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# Paul VI Redevelopment

## Traffic Impact Study

April 18, 2017

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# PAUL VI REDEVELOPMENT
## TRAFFIC IMPACT STUDY
## CITY OF FAIRFAX, VIRGINIA

**Prepared for:**
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**April 18, 2017**

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# CITY OF FAIRFAX, VIRGINIA

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## SECTION 1
## INTRODUCTION

This report presents the results of a traffic impact study conducted in support of the proposed redevelopment of the Paul VI Catholic High School (Paul VI) in the City of Fairfax, Virginia, and presents an evaluation of the existing and future transportation network.

This study was conducted in accordance with a scoping agreement developed with City of Fairfax staff. The study scope was determined with City staff based on a review of key study intersections and roadways that would potentially be affected by the implementation of the proposed redevelopment and the number of new trips expected to be generated.

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

The subject property is comprised of three parcels located at 10675 Fairfax Boulevard, 10600 Cedar Avenue, and 10606 Cedar Avenue, totaling 18.5 acres. The parcel located at 10675 Fairfax Boulevard is zoned CR (Commercial Retail) and the two Cedar Avenue parcels are zoned RM (Residential Medium Density).

The applicant, IDI Group Companies, proposes to develop the site with 220 residential condominium units, 110 town homes, 200 apartments, 25 senior housing units and 10,000 square feet (SF) of local serving retail and 24,000 SF of community center space. A concept development plan is shown on Figure 1-2.

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

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

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

1. Estimation of the net new vehicle trip ends generated by the planned land uses during the AM and PM commuter peak hours and during the PM school peak hour.

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

3. Identification of potential road and/or operational improvements necessary to accommodate the project.

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

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

2. A field review of the subject site in order to determine existing roadway and intersection geometrics and traffic controls, access opportunities and/or constraints, and general traffic conditions.

3. Peak hour turning movement counts obtained at the following study intersections:

    - Lee Highway/Fairfax Boulevard/Main Street
    - Fairfax Boulevard/Fairchester Drive, Walnut Street
    - Fairfax Boulevard/Meredith Drive/Oak Street
    - Fairfax Boulevard/The Shops at Fairfax Entrance-Future Site Entrance.
    - Fairfax Boulevard/Paul VI Entrance (Future Site Entrance)
    - Fairfax Boulevard/McLean Avenue/Warwick Avenue
    - Walnut Street/Cedar Avenue
    - Oak Street/Cedar Avenue
    - McLean Avenue/Cedar Avenue

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

5. Identification of the number of net new peak hour trips that would be generated by the proposed mixed-use development based on standard Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition equations less trips currently generated by the existing Paul VI Catholic High School determined from traffic counts.

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

7. Calculation of future levels of service with and without the proposed development at the key study intersections for a proposed build-out year of 2027.

Sources of data for this analysis include traffic counts conducted by Wells + Associates Inc., information obtained from the City of Fairfax, the Institute of Transportation Engineers (ITE), the Highway Capacity Manual 2000 (Synchro software, version 9.1), IDI Companies Group, and the files and library of Wells + Associates.

## Conclusions

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

1. The Lee Highway/Fairfax Boulevard/Main Street intersection currently operates at or near capacity at level of service (LOS) "E" during each of the three (3) studied peak periods.

2. All other signalized intersections currently operate at an overall LOS D or better during each of the three (3) studied peak periods based on Highway Capacity Manual calculations, however, substantial queues were observed along Fairfax Boulevard during the peak periods. Specifically, substantial queues along eastbound Fairfax Boulevard were observed during the AM peak period and substantial westbound queues were observed during the PM peak period.

3. Historic VDOT traffic data indicates that average daily traffic counts along Fairfax Boulevard and Main Street have decreased by 1.2% to 1.9% per year between 2008 and 2015.

4. The Novus Fairfax Gateway and Mount Vineyard pipeline developments are anticipated to generate 395 AM commuter peak hour trips, 418 PM school peak hour trips, and 576 PM commuter peak hour trips at full buildout.

5. Under future 2027 traffic conditions, without redevelopment of the Paul VI site, minimal increases in delay at the study intersections are expected due to the trips generated by pipeline development in the vicinity of the site and overall levels of service would remain generally consistent with existing conditions.

6. The existing Paul VI Catholic High School currently generates 1,005 trips during the AM commuter peak hour, 563 trips during the PM school peak hour, and 132 trips during the PM commuter peak hour.

7. The Applicant proposes to redevelop the site with 220 residential condominium units, 110 town homes, 200 apartments, 25 senior housing units, 10,000 SF of local serving retail, and 24,000 SF of community center space.

8. The project is estimated to generate 690 ***fewer*** AM peak commuter hour trips, 119 ***fewer*** PM school peak hour trips, and 353 ***more*** PM peak commuter hour trips than are currently generated by the high school.

9. Under future 2027 traffic conditions, with the development of the subject site, intersection levels of service would remain generally consistent with existing and background conditions. The analyses show that the Lee Highway/Fairfax Boulevard/Main Street will continue to operate at LOS E during all three peak periods studied. All other intersections will operate at LOS D or better during each of the studied peak periods.

10. A full turning movement site driveway is proposed along Fairfax Boulevard to align with the existing Shops at Fairfax entrance. The full access signalized intersection would operate at an overall LOS "D" during each of the studied peak periods.

11. A full turning movement, side-street stop-controlled entrance is proposed along Fairfax Boulevard between the Shops at Fairfax intersection and McLean Avenue. This unsignalized intersection will operate at LOS "C" or better during each of the studied time periods.


Figure 1-1
Site Location
Paul VI Redevelopment
City of Fairfax, Virginia

NORTH

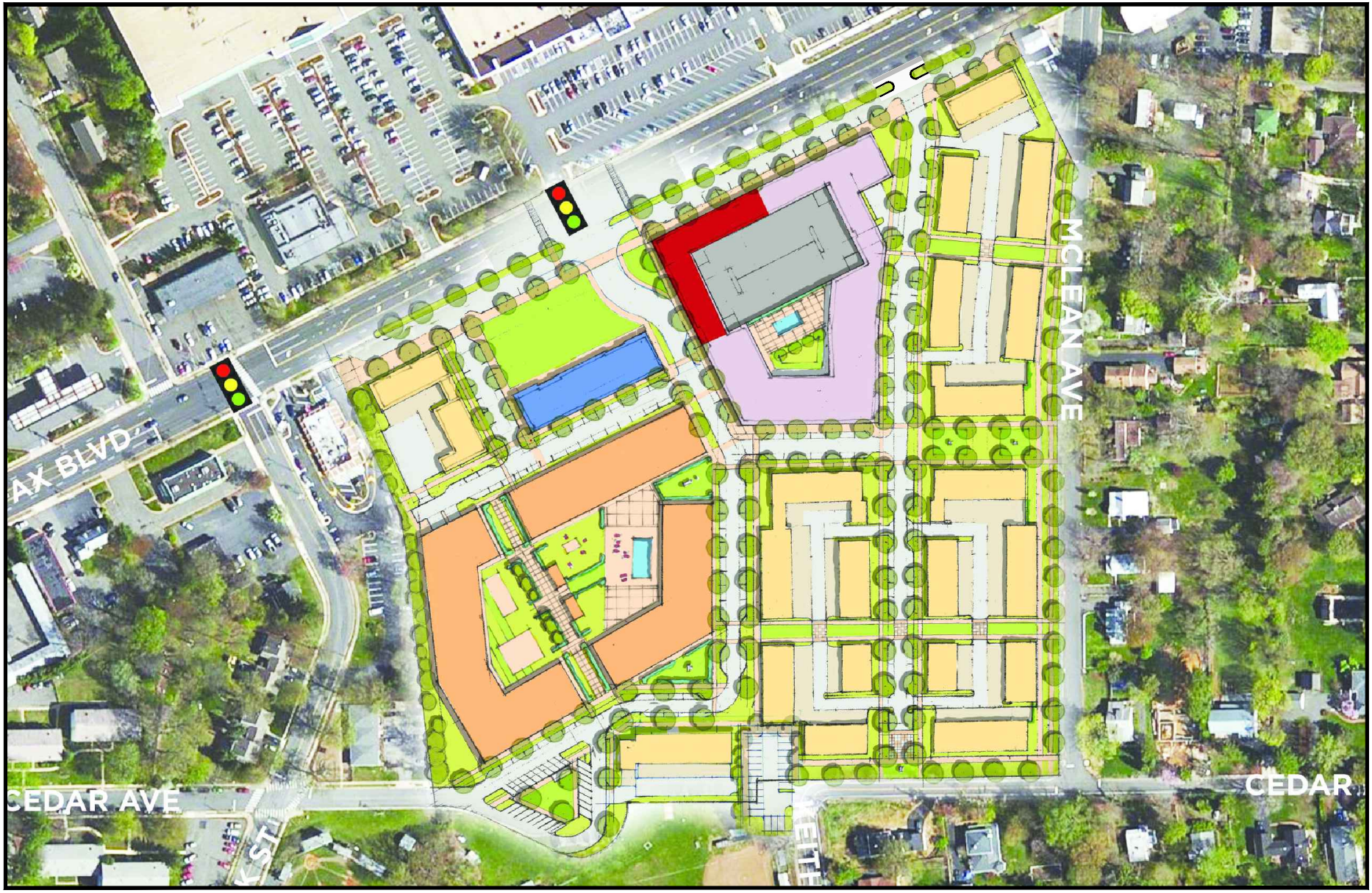



Figure 1-2
Reduced Site Plan

Paul VI Redevelopment

City of Fairfax, Virginia

NORTH

## SECTION 2
## BACKGROUND INFORMATION

### Location and Surrounding Uses

As shown in Figure 1-1, Paul VI is regionally located approximately ½ mile east of Main Street on Fairfax Boulevard in the City of Fairfax. Regional Access is provided by I-66 via Lee Jackson Memorial Highway/Main Street and Chain Bridge Road. Fairfax Boulevard/Arlington Boulevard provides access to/from I-495 (the Capital Beltway).

Properties immediately west and south of the site are generally residential in nature while commercial uses are predominant along Fairfax Boulevard. An existing McDonald's restaurant and a daycare facility are located immediately west of the site and south of Fairfax Boulevard.

### Comprehensive Plan Land Use Recommendations

The City's Comprehensive Plan shows the subject parcels as institutional and residential on the Future Land Use Map.

### Existing Transportation Network

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

*Route 29/50 (Fairfax Boulevard).* Fairfax Boulevard is classified as an arterial roadway according to the City of Fairfax Comprehensive Plan. Within the vicinity of the subject site, Fairfax Boulevard is constructed as a five-lane, undivided roadway with a center two-way left turn lane and a posted speed limit of 35 miles per hour. Traffic signals are provided at major cross-streets including Main Street, Fairchester Drive/Walnut Street, Meredith Drive/Oak Street, and McLean Avenue/Warwick Avenue. The intersection of Fairfax Boulevard and the driveway to The Shops at Fairfax is also signalized. The Lee Highway/Fairfax Boulevard/Main Street intersection (referred to as Kamp Washington) is a critical signalized intersection within the City of Fairfax. Based on 2015 VDOT average annual daily traffic (AADT) data, Fairfax Boulevard east of Main Street carries approximately 35,000 vehicles per day (vpd).

*Route 236 (Main Street).* Main Street is also classified by the Comprehensive Plan as an arterial roadway and is constructed as a four-lane, median-divided roadway with a posted speed limit of 35 miles per hour. Based on 2015 VDOT AADT data, Main Street east of the Kamp Washington intersection carries approximately 35,000 vpd.

Cedar Avenue. Cedar Avenue is a two-lane east-west discontinuous roadway. The section of Cedar Avenue west of Paul VI is approximately 30 feet in width, operates as a collector roadway, and provides access to the parking lot in the rear of Paul VI. The section of Cedar Avenue east of Paul VI operates as a residential street and does not provide access to or from the school.

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

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

McLean Avenue. McLean Avenue is a two-lane undivided north-south residential street that provides access between Fairfax Boulevard and Cedar Avenue, east of Paul VI Catholic High School.

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

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

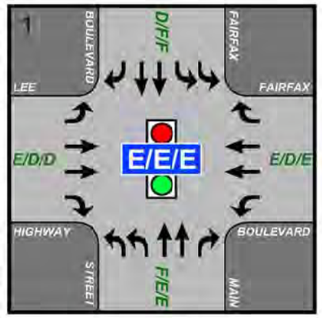
**Pedestrian Facilities.** Concrete sidewalks are provided along both sides of Fairfax Boulevard and Oak Street, and along the north side of Cedar Avenue east of Oak Street. Marked crosswalks are provided across the north, south, and east legs of the Fairfax Boulevard/ Meredith Drive/Oak Street intersection; across the west leg of the Fairfax Boulevard/McLean Avenue/Warwick Avenue intersection; and across the east leg of the intersection of Fairfax Boulevard and The Shops at Fairfax driveway.

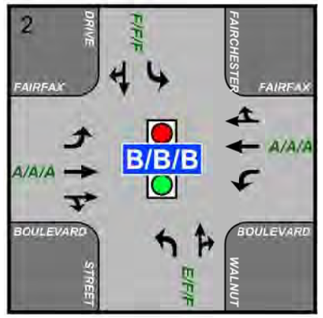
## Future Transportation Network

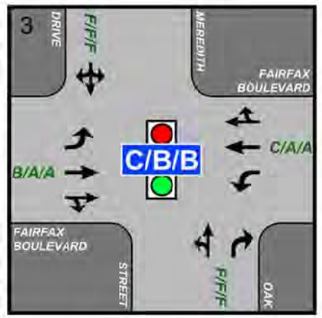
The City of Fairfax's Comprehensive Plan provides recommended strategies for the improvement of the City's transportation network. In general, the Plan recommends that the City should strive to achieve a balance between allowing for the efficient movement of traffic and providing safe and convenient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

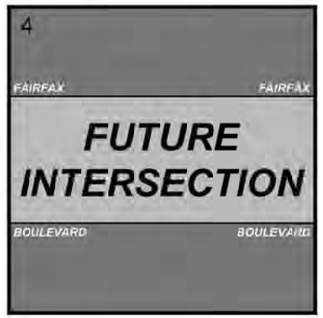
The Comprehensive Plan recommends that Fairfax Boulevard be configured with landscaped medians, where possible, and enhanced streetscape features to encourage pedestrian activity. Slow lanes (with on-street parking), separated from the main travel lanes by landscaped medians should be considered within or adjacent to portions of the Kamp Washington and Northfax Centers if the nature of adjacent redevelopment activity is such that those features would be appropriate.

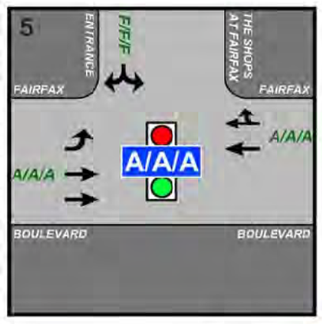
Based on the location of the site, adjacent to the Kamp Washington and Northfax Centers, and the Comprehensive Plan recommendations, a slow lane with on-street parking is proposed along the site frontage of Fairfax Boulevard.

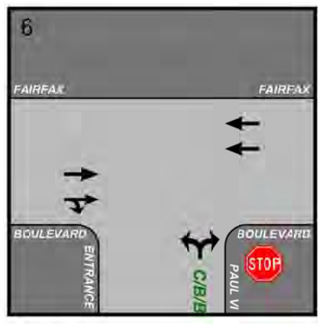


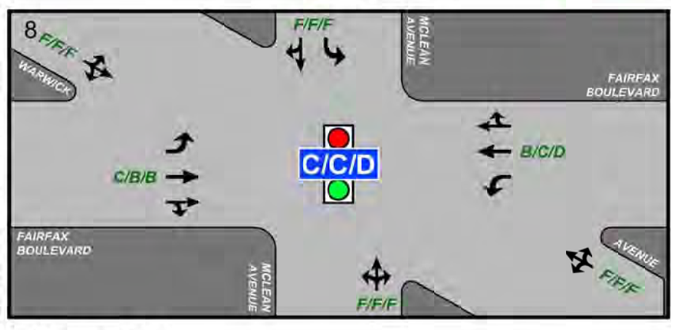



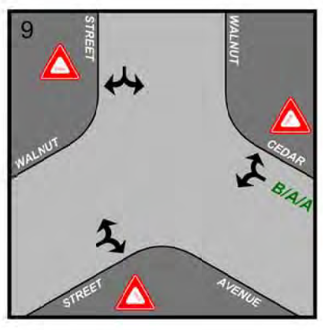



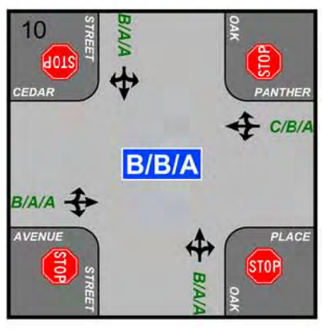



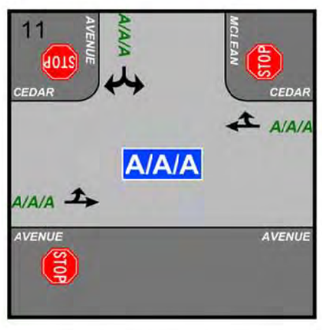


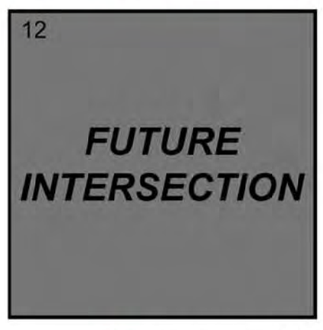


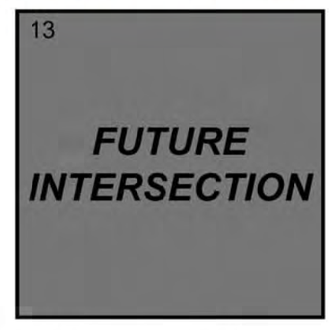




Figure 2-1
Existing Lane Use, Traffic Controls, and Levels of Service

Paul VI Redevelopment

Fairfax County, Virginia

X/X/X Approach Levels of Service

X/X/X Overall Intersection Levels of Service

Represents One Travel Lane

Signalized Intersection

Stop Sign

Yield Sign

NORTH

# SECTION 3
# STUDY SCOPE AND ANALYSIS PARAMETERS

## Overview

The subject site is located south of Fairfax Boulevard, east of Oak Street, and west of McLean Avenue in the City of Fairfax, Virginia. The subject property is comprised of three parcels located at 10675 Fairfax Boulevard, 10600 Cedar Avenue, and 10606 Cedar Avenue totaling 18.5 acres. The parcel located at 10675 Fairfax Boulevard is zoned CR and the two Cedar Avenue parcels are zoned RM.

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

This traffic study was conducted in accordance with the scoping document and discussions with Wells + Associates, City staff, and the Applicant. The traffic study scope was approved by the Applicant and City staff on January 12, 2017 and is provided in Appendix A.

## Study Area

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

- Lee Highway/Fairfax Boulevard/Main Street
- Fairfax Boulevard/Fairchester Drive, Walnut Street
- Fairfax Boulevard/Meredith Drive/Oak Street
- Fairfax Boulevard/The Shops at Fairfax Entrance-Future Site Entrance.
- Fairfax Boulevard/Paul VI Entrance (Future Site Entrance)
- Fairfax Boulevard/McLean Avenue/Warwick Avenue
- Walnut Street/Cedar Avenue
- Oak Street/Cedar Avenue
- McLean Avenue/Cedar Avenue

## Site Development Program

The Applicant proposes to develop the site with 220 residential condominium units, 110 town homes, 200 apartments, 25 senior housing units, 10,000 SF of local serving retail and 24,000 SF of community center space.

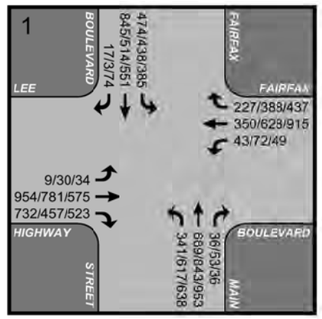
## Analysis Study Periods

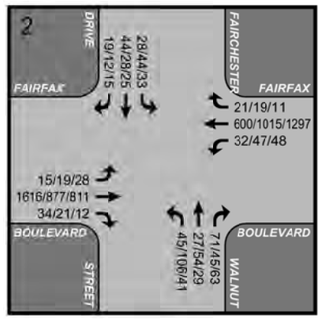
The intersections within the study area were analyzed under AM and PM commuter peak hour conditions and under the PM school peak hour condition.

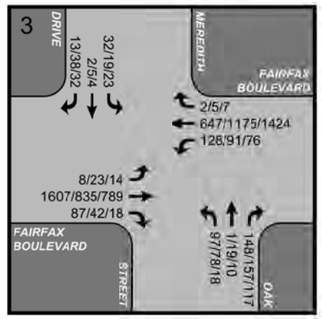
## Existing Traffic Volumes

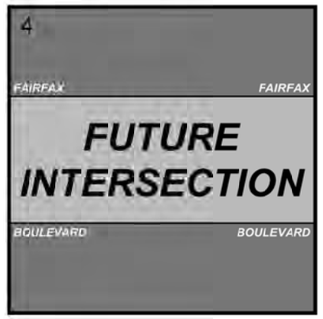
Existing AM commuter, school PM, and PM commuter peak hour turning movements and pedestrian counts were conducted on Wednesday, February 3, 2016, and Thursday, January 5, 2017, at the study intersections from 6:00 AM to 9:00 AM and from 2:00 PM to 7:00 PM:

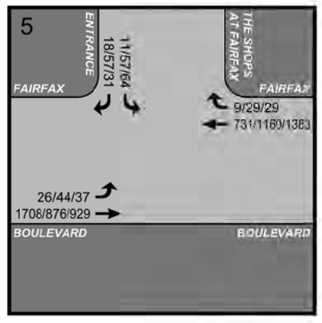
The existing vehicular traffic volumes used in the analyses are provided on Figure 3-1. All existing count data are included in Appendix B.

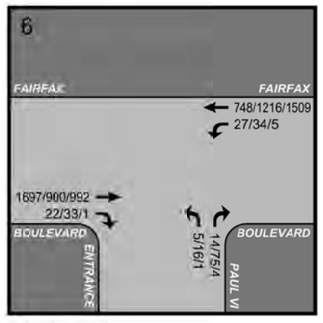


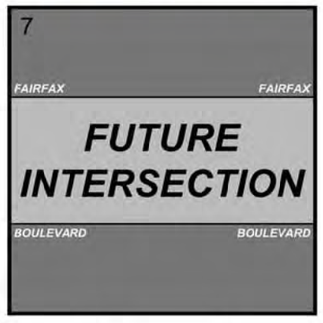



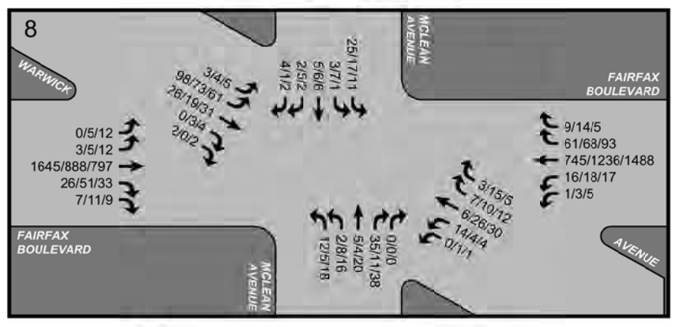



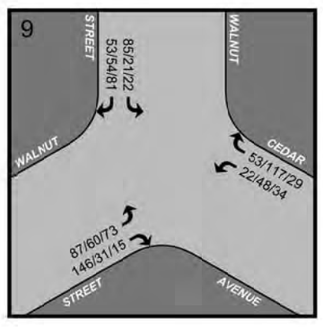



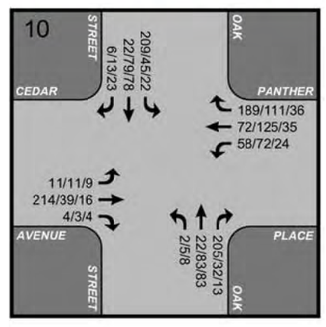



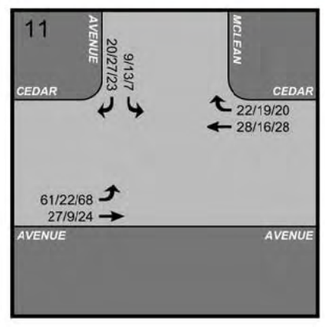


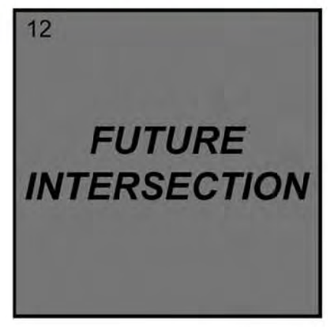




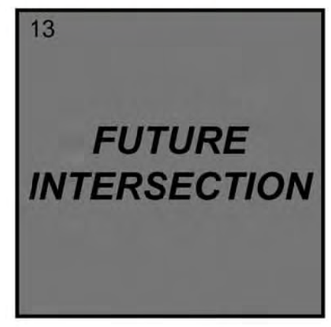




Figure 3-1
Existing Peak Hour Traffic Volumes

Paul VI Redevelopment

Fairfax County, Virginia

AM PEAK HOUR
SCHOOL PM PEAK HOUR
PM PEAK HOUR
000 / 000 / 000

NORTH

# SECTION 4
# EXISTING CONDITIONS ANALYSIS

## Existing Intersection Levels of Service

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

The analyses show that the Lee Highway/Fairfax Boulevard/Main Street intersection currently operates at or near capacity at LOS "E" during each of the peak hours (AM commuter peak, School PM peak, and PM commuter peak) with an average delay per vehicle of between 62.3 and 71.5 seconds.

Other signalized intersections along Fairfax Boulevard in the vicinity of the site operate at adequate overall LOS "D" or better during each of the three peak periods studied. However, the side street approaches operate at LOS "E" and "F" with average delays between 76.1 seconds and 128.0 seconds. The volume-to-capacity (v/c) ratios for the side street approaches at intersections along Fairfax Boulevard east of Main Street are well below 1.0, indicating that the lengthy delays are the result of long cycle lengths (190 seconds during the AM commuter peak hour and 220 seconds during the PM school peak and PM commuter peak hours) and the assignment of the predominance of the green time to the Fairfax Boulevard approaches, rather than insufficient capacity.

All approaches at the unsignalized intersections of Walnut Street/Cedar Avenue, Oak Street/Cedar Avenue, and McLean Avenue/Cedar Avenue operate at LOS "C" or better during each of the peak periods.

## Table 4-1

Paul VI Redevelopment

Existing Intersection Capacity Analysis Summary[1]

| | Intersection | Intersection Control | Approach | Existing | | |
|---|---|---|---|---|---|---|
| | | | | AM Peak | PM School Peak | PM Peak |
| 1. | Lee Highway & Fairfax Boulevard & Main Street[2] | Signal | EB Appr | D (54.0) | F (87.3) | F (91.3) |
| | | | WB Appr | F (96.0) | E (70.1) | E (76.3) |
| | | | NB Appr | E (74.9) | D (45.1) | D (39.1) |
| | | | SB Appr | E (57.4) | D (49.5) | E (71.5) |
| | | | **Overall** | **E (71.5)** | **E (62.3)** | **E (69.8)** |
| 2. | Fairfax Boulevard & Fairchester Drive/Walnut Street | Signal | EB Appr | A (8.2) | A (1.4) | A (1.4) |
| | | | WB Appr | A (5.3) | A (2.6) | A (1.7) |
| | | | NB Appr | E (76.1) | F (87.5) | F (90.9) |
| | | | SB Appr | F (88.8) | F (93.7) | F (118.8) |
| | | | **Overall** | **B (14.1)** | **B (13.0)** | **B (10.1)** |
| 3. | Fairfax Boulevard & Meredith Drive/Oak Street | Signal | EB Appr | B (15.7) | A (4.3) | A (3.3) |
| | | | WB Appr | C (23.3) | A (7.4) | A (8.3) |
| | | | NB Appr | F (83.8) | F (100.1) | F (100.0) |
| | | | SB Appr | F (89.5) | F (102.4) | F (102.5) |
| | | | **Overall** | **C (25.1)** | **B (18.1)** | **B (14.1)** |
| 4. | Fairfax Boulevard & Site Entrance | Free | EB Appr | Future Intersection | | |
| 5. | Fairfax Boulevard & Fairfax Shoppes Entrance/Site Entrance (Future) | Signal | EB Appr | A (2.0) | A (1.0) | A (1.4) |
| | | | WB Appr | A (0.6) | A (1.2) | A (0.5) |
| | | | NB Appr | Future Approach | | |
| | | | SB Appr | F (84.1) | F (104.7) | F (103.9) |
| | | | **Overall** | **A (2.6)** | **A (6.4)** | **A (4.8)** |
| 6. | Fairfax Boulevard & Paul VI Entrance | Stop | NB Appr | C (21.1) | B (13.6) | B (12.6) |
| 7. | Fairfax Boulevard & Site Exit | Stop | NB Appr | Future Intersection | | |
| 8. | Fairfax Boulevard & McLean Avenue & Warwick Road[3] | Signal | EB Appr | F (115.4) | F (117.3) | F (128.0) |
| | | | WB Appr | F (90.4) | F (103.7) | F (103.2) |
| | | | NB Appr | F (88.2) | F (106.5) | F (115.4) |
| | | | SB Appr | F (85.3) | F (104.4) | F (93.1) |
| | | | NE Appr | C (21.9) | B (12.3) | B (11.5) |
| | | | SW Appr | B (19.7) | C (23.3) | D (39.1) |
| | | | **Overall** | **C (28.5)** | **C (26.6)** | **D (37.9)** |
| 9. | Walnut Street & Cedar Avenue[4] | Stop | WB Appr | B (10.1) | A (9.4) | A (9.5) |
| 10. | Oak Street & Cedar Avenue | Stop | EB Appr | B (13.9) | A (8.5) | A (7.8) |
| | | | WB Appr | C (15.6) | B (10.9) | A (8.0) |
| | | | NB Appr | B (12.6) | A (9.0) | A (8.0) |
| | | | SB Appr | B (14.8) | A (9.4) | A (8.1) |
| | | | **Overall** | **B (14.3)** | **B (10.0)** | **A (8.0)** |
| 11. | Cedar Avenue & McLean Avenue | Stop | EB Appr | A (7.7) | A (7.4) | A (7.7) |
| | | | WB Appr | A (7.1) | A (6.9) | A (7.1) |
| | | | SB Appr | A (7.0) | A (6.9) | A (7.0) |
| | | | **Overall** | **A (7.4)** | **A (7.0)** | **A (7.4)** |
| 12. | Internal Road & Frontage Road | Stop | NB Appr | Future Intersection | | |
| 13. | Internal Road & Frontage Road | Stop | NB Appr | Future Intersection | | |

Notes:
1. Capacity analysis based on Highway Capacity Manual methodology, using Synchro 9.1.
2. Fairfax Boulevard/Main Street analyzed as east-west road; Lee Highway/Fairfax Boulevard analyzed as north-south roadway.
3. Warwick Road analyzed as east-west road; McLean Avenue analyzed as north-south roadway; Fairfax Boulevard analyzed as northeast-southwest roadway.
4. Analyzed with northbound and southbound as free movements along Walnut Street, and westbound movements along Cedar Avenue as stop-controlled.

# SECTION 5
# ANALYSIS OF FUTURE CONDITIONS WITHOUT SITE DEVELOPMENT

## Overview

Forecasts for traffic conditions without the redevelopment of Paul VI were estimated at the study intersections based on a composite of existing traffic and pipeline development trips as described in Section 3 of this report. Future levels of service under these forecasted conditions were evaluated at the study intersections.

## Regional Traffic Growth

A review of VDOT AADT volumes along Fairfax Boulevard and Main Street in the vicinity of the site indicates a modest reduction in traffic volumes over the past seven (7) years. AADT volumes along Fairfax Boulevard east of Main Street fell from 38,000 vehicles in 2008 to 35,000 vehicles in 2015, an average annual decrease of approximately 1.2% per year. AADT volumes along Main Street south of Fairfax Boulevard fell from 40,000 vehicles in 2008 to 35,000 vehicles in 2015, an average annual decrease of approximately 1.9% per year.

In order to present a conservative (or worst case) analysis, no continuing decrease in regional traffic volumes was assumed in this analysis.

## Traffic from Other Approved/Pending Developments

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

- Novus Fairfax Gateway
    - 4,000 SF Office
    - 5,000 SF Quality Restaurant
    - 7,400 SF High Turn-Over Sit-Down Restaurant
    - 12,600 SF Shopping Center
    - 395 Residential Apartments

- Mount Vineyard
    - 132 Residential Condominiums/Townhouses

As shown in Table 5-1, these pipeline developments are anticipated to generate 395 AM peak commuter hour trips, 418 PM school peak hour trips, and 576 PM commuter peak hour trips at full buildout.

## Background Traffic Forecasts

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

## Background Future Levels of Service

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

As shown on Table 5-2, the Lee Highway/Fairfax Boulevard/Main Street intersection will continue to operate at or near capacity at LOS "E" during each of the peak hours (AM commuter peak, School PM peak, and PM commuter peak). When compared to existing conditions, the average delay per vehicle at this intersection will increase to between 64.0 and 75.0 seconds during the peak hours, an increase of between 1.7 seconds per vehicle and 3.5 seconds per vehicle.

Other signalized intersections along Fairfax Boulevard in the vicinity of the site continue to operate at an adequate overall LOS "D" or better during each of the three peak periods studied. As with the existing conditions analysis, the side street approaches will continue to operate at LOS "E" and "F" due to the combination of long cycle lengths (190 seconds during the AM commuter peak hour and 220 seconds during the PM school peak and PM commuter peak hours) and the assignment of the predominance of the green time to the Fairfax Boulevard approaches. The side street approaches at signalized intersections east of Main Street will continue to operate with v/c ratios well below 1.0.

All approaches at the unsignalized intersections of Walnut Street/Cedar Avenue, Oak Street/ Cedar Avenue, and McLean Avenue/Cedar Avenue will continue to operate at LOS "C" or better during each of the peak hours.

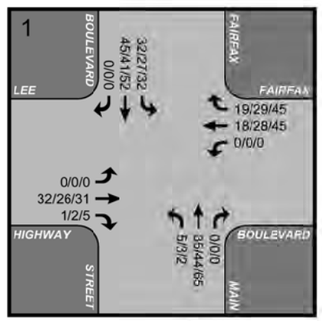
## Table 5-1

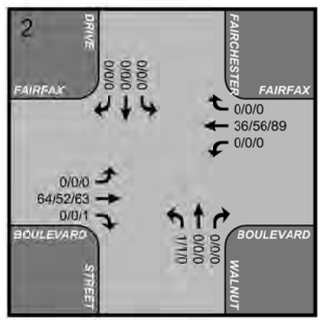
Paul VI Redevelopment

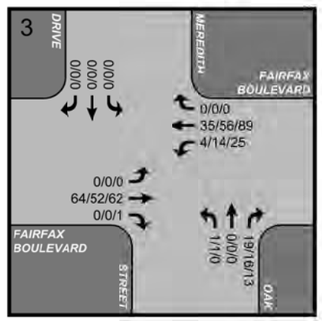
Pipeline Development Trip Generation

| Development | ITE Land Use Code[1] | Amount | Units | AM Peak Hour | | | School PM Peak Hour | | | PM Peak Hour | | | Average Daily Trips |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | In | Out | Total | In | Out | Total | In | Out | Total | |
| **Novus Fairfax Gateway** | | | | | | | | | | | | | |
| Office | 710 | 4,000 | SF | 5 | 1 | 6 | 1 | 2 | 3 | 1 | 5 | 6 | 44 |
| Quality Restaurant | 931 | 5,000 | SF | 2 | 2 | 4 | 5 | 5 | 10 | 25 | 12 | 37 | 450 |
| High Turnover Restaurant | 932 | 7,400 | SF | 44 | 36 | 80 | 9 | 9 | 18 | 44 | 29 | 73 | 941 |
| Shopping Center | 820 | 12,600 | SF | 27 | 17 | 44 | 69 | 78 | 147 | 72 | 78 | 150 | 1,767 |
| Apartments | 220 | 395 | DU | 39 | 158 | 197 | 102 | 79 | 181 | 153 | 82 | 235 | 2,517 |
| **Total Novus Fairfax Gateway Trips** | | | | **117** | **214** | **331** | **186** | **173** | **359** | **295** | **206** | **501** | **5,719** |
| **Mount Vineyard** | | | | | | | | | | | | | |
| Condominiums/Townhomes | 230 | 132 | DU | **11** | **53** | **64** | **33** | **26** | **59** | **50** | **25** | **75** | **819** |
| **Total Background Development Trips** | | | | **128** | **267** | **395** | **219** | **199** | **418** | **345** | **231** | **576** | **6,538** |

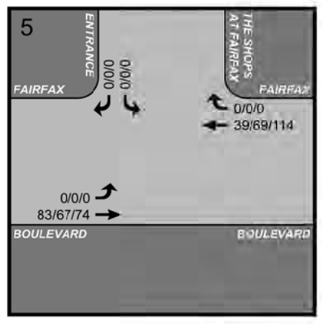
Notes: 1. Institute of Transportation Engineer's (ITE), Trip Generation Manual, 9th Edition

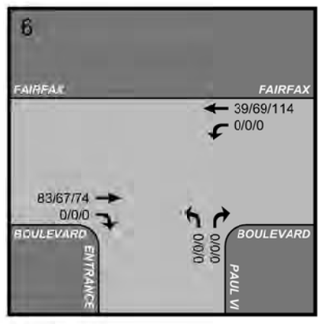


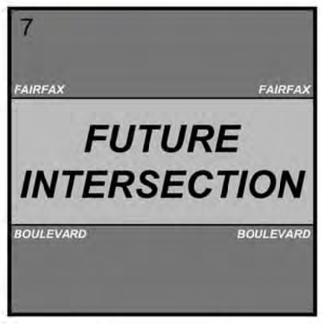





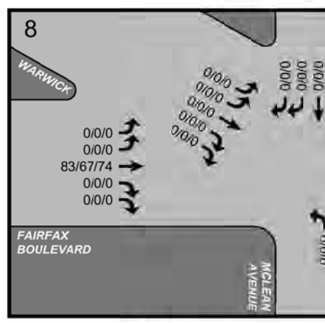


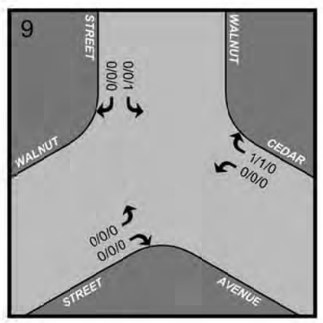



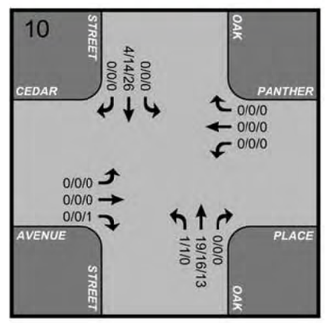



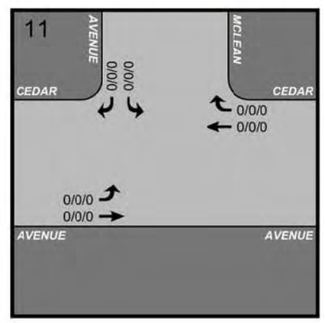


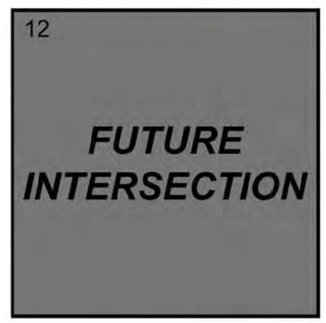




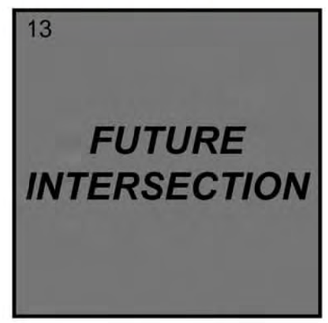



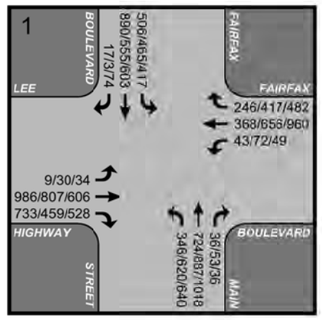

Figure 5-1
Pipeline Development Site Generated Traffic Assignments

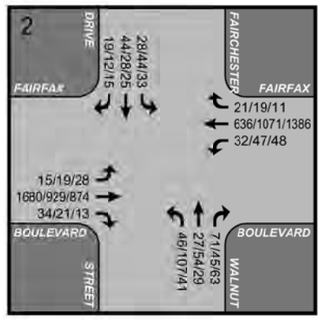
Paul VI Redevelopment

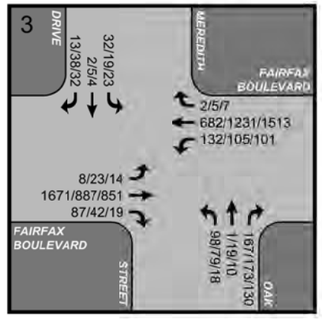
Fairfax County, Virginia

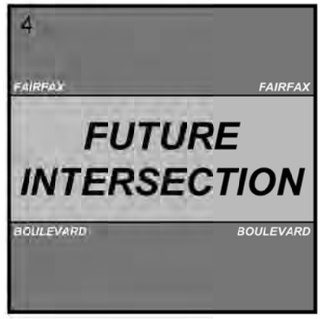
AM PEAK HOUR
SCHOOL PM PEAK HOUR
PM PEAK HOUR
000 / 000 / 000

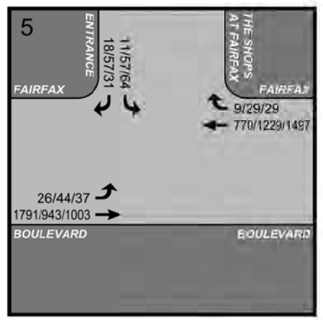
NORTH

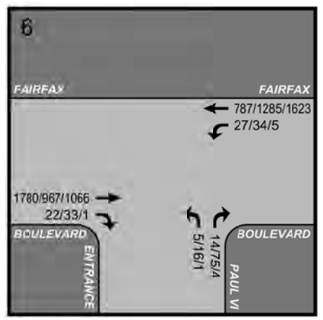


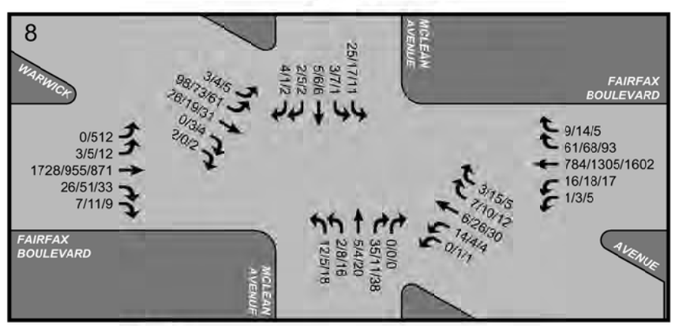



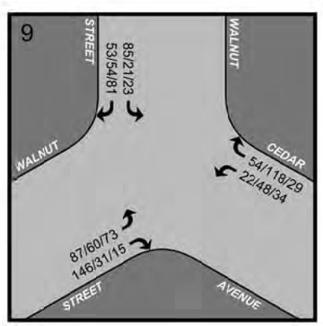



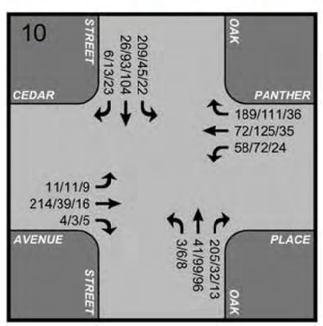



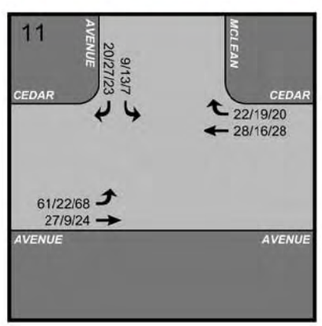


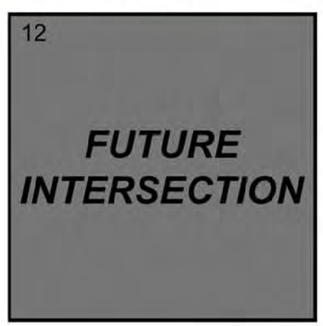


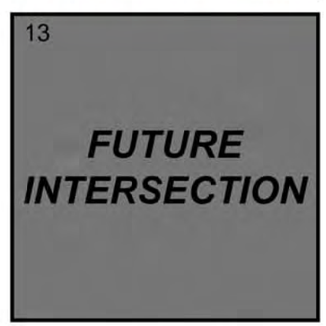



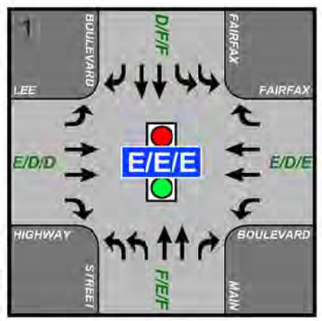

Figure 5-2
2027 Background Future Peak Hour Traffic Forecasts

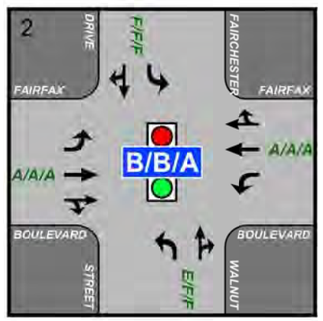
Paul VI Redevelopment

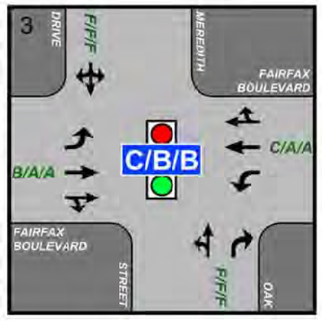
Fairfax County, Virginia

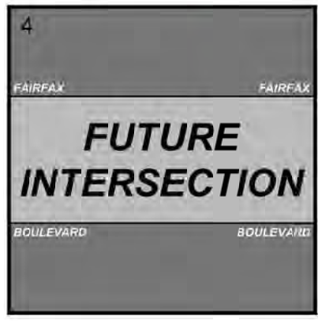
AM PEAK HOUR
SCHOOL PM PEAK HOUR
PM PEAK HOUR
000 / 000 / 000

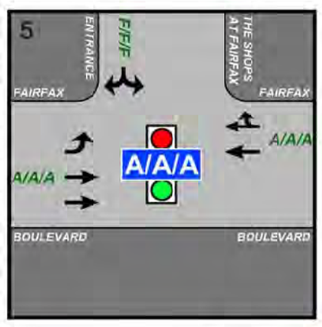
NORTH

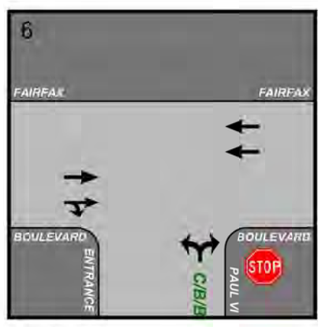


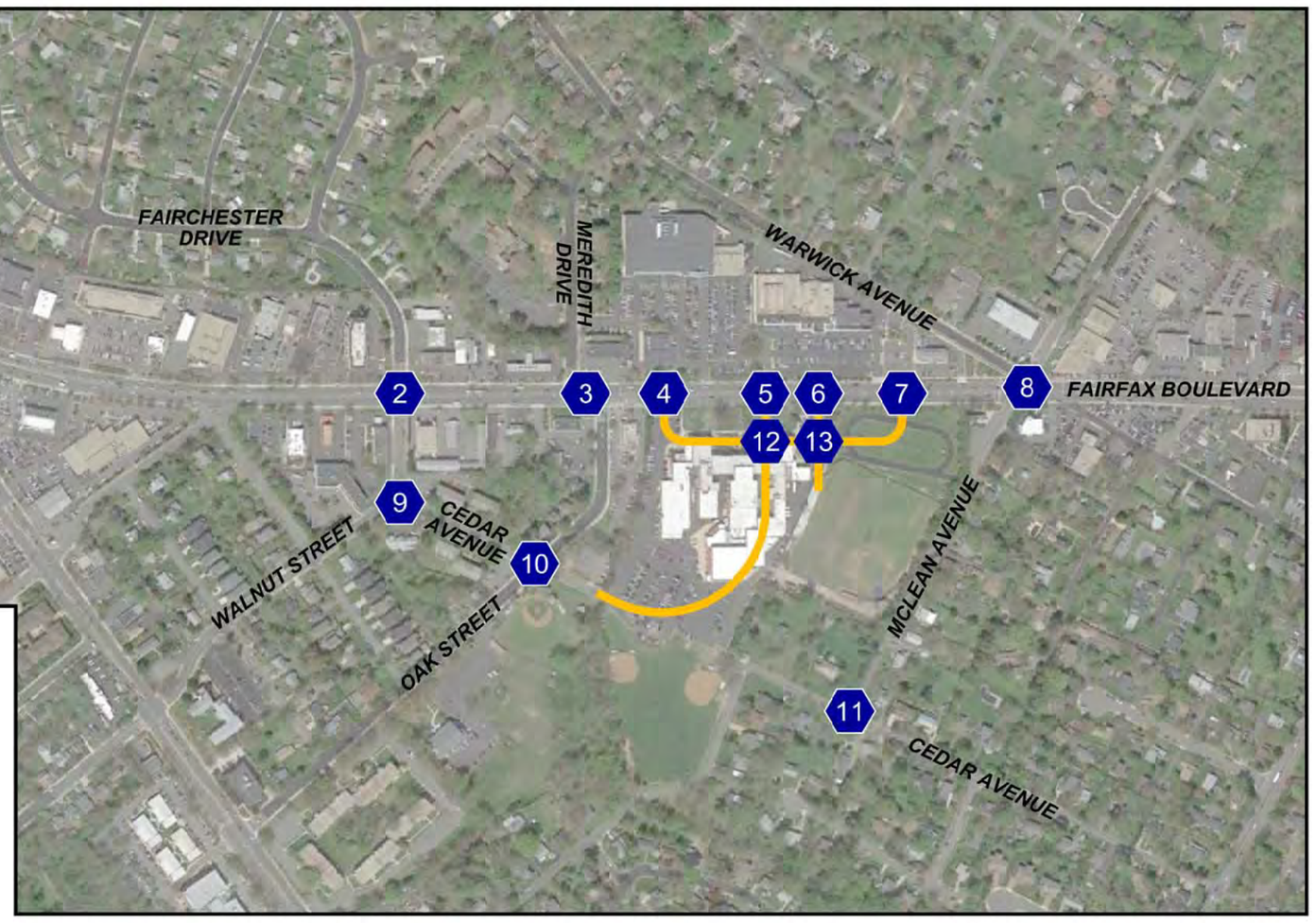



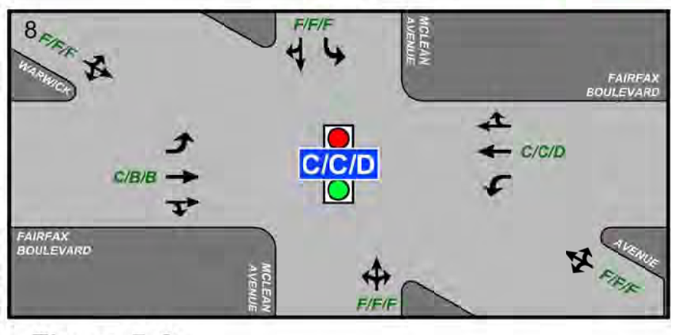



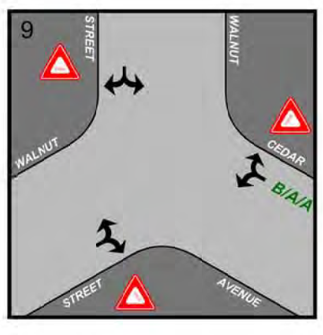



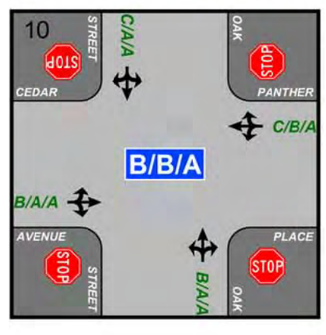



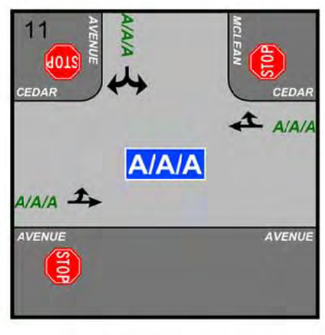


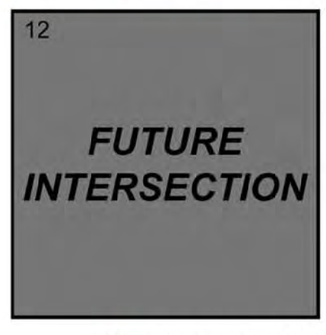


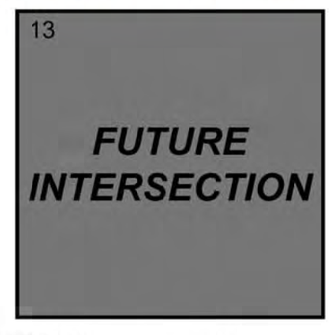




Figure 5-3
Existing Lane Use, Traffic Controls, and Background Future Levels of Service

Paul VI Redevelopment

Fairfax County, Virginia

X/X/X Approach Levels of Service

X/X/X Overall Intersection Levels of Service

Represents One Travel Lane

Signalized Intersection

Stop Sign

Yield Sign

NORTH

## Table 5-2

Paul VI Redevelopment

Background Future Intersection Capacity Analysis Summary[1]

| | Intersection | Intersection Control | Approach | Existing | | | Background Future | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | AM Peak | PM School Peak | PM Peak | AM Peak | PM School Peak | PM Peak |
| 1. | Lee Highway & Fairfax Boulevard & Main Street[2] | Signal | EB Appr | D (54.0) | F (87.3) | F (91.3) | D (54.8) | F (89.0) | F (95.6) |
| | | | WB Appr | F (96.0) | E (70.1) | E (76.3) | F (106.3) | E (72.0) | F (82.9) |
| | | | NB Appr | E (74.9) | D (45.1) | D (39.1) | E (78.4) | D (46.0) | D (40.0) |
| | | | SB Appr | E (57.4) | D (49.5) | E (71.5) | E (56.5) | D (51.1) | E (72.4) |
| | | | **Overall** | **E (71.5)** | **E (62.3)** | **E (69.8)** | **E (75.0)** | **E (64.0)** | **E (73.4)** |
| 2. | Fairfax Boulevard & Fairchester Drive/Walnut Street | Signal | EB Appr | A (8.2) | A (1.4) | A (1.4) | A (9.0) | A (1.4) | A (1.5) |
| | | | WB Appr | A (5.3) | A (2.6) | A (1.7) | A (5.4) | A (2.6) | A (1.8) |
| | | | NB Appr | E (76.1) | F (87.5) | F (90.9) | E (76.0) | F (87.6) | F (90.9) |
| | | | SB Appr | F (88.8) | F (93.7) | F (118.8) | F (88.7) | F (93.6) | F (118.8) |
| | | | **Overall** | **B (14.1)** | **B (13.0)** | **B (10.1)** | **B (14.4)** | **B (12.6)** | **A (9.6)** |
| 3. | Fairfax Boulevard & Meredith Drive/Oak Street | Signal | EB Appr | B (15.7) | A (4.3) | A (3.3) | B (19.2) | A (4.3) | A (3.4) |
| | | | WB Appr | C (23.3) | A (7.4) | A (8.3) | C (23.3) | A (7.5) | A (9.5) |
| | | | NB Appr | F (83.8) | F (100.1) | F (100.0) | F (83.7) | F (99.7) | F (99.8) |
| | | | SB Appr | F (89.5) | F (102.4) | F (102.5) | F (89.5) | F (102.4) | F (102.5) |
| | | | **Overall** | **C (25.1)** | **B (18.1)** | **B (14.1)** | **C (27.4)** | **B (18.1)** | **B (14.8)** |
| 4. | Fairfax Boulevard & Site Entrance | Free | EB Appr | Future Intersection | | | Future Intersection | | |
| 5. | Fairfax Boulevard & Fairfax Shoppes Entrance/Site Entrance (Future) | Signal | EB Appr | A (2.0) | A (1.0) | A (1.4) | A (2.4) | A (1.0) | A (1.4) |
| | | | WB Appr | A (0.6) | A (1.2) | A (0.5) | A (0.6) | A (1.3) | A (0.5) |
| | | | NB Appr | Future Approach | | | Future Approach | | |
| | | | SB Appr | F (84.1) | F (104.7) | F (103.9) | F (84.1) | F (104.7) | F (103.9) |
| | | | **Overall** | **A (2.6)** | **A (6.4)** | **A (4.8)** | **A (2.8)** | **A (6.2)** | **A (4.5)** |
| 6. | Fairfax Boulevard & Paul VI Entrance | Stop | NB Appr | C (21.1) | B (13.6) | B (12.6) | C (22.4) | B (14.2) | B (13.1) |
| 7. | Fairfax Boulevard & Site Exit | Stop | NB Appr | Future Intersection | | | Future Intersection | | |
| 8. | Fairfax Boulevard & McLean Avenue & Warwick Road[3] | Signal | EB Appr | F (115.4) | F (117.3) | F (128.0) | F (115.4) | F (117.3) | F (128.0) |
| | | | WB Appr | F (90.4) | F (103.7) | F (103.2) | F (90.4) | F (103.7) | F (103.2) |
| | | | NB Appr | F (88.2) | F (106.5) | F (115.4) | F (88.2) | F (106.5) | F (115.4) |
| | | | SB Appr | F (85.3) | F (104.4) | F (93.1) | F (85.3) | F (104.4) | F (93.1) |
| | | | NE Appr | C (21.9) | B (12.3) | B (11.5) | C (24.2) | B (13.2) | B (12.6) |
| | | | SW Appr | B (19.7) | C (23.3) | D (39.1) | C (20.1) | C (24.3) | D (43.7) |
| | | | **Overall** | **C (28.5)** | **C (26.6)** | **D (37.9)** | **C (29.7)** | **C (27.1)** | **D (40.4)** |
| 9. | Walnut Street & Cedar Avenue[4] | Stop | WB Appr | B (10.1) | A (9.4) | A (9.5) | B (10.1) | A (9.4) | A (9.5) |
| 10. | Oak Street & Cedar Avenue | Stop | EB Appr | B (13.9) | A (8.5) | A (7.8) | B (14.3) | A (8.7) | A (7.9) |
| | | | WB Appr | C (15.6) | B (10.9) | A (8.0) | C (16.2) | B (11.2) | A (8.1) |
| | | | NB Appr | B (12.6) | A (9.0) | A (8.0) | B (13.6) | A (9.3) | A (8.2) |
| | | | SB Appr | B (14.8) | A (9.4) | A (8.1) | C (15.3) | A (9.7) | A (8.4) |
| | | | **Overall** | **B (14.3)** | **B (10.0)** | **A (8.0)** | **B (14.9)** | **B (10.2)** | **A (8.2)** |
| 11. | Cedar Avenue & McLean Avenue | Stop | EB Appr | A (7.7) | A (7.4) | A (7.7) | A (7.7) | A (7.4) | A (7.7) |
| | | | WB Appr | A (7.1) | A (6.9) | A (7.1) | A (7.1) | A (6.9) | A (7.1) |
| | | | SB Appr | A (7.0) | A (6.9) | A (7.0) | A (7.0) | A (6.9) | A (7.0) |
| | | | **Overall** | **A (7.4)** | **A (7.0)** | **A (7.4)** | **A (7.4)** | **A (7.0)** | **A (7.4)** |
| 12. | Internal Road & Frontage Road | Stop | NB Appr | Future Intersection | | | Future Intersection | | |
| 13. | Internal Road & Frontage Road | Stop | NB Appr | Future Intersection | | | Future Intersection | | |

Notes:
1. Capacity analysis based on Highway Capacity Manual methodology, using Synchro 9.1.
2. Fairfax Boulevard/Main Street analyzed as east-west road; Lee Highway/Fairfax Boulevard analyzed as north-south roadway.
3. Warwick Road analyzed as east-west road; McLean Avenue analyzed as north-south roadway; Fairfax Boulevard analyzed as northeast-southwest roadway.
4. Analyzed with northbound and southbound as free movements along Walnut Street, and westbound movements along Cedar Avenue as stop-controlled.

# SECTION 6
# SITE ANALYSIS

## Overview

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

## Existing Site Trips

As stated previously, the site is currently developed with the Paul VI Catholic High School. The redevelopment plan calls for the elimination of the school use and the construction of a mix of residential, retail, and community uses. Trips currently generated by the school were tabulated through existing traffic counts. As shown in Table 6-1, the Paul VI Catholic High School currently generates 1,005 trips during the AM commuter peak hour, 563 trips during the PM school peak hour, and 132 trips during the PM commuter peak hour.

A portion of the existing school will remain and will be repurposed as local serving retail and/or community use. Existing traffic volumes generated by the high school were eliminated from the existing traffic streams based on the existing driveway counts conducted at existing school access drives. The existing traffic volumes less the existing school trips removed at each of the study intersections are shown on Figure 6-1.

## Proposed Site Access

A reduction of the proposed development plan provided on Figure 1-2 shows that a slow lane (with on-street parking), separated from the main travel lanes by landscaped medians is proposed along the Fairfax Boulevard site frontage. Access between the site and Fairfax Boulevard is proposed via two (2) full access driveways; one (1) will be located directly across Fairfax Boulevard from the existing signalized driveway to/from the Shops at Fairfax, and the other will be located approximately 570’ east of the existing signalized driveway to/from the Shops at Fairfax and approximately 260’ west of the Fairfax Boulevard/Mclean Avenue/Warwick Avenue intersection. An additional right-in/right-out driveway will be provided from the proposed slow lane and access to/from the southern portion of the property will be provided via Cedar Avenue to/from the west. Access between the site and Cedar Avenue to/from the east is not proposed by the Applicant, however access to a new small parking lot for the existing ball fields located south of the Paul VI property is proposed.

## Trip Generation

**Overview.** Trip generation estimates for the AM and PM peak hours, as well as the average daily traffic, were derived from the standard Institute of Transportation Engineers (ITE) trip generation rates, as published in the Trip Generation Manual, 9th edition. The "Residential Condominium/ Townhouse" (230) land use code was used for the proposed townhomes units in Blocks A, E, F, G, and H. The "High-Rise Residential Condominium/Townhouse" (232) land use code was used for the single family attached units proposed for Block I, as these buildings will be three (3) or more floors in height. The "Apartment" (220) land use code was used for the Block D apartment uses, and the "Senior Adult Housing - Attached" (252) land use code was used for the Block D senior units.

The "Shopping Center" (820) land use code was used for the Block B retail uses, and the "Recreational Community Center" (495) land use code was used for the Block B community center use to be operated by the City of Fairfax.

Existing trips generated by Paul VI were determined through traffic counts at the existing site driveways. The trip generation analysis for the existing uses and the proposed uses is presented in Table 6-1.

**Net Site Trips.** The net vehicle trips that would be generated by the proposed development plan were determined by subtracting the current trip generation of Paul VI from the trips anticipated to be generated by the site after redevelopment. This comparison is shown in Table 6-1 and illustrates that the proposed site will generate 690 ***fewer*** AM peak commuter hour trips, 119 ***fewer*** PM school peak hour trips, and 353 ***more*** PM peak commuter hour trips than are currently generated by the high school.

It should be noted that no reduction in site generated trips due to transit mode split was taken in this analysis. However, the applicant intends to take advantage of public transit opportunities available and will implement certain transportation demand management (TDM) strategies as elaborated in Section 8 of this report.

## Site Trip Distribution

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

- To/from the west on Lee Highway/Fairfax Boulevard: 35%
- To/from the northeast on Fairfax Boulevard: 50%
- To/from the southeast on Main Street: 15%

## Site Trip Assignments

The assignments of the total vehicle trips generated upon the future build-out of the Paul VI redevelopment was based on the above distribution, and are depicted on Figure 6-2.

## Table 6-1

Paul VI Redevelopment

Site Trip Generation Analysis

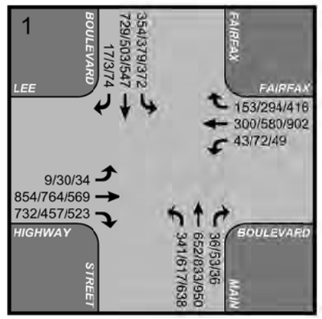
| Development | ITE Land Use Code[1] | Amount | Units | AM Peak Hour In | AM Peak Hour Out | AM Peak Hour Total | PM School Peak (2:45-3:45) In | PM School Peak (2:45-3:45) Out | PM School Peak (2:45-3:45) Total | PM Peak Hour In | PM Peak Hour Out | PM Peak Hour Total | Average Daily Trips |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Existing** | | | | | | | | | | | | | |
| Private High School[2,3] | | | Actual Trips | 671 | 334 | 1,005 | 174 | 389 | 563 | 46 | 86 | 132 | 3,270 |
| **Proposed[4]** | | | | | | | | | | | | | |
| Apartments | 220 | 200 | DU | 20 | 82 | 102 | 54 | 42 | 96 | 83 | 45 | 128 | 1,336 |
| Condominiums | 232 | 220 | DU | 18 | 75 | 93 | 43 | 33 | 76 | 56 | 34 | 90 | 1,053 |
| Townhomes | 230 | 110 | DU | 10 | 46 | 56 | 36 | 31 | 68 | 44 | 21 | 65 | 699 |
| Senior Housing | 252 | 25 | DU | 2 | 3 | 5 | 5 | 4 | 9 | 4 | 4 | 8 | 96 |
| Subtotal Residential | | 555 | DU | 50 | 206 | 256 | 138 | 111 | 249 | 187 | 104 | 291 | 3,184 |
| Community Center | 495 | 24,000 | SF | 32 | 17 | 49 | 28 | 41 | 69 | 32 | 34 | 66 | 812 |
| Local Serving Retail | 820 | 10,000 | SF | 6 | 4 | 10 | 59 | 67 | 126 | 61 | 67 | 128 | 1,520 |
| **Total Proposed Trips** | | | | **88** | **227** | **315** | **225** | **219** | **444** | **280** | **205** | **485** | **5,516** |
| **Comparison** | | | | | | | | | | | | | |
| **Proposed vs. Existing** | | | | **-583** | **-107** | **-690** | **51** | **-170** | **-119** | **234** | **119** | **353** | **2,246** |

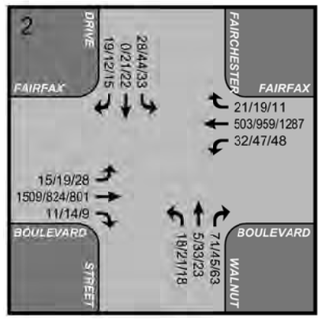
Notes: 1. Institute of Transportation Engineer's (ITE), Trip Generation Manual, 9th Edition

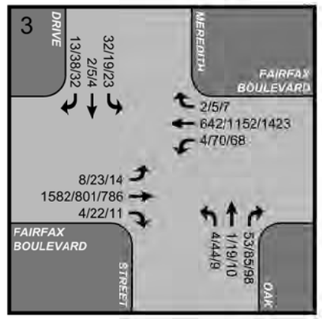
2. Based on traffic counts completed on February 3, 2016.

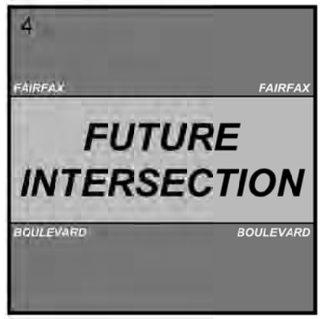
3. Actual ADT estimated based on ITE ADT and PM school peak ratio.

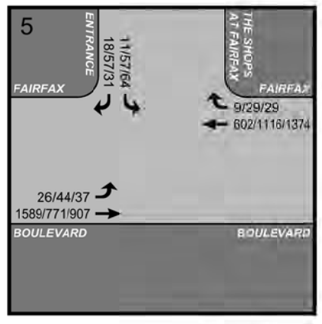
4. PM School Peak trips based on residential and retail diurnal rates compiled from ITE and Wells + Associates files.

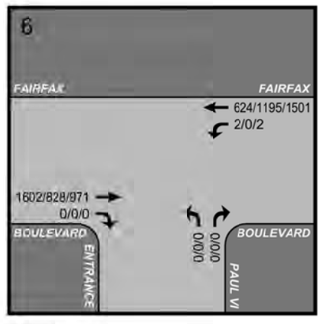


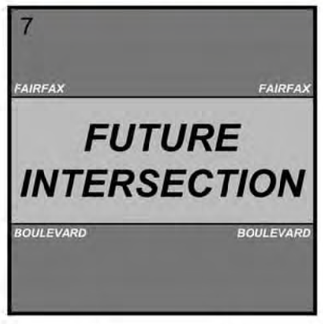



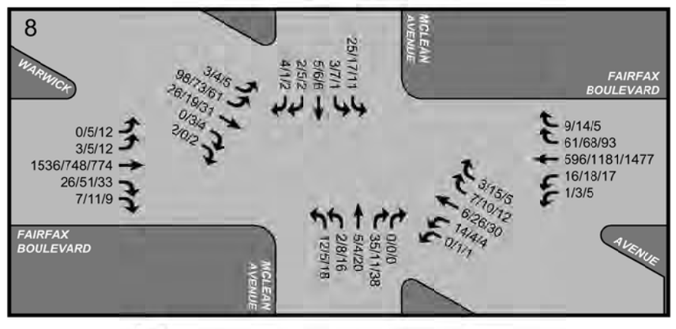



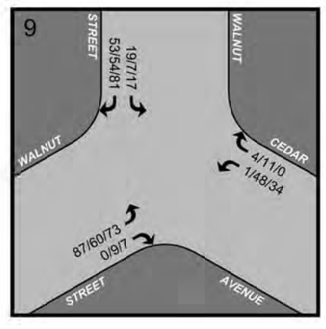



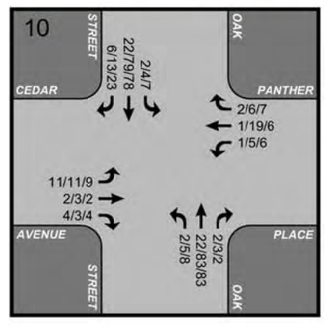



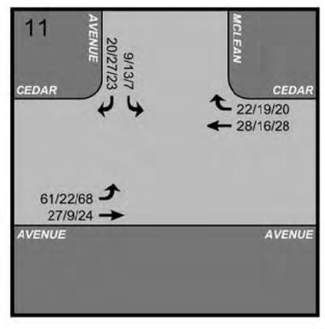


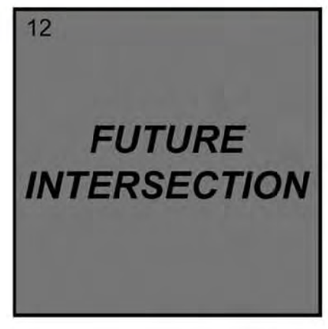




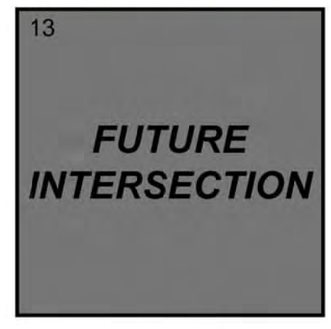



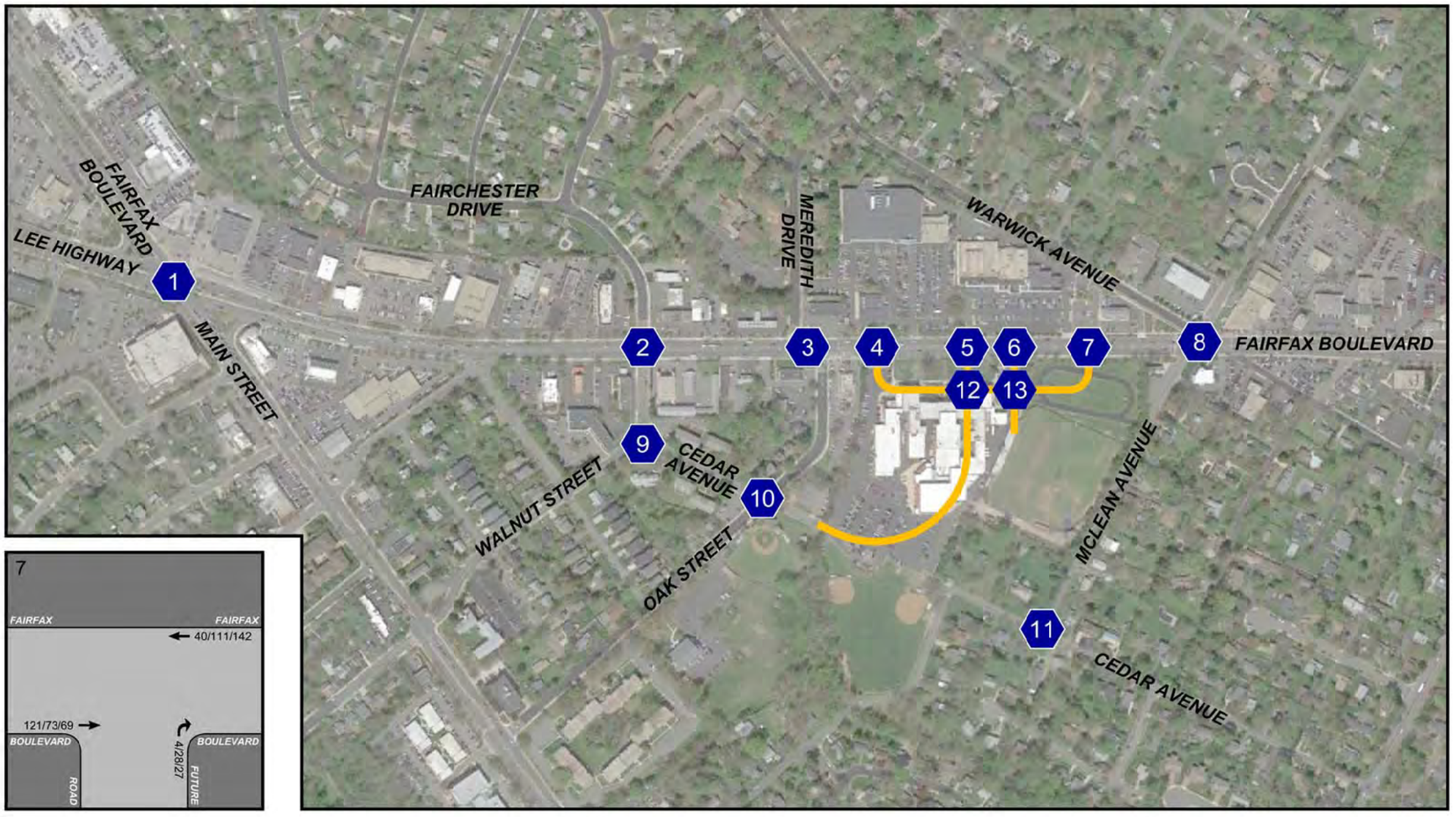

Figure 6-1
Existing Traffic Volumes Less Existing Site Trips

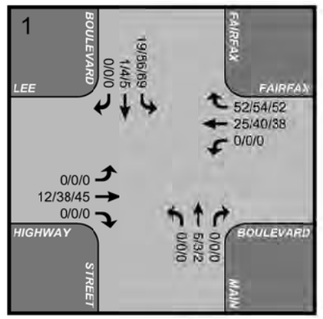
Paul VI Redevelopment

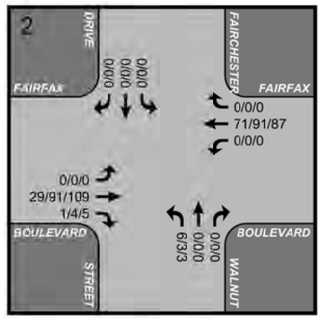
Fairfax County, Virginia

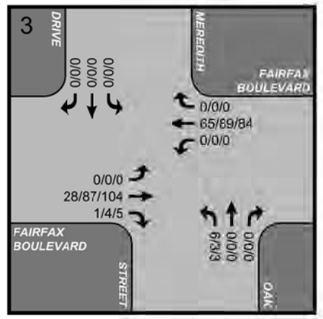
AM PEAK HOUR
SCHOOL PM PEAK HOUR
PM PEAK HOUR
000 / 000 / 000

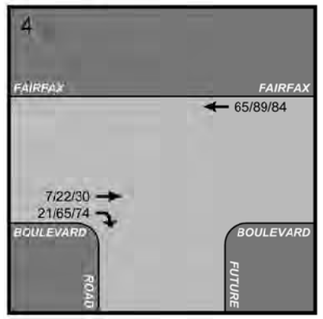
NORTH

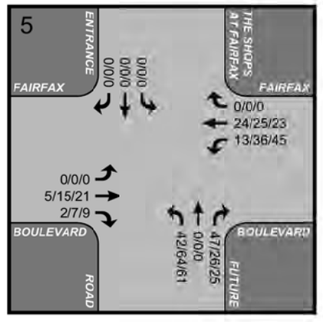


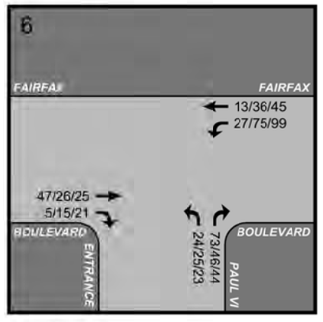



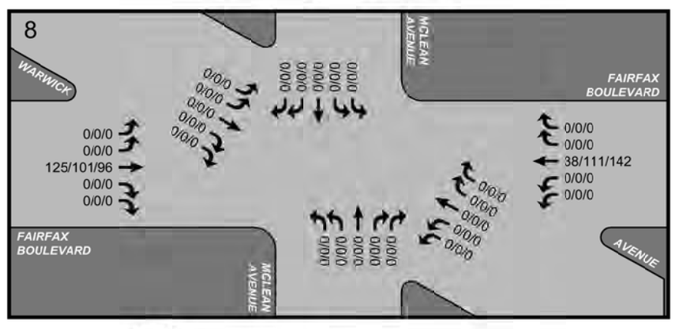



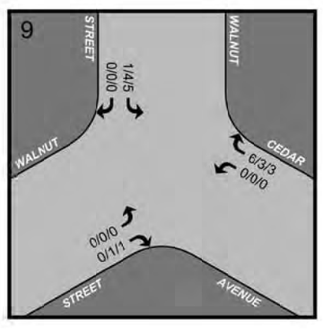



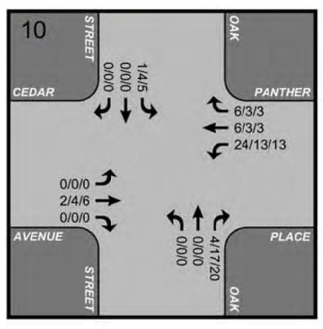



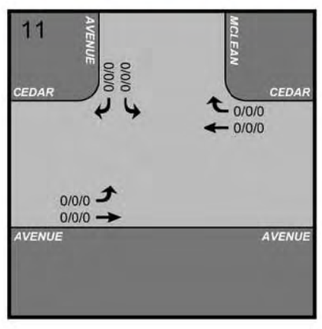


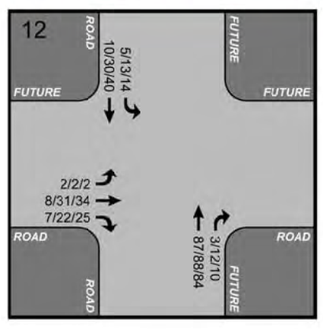




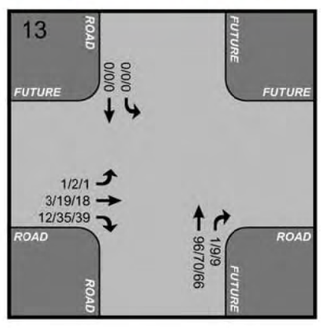




Figure 6-2
Site Trip Assignments

Paul VI Redevelopment

Fairfax County, Virginia

AM PEAK HOUR
SCHOOL PM PEAK HOUR
PM PEAK HOUR
000 / 000 / 000

NORTH

# SECTION 7
# ANALYSIS OF FUTURE CONDITIONS WITH SITE DEVELOPMENT

## Total Future Traffic Forecasts

Site trip assignments shown on Figure 6-2 were added to the existing traffic volumes less the existing site trips at each of the study intersections, shown on Figure 6-1, and pipeline trip assignments shown on Figure 5-2 to yield 2027 total future traffic forecasts, shown on Figure 7-1.

## Proposed Improvements

Provision of a slow lane (with on-street parking), separated from the main travel lanes by landscaped medians is proposed along the Fairfax Boulevard site frontage. Access between the site and Fairfax Boulevard is proposed via two (2) full access driveways. The proposed site driveway will form the fourth (south) leg at the Fairfax Boulevard/The Shops at Fairfax signalized intersection and will provide two northbound and one southbound lane.

The other full access driveway will be located along Fairfax Boulevard approximately 570' east of the existing signalized driveway to/from the Shops at Fairfax and approximately 260' west of the Fairfax Boulevard/Mclean Avenue intersection. Lane use and traffic control at each of the study intersections for 2027 total future conditions is shown on Figure 7-2.

## Total Future Levels of Service with Proposed Development Plan

Future levels of service with the proposed development plan were estimated at the study intersections based on the future traffic volumes shown on Figure 7-1, future lane use and traffic control shown on Figure 7-2, and the 2000 HCM methodologies for signalized and unsignalized intersections. The results of these analyses are provided in Appendix E and summarized in Table 7-1.

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

The Lee Highway/Fairfax Boulevard/Main Street intersection will continue to operate at an overall LOS E during all three studied peak periods under total future conditions. When compared to background future conditions, the intersection will experience minor ***reductions*** in delay (2.3-3.8 seconds) during the AM and PM peak commuter periods and a minor ***increase*** in delay (1.0 seconds) during the PM school peak period.

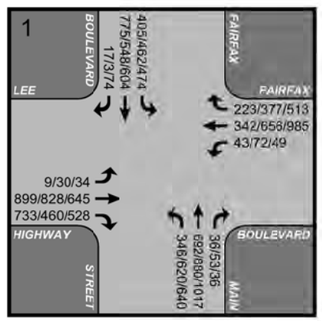
When compared to background future conditions, the Fairfax Boulevard/Fairchester Drive, Walnut Street intersection will experience minor ***reductions*** in overall delay during each of the three peak periods.

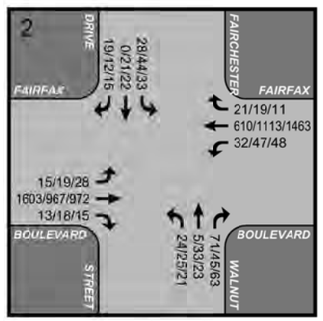
When compared to background future conditions, the Fairfax Boulevard/Meredith Drive/Oak Street will experience a minor ***reduction*** in delay during the AM commuter peak period and minor ***increases*** in delay during the PM school and PM commuter peak periods.

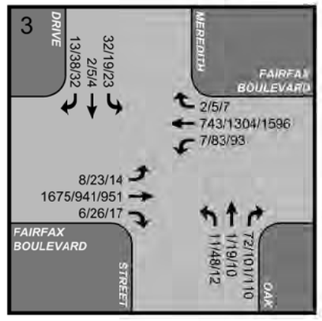
When compared to background future conditions, the Fairfax Boulevard/Shops at Fairfax Driveway/Site Driveway intersection will experience a decline in LOS due to the addition of a fourth (northbound) leg at this intersection. However, this intersection will operate at an acceptable LOS "D" or better during all three (3) peak periods studied.

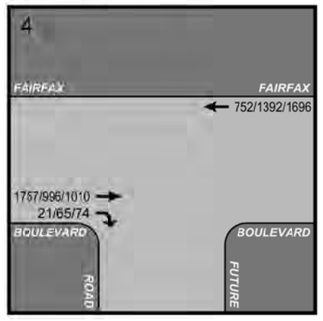
When compared to background future conditions, the Fairfax Boulevard/McLean Avenue/Warwick Road intersection will experience a minor ***reduction*** in delay during the AM commuter peak period and minor ***increases*** in delay during the PM school and PM commuter peak periods.

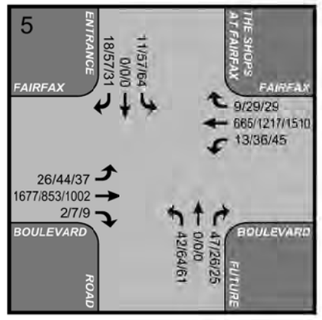
All studied unsignalized intersections will operate at LOS "C" or better during each of the peak periods.

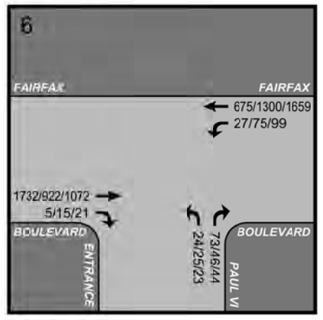


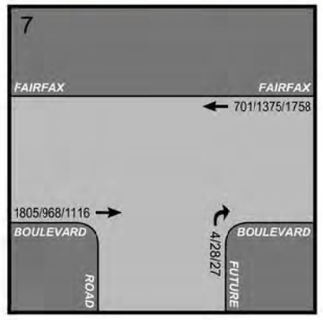



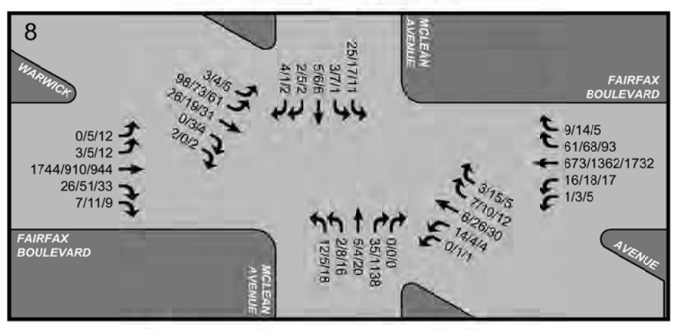



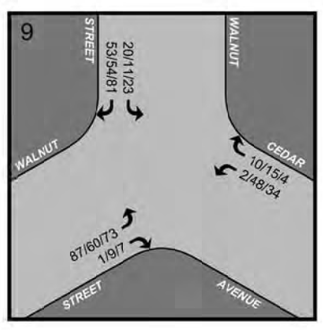



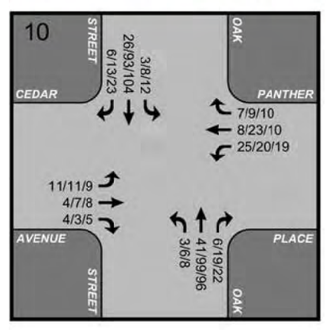



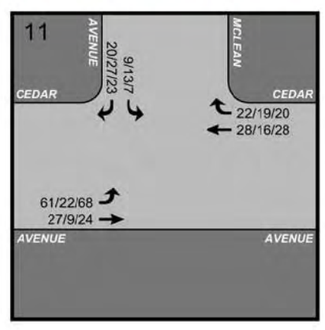


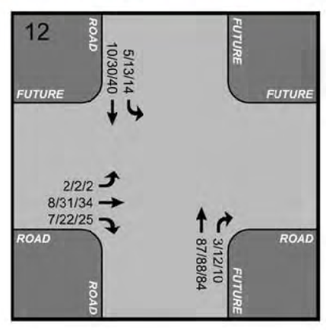




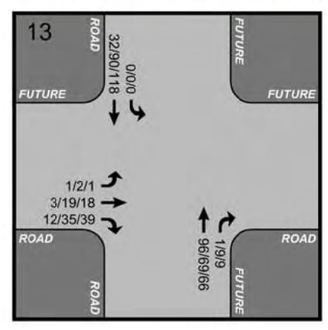




Figure 7-1
2027 Total Future Peak Hour Traffic Forecasts
Paul VI Redevelopment
Fairfax County, Virginia

AM PEAK HOUR
SCHOOL PM PEAK HOUR
PM PEAK HOUR
000 / 000 / 000

NORTH

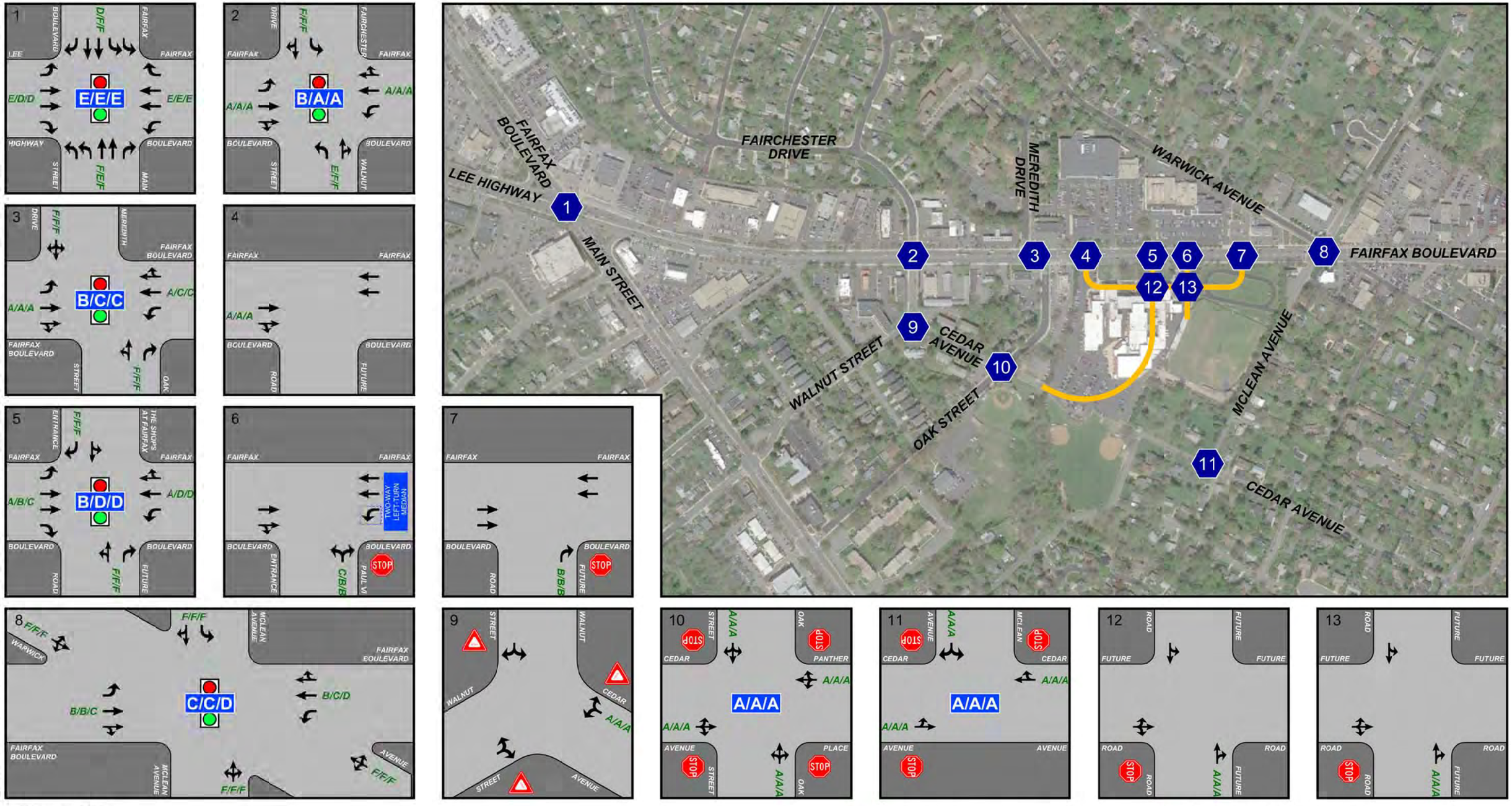



Figure 7-2
Total Future Lane Use, Traffic Controls, and Levels of Service

Paul VI Redevelopment

Fairfax County, Virginia

X/X/X Approach Levels of Service

X/X/X Overall Intersection Levels of Service

Represents One Travel Lane

Signalized Intersection

Stop Sign

Yield Sign

NORTH

## Table 7-1

Paul VI Redevelopment

Total Future Intersection Capacity Analysis Summary[1]

| | Intersection | Intersection Control | Approach | Existing | | | Background Future | | | Total Future | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | AM Peak | PM School Peak | PM Peak | AM Peak | PM School Peak | PM Peak | AM Peak | PM School Peak | PM Peak |
| 1. | Lee Highway & Fairfax Boulevard & Main Street[2] | Signal | EB Appr | D (54.0) | F (87.3) | F (91.3) | D (54.8) | F (89.0) | F (95.6) | D (52.7) | F (88.7) | F (96.3) |
| | | | WB Appr | F (96.0) | E (70.1) | E (76.3) | F (106.3) | E (72.0) | F (82.9) | F (96.7) | E (71.7) | F (82.7) |
| | | | NB Appr | E (74.9) | D (45.1) | D (39.1) | E (78.4) | D (46.0) | D (40.0) | E (71.1) | D (46.7) | D (41.1) |
| | | | SB Appr | E (57.4) | D (49.5) | E (71.5) | E (56.5) | D (51.1) | E (72.4) | E (63.0) | E (55.5) | E (63.0) |
| | | | **Overall** | **E (71.5)** | **E (62.3)** | **E (69.8)** | **E (75.0)** | **E (64.0)** | **E (73.4)** | **E (71.2)** | **E (65.0)** | **E (71.1)** |
| 2. | Fairfax Boulevard & Fairchester Drive/Walnut Street | Signal | EB Appr | A (8.2) | A (1.4) | A (1.4) | A (9.0) | A (1.4) | A (1.5) | A (7.5) | A (1.3) | A (1.7) |
| | | | WB Appr | A (5.3) | A (2.6) | A (1.7) | A (5.4) | A (2.6) | A (1.8) | A (1.1) | A (1.2) | A (2.9) |
| | | | NB Appr | E (76.1) | F (87.5) | F (90.9) | E (76.0) | F (87.6) | F (90.9) | E (75.2) | F (88.8) | F (89.8) |
| | | | SB Appr | F (88.8) | F (93.7) | F (118.8) | F (88.7) | F (93.6) | F (118.8) | F (94.5) | F (111.4) | F (114.7) |
| | | | **Overall** | **B (14.1)** | **B (13.0)** | **B (10.1)** | **B (14.4)** | **B (12.6)** | **A (9.6)** | **B (10.2)** | **A (8.7)** | **A (8.7)** |
| 3. | Fairfax Boulevard & Meredith Drive/Oak Street | Signal | EB Appr | B (15.7) | A (4.3) | A (3.3) | B (19.2) | A (4.3) | A (3.4) | A (6.5) | A (3.9) | A (3.2) |
| | | | WB Appr | C (23.3) | A (7.4) | A (8.3) | C (23.3) | A (7.5) | A (9.5) | A (4.7) | C (22.4) | C (25.5) |
| | | | NB Appr | F (83.8) | F (100.1) | F (100.0) | F (83.7) | F (99.7) | F (99.8) | F (86.3) | F (98.4) | F (100.2) |
| | | | SB Appr | F (89.5) | F (102.4) | F (102.5) | F (89.5) | F (102.4) | F (102.5) | F (89.5) | F (102.4) | F (102.5) |
| | | | **Overall** | **C (25.1)** | **B (18.1)** | **B (14.1)** | **C (27.4)** | **B (18.1)** | **B (14.8)** | **B (10.1)** | **C (22.2)** | **C (22.9)** |
| 4. | Fairfax Boulevard & Site Entrance | Free[3] | EB Appr | Future Intersection | | | Future Intersection | | | A (0.0) | A (0.0) | A (0.0) |
| 5. | Fairfax Boulevard & Fairfax Shoppes Entrance/Site Entrance | Signal | EB Appr | A (2.0) | A (1.0) | A (1.4) | A (2.4) | A (1.0) | A (1.4) | A (8.2) | B (17.2) | C (26.2) |
| | | | WB Appr | A (0.6) | A (1.2) | A (0.5) | A (0.6) | A (1.3) | A (0.5) | A (5.5) | D (43.6) | D (42.4) |
| | | | NB Appr | Future Approach | | | Future Approach | | | F (113.0) | F (92.7) | F (92.2) |
| | | | SB Appr | F (84.1) | F (104.7) | F (103.9) | F (84.1) | F (104.7) | F (103.9) | F (88.2) | F (93.9) | F (96.2) |
| | | | **Overall** | **A (2.6)** | **A (6.4)** | **A (4.8)** | **A (2.8)** | **A (6.2)** | **A (4.5)** | **B (12.1)** | **D (37.9)** | **D (39.7)** |
| 6. | Fairfax Boulevard & Site Entrance | Stop | NB Appr | C (21.1) | B (13.6) | B (12.6) | C (22.4) | B (14.2) | B (13.1) | C (22.9) | B (12.7) | B (13.3) |
| 7. | Fairfax Boulevard & Site Exit | Stop | NB Appr | Future Intersection | | | Future Intersection | | | B (11.6) | B (10.1) | B (10.1) |
| 8. | Fairfax Boulevard & McLean Avenue & Warwick Road[4] | Signal | EB Appr | F (115.4) | F (117.3) | F (128.0) | F (115.4) | F (117.3) | F (128.0) | F (115.4) | F (117.3) | F (128.0) |
| | | | WB Appr | F (90.4) | F (103.7) | F (103.2) | F (90.4) | F (103.7) | F (103.2) | F (90.4) | F (103.7) | F (103.2) |
| | | | NB Appr | F (88.2) | F (106.5) | F (115.4) | F (88.2) | F (106.5) | F (115.4) | F (88.2) | F (106.5) | F (115.4) |
| | | | SB Appr | F (85.3) | F (104.4) | F (93.1) | F (85.3) | F (104.4) | F (93.1) | F (85.4) | F (104.4) | F (93.1) |
| | | | NE Appr | C (21.9) | B (12.3) | B (11.5) | C (24.2) | B (13.2) | B (12.6) | B (19.8) | B (15.5) | C (28.7) |
| | | | SW Appr | B (19.7) | C (23.3) | D (39.1) | C (20.1) | C (24.3) | D (43.7) | B (19.2) | C (25.2) | D (52.6) |
| | | | **Overall** | **C (28.5)** | **C (26.6)** | **D (37.9)** | **C (29.7)** | **C (27.1)** | **D (40.4)** | **C (27.0)** | **C (28.6)** | **D (50.3)** |
| 9. | Walnut Street & Cedar Avenue[5] | Stop | WB Appr | B (10.1) | A (9.4) | A (9.5) | B (10.1) | A (9.4) | A (9.5) | A (8.9) | A (9.4) | A (9.9) |
| 10. | Oak Street & Cedar Avenue | Stop | EB Appr | B (13.9) | A (8.5) | A (7.8) | B (14.3) | A (8.7) | A (7.9) | A (7.3) | A (7.7) | A (7.7) |
| | | | WB Appr | C (15.6) | B (10.9) | A (8.0) | C (16.2) | B (11.2) | A (8.1) | A (7.4) | A (7.9) | A (7.8) |
| | | | NB Appr | B (12.6) | A (9.0) | A (8.0) | B (13.6) | A (9.3) | A (8.2) | A (7.3) | A (7.9) | A (7.9) |
| | | | SB Appr | B (14.8) | A (9.4) | A (8.1) | C (15.3) | A (9.7) | A (8.4) | A (7.2) | A (7.9) | A (8.0) |
| | | | **Overall** | **B (14.3)** | **B (10.0)** | **A (8.0)** | **B (14.9)** | **B (10.2)** | **A (8.2)** | **A (7.3)** | **A (7.9)** | **A (7.9)** |
| 11. | Cedar Avenue & McLean Avenue | Stop | EB Appr | A (7.7) | A (7.4) | A (7.7) | A (7.7) | A (7.4) | A (7.7) | A (7.7) | A (7.4) | A (7.7) |
| | | | WB Appr | A (7.1) | A (6.9) | A (7.1) | A (7.1) | A (6.9) | A (7.1) | A (7.1) | A (6.9) | A (7.1) |
| | | | SB Appr | A (7.0) | A (6.9) | A (7.0) | A (7.0) | A (6.9) | A (7.0) | A (7.0) | A (6.9) | A (7.0) |
| | | | **Overall** | **A (7.4)** | **A (7.0)** | **A (7.4)** | **A (7.4)** | **A (7.0)** | **A (7.4)** | **A (7.4)** | **A (7.0)** | **A (7.4)** |
| 12. | Internal Road & Frontage Road | Stop | NB Appr | Future Intersection | | | Future Intersection | | | A (9.2) | A (9.7) | A (9.8) |
| 13. | Internal Road & Frontage Road | Stop | NB Appr | Future Intersection | | | Future Intersection | | | A (8.8) | A (9.6) | A (9.7) |

Notes:
1. Capacity analysis based on Highway Capacity Manual methodology, using Synchro 9.1.
2. Fairfax Boulevard/Main Street analyzed as east-west road; Lee Highway/Fairfax Boulevard analyzed as north-south roadway.
3. The eastbound right movement is neither signal nor stop-controlled.
4. Warwick Road analyzed as east-west road; McLean Avenue analyzed as north-south roadway; Fairfax Boulevard analyzed as northeast-southwest roadway.
5. Analyzed with northbound and southbound as free movements along Walnut Street, and westbound movements along Cedar Avenue as stop-controlled.

## SECTION 8
## TRANSPORTATION DEMAND MANAGEMENT

In order to mitigate the potential impacts of the development and to take full advantage of the site's proximity to various transit facilities/services while decreasing reliance on the personal automobile and encourage the use of transit, ridesharing, bicycling, and walking, a key component of the project would be the implementation of comprehensive transportation demand management (TDM) strategies.

TDM is a general term for strategies that result in more efficient use of transportation resources. There are many different TDM strategies with a variety of impacts. They can improve the transportation options available to consumers, provide an incentive to choose more efficient travel patterns, or reduce the need for physical travel through mobility substitutes or more efficient land use. TDM strategies can change travel timing, route, destination, or mode.

The following strategies should be considered:

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

   1. Assist residents and employees in making effective and efficient commuting choices.

   2. Disseminate Metrorail, Metrobus, ridesharing, and other relevant transit options to new residents and employees.

   3. Solicit support from the Metropolitan Washington Council of Governments Commuter Connections program, the Washington Metropolitan Area Transit Authority, the City of Fairfax government, and others.

   4. Provide on-site assistance to residents and employees in forming and maintaining carpools and vanpools.

   5. Disseminate park-and-ride lot information to prospective carpoolers and vanpoolers.

   6. Register carpool/vanpool participants, transit users, bicyclists, and walkers in the Guaranteed Ride Home (GRH) program.

   7. Encourage residents and employees to ride bikes or walk to work.

   8. Provide on-site facilities for bicycle parking and/or storage, including bike racks for visitors and bike storage lockers for residents.

   9. Market and promote the TDM Program among residents and employees through printed materials and web sites (if available).

B. Commuter Center.

1. Designate a centralized space on-site as a "Commuter Center". The TMC functions would take place in this space, as appropriate.

2. Install display racks that would provide information on local transit options.

3. Sell transit fare media, such as SmarTrip cards, Metro fare cards, and Metrobus passes.

4. Promote transit and multi-modal options provided by the City.

C. Incentives to use transit, including:

1. Providing information on Metrorail, CUE Bus, Metrobus, and other public transportation facilities, services, routes, schedules, and fares.

2. Disseminating information to transit users regarding free guaranteed rides home in cases of emergency.

3. At the time of initial lease, providing SmarTrip cards to residents.

4. Providing safe, convenient, and attractive pedestrian connections on and off-site.

D. Carpool programs, including:

1. Disseminating information to carpoolers regarding free guaranteed rides home in cases of emergency.

2. Reserving a number of conveniently-located, parking spaces for carpools only.

E. Parking management, including:

1. Reserving a number of conveniently-located, parking spaces for carpools, and/or hybrid vehicles.

2. Implementing a parking pass system in order to manage the number of vehicular parking spaces allotted per resident or dwelling unit.

3. Providing a parking space on site for a car sharing service (i.e., Zip or Flex Car).

## SECTION 9
## CONCLUSIONS

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

1. The Lee Highway/Fairfax Boulevard/Main Street intersection currently operates at or near capacity at level of service (LOS) "E" during each of the three (3) studied peak periods.

2. All other signalized intersections currently operate at an overall LOS D or better during each of the three (3) studied peak periods based on Highway Capacity Manual calculations, however, substantial queues were observed along Fairfax Boulevard during the peak periods. Specifically, substantial queues along eastbound Fairfax Boulevard were observed during the AM peak period and substantial westbound queues were observed during the PM peak period.

3. Historic VDOT traffic data indicates that average daily traffic counts along Fairfax Boulevard and Main Street have decreased by 1.2% to 1.9% per year between 2008 and 2015.

4. The Novus Fairfax Gateway and Mount Vineyard pipeline developments are anticipated to generate 395 AM commuter peak hour trips, 418 PM school peak hour trips, and 576 PM commuter peak hour trips at full buildout.

5. Under future 2027 traffic conditions, without redevelopment of the Paul VI site, minimal increases in delay at the study intersections are expected due to the trips generated by pipeline development in the vicinity of the site and overall levels of service would remain generally consistent with existing conditions.

6. The existing Paul VI Catholic High School currently generates 1,005 trips during the AM commuter peak hour, 563 trips during the PM school peak hour, and 132 trips during the PM commuter peak hour.

7. The Applicant proposes to redevelop the site with 220 residential condominium units, 110 town homes, 200 apartments, 25 senior housing units, 10,000 SF of local serving retail, and 24,000 SF of community center space.

8. The project is estimated to generate 690 ***fewer*** AM peak commuter hour trips, 119 ***fewer*** PM school peak hour trips, and 353 ***more*** PM peak commuter hour trips than are currently generated by the high school.

9. Under future 2027 traffic conditions, with the development of the subject site, intersection levels of service would remain generally consistent with existing and background conditions. The analyses show that the Lee Highway/Fairfax Boulevard/Main Street will continue to operate at LOS E during all three peak periods studied. All other intersections will operate at LOS D or better during each of the studied peak periods.

10. A full turning movement site driveway is proposed along Fairfax Boulevard to align with the existing Shops at Fairfax entrance. The proposed full access signalized intersection at this location will operate at an overall LOS "D" during each of the studied peak periods.

11. A full turning movement stop sign controlled access drive is proposed along Fairfax Boulevard between the Shops at Fairfax entrance and McLean Avenue. This unsignalized intersection will operate at LOS "C" or better during each of the studied time periods.