



Transportation Security Administration

Lease Consolidation Traffic Technical Report

June 2015

Prepared by:



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PROJECT SUMMARY

INTRODUCTION

This Traffic Technical Report has been prepared for the United States General Services Administration (GSA) to assess and report potential transportation impacts resulting from the proposed consolidation of the Transportation Security Administration (TSA) at two alternative sites in Northern Virginia. The two alternative sites are located at 5001 Eisenhower Avenue, Alexandria, VA (Victory Center) and 6601 Springfield Center Drive, Springfield, VA (Springfield Metro Center). The proposed consolidation would result in the relocation of approximately 3,800 TSA employees to a single 650,000 gross square-foot (GSF) (minimum) office site, from five other offices: 601 South 12th Street, 701 South 12th Street, and 6354 Walker Lane in Alexandria, VA, 1900 Oracle Way in Reston, VA, and 45065 Riverside Parkway in Ashburn, VA.

The Springfield Metro Center site would be located within a 15.98 acre office park that is currently approved for four (4) office buildings totaling 1,058,500 GSF, including potential support/ancillary retail uses. Phase I of the Metro Center development would consist of the construction of 653,000 GSF of office space intended for use by the TSA. However, unlike Springfield Metro Center, the Victory Center site currently consists of an existing 606,000 square-foot office building. In order to meet the requirements of the TSA, the existing building would undergo an expansion consisting of 60,000 square-feet of office space and 10,000 square-feet of retail space.

EXISTING CONDITIONS

The existing roadway networks within the vicinity of both sites were assessed to provide a baseline to compare to future conditions. Twelve (12) intersections were analyzed as part of the Springfield Metro Center study area, while nine (9) intersections were analyzed as part of the Victory Center study area. All of the study area intersections operate at overall LOS D or better, except the intersections of Eisenhower Avenue/S Van Dorn Street, which operates at LOS E in both peak hours, and Summers Grove Road/Metro Road, which operates at LOS F in the AM peak hour and LOS E in the PM peak hour. Both intersections are located within the Victory Center study area.

FUTURE CONDITIONS WITHOUT CONSOLIDATION (NO ACTION ALTERNATIVE)

The Future Conditions Analysis without Consolidation (No Action Alternative) examines the future anticipated volumes without taking into consideration traffic that would be generated by consolidation of the 3,800 TSA employees. This analysis includes the existing traffic volumes, and approved un-built developments in the study areas. The No Action Alternative analysis also takes into account any proposed infrastructure improvements in the study areas.

Under the No Action Alternative, delay and queuing are anticipated to increase at all of the study area intersections. The following intersections would operate at LOS E or LOS F in one or more peak hours:

- The intersection of Franconia Road EB Ramps/Loisdale Road/Commerce Street would operate at LOS E in the PM peak hour (Springfield Metro Center study area).

- The intersection of Frontier Drive/Spring Mall Road would operate at LOS E in the PM peak hour (Springfield Metro Center study area).
- The intersection of Eisenhower Avenue/S Van Dorn Street would operate at LOS F in both peak hours (Victory Center study area).
- The intersection of Summers Grove Road/Metro Road would operate at LOS F the AM peak hour and LOS E in the PM peak hour (Victory Center study area).
- The intersection of Eisenhower Avenue/Eisenhower Avenue Connector would operate at LOS F in both peak hours (Victory Center study area).

FUTURE CONDITIONS ANALYSIS WITH CONSOLIDATION (ACTION ALTERNATIVE)

The Future Conditions Analysis with Consolidation (Action Alternative) examines future anticipated volumes taking into consideration traffic under the No Action Alternative as well as traffic that would be generated by the consolidation of 3,800 TSA employees at either site. The Action Alternative also takes into account transportation mitigation measures proposed by the lease offerors. These mitigation measures consist of low-impact improvements such as new traffic signals, updated/improved signal timing and phasing at existing intersections, new or expanded turn bays, and pedestrian and bicycle facility enhancements.

The proposed measures would mitigate increases in delay and queuing at intersections that are impacted by site trips so that the intersections would operate similar to, or better than, they do in the No Action Condition. In fact, based on the results of the Action Alternative capacity analysis results, all intersections would operate at an overall LOS D or better, except:

- The intersection of Franconia Road EB Ramps/Loisdale Road/Commerce Street, which would operate at LOS E in the PM peak hour (Springfield Metro Center study area).
- The intersection of Frontier Drive/Spring Mall Road, which would operate at LOS E in the PM peak hour (Springfield Metro Center study area).
- The intersection of Eisenhower Avenue/S Van Dorn Street, which would operate at LOS F in both peak hours (Victory Center study area).
- The intersection of Eisenhower Avenue/Eisenhower Avenue Connector, which would operate at LOS E in the PM peak hour (Victory Center study area).

TSA EMPLOYEE COMMUTER SURVEY

An online survey of existing TSA employees was conducted to determine the commuting patterns of the employees and how they might change after the consolidation. The survey examined the modes by which employees travel to work, working hours, telecommuting, origin/destination, possible improvements to transit options, and reasons for mode choice. The results show that a strong culture of alternative transportation mode use currently exists, and is expected to continue regardless of office location.

CONCLUSIONS AND MITIGATION

The results of the study show that the consolidation of 3,800 TSA employees to either site would have an adverse impact on traffic conditions within the respective study areas. However, in order to

help mitigate the adverse impact of the added trips on local roadways, the lease offerors have proposed small-scale enhancements to some of the study area intersections, such as new traffic signals, improved timing and phasing at existing signals, new or expanded turn bays, and pedestrian and bicycle facilities. The proposed enhancements would result in intersections that operate at similar, or better, levels of service when compared to the No Action condition. In addition, both sites lie within one-half mile of a Metrorail station, and will engage in TMP to help encourage the use of alternative commute modes to help offset the traffic impacts.

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APPENDICES

- Appendix A: TSA Employee Commuter Survey Questions
- Appendix B: Springfield Metro Center Traffic Impact Statement
- Appendix C: Victory Center Traffic Impact Statement

List of Acronyms

ADA	Americans with Disabilities Act
LOS	Level of Service
GSA	General Services Administration
HCM	Highway Capacity Manual
TSA	Transportation Security Administration
ITE	Institute of Transportation Engineers
LATR & TPAR	Local Area Transportation Review & Transportation Policy Area Review
VRE	Virginia Railway Express
MARC	Maryland Area Regional Commuter
M-NCPPC	Maryland-National Capital Park and Planning Commission
TMP	Transportation Management Plan
WMATA	Washington Metropolitan Area Transit Authority

CHAPTER 1: INTRODUCTION

This Traffic Technical Report has been prepared for the United States General Services Administration (GSA) to assess and report potential transportation impacts resulting from the proposed consolidation of the Transportation Security Administration (TSA) at two alternative sites in Northern Virginia. The two alternative sites are located at 5001 Eisenhower Avenue, Alexandria, VA (Victory Center) and 6601 Springfield Center Drive, Springfield, VA (Springfield Metro Center). The proposed consolidation would result in the relocation of approximately 3,800 TSA employees to a single 650,000 gross square-foot (GSF) (minimum) office site, from five other offices: 601 South 12th Street, 701 South 12th Street, and 6354 Walker Lane in Alexandria, VA, 1900 Oracle Way in Reston, VA, and 45065 Riverside Parkway in Ashburn, VA.

The Springfield Metro Center site would be located within a 15.98 acre office park that is currently approved for four (4) office buildings totaling 1,058,500 GSF, including potential support/ancillary retail uses (Figure 1). Phase I of the Metro Center development would consist of the construction of 653,000 GSF of office space intended for use by the TSA. However, unlike Springfield Metro Center, the Victory Center site currently consists of an existing 606,000 square-foot office building. In order to meet the requirements of the TSA, the existing building would undergo an expansion consisting of 60,000 square-feet of office space and 10,000 square-feet of retail space (Figure 2).

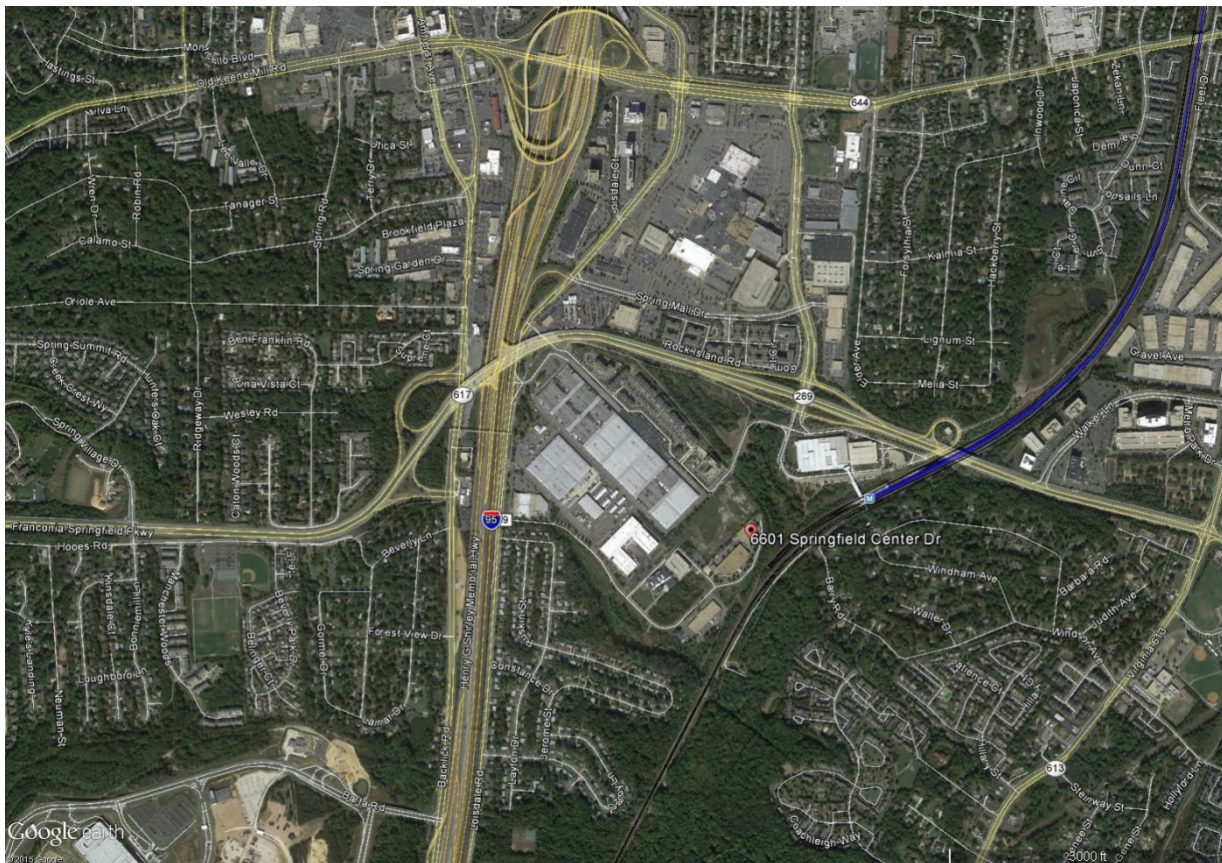


Figure 1: Springfield Metro Center Project Area Map

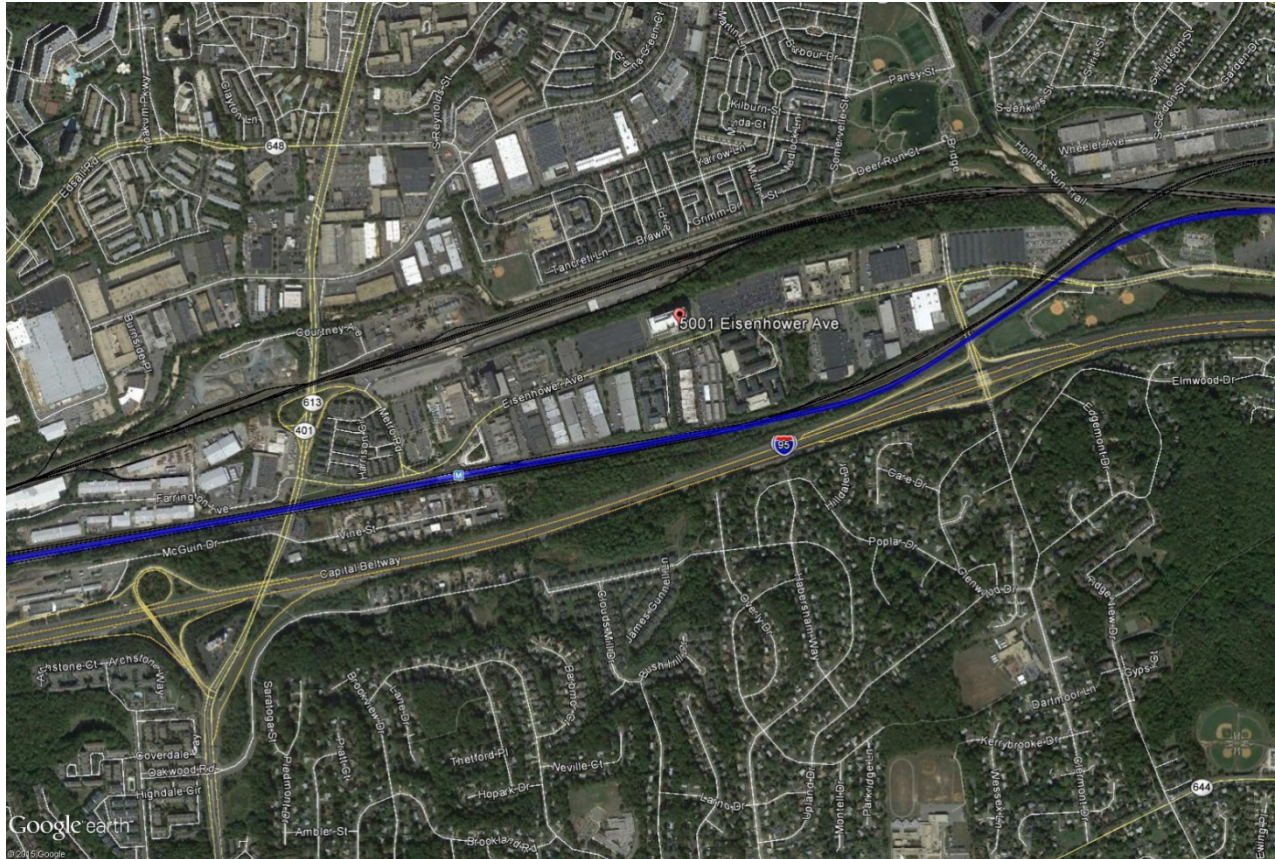


Figure 2: Victory Center Project Area Map

The Traffic Technical Report will assess and evaluate the potential transportation impacts of each site for the following three scenarios:

- Existing Conditions
- Future Conditions without Consolidation (No Action Alternative)
- Future Conditions with Consolidation (Action Alternative)

In order to support the assessment of potential transportation impacts at the two sites, the GSA requested traffic impact study documents from the lease offerors. Both lease offerors retained a traffic engineering consultant to conduct the traffic impact studies. As such, the GSA received the following traffic impact study documentation:

1. *Victory Center (5001 Eisenhower Avenue) Traffic Impact Statement* (October 30, 2014), prepared by Wells and Associates.
2. *Springfield Metro Center II Traffic Impact Study* (December 19, 2014), prepared by Wells and Associates.

All traffic impact study documentation and analysis files were reviewed independently by GSA to ensure that the study area, scope, methodology, and analysis were appropriate to fully assess and document the transportation impacts that could be generated by the proposed consolidation. Comments were provided to the lease offerors in March 2015, and the lease offerors provided the following additional/revised traffic analysis documents to address the comments:

1. *Springfield Metro Center – Phase 1 Comment Response Letter* (March 23, 2015), prepared by Wells and Associates.
2. *Springfield Metro Center II Phase I Traffic Analysis* (March 27, 2015), prepared by Wells and Associates.
3. *Victory Center – Comment Response Letter* (April X, 2015), prepared by Wells and Associates.
4. *Victory Center Traffic Analysis* (April X, 2015), prepared by Wells and Associates.

Based on the review of all documentation provided by the lease offerors, it was determined that the traffic impact studies were adequate to address the analysis requirements of an Environmental Assessment (EA). Thus, the assessment and reporting of potential traffic impacts in this Traffic Technical Report will be largely based on the traffic impact studies prepared by the lease offerors.

Given that this Traffic Technical Report analyzes potential transportation impacts of two alternative consolidation sites, each with its own Existing Condition, No Action, and Action Alternatives, this Report will be divided into four additional chapters. Chapter 2 will document the results of a supporting commuter survey of TSA employees. Chapter 3 will document the traffic impact analysis associated with Springfield Metro Center, while Chapter 4 will document the traffic impact analysis associated with the Victory Center. Finally, Chapter 5 will compare each site from a transportation perspective and summarize the findings and conclusions.

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CHAPTER 2: TSA EMPLOYEE COMMUTER SURVEY

An employee survey was conducted via the internet in March 2015 to determine the commuting patterns of the employees and how they might change if they were relocated to one of four potential sites. The survey was distributed to all TSA employees at the existing four office locations. A copy of the survey is located in Appendix A. The survey investigated the modes by which employees travel to work, working hours, telecommuting, origin/destination, possible improvements to transit options, reasons for mode choice, as well as how mode choice may be affected based on the potential relocation alternatives. The data obtained from the surveys was used to evaluate current commute patterns, as well as to provide data for the transportation impact analyses conducted in Chapters 3 and 4 of this report.

Of the approximately 3,800 TSA employees asked to respond to the survey, approximately 44 percent, or 1,658 employees completed the survey.

SURVEY RESULTS

The survey results for each question are summarized below.

CURRENT COMMUTE MODE CHOICE AND PATTERNS

Survey Questions 1 – 22 ask respondents about their current commute mode and pattern to establish an overall assessment of existing commuting habits of TSA employees. The following text and figures summarize the results of those questions.

Question 1: What is the address of your current TSA office?

Table 1 shows the number of respondents by office location.

Table 1: Number of Respondents by Office Location

Office Location	Number of Responses	Percentage of Responses
601 or 701 South 12 th Street	1,298	78.8%
6354 Walker Lane	44	2.7%
1900 Oracle Way	133	8.1%
45065 Riverside Parkway	3	0.2%
Other	169	10.3%

Question 2: In what zip code is your home located?

Figure 3 depicts the density of employees residences by zip code.

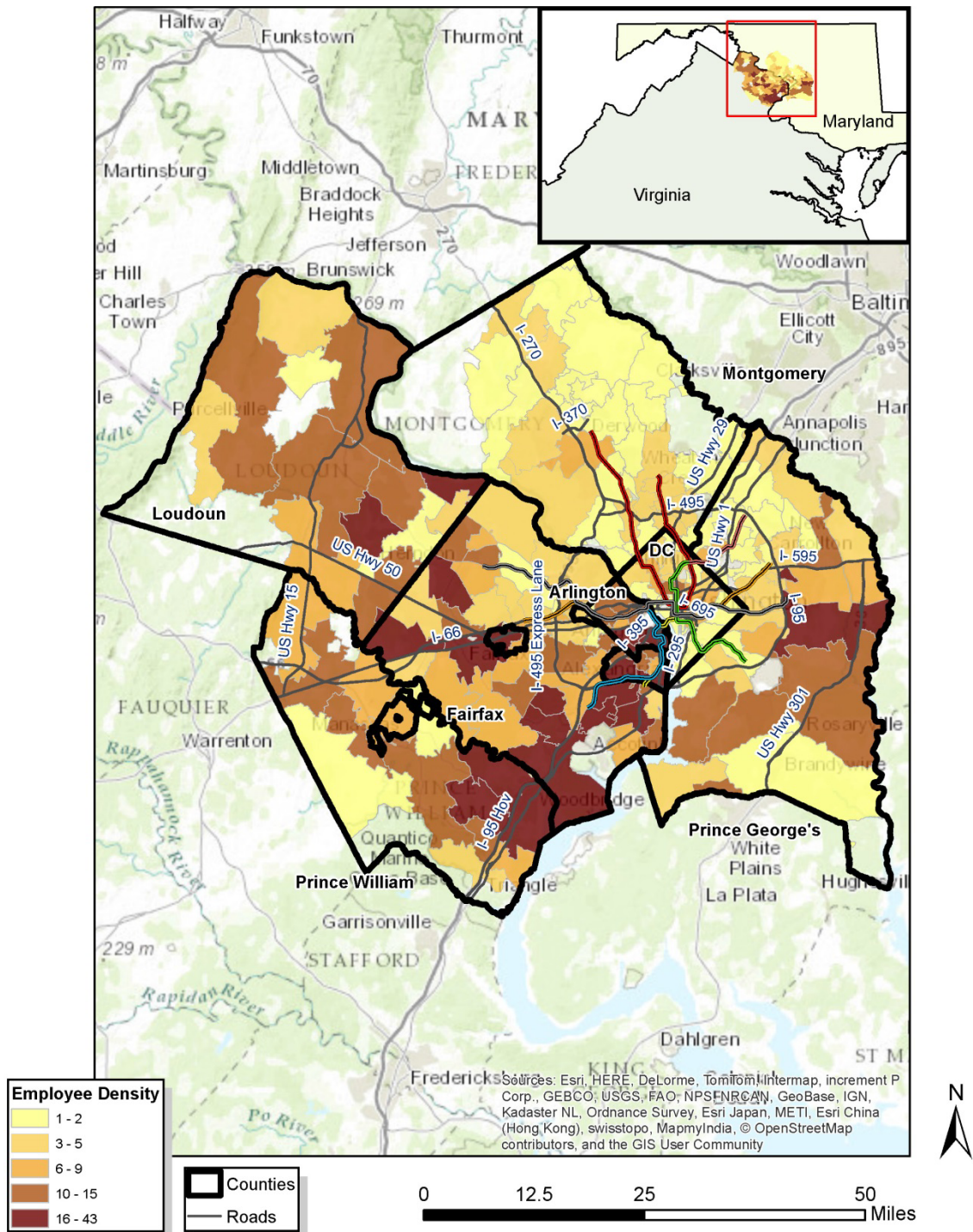


Figure 3: Location of Current Residences of TSA Employees

Question 3: At your current work location, what mode of travel do you primarily and typically use to commute to and from work?

Based on the results, shown in Figure 4, just under half of respondents commute via a personal vehicle. The results also show a significant non-auto driver mode share split. Approximately 11% of responding employees utilize carpools, slug, or vanpools, while approximately 38% of responding employees utilize transit (bus, Metrorail, VRE/MARC, and commuter buses).

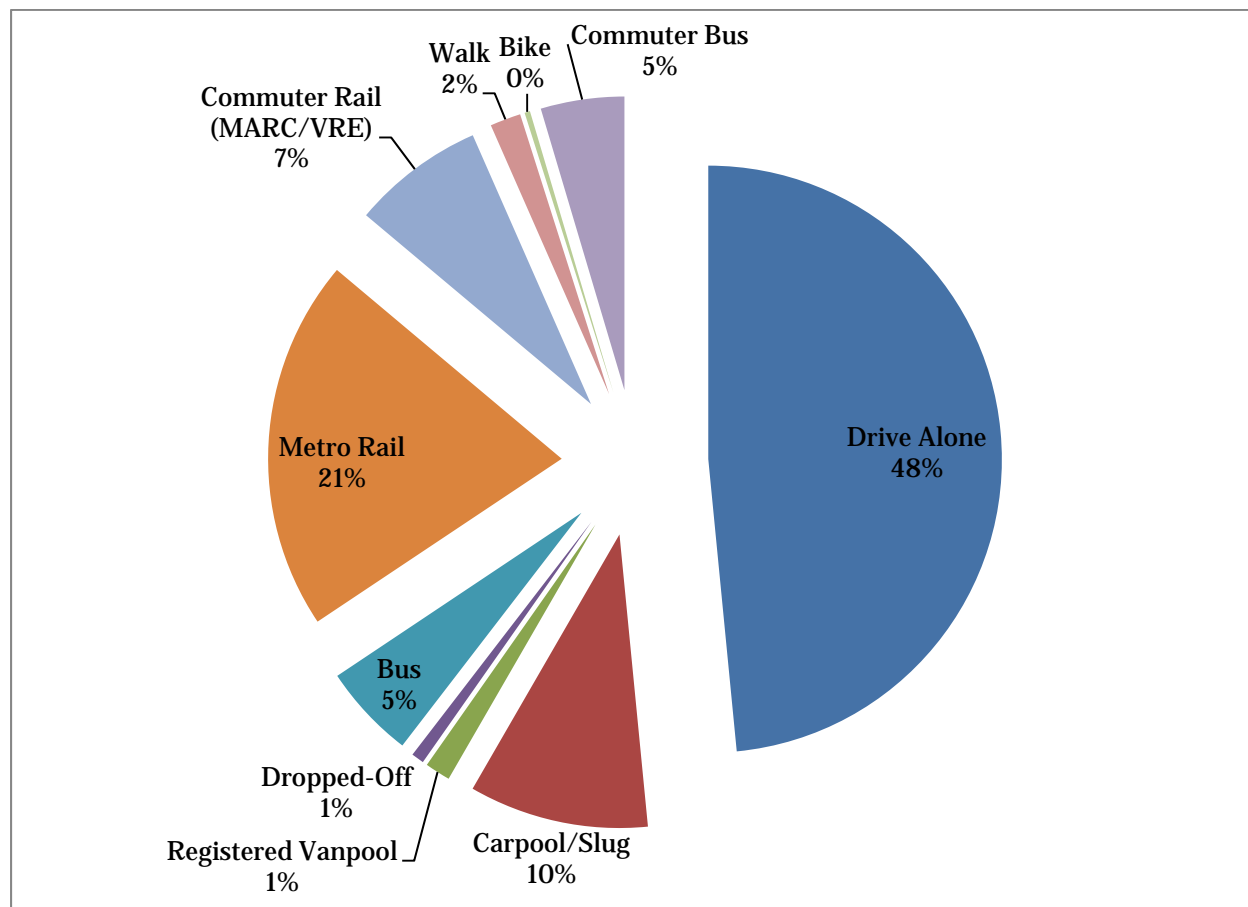


Figure 4: Current Commute Mode Split for TSA Employees

Questions 4 – 6: Carpool/Slug/Vanpool Commuting

Survey Questions 4 – 6 ask those who carpool, slug, or vanpool about their commuting habits, specifically how many days a week, on average, respondents are carpool/slug/vanpool drivers or passengers, as well as how many people are typically in their carpool/slug/vanpool vehicle. The results, shown in Figure 5, indicate that being a driver or passenger for all five days of an average week was the most common response. Fewer respondents indicated that they switch between being a driver and passenger during an average week. Figure 6 also shows that the majority (approximately 70%) of carpool/slug/vanpool vehicles typically have two to three passengers.

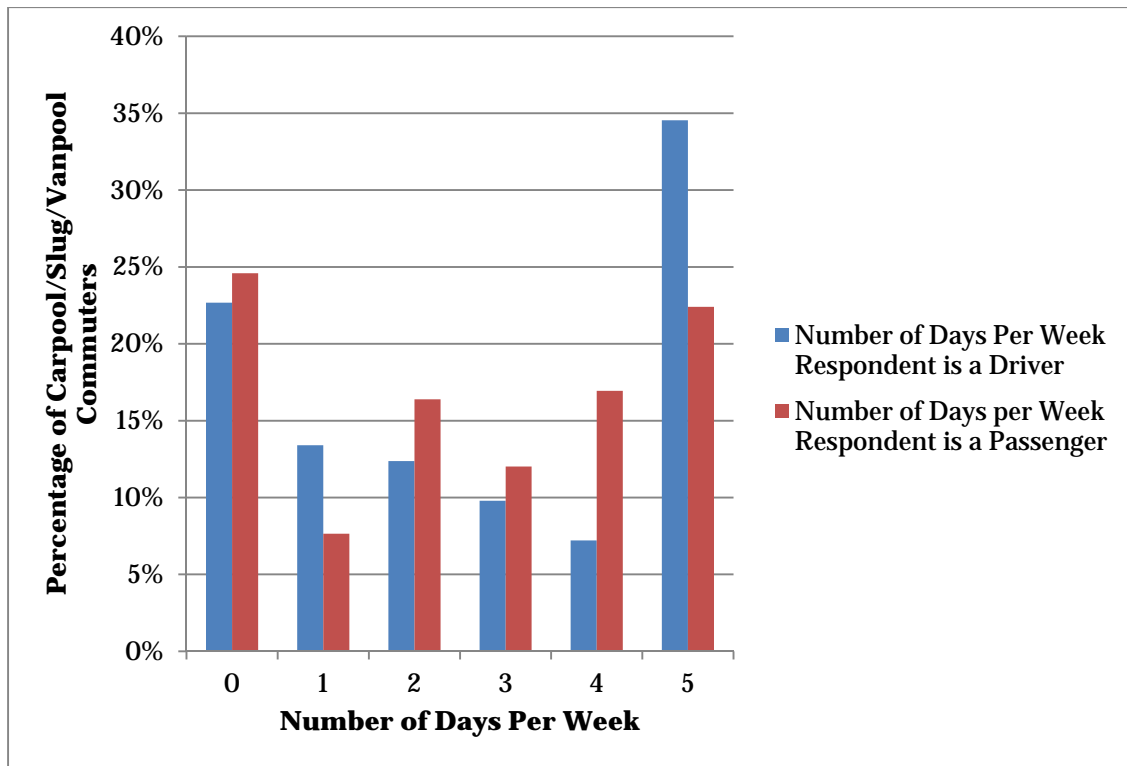


Figure 5: Carpool/Slug/Vanpool Driver and Passenger Habits

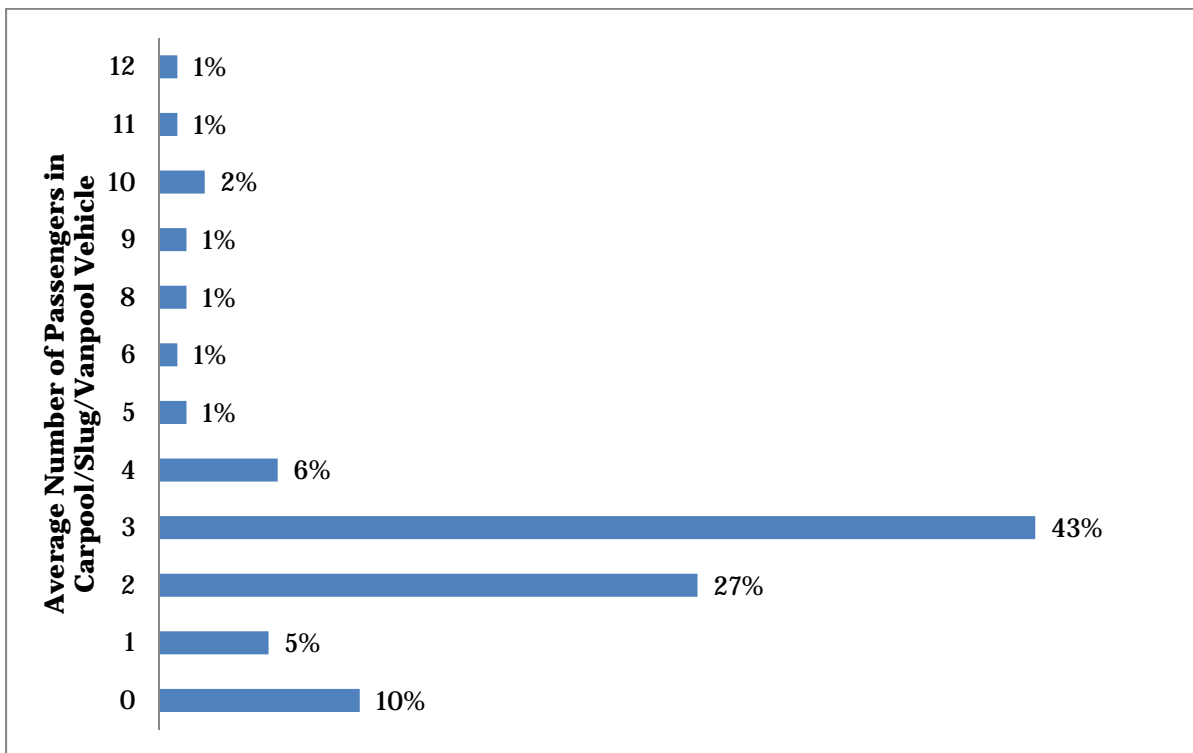


Figure 6: Average Number of Passengers in Carpool/Slug/Vanpool Vehicle

Question 7: If you utilize transit (Bus, Commuter Rail, Metro) at which Metro/Rail station or Park-and-Ride do you board your bus/train?

Survey Question 7 asks respondents that indicated they utilize transit to commute to and from work to identify the station or park-and-ride at which they board their bus or train. Approximately 180 unique responses were provided. Below is a list of the ten-most cited rail stations and park-and-ride facilities:

1. Franconia Springfield Metro Station (7.5%)
2. Crystal City (4.0%)
3. Huntington (3.6%)
4. Vienne (3.5%)
5. Wiehle-Reston (3.3%)
6. Largo (2.5%)
7. Branch Avenue (2.3%)
8. Broad Run (2.3%)
9. Greenbelt (2.3%)
10. Union Station (2.0%)

Question 8: How long does your commute from home to the office (one way) typically take?

The results of this question show that the largest percentage (38.4%) of respondents have a commute that lasts between 30 and 60 minutes (see Figure 7).

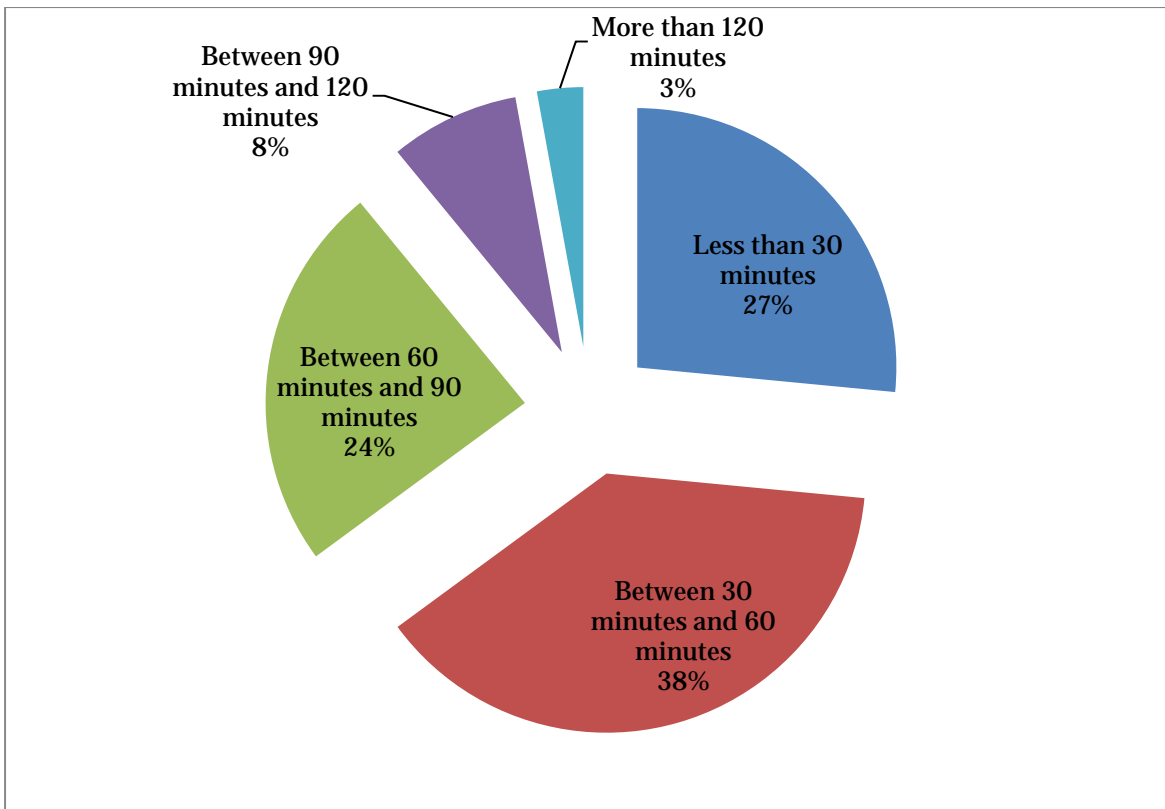


Figure 7: TSA Employee One-Way Commute Time

Questions 9 and 10: Do you currently receive a transit subsidy? If you receive a transit subsidy please specify how much you receive per month.

Survey Questions 9 and 10 ask respondents if they receive a transit subsidy, and if so, how much they receive per month. Approximately 40% of the respondents indicate that they receive a transit subsidy. Of that 40%, the majority (45%) receive \$130 per month (see Figure 8).

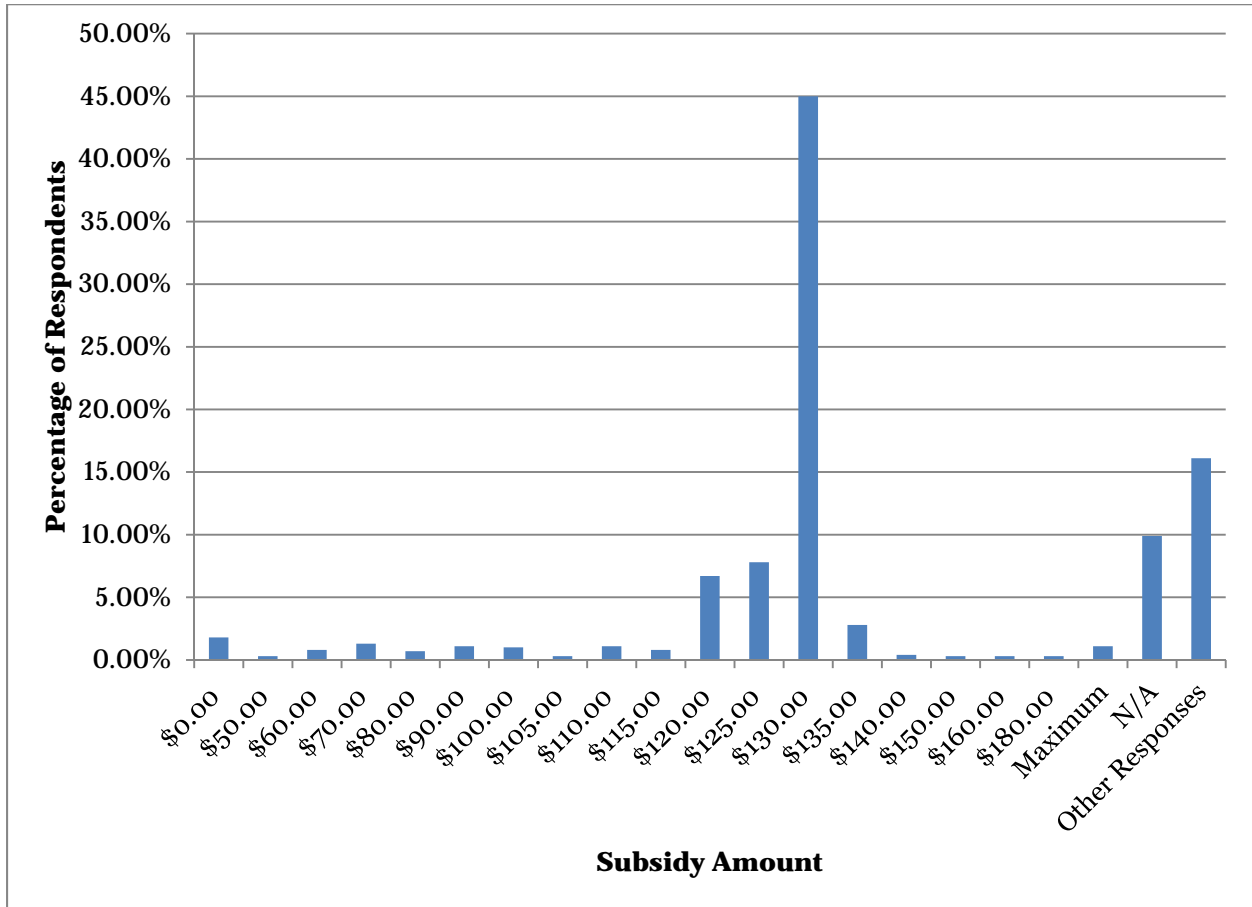


Figure 8: Monthly Transit Subsidies

Question 11: Are you currently registered with Commuter Connections Guaranteed Ride Home Service or any other commuter assistance program?

While approximately 11% of respondents carpool, slug, or vanpool, and 38% commute transit, only 11% of the respondents indicated that they are registered with a guaranteed ride home program. This indicates significant potential to market this type of service to employees who currently commute via alternative modes, as well as to employees who currently drive but may be interested in transit if they were able to utilize a guaranteed ride home service for emergencies.

Questions 12 - 14: Work Schedule

Survey Questions 12 through 14 ask respondents to indicate their work schedule, including typical arrival/departure times and variability of their schedule. The majority of respondents (60%) indicate that they have a typical 5 day/40 hour work week. Approximately 32% indicate that they utilize a 9 day/80 hour work schedule in order to receive a day off every other week. Most respondents (85%) arrive to work between 6:00 AM and 9:00 AM, and depart between 3:30 PM and 6:30 PM (see Figures 9a and 9b).

Arrival Time		Percentage of Respondents
Before 5:00 AM		0.6%
Between 5:00 AM and 5:30 AM		2.4%
Between 5:30 AM and 6:00 AM		6.8%
Between 6:00 AM and 6:30 AM		10.0%
Between 6:30 AM and 7:00 AM		13.8%
Between 7:00 AM and 7:30 AM		18.6%
Between 7:30 AM and 8:00 AM		16.7%
Between 8:00 AM and 8:30 AM		15.4%
Between 8:30 AM and 9:00 AM		9.9%
Between 9:00 AM and 9:30 AM		4.5%
Between 9:30 AM and 10:00 AM		1.2%
After 10:00 AM		0.3%

Figure 9a: Employee Arrival and Departure Trends

Departure Time		Percentage of Respondents
Before 3:00 PM		2.5%
Between 3:00 PM and 3:30 PM		5.8%
Between 3:30 PM and 4:00 PM		14.3%
Between 4:00 PM and 4:30 PM		16.1%
Between 4:30 PM and 5:00 PM		20.8%
Between 5:00 PM and 5:30 PM		16.2%
Between 5:30 PM and 6:00 PM		12.2%
Between 6:00 PM and 6:30 PM		7.9%
Between 6:30 PM and 7:00 PM		2.2%
Between 7:00 PM and 7:30 PM		1.2%
Between 7:30 PM and 8:00 PM		0.5%
After 8:00 PM		0.2%

Figure 9b: Employee Arrival and Departure Trends

Questions 15 - 16: Telecommuting

Survey Questions 15 and 16 ask respondents that work remotely about their telecommuting habits, arrival/departure times and variability of their schedule, specifically how many days a week they telecommute, and on which days. The majority (approximately 38%) indicate that they telecommute one day per week (see Figure 10). Although the distribution of telecommuting days is relatively even Tuesday through Thursday, Monday and Friday workdays have a higher percentage of telecommuters than the rest of the week (see Figure 11).

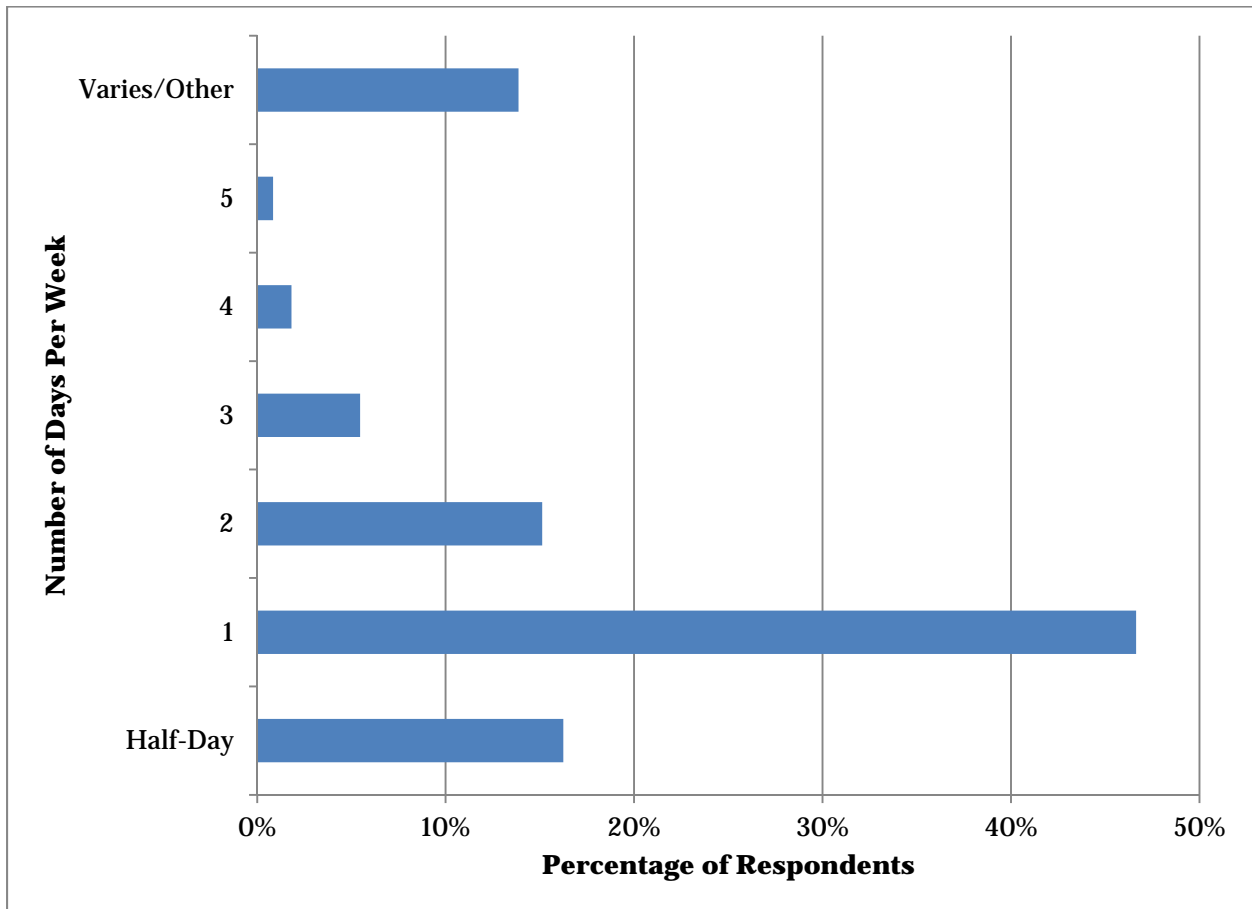


Figure 10: Number of Days Per Week Employees Telecommute

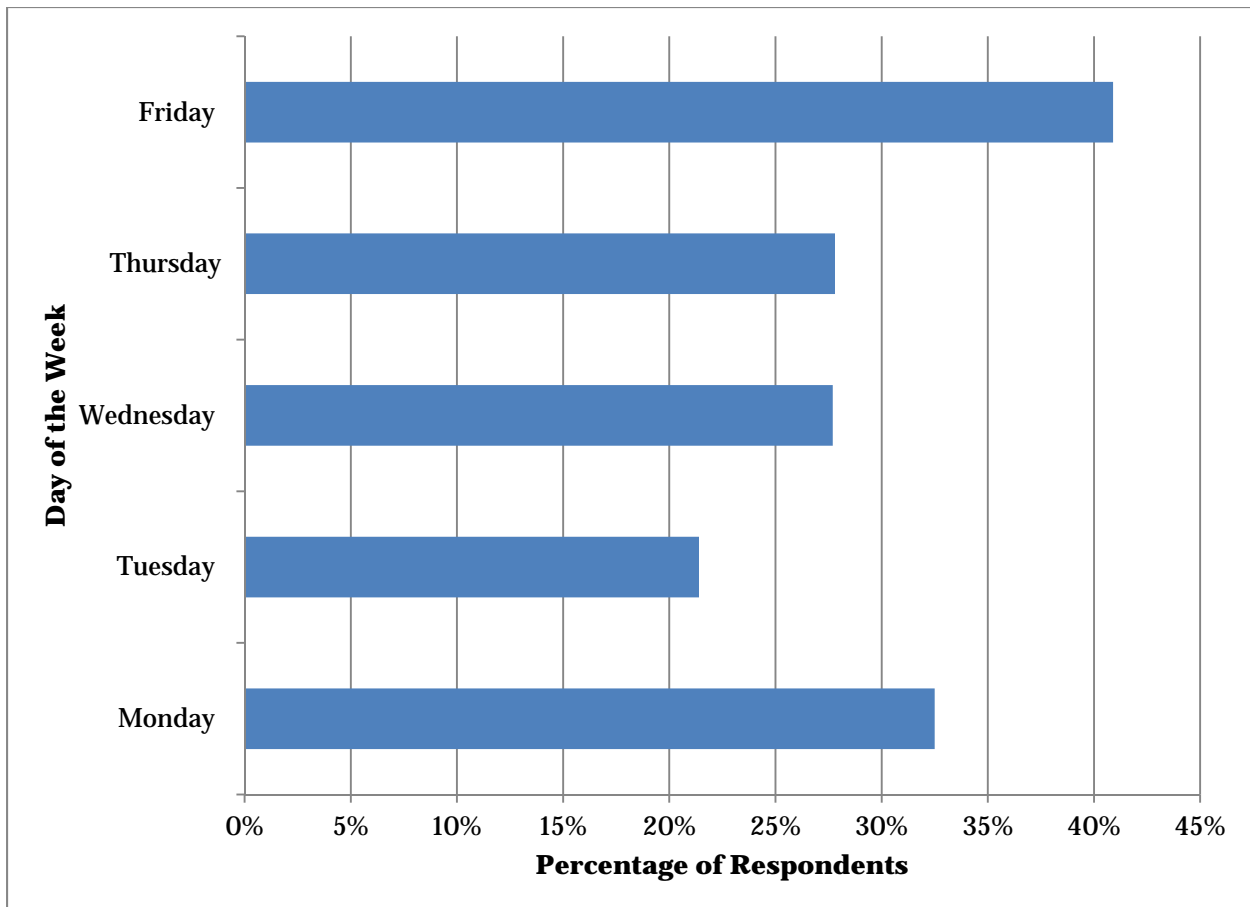


Figure 11: Days of Week Employees Telecommute

Question 17: If you currently drive to work alone, how many days a week do you typically use your vehicle for each of the following purposes?

Survey Question 17 asks respondents that drive to work how often they use their vehicle during the week for work related travel, travel between TSA buildings, shopping/banking/dining during the workday, daycare/childcare, and to drop-off/pick-up items or other passengers on the way home. Respondents were also able to enter their own purpose in an “other” category. As shown in Figure 12, over 58% of respondents who drive alone to work do not use their vehicle for any other purpose, other than commuting. Approximately 25% of respondents indicated that they utilize their vehicle to drop-off/pick-up children for daycare every week day. Shopping, banking, and dining trips accounted for a smaller percentage of vehicle use with only 16% of respondents indicating they use their vehicle for that purpose once per week.

An assessment of the “Other” responses indicate that a smaller portion of respondents also utilize their vehicle for regular healthcare appointments, other activities after work, travel to and from school, or traveling to a second job.

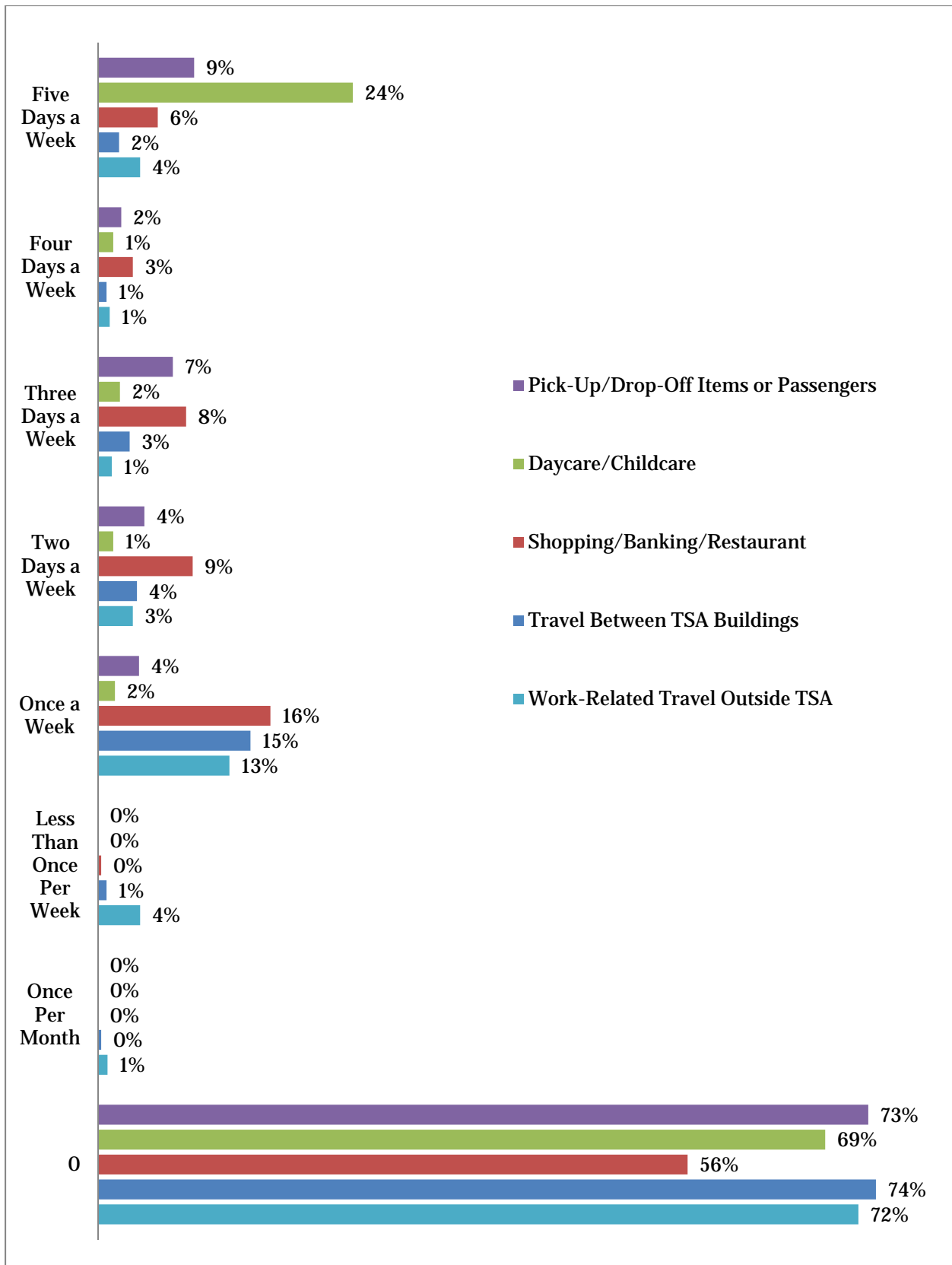


Figure 12: Frequency of Vehicle Use by Employees that Drive Alone To Work

Questions 18 - 19: Probability of Changing Commute Mode from Driving Alone to Alternative Modes

Survey Question 18 asks respondents that drive alone to work if they would be willing to consider alternative modes of transportation. The results of the survey show that only one-third of drive-alone commuters would consider an alternative commute mode. Question 19 follows up with the two-thirds of respondents who indicated that they would not consider an alternative commute mode. Of the respondents that would not consider an alternative mode, 24% indicated that they prefer the convenience/comfort of their own vehicle, 21% have an unpredictable schedule, and 18% need a vehicle to pick-up/drop-off children from childcare (see Figure 13).

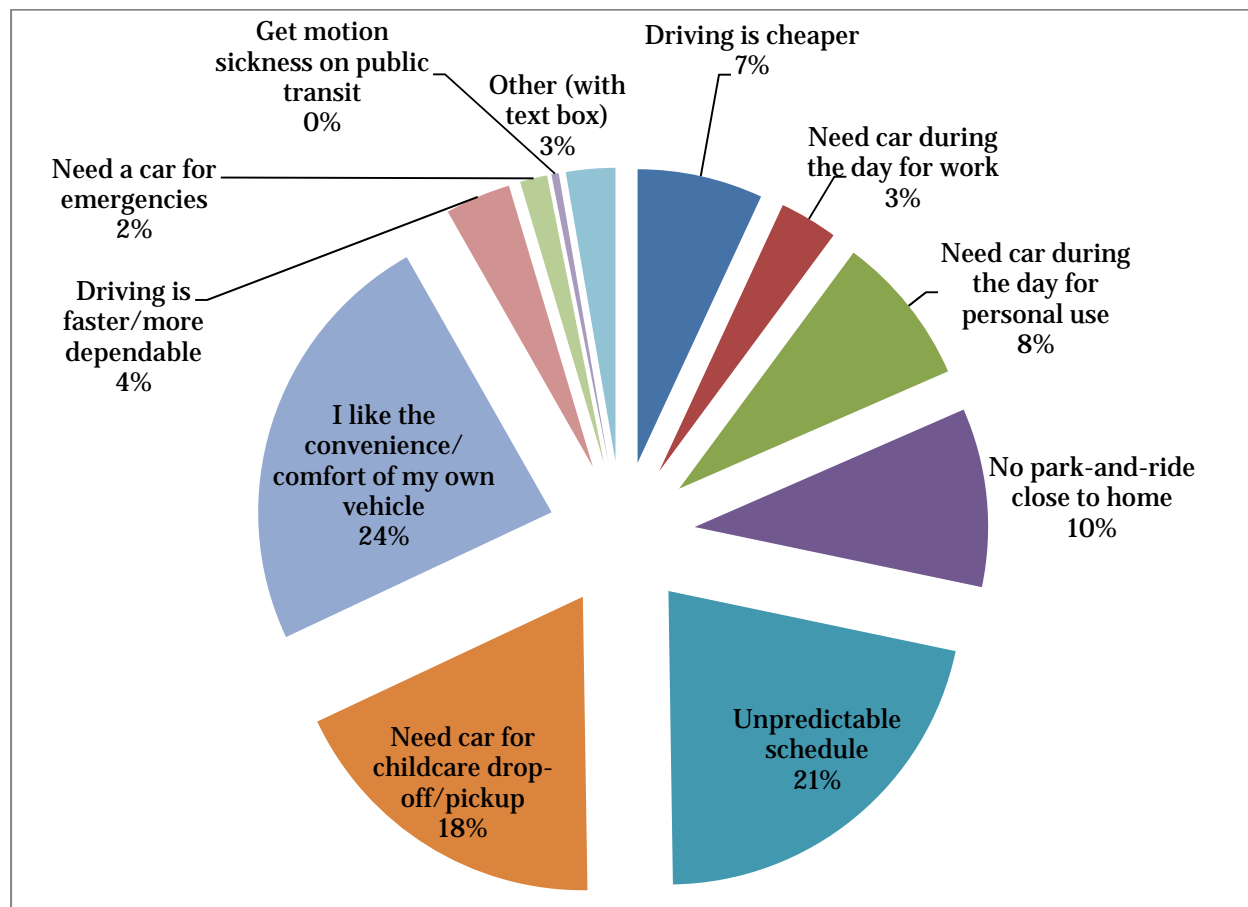


Figure 13: Reasons Why Drive-Alone Commuters Would Not Consider Alternative Commute Modes

Question 20: If a Zip-Car (car sharing service) or an equivalent service was provided at your office location for a fee, would you use it?

Based on the results of the survey, only 20% of respondents indicated a willingness to utilize a car sharing service if one was provided.

Question 21: If you currently drive to work alone, are there any improvements to services that would encourage you to commute by transit?

Survey Question 21 asks employees if improvements to transit services would increase the likelihood that they would consider utilizing transit for commuting. This question was “free-response” allowing respondents to be specific. The results of the question were summarized and are shown in Figure 14. The results show that the largest percentage of respondents indicated that there are no service improvements that would encourage commuting via transit. The next highest responses was for a direct transit service between a park-and-ride facility near their residence to the office (11%), reducing transit costs and/or increasing subsidies (9%), and increasing the frequency, reliability, safety, and comfort of transit (8%).

Question 22: If you currently drive to work alone, would you be willing to carpool or vanpool if you were provided Guaranteed Ride Home services?

Based on the results of the survey, 34% of respondents indicated a willingness to carpool or vanpool if a Guaranteed Ride Home service is provided.

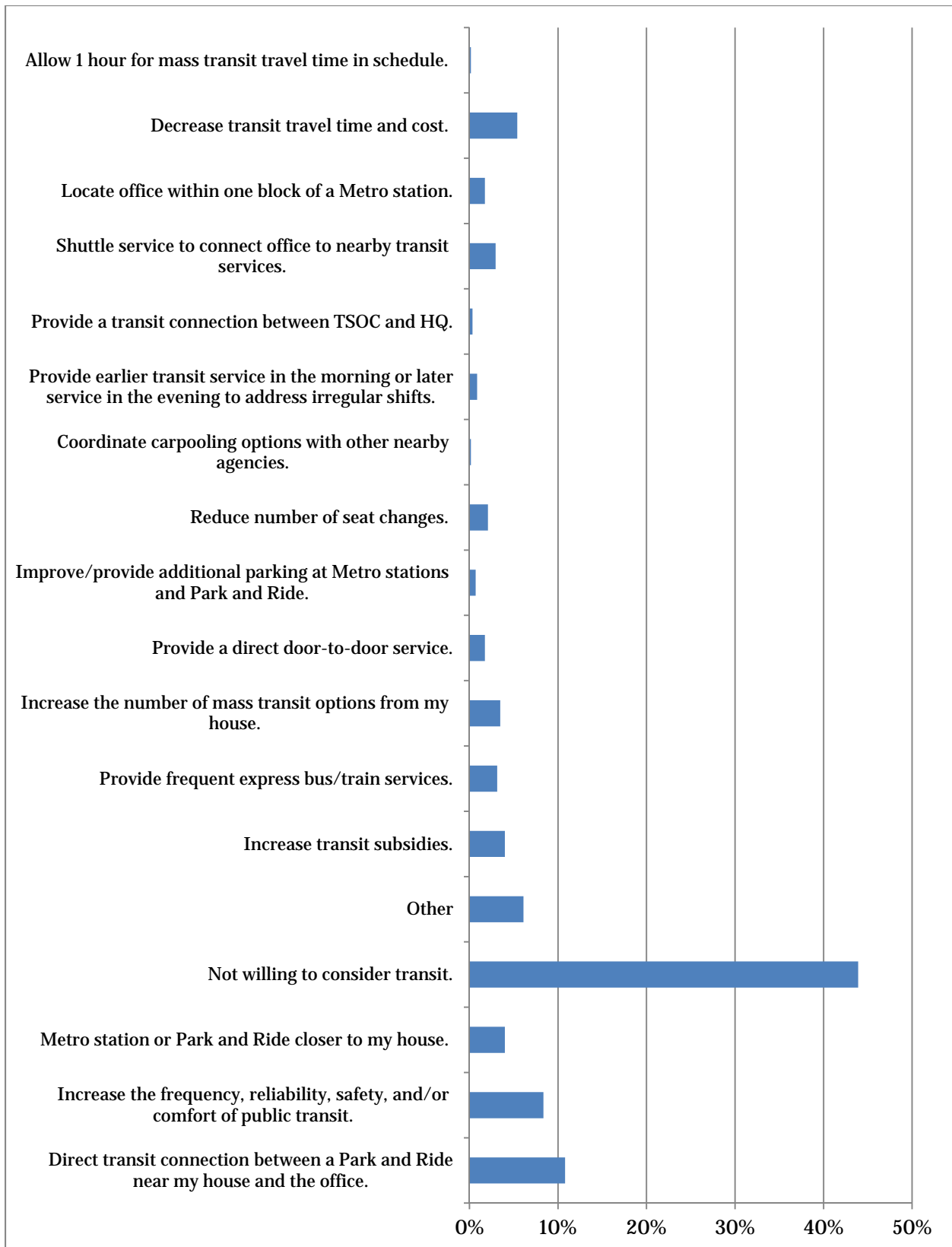


Figure 14: Improvements to Transit Services that Would Encourage Drive-Along Commuters to Consider Alternative Modes

IMPACT OF OFFICE LOCATION ON COMMUTE MODE AND PATTERN

Questions 23 – 30 ask respondents to indicate how their commute mode and pattern would change if they were relocated from their current office to either the Springfield Metro Center or Victory Center site. The following text and figures summarize the results of those questions.

Questions 23 - 24: Would you relocate your place of residence to be close to any of the potential new office locations? If you answered yes, what would be the five-digit zip code of your most likely future place of residence?

Based on the results of the survey, 93% of respondents indicated that they would not relocate their place of residence to be closer to either of the sites. Of the of respondents that would consider relocating, approximately 67% would relocate to zip codes within and immediately surrounding Alexandria if the Victory Center site was selected, while 66% would move to the Franconia-Springfield area if the Springfield Metro Center site was selected.

Question 25: What would you anticipate being your primary mode of travel to work if you were located to any of the potential new locations?

The results of Question 25 indicate that both potential office locations would result in a slight increase in the number of employees that would commute via personal vehicle, from 48% (existing) to 53% (Victory Center) and 56% (Springfield Metro Center) (see Figure 15). Based on the comments provided on the survey for this question, the increase is likely due to a combination of factors, such as more efficient freeway access to both sites and potentially longer transit travel times for some users.

Questions 26 - 27: If you currently take Metro or commuter rail (MARC/VRE), would you board at a different station or park-and-ride if you were relocated to any of the potential new locations? If so, to which would it change?

Based on the survey results, neither site would result in a significant change in where a rail commuter boards his/her train. Approximately 89% of rail commuters would continue to board at their current station if the Victory Center site was selected, while 87% of rail commuters would continue to board at their current station if the Springfield Metro Center site was selected. The survey results also indicated that respondents were confused by Question 27, which asked respondents to identify where they would board in the future. However, the majority of respondents answered this question “not applicable”, “not sure”, or listed the station that would be closest to the potential new office locations. Therefore, data from Question 27 should be omitted.

Question 28: If an express bus (commuter bus) was provided for a fee from a park-and-ride near your home to any of the potential new sites, would you take it?

The survey results indicate that approximately 49% of respondents would consider utilizing a bus that traveled from a park-and-ride near their home to either the Victory Center site or Springfield Metro Center site. However, upon reviewing general comments related to this question, it was apparent that many respondents would only consider an express bus if it traveled directly from the park-and-ride near their home to the office with no additional stops.

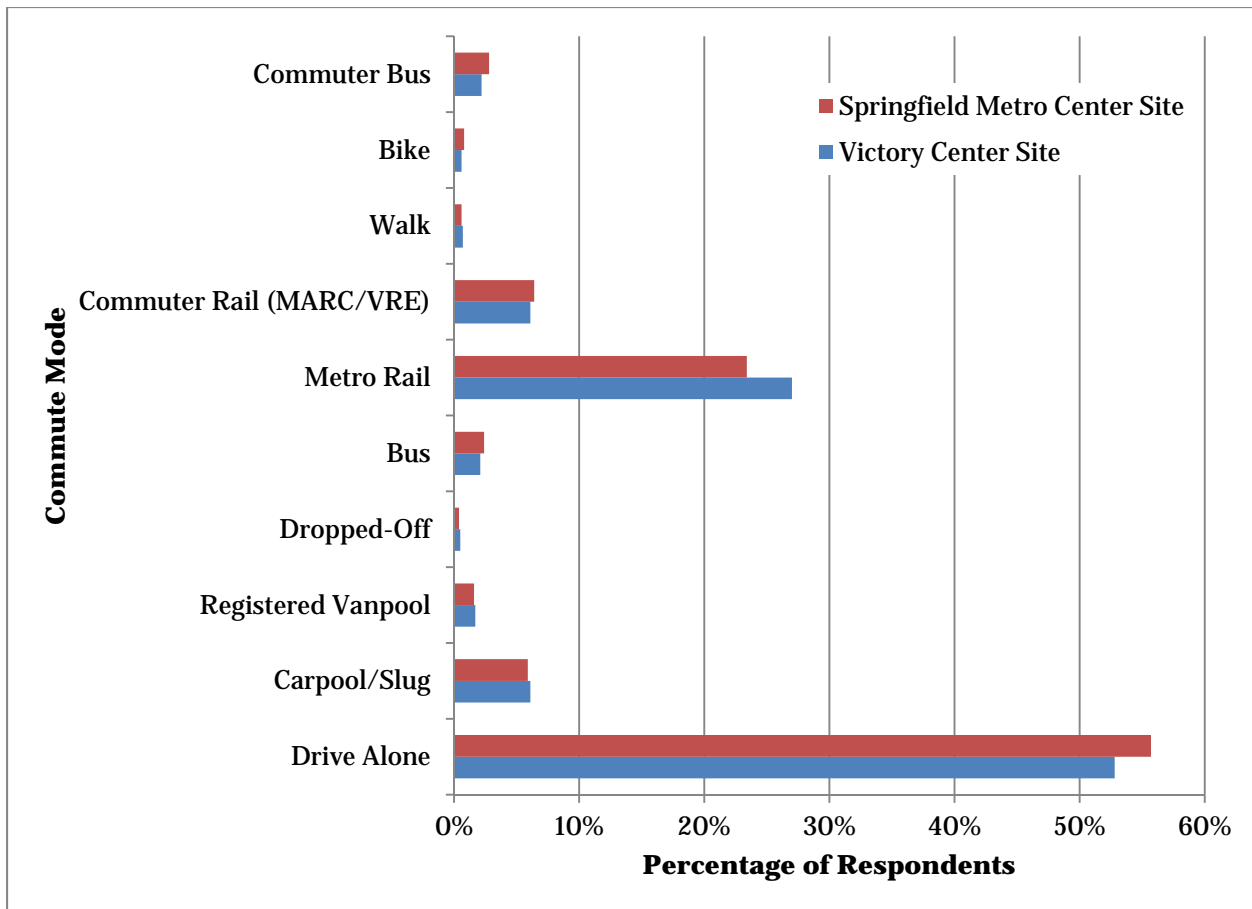


Figure 15: Anticipated Primary Commute Mode Based on Office Location

Question 29: What is the maximum distance you would be willing to walk to access transit (Metro/rail/bus) for the purposes of commuting to and from work?

The purpose of Question 29 was to assess how the distance between the office and a transit station affects the willingness of commuters to utilize that mode of transportation. The results of the survey indicate that the majority of respondents (73%) would only be willing to walk ¼ mile or less, with 30% indicating that the transit stop would have to be within one block of the office (Figure 16). These results indicate that a supplemental connecting service, such as an employee shuttle, might be warranted for either office location because both are more than ¼ mile walking distance from the nearest Metrorail station.

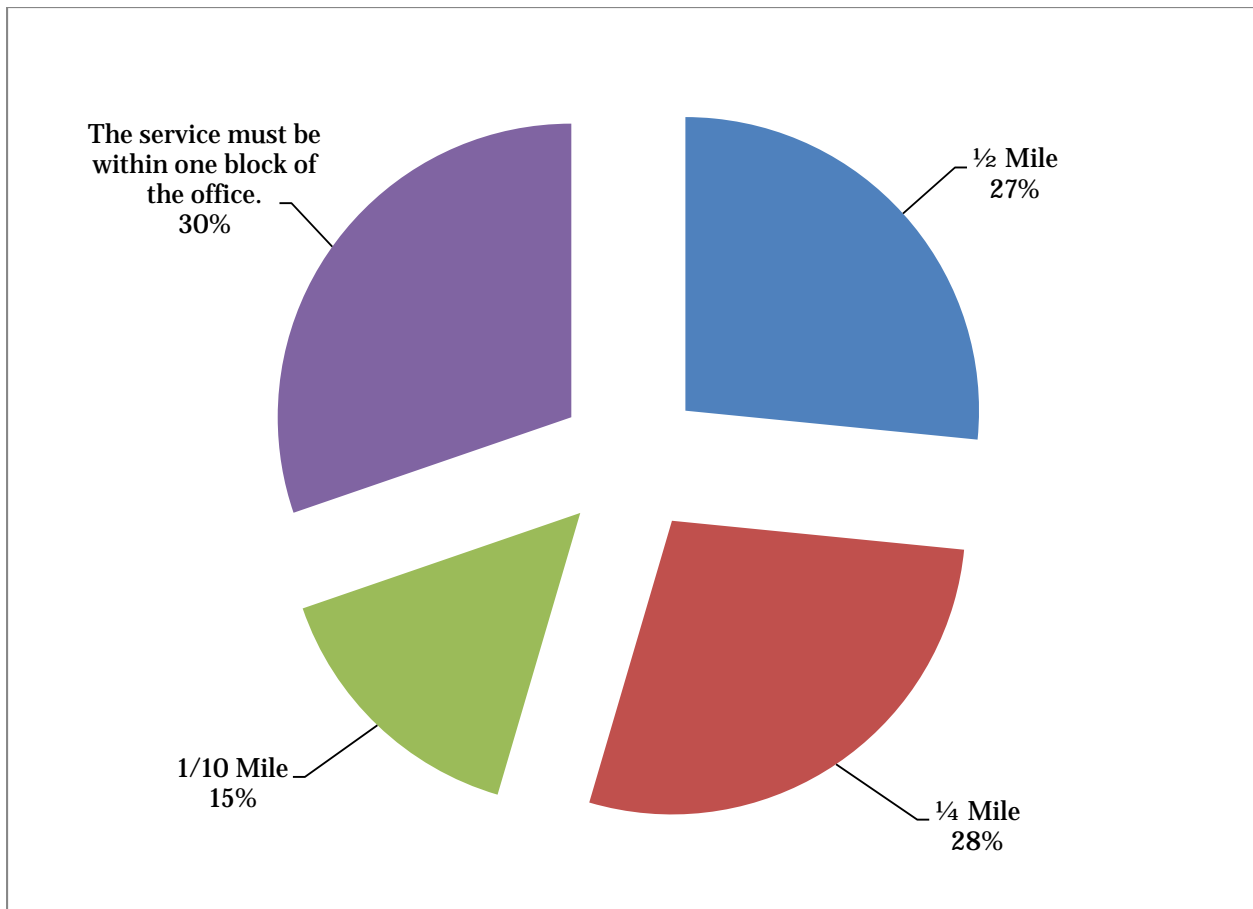


Figure 16: Distance Respondents Would be Willing to Walk to Access Transit

Question 30: If a shuttle service was provided to connect a Metro/rail station to the office, would you utilize it?

The purpose of Question 30 was to assess how a commuter shuttle would be utilized by TSA employees if it were provided to connect the office with a nearby Metro or rail station, as well as if providing a shuttle would encourage transit use. The results of the survey indicate that 83% of the respondents that are planning to utilize Metro or commuter rail would utilize a shuttle if it were provided. It should also be noted that 21% of respondents indicated that they would consider taking Metro or commuter rail if a shuttle was provided (Figure 17).

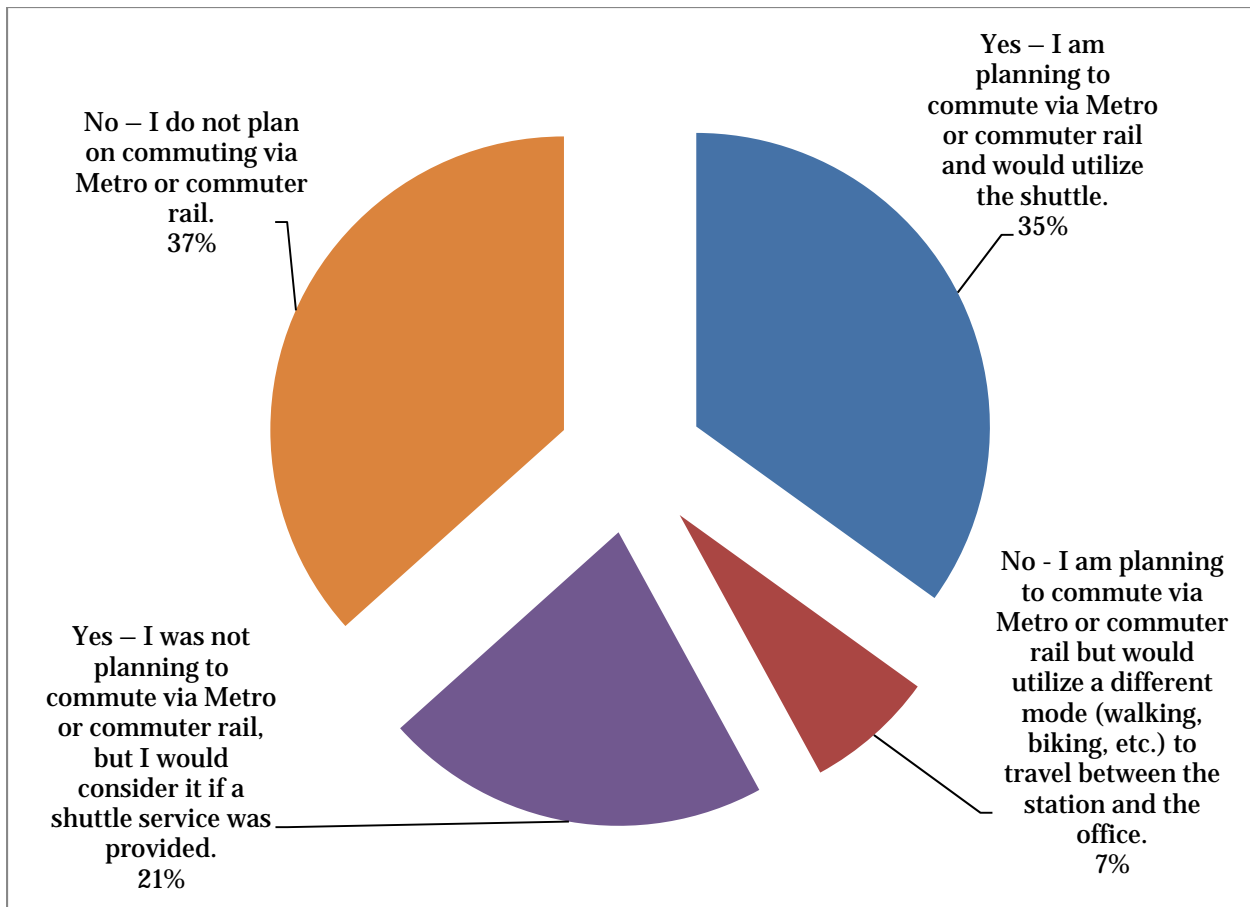


Figure 17: Potential Impacts of a Commuter Shuttle Connecting Office to Metro/Commuter Rail Station

CONCLUSION

The results of the TSA employee commuter survey indicate an existing strong culture of alternative commuting modes. Approximately 52% of respondents currently utilize alternative transportation modes (carpool/vanpool, bus, Metrorail, commuter rail, walking, bicycling, etc.). The survey results also indicate that office location is likely to have a minimal impact on commuter mode, with only 8% of respondents indicating that they would change their commute mode from transit or carpool/vanpool to driving alone. However, introducing/enrolling employees in a Guaranteed Ride Home service, or providing more direct transit connections between park-and-ride facilities and the office location, may further encourage commuters that drive alone to switch to an alternative commute mode.

It should also be noted that the survey indicated that most respondents would only be willing to walk $\frac{1}{4}$ mile or less to access a Metrorail or commuter rail station. Therefore, the TSA should strongly consider implementing a shuttle service at the new office location, as both potential locations require a walking distance greater than $\frac{1}{4}$ mile.

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CHAPTER 3: SPRINGFIELD METRO CENTER

This section describes the assessment of potential transportation impacts resulting from the proposed consolidation of the Transportation Security Administration (TSA) at 6601 Springfield Center Drive, Springfield, VA (Springfield Metro Center) (see Figure 18). The planned consolidation at this site would consist of the construction of 653,000 GSF of office space and the relocation of approximately 3,800 TSA employees from five other offices: 601 South 12th Street, 701 South 12th Street, and 6354 Walker Lane in Alexandria, VA, 1900 Oracle Way in Reston, VA, and 45065 Riverside Parkway in Ashburn, VA.

The subject site is located east of I-95 and bordered on the north by the Franconia Springfield Parkway, on the south by Springfield Center Drive, and on the east by the Metro Blue Line and Virginia Railway Express (VRE) Fredericksburg Line tracks. The existing warehouse buildings currently on the site would be demolished as part of the Springfield Metro Center development, which would consist of 1,058,500 GSF of office, as well as ancillary retail uses. However, it should be noted that this Traffic Technical Report analyzes the impacts of the 653,000 GSF TSA consolidation (Phase I) only as it is unclear at this time when the remaining office space (Phase II) will be constructed.

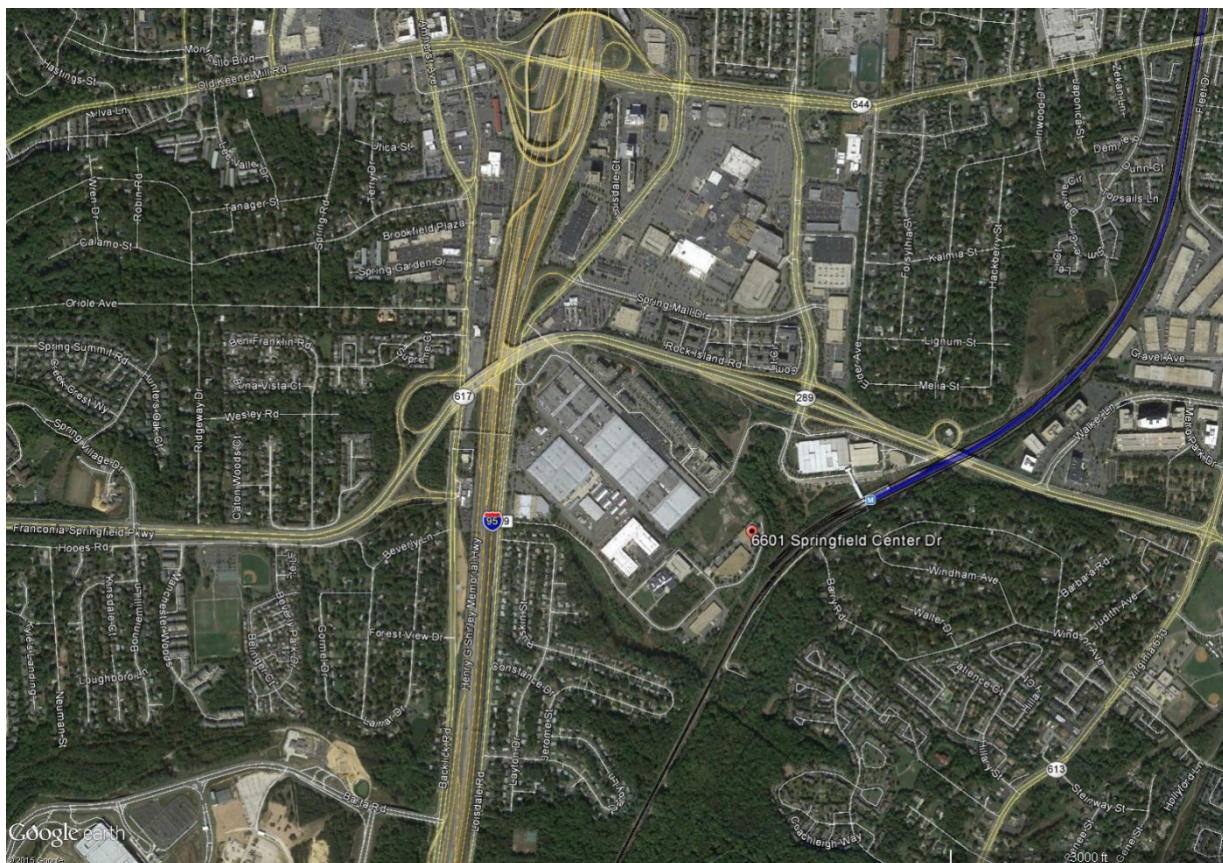


Figure 18: Springfield Metro Center Project Area Map

Potential transportation impacts, assessed in this Traffic Technical Report are based on the transportation analysis and documentation contained in the following reports:

1. *Springfield Metro Center II Traffic Impact Study* (December 19, 2014), prepared by Wells and Associates.
2. *Springfield Metro Center – Phase 1 Comment Response Letter* (March 23, 2015), prepared by Wells and Associates.
3. *Springfield Metro Center II Phase I Traffic Analysis* (March 27, 2015), prepared by Wells and Associates.
4. *Springfield Metro Center II – Phase II Traffic Impact Study* (June 15, 2011), prepared by Wells and Associates

A copy of the documentation is contained in Appendix B.

These documents analyze the following three scenarios:

- Existing Conditions
- Future Conditions without Consolidation (No Action Alternative)
- Future Conditions with Consolidation (Action Alternative)

Discussions with staff from the Virginia Department of Transportation (VDOT) and Fairfax County resulted in the selection of the following twelve (12) intersections that have been analyzed in the documentation listed above (see Figure 19):

1. Lois Dale Road/Franconia Road Eastbound (EB) Ramps
2. Lois Dale Road/Franconia Road Westbound (WB) Ramps
3. Loisdale Road/Loisdale Court
4. Loisdale Road/Spring Mall Road
5. Loisdale Road/Metropolitan Center Drive
6. Loisdale Road/Springfield Center Drive
7. Loisdale Road/Lois Drive
8. Loisdale Road/Newington Road
9. Loisdale Road/Fairfax County Parkway
10. Frontier Drive/Franconia-Springfield Parkway EB Ramps
11. Frontier Drive/Franconia-Springfield Parkway WB Ramps
12. Frontier Drive/Spring Mall Road

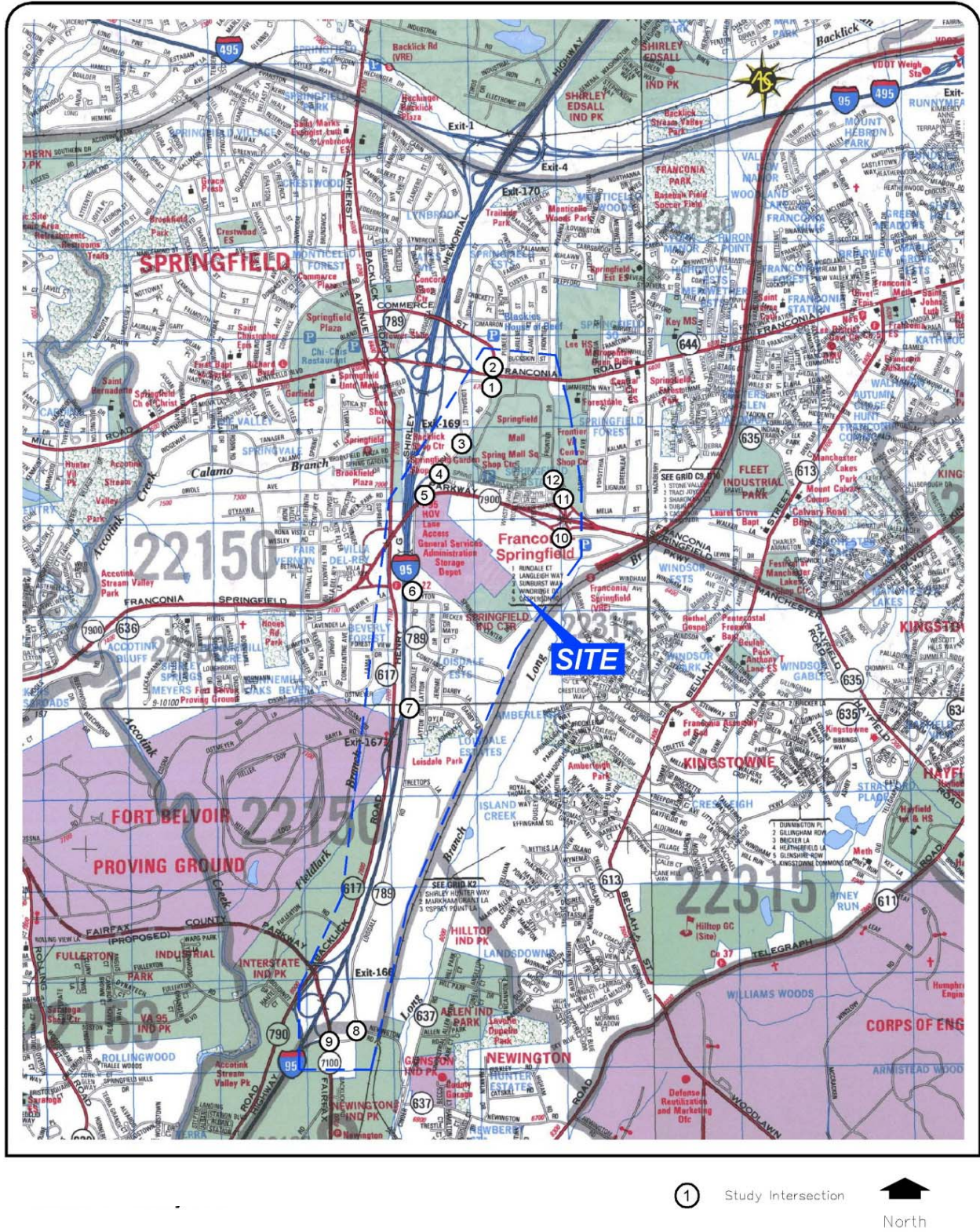


Figure 19: Springfield Metro Center Study Area

EXISTING CONDITIONS

This section describes the existing transportation facilities in the vicinity of the Springfield Metro Center site, including traffic conditions and the availability of public transportation facilities.

EXISTING PUBLIC TRANSPORTATION FACILITIES

Existing public transportation facilities which service Springfield Metro Center include Metrorail, VRE commuter rail, and bus routes. Descriptions of the available transit services are provided below.

METRO RAIL SYSTEM

The Washington Metropolitan Area Transit Authority (WMATA) Metrorail system connects downtown Washington, D.C. to the adjoining areas in Maryland and Virginia (see Figure 20). There are six lines on the Metrorail system which are interconnected within Washington, D.C. The Metrorail system opens at 5:00 a.m. on weekdays and at 7:00 a.m. on weekends and closes at 12:00 a.m. Sunday-Thursday and at 3:00 a.m. Friday and Saturday. Trains arrive approximately every six minutes during the peak hours and every twelve minutes during the non-peak hours.

The Red Line operates between Shady Grove and Glenmont in Montgomery County. This line has 27 stations and has transfer points with the Orange and Blue Lines at Metro Center and the Yellow and Green Lines at Gallery Place and Fort Totten.

The Blue Line operates between Franconia-Springfield in Fairfax County, Virginia and Largo Town Center in Prince George's County. This line has 27 stations and has transfer points with the Red Line at Metro Center and the Yellow and Green Lines at L'Enfant Plaza. The line runs along the same path as the Yellow Line between King Street and Pentagon and runs along the same path as the Orange Line between Rosslyn and Stadium-Armory.

The Orange Line operates between Vienna/Fairfax-GMU in Fairfax County and New Carrollton in Prince George's County. This line has 26 stations and has transfer points with the Red Line at Metro Center and the Yellow and Green Lines at L'Enfant Plaza. The line runs along the same path as the Blue Line between Rosslyn and Stadium-Armory.

The Green Line operates between Branch Avenue and Greenbelt in Prince George's County. This line has 21 stations and has transfer points with the Red Line at Gallery Place and Fort Totten and with the Orange and Blue Lines at L'Enfant Plaza. The line runs along the same path as the Yellow Line from L'Enfant Plaza to Fort Totten.

The Yellow Line operates between Huntington in Fairfax County and Fort Totten in Washington, D.C. This line has 17 stations and has transfer points with the Red Line at Gallery Place and the Orange and Blue Lines at L'Enfant Plaza. The line runs along the same path as the Blue Line between King Street and Pentagon and runs along the same path as the Green Line from L'Enfant Plaza to Fort Totten.

The Silver Line is the newest line on the Metro system. The first phase of the Silver Line was completed to Wiehle-Reston East in 2014 and consists of five stations that extend off of the Orange Line in Loudon County, Virginia. The second phase will consist of six stations including Dulles

Airport and is anticipated to open in 2018. The Silver Line shares tracks with the existing Orange and Blue Lines as it travels across the region and will terminate at Largo Town Center.

The Springfield Metro Center site lies within one-half miles of the Franconia Springfield Metrorail Station along the Blue Line. The Blue Line operates at a 12-minute headway during weekdays and Saturdays, and a 15-minute headway on Sundays. This station is also served by the Yellow Line during rush hour periods (6:30 AM – 9:00 AM and 3:30 PM – 6:00 PM). The Yellow Line operates at a six-minute headway during the AM and PM rush. The average number of weekday passenger boardings for the Franconia Springfield Station was approximately 8,175 in 2014.



Figure 20: Metrorail System Map (not to scale)

VIRGINIA RAILWAY EXPRESS (VRE) RAIL SYSTEM

The Virginia Railway Express (VRE) Rail System is a commuter rail system that connects Washington, D.C. to the surrounding counties in Northern Virginia (see Figure 21). There are two lines operated by VRE and all of the lines connect at four stations: Alexandria, Crystal City, L’Enfant Plaza, and Union Station (all of which provide connection to Metrorail).

The VRE Fredericksburg Line operates between Fredericksburg, Virginia and Union Station in Washington, D.C. This line connects with the Metrorail system at Franconia Springfield, Alexandria, Crystal City on the Blue and Yellow Lines, L'Enfant Plaza on the Yellow, Green, Blue, Silver, and Orange Lines, and Union Station on the Red Line. The Fredericksburg Line operates seven trains in the northbound (inbound) direction in the morning peak hour beginning at 5:05 AM and seven trains in the southbound (outbound) direction in the evening peak hour beginning at 12:55 PM. VRE also has an agreement with AMTRAK to cross-honor tickets to provide additional services on this line.

The VRE Manassas Line operates between Manassas, Virginia and Union Station in Washington, D.C. This line connects with the Metrorail system at Alexandria and Crystal City on the Blue and Yellow Lines, L'Enfant Plaza on the Yellow, Green, Blue, Silver, and Orange Lines, and Union Station on the Red Line. The Manassas Line operates eight trains in the northbound (inbound) direction in the morning peak hour beginning at 5:05 AM and eight trains in the southbound (outbound) direction in the evening peak hour beginning at 1:15 PM.

The Springfield Metro Center site lies within one-half miles of the Franconia Springfield VRE Station (immediately adjacent to the Metrorail Station), along the Fredericksburg Line. Six of the seven AM inbound trains stop at the Franconia Springfield station, while all seven of the PM outbound trains stop at the station. The average daily ridership on the Fredericksburg Line in 2013 was just under 10,000 trips.



Figure 21: VRE Rail System Map (not to scale)

METROBUS AND FAIRFAX CONNECTOR

The Springfield Metro Center site is directly served by Fairfax County Connector Route 334 (DLA Circulator), which currently stops at the NVCC Medical College on Springfield Center Drive. The route is a circulator service that operates between the Franconia Springfield Metrorail and VRE station, the NVCC Medical College (on Springfield Center Drive), the Defense Logistics Agency (DLA), and the Gateway 95 business park. It operates on weekdays between 5:30 AM and 11:15 PM with AM peak headways of approximately 20 minutes during the AM and PM rush and 40 – 50 minutes during off-peak periods. The approximate travel time between the Franconia Springfield Metro Station and the NVCC Medical College (adjacent to the proposed site), is 10 minutes.

Several other Metrobus and Fairfax Connector routes serve the nearby Franconia Springfield Metrorail and VRE station, which lies within one-half mile of Springfield Metro Center (see Figure 22 and Table 2). These routes could be accessed by employees and visitors of the proposed site.

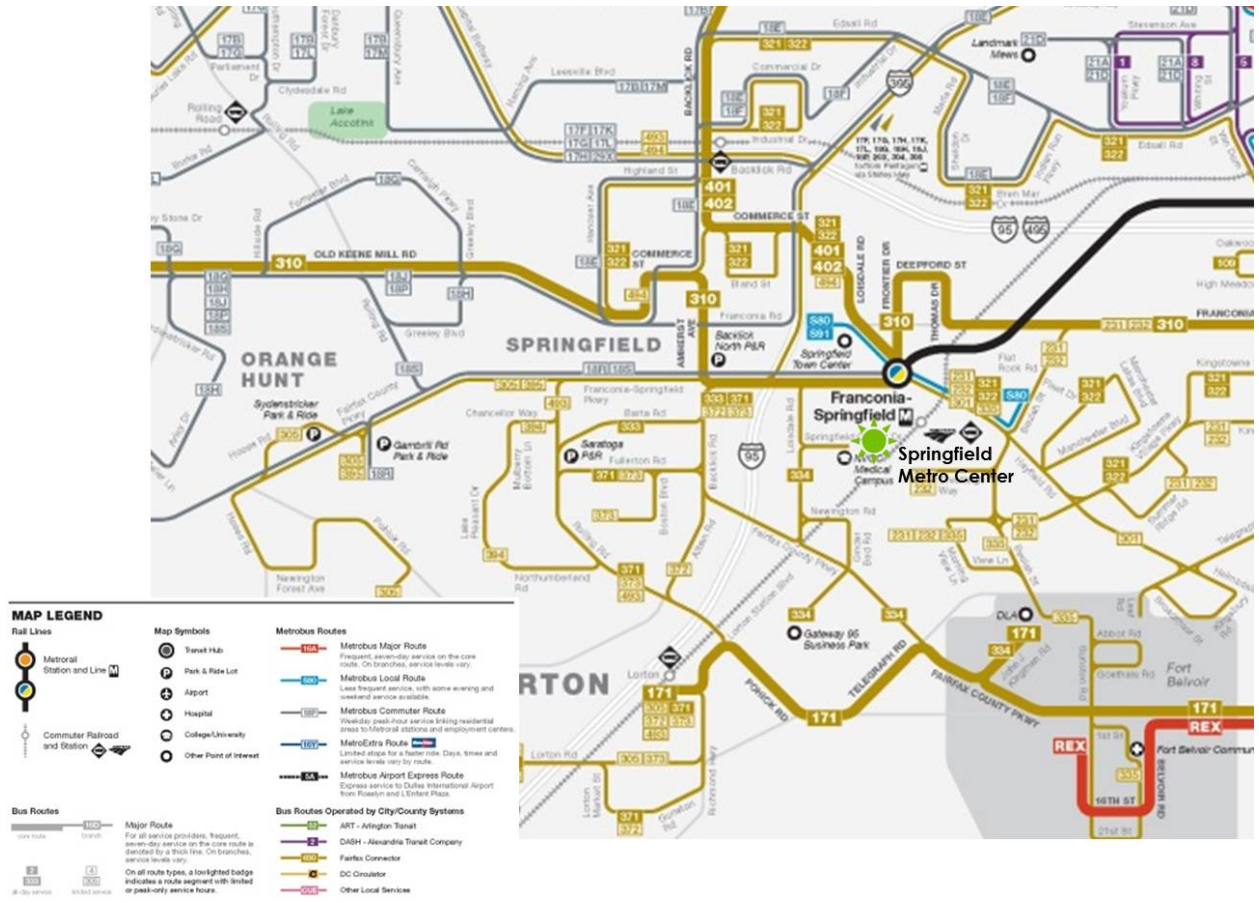


Figure 22: Metrobus and Fairfax Connector Routes (Not to Scale)

Table 2: Metrobus and Fairfax County Connector Routes that Stop at the Franconia Springfield Metrorail/VRE Station

Route	Operating Hours (Monday – Friday)	Average Headway at Franconia Springfield Station
Fairfax Connector Route 231/232 (Kingstowne Line)	5:00 AM – 10:00 AM 3:00 PM – 10:15 PM	30 minutes
Fairfax Connector Route 301 (Telegraph Road)	5:45 AM – 10:00 AM 3:00 PM – 8:30 PM	30 minutes – 1 hour
Fairfax Connector Route 305 (Newington Forest – Silverbrook Road Line)	5:00 AM – 9:45 AM 4:15 PM – 9:45 PM	30 minutes – 1 hour
Fairfax Connector Route 310 (Franconia Road – Rolling Valley Line)	4:15 AM – 1:00 AM	Peak: 20 minutes Off-Peak: 30 minutes – 1 hour
Fairfax Connector Route 321/322 (Greater Springfield Circulator)	6:00 AM – 11:15 PM	1 hour
Fairfax Connector Route 333 (Patriot Ridge/Saratoga Line)	5:30 AM – 10:15 PM	Peak: 20 – 30 minutes Off-Peak: 40 – 50 minutes
Fairfax Connector Route 335 (Fort Belvoir “The Eagle”)	6:15 AM – 9:45 AM 3:00 PM – 6:30 PM	20 – 30 minutes
Fairfax Connector Route 371/372/373 (Lorton – Springfield)	4:00 AM – 1:15 AM	Peak: 10 – 20 minutes Off-Peak: 30 minutes
Fairfax Connector Route 401/402 (Backlick - Gallows)	3:30 AM – 2:30 AM	Peak: 15 minutes Off-Peak: 20 – 30 minutes
Fairfax Connector Route 494 (Franconia-Springfield-Tyson)	5:30 AM – 8:00 PM	Peak: 20 – 30 minutes Off-Peak: 50 minutes – 1 hour
Metrobus Commuter Route 18R/18S (Burke Center Line)	5:45 AM – 9:00 AM 3:45 PM – 9:00 PM	10 – 20 minutes
Metrobus Local Route S80/S91 (Springfield Circulator)	6:00 AM – 8:00 PM	15 minutes

PEDESTRIAN AND BICYCLE FACILITIES

There are sidewalk and pedestrian crossings along Joseph Alexander Road which provide the only connection between the Franconia Springfield Metrorail/VRE station and the Springfield Metro Center site. While the straight line distance between the station and the site is only approximately 0.25 miles, the actual walking distance from the Metrorail/VRE station to the center of the site is approximately 0.52 miles. The Springfield Metro Center site is also connected to the surrounding residential and commercial areas via sidewalks along Metropolitan Center Drive, which connects the site to Loisdale Road, and Joseph Alexander Road, which connects the site to the larger sidewalk network along Frontier Drive and Springfield Mall Drive. However, it should be noted that there are no sidewalks provided along Springfield Center Drive.

The existing sidewalks vary in width and appear to be in overall fair condition. Marked crosswalks are provided at all signals, as well as the majority of unsignalized intersections and driveways. Specifically, crosswalks are present at the following intersections:

- Loisdale Road/Franconia Road EB Ramps (southern, eastern and western legs)
- Loisdale Road/Franconia Road WB Ramps (northern, eastern and western legs)
- Loisdale Road/Loisdale Court (western leg)
- Loisdale Road/Spring Mall Road (eastern leg)
- Loisdale Road/Metropolitan Center Drive (eastern leg)
- Loisdale Road/Springfield Center Drive (southern leg)
- Loisdale Road/Lois Drive (northern leg)
- Loisdale Road/Newington Road (northern and eastern leg)
- Frontier Drive/Franconia-Springfield Parkway EB Ramps (southern, eastern and western legs)
- Frontier Drive/Franconia-Springfield Parkway WB Ramps (northern, eastern and western legs)
- Frontier Drive/Spring Mall Road (northern, eastern and western legs)

Traditional, man-hand pedestrian signals are provided at the majority of the nearby signalized intersections, as well as curb ramps. However, most curb ramps do not meet current Americans with Disabilities Act (ADA) guidelines.

There are no dedicated bicycle facilities which connect directly to the site. However, there is a variable-width (8-10 feet) multi-use path that runs along Loisdale Road, from the southern end of the project study area to Metro Center Drive, where it then travels parallel to the Franconia Springfield Parkway, connecting through the Franconia Springfield Metrorail/VRE station, and ending in a residential neighborhood on Seatrend Way. The Loisdale Road path also connects to a sidewalk and path network on the west side of I-95 via a pedestrian overpass over Loisdale Road, I-95, and Backlick Road, just south of the Franconia Springfield Parkway overpass. A second multi-use path is provided along the east side of Frontier Drive between the Franconia Springfield Metrorail/VRE station and the Best Buy driveway, where it becomes a standard-width sidewalk.

EXISTING LAND USE AND COMPREHENSIVE PLANS

LOCATION WITHIN THE JURISDICTION AND REGION

The Springfield Metro Center campus is located within the Lee Magisterial District in Fairfax County, Virginia. Under the Fairfax County Comprehensive Plan, the subject property is located in the Springfield Planning District (Area IV); Land Units O and P of the Franconia Springfield Transit Station Area.

COMPREHENSIVE PLAN RECOMMENDATIONS FOR PROPERTY

The Franconia Springfield Transit Station Area includes the Joseph Alexander Transportation Center, Springfield Mall, the GSA warehouse, as well as a mix of other retail, office, hotel, and industrial uses. The Comprehensive Plan identifies the area as a Transit Station Area where mixed-use, transit-oriented development is to be encouraged.

LAND USE RECOMMENDATIONS

The Comprehensive Plan outlines specific land use and transportation recommendations for the entire area. Land Unit O is planned for industrial uses up to a 0.50 floor area ratio (FAR). Land Unit P is planned for light industrial uses up to a 0.35 FAR. As an option, Land Unit P could be developed with office uses up to a 2.0 FAR with support retail uses subject to certain conditions as outlined below:

- Accommodations to the extension of Frontier Drive to Springfield Center Drive, and contributions to improvements on Loisdale Road.
- Provision of a grid system that accommodates walking within the site and to the adjacent Joseph Alexander Transportation Center.
- Implementation of a transportation demand management (TDM) program.
- Provision of a shuttle service to the Joseph Alexander Transportation Center.
- Adherence to the adopted Transit Oriented Development Guidelines contained in the Policy Plan.

TRANSPORTATION RECOMMENDATIONS

The area-wide transportation recommendations for the Springfield Planning Area are graphically depicted in Figure 23. The following improvements are recommended for the study area:

- Widening I-95 to 11 lanes with high occupancy toll (HOT) lanes.
- Widening the Franconia Springfield Parkway to eight lanes with high occupancy vehicle (HOV) lanes.
- Improvements to the I-95 and Franconia Springfield Parkway interchange.
- Widening Loisdale Road to four lanes, south of Spring Mall Road.
- Widening Newington Road to four lanes.

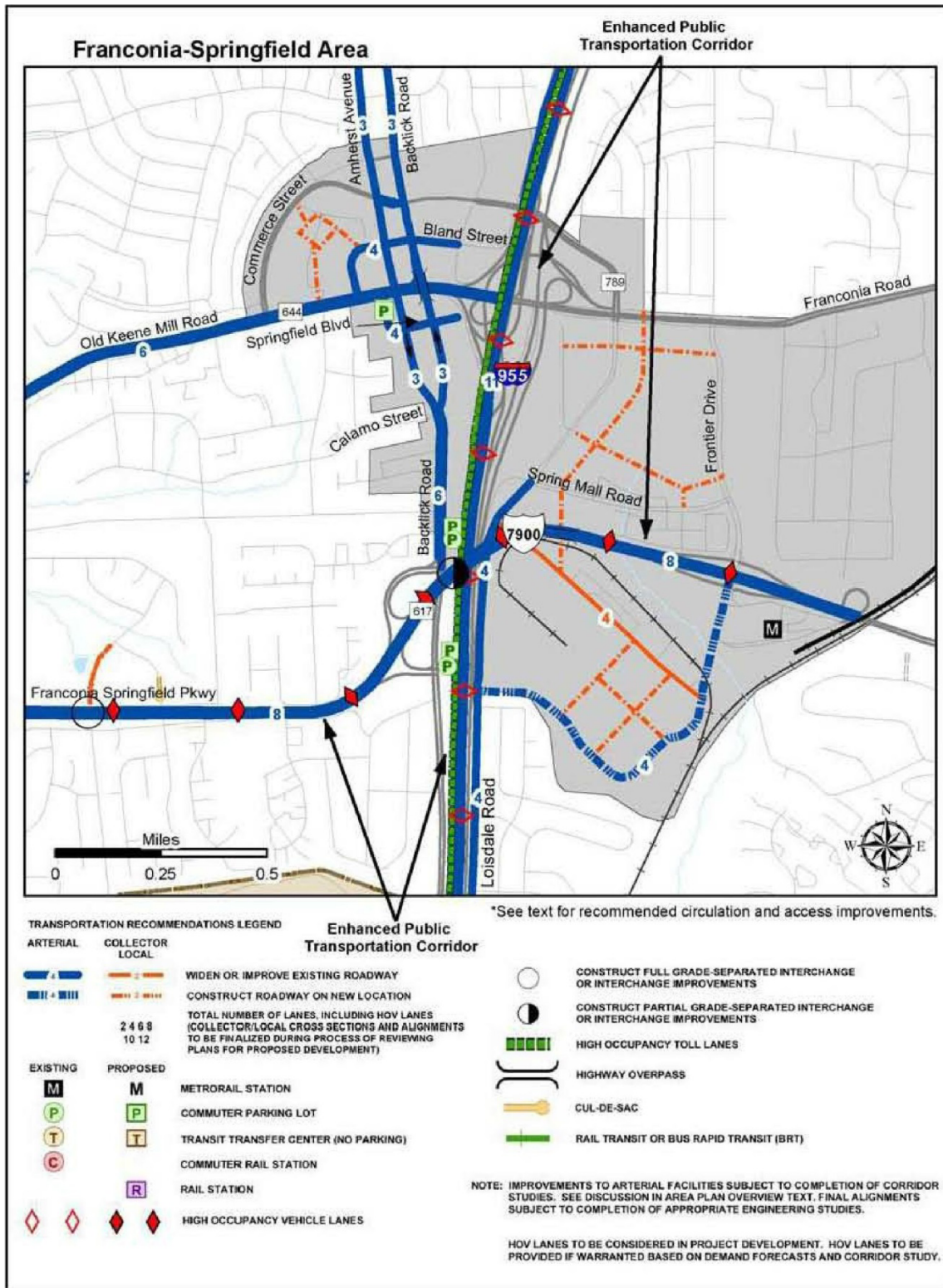


Figure 23: Comprehensive Plan Transportation Recommendations for Study Area (Source: Fairfax County)

SPRINGFIELD CONNECTIVITY PLAN AMENDMENT

On January 12, 2010, the Board of Supervisors approved Plan Amendment S09-Cw-3CP to incorporate recommendations from the Springfield Connectivity Study into the Comprehensive Plan. The plan revisions primarily focus on urban design, streetscaping, and placemaking concepts. The approved amendment provided additional transportation recommendations in the vicinity of the proposed site. Those planned improvements include:

- Widening Springfield Center Drive to four lanes.
- Widening Metropolitan Center Drive to four lanes.
- Extending Frontier Drive south to Springfield Center Drive.
- Construction of a grid of streets.

The Plan Amendment further developed a typology of streets and road designs for the area based on surrounding land uses. However, for the purposes of the analysis, the planned roadway improvements were not assumed.

EXISTING ROADWAY NETWORK AND VOLUMES

Regional access to Springfield Metro Center is provided via I-95 and the Franconia Springfield Parkway. Direct access to the site is provided by Loisdale Road (Route 789), Springfield Center Drive and Metropolitan Center Drive. An inventory of the study area roadways, as well as Existing Conditions peak hour traffic volumes are discussed below.

ROADWAY INVENTORY

Interstate 95 is a multi-lane freeway with a posted speed limit of 55 miles per hour carrying approximately 241,000 average daily vehicles (ADT) according to 2013 VDOT traffic data. Interchanges are provided at Franconia Road, the Franconia-Springfield Parkway (Route 7900), and the Fairfax County Parkway (Route 7100). Directional HOV-3 lanes are provided within the corridor and operate between 6:00 – 9:00 AM (northbound) and 3:30 – 6:00 PM (southbound).

Franconia Road (Route 644) is a six-lane divided minor arterial (Type “A”) roadway with at-grade signalized intersections in the vicinity of the subject property. It has a posted speed limit of 35 miles per hour and carries approximately 58,000 ADT west of Loisdale Road according to the VDOT 2013 traffic data. A fully directional, grade-separated interchange is provided with I-95.

Franconia-Springfield Parkway (Route 289) is a six-lane roadway with a posted speed limit of 50 miles per hour and carries approximately 45,000 ADT. The Fairfax County Comprehensive Plan classifies the section from the Fairfax County Parkway to Beulah Street as a “Freeway/Expressway”. Exclusive grade separated intersections provide access to and from Frontier Drive and the Franconia-Springfield Metrorail Station.

Fairfax County Parkway (Route 286) is a four-lane, median-divided, principal arterial roadway with a posted speed limit of 50 miles per hour and according to VDOT carries approximately 40,000 ADT between Telegraph Road and I-95. Access to I-95 is provided via a grade-separated interchange.

Loisdale Road/Commerce Street (Route 789) is a two-lane, minor arterial (Type “B”) roadway providing a southbound center, two-way left-turn lane between Newington Road and Spring Mall Road; it expands to a four-lane roadway from Spring Mall Road through the overpass across I-95.

The road has a posted speed limit of 35 miles per hour and carries approximately 9,600 ADT in the vicinity of the site based on VDOT traffic data. It provides vehicular and pedestrian access to the subject site at intersections with Metropolitan Center Drive and Springfield Center Drive.

Frontier Drive (Route 2677) is a six-lane, divided, collector between Franconia Road and Joseph Alexander Transportation Center with a posted speed limit of 35 miles per hour. Based on 2013 VDOT ADT data, Frontier Drive carries approximately 34,000 daily vehicles between Spring Mall Road and the Franconia-Springfield Metrorail Station.

Spring Mall Road (Route 4214) is a four-lane divided collector with a posted speed limit of 35 miles per hour and carries 17,000 ADT. Exclusive northbound egress is provided from I-95 onto Spring Mall Road via an at-grade intersection with Loisdale Road. The roadway provides direct access to the Springfield Mall and retail center.

Springfield Center Drive is currently a two-lane, private roadway providing access to warehouse uses and the NVCC satellite campus. The intersection of Springfield Center Drive and Loisdale Road currently operates under STOP control.

Metropolitan Center Drive is a two-lane private roadway providing access to residential and hotel uses north of the GSA warehouse. Joseph Alexander Road provides access for buses and pedestrians from Metropolitan Center Drive to the Franconia-Springfield Metrorail Station. The intersection of Metropolitan Center Drive and Loisdale Road currently operates under STOP control.

EXISTING TRAFFIC CONTROLS

The following study intersections operate under signal control:

- Loisdale Road/Franconia Road EB Ramps
- Loisdale Road/Franconia Road WB Ramps
- Loisdale Road/Loisdale Court
- Loisdale Road/Spring Mall Road
- Loisdale Road/Newington Road
- Loisdale Road/Fairfax County Parkway
- Frontier Drive/Franconia-Springfield Parkway EB Ramps
- Frontier Drive/Franconia-Springfield Parkway WB Ramps
- Frontier Drive/Spring Mall Road

The following study intersections currently operate under STOP sign control:

- Loisdale Road/Metropolitan Center Drive
- Loisdale Road/Springfield Center Drive
- Loisdale Road/Lois Drive

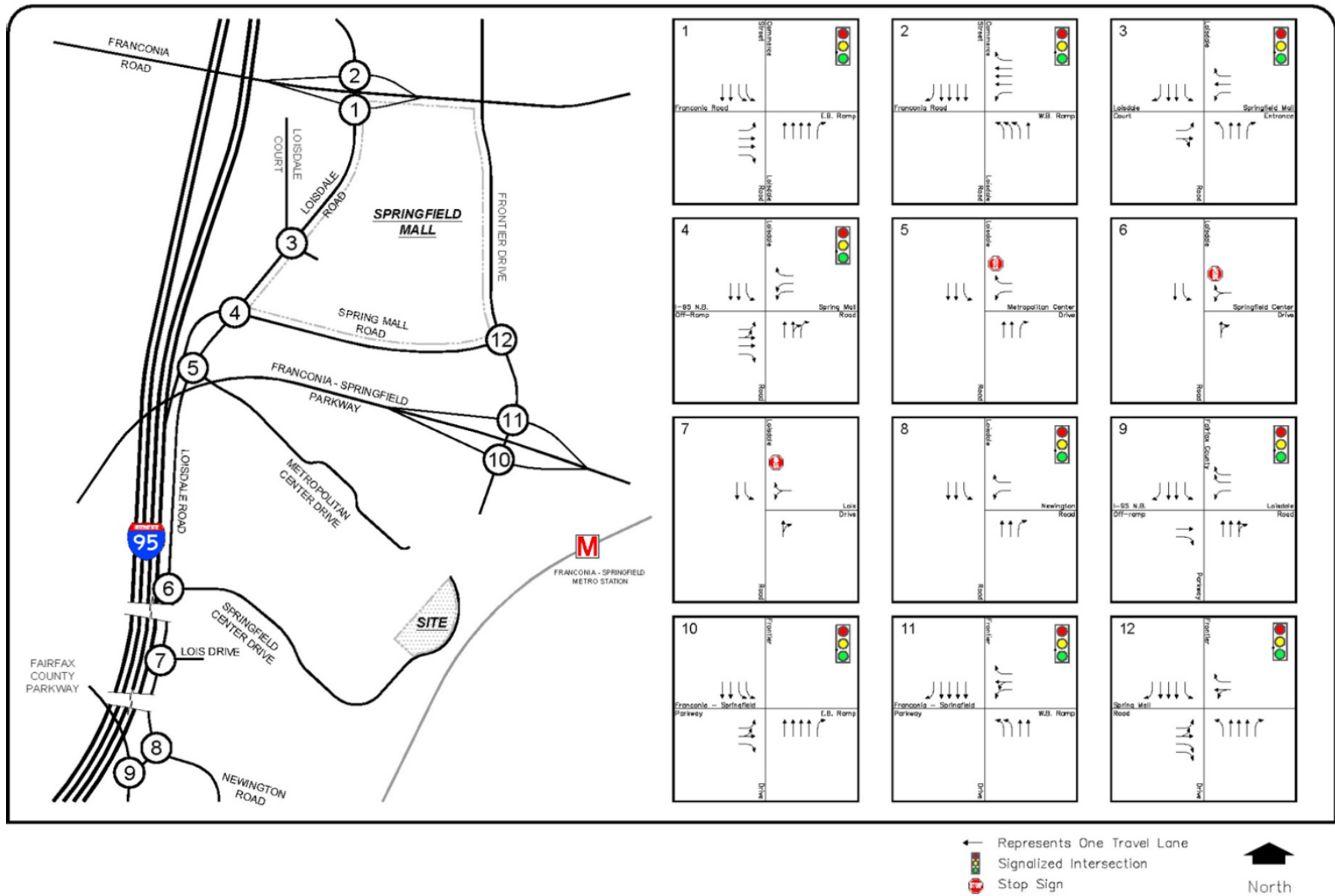


Figure 24: Existing Lane Use and Traffic Controls (Not to Scale)

EXISTING TRAFFIC VOLUMES

Vehicle turning movement counts were conducted at the following twelve (12) intersections by Wells and Associates from 6:00 to 9:00 AM and 4:00 to 7:00 PM on Wednesday December 3, 2014:

- Loisdale Road/Franconia Road EB Ramps
- Loisdale Road/Franconia Road WB Ramps
- Loisdale Road/Loisdale Court
- Loisdale Road/Spring Mall Road
- Loisdale Road/Metropolitan Center Drive
- Loisdale Road/Springfield Center Drive
- Loisdale Road/Lois Drive
- Loisdale Road/Newington Road
- Loisdale Road/Fairfax County Parkway
- Frontier Drive/Franconia-Springfield Parkway EB Ramps
- Frontier Drive/Franconia-Springfield Parkway WB Ramps
- Frontier Drive/Spring Mall Road

The resulting 2014 baseline peak hour traffic volumes for each intersection are summarized on Figure 25. Due to the size of the study area and in the interest of conservatism, the individual intersection peak hours were used for purposes of this analysis.

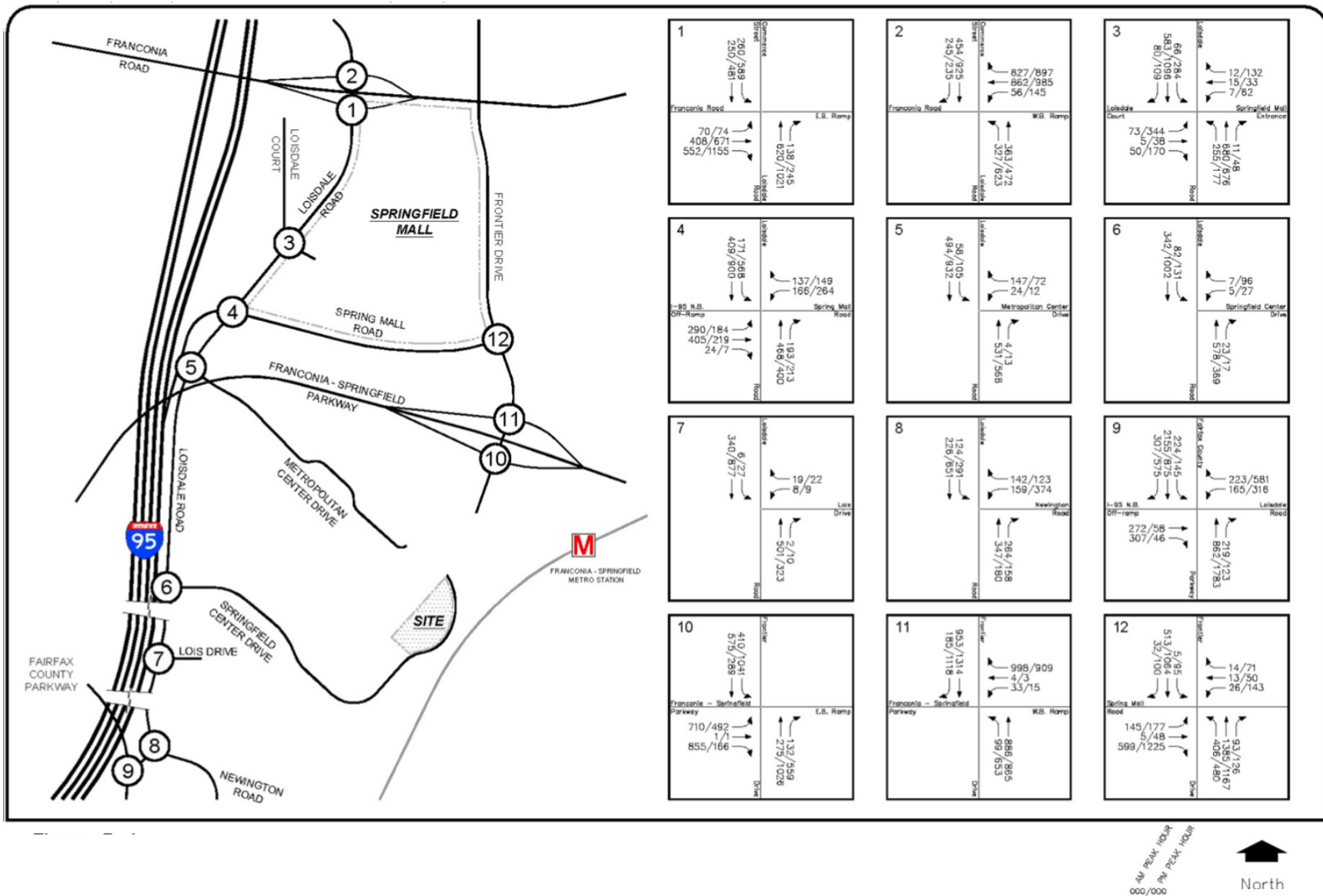


Figure 25: 2014 Existing Condition AM and PM Peak Hour Traffic Volumes (Not to Scale)

EXISTING CONDITIONS TRAFFIC OPERATIONAL ANALYSIS

Fairfax County and the Virginia Department of Transportation (VDOT) require that a capacity analysis be performed based on the Highway Capacity Manual (HCM). Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed using Synchro 8, which is based on the methodology of the *2010 Highway Capacity Manual (HCM)* to establish average volume to capacity (v/c) ratios, delays, and Level of Service (LOS) for each intersection. Roadway geometry, signal timing, and traffic data were entered into the model.

The VDOT Traffic Operations Analysis Toll Guidebook (the “Guide”), recommends that use of HCM 2000 when utilizing Synchro analysis software due to several restrictions with the HCM 2010 methodologies that are not fully incorporated into Synchro. Therefore, the HCM 2000 capacity analysis results were utilized in this analysis.

The v/c ratio relates the demand at a particular intersection (traffic volume) to the available capacity. The available capacity for each movement varies depending on number of lanes, lane width, perception/reaction time, green time, and cycle length, among others. A v/c ratio of 1.0 indicates that the demand for a particular movement is equal to the capacity. A movement with a v/c ratio at or over 1.0 is considered undesirable because the movement volume exceeds the capacity, which results in queuing, indicating unmet demand along that approach.

LOS is an evaluation of the quality of operation of an intersection and is a measure of the average delay a driver experiences while traveling through the intersection. LOS is dependent on a range of defined operating conditions such as traffic demand, lane geometry, and traffic signal timing and phasing.

LOS can range from A to F and is based on the average control delay per vehicle in seconds. For a signalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay in excess of 80 seconds per vehicle. For an unsignalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay in excess of 50 seconds per vehicle. The delay criteria for signalized and unsignalized intersections are summarized in Table 3.

Table 3: LOS Thresholds

Level of Service	Average Control Delay (seconds/vehicle)	
	Signalized	Unsignalized
A	Less than or equal to 10.0	Less than or equal to 10.0
B	>10.0 and ≤20.0	>10.0 and ≤15.0
C	>20.0 and ≤35.0	>15.0 and ≤25.0
D	>35.0 and ≤55.0	>25.0 and ≤35.0
E	>55.0 and ≤80.0	>35.0 and ≤50.0
F	Greater than 80.0 or v/c greater than 1.0	Greater than 50.0 or v/c greater than 1.0

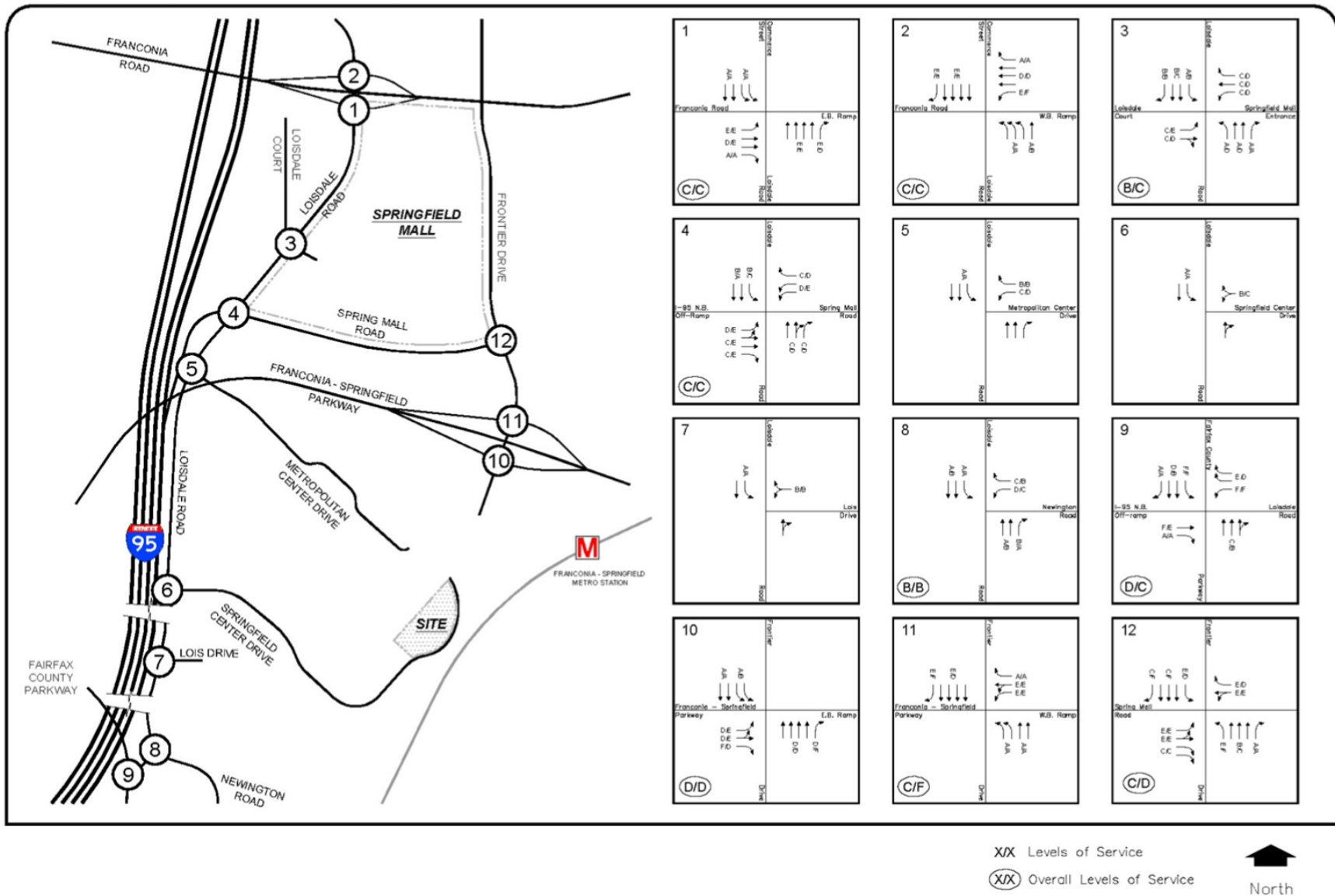
CONGESTION STANDARD

The Comprehensive Plan establishes a level of service (LOS) “E” as the threshold for adequate transportation facilities in the Franconia Springfield Planning Area. At locations where the LOS “E” standard cannot be attained or maintained with planned development, remedies should be proposed to offset impacts using a tiered approach. This tiered approach includes the following:

- First, determine whether additional capacity and/or operation efficiencies is possible;
- Second, decrease future site-generated traffic by modifying the mix of uses, increasing transit mode shares, etc.;
- Lastly, if previous measures do not provide adequate improvement in LOS, the development may need to provide appropriate contributions to an area-wide transportation fund.

2014 EXISTING CONDITIONS CAPACITY ANALYSIS

Using the existing traffic volumes and lane geometries, an intersection capacity analysis was performed for both the morning and evening peak hours. As shown in Table 4, and on Figure 26, all of the signalized intersections operate at overall acceptable levels of service (LOS D or better) during both peak hours. However, individual movements and approaches at some signalized intersections currently operate at LOS E or F during one or both peak hours.



1
2

Figure 26: 2014 Existing Condition Levels of Service (Not to Scale)

Table 4: 2014 Existing Conditions Capacity Level of Service Summary

Intersection	Intersection Control	Critical Movement	2014 Existing	
			AM	PM
(1) Franconia Road EB Ramps/ Loisdale Road/Commerce Street	Signal	EBL	E (63.4)	E (63.4)
		EBT	D (43.1)	E (61.1)
		EBR	A (1.0)	A (2.7)
		NBT	E (62.5)	F (94.0)
		NBR	D (54.2)	D (53.1)
		SBL	A (1.6)	A (1.2)
		SBT	A (0.7)	A (0.2)
		Overall	C (31.7)	D (41.8)
(2) Franconia Road WB Ramps/ Loisdale Road/Commerce Street	Signal	WBL	F (95.7)	F (109.7)
		WBT	D (42.8)	D (46.7)
		WBR	A (1.5)	A (0.8)
		NBL	A (2.5)	A (3.5)
		NBT	A (2.1)	A (0.7)
		SBT	E (66.3)	E (59.8)
		SBR	E (65.9)	E (55.1)
		Overall	C (28.3)	C (32.0)
(3) Loisdale Road/ Loisdale Court/Springfield Mall Entrance	Signal	EBL	C (23.0)	E (60.5)
		EBTR	C (20.8)	D (41.8)
		WBL	C (20.8)	D (43.3)
		WBT	C (20.8)	D (39.1)
		WBR	C (20.5)	D (39.7)
		NBL	A (4.0)	C (23.5)
		NBT	B (10.6)	D (36.6)
		NBR	A (0.0)	A (0.0)
		SBL	A (6.1)	C (22.5)
		SBT	B (12.8)	C (20.7)
		SBR	B (10.4)	B (14.8)
Overall	B (11.5)	C (31.4)		
(4) Loisdale Road/ I-95 NB Ramp/Spring Mall Road	Signal	EBL	C (32.1)	E (64.1)
		EBLT	C (31.6)	E (61.5)
		EBR	C (27.4)	D (52.8)
		WBL	D (36.7)	E (62.0)
		WBR	C (25.4)	C (28.6)
		NBTR	C (29.2)	D (44.3)
		NBR	C (24.3)	D (36.7)
		SBL	B (15.0)	C (32.4)
		SBT	B (14.1)	A (6.0)
		Overall	C (25.9)	D (36.1)
(5) Loisdale Road/ Metropolitan Center Drive	Stop Sign	WBL	C [20.9]	E [40.3]
		WBR	B [11.5]	B [11.9]
		SBL	A [9.0]	A [9.9]
(6) Loisdale Road/ Springfield Center Drive	Stop Sign	WBLR	B [13.7]	B [14.7]
		SBL	A [9.6]	A [8.5]
(7) Loisdale Road/ Lois Drive	Stop Sign	WBLR	B [12.3]	B [12.5]
		SBL	A [8.5]	A [8.2]

Notes: Analysis performed using Synchro, Version 8. Values in () represent signalized delay in seconds. Values in [] represent unsignalized delay in seconds. *-Delay exceeds 999 seconds.

Table 4 Continued: 2014 Existing Conditions Level of Service Summary

Intersection	Intersection Control	Critical Movement	2014 Existing	
			AM	PM
(8) Loisdale Road/ Newington Road	Signal	EBLTR	C (24.6)	B (16.8)
		WBLT	C (34.2)	D (39.7)
		WBR	B (17.0)	A (9.8)
		NBL	B (16.5)	B (12.8)
		NBT	C (25.9)	C (23.3)
		NBR	F (108.1)	F (87.9)
		SBL	A (6.7)	B (10.8)
		SBT	B (10.6)	C (20.3)
		SBR	A (9.8)	B (16.4)
		Overall	C (34.3)	C (29.4)
(9) Fairfax County Parkway/ I-95 NB Ramp/Loisdale Road	Signal	EBT	F (83.0)	E (78.0)
		EBR	A (0.3)	A (0.1)
		WBL	F (177.8)	F (136.5)
		WBR	C (32.8)	D (51.7)
		NBTR	C (31.3)	C (26.2)
		SBL	F (103.7)	F (102.3)
		SBT	C (27.8)	B (12.4)
		SBR	A (0.5)	A (1.0)
		Overall	D (35.7)	C (31.9)
(10) Franconia Springfield Parkway EB Ramps/Frontier Drive	Signal	EBL	C (34.7)	E (63.3)
		EBLT	C (34.7)	E (63.5)
		EBR	E (63.1)	D (54.8)
		NBT	E (57.8)	D (38.4)
		NBR	E (56.8)	D (50.8)
		SBL	A (1.3)	B (12.4)
		SBT	A (5.6)	A (5.5)
		Overall	C (34.3)	C (32.2)
(11) Franconia Springfield Parkway WB Ramps/Frontier Drive	Signal	WBL	E (71.1)	E (69.8)
		WBLT	E (71.2)	E (69.8)
		WBR	A (2.0)	A (2.6)
		NBL	A (0.0)	A (1.1)
		NBT	A (3.5)	A (6.2)
		SBT	E (62.5)	D (36.4)
		SBR	D (54.6)	E (62.3)
		Overall	C (27.8)	C (24.0)
(12) Frontier Drive/ Spring Mall Road	Signal	EBL	E (60.7)	E (70.5)
		EBLT	E (60.7)	E (70.4)
		EBR	D (41.7)	C (29.5)
		WBLT	E (66.1)	E (67.1)
		WBR	E (64.0)	D (47.5)
		NBL	E (60.8)	E (63.5)
		NBT	B (11.0)	C (22.2)
		NBR	A (8.1)	B (14.1)
		SBL	E (69.3)	D (43.8)
		SBT	B (16.3)	E (71.2)
		SBR	B (14.5)	F (85.9)
Overall	C (26.3)	D (45.6)		

TRANSPORTATION IMPACTS

It was assumed that the proposed development would be completed and occupied by 2019. Therefore, this traffic analysis will evaluate a future year of 2019.

FUTURE CONDITIONS ANALYSIS WITHOUT CONSOLIDATION (NO ACTION ALTERNATIVE)

The No Action Conditions Analysis examines the future anticipated volumes without the traffic that would be generated by consolidating 3,800 TSA employees at the Springfield Metro Center site. This analysis includes existing traffic volumes grown to the anticipated build year, any approved but un-built developments (pipeline developments) in the study area, and any funded infrastructure improvements in the study areas.

REGIONAL TRAFFIC GROWTH

Increases in traffic associated with regional growth were estimated at 1.0 percent per year, compounded annually for the 2019 future scenario, as agreed in a scoping meeting with VDOT and Fairfax County. This growth accounts for increases in traffic resulting from influences outside of the immediate study area. The resulting increase in traffic at the study intersections, associated with regional growth for the study period 2014 to 2019, are reflected in Figure 27.

OTHER DEVELOPMENT TRAFFIC FORECASTS

Based on coordination with Fairfax County, six (6) pipeline developments were used in the development of background future traffic forecasts for this study revision:

1. **Loisdale Office Park** is an approved office parcel that is to be developed with 59,500 GSF of office uses. The development is located on the east side of Loisdale Road.
2. **Springfield Mall Town Center** is an approved mixed-use development project located at the existing Springfield Mall. For purposes of this study, trips associated with Phase 1 of the Town Center are included in the 2014 baseline traffic counts. For the year 2019 analyses, full-buildout of Springfield Mall Town Center was assumed, which includes two 225-room hotels, 1,500,000 GSF of office, 2,036,000 GSF of retail, a 2,150 seat cinema and 2,250 multifamily residential units.
3. **Patriot Ridge** was approved (RZ 2008-LE-014) on June 1, 2008 for development of 978,500 GSF of office uses on the west side of Backlick Road.
4. **Lee Village at Silver Lake (Kingstowne Library)** was approved on May 5, 2008 for units located at the southeast quadrant of the Franconia Springfield Parkway/Beulah Street intersection.
5. **Kingstowne Towne Centre Buildings M & N** was approved (PCA 84-L-020-23) to permit development of 1.2 million gross square feet of office space on the north side of Kingstowne Towne Centre. The pipeline development is located north of Kingstowne Boulevard and west of South Van Dorn Street.
6. **Liberty View** was approved (RZ 2010-LE-009) to permit development of 735,962 gross square feet of office space and a 250-room hotel at the northwest quadrant of the Franconia-Springfield Parkway/Beulah Street intersection.

The development levels associated with each of the pipeline developments are summarized and shown in Table 5. The number of trips that would be generated by the incomplete background developments was estimated based on traffic impact studies completed in support of the individual

projects. The trip generation analysis incorporates the internal, pass-by, and transit mode split reductions assumed in the respective traffic studies, if applicable. It should be noted in many cases, the mode splits ultimately proffered to by the site Applicants are not fully reflected in the trip generation estimates utilized in the respective studies in the interest of conservatism.

As shown in Table 5, it is estimated that the pipeline developments could generate a total of 6,082 AM peak hour trips, 6,701 PM peak hour trips, and 55,759 daily trips in 2019. A portion of these trips are anticipated to travel through the study intersections for this project, and were assigned to the existing road network based on those assumptions used in background traffic studies, local knowledge and/or engineering judgment, as appropriate (see Figure 28). However, it should be noted that the project development forecasts are presented for the sole purpose of reasonably reflecting background traffic volumes. They do not constitute an independent economic forecast. Individual projects may develop at a faster or slower pace than forecasted here.

Table 5: Pipeline Development Trip Generation Summary

Development/Use	AM Peak Hour			PM Peak Hour			Weekday Average Daily Traffic
	In	Out	Total	In	Out	Total	
Loisdale Office Park (1): 59,500 GSF Office	109	15	124	25	120	145	894
Springfield Mall Town Center (2): Mix-Use	1,593	917	2,510	1,094	1,682	2,776	28,012
Patriot Ridge (3): 708,309 GSF Office	658	90	748	135	659	794	4,857
Lee Village at Silver Lake (4): 45,900 GSF Library; 84 Active Adult Apartments; 104 Work Force Housing Units	54	63	117	210	199	409	3,151
Kingstown Towne Centre Buildings M&N (5): 1.2 Million GSF Office	1,205	164	1,369	242	1,181	1,423	9,040
Liberty View (6): 250 Room Hotel; 735,962 GSF Office	1,033	181	1,214	249	905	1,154	9,805
Total Pipeline Development Net New Trips	4,625	1,430	6,082	1,955	4,746	6,701	55,759

(1) Loisdale Office Park trip generation based on "Loisdale Office Park - Traffic Impact Assessment" dated September 3, 2008 by Wells + Associates, Inc.

(2) Springfield Mall Town Center trip generation based on "Springfield Mall Town Center Traffic Impact Study" dated September 10, 2008 by Gorove-Slade Associates, Inc.

(3) Lee Village at Silver Lake (Kingstowne Library) trip generation based on "Kingstowne Library - Comparative Network Assessment" dated October 22, 2007 by Wells + Associates, Inc.

(4) Kingstowne Towne Centre Buildings M & N Trip Generation based on "Kingstowne Towne Centre Buildings M & N - Traffic Impact Study" dated August 29, 2006 by Wells + Associates, Inc.

(5) Liberty View trip generation based on "Liberty View Rezoning Traffic Impact Analysis" dated September 28, 2010 by Patton Harris Rust & Associates, Inc.

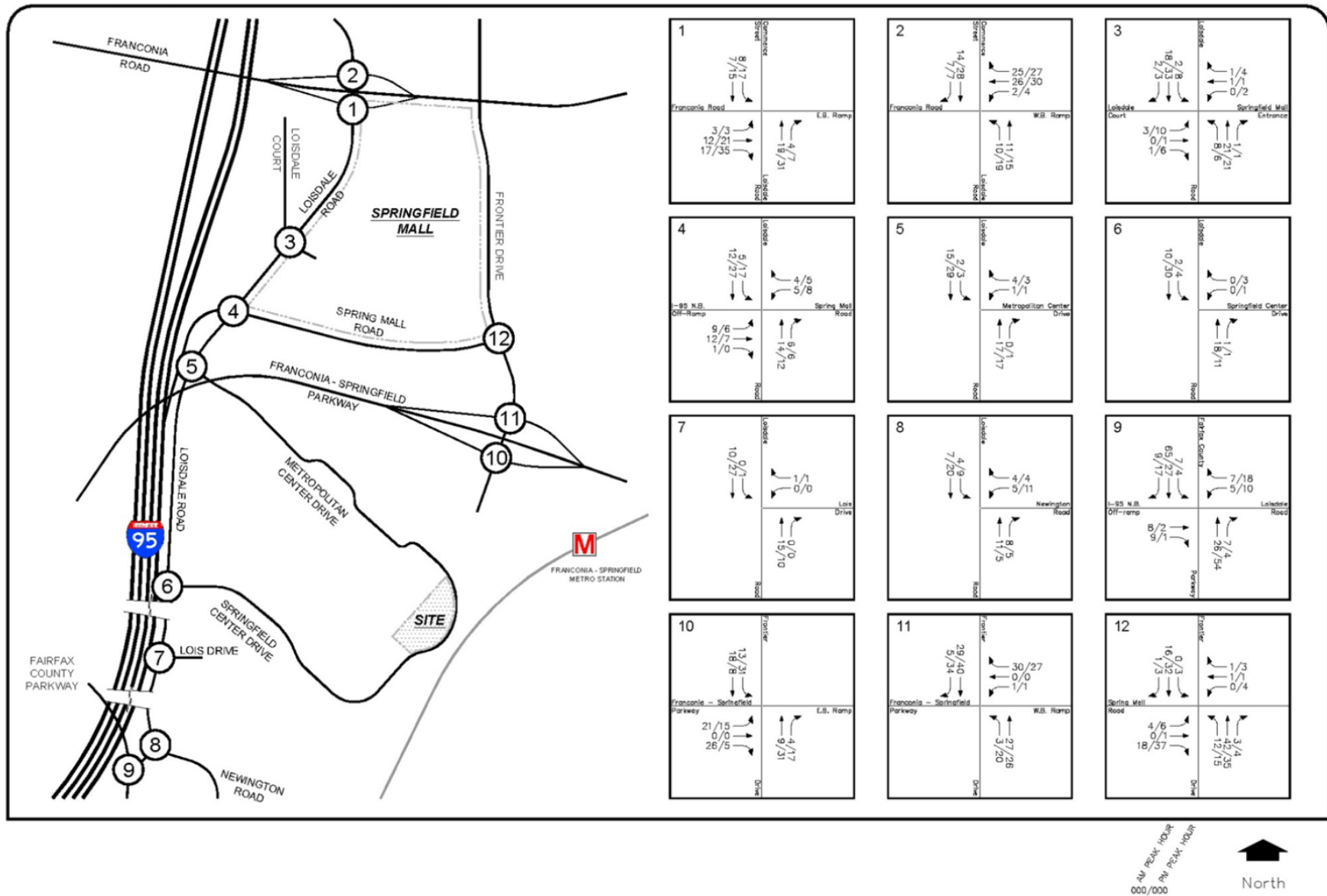


Figure 27: 2019 Regional Traffic Growth (Not to Scale)

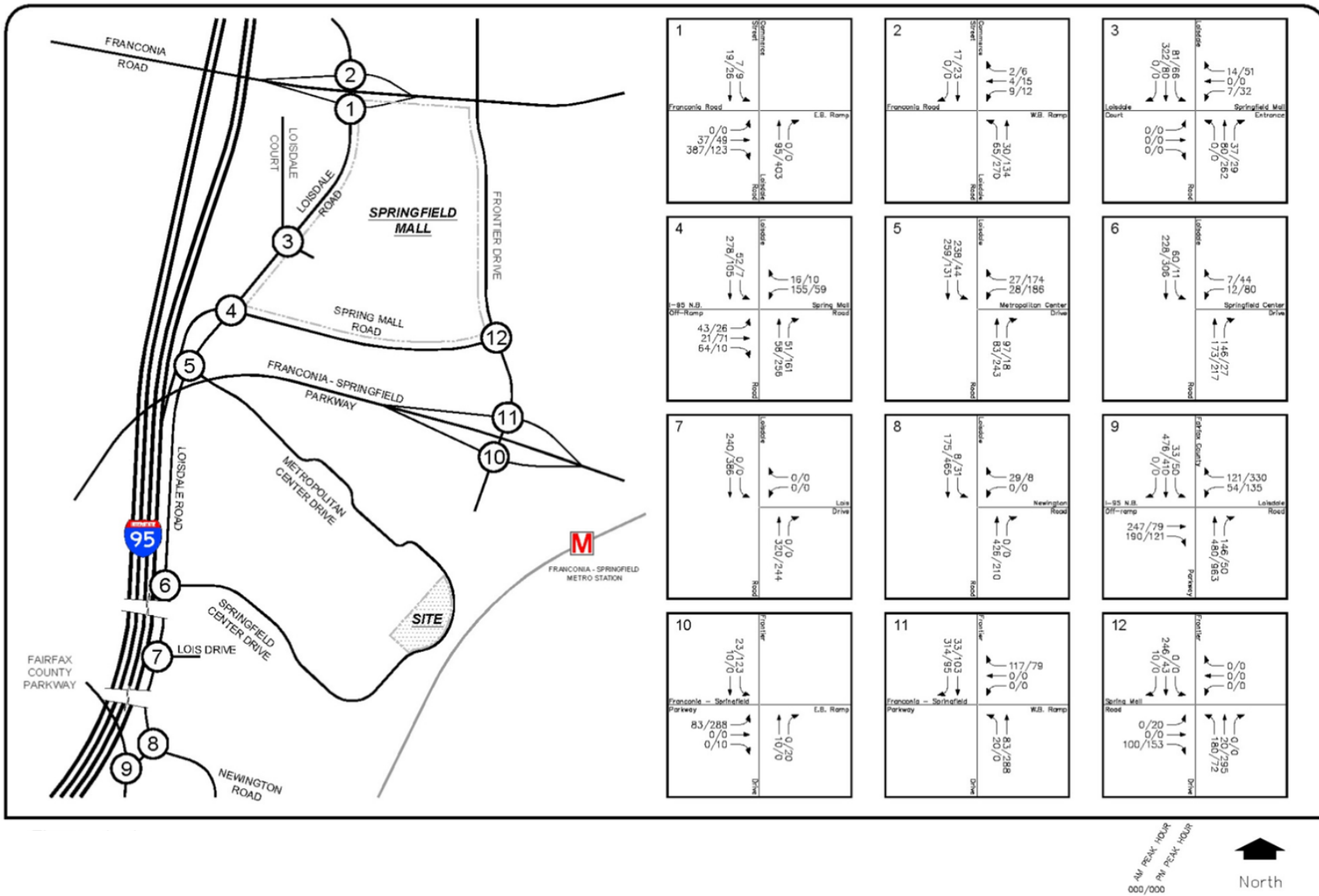


Figure 28: Pipeline Development Trip Distribution (Not to Scale)

BACKGROUND FUTURE TRAFFIC VOLUMES

The 2014 Existing Conditions traffic volumes were combined with the regional traffic growth volumes and the pipeline development trips to yield 2019 No Action Alternative traffic forecasts shown on Figure 29.

FUTURE ANTICIPATED ROADWAY IMPROVEMENTS

Several transportation improvements are planned for some of the study area roadway intersections to mitigate the anticipated traffic impacts of the proposed pipeline developments. The following outlines those improvements assumed completed coincident with the build of the Springfield Metro Center site:

1. Loisdale Office Park (PCA 80-L-004). The transportation-related improvements include:
 - a. Construction of turn lanes at the site driveway on Loisdale Road.
 - b. Installation of a bus shelter.
2. Springfield Mall Town Center (RZ 2007-LE-007). In conjunction with the rezoning application, a number of transportation improvements were approved to help mitigate site impacts. These improvements include:
 - a. Removal of the channelized southbound right turn lane on Frontier Drive onto westbound Franconia-Springfield Parkway to create dual right turns lanes as well as modification of the traffic signal.
 - b. Construction of dual left turn lanes on northbound Frontier Drive at Spring Mall Road.
 - c. Widening Franconia Road to accommodate a third eastbound through lane from approximately 750 feet west of Loisdale Road to Village Drive.
 - d. Widening northbound Loisdale Road to accommodate a second northbound through lane from Lois Lane through the intersection with Franconia Road.
 - e. Widening northbound Loisdale Road to accommodate a third northbound through lane from Spring Mall Road to Lois Lane.
 - f. Construction of a right turn bay on eastbound Loisdale Court onto southbound Loisdale Road.
 - g. Widening southbound Loisdale Road between South Street and Spring Mall Road to provide two through lanes, one full-length left turn lane and one left turn bay onto eastbound Spring Mall Road.
 - h. Reconstruction and extension of the right turn bay from the eastbound I-95 off-ramp to southbound Loisdale Road and modification of the intersection to accommodate two through lanes onto Spring Mall Road and two dedicated left turn lanes onto northbound Loisdale Road, in addition to the right turn bay.
 - i. Commitment to a Transportation Demand Management (TDM) program.
3. Patriot Ridge (2008-LE-014). The transportation-related improvements include:
 - a. Dedication of right-of-way along Backlick Road.
 - b. Installation, if warranted by VDOT, of a traffic signal at the site access on Backlick Road.
 - c. Installation of an eight foot wide asphalt trail.
 - d. Provide interparcel access.
 - e. Provide a monetary contribution to the construction of the Boudinot Drive interchange.

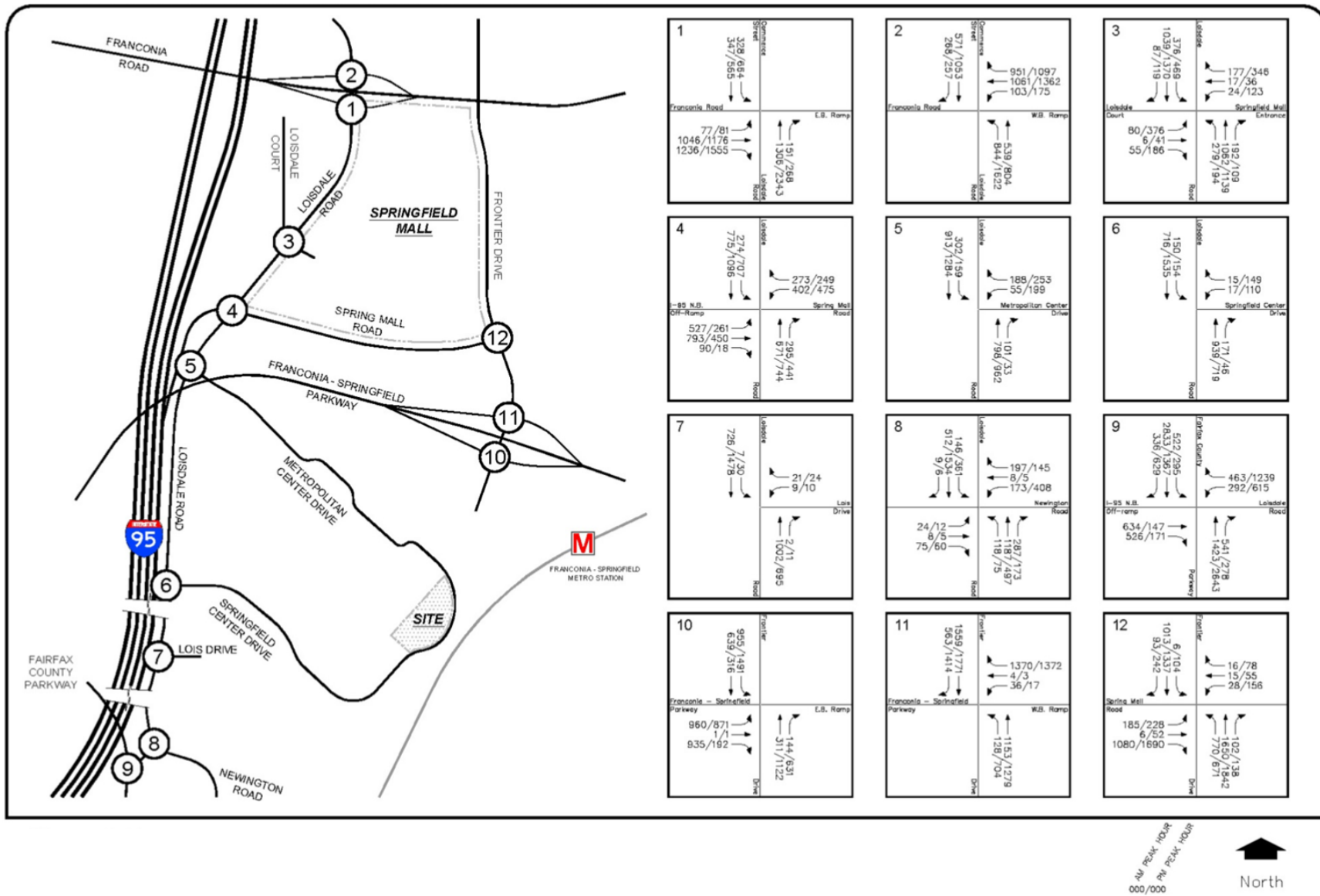


Figure 29: 2019 No Action Alternative Traffic Forecasts (Not to Scale)

- f. Extension of a turn bay on Fullerton Road.
 - g. Installation of a bus shelter on Backlick Road.
 - h. Commitment to a Transportation Demand Management (TDM) program.
4. Lee Village at Silver Lake (RZ 2007-LE-012). The transportation-related improvements include:
 - a. Construction of a bus shelter on Beulah Street.
 - b. Removal of a “pork chop” island at an adjacent intersection on Beulah Street.
 - c. Commitment to a Transportation Demand Management (TDM) program.
 5. Kingstowne Towne Centre (PCA 84-L-020-23). The transportation-related improvements include:
 - a. Submission of traffic signal warrant studies for two intersections on Kingstowne Village Parkway.
 - b. Extension of key turning bays on Kingstowne Village Parkway, Kingstowne Boulevard and South Van Dorn Street.
 - c. Commitment to a Transportation Demand Management (TDM) program.
 6. Liberty View (RZ 2010-LE-009). The transportation-related improvements include:
 - a. Construct an additional southbound right turn lane on Beulah Street at the intersection with the Franconia-Springfield Parkway.
 - b. Construct a right turn lane on westbound Manchester Boulevard at Beulah Street and restripe the westbound approach to provide three through lanes.
 - c. Construct turn lanes at site entrances.
 - d. Improve the Franconia-Springfield Parkway trail.
 - e. Contribution for the future installation of a bus shelter.
 - f. Contribution to an area-wide transportation fund.
 - g. Commitment to a Transportation Demand Management (TDM) program.

The above proposed transportation enhancements were utilized in the 2019 No Action analysis.

In addition to the proposed site-specific improvements, the Fairfax County Comprehensive Plan recommends that Frontier Drive be extended south from the Franconia-Springfield Metrorail Station to Loisdale Road. The extension of Frontier Drive from the Franconia-Springfield Metrorail Station would have a positive impact on area traffic operations. As part of the future transportation improvements in the area, the extension will provide a continuous four-lane, median-divided collector roadway from the metro station to Loisdale Road. However, at this time, the County anticipates the Frontier Drive extension would be completed between 2022 and 2024. To date approximately 75% of the funding needed for this critical link has been allocated by the County as part of its 6-year priority plan. Therefore, the proposed extension was not included in the future condition analyses contained in this Traffic Technical Report.

NO ACTION ALTERNATIVE CAPACITY ANALYSIS RESULTS

The No Action Alternative capacity analysis results are shown in Table 6 and summarized on Figure 30. The results of the capacity analysis indicated the following:

- As a result of background regional growth and pipeline development related trips, the intersections within the study area would see an increase in vehicle trips.

- Upon completion of the planned improvements associated with pipeline developments, all of the nine signalized study intersections would operate at overall acceptable levels of service (LOS “E” or better) during the AM and PM peak hours.
- Specific and/or individual movements and approaches at some signalized intersections would continue to operate at LOS “F” during one or more peak hours.
- The unsignalized intersection of Loisdale Road and Metropolitan Center Drive would operate at capacity (LOS “F”) during the PM peak hour.
- The unsignalized intersection of Loisdale Road and Springfield Center Drive would operate at an acceptable LOS “C” during the AM and PM peak hours.

Table 6: 2014 Existing Condition and 2019 No Action Alternative Level of Service Summary

Intersection	Intersection Control	Critical Movement	2014 Existing		2019 No Action	
			AM	PM	AM	PM
(1) Franconia Road EB Ramps/ Loisdale Road/Commerce Street	Signal	EBL	E (63.4)	E (63.4)	E (67.9)	F (84.0)
		EBT	D (43.1)	E (61.1)	D (44.8)	F (81.8)
		EBR	A (1.0)	A (2.7)	A (2.1)	A (6.2)
		NBT	E (62.5)	F (94.0)	F (89.2)	F (99.0)
		NBR	D (54.2)	D (53.1)	E (55.2)	D (43.1)
		SBL	A (1.6)	A (1.2)	A (1.6)	A (1.5)
		SBT	A (0.7)	A (0.2)	A (0.6)	A (0.1)
		Overall	C (31.7)	D (41.8)	D (44.1)	E (55.8)
(2) Franconia Road WB Ramps/ Loisdale Road/Commerce Street	Signal	WBL	F (95.7)	F (109.7)	F (171.2)	F (223.2)
		WBT	D (42.8)	D (46.7)	D (45.7)	D (53.9)
		WBR	A (1.5)	A (0.8)	A (2.0)	A (1.2)
		NBL	A (2.5)	A (3.5)	A (2.8)	A (4.6)
		NBT	A (2.1)	A (0.7)	A (2.3)	A (0.0)
		SBT	E (66.3)	E (59.8)	E (65.9)	E (71.1)
		SBR	E (65.9)	E (55.1)	E (65.4)	E (60.5)
		Overall	C (28.3)	C (32.0)	C (29.6)	D (35.6)
(3) Loisdale Road/ Loisdale Court/Springfield Mall Entrance	Signal	EBL	C (23.0)	E (60.5)	C (26.8)	E (61.1)
		EBT	C (20.8)	D (41.8)	C (24.2)	D (38.8)
		EBR	N/A: Shared with EBT		C (26.5)	D (41.2)
		WBL	C (20.8)	D (43.3)	C (24.6)	D (41.5)
		WBT	C (20.8)	D (39.1)	C (24.3)	D (38.2)
		WBR	C (20.5)	D (39.7)	C (24.8)	D (40.8)
		NBL	A (4.0)	C (23.5)	A (7.8)	C (24.5)
		NBT	B (10.6)	D (36.6)	B (18.9)	D (35.9)
		NBR	A (0.0)	A (0.0)	A (0.1)	A (0.1)
		SBL	A (6.1)	C (22.5)	B (13.1)	D (41.8)
		SBT	B (12.8)	C (20.7)	B (13.4)	C (23.4)
		SBR	B (10.4)	B (14.8)	B (10.6)	B (15.6)
Overall	B (11.5)	C (31.4)	B (15.9)	C (34.4)		
(4) Loisdale Road/ I-95 NB Ramp/Spring Mall Road	Signal	EBL	C (32.1)	E (64.1)	D (37.4)	E (58.2)
		EBT	C (31.6)	E (61.5)	D (40.1)	E (62.2)
		EBR	C (27.4)	D (52.8)	C (31.6)	D (51.8)
		WBL	D (36.7)	E (62.0)	D (44.6)	E (64.9)
		WBR	C (25.4)	C (28.6)	D (43.0)	D (38.5)
		NBTR	C (29.2)	D (44.3)	D (39.1)	D (39.3)
		NBR	C (24.3)	D (36.7)	C (30.4)	C (32.4)
		SBL	B (15.0)	C (32.4)	C (22.0)	C (21.4)
		SBT	B (14.1)	A (6.0)	C (21.4)	A (6.7)
		Overall	C (25.9)	D (36.1)	D (35.6)	D (36.0)

Table 6 Continued: 2014 Existing Condition and 2019 No Action Alternative Level of Service Summary

Intersection	Intersection Control	Critical Movement	2014 Existing		2019 No Action	
			AM	PM	AM	PM
(5) Loisdale Road/ Metropolitan Center Drive	Stop Sign	WBL	C [20.9]	E [40.3]	D [28.1]	F [66.0]
		WBR	B [11.5]	B [11.9]	B [12.8]	B [12.9]
		SBL	A [9.0]	A [9.9]	A [9.7]	B [10.7]
(6) Loisdale Road/ Springfield Center Drive	Stop Sign	WBLR	B [13.7]	B [14.7]	C [16.2]	C [17.8]
		SBL	A [9.6]	A [8.5]	B [10.6]	A [9.0]
(7) Loisdale Road/ Lois Drive	Stop Sign	WBLR	B [12.3]	B [12.5]	B [14.3]	B [14.0]
		SBL	A [8.5]	A [8.2]	A [9.0]	A [8.6]
(8) Loisdale Road/ Newington Road	Signal	EBLTR	C (24.6)	B (16.8)	C (24.0)	B (16.5)
		WBLT	C (34.2)	D (39.7)	C (34.4)	D (43.9)
		WBR	B (17.0)	A (9.8)	B (17.1)	A (9.3)
		NBL	B (16.5)	B (12.8)	B (16.8)	B (14.3)
		NBT	C (25.9)	C (23.3)	C (28.8)	C (25.3)
		NBR	F (108.1)	F (87.9)	F (100.0)	F (86.2)
		SBL	A (6.7)	B (10.8)	A (7.6)	B (11.6)
		SBT	B (10.6)	C (20.3)	B (11.4)	C (23.1)
		SBR	A (9.8)	B (16.4)	B (10.2)	B (16.7)
		Overall	C (34.3)	C (29.4)	C (32.4)	C (30.2)
(9) Fairfax County Parkway/ I-95 NB Ramp/Loisdale Road	Signal	EBT	F (83.0)	E (78.0)	F (86.9)	E (78.5)
		EBR	A (0.3)	A (0.1)	A (0.3)	A (0.1)
		WBL	F (177.8)	F (136.5)	F (88.1)	E (63.4)
		WBR	C (32.8)	D (51.7)	C (34.1)	E (55.7)
		NBTR	C (31.3)	C (26.2)	D (35.9)	D (46.1)
		SBL	F (103.7)	F (102.3)	F (151.8)	F (122.4)
		SBT	C (27.8)	B (12.4)	D (40.7)	B (17.7)
		SBR	A (0.5)	A (1.0)	A (0.5)	A (1.1)
				Overall	D (35.7)	C (31.9)
(10) Franconia Springfield Parkway EB Ramps/Frontier Drive	Signal	EBL	C (34.7)	E (63.3)	D (38.5)	E (63.6)
		EBLT	C (34.7)	E (63.5)	D (38.5)	E (63.6)
		EBR	E (63.1)	D (54.8)	F (112.4)	D (52.6)
		NBT	E (57.8)	D (38.4)	E (76.5)	D (44.3)
		NBR	E (56.8)	D (50.8)	E (75.6)	E (73.3)
		SBL	A (1.3)	B (12.4)	A (9.2)	C (34.5)
		SBT	A (5.6)	A (5.5)	A (5.4)	A (5.3)
				Overall	C (34.3)	C (32.2)
(11) Franconia Springfield Parkway WB Ramps/Frontier Drive	Signal	WBL	E (71.1)	E (69.8)	F (82.1)	E (69.8)
		WBLT	E (71.2)	E (69.8)	F (82.2)	E (69.8)
		WBR	A (2.0)	A (2.6)	A (3.8)	B (14.4)
		NBL	A (0.0)	A (1.1)	A (0.0)	A (1.4)
		NBT	A (3.5)	A (6.2)	A (4.1)	A (5.9)
		SBT	E (62.5)	D (36.4)	E (77.7)	C (34.2)
		SBR	D (54.6)	E (62.3)	E (59.0)	F (100.3)
				Overall	C (27.8)	C (24.0)

Table 6 Continued: 2014 Existing Condition and 2019 No Action Alternative Level of Service Summary

Intersection	Intersection Control	Critical Movement	2014 Existing		2019 No Action	
			AM	PM	AM	PM
(12) Frontier Drive/ Spring Mall Road	Signal	EBL	E (60.7)	E (70.5)	E (59.7)	E (67.9)
		EBLT	E (60.7)	E (70.4)	E (57.8)	E (67.9)
		EBR	D (41.7)	C (29.5)	D (44.4)	E (57.9)
		WBLT	E (66.1)	E (67.1)	E (66.2)	E (67.2)
		WBR	E (64.0)	D (47.5)	E (63.9)	D (47.0)
		NBL	E (60.8)	E (63.5)	E (58.4)	E (61.4)
		NBT	B (11.0)	C (22.2)	B (13.6)	C (24.8)
		NBR	A (8.1)	B (14.1)	A (9.4)	B (11.0)
		SBL	E (69.3)	D (43.8)	E (69.3)	D (49.8)
		SBT	B (16.3)	E (71.2)	C (24.1)	E (70.5)
		SBR	B (14.5)	F (85.9)	C (20.4)	F (118.5)
	Overall	C (26.3)	D (45.6)	C (30.8)	E (55.1)	

Notes: Analysis performed using Synchro, Version 8. Values in () represent signalized delay in seconds. Values in [] represent unsignalized delay in seconds. *-Delay exceeds 999 seconds.

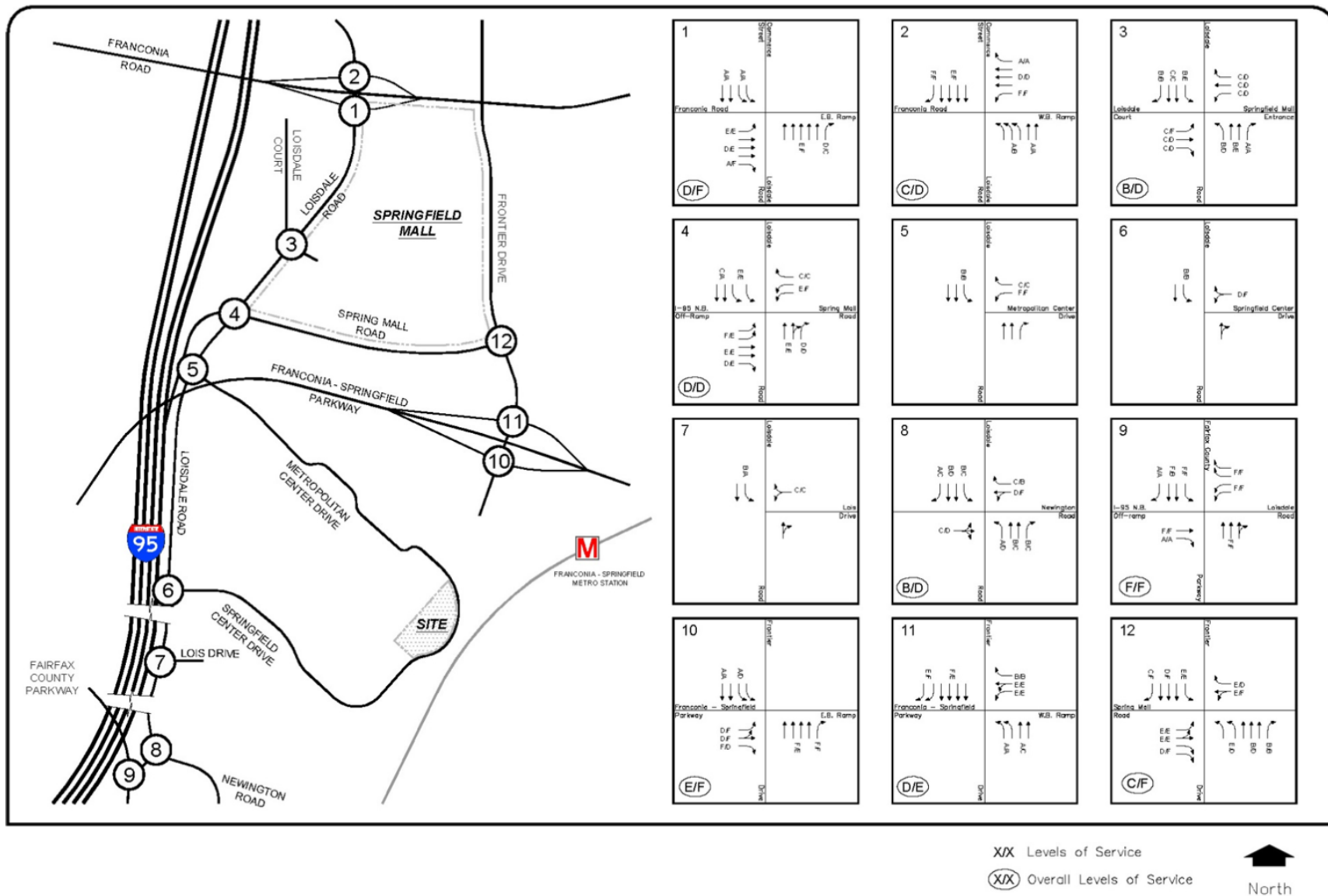


Figure 30: 2019 No Action Alternative Future Levels of Service (Not to Scale)

FUTURE CONDITIONS WITH CONSOLIDATION (ACTION ALTERNATIVE)

The Action Alternative Conditions Analysis examines future anticipated volumes, taking into consideration traffic under the No Action Alternative as well as traffic that would be generated by the proposed collocation of 3,800 TSA employees.

SITE TRIP GENERATION

The number of trips that would be generated by the proposed collocation of the TSA employees and contractors to the Springfield Metro Center site (653,000 GSF of office space) was estimated utilizing the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (9th Edition). As shown in Table 7, the proposed site would generate approximately 859 AM peak hour trips (756 inbound; 103 outbound), 810 PM peak hour trips (138 inbound; 672 outbound), and 5,464 daily trips.

The Springfield Metro Center site is located within close proximity to the Franconia Springfield Metrorail and VRE station. When evaluating potential sites for the TSA consolidation, the GSA required that all potential alternatives be located within one-half mile of a Metrorail station in order to support and encourage commuting by transit. In order to estimate the percentage of employees that would utilize transit if the Springfield Metro Center site was selected, TSA employees were given a survey that asked a variety of questions regarding their current commute mode and pattern, and how that would change if they were relocated to one of the potential alternative sites (see Chapter 2).

The results of the survey indicate that up to 35% of employees would commute via transit to the Springfield Metro Center site, with most planning to commute via Metrorail. However, survey respondents, particularly those taking a mode choice/commuter survey, typically indicate a higher degree of willingness or intent to commute by transit. Oftentimes the anticipated mode split is not realized because a portion of the respondents do not follow-through with making the mode adjustment to transit. Therefore, a 30% transit trip credit was applied in the traffic analysis in order to be conservative. Table 7 shows the adjusted trip generation calculations.

Table 7: Springfield Metro Center Site Trip Generation Summary

Development/Use	AM Peak Hour			PM Peak Hour			Weekday Average Daily Traffic
	In	Out	Total	In	Out	Total	
TSA Offices: 653,000 GSF – Land Use Code 710	756	103	859	138	672	810	5,464
30% Mode Adjustment	-227	-31	-258	-41	-202	-243	-1,639
Total New Site Generated Vehicle Trips	529	72	601	97	470	567	3,825

Notes: Trip generation based on rates and equations published in the ITE *Trip Generation Manual* (9th Edition)

SITE TRIP DISTRIBUTION

Vehicular trip distributions were based on the results on the TSA Commuter Survey Question 2 (see Chapter 2), which asked respondents to indicate their home zip code. Furthermore, based on the results of Survey Question 23, which asked respondents if they would move their residence to be closer to the Springfield Metro Center site, it is not anticipated that a significant portion of employees would change their location of residence if their office was relocated. Therefore, the distribution of zip codes from Question 2 was utilized to develop the following trip distribution percentages for the site generated vehicle trips:

- To/From North via I-95: 50%
- To/From South via I-95: 20%
- To/From East via Franconia Springfield Parkway: 10%
- To/From West via Franconia Springfield Parkway: 15%
- To/From South via Fairfax County Parkway: 5%

The site-generated vehicle volumes summarized in Table 7 were assigned to the roadway network utilizing the above percentages to develop the site trip assignment volumes (see Figure 31). The site-generated volumes were then added to the No Action alternative traffic volumes to develop Action alternative traffic volume (see Figure 32).

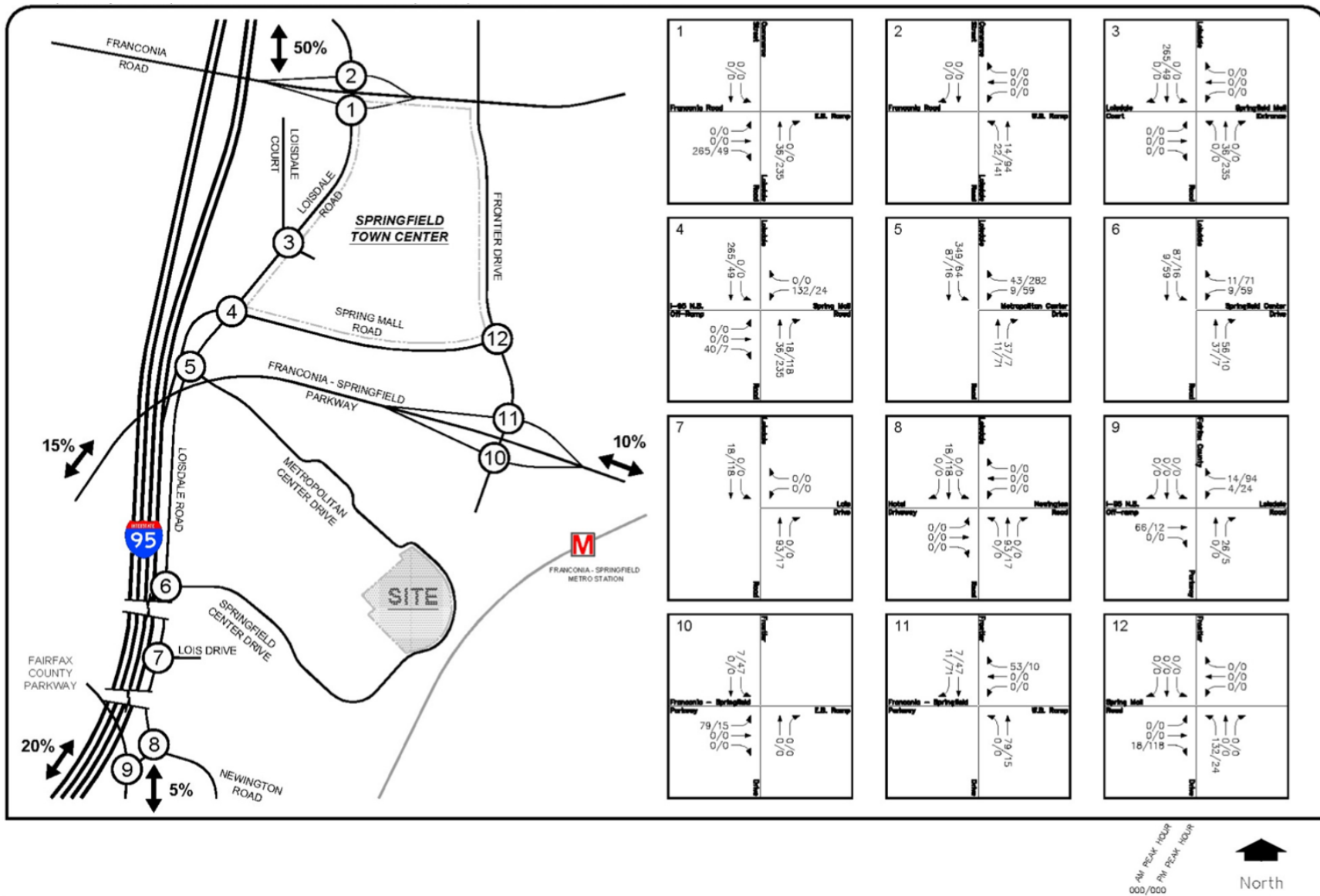


Figure 31: Site Trip Assignments (Not to Scale)

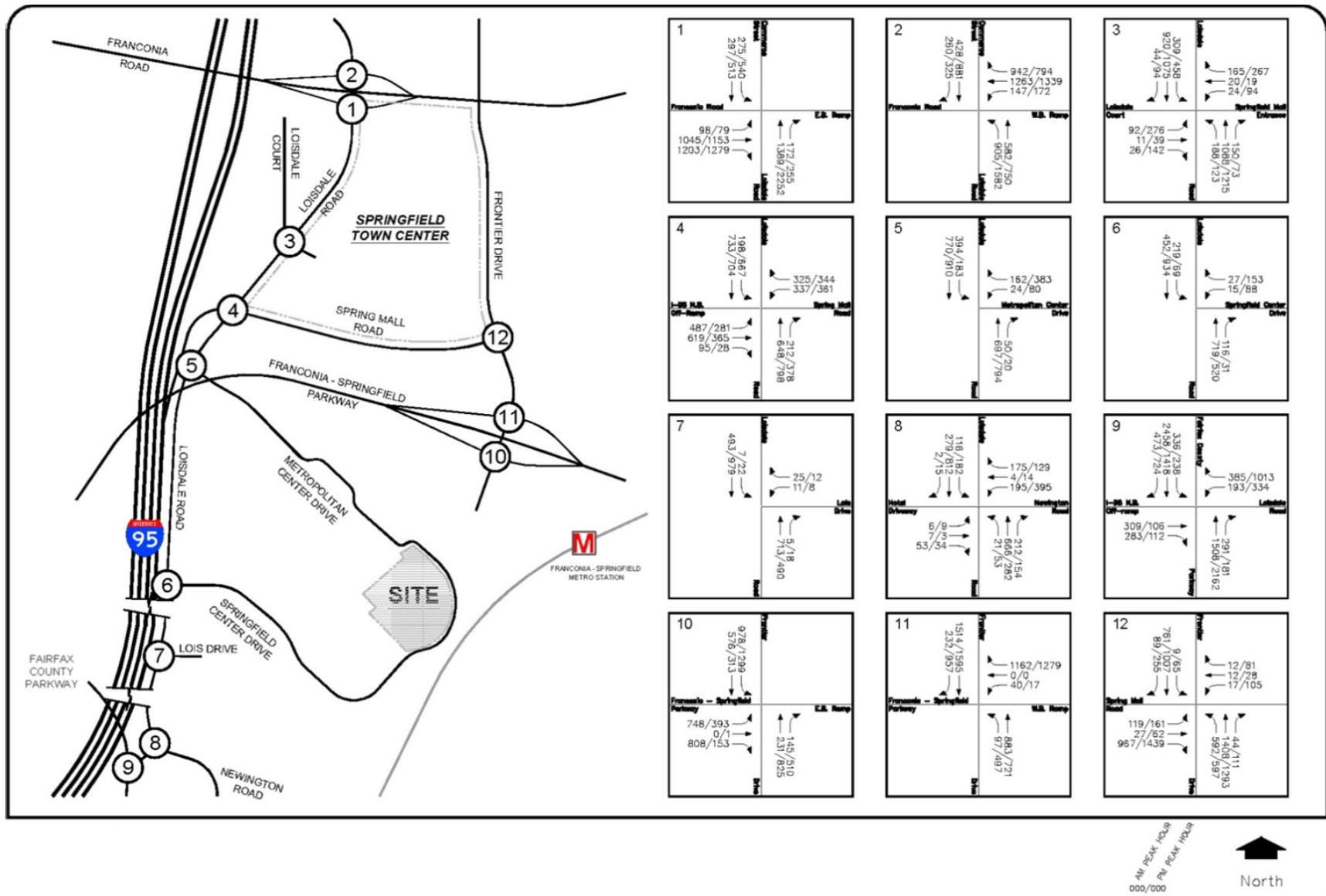


Figure 32: 2019 Action Alternative Traffic Forecasts (Not to Scale)

PROPOSED TRANSPORTATION IMPROVEMENTS

Based on the results of previous traffic impact analyses (2011 and 2014), the developer of the Springfield Metro Center site had agreed to provide specific transportation improvements within the study area to mitigate site transportation impacts. The proposed improvements are as follows:

1. Extend Springfield Center Drive from its current terminus north to Joseph Alexander Drive;
2. Signalize the Loisdale Road/Metropolitan Drive intersection;
3. Restripe the Springfield Center Drive approach to Loisdale Road in order to provide for a westbound left-turn lane; and,
4. Signalize the Loisdale Road/Springfield Center Drive intersection.
5. Engaging in a Transportation Demand Management (TDM) Program.

The first four proposed improvements were incorporated into the analysis of the Action alternative. Given the difficulty in estimating the impact of a TDM program on daily trip generation, no additional credit was given for the program beyond the 30% multimodal credit that has already been applied.

ACTION ALTERNATIVE CAPACITY ANALYSIS RESULTS

The Action Alternative capacity analysis results are shown in Table 8 and summarized on Figure 33. The results of the capacity analysis indicated the following:

- As a result of the site traffic, the intersections within the study area would see an increase in vehicle trips over background future conditions.
- Assuming completion of the site-specific improvements, all of the study area intersections would continue to operate at acceptable levels of service (LOS E or better) during both peak hours.
- Individual movements at some signalized intersections would continue to operate at LOS F during one or more peak hours.
- The unsignalized intersection of Loisdale Road and Lois Drive would operate at acceptable levels of service (LOS C or better) during both peak hours.

Table 8: 2019 No Action and Action Alternatives Level of Service Summary

Intersection	Intersection Control	Critical Movement	2019 No Action		2019 Action	
			AM	PM	AM	PM
(1) Franconia Road EB Ramps/ Loisdale Road/Commerce Street	Signal	EBL	E (67.9)	F (84.0)	E (67.9)	F (84.0)
		EBT	D (44.8)	F (81.8)	D (44.8)	F (81.8)
		EBR	A (2.1)	A (6.2)	A (5.5)	A (8.0)
		NBT	F (89.2)	F (99.0)	F (96.1)	F (135.9)
		NBR	E (55.2)	D (43.1)	E (55.2)	D (43.1)
		SBL	A (1.6)	A (1.5)	A (1.6)	A (1.8)
		SBT	A (0.6)	A (0.1)	A (0.6)	A (0.1)
		Overall	D (44.1)	E (55.8)	D (45.0)	E (71.5)
(2) Franconia Road WB Ramps/ Loisdale Road/Commerce Street	Signal	WBL	F (171.2)	F (223.2)	F (171.2)	F (223.2)
		WBT	D (45.7)	D (53.9)	D (45.7)	D (53.9)
		WBR	A (2.0)	A (1.2)	A (2.0)	A (1.2)
		NBL	A (2.8)	A (4.6)	A (2.9)	B (10.6)
		NBT	A (2.3)	A (0.0)	A (2.3)	A (0.0)
		SBT	E (65.9)	E (71.1)	E (65.9)	E (69.3)
		SBR	E (65.4)	E (60.5)	E (65.4)	E (60.5)
		Overall	C (29.6)	D (35.6)	C (29.4)	D (35.6)
(3) Loisdale Road/ Loisdale Court/Springfield Mall Entrance	Signal	EBL	C (26.8)	E (61.1)	C (27.7)	E (61.4)
		EBT	C (24.2)	D (38.8)	C (24.9)	D (38.8)
		EBR	C (26.5)	D (41.2)	C (27.3)	D (41.2)
		WBL	C (24.6)	D (41.5)	C (25.4)	D (41.6)
		WBT	C (24.3)	D (38.2)	C (25.1)	D (38.3)
		WBR	C (24.8)	D (40.8)	C (25.6)	D (41.3)
		NBL	A (7.8)	C (24.5)	A (8.3)	C (26.7)
		NBT	B (18.9)	D (35.9)	B (19.0)	D (41.4)
		NBR	A (0.1)	A (0.1)	A (0.1)	A (0.0)
		SBL	B (13.1)	D (41.8)	B (14.2)	D (53.5)
		SBT	B (13.4)	C (23.4)	B (15.7)	C (23.6)
		SBR	B (10.6)	B (15.6)	B (10.7)	B (15.5)
Overall	B (15.9)	C (34.4)	B (16.7)	D (37.6)		
(4) Loisdale Road/ I-95 NB Ramp/Spring Mall Road	Signal	EBL	D (37.4)	E (58.2)	D (40.3)	E (58.2)
		EBT	D (40.1)	E (62.2)	D (43.2)	E (62.2)
		EBR	C (31.6)	D (51.8)	C (34.2)	D (51.9)
		WBL	D (44.6)	E (64.9)	D (49.3)	E (67.0)
		WBR	D (43.0)	D (38.5)	D (43.9)	D (36.6)
		NBTR	D (39.1)	D (39.3)	D (42.4)	D (50.1)
		NBR	C (30.4)	C (32.4)	C (32.4)	D (38.6)
		SBL	C (22.0)	C (21.4)	C (24.1)	D (48.6)
		SBT	C (21.4)	A (6.7)	C (25.8)	A (7.0)
		Overall	D (35.6)	D (36.0)	D (38.1)	D (43.5)

Table 8 Continued: 2019 No Action and Action Alternatives Level of Service Summary

Intersection	Intersection Control	Critical Movement	2019 No Action		2019 Action	
			AM	PM	AM	PM
(5) Loisdale Road/ Metropolitan Center Drive	Stop Sign (No Action) / Signal (Action)	WBL	D [28.1]	F [66.0]	C (32.3)	C (26.7)
		WBR	B [12.8]	B [12.9]	C (32.4)	C (30.3)
		NBT	N/A	N/A	B (12.7)	B (16.6)
		NBR	N/A	N/A	A (9.3)	B (13.8)
		SBL	A [9.7]	B [10.7]	A (7.0)	A (6.2)
		SBT	N/A	N/A	A (2.8)	A (5.2)
		Overall	N/A	N/A	A (9.9)	B (14.0)
(6) Loisdale Road/ Springfield Center Drive	Stop Sign	WBL	C [16.2]	C [17.8]	D (46.4)	E (68.2)
		WBR	N/A	N/A	D (45.8)	E (63.5)
		NBTR	N/A	N/A	C (20.1)	A (8.6)
		SBL	B [10.6]	A [9.0]	B (12.7)	A (3.3)
		SBT	N/A	N/A	A (1.8)	A (8.9)
		Overall	N/A	N/A	B (14.7)	B (16.5)
(7) Loisdale Road/ Lois Drive	Stop Sign	WBLR	B [14.3]	B [14.0]	C [15.6]	B [14.8]
		SBL	A [9.0]	A [8.6]	A [9.4]	A [8.6]
(8) Loisdale Road/ Newington Road	Signal	EBLTR	C (24.0)	B (16.5)	C (24.0)	B (16.5)
		WBLT	C (34.4)	D (43.9)	C (34.4)	D (43.9)
		WBR	B (17.1)	A (9.3)	B (17.4)	A (9.3)
		NBL	B (16.8)	B (14.3)	B (17.4)	B (15.2)
		NBT	C (28.8)	C (25.3)	C (32.4)	C (25.9)
		NBR	F (100.0)	F (86.2)	F (107.2)	F (88.4)
		SBL	A (7.6)	B (11.6)	A (8.1)	B (11.6)
		SBT	B (11.4)	C (23.1)	B (11.5)	C (25.0)
		SBR	B (10.2)	B (16.7)	B (10.2)	B (16.7)
Overall	C (32.4)	C (30.2)	C (34.3)	C (30.7)		
(9) Fairfax County Parkway/ I-95 NB Ramp/Loisdale Road	Signal	EBT	F (86.9)	E (78.5)	F (101.8)	E (78.6)
		EBR	A (0.3)	A (0.1)	A (0.3)	A (0.1)
		WBL	F (88.1)	E (63.4)	F (88.2)	E (62.3)
		WBR	C (34.1)	E (55.7)	C (34.5)	E (64.9)
		NBTR	D (35.9)	D (46.1)	D (36.5)	D (46.2)
		SBL	F (151.8)	F (122.4)	F (151.8)	F (109.7)
		SBT	D (40.7)	B (17.7)	D (41.1)	B (17.7)
		SBR	A (0.5)	A (1.1)	A (0.5)	A (1.1)
Overall	D (43.4)	D (39.5)	D (45.0)	D (41.0)		
(10) Franconia Springfield Parkway EB Ramps/Frontier Drive	Signal	EBL	D (38.5)	E (63.6)	D (40.4)	E (63.7)
		EBLT	D (38.5)	E (63.6)	D (40.4)	E (64.0)
		EBR	F (112.4)	D (52.6)	F (112.4)	D (52.2)
		NBT	E (76.5)	D (44.3)	E (76.4)	D (44.3)
		NBR	E (75.6)	E (73.3)	E (75.6)	E (73.3)
		SBL	A (9.2)	C (34.5)	A (9.7)	D (47.4)
		SBT	A (5.4)	A (5.3)	A (5.4)	A (5.3)
Overall	D (46.7)	D (44.1)	D (47.0)	D (48.8)		

Table 8 Continued: 2019 No Action and Action Alternatives Level of Service Summary

Intersection	Intersection Control	Critical Movement	2014 Existing		2019 No Action	
			AM	PM	AM	PM
(11) Franconia Springfield Parkway WB Ramps/Frontier Drive	Signal	WBL	F (82.1)	E (69.8)	F (82.1)	E (69.8)
		WBLT	F (82.2)	E (69.8)	F (82.2)	E (69.8)
		WBR	A (3.8)	B (14.4)	A (4.6)	B (15.6)
		NBL	A (0.0)	A (1.4)	A (0.0)	A (1.3)
		NBT	A (4.1)	A (5.9)	A (4.2)	A (5.6)
		SBT	E (77.7)	C (34.2)	E (78.3)	D (35.5)
		SBR	E (59.0)	F (100.3)	E (59.8)	F (152.0)
		Overall	D (38.4)	C (32.9)	D (38.0)	D (43.7)
(12) Frontier Drive/Spring Mall Road	Signal	EBL	E (59.7)	E (67.9)	E (57.9)	E (67.2)
		EBLT	E (57.8)	E (67.9)	E (57.8)	E (67.0)
		EBR	D (44.4)	E (57.9)	D (38.4)	F (86.1)
		WBLT	E (66.2)	E (67.2)	E (66.2)	E (67.2)
		WBR	E (63.9)	D (47.0)	E (63.9)	D (47.0)
		NBL	E (58.4)	E (61.4)	E (55.8)	E (61.2)
		NBT	B (13.6)	C (24.8)	B (13.6)	C (24.6)
		NBR	A (9.4)	B (11.0)	A (9.4)	B (10.7)
		SBL	E (69.3)	D (49.8)	E (69.3)	D (49.8)
		SBT	C (24.1)	E (70.5)	C (28.3)	E (71.7)
		SBR	C (20.4)	F (118.5)	C (23.9)	F (119.9)
		Overall	C (30.8)	E (55.1)	C (30.8)	E (63.0)

Notes: Analysis performed using Synchro, Version 8. Values in () represent signalized delay in seconds. Values in [] represent unsignalized delay in seconds. *-Delay exceeds 999 seconds.

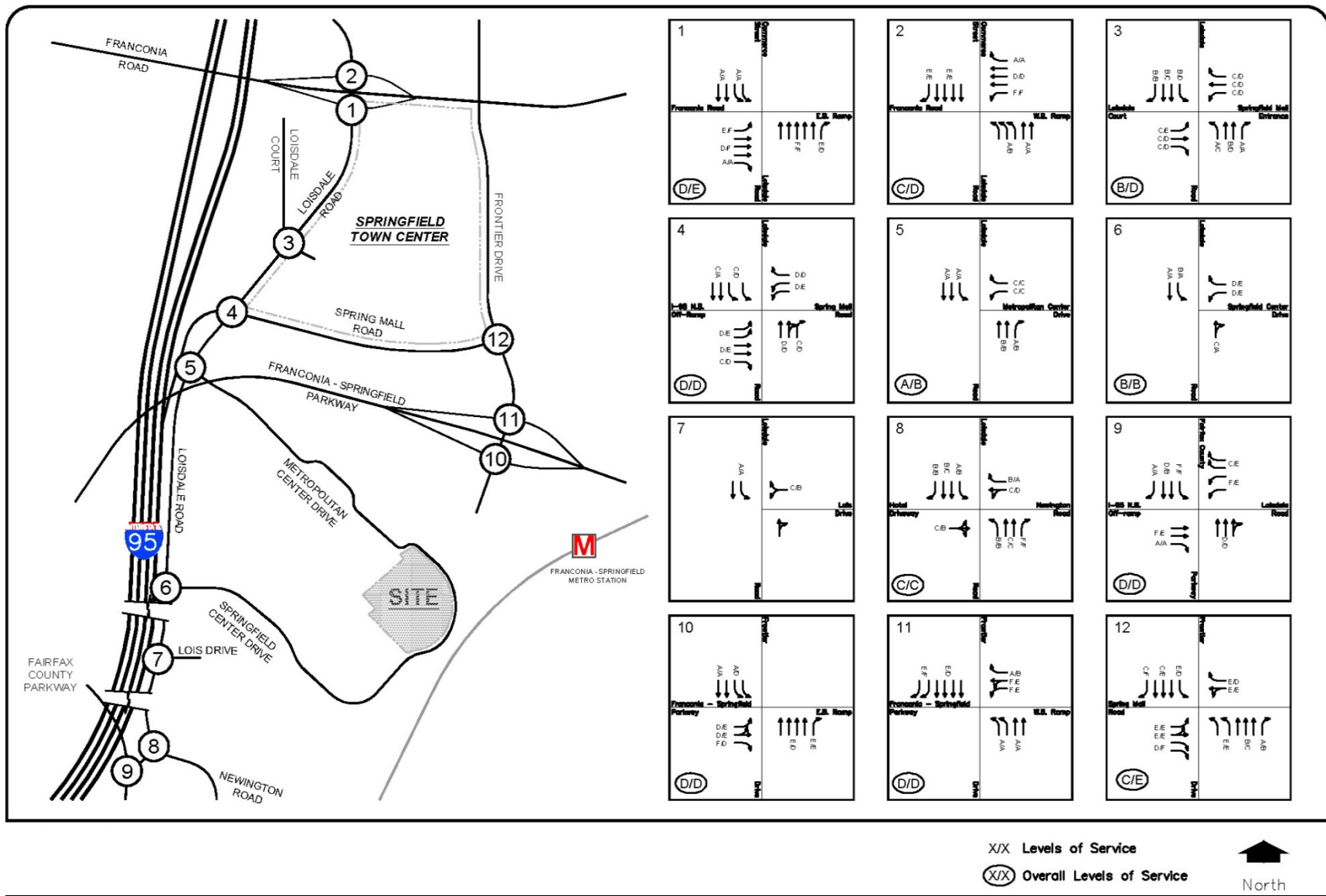


Figure 33: 2019 Action Alternative Future Levels of Service (Not to Scale)

QUEUING ANALYSIS

In order to assess the adequacy of certain critical turn bays at intersections within the study area, a queuing analysis was conducted for existing (2014) and future (2019) conditions both without and with development of the proposed Springfield Metro Center. Synchro software was used to conduct the analyses based on the 95th percentile queue lengths. The 95th percentile queue is the maximum back of queue with the 95th percentile traffic volumes. The results are summarized in Table 9.

With the exception of the following turning movements, all of the turning movements at the study intersections are accommodated within the available storage:

- The southbound left-turn (Fairfax County Parkway) at the Parkway and Loisdale Road intersection.
- The eastbound right-turn (Franconia-Springfield Parkway Eastbound Ramp) and the northbound right turn (Frontier Drive) at the same location.
- The southbound right-turn (Frontier Drive) at the Franconia-Springfield Parkway Westbound Ramps.

The percentage of site generated traffic through each of the intersections listed above is provided on Table 10, which shows that the percentage of site generated traffic through those intersections is 4% or less.

Table 9: Queuing Analysis Summary

Intersection	Critical Movement	Available Storage	2014 Existing			2019 No Action			2019 Action		
			AM	PM	Exceed Storage ?	AM	PM	Exceed Storage ?	AM	PM	Exceed Storage ?
(1) Franconia Road EB Ramps/Loisdale Road/Commerce Street	EBL	480	171	140	No	189	#164	No	189	#164	No
	EBT	N/A	267	486	N/A	427	#587	N/A	427	#587	N/A
	EBR	400	0	0	No	0	0	No	0	0	No
	NBT	N/A	298	#480	N/A	#480	#690	N/A	#503	#810	N/A
	NBR	N/A	4	91	N/A	14	95	N/A	14	95	N/A
(2) Franconia Road WB Ramps/Loisdale Road/Commerce Street	WBL	575	#256	#316	No	#371	#415	No	#371	#415	No
	WBT	N/A	334	340	N/A	405	531	N/A	405	531	N/A
	WBR	615	116	0	No	146	31	No	146	31	No
	SBT	N/A	143	294	N/A	173	331	N/A	173	329	N/A
	SBR	405	122	179	No	142	213	No	142	213	No
(3) Loisdale Road/Loisdale Court/Springfield Mall Entrance	EBL	N/A	77	337	N/A	104	363	N/A	104	365	N/A
	EBT	N/A	25	103	N/A	21	58	N/A	21	58	N/A
	EBR	N/A	N/A	N/A	N/A	0	44	N/A	0	44	N/A
	WBL	N/A	20	96	N/A	36	123	N/A	36	123	N/A
	WBT	N/A	24	32	N/A	32	34	N/A	32	34	N/A
	WBR	N/A	0	38	N/A	46	68	N/A	47	83	N/A
	NBL	210	53	89	No	61	90	No	68	m83	No
	NBT	N/A	206	357	N/A	269	280	N/A	286	339	N/A
	NBR	170	0	m0	No	0	m0	No	0	m0	No
	SBL	N/A	27	309	N/A	186	#662	N/A	193	#768	N/A
	SBT	N/A	152	432	N/A	185	515	N/A	310	540	N/A
(4) Loisdale road/I-95 NB Ramp/Spring Mall Road	SBR	135	6	41	No	5	45	No	5	44	No
	EBL	380	246	247	No	272	193	No	272	193	No
	EBT	N/A	220	223	N/A	360	254	N/A	361	254	N/A
	EBR	305	0	0	No	0	0	No	39	0	No
	WBL	N/A	93	147	N/A	136	239	N/A	218	256	N/A
	WBR	N/A	66	98	N/A	169	183	N/A	167	176	N/A
	NBT	N/A	269	343	N/A	407	378	N/A	436	#630	N/A
	NBR	290	51	57	No	70	58	No	85	193	No
	SBL	485	115	#623	Yes	90	227	No	90	310	No
SBT	N/A	143	97	N/A	213	97	N/A	354	102	N/A	

Table 9 Continued: Queuing Analysis Summary

Intersection	Critical Movement	Available Storage	2014 Existing			2019 No Action			2019 Action		
			AM	PM	Exceed Storage ?	AM	PM	Exceed Storage ?	AM	PM	Exceed Storage ?
(5) Loisdale Road/Metropolitan Center Drive	WBL	450	5	17	No	8	28	No	33	66	No
	WBR	N/A	18	16	N/A	22	19	N/A	45	113	N/A
	NBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	206	303	N/A
	NBR	200	N/A	N/A	N/A	N/A	N/A	N/A	19	m13	No
	SBL	285	4	13	No	5	16	No	139	66	No
	SBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	88	165	N/A
(6) Loisdale Road/Springfield Center Drive	WBL	N/A	4	25	N/A	6	17	N/A	38	154	N/A
	WBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	29	58	N/A
	NBTR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	877	329	N/A
	SBL	285	13	4	No	17	5	No	61	23	No
	SBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	140	410	N/A
(7) Loisdale Road/Lois Drive	WBLR	N/A	6	3	N/A	8	4	N/A	9	5	N/A
	SBL	925	1	2	No	1	2	No	1	2	No
(8) Loisdale Road/Newington Road	EBLTR	N/A	31	25	N/A	31	25	N/A	31	25	N/A
	WBLT	N/A	167	#380	N/A	177	#410	N/A	177	#410	N/A
	WBR	190	25	20	No	55	21	No	67	21	No
	NBL	150	m20	m26	No	m16	m25	No	m15	m26	No
	NBT	N/A	m266	m117	N/A	m353	m137	N/A	m420	m147	N/A
	NBR	365	m186	m116	No	m159	m97	No	m150	m100	No
	SBL	655	56	80	No	60	99	No	60	99	No
	SBT	N/A	63	173	N/A	82	250	N/A	87	303	N/A
(9) Fairfax County Parkway/I-95 NB Ramp/Loisdale Road	SBR	100	0	0	100	0	0	100	0	0	100
	EBT	N/A	180	84	N/A	226	97	N/A	#296	106	N/A
	EBR	270	0	0	No	0	0	No	0	0	No
	WBL	N/A	#397	m#472	N/A	184	m220	N/A	185	m232	N/A
	WBR	N/A	200	581	N/A	247	736	N/A	259	840	N/A
	NBTR	N/A	557	m436	N/A	711	m517	N/A	728	m519	N/A
	SBL	420	#562	#438	Yes	#735	#502	Yes	#735	#486	Yes
	SBT	N/A	1454	423	N/A	#1902	587	N/A	#1902	587	N/A
SBR	N/A	0	0	N/A	0	0	N/A	0	0	N/A	

Table 9 Continued: Queuing Analysis Summary

Intersection	Critical Movement	Available Storage	2014 Existing			2019 No Action			2019 Action		
			AM	PM	Exceed Storage ?	AM	PM	Exceed Storage ?	AM	PM	Exceed Storage ?
(10) Franconia Springfield Parkway EB Ramps/Frontier Drive	EBL	N/A	464	232	N/A	552	277	N/A	632	288	N/A
	EBLT	N/A	464	233	N/A	552	278	N/A	632	289	N/A
	EBR	395	#1039	51	Yes	#1439	51	Yes	#1439	51	Yes
	NBT	N/A	100	271	N/A	125	303	N/A	125	303	N/A
	NBR	60	68	#623	Yes	113	#764	Yes	113	#764	Yes
	SBL	N/A	0	137	N/A	m189	208	N/A	m192	232	N/A
	SBT	N/A	2	7	N/A	m1	7	N/A	m1	7	N/A
(11) Franconia Springfield Parkway WB Ramps/Frontier Drive	WBL	380	56	25	No	58	28	No	58	28	No
	WBLT	N/A	57	28	N/A	62	28	N/A	62	28	N/A
	WBR	N/A	0	0	N/A	0	0	N/A	0	0	N/A
	NBL	N/A	0	17	N/A	0	19	N/A	0	19	N/A
	NBT	N/A	29	17	N/A	36	21	N/A	40	21	N/A
	SBT	N/A	472	#479	N/A	#777	m486	N/A	#783	m486	N/A
	SBR	215	99	#395	Yes	157	m#469	Yes	165	m#483	Yes
(12) Frontier Drive/Spring Mall Road	EBL	195	107	178	No	131	193	No	131	193	No
	EBLT	N/A	108	185	N/A	131	201	N/A	131	200	N/A
	EBR	N/A	125	194	N/A	421	#836	N/A	395	#1010	N/A
	WBLT	N/A	61	203	N/A	64	211	N/A	64	211	N/A
	WBR	N/A	0	8	N/A	0	11	N/A	0	11	N/A
	NBL	500	204	319	No	287	m321	No	353	m331	No
	NBT	N/A	294	297	N/A	353	,447	N/A	353	m438	N/A
	NBR	280	0	m28	No	0	m16	No	0	m15	No
	SBL	205	28	m89	No	28	m102	No	28	m102	No
	SBT	N/A	149	m365	N/A	246	m443	N/A	269	m445	N/A
SBR	220	0	m122	No	0	m207	No	0	m207	No	

Notes: (1) Queue length is based on the 95th percentile queue in feet as reported by Synchro, Version 8. (2) “#”-95th percentile volume exceeds capacity, queue may be longer. (3) “m” – Volume for 95th percentile queue is metered by upstream signal. (4) “*” – Volume exceeds capacity; no result given by Synchro.

Table 10: 2019 Influence Area Summary

Intersection	2019 Total Future Volumes		Site-Generated Volumes		% Site Generated Traffic	
	AM	PM	AM	PM	AM	PM
Loisdale Road/Franconia EB Ramps	4,479	6,071	301	284	7%	5%
Loisdale Road/Franconia WB Ramps	4,527	5,843	36	235	1%	4%
Lois Dale Road/Loisdale Court	3,037	3,875	301	284	10%	7%
Loisdale Road/Spring Mall Road	3,654	3,926	491	433	13%	11%
Loisdale Road/Metropolitan Center Drive	2,097	2,370	536	499	26%	21%
Loisdale Road/Springfield Center Drive	1,548	1,795	209	222	14%	12%
Loisdale Road/Lois Drive	1,254	1,529	111	135	9%	9%
Loisdale Road/Newington Road	1,736	2,082	111	135	6%	6%
Loisdale Road/Fairfax County Parkway	6,236	6,288	110	135	2%	2%
Frontier Drive/Franconia Springfield Parkway EB Ramps	3,486	3,494	86	62	2%	2%
Frontier Drive/Franconia Springfield Parkway WB Ramps	3,928	5,066	150	143	4%	3%
Frontier Drive/Spring Mall Road	4,057	5,204	150	142	4%	3%

TRANSPORTATION DEMAND MANAGEMENT

In order to mitigate the potential impacts of the development and take full advantage of the site's location proximate to the Franconia-Springfield Metrorail station, a key component of the project would be the implementation of a comprehensive Transportation Demand Management (TDM) program.

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

The following strategies were incorporated as part of the site's TDM program and reflected in the proffers.

- A. Designate a Transportation Management Coordinator (TMC) to implement the TDM program and advise tenants and employees of the availability and location of the TDM coordinator and program at least once a year. The position may be part of other duties

assigned to the individual. Duties of the Transportation Management Coordinator could include the following:

- a. Assist employees/tenants in making effective and efficient commuting choices.
 - b. Disseminate Metrorail, Metrobus, ridesharing, and other relevant transit options to new patrons, tenants and employees.
 - c. Solicit support from the Metropolitan Washington Council of Governments (MWCOG) Commuter Connections program, the Washington Metropolitan Area Transit Authority (WMATA), the Fairfax County government, and others.
 - d. Disseminate park-and-ride lot information to patrons/visitors/guests.
 - e. Encourage employees/tenants to bike or walk to work.
 - f. Market and promote the TDM Program among tenants and employees through printed materials and web sites (if available).
- B. Commuter Center.
- a. Install display racks/or and an electronic kiosk that would provide information on the various aspects of the TDM Program.
 - b. Sell transit fare media, such as SmarTrip cards, Metro fare cards, and Metrobus passes.
 - c. Allow tenants and employees to purchase transit fare media by check or credit card.
- C. Incentives to use transit, including:
- a. Provide information on Metrorail, Metrobus, and other public transportation facilities, services, routes, schedules, and fares.
 - b. Disseminate information to transit users regarding free guaranteed rides home in cases of emergency.
 - c. At the time of initial lease/sales, provide SmarTrip cards to residents.
 - d. Provide safe, convenient, and attractive pedestrian connections on and off-site.
- D. Carpool programs, including:
- a. Provide ride-matching assistance and services among the Center's employees and other area residents and employees through direction to the Commuter Connections program of MWCOG.
 - b. Inform employees of High Occupancy Vehicle (HOV) or High Occupancy Toll (HOT) lanes on I-95, I-395, I-66, and/or other highways that are available for use by HOV's, but not by Single Occupancy Vehicles (SOV's), during commuter peak periods.
 - c. Disseminate information to carpoolers regarding free guaranteed rides home in cases of emergency.
- E. Parking management, including:
- a. Reserve a number of conveniently-located, first-level, free parking spaces for carpools, vanpools, and hybrid vehicles.

CONCLUSIONS

The transportation impact analysis for the Springfield Metro Center site reveals that each of the existing signalized intersections currently operates at overall acceptable levels of service during the AM and PM peak hours. However, continued background growth and development within the study area would increase delay and degrade some levels of service at the study area intersections. Improvements proposed by other developments would reduce delays to be consistent with existing levels at most locations. The development of the Springfield Metro site, which would result in the collocate of approximately 3,800 TSA employees, would add an additional 601 AM peak hour, 567 PM peak hour, and 3,825 average daily vehicle trips to the study area roadway network. This additional traffic would further degrade traffic operations at some intersections.

In order to mitigate the transportation impacts of the site, several transportation improvements are proposed, including:

1. Extend Springfield Center Drive from its current terminus north to Joseph Alexander Drive;
2. Signalize the Loisdale Road/Metropolitan Drive intersection;
3. Restripe the Springfield Center Drive approach to Loisdale Road in order to provide for a westbound left-turn lane; and,
4. Signalize the Loisdale Road/Springfield Center Drive intersection.
5. Engaging in a Transportation Demand Management (TDM) Program.

With the construction of the above-listed improvements, all study area intersections would operate at acceptable levels of service. Therefore, it is concluded that the transportation improvements listed above, together with other planned improvements in the area, would be sufficient to accommodate the level of development associated with the Springfield Metro Center site.

In addition to the proposed site-specific improvements, the Fairfax County Comprehensive Plan recommends that Frontier Drive be extended south from the Franconia-Springfield Metrorail Station to Loisdale Road. The County anticipates that the Frontier Drive extension would be completed between 2022 and 2024. The extension of Frontier Drive from the Franconia-Springfield Metrorail Station would have a positive impact on site traffic operations by providing a more direct connection to the Franconia Springfield Parkway.

CHAPTER 4: VICTORY CENTER

This section describes the assessment of potential transportation impacts resulting from the proposed consolidation of the Transportation Security Administration (TSA) at 5001 Eisenhower Avenue, Alexandria, VA (Victory Center) (see Figure 34). The site currently consists of a vacant 606,000 square foot (SF) office building that is served by a surface parking lot. The planned consolidation at this site would consist of the expansion of the existing office building to include an additional 60,000 SF of office space, 10,000 SF of retail space, and a 985 space parking garage and the relocation of approximately 3,800 TSA employees from five other offices: 601 South 12th Street, 701 South 12th Street, and 6354 Walker Lane in Alexandria, VA, 1900 Oracle Way in Reston, VA, and 45065 Riverside Parkway in Ashburn, VA.

The subject site is located north of I-95/I-495 and bordered on the north by a Norfolk Southern freight yard, on the south by Eisenhower Avenue, on the east by a two story office building, and on the west by the Alexandria Fire Station 210 and impound lot. This Traffic Technical Report analyzes the impacts of the 666,000 GSF of office space and 10,000 GSF retail associated with the TSA consolidation.

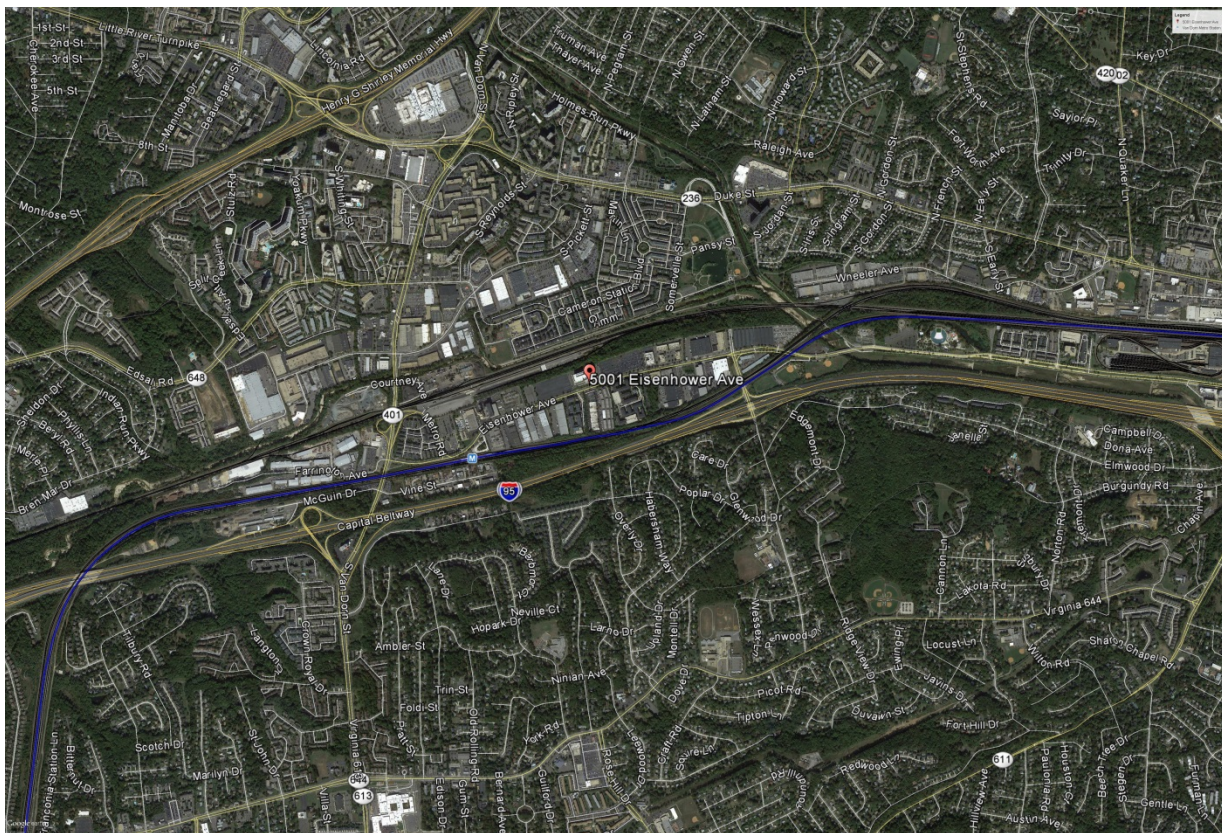


Figure 34: Victory Center Project Area Map

Potential transportation impacts, assessed in this Traffic Technical Report are based on the transportation analysis and documentation contained in the following reports:

1. *Victory Center (5001 Eisenhower Avenue) Traffic Impact Statement* (October 30, 2014), prepared by Wells and Associates.
2. *Victory Center –Comment Response Letter* (March 27, 2015), prepared by Wells and Associates.
3. *Victory Center Traffic Impact Study and Transportation Management Plan* (July 23, 2008), prepared by Wells and Associates.
4. *Victory Center (5001 Eisenhower Avenue) Response to City of Alexandria Comments* (October 19, 2005)
5. *Victory Center Traffic Impact Study and Transportation Management Plan* (June 3, 2005), prepared by Wells and Associates.

A copy of the documentation is contained in Appendix C.

These documents analyze the following three scenarios:

- Existing Conditions
- Future Conditions without Consolidation (No Action Alternative)
- Future Conditions with Consolidation (Action Alternative)

Discussions with staff from the Virginia Department of Transportation (VDOT) and City of Alexandria resulted in the selection of the following eight (8) intersections that have been analyzed in the documentation listed above (see Figure 35):

1. Eisenhower Avenue/S Van Dorn Street
2. Summers Grove Road/Metro Road
3. Eisenhower Avenue/Metro Road
4. Eisenhower Avenue/UPS Driveway/Metro Bus Loop
5. Eisenhower Avenue/Clermont Avenue/Eisenhower Avenue Connector
6. I-495 Westbound Ramps/Eisenhower Avenue Connector
7. I-495 Eastbound Ramps/Eisenhower Avenue Connector
8. Eisenhower Avenue/Victory Center Driveways (2)



Figure 35: Victory Center Study Area



EXISTING CONDITIONS

This section describes the existing transportation facilities in the vicinity of the Victory Center site, including traffic conditions and the availability of public transportation facilities.

EXISTING PUBLIC TRANSPORTATION FACILITIES

Existing public transportation facilities which service Victory Center include Metrorail, and bus routes. Descriptions of the available transit services are provided below.

METRO RAIL SYSTEM

The Washington Metropolitan Area Transit Authority (WMATA) Metrorail system connects downtown Washington, D.C. to the adjoining areas in Maryland and Virginia (see Figure 36). There are six lines on the Metrorail system which are interconnected within Washington, D.C. The Metrorail system opens at 5:00 a.m. on weekdays and at 7:00 a.m. on weekends and closes at 12:00 a.m. Sunday-Thursday and at 3:00 a.m. Friday and Saturday. Trains arrive approximately every six minutes during the peak hours and every twelve minutes during the non-peak hours.

The Red Line operates between Shady Grove and Glenmont in Montgomery County. This line has 27 stations and has transfer points with the Orange and Blue Lines at Metro Center and the Yellow and Green Lines at Gallery Place and Fort Totten.

The Blue Line operates between Franconia-Springfield in Fairfax County, Virginia and Largo Town Center in Prince George's County. This line has 27 stations and has transfer points with the Red Line at Metro Center and the Yellow and Green Lines at L'Enfant Plaza. The line runs along the same path as the Yellow Line between King Street and Pentagon and runs along the same path as the Orange Line between Rosslyn and Stadium-Armory.

The Orange Line operates between Vienna/Fairfax-GMU in Fairfax County and New Carrollton in Prince George's County. This line has 26 stations and has transfer points with the Red Line at Metro Center and the Yellow and Green Lines at L'Enfant Plaza. The line runs along the same path as the Blue Line between Rosslyn and Stadium-Armory.

The Green Line operates between Branch Avenue and Greenbelt in Prince George's County. This line has 21 stations and has transfer points with the Red Line at Gallery Place and Fort Totten and with the Orange and Blue Lines at L'Enfant Plaza. The line runs along the same path as the Yellow Line from L'Enfant Plaza to Fort Totten.

The Yellow Line operates between Huntington in Fairfax County and Fort Totten in Washington, D.C. This line has 17 stations and has transfer points with the Red Line at Gallery Place and the Orange and Blue Lines at L'Enfant Plaza. The line runs along the same path as the Blue Line between King Street and Pentagon and runs along the same path as the Green Line from L'Enfant Plaza to Fort Totten.

The Silver Line is the newest line on the Metro system. The first phase of the Silver Line was completed to Wiehle-Reston East in 2014 and consists of five stations that extend off of the Orange Line in Loudon County, Virginia. The second phase will consist of six stations including Dulles

Airport and is anticipated to open in 2018. The Silver Line shares tracks with the existing Orange and Blue Lines as it travels across the region and will terminate at Largo Town Center.

The Victory Center site lies within one-half miles of the Van Dorn Metrorail Station along the Blue Line. The Blue Line operates at a 12-minute headway during weekdays and Saturdays, and a 15-minute headway on Sundays. This station is also served by the Yellow Line during rush hour periods (6:30 AM – 9:00 AM and 3:30 PM – 6:00 PM). The Yellow Line operates at a six-minute headway during the AM and PM rush. The average number of weekday passenger boardings for the Franconia Springfield Station was approximately 3,374 in 2014.

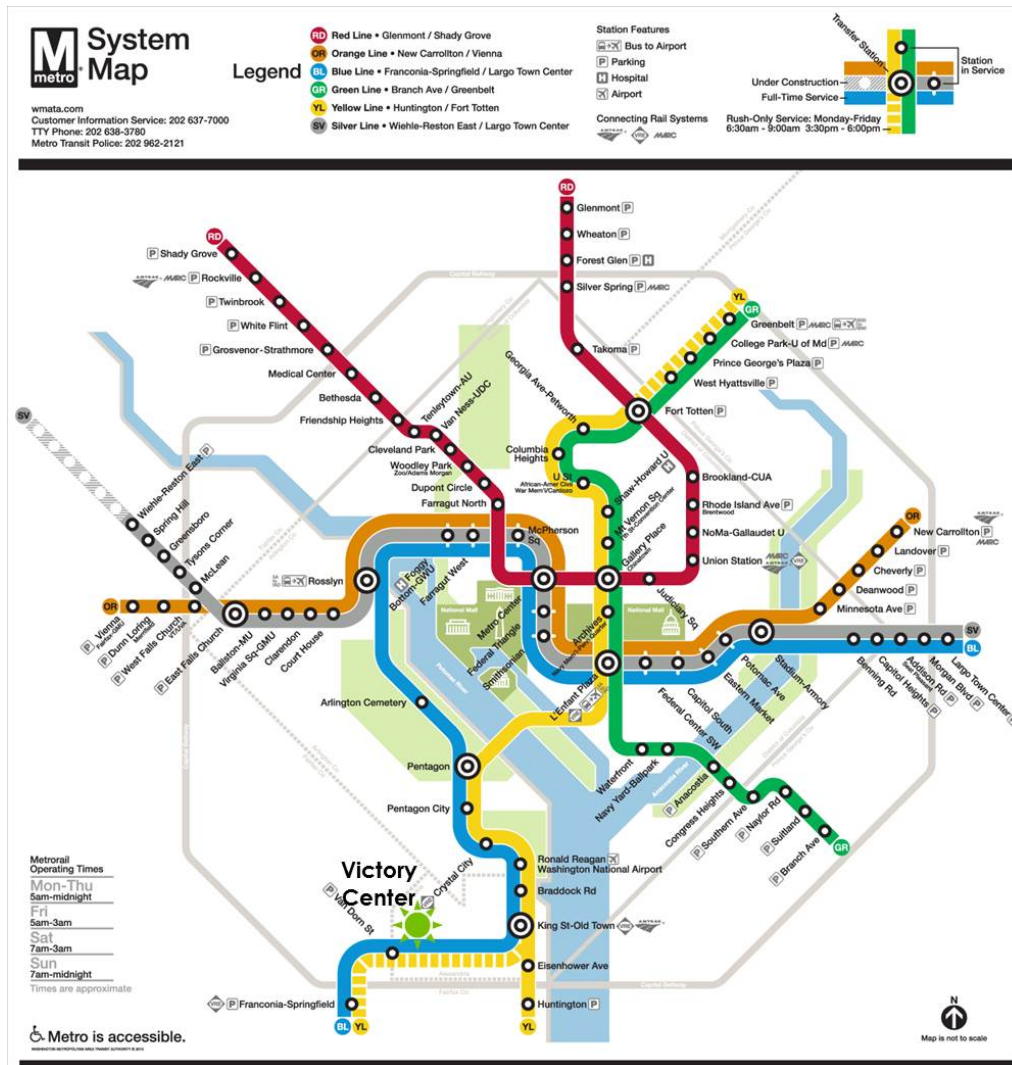


Figure 36: Metrorail System Map (not to scale)

VIRGINIA RAILWAY EXPRESS (VRE) RAIL SYSTEM

The Virginia Railway Express (VRE) Rail System is a commuter rail system that connects Washington, D.C. to the surrounding counties in Northern Virginia (see Figure 37). There are two lines operated by VRE and all of the lines connect at four stations: Alexandria, Crystal City, L’Enfant Plaza, and Union Station (all of which provide connection to Metrorail).

The VRE Fredericksburg Line operates between Fredericksburg, Virginia and Union Station in Washington, D.C. This line connects with the Metrorail system at Franconia Springfield, Alexandria, Crystal City on the Blue and Yellow Lines, L'Enfant Plaza on the Yellow, Green, Blue, Silver, and Orange Lines, and Union Station on the Red Line. The Fredericksburg Line operates seven trains in the northbound (inbound) direction in the morning peak hour beginning at 5:05 AM and seven trains in the southbound (outbound) direction in the evening peak hour beginning at 12:55 PM. VRE also has an agreement with AMTRAK to cross-honor tickets to provide additional services on this line.

The VRE Manassas Line operates between Manassas, Virginia and Union Station in Washington, D.C. This line connects with the Metrorail system at Alexandria and Crystal City on the Blue and Yellow Lines, L'Enfant Plaza on the Yellow, Green, Blue, Silver, and Orange Lines, and Union Station on the Red Line. The Manassas Line operates eight trains in the northbound (inbound) direction in the morning peak hour beginning at 5:05 AM and eight trains in the southbound (outbound) direction in the evening peak hour beginning at 1:15 PM.

The Victory Center site does not have direct access to VRE. Rather, VRE serves two locations which are only one stop on the Blue Line from the Van Dorn Street Metrorail Station. The Fredericksburg Line has a transfer point with the Metrorail Blue Line at the Franconia-Springfield Metrorail Station, and the Manassas Line has a transfer point with the Metrorail Blue and Yellow lines at the King Street Metrorail station.



Figure 37: VRE Rail System Map (not to scale)

METROBUS, FAIRFAX CONNECTOR, AND DASH

The Victory Center site is directly served by DASH Routes AT1 and AT7. Route AT1 runs along Eisenhower Avenue with connections to the King Street, Eisenhower Avenue, and Van Dorn Street Metrorail stations. On weekdays, it operates from approximately 5:00 AM to 10:30 PM, at 30-minute peak period headways and 60-minute off-peak headways. It operates from 6:45 AM to 10:30 PM on Saturdays with 60-minute headways. Route AT7 also runs along Eisenhower Avenue providing weekday service with connections to the King Street, Eisenhower Avenue, and Van Dorn Street Metrorail stations. It operates from approximately 5:40 AM to 9:15 PM, at 30-minute headways.

Several other Metrobus, Fairfax Connector, and DASH routes serve the nearby Van Dorn Street Metrorail station, which lies within one-half mile of Victory Center (see Figure 38 and Table 11). These routes could be accessed by employees and visitors of the proposed site.

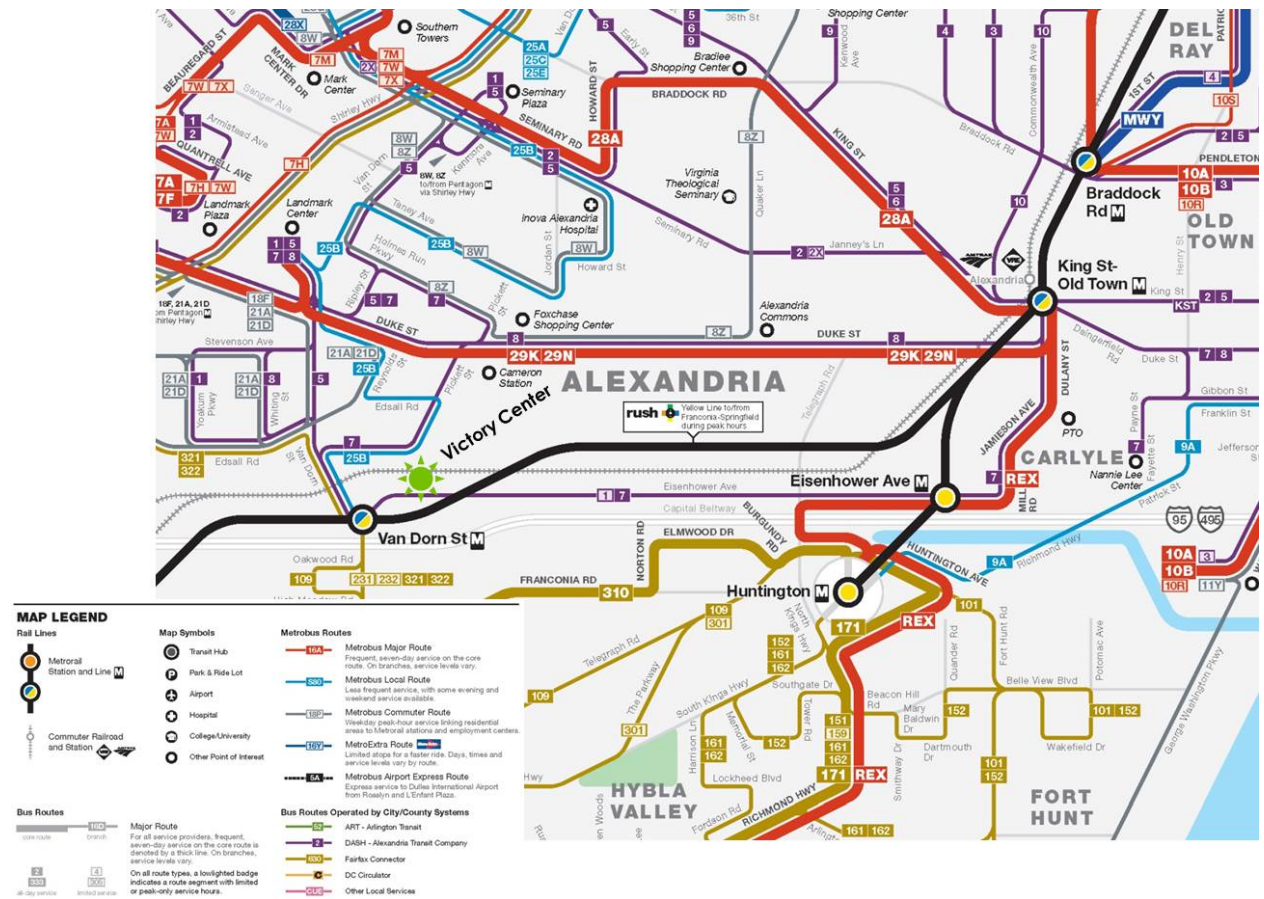


Figure 38: Metrobus, Fairfax Connector, and DASH Routes (Not to Scale)

Table 11: Metrobus, Fairfax County Connector, DASH Routes that Stop at the Van Dorn Metrorail Station

Route	Operating Hours (Monday – Friday)	Average Headway at Van Dorn Station
Metrobus Route 25B	6:00 AM – 10:30 PM	Peak: 30 minutes Off-Peak: 1 hour
DASH Route AT5	5:30 AM – 11:00 PM	30 minutes
DASH Route AT8	5:00 AM – 12:15 AM	20 – 30 minutes
Fairfax Connector Route 109 (Rose Hill)	5:00 AM – 11:30 PM	30 minutes
Fairfax Connector Route 321/322 (Greater Springfield Circulator)	4:00 AM – 11:00 PM	Peak: 30 minutes Off-Peak: 1 hour
Fairfax Connector Route 231/232 (Kingstowne Line)	5:00 AM – 10:00 AM 3:00 PM – 10:00 PM	30 minutes

PEDESTRIAN FACILITIES

Typical four-foot wide sidewalks exist on both the north and south sides of Eisenhower Avenue throughout the study area. A pedestrian signal with a marked crosswalk exists in front of the site. Marked crossings on Eisenhower Avenue are also present at the S Van Dorn Street, Metro Road, and Eisenhower Avenue Connector/Clermont Avenue intersections. Sidewalks exist on the east side of S Van Dorn Street, both sides of Metro Road, and the west side of Eisenhower Avenue Connector. Marked pedestrians are present at the intersections of Metro Road/Summer Grove Road and Eisenhower Avenue Connector/I-495 eastbound ramp.

Traditional man-hand pedestrian signals are provided at the majority of the nearby signalized intersections, as well as curb ramps. However, most curb ramps do not meet current Americans with Disabilities Act (ADA) guidelines.

Victory Center lies within 2,640 feet (or ½ mile) walking distance to a Metrorail station. A study was conducted to evaluate the optimal travel path between Victory Center and the Van Dorn Metrorail station (Figure 39). The walking distance was measured from three (3) locations at the Metro station, the total distance from each location to the front door of Victory Center are summarized below:

- Station threshold to front door: 2,535 feet
- Metrorail turnstile to front door: 2,595 feet

- Accessible elevator to front door: 2,631 feet.

Pedestrians would access the site via two (2) crossings on Eisenhower Avenue to facilitate access to the Van Dorn Metrorail Station. A new signalized crossing would be located at the west driveway and augment the existing signalized crossing directly in front of the building.

The onsite portion of the travel path was reviewed to ensure that the travel path would meet ADA requirements of slopes of less than five (5) percent. Recommendations were made so that the estimated slope between Points A and B (Figure 39) would be approximately 1.4 percent and approximately 0.8 percent between Points B and C. This could be accomplished by regrading the existing berm between the parking lot and Eisenhower Avenue during the time of construction.

BICYCLE FACILITIES

According to the Alexandria Bike Map, Eisenhower Avenue from S Van Dorn Street to Cameron Run is classified as an On-Road Bikeway. East of Cameron Run, Eisenhower Avenue is classified as an Off-Road Bikeway. The Eisenhower Avenue Connector from is classified as an On-Road Bikeway. A bike/pedestrian connection exists south of the I-495 ramp, which connects to Clermont Avenue. In addition there are 20 bicycle parking spaces and six bicycle lockers located at the Van Dorn Street metro station.

EXISTING LAND USE AND COMPREHENSIVE PLANS

LAND USE

According to the City of Alexandria 2015 Zoning Map, the Victory Center site is located within the Office Commercial Medium (OCM (100)) zone. Existing land uses around the site include offices and light industrial/warehousing.

EISENHOWER WEST SMALL AREA PLAN

The Victory Center site also lies within the Eisenhower West Small Area, which was identified in the FY 2014 Interdepartmental Work Program, approved by City Council on May 29, 2013, for a major planning effort beginning in FY 2014. The Eisenhower West Small Area planning process will engage the community and stakeholders in formulating a future vision for the Eisenhower West Small Area through 2040; generate plan principles and goals; and develop a general draft framework for the area including land use, connectivity and transportation, and density options. The plan will address how the area can take advantage of its location near transit and regional roadway networks, and improve connectivity and the quality of life in the plan area. It is anticipated that the Small Area Plan will be completed in mid to late 2015.

The City has also undertaken the Eisenhower West Transportation Study which will serve as the transportation element/analysis of the Small Area Plan. It will include the analysis of various land use scenarios identified in the Small Area Plan, and will conduct additional analyses of a proposed multi-modal bridge concept that was recommended as part of the Landmark/Van Dorn Corridor Plan (adopted in 2009). The proposed bridge would provide a direct connection between the Van Dorn Metrorail station and Pickett Street, and serve future anticipated development. The Transportation Study is anticipated to be completed in Spring 2015.



Figure 39: Walking Path from Van Dorn Metrorail Station to Victory Center

EXISTING ROADWAY NETWORK AND VOLUMES

Regional access to Victory Center is provided from the Capital Beltway (I-495/I-95), S Van Dorn Street, and the Eisenhower Connector at Clermont Avenue via full-movement, grade-separated interchanges. Local access is provided by Eisenhower Avenue. Vehicular access to Victory Center would be provided by five (5) driveways on Eisenhower Avenue. The primary driveway for employees would be located on the east side of the building and would provide access to the 985-space parking garage. A secondary driveway is located on the west side of the building and would serve a visitor parking area of approximately 200 surface parking spaces. These two driveways are the focus of the traffic study. The other driveways are considered minor and are planned for delivery vehicles and access to a limited number of surface parking spaces adjacent to the retail space on the east side of the building (see Figure 40).

An inventory of the study area roadways, as well as Existing Conditions peak hour traffic volumes are discussed below. A diagram of existing lane configurations and traffic controls is contained in Figure 41.

ROADWAY INVENTORY

The Capital Beltway (Interstate 495/95) is a multi-lane freeway with a posted speed limit of 55 miles per hour, and carries approximately 306,000 average daily vehicles (ADT) according to 2013 VDOT traffic data. Interchanges are provided at S Van Dorn Street and the Eisenhower Avenue Connector.

S Van Dorn Street (Route 401/613) is a four-lane divided minor arterial with an at-grade signalized intersection at Eisenhower Avenue in the vicinity of the subject property. It has a posted speed limit of 35 miles per hour and carries approximately 100,000 ADT, according to the VDOT 2013 traffic data. A fully directional, grade-separated interchange is provided with I-495/I-95.

Eisenhower Avenue is a four-lane minor arterial with a posted speed limit of 35 miles per hour and carries approximately 12,000 ADT, according to VDOT 2013 data. The roadway provides direct access to the Victory Center site and has at-grade signalized intersections with S Van Dorn Street, Metro Road, the Metro Station bus access road, and Clermont Avenue/Eisenhower Avenue Connector. The roadway also has a two-way left-turn lane between Clermont Avenue/Eisenhower Avenue Connector and the Metro Bus Loop Driveway.

Eisenhower Avenue Connector is a four-lane, median-divided, major collector roadway with a posted speed limit of 35 miles per hour. According to VDOT, it carries approximately 13,000 ADT between I-495 westbound ramps and Eisenhower Avenue. Access to I-495/I-95 is provided via a grade-separated interchange. The roadway has at-grade signalized intersections with Eisenhower Avenue and the I-495 eastbound ramps.

EXISTING TRAFFIC CONTROLS

The following study intersections operate under signal control:

1. Eisenhower Avenue/S Van Dorn Street
2. Summers Grove Road/Metro Road
3. Eisenhower Avenue/Metro Road
4. Eisenhower Avenue/UPS Driveway/Metro Bus Loop
5. Eisenhower Avenue/Clermont Avenue/Eisenhower Avenue Connector

6. I-495 Westbound Ramps/Eisenhower Avenue Connector

The following study intersections currently operate under STOP/YIELD sign control:

1. I-495 Eastbound Ramps/Eisenhower Avenue Connector
2. Eisenhower Avenue/Victory Center Driveways (2)

EXISTING TRAFFIC VOLUMES

Vehicle turning movement counts were conducted at the following eight (8) intersections by Wells and Associates from 6:00 to 9:00 AM and 4:00 to 7:00 PM on Wednesday February 27, 2014 and Tuesday October 21, 2014:

- Eisenhower Avenue/S Van Dorn Street
- Summers Grove Road/Metro Road
- Eisenhower Avenue/Metro Road
- Eisenhower Avenue/UPS Driveway/Metro Bus Loop
- Eisenhower Avenue/Clermont Avenue/Eisenhower Avenue Connector
- I-495 Westbound Ramps/Eisenhower Avenue Connector
- I-495 Eastbound Ramps/Eisenhower Avenue Connector
- Eisenhower Avenue/Victory Center Driveways (2)

The resulting 2014 baseline peak hour traffic volumes for each intersection are summarized on Figure 42. To provide a more conservative analysis, individual intersection peak hours were used. In addition, peak hour traffic volumes were balanced to within 10 percent along Eisenhower Avenue between S Van Dorn Street and Metro Road.

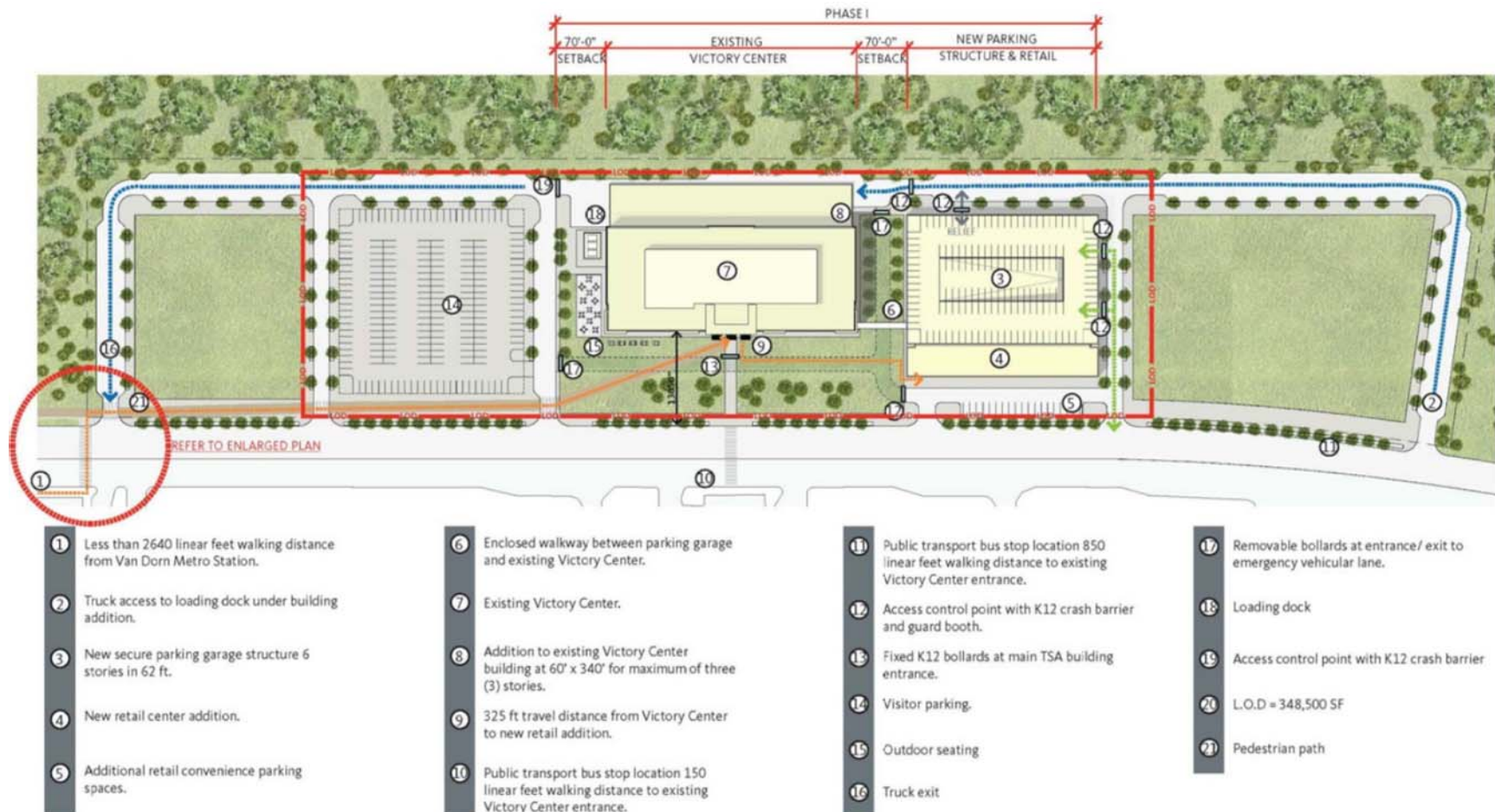


Figure 40: Victory Center Site Plan

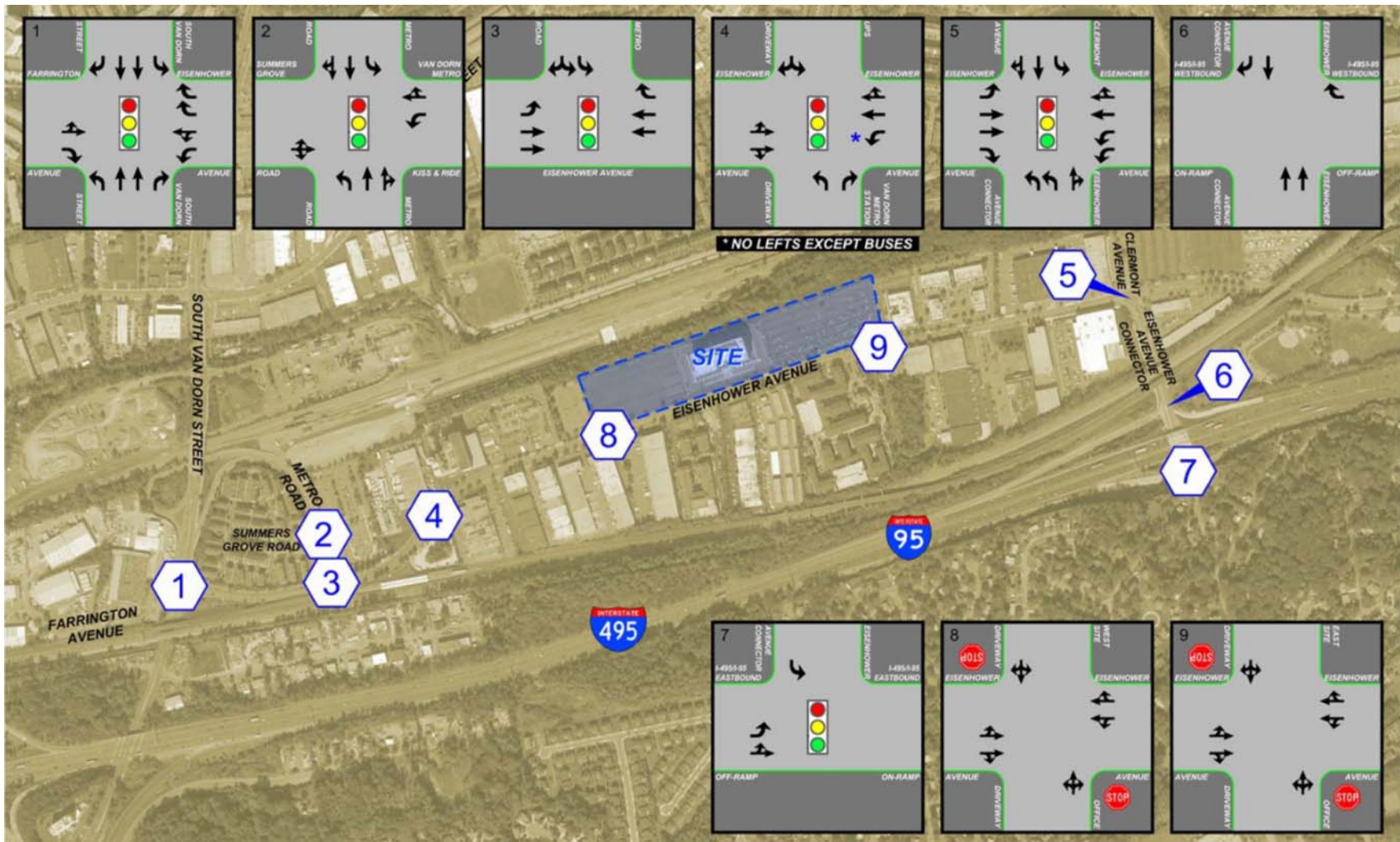


Figure 41: Existing Lane Use and Traffic Controls (Not to Scale)

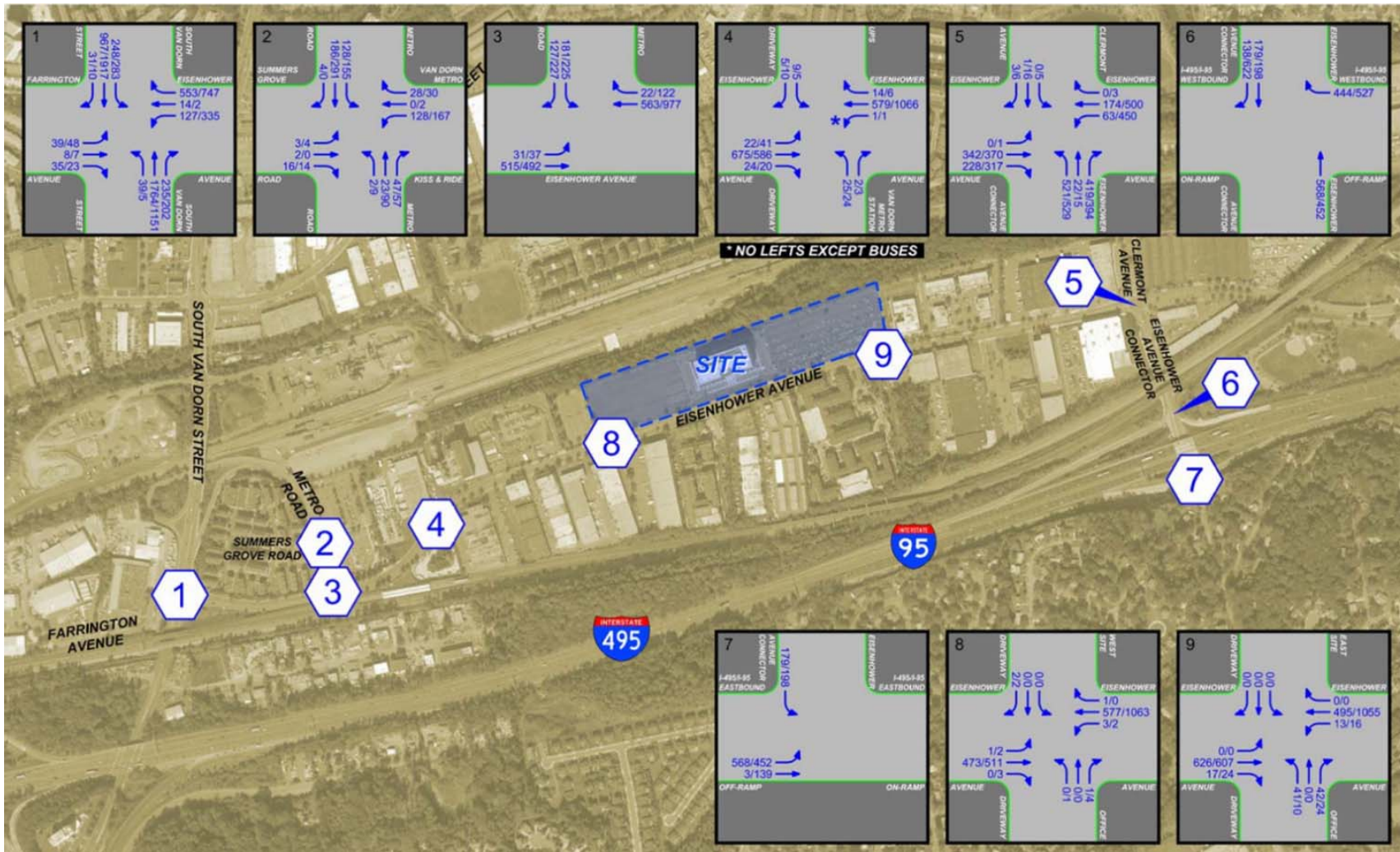


Figure 42: 2014 Existing Condition AM and PM Peak Hour Traffic Volumes (Not to Scale)

EXISTING CONDITIONS TRAFFIC OPERATIONAL ANALYSIS

The Virginia Department of Transportation (VDOT) requires that a capacity analysis be performed based on the Highway Capacity Manual (HCM). Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed using Synchro 7 (Build 773, Rev 8), which is based on the methodology of the *2000 Highway Capacity Manual (HCM)* to establish average volume to capacity (v/c) ratios, delays, and Level of Service (LOS) for each intersection. Roadway geometry, signal timing, and traffic data were entered into the model.

The VDOT Traffic Operations Analysis Toll Guidebook (the “Guide”), recommends that use of HCM 2000 when utilizing Synchro analysis software due to several restrictions with the HCM 2010 methodologies that are not fully incorporated into Synchro. Therefore, the HCM 2000 capacity analysis results were utilized in this analysis.

The v/c ratio relates the demand at a particular intersection (traffic volume) to the available capacity. The available capacity for each movement varies depending on number of lanes, lane width, perception/reaction time, green time, and cycle length, among others. A v/c ratio of 1.0 indicates that the demand for a particular movement is equal to the capacity. A movement with a v/c ratio at or over 1.0 is considered undesirable because the movement volume exceeds the capacity, which results in queuing, indicating unmet demand along that approach.

LOS is an evaluation of the quality of operation of an intersection and is a measure of the average delay a driver experiences while traveling through the intersection. LOS is dependent on a range of defined operating conditions such as traffic demand, lane geometry, and traffic signal timing and phasing.

LOS can range from A to F and is based on the average control delay per vehicle in seconds. For a signalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay in excess of 80 seconds per vehicle. For an unsignalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay in excess of 50 seconds per vehicle. The delay criteria for signalized and unsignalized intersections are summarized in Table 12.

Table 12: LOS Thresholds

Level of Service	Average Control Delay (seconds/vehicle)	
	Signalized	Unsignalized
A	Less than or equal to 10.0	Less than or equal to 10.0
B	>10.0 and ≤20.0	>10.0 and ≤15.0
C	>20.0 and ≤35.0	>15.0 and ≤25.0
D	>35.0 and ≤55.0	>25.0 and ≤35.0
E	>55.0 and ≤80.0	>35.0 and ≤50.0
F	Greater than 80.0 or v/c greater than 1.0	Greater than 50.0 or v/c greater than 1.0

2014 EXISTING CONDITIONS CAPACITY ANALYSIS

Using the existing traffic volumes and lane geometries, an intersection capacity analysis was performed for the AM and PM peak hours. As shown in Table 13, all of the signalized intersections operate at overall acceptable levels of service (LOS D or better) during both peak hours, except:

- The signalized intersection of Eisenhower Avenue and S Van Dorn Street currently operates near capacity and an overall LOS E during both peak hours. It was noted in the field that queuing occurs on S Van Dorn Street in the peak direction during each peak hour and somewhat constrains traffic during these periods.
- The intersection of Summers Grove Road and Metro Road operates at LOS F during the AM peak hour and LOS E during the PM peak hour. This is in part due to the east/west split phasing and the heavy volume leaving the Kiss & Ride facility.

Table 13: 2014 Existing Condition Level of Service Summary

Intersection	Intersection Control	Critical Movement	2014 Existing	
			AM	PM
(1) Eisenhower Avenue/ S Van Dorn Street	Signal	EBLT	F (93.9)	F (88.4)
		EBR	F (80.6)	E (78.7)
		WBL	E (76.0)	F (195.5)
		WBT	E (75.9)	F (197.0)
		WBR	E (60.3)	F (123.7)
		NBL	E (77.3)	E (79.1)
		NBT	E (73.9)	C (32.1)
		NBR	D (35.0)	C (32.8)
		SBL	F (168.3)	F (272.8)
		SBT	C (26.4)	D (44.0)
		SBR	B (19.2)	B (17.3)
		Overall	E (64.2)	E (79.7)
(2) Summers Grove Road/Metro Road	Signal	EBLTR	C (33.9)	C (33.4)
		WBL	F (363.1)	F (219.1)
		WBTR	B (14.8)	B (14.3)
		NBL	B (15.3)	B (15.7)
		NBTR	B (15.5)	B (16.2)
		SBL	B (19.9)	C (23.0)
		SBTR	B (16.9)	B (18.2)
		Overall	F (100.6)	E (62.1)
(3) Eisenhower Avenue/Metro Road	Signal	EBL	A (7.5)	B (10.5)
		EBT	A (8.7)	A (9.6)
		WBT	B (19.0)	D (40.3)
		WBR	A (0.0)	A (0.1)
		SBL	C (32.7)	C (32.4)
		SBR	C (25.6)	C (23.4)
		Overall	B (17.2)	C (27.6)
(4) Eisenhower Avenue/Metro Bus Loop Driveway	Signal	EBLTR	A (1.6)	A (1.6)
		WBL	A (1.5)	A (1.6)
		WBTR	A (2.2)	A (3.3)
		NBL	D (46.6)	D (40.7)
		NBR	D (35.6)	C (33.3)
		SBLTR	D (36.4)	C (33.7)
		Overall	A (3.4)	A (3.6)
(5) Eisenhower Avenue/Clermont Avenue/Eisenhower Avenue Connector	Signal	EBL	A (0.0)	D (51.5)
		EBT	B (18.8)	C (31.2)
		EBR	B (19.7)	D (35.0)
		WBL	D (37.6)	D (45.1)
		WBTR	A (10.0)	B (17.6)
		NBL	D (53.9)	F (125.9)
		NBTR	C (23.4)	C (31.7)
		SBL	A (0.0)	E (61.9)
		SBT	D (41.2)	D (44.1)
		SBR	D (40.6)	D (43.2)
Overall	C (30.2)	D (51.3)		

Table 13 Continued: 2014 Existing Condition Level of Service Summary

Intersection	Intersection Control	Critical Movement	2014 Existing	
			AM	PM
(6) I-495 WB Ramps/Eisenhower Avenue Connector	Yield	WBR	A [0.0]	A [0.0]
(7) I-495 EB Ramps/Eisenhower Connector	Signal	EBL	A (5.1)	A (5.3)
		EBT	A (5.1)	A (5.2)
		SBL	A (9.9)	B (11.5)
		Overall	A (6.2)	A (6.8)
(8) Eisenhower Avenue/West Site Driveway	Stop	EBLTR	A [0.0]	A [0.1]
		WBLTR	A [0.1]	A [0.1]
		NBLTR	B [10.4]	C [15.2]
		SBLTR	B [10.3]	B [12.9]
(9) Eisenhower Avenue/East Site Driveway	Stop	EBLTR	A [0.0]	A [0.0]
		WBLTR	A [0.6]	A [0.5]
		NBLTR	C [19.3]	C [19.8]
		SBLTR	A [0.0]	A [0.0]
		Overall	N/A	N/A

Notes: Analysis performed using Synchro, Version 7. Values in () represent signalized delay in seconds. Values in [] represent unsignalized delay in seconds. *-Delay exceeds 999 seconds.

TRANSPORTATION IMPACTS

It was assumed that the proposed development would be completed and occupied by 2019. Therefore, this traffic analysis will evaluate a future year of 2019.

FUTURE CONDITIONS ANALYSIS WITHOUT CONSOLIDATION (NO ACTION ALTERNATIVE)

The No Action Conditions Analysis examines the future anticipated volumes without the traffic that would be generated by consolidating TSA employees at the Victory Center site. This analysis includes existing traffic volumes grown to the anticipated build year, any approved but un-built developments (pipeline developments) in the study area, and any funded infrastructure improvements in the study areas.

REGIONAL TRAFFIC GROWTH

A review of historical average annual daily traffic (AADT) published by VDOT indicates that regional traffic volumes along Eisenhower Avenue are stable. However, to provide a more conservative analysis, an annual growth rate of 1.0 percent (compounded annually) was applied to the turning movements at the study area intersections for the horizon year of 2019. Baseline volumes were grown as described above and the resulting growth in trips is shown in Figure 43.

OTHER DEVELOPMENT TRAFFIC FORECASTS

Based on coordination with the City of Alexandria, four (4) pipeline developments were used in the development of background future traffic forecasts for this study revision:

1. **Block 8:** 585,000 SF office and 22,120 SF retail
2. **Block 19:** 505 residential units
3. **Landmark Gateway:** 494 dwelling units and 10,746 SF retail
4. **Cameron Park:** 468 residential units and 36,919 SF retail

The number of AM and PM peak hour trips that would be generated by the pipeline developments were taken from recently completed traffic studies and are based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (9th Edition). As shown in Table 14, the four (4) pipeline developments are estimated to generate a total of 913 new AM peak hour trips, 1,195 new PM peak hour trips, and 11,863 new daily trips. It should be noted that the trip generation estimates shown in the table also include non-auto mode split, and internal trip reductions applied in the various traffic impact studies.

A portion of the trips generated by the pipeline developments are anticipated to travel through the study intersections for this project, and were assigned to the existing road network based on those assumptions used in the associated traffic studies. However, it should be noted that the project development forecasts are presented for the sole purpose of reasonably reflecting background traffic volumes. They do not constitute an independent economic forecast. Individual projects may develop at a faster or slower pace than forecasted here. The combined peak hour traffic forecasts of the pipeline developments are shown in Figure 44.

Table 14: Pipeline Development Trip Generation Summary

Development/Use	AM Peak Hour			PM Peak Hour			Weekday Average Daily Traffic
	In	Out	Total	In	Out	Total	
(1) Block 8: 585,000 SF Office and 22,120 SF Retail	360	60	420	122	359	481	4,004
(2) Block 9: 505 Residential Units	27	80	107	74	48	122	1,494
(3) Landmark Gateway: 494 Dwelling Units and 10,746 SF Retail	73	131	204	157	130	287	2,921
(4) Cameron Park: 468 Residential Units and 36,919 SF Retail	27	155	182	203	102	305	3,444
Total Pipeline Development Net New Trips	487	426	913	556	639	1,195	11,863

(1) Trip generation obtained from "Park Meridian at Eisenhower Station, Traffic Impact Study" completed by Kimley-Horn and Associates, Inc.

(2) Based on Trip Generation Memorandum prepared by Patton Harris Rust & Associates dated October 25, 2011.

(3) Trip generation calculations based on ITE *Trip Generation Manual* (9th Edition).

(4) Weekday ADT based on ITE *Trip Generation Rates* (9th Edition). Peak hour trips observed by Wells and Associates on 2-27-2013.

(5) Non-auto trip reduction is based on goals detailed in the Landmark/Van Dorn Corridor Plan.

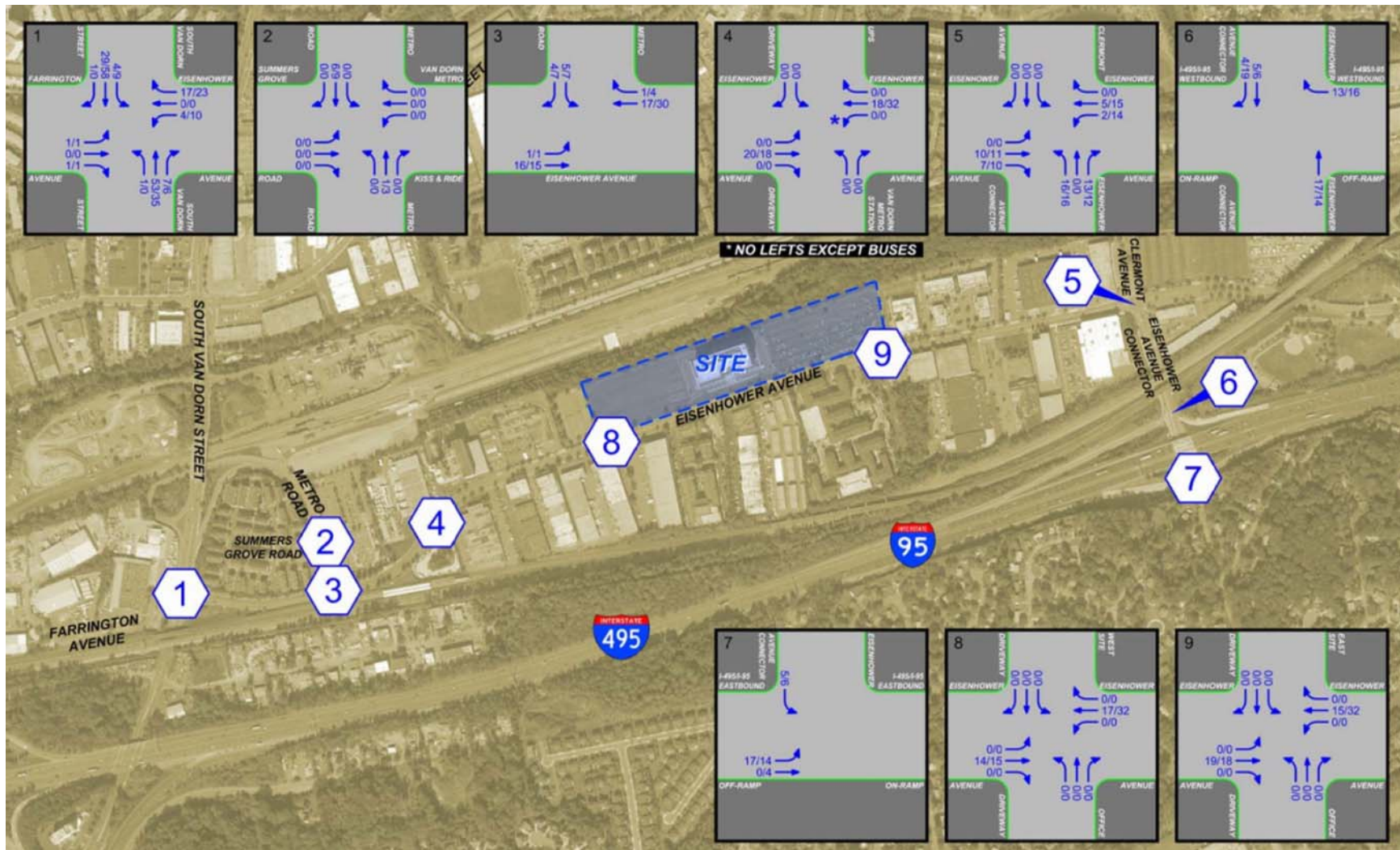


Figure 43: 2019 Regional Traffic Growth (Not to Scale)

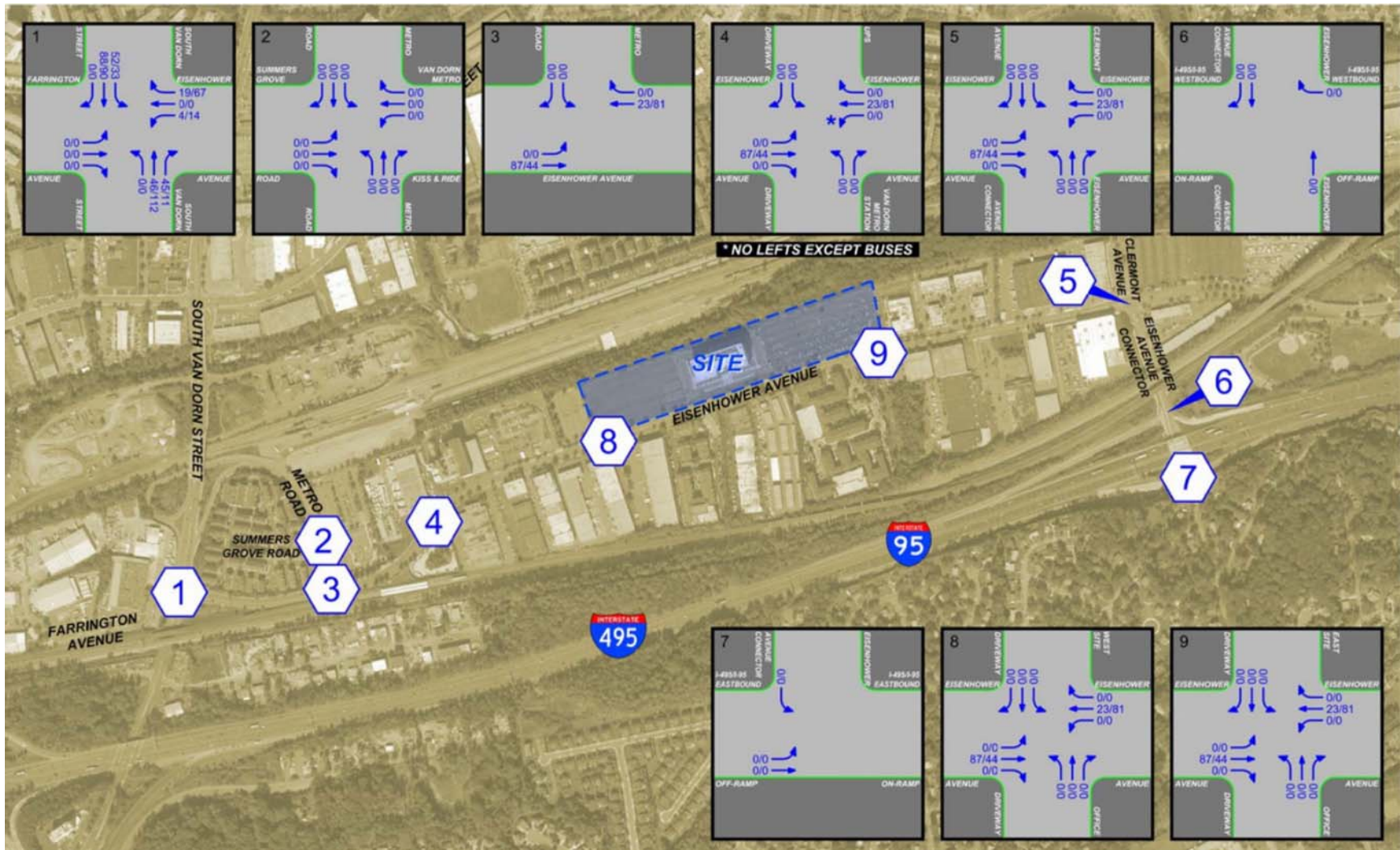


Figure 44: Pipeline Development Trip Distribution (Not to Scale)

NO ACTION ALTERNATIVE CAPACITY ANALYSIS RESULTS

The No Action Alternative capacity analysis results are shown in Table 15. The results of the capacity analysis indicated the following:

- As a result of background regional growth and pipeline development related trips, the intersections within the study area would see an increase in vehicle trips.
- In addition to the intersections of Eisenhower Avenue and S Van Dorn Street, and Summers Grove Road and Metro Road, the intersections of Eisenhower Avenue and Metro Road, and Eisenhower Avenue and Eisenhower Avenue Connector/Clermont Avenue would operate at LOS E or F in one or both peak hours.
- Specific and/or individual movements and approaches at some signalized intersections would continue to operate at LOS “F” during one or more peak hours.

Table 15: 2014 Existing Condition and 2019 No Action Alternative Level of Service Summary

Intersection	Intersection Control	Critical Movement	2014 Existing		2019 No Action	
			AM	PM	AM	PM
(1) Eisenhower Avenue/ S Van Dorn Street	Signal	EBLT	F (93.9)	F (88.4)	F (86.4)	F (89.0)
		EBR	F (80.6)	E (78.7)	E (79.1)	E (78.7)
		WBL	E (76.0)	F (195.5)	F (80.3)	F (404.2)
		WBT	E (75.9)	F (197.0)	F (80.6)	F (407.4)
		WBR	E (60.3)	F (123.7)	E (73.1)	F (270.9)
		NBL	E (77.3)	E (79.1)	E (77.4)	E (79.1)
		NBT	E (73.9)	C (32.1)	F (89.0)	C (35.4)
		NBR	D (35.0)	C (32.8)	D (42.4)	C (34.3)
		SBL	F (168.3)	F (272.8)	F (557.9)	F (408.4)
		SBT	C (26.4)	D (44.0)	C (28.4)	D (63.9)
		SBR	B (19.2)	B (17.3)	B (19.6)	B (17.3)
		Overall	E (64.2)	E (79.7)	F (108.8)	F (146.7)
(2) Summers Grove Road/Metro Road	Signal	EBLTR	C (33.9)	C (33.4)	C (33.9)	C (33.4)
		WBL	F (363.1)	F (219.1)	F (363.1)	F (219.1)
		WBTR	B (14.8)	B (14.3)	B (14.8)	B (14.3)
		NBL	B (15.3)	B (15.7)	B (15.3)	B (15.7)
		NBTR	B (15.5)	B (16.2)	B (15.6)	B (16.2)
		SBL	B (19.9)	C (23.0)	C (20.0)	C (24.1)
		SBTR	B (16.9)	B (18.2)	B (17.5)	B (18.2)
		Overall	F (100.6)	E (62.1)	F (91.5)	E (58.7)
(3) Eisenhower Avenue/Metro Road	Signal	EBL	A (7.5)	B (10.5)	A (9.4)	B (12.7)
		EBT	A (8.7)	A (9.6)	A (12.5)	B (10.4)
		WBT	B (19.0)	D (40.3)	C (26.0)	F (183.2)
		WBR	A (0.0)	A (0.1)	A (0.0)	A (0.2)
		SBL	C (32.7)	C (32.4)	C (33.1)	C (34.1)
		SBR	C (25.6)	C (23.4)	C (23.2)	C (23.0)
		Overall	B (17.2)	C (27.6)	C (20.1)	F (101.1)
(4) Eisenhower Avenue/Metro Bus Loop Driveway	Signal	EBLTR	A (1.6)	A (1.6)	A (2.2)	A (1.9)
		WBL	A (1.5)	A (1.6)	A (1.6)	A (1.6)
		WBTR	A (2.2)	A (3.3)	A (2.4)	A (4.9)
		NBL	D (46.6)	D (40.7)	D (46.6)	D (40.7)
		NBR	D (35.6)	C (33.3)	D (35.6)	C (33.3)
		SBLTR	D (36.4)	C (33.7)	D (36.4)	C (33.8)
		Overall	A (3.4)	A (3.6)	A (3.4)	A (4.6)
(5) Eisenhower Avenue/Clermont Avenue/Eisenhower Avenue Connector	Signal	EBL	A (0.0)	D (51.5)	A (0.0)	E (57.1)
		EBT	B (18.8)	C (31.2)	B (19.8)	C (29.9)
		EBR	B (19.7)	D (35.0)	C (21.2)	E (59.9)
		WBL	D (37.6)	D (45.1)	D (37.7)	E (55.2)
		WBTR	A (10.0)	B (17.6)	B (10.2)	B (16.6)
		NBL	D (53.9)	F (125.9)	F (210.1)	F (277.3)
		NBTR	C (23.4)	C (31.7)	C (23.5)	D (37.7)
		SBL	A (0.0)	E (61.9)	A (0.0)	E (65.8)
		SBT	D (41.2)	D (44.1)	D (41.2)	D (49.1)
		SBR	D (40.6)	D (43.2)	D (40.6)	D (48.2)
Overall	C (30.2)	D (51.3)	F (85.1)	F (86.0)		

Table 15 Continued: 2014 Existing Condition and 2019 No Action Alternative Level of Service Summary

Intersection	Intersection Control	Critical Movement	2014 Existing		2019 No Action	
			AM	PM	AM	PM
(6) I-495 WB Ramps/Eisenhower Avenue Connector	Yield	WBR	A [0.0]	A [0.0]	A [0.0]	A [0.0]
(7) I-495 EB Ramps/Eisenhower Connector	Signal	EBL	A (5.1)	A (5.3)	A (5.2)	A (8.1)
		EBT	A (5.1)	A (5.2)	A (5.2)	A (8.1)
		SBL	A (9.9)	B (11.5)	B (12.3)	B (11.7)
		Overall	A (6.2)	A (6.8)	A (6.8)	A (9.3)
(8) Eisenhower Avenue/West Site Driveway	Stop	EBLTR	A [0.0]	A [0.1]	A [0.0]	A [0.1]
		WBLTR	A [0.1]	A [0.1]	A [0.1]	A [0.1]
		NBLTR	B [10.4]	C [15.2]	B [10.4]	C [15.2]
		SBLTR	B [10.3]	B [12.9]	B [10.3]	B [12.9]
(9) Eisenhower Avenue/East Site Driveway	Stop	EBLTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		WBLTR	A [0.6]	A [0.5]	A [0.6]	A [0.5]
		NBLTR	C [19.3]	C [19.8]	C [19.3]	C [19.8]
		SBLTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		Overall	N/A	N/A	N/A	N/A

Notes: Analysis performed using Synchro, Version 7. Values in () represent signalized delay in seconds. Values in [] represent unsignalized delay in seconds. *-Delay exceeds 999 seconds.

FUTURE CONDITIONS WITH CONSOLIDATION (ACTION ALTERNATIVE)

The Action Alternative Conditions Analysis examines future anticipated volumes, taking into consideration traffic under the No Action Alternative as well as traffic that would be generated by the proposed collocation of 3,800 TSA employees.

SITE TRIP GENERATION

The number of trips that would be generated by the proposed collocation of the TSA employees and contractors to the Victory Center site (666,000 GSF of office space), as well as the 10,000 SF of retail, was estimated utilizing the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (9th Edition).

The Victory Center site is located within close proximity to the Van Dorn Metrorail station. When evaluating potential sites for the TSA consolidation, the GSA required that all potential alternatives be located within one-half mile of a Metrorail station in order to support and encourage commuting by transit. In order to estimate the percentage of employees that would utilize transit if the Victory Center site was selected, TSA employees were given a survey that asked a variety of questions regarding their current commute mode and pattern, and how that would change if they were relocated to one of the potential alternative sites (see Chapter 2).

The results of the survey indicate that up to 37% of employees would commute via transit to the Victory Center site, with most planning to commute via Metrorail. However, survey respondents, particularly those taking a mode choice/commuter survey, typically indicate a higher degree of willingness or intent to commute by transit. Oftentimes the anticipated mode split is not realized because a portion of the respondents do not follow-through with making the mode adjustment to transit. Therefore, a 30% transit trip credit was applied in the traffic analysis in order to be conservative. The 30% trip credit also is consistent with the transportation demand management requirements (TDM) specified by the City of Alexandria for the Victory Center site.

As shown in Table 16, the proposed site would generate approximately 648 AM peak hour trips (556 inbound; 92 outbound), 624 PM peak hour trips (120 inbound; 504 outbound), and 4,349 daily trips.

Table 16: Victory Center Site Trip Generation Summary

Development/Use	AM Peak Hour			PM Peak Hour			Weekday Average Daily Traffic
	In	Out	Total	In	Out	Total	
TSA Offices: 666,000 GSF – Land Use Code 710	769	104	873	141	684	825	5,547
30% Mode Adjustment	-231	-31	-262	-42	-205	-248	-1,664
Specialty Retail: 10,000 SF – Land Use Code 826	18	19	37	21	25	46	466
Total New Site Generated Vehicle Trips	556	92	648	120	504	624	4,349

Notes: Trip generation based on rates and equations published in the ITE *Trip Generation Manual* (9th Edition). The AM peak hour (PH) rate for ITE Trip Generation Manual Land Use Code 826 (Specialty Retail) was calculated using the following formula:

$(AM\ PH\ of\ generator\ rate * PM\ PH\ of\ adjacent\ street\ rate) / PM\ PH\ of\ generator\ rate.$

This methodology is consistent with other previously approved traffic impact studies submitted to the City of Alexandria and/or VDOT.

SITE TRIP DISTRIBUTION

Vehicular trip distributions were based on the results on the TSA Commuter Survey Question 2 (see Chapter 2), which asked respondents to indicate their home zip code. Furthermore, based on the results of Survey Question 23, which asked respondents if they would move their residence to be closer to the Victory Center site, it is not anticipated that a significant portion of employees would change their location of residence if their office was relocated. Therefore, the distribution of zip codes from Question 2 was utilized to develop the following trip distribution percentages for the site generated vehicle trips:

- To/From North via Van Dorn Street: 30%
- To/From South via Van Dorn Street: 10%
- To/From East via Eisenhower Avenue: 5%
- To/From East via I-495: 15%
- To/From West via I-495: 40%

The site-generated vehicle volumes summarized in Table 18 were assigned to the roadway network utilizing the above percentages to develop the site trip assignment volumes (see Figure 45). The site-generated volumes were then added to the No Action alternative traffic volumes to develop Action alternative traffic volume (see Figure 46).

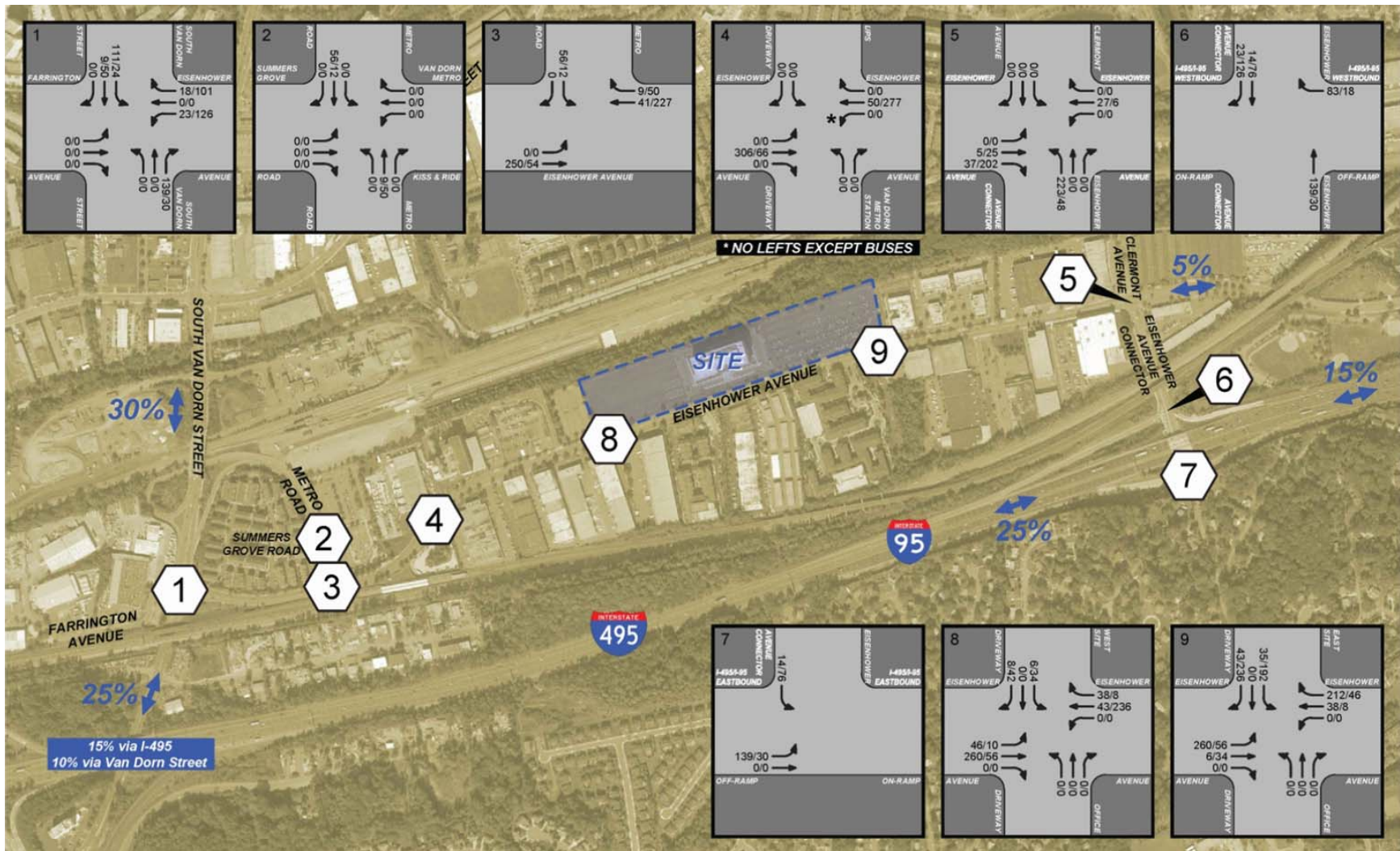


Figure 45: Site Trip Assignments (Not to Scale)

1
2

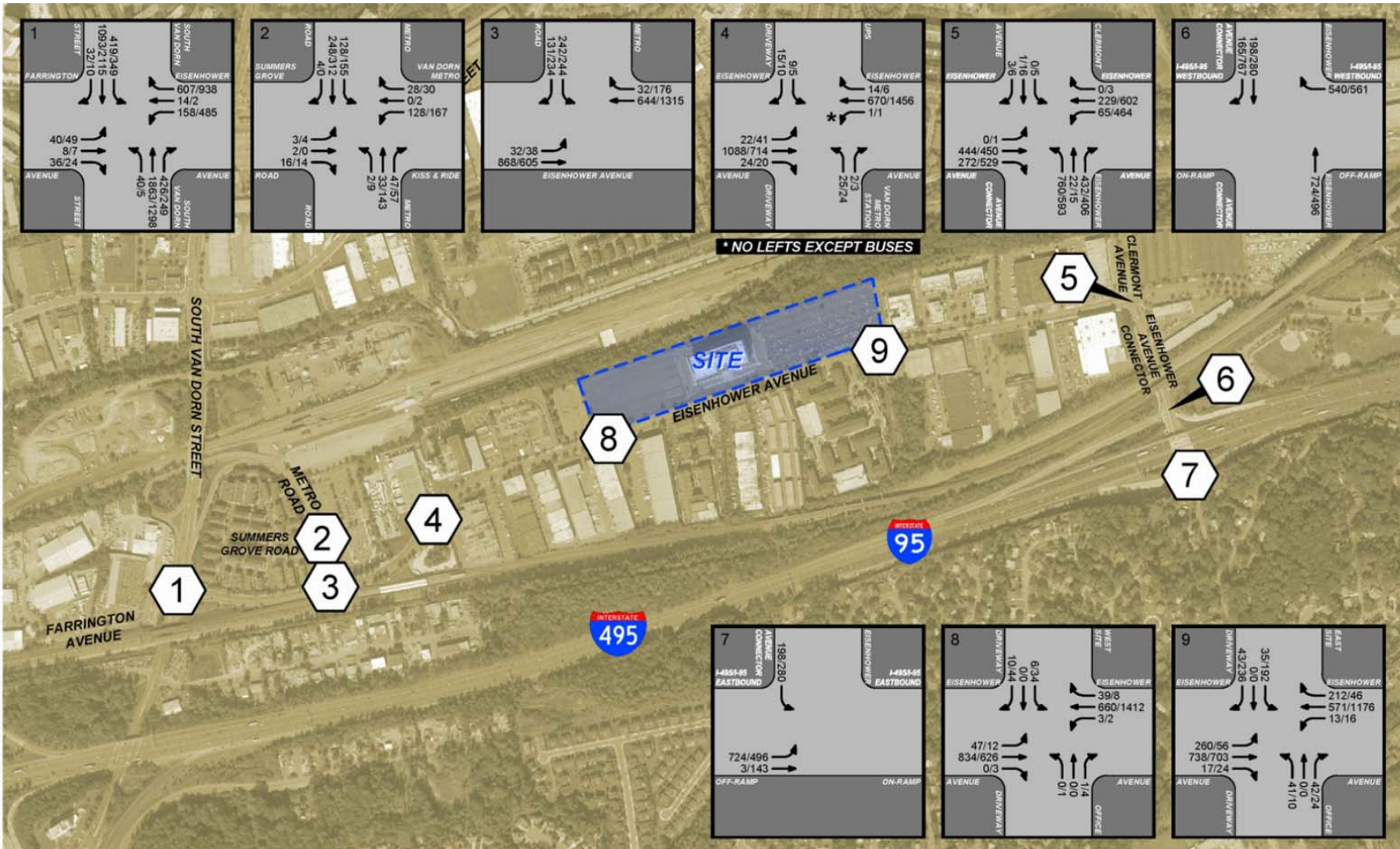


Figure 46: 2019 Action Alternative Traffic Forecasts (Not to Scale)

1
2

PROPOSED TRANSPORTATION IMPROVEMENTS

Based on the results of the previous traffic impact analysis (2008), several transportation improvements have been developed to mitigate the impacts associated with the Action alternative. It is noted that the proposed development is not the driving force of the recommendations as it only accounts for a percentage of the future traffic volumes. The recommendations presented below were derived based on the future traffic forecasts as a result of regional growth, the buildout of four (4) pipeline developments, and the expansion and occupancy of the Victory Center:

1. Eisenhower Avenue and S Van Dorn Street: Convert the protected southbound left turn on S Van Dorn Street to protected-permitted operation and optimize signal timing.
2. Summers Grove Road/Metro Road: Remove the east/west split phasing, provide protected-permitted westbound left turn phase, and optimize signal timing.
3. Eisenhower Avenue and Metro Road: Optimize PM peak hour signal timing.
4. Eisenhower Avenue at Eisenhower Avenue Connector/Clermont Avenue: Optimize AM and PM peak hour signal timings.
5. Install a traffic signal at the eastern site driveway.
6. Install a new pedestrian traffic signal with accessible features at the western most driveway serving the site.
7. Provide bicycle facilities in accordance with TSA requirements.

ACTION ALTERNATIVE CAPACITY ANALYSIS RESULTS

The Action Alternative capacity analysis results are shown in Table 17. The results of the capacity analysis indicated the following:

- As a result of the site traffic, the intersections within the study area would see an increase in vehicle trips over background future conditions.
- Assuming completion of the site-specific improvements, all of the study area intersections would continue to operate at acceptable levels of service (LOS D or better) during both peak hours, with the exception of the intersection of S Van Dorn Street and Eisenhower Avenue, which would continue to operate at LOS F in both peak hours.
- Individual movements at some signalized intersections would continue to operate at LOS F during one or more peak hours.
- The intersections of Eisenhower Avenue with the East and West Site Driveways would operate at acceptable levels of service (LOS C or better) during both peak hours.

Table 17: 2019 No Action and 2019 Action Alternative Level of Service Summary

Intersection	Intersection Control	Critical Movement	2019 No Action		2019 Action	
			AM	PM	AM	PM
(1) Eisenhower Avenue/ S Van Dorn Street	Signal	EBLT	F (86.4)	F (89.0)	F (95.6)	F (93.9)
		EBR	E (79.1)	E (78.7)	F (81.1)	E (79.6)
		WBL	F (80.3)	F (404.2)	F (103.2)	F (166.6)
		WBT	F (80.6)	F (407.4)	F (103.7)	F (170.6)
		WBR	E (73.1)	F (270.9)	E (67.7)	F (156.5)
		NBL	E (77.4)	E (79.1)	E (79.7)	F (86.7)
		NBT	F (89.0)	C (35.4)	F (104.3)	D (48.7)
		NBR	D (42.4)	C (34.3)	D (43.3)	D (37.9)
		SBL	F (557.9)	F (408.4)	F (200.6)	F (217.4)
		SBT	C (28.4)	D (63.9)	C (22.5)	E (71.4)
		SBR	B (19.6)	B (17.3)	B (15.6)	B (18.2)
		Overall	F (108.8)	F (146.7)	F (82.6)	F (98.3)
(2) Summers Grove Road/Metro Road	Signal	EBLTR	C (33.9)	C (33.4)	C (32.9)	C (33.6)
		WBL	F (363.1)	F (219.1)	C (21.1)	C (27.5)
		WBTR	B (14.8)	B (14.3)	B (18.1)	B (19.1)
		NBL	B (15.3)	B (15.7)	A (7.3)	A (6.2)
		NBTR	B (15.6)	B (16.2)	A (7.5)	A (6.5)
		SBL	C (20.0)	C (24.1)	A (9.2)	A (8.7)
		SBTR	B (17.5)	B (18.2)	A (8.3)	A (7.1)
		Overall	F (91.5)	E (58.7)	B (12.3)	B (12.3)
(3) Eisenhower Avenue/Metro Road	Signal	EBL	A (9.4)	B (12.7)	A (9.4)	B (14.2)
		EBT	A (12.5)	B (10.4)	B (12.5)	B (10.2)
		WBT	C (26.0)	F (183.2)	C (26.0)	E (77.9)
		WBR	A (0.0)	A (0.2)	A (0.0)	A (0.2)
		SBL	C (33.1)	C (34.1)	C (33.1)	D (35.1)
		SBR	C (23.2)	C (23.0)	C (23.2)	C (28.5)
		Overall	C (20.1)	F (101.1)	C (20.1)	D (48.1)
(4) Eisenhower Avenue/Metro Bus Loop Driveway	Signal	EBLTR	A (2.2)	A (1.9)	A (2.2)	A (1.8)
		WBL	A (1.6)	A (1.6)	A (1.6)	A (1.6)
		WBTR	A (2.4)	A (4.9)	A (2.4)	A (4.9)
		NBL	D (46.6)	D (40.7)	D (46.6)	D (40.7)
		NBR	D (35.6)	C (33.3)	D (35.6)	C (33.3)
		SBLTR	D (36.4)	C (33.8)	D (36.4)	C (33.8)
		Overall	A (3.4)	A (4.6)	A (3.3)	A (4.6)

Table 17 Continued: 2019 No Action and 2019 Action Alternative Level of Service Summary

Intersection	Intersection Control	Critical Movement	2019 No Action		2019 Action	
			AM	PM	AM	PM
(5) Eisenhower Avenue/Clermont Avenue/Eisenhower Avenue Connector	Signal	EBL	A (0.0)	E (57.1)	A (0.0)	E (69.4)
		EBT	B (19.8)	C (29.9)	C (28.9)	C (34.7)
		EBR	C (21.2)	E (59.9)	C (30.2)	E (61.7)
		WBL	D (37.7)	E (55.2)	D (53.6)	F (105.8)
		WBTR	B (10.2)	B (16.6)	B (17.9)	C (21.6)
		NBL	F (210.1)	F (277.3)	D (42.8)	F (92.8)
		NBTR	C (23.5)	D (37.7)	C (23.9)	D (41.9)
		SBL	A (0.0)	E (65.8)	A (0.0)	F (95.8)
		SBT	D (41.2)	D (49.1)	E (55.7)	E (61.1)
		SBR	D (40.6)	D (48.2)	D (54.7)	E (59.7)
		Overall	F (85.1)	F (86.0)	C (32.4)	E (59.9)
(6) I-495 WB Ramps/Eisenhower Avenue Connector	Yield	WBR	A [0.0]	A [0.0]	A [0.0]	A [0.0]
(7) I-495 EB Ramps/Eisenhower Connector	Signal	EBL	A (5.2)	A (8.1)	A (5.1)	A (7.8)
		EBT	A (5.2)	A (8.1)	A (5.2)	A (7.8)
		SBL	B (12.3)	B (11.7)	B (12.6)	B (11.4)
		Overall	A (6.8)	A (9.3)	A (6.7)	A (8.9)
(8) Eisenhower Avenue/West Site Driveway	Stop	EBLTR	A [0.0]	A [0.1]	A [1.7]	A [1.0]
		WBLTR	A [0.1]	A [0.1]	A [0.2]	A [0.1]
		NBLTR	B [10.4]	C [15.2]	B [14.3]	C [22.9]
		SBLTR	B [10.3]	B [12.9]	D [27.0]	F [229.3]
(9) Eisenhower Avenue/East Site Driveway	Stop/Signal (Action)	EBLTR	A [0.0]	A [0.0]	A (9.3)	C (23.3)
		WBLTR	A [0.6]	A [0.5]	A (5.3)	C (25.0)
		NBLTR	C [19.3]	C [19.8]	C (21.2)	B (15.1)
		SBLTR	A [0.0]	A [0.0]	C (21.0)	C (34.6)
		Overall	N/A	N/A	A (8.6)	C (26.0)

Notes: Analysis performed using Synchro, Version 7. Values in () represent signalized delay in seconds. Values in [] represent unsignalized delay in seconds. *-Delay exceeds 999 seconds.

QUEUING ANALYSIS

Synchro 7 was utilized to obtain 95th percentile queues for the study area intersections in order to compare the Existing, No Action, and Action alternatives, as well as to assess the adequacy of certain critical turn bays at intersections within the study area. The 95th percentile queue is the maximum back of queue with the 95th percentile traffic volumes. The results are summarized in Table 18.

With the exception of the following turning movements, all of the turning movements at the study intersections are accommodated within the available storage:

- The westbound left and right-turns (Eisenhower Avenue) at the Eisenhower Avenue and S Van Dorn Street intersection, in the Existing, No Action and Action alternatives.
- The northbound right-turn (S Van Dorn Street) at the Eisenhower Avenue and S Van Dorn Street intersection in the Existing, No Action, and Action alternatives.

- The southbound left-turn (S Van Dorn Street) at the Eisenhower Avenue and S Van Dorn Street intersection in the Existing, No Action, and Action alternatives.
- The eastbound right-turn (Eisenhower Avenue) at the Eisenhower Avenue and Eisenhower Avenue Connector intersection in the Existing, No Action, and Action alternatives.
- The westbound left-turn (Eisenhower Avenue) at the Eisenhower Avenue and Eisenhower Avenue Connector intersection in the Action alternative.

In addition to the 95th percentile queues that exceed the storage bay lengths, the Synchro outputs also indicate notable queuing in the following areas:

- Peak hour, peak direction (northbound during the AM peak hour and southbound during the PM peak hour) queues along S Van Dorn Street currently existing, and would continue in the No Action and Action alternatives. This is likely due to the fact that S Van Dorn Street is a parallel route on the I-395 corridor, which experiences similar peak hour, peak direction delays.
- The heavy westbound queue on Eisenhower Avenue at S Van Dorn Street is a result of the allocation of green time to S Van Dorn Street. Queues were observed to generally clear during a typical cycle in the Existing condition.

It should be noted that the amount of site traffic that passes through congested intersections is relatively low. The percentage of site generated traffic through each of the intersections listed above is provided on Table 19, which shows that the percentage of site generated traffic through those intersections is 19% or less. Specifically, the percentage of site traffic through the intersection of Eisenhower Avenue and S Van Dorn Street is 6%.

Table 18: 95th Percentile Queuing Analysis Summary

Intersection	Critical Movement	Available Storage	2014 Existing			2019 No Action			2019 Action		
			AM	PM	Exceed Storage ?	AM	PM	Exceed Storage ?	AM	PM	Exceed Storage ?
(1) Eisenhower Avenue/ Van Dorn Street	EBLT	-	112	126	N/A	113	128	N/A	#119	130	N/A
	EBR	-	47	43	N/A	48	43	N/A	50	44	N/A
	WBL	180	157	#461	Yes	187	#701	Yes	#217	#581	Yes
	WBT	-	158	#468	N/A	189	#707	N/A	#222	#587	N/A
	WBR	200	387	#647	Yes	#469	#976	Yes	465	#894	Yes
	NBL	150	61	14	No	62	14	No	68	14	No
	NBT	-	#1389	631	N/A	#1524	761	N/A	#1562	878	N/A
	NBR	135	234	181	Yes	478	232	Yes	484	248	Yes
	SBL	435	#587	#687	Yes	#1074	#876	Yes	#858	#742	Yes
	SBT	-	475	#1424	N/A	558	#1693	N/A	493	#1720	N/A
(2) Summers Grove Road/Metro Road	SBR	135	27	15	No	29	16	No	25	16	No
	EBLTR	-	22	21	N/A	22	21	N/A	22	20	N/A
	WBL	-	#161	#222	N/A	#161	#222	N/A	84	111	N/A
	WBTR	-	0	17	N/A	0	17	N/A	0	17	N/A
	NBL	90	5	14	No	5	14	No	4	9	No
	NBTR	-	18	38	N/A	21	52	N/A	15	33	N/A
	SBL	140	100	124	No	100	#129	No	74	80	No
(3) Eisenhower Avenue/Metro Road	SBTR	-	62	92	N/A	80	98	N/A	58	62	N/A
	EBL	200	19	20	No	21	20	No	21	20	No
	EBT	-	104	91	N/A	210	114	N/A	210	110	N/A
	WBT	-	197	#405	N/A	231	#602	N/A	231	#514	N/A
	WBR	250	0	0	No	0	0	No	0	0	No
	SBL	-	139	168	N/A	178	183	N/A	178	187	N/A
(4) Eisenhower Avenue/Bus Loop Drive	SBR	-	35	43	N/A	33	44	N/A	33	126	N/A
	EBLTR	-	46	24	N/A	85	51	N/A	85	48	N/A
	WBL	130	1	1	No	1	1	No	1	1	No
	WBTR	-	73	160	N/A	87	283	N/A	87	283	N/A
	NBL	-	35	32	N/A	35	32	N/A	35	32	N/A
	NBR	-	6	8	N/A	6	8	N/A	6	8	N/A
SBLTR	-	25	18	N/A	25	18	N/A	25	18	N/A	

Table 18 Continued: 95th Percentile Queuing Analysis Summary

Intersection	Critical Movement	Available Storage	2014 Existing			2019 No Action			2019 Action		
			AM	PM	Exceed Storage ?	AM	PM	Exceed Storage ?	AM	PM	Exceed Storage ?
(5) Eisenhower Avenue/ Eisenhower Avenue Connector	EBL	200	0	7	No	0	7	No	0	7	No
	EBT	-	121	198	N/A	158	245	N/A	205	244	N/A
	EBR	90	115	248	Yes	158	#600	Yes	192	#583	Yes
	WBL	320	39	250	No	40	261	No	51	#369	Yes
	WBTR	-	46	203	N/A	58	254	N/A	86	281	N/A
	NBL	-	#287	#440	N/A	#466	#511	N/A	#437	#423	N/A
	NBTR	-	88	90	N/A	91	90	N/A	124	174	N/A
	SBL	170	0	19	No	0	19	No	0	20	No
	SBT	-	5	35	N/A	5	34	N/A	7	39	N/A
	SBR	-	9	13	N/A	9	19	N/A	11	15	N/A
(6) I-495 WB Ramps/Eisenhower Connector	WBR	-	0	0	N/A	0	0	N/A	0	0	N/A
(7) Summers Grove Road/Metro Road	EBL	-	81	93	N/A	116	127	N/A	112	127	N/A
	EBT	-	82	93	N/A	118	127	N/A	113	127	N/A
	SBL	-	73	91	N/A	98	142	N/A	99	142	N/A
(8) Eisenhower Avenue/West Site Driveway	EBLTR	-	0	0	N/A	5	2	N/A	5	2	N/A
	WBLTR	-	0	0	N/A	0	0	N/A	0	0	N/A
	NBLTR	-	0	1	N/A	0	2	N/A	0	2	N/A
	SBLTR	-	0	0	N/A	0	0	N/A	8	154	N/A
(9) Eisenhower Avenue/East Site Driveway	EBLTR	-	0	0	N/A	34	10	N/A	189	#311	N/A
	WBLTR	-	1	1	N/A	1	2	N/A	86	#468	N/A
	NBLTR	-	24	11	N/A	24	11	N/A	50	21	N/A
	SBLTR	-	0	0	N/A	0	0	N/A	47	#357	N/A

Notes: (1) Queue length is based on the 95th percentile queue in feet as reported by Synchro, Version 7. (2) “#” -95th percentile volume exceeds capacity, queue may be longer. (3) “m” – Volume for 95th percentile queue is metered by upstream signal. (4) “*” – Volume exceeds capacity; no result given by Synchro.

Table 19: 2019 Influence Area Summary

Intersection	2019 Total Future Volumes		Site-Generated Volumes		% Site Generated Traffic	
	AM	PM	AM	PM	AM	PM
Eisenhower Avenue/S Van Dorn Street	4,736	5,531	300	331	6%	6%
Summers Grove Road/Metro Road	693	893	65	62	9%	7%
Eisenhower Avenue/Metro Road	1,949	2,612	356	343	18%	13%
Eisenhower Avenue/Metro Bus Loop	1,870	2,280	356	343	19%	15%
Eisenhower Avenue/Eisenhower Avenue Connector	2,228	3,090	292	281	13%	9%
Eisenhower Avenue Connector/I-495 WB Ramps	1,627	2,104	259	250	16%	12%
Eisenhower Avenue Connector/I-495 EB Ramps	925	919	153	106	17%	12%

TRANSPORTATION DEMAND MANAGEMENT

This section presents the Transportation Management Plan (TMP) conditions of approval for Victory Center, as required by the City of Alexandria Ordinance No.3923. The TMP was amended and approved by the City of Alexandria as part of the Special Use Permit Certificate on September 21, 2013.

According to Article XI, Section 11-700 of the City's Zoning Ordinance, a Transportation Management Plan is required to implement strategies to encourage residents and employees to take utilize other commute modes besides driving alone. Any use authorized by a special use permit shall be operated in conformity with such permit, and failure to so operate shall be deemed grounds for revocation of such permit, after notice and hearing, by the City Council. Victory Center shall provide a TMP in accordance with the following:

- Prior to any lease/purchase agreements, the applicant shall prepare appropriate language to inform tenants/owners of the transportation management plan special use permit and conditions therein, as part of its leasing/purchasing agreements; such language to be reviewed and approved by the City Attorney's office.
- The applicant shall participate in the revised Transportation Management Program if established. The revised program will include the elements outlined in the December 8, 2010 docket memo to City Council and approved by the Council. The revised TMP program will go before the City Council for approval. The revision to the program includes a periodic review of the TMP to determine if goals are being met. Participation in the program will not initially increase the base contribution established in this SUP, however, the base contribution would be subject to adjustment up or down, up to a percentage cap, based on the final revised TMP program language.
- An annual TMP fund shall be created based on the TMP reduction goal of 30% of employees not using single occupant vehicles during the peak hour, based on the projects' size and the

benefits to be offered to participating residents and employees. The annual fund rate for this development shall be \$0.254 per square foot of commercial space. Annually, on July 1, the rate shall increase by an amount equal to the rate of inflation (Consumer Price Index – CPI of the United States) for the previous year. The TMP fund shall be used exclusively for the approved transportation activities detailed in the attachment.

- The applicant shall integrate into a District Transportation Management Program when it is organized. All TMP holders in the established district will be part of this District TMP. The objective of this district is to make optimum use of transportation resources for the benefit of residents and employees through economies of scale. No increase in TMP contributions will be required as a result of participation in the District TMP.
- The TMP Coordinator or Association will submit annual reports, fund reports and modes of transportation surveys to the Transportation Planning Division as detailed in the Attachment.
- An on-site TMP Coordinator shall be designated for the entire project upon application for the initial building permit. The name, location, email and telephone number of the coordinator will be provided to the City at the time, as well as any changes occurring subsequently. This person will be responsible for implementing and managing all aspects of the TMP and the parking management program for the project.
- The Director of T&ES may require that the funds be paid to the City upon determination that the TMP Coordinator or Association has not made a reasonable effort to use the funds for TMP activities. As so determined, any unencumbered funds remaining in the TMP account at the end of each reporting year may be either reprogrammed for TMP activities during the ensuing year or paid to the City for use in transportation support activities which benefit the site.
- An administrative fee shall be assessed to the governing entity for lack of timely compliance with the submission of the TMP mandatory reports required in the attachment (fund reports with supporting documentation, annual reports, survey results with a minimum response rate of 35%, and submission of raw data). The fee shall be in the amount of five hundred seven (\$507.00) for the first 30 (thirty) days late and two hundred and fifty three dollars (\$253.00) for every subsequent month late. The amount of these administrative fees is for the base year in which the TMP is approved and shall increase according to the Consumer Price Index (CPI) going forward.

CONCLUSIONS

The transportation impact analysis for the Victory Center site reveals that the existing signalized intersections currently operate at overall acceptable levels of service during the AM and PM peak hours, with the exception of the intersections of Eisenhower Avenue and S Van Dorn Street, and Summers Grove Road and Metro Road. Continued background growth and development within the study area would increase delay and degrade some levels of service at the study area intersections. The occupation of the Victory Center site, which would result in the collocate of approximately 3,800 TSA employees, would add an additional 640 AM peak hour, 624 PM peak hour, and 4,349 average daily vehicle trips to the study area roadway network. This additional traffic would further degrade traffic operations at some intersections.

In order to mitigate the transportation impacts of the site, several transportation improvements are proposed, including:

1. Eisenhower Avenue and S Van Dorn Street: Convert the protected southbound left turn on S Van Dorn Street to protected-permitted operation and optimize signal timing.
2. Summers Grove Road/Metro Road: Remove the east/west split phasing, provide protected-permitted westbound left turn phase, and optimize signal timing.
3. Eisenhower Avenue and Metro Road: Optimize PM peak hour signal timing.
4. Eisenhower Avenue at Eisenhower Avenue Connector/Clermont Avenue: Optimize AM and PM peak hour signal timings.
5. Install a traffic signal at the eastern site driveway.
6. Install a new pedestrian traffic signal with accessible features at the western most driveway serving the site.
7. Provide bicycle facilities in accordance with TSA requirements.

The results of the traffic analyses indicate that the majority of intersections would operate at acceptable levels of service during the AM peak hours with the construction of the proposed improvements. While some intersections would operate beyond capacity during the PM peak hour, delays could be minimized through phasing and timing improvements within the Eisenhower Avenue corridor. A Transportation Management Plan (TMP), as described herein, would promote other modes of transportation than single occupant vehicles and further improving overall operations within the corridor.

CHAPTER 5: CONCLUSIONS

This Traffic Technical Report has been prepared for the United States General Services Administration (GSA) to assess and report potential transportation impacts resulting from the proposed consolidation of the Transportation Security Administration (TSA) at two alternative sites in Northern Virginia. The two alternative sites are located at 5001 Eisenhower Avenue, Alexandria, VA (Victory Center) and 6601 Springfield Center Drive, Springfield, VA (Springfield Metro Center). The proposed consolidation would result in the relocation of approximately 3,800 TSA employees to a single 650,000 gross square-foot (GSF) (minimum) office site, from five other offices: 601 South 12th Street, 701 South 12th Street, and 6354 Walker Lane in Alexandria, VA, 1900 Oracle Way in Reston, VA, and 45065 Riverside Parkway in Ashburn, VA.

The Springfield Metro Center site would be located within a 15.98 acre office park that is currently approved for four (4) office buildings totaling 1,058,500 GSF, including potential support/ancillary retail uses. Phase I of the Metro Center development would consist of the construction of 653,000 GSF of office space intended for use by the TSA. However, unlike Springfield Metro Center, the Victory Center site currently consists of an existing 606,000 square-foot office building. In order to meet the requirements of the TSA, the existing building would undergo an expansion consisting of 60,000 square-feet of office space and 10,000 square-feet of retail space.

Traffic conditions at each site were analyzed under three different conditions: Existing Conditions, Future Conditions without consolidation (No Action Alternative), and Future Conditions consolidation (Action Alternative). In addition to vehicular impacts, the availability of transit, pedestrian, and bicycle facilities was also evaluated.

The sites are both contained within the Washington DC metropolitan area, near major interstates and within street networks that experience a significant amount of AM and PM peak period congestion. The majority of intersections within the respective study areas contain movements that operate at LOS E or LOS F in one or more peak hours. The only variation in vehicular access between the two sites is the ease of access to a major interstate. The Victory Center site has slightly better access because it is served by two interchanges with I-95/I-495 within one mile of the site, one of which provides direct connection to Eisenhower Avenue, allowing vehicles to avoid the more congested components of the study area roadway network. The Springfield Metro Center site would require vehicles to travel approximately 1.2 miles to the nearest interchange with I-95, all while passing through some of the most congested intersections within the study area.

Conversely, the Springfield Metro Center site would have slightly better access to transit. While both sites are located within one-half mile of a Metrorail station, providing access to the Metro Blue line, as well as many bus routes, the Springfield Metro Center site is also located within one-half mile of a VRE station. VRE riders would have to transfer to Metrorail at the Franconia Springfield or King Street stations, and then ride to the Van Dorn station to access the Victory Center site.

As a result of the consolidation of the 3,800 TSA employees, vehicle delays and queuing at study area intersections are expected to increase. The greatest impacts are experienced at existing congested intersections, as well as intersections with site driveways/access roads. In order to mitigate the anticipated impacts, both site lease offerors have proposed improvements, including new signalized

intersections, enhanced signal timing and phasing at existing signalized intersections, additional or expanded turn bays, and pedestrian and bicycle facility improvements. The proposed improvements are considered minor and are not anticipated to have significant right-of-way or environmental impacts. Furthermore, if constructed, the proposed improvements are anticipated to mitigate impacted intersections so that they would operate at similar or improved levels of service, when compared to the No Action alternative.

The results of the TSA Employee Commuter survey also revealed an existing culture of alternative transportation mode use, with over 35% of employees commuting via modes other than driving alone. It is anticipated that this activity would continue no matter what site is ultimately selected. Furthermore, each site will have limited parking, as well as be required to participate in a TMP, thus further helping to sustain and grow existing use of alternative commute modes, and helping to reduce the impact of the sites on the surrounding study area roadway networks.

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Appendix A: TSA Employee Commute Survey Questions

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Appendix B: Springfield Metro Center Traffic Impact Statement

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Appendix C: Victory Center Traffic Impact Statement

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