MULTIMODAL TRANSPORTATION ASSESSMENT

ARLINGTON CAREER CENTER

ARLINGTON, VA

DRAFT IN PROGRESS

Note: All highlighted sections dependent on conceptual design

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EXECUTIVE SUMMARY

The following report is a Multimodal Transportation Analysis (MMTA) of the Arlington Career Center (CC) campus, located in Arlington, Virginia. The CC campus is home to several buildings and programs, including Arlington Tech high school, the Columbia Pike Branch Library, Montessori Public School of Arlington (MPSA), Arlington Community High School, and other services and programs. The project consists of renovating the existing CC building to include the addition of 800 new high school students to the CC building and the increase in Arlington Tech enrollment to 600 students. All existing programs will remain on campus.

The purpose of this report is to review existing and future transportation facilities in the area surrounding the project site, project transportation demand needs of the project, determine if the new transportation demand generated by the project would have negative impacts on the surrounding transportation network, and present recommendations to minimize the negative impact from the proposed project.

This report concludes that the Arlington Career Center project will not have a negative impact to the surrounding transportation and roadway network given the recommendations from this report are implemented, including the Transportation Management Plan.

This report reached the following major findings and recommendations:

Study Area

This MMTA reached the following major findings on the overall transportation network surround the CC campus:

- The campus is surrounded by an extensive regional and local transportation system that connects students, staff, and visitors of the project to the rest of Arlington County and surrounding areas.
- The campus is served by public transportation with rapid bus access to four Metrorail lines, and several local and regional bus routes.
- The campus has good connectivity to existing on- and off-street bicycle facilities. The campus is surrounded by local neighborhood streets, bicycle lanes on S Walter Reed Drive and 2nd Street S, and the Custis and W&OD Trails.
- There is one (1) Capital Bikeshare station adjacent to the campus and an additional station within one-quarter mile of the campus.
- Pedestrian conditions are generally good, particularly along anticipated major walking routes.

Overall Transportation Strategy

Establishing an instructional facility at the CC campus presents an opportunity to optimize transportation operations. One of the general goals of this project is to provide flexibility in the type of educational programs that can be housed on the campus. When the CC project is complete, the campus will be shared between the CC building, elementary school, and Arlington Community High School but in the future, it may be used for a different educational program like a dedicated high school campus. Thus, although this MMTA makes recommendations primarily on how the building will function as a shared campus, it also considers how it may function in the future.

The recommendations contained within this MMTA, and detailed in the following sections, are all based around this overall strategy.

Mode Splits

This MMTA reached the following major findings on student and staff mode splits, based on 2013 and 2016 APS Go! survey data:

- Students in grades 9 and 10 at the CC campus use transit and bicycle to get to school more than the APS average.
- Based on surveys of grade 11 and 12 students, students in grades 11 and 12 at the CC campus take the school bus in the morning much less than the average APS grade 11 and 12 student, while the number of students getting dropped-off is much higher. In the afternoon, many more students take the school bus, with the amount of driving or getting pick-up decreasing closer to average APS levels for grades 11 and 12.
- The number of students that drive themselves to school in grades 11 and 12 on campus is not significantly different from the APS average for the CC campus.
- As of the 2013 APS Go! survey data, the student walk/bike rate was 22%. This has since increased to

24%, as of 2016 data. As of the 2013 APS Go! survey data, the staff driving rate was 88%. This has since decreased to 85%, as of 2016 data.

Given the trends of APS Go! data, it seems reasonable that the CC can target similar goals. This report recommends the following student and staff mode split targets, specific to the CC:

- A student walk/bike/public transit target of 45%
- A student driving target of 10%
- A 75% driving target for CC staff

Parking

This MMTA reached the following major findings on parking. At the time of counts, Patrick Henry ES remained on-site and there were no relocatable classrooms in the parking lot.

- Existing parking demand within and surrounding the CC campus peaks at 1:00 PM, with 46% of the available parking spaces within the study area occupied.
- The main parking lot on-campus peaks at 95% occupancy at 2:30 PM. It sustains a high level of occupancy between 10:30 AM and 3:00 PM.
- Residential curbside parking that is restricted, peaks at night and early morning at around 75% occupied, with demand lowering to 40-50% in the middle of the weekday.
- Unrestricted parking surrounding the CC maintains relatively constant occupancy levels throughout the day, at around 30-40%.
- The 12-hour meters near the CC have low occupancy, peaking at only 16% in use at 12:30 PM.
- The four (4) off-campus garages peak overall at 8:00 PM, with 45% of the total 896 spaces occupied.

This report recommends the following strategy for accommodating the increase in parking demand:

- Utilize the existing underutilized parking facilities to absorb new parking demand.
- Continue the current APS Go! Transportation Demand Management (TDM) programs to encourage the use of alternative travels for both students and staff, thus reducing the parking demand on the site and surround parking supply.

Traffic Operations

A detailed traffic capacity analysis performed for this MMTA led to the following findings:

- The existing study area intersections all operate at acceptable delay and LOS levels with two (2) exceptions. This is typical for commuting corridors and their side streets.
- Most intersections have acceptable queuing results, with all queues shorter than the available storage lengths, with five (5) exceptions. These exceptions occur primarily during the AM and PM commuter peak hours.
- The future scenarios show…

Bicycle Parking

Because bicycle parking demand is projected to grow, this MMTA is recommending more bicycle parking be added to include XX bicycle spaces.

Arrival/Dismissal – Student Pick-up/Drop-off

During arrival and dismissal times, parents (or guardians) are expected to use…

The proposed area has room to accommodate XX to XX vehicles loading/unloading at the same time for high school and XX to XX vehicles for elementary school.

Arrival/Dismissal – School Buses

Under existing conditions, bus loading and unloading operations occur on-campus, with separate high school and elementary school facilities. The expected future bus demand can be accommodated by…

Transportation Management Plan

This MMTA is recommending establishment of the standard management plans for County schools, including:

- A use permit required Transportation Demand Management (TDM) plan, with the standard elements for APS high school facilities, based on the APS Go! Program.
- A Parking Management Plan (PMP). In addition to standard PMP elements, this MMTA is recommending that the PMP include a section reviewing visitor parking for the school and approved visitor entry

points, making sure there is proximity between the two. Additionally, the PMP should review wayfinding and marketing for after-school activities and events held on campus to increase the amount of parking demand using the parking garage in lieu of on-street parking.

- Arrival and dismissal plans updated for the new CC campus. In addition to standard elements, this report is recommending the arrival and dismissal plans include specific instructions on how to use pick-up/drop-off areas safely, incorporate those plans into the parent/student handbooks, and use APS staff on the sidewalk outside the school to help enforce the plans (similar to how they are used today).
- APS will continue to maintain records of staff participation in APS TDM benefit programs and conduct triennial surveys of students, visitors, staff, and parents, regarding their travel to and from the school. APS will provide a triennial update to the School Board and APS leadership and the County Manager describing the results of the survey and TDM related activities. These items should be monitored at a time around 6 months to one year after the CC project is completed.

INTRODUCTION

This report is a Multimodal Transportation Analysis (MMTA) of the Arlington Career Center (CC) campus, located in Arlington, Virginia. The CC campus is home to several buildings and programs, including Arlington Tech high school, the Columbia Pike Branch Library, Montessori Public School of Arlington (MPSA), Arlington Community High School, and other services and programs. The project consists of renovating the existing CC building to include the addition of 800 new high school students to the CC building and the increase in Arlington Tech enrollment to 600 students. This MMTA is based on the conceptual design plans for the project. Figure 1 shows the location of the CC campus.

PURPOSE OF STUDY

The purpose of this report is to:

1. Review existing and future transportation facilities in the area surrounding the project site.
2. Project the transportation demand needs of the proposed project.
3. Determine if the new transportation demand generated by the project would have negative impacts on the surrounding transportation network.
4. Present recommendations to minimize the negative impact from the proposed project, including providing recommendations for the design team to incorporate into the schematic design.

STUDY TASKS

The following tasks were completed as part of this study:

- Field reconnaissance was performed at the CC campus to review lane configurations and traffic controls, make general parking observations, and view arrival and dismissal procedures at the schools.
- Traffic counts were conducted at ten (10) locations on Wednesday, May 23, 2018 and three (3) additional locations on Wednesday, April 3, 2019.
- APS Go! data for Arlington Public Schools (APS) facilities were reviewed to help establish mode split assumptions.
- Parking counts (inventory and occupancy) were conducted in the areas surrounding the CC campus on Wednesday, May 23, 2018 and Wednesday, April 3, 2019.
- Capacity and queuing analyses for the existing conditions were performed.
- Multimodal analyses were performed reviewing pedestrian and bicycle travel to and from the project.
- The analysis findings were documented in this report.

CONTENTS OF STUDY

This report contains eight (8) chapters as follows:

- *Study Area Overview*
  This chapter reviews the study area and includes an overview of the campus location, including a summary of the major transportation characteristics of the area.
- *Project Design*
  This chapter provides a summary of the existing uses on the CC campus and reviews the transportation components of the CC project. This includes an overview of how the campus will be accessed by various users and how each mode is accommodated.
- *Travel Demand Assumptions*
  This chapter outlines the transportation demand of the proposed CC campus. This includes a review of APS Go! survey information, expected mode splits for staff and students, and vehicular trip generation.
- *Traffic Operations*
  This chapter provides a summary of the existing and future roadway facilities and an analysis of the existing and future roadway capacity in the study area.
- *Parking*
  This chapter reviews the available parking within and surrounding the CC campus.
- *Pedestrian Facilities*
  This chapter summarizes existing pedestrian access to the campus and reviews walking routes to and from the CC campus.
- *Bicycle Facilities*
  This chapter summarizes existing bicycle access to the site and reviews the quality of cycling routes to and from the CC campus.
- *Summary and Conclusions*
  This chapter presents a summary of the existing conditions of the CC campus and presents overall report findings and conclusions.

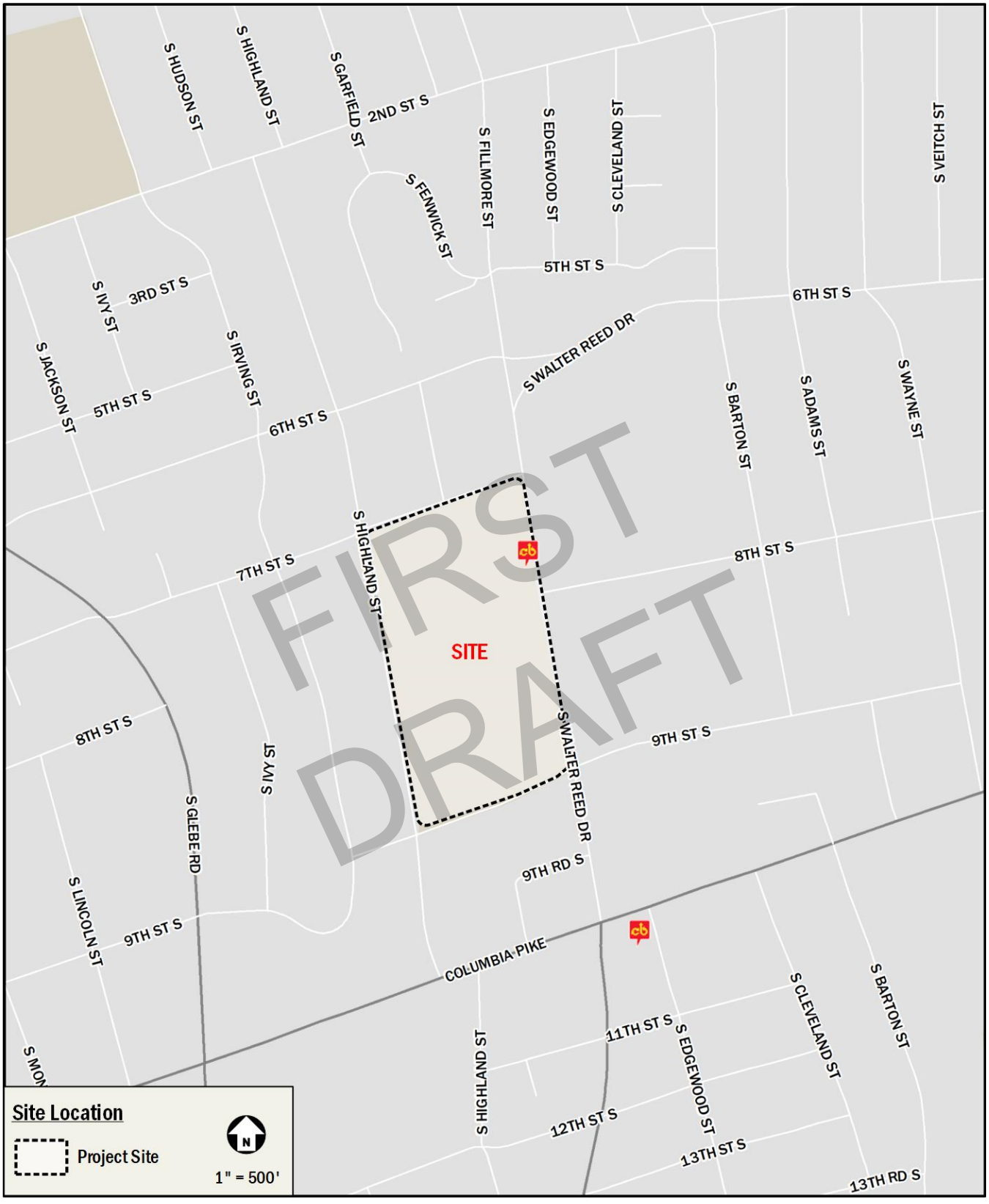


Figure 1: Site Location

STUDY AREA OVERVIEW

This chapter reviews the study area and includes an overview of the campus location, including a summary of the major transportation characteristics of the area.

The following conclusions are reached within this chapter:

- The campus is surrounded by an extensive regional and local transportation system that connects students, staff, and visitors of the campus to the rest of Arlington County and surrounding areas.
- The campus is served by public transportation with access to several local and regional bus routes and four Metrorail lines via those bus routes.
- There is existing bicycle infrastructure including several bicycle lanes and signed routes in the vicinity of the campus and the Custis and W&OD Trails.
- Pedestrian conditions are generally good, particularly along anticipated major walking routes.
- Several local initiatives will positively impact the study area, including the S Walter Reed Complete Streets project, Columbia Pike Bike Boulevards, and the Columbia Pike Premium Transit Network.

MAJOR TRANSPORTATION FEATURES

Overview of Regional Access

The Arlington Career Center (CC) campus has ample access to regional vehicular-, transit-, and bicycle-based transportation options, as shown in Figure 3, that connect the campus to destinations within Virginia, the District, and Maryland.

The campus is accessible from interstate I-395, US Highways such as US-50 (Arlington Boulevard), as well as State Routes such as SR-244 (Columbia Pike), and SR-120 (N Glebe Road). All of these roadways bring vehicular traffic within one-half mile of the campus, at which point arterials and local roads can be used to access the campus directly. The main arterials in the vicinity of the campus are Columbia Pike and N Glebe Road.

The campus is located 1.5 miles from the Virginia Square-GMU Station and Pentagon City Metrorail stations, which are served by the Orange and Silver lines and Blue and Yellow lines, respectively, and provide connection to areas in Virginia, the District, and Maryland that are near Metrorail. The campus is also serviced by 12 major regional bus routes which connect to multiple Metrorail stations in Arlington County and Falls Church.

The campus is located within 2.0 miles of the Custis and W&OD Trails. These trails make up part of the "Arlington Loop", which provides local and regional off-street connectivity for bicycles to and from the campus.

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

Overview of Local Access

There are several local transportation options near the campus that serve vehicular, transit, walking, and cycling trips, as shown on Figure 3. The campus is served by a local vehicular network of low volume neighborhood streets that provide connections from regional roads to the campus.

Arlington Transit (ART) is a local bus system provided by Arlington County. ART supplements Metrobus with cross-County routes as well as neighborhood connections to Metrorail. In the vicinity of the campus, the majority of bus routes travel along Columbia Pike, as shown in Figure 4.

There are existing bicycle facilities that connect the campus to neighborhoods within Arlington County, most notably bicycle lanes on S Walter Reed Drive and 6th Street S. Other facilities include bicycle-friendly roads that include signed routes on 9th Street S, S Highland Street, and 7th Street S.

The CC campus is in an area that provides a better walking environment than other areas to the west and south, which either lack sidewalk coverage or have physical barriers limiting connectivity such as I-395.

Walk Score, Bike Score, and Transit Score

Walkscore.com is a website that provides scores and rankings for the walking, biking, and transit conditions within an area. Based on this website, the CC campus is located in the Arlington Heights neighborhood. The Arlington Heights neighborhood has a walk score of 72 (or "Very Walkable"), a bike score of 84 (or "Very Bikeable"), and a transit score of 58 (or "Good Transit"). Figure 2 shows the borders of the neighborhood in relation to the campus location, displays heat maps for walkability and bikeability, and displays a map of how

far public transit can travel in 30 minutes from the neighborhood.

Walk Score's methodology analyzes hundreds of walking routes to nearby amenities. Points are awarded based on the distance to amenities in each category. Amenities within a 5-minute walk (.25 miles) are given maximum points. Walk score also measures pedestrian friendliness by analyzing population density and road metrics such as block length and intersection density. It does not incorporate details such as crosswalk or sidewalk quality. The campus is situated in an area with a "Very Walkable" walk score because of the abundance of neighborhood serving retail locations that are in close proximity, where most errands can be completed by walking.

Bike Score's methodology measures whether an area is good for biking. For a given location, a bike score is calculated by measuring bike infrastructure (lanes, trails, etc.), hills, destinations and road connectivity, and the number of bike commuters. The campus is situated in an area with a "Very Bikeable" bike score due to its proximity to low volume residential roadways, number of bike lanes and trails, and flat topography.

Transit Score's methodology measures how well a location is served by public transit. Transit score assigns a "usefulness" value to nearby transit routes based on the frequency, type of route (rail, bus, etc.), and distance to the nearest stop on the route. The "usefulness" of all nearby routes is summed and normalized to a score between 0 - 100. The campus is situated in an area with a "Good Transit" transit score based on the neighborhood's proximity to multiple bus lines and distance to the nearest Metrorail station which is located approximately 2.0 miles from the campus.

Overall, the Arlington Heights neighborhood has high walk, transit, and bike scores.

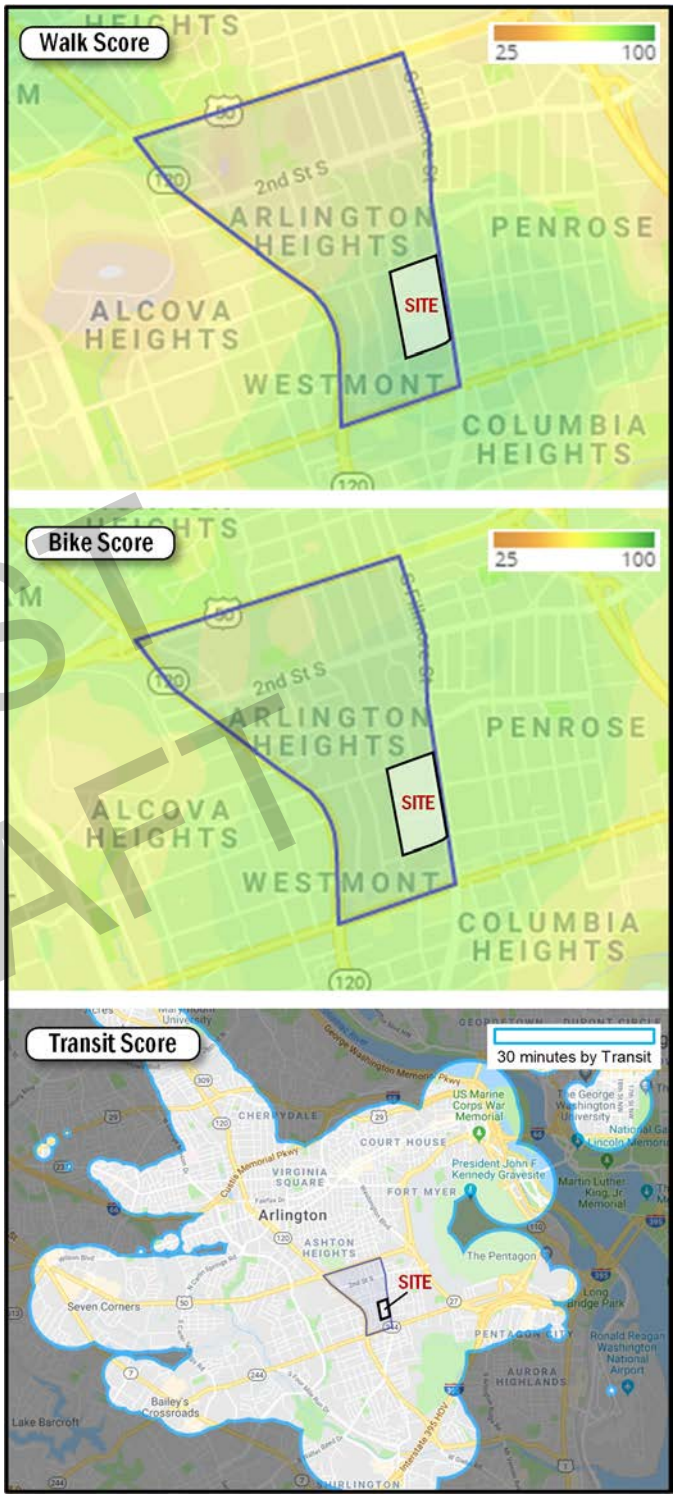


Figure 2: Walkscore, Bikescore, and Transitscore

Car-sharing

Two car-sharing companies provide service in Arlington County: Zipcar and Car2Go. Both are private companies that provide registered users access to a variety of automobiles. Of these, Zipcar has designated spaces for their vehicles. There are two car-shares located on Columbia Pike within one-half mile of the campus at the intersection of S Wayne Street and Columbia Pike.

Car-sharing provided by Car2Go provides point-to-point car-sharing. Car2Go currently has a fleet of vehicles located throughout the District and Arlington. Car2Go vehicles may park in any non-restricted metered curbside parking space or Residential Permit Parking (RPP) location in any zone throughout the defined "Home Area". Members do not have to pay the meters or pay stations. Car2Go does not have permanent designated spaces for their vehicles; however, availability is tracked through their website and mobile phone application, which provides an additional option for car-sharing patrons.

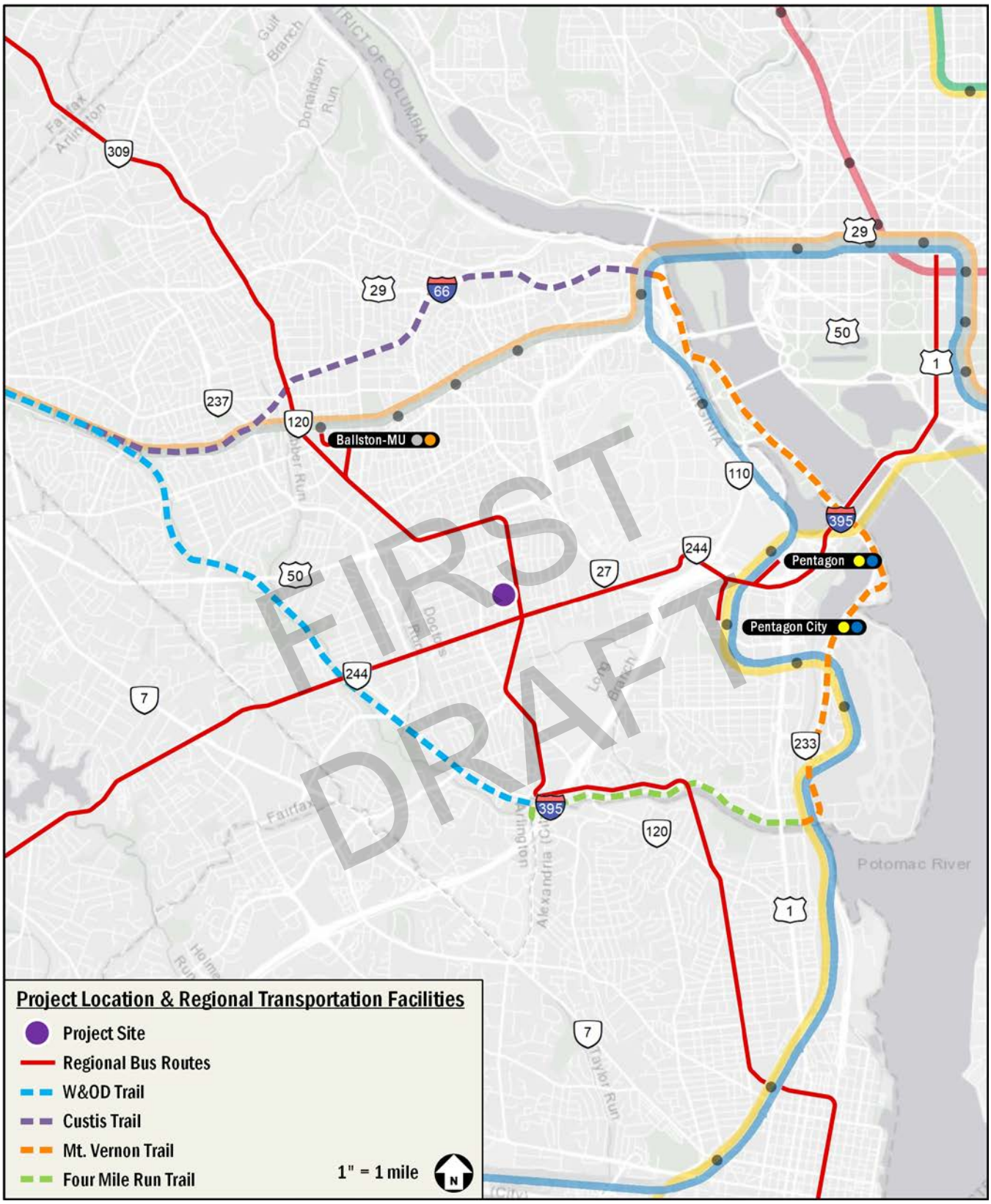


Figure 3: Major Regional Transportation Facilities

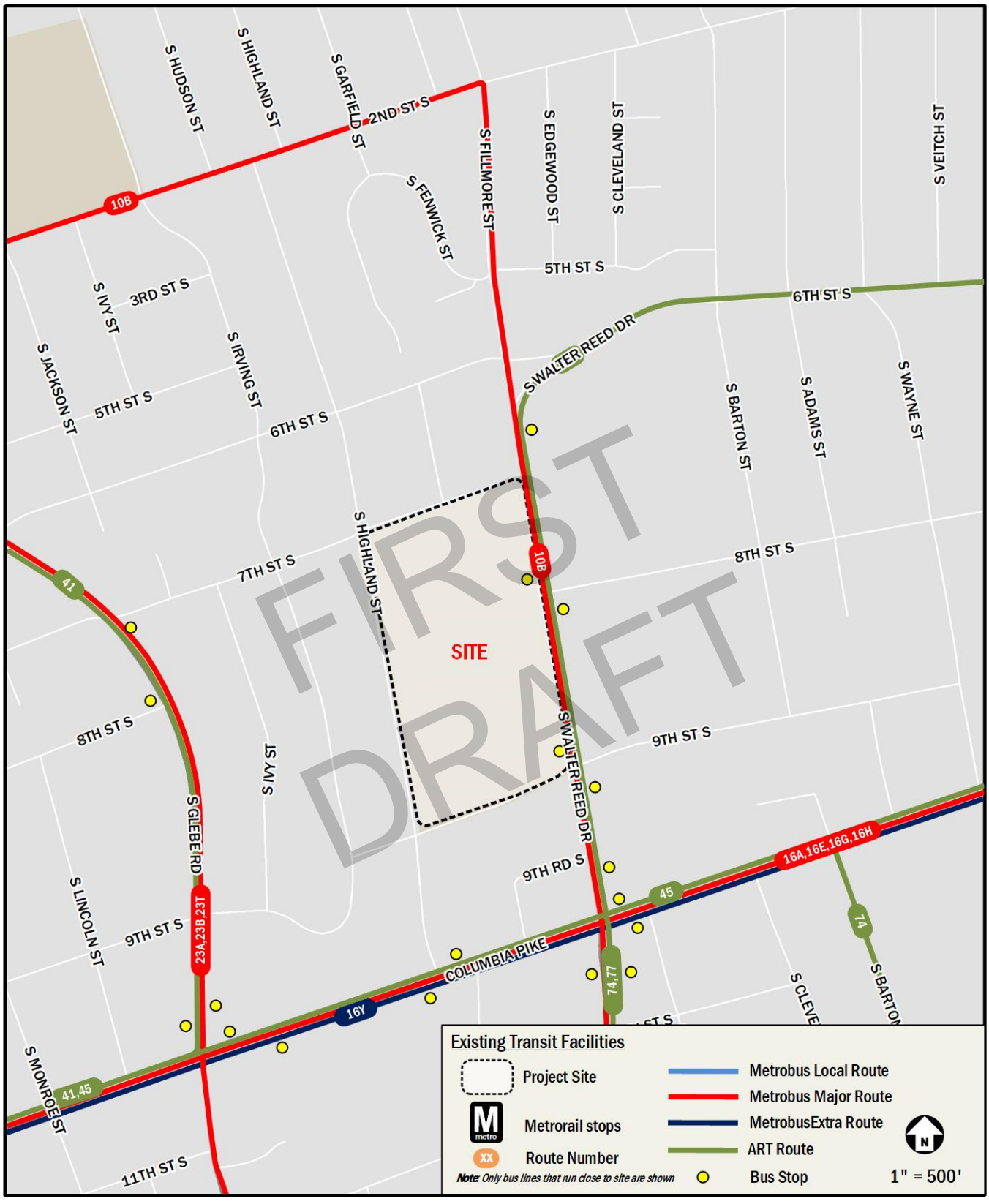


Figure 4: Existing Transit Facilities

FUTURE PROJECTS

There are several count-wide and local initiatives and approved developments in the vicinity of the site. These planned projects are summarized below and shown in Figure 5.

County-wide Initiatives

Arlington Master Transportation Plan

The Arlington County Master Transportation Plan (MTP), adopted in 2011 and updated in 2019, outlines goals to improve various modes of transportation throughout the County. The MTP identifies goals and objectives for each mode to improve safety and access for all users, particularly for pedestrians, bicyclists, and transit users. The Arlington Master Transportation Plan's recommended policies for transportation in the County that apply to the Arlington Career Center campus are outlined as follows:

- Streets (2016) – The County will address the street system and enhance the transportation network by: (1) Utilizing the plan's street typology to guide street planning and ensure each street type supports the general policies of complete streets and adjacent land uses; (2) Including appropriate facilities to meet and balance the needs of all modes; (3) Constructing/converting some local streets to a pedestrian priority or a shared street; (4) Accommodating travel growth through shifts to non-auto modes; (5) Designing streets to favor lower vehicular speeds; and (6) Maintaining a grid-style network to enhance connectivity.
- Transit (2016) – The County will address the transit system by: (1) Developing a Premium Transit Network of high-frequency service connecting major destinations; (2) Operating a Secondary Transit Network of fixed route services that improves access to destinations across Arlington; (3) Making transit more accessible and convenient to all through enhanced facilities and transit-oriented land use policies; (4) Improving Metrorail services and stations; and (5) Expanding pedestrian access to transit facilities.
- Pedestrian (2008) – The County will address the pedestrian system by: (1) Completing the walkway network with appropriate facilities on both sides of arterial streets and at least one side of neighborhood streets; (2) Upgrading existing pedestrian facilities to comply with current standards; (3) Implementing measures aimed at changing motorist behavior to manage vehicular speed and minimize vehicle/pedestrian conflicts; and (4) Developing strategies to encourage more people to walk.
- Bicycle (2019) – The County will address the bicycle system by: (1) Making existing streets safer and more comfortable for bicycling by all users; (2) Expanding travel safety education programs; (3) Providing a network of low-traffic-stress bicycle routes that connect all land uses; (4) Accommodating bicycle infrastructure as part of all street improvement projects; (5) Establishing bicycles as a mainstream travel mode; and (6) Encouraging bicycle facilities, including parking, showers, and lockers.
- Parking and Curb Space (2009) – The County will address the parking system by: (1) Prioritizing the use of curb space, matching the various types of uses to the most appropriate locations; (2) Promoting on-street parking within residential neighborhoods and on commercial streets to calm traffic; (3) Ensuring the minimum parking needs are met and limit excessive parking; (4) Discouraging off-street surface parking; and (5) Allowing reduced parking space requirements for new developments in close proximity to frequent transit service and requiring enhanced TDM measures.
- Transportation Demand Management (2008) – The County will address transportation demand management by: (1) Incorporating comprehensive TDM plans for all site plans to minimize vehicular trips and maximize the use of other modes; (2) Exploring strategies and incentives to achieve TDM measures in existing private buildings; and (3) Applying TDM programs to non-work travel, as well as commuting, through marketing strategies.

The MTP identifies the following recommendations in the vicinity of the Arlington Career Center campus:

- Transit:
  - Develop a Premium Transit Network of high-frequency service connecting major destinations
  - Consolidate bus stops and construct new, high-quality, unique transit stations along Columbia Pike
- Bicycle:
  - Implement wide multi-use trails, or wide sidewalks, along at least one side of Columbia Pike east of S Wayne Street and west of Four Mile Run.
  - Extend the existing bike boulevards on 9th Street S and 12th Street S westward to connect with the W&OD Trail and eastward to connect with eh Washington Boulevard Trail or Arlington View neighborhood.

- Develop an enhanced bicycle facility on Walter Reed Drive and Fillmore Street between Pershing Drive and S Monroe Street.

Local Initiatives

South Walter Reed Drive Complete Street

This project's goal is to create permanent multimodal improvements to the painted road diet and address speeding issues along S Walter Reed Drive. Specific project elements include:

- Redesigning the intersection geometry at 5th Street S and 9th Street S with Walter Reed Drive to increase safety for all users
- Redesign driveway and access at 8th Street S
- New striping and signage
- Replaces existing curb ramps with ADA compliant ramps and adds new crosswalks
- Improve bus stop locations and infrastructure
- Improve pedestrian and bicycle facilities along S Walter Reed Drive

Columbia Pike Bike Boulevards

This project's goal is to implement a bike boulevard parallel to Columbia Pike along 9th Street S and 12th Street S. Key elements of bike boulevards include:

- Located on low-volume and low-speed streets
- Logical, direct, and continuous routes
- Marked with clear signage and street markings
- Provide convenient access to desired destinations
- Provide comfortable and safe crossings for bicycles and pedestrians

Due to limited space, traffic volume, and transit operations, Columbia Pike cannot accommodate extensive biking facilities. This project will significantly improve pedestrian safety at challenging intersections for people walking to and from the Arlington Career Center campus.

Columbia Pike Multimodal Street Improvements

This project's goal is to make Columbia Pike a safer, more accessible route for all users. Columbia Pike, between S Joyce Street and the Arlington-Fairfax County Line, will become a "Complete Street" that balances all modes and supports high-quality, high-frequency transit service. Specific project elements include:

- Modified 56-foot street cross-sections with reconfigured travel and transit lanes, medians, and left-turn lanes
- Signalized and un-signalized intersections
- On-street parking
- Enhanced pedestrian sidewalks and crossings
- Parallel bike boulevards
- Installation of a "Super Stop" transit stop between S Walter Reed Drive and S Edgewood Street, as well as additional "Super Stops" near the intersections with S Glebe Road and S Highland Street

Columbia Pike Premium Transit Network

As part of the County's 10-year plan for transit improvements, the Columbia Pike Premium Transit Network will offer bus service that is fast, frequent, reliable, and easy to use. Key features include simplified routes, increased weekday and weekend service, and new one-seat bus ride from Skyline to Pentagon City-Crystal City. The Premium Transit Network will provide three types of service to meet the needs of different riders: (1) Local connector service, (2) Limited-stop service, and (3) neighborhood connections. This project intends to move more people, enhance connectivity, and provide new travel choices between Columbia Pike, Pentagon City, and Crystal City. Additional amenities include:

- Enhanced transit stations
- Off-vehicle fare collection to speed service by reducing dwell times at bus stops
- Transit signal priority to reduce delays for buses at signalized intersections
- Branded vehicles and information to make it easier to identify and understand

Planned Developments

There are several potential development projects in the vicinity of the Site. Of the background developments considered, three (3) were ultimately included and are described below. For the purpose of the capacity analysis and consistent with Arlington County and industry standards, only approved developments expected to be completed prior to the planned development with an origin/destination within the study area were included. Figure 7 shows the location of these developments in relation to the proposed development.

Gilliam Place

This project consists of a redevelopment of the existing site at the northwest corner of the Columbia Pike and S Lincoln Street intersection into a new mixed-used building containing 8,000 SF of ground-floor retail, 173 residential units, 205 underground parking spaces, and approximately 6,400 SF of private open space. It is currently under construction and scheduled to open in 2019. To determine the number of trips generated by the development, ITE'S Trip Generation, 10th Edition was used, with mode splits based on nearby developments that have recently been studied. The Gilliam Place development is expected to generate 49 weekday AM peak hour vehicle trips and 74 weekday PM peak hour vehicle trips.

Westmont Shopping Center

This project consists of a redevelopment of the existing site at the northwest corner of the Columbia Pike and S Glebe Road intersection into a new mixed-used building containing approximately 250 dwelling units, 23,000 SF of ground-floor retail, and 345 underground parking spaces. The expected build out year is 2020. The Westmont Shopping Center development is expected to generate 99 weekday AM peak hour vehicle trips and 152 weekday PM peak hour vehicle trips based on the Multimodal Transportation Study prepared by Wells + Associates dated December 14, 2018.

2400 Columbia Pike

This project consists a redevelopment of the existing 11,398 SF of retail into a new multi-use building containing 105 residential units, 13,037 SF of retail, and below-grade parking. The expected build out year was initially projected to occur in 2017; however, construction has not yet begun. The 2400 Columbia Pike development is expected to generate 194 weekday AM peak hour vehicle trips and 299 weekday PM peak hour vehicle trips based on the Traffic Impact Study prepared by Wells + Associates dated October 20, 2014.

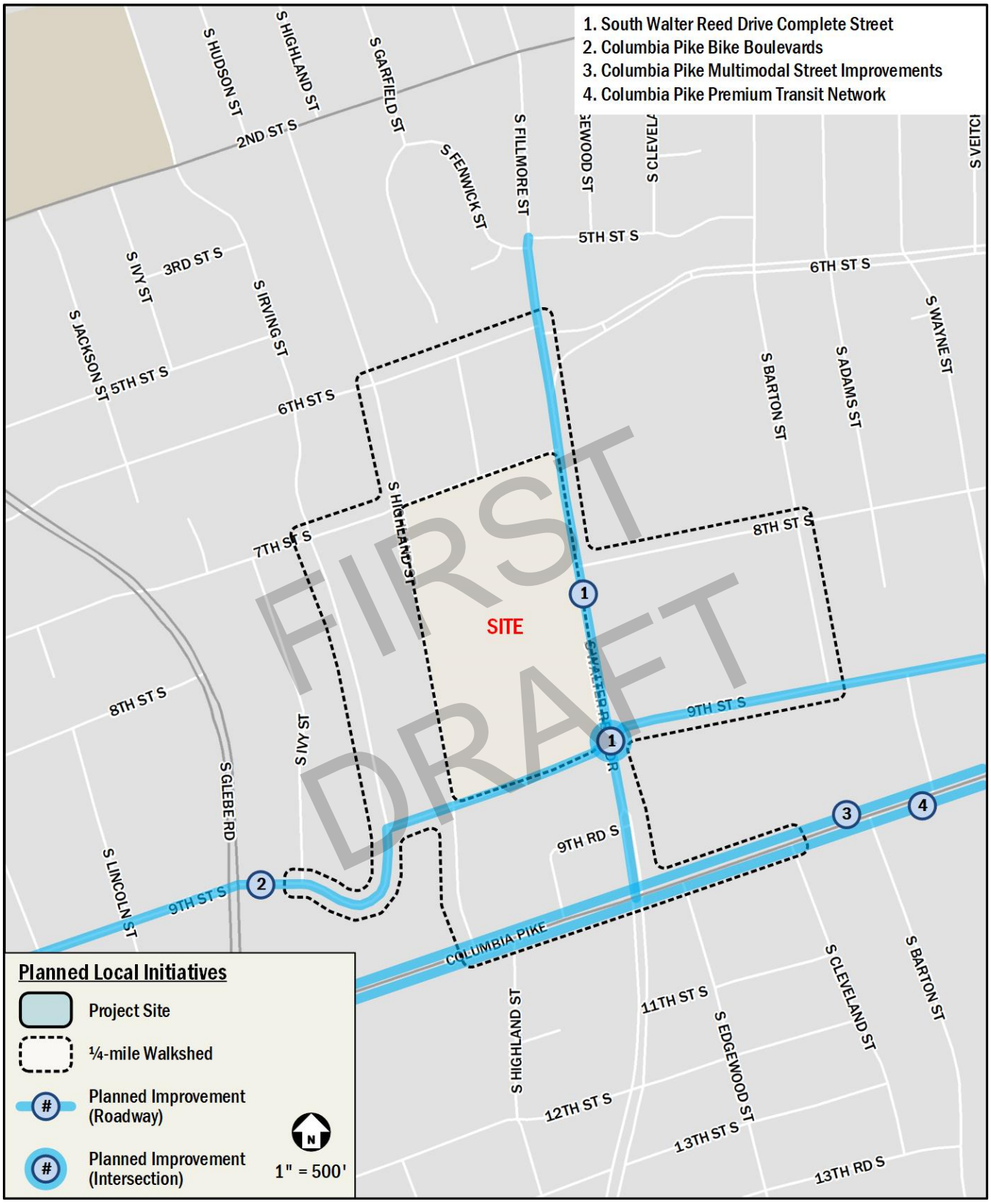


Figure 5: Map of Local Initiatives

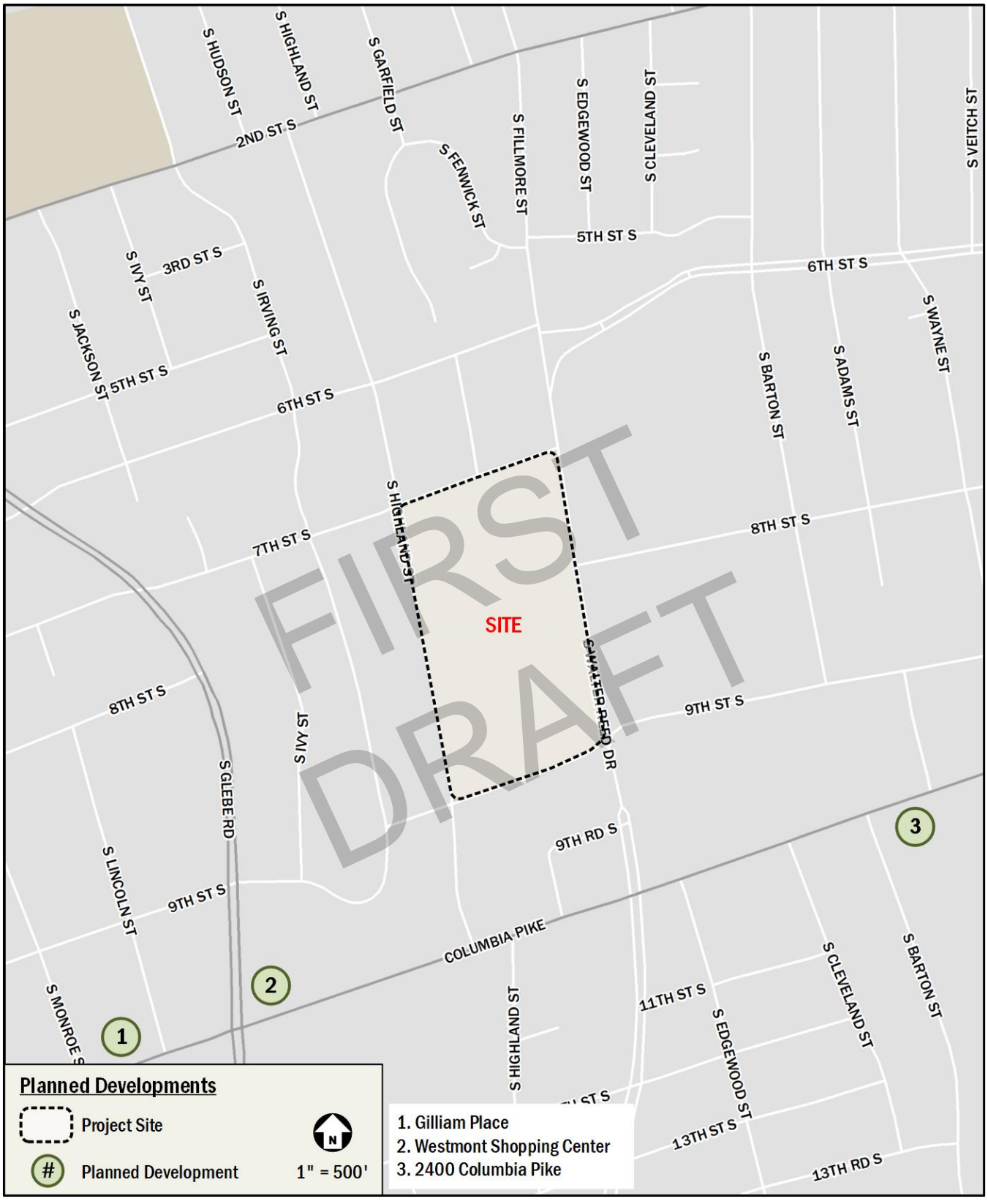


Figure 6: Map of Planned Developments

PROJECT DESIGN

This chapter provides a summary of the existing uses on the Arlington Career Center (CC) campus and reviews the transportation components of the CC project. This includes an overview of how the campus will be accessed by various users and how each mode is accommodated.

EXISTING SITE DESIGN

The CC campus is home to several buildings and programs. The CC itself, housed in the southernmost building on the campus, houses a Continuing Education Program (CTE), Arlington Tech high school, and several additional programs and services. An overview of the high school programs available in the CC building is shown in Table 1. Attached to the CC building is the Columbia Pike Branch Library, a public library. On the northern end of the campus is the Montessori Public School of Arlington (MPSA). Between the CC building and the elementary school is the Fenwick building, which houses the Arlington Community High School, and a surface parking lot that also contains bus loading/unloading areas for the high school and elementary school. Within the surface lot is a relocatable complex that includes eight (8) classrooms. Figure 7 provides a quick overview of the existing campus. Figure 8 shows the existing vehicular circulation throughout the campus. Table 2 provides an overview of the existing student and staff populations at the CC.

Table 2: Existing CC Populations

	Existing Population (As of Spring 2019)
Arlington Tech	196 students
Academic Academy	50 students
English Learner Program	66 students
PEP	55 students
Total Students	***367 students***
CC Staff	124 staff

Table 1: Overview of CC Programs

Arlington Tech	A rigorous, project-based learning, high school program that prepares students to succeed in college and in the workplace through collaborative problem solving. (Grade 9-12) Regular school bus transportation is available for students that live more than 1.5 miles for the CC. After school bus transportation is also available to each comprehensive high school for extracurricular activities. Bell Times: 8 AM to 3:10 PM
Academic Academy	Program designed for students as an alternative to the comprehensive high school; designed with small class settings, low teacher/student ratio, individualized teacher mentoring, and structured academics Students may attend the Academy for five periods and return to the comprehensive high school for an additional two classes, or students may choose to spend the entire academic day at the CC. Bell Times: 8 AM to 3:10 PM
English Learner Program	For students (under age 21) who are interested in completing a high school diploma while learning valuable career and technical skills. (Grades 9-12) Bell Times: 8 AM to 3:10 PM
Program for Employment Preparedness (PEP)	For special needs students who have completed 4 years of high school but have not yet received a diploma. Students learn independent living and work readiness skills within community settings, tailored to the student's needs. Students attend the CC full-time, two days a week.
Continuing Education Program (CTE)	The CC offers the opportunity to become certified or licensed in a chosen field. Most of these certifications, occupational competency assessments and licensures, when passed, qualify students for high school selected verified credits and seals of achievement on their diplomas, as shown. Students attend part-time from their comprehensive high school (2 periods/day, in 3 blocks). Transportation is provided to/from the CC by bus (in three shifts throughout the school day).

Existing Observations

Visits to the CC campus show that outside of school arrival and dismissal times, the campus does not generate a significant amount of traffic. During arrivals and dismissal times though, an increased number of cars both enter and exit the campus and drive on surrounding roads. Parents (or guardians) dropping off students in the morning (and picking them up in the afternoon) unload students in several different places, spreading out this activity, and thus the traffic load. Designated curbside space exists for this activity along S Highland Street, but only a percentage of drop-offs and pick-ups occur in those spaces. Figure 9 shows photos of this activity occurring outside of the designated areas. Although this activity happens in several locations and not all in the designated area, it is not generating any issues, such as queuing that blocks other traffic or unsafe pedestrian crossings, based on observations during the campus visits. Parents using alternative drop-off/pick-up locations were not observed creating congestion issues elsewhere, and the spreading out of traffic demand over several locations potentially decreases impact on S Highland Street.

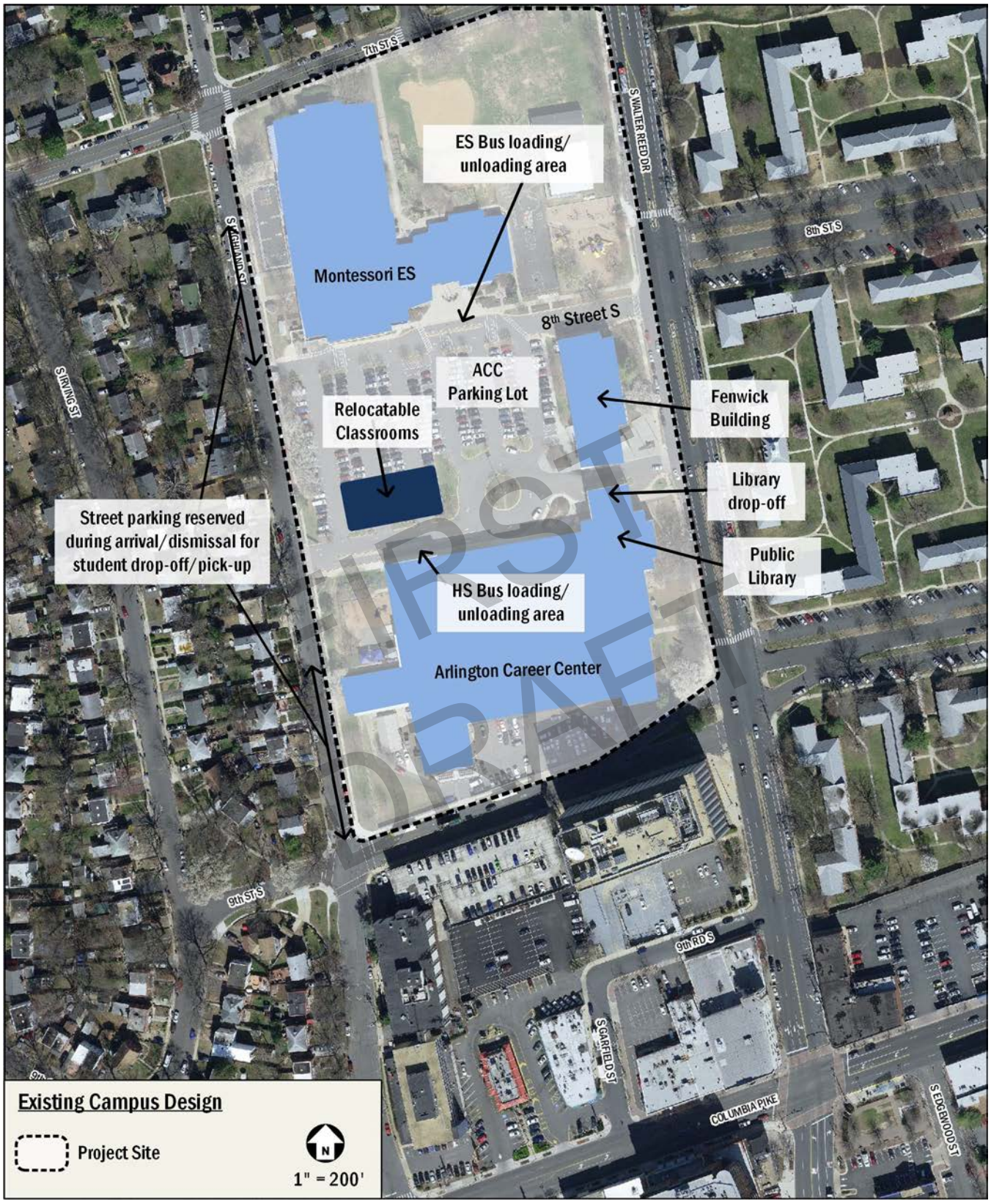


Figure 7: Existing Campus Design

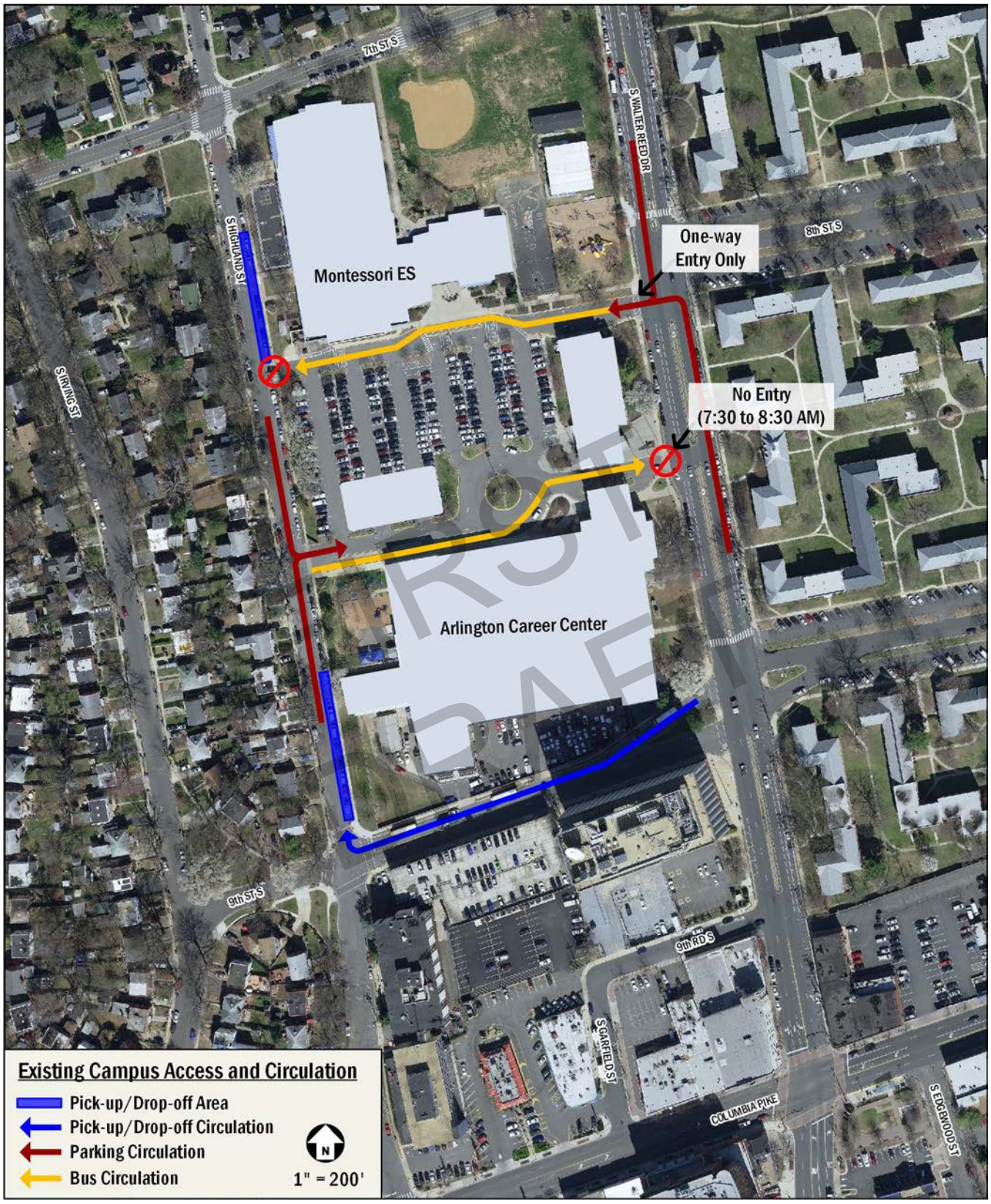


Figure 8: Existing Campus Access and Circulation

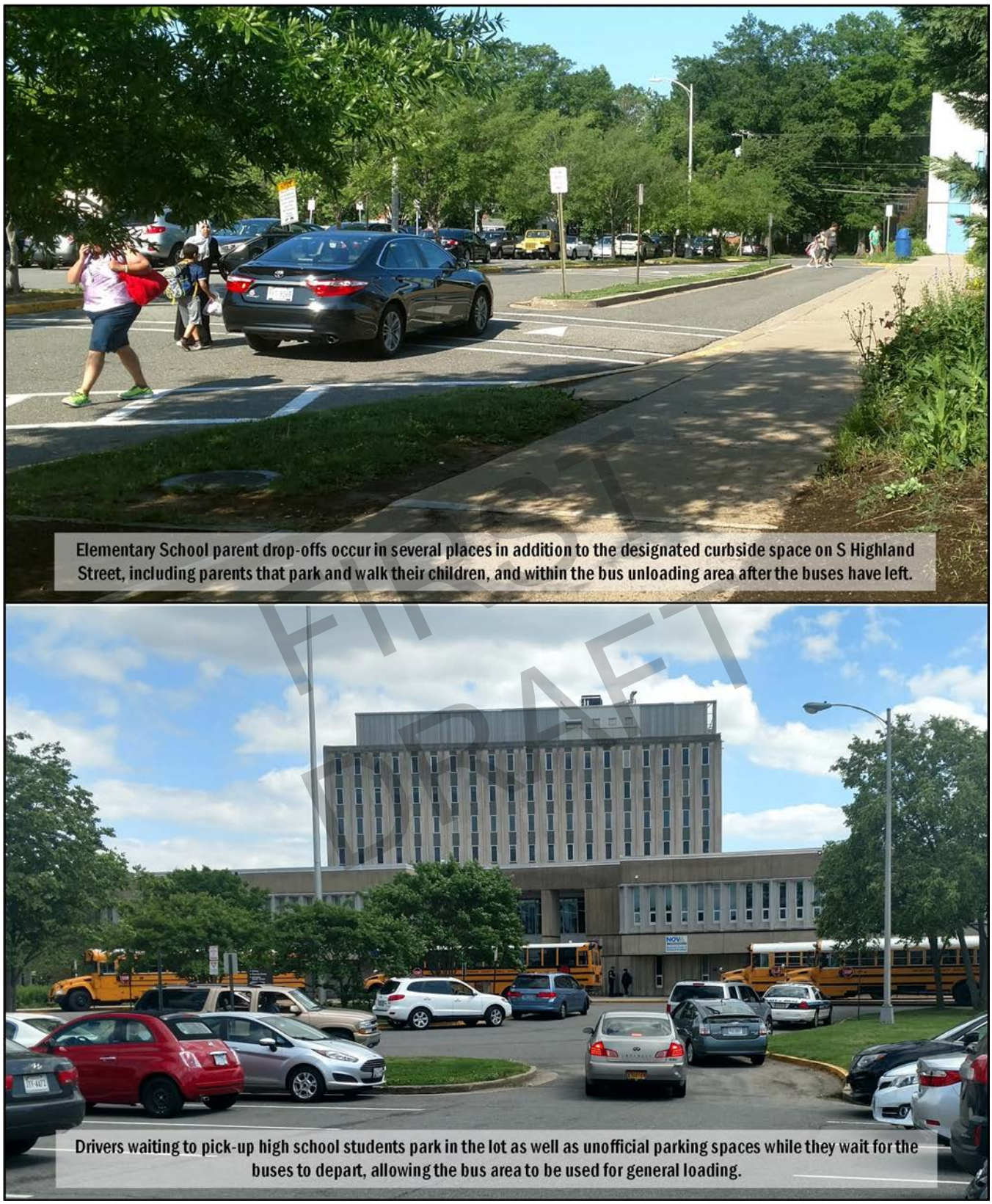


Figure 9: Photos of Arrival/Dismissal

Project Summary

The project consists of renovating the existing CC building to include the addition of 800 new high school students to the CC building and the increase in Arlington Tech enrollment to 600 students. All existing programs will remain on campus. At the time of counts (Spring 2019), Patrick Henry Elementary School remained on campus. As of Fall 2019, that building is occupied by MPSA. Changes in the student and staff populations are summarized in Table 3.

Table 3: Future CC Populations

	Existing Population (As of Spring 2019)	Future Population
Arlington Tech	196 students ⟶	600 students
Academic Academy	50 students ⟶	60 students
English Learner Program	66 students ⟶	70 students
PEP	55 students ⟶	70 students
New HS Seats	0 students ⟶	800 students
Total Students	***367 students ⟶***	***1900 students (+1233)***
CC Staff	124 staff ⟶	266 staff

Overall Transportation Strategy

Establishing an instructional facility at the CC campus presents an opportunity to optimize transportation operations. One of the general goals of this project is to provide flexibility in the type of educational programs that can be housed on the campus. When the CC project is complete, the campus will be shared between the CC building, elementary school, and Arlington Community High School but in the future, it may be used for a different educational program like a dedicated high school campus. Thus, although this MMTA makes recommendations primarily on how the building will function as a shared campus, it also considers how it may function in the future.

The recommendations contained within this MMTA, and detailed in the following sections, are all based around this overall strategy.

Site Access

Vehicular Access

Access to the campus will be provided via…

These internal roadways and vehicular access points are shown in Figure 11.

Parking

Staff Parking

At the time of parking counts, Spring 2018 and Spring 2019, the staff parking demand was 233 spaces. During this time, Patrick Henry ES remained on-site and there were no relocatable classrooms in the parking lot. As a result of the project, staff parking is projected to increase to 326 spaces for staff, a net increase of 93 parking spaces. See the *Parking* chapter of this report for more details on these projections.

These future staff parking assumptions are based on linear growth of the existing staff populations relative to the total student growth. The staff future parking demand may be lower through additional Transportation Demand Management (TDM) programs and policies. Thus, the above estimates represent the worst-case projections of demand. See *Travel Demand Assumptions* for details on these assumptions.

This report recommends accommodating the new parking demand with…

Student Parking

At the time of parking counts, Spring 2018 and Spring 2019, the student parking demand under conditions was 40 spaces. As a result of the project, student parking is projected to increase to 134 spaces for students, a net increase of 94 parking spaces. See the *Parking* chapter of this report for more details on these projections.

These future students parking assumptions are based on the expected growth of the student populations, as outlined in Table 3. The student future parking demand may be lower through additional Transportation Demand Management (TDM) programs and policies. Thus, the above estimates represent the worst-case projections of demand. See *Travel Demand Assumptions* for details on these assumptions.

An analysis of parking availability at other on-street and off-campus locations is presented later in the report.

Student Pick-up/Drop-off

During arrival and dismissal times, parents (or guardians) are expected to use…

The locations of these areas are shown in Figure 10.

Bus Loading/Unloading

The expected bus demand can be accommodated by… The proposed bus loading/unloading area is shown in Figure 10.

BICYCLE FACILITIES

Because bicycle parking demand is projected to grow with increased TDM programs, it is recommended that more bicycle parking be added. The project will include XX bicycle parking spaces.

Figure 10: Project Design

Figure 11: Future Campus Access and Circulation

TRAVEL DEMAND ASSUMPTIONS

This chapter outlines the transportation demand of the proposed Arlington Career Center (CC) campus. This includes a review of APS Go! survey information, expected mode splits for staff and students, and vehicular trip generation.

MODE SPLIT

The main source of mode split information for this report was APS Go! survey and Safe Routes to Schools (SRTS) student count/tally data collected in 2016. The APS Go! surveys included all Arlington Public Schools (APS) schools and consisted of multiple surveys including student, parent, and staff surveys. Not only do these surveys include mode split questions, but they also asked many other relevant questions where the responses were used to help assemble assumptions for this report (e.g. arrival and departure times for staff). The SRTS tallies were performed in school per classroom and provide a good representation of how students traveled to school on a specific date.

After comparing the summaries of survey information, this report decided to base assumptions on the student tallies over the parent surveys, as it appeared they were a more accurate reflection of mode splits. Based on the parent responses, they were overestimating the amount of times they would walk their children to school compared to how much they actually drive their children to school.

This report compares the overall mode split and specific CC campus mode split for elementary school students, high school students, and staff. The purpose of these comparisons is to review differences between them to help identify what makes the CC campus different than the average APS facility. Additionally, assumed mode splits for future students are identified.

Elementary School Students

Mode split comparisons for the elementary school students are shown in Table 4 and Table 5. At the time of the APS Go! survey data, Patrick Henry ES remained on site. These mode splits are used as the basis for future elementary school mode splits on the campus. The elementary school surveys show that Patrick Henry has a significantly higher percentage of students that walk to school than the average APS elementary school, and correspondingly a much lower percentage that take a school bus. This is likely due to the density of homes surrounding the school combined with high quality pedestrian infrastructure, that places more students in a walkable distance from school on quality routes. With the replacement of Patrick Henry, MPSA will assume a mode split consistent with that of Patrick Henry.

Table 4: ES Student Survey Results (Morning)

Population & Source	Morning Mode Split					
	Auto	Carpool	School Bus	Walk	Bike	Transit
All APS Schools						
Parent Survey	24%	2%	43%	27%	3%	1%
Student Tally	37%	2%	39%	21%	1%	<1%
All APS Elementary Schools						
Parent Survey	26%	<1%	44%	27%	2%	<1%
Student Tally	36%	2%	38%	21%	1%	<1%
Patrick Henry ES						
Parent Survey	23%	<1%	13%	50%	13%	<1%
Student Tally	43%	1%	20%	34%	2%	<1%

Table 5: ES Student Survey Results (Afternoon)

Population & Source	Afternoon Mode Split					
	Auto	Carpool	School Bus	Walk	Bike	Transit
All APS Schools						
Parent Survey	27%	1%	40%	28%	3%	1%
Student Tally	36%	3%	38%	22%	1%	<1%
All APS Elementary Schools						
Parent Survey	38%	<1%	35%	25%	2%	<1%
Student Tally	37%	2%	39%	21%	1%	<1%
Patrick Henry ES						
Parent Survey	23%	<1%	10%	57%	10%	<1%
Student Tally	38%	1%	23%	36%	2%	<1%

Because Patrick Henry ES was a neighborhood school and MPSA is an option school, changes to mode splits are expected. Table 6 and Table 7 compares neighborhood and option school mode splits, based on APS Go! survey data for all APS neighborhood elementary schools and all APS option elementary schools. These survey results show that the significant difference in mode splits is between school bus and walk/bike mode splits. Nearly 50% of students take the school bus at option schools, versus 34 percent at neighborhood schools. In turn, more students walk/bike at neighborhood

schools, at 27 percent compared to 9 percent. The percentage of students that are dropped-off/picked-up is generally consistent.

Table 6: Neighborhood vs Option Survey Results (Morning)

Population	Morning Mode Split					
	Auto	Carpool	School Bus	Walk	Bike	Transit
All APS Neighborhood ES Schools (Student Tally)						
	37%	2%	34%	25%	2%	0%
All APS Option ES Schools (Student Tally)						
	39%	1%	51%	8%	1%	0%

Table 7: Neighborhood vs Option Survey Results (Afternoon)

Population	Afternoon Mode Split					
	Auto	Carpool	School Bus	Walk	Bike	Transit
All APS Neighborhood ES Schools (Student Tally)						
	36%	3%	34%	25%	2%	0%
All APS Option ES Schools (Student Tally)						
	40%	2%	49%	8%	1%	0%

High School Students

The APS Go! data for high school students is split between grades 9 and 10, and grades 11 and 12. SRTS tallies were used for grades 9 and 10, while student surveys were used for grades 11 and 12 because of the possibility they may drive to school themselves. Mode split comparisons for the grade 9 and 10 students are shown in Table 8 and Table 9. The new 800 high school seats assume mode splits consistent with that of the existing CC students.

These survey results show that students in grades 9 and 10 at the CC campus have several differences in travel mode compared to average grade 9 and 10 students. First, their use of transit is significantly higher, likely due to the quality options near the CC and the large area that students are drawn from. Second, they have a slightly higher bicycle percentage, possibly due to the quality bicycle routes to and from the CC campus. The one mode that is slightly lower for grades 9 and 10 is the percentage that are dropped-off and picked-up by automobile.

Table 8: Grades 9 & 10 Survey Results (Morning)

Population	Morning Mode Split					
	Auto	Carpool	School Bus	Walk	Bike	Transit
All APS Grades 9 & 10 (Student Tally)						
	28%	4%	42%	20%	4%	2%
Career Center and Community HS Grades 9 & 10 (Student Tally)						
	16%	4%	43%	11%	7%	19%

Table 9: Grades 9 & 10 Survey Results (Afternoon)

Population	Afternoon Mode Split					
	Auto	Carpool	School Bus	Walk	Bike	Transit
All APS Grades 9 & 10 (Student Tally)						
	22%	3%	43%	26%	4%	2%
Career Center and Community HS Grades 9 & 10 (Student Tally)						
	15%	3%	47%	10%	7%	18%

Mode split comparisons for the grade 11 and 12 students are shown in Table 10 and Table 11. At the time of the 2016 survey, Arlington Tech did not have grades 11 and 12. With this, the mode splits are more representative of other programs. The mode splits for grades 11 and 12 show some significant differences from the average grade 11 and 12 student. Mainly, the percentage that take a school bus is lower than average in the morning, while the number of students getting dropped-off is much higher.

Additionally, the morning and afternoon mode splits vary greatly. Reviewing the survey results shows that this is because many students that are dropped-off or carpool in the morning use the school bus in the afternoon. This seems to be due to afterschool programs, or the schedules for pick-up/carpool not matching as they do in the morning.

Table 10: Grades 11 & 12 Survey Results (Morning)

Population	Morning Mode Split						
	Drove	Dropped-Off	Carpool	Walk	School Bus	Bike	Transit
All APS Grades 11 & 12 (Student Survey)							
	17%	21%	11%	15%	33%	2%	1%
Career Center Grades 11 & 12 (Student Survey)							
	13%	39%	17%	17%	9%	0%	4%

Table 11: Grades 11 & 12 Survey Results (Afternoon)

Population	Afternoon Mode Split						
	Drove	Picked-Up	Carpool	Walk	School Bus	Bike	Transit
All APS Grades 11 & 12 (Student Survey)							
	19%	14%	9%	20%	35%	2%	1%
Career Center Grades 11 & 12 (Student Survey)							
	22%	26%	0%	13%	39%	0%	0%

APS Staff

A mode split comparison for APS staff is shown in Table 12. The mode splits for APS staff at the CC campus are similar to staff mode splits throughout APS. There is a slight increase in the amount of elementary school staff that take transit and walk compared to the APS average.

Table 12: Staff Mode Split Survey Results

Population	Mode				
	Auto	Carpool	Walk	Bike	Transit
All APS Staff					
	85%	3%	4%	3%	5%
Patrick Henry ES Staff					
	79%	3%	7%	4%	7%
Career Center and Community HS Staff					
	85%	4%	4%	4%	3%

Mode Split Targets

Mode Split Targets

APS Go! is the TDM program for APS. Within this program, there is a targeted list of the most critical indicators of success related to the APS Go! plan. As part of this list, the program identifies mode split targets for county-wide students and staff to be met by 2021. These targets include:

- Increase the student walk/bike rate to 30% by 2021
- Decrease the staff driving rate to 75% by 2021

As of the 2013 APS Go! survey data, the student walk/bike rate was 22%. This has since increased to 24%, as of 2016 data. As of the 2013 APS Go! survey data, the staff driving rate was 88%. This has since decreased to 85%, as of 2016 data. Given these trends, it seems reasonable that the CC can target similar goals.

Because the CC consists of option seats, the APS Go! student walk/bike target may be difficult to achieve. Instead, a walk/bike/public transit target of 45% may be more appropriate, as there many transit options available around the campus. While APS Go! does not set a target for student driving rates, a reasonable target could be 10% for the CC, given a significant focus of TDM at the CC. Meeting the 75% staff target driving rate seems reasonable for the CC, as the staff mode splits currently align with the county-wide trends. Reductions to student and staff driving rates will impact the overall parking demand on the parking supplies at the CC, as discussed in a later chapter.

TRIP GENERATION

The vehicular trip generation for this project takes into account the changes to the existing uses. This includes the addition of 800 high school students to the Arlington Career Center building and the increase in Arlington Tech enrollment to 600 students. The breakdown of changes to the student and staff populations at the CC is shown in Table 2. At the time of counts (Spring 2019), Patrick Henry Elementary School remained on campus. As of Fall 2019, that building is occupied by MPSA. These population assumptions are currently being reviewed against Ed Specs.

Table 14: CC Populations

	Existing Population (As of Spring 2019)	Future Population
Arlington Tech	196 students ⟶	600 students
Academic Academy	50 students ⟶	60 students
English Learner Program	66 students ⟶	70 students
PEP	55 students ⟶	70 students
New HS Seats	0 students ⟶	800 students
Total Students	***367 students ⟶***	***1900 students***
CC Staff	124 staff ⟶	266 staff

The methodology used to develop the trip generation for the Arlington Career Center project is based primarily on APS Go! data, combined with population numbers of students and staff, and the mode split assumptions summarized above. The APS Go! survey results contain transportation profiles including arrival and departure times. The population for the students and staff were split into different modes using the mode split assumptions, and then assigned arrival and departure times based on the survey information. The existing bell times for the schools on the Arlington Career Center and Arlington Community High School were assumed unchanged. The bell times for MPSA align with that of Patrick Henry Elementary School, with bell times of 9:00 AM to 3:41 PM.

Using this methodology, vehicular trip generation was determined for each user group, shown in Figure 12. This methodology allows for a finer breakdown of how trip generation fluctuates within the peak hours and outside the singular peak hour of analysis.

Table 13: Trip Generation Summary

User Group	ITE Code	Size	Vehicular Trip Generation								
			AM Peak Hour			*PM School Peak Hour*			*PM Commuter Peak Hour*		
			IB	OB	Total	IB	OB	Total	IB	OB	Total
Existing CC Campus											
Students	--	574 HS students & 642 ES students									
		Drive & Park	4 v/hr	0 v/hr	4 v/hr	7 v/hr	36 v/hr	43 v/hr	12 v/hr	15 v/hr	27 v/hr
		Pick-up/Drop-off	215 v/hr	215 v/hr	430 v/hr	168 v/hr	164 v/hr	332 v/hr	59 v/hr	54 v/hr	113 v/hr
		Total Student Trips	**219 v/hr**	**215 v/hr**	**434 v/hr**	**175 v/hr**	**200 v/hr**	**375 v/hr**	**71 v/hr**	**69 v/hr**	**140 v/hr**
Staff	--	256 staff	53 v/hr	1 v/hr	54 v/hr	0 v/hr	71 v/hr	71 v/hr	13 v/hr	73 v/hr	86 v/hr
Visitors	--	44 visitors	4 v/hr	0 v/hr	4 v/hr	4 v/hr	6 v/hr	10 v/hr	0 v/hr	7 v/hr	7 v/hr
Library	590	20,000 sf	10 v/hr	4 v/hr	14 v/hr	54 v/hr	60 v/hr	114 v/hr	54 v/hr	60 v/hr	114 v/hr
Subtotal (Existing CC Trips)			**286 v/hr**	**220 v/hr**	**506 v/hr**	**233 v/hr**	**337 v/hr**	**570 v/hr**	**138 v/hr**	**209 v/hr**	**347 v/hr**
Proposed CC Campus											
Students	--	1,806 HS students & 502 ES students									
		Drive & Park	207 v/hr	0 v/hr	207 v/hr	7 v/hr	122 v/hr	129 v/hr	12 v/hr	49 v/hr	61 v/hr
		Pick-up/Drop-off	351 v/hr	355 v/hr	706 v/hr	238 v/hr	275 v/hr	513 v/hr	98 v/hr	84 v/hr	182 v/hr
		Total Student Trips	**558 v/hr**	**355 v/hr**	**913 v/hr**	**245 v/hr**	**397 v/hr**	**642 v/hr**	**110 v/hr**	**133 v/hr**	**243 v/hr**
Staff	--	465 staff	206 v/hr	1 v/hr	207 v/hr	0 v/hr	124 v/hr	124 v/hr	16 v/hr	96 v/hr	112 v/hr
Visitors	--	54 visitors	4 v/hr	0 v/hr	4 v/hr	3 v/hr	9 v/hr	12 v/hr	0 v/hr	6 v/hr	6 v/hr
Library	590	20,000 sf	10 v/hr	4 v/hr	14 v/hr	54 v/hr	60 v/hr	114 v/hr	54 v/hr	60 v/hr	114 v/hr
Subtotal (Proposed CC Trips)			**778 v/hr**	**360 v/hr**	**1138 v/hr**	**302 v/hr**	**590 v/hr**	**892 v/hr**	**180 v/hr**	**295 v/hr**	**475 v/hr**
Net New Trips (Proposed CC Trips minus Existing CC Trips)			***492 v/hr***	***140 v/hr***	***632 v/hr***	***69 v/hr***	***253 v/hr***	***322 v/hr***	***42 v/hr***	***86 v/hr***	***128 v/hr***

The existing Columbia Pike Library trips were calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 10th Edition, using ITE Land Uses 590 (Library), using a 30% non-auto reduction derived from American Community Survey (ACS) 5-year estimates of the site census tract. The library will remain unchanged under proposed conditions but is included for a comprehensive trip generation of the CC campus.

Once these daily profiles were assembled, the morning peak hour, school dismissal peak hour, and evening commuter peak hour trip generations were assembled. Table 13 contains a summary of the project's trip generation.

Queuing Demand

Drop-off/Pick-up

The amount of queuing space needed in the parent drop-off/pick-up area was based on observations at other APS schools and the student population size. The queuing space required is estimated to be approximately 64 cars for the high school uses on the CC campus and 20 cars for the elementary schools uses on the campus.

Because this project provides an opportunity to establish proper geometry and operational practices for the drop-off/pick-up area, a design target of a 65-car queue length and 25-car queue length is recommended for the high school and elementary school uses, respectively.

Bus Unloading/Loading

The amount of queuing space needed for bus operations is based on the amount of school buses needed to serve comparable APS schools, based on student population size; it represents the higher end of buses needed at high schools. The high school bus demand is estimated to be approximately 19 buses.

Because this project provides an opportunity to establish proper geometry and operational practices for the bus unloading/loading area, a design target of a 20-bus unloading/loading facility is recommended. Depending on the desired location of bus facilities, fewer or more buses may be accommodated.

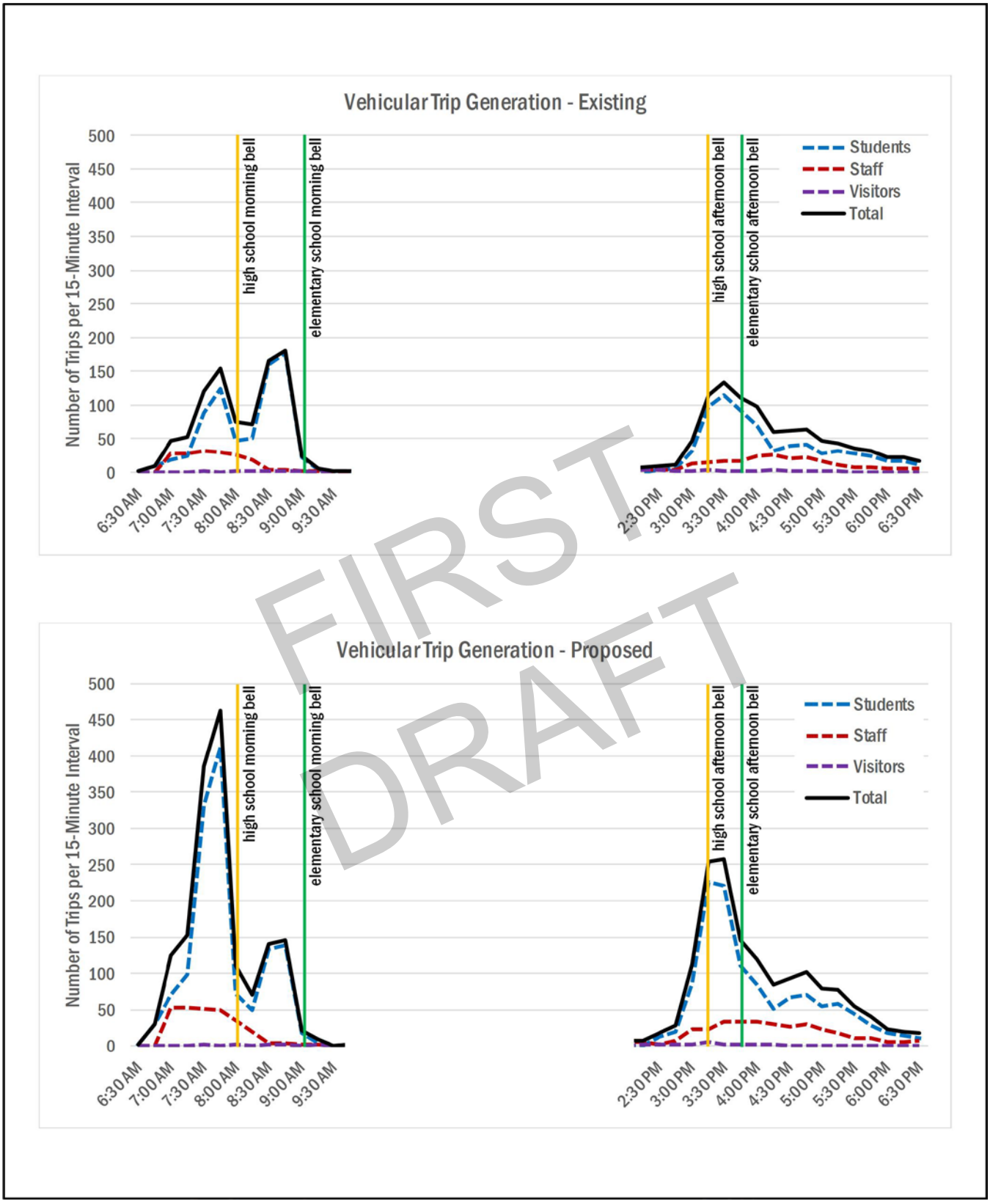


Figure 12: Vehicular Trip Generation Summary

TRAFFIC OPERATIONS

This chapter provides a summary of the existing and future roadway facilities and an analysis of the existing and future roadway capacity in the study area.

The purpose of the capacity analysis is to:

- Determine the existing capacity of the study area roadways;
- Determine the overall impact of the proposed project on the study area roadways; and
- Identify potential areas of concern regarding future growth on the Arlington Career Center (CC) campus.

The following conclusions are reached within this chapter:

- The existing study area intersections all operate at acceptable delay and LOS levels with two (2) exceptions. This is typical for commuting corridors and their side streets.
- Most intersections have acceptable queuing results, with all queues shorter than the available storage lengths, with five (5) exceptions. These exceptions occur primarily during the AM and PM commuter peak hours.
- The future scenarios show…

STUDY AREA, SCOPE, & METHODOLOGY

This section outlines the assumptions used to develop the existing capacity analyses, including volumes, roadway geometries and traffic operations. The general methodology of the analysis follows national and County guidelines on the preparation of transportation impact evaluations of site development.

Capacity Analysis Scenarios

The vehicular analyses were performed to determine if the proposed Arlington Career Center project will lead to adverse impacts on traffic operations. (A review of impacts to each other mode is provided later in this report.) This was accomplished by comparing future scenarios: (1) without the proposed project (referred to as the Background condition) and (2) with volumes generated by the project (referred to as the Total Future condition).

As per this report's scoping agreement, the roadway capacity analysis examined the following scenarios:

1. Existing Conditions
2. Background Conditions without project traffic
3. Total Future Conditions with project traffic

Each scenario contains three distinct hours of analysis:

1. The AM commuter/school peak hour
2. The PM school dismissal peak hour
3. The PM commuter peak hour

Study Area

The study area is a list of intersections where a detailed capacity analysis was performed. They represent the intersections most likely to have potential impacts or require changes to traffic operations to accommodate a proposed project. The following intersections were included:

1. S Highland Street & 7th Street S
2. S Walter Reed Drive & 7th Street S
3. S Highland Street & 8th Street S
4. S Walter Reed Drive & 8th Street S
5. S Highland Street & West Site Driveway
6. S Walter Reed Drive & East Site Driveway
7. S Highland Street & 9th Street S
8. S Walter Reed Drive & 9th Street S
9. Columbia Pike & S Highland Street
10. S Walter Reed Drive & Columbia Pike
11. S Glebe Road & 7th Street S
12. S Glebe Road & Columbia Pike
13. 2nd Street S & S Fillmore Street

Figure 13 shows a map of the study area intersections.

Figure 13: Study Area Intersections

TRAFFIC VOLUME ASSUMPTIONS

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

Existing Traffic Volumes

The existing traffic volumes are comprised of turning movement count data, which were collected on Wednesday, May 23, 2018 and April 3, 2019. The results of the traffic counts are included in the Technical Appendix.

For the AM, PM School Dismissal, and PM Commuter peak hours, the system peak of the study area intersections was used. This was 7:45 AM to 8:45 AM for the AM Peak, 3:15 PM to 4:15 PM in the PM School Dismissal Peak, and 5:00 PM to 6:00 PM in the PM Commuter Peak. The existing peak hour traffic volumes are shown on Figure 14.

Background Volumes (without the project)

The traffic projections for the Background conditions consist of the existing volumes with two additions:

- Traffic generated by developments expected to be completed prior to the project (known as background developments); and
- Inherent growth on the roadway (representing regional traffic growth).

Background Developments

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

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

Based on these criteria, and as discussed previously, three (3) developments were included in the Background scenario. Figure 6 shows the location of these developments in relation to the proposed development. These projects include:

1) **Gilliam Place:** This project consists of a redevelopment of the existing site at the northwest corner of the Columbia Pike and S Lincoln Street intersection into a new mixed-used building containing 8,000 SF of ground-floor retail, 173 residential units, 205 underground parking spaces, and approximately 6,400 SF of private open space. It is currently under construction and scheduled to open in 2019. To determine the number of trips generated by the development, ITE'S Trip Generation, 10th Edition was used, with mode splits based on nearby developments that have recently been studied. The Gilliam Place development is expected to generate 49 weekday AM peak hour vehicle trips and 74 weekday PM peak hour vehicle trips.

2) **Westmont Shopping Center:** This project consists of a redevelopment of the existing site at the northwest corner of the Columbia Pike and S Glebe Road intersection into a new mixed-used building containing approximately 250 dwelling units, 23,000 SF of ground-floor retail, and 345 underground parking spaces. The expected build out year is 2020. The Westmont Shopping Center development is expected to generate 99 weekday AM peak hour vehicle trips and 152 weekday PM peak hour vehicle trips based on the Multimodal Transportation Study prepared by Wells + Associates dated December 14, 2018.

3) **2400 Columbia Pike:** This project consists of a redevelopment of the existing 11,398 SF of retail into a new multi-use building containing 105 residential units, 13,037 SF of retail, and below-grade parking. The expected build out year was initially projected to occur in 2017; however, construction has not yet begun. The 2400 Columbia Pike development is expected to generate 194 weekday AM peak hour vehicle trips and 299 weekday PM peak hour vehicle trips based on the Traffic Impact Study prepared by Wells + Associates dated October 20, 2014.

Trip distribution assumptions for each background development were based on the distributions included in their respective studies or was based on those determined for the development based on recent nearby studies and altered where necessary based on anticipated travel patterns. The total traffic generated by these background developments is presented in Table 15. The background development generated traffic volumes are shown in Figure 15.

Table 15: Background Development Trip Generation

Background Development	Quantity	AM Peak Hour			PM School Dismissal Peak Hour			PM Commuter Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Gilliam Place	173 Dwelling Units	16	46	62	46	30	76	46	30	76
	Minus Reductions	*-5*	*-14*	*-19*	*-14*	*-9*	*-23*	*-14*	*-9*	*-23*
	Residential Total	11	32	43	32	21	53	32	21	53
	8,000 SF Retail	5	3	8	14	16	30	14	16	30
	Minus Reductions	*-2*	*-0*	*-2*	*-4*	*-5*	*-9*	*-4*	*-5*	*-9*
	Retail Total	3	3	6	10	11	21	10	11	21
	Total Trips	**14**	**35**	**49**	**42**	**32**	**74**	**42**	**32**	**74**
Westmont Shopping Center	250 Dwelling Units	25	101	126	101	54	155	101	54	155
	Minus Reductions	*-8*	*-30*	*-38*	*-30*	*-16*	*-46*	-30	-16	-46
	Residential Total	17	71	88	71	38	109	71	38	109
	22,342 SF Retail	13	8	21	40	43	83	40	43	83
	Minus Reductions	-6	-4	-10	-19	-21	-40	-19	-21	-40
	Retail Total	7	4	11	21	22	43	21	22	43
	Total Trips	**24**	**75**	**99**	**92**	**60**	**152**	**92**	**60**	**152**
2400 Columbia Pike	105 Dwelling Units	11	44	55	49	26	75	49	26	75
	13,000 SF Retail	43	5	48	24	29	53	24	29	53
	Minus Reductions	-4	-13	-17	*-15*	*-8*	*-23*	-15	-8	-23
	Removal of existing trips	-29	-11	-40	*-13*	*-19*	*-32*	-13	-19	-32
	Total Trips	**21**	**25**	**46**	**45**	**28**	**73**	**45**	**28**	**73**
	Net Background Site Trips	**59**	**135**	**194**	**179**	**120**	**299**	**179**	**120**	**299**

(1) Trips generated using ITE Trip Generation, 10th Edition. Non-auto mode split reductions based on other studies.
(2) Extracted from Westmont Shopping Center MMTA (12.14.2018) prepared by Wells + Associates.
(3) Extracted from 2400 Columbia Pike TIS (10.20.2014) prepared by Wells + Associates.

Regional Growth

While the background developments represent local traffic changes, regional traffic growth is typically accounted for using growth rates. The growth rates used in this analysis are derived using trends in historical counts. Table 16 shows a summary of the growth in traffic volumes on roadways adjacent to the study area. Based on this analysis an annual growth rate of 0.8% was assumed.

The traffic volumes generated by the inherent growth along the network were added to the existing traffic volumes in order to establish the Background traffic volumes. The Background peak hour traffic volumes are shown on Figure 16.

Table 16: AADT Volume Trends

Roadway	AADT					Annual % Change (2013 - 2017)
	2013	*2014*	*2015*	*2016*	*2017*	
Walter Reed Dr from Columbia Pike to 6th St S	12,000	11,000	11,000	13,000	13,000	2.0%
Columbia Pike from SR 120 Glebe Rd to SR 27 W, Washington Blvd	25,000	25,000	24,000	24,000	25,000	0.0%
Glebe Rd from US 50 to SR 244 Columbia Pike	31,000	30,000	30,000	31,000	31,000	0.0%
2nd St from Irving St to SR 27 Washington Blvd	7,000	6,900	6,800	7,200	7,300	1.1%
Average						**0.8%**

Source: VDOT Traffic Data 2013 to 2017 (http://www.virginiadot.org/info/ct-trafficcounts.asp)

Total Future Volumes (with Project)
The Total Future Volumes consist of the Background volumes with the addition of the traffic volumes generated by the project. Thus, the Total Future traffic volumes with the project include traffic generated by: the existing volumes, the background developments, and the trips generated by the project.

Distribution and routing assumptions were based on traffic counts, existing volume patterns, and anticipated changes to site access. The peak hour trips were calculated and assigned to the roadway network based on the traffic distribution shown in Figure 17. The proposed project's trip generation methodology was presented in the *Travel Demand Assumptions* chapter of this MMTA. Figure 18 shows the total new trips generated by the CC campus. Figure 19 shows the Total Future peak hour trips.

Geometry and Operations Assumptions

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

Existing Geometry and Operations
Study area intersection geometry, lane configuration and additional infrastructure details were recorded at the time of the traffic counts and confirmed via field reconnaissance by Gorove/Slade.

Some intersections within the study area have atypical geometry. For these intersections, Gorove/Slade assumed the closest lane configuration that could be represented in the analysis software. For example, the westbound approach of 8th Street S to S Walter Reed Drive has adjacent parking lanes that complicate the intersection. For purposes of the analysis, this was simplified to a single lane approach.

For some intersections where wide travel lanes exist, observations were made on how traffic flowed through the intersection and the lane configuration was adjusted. For example, on the southbound approach of S Highland Street and Columbia Pike there is technically only one lane, but high enough volumes and pavement width that right-turning vehicles squeeze by left-turning/thru vehicles waiting for an acceptable gap. Based on field observations this was coded in the traffic model as separate right-turning lane to better reflect actual conditions.

Traffic signal timings were provided by County staff and confirmed in the field. Figure 20 shows the existing lane configurations.

Background Geometry and Operations Assumptions
Following industry standard methodologies, a background geometry improvement must meet the following criteria to be incorporated into the analysis:

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

Based on these criteria, the following geometry improvements were included in the Background scenario. Roadway improvements as part of the S Walter Reed Drive Complete Street project were included. Coinciding with these plans, the following changes were incorporated:

- Reconfiguration of the 9th Street S and S Walter Reed Drive intersection with simplified geometry. The northbound channelized right-turn lane will be removed, and the northbound left/thru lane will be converted to a left/thru/right lane. The access lanes along both sides of the westbound approach will be removed, converting this approach to one left/thru/right lane.

The lane configurations and traffic controls for the Background scenario are shown in Figure 21.

Total Future Geometry and Operations Assumptions
The geometry and operations assumptions align with that which were assumed under Background conditions, with the addition of the proposed project. As part of the proposed project, the following changes to geometry and operations are anticipated…

The lane configurations and traffic controls for the Total Future scenario are shown in Figure 22.

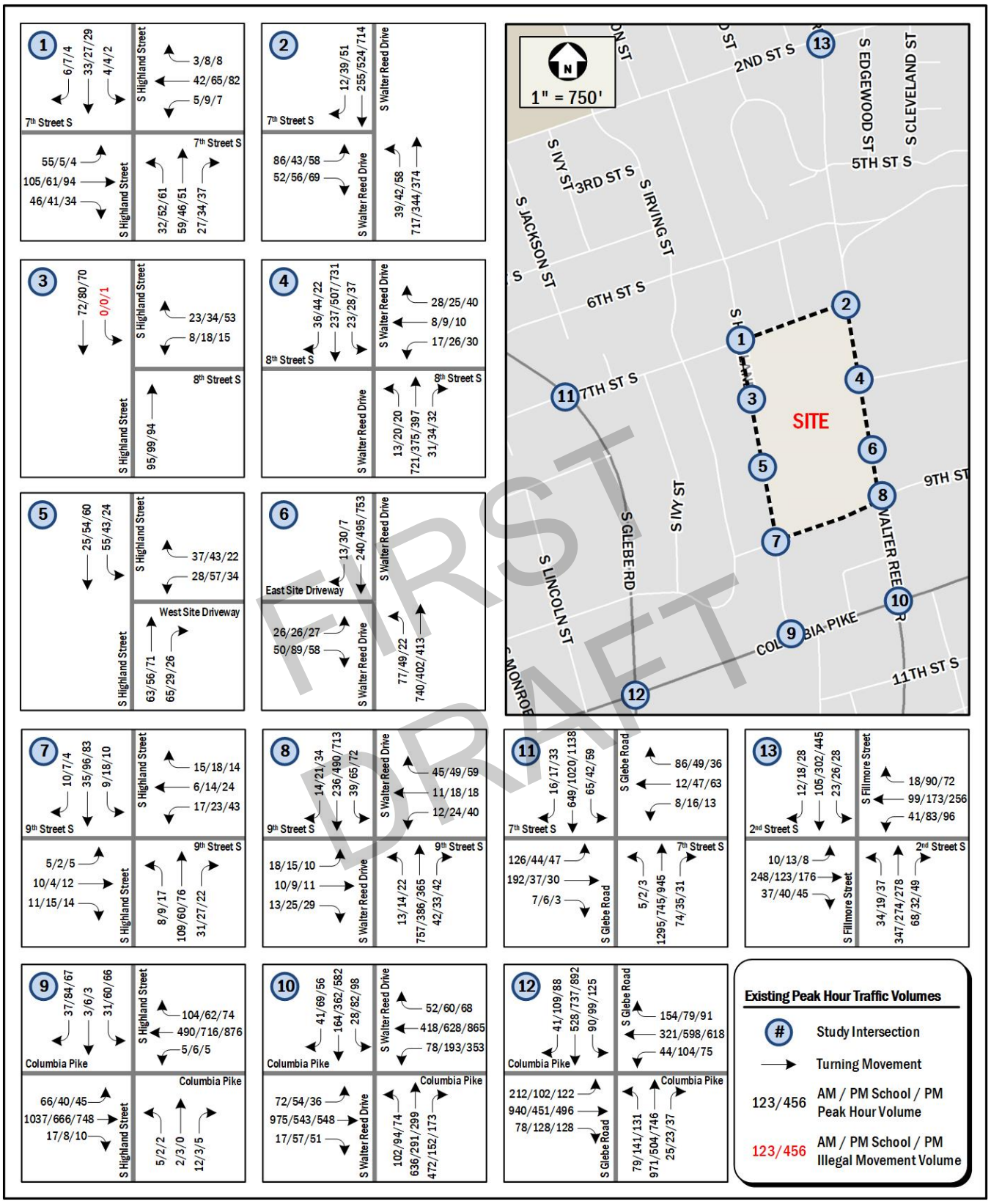


Figure 14: Existing Peak Hour Traffic Volumes

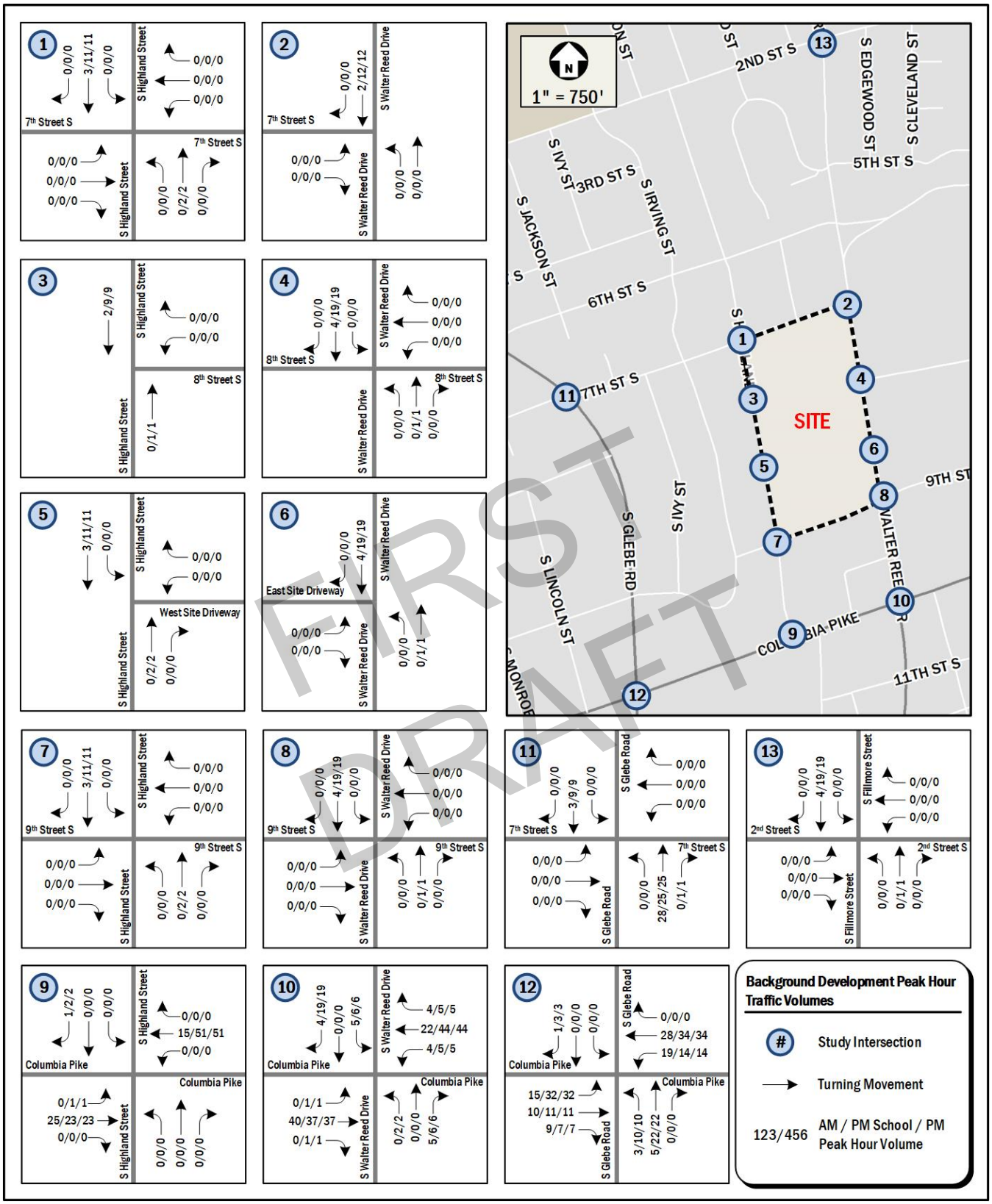


Figure 15: Background Development Peak Hour Traffic Volumes

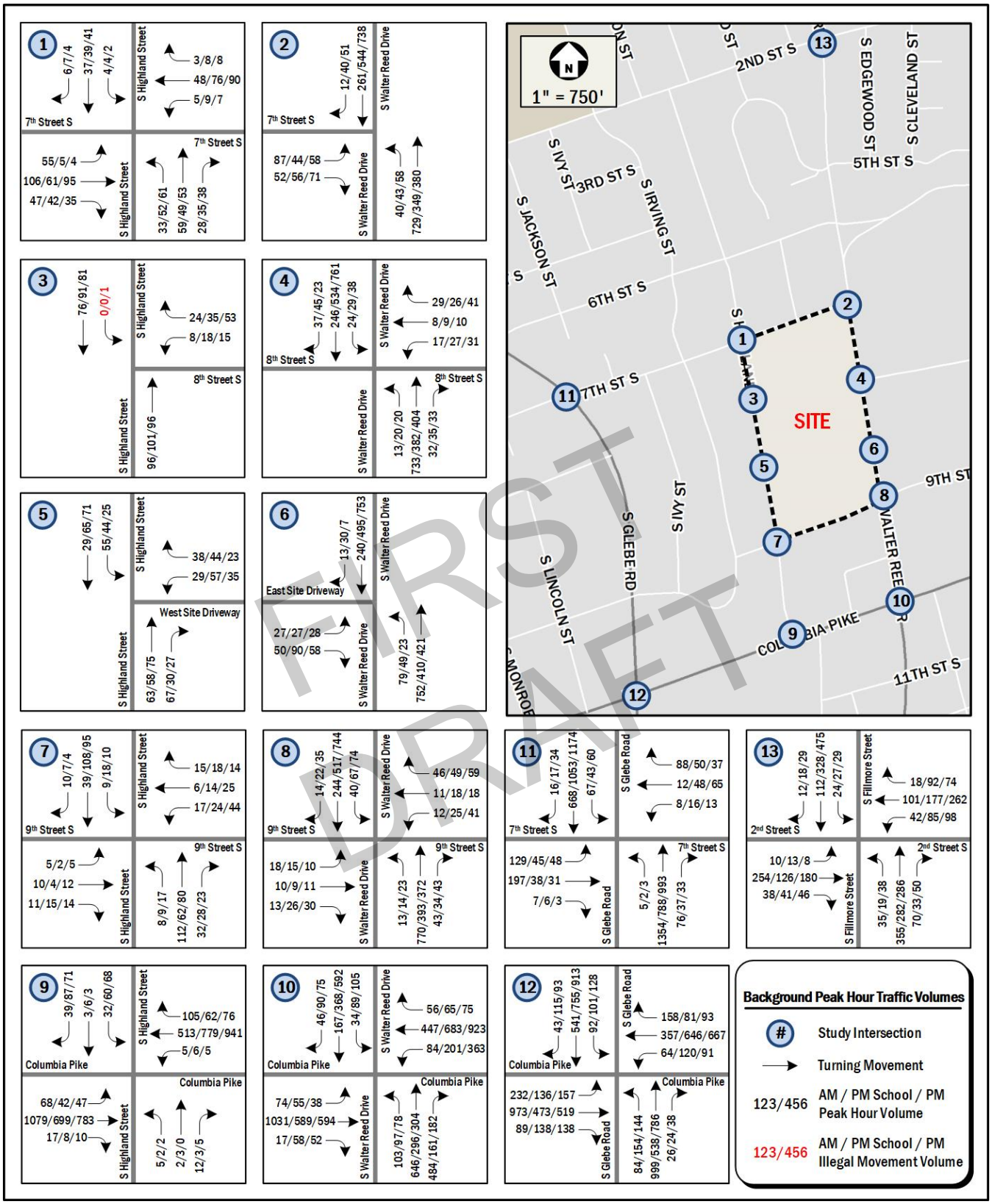


Figure 16: Background Peak Hour Traffic Volumes

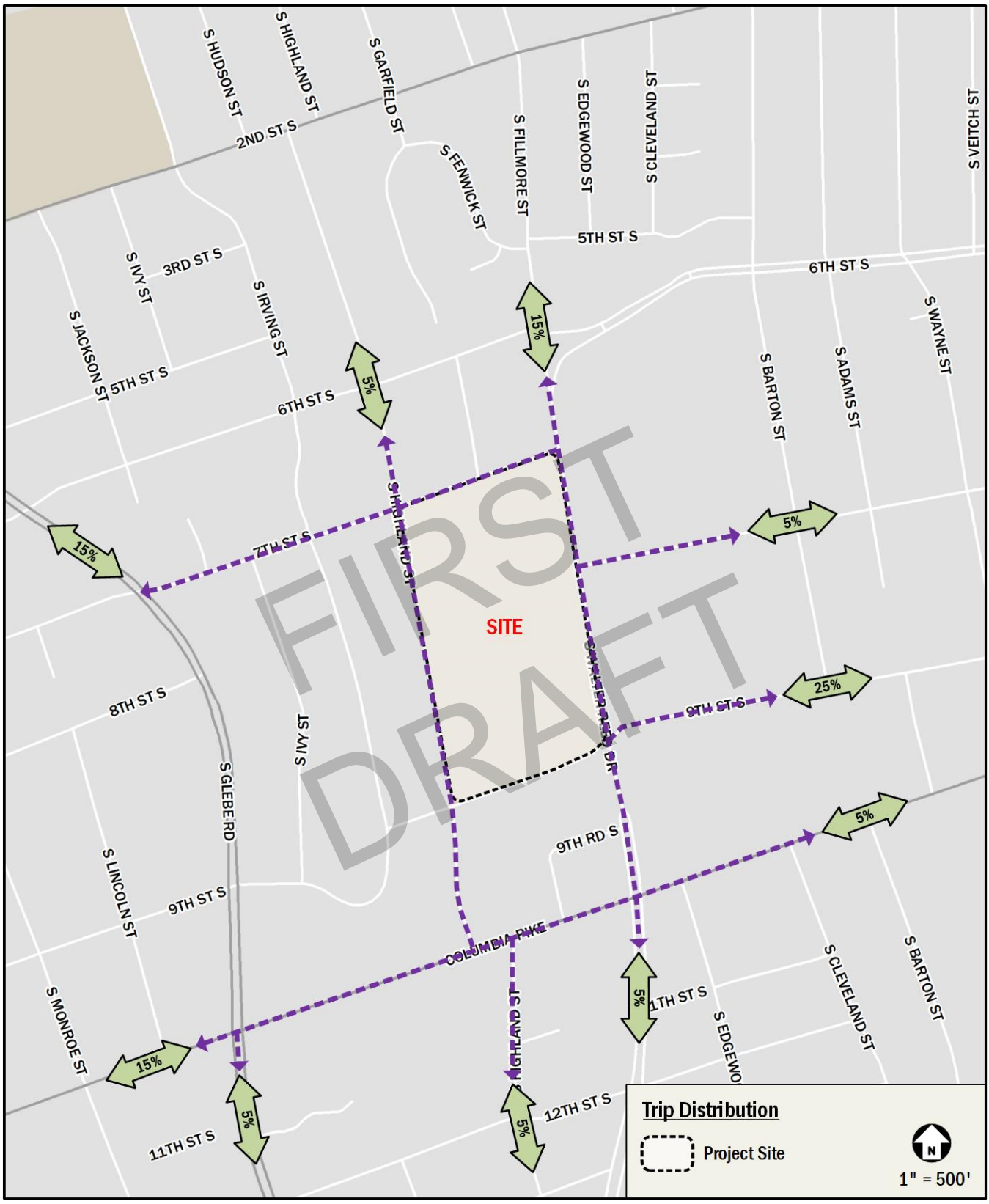


Figure 17: Trip Distribution

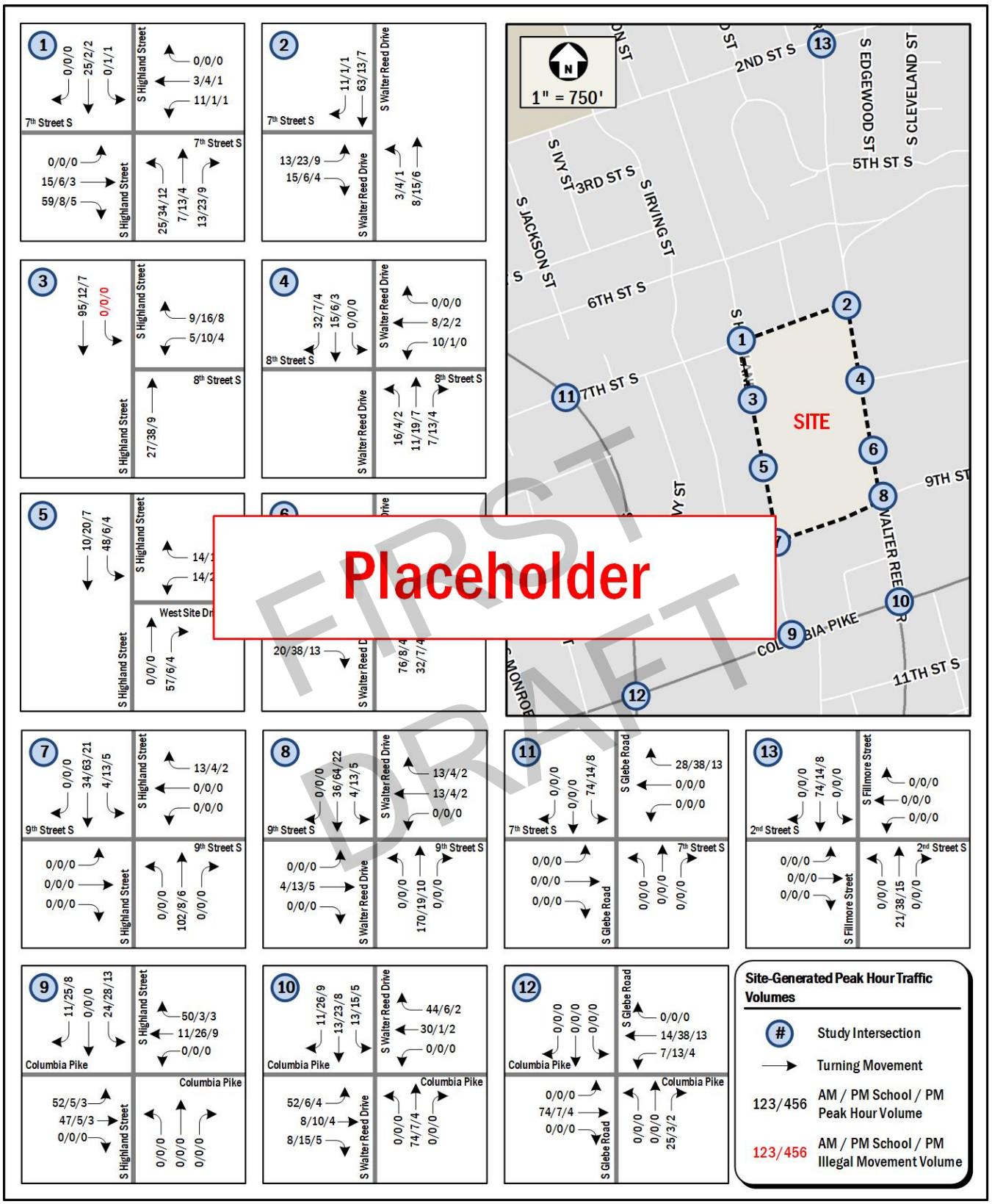


Figure 18: Site-Generated Peak Hour Traffic Volumes

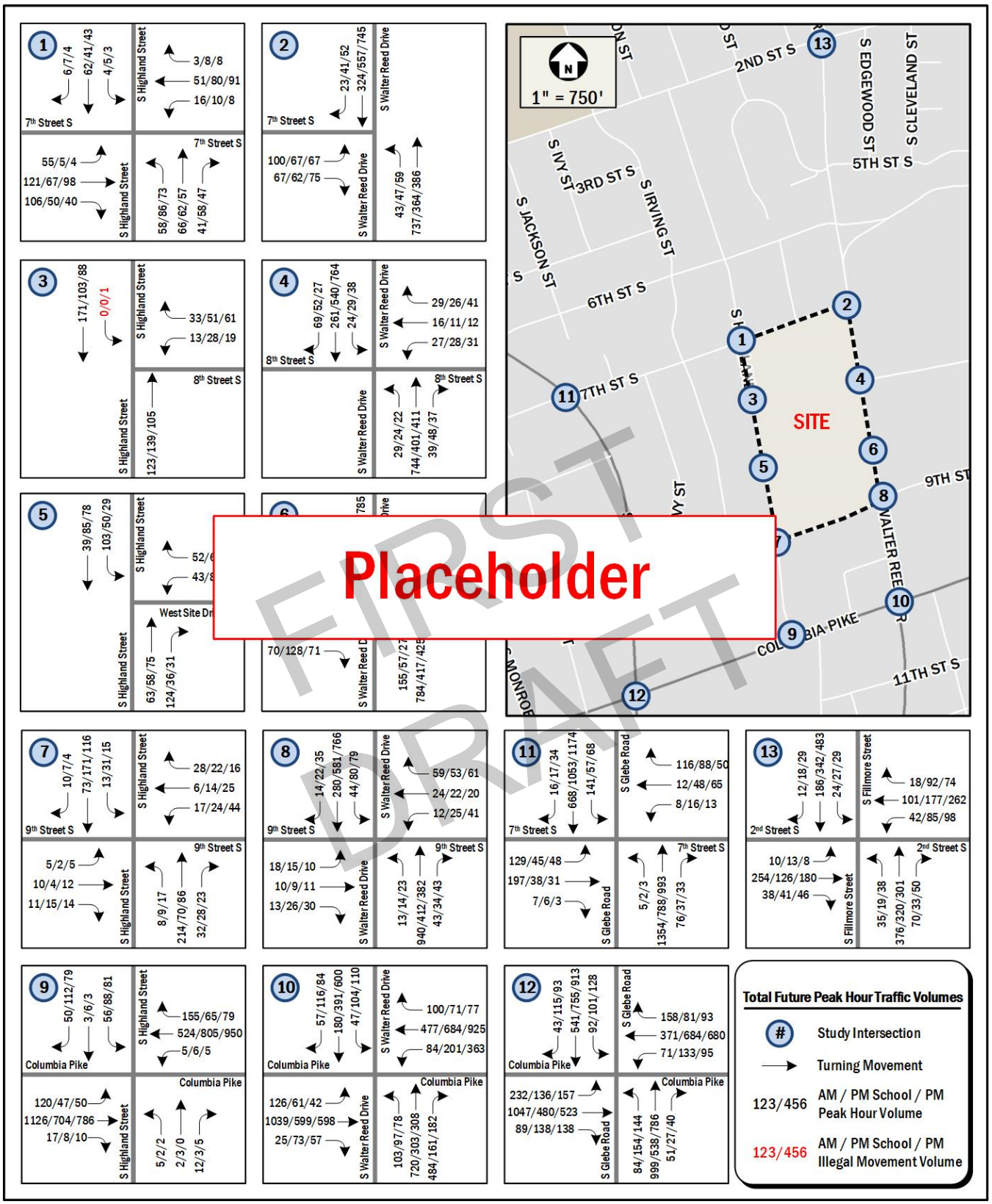


Figure 19: Total Future Peak Hour Traffic Volumes

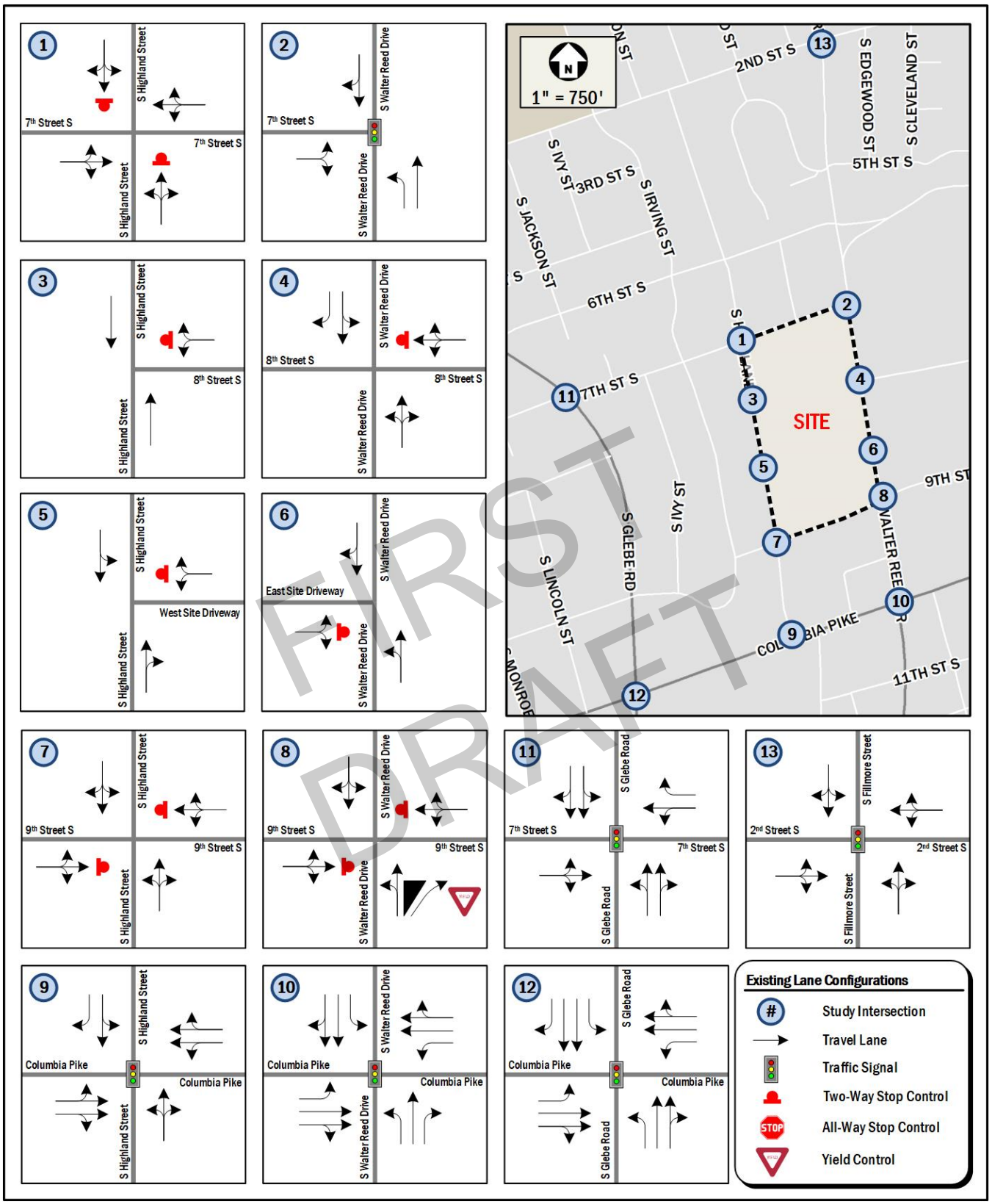


Figure 20: Existing Lane Configurations

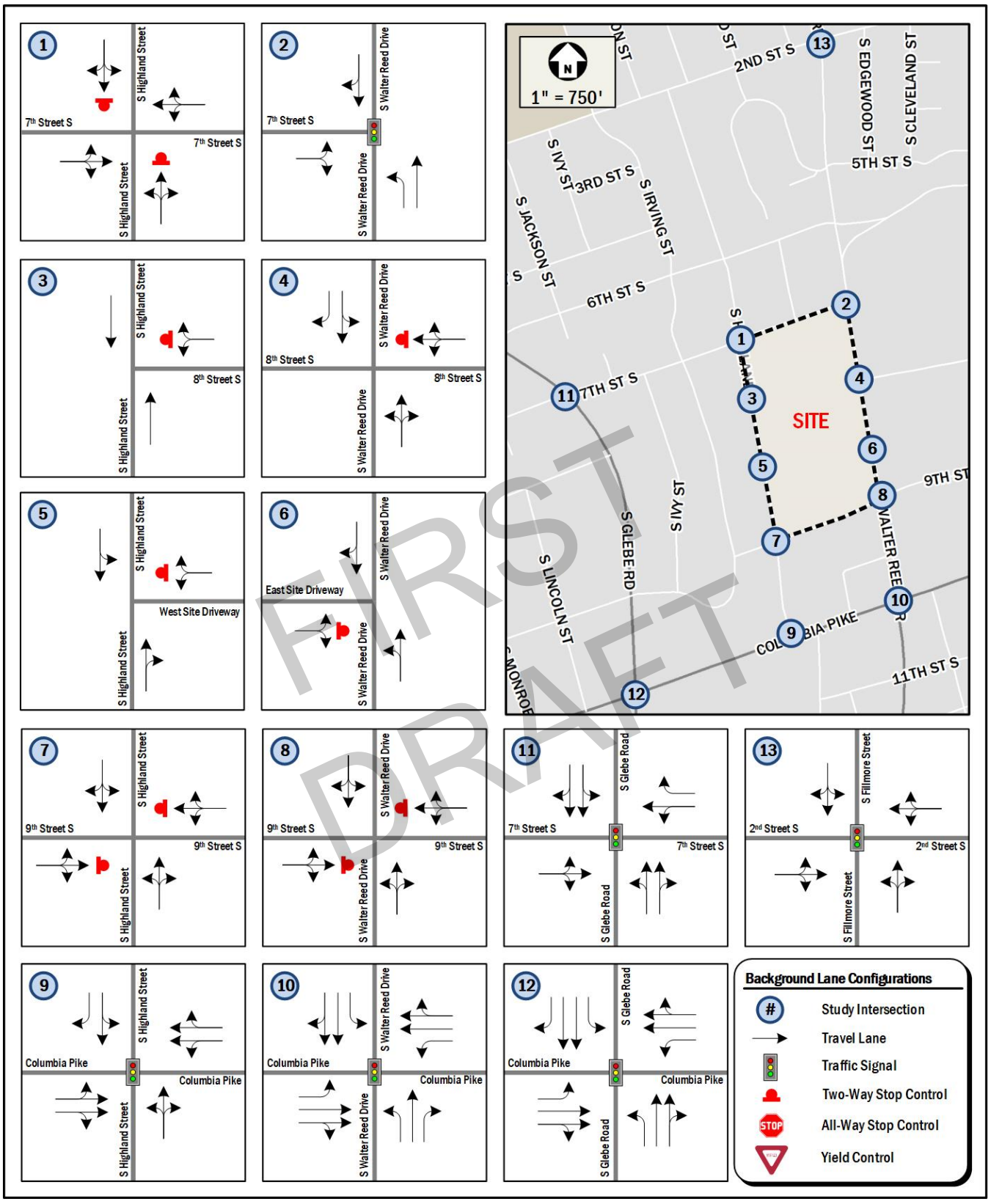


Figure 21: Background Lane Configurations

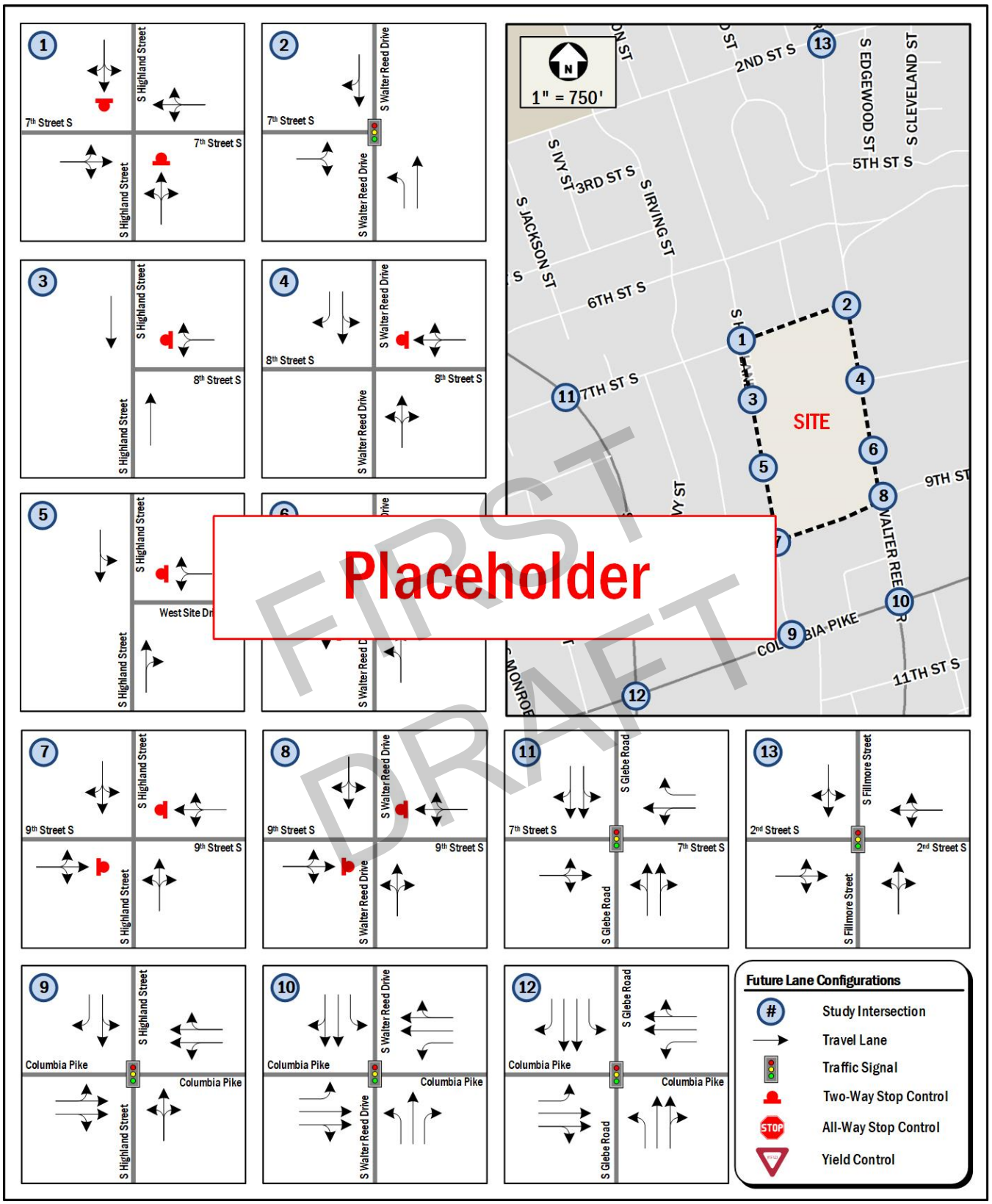


Figure 22: Future Lane Configurations

VEHICULAR ANALYSIS RESULTS

Intersection Capacity Analysis

Intersection capacity analyses were performed for the existing conditions at the intersections contained within the study area during the morning commuter, afternoon school dismissal, and afternoon commuter peak hours. Synchro version 9.2 was used to analyze the study intersections based on the *Highway Capacity Manual* (HCM) 2000 methodology.

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from "A" being the best to "F" being the worst. LOS E is typically used as the acceptable LOS threshold in the County; although F is sometimes accepted in urbanized areas if vehicular improvements would be a detriment to safety or non-auto modes of transportation.

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

Table 17, Table 18, and Table 19 show the results of the capacity analyses. The results show that most study area intersections operate at acceptable delay and LOS levels, with several exceptions which are highlighted in red in Table 17, Table 18, and Table 19. Total future capacity analysis results are placeholders to be adjusted with conceptual design.

Queuing Analysis

In addition to the capacity analyses presented above, queuing analyses were performed at the study intersections. The queuing analysis was performed using *Synchro* software. The 50th percentile and 95th percentile queue lengths are shown for each lane group at the study area signalized intersections. The 50th percentile queue is the maximum back of queue on a median cycle. The 95th percentile queue is the maximum back of queue that is exceeded 5% of the time. For unsignalized intersections, only the 95th percentile queue is reported for each lane group (including free-flowing left turns and stop-controlled movements) based on the HCM calculations. HCM 2000 does not calculate queuing for all-way stops.

Table 20 shows the results of the queuing analysis. The queuing analyses show that most intersections have acceptable queuing results with the CC campus project, with most queues shorter than the available storage lengths. Total future queuing analysis results are placeholders to be adjusted with conceptual design.

Mitigations

Based on County standards, the proposed project is determined to have an impact if:

- The overall intersection or any movement operates at LOS F in the future conditions with the proposed project where one does not exist in the background conditions without the proposed project;
- The overall intersection or any movement operates at LOS F during the background condition and the delay increases by more than 10% in the future conditions with the proposed project; or
- If any 95th percentile queue length that exceeds the available capacity in the background conditions increases by more than 150 feet in the future conditions with the proposed project.

There are XX locations in the study area that meet these criteria…

Table 17: AM Peak Analysis Results

	Intersection and Movement	AM Peak Hour					
		Existing		*Background*		*Total Future*	
		Delay	LOS	Delay	LOS	Delay	LOS
1.	**S Highland Street & 7th Street S**						
	Eastbound LTR	2.3	A	2.3	A	1.8	A
	Westbound LTR	0.8	A	0.7	A	1.9	A
	Northbound LTR	15.0	C	14.4	B	18.6	C
	Southbound LTR	13.5	B	13.2	B	15.7	C
2.	**S Walter Reed Drive & 7th Street S**						
	Overall	**11.9**	**B**	**12.1**	**B**	**12.5**	**B**
	Eastbound LR	25.8	C	25.7	C	24.6	C
	Northbound Left	3.3	A	3.1	A	3.7	A
	Northbound Thru	11.9	B	12.3	B	12.7	B
	Southbound TR	6.2	A	6.0	A	7.5	A
3.	**S Highland Street & 8th Street S**						
	Westbound LR	9.4	A	9.3	A	9.8	A
	Northbound Thru	0.0	A	0.0	A	0.0	A
	Southbound Thru	0.0	A	0.0	A	0.0	A
4.	**S Walter Reed Drive & 8th Street S**						
	Westbound LTR	31.4	D	31.0	D	55.8	F
	Northbound LTR	0.3	A	0.3	A	0.8	A
	Southbound LT	1.4	A	1.4	A	1.4	A
	Southbound Right	0.0	A	0.0	A	0.0	A
5.	**S Highland Street & West Site Driveway**						
	Westbound LR	10.2	B	10.1	B	11.4	B
	Northbound TR	0.0	A	0.0	A	0.0	A
	Southbound LT	5.5	A	5.2	A	6.1	A
6.	**S Walter Reed Drive & East Site Driveway**						
	Eastbound LR	31.1	D	25.9	D	65.0	F
	Northbound LT	2.0	A	1.8	A	3.4	A
	Southbound TR	0.0	A	0.0	A	0.0	A
7.	**S Highland Street & 9th Street S**						
	Eastbound LTR	10.5	B	10.4	B	11.5	B
	Westbound LTR	11.0	B	10.9	B	12.1	B
	Northbound LTR	0.4	A	0.4	A	0.3	A
	Southbound LTR	1.4	A	1.3	A	1.4	A
8.	**S Walter Reed Drive & 9th Street S**						
	Eastbound LTR	73.2	F	75.9	F	571.8	F
	Westbound LTR	41.3	E	42.5	E	222.3	F
	Northbound LT	0.3	A	-	-	-	-
	Northbound Right	0.0	A	-	-	-	-
	Northbound LTR	-	-	0.3	A	0.4	A
	Southbound LTR	2.2	A	2.3	A	3.2	A
9.	**Columbia Pike & S Highland Street**						
	Overall	**5.9**	**A**	**5.8**	**A**	**8.6**	**A**
	Eastbound LTR	3.3	A	3.4	A	7.1	A
	Westbound LTR	3.7	A	3.5	A	3.5	A
	Northbound LTR	49.7	D	49.7	D	49.7	D
	Southbound LT	51.7	D	51.6	D	53.6	D

	Intersection and Movement	AM Peak Hour					
		Existing		*Background*		*Total Future*	
		Delay	LOS	Delay	LOS	Delay	LOS
	Southbound Right	49.6	D	49.5	D	49.5	D
10.	**S Walter Reed Drive & Columbia Pike**						
	Overall	**29.9**	**C**	**30.8**	**C**	**38.9**	**D**
	Eastbound Left	7.6	A	7.3	A	15.8	B
	Eastbound TR	12.0	B	12.9	B	18.4	B
	Westbound Left	23.4	C	26.2	C	28.6	C
	Westbound TR	17.5	B	18.0	B	19.2	B
	Northbound Left	28.4	C	28.0	C	27.6	C
	Northbound Thru	63.5	E	65.7	E	90.5	F
	Northbound Right	36.0	D	36.6	D	35.6	D
	Southbound Left	58.2	E	68.7	E	127.1	F
	Southbound TR	39.7	D	39.3	D	38.9	D
11.	**S Glebe Road & 7th Street S**						
	Overall	**26.2**	**C**	**25.0**	**C**	**27.7**	**C**
	Eastbound LTR	76.9	E	73.3	E	73.3	E
	Westbound LT	39.1	D	39.9	D	39.9	D
	Westbound Right	41.7	D	42.3	D	43.4	D
	Northbound LTR	17.0	B	17.0	B	17.0	B
	Southbound LTR	16.6	B	16.0	B	24.7	C
12.	**S Glebe Road & Columbia Pike**						
	Overall	**48.0**	**D**	**50.4**	**D**	**54.2**	**D**
	Eastbound Left	34.3	C	36.7	D	37.7	D
	Eastbound TR	44.6	D	47.0	D	53.7	D
	Westbound Left	47.4	D	56.6	E	59.7	E
	Westbound TR	46.9	D	48.1	D	47.1	D
	Northbound Left	28.8	C	28.9	C	28.9	C
	Northbound TR	60.4	E	65.0	E	71.6	E
	Southbound Left	56.3	E	53.3	D	53.6	D
	Southbound Thru	41.7	D	42.1	D	42.1	D
	Southbound Right	33.0	C	33.0	C	33.0	C
13.	**S Fillmore Street & 2nd Street S**						
	Overall	**16.8**	**B**	**16.7**	**B**	**17.2**	**B**
	Eastbound LT	14.9	B	14.9	B	14.9	B
	Eastbound Right	11.7	B	11.7	B	11.7	B
	Westbound LTR	13.8	B	13.7	B	13.7	B
	Northbound LTR	20.4	C	20.3	C	21.4	C
	Southbound LTR	13.5	B	13.4	B	14.6	B

Table 18: PM School Dismissal Peak Analysis Results

	Intersection and Movement	PM School Dismissal Peak Hour					
		Existing		*Background*		*Total Future*	
		Delay	LOS	Delay	LOS	Delay	LOS
1.	**S Highland Street & 7th Street S**						
	Eastbound LTR	0.4	A	0.4	A	0.3	A
	Westbound LTR	0.9	A	0.8	A	0.9	A
	Northbound LTR	13.5	B	13.3	B	15.4	C
	Southbound LTR	11.9	B	12.0	B	12.4	B
2.	**S Walter Reed Drive & 7th Street S**						
	Overall	**9.1**	**A**	**9.1**	**A**	**9.9**	**A**
	Eastbound LR	11.9	B	12.3	B	14.2	B
	Northbound Left	5.4	A	5.3	A	5.8	A
	Northbound Thru	6.5	A	6.3	A	6.9	A
	Southbound TR	10.5	A	10.5	B	11.2	B
3.	**S Highland Street & 8th Street S**						
	Westbound LR	9.8	A	9.7	A	10.3	B
	Northbound Thru	0.0	A	0.0	A	0.0	A
	Southbound Thru	0.0	A	0.0	A	0.0	A
4.	**S Walter Reed Drive & 8th Street S**						
	Westbound LTR	29.3	D	27.3	D	29.9	D
	Northbound LTR	0.8	A	0.7	A	0.9	A
	Southbound LT	0.8	A	0.8	A	0.8	A
	Southbound Right	0.0	A	0.0	A	0.0	A
5.	**S Highland Street & West Site Driveway**						
	Westbound LR	10.5	B	10.4	B	11.1	B
	Northbound TR	0.0	A	0.0	A	0.0	A
	Southbound LT	3.5	A	3.2	A	3.0	A
6.	**S Walter Reed Drive & East Site Driveway**						
	Eastbound LR	19.6	C	18.0	C	22.5	C
	Northbound LT	1.8	A	1.7	A	1.9	A
	Southbound TR	0.0	A	0.0	A	0.0	A
7.	**S Highland Street & 9th Street S**						
	Eastbound LTR	10.0	B	10.0	A	10.6	B
	Westbound LTR	11.4	B	11.3	B	12.1	B
	Northbound LTR	0.8	A	0.8	A	0.7	A
	Southbound LTR	1.2	A	1.2	A	1.3	A
8.	**S Walter Reed Drive & 9th Street S**						
	Eastbound LTR	38.6	E	40.1	E	74.5	F
	Westbound LTR	38.4	D	42.4	E	76.6	F
	Northbound LT	0.5	A	-	-	-	-
	Northbound Right	0.0	A	-	-	-	-
	Northbound LTR	-	-	0.5	A	0.5	A
	Southbound LTR	1.9	A	1.9	A	2.2	A
9.	**Columbia Pike & S Highland Street**						
	Overall	**12.9**	**B**	**12.7**	**B**	**13.4**	**B**
	Eastbound LTR	4.6	A	4.4	A	4.5	A
	Westbound LTR	15.5	B	15.4	B	15.2	B
	Northbound LTR	33.8	C	33.8	C	33.5	C
	Southbound LT	37.1	D	36.9	D	38.1	D

	Intersection and Movement	PM School Dismissal Peak Hour					
		Existing		*Background*		*Total Future*	
		Delay	LOS	Delay	LOS	Delay	LOS
	Southbound Right	37.9	D	38.1	D	38.2	D
10.	**S Walter Reed Drive & Columbia Pike**						
	Overall	**25.9**	**C**	**25.8**	**C**	**26.4**	**C**
	Eastbound Left	27.7	C	27.3	C	27.0	C
	Eastbound TR	30.0	C	29.8	C	29.1	C
	Westbound Left	28.6	C	26.1	C	28.8	C
	Westbound TR	17.0	B	17.4	B	17.5	B
	Northbound Left	23.2	C	23.4	C	23.8	C
	Northbound Thru	25.1	C	25.1	C	25.2	C
	Northbound Right	18.2	B	18.1	B	18.0	B
	Southbound Left	34.8	C	34.9	C	35.5	D
	Southbound TR	35.0	D	35.6	D	36.9	D
11.	**S Glebe Road & 7th Street S**						
	Overall	**10.2**	**B**	**10.0**	**A**	**10.7**	**B**
	Eastbound LTR	38.2	D	38.1	D	38.1	D
	Westbound LT	33.0	C	33.3	C	33.7	C
	Westbound Right	32.4	C	33.0	C	35.1	D
	Northbound LTR	6.2	A	6.1	A	6.1	A
	Southbound LTR	8.2	A	8.2	A	8.7	A
12.	**S Glebe Road & Columbia Pike**						
	Overall	**36.6**	**D**	**35.7**	**D**	**36.1**	**D**
	Eastbound Left	30.3	C	40.3	D	44.7	D
	Eastbound TR	32.4	C	32.9	C	33.1	C
	Westbound Left	14.9	B	17.7	B	21.6	C
	Westbound TR	19.1	B	21.0	C	24.5	C
	Northbound Left	32.6	C	34.5	C	34.5	C
	Northbound TR	33.6	C	33.7	C	33.7	C
	Southbound Left	19.7	B	19.3	B	19.0	B
	Southbound Thru	44.5	D	47.9	D	47.1	D
	Southbound Right	176.8	F	101.6	F	91.0	F
13.	**S Fillmore Street & 2nd Street S**						
	Overall	**16.1**	**B**	**16.2**	**B**	**16.6**	**B**
	Eastbound LT	11.5	B	11.4	B	11.4	B
	Eastbound Right	10.2	B	10.2	B	10.2	B
	Westbound LTR	16.4	B	15.8	B	15.8	B
	Northbound LTR	17.1	B	17.2	B	18.3	B
	Southbound LTR	17.5	B	18.1	B	18.5	B

Table 19: PM Commuter Peak Analysis Results

	Intersection and Movement	PM Commuter Peak Hour					
		Existing		*Background*		*Total Future*	
		Delay	LOS	Delay	LOS	Delay	LOS
1.	**S Highland Street & 7th Street S**						
	Eastbound LTR	0.3	A	0.2	A	0.2	A
	Westbound LTR	0.6	A	0.6	A	0.6	A
	Northbound LTR	12.8	B	12.7	B	13.3	B
	Southbound LTR	11.4	B	11.5	B	11.7	B
2.	**S Walter Reed Drive & 7th Street S**						
	Overall	**10.7**	**A**	**10.9**	**B**	**11.5**	**B**
	Eastbound LR	29.5	C	30.2	C	29.5	C
	Northbound Left	5.5	A	5.3	A	5.9	A
	Northbound Thru	4.6	A	4.5	A	4.7	A
	Southbound TR	11.1	B	11.4	B	12.1	B
3.	**S Highland Street & 8th Street S**						
	Westbound LR	9.6	A	9.5	A	9.7	A
	Northbound Thru	0.0	A	0.0	A	0.0	A
	Southbound Thru	0.1	A	0.1	A	0.1	A
4.	**S Walter Reed Drive & 8th Street S**						
	Westbound LTR	34.4	D	37.6	E	41.5	E
	Northbound LTR	0.9	A	0.9	A	1.0	A
	Southbound LT	1.1	A	1.0	A	1.1	A
	Southbound Right	0.0	A	0.0	A	0.0	A
5.	**S Highland Street & West Site Driveway**						
	Westbound LR	10.0	A	10.0	B	10.3	B
	Northbound TR	0.0	A	0.0	A	0.0	A
	Southbound LT	2.3	A	2.1	A	2.2	A
6.	**S Walter Reed Drive & East Site Driveway**						
	Eastbound LR	29.2	D	26.4	D	29.8	D
	Northbound LT	1.2	A	1.1	A	1.3	A
	Southbound TR	0.0	A	0.0	A	0.0	A
7.	**S Highland Street & 9th Street S**						
	Eastbound LTR	10.4	B	10.4	B	10.6	B
	Westbound LTR	11.7	B	11.7	B	12.1	B
	Northbound LTR	1.2	A	1.1	A	1.1	A
	Southbound LTR	0.8	A	0.8	A	0.9	A
8.	**S Walter Reed Drive & 9th Street S**						
	Eastbound LTR	31.3	D	33.5	D	40.8	E
	Westbound LTR	52.1	F	57.6	F	78.3	F
	Northbound LT	1.0	A	-	-	-	-
	Northbound Right	0.0	A	-	-	-	-
	Northbound LTR	-	-	1.0	A	1.1	A
	Southbound LTR	2.0	A	2.0	A	2.2	A
9.	**Columbia Pike & S Highland Street**						
	Overall	**11.6**	**B**	**11.3**	**B**	**11.8**	**B**
	Eastbound LTR	3.3	A	3.0	A	3.2	A
	Westbound LTR	12.7	B	12.3	B	12.4	B
	Northbound LTR	48.0	D	48.1	D	47.9	D
	Southbound LT	53.1	D	52.7	D	53.8	D

	Intersection and Movement	PM Commuter Peak Hour					
		Existing		*Background*		*Total Future*	
		Delay	LOS	Delay	LOS	Delay	LOS
	Southbound Right	49.2	D	49.9	D	49.5	D
10.	**S Walter Reed Drive & Columbia Pike**						
	Overall	**36.6**	**D**	**37.2**	**D**	**37.8**	**D**
	Eastbound Left	47.1	D	50.1	D	51.1	D
	Eastbound TR	51.2	D	53.9	D	54.2	D
	Westbound Left	43.4	D	44.4	D	47.3	D
	Westbound TR	19.3	B	20.6	C	21.0	C
	Northbound Left	34.6	C	35.1	D	35.3	D
	Northbound Thru	36.2	D	34.5	C	34.3	C
	Northbound Right	18.9	B	18.4	B	18.1	B
	Southbound Left	39.8	D	37.7	D	37.8	D
	Southbound TR	47.8	D	47.6	D	48.2	D
11.	**S Glebe Road & 7th Street S**						
	Overall	**9.2**	**A**	**9.0**	**A**	**9.4**	**A**
	Eastbound LTR	57.7	E	57.5	E	57.5	E
	Westbound LT	54.0	D	53.7	D	53.6	D
	Westbound Right	51.9	D	51.9	D	52.6	D
	Northbound LTR	2.5	A	2.4	A	2.4	A
	Southbound LTR	7.5	A	7.2	A	7.6	A
12.	**S Glebe Road & Columbia Pike**						
	Overall	**45.8**	**D**	**47.4**	**D**	**47.6**	**D**
	Eastbound Left	36.7	D	47.2	D	48.7	D
	Eastbound TR	38.1	D	38.6	D	38.7	D
	Westbound Left	36.3	D	38.9	D	39.3	D
	Westbound TR	38.0	D	40.9	D	41.5	D
	Northbound Left	54.1	D	59.4	E	59.4	E
	Northbound TR	50.7	D	50.3	D	50.4	D
	Southbound Left	49.4	D	47.8	D	47.4	D
	Southbound Thru	45.3	D	46.4	D	46.3	D
	Southbound Right	120.0	F	135.3	F	137.5	F
13.	**S Fillmore Street & 2nd Street S**						
	Overall	**23.8**	**C**	**23.5**	**C**	**23.5**	**C**
	Eastbound LT	20.5	C	20.3	C	20.3	C
	Eastbound Right	17.0	B	17.0	B	17.0	B
	Westbound LTR	46.8	D	45.6	D	45.6	D
	Northbound LTR	12.5	B	12.4	B	12.7	B
	Southbound LTR	14.4	B	15.0	B	15.2	B

Table 20: Queuing Analysis Results

Intersection and Lane Group	Storage Length (ft)	AM Peak Hour						PM School Dismissal Peak Hour						PM Commuter Peak Hour					
		Existing		*Background*		*Total Future*		*Existing*		*Background*		*Total Future*		*Existing*		*Background*		*Total Future*	
		50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
1. S Highland Street & 7th Street S																			
Eastbound LTR	270	-	3	-	3	-	3	-	0	-	0	-	0	-	0	-	0	-	0
Westbound LTR	250	-	0	-	0	-	1	-	1	-	1	-	1	-	0	-	0	-	0
Northbound LTR	330	-	28	-	25	-	48	-	27	-	25	-	47	-	27	-	26	-	32
Southbound LTR	380	-	9	-	9	-	17	-	6	-	8	-	9	-	5	-	7	-	8
2. S Walter Reed Drive & 7th Street S																			
Eastbound LR	240	39	63	36	63	45	74	17	19	15	20	22	27	34	45	33	47	39	m55
Northbound Left	90	3	m17	3	m17	3	m16	5	19	4	m20	5	m22	7	28	7	m25	7	m26
Northbound Thru	300	206	m#676	223	m#695	215	m#571	40	117	38	115	42	130	47	125	46	113	49	116
Southbound TR	270	46	129	42	131	60	171	100	#379	99	#386	109	#398	164	#562	170	#581	180	#589
3. S Highland Street & 8th Street S																			
Westbound LR	515	-	3	-	3	-	5	-	6	-	6	-	9	-	8	-	7	-	8
Northbound Thru	240	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
Southbound Thru	330	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
4. S Walter Reed Drive & 8th Street S																			
Westbound LTR	520	-	32	-	30	-	67	-	34	-	30	-	34	-	52	-	54	-	60
Northbound LTR	250	-	1	-	1	-	2	-	2	-	2	-	2	-	3	-	3	-	3
Southbound LT	400	-	3	-	3	-	3	-	2	-	2	-	2	-	3	-	3	-	3
Southbound Right	75	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
5. S Highland Street & West Site Driveway																			
Westbound LR	540	-	8	-	8	-	14	-	13	-	12	-	20	-	7	-	7	-	9
Northbound TR	365	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
Southbound LT	240	-	4	-	3	-	7	-	3	-	3	-	3	-	1	-	1	-	2
6. S Walter Reed Drive & East Site Driveway																			
Eastbound LR	540	-	45	-	34	-	103	-	40	-	33	-	63	-	46	-	39	-	5
Northbound LT	250	-	6	-	6	-	12	-	5	-	5	-	6	-	3	-	3	-	4
Southbound TR	190	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
7. S Highland Street & 9th Street S																			
Eastbound LTR	180	-	3	-	3	-	4	-	3	-	2	-	3	-	4	-	4	-	4
Westbound LTR	530	-	6	-	5	-	8	-	9	-	8	-	10	-	13	-	12	-	13
Northbound LTR	440	-	0	-	0	-	0	-	1	-	1	-	1	-	1	-	1	-	1
Southbound LTR	360	-	1	-	1	-	1	-	1	-	1	-	2	-	1	-	1	-	1
8. S Walter Reed Drive & 9th Street S																			
Eastbound LTR	530	-	54	-	52	-	139	-	37	-	36	-	73	-	30	-	31	-	41
Westbound LTR	530	-	53	-	51	-	176	-	64	-	66	-	109	-	100	-	104	-	130
Northbound LT	315	-	1	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-
Northbound Right	50	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-
Northbound LTR	315	-	-	-	1	-	1	-	-	-	1	-	1	-	-	-	3	-	3
Southbound LTR	250	-	6	-	6	-	8	-	6	-	6	-	7	-	7	-	6	-	7
9. Columbia Pike & S Highland Street																			
Eastbound LTR	785	44	m43	44	m46	131	m133	74	74	72	72	73	72	73	67	66	60	67	61
Westbound LTR	500	69	77	61	75	63	77	226	288	243	302	245	303	337	415	362	446	366	450
Northbound LTR	40	6	29	5	29	5	29	3	16	3	15	3	15	0	0	0	0	0	0
Southbound LT	435	30	62	28	63	48	95	41	m81	38	m81	55	m110	63	m110	59	m112	71	m128
Southbound Right	130	0	31	0	34	0	39	0	37	0	m43	0	m48	0	m42	0	m47	0	m50
10. S Walter Reed Drive & Columbia Pike																			
Eastbound Left	320	13	27	12	27	31	m94	39	78	37	78	40	81	28	60	28	62	32	71
Eastbound TR	385	230	265	259	288	227	426	234	282	237	306	239	307	253	297	256	346	261	354
Westbound Left	460	39	65	38	69	38	#70	87	#163	84	#174	84	#181	198	#379	198	#391	204	#400
Westbound TR	500	132	166	135	175	160	204	173	223	186	241	188	244	280	351	314	383	317	385
Northbound Left	160	67	106	62	106	62	106	41	76	41	77	41	77	46	83	47	86	47	86
Northbound Thru	335	528	#768	540	#786	~684	#926	139	214	142	217	146	223	236	305	215	306	218	312
Northbound Right	340	307	#448	318	#465	318	#465	56	89	55	93	55	93	82	116	77	120	77	120
Southbound Left	80	22	#69	26	#91	40	#128	46	106	46	m112	55	m125	82	m108	78	m102	83	m109
Southbound TR	175	80	126	77	130	87	142	119	207	125	218	141	239	281	296	293	312	303	326
11. S Glebe Road & 7th Street S																			
Eastbound LTR	690	333	#459	311	#470	311	#470	63	90	59	91	59	91	75	110	73	115	73	115
Westbound LT	190	16	37	15	38	15	38	41	m54	39	m54	39	m56	76	m118	72	m119	72	m117
Westbound Right	70	72	116	68	119	92	152	30	m44	30	m45	55	m74	32	m61	33	m62	45	m78
Northbound LTR	300	428	510	457	545	457	546	5	371	6	277	6	276	56	100	61	104	61	104
Southbound LTR	400	223	294	225	298	319	449	132	311	134	325	141	343	201	436	197	428	206	451
12. S Glebe Road & Columbia Pike																			
Eastbound Left	300	127	177	129	192	129	#196	44	78	57	#114	57	#130	73	112	88	#161	88	#168
Eastbound TR	460	429	522	453	550	502	#646	164	223	173	234	176	237	243	308	255	323	256	325
Westbound Left	125	30	56	42	79	45	#87	16	30	17	43	22	58	36	67	43	83	45	85
Westbound TR	775	148	195	168	216	176	225	52	91	56	110	70	#168	163	236	184	258	191	266
Northbound Left	275	47	79	46	83	46	83	61	113	66	#133	66	#133	76	#154	78	#195	78	#195
Northbound TR	545	440	#577	456	#603	474	#631	173	223	175	235	176	236	373	436	370	454	371	455
Southbound Left	145	54	#106	51	#108	51	#108	44	20	42	20	41	m19	74	162	68	159	69	m156
Southbound Thru	420	213	274	219	282	219	282	264	#382	273	#398	272	#398	348	715	372	434	361	441
Southbound Right	125	0	0	0	0	0	0	8	28	9	29	8	m26	0	m32	0	m29	0	m28
13. S Fillmore Street & 2nd Street S																			
Eastbound LT	390	82	136	80	136	80	136	37	66	34	67	34	67	75	121	71	124	71	124
Eastbound Right	55	0	15	0	16	0	16	0	14	0	15	0	15	0	20	0	22	0	22
Westbound LTR	180	43	82	42	82	42	82	102	164	95	169	95	169	201	#382	201	#380	201	#380
Northbound LTR	625	159	262	159	261	171	279	97	167	100	170	115	194	104	172	103	170	109	179
Southbound LTR	245	41	74	40	77	65	115	104	178	113	191	119	200	160	253	171	270	175	277

95th percentile volume exceeds capacity, queue may be longer.
m Volume for 95th percentile queue is metered by upstream signal.
~ Volume exceeds capacity, queue is theoretically infinite.

PARKING

This chapter reviews the available parking within and surrounding the Arlington Career Center (CC) campus, including:

- A summary of parking data collected in the area surrounding the campus site on a typical weekday
- A review of existing peak parking demand by source of parking supply

The following conclusions are reached within this chapter:

- Parking demand within and surrounding the CC campus peaks at 1:00 PM, with 46% of the available parking spaces within the study area occupied.
- The main parking lot on-campus peaks at 95% occupancy at 2:30 PM. It sustains a high level of occupancy between 10:30 AM and 3:00 PM.
- Residential curbside parking that is restricted, peaks at night and early morning at around 75% occupied, with demand lowering to 40-50% in the middle of the weekday.
- Unrestricted parking near the CC campus maintains relatively constant occupancy levels throughout the day, at around 30-40%.
- The 2-hour meters south of the CC campus peak during the evening, coinciding with retail parking demand.
- The 12-hour meters near the CC campus have low occupancy, peaking at only 16% in use at 12:30 PM.
- The four (4) off-campus garages peak overall at 8:00 PM, with 45% of the total 896 spaces occupied.

EXISTING PARKING DEMAND

As part of this transportation report, detailed counts of parking supply and demand were conducted surrounding the CC campus. The purpose of these counts was to determine the amount of parking supply and demand on streets within walking distance of the campus and to identify trends or patterns associated with parking demand. The area surveyed during this study is shown in Figure 23.

Data was collected in the study area on Wednesday, May 23, 2018 from 6:00 AM to 10:30 PM and Wednesday, April 3, 2019 from 6:00 AM to 10:30 PM. At the time of counts, Patrick Henry ES remained on-site and there were no relocatable classrooms in the parking lot. The parking demand sweeps were conducted every 30 minutes. The time and date of the parking data collection were selected based on the purpose of the counts. Since the information will be used to help determine parking supply needs for the ACC campus, the date of the count was selected to represent a "typical weekday," as school parking demand is highest during a school day when staff is parked on-campus and the public library is open.

Each block-face in the study area was surveyed to determine whether parking is allowed and the approximate number of spaces on the block face. Block-faces that are designated as loading zones or private property were considered 'No Parking' areas.

The two (2) on-campus parking lots were included in the study area. However, for the purposes of this study, the on-campus lot south of the Career Center building was considered a 'No Parking' area. This lot is currently used for vehicle storage.

To help review potential shared parking solutions, the study area also included four (4) off-campus parking garages that are within walking distance to the ACC campus. These garages include: the ECDC Garage, the Penrose Garage, the Siena Park Garage, and the Halstead Garage. The locations of the garages, in relation to the CC campus, are shown in Figure 23.

The parking data found a total of 2044 parking spaces in the study area, the majority of which are located in off-campus garages or on unrestricted residential streets. All metered parking is located south of the campus. The residential blocks along east of the campus have restricted (permit) parking only. Parking along S Walter Reed Drive, adjacent to the campus, is restricted to 4-hour parking from 8 AM to 6 PM Monday through Saturday on the west side and is unrestricted on the east side. Unrestricted parking is available in 664 parking spaces along S Highland Street, S Walter Reed Drive, 7th Street S, 9th Street S, and residential blocks to the north of the CC campus.

The parking data found that the peak parking occupancy for the entire area occurred at 1:00 PM with an overall parking utilization of 46 percent (2044 available: 754 occupied; 1299 unoccupied). The largest contributor to the peak is the on-campus parking within the CC campus. Most other streets observed have an occupancy lower than 50%, as shown on the peak occupancy map in Figure 24.

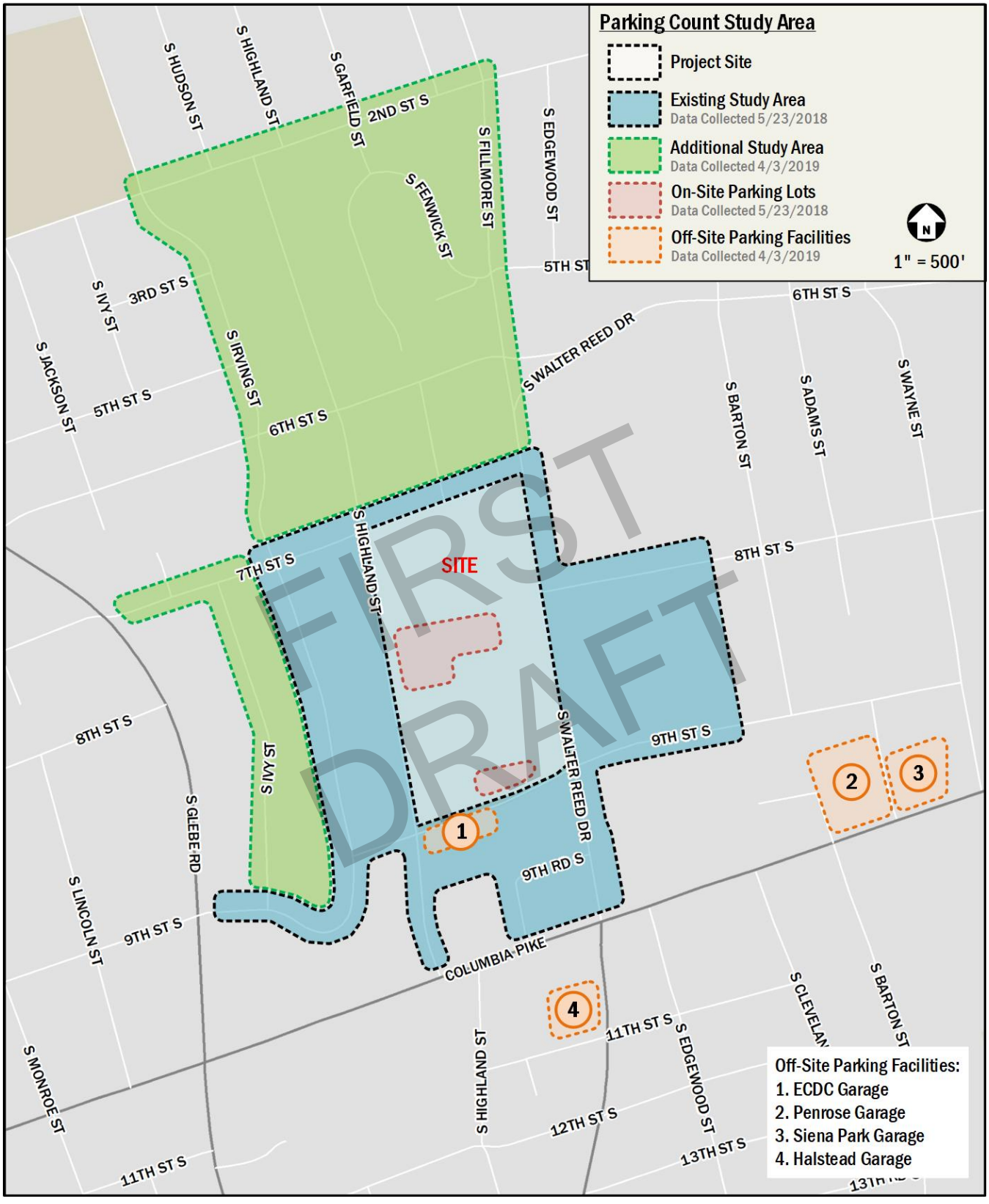


Figure 23: Parking Count Study Area

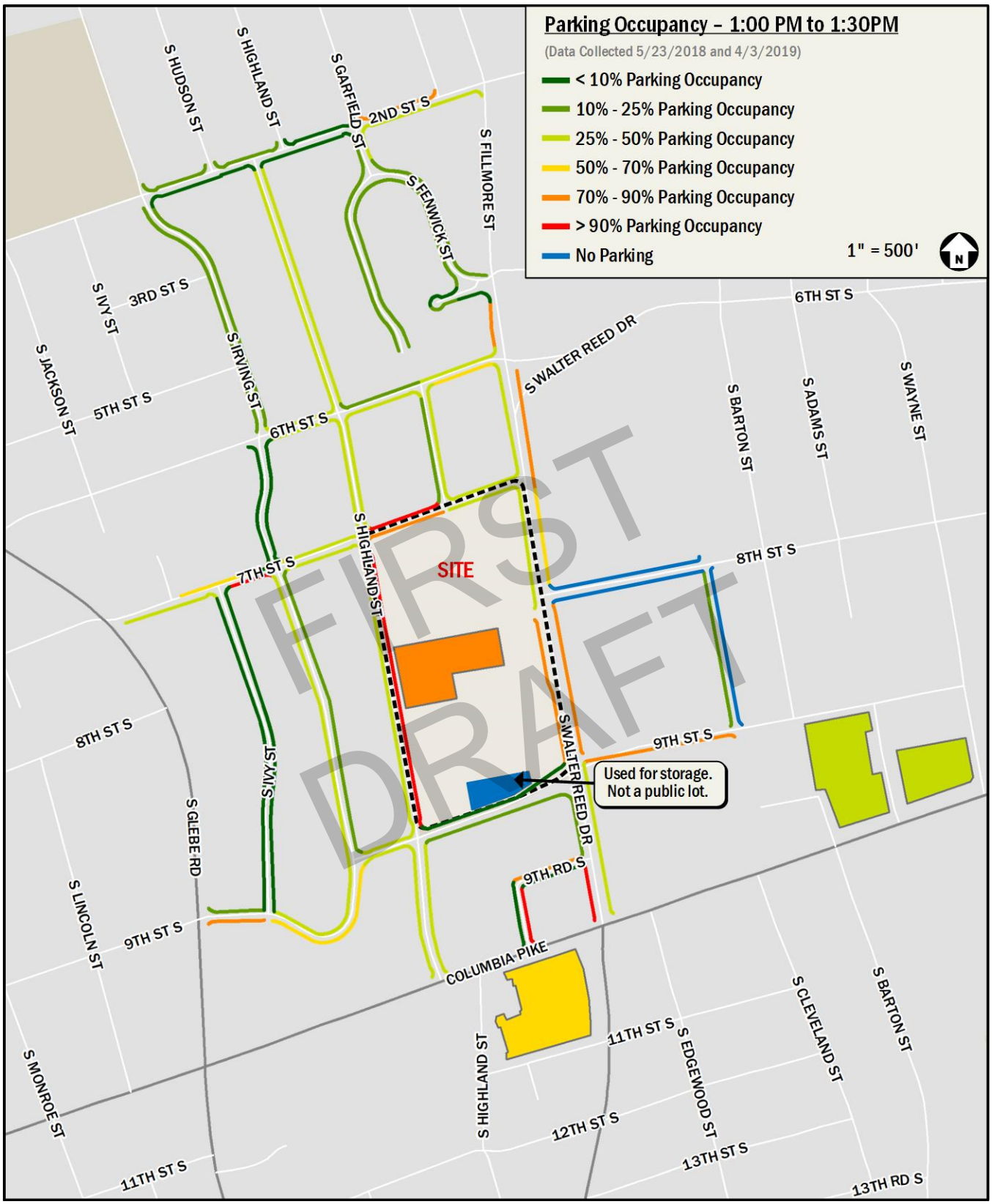


Figure 24: Peak Parking Occupancy

For purposes of reviewing the parking demand in more detail, the parking supply within the study area was broken down into nine (9) categories, shown in Figure 25. Table 21 provides a review of each category's peak parking demands. Figure 26 shows the overall parking demand over the course of the counts. Figure 27 through Figure 34 shows the parking demands over the course of the counts in each of the categories.

- On-Campus Parking, which consists of the existing large parking lot on the CC campus. On-campus parking peaks at 2:30 PM, with 95% of the 234 off-street spaces on the CC campus occupied. The lot on the CC campus peaks during the middle of the day and drops around 5:00 PM, which is logical considering the uses on the campus (elementary school, high school, and public library). Parking in the on-campus lot is reserved for vehicles with county stickers, staff, or guests with parking passes; no students.
- Residential Restricted Parking, which includes on-street parking for residents only. Permit required.

  Residential Restricted parking in the neighborhoods surrounding the campus maintains around 60% occupancy during the day, peaking at over 70% at 7:00 PM.
- Unrestricted Parking, which includes on-street parking spaces with no restrictions. Unrestricted parking maintains relatively constant occupancy levels at around 30-40% throughout the day.
- Metered Parking (12-hr), which includes on-street paid parking with a 12-hour limit. Metered Parking (12-hr) is readily available throughout the day, peaking below 20% around midday.
- Metered Parking (2-hr), which includes on-street paid parking with a 2-hour limit. Metered Parking (2-hr) is over 50% occupied around midday, drops to just under 15% at 3:30 PM and peaks at 7:30 PM with over 80% spaces occupied.
- Time Restricted Parking (4-hr), which includes on-street parking with a 4-hr limit from 8 am to 6 pm Monday through Saturday. Time restricted parking maintains relatively constant occupancy levels at around 50% throughout the day.
- Mixed Parking, which includes on-street parking block faces with multiple restrictions. Mixed parking maintains relatively constant occupancy levels at around 45% throughout the day.
- Off-Campus Garages, which includes four (4) off-campus garages within walking distance to the CC campus:
  - ECDC Garage, with 302 spaces
  - Penrose Garage, with 320 spaces
  - Siena Park Garage, with 123 spaces
  - Halstead Garage, with 151 spaces

  The four (4) garages peak overall at 8:00 PM, with 45% of the total 896 spaces occupied; however, each garage has different peak occupancies:

  - ECDC Garage peaks at 14% occupancy, with 43 of its 302 spaces occupied, and maintains a relatively constant occupancy level throughout the day. This garage is restricted to employees only.
  - Penrose Garage has low occupancy in the morning and peaks around midday and in the evening, with under 40% of its 320 spaces occupied.
  - Siena Park Garage peaks at night, at 8:00 PM, with 43% of its 123 spaces occupied. The garage maintains relatively constant occupancy levels throughout the day, at around 25-35% occupancy.
  - Halstead Garage peaks at night, at 8:30 PM, with 70% of its 151 spaces occupied. The garage maintains relatively constant occupancy levels throughout the day, at around 50% occupancy.
- No Parking, which includes on-street parking marked as 'No Parking', on-street parking on private property, loading zones, and an on-campus parking lot marked for employees only.

Table 21: Summary of Existing Parking Demand

Parking Type	Number of Spaces	Peak Demand
On-Campus	234	95% at 2:30 PM
Residential Restricted	59	76% at 7:00 PM
Unrestricted	664	39% at 6:00 AM/10:00PM
Metered (12-hr)	32	16% at 12:30 PM
Metered (2-hr)	45	84% at 7:30 PM
Time Restricted (4-hr)	35	69% at 10:30 AM
Mixed	79	57% at 7:00 PM
Off-Campus Garages	896	45% at 8:00 PM
No Parking	28	N/A
Total	**2072**	**46% at 1:00 PM**

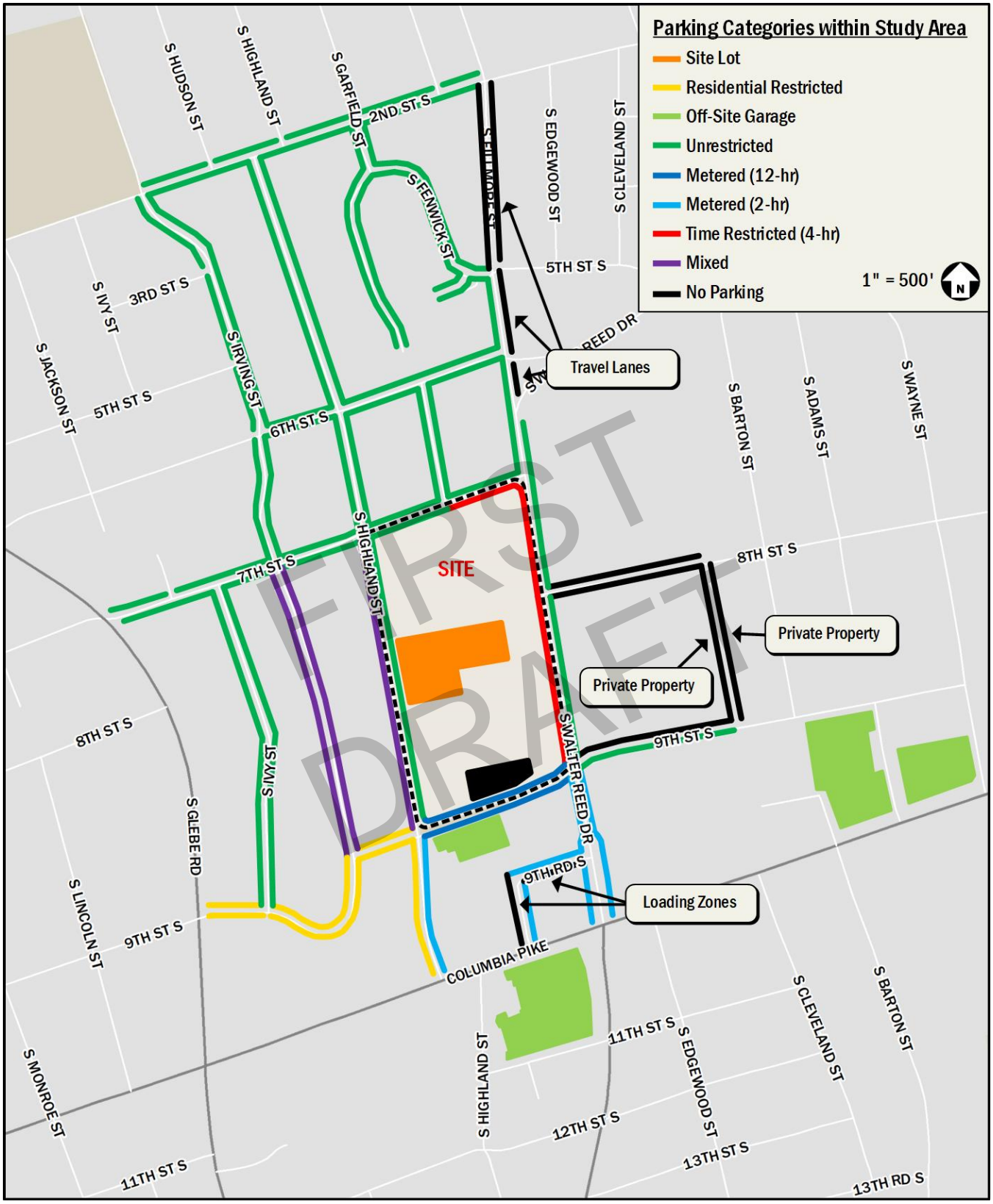


Figure 25: Parking Categories within Study Area

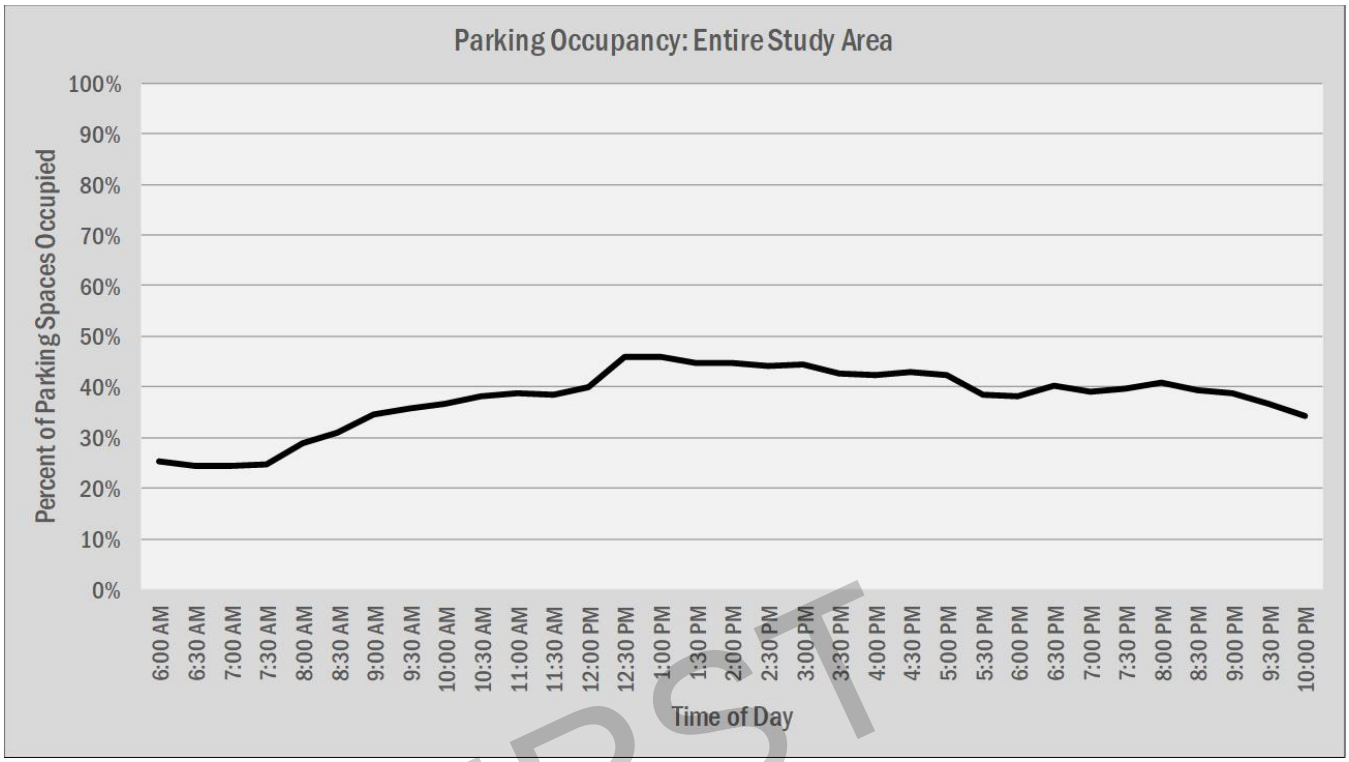


Figure 26: Parking Occupancy, Overall

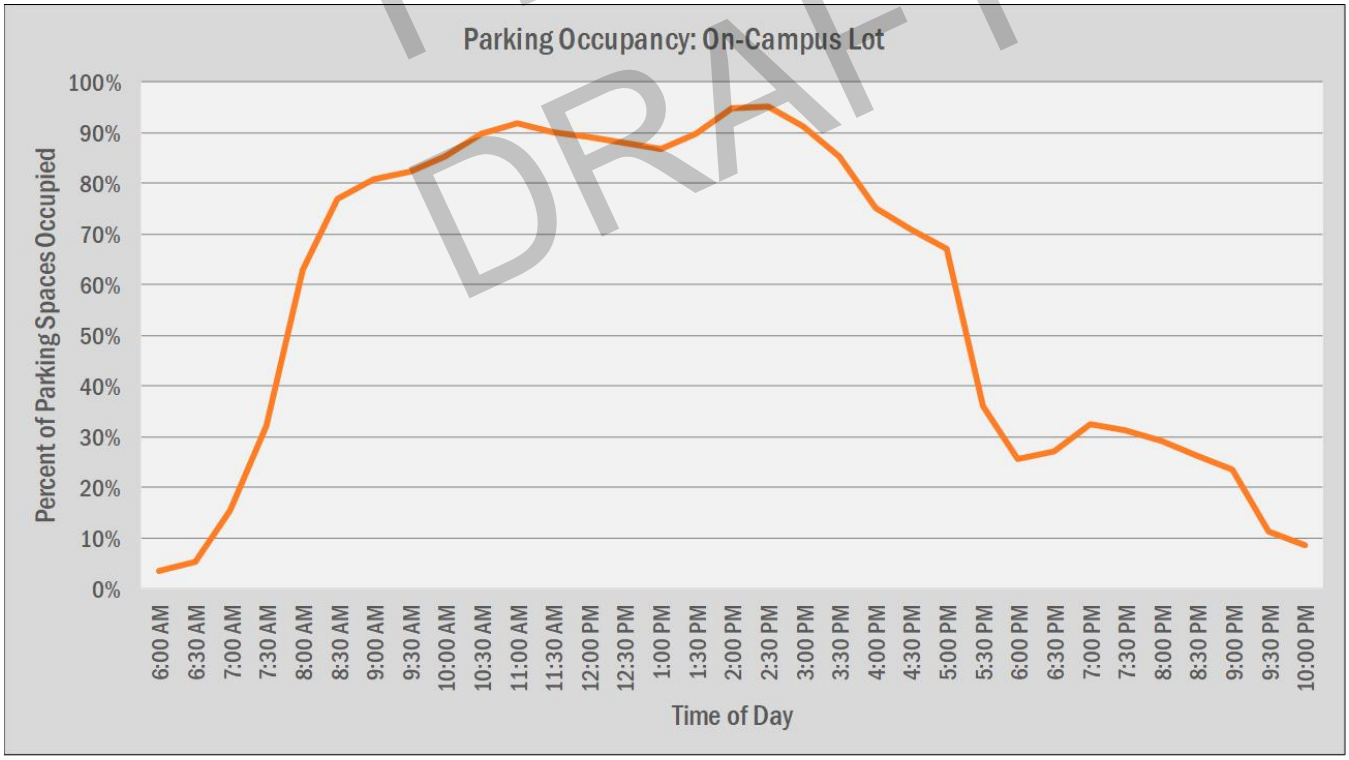


Figure 27: Parking Occupancy, On-Campus

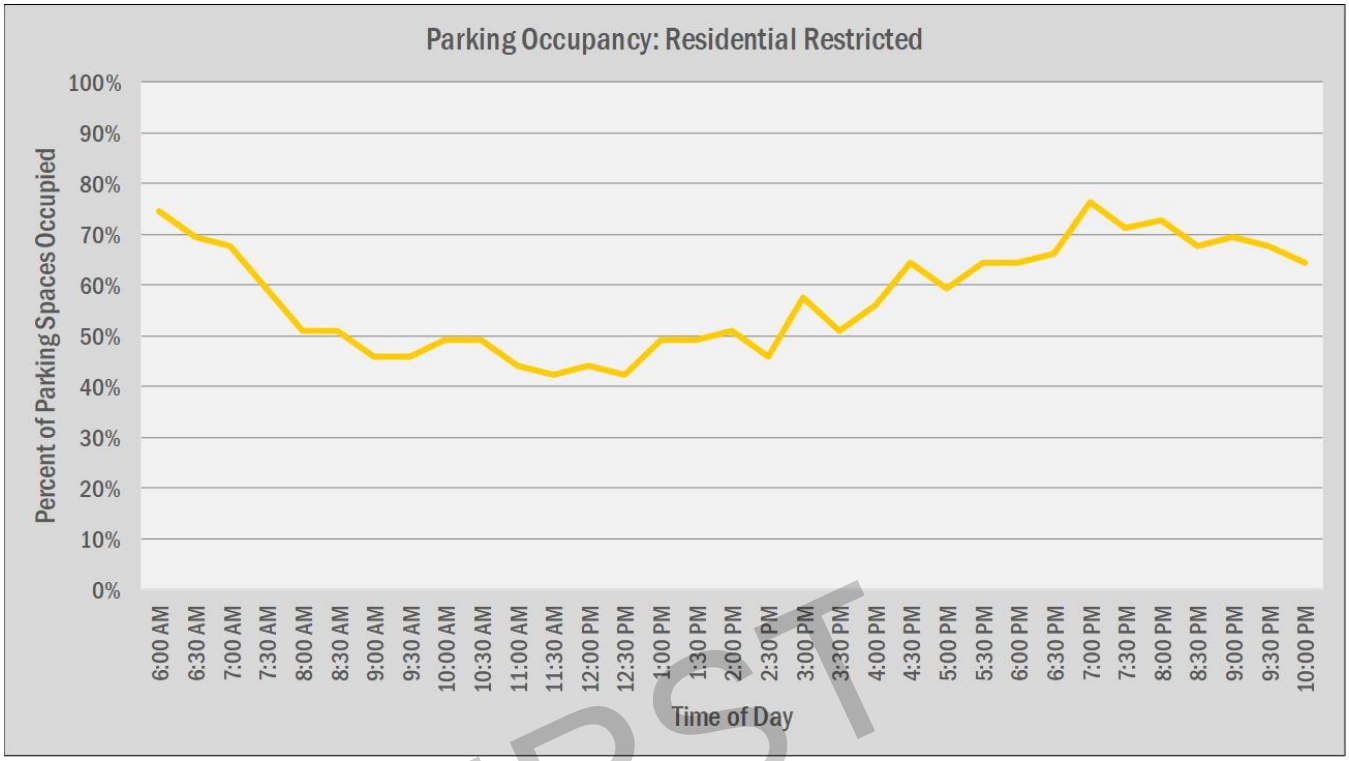


Figure 28: Parking Occupancy, Residential Restricted

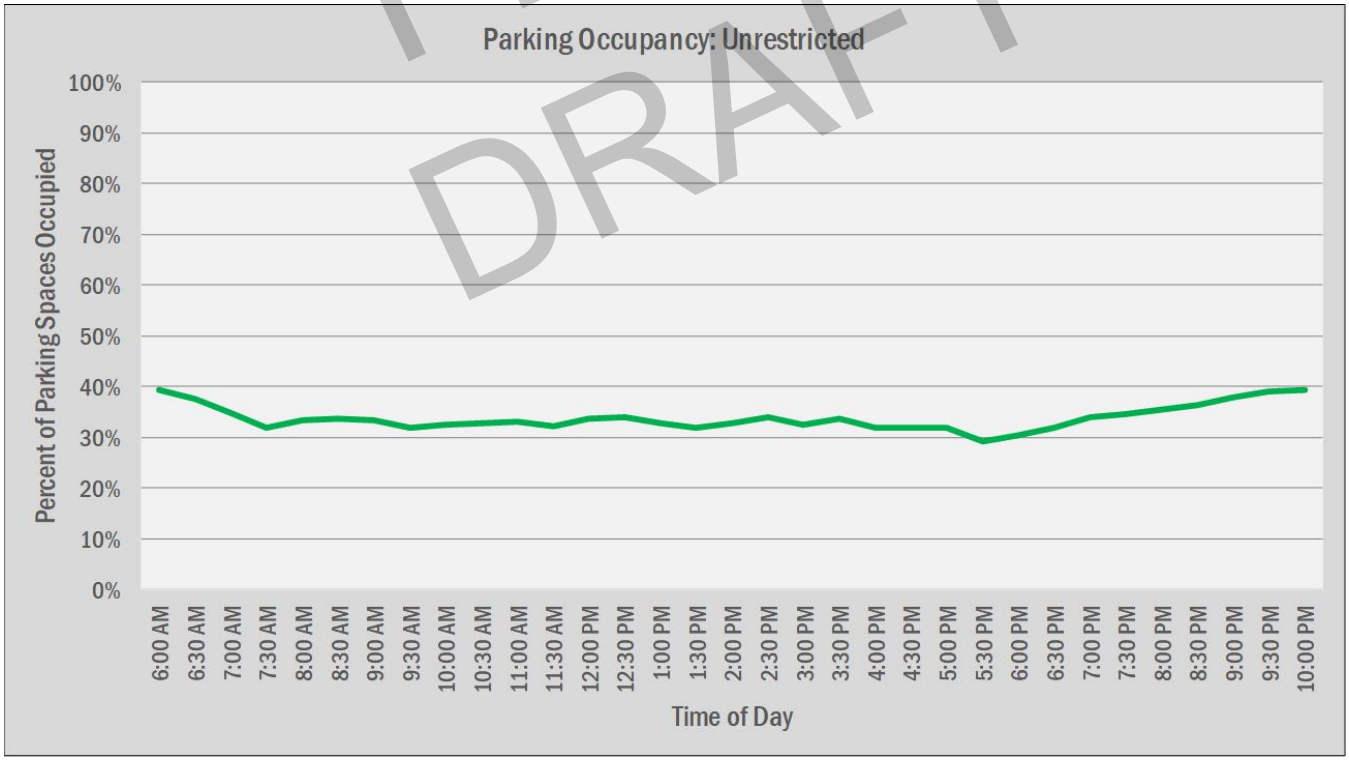


Figure 29: Parking Occupancy, Unrestricted

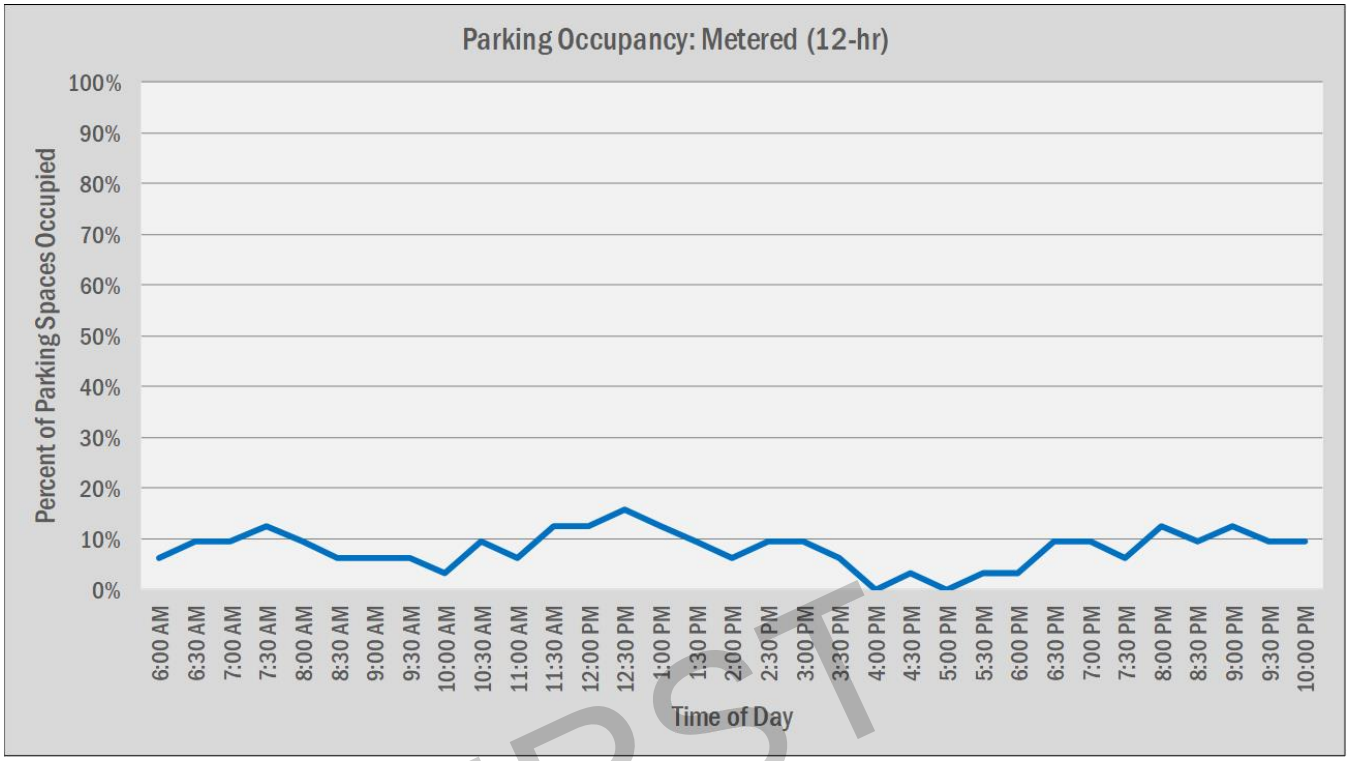


Figure 30: Parking Occupancy, Metered (12-hr)

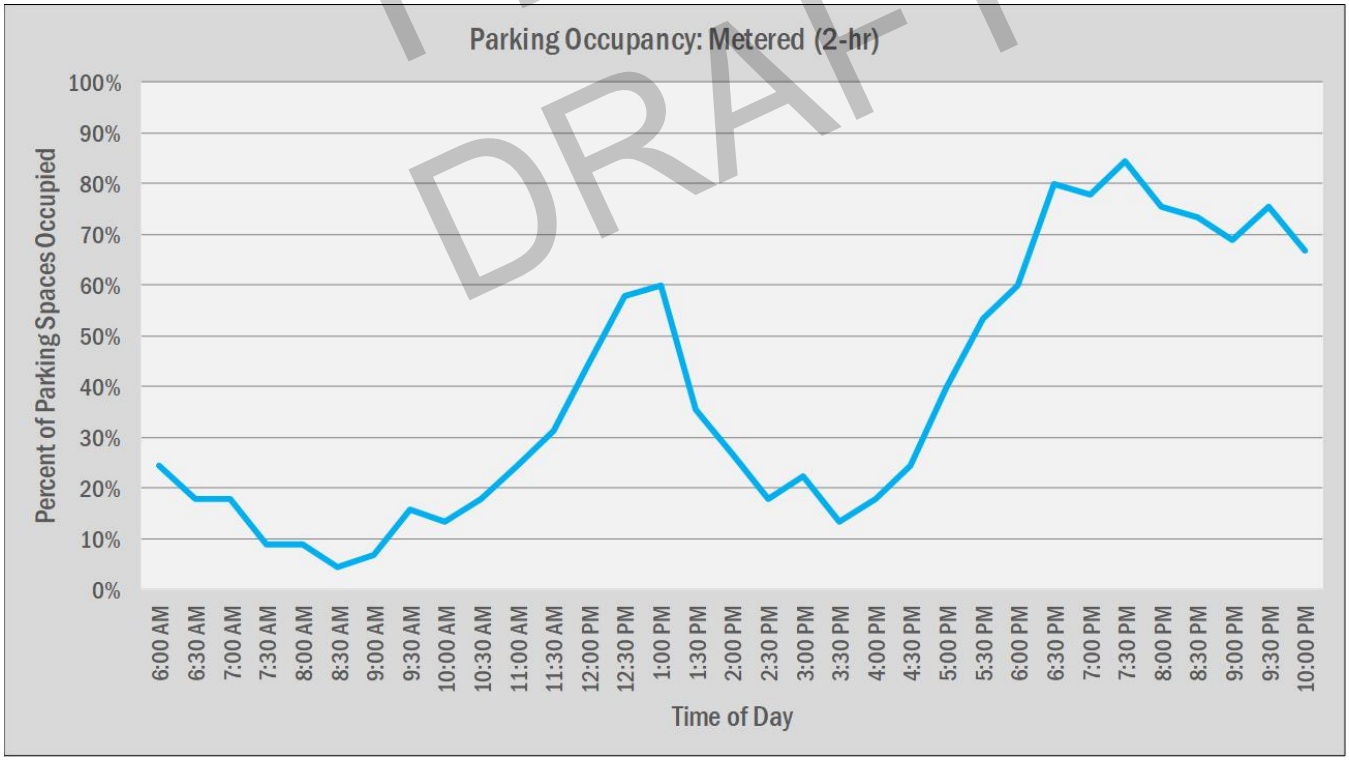


Figure 31: Parking Occupancy, Metered (2-hr)

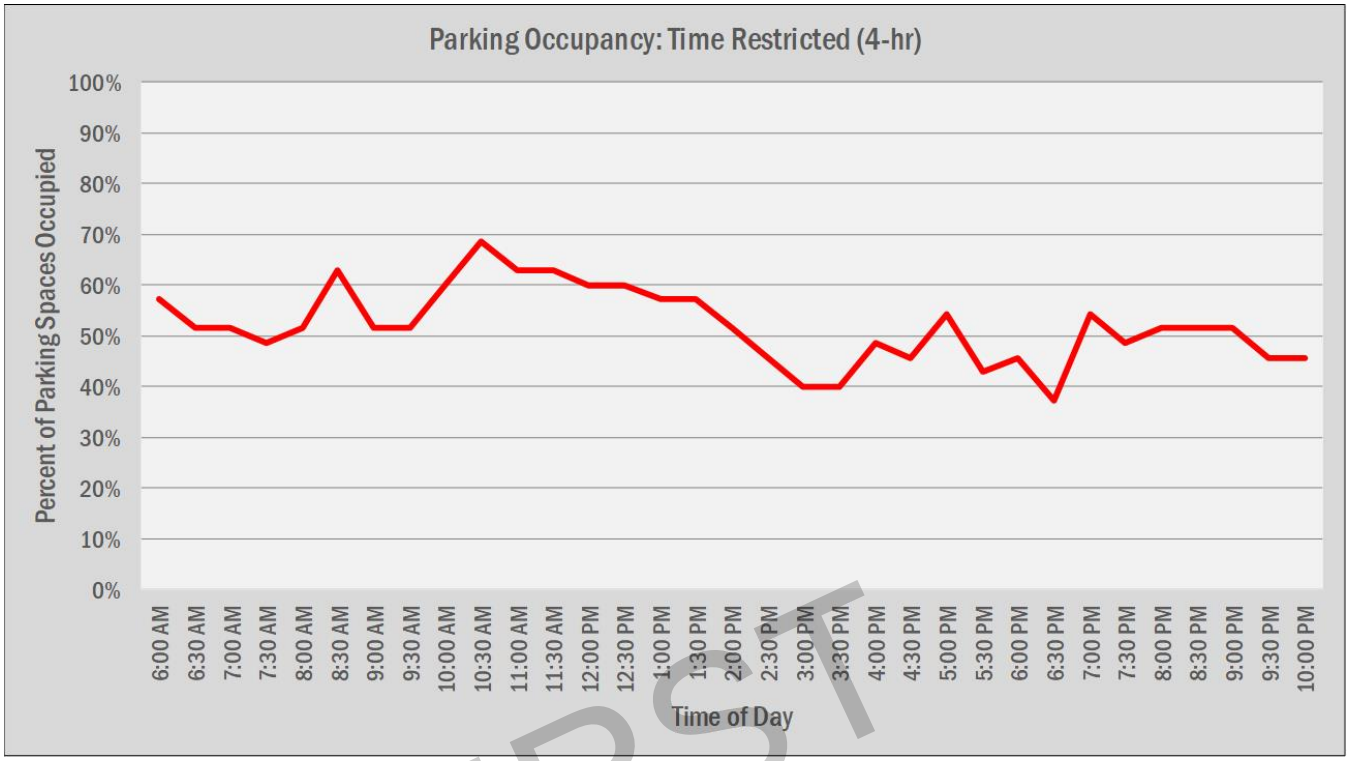


Figure 32: Parking Occupancy, Time Restricted (4-hr)

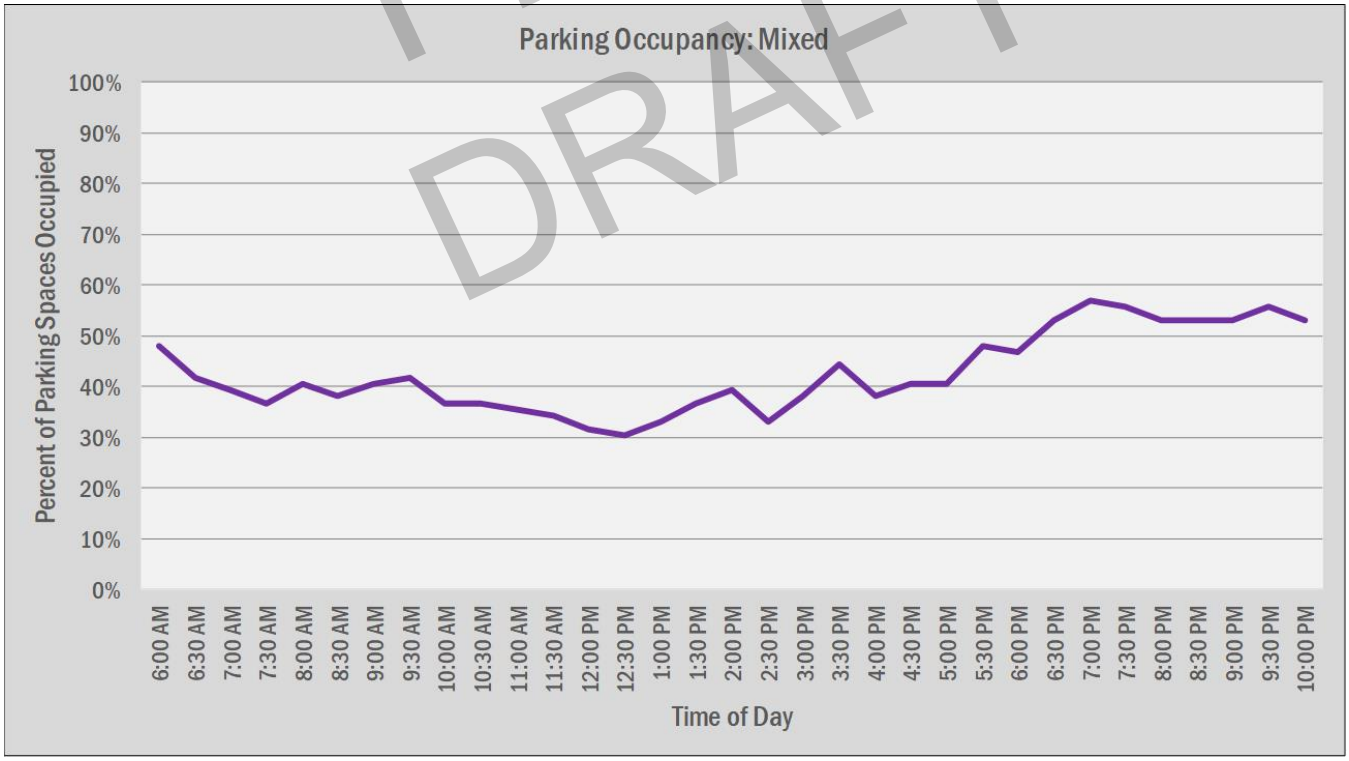
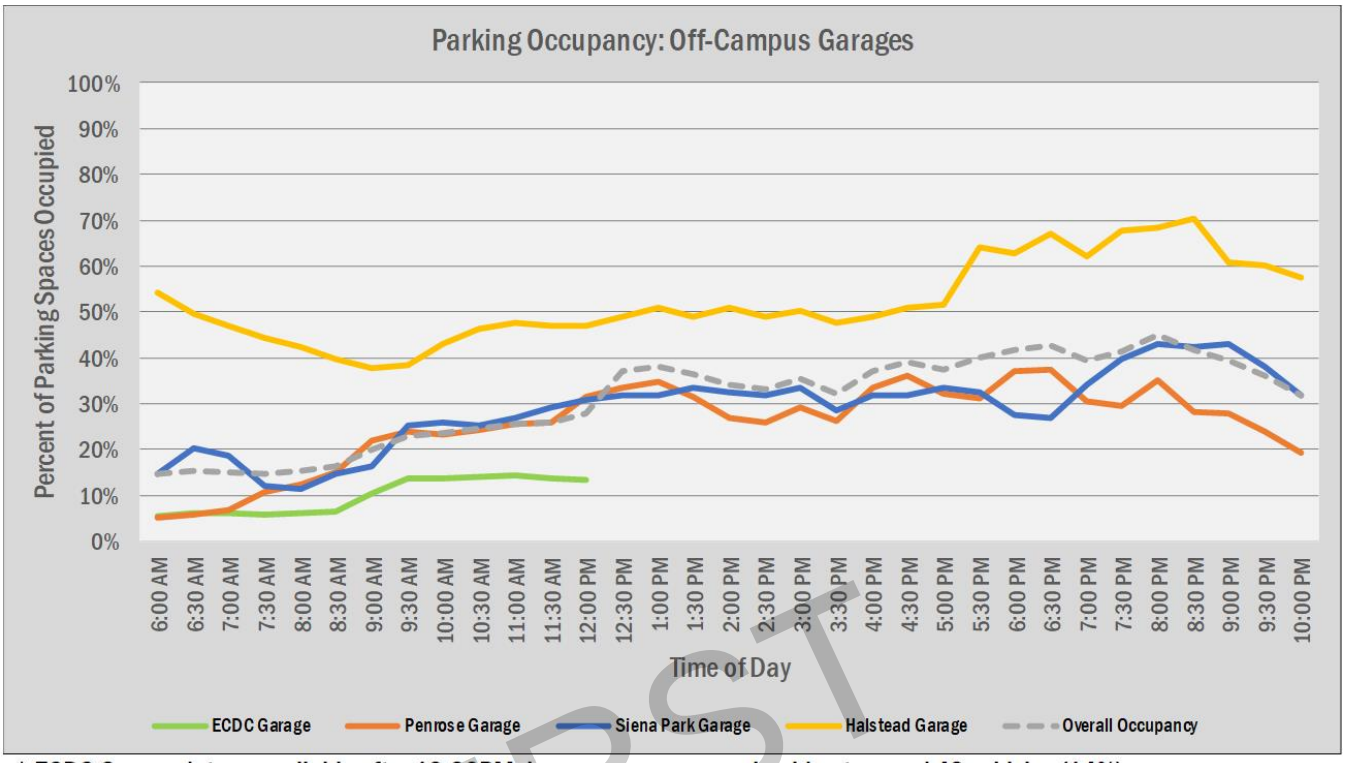


Figure 33: Parking Occupancy, Mixed



* ECDC Garage data unavailable after 12:30PM; however, occupancy should not exceed 43 vehicles (14%)

Figure 34: Parking Occupancy, Off-Campus Garages

PARKING RECOMMENDATIONS

Future Parking Demand

The parking model was used to project the future parking demand based on the future student and staff populations outlined in a previous chapter. The breakdown of the peak future parking demand by user-type is shown in Table 22.

The model estimates the future peak demand to be 494 spaces, a 187-space increase. The increased demand comes mainly from the significant increase in high school students from Arlington Tech growth and the new 800 students, and the resulting increase in CC staff. The major demand component remains staff parking, at 66% of the total parking demand. However, student parking significantly contributes to the future demand, with 27% of the total parking demand.

Table 22: Future Parking Demand from Model

	Peak Parking Demand (@ 2 PM)	
	Existing	Future
CC Students	31 spaces	125 spaces
ACHS Students	9 spaces	9 spaces
CC Staff	102 spaces	216 spaces
ACHS Staff	31 spaces	31 spaces
ES Staff	100 spaces	79 spaces
Library	35 spaces	35 spaces
Total	**308 spaces**	**495 spaces (+187)**

Future Parking Demand with TDM

As previously discussed, implementing TDM measures to meet reasonable target mode splits for the CC will reduce the overall parking demand from the CC.

The parking model was used to estimate the potential for reductions in the future parking demand when the target mode splits are met; with a 75% staff driving mode split and a 10% student driving mode split.

Table 23 shows a breakdown of the reduced peak parking demand compared to the future parking demand, with and without the appropriate TDM measures. Meeting the target mode splits reduces the student parking demand by 37% and staff parking demand by 13%, with an estimated peak demand of 402 spaces.

Table 23: Future Parking Demand from Model (with TDM)

	Future Peak Parking Demand (@ 2 PM)	
	Without TDM Reductions	With TDM Reductions[1]
CC Students	125 spaces	79 spaces
ACHS Students	9 spaces	6 spaces
CC Staff	216 spaces	185 spaces
ACHS Staff	31 spaces	25 spaces
ES Staff	79 spaces	72 spaces
Library	35 spaces	35 spaces
Total	**495 spaces**	**402 spaces (-93)**

[1]Based on previously discussed CC mode split targets

Summary

This report uses the parking demand with enhanced TDM as the design condition for the proposed CC campus. With this, this report recommends a 402-space design target for available parking facilities surrounding the CC campus. This parking design target may be accommodated various ways in conceptual design, considering on-site, on-street, and off-site parking garage options.

PEDESTRIAN FACILITIES

This chapter presents a review of pedestrian facilities along walking routes to and from the CC campus.

The following conclusions are reached within this chapter:

- The existing pedestrian facilities surrounding the campus provide a quality walking environment.
- Walking routes adjacent to the campus generally meet Arlington County standards, with some exceptions to the north of the campus in residential neighborhoods, and along sections of S Walter Reed Drive and Columbia Pike, and a portion of 9th Street S.

SIDEWALK REVIEW

The sidewalk review is an examination of sidewalks along expected walking routes to and from the CC campus, comparing their sidewalk widths, buffer widths, and curb ramps to Arlington County standards. The sidewalk review for this report was performed for all facilities within one-quarter mile of the campus.

Figure 35 shows the pedestrian study area that was evaluated as part of this report. The sidewalks, crosswalks, and curb ramps within the study area were evaluated based on the guidelines set forth by Arlington County. Table 24 summarizes the county width requirements for sidewalks and buffers by street type.

Table 24: Arlington County Sidewalk Requirements

Street Type	Minimum Widths	
	Sidewalk	*Buffer*
Neighborhood (Low Density)	4’	2’
Primarily Single-Family Residential Neighborhood Arterial	5’	4’
Primarily Commercial Centers	6’	6’
Urban Center Local (Medium to High Density)	6’	4’
Primarily Retail Oriented Mixed-Use Arterial	10’	6’

Comparisons of the pedestrian facilities within the study area to Arlington County standards are shown on Figure 36.

Within one-quarter mile of the campus, almost all of the roadways are considered neighborhood (low density). Columbia Pike is an arterial. S Walter Reed Drive between Columbia Pike and 7th Street S is classified as Primarily Commercial Centers, with S Walter Reed Drive between 7th Street S and 2nd Street S classified as Primarily Single-Family Residential Neighborhood Arterials.

Sidewalks

Most of the sidewalks surrounding the campus meet County standards for sidewalk width and buffer; however, there are exceptions. Firstly, while there are sidewalks and buffers present on both S Walter Reed Drive and Columbia Pike, the sidewalk and buffer widths do not meet the minimum specified widths per County standards. Secondly, there is a missing sidewalk on the north side of 9th Street S between S Highland Street and S Irving Street.

Curb Ramps

ADA standards require that all curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, curb ramps shared between two crosswalks is not desired. Under existing conditions there are curb ramps present at most intersections; however, many intersections have curb ramps that are shared by multiple crosswalks and/or are missing detectable warnings, which is undesired. There are missing curb ramps at the intersection of 9th Street S and S Irving Street.

Summary

In general, there are no major gaps in the pedestrian network surrounding the campus, though the pedestrian experience could be improved by bringing sidewalks and curb ramps up to County and ADA standards wherever feasible.

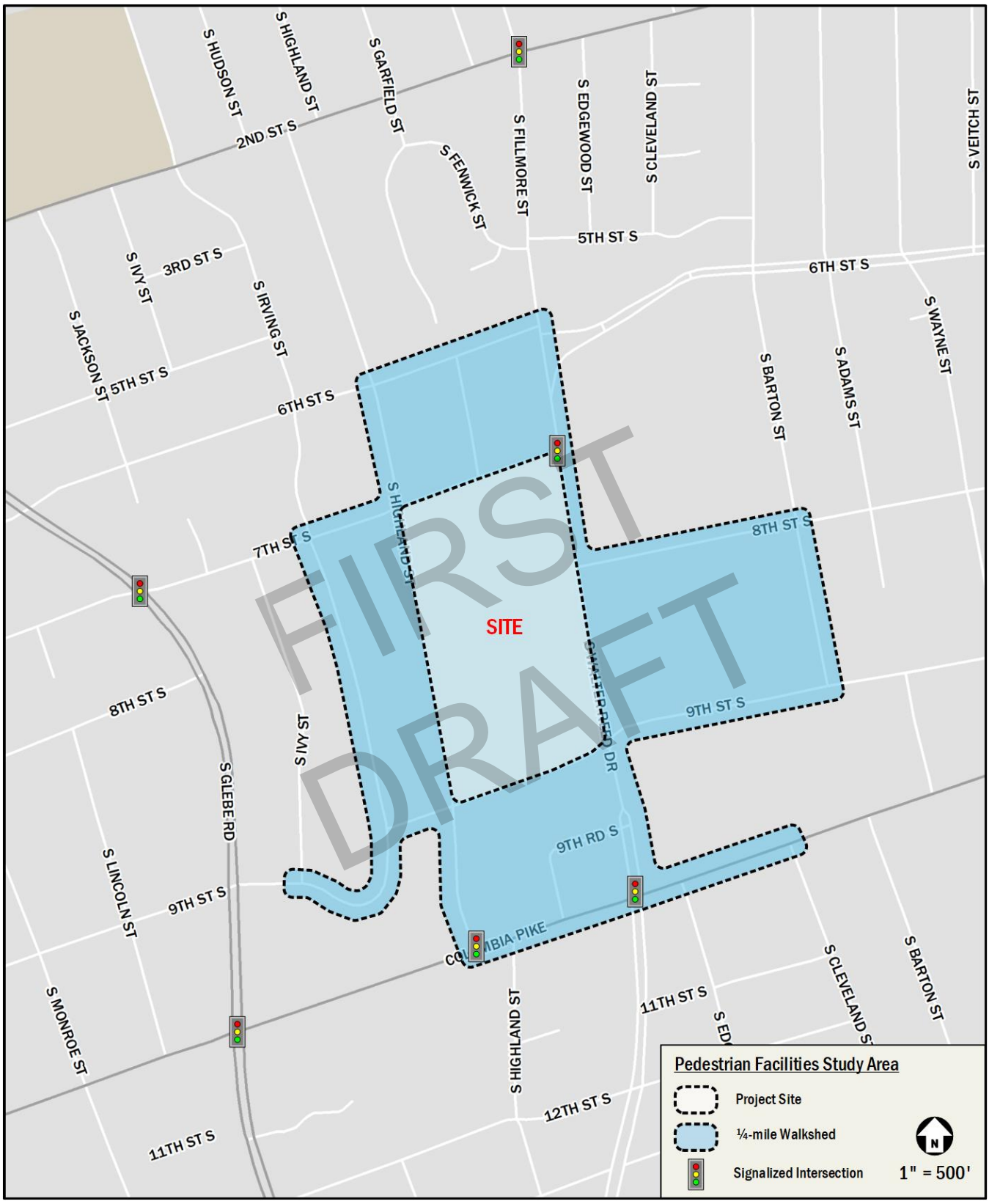


Figure 35: Pedestrian Facilities Study Area

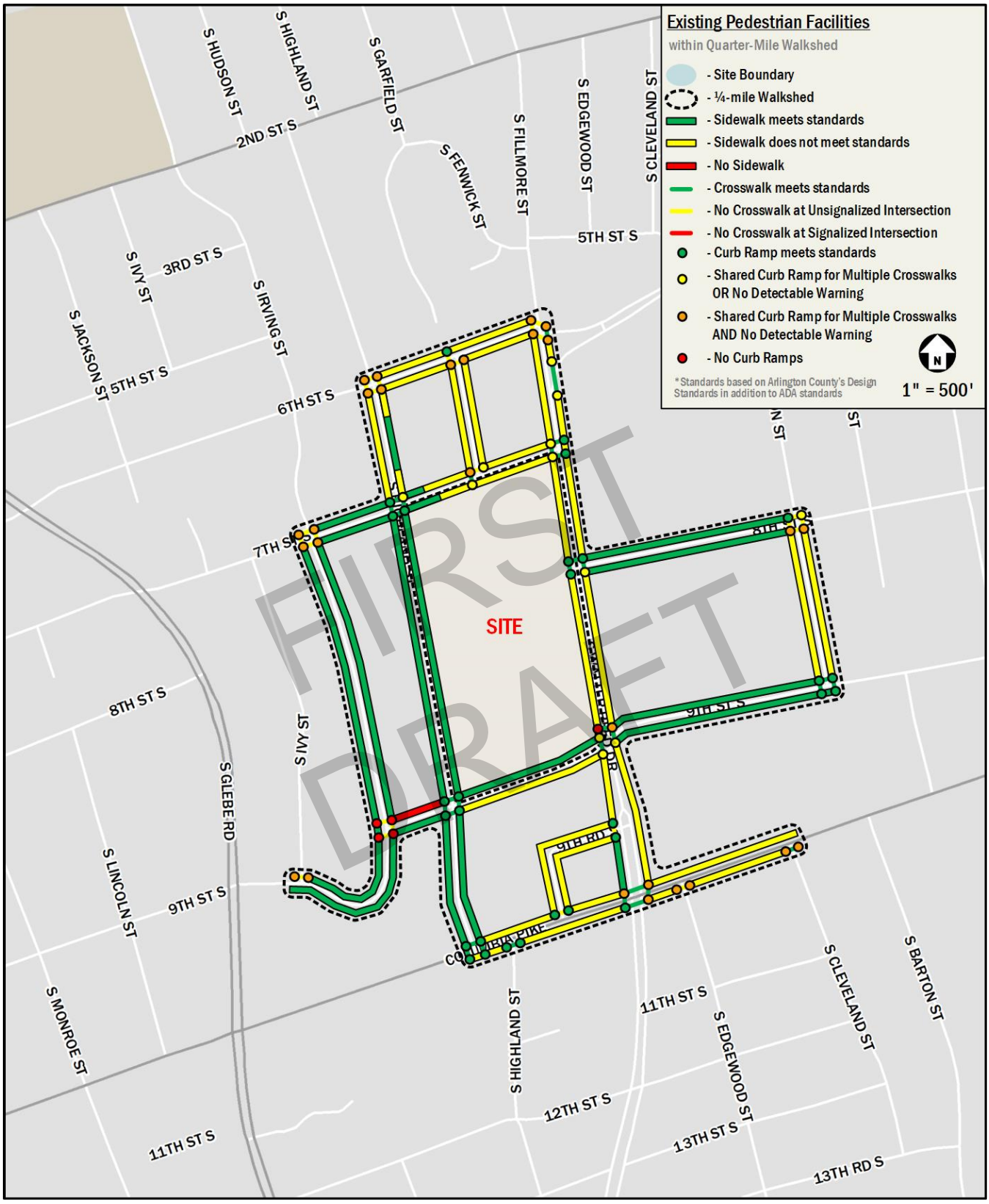


Figure 36: Existing Pedestrian Facilities

BICYCLE FACILITIES

This chapter presents a review of bicycle routes to and from the CC campus.

The following conclusions are reached within this chapter:

- The campus has good connectivity to existing on- and off-street bicycle facilities. The campus is surrounded by local neighborhood streets, bicycle lanes on S Walter Reed Drive and 2nd Street S, and the Custis and W&OD Trails.
- There is one (1) Capital Bikeshare station adjacent to the campus and an additional station within one-quarter mile of the campus.

EXISTING BICYCLE FACILITIES REVIEW

The campus has good connectivity to existing on- and off-street bicycle facilities, and the campus is surrounded by neighborhood streets that are relatively low in vehicular traffic and speed. North-south connectivity is provided via bicycle lanes on S Walter Reed Drive and signed routes on S Highland Street and S Irving Street. East-west connectivity is provided via bicycle lanes on 2nd Street S and signed routes on 7th Street S and 9th Streets, which is designated as a bike boulevard. These bicycle facilities connect to the Custis Trail to the north and the W&OD Trail to the west. These trails provide regional connectivity for bicycles to and from the campus.

Figure 37 shows existing bicycle facilities in the area.

Arlington County publishes an annual Bicycle Comfort Level Map highlighting the most comfortable bicycle routes throughout the County. The map uses a rating system of "perception of comfort" to show which routes are most comfortable. Routes are rated as 'Most Comfortable', 'Somewhat Comfortable', 'Less Comfortable', 'Least Comfortable', or 'Prohibited'. In the most recent publication of the map, the majority of bicycle routes in the vicinity of the campus are rated as 'Most Comfortable', with S Walter Reed Drive and 2nd Street rated as 'Somewhat Comfortable' and S Glebe Road and Columbia Pike rated as 'Least Comfortable', most likely due to their high traffic volumes.

Bicycle Parking

There is some short-term bicycle parking on-campus, more specifically near the entrance to MPSA on S Highland Street and on 8th Street S.

Capital Bikeshare

In addition to personal bicycles, the Capital Bikeshare program provides additional cycling options for staff and visitors of the planned development. The Bikeshare program has placed over 500 Bikeshare stations across Washington, DC, Arlington, and Alexandria, VA, Montgomery County, MD, and most recently Fairfax, VA, with over 4,300 bicycles provided. There is a Capital Bikeshare station on the east side of the campus, on the northwest corner of the S Walter Reed Drive and 8th Street S intersection. This Capital Bikeshare station houses a total of eight (8) docks. There is also a station about one-quarter mile south on S Walter Reed Drive at the S Walter Reed Drive and Columbia Pike intersection, which houses a total of ten (10) docks.

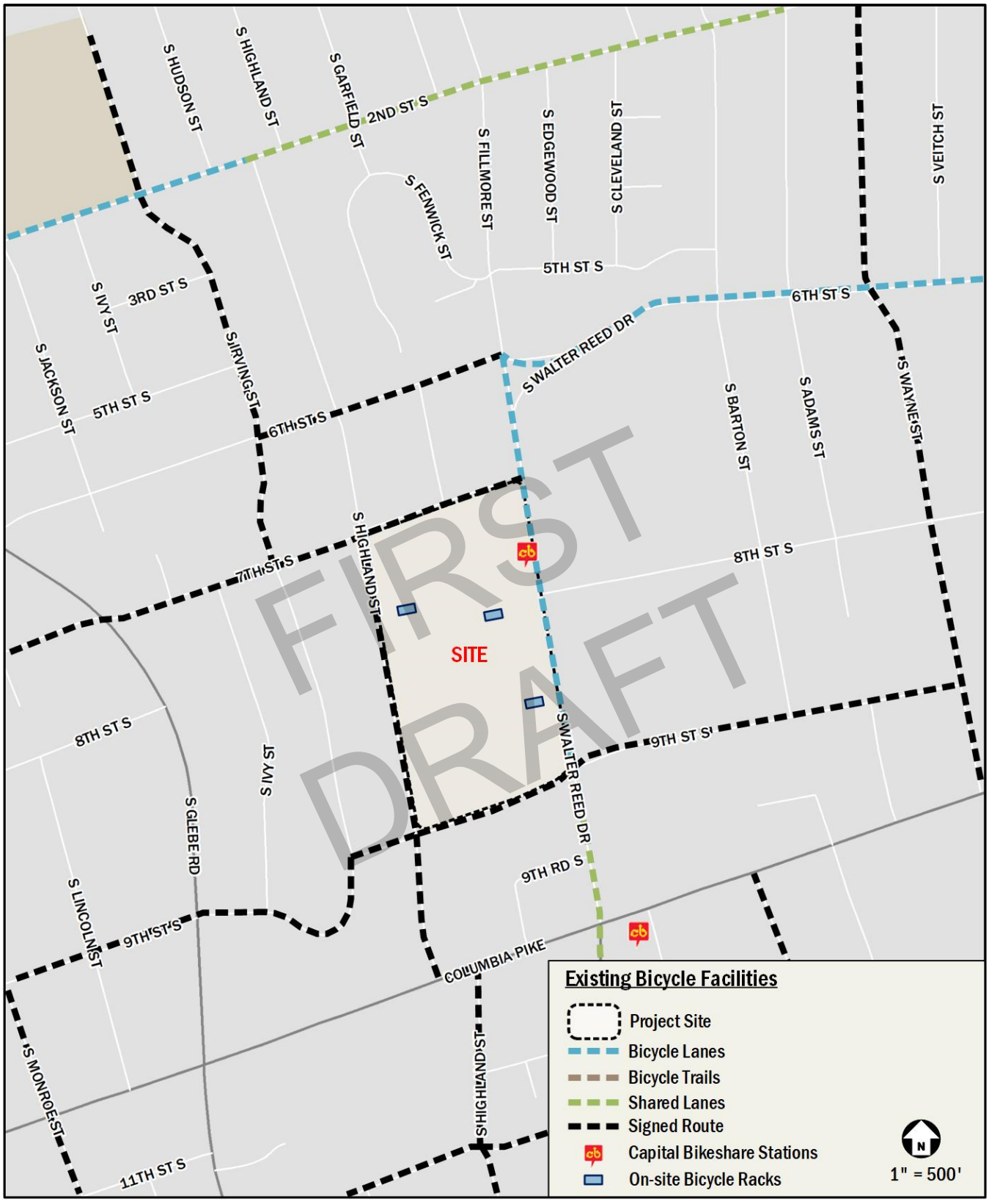


Figure 37: Existing Bicycle Facilities

TRANSPORTATION MANAGEMENT PLAN

A Transportation Management Plan (TMP) has many components that are tailored to accommodate a given facility with the goal of reducing of automobile trips by encouraging alternative forms of transportation.

A few typical TMP components for high schools are the establishment of a Transportation Demand Management (TDM) plan, the establishment of a Parking Management Plan, the establishment of Arrival and Dismissal Plans, and the establishment of a Performance and Monitoring Plan.

The TMP will include a schedule and details of implementation and continued operation of the elements in the plan. The TMP for the Arlington Career Center may include, but not be limited to, the following:

TRANSPORTATION DEMAND MANAGEMENT

The TDM Plan addresses the use permit conditions and includes additional strategies for reducing single-occupancy vehicle (SOV) and single-family travel to the APS Education Center consistent with the Arlington County TDM program and the APS Go! Master Plan.

The goals of the TDM plan are to:

1. Reduce staff drive rates from the existing rate in support of APS's division-wide goal of 75% by 2021 (as an average of all sites).
2. Increase the student walk/bike rate from the existing rate in support of APS's division-wide goal of 30% by 2021 (as an average of all schools).
3. Increase the number of school bus eligible students who ride the school bus.
4. Mitigate potential adverse impacts of parking on APS sites and in surrounding communities.
5. Support and grow a culture around walking, biking, carpooling and public transit use among students and staff.

A number of TDM strategies are outlined in the APS Go! Master Plan, which can be used to increase school bus utilization, public transit utilization, vanpool and carpool utilization, and active transportation modes – e.g., walking and biking, strategies for managing motor vehicle parking and student drop-off/pickup, and evaluation. This report recommends focusing on the following TDM strategies:

General TDM Strategies

1. Appoint a School Transportation Coordinator (STC);
2. Promote the APS pre-tax transportation benefit;
3. Invite Arlington Transportation Partners (ATP) and Safe Routes to School staff to Open House nights;

Strategies to Increase School Bus Utilization

4. Establish frequent bus rider incentive program;
5. Establish "walking school bus" program to bus stops;
6. Promote school bus use in communications with parents;

Strategies to Increase Public Transit Use

7. Offer transit benefit subsidy for those who commute by public transportation;
8. Offer transit training for students;
9. Promote student iRide card, which provides rides on ART buses for half price to students;

Strategies to Increase Vanpool and Carpool Utilization

10. Inform staff members about the "Guaranteed Ride Home" program;
11. Offer TDM benefit to staff who participate in carpool or vanpools for travel to and from work;

Strategies to Increase Active Transportation Mode Utilization

12. Continue partnering with the County to make physical improvements to the pedestrian and bicycle environment near the school, as necessary
13. Provide secure bicycle parking/storage facilities for students and staff;
14. Provide shower/changing facilities on site for staff who bike or walk to work;
15. Maintain trained crossing guards at appropriate intersections near school;
16. Establish a walking club;
17. Establish and provide parents with information on walking school buses and bike trains;

Additional TDM strategies will be included in the final use permit. These TDM strategies will target specific community concerns regarding traffic, while complementing the site's location and proximity to transit and bicycle facilities.

SAFE ROUTES TO SCHOOL

Safe Routes to School (SRTS) is a national program that works to make it safer and easier for students to walk or bike to school. SRTS programs examine conditions around schools and conduct projects and activities that work to improve safety and

accessibility, and reduce traffic and air pollution in the vicinity of schools. The core elements of SRTS include:

- Enabling and encouraging children, including those with disabilities, to walk and bicycle to school
- Making bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age.
- Facilitating the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution near schools.

APS has a SRTS Coordinator on staff whose position is funded through VDOT's SRTS Program whose work focuses on these core elements. The following additional strategies can be used to complement the TDM plan, and encourage and enable students to walk and bicycle to the new Ed Center annex while fulfilling SRTS objectives:

1. Participate in Walk to School Day and Bike to School Day;
2. Consider establishing a regular (i.e. weekly or monthly) walk and bike to school day;
3. Hold pedestrian safety classes or assemblies;
4. Partner with the County's Active Transportation team to offer safe cycling classes/training; and
5. Create a frequent walker, biker, and bus rider program with associated travel training opportunities.

Parking Management Plan

A Parking Management Plan (PMP) will address the use permit conditions and be consistent with Arlington Public Schools Policy 50-1.1.

The PMP will show how curbside space adjacent to the site will be designated for parking by the various users of the project. In addition, the PMP will provide effective directional signage to direct staff and visitors to appropriate location on the property.

Per previous discussion in this report, this MMTA is recommending that the PMP include a section reviewing visitor parking for the school and approved visitor entry points, making sure there is proximity between the two. Additionally, the PMP should review wayfinding and marketing for after-school activities and events held on campus to increase the amount of parking demand using the parking garage in lieu of on-street parking.

Arrival and Dismissal Plans

Arrival and dismissal plans will be reviewed and updated for the Arlington Career Center campus with the addition of the Career Center building and population. Their purpose of these plans is to ensure that school arrival and dismissal occurs safely and efficiently for users of all modes.

These plans will include details on parent drop-off and pick-up procedures, including how the queuing space will be managed, where school staff will be placed and their roles, and the marketing/messaging for parents and students.

This report is recommending Arlington Career Center enhance its arrival and dismissal plans with specific instructions on how to use pick-up/drop-off areas safely, incorporate those plans into the parent/student handbooks, and use APS staff on the sidewalk outside the school to help enforce the plans (similar to how they are used today).

Performance and Monitoring

APS will continue to maintain records of staff participation in APS TDM benefit programs and conduct triennial surveys of students, visitors, staff, and parents, regarding their travel to and from the school. APS will provide a triennial update to the School Board and APS leadership and the County Manager describing the results of the survey and TDM related activities.

These items should be monitored at a time around 6 months to one year after the Arlington Career Center project is completed.

SUMMARY AND CONCLUSIONS

This report reached the following major findings and recommendations:

Study Area

This MMTA reached the following major findings on the overall transportation network surround the CC campus:

- The campus is surrounded by an extensive regional and local transportation system that connects students, staff, and visitors of the project to the rest of Arlington County and surrounding areas.
- The campus is served by public transportation with access to four Metrorail lines, and several local and regional bus routes.
- The campus has good connectivity to existing on- and off-street bicycle facilities. The campus is surrounded by local neighborhood streets, bicycle lanes on S Walter Reed Drive and 2nd Street S, and the Custis and W&OD Trails.
- There is one (1) Capital Bikeshare station adjacent to the campus and an additional station within one-quarter mile of the campus.
- Pedestrian conditions are generally good, particularly along anticipated major walking routes.

Overall Transportation Strategy

Establishing an instructional facility at the CC campus presents an opportunity to optimize transportation operations. One of the general goals of this project is to provide flexibility in the type of educational programs that can be housed on the campus. When the CC project is complete, the campus will be shared between the CC building, elementary school, and Arlington Community High School but in the future, it may be used for a different educational program like a dedicated high school campus. Thus, although this MMTA makes recommendations primarily on how the building will function as a shared campus, it also considers how it may function in the future.

The recommendations contained within this MMTA, and detailed in the following sections, are all based around this overall strategy.

Mode Splits

This MMTA reached the following major findings on student and staff mode splits, based on 2013 and 2016 APS Go! survey data:

- Students in grades 9 and 10 at the CC campus use transit and bicycle to get to school more than the APS average.
- Based on surveys of grade 11 and 12 students, students in grades 11 and 12 at the CC campus take the school bus in the morning much less than the average APS grade 11 and 12 student, while the number of students getting dropped-off is much higher. In the afternoon, many more students take the school bus, with the amount of driving or getting pick-up decreasing closer to average APS levels for grades 11 and 12.
- The number of students that drive themselves to school in grades 11 and 12 on campus is not significantly different from the APS average for the CC campus.
- As of the 2013 APS Go! survey data, the student walk/bike rate was 22%. This has since increased to 24%, as of 2016 data. As of the 2013 APS Go! survey data, the staff driving rate was 88%. This has since decreased to 85%, as of 2016 data.

Given the trends of APS Go! data, it seems reasonable that the CC can target similar goals. This report recommends the following student and staff mode split targets, specific to the CC:

- A student walk/bike/public transit target of 45%
- A student driving target of 10%
- A 75% driving target for CC staff

Parking

This MMTA reached the following major findings on parking. At the time of counts, Patrick Henry ES remained on-site and there were no relocatable classrooms in the parking lot.

- Existing parking demand within and surrounding the CC campus peaks at 1:00 PM, with 46% of the available parking spaces within the study area occupied.

- The main parking lot on-campus peaks at 95% occupancy at 2:30 PM. It sustains a high level of occupancy between 10:30 AM and 3:00 PM.
- Residential curbside parking that is restricted, peaks at night and early morning at around 75% occupied, with demand lowering to 40-50% in the middle of the weekday.
- Unrestricted parking surrounding the CC maintains relatively constant occupancy levels throughout the day, at around 30-40%.
- The 12-hour meters near the CC have low occupancy, peaking at only 16% in use at 12:30 PM.
- The four (4) off-campus garages peak overall at 8:00 PM, with 45% of the total 896 spaces occupied.

This report recommends the following strategy for accommodating the increase in parking demand:

- Utilize the existing underutilized parking facilities to absorb new parking demand.
- Continue the current APS Go! Transportation Demand Management (TDM) programs to encourage the use of alternative travels for both students and staff, thus reducing the parking demand on the site and surround parking supply.

Traffic Operations

A detailed traffic capacity analysis performed for this MMTA led to the following findings:

- The existing study area intersections all operate at acceptable delay and LOS levels with two (2) exceptions. This is typical for commuting corridors and their side streets.
- Most intersections have acceptable queuing results, with all queues shorter than the available storage lengths, with five (5) exceptions. These exceptions occur primarily during the AM and PM commuter peak hours.
- The future scenarios show…

Bicycle Parking

Because bicycle parking demand is projected to grow, this MMTA is recommending more bicycle parking be added to include XX bicycle spaces.

Arrival/Dismissal – Student Pick-up/Drop-off

During arrival and dismissal times, parents (or guardians) are expected to use…

The proposed area has room to accommodate XX to XX vehicles loading/unloading at the same time for high school and XX to XX vehicles for elementary school.

Arrival/Dismissal – School Buses

Under existing conditions, bus loading and unloading operations occur on-campus, with separate high school and elementary school facilities. The expected future bus demand can be accommodated by…

Transportation Management Plan

This MMTA is recommending establishment of the standard management plans for County schools, including:

- A use permit required Transportation Demand Management (TDM) plan, with the standard elements for APS high school facilities, based on the APS Go! Program
- A Parking Management Plan (PMP). In addition to standard PMP elements, this MMTA is recommending that the PMP include a section reviewing visitor parking for the school and approved visitor entry points, making sure there is proximity between the two. Additionally, the PMP should review wayfinding and marketing for after-school activities and events held on campus to increase the amount of parking demand using the parking garage in lieu of on-street parking.
- Arrival and dismissal plans updated for the new CC campus. In addition to standard elements, this report is recommending the arrival and dismissal plans include specific instructions on how to use pick-up/drop-off areas safely, incorporate those plans into the parent/student handbooks, and use APS staff on the sidewalk outside the school to help enforce the plans (similar to how they are used today).
- APS will continue to maintain records of staff participation in APS TDM benefit programs and conduct triennial surveys of students, visitors, staff, and parents, regarding their travel to and from the school. APS will provide a triennial update to the School Board and APS leadership and the County Manager describing the results of the survey and TDM related activities. These items should be monitored at a time around 6 months to one year after the CC project is completed.