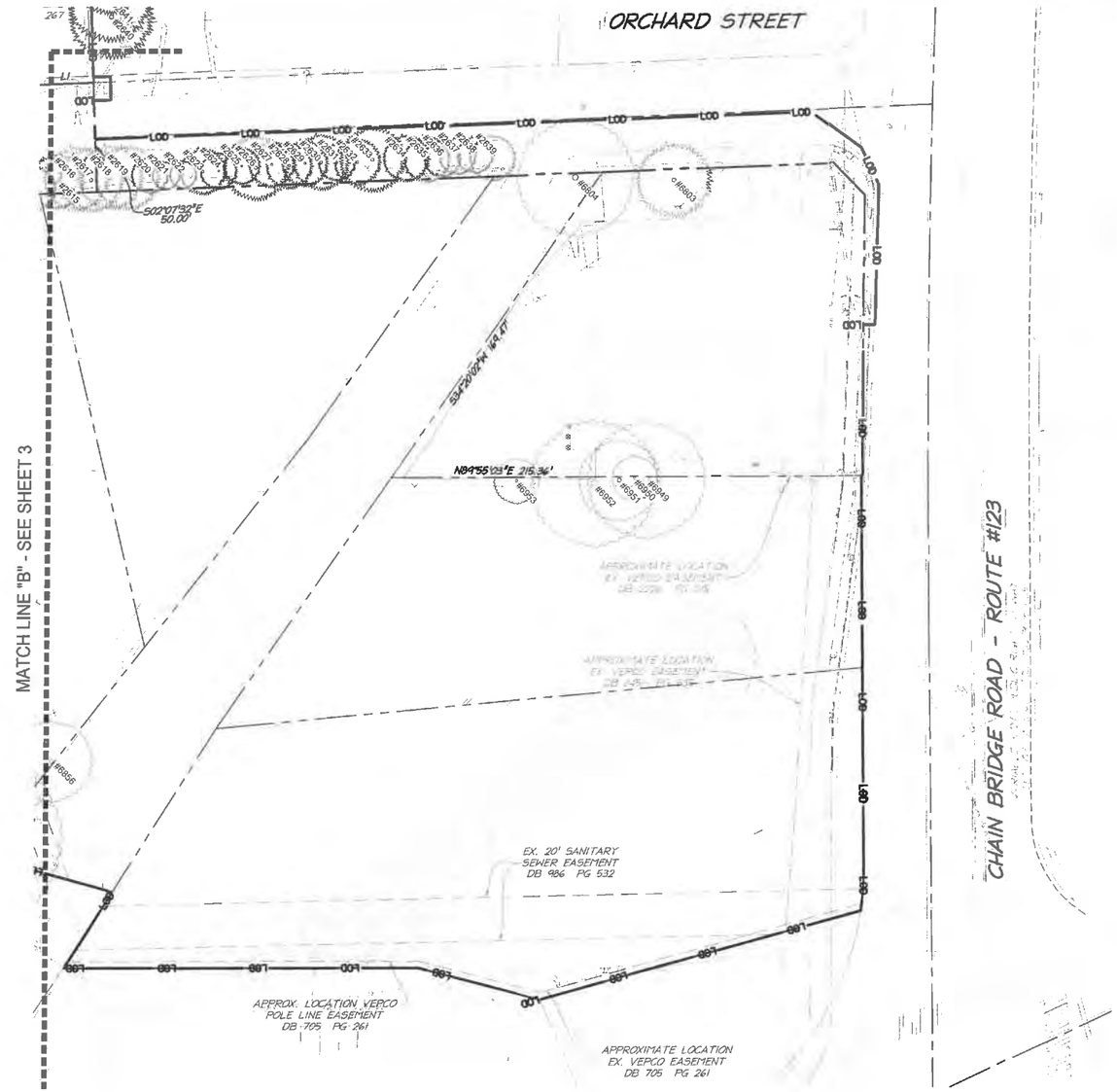
SHEET TITLE:

TREE MANAGEMENT PLAN

SHEET No.
3

SCALE: 1"=30'





NOTES

1. SEE SHEETS 3B AND 3C - TREE MANAGEMENT SCHEDULE.
2. SEE SHEET 3D - TREE MANAGEMENT NOTES & DETAILS .

LEGEND

- #6608 — EXISTING VEGETATION LINE
- #6859 — EXISTING TREE TO BE PRESERVED
- #6608 — EXISTING TREE TO BE REMOVED
- LOD — LIMITS OF DISTURBANCE
- RP — TREE PROTECTION FENCE AND ROOT PRUNING

VIRGINIA STATE GRID NORTH NAD 83

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE 1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

PLAN PREPARED BY LAURIE BETH DONNACHIE
ISA CERTIFIED ARBORIST NO. MA-5723A
SIGNATURE: Laurie B Donnachie DATE: 2020-01-03

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COMMONWEALTH OF VIRGINIA
LAURIE B. DONNACHIE
Lic. No. 0406001880
2020-01-03
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109832
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:

TREE MANAGEMENT PLAN

SHEET No.

3A

SCALE: 1"=30'

TREE MANAGEMENT SCHEDULE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
1974	*THUJA SPP.*	ARBORVITAE	10	8	78	PRESERVE
1975	*THUJA SPP.*	ARBORVITAE	10	8	75	REMOVE
1976	*THUJA SPP.*	ARBORVITAE	12	10	74	REMOVE
1977	*THUJA SPP.*	ARBORVITAE	10	8	78	REMOVE
1978	*THUJA SPP.*	ARBORVITAE	10	8	78	REMOVE
1979	*THUJA SPP.*	ARBORVITAE	10	8	78	REMOVE
1980	*THUJA SPP.*	ARBORVITAE	10	8	74	REMOVE
1981	*THUJA SPP.*	ARBORVITAE	10	8	72	REMOVE
1982	*THUJA SPP.*	ARBORVITAE	10	8	72	REMOVE
1984	*THUJA SPP.*	ARBORVITAE	12	10	74	REMOVE
1985	*THUJA SPP.*	ARBORVITAE	10	8	74	REMOVE
1986	*THUJA SPP.*	ARBORVITAE	12	10	72	REMOVE
1987	*THUJA SPP.*	ARBORVITAE	12	10	72	REMOVE
1988	*THUJA SPP.*	ARBORVITAE	12	10	72	REMOVE
1989	*THUJA SPP.*	ARBORVITAE	12	10	73	REMOVE
1990	*THUJA SPP.*	ARBORVITAE	12	10	74	REMOVE
1991	*THUJA SPP.*	ARBORVITAE	12	10	74	REMOVE
1992	*THUJA SPP.*	ARBORVITAE	12	10	78	REMOVE
1993	*THUJA SPP.*	ARBORVITAE	12	10	78	REMOVE
1994	*THUJA SPP.*	ARBORVITAE	12	10	75	REMOVE
1995	*THUJA SPP.*	ARBORVITAE	12	10	73	REMOVE
1996	*THUJA SPP.*	ARBORVITAE	12	10	73	REMOVE
1997	*THUJA SPP.*	ARBORVITAE	12	10	73	REMOVE
1998	*THUJA SPP.*	ARBORVITAE	12	10	73	REMOVE
1999	*THUJA SPP.*	ARBORVITAE	12	10	73	REMOVE
2000	*THUJA SPP.*	ARBORVITAE	12	10	78	REMOVE
2001	*THUJA SPP.*	ARBORVITAE	12	10	78	REMOVE
2002	*THUJA SPP.*	ARBORVITAE	12	10	78	REMOVE
2003	*THUJA SPP.*	ARBORVITAE	12	10	78	REMOVE
2005	*ACER RUBRUM*	RED MAPLE	40	36	65	REMOVE
2006	*ACER RUBRUM*	RED MAPLE	8	6	72	REMOVE
2007	*FRAXINUS PENNSYLVANICA*	GREEN ASH	20	16	0	REMOVE
2008	*ACER RUBRUM*	RED MAPLE	20	16	72	REMOVE
2009	*ACER RUBRUM*	RED MAPLE	18	14	67	REMOVE
2010	*ACER RUBRUM*	RED MAPLE	10	8	56	REMOVE
2011	*UNIDENTIFIED*	DEAD TREE	8	6	0	REMOVE
2012	*FRAXINUS PENNSYLVANICA*	GREEN ASH	22	18	0	REMOVE
2014	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	14	10	72	REMOVE
2015	*CATALPA SPECIOSA*	NORTHERN CATALPA	16	12	50	REMOVE
2016	*ACER RUBRUM*	RED MAPLE	8	6	66	REMOVE
2018	*MORUS ALBA*	WHITE MULBERRY	8	6	70	REMOVE
2019	*MORUS ALBA*	WHITE MULBERRY	20	16	50	REMOVE
2020	*ROBINIA PSEUDOACACIA*	BLACK LOCUST	8	6	50	REMOVE
2612	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	8	70	REMOVE
2615	*THUJA SPP.*	ARBORVITAE	12	10	72	REMOVE
2616	*THUJA SPP.*	ARBORVITAE	14	10	75	REMOVE
2617	*THUJA SPP.*	ARBORVITAE	14	10	72	REMOVE
2618	*THUJA SPP.*	ARBORVITAE	14	10	75	REMOVE
2619	*THUJA SPP.*	ARBORVITAE	14	10	72	REMOVE
2620	*THUJA SPP.*	ARBORVITAE	8	6	72	REMOVE
2621	*THUJA SPP.*	ARBORVITAE	6	4	68	REMOVE
2622	*THUJA SPP.*	ARBORVITAE	6	4	75	REMOVE
2623	*THUJA SPP.*	ARBORVITAE	10	8	68	REMOVE
2624	*THUJA SPP.*	ARBORVITAE	8	6	72	REMOVE
2625	*THUJA SPP.*	ARBORVITAE	8	6	67	REMOVE
2626	*THUJA SPP.*	ARBORVITAE	14	10	72	REMOVE
2627	*THUJA SPP.*	ARBORVITAE	10	8	68	REMOVE
2628	*THUJA SPP.*	ARBORVITAE	10	8	72	REMOVE
2629	*THUJA SPP.*	ARBORVITAE	10	8	68	REMOVE
2630	*THUJA SPP.*	ARBORVITAE	12	10	72	REMOVE
2631	*THUJA SPP.*	ARBORVITAE	8	6	67	REMOVE
2632	*THUJA SPP.*	ARBORVITAE	10	8	72	REMOVE
2633	*THUJA SPP.*	ARBORVITAE	14	10	68	REMOVE
2634	*THUJA SPP.*	ARBORVITAE	10	8	69	REMOVE
2635	*THUJA SPP.*	ARBORVITAE	10	8	67	REMOVE
2636	*THUJA SPP.*	ARBORVITAE	8	6	69	REMOVE
2637	*THUJA SPP.*	ARBORVITAE	8	6	68	REMOVE
2638	*THUJA SPP.*	ARBORVITAE	8	6	72	REMOVE
2639	*THUJA SPP.*	ARBORVITAE	10	8	66	REMOVE
2640	*THUJA SPP.*	ARBORVITAE	18	14	72	PRESERVE
2641	*THUJA SPP.*	ARBORVITAE	18	14	73	PRESERVE
2642	*THUJA SPP.*	ARBORVITAE	14	12	72	PRESERVE
2643	*THUJA SPP.*	ARBORVITAE	14	12	68	PRESERVE
2644	*THUJA SPP.*	ARBORVITAE	14	12	69	PRESERVE
2645	*THUJA SPP.*	ARBORVITAE	14	12	70	PRESERVE
2646	*THUJA SPP.*	ARBORVITAE	14	12	69	PRESERVE
2647	*THUJA SPP.*	ARBORVITAE	14	12	70	PRESERVE
2648	*THUJA SPP.*	ARBORVITAE	12	10	69	PRESERVE
2649	*THUJA SPP.*	ARBORVITAE	14	10	68	PRESERVE
2650	*THUJA SPP.*	ARBORVITAE	8	6	56	PRESERVE
2651	*THUJA SPP.*	ARBORVITAE	14	10	69	PRESERVE
2652	*THUJA SPP.*	ARBORVITAE	12	10	68	PRESERVE
2653	*THUJA SPP.*	ARBORVITAE	14	10	70	PRESERVE
2654	*THUJA SPP.*	ARBORVITAE	14	10	66	PRESERVE
2655	*THUJA SPP.*	ARBORVITAE	14	10	65	PRESERVE
2656	*THUJA SPP.*	ARBORVITAE	14	10	66	PRESERVE
2657	*THUJA SPP.*	ARBORVITAE	14	10	70	PRESERVE
2658	*THUJA SPP.*	ARBORVITAE	14	10	53	PRESERVE
2659	*THUJA SPP.*	ARBORVITAE	14	10	71	PRESERVE
2660	*THUJA SPP.*	ARBORVITAE	14	10	69	PRESERVE
2661	*THUJA SPP.*	ARBORVITAE	14	10	68	PRESERVE
2662	*THUJA SPP.*	ARBORVITAE	14	10	75	PRESERVE
2663	*THUJA SPP.*	ARBORVITAE	14	10	73	PRESERVE
2664	*THUJA SPP.*	ARBORVITAE	14	10	75	PRESERVE
2665	*THUJA SPP.*	ARBORVITAE	10	8	69	PRESERVE
6056	*ACER RUBRUM*	RED MAPLE	15	10	53	REMOVE
6301	*PRUNUS SEROTINA*	BLACK CHERRY	10	12	69	REMOVE
6302	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	20	66	REMOVE
6303	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	12	72	REMOVE
6304	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	72	REMOVE
6305	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	20	70	REMOVE
6306	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	15	72	REMOVE
6307	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	20	75	REMOVE
6308	*ACER RUBRUM*	RED MAPLE	15	15	73	REMOVE
6309	*FRAXINUS PENNSYLVANICA*	GREEN ASH	10	14	0	REMOVE
6310	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	5	6	72	REMOVE
6311	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	20	71	REMOVE
6312	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	26	75	REMOVE
6313	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	26	72	REMOVE
6314	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	18	69	REMOVE
6315	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	15	70	REMOVE
6316	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	24	72	REMOVE
6317	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	15	72	REMOVE
6318	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	15	69	REMOVE
6319	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	36	70	REMOVE
6320	*ACER RUBRUM*	RED MAPLE	25	12	50	REMOVE
6321	*ACER RUBRUM*	RED MAPLE	15	10	60	REMOVE

TREE MANAGEMENT SCHEDULE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
6322	*ACER RUBRUM*	RED MAPLE	35	24	63	REMOVE
6323	*ACER RUBRUM*	RED MAPLE	10	12	0	REMOVE
6324	*ACER RUBRUM*	RED MAPLE	25	24	47	REMOVE
6325	*PRUNUS SEROTINA*	BLACK CHERRY	10	12	68	REMOVE
6326	*PRUNUS SEROTINA*	BLACK CHERRY	10	6	44	REMOVE
6327	*ACER RUBRUM*	RED MAPLE	10	6	65	REMOVE
6328	*ACER RUBRUM*	RED MAPLE	20	24	75	REMOVE
6329	*ACER RUBRUM*	RED MAPLE	15	15	67	REMOVE
6330	*ACER RUBRUM*	RED MAPLE	15	24	66	REMOVE
6331	*ACER RUBRUM*	RED MAPLE	20	14	67	REMOVE
6332	*ACER RUBRUM*	RED MAPLE	30	24	68	REMOVE
6333	*ACER RUBRUM*	RED MAPLE	10	8	72	REMOVE
6334	*QUERCUS RUBRA*	NORTHERN RED OAK	25	24	69	REMOVE
6335	*ACER RUBRUM*	RED MAPLE	15	10	69	REMOVE
6336	*ACER RUBRUM*	RED MAPLE	20	24	63	REMOVE
6337	*ACER RUBRUM*	RED MAPLE	15	12	70	REMOVE
6338	*PRUNUS SEROTINA*	BLACK CHERRY	10	10	60	REMOVE
6339	*ACER RUBRUM*	RED MAPLE	25	24	65	REMOVE
6340	*FRAXINUS PENNSYLVANICA*	GREEN ASH	25	24	0	REMOVE
6341	*FRAXINUS PENNSYLVANICA*	GREEN ASH	15	15	0	REMOVE
6342	*MORUS ALBA*	WHITE MULBERRY	50	24	44	REMOVE
6343	*ACER RUBRUM*	RED MAPLE	15	6	68	REMOVE
6344	*ACER RUBRUM*	RED MAPLE	15	6	72	REMOVE
6345	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	68	REMOVE
6346	*FRAXINUS PENNSYLVANICA*	GREEN ASH	15	15	0	REMOVE
6347	*PRUNUS SEROTINA*	BLACK CHERRY	15	10	71	REMOVE
6348	*FRAXINUS PENNSYLVANICA*	GREEN ASH	25	18	0	REMOVE
6349	*PRUNUS SEROTINA*	BLACK CHERRY	20	12	68	REMOVE
6350	*FRAXINUS PENNSYLVANICA*	GREEN ASH	25	36	40	REMOVE
6351	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	15	67	REMOVE
6352	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	28	69	REMOVE
6353	*ACER RUBRUM*	RED MAPLE	30	36	65	REMOVE
6354	*ACER RUBRUM*	RED MAPLE	25	24	72	REMOVE
6355	*ACER RUBRUM*	RED MAPLE	10	12	50	REMOVE
6356	*ACER RUBRUM*	RED MAPLE	35	26	53	REMOVE
6357	*ACER RUBRUM*	RED MAPLE	20	24	55	REMOVE
6359	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	70	REMOVE
6360	*ULMUS AMERICANA*	AMERICAN ELM	20	24	41	REMOVE
6361	*ULMUS AMERICANA*	AMERICAN ELM	10	8	50	REMOVE
6362	*ULMUS AMERICANA*	AMERICAN ELM	10	12	50	REMOVE
6363	*ACER RUBRUM*	RED MAPLE	15	24	60	REMOVE
6364	*JUGLANS NIGRA*	BLACK WALNUT	25	28	69	PRESERVE
6366	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	15	12	66	REMOVE
6367	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	8	67	REMOVE
6368	*JUGLANS NIGRA*	BLACK WALNUT	10	6	66	REMOVE
6369	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	8	69	PRESERVE
6370	*ACER RUBRUM*	RED MAPLE	30	30	72	PRESERVE
6372	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	5	6	75	PRESERVE
6373	*CARYA CORDIFORMIS*	BITTERNUT HICKORY	10	10	70	PRESERVE
6374	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	72	PRESERVE
6375	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	25	18	66	PRESERVE
6376	*CARYA CORDIFORMIS*	BITTERNUT HICKORY	15	15	25	PRESERVE
6377	*ULMUS AMERICANA*	AMERICAN ELM	10	8	40	PRESERVE
6378	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	10	10	53	PRESERVE
6379	*MORUS ALBA*	WHITE MULBERRY	15	5	45	REMOVE
6381	*MORUS ALBA*	WHITE MULBERRY	10	6	60	REMOVE
6382	*PRUNUS SEROTINA*	BLACK CHERRY	20	10	56	PRESERVE
6383	*PRUNUS SEROTINA*	BLACK CHERRY	10	10	65	PRESERVE
6384	*PRUNUS SEROTINA*	BLACK CHERRY	15	5	75	PRESERVE
6385	*ALBIZIA JULIBRISSIN*	MIMOSA	10	7	50	PRESERVE
6386	*CATALPA SPECIOSA*	NORTHERN CATALPA	20	12	69	PRESERVE
6387	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	18	45	PRESERVE
6388	*ACER RUBRUM*	RED MAPLE	15	12	66	PRESERVE
6389	*NYSSA SYLVATICA*	BLACK GUM	15	8	65	PRESERVE
6390	*QUERCUS RUBRA*	NORTHERN RED OAK	20	15	56	PRESERVE
6391	*QUERCUS RUBRA*	NORTHERN RED OAK	15	10	55	PRESERVE
6392	*ULMUS AMERICANA*	AMERICAN ELM	20	6	63	PRESERVE
6393	*ACER RUBRUM*	RED MAPLE	60	40	55	PRESERVE
6394	*PRUNUS SEROTINA*	BLACK CHERRY	20	10	25	PRESERVE
6395	*ACER PLATANOIDES*	NORWAY MAPLE	15	6	70	REMOVE
6396	*QUERCUS ALBA*	WHITE OAK	15	15	56	PRESERVE
6397	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	36	68	PRESERVE
6398	*PRUNUS SEROTINA*	BLACK CHERRY	15	6	66	PRESERVE
6399	*ULMUS AMERICANA*	AMERICAN ELM	15	6	72	PRESERVE
6400	*FAGUS GRANDFOLIA*	AMERICAN BEECH	15	8	59	PRESERVE
6401	*MORUS ALBA*	WHITE MULBERRY	20	15	67	REMOVE
6402	*ACER RUBRUM*	RED MAPLE	15	6	63	PRESERVE
6403	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	25	24	70	PRESERVE
6404	*MORUS ALBA*	WHITE MULBERRY	10	8	66	REMOVE
6407	*ACER RUBRUM*	RED MAPLE	25	24	72	PRESERVE
6408	*ACER RUBRUM*	RED MAPLE	10	15	63	PRESERVE
6409	*ACER RUBRUM*	RED MAPLE	15	8	65	PRESERVE
6410	*ULMUS AMERICANA*	AMERICAN ELM	20	10	59	PRESERVE
6411	*ACER RUBRUM*	RED MAPLE	10	8	70	PRESERVE
6412	*QUERCUS RUBRA*	NORTHERN RED OAK	40	48	53	PRESERVE
6413	*QUERCUS RUBRA*	NORTHERN RED OAK	10	10	66	PRESERVE
6414	*QUERCUS RUBRA*	NORTHERN RED OAK	25	38	69	PRESERVE
6415	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	30	50	72	PRESERVE
6416	*FAGUS GRANDFOLIA*	AMERICAN BEECH	20	24	66	PRESERVE
6417	*QUERCUS RUBRA*	NORTHERN RED OAK	25	40	50	PRESERVE
6418	*QUERCUS RUBRA*	NORTHERN RED OAK	30	40	56	PRESERVE
6419	*ACER RUBRUM*	RED MAPLE	15	12	70	PRESERVE
6420	*PRUNUS SEROTINA*	BLACK CHERRY	12	8	72	PRESERVE
6421	*QUERCUS RUBRA*	NORTHERN RED OAK	12	10	74	PRESERVE
6422	*ACER RUBRUM*	RED MAPLE	10	12	75	PRESERVE
6423	*QUERCUS RUBRA*	NORTHERN RED OAK	25	24	73	PRESERVE
6424	*QUERCUS RUBRA*	NORTHERN RED OAK	10	6	72	PRESERVE
6504	*ACER SACCHARUM*	SUGAR MAPLE	10	6	75	PRESERVE
6505	*FRAXINUS PENNSYLVANICA*	GREEN ASH	12	8	25	REMOVE
6509	*MORUS ALBA*	WHITE MULBERRY	22	18	68	PRESERVE
6511	*ACER RUBRUM*	RED MAPLE	16	14	25	REMOVE
6512	*FRAXINUS PENNSYLVANICA*	GREEN ASH	18	14	40	REMOVE
6513	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	44	40	40	REMOVE
6514	*ACER SACCHARUM*	SUGAR MAPLE	7	5	53	REMOVE
6515	*FRAXINUS PENNSYLVANICA*	GREEN ASH	20	16	30	REMOVE
6516	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	12	8	69	REMOVE
6517	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	14	60	REMOVE
6518	*CATALPA SPECIOSA*	NORTHERN CATALPA	28	24	64	REMOVE
6519	*CATALPA SPECIOSA*	NORTHERN CATALPA	16	12	60	REMOVE
6520	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	24	20	66	REMOVE
6521	*MORUS ALBA*	WHITE MULBERRY	40	36	55	REMOVE
6522	*PRUNUS SEROTINA*	BLACK CHERRY	8	6	65	REMOVE
6523	*JUGLANS NIGRA*	BLACK WALNUT	12	8	65	REMOVE
6524	*ACER RUBRUM*	RED MAPLE	8	6	59	REMOVE
6525	*ACER RUBRUM*	RED MAPLE	16	12	65	REMOVE
6526	*ROBINIA PSEUDOACACIA*	BLACK LOCUST	18	14	56	REMOVE
6527	*ACER RUBRUM*	RED MAPLE	20	16	67	REMOVE

TREE MANAGEMENT SCHEDULE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
6528	*ROBINIA PSEUDOACACIA*	BLACK LOCUST	16	12	53	REMOVE
6529	*FRAXINUS PENNSYLVANICA*	GREEN ASH	12	8	0	REMOVE
6530	*ILEX OPACA*	AMERICAN HOLLY	16	12	72	REMOVE
6531	*QUERCUS PALUSTRIS*	PIN OAK	40	36	60	REMOVE
6533	*PLATANUS OCCIDENTALIS*	SYCAMORE	44	40	75	REMOVE
6534	*ACER RUBRUM*	RED MAPLE	24	20	69	REMOVE
6535	*NYSSA SYLVATICA*	BLACK GUM	12	8	67	REMOVE
6536	*ACER RUBRUM*	RED MAPLE	7	5	69	REMOVE
6537	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	14	10	68	REMOVE
6538	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	16	12	75	REMOVE
6539	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	14	73	REMOVE
6540	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	20	16	72	REMOVE
6541	*ACER RUBRUM*	RED MAPLE	14	10	70	REMOVE
6542	*ACER RUBRUM*	RED MAPLE	16	12	69	REMOVE
6543	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	22	18	67	REMOVE
6544	*ACER RUBRUM*	RED MAPLE	16	12	69	REMOVE
6546	*ACER RUBRUM*	RED MAPLE	7	5	75	REMOVE
6547	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	14	10	70	REMOVE
6548	*ACER RUBRUM*	RED MAPLE	14	10	72	REMOVE
6549	*UNIDENTIFIED*	DEAD TREE	12	8	0	REMOVE
6551	*ACER RUBRUM*	RED MAPLE	14	10	73	REMOVE
6552	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	16	12	69	REMOVE
6553	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	7	5	65	REMOVE
6554	*ACER RUBRUM*	RED MAPLE	8	6	72	REMOVE
6555	*ACER RUBRUM*	RED MAPLE	18	14	68	REMOVE
6556	*ACER RUBRUM*	RED MAPLE	16	12	75	REMOVE
6557	*UNIDENTIFIED*	DEAD TREE	12	8	0	REMOVE
6558	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	22	18	72	REMOVE
6559	*ACER RUBRUM*	RED MAPLE	7	5	60	REMOVE
6560	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	28	22	75	REMOVE
6561	*ACER RUBRUM*	RED MAPLE	18	14	69	REMOVE
6562	*ACER RUBRUM*	RED MAPLE	14	10	72	REMOVE
6564	*ACER RUBRUM*	RED MAPLE	8	6	75	REMOVE
6565	*UNIDENTIFIED*	DEAD TREE	12	8	0	REMOVE
6566	*ACER RUBRUM*	RED MAPLE	8	6	66	REMOVE
6567	*ACER RUBRUM*	RED MAPLE	18	14	70	REMOVE
6568	*ACER RUBRUM*	RED MAPLE	12	8	53	REMOVE
6569	*ACER SACCHARINUM*	SILVER MAPLE	8	6	45	REMOVE
6570	*ACER RUBRUM*	RED MAPLE	16	12	69	REMOVE
6571	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	16	12	60	REMOVE
6572	*ACER RUBRUM*	RED MAPLE	12	8	75	REMOVE
6573	*ACER RUBRUM*	RED MAPLE	10	8	71	REMOVE
6574	*ACER RUBRUM*	RED MAPLE	14	10	69	REMOVE
6575	*UNIDENTIFIED*	DEAD TREE	22	18	0	REMOVE
6576	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	14	10	75	REMOVE
6577	*ACER RUBRUM*	RED MAPLE	8	6	73	REMOVE
6578	*ACER RUBRUM*	RED MAPLE	7	5	75	REMOVE
6579	*ACER RUBRUM*	RED MAPLE	24	20	70	REMOVE
6580	*ACER RUBRUM*	RED MAPLE	12	8	69	REMOVE
6581	*UNIDENTIFIED*	DEAD TREE	20	16	0	REMOVE
6582	*ACER RUBRUM*	RED MAPLE	8	6	63	REMOVE
6583	*ACER RUBRUM*	RED MAPLE	7	5	71	REMOVE
6584	*ACER RUBRUM*	RED MAPLE	12	8	60	REMOVE
6585	*UNIDENTIFIED*	DEAD TREE	8	6	0	REMOVE
6586	*ACER RUBRUM*	RED MAPLE	12	8	0	REMOVE
6587	*UNIDENTIFIED*	DEAD TREE	32	28	0	REMOVE
6588	*ACER RUBRUM*	RED MAPLE	16	12	75	REMOVE
6589	*UNIDENTIFIED*	DEAD TREE	14	10	0	REMOVE
6590	*QUERCUS RUBRA*	NORTHERN RED OAK	28	24	38	REMOVE
6591	*ACER RUBRUM*	RED MAPLE	14	10	65	REMOVE
6592	*ACER SACCHARINUM*	SILVER MAPLE	14	10	63	REMOVE
6593	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	8	6	70	REMOVE
6594	*FRAXINUS PENNSYLVANICA*	GREEN ASH	22	18	40	REMOVE
6595	*ACER RUBRUM*	RED MAPLE	14	10	55	REMOVE
6596	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	16	12	56	REMOVE
6597	*ACER RUBRUM*	RED MAPLE	16	12	72	REMOVE
6598	*ACER RUBRUM*	RED MAPLE	14	10	69	REMOVE
6599	*ACER RUBRUM*	RED MAPLE	18	12	70	REMOVE
6600	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	16	12	72	REMOVE
6601	*LIQUIDAMBAR STYRACIFLUA*	SWEETGUM	11	7	69	REMOVE
6602	*ACER RUBRUM*	RED MAPLE	8	6	0	REMOVE
6603	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	18	14	70	REMOVE
6604	*FRAXINUS PENNSYLVANICA*	GREEN ASH	8	6	0	REMOVE
6605	*ACER RUBRUM*	RED MAPLE	10	8	50	REMOVE
6606	*FRAXINUS PENNSYLVANICA*	GREEN ASH	14	10	0	REMOVE
6607	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	16	12	68	REMOVE
6608	*FRAXINUS PENNSYLVANICA*	GREEN ASH	16	12	0	REMOVE
6609	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	16	12	70	REMOVE
6610	*FRAXINUS PENNSYLVANICA*	GREEN ASH	12	8	0	REMOVE
6611	*ACER RUBRUM*	RED MAPLE	14	10	65	REMOVE
6612	*ACER RUBRUM*	RED MAPLE	8	6	69	REMOVE
6614	*ULMUS AMERICANA*	AMERICAN ELM	7	5	72	REMOVE
6615	*ACER RUBRUM*	RED MAPLE	18	14	50	REMOVE
6616	*ACER RUBRUM*	RED MAPLE	8	6	56	REMOVE
6617	*ACER RUBRUM*	RED MAPLE	8	6	71	REMOVE
6618	*FRAXINUS PENNSYLVANICA*	GREEN ASH	8	6	0	REMOVE
6619	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	14	10	65	REMOVE
6620	*ACER RUBRUM*	RED MAPLE	14	10	69	REMOVE
6621	*CARYA TOMENTOSA*	MOCKERNUT HICKORY	16	12	60	REMOVE
6622	*FRAXINUS PENNSYLVANICA*	GREEN ASH	14	10	0	REMOVE
6624	*ACER RUBRUM*	RED MAPLE	12	8	66	REMOVE
6625	*ULMUS AMERICANA*	AMERICAN ELM	28	24	65	REMOVE
6626	*ACER RUBRUM*	RED MAPLE	12	8	68	REMOVE
6627	*QUERCUS RUBRA*	NORTHERN RED OAK	16	12	68	REMOVE
6628	*FRAXINUS PENNSYLVANICA*	GREEN ASH	26	22	0	REMOVE
6629	*ULMUS AMERICANA*	AMERICAN ELM	20	16	68	REMOVE
6630	*ULMUS AMERICANA*	AMERICAN ELM	12	8	66	REMOVE
6631	*LIRIODENDRON TULIPIFERA*	TULIP POPLAR	28	24	70	REMOVE
6632	*FRAXINUS PENNSYLVANICA*	GREEN ASH	20	16	0	REMOVE
6633	*ACER RUBRUM*	RED MAPLE	14	10	70	REMOVE
6634	*ACER RUBRUM*	RED MAPLE	8	6	75	REMOVE
6635	*ACER RUBRUM*	RED MAPLE	8	6	60	REMOVE
6636	*ACER RUBRUM*	RED MAPLE	14	10	75	REMOVE
6637	*ACER RUBRUM*	RED MAPLE	12	8	68	REMOVE
6638	*ACER RUBRUM*	RED MAPLE	18	12	69	REMOVE
6639	*ACER RUBRUM*	RED MAPLE	14	10	72	REMOVE
6640	*ULMUS AMERICANA*	AMERICAN ELM	12	8	75	REMOVE
6641	*ULMUS AMERICANA*	AMERICAN ELM	12	8	30	REMOVE
6643	*ACER RUBRUM*	RED MAPLE	20	16	70	REMOVE

PLAN PREPARED BY LAURIE BETH DONNACHIE
ISA CERTIFIED ARBORIST NO. MA-5723A
SIGNATURE: Laurie B Donnachie DATE: 2020-01-03

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COMMONWEALTH OF VIRGINIA
LAURIE B. DONNACHIE
Lic. No. 0406001880
2020-01-03
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:
TREE MANAGEMENT SCHEDULE

SHEET No.
3B

SCALE: N/A

TREE MANAGEMENT SCHEDULE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
6645	ACER RUBRUM	RED MAPLE	11	7	72	REMOVE
6646	ACER RUBRUM	RED MAPLE	16	12	72	REMOVE
6647	ACER RUBRUM	RED MAPLE	12	8	69	REMOVE
6648	ULMUS AMERICANA	AMERICAN ELM	12	8	41	REMOVE
6649	FRAXINUS PENNSYLVANICA	GREEN ASH	16	12	30	REMOVE
6650	ACER RUBRUM	RED MAPLE	20	16	72	REMOVE
6651	ACER RUBRUM	RED MAPLE	12	8	50	REMOVE
6652	ULMUS AMERICANA	AMERICAN ELM	12	8	66	REMOVE
6653	LIRIODENDRON TULIPIFERA	TULIP POPLAR	7	5	72	REMOVE
6654	ACER RUBRUM	RED MAPLE	16	12	69	REMOVE
6655	ACER SACCHARINUM	SILVER MAPLE	30	26	71	REMOVE
6657	ACER RUBRUM	RED MAPLE	34	30	71	REMOVE
6658	ACER RUBRUM	RED MAPLE	20	16	72	REMOVE
6659	ACER RUBRUM	RED MAPLE	16	12	75	REMOVE
6661	UNIDENTIFIED	DEAD TREE	8	6	0	REMOVE
6662	ACER RUBRUM	RED MAPLE	20	16	72	REMOVE
6663	UNIDENTIFIED	DEAD TREE	18	14	0	REMOVE
6664	PRUNUS SEROTINA	BLACK CHERRY	10	8	66	PRESERVE
6665	LIRIODENDRON TULIPIFERA	TULIP POPLAR	22	18	68	PRESERVE
6666	LIRIODENDRON TULIPIFERA	TULIP POPLAR	8	6	75	REMOVE
6667	FRAXINUS PENNSYLVANICA	GREEN ASH	14	10	0	REMOVE
6668	FRAXINUS PENNSYLVANICA	GREEN ASH	14	10	0	REMOVE
6669	LIRIODENDRON TULIPIFERA	TULIP POPLAR	5	5	70	REMOVE
6670	QUERCUS RUBRA	NORTHERN RED OAK	34	30	72	REMOVE
6671	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	10	66	PRESERVE
6672	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	8	68	PRESERVE
6673	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	12	50	PRESERVE
6674	ACER SACCHARINUM	SILVER MAPLE	40	36	72	REMOVE
6675	UNIDENTIFIED	DEAD TREE	16	12	0	REMOVE
6676	QUERCUS ALBA	WHITE OAK	50	40	66	PRESERVE
6677	ACER RUBRUM	RED MAPLE	38	32	63	PRESERVE
6678	ULMUS AMERICANA	AMERICAN ELM	7	5	72	REMOVE
6679	ACER RUBRUM	RED MAPLE	24	20	70	REMOVE
6680	FRAXINUS PENNSYLVANICA	GREEN ASH	28	24	0	REMOVE
6681	ULMUS AMERICANA	AMERICAN ELM	8	6	55	PRESERVE
6682	LIRIODENDRON TULIPIFERA	TULIP POPLAR	8	6	69	REMOVE
6683	LIRIODENDRON TULIPIFERA	TULIP POPLAR	6	6	68	REMOVE
6684	QUERCUS ALBA	WHITE OAK	40	36	56	PRESERVE
6685	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	12	69	PRESERVE
6686	FRAXINUS PENNSYLVANICA	GREEN ASH	24	20	40	REMOVE
6687	LIRIODENDRON TULIPIFERA	TULIP POPLAR	5	5	66	REMOVE
6688	QUERCUS RUBRA	NORTHERN RED OAK	15	6	75	PRESERVE
6689	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	20	69	PRESERVE
6690	FRAXINUS PENNSYLVANICA	GREEN ASH	22	18	0	REMOVE
6691	ACER RUBRUM	RED MAPLE	30	30	65	PRESERVE
6692	FRAXINUS PENNSYLVANICA	GREEN ASH	26	22	0	REMOVE
6693	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	8	72	REMOVE
6695	ACER RUBRUM	RED MAPLE	8	6	55	REMOVE
6696	LIRIODENDRON TULIPIFERA	TULIP POPLAR	22	18	69	PRESERVE
6697	LIRIODENDRON TULIPIFERA	TULIP POPLAR	34	30	68	PRESERVE
6698	MORUS ALBA	WHITE MULBERRY	20	15	34	REMOVE
6699	ACER RUBRUM	RED MAPLE	12	8	71	REMOVE
6700	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	10	75	REMOVE
6703	CEDRUS ATLANTICA	ATLAS CEDAR	16	14	70	REMOVE
6804	QUERCUS PALUSTRIS	PIN OAK	26	22	74	REMOVE
6807	THUJA SPP.	ARBORVITAE	10	8	76	REMOVE
6808	THUJA SPP.	ARBORVITAE	10	8	72	REMOVE
6809	THUJA SPP.	ARBORVITAE	10	8	74	REMOVE
6810	THUJA SPP.	ARBORVITAE	12	10	75	REMOVE
6811	THUJA SPP.	ARBORVITAE	12	10	75	REMOVE
6812	THUJA SPP.	ARBORVITAE	12	10	75	REMOVE
6813	THUJA SPP.	ARBORVITAE	10	8	75	REMOVE
6814	THUJA SPP.	ARBORVITAE	10	8	75	REMOVE
6815	THUJA SPP.	ARBORVITAE	12	10	75	REMOVE
6816	THUJA SPP.	ARBORVITAE	10	8	75	REMOVE
6817	THUJA SPP.	ARBORVITAE	10	8	70	REMOVE
6818	THUJA SPP.	ARBORVITAE	10	8	69	REMOVE
6819	THUJA SPP.	ARBORVITAE	10	8	76	REMOVE
6820	THUJA SPP.	ARBORVITAE	10	8	75	REMOVE
6821	THUJA SPP.	ARBORVITAE	10	8	77	REMOVE
6822	THUJA SPP.	ARBORVITAE	10	8	72	REMOVE
6823	THUJA SPP.	ARBORVITAE	10	8	74	REMOVE
6824	JUNIPERUS VIRGINIANA	EASTERN REDCEDAR	16	12	66	REMOVE
6825	JUNIPERUS VIRGINIANA	EASTERN REDCEDAR	16	12	74	REMOVE
6826	FRAXINUS PENNSYLVANICA	GREEN ASH	20	16	65	REMOVE
6827	PICEA ABIES	NORWAY SPRUCE	26	22	72	REMOVE
6828	JUNIPERUS VIRGINIANA	EASTERN REDCEDAR	8	6	72	REMOVE
6829	JUNIPERUS VIRGINIANA	EASTERN REDCEDAR	7	5	74	REMOVE
6830	JUNIPERUS VIRGINIANA	EASTERN REDCEDAR	12	10	76	REMOVE
6831	JUNIPERUS VIRGINIANA	EASTERN REDCEDAR	12	10	71	REMOVE
6832	JUNIPERUS VIRGINIANA	EASTERN REDCEDAR	10	6	75	REMOVE
6833	JUNIPERUS VIRGINIANA	EASTERN REDCEDAR	12	10	76	REMOVE
6834	CARYA CORDIFORMIS	BITTERNUT HICKORY	26	22	71	REMOVE
6835	ACER RUBRUM	RED MAPLE	26	22	68	REMOVE
6836	FRAXINUS PENNSYLVANICA	GREEN ASH	8	6	68	REMOVE
6837	ACER RUBRUM	RED MAPLE	20	16	72	REMOVE
6838	ACER RUBRUM	RED MAPLE	14	10	63	REMOVE
6839	ACER RUBRUM	RED MAPLE	12	8	70	REMOVE
6840	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	16	72	REMOVE
6841	ACER RUBRUM	RED MAPLE	22	18	70	REMOVE
6842	ACER RUBRUM	RED MAPLE	20	16	75	REMOVE
6843	ACER RUBRUM	RED MAPLE	18	14	72	REMOVE
6844	ACER RUBRUM	RED MAPLE	20	16	41	REMOVE
6845	ACER RUBRUM	RED MAPLE	24	20	71	REMOVE
6846	ACER RUBRUM	RED MAPLE	28	24	59	REMOVE
6847	LIRIODENDRON TULIPIFERA	TULIP POPLAR	28	24	68	REMOVE
6848	ACER RUBRUM	RED MAPLE	30	26	53	REMOVE
6849	ACER RUBRUM	RED MAPLE	18	14	71	REMOVE
6850	LIRIODENDRON TULIPIFERA	TULIP POPLAR	2	16	53	REMOVE
6851	ACER RUBRUM	RED MAPLE	26	22	70	REMOVE
6852	ACER RUBRUM	RED MAPLE	32	28	56	REMOVE
6853	ACER RUBRUM	RED MAPLE	32	28	70	REMOVE
6854	CATALPA SPECIOSA	NORTHERN CATALPA	8	6	53	REMOVE
6855	CATALPA SPECIOSA	NORTHERN CATALPA	14	10	72	REMOVE
6856	ACER RUBRUM	RED MAPLE	18	14	38	REMOVE
6859	SASSAFRAS ALBIDUM	SASSAFRAS	16	12	50	REMOVE
6861	FRAXINUS PENNSYLVANICA	GREEN ASH	40	36	0	REMOVE
6865	MORUS ALBA	WHITE MULBERRY	14	12	50	REMOVE
6866	ACER RUBRUM	RED MAPLE	16	12	50	REMOVE
6867	PINUS STROBUS	WHITE PINE	28	24	70	REMOVE
6868	ILEX OPACA	AMERICAN HOLLY	20	16	71	REMOVE
6870	ROBINIA PSEUDOACACIA	BLACK LOCUST	18	14	38	REMOVE
6871	SASSAFRAS ALBIDUM	SASSAFRAS	16	12	70	REMOVE
6872	QUERCUS RUBRA	NORTHERN RED OAK	24	20	72	REMOVE
6873	QUERCUS PALUSTRIS	PIN OAK	24	20	70	REMOVE
6874	ACER RUBRUM	RED MAPLE	18	14	72	REMOVE
6876	ACER RUBRUM	RED MAPLE	14	10	72	REMOVE

TREE MANAGEMENT SCHEDULE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
6877	ACER RUBRUM	RED MAPLE	20	16	68	REMOVE
6878	ACER RUBRUM	RED MAPLE	26	22	69	REMOVE
6880	ACER RUBRUM	RED MAPLE	26	22	72	REMOVE
6881	LIRIODENDRON TULIPIFERA	TULIP POPLAR	28	24	72	REMOVE
6882	LIRIODENDRON TULIPIFERA	TULIP POPLAR	40	36	72	REMOVE
6883	PRUNUS SEROTINA	BLACK CHERRY	24	20	65	REMOVE
6884	LIRIODENDRON TULIPIFERA	TULIP POPLAR	28	24	69	REMOVE
6886	ACER RUBRUM	RED MAPLE	28	24	66	REMOVE
6887	QUERCUS PALUSTRIS	PIN OAK	18	14	50	REMOVE
6888	ACER RUBRUM	RED MAPLE	7	5	66	REMOVE
6889	LIRIODENDRON TULIPIFERA	TULIP POPLAR	46	40	55	REMOVE
6890	ACER RUBRUM	RED MAPLE	16	12	63	REMOVE
6891	ACER RUBRUM	RED MAPLE	20	16	68	REMOVE
6892	PRUNUS SEROTINA	BLACK CHERRY	20	16	63	REMOVE
6893	ACER RUBRUM	RED MAPLE	12	8	60	REMOVE
6894	LIRIODENDRON TULIPIFERA	TULIP POPLAR	26	22	75	REMOVE
6895	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	16	70	REMOVE
6896	ACER RUBRUM	RED MAPLE	14	10	63	REMOVE
6897	ACER RUBRUM	RED MAPLE	14	10	70	REMOVE
6898	ACER RUBRUM	RED MAPLE	20	16	63	REMOVE
6899	PICEA ABIES	NORWAY SPRUCE	18	14	70	REMOVE
6900	LIRIODENDRON TULIPIFERA	TULIP POPLAR	28	24	69	REMOVE
6901	LIRIODENDRON TULIPIFERA	TULIP POPLAR	18	14	67	REMOVE
6902	UNIDENTIFIED	DEAD TREE	14	10	31	REMOVE
6903	ACER RUBRUM	RED MAPLE	18	14	40	REMOVE
6904	LIRIODENDRON TULIPIFERA	TULIP POPLAR	40	36	75	REMOVE
6905	LIRIODENDRON TULIPIFERA	TULIP POPLAR	34	30	69	REMOVE
6907	ACER RUBRUM	RED MAPLE	24	20	45	REMOVE
6908	QUERCUS RUBRA	NORTHERN RED OAK	40	36	66	REMOVE
6909	MAGNOLIA GRANDIFLORA	SOUTHERN MAGNOLIA	16	12	60	REMOVE
6910	ILEX OPACA	AMERICAN HOLLY	12	10	31	REMOVE
6911	PICEA ABIES	NORWAY SPRUCE	12	8	65	REMOVE
6912	ACER RUBRUM	RED MAPLE	22	18	28	REMOVE
6913	PINUS STROBUS	WHITE PINE	12	8	50	REMOVE
6914	ACER RUBRUM	RED MAPLE	34	30	66	REMOVE
6915	ACER RUBRUM	RED MAPLE	26	22	65	REMOVE
6916	ACER RUBRUM	RED MAPLE	20	16	59	REMOVE
6917	ACER RUBRUM	RED MAPLE	26	22	30	REMOVE
6918	JUGLANS NIGRA	BLACK WALNUT	20	16	50	REMOVE
6919	LIRIODENDRON TULIPIFERA	TULIP POPLAR	34	30	69	REMOVE
6921	JUGLANS NIGRA	BLACK WALNUT	22	18	67	REMOVE
6925	ACER RUBRUM	RED MAPLE	5	5	30	REMOVE
6926	ACER RUBRUM	RED MAPLE	10	8	59	REMOVE
6927	UNIDENTIFIED	DEAD TREE	15	12	0	REMOVE
6928	ACER RUBRUM	RED MAPLE	15	8	69	REMOVE
6929	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	24	72	REMOVE
6932	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	15	60	REMOVE
6933	PINUS VIRGINIANA	VIRGINIA PINE	18	14	60	REMOVE
6934	ACER RUBRUM	RED MAPLE	10	5	63	REMOVE
6935	PRUNUS SEROTINA	BLACK CHERRY	30	30	60	REMOVE
6936	CATALPA SPECIOSA	NORTHERN CATALPA	10	5	69	REMOVE
6937	LIRIODENDRON TULIPIFERA	TULIP POPLAR	25	30	71	REMOVE
6939	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	18	72	REMOVE
6940	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	18	71	REMOVE
6941	ACER RUBRUM	RED MAPLE	10	12	70	REMOVE
6942	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	24	74	REMOVE
6943	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	24	73	REMOVE
6944	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	12	75	REMOVE
6945	UNIDENTIFIED	DEAD TREE	1	8	0	REMOVE
6946	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	15	63	REMOVE
6947	ACER RUBRUM	RED MAPLE	15	8	65	REMOVE
6948	LIRIODENDRON TULIPIFERA	TULIP POPLAR	30	27	59	REMOVE
6949	ACER RUBRUM	RED MAPLE	26	24	68	REMOVE
6950	ACER RUBRUM	RED MAPLE	10	12	30	REMOVE
6951	ACER RUBRUM	RED MAPLE	18	14	70	REMOVE
6952	ULMUS AMERICANA	AMERICAN ELM	28	24	60	REMOVE
6953	ACER RUBRUM	RED MAPLE	10	6	60	REMOVE
6954	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	18	69	REMOVE
6955	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	15	70	REMOVE
6956	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	21	69	REMOVE
6957	ACER RUBRUM	RED MAPLE	10	5	45	REMOVE
6958	LIRIODENDRON TULIPIFERA	TULIP POPLAR	5	8	69	REMOVE
6959	LIRIODENDRON TULIPIFERA	TULIP POPLAR	5	8	68	REMOVE
6960	ACER RUBRUM	RED MAPLE	15	12	28	REMOVE
6964	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	8	75	REMOVE
6965	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	12	70	REMOVE
6966	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	10	72	REMOVE
6967	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	27	72	REMOVE
6968	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	24	63	REMOVE
6969	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	15	72	REMOVE
6970	FRAXINUS PENNSYLVANICA	GREEN ASH	22	18	0	REMOVE
6971	ACER RUBRUM	RED MAPLE	14	10	65	REMOVE
6972	FRAXINUS PENNSYLVANICA	GREEN ASH	14	10	0	REMOVE
6973	FRAXINUS PENNSYLVANICA	GREEN ASH	7	5	30	REMOVE
6974	LIRIODENDRON TULIPIFERA	TULIP POPLAR	34	30	66	REMOVE
6975	LIRIODENDRON TULIPIFERA	TULIP POPLAR	3	72	73	REMOVE
6976	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12	8	72	REMOVE
6977	LIRIODENDRON TULIPIFERA	TULIP POPLAR	48	44	72	REMOVE
6978	JUGLANS NIGRA	BLACK WALNUT	16	12	66	REMOVE
6979	CATALPA SPECIOSA	NORTHERN CATALPA	14	10	40	REMOVE
6980	MORUS ALBA	WHITE MULBERRY	18	14	50	REMOVE
6982	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	24	69	REMOVE
6983	PINUS VIRGINIANA	VIRGINIA PINE	28	24	70	REMOVE
6984	CATALPA SPECIOSA	NORTHERN CATALPA	8	6	72	REMOVE
6985	ACER RUBRUM	RED MAPLE	40	36	65	REMOVE
6986	PRUNUS SEROTINA	BLACK CHERRY	12	8	63	REMOVE
6987	QUERCUS PALUSTRIS	PIN OAK	38	32	71	REMOVE
6988	PRUNUS SEROTINA	BLACK CHERRY	14	10	59	REMOVE
6989	ACER RUBRUM	RED MAPLE	12	8	67	REMOVE
6990	ACER RUBRUM	RED MAPLE	25	12	58	REMOVE
6991	LAGERSTROEMIA SPP.	CREPE MYRTLE	24	20	70	REMOVE
6992	QUERCUS PALUSTRIS	PIN OAK	12	8	72	REMOVE
6993	ACER RUBRUM	RED MAPLE	12	10	70	REMOVE
6994	ILEX OPACA	AMERICAN HOLLY	28	24	70	REMOVE
6996	ULMUS AMERICANA	AMERICAN ELM	8	6	53	REMOVE
6997	FRAXINUS PENNSYLVANICA	GREEN ASH	24	20	50	REMOVE
6998	ACER RUBRUM	RED MAPLE	30	26	63	REMOVE
7000	LIRIODENDRON TULIPIFERA	TULIP POPLAR	25	20	38	REMOVE
7002	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	15	75	REMOVE
7003	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	27	73	REMOVE
7004	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	24	72	REMOVE
7005	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	24	69	REMOVE
7006	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	8	69	REMOVE
7007	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	30	67	REMOVE
7008	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	24	75	REMOVE
7009	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	15	72	REMOVE
7010	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	10	88	REMOVE

TREE MANAGEMENT SCHEDULE

TREE #	BOTANICAL NAME	COMMON NAME	CRITICAL ROOT ZONE RADIUS (FEET)	TRUNK DIAMETER (INCHES)	CONDITION RATING	PROCEDURE
7011	LIRIODENDRON TULIPIFERA	TULIP POPLAR	25	40	89	REMOVE
7012	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	12	56	REMOVE
7014	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	30	69	REMOVE
7015	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	24	72	REMOVE
7016	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	30	66	REMOVE
7019	LIRIODENDRON TULIPIFERA	TULIP POPLAR	30	40	89	REMOVE
7020	LIRIODENDRON TULIPIFERA	TULIP POPLAR	25	36	69	REMOVE
7023	ACER RUBRUM	RED MAPLE	35	36	55	REMOVE
7027	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	20	70	PRESERVE
7030	LIRIODENDRON TULIPIFERA	TULIP POPLAR	25	15	68	PRESERVE
7031	ULMUS AMERICANA	AMERICAN ELM	25	15	67	PRESERVE
7032	ULMUS AMERICANA	AMERICAN ELM	15	12	66	PRESERVE
7033	MORUS ALBA	WHITE MULBERRY	10	8	50	REMOVE
7036	ACER RUBRUM	RED MAPLE	30	36	41	REMOVE
7037	QUERCUS RUBRA	NORTHERN RED OAK	20	12	68	PRESERVE
7038	PRUNUS SEROTINA	BLACK CHERRY	10	8	59	PRESERVE
7039	PRUNUS SEROTINA	BLACK CHERRY	10	5	90	PRESERVE
7040	CARYA TOMENTOSA	MOCKERNUT HICKORY	15	5	44	PRESERVE
7042	ACER RUBRUM	RED MAPLE	8	8	59	PRESERVE
7043	QUERCUS RUBRA	NORTHERN RED OAK	12	10	70	PRESERVE
7045	QUERCUS RUBRA	NORTHERN RED OAK	20	20	73	PRESERVE
7047	FAGUS GRANDIFOLIA	AMERICAN BEECH	20	24	73	PRESERVE
7048	QUERCUS RUBRA	NORTHERN RED OAK	15	12	66	PRESERVE
7201	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	15	59	REMOVE
7202	LIRIODENDRON TULIPIFERA	TULIP POPLAR	27	20	70	REMOVE
7203	LIRIODENDRON TULIPIFERA	TULIP POPLAR	40	25	68	REMOVE
7204	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	12	40	REMOVE
7205	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	10	69	REMOVE
7206	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15	10	70	REMOVE
7207	LIRIODENDRON TULIPIFERA	TULIP POPLAR	24	20	68	REMOVE
7208	LIRIODENDRON TULIPIFERA	TULIP POPLAR	24	15	70	REMOVE
7209	LIRIODENDRON TULIPIFERA	TULIP POPLAR	24	15	67	REMOVE
7210	LIRIODENDRON TULIPIFERA	TULIP POPLAR	10	8	68	REMOVE
7211	LIRIODENDRON TULIPIFERA	TULIP POPLAR	22	16	67	REMOVE
7212	LIRIODENDRON TULIPIFERA	TULIP POPLAR	30	26	65	REMOVE
7213	LIRIODENDRON TULIPIFERA	TULIP POPLAR	30	22	60	REMOVE
7214	LIRIODENDRON TULIPIFERA	TULIP POPLAR	30	26	70	REMOVE
7215	LIRIODENDRON TULIPIFERA	TULIP POPLAR	32	26	67	REMOVE
7216	LIRIODENDRON TULIPIFERA	TULIP POPLAR	40	30	69	REMOVE
7217	ACER RUBRUM	RED MAPLE	12	10	67	REMOVE
7218	LIRIODENDRON TULIPIFERA	TULIP POPLAR	20	18	63	REMOVE

PLAN PREPARED BY LAURIE BETH DONNACHIE
ISA CERTIFIED ARBORIST NO. MA-5723A
SIGNATURE: Laurie B Donnachie DATE: 2020-01-03

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COMMONWEALTH OF VIRGINIA
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2020-01-03
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN

CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:

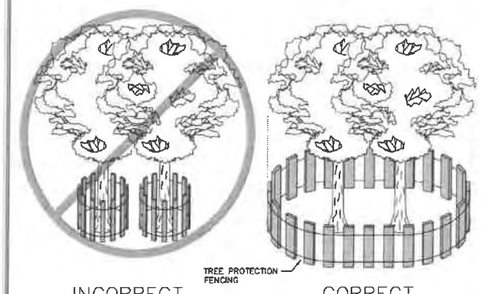
TREE MANAGEMENT SCHEDULE

SHEET No.
3C

SCALE: N/A

TREE PRESERVATION NOTES

1. PROJECT NOTES
   - 1.1. THE REQUIREMENTS OF THE CITY OF FAIRFAX ZONING ORDINANCE AND PUBLIC FACILITIES MANUAL SHALL BE FOLLOWED.
   - 1.2. ALL TREE PRESERVATION ACTIVITIES SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION OF AN ISA CERTIFIED ARBORIST.
   - 1.3. ALL TREE WORK PERFORMED SHALL MEET OR EXCEED THE MOST RECENT INDUSTRY STANDARDS, AS PUBLISHED BY THE INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA).
2. PRE-CONSTRUCTION
   - 2.1. PRIOR TO THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL HAVE THE LIMITS OF CLEARING AND GRADING CLEARLY MARKED IN THE FIELD WITH FLAGGING. THESE LIMITS SHALL NOT EXCEED THOSE SHOWN ON THE APPROVED PLANS.
   - 2.2. AFTER LIMITS HAVE BEEN STAKED, THE CONTRACTOR SHALL REQUEST A PRE-CONSTRUCTION MEETING WITH CITY OF FAIRFAX AND PROJECT ARBORIST.
   - 2.3. DURING THE PRE-CONSTRUCTION MEETING, THE LIMITS MAY BE ADJUSTED TO BETTER PRESERVE OR REMOVE TREES IMPACTED BY CONSTRUCTION ACTIVITIES.
3. INSTALLATION OF TREE PROTECTION MEASURES
   - 3.1. ROOT PRUNING: PRIOR TO CONSTRUCTION, ROOT PRUNING SHALL BE COMPLETED AT THE LIMITS. ROOT PRUNING SHALL BE TO THE DEPTH OF EIGHTEEN (18) TO TWENTY-FOUR (24) INCHES AND SHALL BE ACCOMPLISHED BY USING A TRENCHER, VIBRATING PLOW OR BY HAND. TRENCH SHOULD BE IMMEDIATELY BACKFILLED WITH REMOVED SOIL. WHEN EXCAVATING ALL TREE ROOTS GREATER THAN 1 INCH IN DIAMETER THAT ARE EXPOSED AND/OR DAMAGED SHALL BE TRIMMED CLEANLY, AND COVERED WITH ORGANIC MULCH, TOPSOIL, OR OTHER SUITABLE MATERIAL TO PREVENT THE EXPOSED ROOTS FROM DRYING OUT.
   - 3.2. TREE PROTECTION FENCING: IMMEDIATELY FOLLOWING ROOT PRUNING, TREE PROTECTION FENCING SHALL BE COMPLETED AT THE LIMITS. TREE PROTECTION FENCING SHALL BE INSTALLED PER TREE PRESERVATION PLAN AND SHALL CONSIST OF EITHER OF THE FOLLOWING MATERIALS:
     - 3.2.1. FOURTEEN (14) GAUGE WELDED WIRE MESH THAT IS A MINIMUM OF FOUR (4) FOOT TALL. THE MESH SHALL BE ATTACHED TO SIX (6) FOOT TALL, TWO-INCH (2") STEEL U-CHANNEL ANCHOR POSTS DRIVEN EIGHTEEN (18) INCHES INTO THE GROUND. THE POSTS SHALL BE PLACED NO FURTHER THAN TEN (10) FEET APART.
     - 3.2.2. SUPER SILT FENCE
   - 3.3. TREE PROTECTION SIGNAGE: BILINGUAL SIGNS STATING "TREE PRESERVATION AREA - KEEP OUT" SHALL BE AFFIXED TO THE TREE PRESERVATION FENCE AT LEAST EVERY 50 FEET IMMEDIATELY FOLLOWING TREE PROTECTION FENCING INSTALLATION.
   - 3.4. CITY OF FAIRFAX SHALL BE NOTIFIED AND GIVEN THE OPPORTUNITY TO INSPECT THE SITE TO ASSURE THAT ALL TREE PROTECTION DEVICES HAVE BEEN CORRECTLY INSTALLED. IF IT IS DETERMINED THAT THE FENCING HAS NOT BEEN INSTALLED CORRECTLY, NO CONSTRUCTION ACTIVITIES SHALL OCCUR UNTIL THE FENCING IS INSTALLED CORRECTLY, AS DETERMINED BY CITY OF FAIRFAX .
   - 3.5. TREES BEING REMOVED SHALL NOT BE FELLED, PUSHED OR PULLED INTO TREE PRESERVATION AREAS. EQUIPMENT OPERATORS SHALL NOT CLEAN ANY PART OF THEIR EQUIPMENT BY SLAMMING AGAINST THE TRUNKS OF TREES TO BE RETAINED.
   - 3.6. TREES ON THE EDGE OF THE LIMITS OF CLEARING AND GRADING SHALL BE CUT DOWN BY HAND WITH A CHAIN SAW. REMAINING STUMPS SHALL EITHER BE LEFT IN PLACE OR GROUND DOWN WITH A STUMP GRINDER.
   - 3.7. TREES INDICATED WILL BE MULCHED WITH WOOD CHIPS GENERATED FROM ON SITE CLEARING OR TREE REMOVAL AND PRUNING OPERATIONS WHEN POSSIBLE. SHREDDED HARDWOOD MULCH FROM OFFSITE MAY BE UTILIZED IF APPROVED BY PROJECT ARBORIST. MULCH SHALL BE SPREAD IN A UNIFORM DEPTH OF THREE (3") INCHES BY HAND. MULCH SHALL BE PLACED IN AREAS AS INDICATED ON APPROVED PLANS.
4. CONSTRUCTION
   - 4.1. DURING CLEARING AND GRADING OPERATIONS AND THROUGHOUT CONSTRUCTION, NO ACTIVITY SHALL BE PERMITTED IN TREE SAVE AREAS WITHOUT AUTHORIZATION FROM OWNER, ARBORIST, OR CITY OF FAIRFAX . PRECLUDED ACTIVITIES INCLUDE:
     - 4.1.1. FELLING OF TREES INTO PRESERVATION AREAS OR OPERATION OF HEAVY MACHINERY IN SAVE AREAS TO FELL TREES ON THE PERIMETER OF PRESERVATION AREAS.
     - 4.1.2. OPERATION OF HEAVY EQUIPMENT OR MACHINERY OF ANY KIND IN PRESERVATION AREAS FOR ANY PURPOSE.
     - 4.1.3. PLACEMENT OF EXCESS SOIL, FILL, OR MATERIALS OF ANY KIND IN PRESERVATION AREAS.
     - 4.1.4. PLACEMENT OF ANY CONSTRUCTION MATERIALS OF ANY KIND IN PRESERVATION AREAS.
     - 4.1.5. PARKING OR STORING EQUIPMENT OR VEHICLES IN PRESERVATION AREAS.
     - 4.1.6. DUMPING CHEMICALS OR CONCRETE WASHOUT IN PRESERVATION AREAS.
     - 4.1.7. BURNING OF ANY MATERIAL OR DEBRIS IN PRESERVATION AREAS OR WITHIN 200 FEET OF PRESERVATION AREAS.
     - 4.1.8. TRENCHING, GRADING, EXCAVATING FOR ANY PURPOSE IN PRESERVATION AREAS.
   - 4.2. ALL EXISTING TRASH AND/OR DEBRIS ON SITE SHALL BE REMOVED AT THE TIME OF DISTURBANCE. INDIVIDUAL TREES AND FORESTED AREAS DESIGNATED TO BE PRESERVED SHALL BE PROTECTED AND MANAGED TO ENSURE TREE SURVIVAL DURING ALL PHASES OF DEMOLITION, CLEARING AND GRADING, AND CONSTRUCTION. IN ADDITION TO PROTECTING TREES, ALL UNDERSTORY PLANTS, LEAF LITTER AND SOIL CONDITIONS FOUND IN FORESTED AREAS DESIGNATED TO BE LEFT PRESERVED SHALL BE PROTECTED.
   - 4.3. TREES TO REMAIN LOCATED ALONG THE LIMITS OF CLEARING AND GRADING SHALL BE PRUNED DURING CLEARING OPERATIONS TO AVOID MECHANICAL DAMAGE. THIS SHALL BE ADMINISTRATED UNDER THE SUPERVISION OF AN ISA CERTIFIED ARBORIST.
   - 4.4. ANY DAMAGE INFLICTED TO THE ABOVE OR BELOW-GROUND PORTIONS OF THE TREES SHOWED TO BE PRESERVED SHALL BE REPAIRED IMMEDIATELY PER ISA STANDARDS.
   - 4.5. ALL PRUNING SHALL CONFORM TO THE LATEST EDITION OF ANSI A300 (PART 1) PRUNING STANDARDS. DISEASED LIMBS SHALL BE REMOVED OR TREATED AT THE DISCRETION OF THE ARBORIST. WHILE PRUNING, THE ARBORIST SHALL MAKE NOTE OF ANY CONDITIONS WHICH AFFECT THE HEALTH OR CONDITION OF THE TREE AND RECOMMEND CORRECTIVE TREATMENT FOR THESE CONDITIONS. VINE REMOVAL SHALL BE INCLUDED IN ALL PRUNING ACTIVITIES. UNDER NO CIRCUMSTANCES SHALL THE INTERIOR OF TREES BE STRIPPED OF FOLIAGE, SUCKERS, EPICORMIC BRANCHING, OR OTHER LIVE GROWTH. INTERIOR GROWTH MAY BE THINNED AS NECESSARY TO REMOVE BRANCHES DAMAGED DURING OPERATIONS. DEBRIS FROM PRUNING SHALL BE CHIPPED AND DEPOSITED INTO THE TREE SAVE AREA AND SPREAD BY HAND TO A UNIFORM THICKNESS OR BE REMOVED FROM SITE.

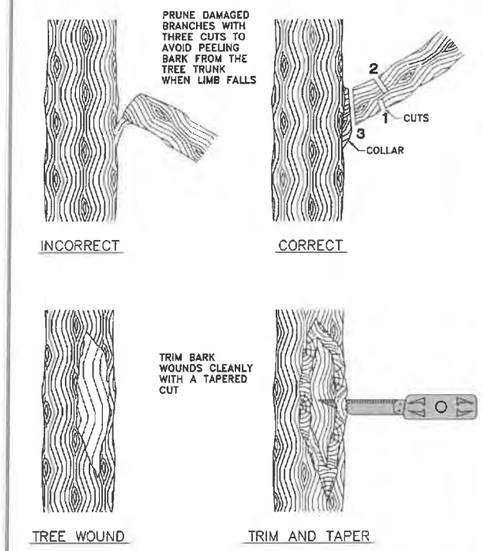


BARRIER INSTALLED AT THE DRIP LINE OF TREE BRANCHES

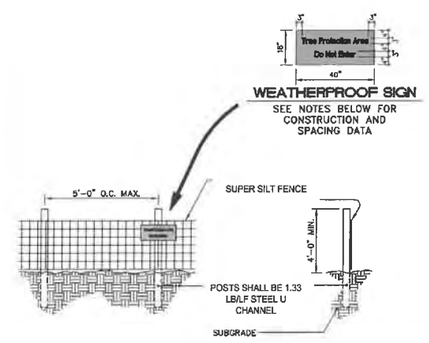
NOTES:

1. Precautions shall be taken to prevent and minimize damage to trees. In such cases repair any damage to crown, trunk or root system immediately.
   - A. Repair roots by cleanly cutting off the damaged areas. Spread ~~peat moss~~ or moist topsoil over exposed roots.
   - B. Repair damage to bark by trimming around the damaged area as shown in Detail 8.10. Taper the cut to provide drainage.
   - C. Cut off damaged tree limbs above the tree collar at the trunk or main branch. Use three separate cuts as shown in Detail 8.10 to avoid peeling bark from healthy areas of tree.

Department of Public Works 10455 Armstrong Street Fairfax, VA 22030-3630	CITY of FAIRFAX USE WITH THE FAIRFAX STANDARD SPECIFICATIONS ONLY	Voice (703) 385-7810 FAX (703) 591-3727 www.fairfaxva.gov
STANDARD TREE PROTECTION DETAIL	SCALE: Not To Scale REVISION DATE: December 2016	DETAIL # 8.09 SHEET # 1 of 2



Department of Public Works 10455 Armstrong Street Fairfax, VA 22030-3630	CITY of FAIRFAX USE WITH THE FAIRFAX STANDARD SPECIFICATIONS ONLY	Voice (703) 385-7810 FAX (703) 591-3727 www.fairfaxva.gov
TREE SURGERY DETAIL	SCALE: Not To Scale REVISION DATE: December 2016	DETAIL # 8.10 SHEET # 1 of 1



NOTES:

1. Install tree protection fence and signage prior to calling for the initial on site inspection by the City of Fairfax inspector.
2. Warning signs shall be made of durable, weatherproof material.
3. Letters shall be 3" high minimum, clearly legible and spaced as detailed.
4. Signs shall be placed no greater than 50' on center or as approved.
5. For tree protection areas less than 200' in perimeter, provide no less than three signs per protected area.
6. Attach signs securely to fence posts and fabric.
7. Maintain tree protection fence throughout duration of project.
8. Additional signs may be required by City of Fairfax inspections based on actual field conditions.
9. No activity shall occur within the protected area including material storage, stockpiling, parking or any activity that may compact the ground or damage the trees.
10. The City reserves the right to require a 4' to 6' height chain link fencing for identified trees, such as specimen or champion trees, to maximize the protection of the tree and its critical root zone.

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STANDARD TREE PROTECTION DETAIL	SCALE: Not To Scale REVISION DATE: December 2016	DETAIL # 8.09 SHEET # 2 of 2

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

PLAN PREPARED BY LAURIE BETH DONNACHIE
ISA CERTIFIED ARBORIST NO. MA-5723A
SIGNATURE: Laurie B Donnachie DATE: 2020-01-03

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2020-01-03
LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN

CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: LBD
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:

TREE MANAGEMENT NOTES & DETAILS

SHEET No.

3D

SCALE: N/A

MATCH LINE "A" - SEE SHEET 4A

PROP. RETAINING WALL

N84°22'29"E 585.06'

SWALE CENTERLINE

PROP. TOWNHOUSES

24' TYP.

TOWNHOUSE PARCEL
±1.9 ACRES

HYDRODYNAMIC SEPARATOR (BMP 8)

6' SIDEWALK

STORMFILTER (BMP 9)

100-YR FLOODPLAIN

RPA (POST-REVEGETATED)

APPROXIMATE LOCATION OF AMENITY AREA

N04°24'27"W 38.28'

S88°12'58"W 89.62'

N04°24'00"W 98.08'

N84°15'12"W 89.44'

PROP. 30' STM. ESMT.

PROP. RETAINING WALL

HYDRODYNAMIC SEPARATOR

ISOLATOR ROW (BMP 5)

ISOLATOR ROW (BMP 6)

HYDRODYNAMIC SEPARATOR (BMP 7)

FILTERRA (BMP 10)

FILTERRA (BMP 11)

5' BIKE LANE

ORCHARD STREET

FARR AVENUE

67' ROW

PARKING GARAGE ENTRANCE

GREENROOF

HYDRODYNAMIC SEPARATOR (BMP 1)

PROPOSED BUILDING

STORMFILTER (BMP 2)

FARR AVENUE TO BE DESIGNED AND CONSTRUCTED BY OTHERS

SENIOR LIVING PARCEL
±2.2 ACRES

STORMFILTER (BMP 4)

HYDRODYNAMIC SEPARATOR (BMP 3)

DROP OFF BAY

PROP. 30' STM. ESMT.

MATCH LINE "B" - SEE SHEET 4A

VIRGINIA STATE GRID NORTH
NAD 83

BROWN'S FAIRFAX MAZDA PROPOSED DEVELOPMENT (SUP SUB 01-20191105)

N84°15'12"W 476.16'

S37°59'08"W 44.06'

N74°25'59"W 62.77'

HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
ELI GOLDMAN
Lic. No.55868
01/03/2020
PROFESSIONAL ENGINEER

NORTHFAX WEST
MASTER DEVELOPMENT PLAN

CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

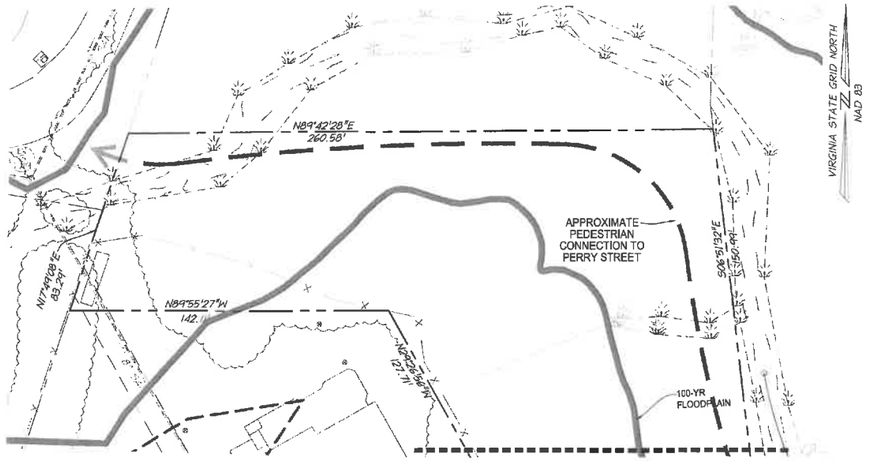
SHEET TITLE:

MASTER DEVELOPMENT PLAN

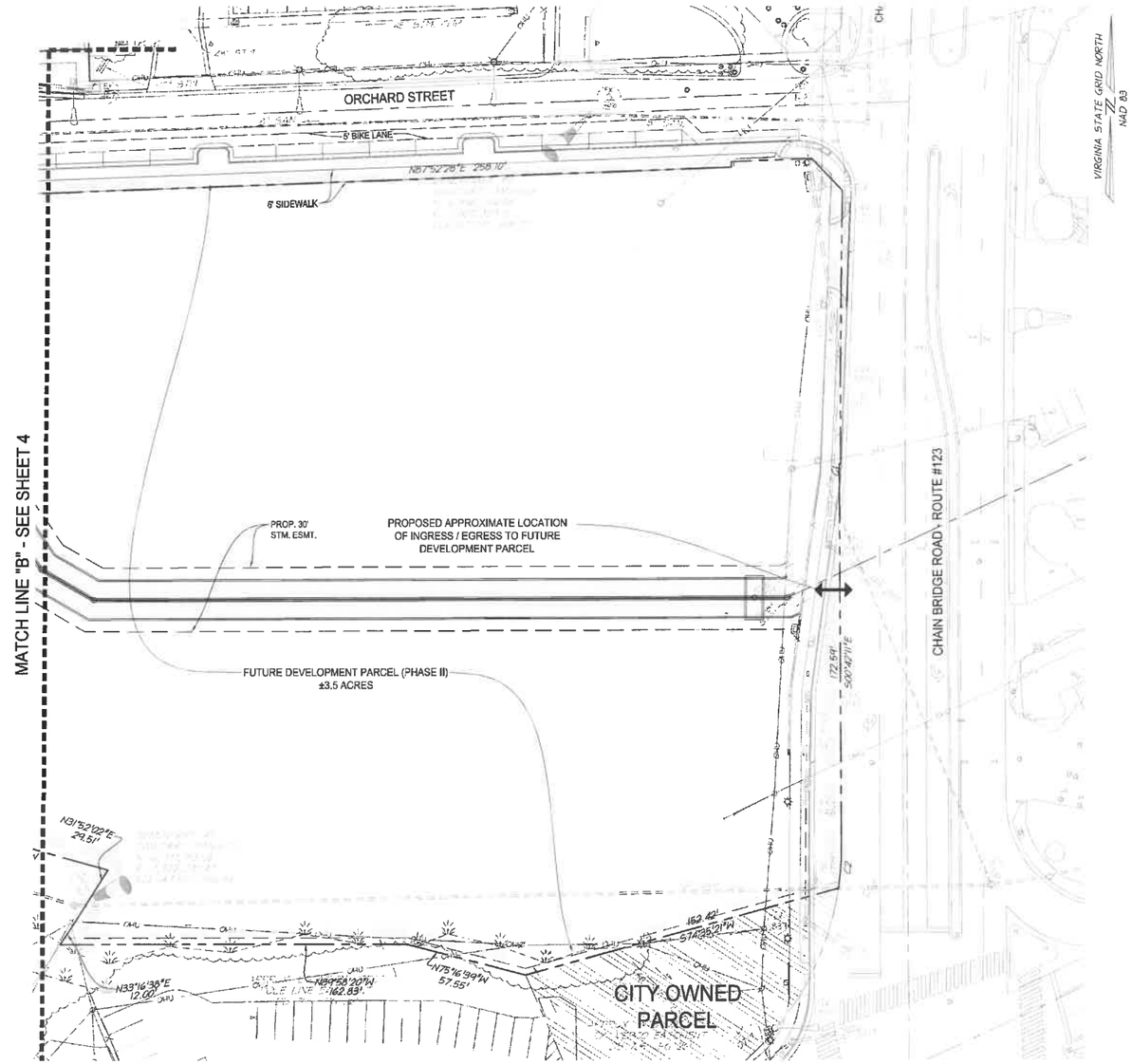
SHEET No.

4

SCALE: 1"=30'



MATCH LINE "A" - SEE SHEET 4



MATCH LINE "B" - SEE SHEET 4

PROPOSED TABULATIONS FOR DEVELOPMENT PROGRAM

SITE AREA
REQUIRED: 2 ACRES (PD-M)
PROVIDED: 10.65 AC (464,080 SF)
TOWNHOUSE PARCEL = 4.93 AC (214,890 SF)
SENIOR LIVING PARCEL = 2.23 AC (97,316 SF)
FUTURE DEVELOPMENT PARCEL = 3.49 AC (151,884 SF)

NOTES:
(1) RIGHT-OF-WAY OF ORCHARD STREET TO BE RE-ALIGNED.
(2) RIGHT-OF-WAY TO BE DEDICATED FOR FARR AVENUE EXTENSION.
(3) EXISTING SITE AREA IS 11.32 ACRES.

DENSITY
PERMITTED: NO REQUIREMENT
PROVIDED: TOWNHOUSE PARCEL = 56 TOWNHOUSES
SENIOR LIVING PARCEL = 200 UNITS (284 BEDS)
FUTURE DEVELOPMENT PARCEL = TO BE DETERMINED

BUILDING HEIGHT
PERMITTED: NO REQUIREMENT
PROVIDED: TOWNHOUSE PARCEL = 40' HIGH TO MID POINT OF ROOF
SENIOR LIVING PARCEL = 80' HIGH TO MID POINT OF ROOF
FUTURE PARCEL = TO BE DETERMINED

BUILDING COVERAGE
PERMITTED: 80% MAXIMUM
PROVIDED: TOWNHOUSE PARCEL = 25%
SENIOR LIVING PARCEL = 60%
FUTURE PARCEL = TO BE DETERMINED

SIDEWALK
REQUIRED: 5'
PROVIDED: 6' ALONG ORCHARD STREET & FARR AVENUE

OPEN SPACE
REQUIRED: 20% (PD-M)
PROVIDED: SEE SHEET 7 FOR CALCULATIONS

TREE CANOPY
REQUIRED: 10% (PD-M)
PROVIDED: SEE SHEET 8A FOR CALCULATIONS

OFF-STREET PARKING
REQUIRED: NONE
PROVIDED: SEE CHART BELOW

NOTE: 2 LOADING SPACES REQUIRED AND PROVIDED FOR THE SENIOR LIVING BUILDING.

FUTURE DEVELOPMENT PARCEL PERMITTED USES:
SUBJECT TO APPROVAL OF AN AMENDED MASTER DEVELOPMENT PLAN, USES PERMITTED ON THE FUTURE DEVELOPMENT PARCEL SHALL INCLUDE ALL USES PERMITTED IN THE PD-M (PLANNED DEVELOPMENT MIXED USE) DISTRICT, AS MORE SPECIFICALLY DEFINED IN SECTION 3.8.4 OF THE ZONING ORDINANCE OF THE CITY OF FAIRFAX, EXCEPT FOR THE FOLLOWING PERMITTED USES, WHICH ARE SPECIFICALLY EXCLUDED:
- CEMETERIES
- DETENTION FACILITIES OR JAILS
- ADULT USES
- BUILDING SUPPLIES AND LUMBER SALES
- FUEL STATIONS
- VEHICLE REPAIRS
- VEHICLE SALES AND LEASING
- VEHICLE SERVICE

ADDITIONALLY, PERMITTED USES ON THE FUTURE DEVELOPMENT PARCEL SHALL INCLUDE ANY PERMITTED TEMPORARY USES, INCLUDING TEMPORARY VEHICLE STORAGE.

ADJACENT PROJECT NARRATIVE:
AT THE TIME OF THIS REZONING APPLICATION THERE ARE TWO PROJECTS IN THE IMMEDIATE VICINITY THAT IMPACT THIS DEVELOPMENT AND REQUIRE COORDINATION. BROWNS MAZDA, LOCATED SOUTH OF THE SUBJECT SITE HAS SUBMITTED A SPECIAL USE PERMIT TO ALLOW FOR A NEW DEALERSHIP WITH AN ABOVE GROUND PARKING DECK. THE CITY IS IN THE PROCESS OF DESIGNING A NEW PUBLIC ROAD (FARR AVENUE) THAT WILL CONNECT FAIRFAX BOULEVARD TO ORCHARD STREET. IN ORDER FOR BOTH OF THE PROJECTS TO MOVE FORWARD TO CONSTRUCTION, THE SUBJECT SITE WILL NEED TO BE REZONED AND RE-DEVELOPED.

PROPOSED PARKING TABULATION

PROPOSED USE				REQUIRED PARKING SPACES		PARKING SPACES PROVIDED	
TOWNHOUSES		56	UNITS	2.0 SPACES PER UNIT -	112 SPACES	112	GARAGE SPACES
						20	SURFACE SPACES
SENIOR LIVING	INDEPENDENT LIVING	114	UNITS	1.5 SPACES PER UNIT -	171 SPACES	120	GARAGE SPACES
	ASSISTED LIVING / MEMORY CARE	96	BEDS	1 SPACE PER 4 BEDS -	24 SPACES		
TOTAL PARKING					283 SPACES	252	SPACES

NOTES
(1) PARKING REQUIRED AND PROVIDED FOR THE FUTURE DEVELOPMENT PARCEL TO BE DETERMINED.
(2) AN ADDITIONAL 40 STREET SPACES ARE PROVIDED IN THE PUBLIC ROW ALONG ORCHARD STREET AND FARR AVENUE.

STORMWATER MANAGEMENT & BEST MANAGEMENT PRACTICE (SWM/BMP) NARRATIVE

SWM
WATER QUANTITY FOR THIS PROJECT WILL BE PROVIDED IN ACCORDANCE WITH STATE CODE 9VAC25-870-66-WATER QUANTITY AND THE CITY OF FAIRFAX STORMWATER ORDINANCE.

THE WATER QUANTITY REQUIREMENTS WILL BE MET BY DISCHARGING STORMWATER LESS THAN 1% OF THE TOTAL DRAINAGE AREA TO A MANMADE SYSTEM. IF IT IS DETERMINED DURING THE FINAL SITE PLAN THAT DETENTION IS REQUIRED, THEN STORMWATER VAULTS OR ARCHED PIPES WILL BE USED TO MANAGE THE STORMWATER RUNOFF.

ADEQUATE OUTFALL
THE EXISTING SITE MAINLY DISCHARGES RUNOFF TO A STREAM THAT BISECTS THE PROPERTY.

THE MAJORITY OF THE SITE WILL DRAIN TO THE PROPOSED TWIN BOX CULVERT THAT IS BEING INSTALLED TO CONTAIN THE STREAM AND PASS IT THROUGH THE SITE TO THE EAST AT THE SITE'S MAJOR OUTFALL.

BMP
THIS PROJECT WILL USE THE VIRGINIA RUNOFF REDUCTION METHOD (VRRM) REDEVELOPMENT TO MEET THE STATE, PART IIB CRITERIA (9VAC25-870-65) AND CITY WATER QUALITY DESIGN CRITERIA. THE PROJECT SITE AREA FOR WATER QUALITY CALCULATIONS WILL INCLUDE ALL AREA WITHIN THE LIMITS OF CLEARING AND GRADING (EXCLUDING THE RIGHT-OF-WAY OF FARR AVENUE TO BE DEVELOPED BY OTHERS). TO MEET WATER QUALITY DESIGN CRITERIA AND PHOSPHORUS REMOVAL, A COMBINATION OF PROPRIETARY BMP FACILITIES WILL BE USED. THESE FACILITIES MAY INCLUDE; HYDRODYNAMIC SEPARATORS, FILTERRAS AND/OR STORMFILTERS. ADDITIONAL PROPRIETARY AND NON-PROPRIETARY BMP FACILITIES MAY BE USED AS THE DESIGN OF THE SITE DEVELOPS FURTHER. PRELIMINARY LOCATIONS ARE SHOWN ON THE DEVELOPMENT PLAN.

NOTE:
LOCATIONS AND SIZING OF SWM/BMP FACILITIES SHOWN ARE BASED ON A PRELIMINARY STUDY TO ENSURE COMPLIANCE WITH STATE AND CITY REQUIREMENTS; THE LOCATION AND TYPE OF FACILITY IS SUBJECT TO CHANGE WITH FINAL DESIGN.

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
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Lic. No.55868
01/03/2020
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NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

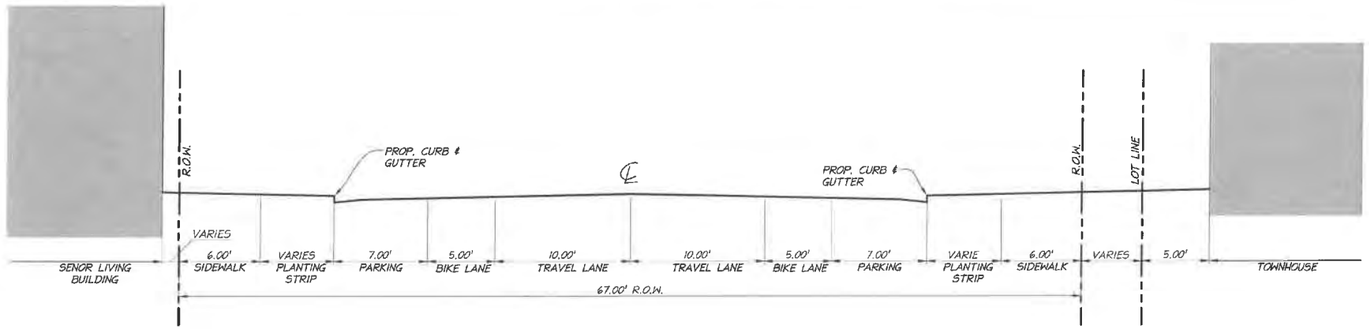
MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

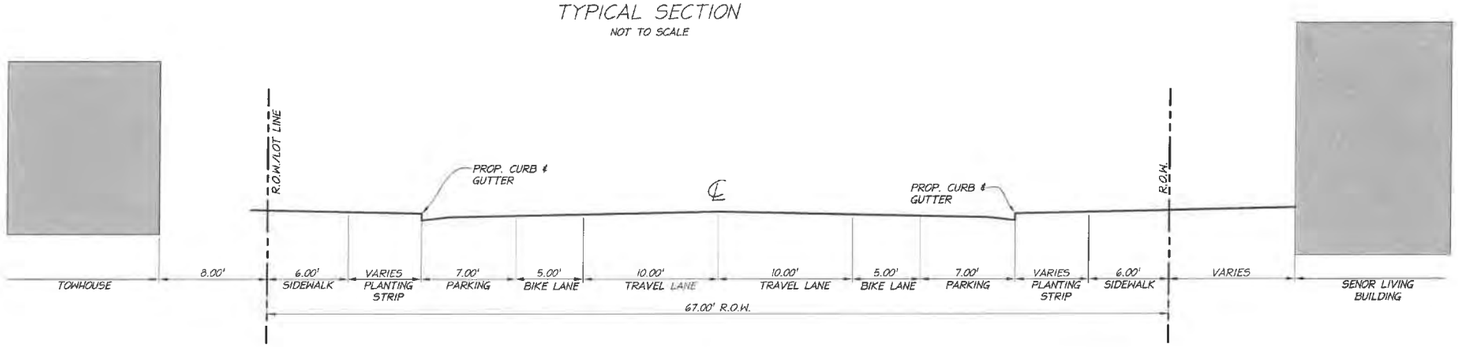
SHEET TITLE:
MASTER DEVELOPMENT PLAN

SHEET No.
4A

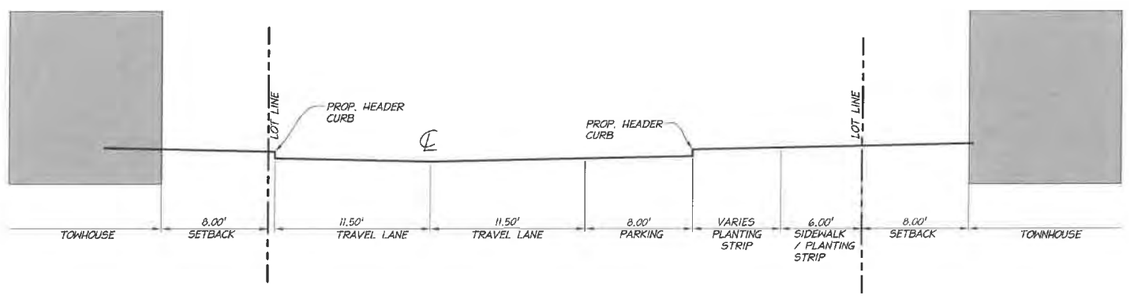
SCALE: 1"=30'



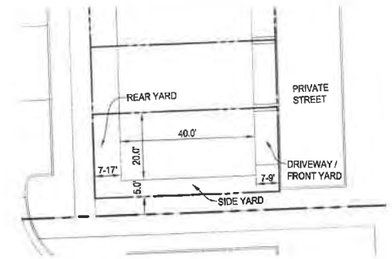
ORCHARD STREET
TYPICAL SECTION
NOT TO SCALE



FARR AVENUE
TYPICAL SECTION
NOT TO SCALE

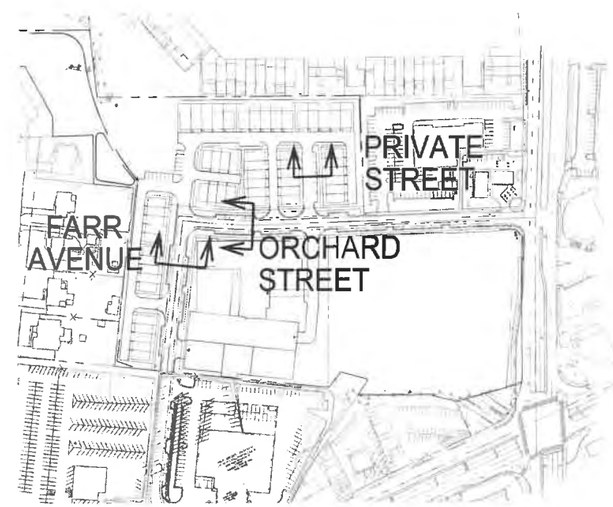


PRIVATE STREET
TYPICAL SECTION
NOT TO SCALE



TYPICAL TOWNHOUSE LOT DETAILS
SCALE: 1" =20'

20 10 0 20 40
HORIZONTAL GRAPHIC SCALE
1" = 20'



KEY MAP
NOT TO SCALE

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NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

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SHEET TITLE:
STREET SECTIONS AND TYPICAL TOWNHOUSE YARDS

SHEET No.
4B

SCALE: SEE DWGS.

MATCH LINE "A" - SEE SHEET 5A

MATCH LINE "B" - SEE SHEET 5A

VIRGINIA STATE GRID NORTH
NAD 83

TOWNHOUSE PARCEL
±1.7 ACRES

SENIOR LIVING PARCEL
±2.2 ACRES

ORCHARD STREET

FARR AVENUE

APPROXIMATE LOCATION OF AMENITY AREA

RPA (POST-DEVELOPED)

100 YR FLOODPLAIN

SWALE CENTERLINE

PROP. 30' STM. ESMT.

PROP. RETAINING WALL

HYDRODYNAMIC SEPARATOR

ISOLATOR ROW (BMP 5)

ISOLATOR ROW (BMP 6)

HYDRODYNAMIC SEPARATOR (BMP 7)

HYDRODYNAMIC SEPARATOR (BMP 1)

HYDRODYNAMIC SEPARATOR (BMP 3)

STORMFILTER (BMP 2)

STORMFILTER (BMP 4)

STORMFILTER (BMP 8)

GREENROOF

PROPOSED BUILDING
FF=359.00

PARKING GARAGE ENTRANCE

FARR AVENUE TO BE DESIGNED AND CONSTRUCTED BY OTHERS

BROWN'S FAIRFAX MAZDA PROPOSED DEVELOPMENT (SUP-SUB 01-20191105)

6' SIDEWALK

5' BIKE LANE

PROP. TOWNHOUSES

PROP. TO INHOUSE

LEGEND

- EX. SPOT SHOT
- EX. INDEX CONTOUR (5')
- EX. INT. CONTOUR (1')
- 150.0 PROP. SPOT SHOT
- PROP. INDEX CONTOUR (5')
- PROP. INT. CONTOUR (1')
- LOD — LIMITS OF DISTURBANCE

NOTE: THE GRADING FOR THE CONSTRUCTION OF THE TWIN BOX CULVERT EXTENDS INTO THE REDEFINED RPA AREA AND FOR THE CONSTRUCTION OF THE PEDESTRIAN TRAIL ARE EXEMPT PER SECTION 4.18.10 OF THE ZONING ORDINANCE.

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

PRELIMINARY GRADING PLAN

SHEET No.
5

SCALE: 1"=30'

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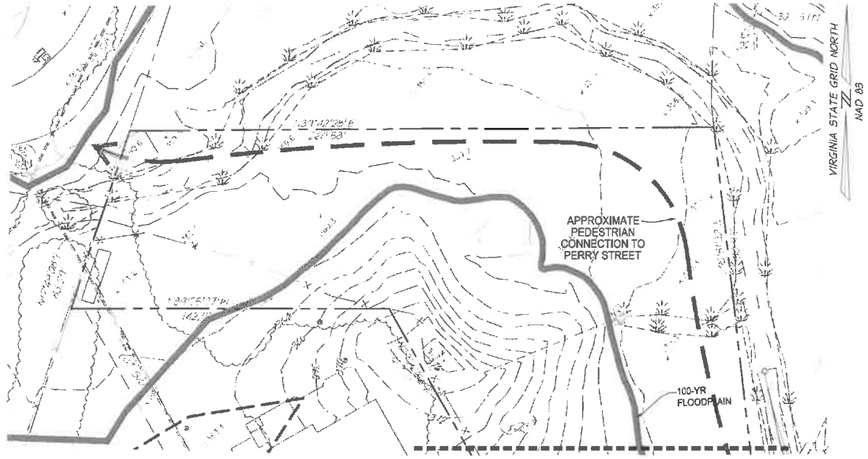
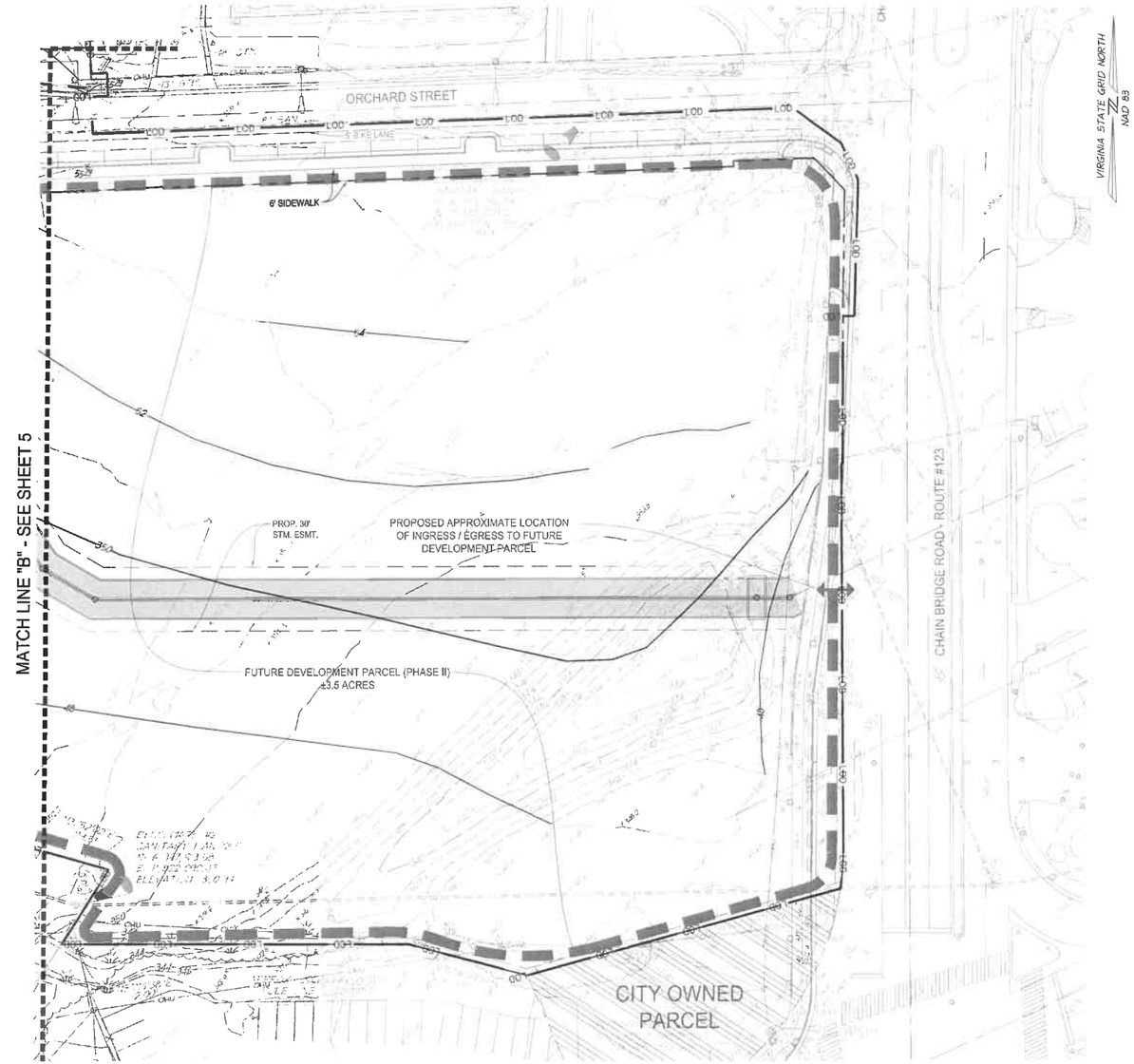


MATCH LINE "A" - SEE SHEET 5



MATCH LINE "B" - SEE SHEET 5

INTERIM GRADING NARRATIVE:
THE GRADING SHOWN ON THIS PLAN IS FINAL GRADING THAT WILL BE SET AT THE COMPLETION OF THE DEVELOPMENT , PENDING THE COMPLETION OF CONSTRUCTION OF BOTH THE BROWN'S MAZDA SITE LOCATED TO THE SOUTH AND THE CITY'S FARR AVENUE PROJECT. IF THE CONSTRUCTION OF EITHER OF THOSE PROJECTS ARE DELAYED, THE GRADING FOR THIS SITE WILL BE IMPACTED AND THUS REQUIRE INTERIM GRADING. AT THE TIME OF FINAL SITE PLAN FOR THE TOWNHOUSE PARCEL OR SENIOR LIVING PARCEL, OR FOR THE PUBLIC IMPROVEMENT PLAN (STORM CULVERT, UTILITIES AND ORCHARD STREET), THE GRADING MAY BE MODIFIED BASED ON FIELD CONDITIONS AND STILL MEET THE OVERALL INTENT OF THE GRADING THAT IS GENERALLY SHOWN ON THIS MDP.

NOTE: THE GRADING FOR THE CONSTRUCTION OF THE TWIN BOX CULVERT EXTENDS INTO THE REDEFINED RPA AREA AND FOR THE CONSTRUCTION OF THE PEDESTRIAN TRAIL ARE EXEMPT PER SECTION 4.18.10 OF THE ZONING ORDINANCE.

LEGEND

	EX. SPOT SHOT
	EX. INDEX CONTOUR (5')
	EX. INT. CONTOUR (1')
+150.0	PROP. SPOT SHOT
	PROP. INDEX CONTOUR (5')
	PROP. INT. CONTOUR (1')
LOD	LIMITS OF DISTURBANCE

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

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DESIGN: EG
DRAWN: JS
CHECKED: KMW

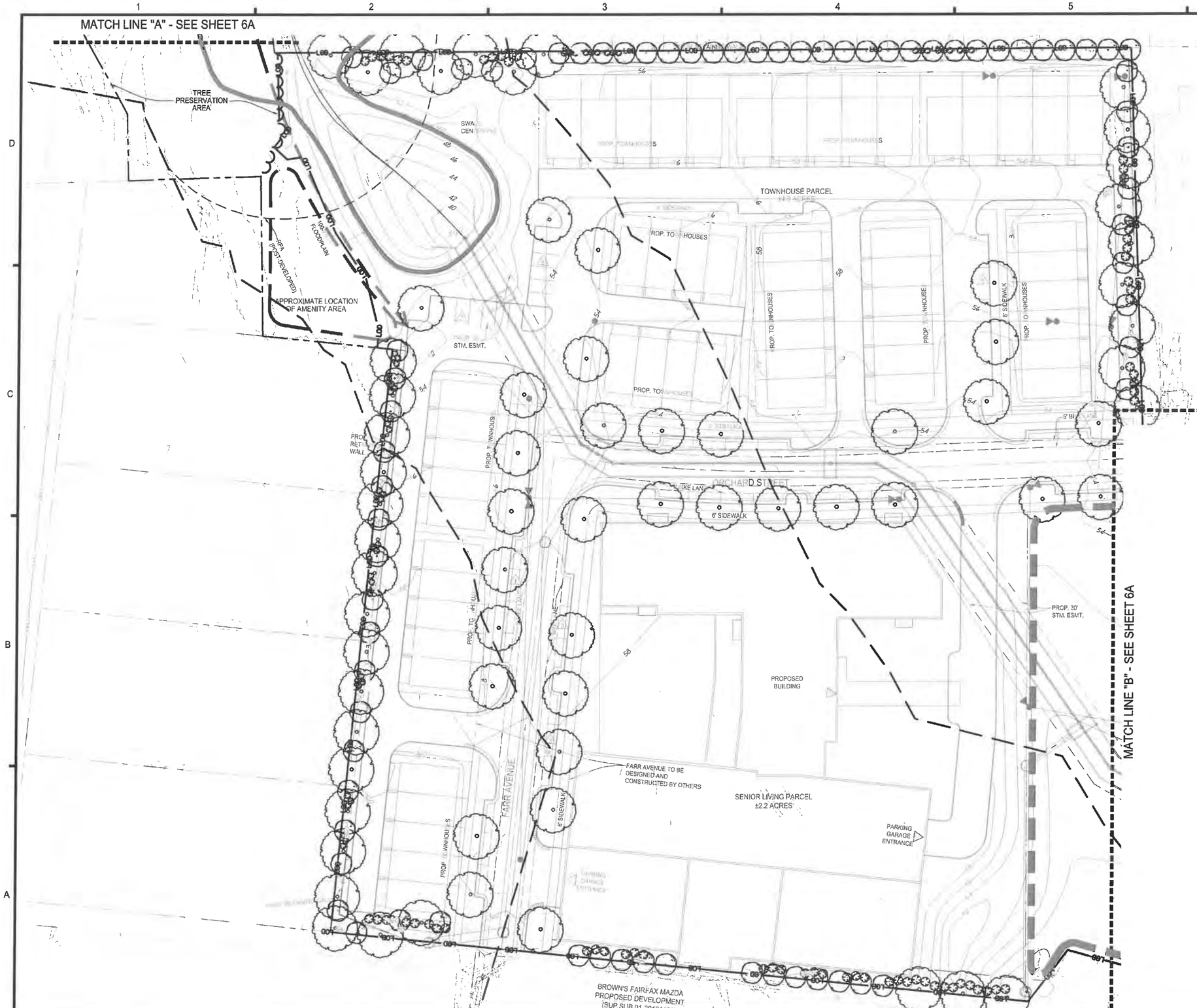
SHEET TITLE:

PRELIMINARY GRADING PLAN

SHEET No.
5A

SCALE: 1"=30'

F:\PDX\Projects\13139\05500\109532 Northfax MDP\SA PRELIMINARY GRADING PLAN.dwg, 1/3/2020 3:31:57 PM, DWG To PDF.Merge.pc3



NOTES
1. PROPOSED VEGETATION TO BE A MIXTURE OF DECIDUOUS AND EVERGREEN.

LEGEND

LOD — LIMITS OF DISTURBANCE
PROPOSED VEGETATION LINE
CANOPY TREE
UNDERSTORY TREE
SHRUB

VIRGINIA STATE GRID NORTH NAD 83

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE 1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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COMMONWEALTH OF VIRGINIA
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LANDSCAPE ARCHITECT

NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
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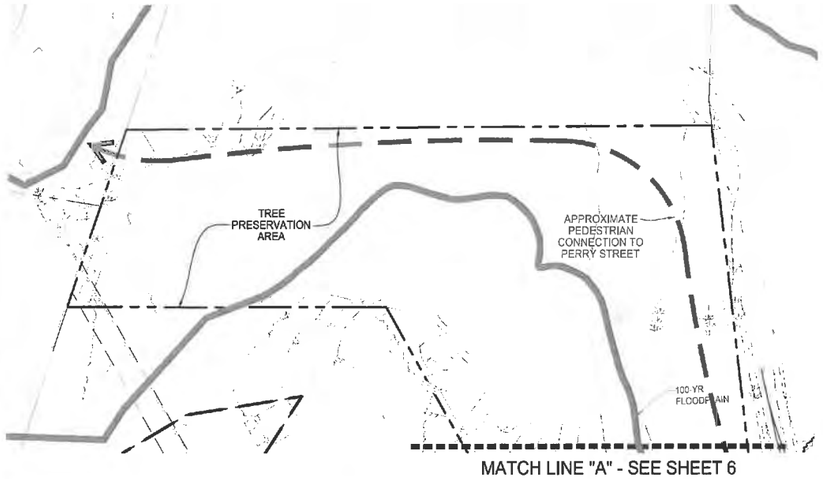
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:

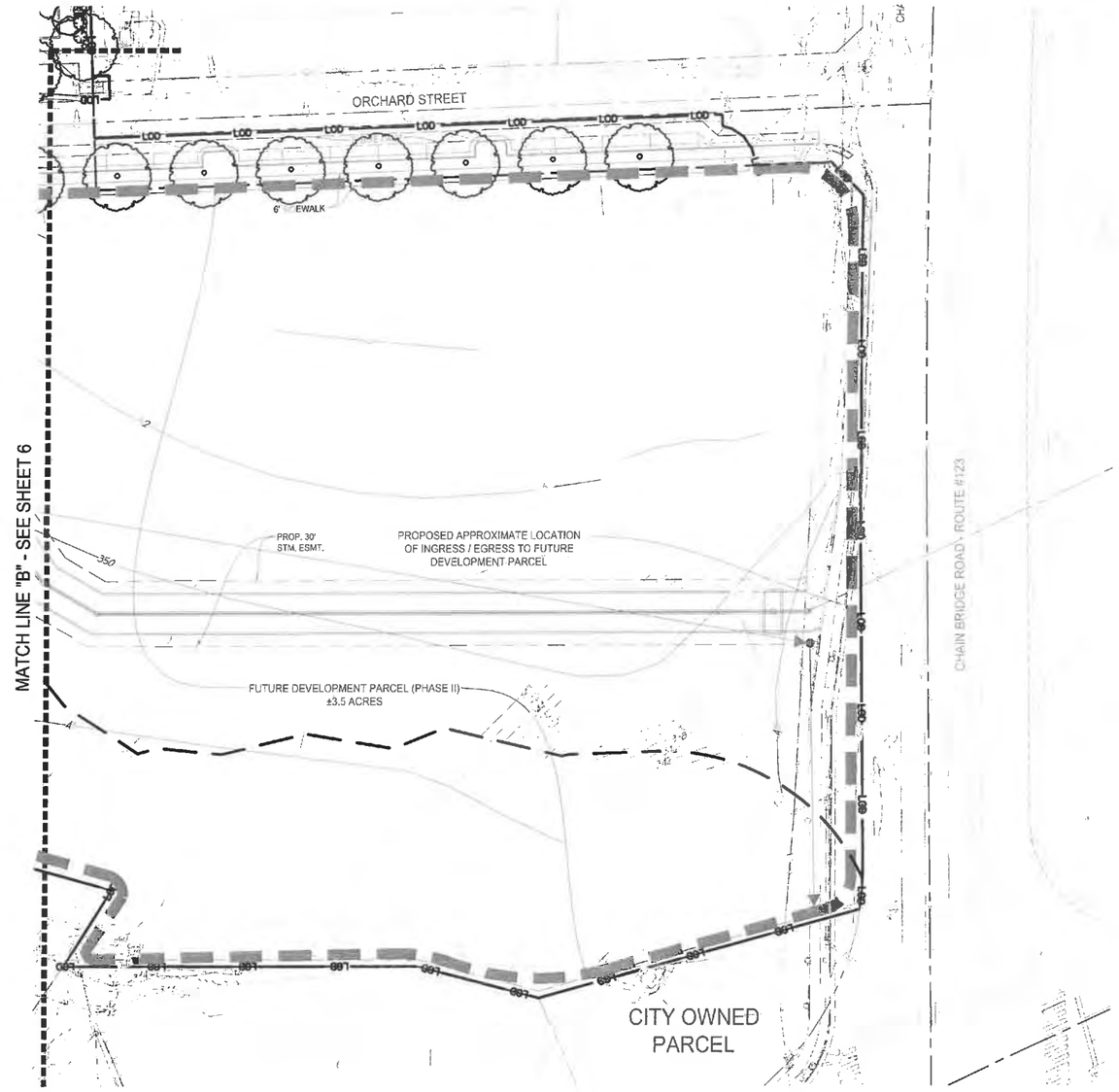
CONCEPTUAL LANDSCAPE PLAN

SHEET No.
6

SCALE: 1"=30'



MATCH LINE "A" - SEE SHEET 6



MATCH LINE "B" - SEE SHEET 6

TRANSITIONAL YARDS

TRANSITIONAL YARD 3 - NORTH

LINEAR FEET		585'	
REQUIRED			PROVIDED
WIDTH OF LANDSCAPE STRIP		15'	15'
FENCE OR WALL HEIGHT		6'	6' FENCE 1.5 - 7.9' WALL
CANOPY TREE	(4 per 100 feet)	23	7
UNDERSTORY TREE	(4 per 100 feet)	23	33
SHRUB	(4 per 100 feet)	23	29
SEE SHEET 1 FOR MODIFICATION REQUEST			

TRANSITIONAL YARD 3 - NORTHEAST

LINEAR FEET		232'	
REQUIRED			PROVIDED
WIDTH OF LANDSCAPE STRIP		15'	15'
FENCE OR WALL HEIGHT		6'	6' FENCE 1.5 - 7.9' WALL
CANOPY TREE	(4 per 100 feet)	9	9
UNDERSTORY TREE	(4 per 100 feet)	9	9
SHRUB	(4 per 100 feet)	9	16
NO MODIFICATION REQUESTED			

TRANSITIONAL YARD 3 - SOUTHEAST

LINEAR FEET		327'	
REQUIRED			PROVIDED
WIDTH OF LANDSCAPE STRIP		15'	0 - 15'
FENCE OR WALL HEIGHT		6'	NONE FENCE WALL
CANOPY TREE	(4 per 100 feet)	13	3
UNDERSTORY TREE	(4 per 100 feet)	13	12
SHRUB	(4 per 100 feet)	13	29
SEE SHEET 1 FOR MODIFICATION REQUEST			

TRANSITIONAL YARD 3 - SOUTHWEST

LINEAR FEET		75'	
REQUIRED			PROVIDED
WIDTH OF LANDSCAPE STRIP		15'	15'
FENCE OR WALL HEIGHT		6'	6' FENCE 1.5 - 7.9' WALL
CANOPY TREE	(4 per 100 feet)	3	2
UNDERSTORY TREE	(4 per 100 feet)	3	3
SHRUB	(4 per 100 feet)	3	8
SEE SHEET 1 FOR MODIFICATION REQUEST			

TRANSITIONAL YARD 3 - WEST

LINEAR FEET		400'	
REQUIRED			PROVIDED
WIDTH OF LANDSCAPE STRIP		15'	8.5'
FENCE OR WALL HEIGHT		6'	6' FENCE 1.5 - 7.9' WALL
CANOPY TREE	(4 per 100 feet)	16	16
UNDERSTORY TREE	(4 per 100 feet)	16	16
SHRUB	(4 per 100 feet)	16	28
SEE SHEET 1 FOR MODIFICATION REQUEST			

NOTES:
1. EASTERN AND NORTHWESTERN TRANSITIONAL YARD PROVIDED BY EXISTING VEGETATION AND/OR FUTURE DEVELOPMENT PARCEL.
2. WHERE WALLS ARE LOCATED INSIDE THE TRANSITIONAL YARD A FENCE WILL BE ADDED IN ORDER TO MEET THE 6' HEIGHT REQUIREMENT.

10-YEAR TREE CANOPY CALCULATIONS

TREE CANOPY REQUIRED	
SITE AREA (DOES NOT INCLUDE ROW)	464,090 SF
TREE CANOPY COVERAGE REQUIRED PER ZO 4.5.6.A.	**10 %**
TOTAL CANOPY AREA REQUIRED	46,409 SF

TREE CANOPY PROVIDED

PLANT TYPE	STOCK SIZE	QUANTITY	CANOPY PER TREE	CANOPY PER TYPE
CANOPY TREE	2" CALIPER	44	200 SF	8,800 SF
UNDERSTORY TREE	2" CALIPER	74	100 SF	7,400 SF
SUBTOTAL CANOPY AREA PROVIDED THROUGH TREE PLANTING				16,200 SF
SUBTOTAL CANOPY AREA PROVIDED THROUGH TREE PRESERVATION				40,000 SF
TOTAL CANOPY AREA PROVIDED				56,200 SF
TOTAL CANOPY COVERAGE PROVIDED				**12.1 %**

NOTE: THE FOLLOWING TREES ARE PROPOSED WITHIN THE ROW AND THEREFORE NOT INCLUDED IN THE ABOVE TREE CANOPY CALCULATIONS

CANOPY TREE	2" CALIPER	34	--	--

STREET TREES REQUIRED:
MINIMUM 10' WIDE LANDSCAPE STRIP ALONG ALL STREETS
1 CANOPY TREE PER 40 LINEAR FEET ALONG ALL STREETS

STREET TREES PROVIDED:
5 -13' WIDE LANDSCAPE STRIP ALONG ALL PUBLIC AND PRIVATE STREETS
1 CANOPY TREE PER 40 LINEAR FEET ALONG ALL PUBLIC AND PRIVATE STREETS, IF NO CONFLICTS WITH UTILITIES.
SEE SHEET 1 FOR MODIFICATION REQUEST.

INTERIOR PARKING LOT LANDSCAPING REQUIRED:
1 CANOPY TREE FOR EVERY 10 SPACES

INTERIOR PARKING LOT LANDSCAPING PROVIDED:
2 CANOPY TREES FOR 13 SPACES
SEE SHEET 1 FOR MODIFICATION REQUEST.

NOTES
1. PROPOSED VEGETATION TO BE A MIXTURE OF DECIDUOUS AND EVERGREEN.

LEGEND
LOD — LIMITS OF DISTURBANCE
PROPOSED VEGETATION LINE
CANOPY TREE
UNDERSTORY TREE
SHRUB

VIRGINIA STATE GRID NORTH
NAD 83

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

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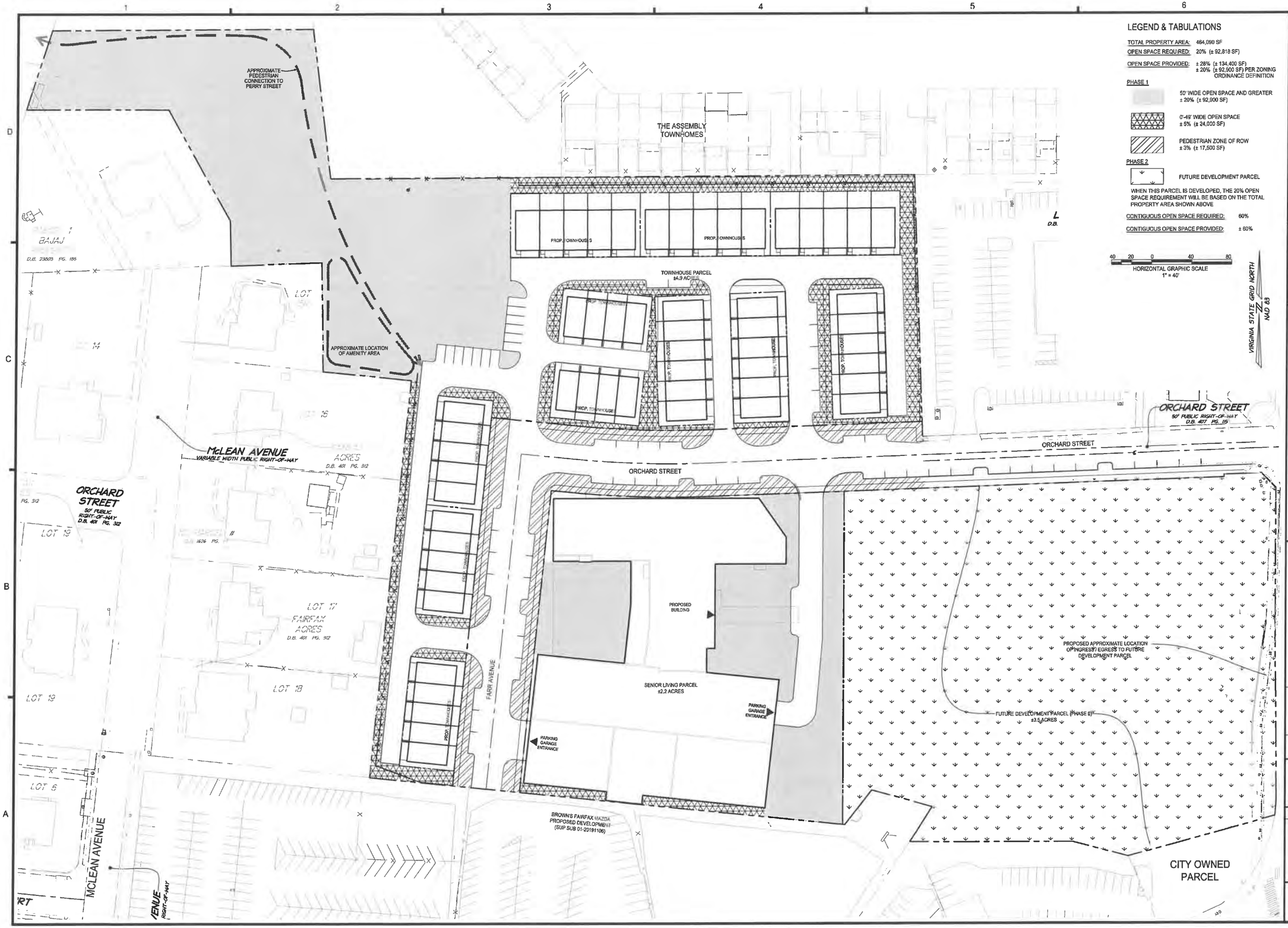
DRAWN: LBD
CHECKED: LBD

SHEET TITLE:
CONCEPTUAL LANDSCAPE PLAN

SHEET No.
6A

SCALE: 1"=30'



LEGEND & TABULATIONS

TOTAL PROPERTY AREA: 464,090 SF

OPEN SPACE REQUIRED: 20% (± 92,818 SF)

OPEN SPACE PROVIDED: ± 28% (± 134,400 SF)
± 20% (± 92,900 SF) PER ZONING ORDINANCE DEFINITION

PHASE 1

50' WIDE OPEN SPACE AND GREATER ± 20% (± 92,900 SF)

0'-49' WIDE OPEN SPACE ± 5% (± 24,000 SF)

PEDESTRIAN ZONE OF ROW ± 3% (± 17,500 SF)

PHASE 2

FUTURE DEVELOPMENT PARCEL

WHEN THIS PARCEL IS DEVELOPED, THE 20% OPEN SPACE REQUIREMENT WILL BE BASED ON THE TOTAL PROPERTY AREA SHOWN ABOVE

CONTIGUOUS OPEN SPACE REQUIRED: 60%

CONTIGUOUS OPEN SPACE PROVIDED: ± 60%

40 20 0 40 80
HORIZONTAL GRAPHIC SCALE
1" = 40'

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DRAWN: AK
CHECKED: LBD

SHEET TITLE:

OPEN SPACE PLAN

SHEET No.
7

SCALE: 1"=40'

OFFSITE SANITARY FLOW ESTIMATES:

AREA #1
EXISTING DEVELOPMENT ESTIMATES:
RESIDENTIAL= 162 DWELLING UNITS

FLOW ESTIMATES:
162 UNITS x 350 GPD/UNIT = 56,700 GPD

TOTAL FLOW = 56,700 GPD

TOTAL PEAK FLOW = 226,800 GPD = 0.23 MGD

AREA #2
EXISTING DEVELOPMENT ESTIMATES:
HOTEL= 152 ROOMS

FLOW ESTIMATES:
152 UNITS x 130 GPD/UNIT = 19,760 GPD

TOTAL FLOW = 19,760 GPD

TOTAL PEAK FLOW = 79,040 GPD = 0.08 MGD

AREA #3
EXISTING DEVELOPMENT ESTIMATES:
RESIDENTIAL= 53 DWELLING UNITS

FLOW ESTIMATES:
53 UNITS x 350 GPD/UNIT = 18,550 GPD

TOTAL FLOW = 18,550 GPD

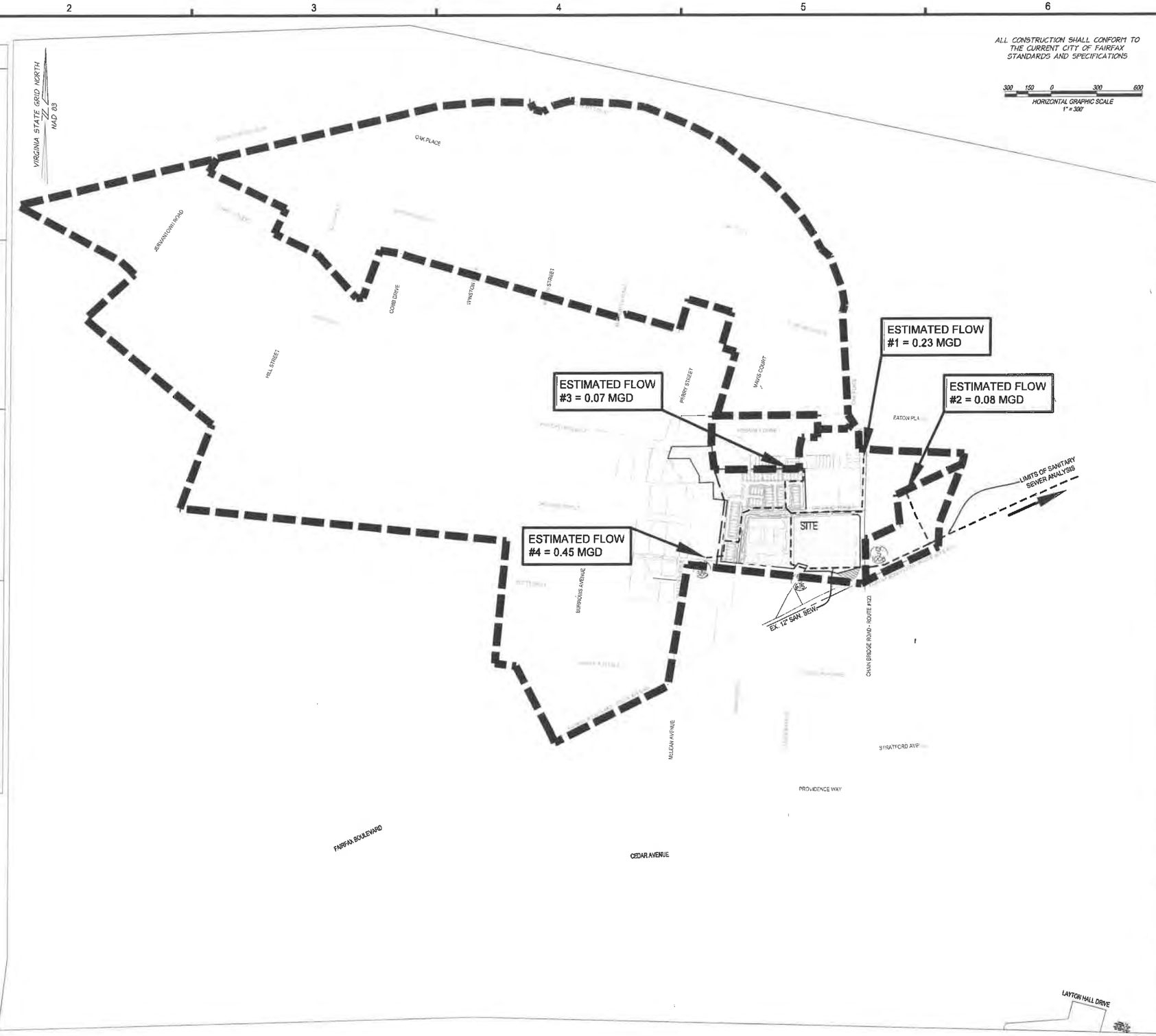
TOTAL PEAK FLOW = 74,200 GPD = 0.07 MGD

AREA #4
EXISTING DEVELOPMENT ESTIMATES:
RESIDENTIAL= 256 DWELLING UNITS
OFFICE/RETAIL = 113,830 SF

FLOW ESTIMATES:
256 UNITS x 350 GPD/UNIT = 89,600 GPD
113,830 SF OFFICE/RETAIL x 200 GPD/1000 SF = 22,766 GPD

TOTAL FLOW = 112,366 GPD

TOTAL PEAK FLOW = 449,464 GPD = 0.45 MGD



NOTES:
1. SEE SHEET 9 FOR SANITARY SEWER ANALYSIS.
2. SEE THE NARRATIVE TITLED "ANALYSIS OF EXISTING 12" SEWER" NARRATIVE ON SHEET 9 FOR FLOW ASSUMPTIONS.
3. A PEAK FACTOR OF 4.0 WAS USED FOR ALL OFFSITE SANITARY FLOWS.

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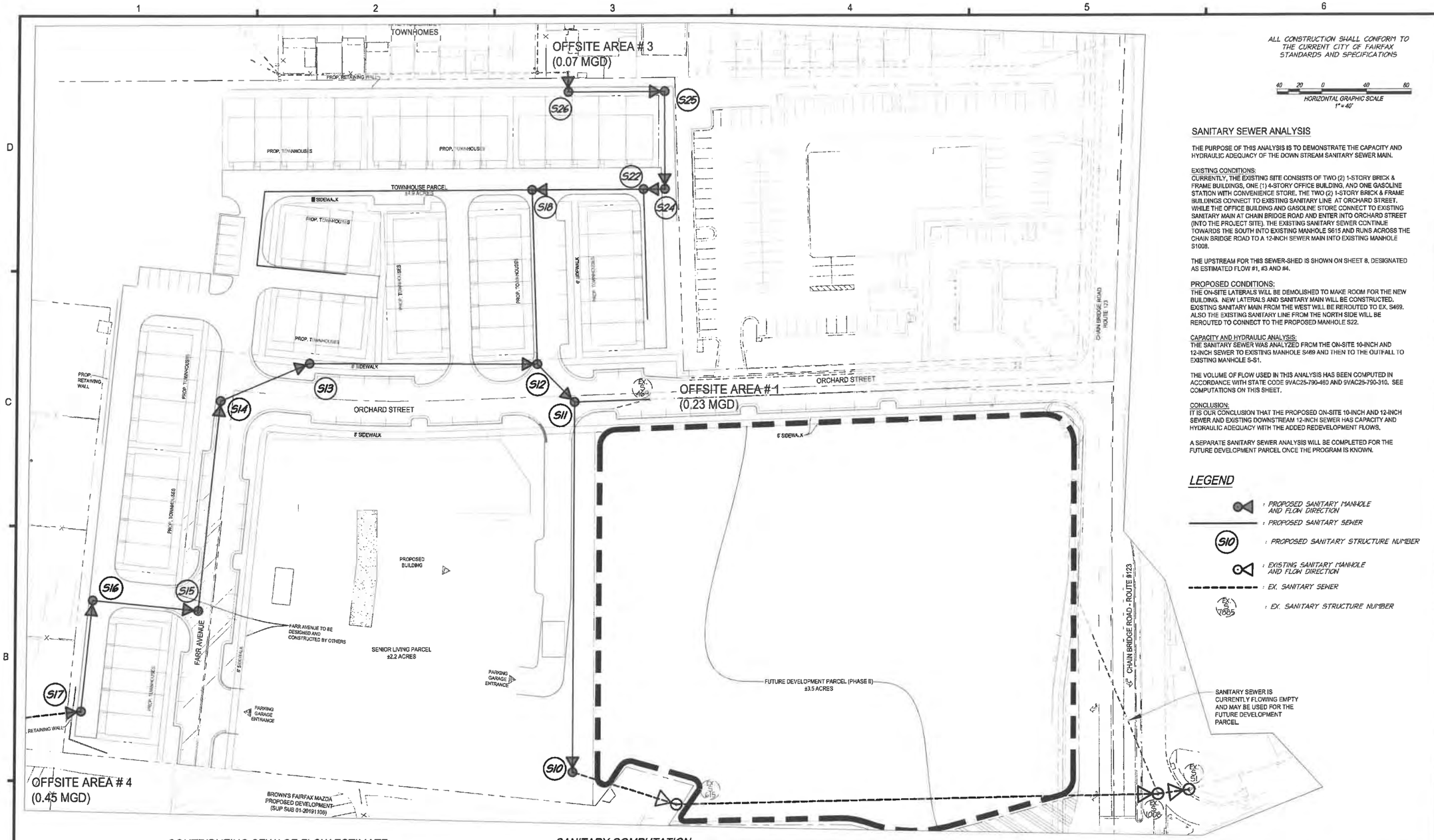
CHECKED: KMW

SHEET TITLE:

SANITARY SEWER OFF-SITE MAP

SHEET No.
8

SCALE: 1"=300'



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40 20 0 40 80
HORIZONTAL GRAPHIC SCALE
1" = 40'

SANITARY SEWER ANALYSIS

THE PURPOSE OF THIS ANALYSIS IS TO DEMONSTRATE THE CAPACITY AND HYDRAULIC ADEQUACY OF THE DOWN STREAM SANITARY SEWER MAIN.

EXISTING CONDITIONS:
CURRENTLY, THE EXISTING SITE CONSISTS OF TWO (2) 1-STORY BRICK & FRAME BUILDINGS, ONE (1) 4-STORY OFFICE BUILDING, AND ONE GASOLINE STATION WITH CONVENIENCE STORE. THE TWO (2) 1-STORY BRICK & FRAME BUILDINGS CONNECT TO EXISTING SANITARY LINE AT ORCHARD STREET. WHILE THE OFFICE BUILDING AND GASOLINE STORE CONNECT TO EXISTING SANITARY MAIN AT CHAIN BRIDGE ROAD AND ENTER INTO ORCHARD STREET (INTO THE PROJECT SITE). THE EXISTING SANITARY SEWER CONTINUE TOWARDS THE SOUTH INTO EXISTING MANHOLE S615 AND RUNS ACROSS THE CHAIN BRIDGE ROAD TO A 12-INCH SEWER MAIN INTO EXISTING MANHOLE S1008.

THE UPSTREAM FOR THIS SEWER-SHED IS SHOWN ON SHEET 8, DESIGNATED AS ESTIMATED FLOW #1, #3 AND #4.

PROPOSED CONDITIONS:
THE ON-SITE LATERALS WILL BE DEMOLISHED TO MAKE ROOM FOR THE NEW BUILDING. NEW LATERALS AND SANITARY MAIN WILL BE CONSTRUCTED. EXISTING SANITARY MAIN FROM THE WEST WILL BE REROUTED TO EX. S469. ALSO THE EXISTING SANITARY LINE FROM THE NORTH SIDE WILL BE REROUTED TO CONNECT TO THE PROPOSED MANHOLE S22.

CAPACITY AND HYDRAULIC ANALYSIS:
THE SANITARY SEWER WAS ANALYZED FROM THE ON-SITE 10-INCH AND 12-INCH SEWER TO EXISTING MANHOLE S469 AND THEN TO THE OUTFALL TO EXISTING MANHOLE S-S1.

THE VOLUME OF FLOW USED IN THIS ANALYSIS HAS BEEN COMPUTED IN ACCORDANCE WITH STATE CODE 9VAC25-790-460 AND 9VAC25-790-310. SEE COMPUTATIONS ON THIS SHEET.

CONCLUSION:
IT IS OUR CONCLUSION THAT THE PROPOSED ON-SITE 10-INCH AND 12-INCH SEWER AND EXISTING DOWNSTREAM 12-INCH SEWER HAS CAPACITY AND HYDRAULIC ADEQUACY WITH THE ADDED REDEVELOPMENT FLOWS.

A SEPARATE SANITARY SEWER ANALYSIS WILL BE COMPLETED FOR THE FUTURE DEVELOPMENT PARCEL ONCE THE PROGRAM IS KNOWN.

LEGEND

- : PROPOSED SANITARY MANHOLE AND FLOW DIRECTION
- : PROPOSED SANITARY SEWER
- S10 : PROPOSED SANITARY STRUCTURE NUMBER
- : EXISTING SANITARY MANHOLE AND FLOW DIRECTION
- : EX. SANITARY SEWER
- EX. S385 : EX. SANITARY STRUCTURE NUMBER

CONTRIBUTING SEWAGE FLOW ESTIMATE:

Contributing Sewage Flow Estimate

Discharge Facility	No. of Units	No. of People	No. of Dwellings	Average Flow for Dwellings (100 gpd/person)	No. of Beds	Average Flow per Bed (200 gpd/Bed)	Ultimate Floor Space	Average Flow per 1000 sf (250 gpd/1,000sf)	Total Incremental Flow (gpd)	Total Cummulative Flow (gpd	Sanitary From	Sanitary To
Townhouses	5	5	25	2500					2,500	2,500	S17	S16
Townhouses	8	5	40	4000					4,000	6,500	S15	S14
Townhouses	3	5	15	1500					1,500	8,000	S14	S13
Townhouses	3	5	15	1500					1,500	1,500	S13	S12
Townhouses	37	5	185	18500					18,500	18,500	S12	S11
Senior Living					200	40,000			40,200	40,200	S11	S10
Future Development							114,000	28500	114,000	114,000	EX.S615	EX.S1008

SANITARY COMPUTATION:

	FROM	TO	UPPER INV	LOWER INV	L (FT)	SLOPE (%)	DIA (IN)	MATERIAL	N	CAPACITY (cfs)	CAPACITY (MGD)	DESIGN FLOW (cfs)	DESIGN FLOW (MGD)	V (ft/s)	Assumptions	Inc (MGD)	Peak Flow Factor	Design Inc (MGD)
	EX. S385	S17	351.91	350.95	110.02	0.87	10	PVC	0.011	2.39	1.54	0.70	0.450	3.4	PEAK FLOW FROM OFFSITE AREA #4 = 0.45 MGD			0.450
	S17	S16	350.85	349.95	99.85	0.90	10	PVC	0.011	2.43	1.57	0.71	0.458	3.4		0.002	4.0	0.008
	S16	S15	349.85	349.05	94.00	0.85	10	PVC	0.011	2.39	1.54	0.71	0.458	4.3				0.000
	S15	S14	348.95	347.21	188.74	0.92	10	PVC	0.011	2.46	1.59	0.73	0.470	5.7		0.003	4.0	0.012
	S14	S13	347.11	346.51	86.68	0.69	12	PVC	0.011	3.50	2.26	0.73	0.474	6.7		0.001	4.0	0.005
	S13	S12	346.41	343.75	203.14	1.31	12	PVC	0.011	4.82	3.12	0.74	0.479	6.7		0.001	4.0	0.005
	S12	S11	343.65	342.85	47.82	1.67	12	PVC	0.011	5.44	3.52	0.93	0.604	5.7	PEAK FLOW FROM OFFSITE AREA #3 = 0.07 MGD	0.014	4.0	0.126
	S11	S10	342.75	340.29	331.34	0.74	12	PVC	0.011	3.62	2.34	1.48	0.955	3.8	PEAK FLOW FROM OFFSITE AREA #1 = 0.23 MGD	0.030	4.0	0.351
	S10	EX. S615	339.22	337.15	97.14	2.13	12	RCP	0.015	6.14	3.97	1.48	0.955	4.0				0.000
	EX. S615	EX. S1008	336.89	332.59	430.00	1.00	12	RCP	0.015	3.30	2.13	2.01	1.297	4.3		0.086	4.0	0.342

Notes:
1. See contributing sewage flow estimates on sheet 8.
2. All velocities shown are calculated per a partial flow analysis.
3. A peak factor fo 4.0 was used on all flows.
4. The lower invert of EX. S1008 is an assumed elevation and will need to be surveyed.

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NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

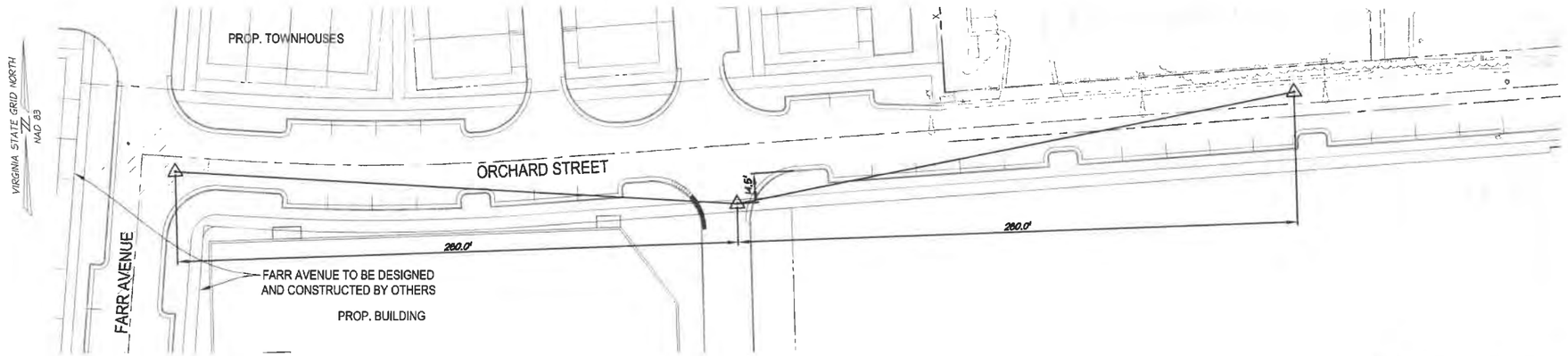
PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:
SANITARY SEWER ANALYSIS

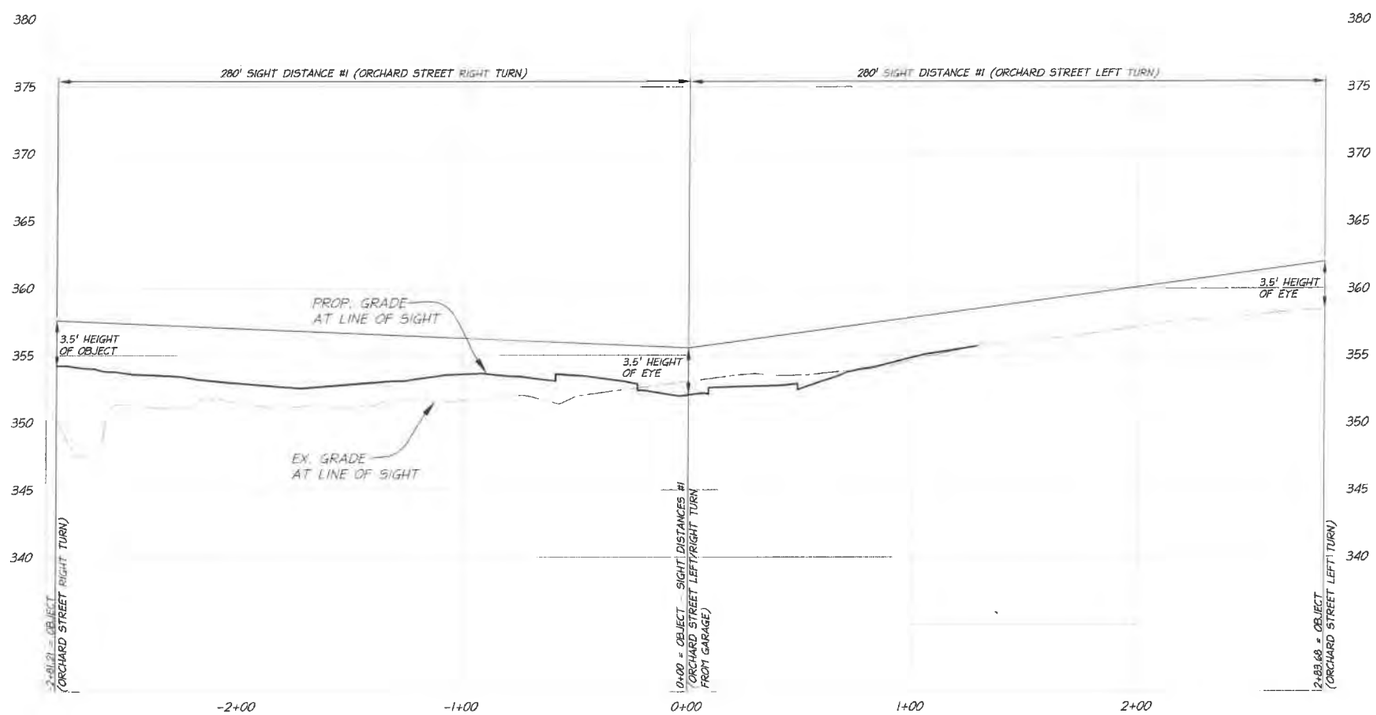
SHEET No.
9

SCALE: 1"=30'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS



30 15 0 30 60
GRAPHIC SCALE
1" = 30'



ORCHARD STREET SIGHT DISTANCE #1 (FROM PRIVATE STREET)
POSTED SPEED: 25 MPH

5 2.5 0 5 10
VERTICAL GRAPHIC SCALE
1" = 5'

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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NORTHFAX WEST
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FAIRFAX CITY, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 105632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

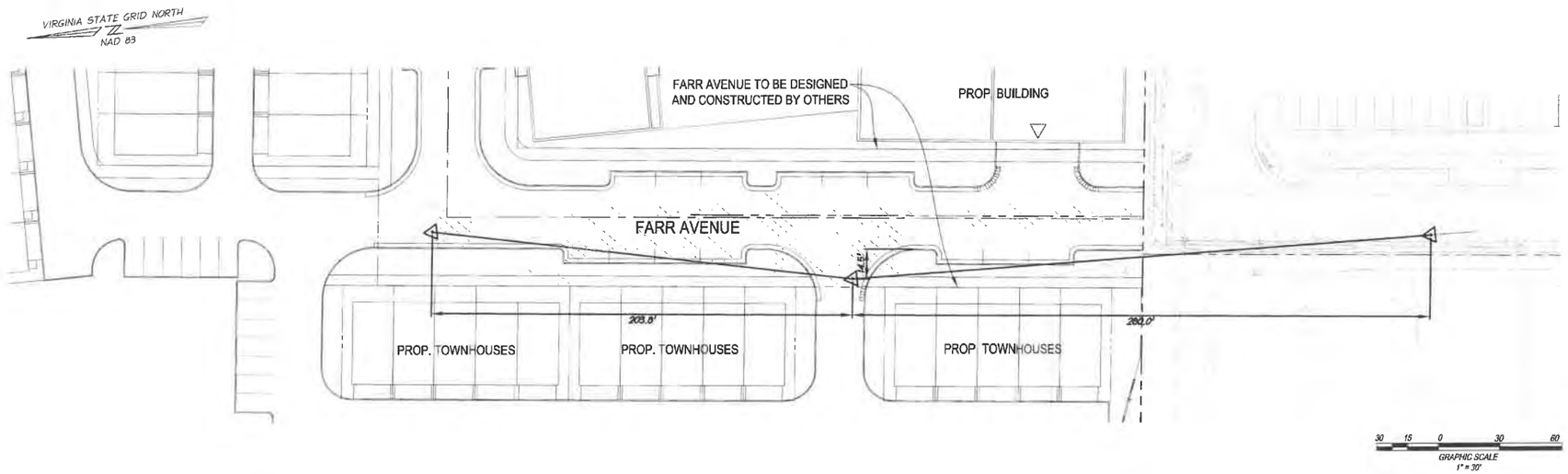
SHEET TITLE:

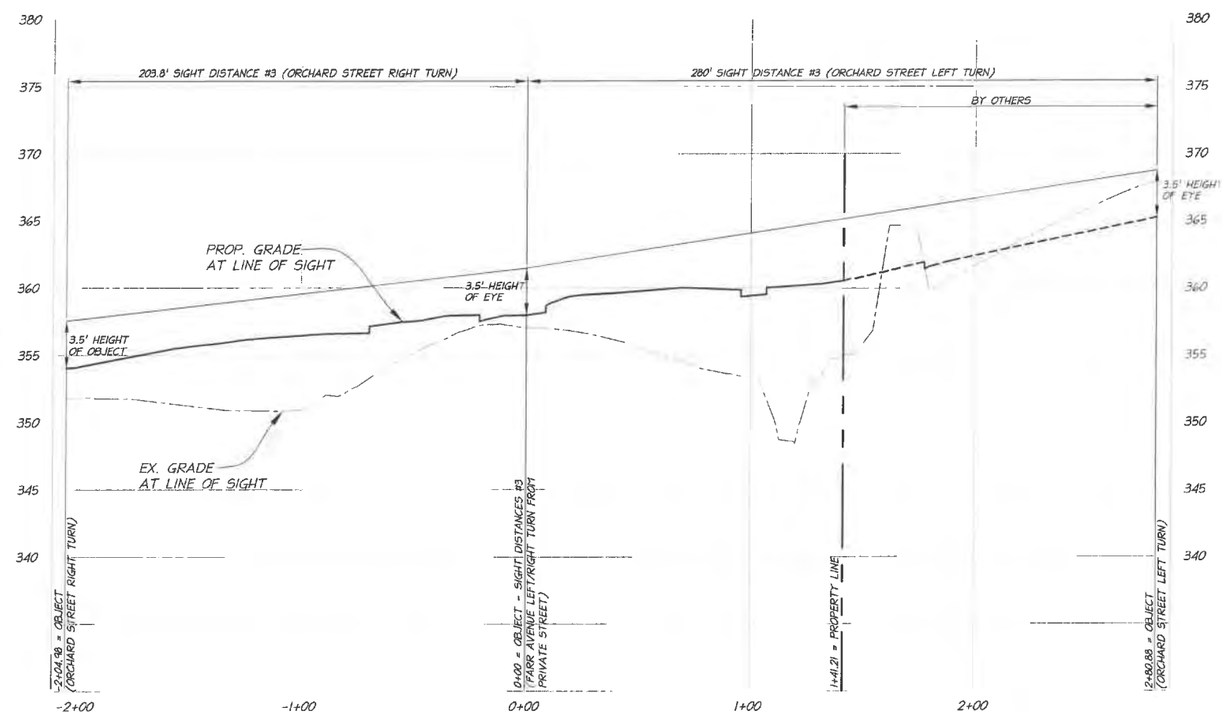
SIGHT DISTANCE

SHEET No.
10

SCALE: SEE DWGS.

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS





FARR AVENUE SIGHT DISTANCE #3 (FROM PRIVATE STREET)

POSTED SPEED: 25 MPH

5 2.5 0 5 10
VERTICAL GRAPHIC SCALE
1" = 5'

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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NORTHFAX WEST
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CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

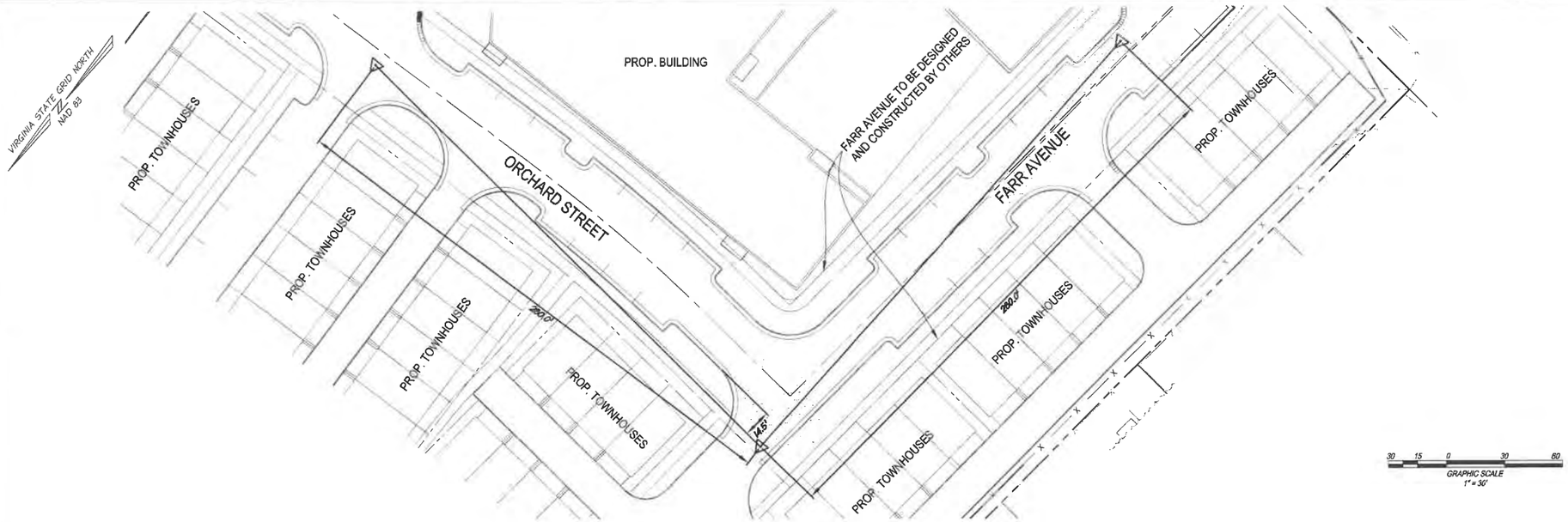
SHEET TITLE:

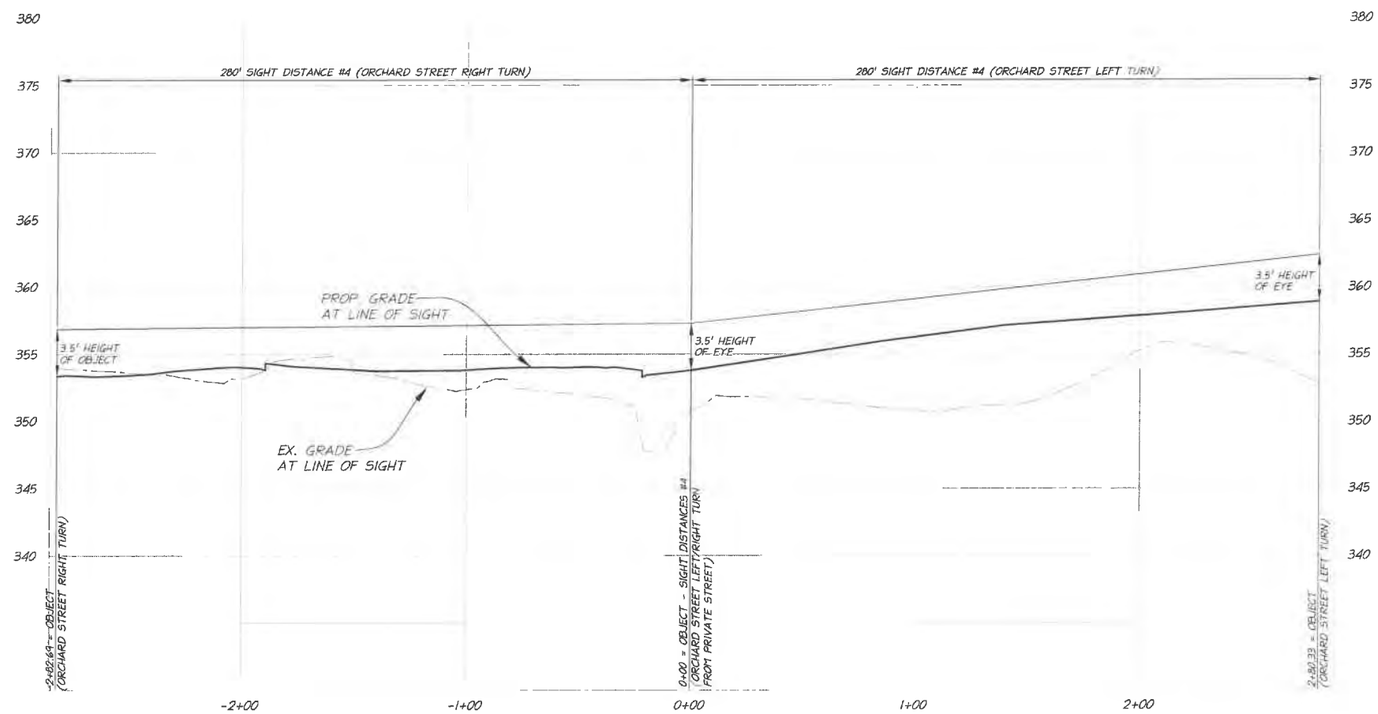
SIGHT DISTANCE

SHEET No.
11

SCALE: SEE DWGS.

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS





ORCHARD STREET SIGHT DISTANCE #4 (FROM PRIVATE STREET)
POSTED SPEED: 25 MPH

VERTICAL GRAPHIC SCALE
1" = 5'

HORIZONTAL GRAPHIC SCALE
1" = 30'

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CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 105532
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

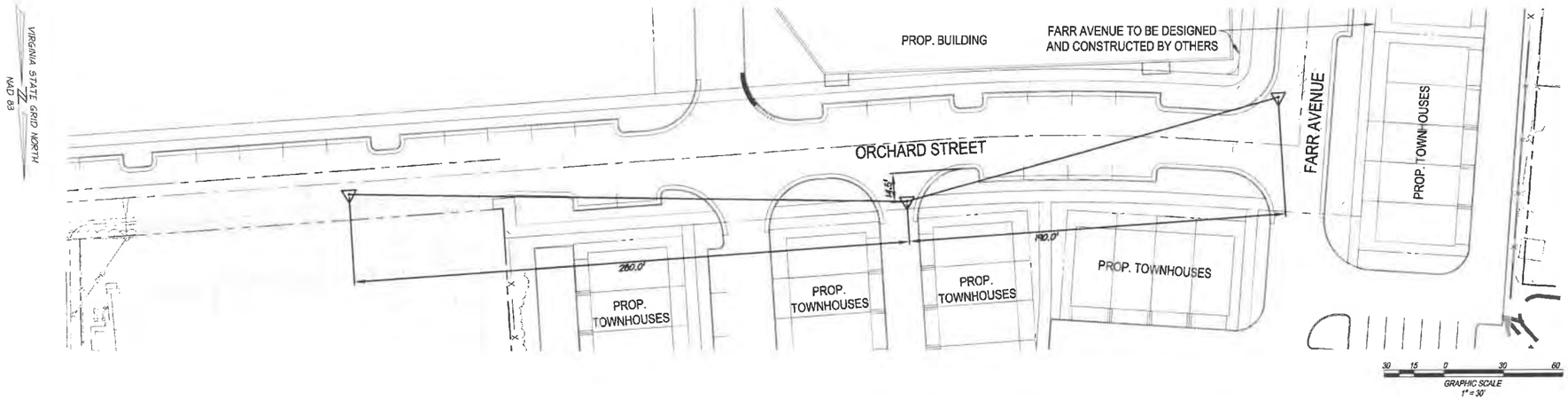
SHEET TITLE:

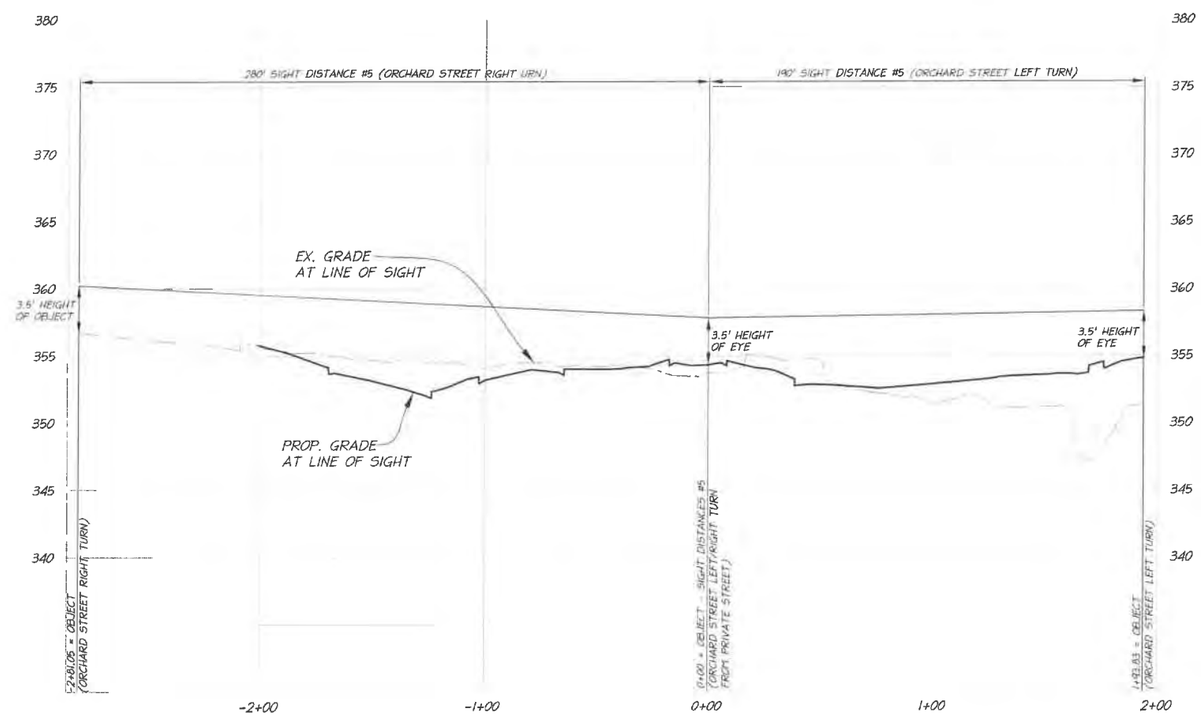
SIGHT DISTANCE

SHEET No.
12

SCALE: SEE DWGS.

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS





ORCHARD STREET SIGHT DISTANCE #5 (FROM PRIVATE STREET)

POSTED SPEED: 25 MPH

5 2.5 0 5 10
VERTICAL GRAPHIC SCALE
1" = 5'

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109632
DATE: 11-21-2019
DESIGN: ES
DRAWN: JS
CHECKED: KMW

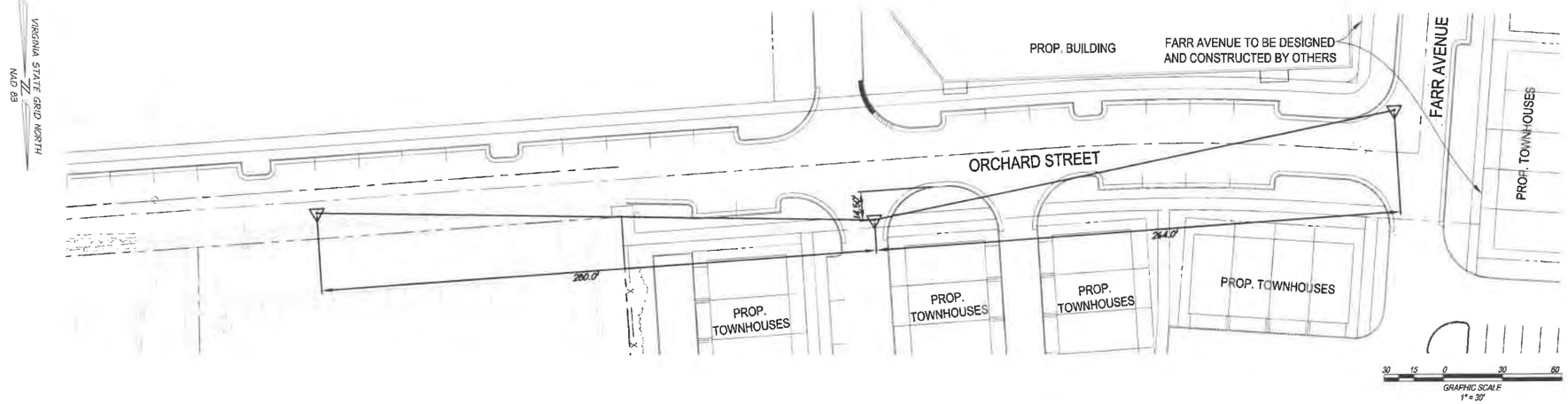
SHEET TITLE:

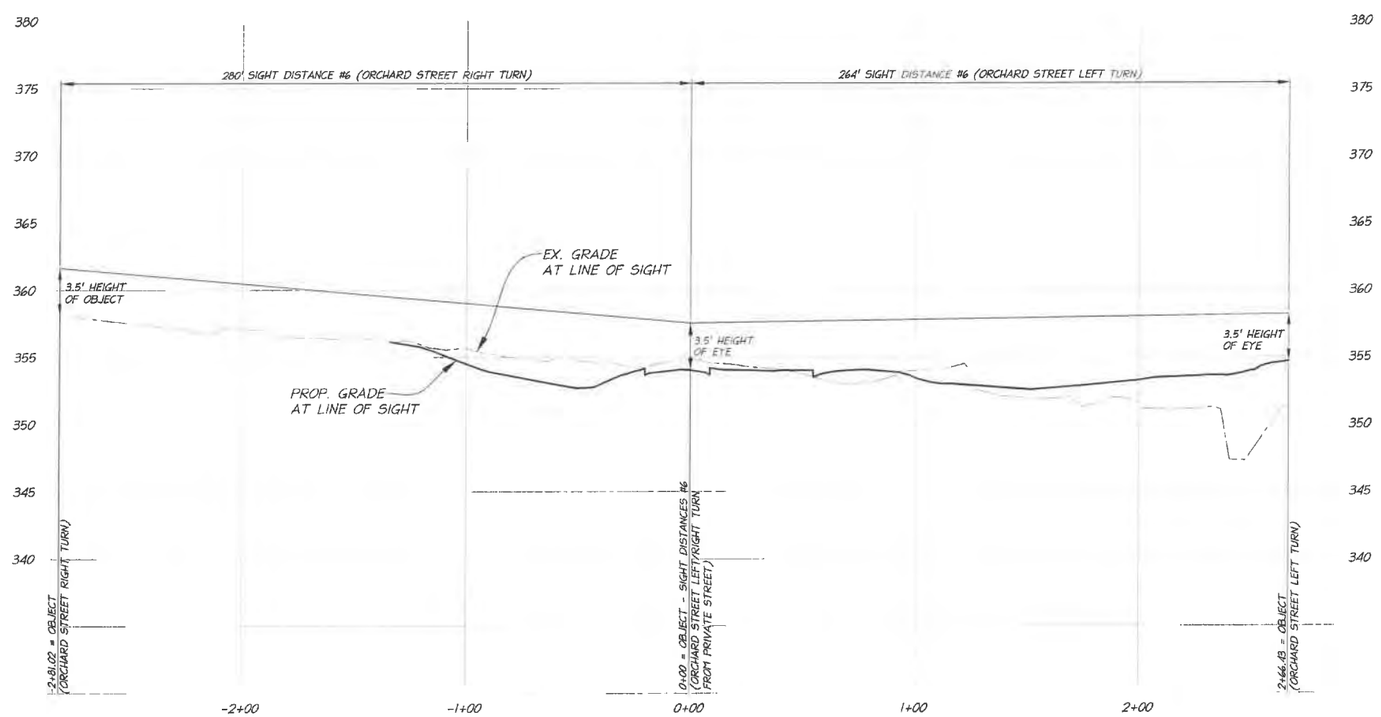
SIGHT DISTANCE

SHEET No.
13

SCALE: SEE DWGS.

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS





ORCHARD STREET SIGHT DISTANCE #6 (FROM PRIVATE STREET)
POSTED SPEED: 25 MPH

5 2.5 0 5 10
VERTICAL GRAPHIC SCALE
1" = 5'

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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MARK	DATE	DESCRIPTION

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DESIGN: EG
DRAWN: JS
CHECKED: KMW

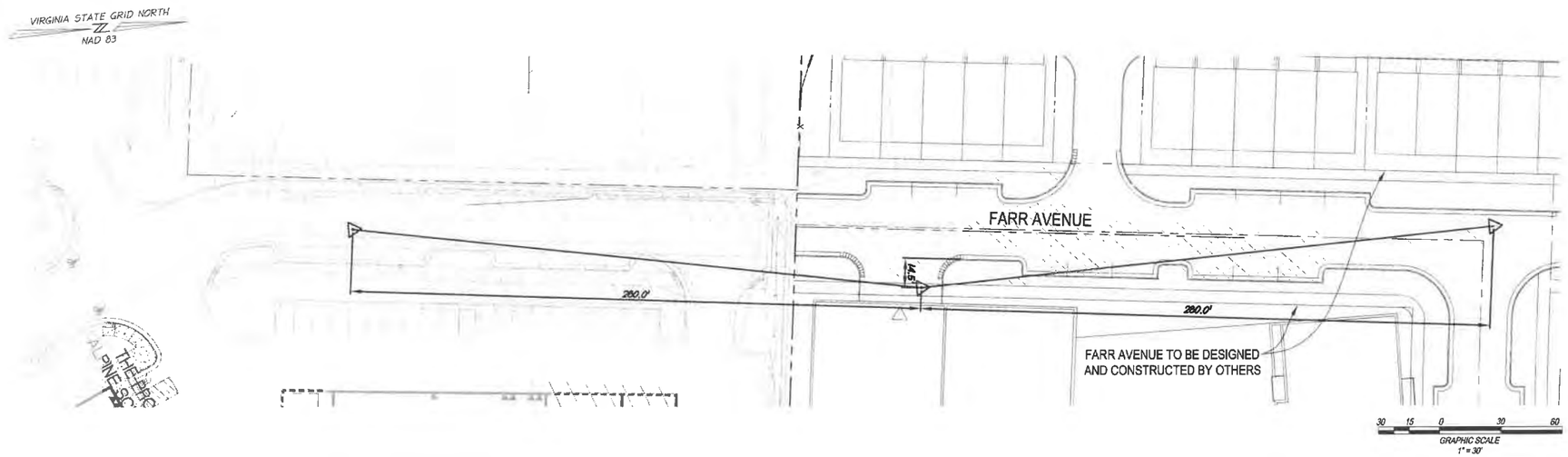
SHEET TITLE:

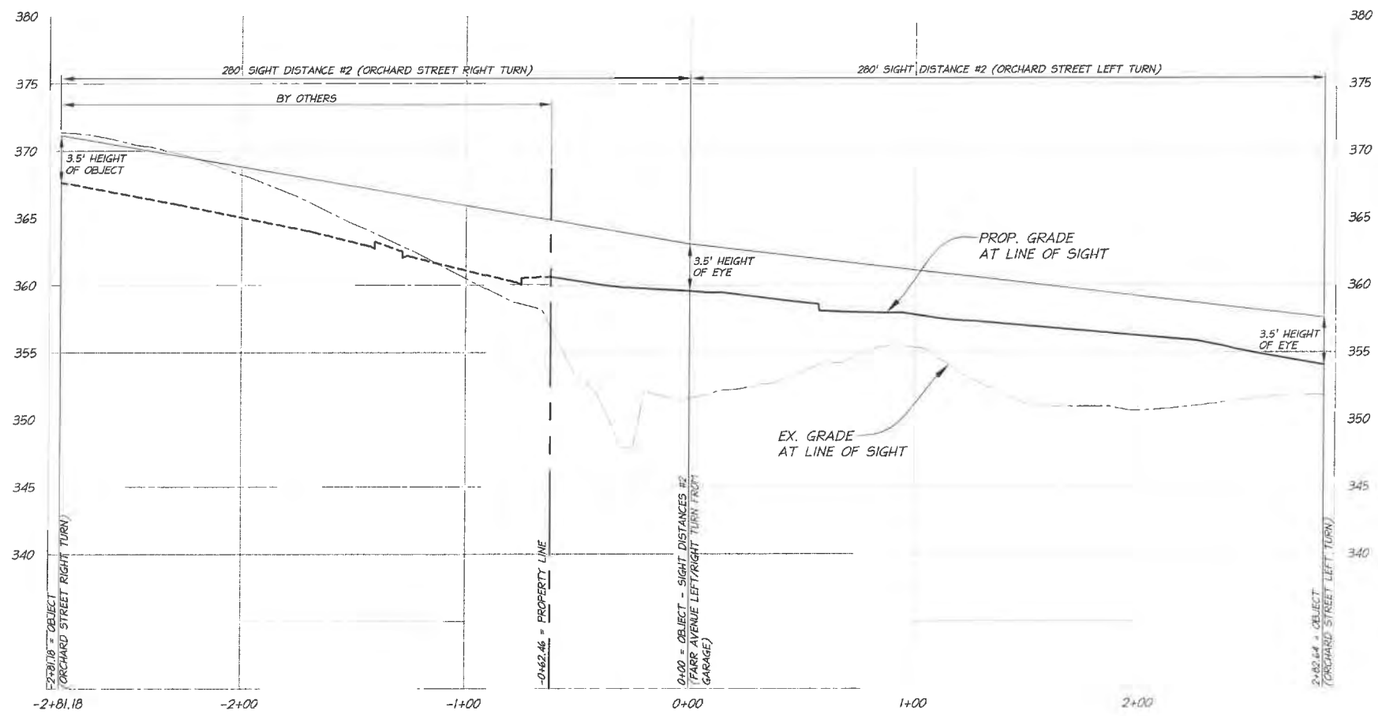
SIGHT DISTANCE

SHEET No.
14

SCALE: SEE DWGS.

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS





FARR AVENUE SIGHT DISTANCE #2 (FROM GARAGE)

POSTED SPEED: 25 MPH

5 2.5 0 5 10
VERTICAL GRAPHIC SCALE
1" = 5'

30 15 0 30 60
HORIZONTAL GRAPHIC SCALE
1" = 30'

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MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
DRAWING No.: 109832
DATE: 11-21-2019
DESIGN: EG
DRAWN: JS
CHECKED: KMW

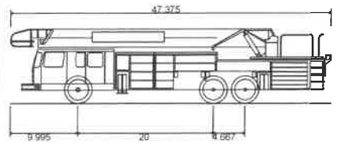
SHEET TITLE:

SIGHT DISTANCE

SHEET No.

15

SCALE: SEE DWGS.



Tower 203 Fire Truck	
Overall Length	47.375ft
Overall Width	8.167ft
Overall Body Height	11.082ft
Min Body Ground Clearance	1.512ft
Track Width	7.667ft
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	54.980ft

FIRE TRUCK TURNING MOVEMENTS

SCALE: 1"=40'

VIRGINIA STATE GRID NORTH
NAD 83

40 20 0 40 80
HORIZONTAL GRAPHIC SCALE
1" = 40'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT FAIRFAX CITY AND VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS

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CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

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DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

TURNING MOVEMENTS

SHEET No.

16

SCALE: 1"=40'

LEGEND

- : PROPOSED R.O.W.
- : BUILDING ENTRANCE
- FDC : PROPOSED FIRE DEPARTMENT CONNECTION
- : PROPOSED FIRE LANE
- : PROPOSED WATERLINE
- KW : EXISTING WATERLINE
- : EXISTING FIRE HYDRANT

VIRGINIA STATE GRID NORTH NAD 83

SENIOR LIVING BUILDING:

BUILDING TYPE:	7 STORY
OCCUPANCY TYPE:	RESIDENTIAL R-2
CONSTRUCTION TYPE:	I-B
SPRINKLER TYPE:	FULLY SPRINKLED, NFPA 13
BUILDING AREA:	230,000 SF

BUILDING HEIGHT: REFER TO ARCHITECTURAL EXTERIOR ELEVATIONS

TOWNHOUSE:

BUILDING TYPE:	TOWNHOUSE
OCCUPANCY TYPE:	RESIDENTIAL R-3
CONSTRUCTION TYPE:	5-B
SPRINKLER TYPE:	NFPA 13R

BUILDING HEIGHT: REFER TO ARCHITECTURAL EXTERIOR ELEVATIONS

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

40 20 0 40 80
HORIZONTAL GRAPHIC SCALE
1" = 40'

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CITY OF FAIRFAX, VIRGINIA

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SHEET TITLE:

FIRE SERVICE PLAN

SHEET No.
17

SCALE: 1"=40'

100-YR FLOODPLAIN
(PRE-DEVELOPED)

EX. RPA
LINE

100-YR FLOODPLAIN
(PRE-DEVELOPED)

McLEAN AVENUE
VARIABLE WIDTH PUBLIC RIGHT-OF-WAY

ORCHARD STREET
50' PUBLIC RIGHT-OF-WAY
D.B. 401-PG-312

ORCHARD STREET
50' PUBLIC RIGHT-OF-WAY
D.B. 407-PG-115

McLEAN COURT
50' RIGHT-OF-WAY

CHAIN BRIDGE ROAD - ROUTE #123
VARIABLE WIDTH PUBLIC RIGHT-OF-WAY
CITY OF FAIRFAX PROJ. #0029-151-105

FAIRFAX BOULEVARD - ROUTE #50
VARIABLE WIDTH PUBLIC RIGHT-OF-WAY
CITY OF FAIRFAX PROJ. #0029-151-105

VIRGINIA STATE GRID NORTH
NAD 83

50 25 0 50 100
HORIZONTAL GRAPHIC SCALE
1" = 50'

ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
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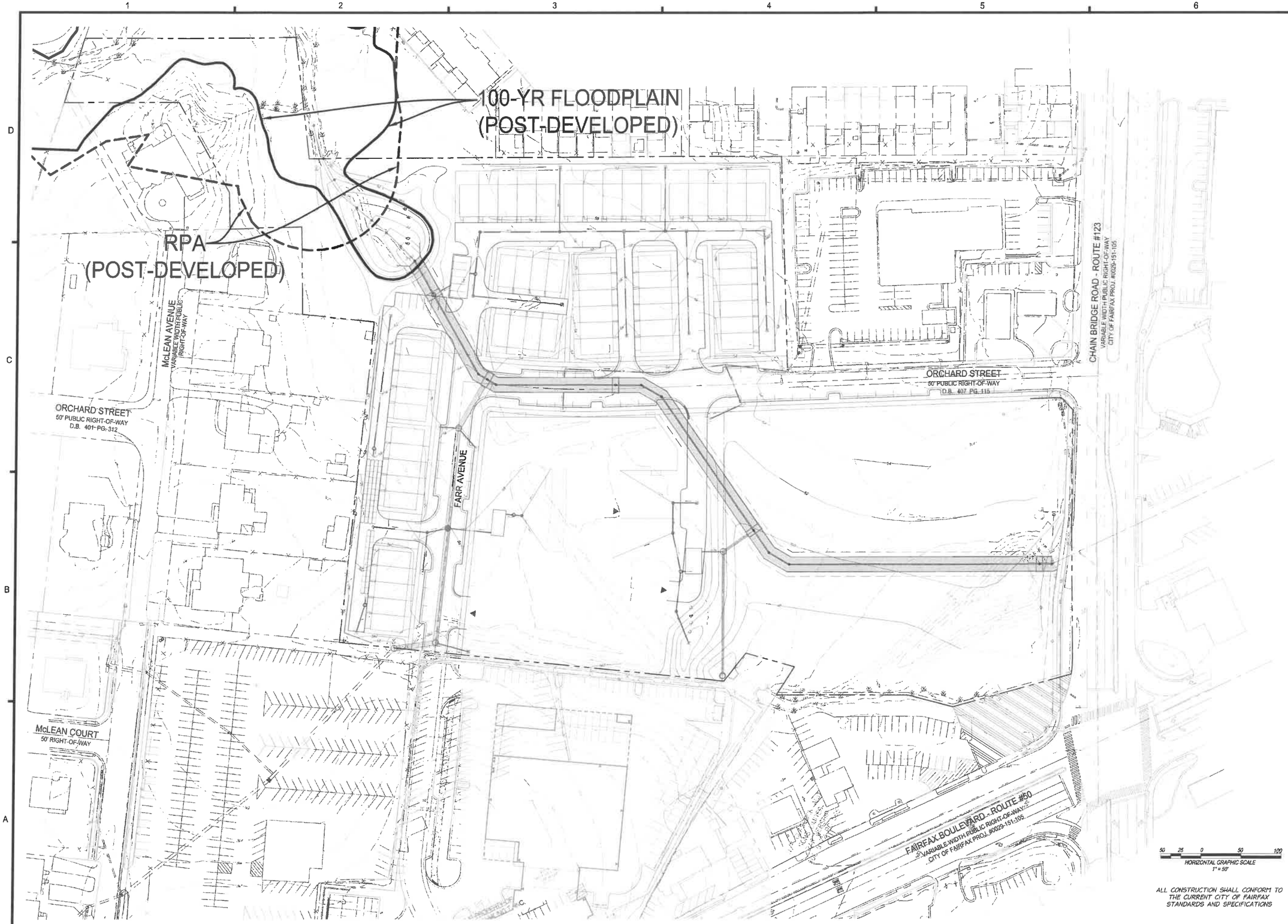
DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

FLOODPLAIN AND RPA (PRE-DEVELOPED)

SHEET No.
18

SCALE: 1"=50'



ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT CITY OF FAIRFAX STANDARDS AND SPECIFICATIONS

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NORTHFAX WEST
MASTER DEVELOPMENT PLAN
CITY OF FAIRFAX, VIRGINIA

MARK	DATE	DESCRIPTION

PROJECT No.: 13139.005.00
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DESIGN: EG
DRAWN: JS
CHECKED: KMW

SHEET TITLE:

FOODPLAIN AND RPA (POST-DEVELOPED)

SHEET No.

18A

SCALE: 1"=50'

Appendix E – BEHI and NBS Study

Northfax Project - Bank Erosion Hazard Index and Near Bank Stress Assessment

The following Bank Erosion Hazard Index (BEHI) and Near Bank Stress (NBS) study was conducted for two streams (A1 & A2) located on the Northfax Project in the City of Fairfax, Virginia. Stream A1 and A2 are approximately 5 to 6 feet wide with banks ranging from 1 to 6 feet high, and are bordered by riparian woodlands, residential development, and commercial property. The project area is located within the Middle Potomac-Anacostia-Occoquan watershed (HUC 02070010) and the Accotink Creek subwatershed (HUC 020700100402).

On December 16, 2019, Apex Companies, LLC (Apex) conducted a site visit to analyze potential for stream bank erosion on an approximately 1,750 linear feet (LF) of stream channel within the project area. Apex used the BEHI rating system to evaluate the bank characteristics and NBS to assess the flow distribution and risk ratings based on multiple erosional processes. Factors which affect the risk rating for a stream bank include bank-height ratio, root-depth ratio, weighted root density, bank angle, surface protection, bank material, and stratification of bank substrate. Using these factors stream banks were assigned ratings of very low, low, moderate, high, very high, or extreme erosion potential. NBS was evaluated to determine Total Suspended Sediment (TSS), Total Nitrogen (TN) and Total Phosphorus (TP) using methods discussed in *Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects* (Schueler, T., Stack, B. 2013).

The study resulted in five (5) assessment points to document bank characteristics and collect data BEHI and NBS evaluations (Figure 1: Site Location and BEHI Map). Table 1 summarizes the following results of the BEHI assessment across all streams onsite.

Table 1: Summary of BEHI Assessment Results for the Northfax Project

Stream ID	Erosion Hazard Potential				
	Extreme	Very High	High	Moderate	Low
Stream A1	321 LF	1,192 LF	434 LF	0 LF	735 LF
Stream A2	217 LF	311 LF	290 LF	0 LF	0 LF
Total	538 LF	1,503 LF	724 LF	0 LF	735 LF

The NBS data collected for each stream were assessed to predict potential sediment loading for the streams caused by near bank stress. Apex estimated the potential for approximately 3,036 tons/year of TSS caused by near bank stress and erosion for Stream A1 and Stream A2. Further, approximately 0.13 tons/year of TN and 0.12 tons/year of TP were also estimated to result from near bank stress.

Attachment 1 provides a Site Location and BEHI Map (Figure 1) and a Photograph Location Map (Figure 2) to accompany the results of Apex's assessment. The photograph log in Attachment 2 shows existing conditions along Stream A1 and A2, including the assessment points used to collect BEHI and NBS data. BEHI and NBS data collected by Apex is provided in Attachment 3 and 4, respectively.

Attachment 1: Figures

Apex Companies, LLC
203 Wylderose Ct, Midlothian, VA 23113
Phone: 804-897-2718
www.apexcos.com

Northfax Project
Fairfax, Virginia

Figure 1.
Site Location and BEHI Map

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Northfax Project
Fairfax, Virginia

Figure 2
Photograph Location Map

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Attachment 2: Photograph Log

Photo 1

Stream A1 – Very high erosion potential on right bank and high erosion potential on left bank with low erosion potential open bottom stone culvert

Photo 2

Stream A1 – high erosion potential on right bank

Photo 3

Stream A1 – very high erosion potential on left bank

Photo 4 Stream A1 – collapsing culverts under road	

Photo 5 Stream A2 – extreme erosion potential	

Photo 6 Stream A2 – extreme erosion potential	

Photo 7

Stream A1 – extreme erosion potential on east bank

Photo 8

Stream A2 – high erosion potential

Photo 9

Stream A1 – high erosion potential

Photo 10

Stream A1 – very high erosion potential on both banks

Photo 11

Stream A2 – high erosion potential on right bank

Photo 12

Stream A1 – low erosion potential due to riprap on east bank

Photo 13

Stream A1 – low erosion potential due to riprap

Photo 14

Stream A1 – low erosion potential due to riprap

Photo 15

Stream A1 – very high erosion potential on both banks

Photo 16 Stream A1 – very high erosion potential on east bank and extreme erosion potential on west bank	

Photo 17 Stream A1 – very high erosion potential on east bank and extreme erosion potential on west bank	

Attachment 3: BEHI Data

Stream:	**Stream A1, High 1**	Location:	
Station:		Observers:	
Date:	**12/16/19**	Stream Type:	Valley Type:

						BEHI Score (Fig. 5-19)
Study Bank Height / Bankfull Height (C)						
Study Bank Height (ft) =	**1.5** (A	**Bankfull Height** (ft) =	**0.51** (B)	(A) / (B) =	**2.94** (C)	**9**
Root Depth / Study Bank Height (E)						
Root Depth (ft) =	**0.7** (D	**Study Bank Height** (ft) =	**0.85** (A)	(D) / (A) =	**0.824** (E)	**2.5**
Weighted Root Density (G)						
		Root Density as % =	**30%** (F)	(F) X (E) =	**24.71** (G)	**6.5**
Bank Angle (H)						
				Bank Angle as *Degrees* =	**85** (H)	**7**
Surface Protection (I)						
				Surface Protection as % =	**10%** (I)	**9**

Bank Material Adjustment:

Bedrock (Overall Very Low BEHI)
Boulders (Overall Low BEHI)
Cobble (Subtract 10 points if uniform medium to large cobble)
Gravel or Composite Matrix (Add 5–10 points depending on percentage of bank material that is composed of sand)
Sand (Add 10 points)
Silt/Clay (no adjustment)

Bank Material Adjustment

Stratification Adjustment
Add 5–10 points, depending on position of unstable layers in relation to bankfull stage

Very Low	Low	Moderate	High	Very High	Extreme	Adjective Rating and Total Score	
5 – 9.5	10 – 19.5	20 – 29.5	30 – 39.5	40 – 45	46 – 50		**34**

Stream:	**Stream A1, High 2**	Location:	
Station:		Observers:	
Date:	**12/16/19** Stream Type:	Valley Type:	

						BEHI Score (Fig. 5-19)
Study Bank Height / Bankfull Height (C)						
Study Bank Height (ft) =	2.5 (A	Bankfull Height (ft) =	0.51 (B)	(A) / (B) =	4.9 (C)	10
Root Depth / Study Bank Height (E)						
Root Depth (ft) =	0.75 (D	Study Bank Height (ft) =	2.5 (A)	(D) / (A) =	0.3 (E)	5.5
Weighted Root Density (G)						
		Root Density as % =	10% (F)	(F) x (E) =	3.00 (G)	9
Bank Angle (H)						
				Bank Angle as *Degrees* =	40 (H)	3
Surface Protection (I)						
				Surface Protection as % =	10% (I)	9

Bank Material Adjustment:

Bedrock (Overall Very Low BEHI)

Boulders (Overall Low BEHI)

Cobble (Subtract 10 points if uniform medium to large cobble)

Gravel or Composite Matrix (Add 5–10 points depending on percentage of bank material that is composed of sand)

Sand (Add 10 points)

Silt/Clay (no adjustment)

Bank Material Adjustment

Stratification Adjustment

Add 5–10 points, depending on position of unstable layers in relation to bankfull stage

Very Low	Low	Moderate	High	Very High	Extreme	Adjective Rating and Total Score	
5 – 9.5	10 – 19.5	20 – 29.5	30 – 39.5	40 – 45	46 – 50		36.5

Stream:	**Stream A1, Extreme 1**	Location:	
Station:		Observers:	
Date:	**12/16/19**	Stream Type:	Valley Type:

						BEHI Score (Fig. 5-19)
Study Bank Height / Bankfull Height (C)						
Study Bank Height (ft) =	**4** (A	**Bankfull Height** (ft) =	**0.51** (B)	(A) / (B) =	**7.8** (C	**10**
Root Depth / Study Bank Height (E)						
Root Depth (ft) =	**0.8** (D	**Study Bank Height** (ft) =	**4** (A)	(D) / (A) =	**0.2** (E	**7**
Weighted Root Density (G)						
		Root Density as % =	**20%** (F)	(F) x (E) =	**4** (G)	**9.5**
Bank Angle (H)						
				Bank Angle as *Degrees* =	**110** (H	**8.5**
Surface Protection (I)						
				Surface Protection as % =	**5%** (I	**10**

Bank Material Adjustment:

Bedrock (Overall Very Low BEHI)

Boulders (Overall Low BEHI)

Cobble (Subtract 10 points if uniform medium to large cobble)

Gravel or Composite Matrix (Add 5–10 points depending on percentage of bank material that is composed of sand)

Sand (Add 10 points)

Silt/Clay (no adjustment)

Bank Material Adjustment

Stratification Adjustment

Add 5–10 points, depending on position of unstable layers in relation to bankfull stage

10

Very Low	Low	Moderate	High	Very High	Extreme
5 – 9.5	10 – 19.5	20 – 29.5	30 – 39.5	40 – 45	46 – 50

Adjective Rating and **Total Score**

55

Stream:	**Stream A2, Very High 1**	Location:	
Station:		Observers:	
Date:	**12/16/19**	Stream Type:	Valley Type:

						BEHI Score (Fig. 5-19)
Study Bank Height / Bankfull Height (C)						
Study Bank Height (ft) =	**6** (A	**Bankfull Height** (ft) =	**0.51** (B)	(A) / (B) =	**11.8** (C)	**10**
Root Depth / Study Bank Height (E)						
Root Depth (ft) =	**2** (D	**Study Bank Height** (ft) =	**6** (A)	(D) / (A) =	**0.33** (E)	**6**
Weighted Root Density (G)						
		Root Density as % =	**50%** (F)	(F) X (E) =	**16.67** (G)	**8**
Bank Angle (H)						
				Bank Angle as *Degrees* =	**120** (H)	**10**
Surface Protection (I)						
				Surface Protection as % =	**30%** (I)	**6**

Bank Material Adjustment:

Bedrock (Overall Very Low BEHI)

Boulders (Overall Low BEHI)

Cobble (Subtract 10 points if uniform medium to large cobble)

Gravel or Composite Matrix (Add 5–10 points depending on percentage of bank material that is composed of sand)

Sand (Add 10 points)

Silt/Clay (no adjustment)

Bank Material Adjustment

Stratification Adjustment

Add 5–10 points, depending on position of unstable layers in relation to bankfull stage

5

Very Low	Low	Moderate	High	Very High	Extreme
5 – 9.5	10 – 19.5	20 – 29.5	30 – 39.5	40 – 45	46 – 50

Adjective Rating and **Total Score**

45

Stream:	**Stream A2, Extreme 2**	Location:	
Station:		Observers:	
Date:	**12/16/19**	Stream Type:	Valley Type:

							BEHI Score (Fig. 5-19)
Study Bank Height / Bankfull Height (C)							
Study Bank Height (ft) =	**4** (A	**Bankfull Height** (ft) =	**0.51** (B)	(A) / (B) =	**7.8** (C		**10**
Root Depth / Study Bank Height (E)							
Root Depth (ft) =	**0.5** (D	**Study Bank Height** (ft) =	**4** (A)	(D) / (A) =	**0.125** (E		**8**
Weighted Root Density (G)							
		Root Density as % =	**15%** (F)	(F) x (E) =	**1.88** (G)		**9.5**
Bank Angle (H)							
				Bank Angle as *Degrees* =	**90** (H		**7**
Surface Protection (I)							
				Surface Protection as % =	**10%** (I		**8.5**

Bank Material Adjustment:

Bedrock (Overall Very Low BEHI)
Boulders (Overall Low BEHI)
Cobble (Subtract 10 points if uniform medium to large cobble)
Gravel or Composite Matrix (Add 5–10 points depending on percentage of bank material that is composed of sand)
Sand (Add 10 points)
Silt/Clay (no adjustment)

Bank Material Adjustment → **5**

Stratification Adjustment
Add 5–10 points, depending on position of unstable layers in relation to bankfull stage

Very Low	Low	Moderate	High	Very High	Extreme	Adjective Rating and Total Score	
5 – 9.5	10 – 19.5	20 – 29.5	30 – 39.5	40 – 45	46 – 50		48

Attachment 4: NBS Data

NBS Data

Table 1: Near-Bank Stress (NBS) Data

Location	Bank Depth (ft)	Bank-full Depth (ft.)	Bank Depth / Bank-full Depth	NBS Rating	Bank Erosion Rate	Length of Bank	Study Bank Height	Erosion Rate (ft3/yr.)
Low	5	0.51	9.80	Extreme (6)	1.3218	735	5	4857.60
Moderate	1	0.51	1.96	High (4)	0.4203	0	1	0.00000
High	2	0.51	3.92	Extreme (6)	1.3218	724	2	1913.96
Very High	4	0.51	7.84	Extreme (6)	1.3218	1503	4	7946.64
Extreme	5	0.51	9.80	Extreme (6)	17.973	538	5	48346.27
Total Erosion Rate								
							ft^3/yr.	63064.48
							yd^3/yr.	2335.72
							tons/yr.	3036.43
							tons/yr./ft	0.87

Table 1.5: Converting Values to Near-Bank Stress Rating

NBS Rating	Bank Depth / Bank-full Depth
Very Low	<1.00
Low	1.00 – 1.50
Moderate	1.51 – 1.80
High	1.81 – 2.50
Very High	2.51 – 3.00
Extreme	>3.00

Table 2: Total Nitrogen

Linear Feet of Stream Bank	TN Rate (lbs/ft/yr)	TN (lb/yr)	TN (tons/yr)
3500	0.075	262.5	0.13125

Table 3: Total Phosphorus

Linear Feet of Stream Bank	TP Rate (lbs/ft/yr)	TP (lb/yr)	TP (tons/yr)
3500	0.068	238	0.119

Exhibit 15

Tax Map No.	Parcel No.	Property Address	Current Owner of Record
57-2-02	003	10516 Orchard Street	Orchard RE Investments, LLC
57-2-02	005	10517 Orchard Street	Orchard RE Investments, LLC
57-2-02	017	3590 Chain Bridge Road	A.R.G. II, L.L.C.
57-2-02	018	3580 Chain Bridge Road	A.R.G. II, L.L.C.
57-2-02	019	10505 Orchard Street	A.R.G. II, L.L.C.
57-2-02	020	3570 Chain Bridge Road	Northfax JV LLC
57-2-07	015-B	McLean Avenue	Orchard RE Investments, LLC
57-2-08	005	10508 Orchard Street	Orchard RE Investments, LLC
57-2-08	006	10510 Orchard Street	Orchard RE Investments, LLC
57-2-08	007	10512 Orchard Street	Orchard RE Investments, LLC
57-2-08	008	10514 Orchard Street	Orchard RE Investments, LLC
57-2-08	010	10515 Orchard Street	Orchard RE Investments, LLC
57-2-08	011	10507 Orchard Street	A.R.G. II, L.L.C.
57-2-08	012	10509 Orchard Street	A.R.G. II, L.L.C.
57-2-08	013	10511 Orchard Street	A.R.G. II, L.L.C.
57-2-08	014	10513 Orchard Street	A.R.G. II, L.L.C.
57-2-47	000-A	McLean Avenue	Orchard RE Investments, LLC
		Orchard Street right-of-way	City of Fairfax