

Transportation Impact Study

The Ox Fairfax – Block A

City of Fairfax, Virginia

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TABLE OF CONTENTS

Executive Summary	6
Site Location and Study Area	6
Description of Proposed Development	7
Principal Findings and Conclusions	7
Introduction	9
Background Information: Proposed Development (Site and Nearby)	10
Description of the Existing Site	10
Site Location	10
Description of the Parcel	11
Location within Jurisdiction and Region	12
Comprehensive Plan Recommendations	13
Zoning for the Site and Nearby Uses	13
Description of Geometric Scope and Limits of the Study Area	14
Existing Roadways	14
Planned Future Transportation Improvements	14
South Street Extension	14
Old Town Streetscape Plan & Standards and Main Street Streetscape Design	15
University Drive Road Diet	15
Transit Improvements	15
Bicycle and Pedestrian Improvements	16
Existing Conditions (2023)	17
Existing Transit Service	17
Existing Bicycle Facilities	21
Existing Pedestrian Facilities	23
Existing Roadway Network	25
Historical Crash Data	25
Existing Traffic Volumes	26
Existing (2023) Intersection Capacity Analysis	29
Future Conditions without Development (2026)	34
Future without Development (2026) Traffic Volumes	34
Future without Development (2026) Intersection Capacity Analysis	38
Future Conditions with Development (2026) – Interim Condition	42
Site Description	42

Site Access	42
Transportation Demand Management.....	42
Preliminary Event Operations Plan for The Ox Fairfax – Block A.....	42
Parking.....	43
Site Generated Traffic	46
Site Trip Distribution	47
Future with Development (2026) Traffic Volumes	48
Future with Development (2026) Intersection Capacity Analysis	52
Future Conditions with Development (2031) – Ultimate Condition	59
Future with Development (2031) Intersection Capacity Analysis	60
Future Conditions with Development (2032) – Planning Scenario	66
Future with Development (2032) Traffic Volumes	66
Future Conditions (2032) Volume-to-Capacity Analysis	66
Intersection Analysis Summary	69
VDOT Chapter 536 Compliance.....	71
Conclusions.....	73

APPENDICES

Appendix A – Scoping Document
Appendix B – Crash Data
Appendix C – Existing Turning Movement Counts
Appendix D – Intersection Capacity Analysis – Existing (2023)
Appendix E – Intersection Capacity Analysis – Future without Development (2026)
Appendix F – Intersection Capacity Analysis – Future with Development (2026) – Interim Condition
Appendix G – Intersection Capacity Analysis – Future with Development (2031) – Ultimate Condition

LIST OF FIGURES

Figure 1: Study Intersections.....	10
Figure 2: Parcel Map.....	11
Figure 3: Jurisdiction Location (Source: City of Fairfax 2035 Comprehensive Plan).....	12
Figure 4: Zoning Map	13
Figure 5: Proposed Transit Network Enhancements (Source: City of Fairfax 2035 Comprehensive Plan).....	15
Figure 6: Proposed Network for Bicycle Travel (Source: City of Fairfax 2035 Comprehensive Plan)	16
Figure 7: Existing CUE Bus Routes (Source: City of Fairfax).....	18
Figure 8: Existing Metrobus Route 29K (Source: WMATA).....	19
Figure 9: Existing Metrobus Route 17G (Source: WMATA)	20
Figure 10: Existing Fairfax Connector Route 306 (Source: Fairfax Connector).....	21

Figure 11: Approximate Bicycle Travel Times	22
Figure 12: Existing Pedestrian Facilities.....	23
Figure 13: Approximate Pedestrian Travel Times	24
Figure 14: Existing (2023) – Lane Configuration	27
Figure 15: Existing (2023) – Peak Hour Traffic Volumes.....	28
Figure 16: Existing (2023) – Levels of Service	33
Figure 17: Background Growth (2026)	35
Figure 18: Background Development (2026) – Peak Hour Traffic Volumes	36
Figure 19: Future without Development (2026) – Peak Hour Traffic Volumes	37
Figure 20: Future without Development (2026) – Levels of Service	41
Figure 21: Public Parking Lots – Pedestrian Routes	44
Figure 22: Public Parking Lots – Walksheds	45
Figure 23: Directional Distribution	47
Figure 24: Removed Trips (2026).....	48
Figure 25: Site Trips (2026).....	49
Figure 26: Pass-By Trips (2026)	50
Figure 27: Future with Development (2026) – Peak Hour Traffic Volumes	51
Figure 28: Future with Development (2026) – Levels of Service.....	58
Figure 29: Future with Development (2031) – Peak Hour Traffic Volumes	59
Figure 30: Future with Development (2031) – Levels of Service.....	64
Figure 31: Future with Development (2032) – Traffic Volumes	66

LIST OF TABLES

Table 1: Existing Road Network	25
Table 2: Crash Data (January 2017 – December 2022).....	25
Table 3: SimTraffic Analysis Input Parameters	29
Table 4: Existing (2023) – Intersection Capacity Analysis.....	30
Table 5: Historical Growth Rate	34
Table 6: Future without Development (2026) – Intersection Capacity Analysis.....	38
Table 7: Public Parking Lots.....	44
Table 8: Trip Generation (2026)	46
Table 9: Future with Development (2026) – Intersection Capacity Analysis.....	52
Table 10: Future with Development (2026) Mitigated – Intersection Capacity Analysis	56
Table 11: Future with Development (2031) – Intersection Capacity Analysis.....	60
Table 12: V/C Analysis Results	67
Table 13: MOE Comparison Table	70
Table 14: V/C Assessment.....	71

Executive Summary

The following report presents the findings of a Transportation Impact Study (TIS) conducted for the proposed redevelopment of The Ox Fairfax – Block A site in the City of Fairfax, Virginia. This study was developed in accordance with guidelines and recommendations set forth by the City of Fairfax and VDOT.

This study was prepared in accordance with the best professional practices and standards in order to assess the impact of the proposed redevelopment on the surrounding transportation systems and recommend improvements to lessen or negate those impacts. This study involves the evaluation of anticipated roadway conditions with and without the proposed redevelopment and recommends possible transportation improvements and strategies to offset both the impacts of the increase in future traffic demand and the changes in traffic operations and characteristics due to the redevelopment. This study serves to assist public officials and developers to balance interrelations between efficient traffic movements with necessary access.

Site Location and Study Area

The site is located north of Armstrong Street, south of Sager Avenue, west of University Drive, and east of Chain Bridge Road in the City of Fairfax, Virginia. The site is located in the Old Town Fairfax Activity Center within the Old Town Fairfax Historic District.

For the purposes of this study, the analysis presented herein includes 17 existing intersections and two (2) future intersections.

The study intersections are as follows:

1. Main Street and West Street/North Street
2. Chain Bridge Road and North Street
3. University Drive and North Street
4. North Street and Blenheim Boulevard
5. Main Street and East Street/Blenheim Boulevard
6. Main Street and University Drive
7. Main Street and Chain Bridge Road
8. Chain Bridge Road and Sager Avenue
9. Sager Avenue and Site Entrance
10. University Drive and Sager Avenue
11. Sager Avenue and East Street/South Street
12. University Drive and South Street
13. University Drive and Parking Lot
14. University Drive and Armstrong Street
15. Chain Bridge Road and Armstrong Street
16. Chain Bridge Road and Judicial Drive
17. Chain Bridge Road and Humane Society Entrance
18. Chain Bridge Road and South Street (Future)
19. South Street and West Street (Future by Others)

Description of Proposed Development

The site is currently developed with 90,421 SF of office and other non-residential uses split between three (3) buildings. The proposed program is a mixed-use development comprised of up to a 4,127-person capacity (2,796 fixed seat) concert hall with a 117 seat black box theater, a 169-room hotel with 26,127 SF of conference space, 6,049 SF of office, two (2) art galleries totaling 8,399 SF, 13,912 SF of restaurant space, and 13,912 SF of retail. Total site build-out is planned for the year 2026.

Principal Findings and Conclusions

Discussions regarding the study assumptions and relevant background information were held with the City of Fairfax and VDOT staff during a scoping meeting on March 30, 2023. A copy of the signed scoping document is included in Appendix A.

The analysis presented in this report supports the following major finding:

- After the addition of redevelopment traffic, one (1) intersection has movements that begin to operate below acceptable levels of service as compared to the Future Conditions without Development (2026), after mitigations.

Additional assumptions, findings, and conclusions are as follows:

TIA Components

- As determined based on discussions with the City, a growth rate of one (1) percent per year was applied to major movements at the study intersections to account for regional growth in background traffic volumes.
- A Mode Split/TDM reduction of fifteen (15) percent was applied to the theater (attendees and employees), hotel, and office uses, as agreed upon with the City.
- The site is expected to generate approximately 259 trips in the AM peak hour, 511 trips in the PM peak hour, and 580 trips in the Saturday peak hour, after reductions.

Infrastructure

- Existing vehicular access is provided via two (2) driveways on Chain Bridge Road, two (2) driveways on Sager Avenue, and two (2) driveways on University Drive.
- With redevelopment of the property, site access will be provided via Sager Avenue and University Drive.
- The proposed South Street Extension will reroute traffic and relieve congestion on Main Street through Old Town and will ultimately provide access to The Ox Fairfax – Block A site. The extension is expected to be complete in 2031 and is to be built by others.

Non-SOV Elements

- Sidewalks and curb ramps generally exist along the corridors adjacent to and within the vicinity of the site.
- A dedicated on-street bike lane currently exists on University Drive adjacent to the site.
- Five (5) bus routes provide service in the vicinity of the site, providing regional access to the area.

Analysis Results

- Nine (9) intersections within the study area have movements that operate below acceptable levels of service under the Existing Conditions (2023).
- Ten (10) intersections within the study area have movements that operate below acceptable levels of service under Future Conditions without Development (2026).
- After the addition of redevelopment traffic, one (1) intersection has movements that begin to operate below acceptable levels of service as compared to the Future Conditions without Development (2026), after mitigations.

Proposed Mitigation

- Future with Development (2026) – Mitigation measures have been identified to improve traffic operations in the Future with Development (2026) scenario. These improvements include the following:
 - Intersection 1: Main Street and West Street/North Street
 - Adjust signal timings to improve operations (SAT Peak only).
 - Intersection 5: Main Street and East Street/Blenheim Boulevard
 - Adjust signal timings to improve operations (PM Peak only).
 - Intersection 7: Main Street and Chain Bridge Road
 - Adjust signal timings to improve operations (PM Peak only).
 - Intersection 12: University Drive and South Street
 - Install a traffic signal and add exclusive northbound left lane.

Introduction

The following report presents the findings of a Transportation Impact Study (TIS) conducted for the proposed redevelopment of The Ox Fairfax – Block A site in the City of Fairfax, Virginia. This study was developed in accordance with guidelines and recommendations set forth by the City of Fairfax and VDOT.

The proposed program is a mixed-use development comprised of up to a 4,127-person capacity (2,796 fixed seat) concert hall with a 117 seat black box theater, a 169-room hotel with 26,127 SF of conference space, 6,049 SF of office, two (2) art galleries totaling 8,399 SF, 13,912 SF of restaurant space, and 13,912 SF of retail. Total site build-out is planned for the year 2026.

The following tasks were completed as part of this study effort:

- A scoping meeting was held with City of Fairfax and VDOT staff on March 30, 2023, which included discussions about the parameters of the study and relevant background information. A copy of the scoping document is included in Appendix A.
- Existing conditions were observed in the field to verify roadway geometry, pedestrian and bicycle infrastructure, and traffic flow characteristics.
- Turning movement counts were collected at the study area intersections on Tuesday, April 25, 2023 during the morning and afternoon peak periods. Turning movement counts were also collected at the study intersections on Saturday, April 29, 2023 and Saturday, May 6, 2023 from 10:00 AM to 2:00 PM.
- Vehicular traffic analysis for the study intersections was performed using *Synchro 11* based on Highway Capacity Manual (HCM) 6th Edition methodology. HCM 2000 methodology was used for all intersections in lieu of HCM 6th Edition if HCM 6th Edition methodology was not applicable.
- Intersection capacity analyses were performed for existing conditions (2023), interim future conditions (2026), ultimate future conditions (2031), and the design year (2032).
- Future traffic volumes were developed by accounting for regional growth in the area and background developments and roadway improvements. A growth rate of one (1) percent per year was applied to the existing volumes to account for a regional increase in background traffic.
- Proposed site traffic volumes were generated based on the methodology outlined in ITE *Trip Generation*, 11th Edition.
- An assessment of the previous crashes has been conducted at existing study intersections.

Sources of data for this study include Institute of Transportation Engineers (ITE), Virginia Department of Transportation (VDOT), City of Fairfax, and the office files and field reconnaissance efforts by Gorove Slade.

Background Information: Proposed Development (Site and Nearby)

Description of the Existing Site

Site Location

The site is located north of Armstrong Street, south of Sager Avenue, west of University Drive, and east of Chain Bridge Road in the City of Fairfax, Virginia. The site is located in the Old Town Fairfax Activity Center within the Old Town Fairfax Historic District.

The geographic scope of the study area was developed in accordance with City of Fairfax guidance. Figure 1 shows the location of existing and future study intersections.

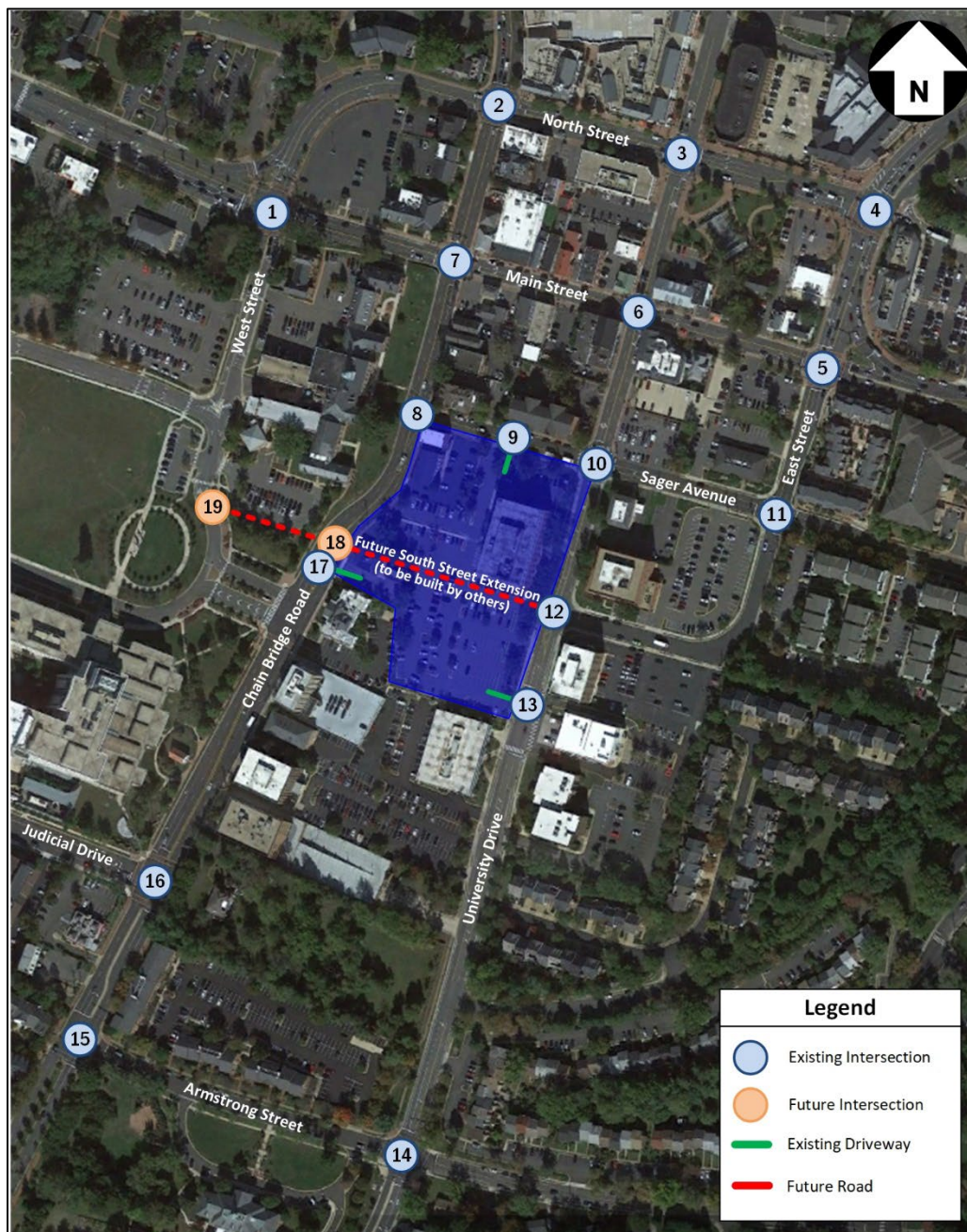


Figure 1: Study Intersections

Description of the Parcel

The Ox Fairfax – Block A site is approximately 3.589 acres and is comprised of three (3) parcels, which are identified on the City of Fairfax Tax Map as Tax Map #57-04-02-044, #57-04-02-045, and #57-04-02-046. The parcel map is shown in Figure 2.

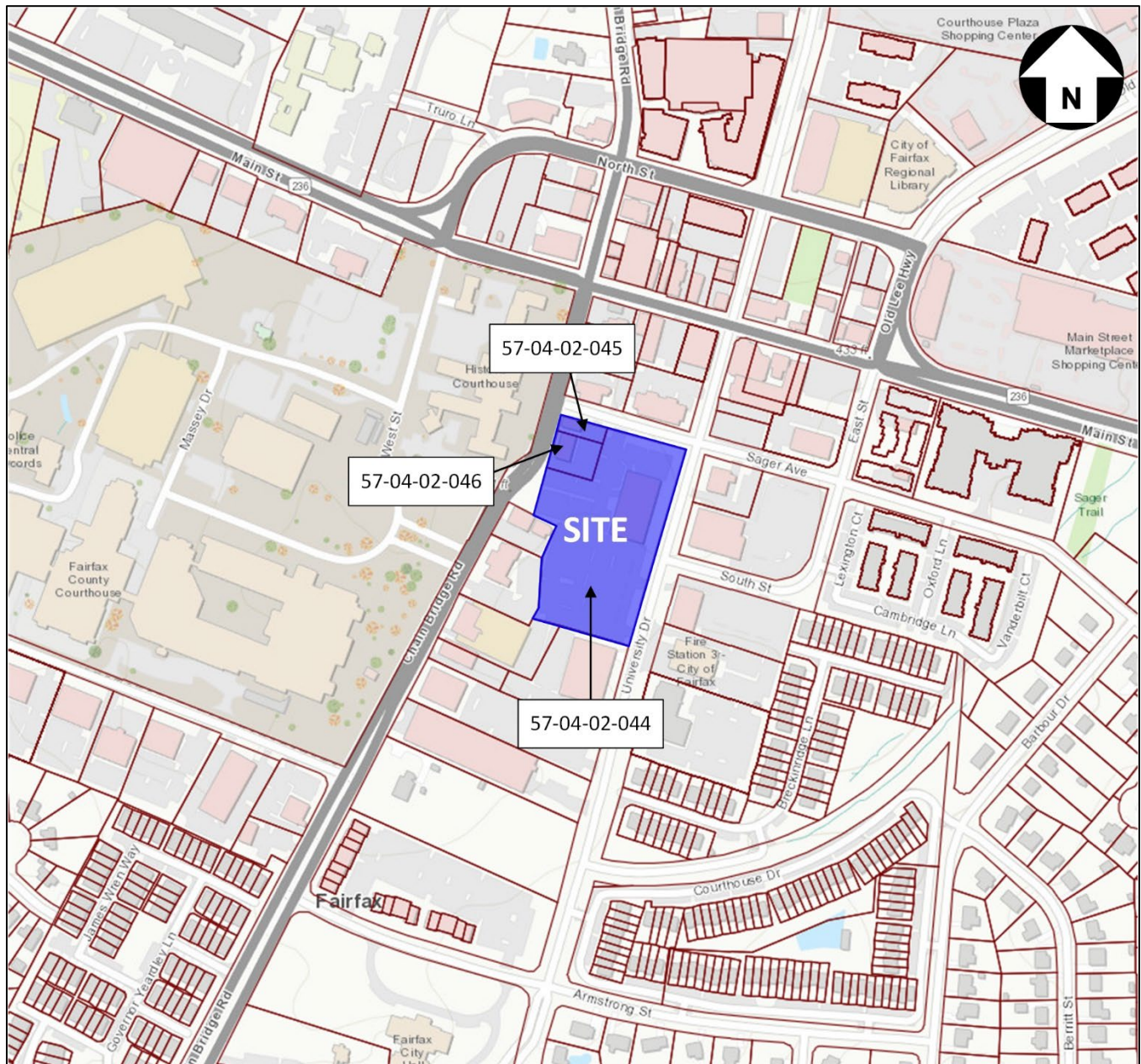


Figure 2: Parcel Map

Location within Jurisdiction and Region

The site is located in the Old Town Fairfax Activity Center within the Old Town Fairfax Historic District in the City of Fairfax as shown in Figure 3. Specifically, the site is included within the boundaries of the Old Town Fairfax Small Area Plan.

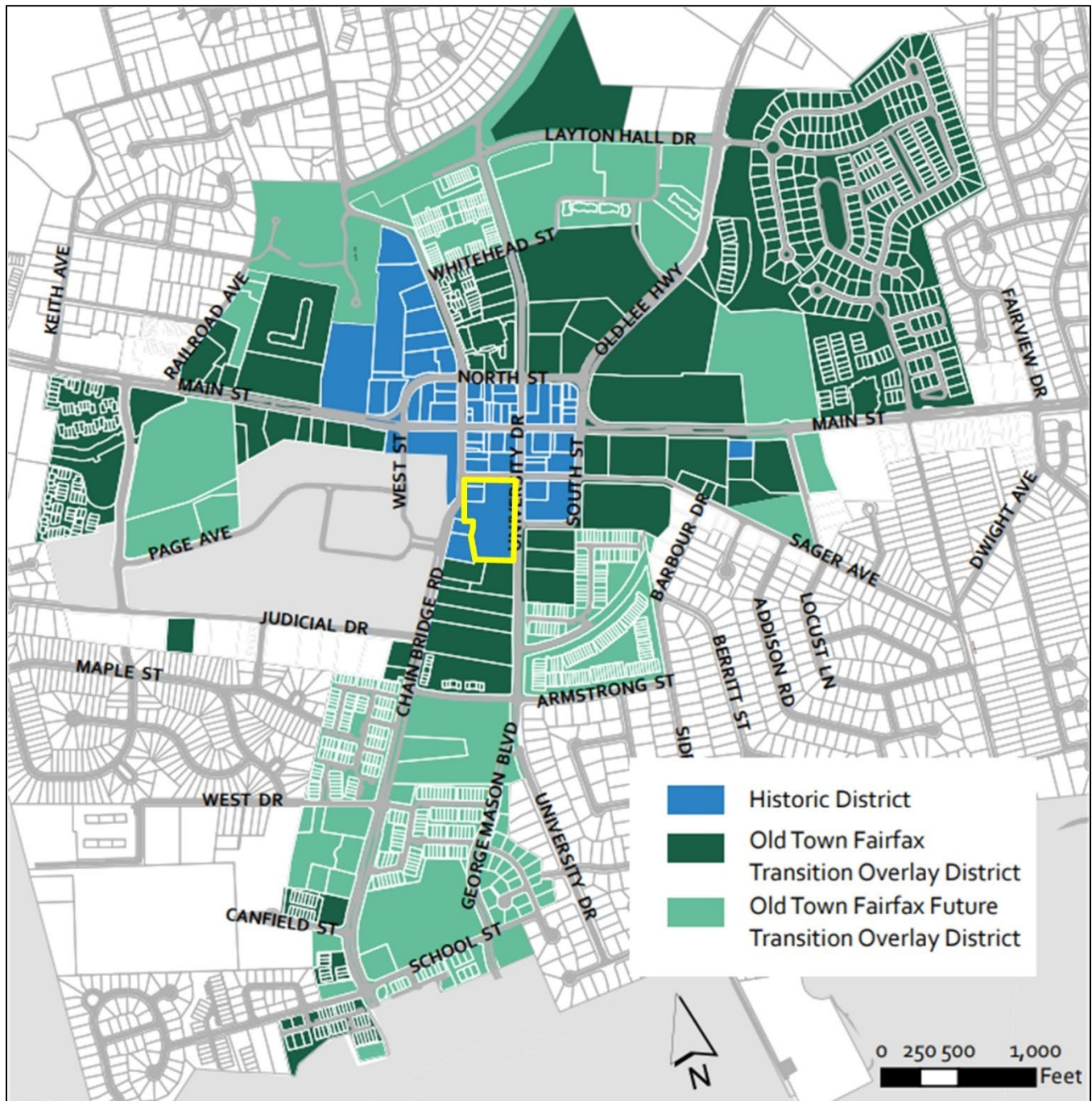


Figure 3: Jurisdiction Location (Source: City of Fairfax 2035 Comprehensive Plan)

Comprehensive Plan Recommendations

According to the City of Fairfax 2035 Comprehensive Plan, this site is planned for the Activity Center Place Type. The Activity Center Place Type applies to locations in the City where pedestrian-oriented, mixed-use development is strongly encouraged. The Old Town Fairfax Activity Center encompasses a cultural hub for the City, with a concentration of historic buildings, public services, active open space, and commercial buildings. Old Town Fairfax can also capitalize on its proximity to George Mason University to attract university supported businesses and arts and entertainment venues.

Zoning for the Site and Nearby Uses

The existing zoning for the site is CR (Commercial Retail) as shown in Figure 4.

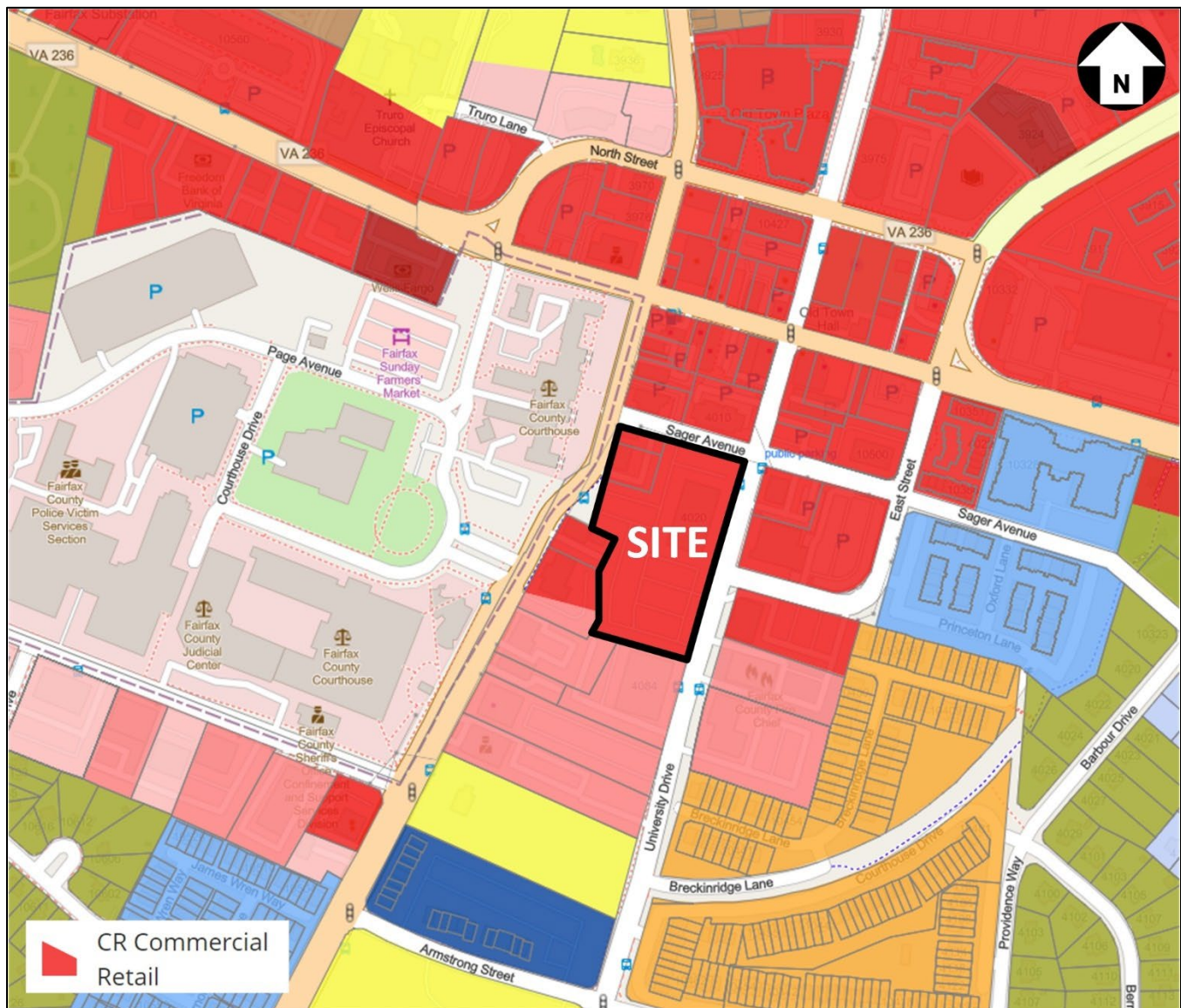


Figure 4: Zoning Map

Description of Geometric Scope and Limits of the Study Area

The geographic scope of the study area was developed in accordance with the City of Fairfax guidance.

Existing Roadways

The site is located north of Armstrong Street, south of Sager Avenue, west of University Drive, and east of Chain Bridge Road in the City of Fairfax, Virginia.

The existing study area includes seventeen (17) intersections along Chain Bridge Road, Sager Avenue and University Drive.

Detailed roadway descriptions are provided in the *Existing Conditions (2023)* section of this study.

The vehicular study area includes the following existing intersections:

1. Main Street and West Street/North Street
2. Chain Bridge Road and North Street
3. University Drive and North Street
4. North Street and Blenheim Boulevard
5. Main Street and East Street/Blenheim Boulevard
6. Main Street and University Drive
7. Main Street and Chain Bridge Road
8. Chain Bridge Road and Sager Avenue
9. Sager Avenue and Site Entrance
10. University Drive and Sager Avenue
11. Sager Avenue and East Street/South Street
12. University Drive and South Street
13. University Drive and Parking Lot
14. University Drive and Armstrong Street
15. Chain Bridge Road and Armstrong Street
16. Chain Bridge Road and Judicial Drive
17. Chain Bridge Road and Humane Society Entrance

Planned Future Transportation Improvements

South Street Extension

The City's recommended extension of South Street to West Street between University Drive and Chain Bridge Road will reroute traffic and relieve congestion on Main Street through Old Town. The extension will also permit the continuation of pedestrian facilities through Old Town. The proposed South Street Extension is expected to be complete in 2031 and is to be built by others. The extension will ultimately provide access to The Ox Fairfax – Block A site. For the purposes of this study, an ultimate scenario was evaluated with the South Street Extension in place through The Ox Fairfax – Block A site.

Old Town Streetscape Plan & Standards and Main Street Streetscape Design

The Main Street Streetscape Design is part of an overall effort to prepare an Old Town Streetscape Plan and Standards that would improve the appearance and experience of Old Town Fairfax as a destination. These improvements are to be completed by others.

University Drive Road Diet

This is a project to modify the roadway configuration of University Drive between South Street and Layton Hall Drive. The project will extend the redesign that previously converted University Drive from four lanes to three travel lanes with on-street bike lanes between Armstrong Street and South Street. The proposed project will install on-street bike lanes and sharrows between North Street and Layton Hall Drive to help improve pedestrian and bicycle safety. These improvements are to be completed by others.

Transit Improvements

According to the City of Fairfax 2035 Comprehensive Plan, bus improvement and bus transfer improvements are proposed in the vicinity of the site. Figure 5 shows the City's proposed transit network enhancements.



Figure 5: Proposed Transit Network Enhancements (Source: City of Fairfax 2035 Comprehensive Plan)

Bicycle and Pedestrian Improvements

According to the City of Fairfax 2035 Comprehensive Plan, on-street bike facilities and concentrated bicycle supportive infrastructure are proposed along and near Main Street and University Drive in the vicinity of the site. Figure 6 shows the City's proposed network for bicycle travel.

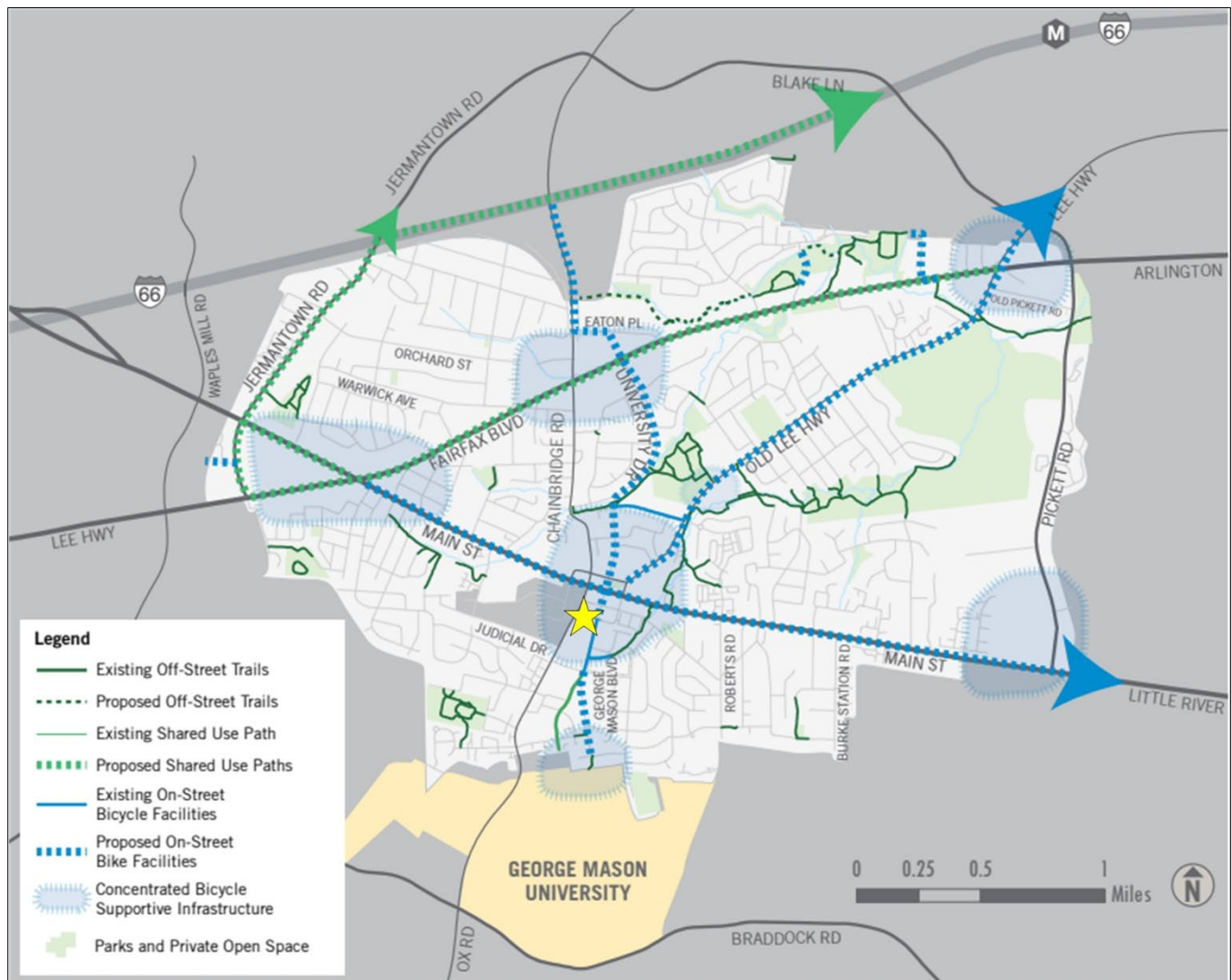


Figure 6: Proposed Network for Bicycle Travel (Source: City of Fairfax 2035 Comprehensive Plan)

Existing Conditions (2023)

In order to project future traffic conditions, it was necessary to create an existing scenario.

A site visit was conducted in order to capture existing conditions along the site perimeter and written descriptions of the conditions observed, noting any deficiencies and substandard conditions of the multimodal facilities present or lacking.

The site visit, which involved documenting elements within up to a half-mile radius in the vicinity of the site, occurred on Thursday, July 13, 2023.

The site visit indicates locations with which to improve the multimodal connectivity aspects in and around the site and provide suggestions with which to improve upon any discontinuous facility segments, lack of a crosswalks, or other places with low levels of comfort in the vicinity of the site.

Existing Transit Service

Five (5) bus routes currently serve the site area on Main Street, Chain Bridge Road (Route 123), and University Drive. Bus service is provided by City of Fairfax CUE Gold and Green Routes, Metrobus Routes 29K and 17G, and Fairfax Connector Route 306. The existing bus routes are shown in Figure 7 through Figure 10.

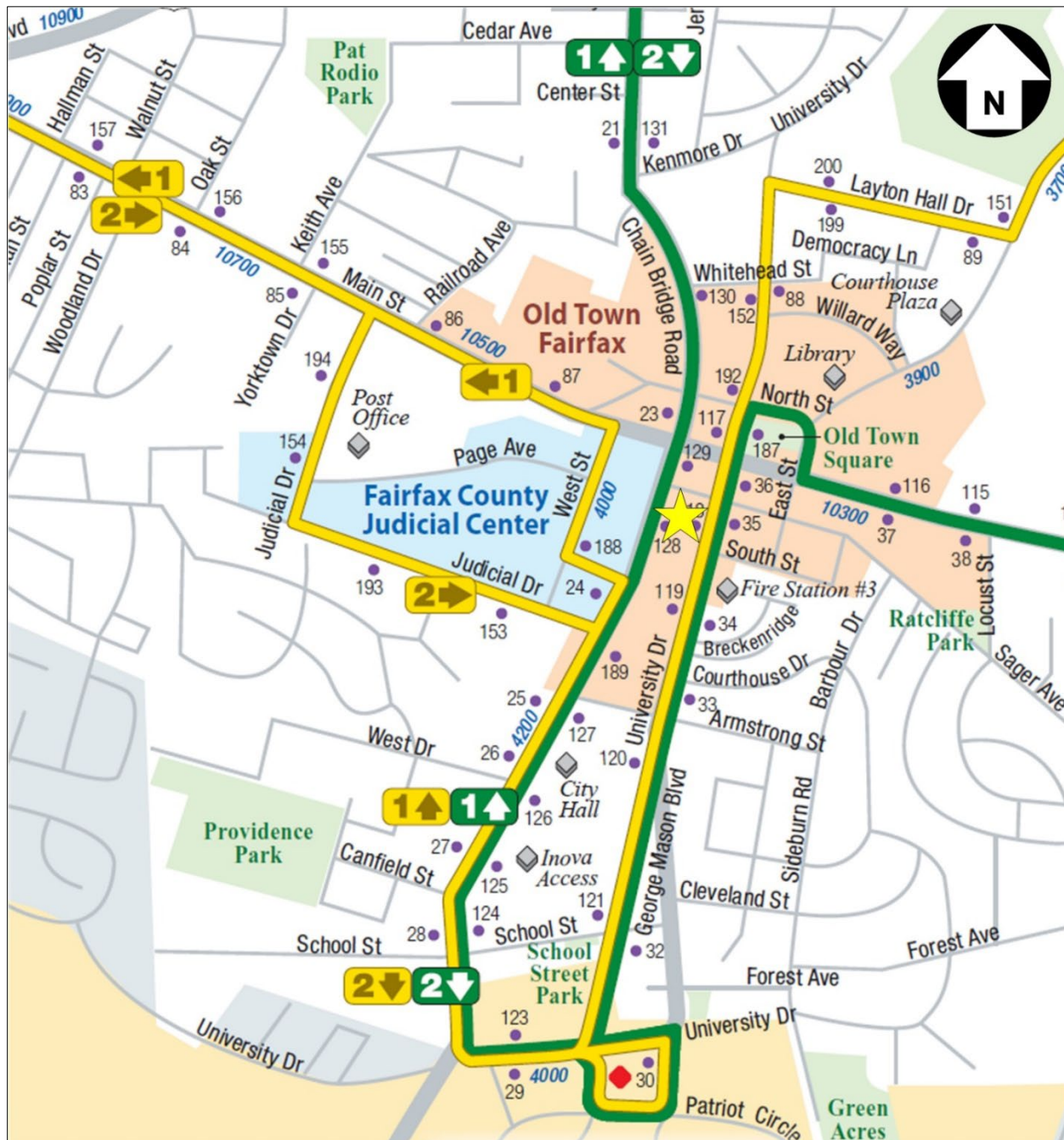


Figure 7: Existing CUE Bus Routes (Source: City of Fairfax)

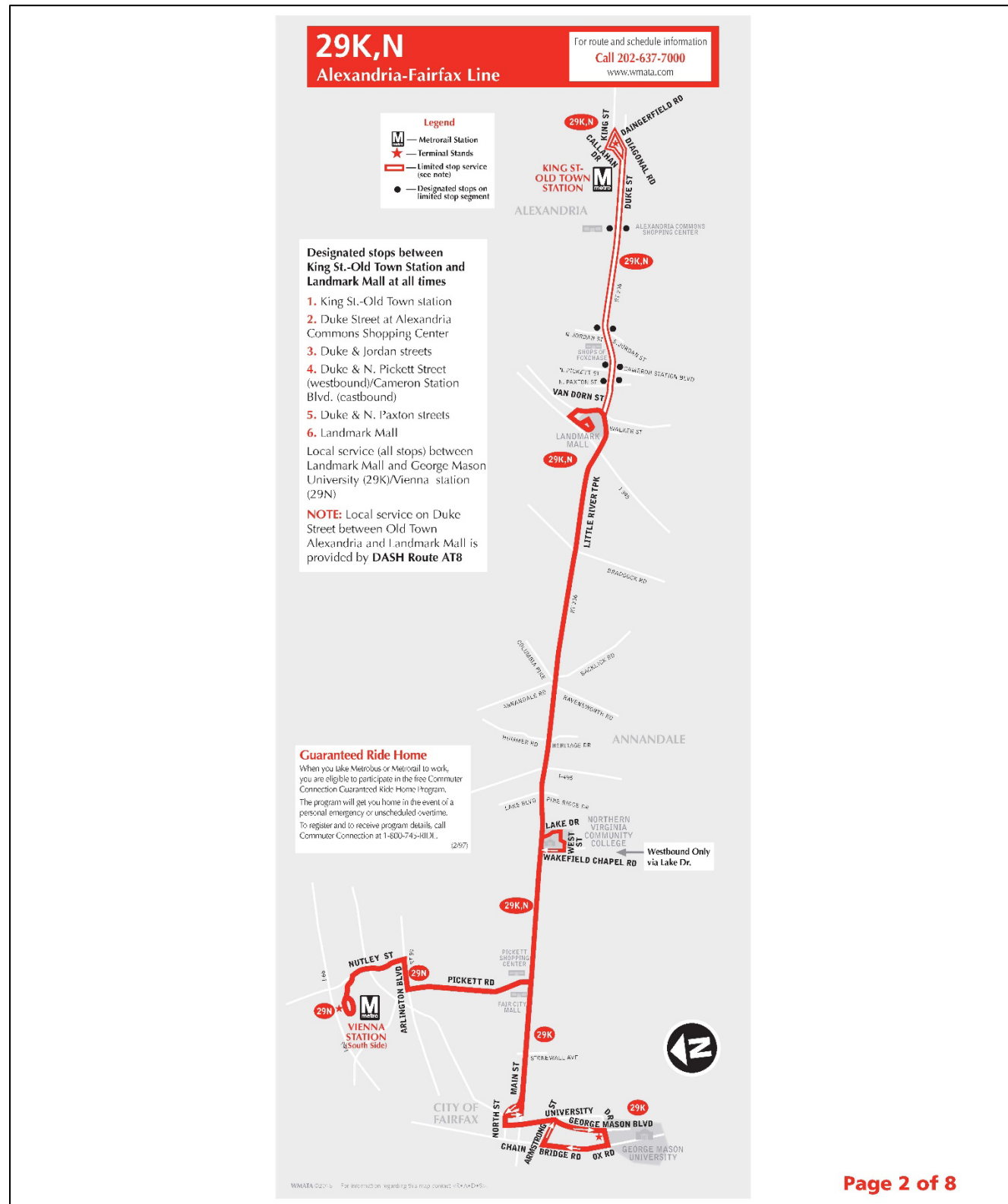


Figure 8: Existing Metrobus Route 29K (Source: WMATA)

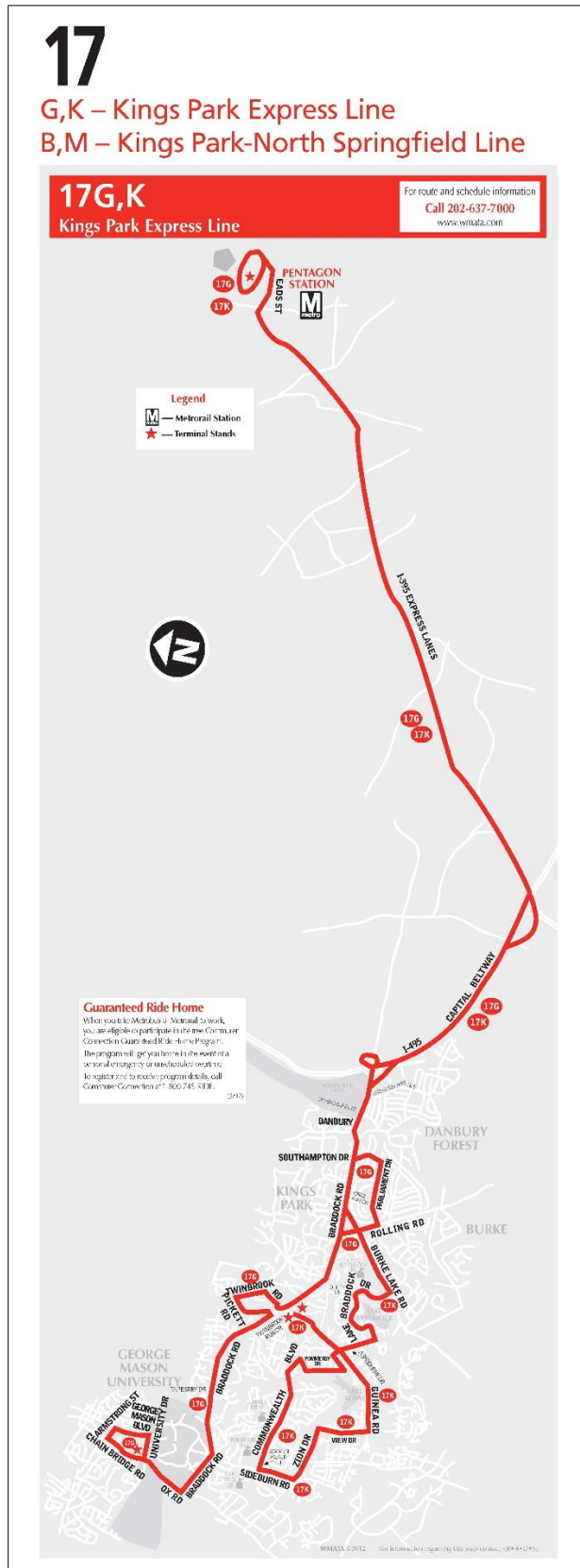


Figure 9: Existing Metrobus Route 17G (Source: WMATA)

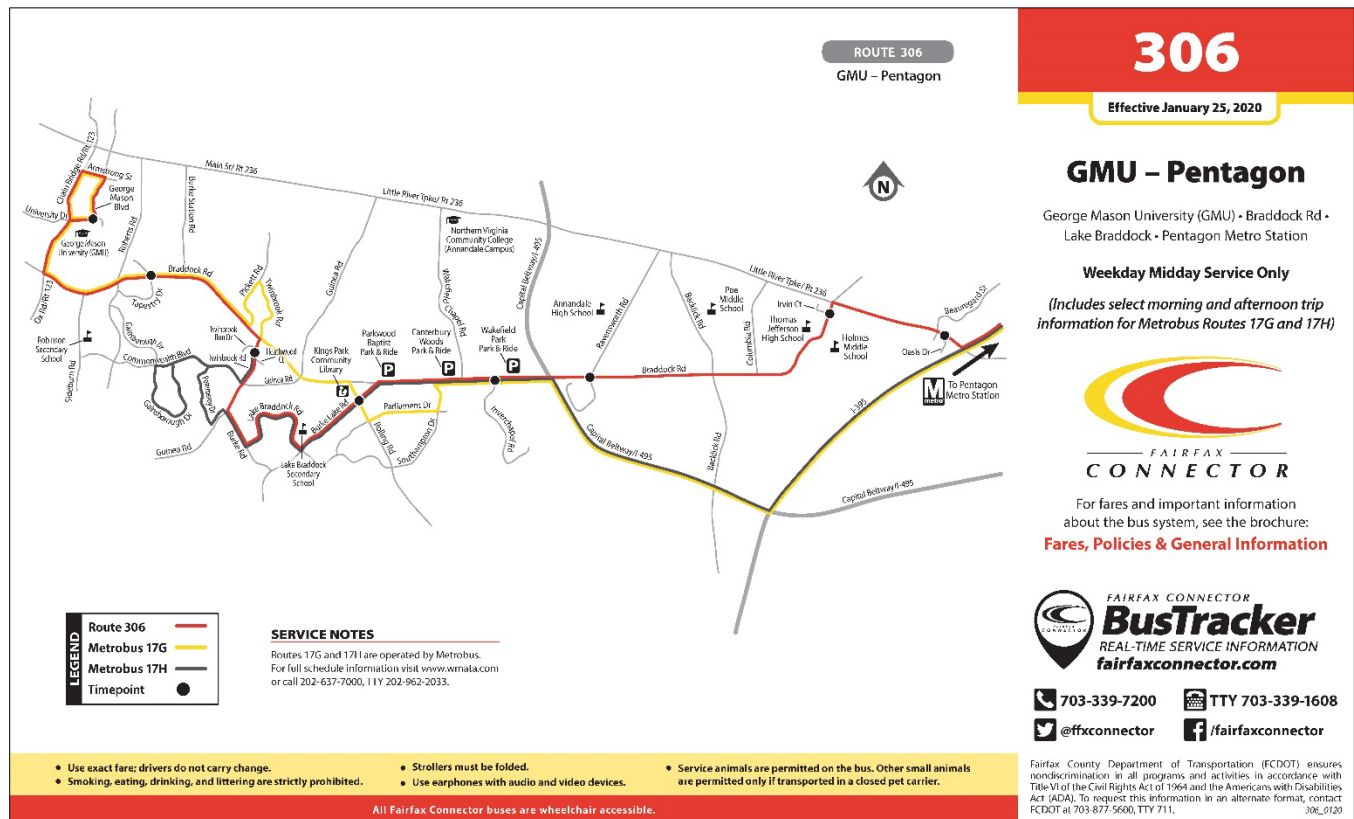


Figure 10: Existing Fairfax Connector Route 306 (Source: Fairfax Connector)

Existing Bicycle Facilities

The roadways adjacent to the site are considered comfortable bicycling routes per the Fairfax County Bicycle Map (which includes the City of Fairfax). Sager Avenue is considered “Most Comfortable”, University Drive is considered “Somewhat Comfortable”, and Chain Bridge Road is considered “Less Comfortable”. Main Street is considered a “Use Caution” bicycling route. A dedicated on-street bike lane currently exists on University Drive adjacent to the site.

The 10-minute, 20-minute, and 30-minute bicycle travel shed for the proposed development is shown in Figure 11. Within a 10-minute bicycle ride, the proposed development has access to several destinations including George Mason University, public transportation stops, residential neighborhoods, retail zones, and community amenities. Within a 20-minute bicycle ride, the proposed development has access to destinations in Fairfax County including residential neighborhoods and retail zones. Within a 30-minute bicycle ride, the proposed development has access to the Town of Vienna, the Mosaic District, and is accessible to the Vienna/Fairfax-GMU Metro station served by the Orange line and the Burke Centre Amtrak/VRE Station.

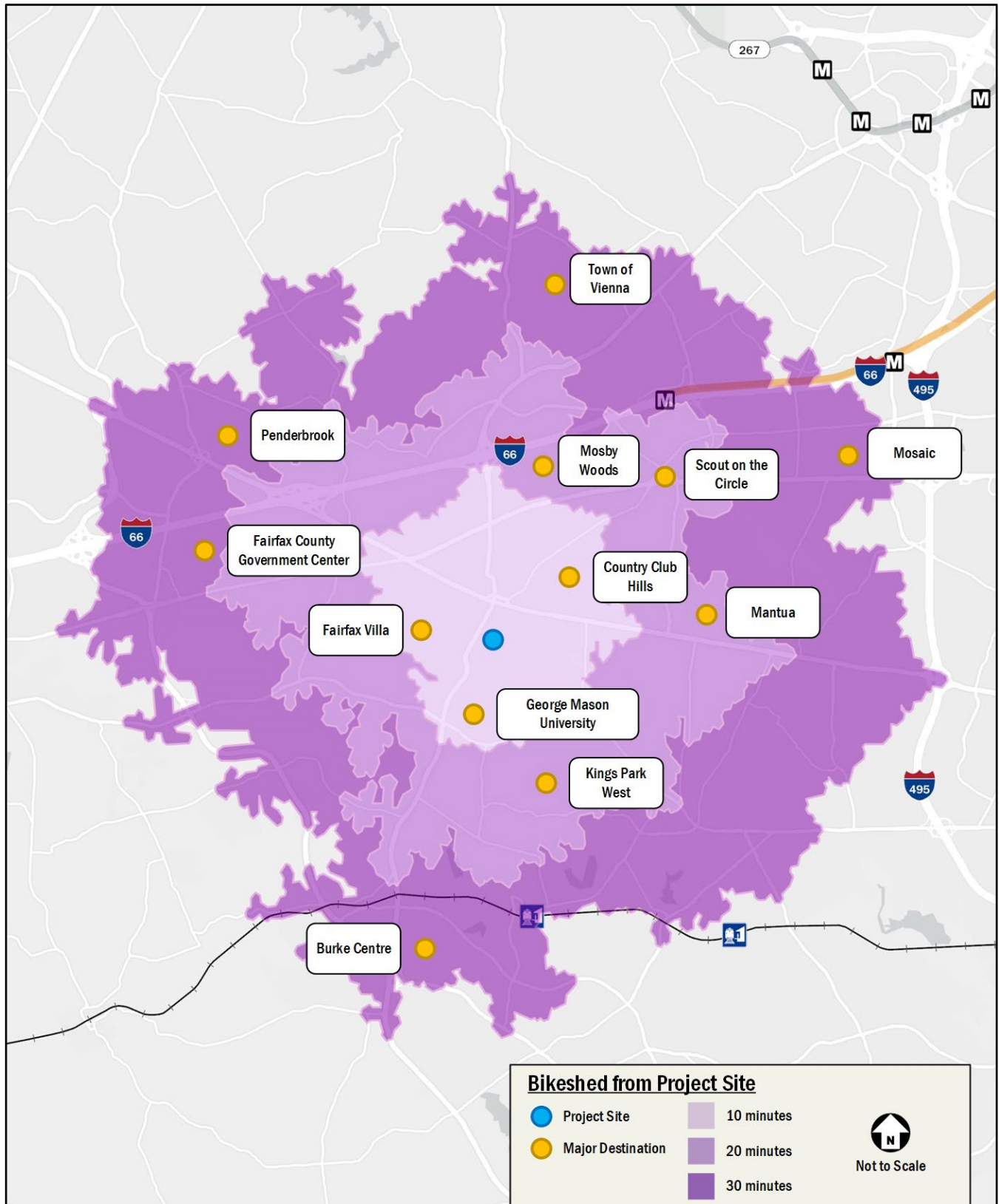


Figure 11: Approximate Bicycle Travel Times

Existing Pedestrian Facilities

Sidewalks and curb ramps generally exist along the corridors adjacent to and within the vicinity of the site. Sidewalks exist on one side of Chain Bridge Road and both sides of University Drive and Sager Avenue along the perimeter of the site, but most driveways lack crosswalks. The signalized intersection of University Drive and Sager Avenue has marked crosswalks with pedestrian signal heads and call buttons in place. The unsignalized intersections of Chain Bridge Road and Sager Avenue and University Drive & Fairfax Volunteer Fire Department Entrance have marked crosswalks in place.

The existing pedestrian infrastructure facilities, including curb ramps, marked striped crossings, and any observed deficiencies are depicted in Figure 12. Of note, this graphic includes these items within a quarter-mile radius walkshed of the site.

The 10-minute, 20-minute, and 30-minute walk travel shed for the proposed development is shown in Figure 13. Within a 10-minute walk, the proposed development has access to several destinations including the Fairfax County Judicial Center, the City of Fairfax Regional Library, public transportation stops, nearby residential neighborhoods, and retail zones. Within a 20-minute walk, the proposed development has access to destinations including City Hall, residential neighborhoods, and retail zones. Within a 30-minute walk, the proposed development has access to destinations including the Stacy C. Sherwood Community Center, United States Postal Service, and residential neighborhoods.

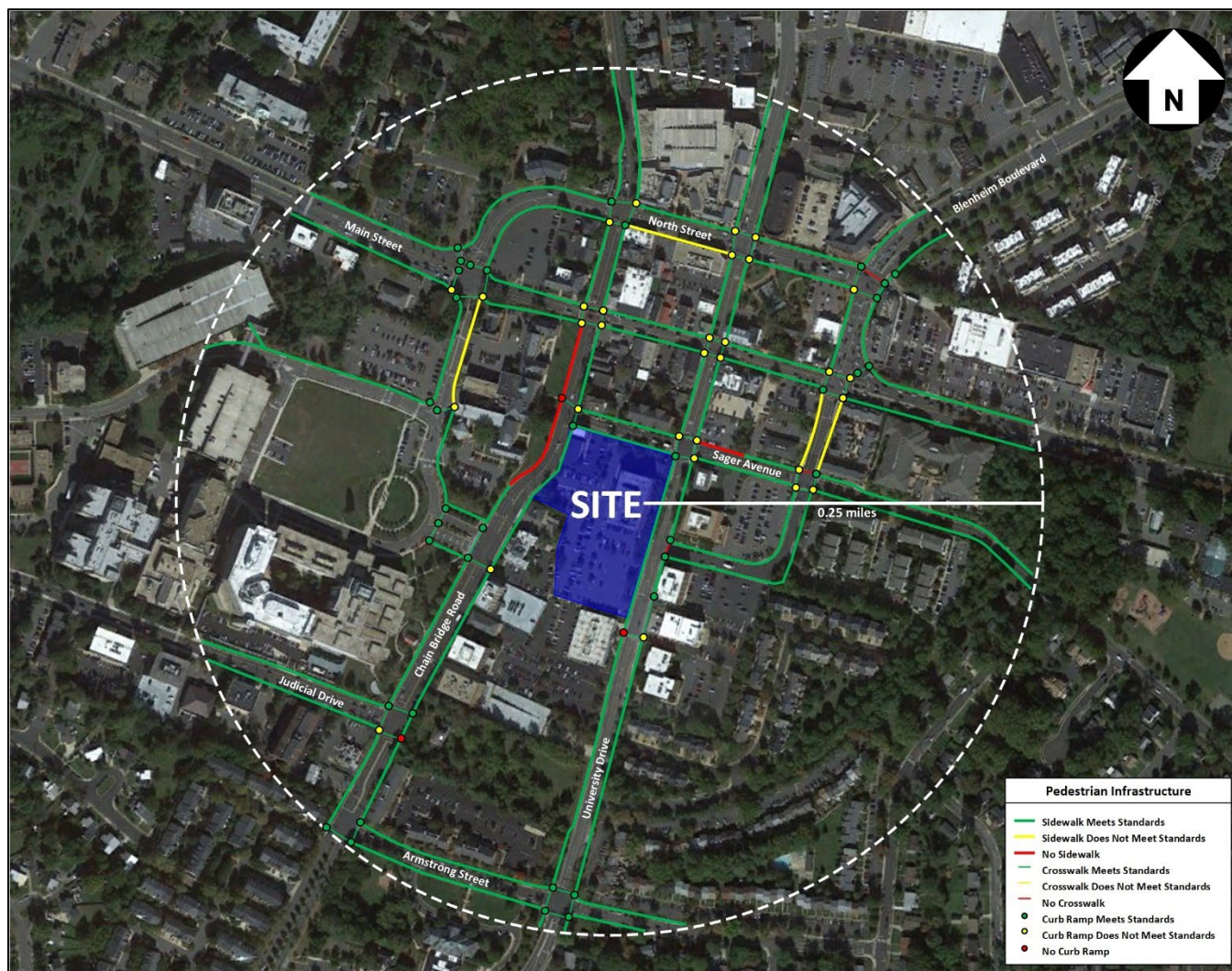


Figure 12: Existing Pedestrian Facilities

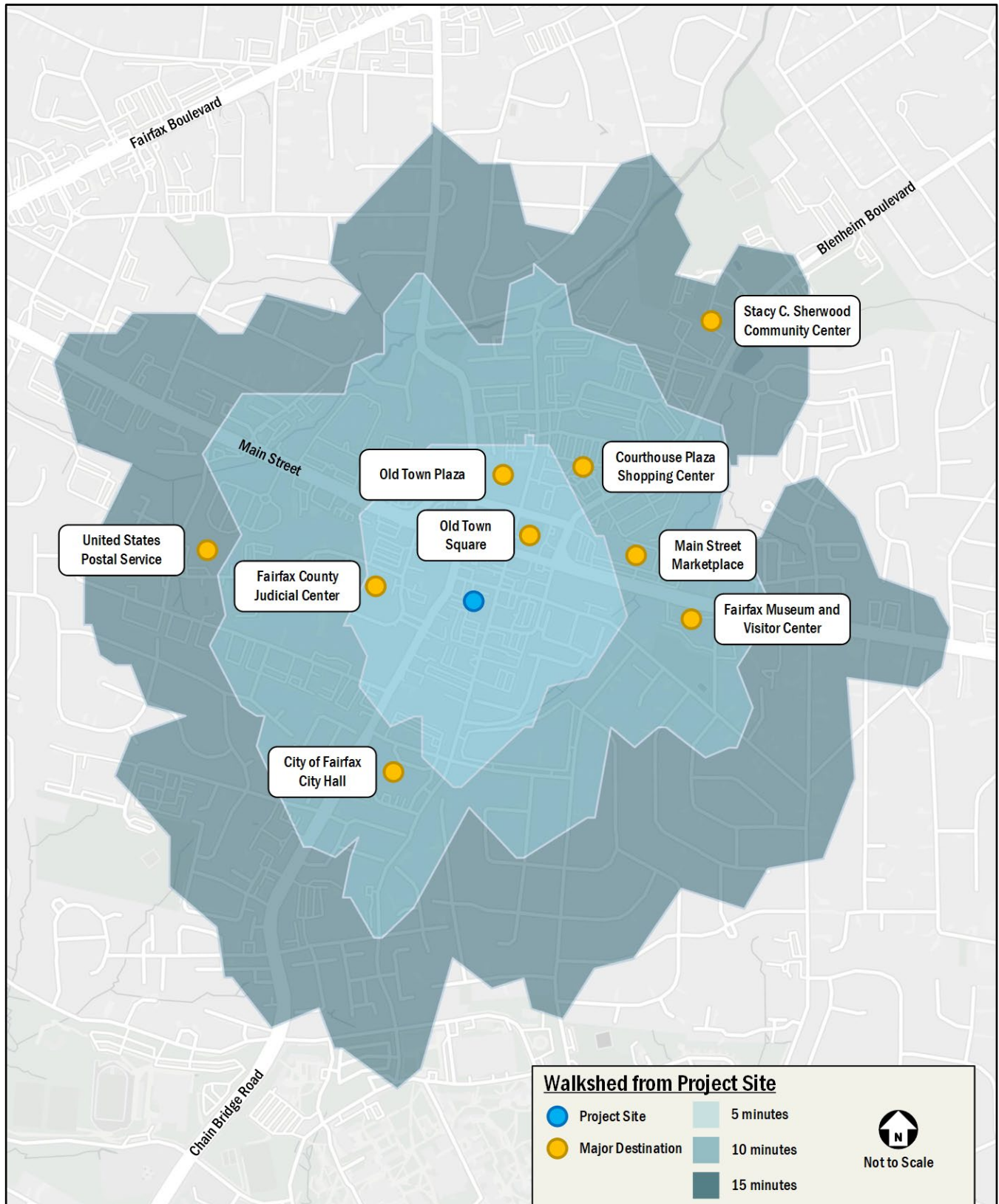


Figure 13: Approximate Pedestrian Travel Times

Existing Roadway Network

A description of the major roadways within the study area is presented in Table 1. The existing lane configurations and traffic control devices at the study intersections are shown in Figure 14.

Table 1: Existing Road Network

Roadway	From	To	VDOT Classification	Lanes	Speed (mph)	On-Street Parking	2019 AADT (vpd)*	2022 AADT (vpd)*
Main Street	Fairfax Boulevard	West Street	Other Principal Arterial	4	25-35	No	38,000	33,075
Main Street	West Street	Old Lee Highway	Other Principal Arterial	2	25	Yes	11,000	9,419
Chain Bridge Road	SCL Fairfax	Judicial Drive	Other Principal Arterial	4	25-30	No	28,000	14,602
Chain Bridge Road	Judicial Drive	Main Street	Other Principal Arterial	4	25	No	22,000	12,517
Sager Avenue	Chain Bridge Road	Dwight Avenue	Local Road	2	25	Yes	2,700	5,752
Judicial Drive	Main Street	Page Avenue	Major Collector	4	25	No	11,000	7,784
Judicial Drive	Page Avenue	Chain Bridge Road	Major Collector	2	25	No	9,000	9,840

* VDOT Annual Average Daily Traffic (AADT) Data

Historical Crash Data

Historical crash data at the existing study intersections was obtained from VDOT for 2017 through 2022. Crash data for the most recent six (6) years (January 2017 to December 2022) is summarized in Table 2.

Table 2: Crash Data (January 2017 – December 2022)

Intersection	Total Number of Crashes	Number of Property Damage Crashes	Number of Crashes Resulting in Injury	Number of Fatal Crash	Intersection Crash Rate (Crashes/million entering vehicles)
1 Main Street and West Street/North Street	29	24	5	0	0.43
2 Chain Bridge Road and North Street	11	8	3	0	0.13
3 University Drive and North Street	14	13	1	0	0.21
4 North Street and Blenheim Boulevard	12	9	3	0	0.18
5 Main Street and East Street/Blenheim Boulevard	7	7	0	0	0.09
6 Main Street and University Drive	13	12	1	0	0.33
7 Main Street and Chain Bridge Road	5	3	2	0	0.08
8 Chain Bridge Road and Sager Avenue	0	0	0	0	0.00
9 Sager Avenue and Site Entrance	0	0	0	0	0.00
10 University Drive and Sager Avenue	15	8	7	0	0.70
11 Sager Avenue and East Street/South Street	1	1	0	0	0.06
12 University Drive and South Street	2	1	1	0	0.10
13 University Drive and Parking Lot	0	0	0	0	0.00
14 University Drive and Armstrong Street	3	2	1	0	0.13
15 Chain Bridge Road and Armstrong Street	2	1	1	0	0.03
16 Chain Bridge Road and Judicial Drive	5	5	0	0	0.09
17 Chain Bridge Road and Humane Society Entrance	0	0	0	0	0.00
Total	119	94	25	0	

* There were one and three pedestrian injury crashes included in number of crashes resulting in injury at Intersection 3 and Intersection 10 respectively

As shown in Table 2, the intersection of Main Street and West Street had the highest number of reported crashes (29) during the six-year study period. The most common crash type was rear end.

The intersection of University Drive and Sager Avenue had the second highest number of reported crashes (15). The most common crash type was angle.

All existing intersections have a crash rate of less than 1.0 crashes per Million Entering Vehicles (MEV) and are not considered high crash intersections.

The crash rates shown for each intersection are calculated as crashes per one million entering vehicles (MEV), and were calculated based on the following formula:

$$Rate_{intersection} = \frac{1,000,000 * \# \text{ of Crashes}}{\# \text{ of Years} * 365 \left(\frac{\text{days}}{\text{year}} \right) * ADT_{approach}}$$

The approach ADT for an intersection is calculated as the sum of each leg, divided by 2.

The crash data provided by VDOT is included in Appendix B.

Existing Traffic Volumes

Turning movement counts were collected at the study area intersections on Tuesday, April 25, 2023, Saturday, April 29, 2023, and Saturday, May 6, 2023. Analysis of the traffic data found the following system peak hours:

- Weekday Morning (AM) Peak Hour: 7:45 AM to 8:45 AM
- Weekday Afternoon (PM) Peak Hour: 4:45 AM to 5:45 PM
- Weekend (Saturday) Peak Hour: 12:45 PM to 1:45 PM

The existing peak hour traffic volumes for the study area intersections are presented in Figure 15. The existing turning movement counts are included in Appendix C.

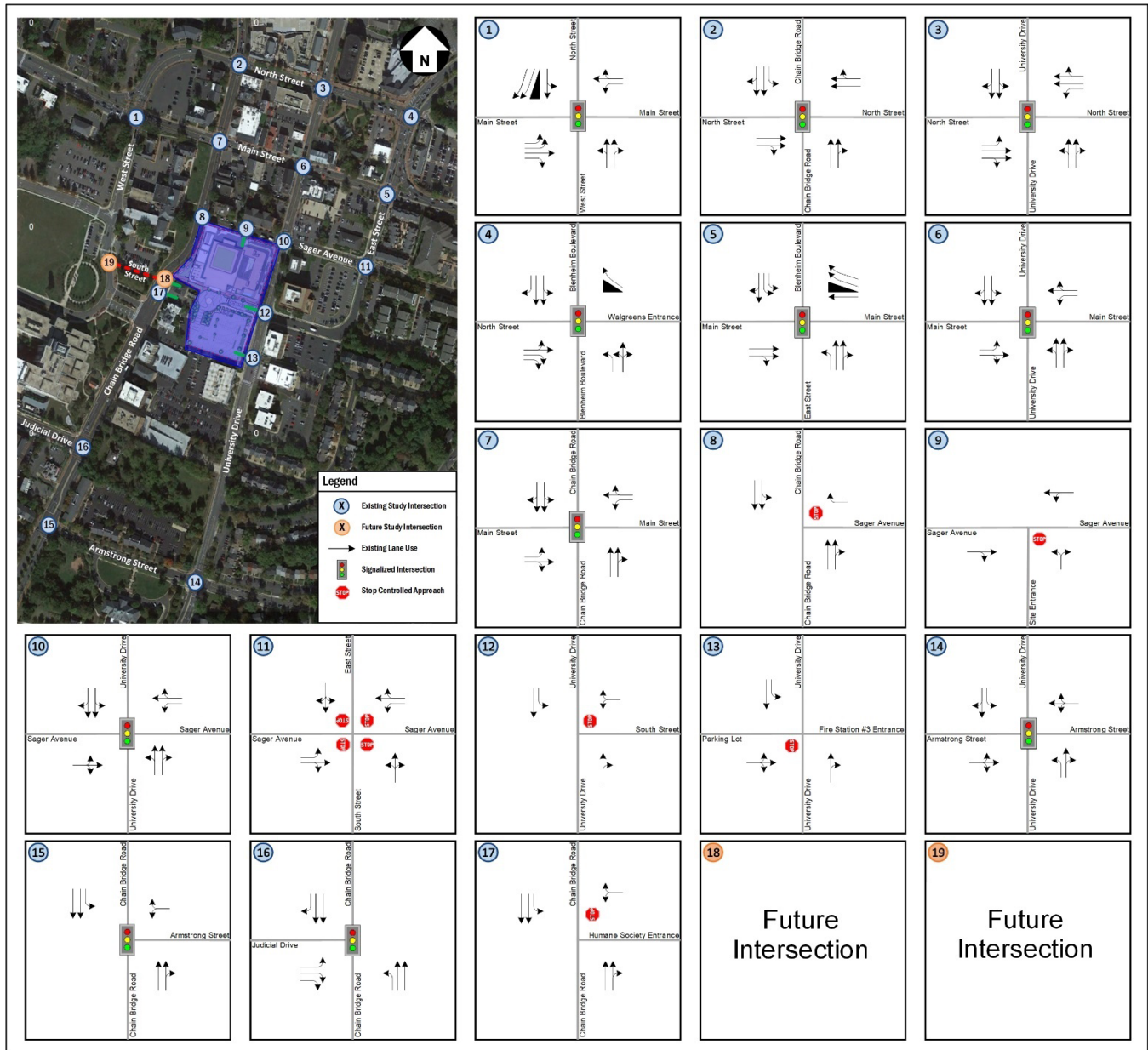


Figure 14: Existing (2023) – Lane Configuration



Figure 15: Existing (2023) – Peak Hour Traffic Volumes

Existing (2023) Intersection Capacity Analysis

Intersection capacity analysis was performed at the intersections within the study area during the weekday AM, weekday PM, and Saturday peak hours under Existing Conditions (2023). *Synchro Version 11* was used to analyze the study intersections based on the *Highway Capacity Manual* (HCM) methodology and includes level of service (LOS), delay, and queue length for the turning movements analyzed.

Existing signal timings were provided by the City and used as a base for the existing analysis. Existing peak hour factors found in the field were used, except where the field peak hour factor was lower than 0.85 in which case a minimum value of 0.85 was used, consistent with VDOT analysis guidelines. Heavy vehicle percentages determined by existing traffic counts were used for analysis. Pedestrian volumes were also collected during the intersection traffic counts and included in the analysis.

SimTraffic was used to run the simulations for the analysis in order to determine the queue. The same network files that were used for the Synchro analysis were used as input for the SimTraffic analysis. As noted in the scoping document, SimTraffic was calibrated for the traffic volumes entering the roadway network. Consistent with the guidelines set forth in VDOT's *Traffic Operations and Safety Analysis Manual* (TOSAM), Table 3 below shows the parameters that were used for the simulation. Per Section 7.6 of the TOSAM all other parameters not addressed in the table should not be modified from the default value.

Table 3: SimTraffic Analysis Input Parameters

SimTraffic (Version 11) Analysis Input Parameters	
Number of Intervals	One seeding interval and four 15 minute recording intervals
Seeding Interval Duration	15 minutes
PHF Adjust	• Selected "Yes" for one of the four, 15 minute recording intervals • Selected "No" for all other intervals
Anti-PHF Adjust	• Selected "Yes" for three, 15 minute recording intervals where PHF Adjust is set to "No" • Selected "No" for the recording interval where PHF Adjust is set to "Yes"
Number of Runs	10

A seeding period is necessary to ensure that the results obtained are not skewed because the network is void of any vehicles prior to seeding. Foregoing seeding would lead to lower travel times and delays for the traffic at the beginning of the simulation. The network reaches a normal state during the seeding period without affecting the results of the simulation.

The results of the intersection capacity analysis are presented in Table 4 and are expressed in LOS and delay (seconds per vehicle) per lane group. The average and maximum queue results from SimTraffic are presented in Table 4 and are expressed in feet. Level of service results are also presented in Figure 16. The detailed analysis worksheets are included in Appendix D.

Table 4: Existing (2023) – Intersection Capacity Analysis

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]
			Synchro		SimTraffic	Synchro		SimTraffic	Synchro		SimTraffic
1	Main Street (EW) and West Street/North Street (NS) Overall Intersection (Signalized)		C	30.0		C	31.3		C	29.8	
	Eastbound Left	665	C	29.0	325	C	30.1	312	C	32.8	271
	Eastbound Thru		C	32.8	485	D	35.2	406	C	34.9	493
	Eastbound Right	125	C	22.4	125	C	26.6	125	C	24.5	89
	Westbound Left	125	D	39.9	124	D	50.2	92	C	34.6	32
	Westbound Thru/Right		C	33.5	266	F	94.9	308	D	44.3	290
	Northbound Left/Thru Thru/Right		E	65.9	107	E	64.1	144	E	57.5	89
	Southbound Left/Thru		D	45.9	202	F	81.0	70	D	38.2	80
	Southbound Right		C	24.7	315	B	11.9	21	B	18.8	315
2	Chain Bridge Road (NS) and North Street (EW) Overall Intersection (Signalized)		B	17.1		D	45.2		B	15.1	
	Eastbound Thru Thru/Right		A	5.6	258	B	11.7	186	B	19.2	228
	Westbound Thru Thru/Right		B	14.0	264	D	50.9	343	A	6.5	140
	Northbound Thru Thru/Right		C	21.0	288	F	84.8	292	B	15.5	269
	Southbound Left	160	C	30.5	144	C	29.6	160	C	23.3	156
	Southbound Thru Thru/Right		C	29.6	452	C	31.2	620	C	23.2	291
3	University Drive (NS) and North Street (EW) Overall Intersection (Signalized)		B	17.1		C	22.1		B	18.9	
	Eastbound Left	215	A	4.5	179	C	21.4	191	B	11.1	120
	Eastbound Thru Thru/Right		A	1.9	208	C	21.1	277	B	14.1	166
	Westbound Left	150	A	2.3	64	A	6.1	149	B	10.2	134
	Westbound Thru Thru/Right		A	2.6	223	B	16.2	386	C	22.4	288
	Northbound Left/Thru Thru/Right		E	71.9	200	B	16.0	99	A	9.6	87
	Southbound Left/Thru Thru/Right		E	69.1	230	D	41.2	365	C	30.5	218
4	North Street (EW) and Blenheim Boulevard (NS) Overall Intersection (Signalized)		C	30.0		C	31.0		C	26.8	
	Eastbound Left/Thru		F	90.9	140	F	97.7	140	D	45.8	140
	Eastbound Right		A	2.0	323	A	2.8	295	B	15.5	297
	Westbound Right		A	0.0	0	A	0.1	0	A	0.1	0
	Northbound Left		B	14.3	318	B	14.3	405	B	18.7	376
	Northbound Left/Thru/Right		B	14.1	367	B	14.2	381	B	18.7	374
	Southbound Left/Thru Thru		E	73.0	237	F	83.4	634	D	52.8	219
	Southbound Right	750	E	57.4	164	D	51.1	632	D	45.5	160
5	Main Street (EW) and East Street/Blenheim Boulevard (NS) Overall Intersection (Signalized)		C	23.7		C	27.3		C	24.7	
	Eastbound Thru Thru/Right		C	34.6	282	D	51.1	315	D	47.9	310
	Westbound Thru		D	42.2	224	D	52.7	225	C	32.5	224
	Westbound Right		A	3.4	309	A	8.4	602	B	15.3	423
	Northbound Left	105	D	51.4	92	D	51.3	104	D	48.9	71
	Northbound Thru Thru/Right		E	58.3	201	E	62.3	275	D	53.3	172
	Southbound Left		B	17.6	263	B	12.0	302	A	7.6	290
	Southbound Thru/Right		D	41.8	243	D	40.9	292	C	20.7	266
6	Main Street (EW) and University Drive (NS) Overall Intersection (Signalized)		C	20.4		B	16.3		B	18.0	
	Eastbound Left	90	A	2.1	42	B	12.5	62	A	3.6	69
	Eastbound Thru/Right		A	3.0	120	B	15.4	197	A	5.6	185
	Westbound Left	125	A	0.1	83	A	8.0	90	A	2.3	81
	Westbound Thru/Right		A	0.7	43	B	10.3	128	A	3.3	124
	Northbound Left/Thru Thru/Right		E	62.3	102	C	28.4	103	D	53.9	103
	Southbound Left/Thru Thru/Right		C	30.4	160	B	12.3	132	D	36.1	197
7	Main Street (EW) and Chain Bridge Road (NS) Overall Intersection (Signalized)		C	28.5		D	37.4		C	20.5	
	Eastbound Left	125	A	9.4	53	A	9.7	90	A	5.1	89
	Eastbound Thru/Right		B	13.3	259	B	17.2	301	B	14.9	296
	Westbound Left	200	E	74.2	167	F	87.2	196	E	73.0	165
	Westbound Thru/Right		B	14.8	190	B	10.2	264	B	10.0	140
	Northbound Thru Thru/Right		D	44.3	322	D	43.9	314	C	27.2	292
	Southbound Left/Thru Thru/Right		B	11.0	150	D	43.6	288	A	8.9	142
8	Chain Bridge Road (NS) and Sager Avenue (EW) Overall Intersection (Unsignalized)										
	Westbound Right		B	12.4	87	B	11.7	128	B	11.6	79
	Southbound Left/Thru Thru		A	2.7	164	A	2.2	275	A	2.6	90
9	Sager Avenue (EW) and Site Entrance (NS) Overall Intersection (Unsignalized)										
	Westbound Left/Thru		A	1.2	24	A	0.7	21	A	0.9	15
	Northbound Left/Right		A	9.0	24	A	9.3	52	A	9.2	41
10	University Drive (NS) and Sager Avenue (EW) Overall Intersection (Signalized)		B	11.2		B	10.2		A	10.0	
	Eastbound Left/Thru/Right		C	33.1	119	D	36.2	182	C	24.9	104
	Westbound Left	130	C	29.5	102	C	27.7	102	C	24.5	49
	Westbound Thru/Right		C	30.1	135	C	27.6	131	C	25.5	117
	Northbound Left/Thru Thru/Right		A	2.8	84	A	3.7	97	A	3.2	80
	Southbound Left/Thru Thru/Right		A	0.7	81	A	1.1	111	A	1.8	80

No.	Intersection (Movement)	Effective Storage Length (ft.) ^[1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay (sec/veh)	Ave. Max Queue (ft.) ^[4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) ^[4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) ^[4]
			Synchro		SimTraffic	Synchro		SimTraffic	Synchro		SimTraffic
11	Sager Avenue (EW) and South Street/East Street (NS) Overall Intersection (Unsignalized)										
	Eastbound Left	90	A	8.2	55	A	9.7	88	A	7.9	45
	Eastbound Thru/Right		A	7.8	61	B	10.7	251	A	7.8	56
	Westbound Left	80	A	7.8	63	A	9.1	80	A	7.7	40
	Westbound Thru/Right		A	9.7	104	B	11.4	397	A	8.8	99
	Northbound Left/Thru/Right		A	8.9	74	B	11.3	380	A	8.4	64
	Southbound Left/Thru/Right		A	9.3	147	B	13.2	252	A	9.1	120
12	University Drive (NS) and South Street (EW) Overall Intersection (Unsignalized)										
	Westbound Left/Right		B	13.9	72	C	17.3	92	B	11.7	64
	Southbound Left		A	8.0	25	A	8.3	21	A	7.8	9
13	University Drive (NS) and Parking Lot/Fire Station #3 Entrance (EW) Overall Intersection (Unsignalized)										
	Eastbound Left/Thru/Right		B	11.2	33	B	12.7	46	B	10.2	33
	Southbound Left	85	A	7.9	2	A	8.3	5	A	9.0	10
14	University Drive/George Mason Boulevard (NS) and Armstrong Street (EW) Overall Intersection (Signalized)										
	Eastbound Left/Thru/Right		B	11.8		B	12.5		B	11.4	
	Westbound Left/Thru/Right		B	16.7	130	C	20.1	128	B	19.5	114
	Northbound Left	160	B	15.6	91	B	19.0	118	B	16.5	87
	Northbound Thru/Right		A	7.8	31	A	7.4	65	A	6.8	30
	Southbound Left	230	B	10.2	31	A	9.6	177	A	8.2	120
	Southbound Thru/Right		A	7.8	37	A	7.2	79	A	6.8	120
			B	10.5	194	B	11.3	232	A	8.5	141
15	Chain Bridge Road (NS) and Armstrong Street (EW) Overall Intersection (Signalized)										
	Westbound Left/Right		A	7.3		B	17.0		A	8.1	
	Northbound Thru Thru/Right		E	65.0	182	E	69.5	283	D	36.9	114
	Southbound Left	80	A	5.0	227	C	22.0	376	A	9.0	236
	Southbound Thru		A	9.3	79	A	2.5	73	A	3.7	76
			A	2.1	215	A	2.3	252	A	3.4	186
16	Chain Bridge Road (NS) and Judicial Drive (EW) Overall Intersection (Signalized)										
	Eastbound Left	410	B	15.0		B	15.4		B	10.2	
	Eastbound Right		E	70.6	153	E	66.3	170	E	59.7	90
	Northbound Left	160	D	50.4	85	D	45.6	117	D	48.0	82
	Northbound Thru		A	5.4	160	B	15.8	161	A	1.8	135
	Southbound Thru		A	5.7	289	A	1.4	282	A	1.8	162
	Southbound Left	240	B	19.7	252	A	8.3	174	A	5.2	182
	Southbound Right		D	37.1	117	A	5.9	47	A	4.3	54
17	Chain Bridge Road (NS) and Humane Society Driveway (EW) Overall Intersection (Unsignalized)										
	Westbound Left/Right		A	0.0	0	A	0.0	0	C	15.0	40
	Southbound Left	90	A	0.0	0	A	0.0	0	A	9.3	21

NOTES:

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

[2] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

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

[4] Max queues are based on results from SimTraffic. Per TOSAM guidelines, the queues are based on the average to 10 simulations.

[5] 50th Percentile Queues are not reported for TWSC intersections under HCM Methodology.

For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of D or better for each lane group at the study intersections.

The intersection capacity analysis results show that the following nine (9) intersections have movements that operate below the acceptable levels of service during one or more peak hours under Existing Conditions (2023):

- Intersection 1: Main Street and West Street/North Street
 - Westbound Thru/Right (PM Peak)
 - Northbound Left/Thru, Thru/Right (AM, PM, and SAT Peaks)
 - Southbound Left/Thru (PM Peak)
- Intersection 2: Main Street and North Street
 - Northbound Thru, Thru/Right (PM Peak)
- Intersection 3: University Drive and North Street
 - Northbound Left/Thru, Thru/Right (AM Peak)
 - Southbound Left/Thru, Thru/Right (AM Peak)
- Intersection 4: North Street and Blenheim Boulevard
 - Eastbound Left/Thru (AM and PM Peaks)
 - Southbound Left/Thru, Thru (AM and PM Peaks)
 - Southbound Right (AM Peak)
- Intersection 5: Main Street and East Street/Blenheim Boulevard
 - Northbound Thru, Thru/Right (AM and PM Peaks)
- Intersection 6: Main Street and University Drive
 - Northbound Left/Thru, Thru/Right (AM Peak)
- Intersection 7: Main Street and Chain Bridge Road
 - Westbound Left (AM, PM, and SAT Peaks)
- Intersection 15: Chain Bridge Road and Armstrong Street
 - Westbound Left/Right (AM and PM Peaks)
- Intersection 16: Chain Bridge Road and Judicial Drive
 - Eastbound Left (AM, PM, and SAT Peaks)



Figure 16: Existing (2023) – Levels of Service

Future Conditions without Development (2026)

Future without Development (2026) Traffic Volumes

The proposed The Ox Fairfax – Block A redevelopment is anticipated to be complete in 2026. The future background traffic volumes were projected by increasing the existing volumes to 2026 using an inherent growth rate. Historical ADT data is shown in Table 5. As determined based on discussions with the City, a growth rate of one (1) percent per year was applied to existing traffic volumes on major movements as shown in Figure 17.

Table 5: Historical Growth Rate

Route	From	To	AADT						Annual % Change (2015-2019)	Annual % Change (2015-2021)
			2015	2016	2017	2018	2019	2021		
Main Street	Fairfax Boulevard	West Street	35,000	35,000	36,000	38,000	38,000	32,000	2.1%	-1.8%
Main Street	West Street	Old Lee Highway	13,000	13,000	11,000	11,000	11,000	8,900	-4.1%	-7.3%
Chain Bridge Road	Judicial Drive	Main Street	20,000	21,000	21,000	21,000	22,000	14,000	2.4%	-7.8%
University Drive	Armstrong Street	South Street	14,000	14,000	14,000	14,000	15,000	12,000	1.7%	-3.0%
University Drive	South Street	Main Street	12,000	12,000	11,000	11,000	11,000	5,700	-2.2%	-13.8%
Sager Avenue	Chain Bridge Road	Dwight Avenue	2,700	2,700	2,700	2,700	2,700	2,200	0.0%	-4.0%

Source: VDOT Traffic Data (<http://www.virginiadot.org/info/ct-trafficcounts.asp>)

In addition to the regional background growth, four (4) planned yet currently unbuilt developments in the vicinity of the site were taken into consideration. As discussed at the scoping meeting, the following developments were included in the 2026 analysis:

- **One University** – One University is a 10.8-acre site is located adjacent to the George Mason University campus in Fairfax County. For the purposes of this analysis, the One University site was anticipated to include 120 affordable senior independent dwelling units, 120 affordable multifamily dwelling units, and 360 student housing dwelling units.
- **West Drive Homes** – West Drive Homes is a 0.55-acre site located at 10642 West Drive in the City of Fairfax. For the purposes of this analysis, the West Drive Homes site was anticipated to include two (2) single-family homes and four (4) duplexes.
- **Fairfax County Judicial Complex** – The Judicial Complex is a 47.8-acre portion of Fairfax County surrounded by the City of Fairfax. A new Master Plan for the complex was completed in January 2021. Building One of the redevelopment project was assumed to be in place by 2025. For the purposes of this analysis, Building One was anticipated to included 60,317 SF of government related uses (records and evidence storage) and 89,683 SF of office uses. It should be noted that the entitlement for Phase 1 of the Fairfax County Judicial Complex is not yet approved.
- **City Centre West** – The City Centre West is a 2.12-acre site located adjacent to the Fairfax County Judicial Complex in the City of Fairfax. For the purposes of this analysis, the City Centre West site was anticipated to include 79 multifamily units, 27,793 SF of general office, 8,584 SF of medical office, 3,866 SF of retail, a 3,510 SF bank, and a 3,865 SF restaurant.

The background growth is shown in Figure 17 and the background development volumes are show in Figure 18.

The trips generated by background growth and background development were added to the existing volumes in order to generate the Future Conditions without Development (2025) traffic volumes presented in Figure 19.



Figure 17: Background Growth (2026)



Figure 18: Background Development (2026) – Peak Hour Traffic Volumes

Note: The volumes above reflect a total of the rerouting of existing trips, addition of pass-by trips of the background developments, and addition of the background development site trips, consistent with methodology of the respective traffic studies; therefore, volumes presented above may be shown as negative.



Figure 19: Future without Development (2026) – Peak Hour Traffic Volumes

Future without Development (2026) Intersection Capacity Analysis

Intersection capacity analysis was performed at the intersections within the study area during the weekday AM, weekday PM, and Saturday peak hours under Future Conditions without Development (2026). *Synchro Version 11* was used to analyze the study intersections based on the *Highway Capacity Manual* (HCM) methodology and includes level of service (LOS), delay, and queue length for the turning movements analyzed.

Signal phasing and timings were not changed from the existing conditions. A peak hour factor of 0.92 was used, unless the peak hour collected in the field was higher.

The results of the intersection capacity analysis are presented in Table 6 and are expressed in LOS and delay (seconds per vehicle) per lane group. The average and maximum queue results from SimTraffic are presented in Table 6 and are expressed in feet. Level of service results are also presented in Figure 20. The detailed analysis worksheets are included in Appendix E.

Table 6: Future without Development (2026) – Intersection Capacity Analysis

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]
			Synchro		SimTraffic	Synchro		SimTraffic	Synchro		SimTraffic
1	Main Street (E/W) and West Street/North Street (N/S) Overall Intersection (Signalized) Eastbound Left Eastbound Thru Eastbound Right Westbound Left Westbound Thru/Right Northbound Left/Thru Thru/Right Southbound Left/Thru Thru/Right Southbound Right	665 125 125 	C C D C D E D C	33.7 31.0 35.3 23.8 40.6 64.1 35.3 52.7 27.6	350 510 125 125 248 120 249 325	C C D C D E E B	34.9 33.9 40.5 28.9 51.0 96.2 63.9 78.6 10.8	378 511 124 125 298 194 128 76	D D D C D D C D	39.4 36.9 40.4 26.9 31.9 44.4 54.2 23.1 39.7	654 756 115 124 297 108 217 325
2	Chain Bridge Road (N/S) and North Street (E/W) Overall Intersection (Signalized) Eastbound Thru Thru/Right Westbound Thru Thru/Right Northbound Thru Thru/Right Southbound Left Southbound Thru Thru/Right	 160	B A B B C C	16.9 7.8 15.8 16.8 30.0 29.1	258 296 287 136 513	D B D F C C	45.0 13.9 50.8 82.6 30.7 32.2	256 338 300 160 621	B B A B C C	15.2 16.2 7.3 16.9 23.9 23.7	249 194 274 159 356
3	University Drive (N/S) and North Street (E/W) Overall Intersection (Signalized) Eastbound Left Eastbound Thru Thru/Right Westbound Left Westbound Thru Thru/Right Northbound Left/Thru Thru/Right Southbound Left/Thru Thru/Right	215 150 	B A A A A E E	16.4 6.0 2.0 2.7 3.2 58.8 68.5	187 226 99 236 197 228	C D C A B B D	24.6 36.9 23.9 6.9 17.9 16.5 42.4	215 149 388 218 766	B B B A C B C	18.1 11.6 10.7 9.5 22.9 10.1 31.0	134 169 133 334 89 233
4	North Street (E/W) and Blenheim Boulevard (N/S) Overall Intersection (Signalized) Eastbound Left/Thru Eastbound Right Westbound Right Northbound Left Northbound Left/Thru/Right Southbound Left/Thru Thru Southbound Right	 750	C F A A B B E E	30.7 93.9 2.5 0.0 14.1 13.9 71.7 57.6	140 326 0 343 367 235 164	D F A A B B F D	37.3 155.3 2.6 0.1 14.8 14.7 89.0 51.3	140 359 11 385 386 636 624	C D B A C D D	28.5 48.0 18.3 0.1 20.2 20.1 52.1 45.2	140 302 0 373 378 227 190
5	Main Street (E/W) and East Street/Blenheim Boulevard (N/S) Overall Intersection (Signalized) Eastbound Thru Thru/Right Westbound Thru Westbound Right Northbound Left Northbound Thru Thru/Right Southbound Left Southbound Thru/Right	 105 	C D D A A D E B D	24.2 37.2 44.1 3.4 51.4 58.3 17.1 41.3	304 223 390 90 181 273 250	C E E A D E B D	29.0 55.9 59.7 8.4 51.3 62.3 12.1 42.1	299 225 602 104 280 311 285	C D C B D A B	24.3 46.5 33.8 15.0 49.1 53.4 6.9 18.8	317 225 516 78 146 285 263
6	Main Street (E/W) and University Drive (N/S) Overall Intersection (Signalized) Eastbound Left Eastbound Thru/Right Westbound Left Westbound Thru/Right Northbound Left/Thru Thru/Right Southbound Left/Thru Thru/Right	90 125 	C A A A A E D	21.0 2.7 4.3 0.2 0.8 62.9 36.1	49 160 86 69 105 178	B B A B C B	16.4 13.8 17.3 7.7 10.1 28.4 11.8	80 198 96 191 114 158	B A A A D D	17.6 3.5 6.1 2.4 3.5 54.0 36.0	84 231 80 151 105 186
7	Main Street (E/W) and Chain Bridge Road (N/S) Overall Intersection (Signalized) Eastbound Left Eastbound Thru/Right Westbound Left Westbound Thru/Right Northbound Thru Thru/Right Southbound Left/Thru Thru/Right	125 200 	C A B E B D B	28.1 9.8 13.1 75.2 16.6 42.0 11.3	63 249 167 242 323 181	D C B F B D D	39.2 12.6 23.2 91.1 10.5 44.1 43.9	119 307 198 276 322 306	C A B E A C A	21.3 6.2 15.2 76.1 9.9 27.9 8.9	124 311 190 207 298 185
8	Chain Bridge Road (N/S) and Sager Avenue (E/W) Overall Intersection (Unsignalized) Westbound Right Southbound Left/Thru Thru	 	B A	11.7 2.5	82 166	B A	11.4 2.1	150 286	B A	10.6 2.4	84 109

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]
			Synchro		SimTraffic	Synchro		SimTraffic	Synchro		SimTraffic
9	Sager Avenue (E/W) and Site Entrance (N/S) Overall Intersection (Unsignalized)										
	Westbound Left/Thru		A	1.3	33	A	0.8	54	A	0.9	26
	Northbound Left/Right		A	9.0	30	A	9.2	80	A	9.1	58
10	University Drive (N/S) and Sager Avenue (E/W) Overall Intersection (Signalized)										
	Eastbound Left/Thru/Right	130	B	10.9		B	10.1		A	9.8	
	Westbound Left		C	31.4	117	D	36.2	187	C	24.7	96
	Westbound Thru/Right		C	29.5	80	C	27.7	104	C	24.5	51
	Northbound Left/Thru Thru/Right		C	30.0	124	C	27.6	174	C	25.5	134
	Southbound Left/Thru Thru/Right		A	2.8	81	A	3.7	135	A	3.2	86
			A	0.8	91	A	1.1	117	A	1.7	80
11	Sager Avenue (E/W) and South Street/East Street (N/S) Overall Intersection (Unsignalized)										
	Eastbound Left	90	A	8.0	44	A	9.5	89	A	7.9	42
	Eastbound Thru/Right		A	7.7	72	A	10.4	251	A	7.8	65
	Westbound Left	80	A	7.7	59	A	9.0	80	A	7.7	46
	Westbound Thru/Right		A	9.2	99	A	11.0	400	A	8.7	116
	Northbound Left/Thru/Right		A	8.7	67	A	11.0	398	A	8.3	57
	Southbound Left/Thru/Right		A	9.0	164	A	12.8	251	A	9.0	126
12	University Drive (N/S) and South Street (E/W) Overall Intersection (Unsignalized)										
	Westbound Left/Right		B	13.8	77	C	18.7	93	B	11.5	75
	Southbound Left		A	8.0	28	A	8.3	21	A	7.7	12
13	University Drive (N/S) and Parking Lot/Fire Station #3 Entrance (E/W) Overall Intersection (Unsignalized)										
	Eastbound Left/Thru/Right		B	11.0	30	B	12.3	53	B	10.0	38
	Southbound Left	85	A	7.9	2	A	8.2	9	A	8.9	5
14	University Drive/George Mason Boulevard (N/S) and Armstrong Street (E/W) Overall Intersection (Signalized)										
	Eastbound Left/Thru/Right		B	11.7		B	13.0		B	11.4	
	Westbound Left/Thru/Right		B	16.6	96	C	22.3	143	B	19.6	122
	Northbound Left	160	B	15.7	96	C	20.5	124	B	16.5	87
	Northbound Thru/Right		A	7.9	41	A	6.7	93	A	6.8	31
	Southbound Left	230	B	10.1	134	A	9.2	180	A	8.3	163
	Southbound Thru/Right		A	7.8	37	A	7.5	54	A	6.8	43
			B	10.4	184	B	11.7	259	A	8.6	162
15	Chain Bridge Road (N/S) and Armstrong Street (E/W) Overall Intersection (Signalized)										
	Westbound Left/Right		A	8.3		B	17.1		A	8.9	
	Northbound Thru Thru/Right		E	65.0	184	E	69.7	356	D	35.3	161
	Southbound Left	80	A	6.0	362	C	24.0	485	B	10.3	294
	Southbound Thru		B	19.9	77	A	2.4	78	A	4.5	79
			A	1.9	169	A	2.2	259	A	4.0	223
16	Chain Bridge Road (N/S) and Judicial Drive (E/W) Overall Intersection (Signalized)										
	Eastbound Left	410	B	14.5		B	17.4		A	9.6	
	Eastbound Right		E	70.1	136	E	66.3	363	E	59.7	98
	Northbound Left	160	D	47.6	76	D	42.8	557	D	47.8	80
	Northbound Thru		A	6.0	160	D	35.2	160	A	2.0	149
	Southbound Thru		A	6.2	292	A	1.5	312	A	1.9	196
	Southbound Right	240	B	19.7	260	B	10.3	231	A	5.5	218
			C	34.5	136	A	7.3	69	A	4.4	78
17	Chain Bridge Road (N/S) and Humane Society Driveway (E/W) INTERSECTION REMOVED										
18	Chain Bridge Road (N/S) and South Street/Humane Society Entrance (E/W) Overall Intersection (Signalized)										
	Eastbound Left/Thru		A	3.4		A	9.3		A	7.4	
	Eastbound Right		E	66.5	66	E	65.0	129	E	62.4	41
	Westbound Left/Thru/Right		E	64.3	58	E	61.5	100	E	60.9	47
	Northbound Left	230	A	0.0	0	A	0.0	0	A	0.0	60
	Northbound Thru Thru/Right		A	1.5	163	A	1.8	230	A	2.8	56
	Southbound Left		A	2.0	196	A	1.9	412	A	4.9	155
	Southbound Thru Thru/Right		A	0.0	0	A	0.0	0	A	0.0	30
			A	1.2	97	A	6.9	248	A	6.0	288
19	West Street (N/S) and South Street (E/W) Overall Intersection (Unsignalized)										
	Eastbound Left/Thru/Right		A	0.8	15	A	1.2	34	A	1.9	6
	Southbound Left/Thru/Right		B	10.4	42	B	10.3	38	A	9.0	43

NOTES:

- [1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.
[2] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.
[3] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.
[4] Max queues are based on results from SimTraffic. Per TOSAM guidelines, the queues are based on the average to 10 simulations.
[5] 50th Percentile Queues are not reported for TWSC intersections under HCM Methodology.
[6] ~: Volume exceeds capacity, queue is theoretically infinite.

For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of D or better for each lane group at the study intersections.

The intersection capacity analysis results show that the following ten (10) intersections have movements that operate below the acceptable levels of service during one or more peak hours under Future Conditions without Development (2026). Movements in **bold** operate below acceptable levels of service under Existing Conditions (2023):

- Intersection 1: Main Street and West Street/North Street
 - **Westbound Thru/Right (PM Peak)**
 - **Northbound Left/Thru, Thru/Right (AM and PM Peaks)**
 - **Southbound Left/Thru (PM Peak)**
- Intersection 2: Main Street and North Street
 - **Northbound Thru, Thru/Right (PM Peak)**
- Intersection 3: University Drive and North Street
 - **Northbound Left/Thru, Thru/Right (AM Peak)**
 - **Southbound Left/Thru, Thru/Right (AM Peak)**
- Intersection 4: North Street and Blenheim Boulevard
 - **Eastbound Left/Thru (AM and PM Peaks)**
 - **Southbound Left/Thru, Thru (AM and PM Peaks)**
 - **Southbound Right (AM Peak)**
- Intersection 5: Main Street and East Street/Blenheim Boulevard
 - Eastbound Thru, Thru/Right (PM Peak)
 - Westbound Thru (PM Peak)
 - **Northbound Thru, Thru/Right (AM and PM Peaks)**
- Intersection 6: Main Street and University Drive
 - **Northbound Left/Thru, Thru/Right (AM Peak)**
- Intersection 7: Main Street and Chain Bridge Road
 - **Westbound Left (AM, PM, and SAT Peaks)**
- Intersection 15: Chain Bridge Road and Armstrong Street
 - **Westbound Left/Right (AM and PM Peaks)**
- Intersection 16: Chain Bridge Road and Judicial Drive
 - **Eastbound Left (AM, PM, and SAT Peaks)**
- Intersection 18: Chain Bridge Road and South Street/Humane Society Entrance
 - Eastbound Left/Thru (AM, PM, and SAT Peaks)
 - Eastbound Right (AM, PM, and SAT Peaks)



Figure 20: Future without Development (2026) – Levels of Service

Future Conditions with Development (2026) – Interim Condition

Site Description

The proposed program is a mixed-use development comprised of up to a 4,127-person capacity (2,796 fixed seat) concert hall with a 117 seat black box theater, a 169-room hotel with 26,127 SF of conference space, 6,049 SF of office, two (2) art galleries totaling 8,399 SF, 13,912 SF of restaurant space, and 13,912 SF of retail. Total site build-out is planned for the year 2026.

Site Access

Existing vehicular access is provided via two (2) driveways on Chain Bridge Road, two (2) driveways on Sager Avenue, and two (2) driveways on University Drive.

With redevelopment of the property, site access will be provided via Sager Avenue and University Drive.

Transportation Demand Management

The redevelopment of The Ox Fairfax – Block A site provides an opportunity to create a high-density, mixed-use environment that increases pedestrian accessibility and promotes recreational and educational use in the Old Town Fairfax Activity Center. Encouragement of non-singular occupancy vehicle (SOV) use, non-peak hour SOV trips, and non-automobile modes of transportation will result in less vehicular impacts on the surrounding roadway network.

Transportation Demand Management involves many components that are tailored to accommodate a given facility with a goal of reducing peak hour automobile trips by encouraging alternative forms of transportation. The following strategies are anticipated to be considered:

- Provide incentives to use transit, potentially including:
 - Providing information on the City of Fairfax CUE Bus, Fairfax Connector, and Metrobus routes, schedules, and fares
 - Providing safe pedestrian connections on and off site
 - Providing bicycle parking
- Parking Management, potentially including:
 - On-site parking spaces for carshare agencies

A full Transportation Demand Management (TDM) Plan will be submitted with the application.

Preliminary Event Operations Plan for The Ox Fairfax – Block A

This section of the report reviews the transportation operations plan for The Ox Fairfax – Block A, which includes a concert hall that will serve as a venue for concerts by musicians, bands, and other performing artists, with a total patron-capacity of 4,127 people.

This section provides an outline of a preliminary operation plan for The Ox Fairfax – Block A, including discussing traffic and parking demand loads that the concert hall will generate. Sellout concerts will be the largest event the concert hall will be able to accommodate. They will have the highest parking demand of any event, and the highest traffic demand for all modes. When they occur on weeknights, they have the greatest chance of traffic impacts when some concertgoers start arriving at the end of the PM peak commuter hour. Based on this overview, this preliminary event operation plan is based on the worst case scenario to provide a conservative transportation analysis. The worst case scenario analyzed within this report is a sellout crowd of 4,127 people. Events of this size may occur both on weekends and weeknights.

The projected timeline of arrivals and departures for sellout concerts, and initial considerations on traffic capacity are below:

- Employees of the theater working the show will arrive by 6:00 PM. It is assumed that a portion of the employees arriving will overlap with the PM peak commuter hour.
- Doors to the show will open at 7:00 PM. It is anticipated that arriving theater traffic will peak between 7:00 PM and 8:00 PM, which is off-peak for commuter traffic. With proper dispersal of drivers along different routes and between different times, roadway congestion better than commuter peak times is achievable.
- The concert will begin at 8:00 PM. It is anticipated that some concertgoers will continue to arrive after the show has begun.
- The headliner will come on at 9:00 PM. It is anticipated that all concert attendees have arrived by this time.
- The concert will end at approximately 11:15 PM. It is anticipated that departing traffic will peak between 11:00 PM and 12:00 AM. This time is off-peak with a relatively small number of vehicles on the road. Intersections will be congested from pedestrians walking to off-site parking, and once they are cleared out, vehicles exiting the parking garage and surface lot and heading home should not overwhelm the roadways and create congestion spots.

The parking and transportation demand characteristics of such a concert are summarized in Table 8, and are based on the following assumptions:

- **Mode Split:** A Mode Split/TDM reduction of 15 percent was applied to the theater (attendees and employees), hotel, and office uses, based on guidance from City staff. It was assumed that 35% of inbound auto trips during the PM peak commuter hour and Saturday peak hour are using some sort of rideshare, and therefore, are not parking on site.
- **Car Occupancy:** This report assumed an event car occupancy of three (3) persons per vehicle, per *Parking* (Robert A. Weant and Herbert S. Levinson, Eno Foundation for Transportation, 1990).
- **Attendee Peak Flows:** Not all concert attendees will arrive and depart at the same time. This report assumes that 12% of people will arrive during the PM peak commuter hour and Saturday peak hour. The AM peak commuter hour trips were based on 25% of the PM peak hour trips.
- **Employee Peak Flows:** Based on information provided by the Applicant, approximately 171 staff members will work sellout concerts. This report assumes that 10% of theater employees will generate trips during the AM peak commuter hour and 75% of employees will generate trips during the PM peak commuter hour. It is assumed that the employees arriving during the AM peak commuter hour work typical office hours and will therefore be outbound trips during the PM peak commuter hour.
- **Theater Capacity:** The Ox Fairfax – Block A will consist of a 4,127-person capacity concert hall with a 117 seat black box theater. The black box theater will host smaller performances, but performances will not overlap with the larger concert hall. Therefore, a maximum theater capacity of 4,127 people was analyzed in this study.
- **Conference Center Use:** The 26,127 SF of conference center space will be a part of the hotel and is accounted for in the hotel trip generation calculation.

These demand estimates form the basis for the recommendations in the following sections.

Parking

The City of Fairfax has nine (9) public parking lots in Old Town Fairfax. Public parking lots would be available to visitors of The Ox Fairfax – Block A site who opt to park off-site, as an alternative to paying for parking on-site. Thus, a portion of site trips have been routed to public parking lots throughout the City. The Fairfax County Judicial Center also has a paid public parking garage that would be available to visitors of The Ox Fairfax – Block A site. The City's public parking lots and their hours of operation are

summarized in Table 7. The public parking lots and associated pedestrian routes and walksheds relative to The Ox Fairfax – Block A site are shown in Figure 21 and Figure 22, respectively.

Table 7: Public Parking Lots

Parking Facility	Type	Hours	Rate	Notes
1. Truro Anglican Church (10480 Main Street)	Surface Lot	24/7	Free	None
2. Bank of America (10440 Main Street)	Surface Lot	M-Sun 6a-6p	Free	No overnight parking allowed
3. Old Town Plaza (3955 Chain Bridge Road)	Garage	24/7	Free	2 hour parking restriction
4. City of Fairfax Regional Library (10360 North Street)	Garage	M-T 1p-9p; W-Sun 10a-6p	Free	None
5. Webb Parking Lot (3990 University Drive)	Surface Lot	M-F after 6p, Sat after 1p, Sunday	Free	None
6. Old Town Hall Parking Lot (3999 University Drive)	Surface Lot	24/7	Free	2 hour parking restriction M-F 9a-5p, all other times no restrictions
7. Upper Old Town Hall Parking Lot (10413 North Street)	Surface Lot	24/7	Free	3 hour parking restriction M-F 9a-5p, all other times no restrictions
8. Main Street Parking Lot (10367 Main Street)	Surface Lot	24/7	Free	None
9. Sager Avenue Parking Lot (10412 Sager Avenue)	Surface Lot	M-Sun 6a-2a	Free	Free parking except for reserved spaces
10. Fairfax County Court Parking Garage (10550 Page Avenue)	Garage	24/7	\$2.50/hr, \$12.50 max	Parking is paid M-F 7a-7p



Figure 21: Public Parking Lots – Pedestrian Routes

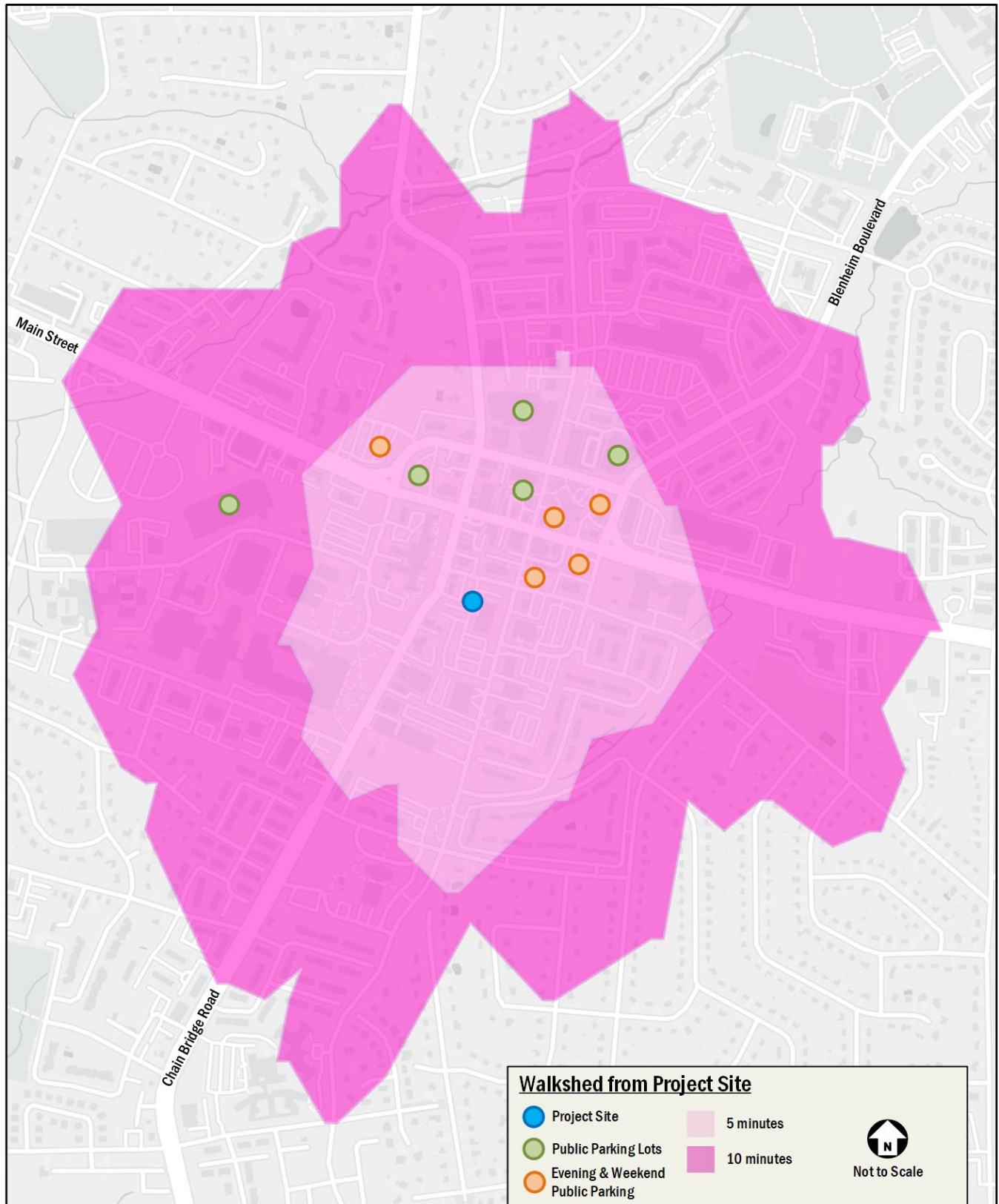


Figure 22: Public Parking Lots – Walksheds

Site Generated Traffic

The Institute of Transportation Engineers (ITE) *Trip Generation*, 11th Edition along with the assumptions described above were used to determine the future trips generated by the proposed development as shown in Table 8. In order to account for the existing office buildings being removed, the associated existing office trips were removed from the street network. The removed trips are shown in Figure 24.

As stated previously, the 26,127 SF of conference center space will be a part of the hotel and is accounted for in the hotel trip generation calculation. The Ox Fairfax – Block A will consist of a 4,127-person capacity concert hall with a 117 seat black box theater. The black box theater will host smaller performances, but performances will not overlap with the larger concert hall. Therefore, a maximum theater capacity of 4,127 people was analyzed in this study.

Table 8: Trip Generation (2026)

Land Use	ITE Code	Size	----- Weekday -----							----- Saturday -----			
			AM Peak Hour			PM Peak Hour			Daily	Peak Hour			Daily
			In	Out	Total	In	Out	Total	Total	In	Out	Total	Total
Trip Generation, 11th Ed.													
Proposed Development													
Shopping Center ⁵	822	13.9 kSF of GFA	20	13	33	46	46	92	817	46	45	91	910
	Internal Capture Retail - Office ⁴	(2)	0	-1	-1	-1	0	-1	-5	0	0	0	-1
	Internal Capture Retail - Hotel ⁴	(3)	-2	-1	-3	-5	-5	-10	-82	-5	-5	-10	-91
	Retail With Internal Reductions		18	11	29	40	41	81	730	41	40	81	818
	Pass-By Reduction ³	25%/34%/26%	-5	-3	-8	-14	-14	-28	-183	-11	-10	-21	-205
	Retail Subtotal		13	8	21	26	27	53	547	30	30	60	613
High-Turnover (Sit-Down) Restaurant	932	13.9 kSF of GFA	73	60	133	77	49	126	1,491	80	76	156	1,703
	Pass-By Reduction ³	25%/43%/25%	-18	-15	-33	-33	-21	-54	-373	-20	-19	-39	-426
	Restaurant Subtotal		55	45	100	44	28	72	1,118	60	57	117	1,277
Theater ¹		4,127 People	28	28	56	165	58	223	2,751	165	58	223	2,751
	Mode Split/TDM Reduction	15%	-4	-4	-8	-25	-9	-34	-413	-25	-9	-34	-413
	Entertainment Subtotal		24	24	48	140	49	189	2,338	140	49	189	2,338
Theater ¹		171 Employees	15	2	17	113	15	128	342	113	15	128	342
	Mode Split/TDM Reduction	15%	-2	0	-2	-17	-2	-19	-51	-17	-2	-19	-51
			13	2	15	96	13	109	291	96	13	109	291
Hotel ²	310	169 Rooms	43	34	77	49	48	97	1,408	69	54	123	1,311
	Internal Capture Hotel - Office ⁴	(1)	0	-1	-1	-1	0	-1	-10	0	0	0	-1
	Internal Capture Hotel - Retail ⁴	(3)	-1	-2	-3	-5	-5	-10	-82	-5	-5	-10	-91
	Hotel With Internal Reductions		42	31	73	43	43	86	1,316	64	49	113	1,219
	Mode Split/TDM Reduction	15%	-6	-5	-11	-6	-6	-12	-197	-10	-7	-17	-183
	Hotel Subtotal		36	26	62	37	37	74	1,119	54	42	96	1,036
General Office Building	710	6.0 kSF of GFA	13	2	15	3	13	16	101	2	1	3	13
	Internal Capture Office - Hotel ⁴	(1)	-1	0	-1	0	-1	-1	-10	0	0	0	-1
	Internal Capture Office - Retail ⁴	(2)	-1	0	-1	0	-1	-1	-5	0	0	0	-1
	Office With Internal Reductions		11	2	13	3	11	14	86	2	1	3	11
	Mode Split/TDM Reduction	15%	-2	0	-2	0	-2	-2	-13	0	0	0	-2
	Office Subtotal		9	2	11	3	9	12	73	2	1	3	9
Museum ⁶	580	8.4 kSF of GFA	2	0	2	0	2	2	20	4	2	6	60
	Proposed Development Site Trips With Reductions		152	106	259	346	165	511	5,506	386	194	580	5,624

¹ Since doors to shows will not open until 7 PM and shows will not start until 8 PM, it was assumed 12% of people would arrive during the PM and SAT peak hour with three (3) people per car. AM peak hour trips were based on 25% of the PM peak hour trips. It was assumed that 10% of employees and 75% of employees would arrive during the AM and PM peak hours, respectively.

Note: City of Fairfax Zoning Ordinance defines a theater as any building, structure or other indoor place, or any portion thereof, having fixed seating arranged in rows to allow spectators an unobstructed view and devoted to the performance arts for which an admission charge is made. The parking ratio requirement is 1 space per 4 seats.

² Hotel includes 26,127 SF of conference center space.

³ The pass by reduction for Shopping Center is based on the ITE Trip Generation methodology, as provided in the Trip Generation Handbook, 3rd Edition. The average rate for Shopping Centers is 34% for the PM Peak and 26% for the Saturday Peak. The average rate for High-Turnover (Sit-Down) Restaurants is 43% for the PM Peak. For all other time periods, the default pass by rate is 25%.

⁴ Internal capture rates consider site trips "captured" within a mixed use development, recognizing that trips from one land use can access another land use within a site development without having to access the adjacent street system. Internal capture allows reduction of site trips from adjacent intersections and roadways.

The internal reduction is based on the VDOT Updated Administrative Guidelines for the Traffic Impact Analysis Regulations:

(1) office / hotel - smaller of 10% of office trips or 10% of hotel trips

(2) office / retail - smaller of 5% of office trips or 5% of retail trips

(3) retail / hotel - smaller of 10% of retail trips or 10% of hotel trips

⁵ Saturday rates are not provided for the Shopping Center (822) land use; therefore, daily trips were estimated as 10 times the Saturday peak hour trips.

⁶ Weekday and Saturday daily rates are not provided for the Museum (580) land use; therefore, daily trips were estimated as 10 times the PM and Saturday peak hour trips, respectively.

Site Trip Distribution

The distribution of site trips was based on the 2045 Metropolitan Council of Governments (MWCOC) model as well as existing and anticipated traffic patterns with guidance and input from the City staff. The directional distribution percentages are shown in Figure 23. The site generated traffic volumes at the study intersections are shown in Figure 25 and the pass-by trips are shown in Figure 26.

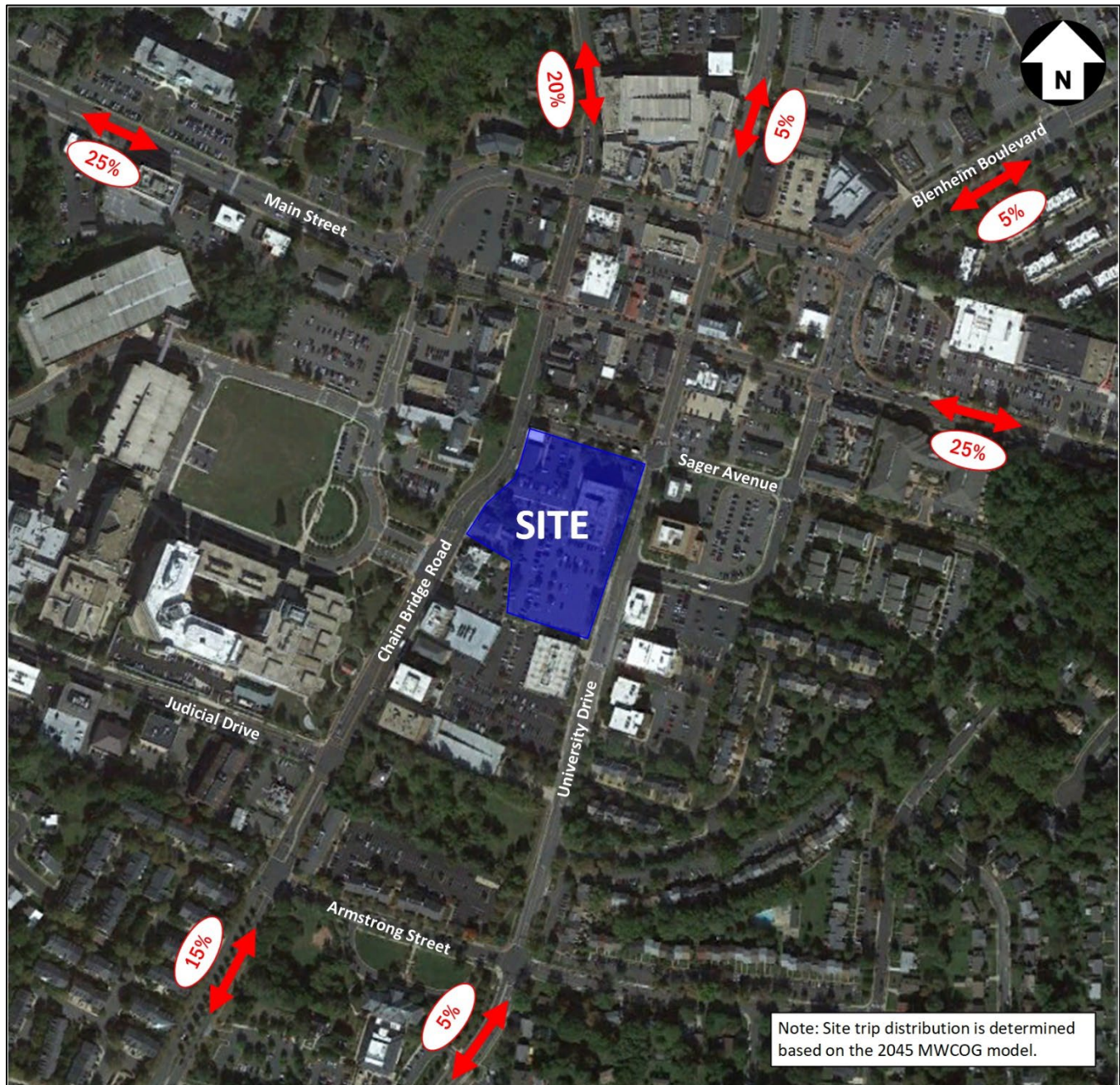


Figure 23: Directional Distribution

Future with Development (2026) Traffic Volumes

In order to determine the Future Conditions with Development (2026) traffic volumes, the trips associated with the existing office buildings were removed and the site generated traffic volumes and pass-by trips were added to the Future without Development (2026) traffic volumes. The Future with Development (2026) peak hour traffic volumes are presented in Figure 27.

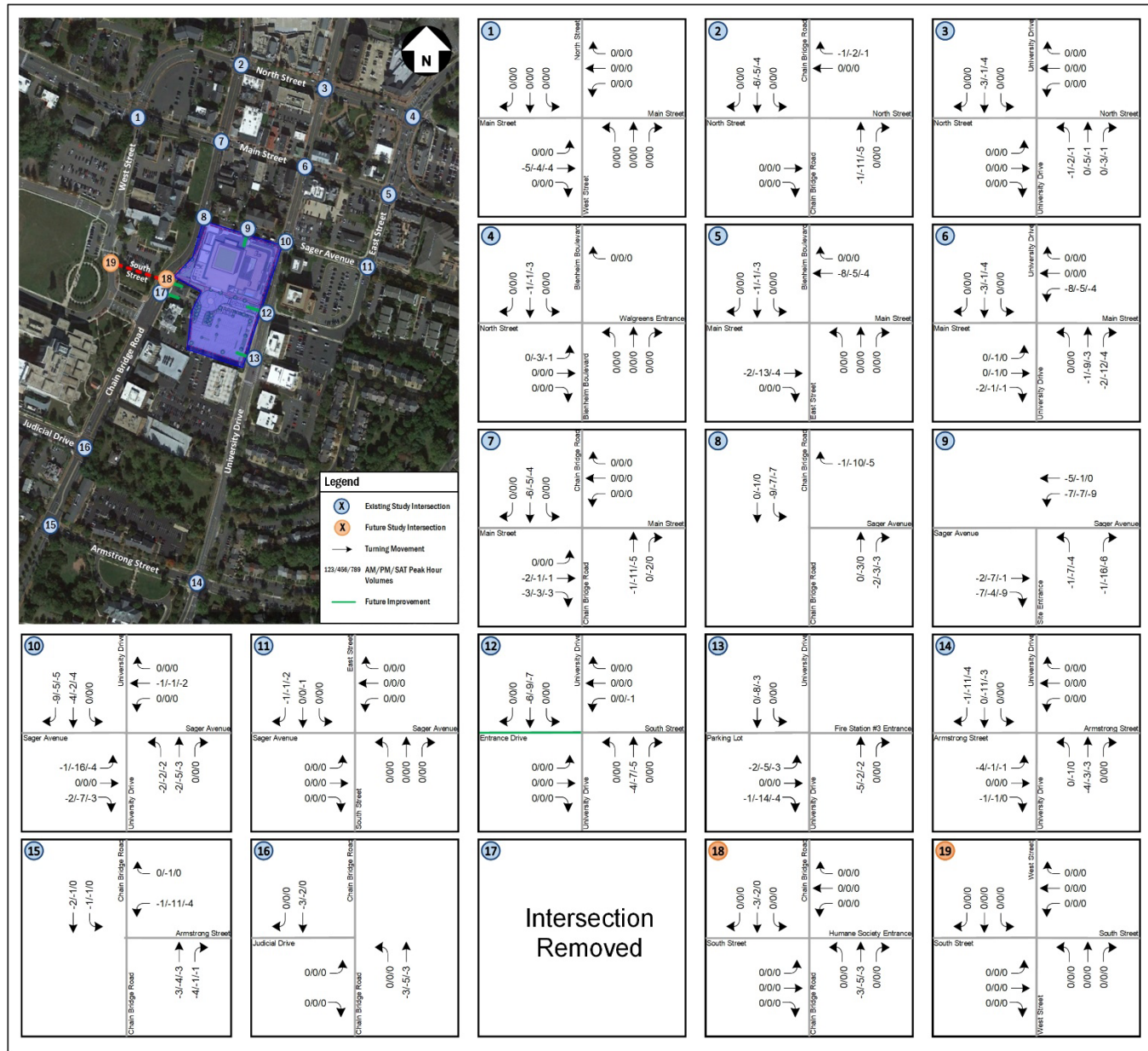


Figure 24: Removed Trips (2026)



Figure 25: Site Trips (2026)

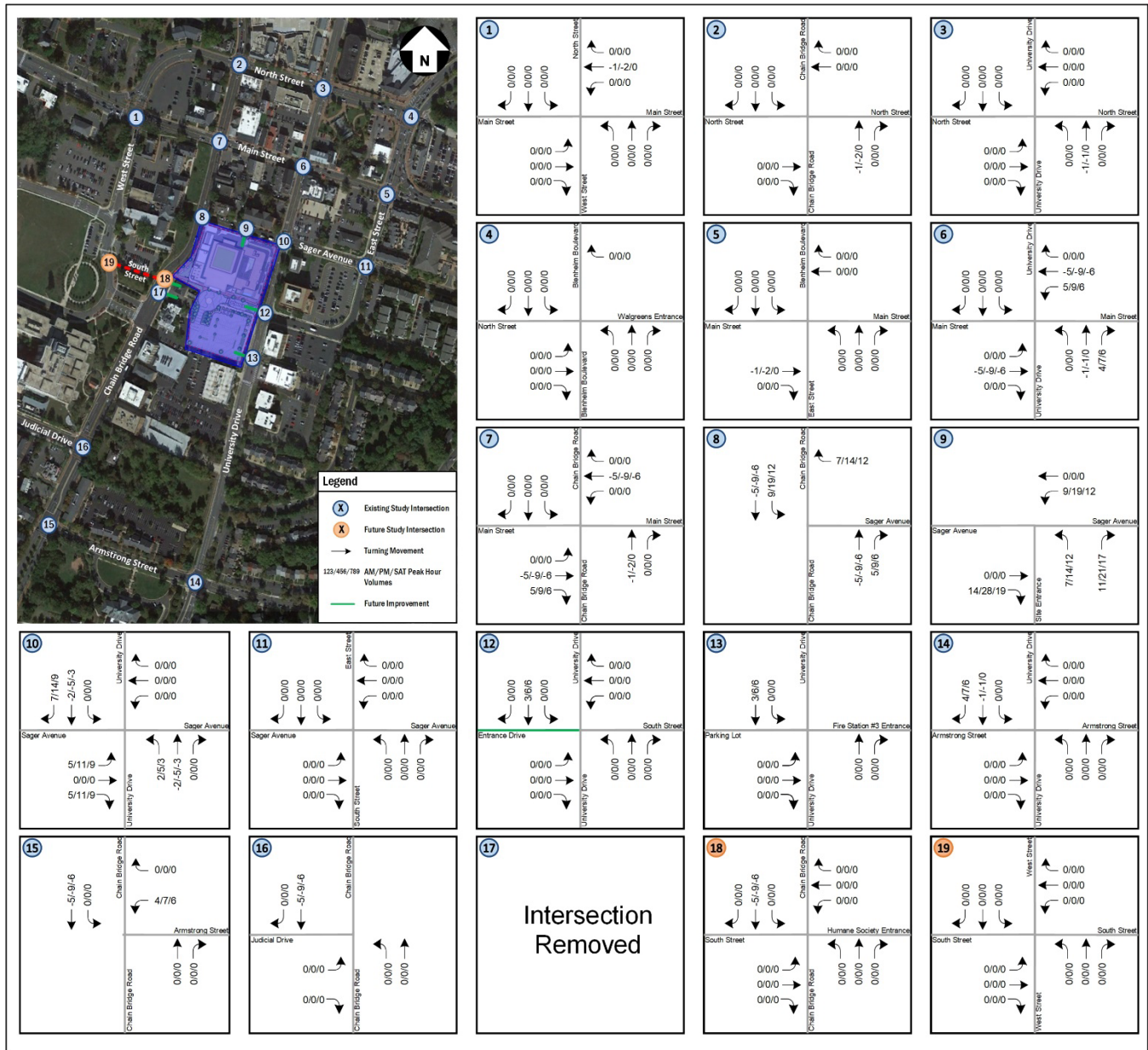


Figure 26: Pass-By Trips (2026)



Figure 27: Future with Development (2026) – Peak Hour Traffic Volumes

Future with Development (2026) Intersection Capacity Analysis

Intersection capacity analysis was performed in a manner consistent with the methodology used for the Future Conditions without Development (2026) analysis.

The results of the intersection analysis are presented in Table 9, and are expressed in LOS and delay (seconds per vehicle) per lane group. The average and maximum queue results from SimTraffic are presented in Table 9 and are expressed in feet. The detailed analysis worksheets are included in Appendix F.

Table 9: Future with Development (2026) – Intersection Capacity Analysis

No.	Intersection (Movement)	Effective Storage Length (ft.) (1)	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay (sec/veh)	Ave. Max Queue (ft.) (4)	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) (4)	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) (4)
			Synchro		SimTraffic	Synchro		SimTraffic	Synchro		SimTraffic
1	Main Street (E/W) and West Street/North Street (N/S) Overall Intersection (Signalized)		D	35.0		D	40.3		D	43.6	
	Eastbound Left	665	C	31.0	383	C	34.1	760	D	37.4	841
	Eastbound Thru		D	37.0	547	D	45.0	797	D	48.2	858
	Eastbound Right	125	C	23.8	125	C	29.0	112	C	26.9	92
	Westbound Left	125	D	44.7	125	D	47.5	125	C	32.3	125
	Westbound Thru/Right		D	43.9	301	F	136.8	306	E	62.3	312
	Northbound Left/Thru Thru/Right		E	62.3	106	E	63.8	217	D	54.1	109
	Southbound Left/Thru		D	52.1	249	E	78.0	149	C	23.8	211
	Southbound Right		C	28.7	328	B	10.3	65	D	39.9	316
2	Chain Bridge Road (N/S) and North Street (E/W) Overall Intersection (Signalized)		B	17.3		D	44.9		B	15.7	
	Eastbound Thru Thru/Right		A	8.4	264	B	14.1	268	B	16.0	235
	Westbound Thru Thru/Right		B	16.8	313	D	50.3	338	A	7.8	186
	Northbound Thru Thru/Right		B	16.5	295	F	82.8	295	B	17.0	276
	Southbound Left	160	C	30.4	144	C	34.5	160	C	25.9	159
	Southbound Thru Thru/Right		C	28.7	512	C	32.6	620	C	24.0	475
3	University Drive (N/S) and North Street (E/W) Overall Intersection (Signalized)		B	18.6		C	24.9		B	18.8	
	Eastbound Left	215	A	6.0	172	D	38.9	214	B	13.0	134
	Eastbound Thru Thru/Right		A	2.6	211	C	23.9	322	B	12.7	196
	Westbound Left	150	A	2.6	120	A	7.1	149	A	9.7	140
	Westbound Thru Thru/Right		A	3.3	279	B	17.9	384	C	23.3	325
	Northbound Left/Thru Thru/Right		E	74.8	196	B	16.9	190	B	10.8	116
	Southbound Left/Thru Thru/Right		E	69.8	252	D	43.4	709	C	31.2	284
4	North Street (E/W) and Blenheim Boulevard (N/S) Overall Intersection (Signalized)		C	31.0		D	38.4		C	29.3	
	Eastbound Left/Thru		F	94.6	140	F	152.9	140	D	47.8	140
	Eastbound Right		A	2.5	331	A	2.7	352	B	18.4	314
	Westbound Right		A	0.0	0	A	0.1	0	A	0.1	0
	Northbound Left		B	14.1	339	B	14.8	393	C	21.9	369
	Northbound Left/Thru/Right		B	14.0	367	B	14.8	380	C	21.8	382
	Southbound Left/Thru Thru		E	72.3	234	F	95.3	635	D	52.2	295
	Southbound Right	750	E	57.6	206	D	51.3	625	D	44.9	193
5	Main Street (E/W) and East Street/Blenheim Boulevard (N/S) Overall Intersection (Signalized)		C	25.3		C	34.0		C	26.2	
	Eastbound Thru Thru/Right		D	38.5	299	E	58.7	316	D	44.5	314
	Westbound Thru		D	46.1	224	F	89.9	225	D	41.9	225
	Westbound Right		A	3.4	376	A	8.1	604	B	15.6	586
	Northbound Left	105	D	51.4	101	D	51.3	104	D	48.1	75
	Northbound Thru Thru/Right		E	59.3	202	E	64.1	278	D	53.4	173
	Southbound Left		B	16.8	275	B	11.8	310	A	6.8	286
	Southbound Thru/Right		D	41.4	247	D	43.2	295	B	19.5	262
6	Main Street (E/W) and University Drive (N/S) Overall Intersection (Signalized)		B	19.9		B	17.6		B	19.3	
	Eastbound Left	90	A	3.6	60	B	13.6	89	A	6.1	88
	Eastbound Thru/Right		A	5.3	191	B	17.5	275	A	8.9	272
	Westbound Left	125	A	0.3	108	B	10.1	118	A	3.2	118
	Westbound Thru/Right		A	0.9	84	A	8.0	235	A	4.1	214
	Northbound Left/Thru Thru/Right		E	62.3	109	C	30.1	112	D	48.5	103
	Southbound Left/Thru Thru/Right		B	18.6	198	B	15.6	218	C	32.6	210
7	Main Street (E/W) and Chain Bridge Road (N/S) Overall Intersection (Signalized)		C	29.5		D	39.1		C	21.8	
	Eastbound Left	125	B	11.8	83	B	11.0	119	A	5.5	100
	Eastbound Thru/Right		B	15.4	266	C	25.2	316	B	18.1	316
	Westbound Left	200	E	70.3	172	F	84.3	198	E	71.2	195
	Westbound Thru/Right		C	20.3	219	B	13.9	301	B	12.1	235
	Northbound Thru Thru/Right		D	44.4	324	D	45.2	325	C	28.9	301
	Southbound Left/Thru Thru/Right		B	11.7	219	D	44.2	294	A	8.9	208
8	Chain Bridge Road (N/S) and Sager Avenue (E/W) Overall Intersection (Unsignalized)		B	12.0	106	B	11.7	176	A	9.5	85
	Westbound Right		A	5.0	254	A	4.8	316	A	4.7	155
9	Sager Avenue (E/W) and Site Entrance (N/S) Overall Intersection (Unsignalized)		A	5.1	63	A	4.7	116	A	4.4	81
	Westbound Left/Thru		A	9.8	82	B	10.7	129	B	10.6	96

No.	Intersection (Movement)	Effective Storage Length (ft.) ^[1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay (sec/veh)	Ave. Max Queue (ft.) ^[4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) ^[4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) ^[4]
			Synchro		SimTraffic	Synchro		SimTraffic	Synchro		SimTraffic
10	University Drive (NS) and Sager Avenue (EW) Overall Intersection (Signalized)	130	B	10.7		B	10.3		A	9.5	
	Eastbound Left/Thru/Right		C	29.4	150	C	33.7	184	C	24.4	147
	Westbound Left		C	25.3	100	C	23.7	96	B	19.8	63
	Westbound Thru/Right		C	25.3	128	C	23.5	211	C	20.3	161
	Northbound Left/Thru/Right		A	1.8	88	A	3.5	209	A	4.3	120
	Southbound Left/Thru/Right		A	1.0	113	A	3.1	128	A	2.6	120
11	Sager Avenue (EW) and South Street/East Street (NS) Overall Intersection (Unsignalized)	90	A	8.2	60	A	9.9	89	A	8.2	48
	Eastbound Left		A	7.7	66	B	10.6	261	A	7.8	65
	Eastbound Thru/Right		A	7.8	58	A	9.2	80	A	7.8	36
	Westbound Left	80	A	9.3	98	B	11.3	393	A	8.9	114
	Westbound Thru/Right		A	8.8	65	B	11.4	387	A	8.5	58
	Northbound Left/Thru/Right		A	9.1	154	B	13.3	249	A	9.2	127
12	University Drive (NS) and Entrance Drive/South Street (EW) Overall Intersection (Signalized)		A	6.0		A	9.6		A	7.1	
	Eastbound Left/Thru/Right		A	0.0	0	C	26.7	113	C	27.9	97
	Westbound Left/Thru/Right		C	29.7	118	C	33.6	140	C	28.4	87
	Northbound Left/Thru/Right		A	4.2	129	A	6.5	143	A	3.6	116
	Southbound Left		A	1.8	25	A	2.9	28	A	1.8	25
	Southbound Thru/Right		A	2.4	104	A	4.2	162	A	2.3	108
13	University Drive (NS) and Parking Lot/Fire Station #3 Entrance (EW) Overall Intersection (Unsignalized)										
	Eastbound Left/Thru/Right		B	11.5	54	B	13.5	105	B	11.0	68
	Southbound Left	85	A	7.9	4	A	8.4	5	A	9.1	0
14	University Drive/George Mason Boulevard (NS) and Armstrong Street (EW) Overall Intersection (Signalized)		B	11.7		B	14.7		B	12.0	
	Eastbound Left/Thru/Right		B	17.2	114	C	20.2	164	B	16.6	141
	Westbound Left/Thru/Right		B	16.1	107	B	18.4	202	B	14.5	127
	Northbound Left	160	A	7.8	39	A	8.4	75	A	8.2	40
	Northbound Thru/Right		A	9.9	136	B	11.2	262	B	10.0	170
	Southbound Left	230	A	7.7	36	A	9.1	32	A	8.3	63
	Southbound Thru/Right		B	10.4	187	B	15.1	241	B	10.6	160
15	Chain Bridge Road (NS) and Armstrong Street (EW) Overall Intersection (Signalized)		A	9.6		B	18.9		B	10.6	
	Westbound Left/Right		E	67.4	204	E	72.3	342	D	36.4	170
	Northbound Thru/Right		A	6.7	355	C	26.1	545	B	11.9	315
	Southbound Left	80	B	18.9	79	A	2.7	76	A	5.6	80
	Southbound Thru		A	2.6	208	A	2.4	240	A	4.7	193
16	Chain Bridge Road (NS) and Judicial Drive (EW) Overall Intersection (Signalized)		B	14.4		B	17.0		A	9.5	
	Eastbound Left	410	E	70.1	146	E	66.3	360	E	59.7	90
	Eastbound Right		D	48.0	83	D	42.8	737	D	47.8	79
	Northbound Left	160	A	5.8	160	C	33.2	159	A	2.0	147
	Northbound Thru		A	6.1	295	A	1.5	308	A	1.9	231
	Southbound Thru		B	19.3	231	B	10.2	218	A	5.5	195
	Southbound Right	240	C	34.1	96	A	6.5	82	A	4.4	40
17	Chain Bridge Road (NS) and Humane Society Driveway (EW) INTERSECTION REMOVED										
18	Chain Bridge Road (NS) and South Street/Humane Society Entrance (EW) Overall Intersection (Signalized)		A	3.5		A	9.0		B	10.7	
	Eastbound Left/Thru		E	66.5	67	E	65.0	148	C	23.9	36
	Eastbound Right		E	64.3	62	E	61.5	92	C	22.8	48
	Westbound Left/Thru/Right		A	0.0	0	A	0.0	0	C	23.9	51
	Northbound Left		A	1.4	212	A	1.6	230	A	6.2	75
	Northbound Thru/Right	230	A	2.1	320	A	1.9	407	A	9.7	227
	Southbound Left		A	0.0	0	A	0.0	0	A	8.6	30
	Southbound Thru/Right		A	1.4	104	A	6.5	207	B	11.2	201
19	West Street (NS) and South Street (EW) Overall Intersection (Unsignalized)										
	Eastbound Left/Thru/Right		A	0.8	21	A	1.2	63	A	1.9	6
	Southbound Left/Thru/Right		B	10.4	46	B	10.4	36	A	9.0	45

NOTES:

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

[2] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.

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

[4] Max queues are based on results from Sim Traffic. Per TOSAM guidelines, the queues are based on the average to 10 simulations.

[5] 50th Percentile Queues are not reported for TWSC intersections under HCM Methodology.

[6] ~: Volume exceeds capacity, queue is theoretically infinite.

For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of D or better for each lane group at the study intersections.

The intersection capacity analysis results show that the following ten (10) intersections have movements that operate below the acceptable levels of service during one or more peak hours under Future Conditions with Development (2026). Movements in **bold** operate below acceptable levels of service under Future Conditions without Development (2026).

- Intersection 1: Main Street and West Street/North Street
 - **Westbound Thru/Right (PM and SAT Peaks)**
 - **Northbound Left/Thru, Thru/Right (AM and PM Peaks)**
 - **Southbound Left/Thru (PM Peak)**
- Intersection 2: Main Street and North Street
 - **Northbound Thru, Thru/Right (PM Peak)**
- Intersection 3: University Drive and North Street
 - **Northbound Left/Thru, Thru/Right (AM Peak)**
 - **Southbound Left/Thru, Thru/Right (AM Peak)**
- Intersection 4: North Street and Blenheim Boulevard
 - **Eastbound Left/Thru (AM and PM Peaks)**
 - **Southbound Left/Thru, Thru (AM and PM Peaks)**
 - **Southbound Right (AM Peak)**
- Intersection 5: Main Street and East Street/Blenheim Boulevard
 - **Eastbound Thru, Thru/Right (PM Peak)**
 - **Westbound Thru (PM Peak)**
 - **Northbound Thru, Thru/Right (AM and PM Peaks)**
- Intersection 6: Main Street and University Drive
 - **Northbound Left/Thru, Thru/Right (AM Peak)**
- Intersection 7: Main Street and Chain Bridge Road
 - **Westbound Left (AM, PM, and SAT Peaks)**
- Intersection 15: Chain Bridge Road and Armstrong Street
 - **Westbound Left/Right (AM and PM Peaks)**
- Intersection 16: Chain Bridge Road and Judicial Drive
 - **Eastbound Left (AM, PM, and SAT Peaks)**
- Intersection 18: Chain Bridge Road and South Street/Humane Society Entrance
 - **Eastbound Left/Thru (AM and PM Peaks)**
 - **Eastbound Right (AM and PM Peaks)**

In order to achieve acceptable levels of service or maintain similar traffic operation conditions as compared to the Future without Development (2026) scenario, the following roadway improvements are recommended (by intersection):

- Intersection 1: Main Street and West Street/North Street
 - Adjust signal timings to improve operations (SAT Peak only).
- Intersection 5: Main Street and East Street/Blenheim Boulevard
 - Adjust signal timings to improve operations (PM Peak only).
- Intersection 7: Main Street and Chain Bridge Road
 - Adjust signal timings to improve operations (PM Peak only).
- Intersection 12: University Drive and South Street
 - Install a traffic signal and add exclusive northbound left lane.

The results of the mitigated intersection analysis are presented in Table 10, and are expressed in LOS and delay (seconds per vehicle) per lane group. The average and maximum queue results from the mitigated SimTraffic are presented in Table 10 and are expressed in feet. Level of service results are also presented in Figure 28.

Table 10: Future with Development (2026) Mitigated – Intersection Capacity Analysis

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]
			Synchro		SimTraffic	Synchro		SimTraffic	Synchro		SimTraffic
1	Main Street (EW) and West Street/North Street (NS) Overall Intersection (Signalized) (MIT: Signal timing modification - SAT Only)		D	35.0		C	34.1		D	40.1	
	Eastbound Left	665	C	31.0	402	D	36.6	848	D	47.5	496
	Eastbound Thru		D	37.0	601	C	24.9	836	C	26.6	612
	Eastbound Right	125	C	23.8	125	B	17.3	114	B	17.4	67
	Westbound Left	125	D	44.7	125	D	46.0	117	B	18.9	115
	Westbound Thru/Right		D	43.9	265	F	95.6	314	C	22.5	310
	Northbound Left/Thru Thru/Right		E	62.3	122	E	64.1	389	D	54.1	116
	Southbound Left/Thru		D	52.1	252	E	78.0	139	D	40.9	247
	Southbound Right		C	28.7	314	B	11.4	108	D	49.0	330
2	Chain Bridge Road (NS) and North Street (EW) Overall Intersection (Signalized)		B	17.3		C	31.0		B	12.8	
	Eastbound Thru Thru/Right		A	8.4	269	B	14.1	284	A	2.4	213
	Westbound Thru Thru/Right		B	16.8	287	D	50.3	341	A	7.8	181
	Northbound Thru Thru/Right		B	16.5	293	B	13.9	285	B	16.9	279
	Southbound Left	160	C	30.4	150	C	34.5	160	C	25.9	159
	Southbound Thru Thru/Right		C	28.7	483	C	32.6	626	C	24.0	508
3	University Drive (NS) and North Street (EW) Overall Intersection (Signalized)		B	18.6		C	25.6		B	19.1	
	Eastbound Left	215	A	6.0	182	D	38.9	215	B	11.5	195
	Eastbound Thru Thru/Right		A	2.6	236	C	25.3	335	B	11.3	288
	Westbound Left	150	A	2.6	91	A	7.0	139	B	10.7	139
	Westbound Thru Thru/Right		A	3.3	254	B	17.8	377	C	25.5	307
	Northbound Left/Thru Thru/Right		E	74.7	174	B	19.8	172	B	10.3	116
	Southbound Left/Thru Thru/Right		E	69.8	214	D	43.4	794	C	31.2	233
4	North Street (EW) and Blenheim Boulevard (NS) Overall Intersection (Signalized)		C	31.0		D	38.3		C	30.5	
	Eastbound Left/Thru		F	94.6	140	F	153.0	140	D	45.5	140
	Eastbound Right		A	2.5	329	A	2.6	376	B	16.3	340
	Westbound Right		A	0.0	0	A	0.1	0	A	0.1	10
	Northbound Left		B	14.1	356	B	14.8	384	C	26.8	378
	Northbound Left/Thru/Right		B	14.0	364	B	14.7	379	C	26.7	374
	Southbound Left/Thru Thru		E	72.3	237	F	95.3	638	D	52.2	552
	Southbound Right	750	E	57.6	192	D	51.3	622	D	44.9	530
5	Main Street (EW) and East Street/Blenheim Boulevard (NS) Overall Intersection (Signalized) (MIT: Signal timing modification - PM Only)		C	25.3		C	29.3		C	25.2	
	Eastbound Thru Thru/Right		D	38.4	294	D	39.5	163	D	40.6	309
	Westbound Thru		D	46.1	224	E	57.1	225	C	33.7	225
	Westbound Right		A	3.4	434	A	8.1	609	B	13.6	561
	Northbound Left	105	D	51.4	85	D	52.2	83	D	48.9	98
	Northbound Thru Thru/Right		E	59.3	195	E	66.8	277	E	55.3	242
	Southbound Left		B	16.8	275	B	15.0	313	B	10.7	307
	Southbound Thru/Right		D	41.4	254	D	48.3	293	C	26.5	289
6	Main Street (EW) and University Drive (NS) Overall Intersection (Signalized)		B	19.9		C	21.0		B	18.9	
	Eastbound Left	90	A	3.6	66	A	10.0	79	A	6.1	85
	Eastbound Thru/Right		A	5.3	156	C	29.1	324	A	8.9	278
	Westbound Left	125	A	0.3	111	B	10.1	106	A	2.2	121
	Westbound Thru/Right		A	0.9	88	B	11.8	137	A	3.2	237
	Northbound Left/Thru Thru/Right		E	62.3	153	C	29.5	152	D	48.6	151
	Southbound Left/Thru Thru/Right		B	18.6	153	B	15.6	137	C	32.1	194
7	Main Street (EW) and Chain Bridge Road (NS) Overall Intersection (Signalized) (MIT: Signal timing modification - PM Only)		C	29.5		C	34.1		C	24.1	
	Eastbound Left	125	B	11.8	105	B	18.9	122	B	12.7	115
	Eastbound Thru/Right		B	15.4	283	C	25.0	322	C	27.0	318
	Westbound Left	200	E	70.4	186	E	62.1	200	E	66.9	199
	Westbound Thru/Right		C	20.3	238	C	31.0	322	B	16.6	269
	Northbound Thru Thru/Right		D	44.4	313	D	52.9	309	C	28.9	300
	Southbound Left/Thru Thru/Right		B	11.7	208	B	14.1	220	A	8.9	251
8	Chain Bridge Road (NS) and Sager Avenue (EW) Overall Intersection (Unsignalized)										
	Westbound Right		B	12.0	90	B	11.7	111	A	9.5	134
	Southbound Left/Thru Thru		A	5.0	240	A	4.8	277	A	4.7	183
9	Sager Avenue (EW) and Site Entrance Overall Intersection (Unsignalized)										
	Westbound Left/Thru		A	5.1	62	A	4.7	75	A	4.4	91
	Northbound Left/Right		A	9.8	70	B	10.7	123	B	10.6	109

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]
			Synchro		SimTraffic	Synchro		SimTraffic	Synchro		SimTraffic
10	University Drive (N/S) and Sager Avenue (E/W) Overall Intersection (Signalized) Eastbound Left/Thru/Right Westbound Left Westbound Thru/Right Northbound Left/Thru/Right Southbound Left/Thru/Right	130	B	10.7		A	10.0		A	9.9	
			C	29.4	150	C	28.8	148	C	24.4	157
			C	25.3	89	C	23.7	77	B	19.8	61
			C	25.3	139	C	23.5	170	C	20.3	192
			A	1.8	80	A	5.6	194	A	4.3	125
			A	1.0	74	A	2.7	133	A	3.3	93
11	Sager Avenue (E/W) and South Street/East Street (N/S) Overall Intersection (Unsignalized) Eastbound Left Eastbound Thru/Right Westbound Left Westbound Thru/Right Northbound Left/Thru/Right Southbound Left/Thru/Right	90 80	A	8.2	57	A	9.9	89	A	8.2	66
			A	7.7	61	B	10.6	314	A	7.8	91
			A	7.8	67	A	9.2	80	A	7.8	51
			A	9.3	98	B	11.3	396	A	8.9	212
			A	8.8	71	B	11.4	431	A	8.5	73
			A	9.1	154	B	13.3	262	A	9.2	158
12	University Drive (N/S) and Entrance Drive/South Street (E/W) Overall Intersection (Signalized) (MIT: Install signal, add exclusive NBL lane) Eastbound Left/Thru/Right Westbound Left/Thru/Right Northbound Left Northbound Thru/Right Southbound Left Southbound Thru/Right	50	A	6.0		B	13.6		A	7.0	
			A	0.0	40	C	31.1	120	C	27.9	63
			C	29.7	105	D	41.7	165	C	28.4	96
			A	3.0	27	A	6.3	70	A	2.8	48
			A	4.1	120	A	8.4	145	A	3.4	115
			A	1.8	46	A	7.6	85	A	1.8	37
			A	2.4	86	A	9.4	161	A	2.4	89
13	University Drive (N/S) and Parking Lot/Fire Station #3 Entrance (E/W) Overall Intersection (Unsignalized) Eastbound Left/Thru/Right Southbound Left	50	B	11.5	49	B	13.4	124	B	11.0	74
			A	7.9	2	A	8.4	4	A	9.1	2
14	University Drive/George Mason Boulevard (N/S) and Armstrong Street (E/W) Overall Intersection (Signalized) Eastbound Left/Thru/Right Westbound Left/Thru/Right Northbound Left Northbound Thru/Right Southbound Left Southbound Thru/Right	160 230	B	11.7		B	14.7		B	12.0	
			B	17.2	116	C	20.2	201	B	16.6	120
			B	16.1	105	B	18.4	224	B	14.5	83
			A	7.8	39	A	8.4	66	A	8.2	35
			A	9.9	130	B	11.2	364	B	10.0	136
			A	7.7	40	A	9.1	34	A	8.3	34
			B	10.4	188	B	15.1	235	B	10.6	130
15	Chain Bridge Road (N/S) and Armstrong Street (E/W) Overall Intersection (Signalized) Westbound Left/Right Northbound Thru Thru/Right Southbound Left Southbound Thru	80	A	9.6		B	18.9		B	10.6	
			E	67.4	209	E	72.3	343	D	36.4	179
			A	6.7	325	C	26.1	577	B	11.9	440
			B	18.9	79	A	2.7	77	A	5.6	79
			A	2.6	213	A	2.4	289	A	4.7	236
16	Chain Bridge Road (N/S) and Judicial Drive (E/W) Overall Intersection (Signalized) Eastbound Left Eastbound Right Northbound Left Northbound Thru Southbound Thru Southbound Right	410 160 240	B	14.4		B	16.8		A	9.5	
			E	70.1	139	E	66.3	277	E	59.7	88
			D	48.0	72	D	42.8	277	D	47.8	89
			A	5.8	160	C	33.2	160	A	2.0	149
			A	6.1	293	A	1.5	293	A	1.9	255
			B	19.3	261	B	10.0	284	A	5.5	222
			C	34.1	170	A	3.6	62	A	4.4	66
17	Chain Bridge Road (N/S) and Humane Society Driveway (E/W) INTERSECTION REMOVED										
18	Chain Bridge Road (N/S) and South Street/Humane Society Entrance (E/W) Overall Intersection (Signalized) Eastbound Left/Thru Eastbound Right Westbound Left/Thru/Right Northbound Left Northbound Thru Thru/Right Southbound Left Southbound Thru Thru/Right	230	A	3.5		A	8.4		B	10.7	
			E	66.5	58	E	65.0	147	C	23.9	39
			E	64.3	72	E	61.5	79	C	22.8	56
			A	0.0	68	A	0.0	0	C	23.9	175
			A	1.4	216	A	1.6	130	A	6.2	148
			A	2.1	346	A	1.9	341	A	9.7	356
			A	0.0	83	A	0.0	30	A	8.6	81
			A	1.4	280	A	5.3	215	B	11.2	241
19	West Street (N/S) and South Street (E/W) Overall Intersection (Unsignalized) Eastbound Left/Thru/Right Southbound Left/Thru/Right		A	0.8	14	A	1.2	72	A	1.9	3
			B	10.4	50	B	10.4	38	A	9.0	46

NOTES:

- [1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.
[2] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.
[3] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.
[4] Max queues are based on results from SimTraffic. Per TOSAM guidelines, the queues are based on the average to 10 simulations.
[5] 50th Percentile Queues are not reported for TWSC intersections under HCM Methodology.
[6] -: Volume exceeds capacity; queue is theoretically infinite.

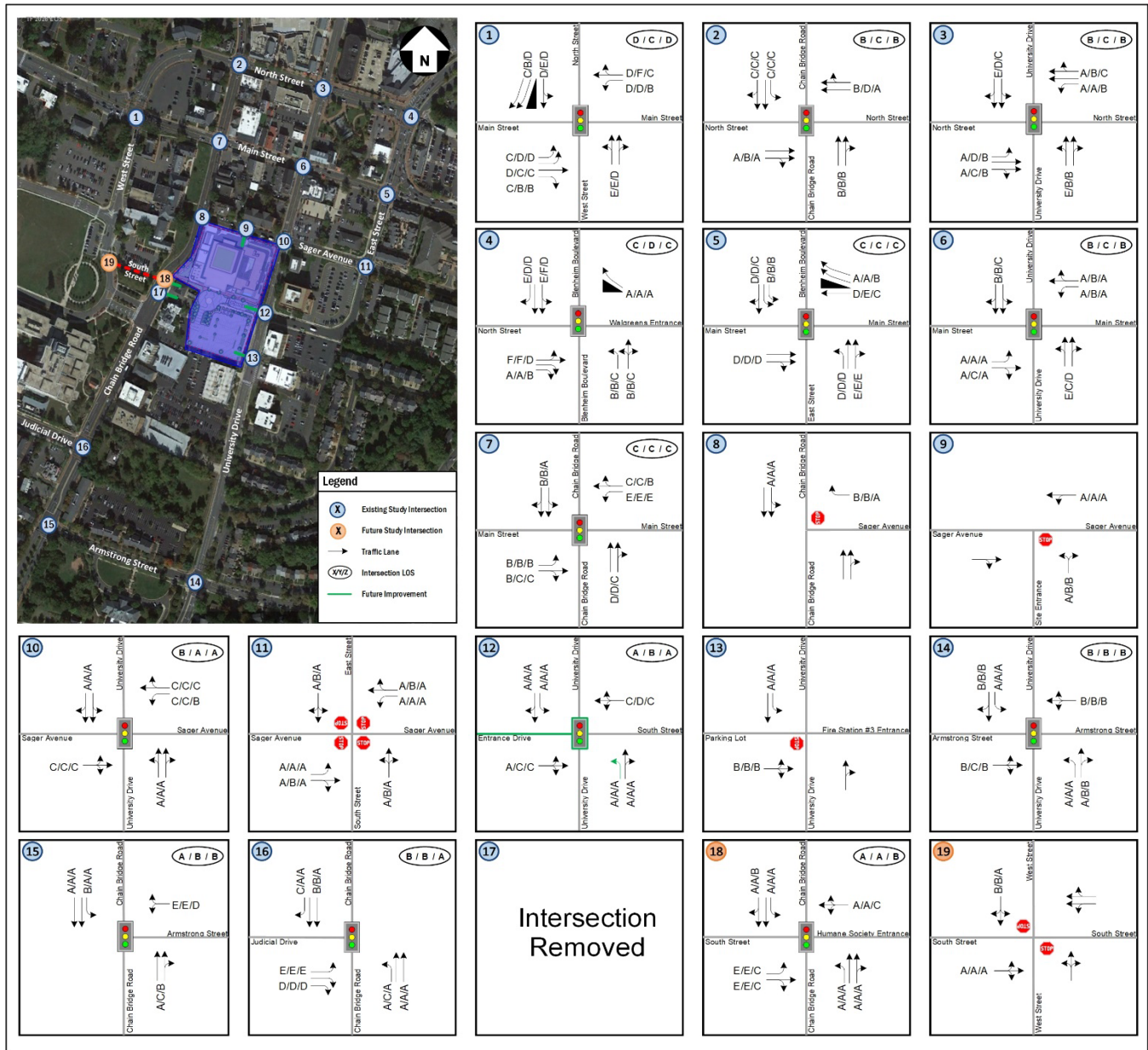


Figure 28: Future with Development (2026) – Levels of Service

Future Conditions with Development (2031) – Ultimate Condition

The City's recommended extension of South Street to West Street between University Drive and Chain Bridge Road will reroute traffic and relieve congestion on Main Street through Old Town. The extension will also permit the continuation of pedestrian facilities through Old Town. The proposed South Street Extension is expected to be complete in 2031 and will be built by others. The extension will ultimately provide access to The Ox Fairfax – Block A site. For the purposes of this study, an ultimate scenario was evaluated with the South Street Extension in place through The Ox Fairfax – Block A site.

The Future with Development (2031) peak hour traffic volumes are presented in Figure 29.

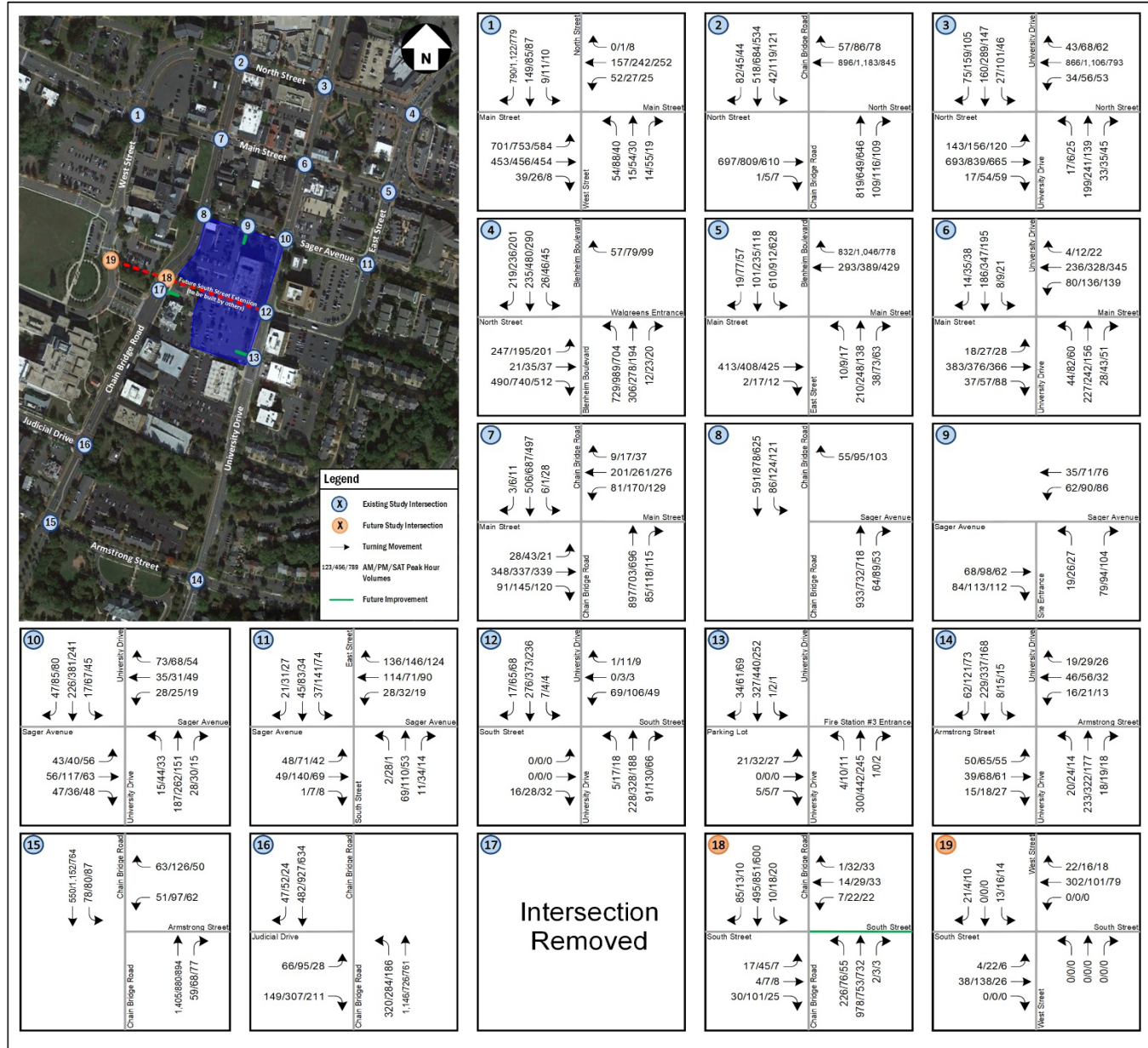


Figure 29: Future with Development (2031) – Peak Hour Traffic Volumes

Future with Development (2031) Intersection Capacity Analysis

Intersection capacity analysis was performed in a manner consistent with the methodology used for the Future Conditions with Development (2026) analysis.

The results of the intersection analysis are presented in Table 11, and are expressed in LOS and delay (seconds per vehicle) per lane group. The average and maximum queue results from SimTraffic are presented in Table 11 and are expressed in feet. The detailed analysis worksheets are included in Appendix G.

Table 11: Future with Development (2031) – Intersection Capacity Analysis

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]
			Synchro		SimTraffic	Synchro		SimTraffic	Synchro		SimTraffic
1	Main Street (EW) and West Street/North Street (NS) Overall Intersection (Signalized) (MIT: Signal timing modification - SAT Only)		C	34.9		C	32.7		D	41.4	
	Eastbound Left	665	C	31.3	389	D	37.4	846	D	49.2	502
	Eastbound Thru		D	36.5	613	C	24.8	843	C	26.3	601
	Eastbound Right	125	C	23.7	124	B	17.3	115	B	17.4	93
	Westbound Left	125	D	43.5	125	D	50.2	125	B	19.4	123
	Westbound Thru/Right		D	41.1	269	E	76.2	314	C	20.5	316
	Northbound Left/Thru Thru/Right		E	60.2	113	E	64.1	392	D	54.1	145
	Southbound Left/Thru		D	51.0	251	E	79.4	131	D	39.9	254
	Southbound Right		C	30.0	331	B	13.6	72	D	50.9	334
2	Chain Bridge Road (NS) and North Street (EW) Overall Intersection (Signalized)		B	17.4		C	32.3		B	12.8	
	Eastbound Thru Thru/Right		A	8.7	259	B	15.0	288	A	2.4	218
	Westbound Thru Thru/Right		B	17.6	319	D	51.2	336	A	7.2	202
	Northbound Thru Thru/Right		B	16.4	290	B	18.2	291	B	17.2	287
	Southbound Left	160	C	30.1	159	D	36.1	159	C	26.5	159
	Southbound Thru Thru/Right		C	28.0	538	C	33.1	627	C	24.4	568
3	University Drive (NS) and North Street (EW) Overall Intersection (Signalized)		B	18.1		C	26.6		B	19.3	
	Eastbound Left	215	A	8.0	185	D	47.5	215	B	14.0	215
	Eastbound Thru Thru/Right		A	2.5	236	C	26.0	336	B	10.8	314
	Westbound Left	150	A	2.6	83	A	7.3	139	B	10.4	132
	Westbound Thru Thru/Right		A	3.4	283	B	19.0	377	C	26.1	352
	Northbound Left/Thru Thru/Right		E	69.5	194	B	19.2	154	A	9.5	114
	Southbound Left/Thru Thru/Right		E	69.6	211	D	43.7	799	C	31.2	316
4	North Street (EW) and Blenheim Boulevard (NS) Overall Intersection (Signalized)		C	32.1		D	40.6		C	31.4	
	Eastbound Left/Thru		F	99.3	140	F	172.6	140	D	47.1	140
	Eastbound Right		A	2.5	326	A	2.5	371	B	16.6	348
	Westbound Right		A	0.0	0	A	0.1	0	A	0.1	0
	Northbound Left		B	15.0	367	B	15.5	393	C	28.5	380
	Northbound Left/Thru/Right		B	14.8	374	B	15.3	383	C	28.4	374
	Southbound Left/Thru Thru		E	74.0	249	F	99.7	637	D	52.4	617
	Southbound Right	750	E	57.5	212	D	51.4	623	D	44.8	613
5	Main Street (EW) and East Street/Blenheim Boulevard (NS) Overall Intersection (Signalized) (MIT: Signal timing modification - PM Only)		C	24.8		C	29.0		C	25.0	
	Eastbound Thru Thru/Right		D	37.8	295	D	39.3	158	D	40.7	312
	Westbound Thru		D	46.3	224	E	57.3	225	C	33.7	225
	Westbound Right		A	3.6	399	A	8.7	606	B	14.2	592
	Northbound Left	105	D	51.4	82	D	52.2	104	D	49.0	104
	Northbound Thru Thru/Right		E	59.3	195	E	66.4	278	E	55.4	251
	Southbound Left		B	16.8	289	B	15.5	313	B	10.7	304
	Southbound Thru/Right		D	41.0	264	D	48.1	292	C	25.7	291
6	Main Street (EW) and University Drive (NS) Overall Intersection (Signalized)		C	20.5		C	20.1		B	18.5	
	Eastbound Left	90	A	3.4	60	A	9.9	83	A	4.8	88
	Eastbound Thru/Right		A	5.1	192	C	28.2	326	A	7.9	255
	Westbound Left	125	A	0.3	110	B	10.2	107	A	1.6	124
	Westbound Thru/Right		A	0.9	92	B	11.8	136	A	2.5	236
	Northbound Left/Thru Thru/Right		E	64.0	148	C	28.5	151	D	53.4	144
	Southbound Left/Thru Thru/Right		C	21.0	174	B	14.4	143	C	34.5	194
7	Main Street (EW) and Chain Bridge Road (NS) Overall Intersection (Signalized) (MIT: Signal timing modification - PM Only)		C	28.6		C	32.3		C	24.3	
	Eastbound Left	125	B	12.0	104	C	20.1	125	B	12.3	110
	Eastbound Thru/Right		B	15.9	288	C	26.5	325	C	26.2	317
	Westbound Left	200	E	71.8	190	E	59.5	200	E	68.8	195
	Westbound Thru/Right		B	19.6	228	C	34.9	321	B	15.2	286
	Northbound Thru Thru/Right		D	41.6	314	D	47.5	311	C	29.9	299
	Southbound Left/Thru Thru/Right		B	12.3	214	B	11.3	187	A	9.2	246

No.	Intersection (Movement)	Effective Storage Length (ft.) [1]	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
			LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]	LOS	Delay (sec/veh)	Ave. Max Queue (ft.) [4]
			Synchro		SimTraffic	Synchro		SimTraffic	Synchro		SimTraffic
8	Chain Bridge Road (N/S) and Sager Avenue (E/W) Overall Intersection (Unsignalized)										
	Westbound Right		B	10.8	100	B	10.6	89	A	9.6	134
	Southbound Left/Thru		A	4.6	226	A	4.5	249	A	4.5	188
9	Sager Avenue (E/W) and Site Entrance Overall Intersection (Unsignalized)										
	Westbound Left/Thru		A	5.0	60	A	4.7	60	A	4.4	103
	Northbound Left/Right		A	9.8	80	B	10.7	111	B	10.5	105
10	University Drive (N/S) and Sager Avenue (E/W) Overall Intersection (Signalized)										
	Eastbound Left/Thru/Right	130	B	11.0		A	9.8		A	9.7	
	Westbound Left		C	31.8	148	C	28.6	148	C	23.9	144
	Westbound Thru/Right		C	26.0	86	C	24.2	91	C	20.4	56
	Northbound Left/Thru/Right		C	25.9	125	C	24.0	119	C	21.0	186
	Southbound Left/Thru/Right		A	1.7	79	A	5.3	185	A	3.0	125
	Southbound Left/Thru/Right		A	0.9	77	A	2.5	137	A	3.1	106
11	Sager Avenue (E/W) and South Street/East Street (N/S) Overall Intersection (Unsignalized)										
	Eastbound Left	90	A	8.2	66	A	9.9	89	A	8.1	50
	Eastbound Thru/Right		A	7.7	65	B	10.6	323	A	7.8	66
	Westbound Left	80	A	7.8	59	A	9.1	80	A	7.8	43
	Westbound Thru/Right		A	9.3	95	B	11.3	397	A	8.9	163
	Northbound Left/Thru/Right		A	8.8	71	B	11.3	423	A	8.5	62
	Southbound Left/Thru/Right		A	9.1	163	B	13.3	272	A	9.2	141
12	University Drive (N/S) and South Street (E/W) Overall Intersection (Signalized) (MIT: Install signal, add exclusive NBL lane)										
	Eastbound Left/Thru/Right		A	6.1		B	12.9		A	6.2	
	Westbound Left/Thru/Right		C	28.8	48	C	29.4	59	C	24.8	52
	Northbound Left	50	C	30.7	116	D	40.9	135	C	28.3	108
	Northbound Thru/Right		A	2.5	25	A	6.1	58	A	2.7	46
	Southbound Left		A	3.6	129	A	8.4	147	A	3.4	118
	Southbound Thru/Right		A	1.5	43	A	7.6	102	A	1.8	37
	Southbound Thru/Right		A	2.0	99	A	9.3	146	A	2.5	100
13	University Drive (N/S) and Parking Lot/Fire Station #3 Entrance (E/W) Overall Intersection (Unsignalized)										
	Eastbound Left/Thru/Right		B	11.7	47	B	13.7	144	B	11.2	81
	Northbound Left/Thru/Right		A	0.1	37	A	0.3	510	A	0.4	150
	Southbound Left	50	A	7.9	5	A	8.4	14	A	9.1	7
14	University Drive/George Mason Boulevard (N/S) and Armstrong Street (E/W) Overall Intersection (Signalized)										
	Eastbound Left/Thru/Right		B	11.7		B	14.6		B	11.9	
	Westbound Left/Thru/Right		B	17.2	126	B	20.0	243	B	16.4	133
	Northbound Left	160	B	16.1	116	B	18.3	148	B	14.4	147
	Northbound Thru/Right		A	7.8	55	A	8.4	135	A	8.3	31
	Southbound Left	230	A	10.0	153	B	11.4	390	B	10.1	167
	Southbound Thru/Right		A	7.7	38	A	9.1	57	A	8.3	39
	Southbound Thru/Right		B	10.4	181	B	14.9	217	B	10.5	166
15	Chain Bridge Road (N/S) and Armstrong Street (E/W) Overall Intersection (Signalized)										
	Westbound Left/Right		A	9.3		B	17.6		A	9.8	
	Northbound Thru/Right		E	66.9	226	E	70.2	285	D	35.7	169
	Southbound Left	80	A	6.7	515	C	25.2	474	B	11.4	413
	Southbound Thru		C	26.0	79	A	2.5	79	A	5.3	77
	Southbound Thru		A	1.9	206	A	2.2	286	A	4.4	200
16	Chain Bridge Road (N/S) and Judicial Drive (E/W) Overall Intersection (Signalized)										
	Eastbound Left	410	B	10.6		B	18.4		A	9.4	
	Eastbound Right		E	70.1	150	E	66.3	212	E	59.7	134
	Northbound Left	160	D	46.5	75	D	42.8	198	D	47.8	110
	Northbound Thru		A	6.1	160	D	41.5	160	A	2.1	151
	Southbound Left		A	6.2	300	A	1.5	283	A	1.9	240
	Southbound Thru		A	5.6	269	B	12.1	314	A	5.6	207
	Southbound Right	240	A	2.2	150	A	7.9	184	A	4.4	100
17	Chain Bridge Road (N/S) and Humane Society Driveway (E/W) INTERSECTION REMOVED										
18	Chain Bridge Road (N/S) and South Street (E/W) Overall Intersection (Signalized)										
	Eastbound Left/Thru		B	13.6		B	14.7		B	15.3	
	Eastbound Right		E	66.7	67	E	65.0	120	C	30.6	56
	Westbound Left/Thru/Right		E	64.1	48	E	61.0	90	C	29.5	60
	Northbound Left	230	E	58.3	71	E	66.6	138	C	29.1	140
	Northbound Thru/Right		A	4.6	229	A	4.4	178	A	8.3	178
	Southbound Left	90	A	7.5	394	A	6.3	339	B	13.6	338
	Southbound Thru/Right		B	17.6	78	A	7.2	85	B	11.2	68
	Southbound Thru/Right		C	20.9	299	A	9.6	286	B	15.2	239
19	West Street (N/S) and South Street (E/W) Overall Intersection (Unsignalized)										
	Eastbound Left/Thru/Right		A	0.7	18	A	1.2	38	A	1.5	15
	Southbound Left/Thru/Right		B	10.5	44	B	10.7	40	A	9.2	48

NOTES:

- [1] Effective storage length is based on the storage length plus one-half of the taper length per TOSAM guidelines.
[2] #: 95th percentile queues (reported from Synchro) exceed capacity; actual queues may be longer. Queues shown are based on the maximum after two cycles.
[3] m: 95th percentile volume and queues (reported from Synchro) are metered by upstream signal.
[4] Max queues are based on results from SimTraffic. Per TOSAM guidelines, the queues are based on the average to 10 simulations.
[5] 50th Percentile Queues are not reported for TWSC intersections under HCM Methodology.
[6] ~: Volume exceeds capacity, queue is theoretically infinite.

For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of D or better for each lane group at the study intersections.

The intersection capacity analysis results show that the following nine (9) intersections have movements that operate below the acceptable levels of service during one or more peak hours under Future Conditions with Development (2031). Movements in **bold** operate below acceptable levels of service under Future Conditions with Development (2026).

- Intersection 1: Main Street and West Street/North Street
 - **Westbound Thru/Right (PM Peak)**
 - **Northbound Left/Thru, Thru/Right (AM and PM Peaks)**
 - **Southbound Left/Thru (PM Peak)**
- Intersection 3: University Drive and North Street
 - **Northbound Left/Thru, Thru/Right (AM Peak)**
 - **Southbound Left/Thru, Thru/Right (AM Peak)**
- Intersection 4: North Street and Blenheim Boulevard
 - **Eastbound Left/Thru (AM and PM Peaks)**
 - **Southbound Left/Thru, Thru (AM and PM Peaks)**
 - **Southbound Right (AM Peak)**
- Intersection 5: Main Street and East Street/Blenheim Boulevard
 - **Westbound Thru (PM Peak)**
 - **Northbound Thru, Thru/Right (AM, PM, and SAT Peaks)**
- Intersection 6: Main Street and University Drive
 - **Northbound Left/Thru, Thru/Right (AM Peak)**
- Intersection 7: Main Street and Chain Bridge Road
 - **Westbound Left (AM, PM, and SAT Peaks)**
- Intersection 15: Chain Bridge Road and Armstrong Street
 - **Westbound Left/Right (AM and PM Peaks)**
- Intersection 16: Chain Bridge Road and Judicial Drive
 - **Eastbound Left (AM, PM, and SAT Peaks)**
- Intersection 18: Chain Bridge Road and South Street
 - **Eastbound Left/Thru (AM and PM Peaks)**
 - **Eastbound Right (AM and PM Peaks)**
 - Westbound Left/Thru/Right (AM and PM Peaks)

The following roadway improvements were recommended in the Future Conditions with Development (2026) and continue to be recommended in the Future with Development (2031) scenario:

- Intersection 1: Main Street and West Street/North Street
 - Adjust signal timings to improve operations (SAT Peak only).
- Intersection 5: Main Street and East Street/Blenheim Boulevard
 - Adjust signal timings to improve operations (PM Peak only).
- Intersection 7: Main Street and Chain Bridge Road
 - Adjust signal timings to improve operations (PM Peak only).
- Intersection 12: University Drive and South Street
 - Install a traffic signal and add exclusive northbound left lane.

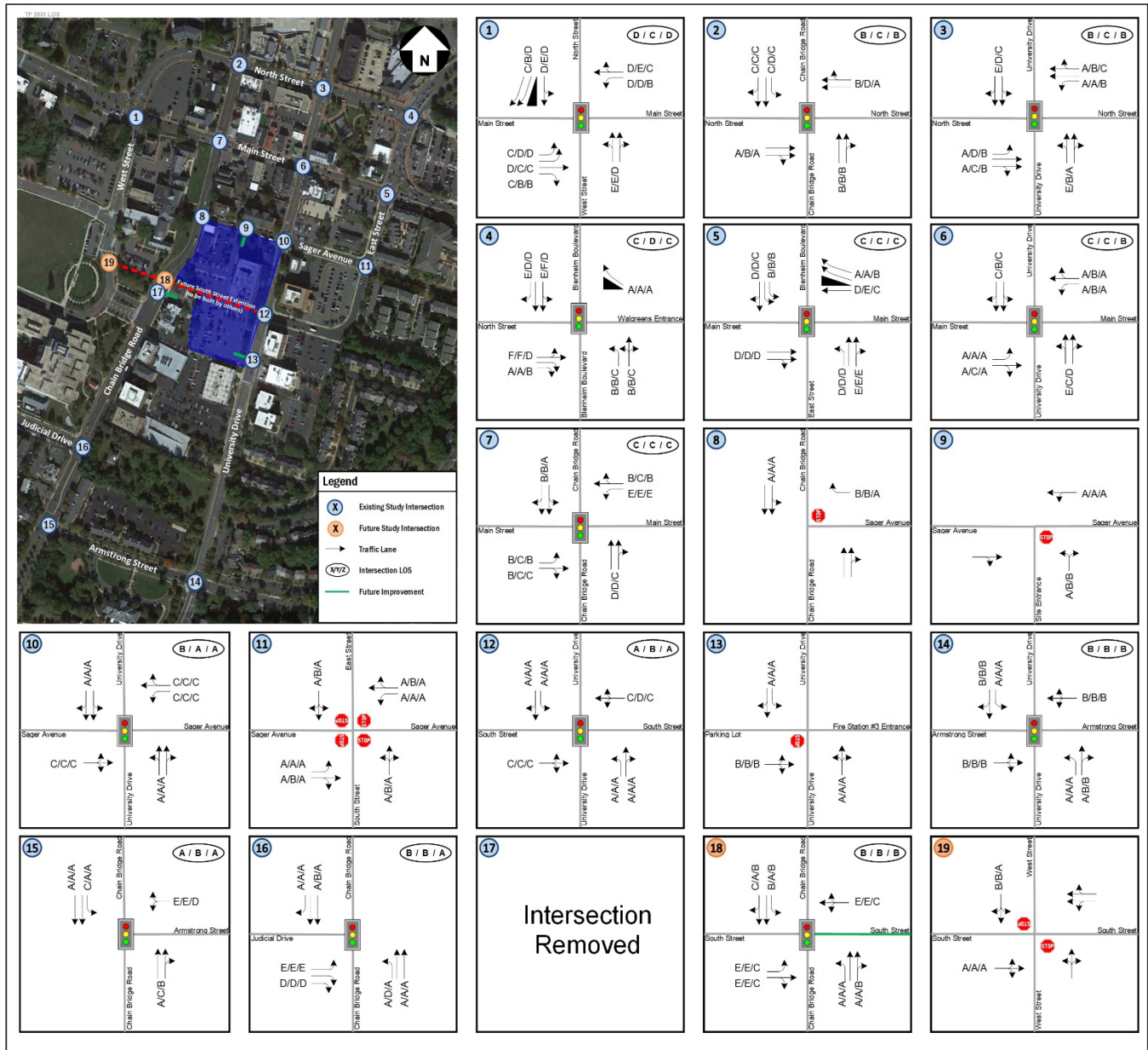


Figure 30: Future with Development (2031) – Levels of Service

Homeland Security Emergency Evacuations

The Ox Fairfax – Block A redevelopment is situated with access to all surrounding roadways. The redevelopment has a total of three (3) access points; one (1) to the north onto Sager Avenue and two (2) to the east onto University Drive. The site also has proximity to multi-lane highways and mass transit. Interstate 66 (I-66) is within two (2) miles of the site. Additionally, the site is served by five (5) bus routes. Crosswalks currently exist at the signalized intersections, and sidewalks are located along most of the roads.

Future Conditions with Development (2032) – Planning Scenario

For the purposes of this study, the development is anticipated to be fully constructed by 2026. Based on discussions with VDOT and the City, a planning level analysis was recommended for the year 2032.

Future with Development (2032) Traffic Volumes

Traffic volumes were projected by increasing the Future without Development (2031) traffic volumes to the year 2032 using an inherent growth rate of one (1) percent per year. The removed existing trips, proposed site trips, and pass-by trips were added to the inherent growth volumes to determine the Future with Development (2032) volumes. The Future with Development (2032) traffic volumes along the arterial corridors are shown in Figure 31.

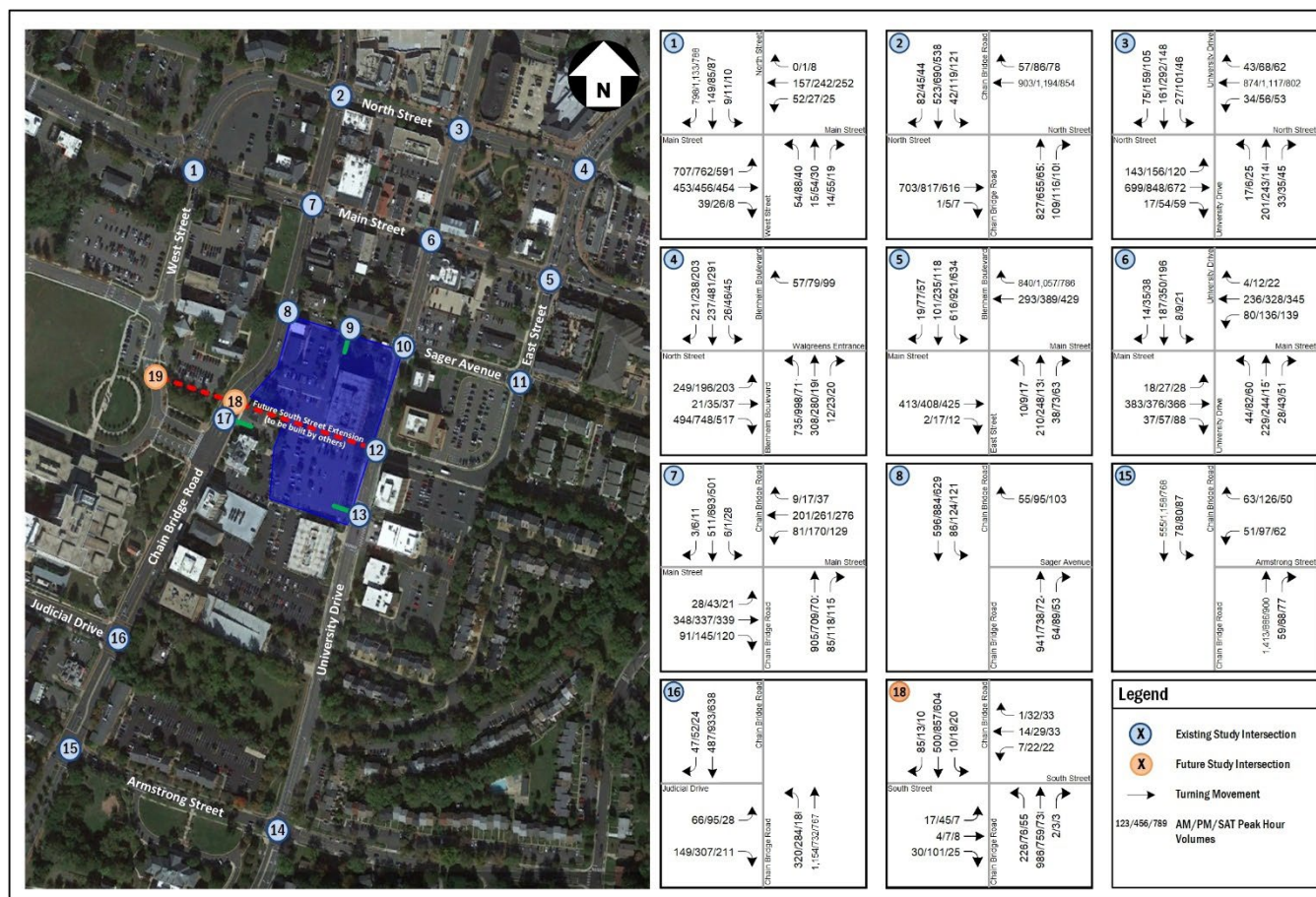


Figure 31: Future with Development (2032) – Traffic Volumes

Future Conditions (2032) Volume-to-Capacity Analysis

As noted previously, the Future with Development (2032) scenario is to be used for planning purposes only. As such, in order to determine the potential traffic demand along the Main, North, Chain Bridge, and Blenheim Corridors, the projected 2032 traffic volumes with the development in place were used to determine the volume-to-capacity (V/C) ratio at eleven (11) intersections along the arterial corridors within the vicinity of the study area.

For the planning scenario, the Synchro model was used to determine the V/C ratios. V/C ratios for the Future with Development (2032) conditions are shown in Table 12.

Table 12: V/C Analysis Results

Intersection (Movement)	V/C Ratios		
	AM Peak	PM Peak	SAT Peak
	TF 2032	TF 2032	TF 2032
1 Main Street and West Street/North Street Overall Intersection (Signalized)			
Eastbound Left	0.53	0.61	0.78
Eastbound Thru	0.65	0.50	0.57
Eastbound Right	0.03	0.02	0.01
Westbound Left	0.15	0.17	0.09
Westbound Thru/Right	0.65	0.83	0.59
Northbound Left/Thru Thru/Right	0.38	0.58	0.34
Southbound Left/Thru	0.52	0.31	0.27
Southbound Right	0.53	0.76	0.69
2 Chain Bridge Road and North Street Overall Intersection (Signalized)			
Eastbound Thru Thru/Right	0.44	0.46	0.38
Westbound Thru Thru/Right	0.62	0.72	0.57
Northbound Thru Thru/Right	0.86	0.78	0.74
Southbound Left	0.32	0.62	0.54
Southbound Thru Thru/Right	0.44	0.54	0.40
3 North Street and University Drive Overall Intersection (Signalized)			
Eastbound Left	0.36	0.76	0.44
Eastbound Thru Thru/Right	0.31	0.56	0.48
Westbound Left	0.08	0.24	0.18
Westbound Thru Thru/Right	0.43	0.79	0.59
Northbound Left/Thru Thru/Right	0.68	0.29	0.24
Southbound Left/Thru Thru/Right	0.79	0.71	0.36
4 North Street and Blenheim Boulevard Overall Intersection (Signalized)			
Eastbound Left/Thru	0.97	1.17	0.81
Eastbound Right	0.24	0.37	0.26
Westbound Right	0.04	0.05	0.07
Northbound Left	0.58	0.68	0.55
Northbound Left/Thru/Right	0.58	0.67	0.55
Southbound Left/Thru Thru	0.81	1.01	0.69
Southbound Right	0.16	0.17	0.14
5 Main Street and Blenheim Boulevard/East Street Overall Intersection (Signalized)			
Eastbound Thru Thru/Right	0.48	0.48	0.40
Westbound Thru	0.62	0.84	0.70
Westbound Right	0.43	0.56	0.56
Northbound Left	0.04	0.04	0.10
Northbound Thru Thru/Right	0.54	0.72	0.63
Southbound Left	0.42	0.60	0.49
Southbound Thru/Right	0.34	0.78	0.47
6 Main Street and University Drive Overall Intersection (Signalized)			
Eastbound Left	0.02	0.07	0.04
Eastbound Thru/Right	0.38	0.62	0.41
Westbound Left	0.13	0.42	0.23
Westbound Thru/Right	0.20	0.44	0.30
Northbound Left/Thru Thru/Right	0.80	0.40	0.75
Southbound Left/Thru Thru/Right	0.47	0.32	0.57

Intersection (Movement)	V/C Ratios		
	AM Peak	PM Peak	SAT Peak
	TF 2032	TF 2032	TF 2032
7 Main Street and Chain Bridge Road Overall Intersection (Signalized)			
Eastbound Left	0.06	0.08	0.05
Eastbound Thru/Right	0.70	0.65	0.80
Westbound Left	0.56	0.72	0.62
Westbound Thru/Right	0.28	0.30	0.41
Northbound Thru Thru/Right	0.82	0.83	0.62
Southbound Left/Thru Thru/Right	0.34	0.68	0.44
8 Chain Bridge Road and Sager Avenue Overall Intersection (Unsignalized)			
Westbound Right	0.09	0.14	0.12
Northbound Thru Thru/Right	0.40	0.31	0.31
Southbound Left/Thru Thru	0.25	0.38	0.27
15 Chain Bridge Road and Armstrong Street Overall Intersection (Signalized)			
Westbound Left/Right	0.59	0.76	0.47
Northbound Thru Thru/Right	0.64	0.42	0.52
Southbound Left	0.36	0.20	0.25
Southbound Thru	0.21	0.44	0.32
16 Chain Bridge Road and Judicial Drive Overall Intersection (Signalized)			
Eastbound Left	0.59	0.60	0.42
Eastbound Right	0.06	0.12	0.08
Northbound Left	0.45	0.57	0.31
Northbound Thru	0.43	0.27	0.27
Southbound Thru	0.23	0.44	0.26
Southbound Right	0.03	0.04	0.02
18 Chain Bridge Road and South Street Overall Intersection (Signalized)			
Eastbound Left/Thru	0.28	0.45	0.19
Eastbound Right	0.02	0.07	0.02
Westbound Left/Thru/Right	0.40	0.56	0.47
Northbound Left	0.40	0.20	0.15
Northbound Thru Thru/Right	0.42	0.35	0.52
Southbound Left	0.03	0.05	0.08
Southbound Thru Thru/Right	0.27	0.41	0.48

As shown in Table 12, two (2) lane groups at one (1) study intersection are anticipated to operate at a V/C greater than 1.0 during one (1) peak hour.

Intersection Analysis Summary

As described in previous sections, vehicular capacity analysis was performed for the following five (5) scenarios:

- **Existing (2023)** – based on existing 2023 turning movement counts.
- **Future without Development (2026)** – assumes existing traffic plus additional traffic due to a one (1) percent annual growth rate plus traffic due to planned yet unbuilt background developments.
- **Future with Development (2026)** – assumes existing traffic plus additional traffic due to a one (1) percent annual growth rate plus traffic due to planned yet unbuilt background developments plus traffic generated by The Ox Fairfax – Block A site.
- **Future with Development (2026) Mitigated** – assumes existing traffic plus additional traffic due to a one (1) percent annual growth rate plus traffic due to planned yet unbuilt background developments plus traffic generated by The Ox Fairfax – Block A site plus mitigations.
- **Future with Development (2031)** – assumes existing traffic plus additional traffic due to a one (1) percent annual growth rate plus traffic due to planned yet unbuilt background developments plus traffic generated by The Ox Fairfax – Block A site plus mitigations plus the South Street Extension in place.

A comparison of the MOE results for all five (5) scenarios are presented in Table 13.

Table 13: MOE Comparison Table

No.	Intersection (Movement)	Level of Service (LOS) (Sec/Veh.)										Effective Storage Length (ft.)	Maximum Queues (ft.)																				
		AM Peak Hour					PM Peak Hour						SAT Peak Hour					AM Peak Hour					SAT Peak Hour										
		2023 Existing	2026 Future Background	2026 Total Future	2026 Total Future Mitigated	2031 Total Future	2023 Existing	2026 Future Background	2026 Total Future	2026 Total Future Mitigated	2031 Total Future		2023 Existing	2026 Future Background	2026 Total Future	2026 Total Future Mitigated	2031 Total Future	2023 Existing	2026 Future Background	2026 Total Future	2026 Total Future Mitigated	2031 Total Future	2023 Existing	2026 Future Background	2026 Total Future	2026 Total Future Mitigated	2031 Total Future						
1	Main Street (E/W) and West Street/North Street (N/S) Overall Intersection (Signalized)	C (30)	C (33.7)	D (35)	D (35)	C (34.9)	C (31.3)	C (34.9)	D (40.3)	C (34.1)	C (32.7)	C (29.8)	D (39.4)	D (43.6)	D (40.1)	D (41.4)	665	325	350	383	402	389	312	378	760	848	846	271	654	841	496	502	
		C (29)	C (31)	C (31.3)	C (31.3)	C (30.4)	C (30.1)	C (33.9)	C (34.1)	C (32.7)	C (30.4)	D (36.6)	D (37.4)	D (40.2)	D (40.2)	485		510	547	601	613	406	511	797	836	843	493	756	858	612	601		
		C (32.8)	D (35.3)	D (37)	D (37)	D (36.5)	D (35.2)	D (40.5)	D (45)	C (24.9)	C (24.8)	C (34.9)	D (40.4)	D (48.2)	C (26.6)	C (26.3)		125	125	125	125	125	125	125	125	125	112	115	89	115	92	127	93
		C (22.4)	C (23.8)	C (23.8)	C (23.8)	C (23.7)	C (26.8)	C (28.9)	B (17.3)	C (24.5)	C (26.9)	C (26.9)	B (17.4)	B (17.4)	B (17.4)	B (17.4)		125	125	125	125	125	92	125	125	125	112	115	89	115	92	127	93
		D (39.9)	D (40.6)	D (44.7)	D (44.7)	D (43.5)	D (50.2)	D (51)	D (47.5)	D (46)	D (50.2)	C (34.6)	C (31.9)	C (32.3)	B (18.9)	B (19.4)		124	125	125	125	125	92	125	125	125	112	115	89	115	92	127	93
2	Chain Bridge Road (N/S) and North Street (E/W) Overall Intersection (Signalized)	C (33.5)	D (35.3)	D (43.9)	D (43.9)	D (41.1)	F (94.9)	F (98.2)	F (138.8)	F (95.6)	E (76.2)	D (44.3)	D (44.4)	C (20.5)	C (20.5)	C (20.5)	160	266	248	266	266	266	314	314	297	312	312	312	310	316			
		E (65.9)	E (64.1)	E (62.3)	E (62.3)	E (60.2)	E (64.1)	E (63.8)	E (63.8)	E (64.1)	E (57.5)	E (57.5)	D (54.1)	D (54.1)	D (54.1)	D (54.1)		107	120	106	122	113	144	194	217	189	108	109	116	145	145		
		D (45.9)	D (52.7)	D (52.1)	D (52.1)	D (51)	F (81)	E (78.6)	E (78)	E (78)	E (79.4)	D (38.2)	C (23.1)	C (23.8)	D (40.9)	D (39.9)		202	249	249	252	251	70	128	149	139	131	80	217	211	247	254	
		C (24.7)	C (27.8)	C (28.7)	C (28.7)	C (30)	C (30)	B (10.8)	B (10.3)	B (11.4)	B (13.6)	B (18.8)	D (39.7)	D (39.9)	D (49)	D (50.9)		315	325	328	314	331	21	76	65	108	72	315	325	316	330	334	
		B (17.1)	B (16.9)	B (17.3)	B (17.3)	B (17.3)	D (45.2)	D (45)	D (44.9)	C (31)	C (32.3)	B (15.1)	B (16.2)	B (16)	B (12.8)	B (12.8)		258	258	264	269	259	186	256	268	284	288	228	249	235	213	218	
3	University Drive (N/S) and North Street (E/W) Overall Intersection (Signalized)	B (14)	B (15.8)	B (16.5)	B (16.5)	B (16.4)	F (84.9)	F (82.6)	F (82.8)	B (13.9)	B (18.2)	B (15.5)	B (16.9)	B (17)	B (16.9)	B (17.2)	215	284	287	295	293	290	292	300	295	285	291	269	274	276	279	287	
		C (21)	B (16.8)	B (16.5)	B (16.5)	B (16.4)	F (84.9)	F (82.6)	F (82.8)	B (13.9)	B (18.2)	B (15.5)	B (16.9)	B (17)	B (16.9)	B (17.2)		144	136	144	150	160	160	160	160	160	160	159	156	159	159	159	
		C (30.5)	C (30.4)	C (30.4)	C (30.4)	C (30.1)	C (29.6)	C (30.7)	C (34.5)	C (34.5)	C (36.1)	C (23.3)	C (23.9)	C (25.9)	C (26.5)	C (26.5)		144	136	144	150	160	160	160	160	160	160	159	156	159	159	159	
		C (29.6)	C (29.1)	C (28.7)	C (28.7)	C (28)	C (31.2)	C (32.2)	C (32.6)	C (32.6)	C (33.1)	C (23.2)	C (23.7)	C (24)	C (24)	C (24.4)		452	513	512	483	538	620	621	620	626	627	291	356	475	508	568	
		B (17.1)	B (16.4)	B (18.6)	B (18.6)	B (18.1)	C (22.1)	C (24.6)	C (24.9)	C (25.6)	C (26.6)	B (18.9)	B (18.1)	B (18.8)	B (19.1)	B (19.3)		179	187	172	182	185	191	215	214	215	215	120	134	134	195	215	
4	North Street (E/W) and Blenheim Boulevard (N/S) Overall Intersection (Signalized)	A (4.5)	A (6)	A (6)	A (6)	A (4.5)	C (21.4)	D (36.9)	D (38.9)	D (38.9)	D (47.5)	B (11.1)	B (11.6)	B (13)	B (11.5)	B (14)	150	179	187	172	182	185	191	215	214	215	120	134	134	195	215		
		A (1.9)	A (2.6)	A (2.6)	A (2.6)	A (2.5)	C (21.4)	D (36.9)	D (38.9)	D (38.9)	D (47.5)	B (11.1)	B (11.6)	B (13)	B (11.5)	B (14)		208	226	211	236	236	277	314	322	335	336	166	169	196	288	314	
		A (2.3)	A (2.7)	A (2.6)	A (2.6)	A (2.6)	A (6.1)	A (6.9)	A (7.1)	A (7)	A (7.3)	B (10.2)	A (9.5)	A (10.7)	B (10.4)	B (10.4)		64	99	120	91	83	149	149	139	134	133	140	139	132	132		
		A (2.6)	A (3.2)	A (3.3)	A (3.3)	A (3.4)	B (16.2)	B (17.9)	B (17.9)	B (17.8)	B (19)	C (22.4)	C (22.9)	C (23.3)	C (25.5)	C (26.1)		223	236	279	254	283	386	388	384	377	377	288	334	325	307	352	
		E (71.9)	E (59.8)	E (74.7)	E (69.5)	E (69.5)	B (16)	B (16.5)	B (16.9)	B (19.8)	B (19.2)	A (9.6)	B (10.1)	B (10.8)	B (10.3)	A (9.5)		200	197	196	174	194	99	218	104	87	89	116	116	114	114	114	
5	Main Street (E/W) and East Street/Blenheim Boulevard (N/S) Overall Intersection (Signalized)	E (73)	E (73)	E (73)	E (73)	E (73)	F (63.4)	F (65)	F (65.1)	F (65.1)	F (65.1)	D (52.2)	D (52.2)	D (52.2)	D (52.4)	D (52.4)	750	237	235	234	237	234	634	638	635	637	634	637	634	635	617	617	
		E (57.4)	E (57.6)	E (57.6)	E (57.6)	E (57.5)	D (51.1)	D (51.3)	D (51.3)	D (51.3)	D (51.4)	D (45.5)	D (45.2)	D (44.9)	D (44.8)	D (44.8)		164	164	206	192	212	632	624	625	622	623	160	190	193	530	613	
		C (23.7)	C (24.2)	C (25.3)	C (25.3)	C (24.8)	C (27.3)	C (29)	C (34)	C (29.3)	C (26.9)	C (24.7)	C (24.3)	C (26.2)	C (25.2)	C (25)		282	304	299	294	295	315	299	316	163	158	310	317	314	309	312	
		D (42.2)	D (44.1)	D (46.1)	D (46.1)	D (46.1)	D (42.2)	D (43.7)	F (89.9)	E (57.1)	E (57.1)	C (32.5)	C (33.8)	D (41.9)	C (33.7)	C (33.7)		224	223	224	224	225	225	225	225	225	225	225	225	225	225	225	225
		A (3.4)	A (3.4)	A (3.4)	A (3.4)	A (3.6)	A (8.4)	A (8.4)	A (8.1)	A (8.1)	A (8.7)	B (15.3)	B (15)	B (15.8)	B (13.6)	B (14.2)		309	390	376	434	399	602	602	606	606	423	516	586	561	592		
6	Main Street (E/W) and University Drive (N/S) Overall Intersection (Signalized)	D (51.4)	D (51.4)	D (51.4)	D (51.4)	D (51.4)	D (51.3)	D (51.3)	D (51.3)	D (52.2)	D (52.2)	D (48.9)	D (49)	D (48.1)	D (48.9)	D (49)	105	92	90	101	85	82	104	104	104	83	104	71	78	75	98	104	
		E (58.3)	E (58.3)	E (58.3)	E (58.3)	E (58.3)	E (58.3)	E (58.3)	E (58.3)	E (58.3)	E (58.3)	D (53.4)	D (53.4)	D (53.4)	D (53.4)	D (53.4)		201	181	195	185	195	275	280	278	173	246	173	246	173	246		
		B (17.6)	B (17.1)	B (16.8)	B (16.8)	B (16.8)	B (12)	B (12.1)	B (11.8)	B (15)	B (15.5)	A (7.6)	A (6.9)	A (6.8)	B (10.7)	B (10.7)		263	273	275	275	289	302	311	310	313	313	290	285	286	307	304	
		D (41.8)	D (41.3)	D (41.4)	D (41.4)	D (41.4)	D (40.9)	D (42.1)	D (43.2)	D (43.2)	D (48.1)	C (20.7)	B (18.8)	B (19.5)	C (28.5)	C (25.7)		243	250	247	254	264	292	285	295	292	285	266	283	262	289	291	
		C (20.4)	C (21)	B (19.9)	B (19.9)	C (20.5)	B (16.3)	B (16.4)	B (17.6)	C (21)	C (20.1)	B (18)	B (17.5)	B (19.3)	B (18.9)	B (18.5)		90	42	49	60	66	60	62	80	89	79	83	69	84	88	85	88
A (2.1)	A (2.7)	A (3.6)	A (3.6)	A (3.4)	B (12.5)	B (13.8)	B (13.6)	A (10)	A (9.1)	A (3.6)	A (3.5)	A (6.1)	A (6.1)	A (4.8)	120	160	191		156	192	197	198	275										

VDOT Chapter 536 Compliance

This section provides the results of a Chapter 536 volume-to-capacity ratio (V/C) analysis in order to satisfy VDOT requirements. Per the Chapter 536 Code, VDOT shall specify by name and location any transportation facility within the scope of the review having a functional classification of minor arterial or higher for which an increase in traffic volume is expected to exceed the capacity of the facility as a result of the proposed plan.

Four (4) roadways within the study area have a functional classification of minor arterial or higher:

- Chain Bridge Road (Other Principal Arterial)
- Main Street (Other Principal Arterial)
- North Street (Other Principal Arterial)
- Blenheim Boulevard (Minor Arterial)

The V/C ratios were assessed for seventeen (17) roadway segments using the approach traffic volumes as shown in Table 14. For the purposes of this analysis, the capacity used was based on the industry standard of 1,900 vehicles per hour per lane on an interrupted-flow thoroughfare.

Table 14: V/C Assessment

Segment	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
	Volume per Hour (V)	Hourly Capacity (C)	V/C	Volume per Hour (V)	Hourly Capacity (C)	V/C	Volume per Hour (V)	Hourly Capacity (C)	V/C
Main Street (West of West Street)									
Existing 2023	2,010	3,800	0.53	1,744	3,800	0.46	1,247	3,800	0.33
Future without Development 2026	2,080	3,800	0.55	2,507	3,800	0.66	1,947	3,800	0.51
Future with Development 2026	2,140	3,800	0.56	2,631	3,800	0.69	2,092	3,800	0.55
Main Street (Between West Street and Chain Bridge Road)									
Existing 2023	592	3,800	0.16	625	3,800	0.16	613	3,800	0.16
Future without Development 2026	634	3,800	0.17	712	3,800	0.19	678	3,800	0.18
Future with Development 2026	694	3,800	0.18	828	3,800	0.22	809	3,800	0.21
Main Street (Between Chain Bridge Road and University Drive)									
Existing 2023	647	3,800	0.17	779	3,800	0.21	801	3,800	0.21
Future without Development 2026	725	3,800	0.19	869	3,800	0.23	878	3,800	0.23
Future with Development 2026	748	3,800	0.20	929	3,800	0.24	958	3,800	0.25
Main Street (Between University Drive and Blenheim Boulevard)									
Existing 2023	632	3,800	0.17	734	3,800	0.19	767	3,800	0.20
Future without Development 2026	698	3,800	0.18	813	3,800	0.21	834	3,800	0.22
Future with Development 2026	740	3,800	0.19	904	3,800	0.24	945	3,800	0.25
Main Street (East of Blenheim Boulevard)									
Existing 2023	1,935	3,800	0.51	2,479	3,800	0.65	2,001	3,800	0.53
Future without Development 2026	2,061	3,800	0.54	2,624	3,800	0.69	2,116	3,800	0.56
Future with Development 2026	2,117	3,800	0.56	2,735	3,800	0.72	2,256	3,800	0.59
North Street (Between Main Street and Chain Bridge Road)									
Existing 2023	1,461	7,600	0.19	1,730	7,600	0.23	1,245	7,600	0.16
Future without Development 2026	1,606	7,600	0.21	1,939	7,600	0.26	1,418	7,600	0.19
Future with Development 2026	1,666	7,600	0.22	1,950	7,600	0.26	1,436	7,600	0.19
North Street (Between Chain Bridge Road and University Drive)									
Existing 2023	1,599	7,600	0.21	1,996	7,600	0.26	1,486	7,600	0.20
Future without Development 2026	1,720	7,600	0.23	2,175	7,600	0.29	1,637	7,600	0.22
Future with Development 2026	1,738	7,600	0.23	2,237	7,600	0.29	1,711	7,600	0.23
North Street (Between University Drive and Blenheim Boulevard)									
Existing 2023	1,523	5,700	0.27	1,961	5,700	0.34	1,458	5,700	0.26
Future without Development 2026	1,621	5,700	0.28	2,094	5,700	0.37	1,519	5,700	0.27
Future with Development 2026	1,626	5,700	0.29	2,110	5,700	0.37	1,593	5,700	0.28
Chain Bridge Road (North of North Street)									
Existing 2023	1,306	7,600	0.17	1,313	7,600	0.17	1,174	7,600	0.15
Future without Development 2026	1,408	7,600	0.19	1,444	7,600	0.19	1,271	7,600	0.17
Future with Development 2026	1,451	7,600	0.19	1,523	7,600	0.20	1,372	7,600	0.18
Chain Bridge Road (Between North Street and Main Street)									
Existing 2023	1,258	7,600	0.17	1,222	7,600	0.16	1,090	7,600	0.14
Future without Development 2026	1,348	7,600	0.18	1,340	7,600	0.18	1,172	7,600	0.15
Future with Development 2026	1,373	7,600	0.18	1,366	7,600	0.18	1,215	7,600	0.16
Chain Bridge Road (Between Main Street and Sager Avenue)									
Existing 2023	1,393	7,600	0.18	1,468	7,600	0.19	1,245	7,600	0.16
Future without Development 2026	1,533	7,600	0.20	1,647	7,600	0.22	1,371	7,600	0.18
Future with Development 2026	1,591	7,600	0.21	1,719	7,600	0.23	1,461	7,600	0.19

Segment	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
	Volume per Hour (V)	Hourly Capacity (C)	V/C	Volume per Hour (V)	Hourly Capacity (C)	V/C	Volume per Hour (V)	Hourly Capacity (C)	V/C
Chain Bridge Road (Between Sager Avenue and South Street)									
Existing 2023	1,367	7,600	0.18	1,403	7,600	0.18	1,149	7,600	0.15
Future without Development 2026	1,507	7,600	0.20	1,582	7,600	0.21	1,276	7,600	0.17
Future with Development 2026	1,517	7,600	0.20	1,589	7,600	0.21	1,295	7,600	0.17
Chain Bridge Road (Between South Street and Judicial Drive)									
Existing 2023	1,489	7,600	0.20	1,491	7,600	0.20	1,184	7,600	0.16
Future without Development 2026	1,663	7,600	0.22	1,709	7,600	0.22	1,335	7,600	0.18
Future with Development 2026	1,669	7,600	0.22	1,721	7,600	0.23	1,358	7,600	0.18
Chain Bridge Road (Between Judicial Drive and Armstrong Street)									
Existing 2023	1,815	7,600	0.24	1,917	7,600	0.25	1,509	7,600	0.20
Future without Development 2026	2,022	7,600	0.27	2,146	7,600	0.28	1,689	7,600	0.22
Future with Development 2026	2,028	7,600	0.27	2,159	7,600	0.28	1,712	7,600	0.23
Chain Bridge Road (South of Armstrong Street)									
Existing 2023	1,786	3,800	0.47	1,862	3,800	0.49	1,489	3,800	0.39
Future without Development 2026	1,976	3,800	0.52	2,077	3,800	0.55	1,662	3,800	0.44
Future with Development 2026	2,004	3,800	0.53	2,137	3,800	0.56	1,777	3,800	0.47
Blenheim Boulevard (Between Main Street and North Street)									
Existing 2023	1,632	7,600	0.21	2,313	7,600	0.30	1,563	7,600	0.21
Future without Development 2026	1,696	7,600	0.22	2,395	7,600	0.32	1,624	7,600	0.21
Future with Development 2026	1,703	7,600	0.22	2,420	7,600	0.32	1,656	7,600	0.22
Blenheim Boulevard (North of North Street)									
Existing 2023	973	7,600	0.13	1,167	7,600	0.15	897	7,600	0.12
Future without Development 2026	1,035	7,600	0.14	1,256	7,600	0.17	974	7,600	0.13
Future with Development 2026	1,047	7,600	0.14	1,277	7,600	0.17	999	7,600	0.13

As shown in Table 14, the roadway segments along Main Street, North Street, Chain Bridge Road, and Blenheim Boulevard are anticipated to operate at a V/C ratio of 0.72 or less, indicating sufficient capacity along the roadway network.

Conclusions

This report presented the findings of a Transportation Impact Study (TIS) conducted for the proposed redevelopment of The Ox Fairfax – Block A site in the City of Fairfax, Virginia.

The analysis presented in this report supports the following major finding:

- After the addition of redevelopment traffic, one (1) intersection has movements that begin to operate below acceptable levels of service as compared to the Future Conditions without Development (2026), after mitigations.

Additional assumptions, findings, and conclusions are as follows:

TIA Components

- As determined based on discussions with the City, a growth rate of one (1) percent per year was applied to major movements at the study intersections to account for regional growth in background traffic volumes.
- A Mode Split/TDM reduction of fifteen (15) percent was applied to the theater (attendees and employees), hotel, and office uses, as agreed upon with the City.
- The site is expected to generate approximately 259 trips in the AM peak hour, 511 trips in the PM peak hour, and 580 trips in the Saturday peak hour, after reductions.

Infrastructure

- Existing vehicular access is provided via two (2) driveways on Chain Bridge Road, two (2) driveways on Sager Avenue, and two (2) driveways on University Drive.
- With redevelopment of the property, site access will be provided via Sager Avenue and University Drive.
- The proposed South Street Extension will reroute traffic and relieve congestion on Main Street through Old Town and will ultimately provide access to The Ox Fairfax – Block A site. The extension is expected to be complete in 2031 and is to be built by others.

Non-SOV Elements

- Sidewalks and curb ramps generally exist along the corridors adjacent to and within the vicinity of the site.
- A dedicated on-street bike lane currently exists on University Drive adjacent to the site.
- Five (5) bus routes provide service in the vicinity of the site, providing regional access to the area.

Analysis Results

- Nine (9) intersections within the study area have movements that operate below acceptable levels of service under the Existing Conditions (2023).
- Ten (10) intersections within the study area have movements that operate below acceptable levels of service under Future Conditions without Development (2026).
- After the addition of redevelopment traffic, one (1) intersection has movements that begin to operate below acceptable levels of service as compared to the Future Conditions without Development (2026), after mitigations.

Proposed Mitigation

- Future with Development (2026) – Mitigation measures have been identified to improve traffic operations in the Future with Development (2026) scenario. These improvements include the following:
 - Intersection 1: Main Street and West Street/North Street
 - Adjust signal timings to improve operations (SAT Peak only).

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- Intersection 5: Main Street and East Street/Blenheim Boulevard
 - Adjust signal timings to improve operations (PM Peak only).
 - Intersection 7: Main Street and Chain Bridge Road
 - Adjust signal timings to improve operations (PM Peak only).
 - Intersection 12: University Drive and South Street
 - Install a traffic signal and add exclusive northbound left lane.