Multimodal Transportation Study

ACPS George Mason Elementary School

City of Alexandria, Virginia

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GOROVE SLADE
Transportation Planners and Engineers

Prepared by:

GOROVE SLADE
Transportation Planners and Engineers

4114 Legato Road	225 Reinekers Lane	1140 Connecticut Ave NW	4951 Lake Brook Drive	4550 Montgomery Avenue
Suite 650	Suite 750	Suite 1010	Suite 250	Suite 400
Fairfax, VA 22033	Alexandria, VA 22314	Washington, DC 20036	Glen Allen, VA 23060	Bethesda, MD 20814
T 703.787.9595	T 703.721.3044	T 202.296.8625	T 804.362.0578	T 301.708.3061

www.goroveslade.com

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Executive Summary

The following report presents a Multimodal Transportation Study (MTS) for the proposed expansion of Alexandria City Public School's (ACPS) George Mason Elementary School (GMES) in the City of Alexandria, Virginia.

The purpose of the MTS is to summarize the transportation observations, analyses, and findings performed as part of the study and detail how they influence the project's transportation site elements and accommodations. Additionally, a technical capacity analysis was performed to identify potential external roadway improvements necessary to accommodate future vehicular demand.

Proposed Project

The proposed development site is in the North Ridge neighborhood of the City and is bounded by Cameron Mills Road to the west, Monticello Boulevard to the north, Virgina Avenue to the south, and existing properties to the east.

GMES' current enrollment is 320 students with a staff and teacher count of 65. The proposed project expands the school's capacity to 670 students with a staff and teacher count of 80. Details of the project's transportation facilities incorporated into the site plans are included below.

Multi-Modal Site Overview

The site is well serviced by multiple modes of travel:

- Transit: The site is approximately 1.5 miles away from the Braddock Road Metrorail Station and is served by one (1) DASH route runs directly adjacent to the site, with seven (7) bus stops within a quarter mile walk of the site.
- Bicycle: The site has access to several on- and off-street bicycle facilities, including bicycle lanes along Monticello Boulevard between Cameron Mills Road and Russell Road, shared lane markings along Allison Street, and signed routes along Summit Avenue.
- Pedestrian: The pedestrian network near the site is well established. Most roads within a quarter-mile provide sidewalks on both sides and multiple potential walking routes to and from the site.
- Roadways: The project site is well-connected via I-395 and principal arterials such as King Street (VA-7). These arterials ultimately create connections to the Capital Beltway (I-495) and I-66. Cameron Mills Road and Taylor Avenue bring vehicular traffic directly to the site.

Observations

Observations of morning arrival and afternoon dismissal, performed on September 19th, 2024, were used to help develop recommendations on how to accommodate school transportation demands with the proposed expansion.

Highlights of the observations include:

- The roadways adjacent to the school didn't experience any roadway capacity issues due to the number of vehicles relative to the roadway capacity provided, but some congestion was observed to occur due to disruptive driver behavior.
- Examples of disruptive driver behavior included on-street parked vehicles illegally parked in areas with timed restrictions (i.e., the space reserved for school use during arrival and dismissal), U-turns in the middle of the street (e.g., for drivers trying to line up for pick-up/drop-off), and parents/guardians stopping in a travel lane in an attempt to pick-up or drop-off a student.
- School buses use the curbside area along Cameron Mills Road in front of the school front door. During most times, on-street parking is not permitted along this curb, as the roadway can only accommodate one side of on-street parking, which occurs on the opposite side of the street. During arrival and dismissal, on-street parking is restricted on that side, and the travel lanes shift over to make room for curbside activity on the school side.
- Parent/guardian morning drop-off and afternoon pick-up officially occurs in the curbside space to the south of the buses on Cameron Mills Road. Most parent/guardians used this area, although some pick-up/drop-off activity was observed in informal areas (e.g., the nearby church parking lot and side streets).
- The parking lot on site does not accommodate all teachers and staff that drive, with over half of them parking off-site, between the church parking lot and on-street, mostly on Taylor and Virginia Avenues south of the school.

- A significant number of students were observed walking to school, from all directions, including using paths through the park and connecting to all local neighborhood streets. Two crossing guards are employed along Cameron Mills Road.
- Some students were observed bicycling to school and using racks provided on site.

Additional details on the observations are included in the main body of the MTS.

Project Transportation Facilities

The observations, data collected, and analyses contained in this MTS were used to help inform the project design team on accommodating future GMES transportation demands on the site plan. A summary of how the site plan accommodates future demand is as follows:

- Walking routes were incorporated into the site plan around the edges and internally, to help maintain and encourage an increase in the number of students walking to school.
- New bicycle racks were included in the site plan, with the goal of providing a minimum of 34 spaces, representing a goal of 5% of the future total population. The most recent Safe Routes to School survey indicated an existing bicycle mode share of 4%; the 5% goal mode share for parking was set to target an increase in bicycle trips to the site.
- Buses will remain in front of the school on Cameron Mills Road, with more dedicated space providing room for the expected increase in buses to a maximum of six. The section of Cameron Mills Road will be widened to provide this bus loading/unloading zone, eliminating the need to switch which side of the street has parking restrictions during arrival and dismissal.
- Parent/guardian pick-up/drop-off will continue to occur south of the bus area on Cameron Mills Road. To create more room, an off-street a pick-up/drop-off (PUDO) 'loop' was added. This facility is anticipated to accommodate around half of the maximum queue expected at afternoon dismissal, balancing the needs of not encouraging parents to drive students to school, while also not having students being picked-up/dropped-off too far from the school in unsafe locations.
- The new PUDO 'loop' and the widening of Cameron Mills Road for the bus loading/unloading area allow for the elimination of how parking restrictions on the street change during arrival and dismissal, and should reduce the amount of disruptive driver behavior observed. For example, the PUDO loop should eliminate the need for mid-block U-turns, and removing the time restrictions on the on-street parking should eliminate parked cars that don't remember to move, reducing the road to only-one travel lane.
- In addition, the new bus loading/unloading area and the PUDO 'loop' can assist with non-arrival/dismissal transportation needs, such as bus parking for field trips between arrival/dismissal hours, pick-up/drop-off for before and after school services, and visitor parking. Currently those demands cannot use existing arrival/dismissal facilities since those are created only through timed restrictions of on-street parking.
- To provide a quality experience for their teachers and be a good neighbor, the site plan proposes 56 on-site parking spaces, a significant increase that, when combined with the 13 parking spaces in the park, should minimize off-site parking in the neighborhood. This provides a total of 69 parking spaces for a projected 80 combined teachers and staff. Both the north and south on-site parking lots are designated for school staff parking during school hours and for school-related programs held outside of school hours. Outside of PUDO hours, the PUDO 'loop' is proposed to accommodate visitor parking and potentially small delivery vehicles, such as UPS trucks. A detailed parking demand and supply is included in the main body of this report, including parking counts conducted over the course of a school day.
- Two loading berths are proposed as part of the southern parking lot, to accommodate the practical loading and delivery needs of the future school.

Technical Capacity Analysis

The MTS also includes a technical analysis of vehicular roadway capacity at intersections near the site. The purpose of this analysis is to identify potential external roadway improvements necessary to accommodate future vehicular demand. The vehicular study area consists of eight (8) intersections along Cameron Mills Road, Monticello Boulevard, and Virginia Avenue, as vetted and approved by the City of Alexandria.

For each of the study area intersections, capacity analyses were performed for the morning and afternoon peak hours, corresponding to the periods with the greatest school-related arrival and dismissal traffic. These analyses were done for existing conditions and future projected conditions with and without the project. The difference between the future condition scenarios with and without the project provides the main basis for determining if roadway improvements are necessary as part of the school expansion. In order to project future GMES traffic, a custom multi-step approach was utilized based on the proposed number of students and staff and data on hourly distribution of trips from comparable sites in the region, as vetted and approved by the City of Alexandria during the scoping process.

The technical capacity analyses showed that projected future traffic operations in the study area are acceptable in both scenarios with and without the project. Thus, this MTS does not recommend any external roadway capacity improvements be incorporated into the project.

Introduction

This report presents the findings of a Multimodal Transportation Study (MTS) for the proposed redevelopment of George Mason Elementary School located in the City of Alexandria, Virginia.

The purpose of the MTS is to summarize the transportation observations, analyses, and findings performed as part of the study and detail how they influence the project's transportation site elements and accommodations.

The site currently consists of the existing George Mason Elementary School on the west side of the site and George Mason Park on the east side. As part of the proposed project, a small portion of the existing school building will remain and be renovated, while the rest of the school will be demolished to make way for the construction of a new school building. Around the new school, there will be parking, walkways, playgrounds, and bioretention facilities. George Mason Park will also be redeveloped, with the proposed condition to include a baseball diamond, basketball court, and additional play areas which are proposed to be utilized by the school as well. Frontage improvements along Cameron Mills Road include a dedicated pullout area for school buses and a new off-street pick-up/drop-off (PUDO) loop.

The current enrollment at the school is 320 students, and the staff count is 65. The proposed project aims to expand the school's capacity by increasing the maximum enrollment to 670 students and the staff count to 80.

Purpose of Study

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

Study Tasks

The following tasks were completed as part of this study:

- A scoping meeting was held on September 11, 2024, with representatives from the City of Alexandria. An updated scope dated September 27, 2024, was submitted by Gorove Slade to the City of Alexandria. This scope includes discussions about the parameters of the study and relevant background information. A copy of the signed scoping document is included in the Technical Attachments.
- Field reconnaissance in the vicinity of the site was performed to collect information related to the existing pick-up/drop-off operations, existing traffic controls, roadway geometry, traffic flow characteristics, sidewalk conditions, bicycle facilities, and transit stop amenities.
- Traffic turning movement counts were collected at the study intersections on Thursday, September 19, 2024, during the morning hours between 6:30 and 9:30 AM and afternoon hours between 1:30 and 4:30 PM.
- Parking occupancy and inventory data were collected within a quarter mile of the project site on Thursday, September 19, 2024, with hourly occupancy counts from 6 AM to 7 PM.
- As outlined in the scoping document, the project site is located in a single-family residential neighborhood with no known planned background developments in the vicinity of the proposed development that would generate trips through study intersections. Additionally, based on historical data obtained from VDOT, the residential context of the surrounding roadway network, and discussions with the City during scoping process, no inherent annual growth rate was assumed. Therefore, the 2027 Future Conditions without the proposed development (referred to as the Background conditions) is not analyzed because it is assumed to be the same as 2024 Existing Conditions.
- Proposed site traffic volumes for educational use were generated based on a custom multi-process approach, as outlined in a later chapter of this report.
- Intersection capacity analyses were performed using the software package Synchro, Version 11 based on the *Highway Capacity Manual (HCM) 2000* methodology. Traffic analyses were performed for Existing Conditions (2024) and Future Conditions (2027) with development.

Project Summary

Site Location

The proposed development site is located in the North Ridge neighborhood of the City of Alexandria, Virginia. The site is bounded by Cameron Mills Road to the west, Westminster Presbyterian Church to the north, and existing residential properties to the south and east. Figure 1 shows the location of the project in a regional context. Figure 2 shows the site location within the surrounding area.

Zoning Information

According to the City of Alexandria Zoning Map and Zoning Ordinance, the site is currently zoned as Single Family, 8,000 square feet (R8) Zone. The R8 zone is established to provide and maintain land areas for low density residential neighborhoods of single-unit, two-unit, and multi-unit up to four units dwellings on 8,000 square foot lots.

Proposed Site Plan

The site currently consists of the existing school on the west side of the site and George Mason Park on the east side of the site. As part of the proposed project, a small portion of the existing school building will remain and be renovated, while the rest of the school will be demolished to make way for the construction of a new school building. Around the new school, there will be parking, walkways, playgrounds, and bioretention facilities. George Mason Park will also be redeveloped, with the proposed condition to include a baseball diamond, basketball court, and additional play areas, which are proposed to be utilized by the school as well. Frontage improvements along Cameron Mills Road include a dedicated pullout area for school buses and a new off-street pick-up/drop-off (PUDO) loop.

The current enrollment is 320 students, and the staff count is 65. The proposed project aims to expand the school's capacity by increasing the maximum enrollment to 670 students and the staff count to 80.

The proposed project will provide 56 on-site parking spaces dedicated for school use in two (2) on-site parking lots. The proposed parking spaces are expected to meet the practical needs of the site. Vehicular access will be provided from Cameron Mills Road and Taylor Avenue.

The proposed project build-out year is 2027. The proposed site plan is shown in Figure 3.

Scope and Limits of the Study Area

The proposed development site is located in the North Ridge neighborhood of the City of Alexandria, Virginia. The proposed campus is bounded by Cameron Mills Road to the west, Monticello Boulevard to the north, Virginia Avenue to the south, and existing properties to the east. The following intersections were identified for inclusion in the vehicular study area, as shown in Figure 4:

1. Cameron Mills Road & Virginia Avenue
2. Taylor Avenue & Virginia Avenue
3. Cameron Mills Road & Summit Avenue/Monticello Boulevard
4. Pierpont Street & Monticello Boulevard
5. Church Driveway 1 (west) & Monticello Boulevard
6. Church Driveway 2 (east) & Monticello Boulevard
7. Cameron Mills Road & Parking Driveway 1 (Future)
8. Cameron Mills Road & PUDO Driveway (Future)

Data Sources

Sources of data for this study include City of Alexandria, the Virginia Department of Transportation (VDOT), the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition, Census Transportation Planning Products (CTPP), Alexandria City Public Schools, IMEG, VMDO, and the office files and field reconnaissance efforts of Gorove Slade Associates, Inc.

Contents of Study

This report contains nine (9) chapters as follows:

- Study Area Overview

  This chapter reviews the area near and adjacent to the project and includes an overview of the site location.

- Project Design

  This chapter reviews the transportation components of the project, including the site plan and access.

- Transit Facilities

  This chapter reviews existing and future transit service adjacent to the site, reviews how the proposed development's transit demand will be accommodated, outlines impacts, and presents recommendations as needed.

- Bicycle Facilities

  This chapter reviews existing and future bicycle facilities access to the proposed development, reviews the quality

of cycling routes to and from the project site, outlines impacts, and presents recommendations as needed.

- Pedestrian Facilities

  This chapter reviews existing and future pedestrian facilities, reviews walking routes to and from the proposed development, outlines impacts, and presents recommendations as needed.

- Travel Demand Assumptions

  This chapter outlines the travel demand of the proposed development. It summarizes the expected mode splits multimodal trip generation of the proposed development.

- 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. It summarizes the distribution and routing assumptions used in the analysis. This chapter highlights the vehicular impacts of the proposed development, including presenting mitigation measures for minimizing impacts as needed.

- Parking Study

  This chapter reviews the inventory of the available on- and off-street parking in the vicinity of the project site. It includes the findings and recommendations of a parking occupancy study.

- Summary and Conclusions

  This chapter presents a summary of the recommended mitigation measures by mode and presents overall findings and conclusions.

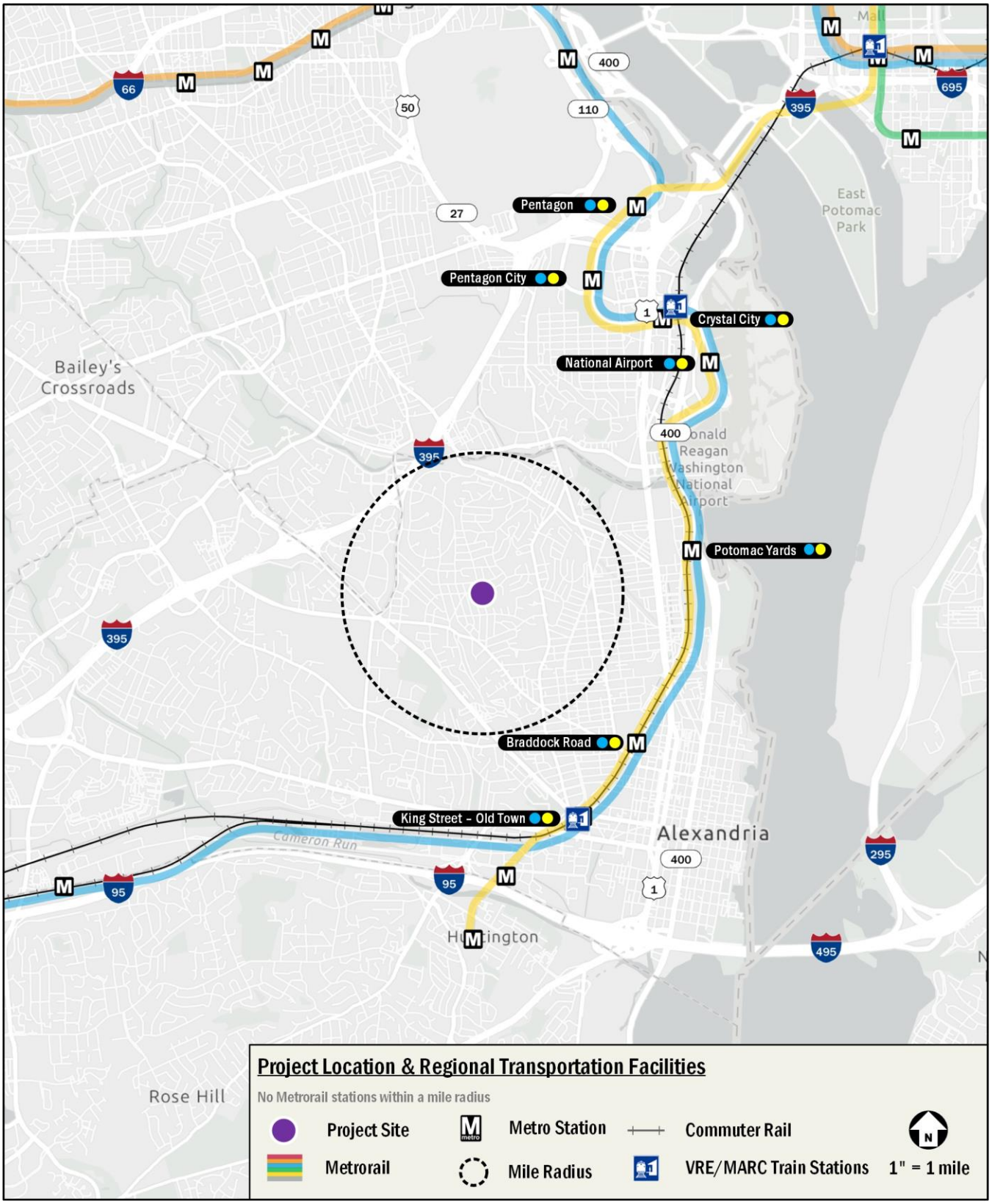

Figure 1: Project Location & Regional Transportation Facilities

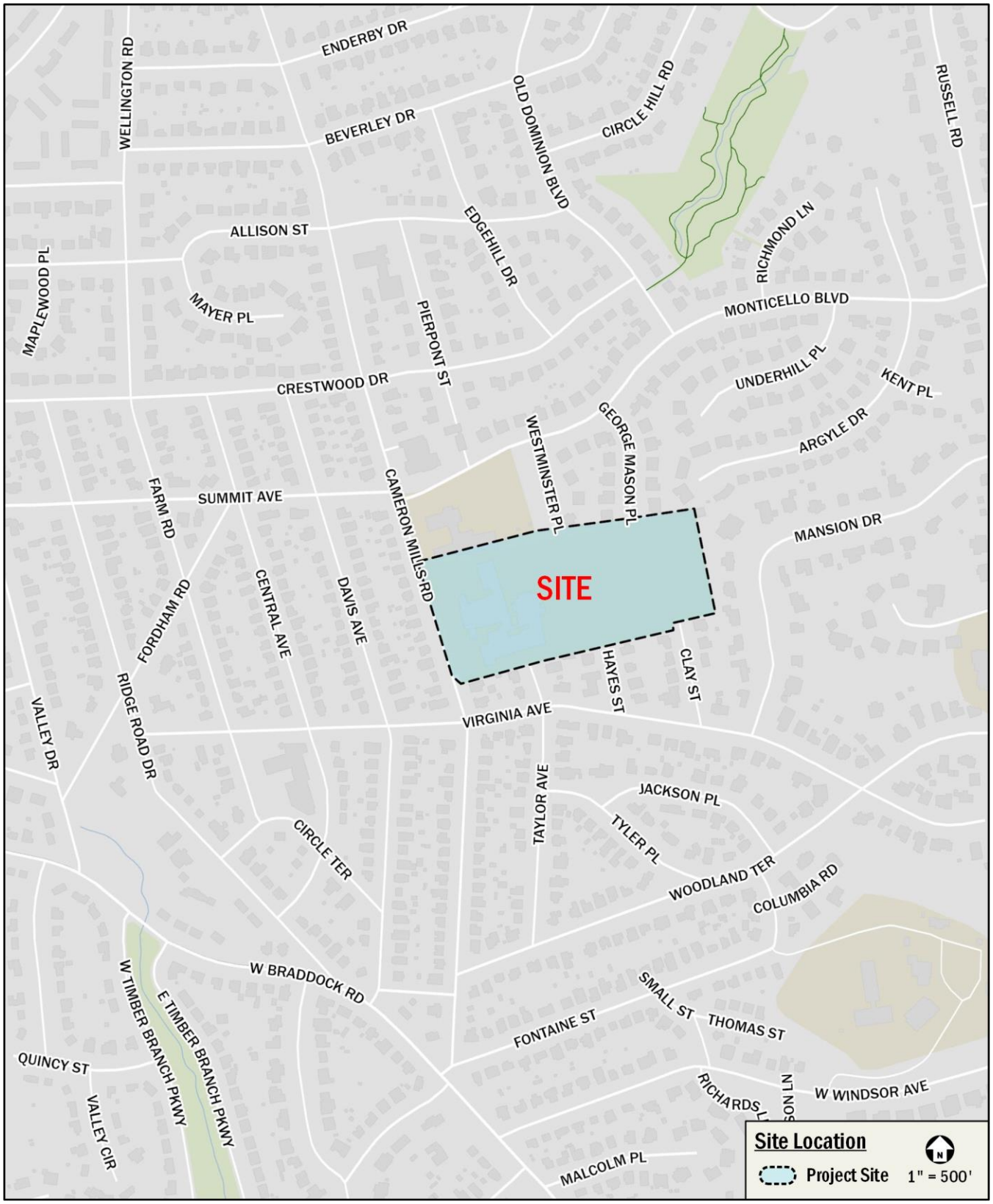

Figure 2: Site Location

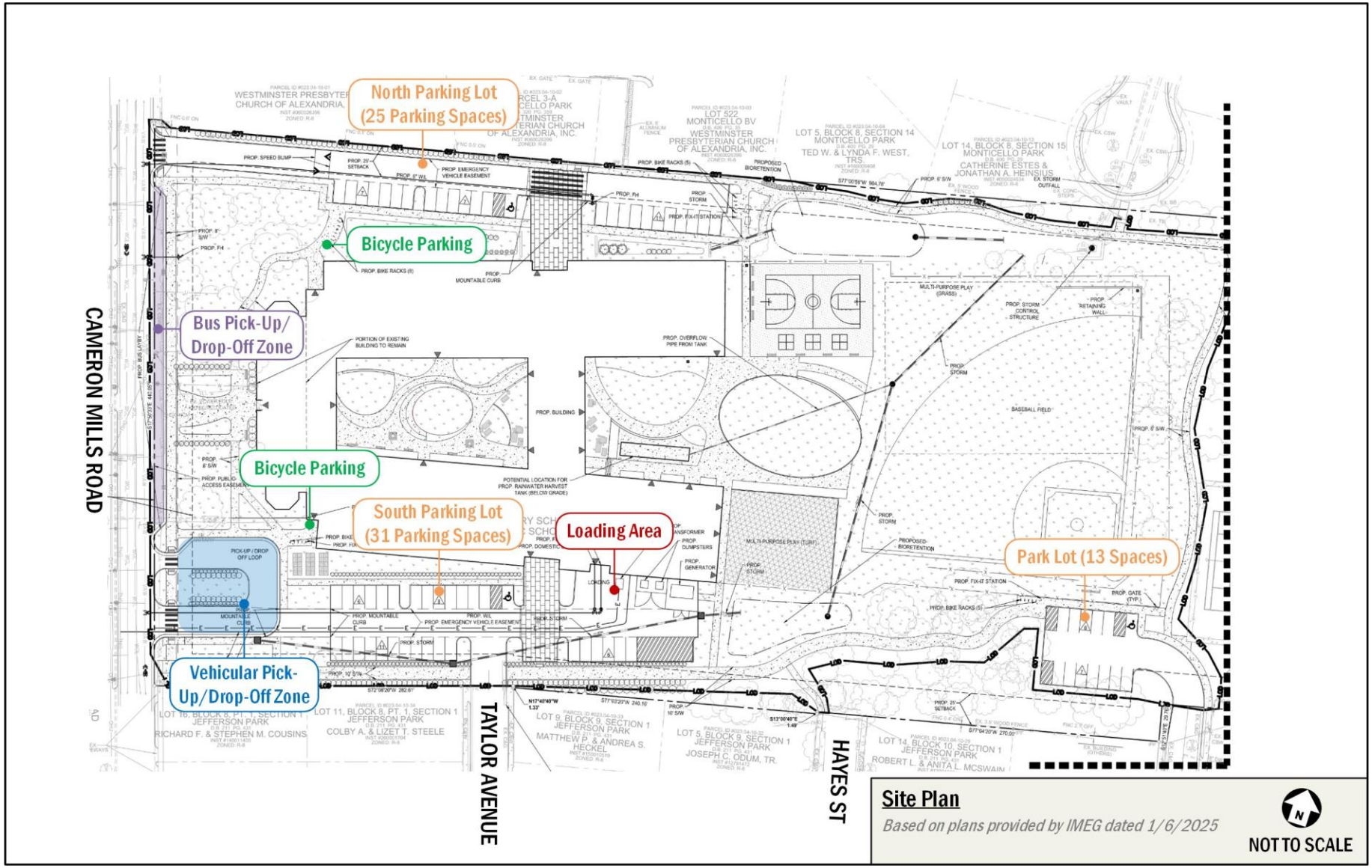

Figure 3: Conceptual Site Plan

Figure 4: Study Area Intersections

Study Area Overview

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

The following conclusions are reached within this chapter:

- The project site is surrounded by an extensive regional and local transportation system that will accommodate the students and employees of the proposed development.
- The project area is served by public transportation with access to one (1) bus route within walking distance from the site.
- The site is surrounded by a well-connected pedestrian environment with facilities that generally meet standards recommended by the City of Alexandria, particularly along anticipated major walking routes.
- The existing bicycle network, including off-road trails, bicycle lanes, designated bicycle routes, and shared bicycle lanes near the project site, provides regional and local connections that facilitate bicycle commuting and recreational cycling options.
- Several local initiatives will positively impact the study area, including streetscape enhancements and investments to improve the transit, pedestrian, and bicycle networks.

Major Transportation Features

Overview of Regional Access

Under existing conditions, the proposed development site has ample access to regional vehicular- and transit-based transportation options, as shown in Figure 1, that connect the project area to destinations within Virginia, the District, and Maryland.

The project site is well-connected via I-395 and principal arterials such as King Street (VA-7). These arterials ultimately create connections to the Capital Beltway (I-495) and I-66. Cameron Mills Road and Taylor Avenue bring vehicular traffic directly to the site.

The project site has access to the Yellow and Blue Lines via the Braddock Road Metro station, located approximately 1.5 miles east of the site, which provides connections to areas in Virginia, the District, and Maryland. The Yellow Line connects the Huntington neighborhood of Fairfax County, VA with the Mount Vernon Square neighborhood in Washington, DC. The Blue Line connects Springfield, VA with Largo, MD. Both lines provide access to the District core and connection to all other Metrorail lines allowing for access to much of the DC Metropolitan area. Via the Red Line, Metrorail riders can access Union Station, a hub for commuter rail such as Amtrak, Maryland Area Rail Commuter (MARC), and Virginia Railway Express (VRE). Seven (7) DASH bus stops are located less than a quarter-mile radius of the site; all of which travel northbound or southbound along Cameron Mills Road. The DASH bus route directly serving this area is Line 104, providing connections to the Pentagon and the Braddock Road Metrorail Station.

Additionally, Alexandria Union Station is located 1.6 miles southeast of the site, which is serviced by Amtrak and VRE station, providing additional regional options. The station serves Amtrak's Cardinal, Carolinian, Crescent, Northeast Regional, Palmetto, Silver Meteor, and Silver Star routes, as well as VRE's Manassas and Fredericksburg Lines.

The proposed development will have access via the surface bicycle network to the closest off-street trail to the site, Four Mile Run Trail, which provides access to regional destinations. The Four Mile Run Trail is located approximately 1.1 miles northeast of the site with its closest access in the Four Mile Run Park. The Four Mile Run is a multi-use trail in Virgnia that stretches alongside the Four Mile Run stream, providing a vital connection for cyclists and pedestrians in the region. The trail links to several major pathways, including the Washington and Old Dominion (W&OD) Trail and the Mount Vernon Trail. This network of trails enhances regional connectivity, offering easy access for cyclists to areas to Alexandria, Arlington, and Washington DC.

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

Overview of Local Access

There are several local transportation options near the proposed development site that serve vehicular, transit, walking, and cycling trips under existing conditions, as shown in Figure 5 and Figure 6.

In addition to the principal arterials King Street (VA-7) and I-395, the site is served by a local vehicular network that includes collectors such as Summit Avenue, Monticello Boulevard, and Cameron Mills Road, as well as local streets such as Virginia Avenue and Taylor Avenue.

The DASH bus system provides local transit service in the vicinity of the site, including connections to several neighborhoods within Virginia, the District, and additional Metro stations. The project site is directly serviced by the DASH bus system. DASH is a local, fare-free bus system operated by the City of Alexandria. DASH supplements Metrobus with cross-city routes as well as connections to Metrorail. A detailed review of existing and future transit facilities is provided in a later chapter of this report. A detailed review of transit facilities is provided in a later chapter of this report.

There are existing bicycle facilities that connect the proposed development to neighborhoods within the City of Alexandria, including bicycle lanes along a portion of Monticello Boulevard, shared markings along Allison Street, and signed routes along Summit Avenue. A detailed review of existing and future bicycle facilities and connectivity is provided in a later chapter of this report.

In the vicinity of the site, pedestrian facilities are well established, with most sidewalks meeting Americans with Disabilities Act (ADA) and City of Alexandria standards. Anticipated pedestrian routes, such as those to public transportation stops, nearby residential areas, and community amenities provide well-connected pedestrian facilities. A detailed review of existing pedestrian infrastructure is provided in a later chapter of this report.

Overall, the site is surrounded by an extensive regional and local transportation network that allows for efficient transportation options via transit, bicycle, walking, or vehicular modes.

Carsharing

One (1) car sharing company, Zipcar, provides service in the City of Alexandria. Zipcar is a private company that provides registered users access to a variety of automobiles in designated spaces for their vehicles. Currently, there are no Zipcar locations within a half-mile radius of the site.

Bikeshare and Dockless Mobility

The Capital Bikeshare program provides an additional cycling option for residents, employees, and visitors throughout the area. The Bikeshare program has placed over 700 bicycle-share stations across the Washington, DC metropolitan area with over 6,000 bicycles and electric-assist bicycles (e-bikes) provided. No Capital Bikeshare stations currently exist within a half-mile radius of the site.

As of December 2024, the City of Alexandria has granted operating permits to two (2) companies (Bird and Lime) to provide additional options for point-to-point Shared Mobility Device (SMD) transportation services through March 31, 2025. These SMDs are provided by private companies that give registered users access to a variety of e-scooter and e-bike options. These devices are used through each company-specific mobile phone application.

Walkscore and Bikescore

Walkscore.com is a website that provides scores and rankings for the walking, biking, and transit conditions for an area. The project site is located in the North Ridge neighborhood in the City of Alexandria, Virginia. The site has a transit score of 44 (or “Some Transit”), a bike score of 63 (or “Bikeable”), and a walk score of 34 (or “Car-Dependent”). Figure 7 displays a heat map for walkability and bikeability for the study area in the vicinity of the site.

The following conclusions can be made based on the data obtained from Walkscore.com:

- The site is situated in an area with a “Some Transit” transit score due to its proximity to a few nearby public transportation options.
- The site is situated in an area with a “Bikeable” bike score due to its proximity to local roadways and existence of some bicycle facilities, which result in biking being a viable mode for most daily activities.
- The site is situated in an area with a “Car-Dependent” walk score given that most errands would require a car.

Overall, while the North Ridge neighborhood is rated as relatively car-dependent with moderate transit and bicycle scores, these scores primarily reflect the accessibility of amenities for general residents rather than the network’s ability to accommodate

school-related trips. Since the trips to and from the site will primarily involve students who live nearby, the existing infrastructure is likely sufficient to support these specific travel patterns.

Figure 5: Pedestrian and Bicycle Study Area

Figure 6: Major Local Transportation Facilities

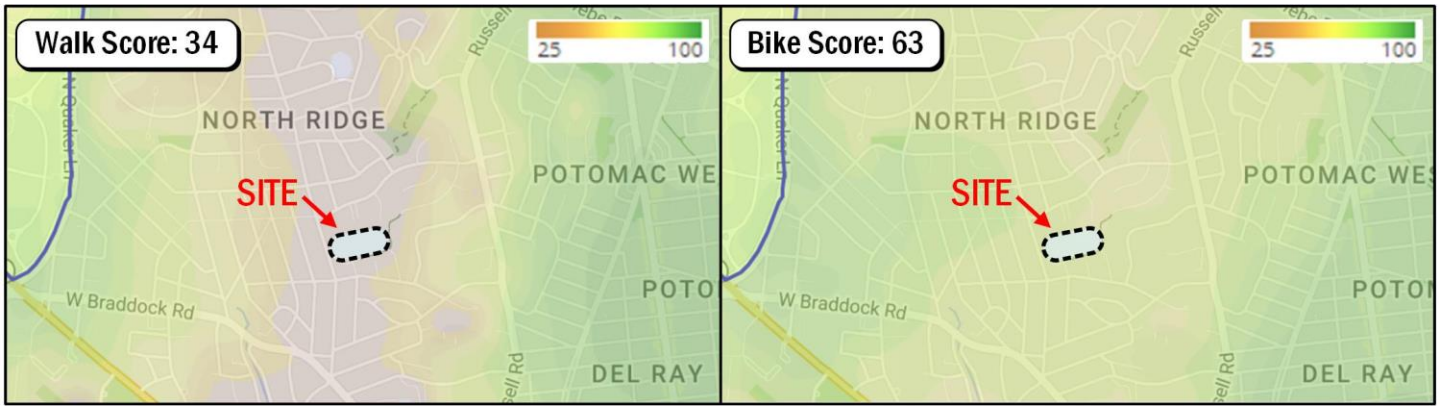

Figure 7: Walkscore and Bikescore Summary

Future Projects

This section reviews City-wide initiatives, local initiatives, and planned transportation improvements in the vicinity of the site. These planned projects are summarized below.

City-wide Initiatives

Alexandria Mobility Plan (2021)

Adopted in November 2021, the City of Alexandria Mobility Plan (AMP) is an update to the 2008 Comprehensive Transportation Master Plan. This update lays out the policies and strategies that shall guide transportation decisions for the City in pursuit of enhanced quality of life, sustainability, and equity, centered around the concept of choice.

The AMP includes policies and strategies that seek to improve and expand access to transportation choices and key destinations throughout Alexandria. These policies and strategies are sorted into broader categories, each with a chapter in the Plan. The Plan's recommended policies for transportation in the City that apply to the project area are outlined as follows:

- Transit – The City will address the transit system by: (1) Implementing a citywide transit network with frequent, all-day service; (2) Building out the city's priority transitway corridors and identify improvements on congested, high ridership corridors to reduce travel times and improve reliability; (3) Transitioning the City's bus fleet to fully electric, zero-emission vehicles; (4) Improving the rider experience from trip planning, to accessing the stop, riding the bus, and arriving at the destination; (5) Evaluating DASH's fare free service and continue to explore low-income WMATA fares; (6) Supporting a better connected regional transit network; and (7) Modernizing the paratransit program for the city's aging population.
- Smart Mobility – The City will (1) Expand smart signal technology to enable detection and real-time signal adjustments; (2) Strategically invest in partnerships to expand city data, technology, and communications capabilities; (3) Upgrade capabilities of the Traffic Management Center to better manage congestion in real-time; (4) Proactively prepare for connected and autonomous vehicles; and (5) Develop a framework for pilot projects to test new modes, infrastructure, or initiatives.
- Streets – The City will (1) Implement the Vision Zero Action Plan to eliminate traffic fatalities and serious injuries by 2028; (2) Develop a comprehensive program to reduce speeding and cut through traffic on local streets; (3) Ensure new development minimizes negative impacts to the street network; (4) Work with regional, state, and private sector partners to develop tools to keep traffic on highways and reduce regional cut through traffic; (5) Consider the use of speed cameras and other automated tools to improve safety; and (6) Maintain a state of good repair for our streets using a proactive, data driven, and equitable approach.
- Pedestrian and Bicycle – The City will (1) Create a safe, well-maintained, and comfortable walking and bicycling environment; (2) Build out a continuous, connected, and accessible pedestrian network that enables people of all ages and abilities to move safely and comfortably; (3) Build out a connected bicycle network of both on- and off-street facilities and shared mobility devices to benefit riders of all ages and abilities; (4) Upgrade or install infrastructure that increases the accessibility of City streets and public spaces for people of all ages and abilities; and (5) Educate all street users about safety and traffic laws.
- Supporting Travel Options – The City will (1) Use information, programs, and encouragement to make it easier for residents and workers to choose options other than driving alone; (2) Use the Potomac River to expand transportation options; (3) Create mobility hubs; and (4) Pursue regional approaches to reduce traffic and congestion, particularly during peak times.
- Curb Space and Parking – The City will (1) Implement a prioritization framework for making changes to curb space; (2) Consider pricing, regulation, data, and communications to manage parking availability; (3) Reconsider parking requirements in new developments; (4) Promote electric vehicle charging opportunities.

These policies and strategies are consistent with previous plans as outlined in the 2008 Transportation Master Plan.

The proposed development is consistent with many of the recommendations laid out by this plan. The development of the site's frontage on Cameron Mills Road will adhere to the City's Complete Streets Design guidelines with all user groups in mind. The provision of trail facilities around the site and through the

park will assist in the build-out of a connected bicycle and pedestrian network. Building out a continuous, connected, and accessible pedestrian network that enables people of all ages and abilities to move safely and comfortably. Both the bicycle and pedestrian networks will work in concert to provide quality access to transit amenities including DASH Bus and Metrorail.

The AMP also identifies the following specific recommendations which are expected to be implemented in the North Ridge neighborhood and in close proximity to the project site:

- Transit:
  - New DASH system routes (103 and 104) implemented in the vicinity of the project site
- Pedestrian and Bicycle:
  - Improve the Tier 4 Sidewalk Gap on Jackson Place, Westminster Place, Circle Terrace, and portions of Cameron Mills Road
  - Planned enhanced bicycle facilities and shared lanes on Cameron Mills Road.

In direct relation to the ACPS George Mason Elementary School site, these improvements would create additional multi-modal capacity and connectivity to/from the site.

Alexandria Transit Vision Plan

The City of Alexandria conducted a comprehensive review of how the bus network in the City can best serve existing needs, as well as new residents, business, and visitors who come to Alexandria over the next 10-20 years. The Transit Choices Report presents an overview of Alexandria's existing transit network, as well as the City's current and planned development patterns as they relate to transit performance. After several rounds of public engagement, the City adopted the Alexandria Transit Vision Plan proposed transit networks.

The first phase of the 2022 Alexandria Transit Vision Plan – referred to as the "New DASH Network" – went into effect in September 2021. The first phase of the Plan included major route and service changes and the change to fare-free DASH bus service. The Plan includes a proposed 2030 Vision Plan Network which seeks to increase the number of jobs, people and opportunities accessible by transit.

In direct relation to the ACPS George Mason Elementary School site, the 2030 Vision Plan includes a route near the site (Route N24) along Cameron Mills Road which would provide access to the Pentagon and the Braddock Road Metro Station with all-day 20-minute headways.

Complete Streets Design Guidelines (2016)

The Complete Streets Design Guidelines integrate existing City policy and design guidance related to roadways, sidewalks, and trails, and incorporate new information to reflect best practices for developing a transportation system that serves the needs of people who walk, bike, ride transit or drive vehicles. The Complete Streets Design Guidelines identify new street types for Alexandria and provide directions on the design of sidewalks, roadways, intersections, and curbsides.

The Complete Streets Design Guidelines are used by City staff, design professionals, developers, and consultants in the planning and design of all types of street improvements. The Guidelines ensure that new roadways, intersections, sidewalks, and trails are achieving the City's objectives for a safe and effective multimodal transportation system.

The proposed development incorporates these guidelines in the proposed modifications to the site's frontage along Cameron Mills Road. Sidewalks adjacent to the proposed development will be improved over existing conditions with a resulting positive impact on pedestrian circulation.

Vision Zero

Vision Zero is a multi-national initiative that aims to eliminate road deaths and serious injuries for all users, regardless of transportation mode. The City of Alexandria is one of over 20 municipalities across the United States that has adopted its own Vision Zero program.

The City of Alexandria included the development of a Vision Zero program in a 2016 amendment to its Transportation Master Plan. In January 2017, the City adopted a Vision Zero resolution instructing the City Manager to develop an action plan. The resulting action plan was adopted by the City Council in December 2017.

The City's Vision Zero Action Plan includes the following strategies:

- Improve data collection and evaluation
- Enhance city processes and collaboration
- Build safe streets for everyone
- Promote a culture of safety

While the Vision Zero Action Plan's recommendations are more related to overall strategy than individual projects, the Action Plan references several funded City programs projects that are aligned with Vision Zero principles.

As part of Alexandria's Vision Zero Action Plan, new "no turn on red" restrictions will go into place at various intersections throughout the City. These restrictions are designed to improve pedestrian safety by reducing turning-movement vehicle crashes.

Another Vision Zero strategy includes Leading Pedestrian Interval (LPI) signal treatments, which will be implemented at various intersections throughout the City. LPIs are designed to improve pedestrian safety by increasing pedestrian visibility in intersections and reinforcing pedestrian priority above turning vehicles during shared signal phases.

The proposed development aligns with the Vision Zero Action Plan's goals by enhancing pedestrian facilities on the perimeter of the site and designing site access to accommodate all modes of transportation.

Local Initiatives

Northridge and Rosemont Small Area Plan

The City Council adopted the Northridge and Rosemont Small Area Plan (SAP) in 1992. The SAP provides recommendations for the long-term vision of the overall area. The City Council has since amended the SAP multiple times, including the incorporation of Four Mile Run Restoration Master Plan in 2006.

The goals of the SAP are to protect and preserve existing residential areas and to protect the residential neighborhood from non-local traffic. The following objectives were identified in the SAP:

- Protect the residential nature of the study area by changing commercial and industrially zoned sites to zones more appropriate adjacent to residential areas and by controlling professional home occupation in residential zones.
- Protect the density and scale of existing residential areas by allowing development of substandard vacant lots with a SUP only when the size and dimensions of the lots are essentially identical to existing developed lots.
- Ensure preservation of existing open space and, if opportunities occur, expand the amount of recreational or open space in the area.
- Discourage improvements to local streets when such improvements will bring through traffic into the study area.

The proposed development supports the SAP's goal by enhancing community infrastructure while maintaining the residential character of the neighborhood. The proposed development aligns with the SAP's objectives by focusing on educational improvements that serve local needs without introducing non-local traffic or altering the residential density and scale. Additionally, it contributes to the preservation of open space and the overall quality of the neighborhood environment.

Project Design

This chapter reviews the transportation components of the proposed ACPS George Mason Elementary School development, including the proposed site plan and access points, loading, parking, pick-up/drop-off (PUDO) operations, curbside management, and bicycle and pedestrian facilities.

Project Overview

The George Mason Elementary School site is located at 2601 Cameron Mills Road, in the North Ridge neighborhood of the City of Alexandria, Virginia. The site is bounded by Cameron Mills Road to the west, Monticello Boulevard to the north, Virigina Avenue to the south, and residential properties to the east. The site location is shown in Figure 2. The proposed site plan for the redevelopment is shown in Figure 3.

The site currently consists of the existing school on the west side of the site and George Mason Park east side. As part of the proposed project, a small portion of the existing school building will remain and be renovated, while the rest of the school will be demolished to make way for the construction of a new school building. Around the new school, there will be parking, walkways, playgrounds, and bioretention facilities. George Mason Park will also be redeveloped, with the proposed condition to include a baseball diamond, basketball court, and additional play areas, which are proposed to be utilized by the school as well. Frontage improvements along Cameron Mills Road include a new layby for school buses and a new pick-up/drop-off driveway loop for students.

The current enrollment at the school is 320 students, and the staff count is 65. The proposed project aims to expand the school's capacity by increasing the maximum enrollment to 670 students and the staff count to 80.

The existing on-site parking lot currently has 23 parking spaces. The proposed project will provide 56 on-site parking spaces dedicated for school use in two (2) on-site parking lots. The proposed parking spaces are expected to meet the practical needs of the site. Vehicular access to the north parking lot and the PUDO area will be provided along Cameron Mills Road via two (2) new curb cuts. Access to the south parking lot will be provided from Taylor Avenue, consistent with existing conditions. The proposed project will provide two (2) loading berths in the south parking lot. Loading berths will be accessed via the mountable curb driveway connecting the south parking lot to the PUDO area off of Cameron Mills Road. A circulation plan showing expected vehicular routes is shown in shown in Figure 8.

The proposed development will provide new short-term bicycle parking spaces around the site in highly visible and accessible areas.

Observations

Observations of morning arrival and afternoon dismissal, performed on September 19th, 2024, were used to help develop recommendations on how to accommodate school transportation demands with the proposed expansion.

Highlights of the observations include:

- The roadways adjacent to the school didn't experience any roadway capacity issues due to the number of vehicles relative to the roadway capacity provided, but some congestion was observed to occur due to disruptive driver behavior.
- Examples of disruptive driver behavior included on-street parked vehicles illegally parked in areas with timed restrictions (i.e., the space reserved for school use during arrival and dismissal), U-turns in the middle of the street (e.g., for drivers trying to line up for pick-up/drop-off), and parents/guardians stopping in a travel lane in an attempt to pick-up or drop-off a student.
- School buses use the curbside area along Cameron Mills Road in front of the school front door. During most times, on-street parking is not permitted along this curb, as the roadway can only accommodate one side of on-street parking, which occurs on the opposite side of the street. During arrival and dismissal, on-street parking is restricted on that side, and the travel lanes shift over to make room for curbside activity on the school side.
- Parent/guardian morning drop-off and afternoon pick-up officially occurs in the curbside space to the south of the buses on Cameron Mills Road. Most parent/guardians used this area, although some pick-up/drop-off activity was observed in informal areas (e.g., the nearby church parking lot and side streets).
- The parking lot on site does not accommodate all teachers and staff that drive, with over half of them parking off-site, between the church parking lot and on-

street, mostly on Taylor and Virginia Avenues south of the school.

- A significant number of students were observed walking to school, from all directions, including using paths through the park and connecting to all local neighborhood streets. Two crossing guards are employed along Cameron Mills Road.
- Some students were observed bicycling to school and using racks provided on site.

Project Transportation Facilities

The observations, data collected, and analyses contained in this MTS were used to help inform the project design team on accommodating future GMES transportation demands on the site plan.

Bicycle and Pedestrian Facilities

Per the City of Alexandria's Bicycle Parking Requirements, the proposed development is not required to provide bicycle parking spaces for the proposed uses.

While not required, new bicycle racks were included in the site plan, with the goal of providing a minimum of 34 spaces, representing a goal of 5% of the future total population. The most recent Safe Routes to School survey indicated an existing bicycle mode share of 4%; the 5% goal mode share for parking was set to target an increase in bicycle trips to the site.

The pedestrian network in the vicinity of the site is very well established. Most roadways within a quarter-mile walkshed provide sidewalks on both sides and provide multiple potential walking routes to major destinations and nearby transit options.

While the existing facilities around the site offer a quality walking environment, the proposed development will further enhance the pedestrian environment by improving connectivity. Walking routes were incorporated into the site plan around the edges and internally, to help maintain and encourage an increase in the number of students walking to school.

Bus Pick-Up/Drop-Off Zone

Buses will remain in front of the school on Cameron Mills Road, with more dedicated space providing room for the expected increase in buses to a maximum of six. The section of Cameron Mills Road will be widened to provide this bus loading/unloading zone, eliminating the need to switch which side of the street has parking restrictions during arrival and dismissal.

Existing Pick-Up/Drop-Off

School starts at 7:50 AM and ends at 2:35 PM, and PUDO operations primarily take place during school arrival and dismissal times. Under existing conditions, PUDO activity occurs primarily along the east side of Cameron Mills Road. Dedicated curbside space for PUDO activity is located immediately south of the dedicated bus loading/unloading zone on the east side of the street. Both of these zones are designated with signage. The church parking lot adjacent to the playground is also used informally for PUDO activity. Crossing guards are stationed at key intersections, including Cameron Mills Road at Monticello Boulevard and Virginia Avenue, to assist pedestrians and improve safety during these times. Existing PUDO operations observed by Gorove Slade staff are shown in Figure 9 and Figure 10. Pick-up and drop-off observations were conducted during the periods immediately before, during, and after school and arrival and dismissal times at 7:50 AM and 2:35 PM, respectively, approximately 30 minutes before and after each time.

During morning arrival, vehicles in the PUDO zone queue individually and use the designated bus loading/unloading zone for drop-off after the buses leave. Parents/guardians also utilize informal drop-off areas such as the church parking lot and the west side of Cameron Mills Road. The maximum observed morning queue on the east side of Cameron Mills Road included three (3) school buses or vans and eight (8) cars, with buses leaving the designated zone after the morning bell.

During afternoon dismissal, the PUDO zone experiences more pronounced queuing and activity. Under existing conditions, the maximum observed queue included approximately four (4) buses or vans and 10 cars. Parents waiting in the PUDO zone often left individually without advancing to create additional space, and some made U-turns to reach the school-side curb. Parents parked on Cameron Mills Road often walked to the open space in front of the school to wait for their children. The church parking lot showed reduced pick-up activity compared to the morning arrival.

Currently, the Campagna Kids Aftercare program provides after-school care; its hours are 2:30 to 6:00 PM. The pick-up procedure for the existing Campagna program involves parents/guardians parking and walking into the school to pick up students. Parents/guardians predominantly park in the neighborhood and walk into the school.

Throughout dismissal, crossing guards continued to assist students walking or biking home at key locations, ensuring safe passage through the area.

Proposed Pick-Up/Drop-Off

Parent/guardian pick-up/drop-off will continue to occur south of the bus area on Cameron Mills Road. To create more room, an off-street a pick-up/drop-off (PUDO) 'loop' was added. This facility is anticipated to accommodate around half of the maximum queue expected at afternoon dismissal, balancing the needs of not encouraging parents to drive students to school, while also not having students being picked-up/dropped-off too far from the school in unsafe locations.

This loop will consist of two (2) lanes with one (1) lane for queuing and one (1) lane for pass-by, providing a pick-up and drop-off system that can accommodate up to eight (8) vehicles in the queue at one time. The proposed PUDO operations are summarized in Figure 11 and Figure 12.

During morning arrival, parents/guardians will use the proposed driveway loop as the primary drop-off area. Vehicles will enter from Cameron Mills Road and queue within the loop, reducing the reliance on informal drop-off locations, such as the church parking lot or the west side of Cameron Mills Road. Crossing guards will continue to be stationed at key intersections, consistent with existing conditions. The driveway loop is expected to improve traffic flow and reduce conflicts during peak arrival times. Additionally, school staff are anticipated to be present at the PUDO area to help maintain a clear and orderly flow.

The proposed PUDO 'loop' has been designed to accommodate multiple operational approaches, allowing school staff to determine the most effective method over time. During morning arrival, it is expected to function on a first-come, first-served basis, while during afternoon dismissal, it may operate in an 'airport-style' system, where vehicles enter and exit separately, using the inside lane of the loop for circulation. The inclusion of an inside lane provides flexibility to test alternative strategies, such as implementing PUDO in waves. With two (2) lanes and a continuous sidewalk along the entire loop, the design supports adaptable operations, giving staff the ability to refine and optimize the system as needed.

The new PUDO 'loop' and the widening of Cameron Mills Road for the bus loading/unloading area allow for the elimination of how parking restrictions on the street change during arrival and dismissal, and should reduce the amount of disruptive driver behavior observed. For example, the PUDO loop should eliminate the need for mid-block U-turns, and removing the time restrictions on the on-street parking should eliminate parked cars that don't remember to move, reducing the road to only-one travel lane.

In addition, the new bus loading/unloading area and the PUDO 'loop' can assist with non-arrival/dismissal transportation needs, such as bus parking for field trips between arrival/dismissal hours, pick-up/drop-off for before and after school services, and visitor parking. Currently those demands cannot use existing arrival/dismissal facilities since those are created only through timed restrictions of on-street parking.

The future after-school programming and times are yet to be determined; however, it is anticipated that if a similar after-school care program is provided, it would operate with a similar pick-up procedure. Parents/guardians would be able to park in the proposed bus pullout area, which is proposed to be unrestricted after the afternoon school dismissal period, the proposed pick-up/drop-off loop, or the on-site parking lots.

Parking

Based on the City of Alexandria's Zoning Ordinance, the following outlines the vehicular parking requirements for the proposed development:

- School, elementary
- 1 space for each 25 classroom seats

Per the Zoning Ordinance, the proposed development is required to provide a minimum of 27 spaces. Detailed zoning calculations, along with zoning requirements, are provided in Table 1.

To provide a quality experience for their teachers and be a good neighbor, the site plan proposes 56 on-site parking spaces, a significant increase that, when combined with the 13 parking spaces in the park, should minimize off-site parking in the neighborhood. This provides a total of 69 parking spaces for a projected 80 combined teachers and staff. Both the north and south on-site parking lots are designated for school staff parking during school hours and for school-related programs held outside of school hours. Outside of PUDO hours, the PUDO 'loop' is proposed to accommodate visitor parking and potentially small delivery vehicles, such as UPS trucks. A detailed discussion of parking demand and supply is included in a later section of this report, including parking counts conducted over

the course of a school day. The number of on-site parking spaces will meet the minimum zoning requirement.

Table 1: Zoning Parking Requirements

	Baseline Zoning Ratio		Development Size			Minimum Spaces
School Rates						
Elementary School[1]	0.04	/classroom seat	670	Students	=	27
Total with Zoning Requirements						**27**

1. Ratios based on City of Alexandria Parking Codes for General Parking Regulations dated September 29, 2020.

Curbside Management

A review of the existing curbside management was conducted and is shown on Figure 13. Currently, on-street parking is provided near the site along Virginia Avenue, Taylor Avenue, Hayes Street, Clay Street, Monticello Avenue, Westminster Place, and George Mason Place. Additionally, a segment on the east side of Cameron Mills Road provides designated 10-minute parking for student pick-up and drop-off.

As part of the proposed development, three (3) curb cuts will be introduced along the site's frontage on Cameron Mills Road: one (1) serving the north parking lot and two (2) serving the PUDO loop. Parking restrictions will be adjusted to accommodate the new curb cuts. Additionally, an approximately 290-foot layby for school buses will be constructed between the curb cuts for the parking lot and the PUDO area, adjacent to school building's entrance. During PUDO hours, the layby will be designated for school bus use, with visitor parking between those periods and unrestricted parking on nights and weekends. Currently, the west side of Cameron Mills Road is restricted to no parking during arrival and dismissal hours to allow two-way traffic while buses park on the east site. However, the proposed condition includes a widened Cameron Mills Road to accommodate the bus layby area, eliminating the need for parking restrictions on the west side of the street during these peak times.

Figure 14 show the proposed curbside management including the aforementioned changes.

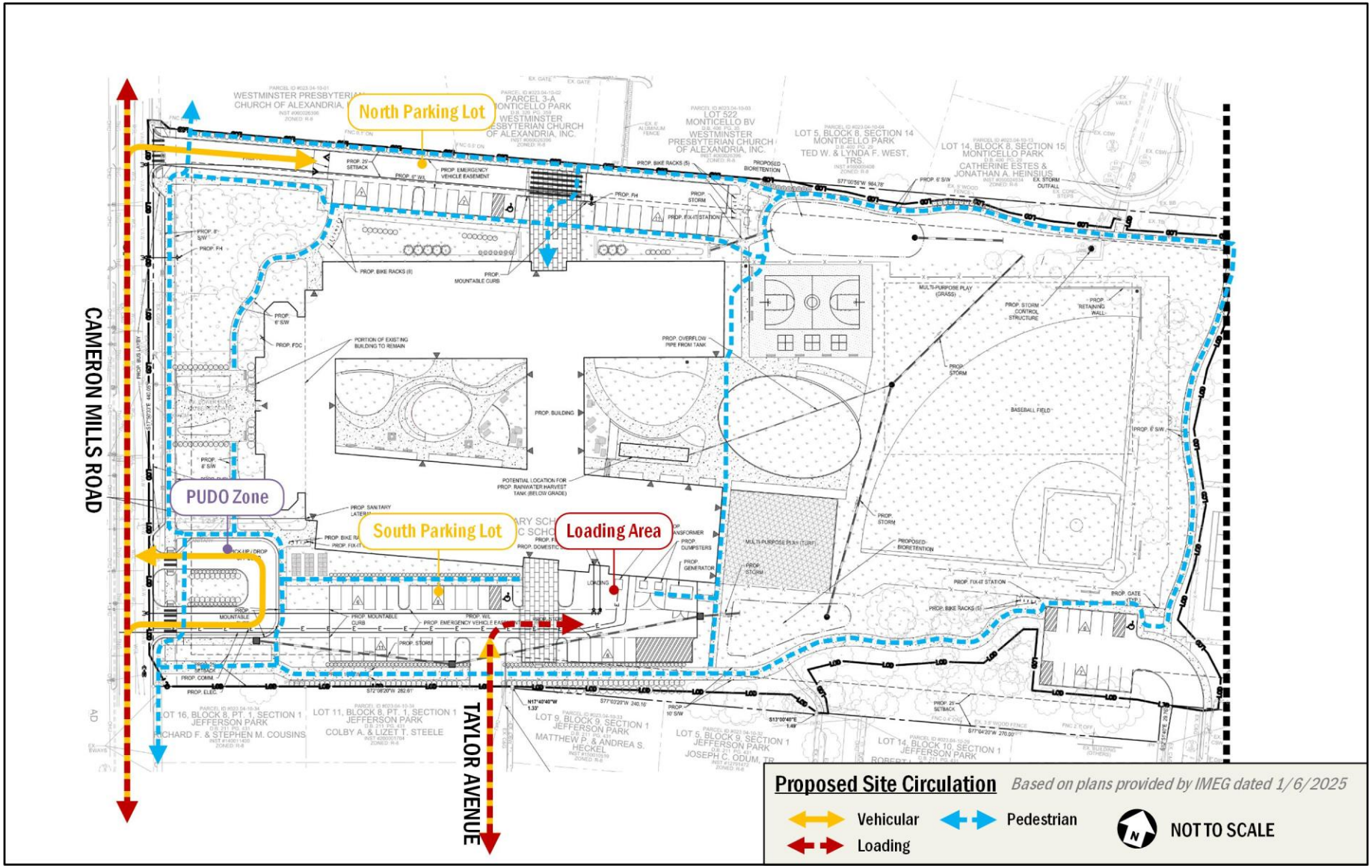

Figure 8: Proposed Site Circulation

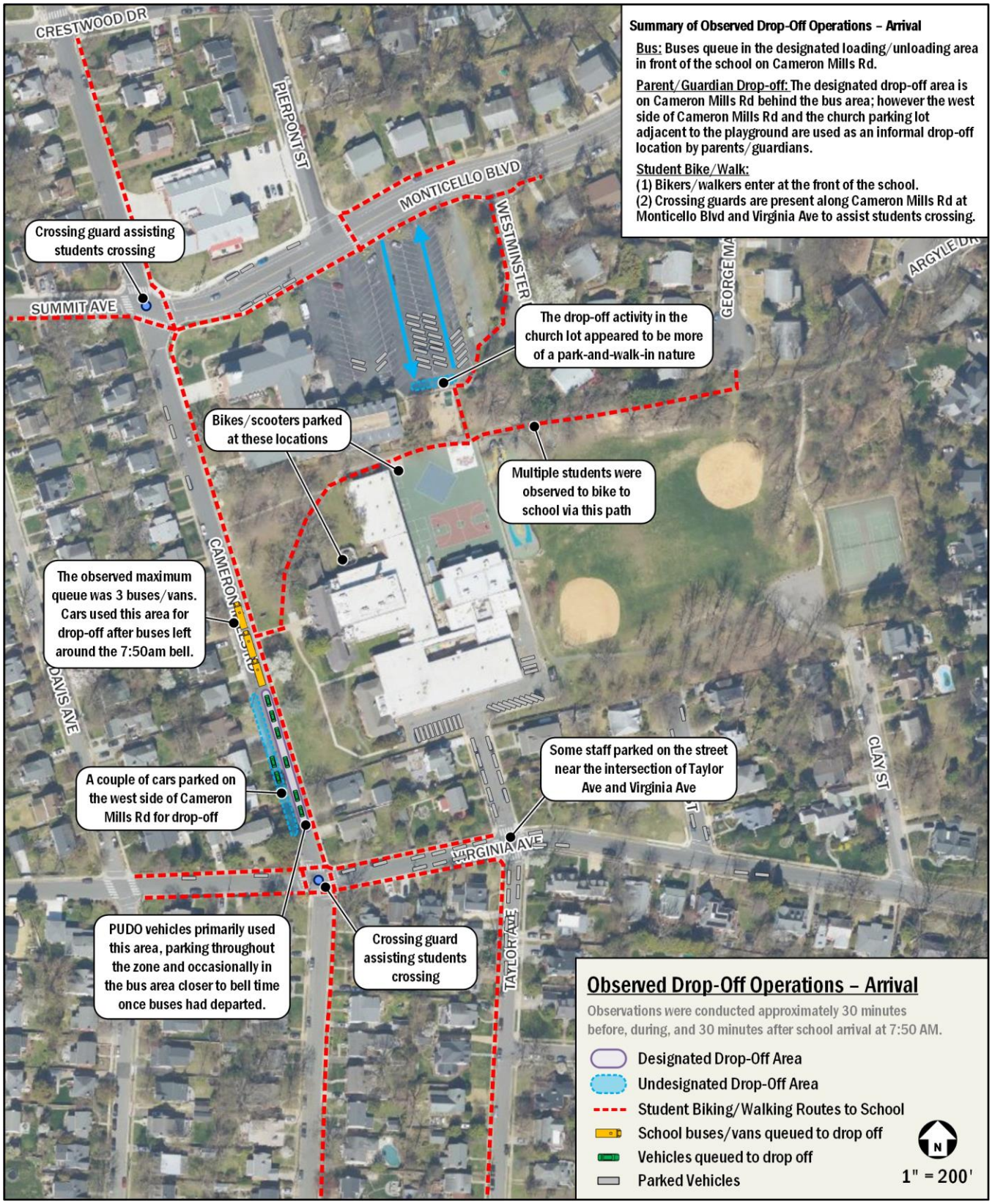

Figure 9: Observed Drop-Off Operations – Arrival

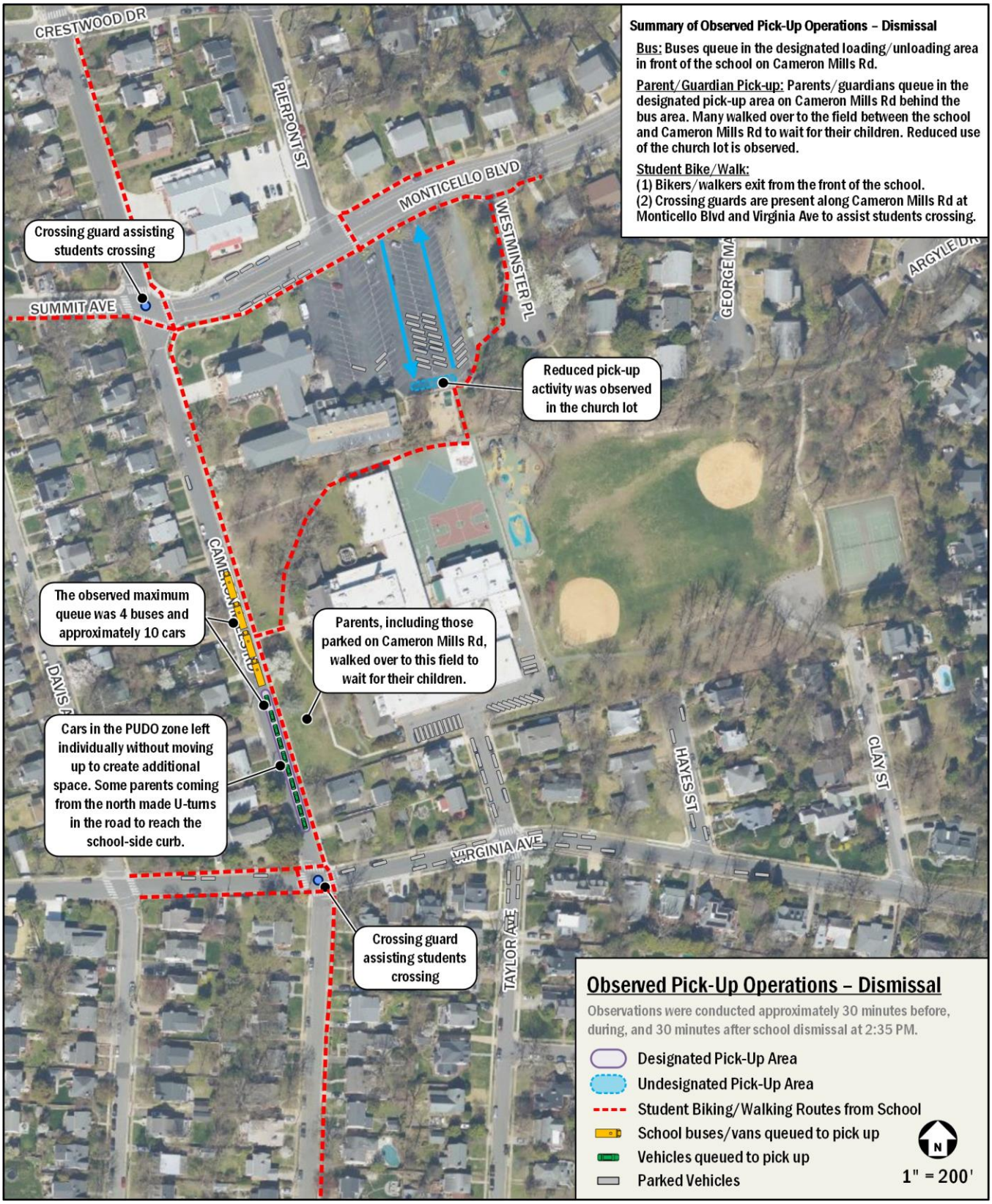

Figure 10: Observed Pick-Up Operations – Dismissal

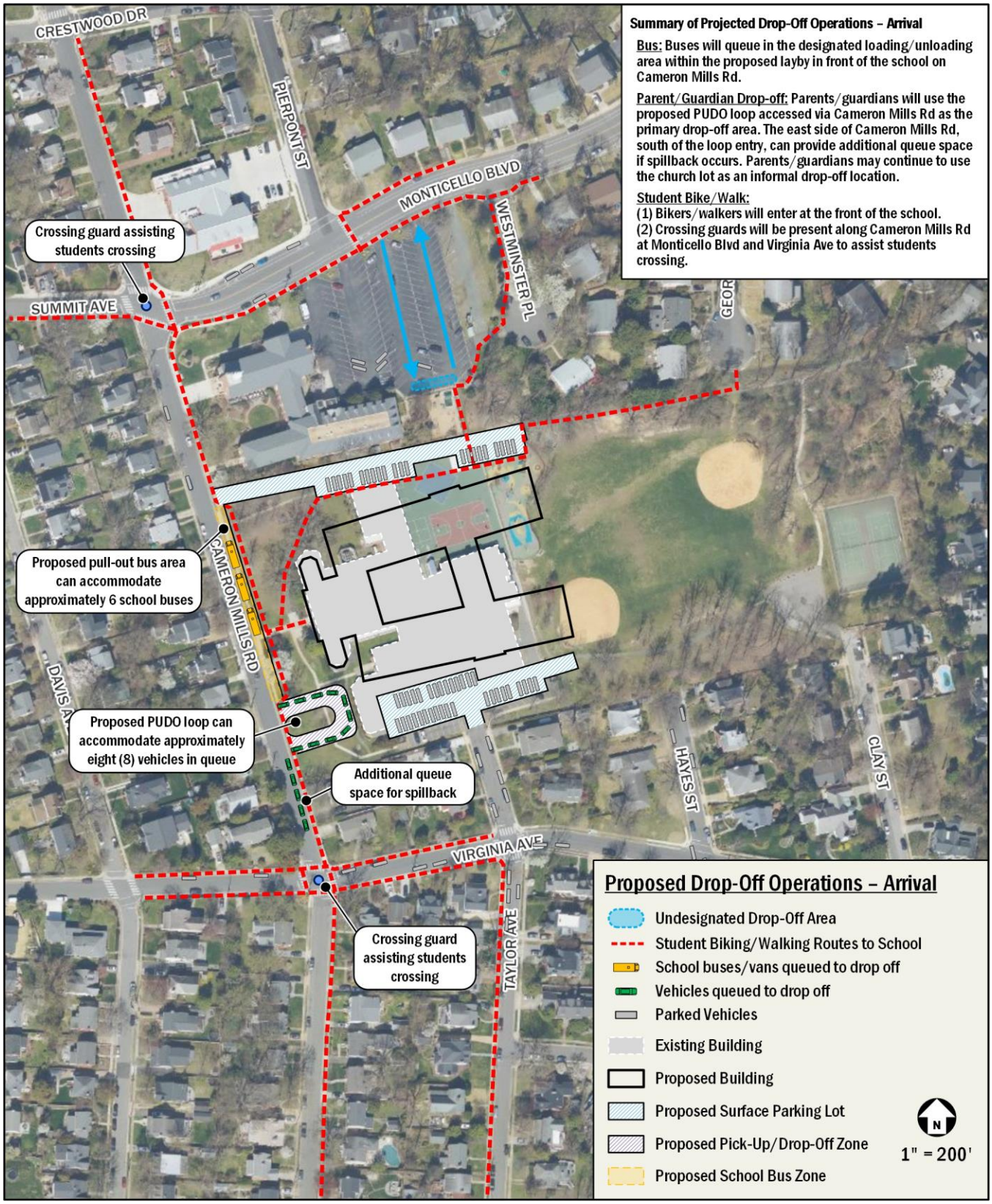

Figure 11: Proposed Drop-Off Operations – Arrival

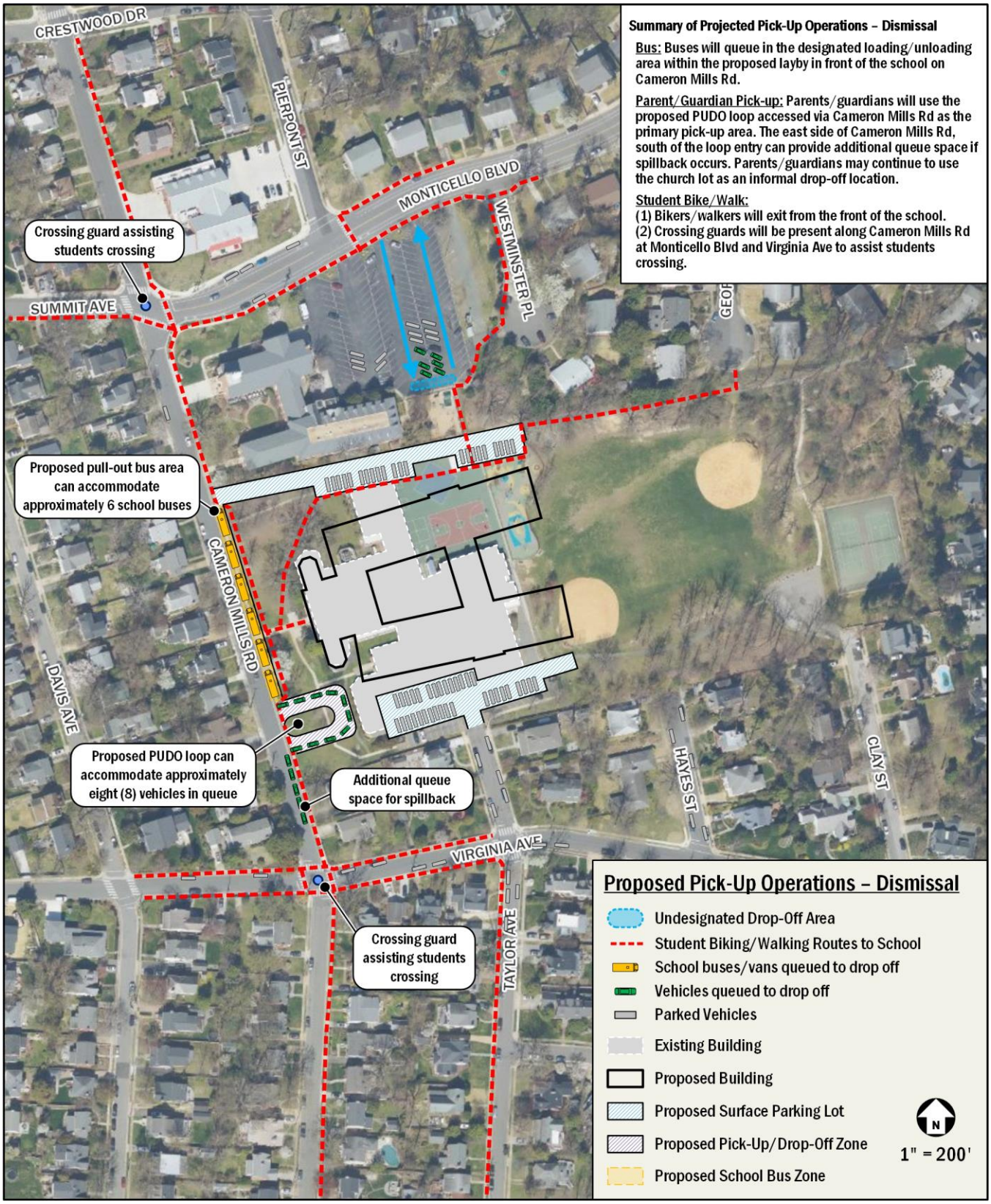

Figure 12: Proposed Pick-Up Operations – Dismissal

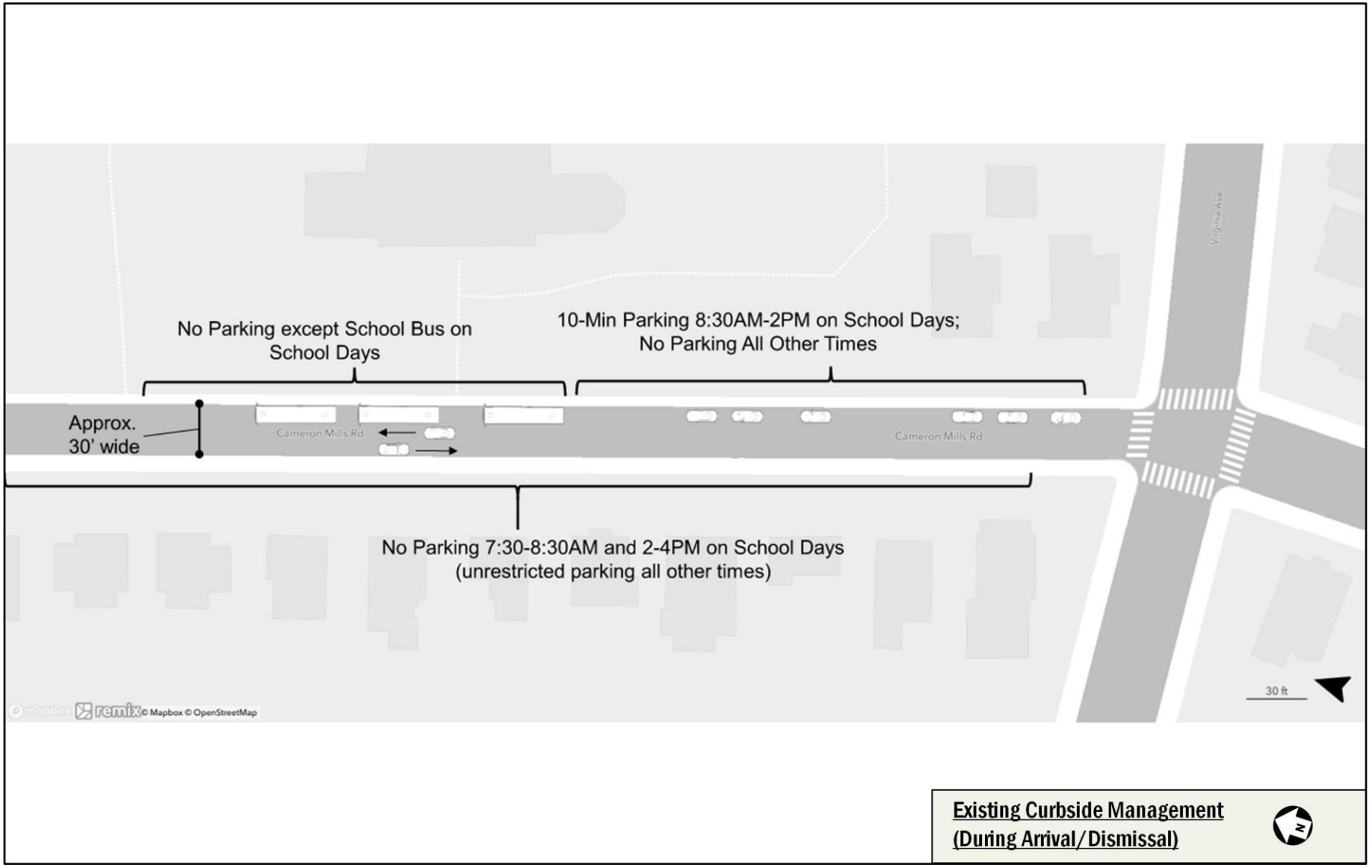

Figure 13: Existing Curbside Management

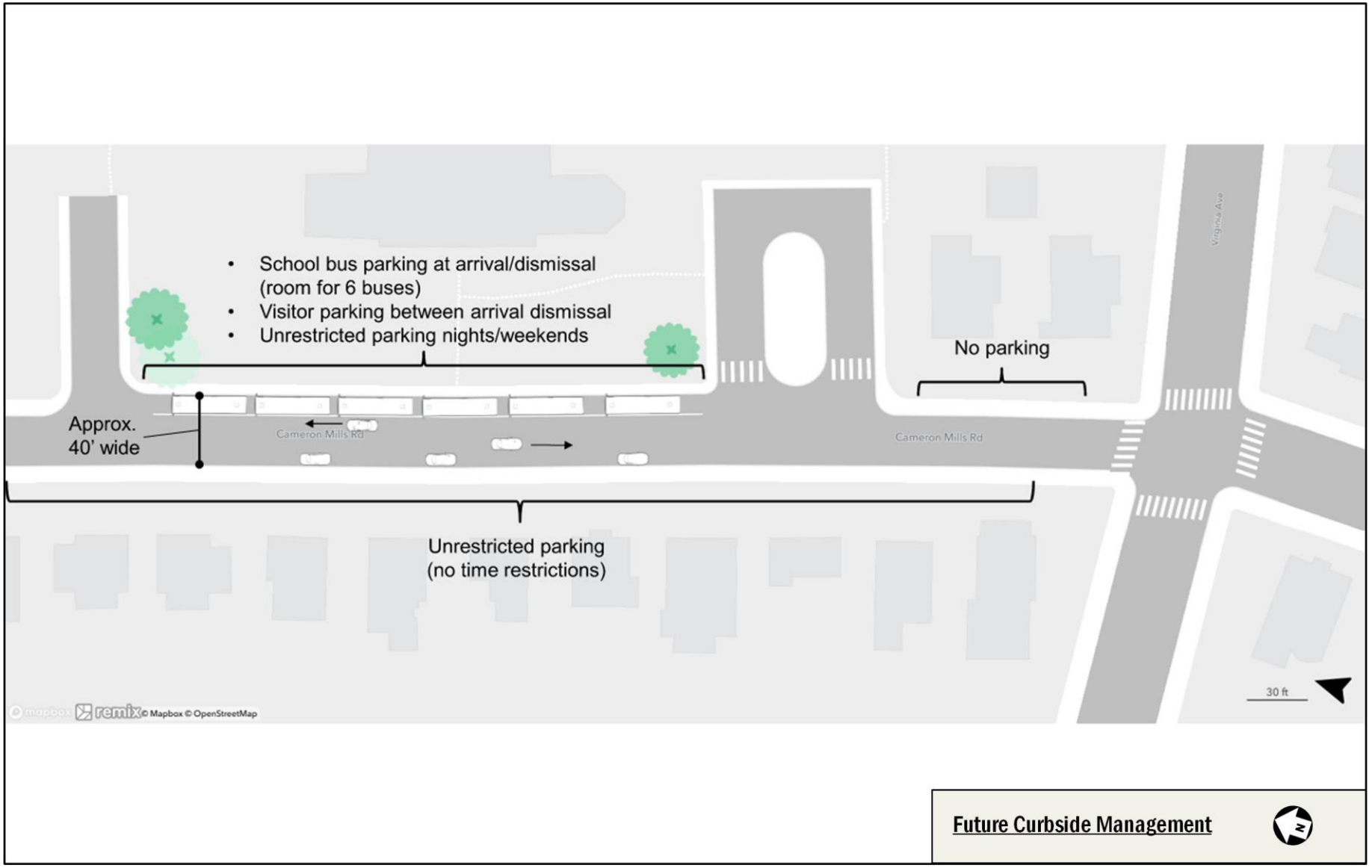

Figure 14: Proposed Curbside Management

Transit

This chapter discusses the existing and planned transit facilities in the vicinity of the site, accessibility to transit, and evaluates the overall transit impacts of the proposed development.

The following conclusions are reached within this chapter:

- The existing transit infrastructure surrounding the site provides a connected network.
- The development is located approximately 1.5 miles away from the Braddock Road Metrorail Station.
- There is one (1) bus route that stops within a quarter mile walk of the site.
- Planned and proposed improvements to transit service in the vicinity of the site will improve connectivity to/from the proposed development.

The site is served by local transit services under existing conditions. These transit services provide local and citywide connections and link the site with cultural, residential, employment, and commercial destinations throughout the city.

Figure 15 identifies the major transit routes, stations, and stops in the study area.

Existing Transit Facilities

Metrorail Service

The project site is located approximately 1.5 miles away from the closest metro station, Braddock Road. This station is served by the Blue and Yellow Lines. The Blue Line travels north from Alexandria to Rosslyn then continues east to Largo, MD. The Yellow Line travels north from Alexandria to Pentagon City then continues northeast to Mount Vernon Square in DC. The Blue Line train runs approximately every 10 minutes while the Yellow Line train runs approximately every 6 minutes during the morning and afternoon peak periods. During weekday non-peak periods, the Blue and Yellow Lines run every 12 and 8 minutes respectively, and every 8-15 minutes on weekends.

Figure 16 shows the average annual weekday passenger boardings from 2012 to 2023 for the Braddock Road Metro station. Metrorail ridership has decreased significantly in the years following 2020 amidst the COVID-19 pandemic. The number of average daily entries for the Braddock Road Metro station in 2023 has surpassed the number of those in 2020, 2021 and 2022. The average daily boardings was 2,075 in 2023 and 3,911 in 2019 (pre-COVID-19). Ridership is expected to gradually increase over the coming years, as indicated by the three (3) years of data since the beginning of the pandemic.

Bus Service

A review of the existing bus stops within a quarter-mile radius of the site, detailing individual bus stop amenities and conditions, is shown in Table 2. There are seven (7) bus stops within approximately one-quarter mile of the site, all located on Cameron Mills Road. These stops are served by one (1) DASH (Alexandria Transit Company) route: Line 104. This bus line connects the site to many areas of northern Virginia, including the Pentagon Metrorail Station. Table 3 shows a summary of information for the bus route that serves the site, including service hours, headway, and distance to the nearest bus stop.

Figure 17 shows the 10-minute, 20-minute, and 30-minute transit travel shed to and from the proposed development. As shown in the transit travel shed, much of the City of Alexandria is accessible via transit within 30 minutes from the proposed development, including most of Old Town and Old Town North destinations, several metro stations, as well as Ronald Reagan Washington National Airport.

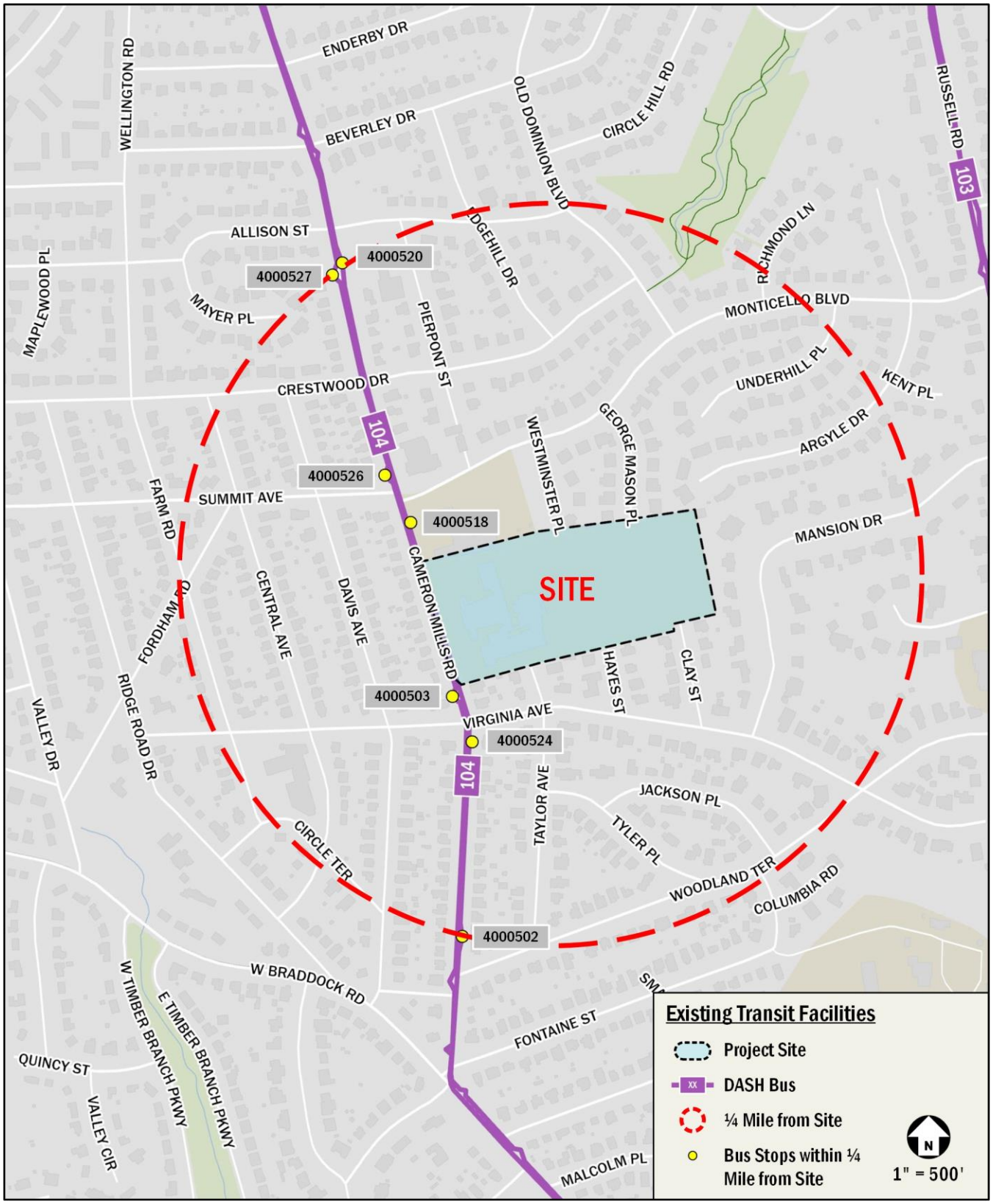

Figure 15: Existing Transit Facilities

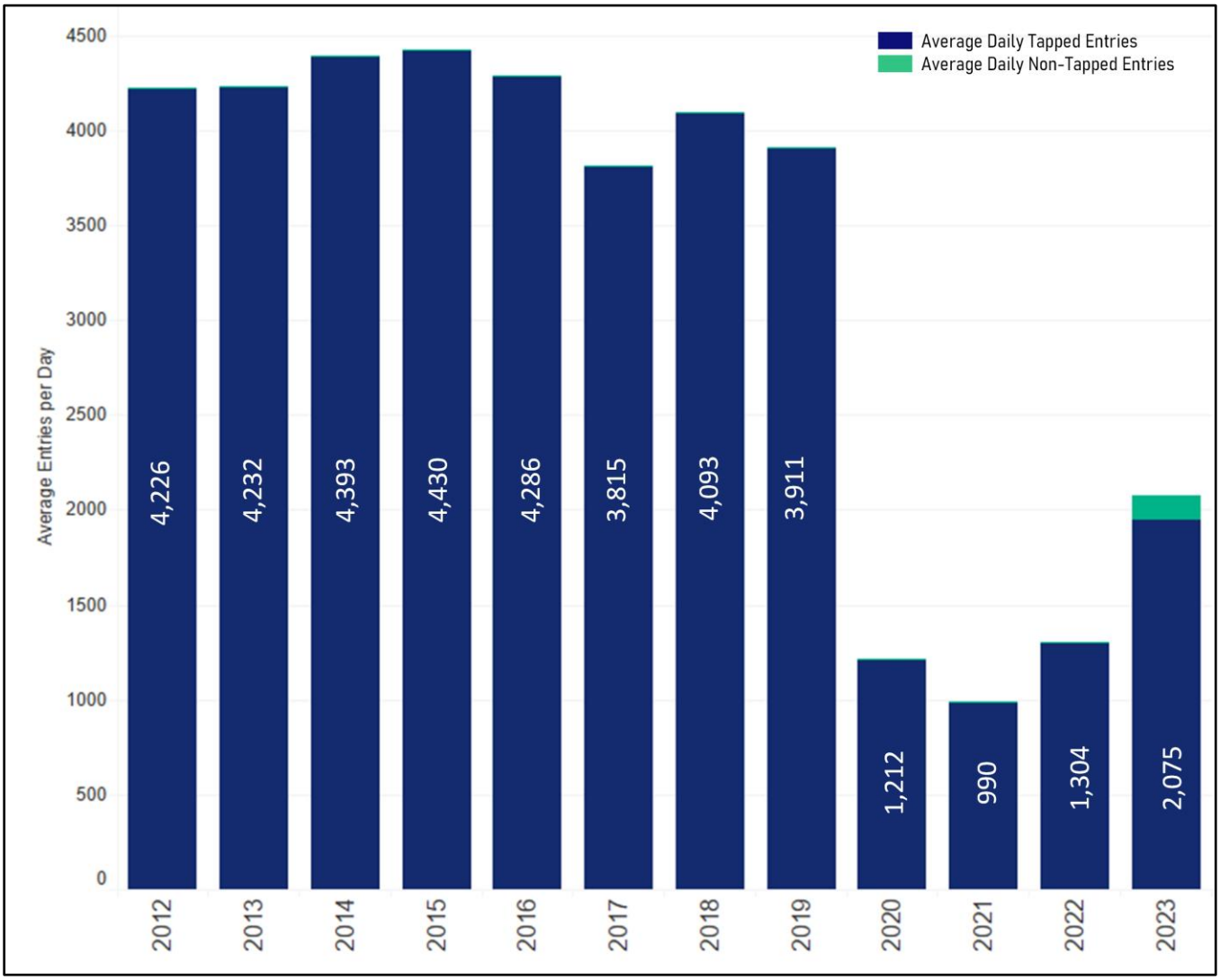

Figure 16: Annual Metro Ridership at Braddock Road Metro Station (Source: WMATA 2024)

Table 2: Existing Bus Stop Inventory

Location	Stop ID	Routes Served	Amenities							
			Sign	ADA Landing Pad	Sidewalk	Info Case	Seating	Shelter	Trash Recep.	Streetlight
Cameron Mills Rd & Allison St (NB)	4000520	104	●		●					●
Cameron Mills Rd & Allison St (SB)	4000527	104	●		●					●
Cameron Mills Rd & Monticello Blvd (SB)	4000526	104	●		●					●
Cameron Mills Rd & Monticello Blvd (NB)	4000518	104	●		●		●			●
Cameron Mills Rd & Virgina Ave (SB)	4000503	104	●		●					●
Cameron Mills Rd & Virginia Ave (NB)	4000524	104	●		●					●
Cameron Mills Rd & Woodland Ter	4000502	104	●		●					●

Table 3: Existing Bus Route Information

Route Number	Route Name	Service Hours	Headway (minutes)	Walking Distance to Nearest Bus Stop
104	Braddock Road Metro to Pentagon Metro via Cameron Mills Drive and Parkfairfax	Weekdays: 6:15 AM – 8:15 PM	30	250 feet (1 min)

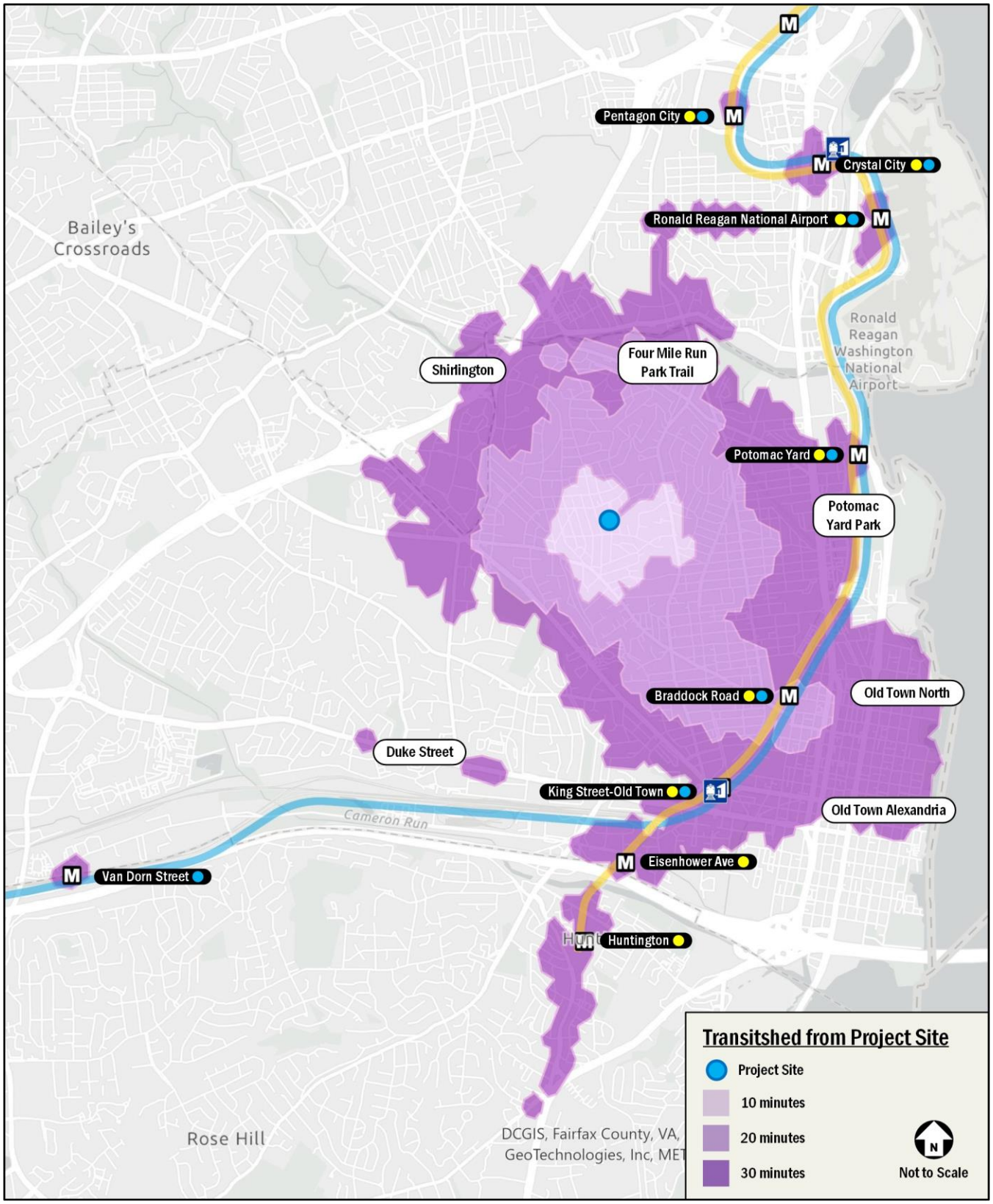

Figure 17: Transitshed from Project Site

Planned Transit Facilities

Comprehensive Transportation Master Plan (2008)

As part of the Comprehensive Transportation Master Plan, the City of Alexandria will create a network of three (3) transit corridors within secure rights-of-way dedicated exclusively for transit use. The Comprehensive Transportation Master Plan has identified the corridors of Route 1, Van Dorn/Shirlington (the "West End Transitway", and Duke Street (the "Duke Street Bus Rapid Transit (BRT)") for these projects. The City has already implemented the Route 1 transitway in the form of the Metroway bus rapid transit line.

In creating this network of dedicated transitways, the City will:

1. Conduct public outreach regarding the concept and process;
2. Coordinate with adjacent jurisdictions to ensure integration with existing transit and explore opportunities for future connections;
3. Prioritize transit corridors for investments;
4. Plan for dedicated transit lanes and ensure new developments do not preclude dedicated transit lanes;
5. Identify locations for smart stations that serve both new and existing transportation modes;
6. Ensure development does not preclude efforts to expand public transit;
7. Identify transit technologies and techniques that suit the identified corridors;
8. Integrate existing DASH service with new transit system elements;
9. Incorporate traffic signal priority, traffic circulation changes, and other on-street enhancements into the new system;
10. Create Transportation Management Plans, Transit Overlay Zoning Districts, Parking Management Zones, etc. to coordinate efforts to support the system;
11. Investigate potential funding from existing and new revenue sources;
12. Develop an outreach and marketing campaign to engage citizens about the City's transportation future; and
13. Coordinate with pertinent Boards and Commissions to ensure special transportation needs of all citizens are considered.

Alexandria Transit Vision Plan (2020)

Through the Transit Vision Study, the City of Alexandria conducted a comprehensive review of how the bus network in the City can best serve existing needs, as well as new residents, business, and visitors who come to Alexandria over the next 10-20 years. The study presents an overview of Alexandria's existing transit network, as well as the City's current and planned development patterns as they relate to transit performance. After several rounds of public engagement, the City adopted the Alexandria Transit Vision Plan proposed transit networks. The first phase of the 2022 Alexandria Transit Vision Plan – referred to as the "New DASH Network" – went into effect in September 2021. The first phase of the Plan included major route and service changes and the change to fare-free DASH bus service. The network impacts routes 103 and 104 which run near the site, and other DASH routes including the 30, 31, and 34 which stop at Braddock Road and Potomac Yard Metrorail Stations.

Alexandria Mobility Plan (2021)

The Alexandria Mobility plan outlines transit-supportive policies and strategies that will help the City achieve the 2030 network envisioned in the Transit Vision Plan and build upon the three (3) transitway corridors identified in the 2008 Transportation Master Plan. The Plan identifies the following transit-related strategies to achieve its vision:

- Implement a citywide transit network with frequent, all-day service
- Build out the city's priority transitway corridors and identify improvements on congested, high ridership corridors to reduce travel times and improve reliability
- Transition the City's bus fleet to fully electric, zero-emission vehicles
- Improve the rider experience from trip planning, to accessing the stop, riding the bus, and arriving at the destination
- Evaluate DASH's fare free service and continue to explore low-income WMATA fares
- Support a better-connected regional transit network
- Modernize the paratransit program for the city's aging population

FY 2023 – FY 2028 Alexandria Transit Company (DASH) Transit Development Plan (Adopted 2022)

In 2022, the Alexandria Transit Company (DASH) adopted a transit development plan (TDP) which provides a comprehensive vision for implementing changes to transit service in the City. The TDP is updated annually, and the TDP adopted in 2022 identifies steps to implement the 2030 Transit Vision Plan Network.

The plan included the implementation of a new DASH network in September 2021. The changes in direction relation to the proposed project are as follows:

- Bus Stop Consolidations and Improvements
- Increased weekday service on Lines 103 and 104 to every 20 minutes

The planned transit network in the vicinity of the project site is shown in Figure 18.

Site-Generated Transit Impacts

The proposed development is projected to generate one (1) transit trip (1 inbound, 0 outbound) during the morning peak hour, zero (0) transit trips during the afternoon peak hour, and three (3) daily trips. Compared to 330 daily school bus/transit trips under existing conditions, the project is estimated to generate 706 daily school bus/transit trips under future conditions, a net increase of 376 daily transit trips. These transit trips account for trips to/from on-site transit facilities and walking trips to transit facilities located off-site (e.g., DASH and Metrorail).

It is expected that the future transit network can accommodate these new site-generated trips.

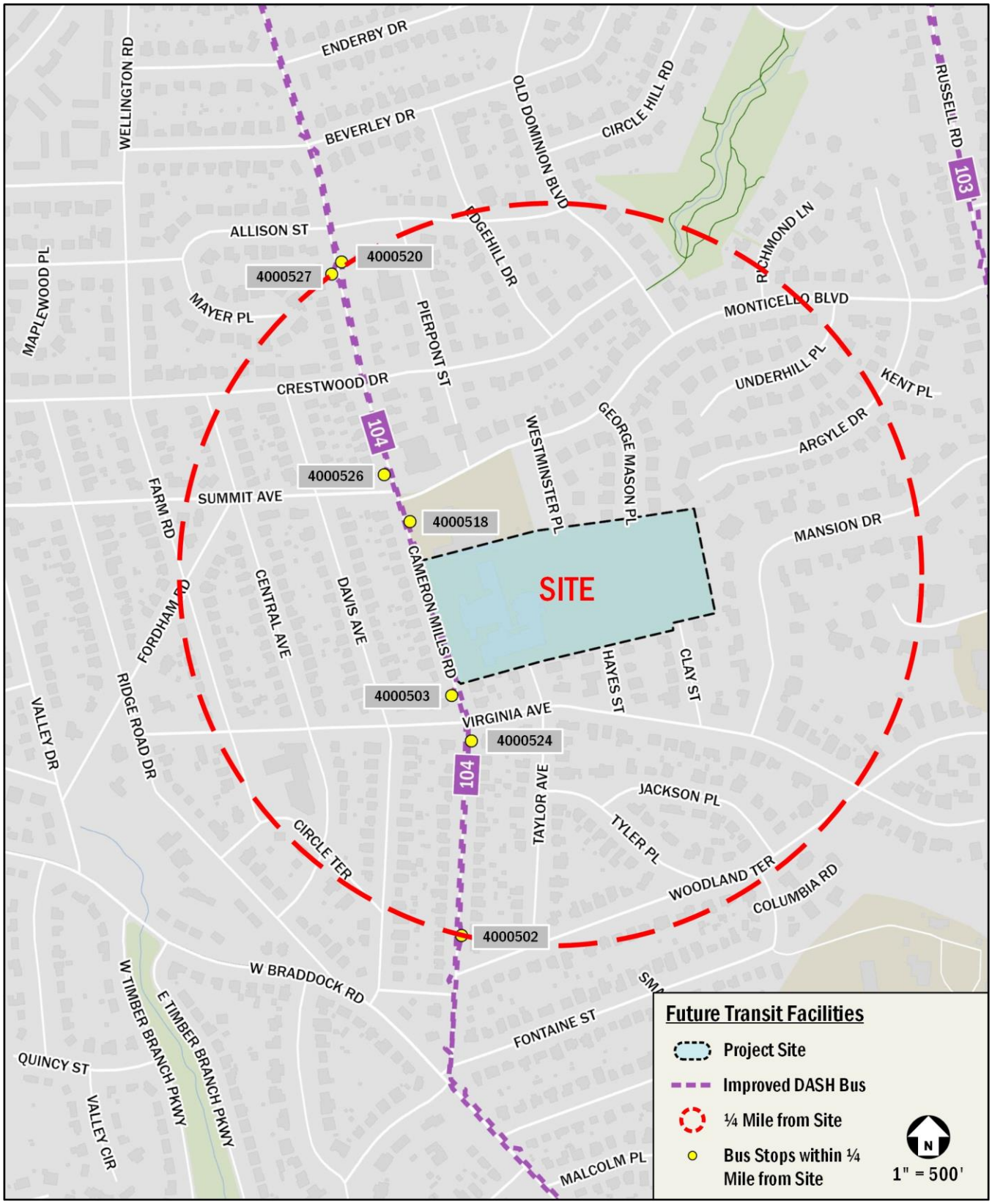

Figure 18: Planned Transit Facilities

Bicycle Facilities

This chapter summarizes existing and future bicycle access to the Robinson Terminal North development and reviews the quality of cycling routes to and from the site.

The following conclusions are reached within this chapter:

- Within a quarter-mile radius of the site, there is access to several on-street bicycle facilities including bicycle lanes along Monticello Boulevard between Cameron Mills Road and Argyle Drive, shared lane markings along Allison Street, and signed routes along Summit Avenue.
- A planned bicycle corridor enhancement is located directly along the site's frontage on Cameron Mills Road, which will improve local and regional connectivity to the site.
- New bicycle racks were included in the site plan, with the goal of providing a minimum of 34 spaces, representing a goal of 5% of the future total population. The most recent Safe Routes to School survey indicated an existing bicycle mode share of 4%; the 5% goal mode share for parking was set to target an increase in bicycle trips to the site.

Existing Bicycle Facilities

The site has access to on- and off-street bicycle facilities. Under existing conditions, shared lane markings are provided along Allison Street, Valley Drive, and West Braddock Road; bicycle lanes are provided on Monticello Boulevard between Cameron Mills Road and Argyle Drive; and signed routes are provided on Summit Avenue. These facilities provide connections to the nearby residential neighborhoods. Figure 19 shows the existing facilities within the study area.

The Four Mile Run Trail is located approximately 1.1 miles northeast of the site with its closest access in the Four Mile Run Park. The Four Mile Run is a multi-use trail in Virgnia that stretches alongside the Four Mile Run stream, providing a vital connection for cyclists and pedestrians in the region. The trail links to several major pathways, including the Washington and Old Dominion (W&OD) Trail and the Mount Vernon Trail. This network of trails enhances regional connectivity, offering easy access for cyclists to areas to Alexandria, Arlington, and Washington DC.

Currently, short-term bicycle parking spaces are provided near the building entrance off Cameron Mills Road and the paved play area at the rear of the building.

Figure 20 shows the 10-minute, 20-minute, and 30-minute bicycle travel shed for the proposed development. Within a 10-minute bicycle ride, the proposed development has access to several destinations including the Four Mile Run Trail and Potomac Yard Trail as well as residential neighborhoods. Within a 20-minute bicycle ride, the proposed development has access to destinations in Alexandria and Arlington, such as the Mount Vernon Trail, Potomac Yard Center, Old Town Alexandria, Crystal City, Shirlington, and retail zones. Within a 30-minute bicycle ride, the proposed development has access to additional portions of Arlington, including the Pentagon and Pentagon City.

Capital Bikeshare

In addition to personal bicycles, the Capital Bikeshare program provides cycling options for students and employees of the proposed development.

The Capital Bikeshare program has placed more than 700 Bikeshare stations across Washington, DC, Arlington County, VA, City of Alexandria, VA, Montgomery County, MD, Fairfax County, VA, Prince George's County, MD, and most recently the City of Falls Church, VA, with around 6,000 bicycles and electric-assist bicycles (e-bikes) provided. No Capital Bikeshare stations currently exist within a half-mile radius of the site. The nearest station is located at King Street and Kenwood Avenue, approximately 0.7 miles from the site.

E-Scooters and Dockless E-Bicycles

As of October 2024, the City of Alexandria has granted operating permits to two (2) companies (Bird and Lime) to provide additional options for point-to-point Shared Mobility Device (SMD) transportation services through March 31, 2025. These SMDs are provided by private companies that give registered users access to a variety of e-scooter and e-bike options. These devices are used through each company-specific mobile phone application.

Planned Bicycle Facilities

On-Site Bicycle Infrastructure

While not required, new bicycle racks were included in the site plan, with the goal of providing a minimum of 34 spaces,

representing a goal of 5% of the future total population. The most recent Safe Routes to School survey indicated an existing bicycle mode share of 4%; the 5% goal mode share for parking was set to target an increase in bicycle trips to the site. The bicycle parking will be provided in highly visible and accessible areas.

Pedestrian and Bicycle Master Plan Update (2016)

In 2016, the City of Alexandria updated the pedestrian and bicycle sections of its 2008 Comprehensive Transportation Master Plan and replaced them with a new Pedestrian and Bicycle Chapter. This update included an evaluation of existing conditions, issues, constraints, and needs, as well as a review of policies, goals, and objectives. This effort incorporated public feedback through mapping and survey exercises.

Planned bicycle facilities include an enhanced facility along Cameron Mills Road between Allison Street and Summit Avenue/Monticello Boulevard, as well as shared lanes along Cameron Mills Road north of Allison Street and south of Summit Avenue/Monticello Boulevard, which will run directly along the site's frontage and enhance connectivity for cyclists in the area.

An enhanced bicycle facility may include improvements like roadway resurfacing for a smoother cycling surface, lane narrowing to accommodate dedicated bike lane markings, and shared lane markings in areas where a full bike lane isn't feasible.

Alexandria Mobility Plan (2021)

In November 2021, the City of Alexandria adopted the Alexandria Mobility Plan (AMP) to replace the 2008 Comprehensive Transportation Master Plan. The Pedestrian and Bicycle Chapter of the Plan incorporates the 2016 Pedestrian and Bicycle Master Plan Update with City policies and programs developed after 2016, such the City's Vision Zero and Complete Streets programs. The Pedestrian and Bicycle chapter policies identified in the Plan are to a) prioritize safety by focusing on vulnerable street user crashes to help achieve Vision Zero, and b) to address network gaps by completing pedestrian and bicycle networks equitably and cost-effectively.

The AMP incorporates the specific bicycle projects that were identified and prioritized as part of the 2016 Pedestrian and Bicycle Master Plan update, accounting for projects that have been completed since 2016. The planned bicycle network is shown in Figure 21. The City continues its work to pursue funding from grants and through the City's budget process and implement pedestrian and bicycle projects through routine street resurfacing, as part of larger capital investments, and in coordination with developers and redevelopment.

Site-Generated Bicycle Impacts

The proposed development is projected to generate 25 bicycle trips (25 inbound, 0 outbound) during the morning peak hour and 16 bicycle trips (0 inbound, 16 outbound) during the afternoon peak hour, and 56 daily trips. Compared to 27 daily bicycle trips under existing conditions, the project is estimated to generate 56 daily bicycle trips under future conditions, a net increase of 29 daily bicycle trips.

It is expected that the future bicycle network can accommodate these new site-generated trips.

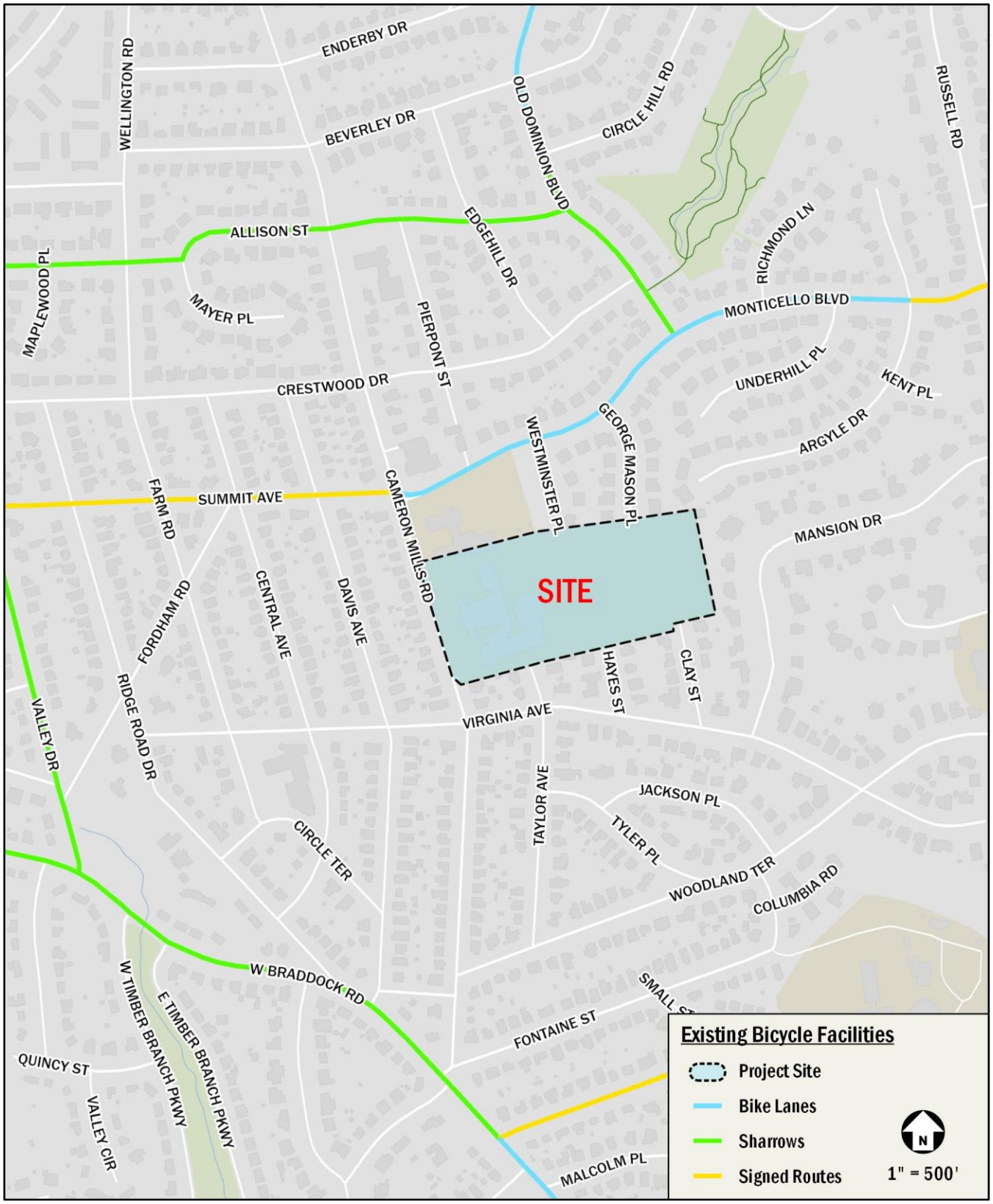

Figure 19: Existing Bicycle Facilities

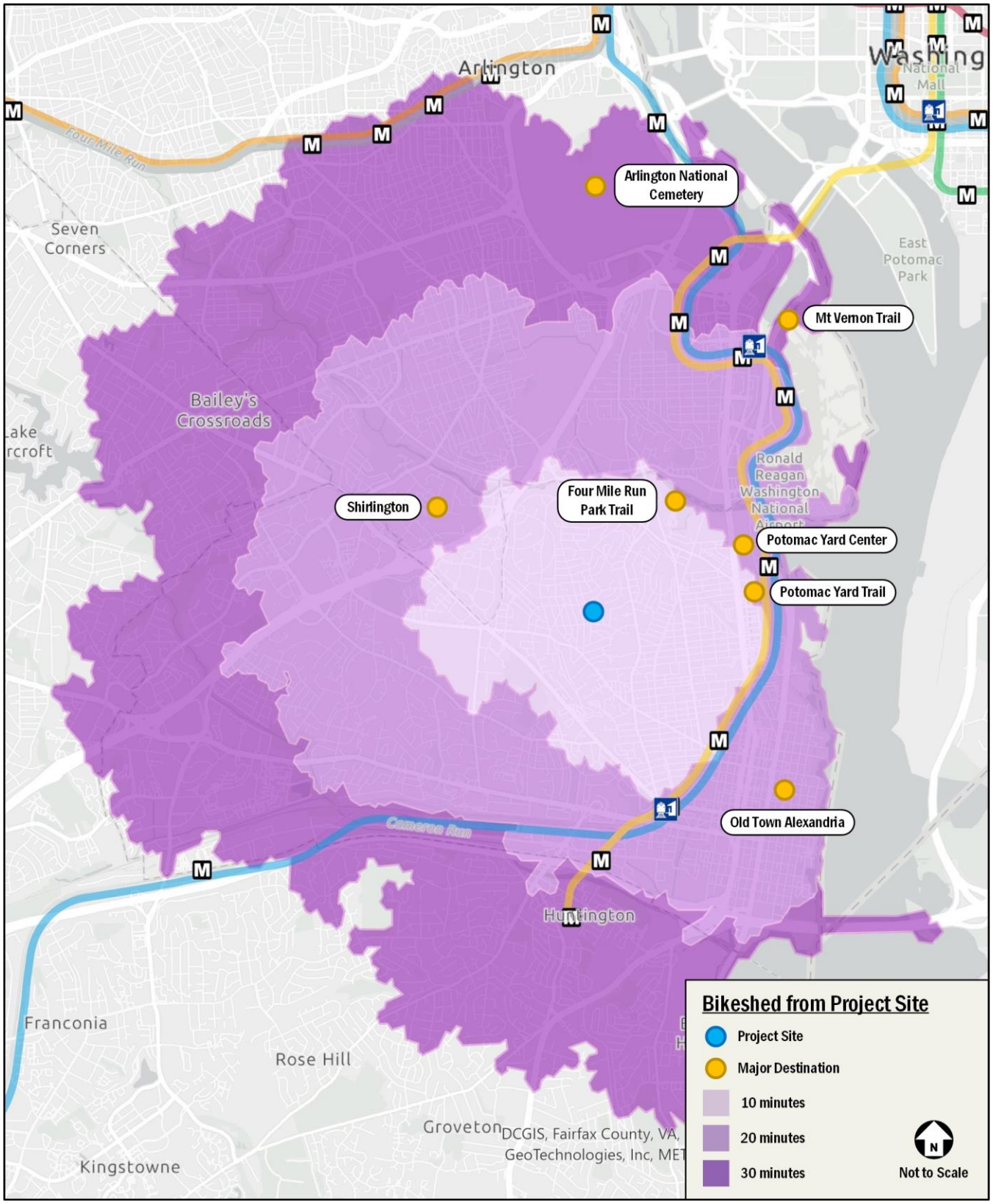

Figure 20: Bikeshed from Project Site

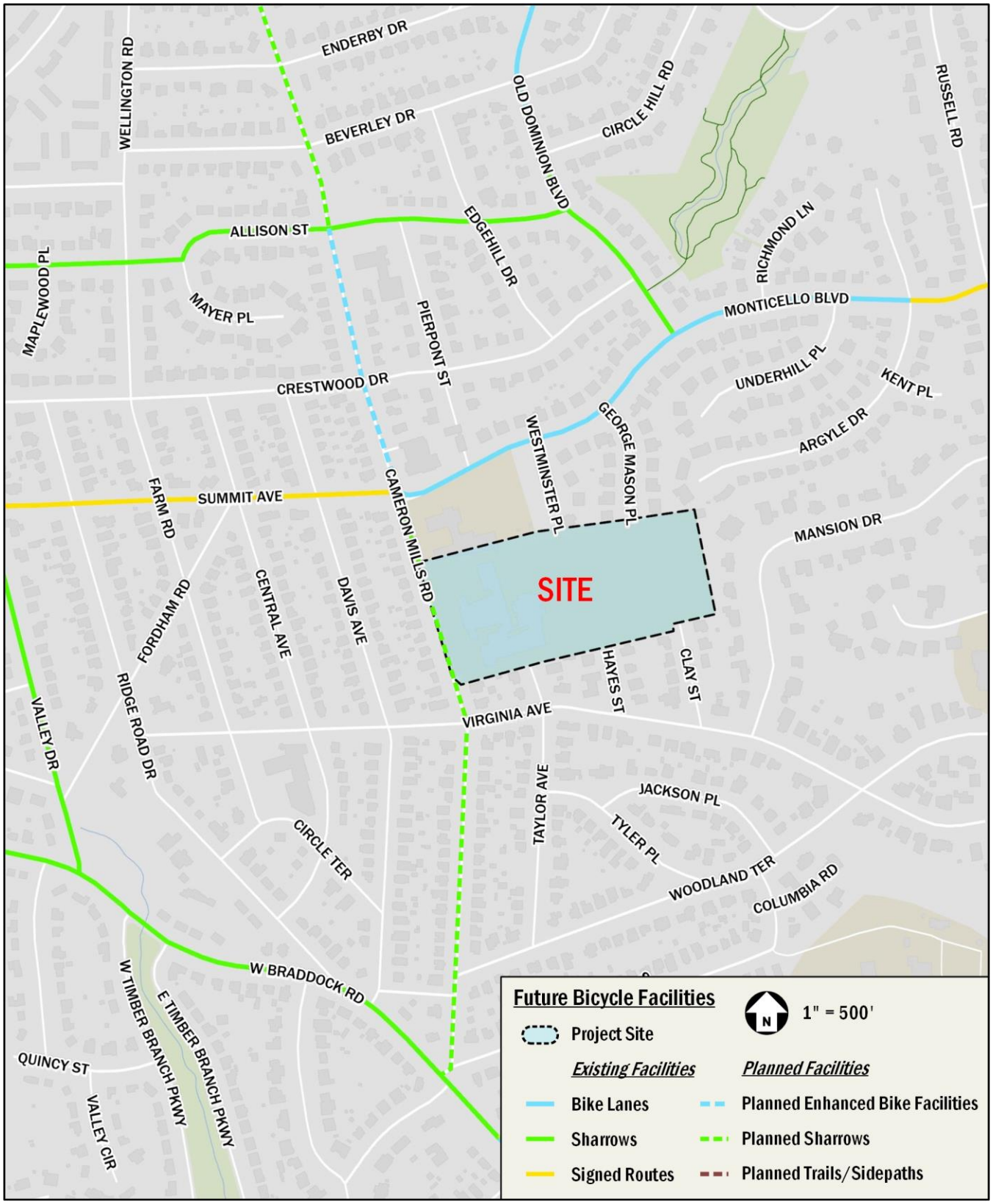

Figure 21: Future Bicycle Facilities

Pedestrian Facilities

This chapter summarizes the existing and future pedestrian access to the site and reviews walking routes to and from the site.

The following conclusions are reached within this chapter:

- The existing pedestrian infrastructure surrounding the site provides a quality walking environment. There are sidewalks along the majority of primary routes to pedestrian destinations with few gaps in the system.
- Planned and proposed pedestrian improvements to the pedestrian infrastructure surrounding the site will improve pedestrian comfort and connectivity.

Pedestrian Study Area

Pedestrian facilities within a quarter-mile radius of the site were evaluated. The site is accessible to transit options such as multiple bus stops along Cameron Mills Road. Existing pedestrian facilities surrounding the site provide comfortable walking routes to and from nearby transit options.

Figure 22 shows the 10-minute, 20-minute, and 30-minute walk travel shed for the proposed development. Within a 10-minute walk, the proposed development has access to several destinations including DASH bus stops and nearby residential neighborhoods. Within a 20-minute walk, the proposed development has access to destinations such as Monticello Park. Within a 30-minute walk, the proposed development has access to destinations including the Four Mile Run Park, W&OD trailhead, and retail zones and community amenities.

Figure 23 shows the expected primary pedestrian pathways to and from the school, based on the current attendance zone.

Existing Pedestrian Facilities

A review of pedestrian facilities surrounding the proposed development shows that many facilities provide a quality walking environment. Figure 24 shows a detailed inventory of the existing pedestrian infrastructure within a quarter-mile radius of the site. Sidewalks, crosswalks, and curb ramps are evaluated based on the guidelines set forth by the City of Alexandria and ADA standards. Table 4 outlines the City of Alexandria sidewalk and buffer width recommendations. It should be noted that the sidewalk widths shown in Figure 24 reflect the total sidewalk widths based on observations in the field taken for the pedestrian and buffer zones and do not evaluate the frontage zone.

ADA standards require that curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, curb ramps shared between two crosswalks are not desired. As shown in Figure 24, under existing conditions a sizable number of curb ramps are either shared between crosswalks and/or do not provide detectable warnings.

Within the study area, two (2) curb ramps are missing at the intersection of Tyler Place and Woodland Terrace and the intersection of Central Avenue and Circle Terrace, respectively. Additionally, a number of crosswalks are missing for at least one (1) leg of the unsignalized intersections under existing conditions. Most roadways have existing sidewalks on both sides, with noticeable gaps and missing sidewalks south of the site along Jackson Place. However, alternative pedestrian pathway is provided on Tyler Place. The proposed development will provide improved sidewalks along the site frontage on Cameron Mills Road that meet or exceed standards, enhancing the overall pedestrian environment in the vicinity of the site.

All primary pedestrian destinations are accessible via routes with crosswalks and sidewalks, many of which meet the City of Alexandria's and ADA standards. Overall, the site is situated within a residential transportation network, with quality pedestrian access.

Table 4: Preferred Sidewalk Widths per City of Alexandria Complete Streets Design Guidelines

Street Type	Preferred Sidewalk Width	Preferred Buffer Width
Commercial Connector	6-15 ft	6-10 ft
Main Street	6-10 ft	6-10 ft
Mixed Use Boulevard	6-18 ft	6-10 ft
Neighborhood Connector	6-8 ft	6-7 ft
Neighborhood Residential	6 ft	5-7 ft
Parkway	6-10 ft	5-10 ft
Industrial	6 ft	5-7 ft

Planned Pedestrian Facilities

Proposed Pedestrian Infrastructure Improvements

The pedestrian network in the vicinity of the site is very well established. Most roadways within a quarter-mile walkshed provide sidewalks on both sides and provide multiple potential walking routes to major destinations and nearby transit options.

While the existing facilities around the site offer a quality walking environment, the proposed development will further enhance the pedestrian environment by improving connectivity. Sidewalks

along the site's frontage on Cameron Mills Road will be upgraded to meet or exceed City of Alexandria and ADA standards, enhancing mobility and safety for students and employees. Additionally, the proposed development will enhance multi-use paths internal to and around the site, including those in the adjacent park to the east, improving pedestrian safety and visibility throughout the site. These crosswalks will align with the proposed vehicular access points, improving pedestrian safety and visibility throughout the site.

The proposed development will also redevelop George Mason Park on the east of the site to include a baseball diamond, basketball court, and additional play areas, improving porosity in the vicinity of the site and providing amenities that will support gathering and physical activity to further activate the pedestrian environment. The public space will be accessible via new or improved sidewalks and crosswalks.

All new pedestrian facilities are expected to meet City requirements with an emphasis on pedestrian safety and comfort. This includes the sidewalks that meet or exceed the width requirements, crosswalks at all necessary locations, and curb ramps with detectable warnings.

Alexandria Mobility Plan (2021)

In November 2021, the City of Alexandria adopted the Alexandria Mobility Plan (AMP) to replace the 2008 Comprehensive Transportation Master Plan. The Pedestrian and Bicycle Chapter incorporates the 2016 chapter update with City policies and programs developed after 2016, such as the City's Vision Zero and Complete Streets programs. The pedestrian and bicycle policies identified in the AMP are to prioritize safety by focusing on vulnerable street user crashes to help achieve Vision Zero, and to address network gaps by completing pedestrian and bicycle networks equitably and cost-effectively.

The AMP sets out pedestrian priority projects through a tiered prioritization of sidewalk gaps in the City. In the vicinity of the project site, the AMP identifies the following sidewalk gap, which is classified as a Tier 4 priority:

- Jackson Place;
- Westminster Place;
- Circle Terrace; and
- Cameron Mills Road between Crestwood Drive and Summit Avenue.

Site-Generated Pedestrian Impacts

The proposed development is projected to generate 219 pedestrian trips (219 inbound, 0 outbound) during the morning peak hour, 145 pedestrian trips (0 inbound, 145 outbound) during the afternoon peak hour, and 486 daily trips. Compared to 230 daily pedestrian trips under existing conditions, the project is estimated to generate 486 daily pedestrian trips under future conditions, a net increase of 256 daily pedestrian trips.

The origin and destinations of these pedestrian trips are likely to be:

- Nearby residential neighborhoods; and
- Neighborhood connecting trails and parks.

It is expected that the future pedestrian network can accommodate these new site-generated trips.

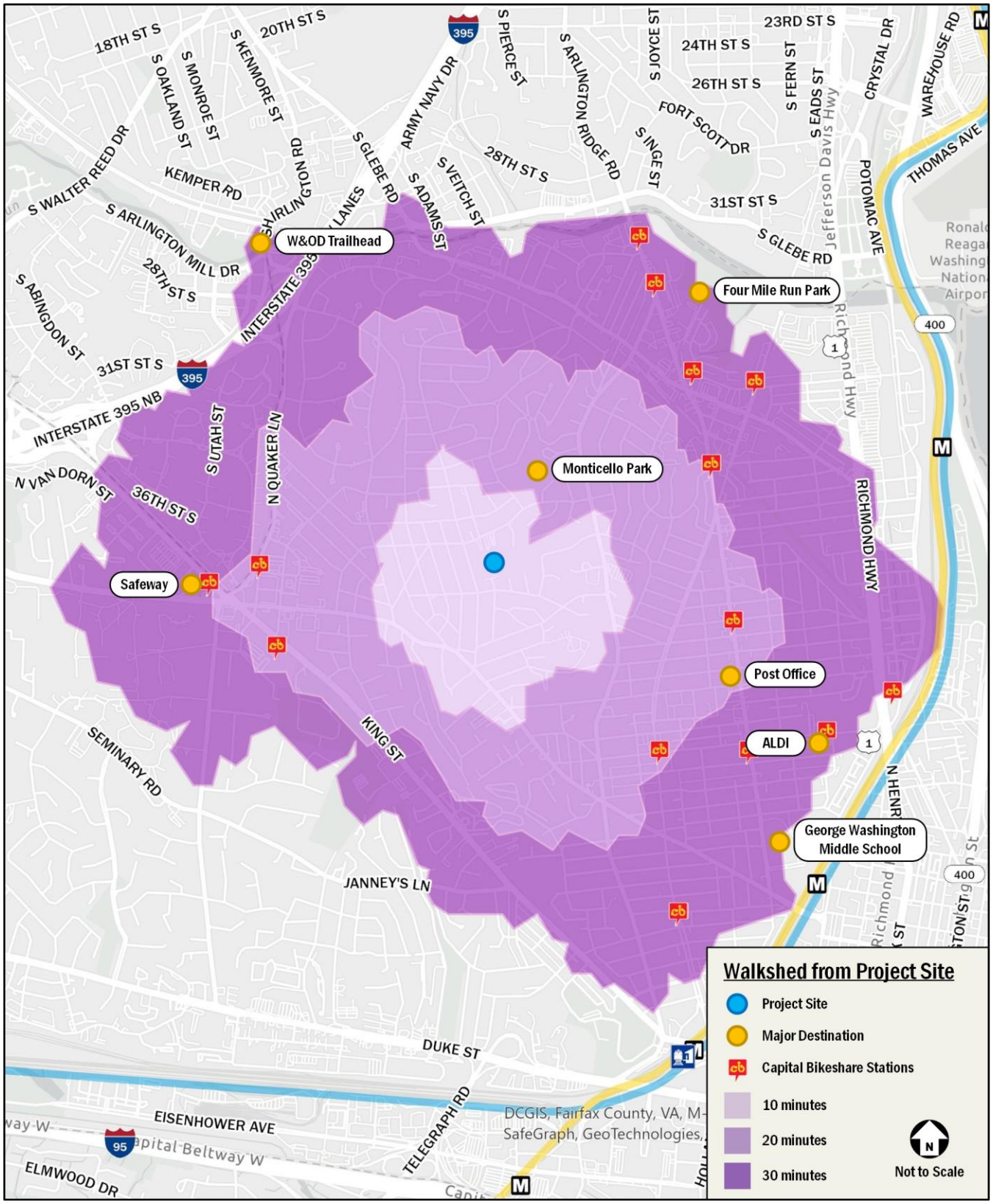

Figure 22: Walkshed from Project Site

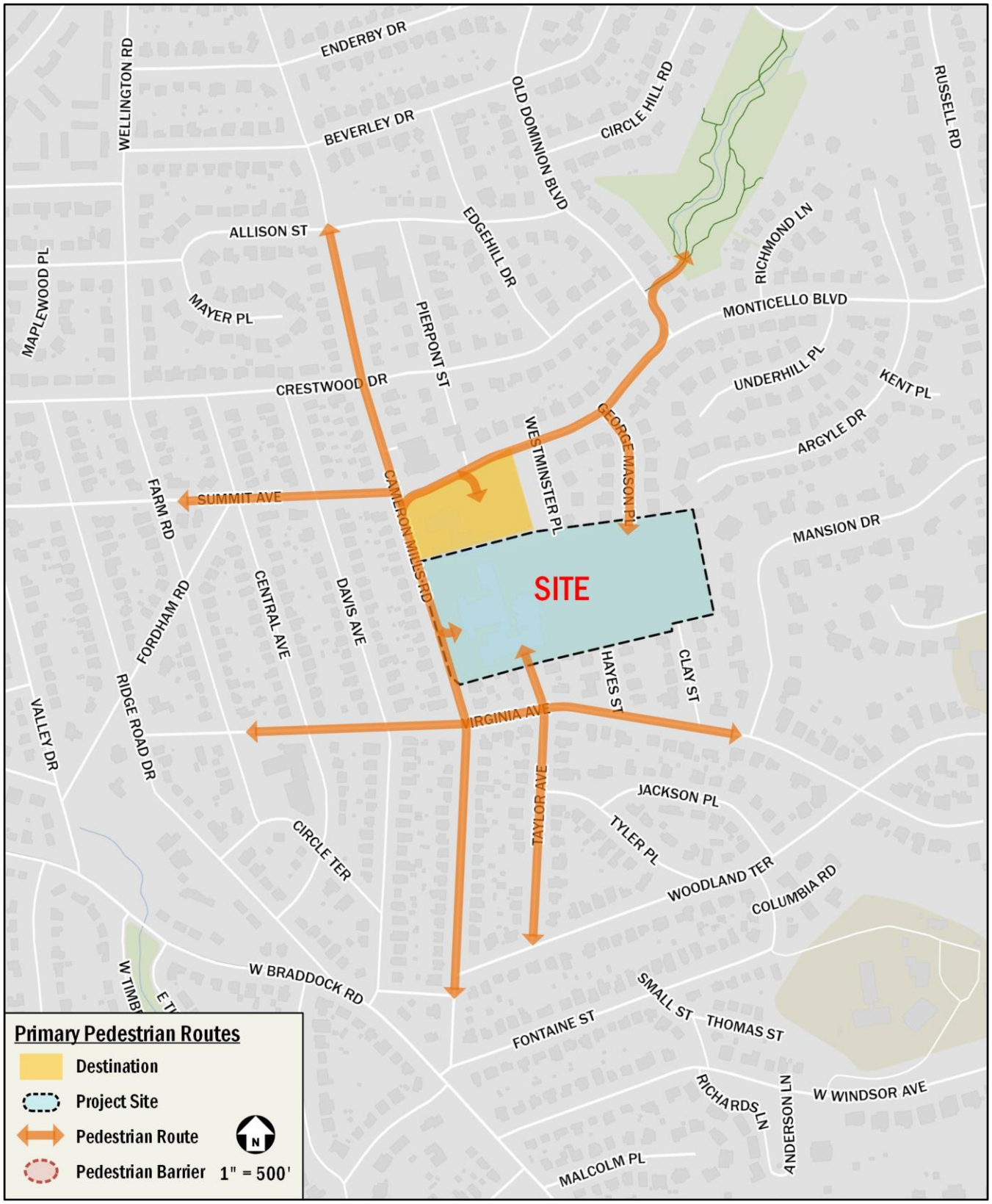

Figure 23: Primary Pedestrian Routes

Figure 24: Existing Pedestrian Facilities

Parking Study

This chapter includes the findings and recommendations of a parking occupancy study. It includes an inventory of the available on- and off-street parking in the vicinity of the project site.

The following conclusions are reached within this chapter:

- There are 1,159 on-street and 162 off-street parking spaces, for a total of 1,321 spaces available in the parking study area.
- The peak parking occupancy within a two-block radius of the site is approximately 29% on a typical weekday.

Parking Inventory and Occupancy

An on- and off-street parking inventory and occupancy study was conducted to assess the existing conditions.

As part of this report, detailed counts of on-street parking supply and demand were conducted within a quarter-mile radius of the site, referred to as “Neighborhood Parking Study Area”. Counts of off-street parking supply and demand were conducted at three locations near the site: the existing school parking lot, the George Mason Park lot, and the Westminster Presbyterian Church parking lot. Figure 25 shows the parking facilities within the extents of the parking data collection area.

Data was collected in the study area on Thursday, September 19, 2024, from 6:00 AM to 7:00 PM. The date was selected to capture a “typical” school day, and the time period was selected to capture both school-related parking activity during the day and residential parking activity, which typically is greater in the evening. Parking demand sweeps were conducted hourly. The scope of the on- and off-street parking inventory and occupancy data collection was agreed to by the City of Alexandria during the scoping process.

The parking inventory data found a total of 1,324 parking spaces, with 1,159 on-street spaces and 165 off-street spaces, within the neighborhood parking study area.

For the purpose of reviewing the parking inventory in more detail, the on-street parking supply was broken down into three (3) categories. Table 5 summarizes the different categories and the number of spaces for each category in the study area. Block faces that are designated as permanent loading zones or private property were considered ‘No Parking’ areas. Figure 26 details the specific parking restrictions found on each block face in the study area.

- Unrestricted Parking, which includes on-street parking with no time, permit, metered, or loading restrictions.
- Time Restricted Parking, which includes on-street parking with a 10-minute time limit during the day, from 8:30 AM to 2:00 PM on school days.
- School Bus Parking, which includes on-street restricted spaces for school buses on school days.

Table 5: Existing On-Street Parking Inventory Summary

Parking Restriction Category	Number of Spaces
Unrestricted	1,131 spaces
Time Restricted (Pick-Up/Drop-Off Zone)	25 spaces
No Parking except School Bus on School Days	3 paces
Total	**1,159 spaces**

Table 6: Existing Off-Street Parking Inventory Summary

Parking Restriction Category	Number of Spaces
Unrestricted	140 spaces
School Staff Parking	23 spaces
First-Time Church Visitor Parking	2 spaces
Total	**165 spaces**

The parking occupancy by block face during the overall peak for a typical weekday and weekend is shown in Figure 27. The detailed parking inventory and occupancy data are provided in the Technical Attachments.

The on-street parking study found the peak occupancy for the entire study area to occur at 12:00 PM with an overall parking utilization of 29 percent (389 of 1,321 spaces occupied). The assessment of parking occupancy was based off the number of parking spaces on each side of the block.

As shown in Figure 27, the average parking occupancy is less than 50% within a quarter-mile radius of the site, with the highest occupancy observed along segments of Taylor and Virginia Avenues adjacent to the existing on-site school parking lot. This is due to spillover parking from the school’s parking lot; staff park along these streets when on-site parking is not available. Additional staff parking occurs in the Westminster Presbyterian Church parking lot. Based on the time-of-day patterns in occupancy, it was assumed that changes in parking occupancy at these locations during school arrival and dismissal were associated with school staff parking in these locations, allowing for the number of school vs. non-school vehicles in these

locations to be estimated. Figure 28 visualizes the distribution of school and non-school vehicles parked in the immediate vicinity of the school at the time of peak parking occupancy during the day (12:00 PM).

Parking Recommendations

Per the Zoning Ordinance, the proposed development must provide at least 27 parking spaces. To provide a quality experience for their teachers and be a good neighbor, the site plan proposes 56 on-site parking spaces, a significant increase that, when combined with the 13 parking spaces in the park, should minimize off-site parking in the neighborhood. This provides a total of 69 parking spaces for a projected 80 combined teachers and staff. Both the north and south on-site parking lots are designated for school staff parking during school hours and for school-related programs held outside of school hours. Outside of PUDO hours, the PUDO 'loop' is proposed to accommodate visitor parking and potentially small delivery vehicles, such as UPS trucks. The number of parking spaces provided will meet zoning requirements.

The inventory of the existing on-street parking within a two-block radius of the project site found a total of 1,324 on-street parking spaces. The on-street parking data found the peak occupancy for the entire study area on a typical weekday to occur at 12:00 PM with an overall parking utilization of 29 percent (389 of 1,321 spaces occupied).

The results of the study of the on-street parking facilities for the Neighborhood Parking Study Area in the vicinity of the project site indicate that there is sufficient capacity to absorb any additional parking demand that may be generated by the proposed redevelopment in excess of the parking spaces provided on-site. The on-street parking on Cameron Mills Road on the school side is proposed to be designated for school bus use during PUDO hours, with visitor parking between those periods and unrestricted parking on nights and weekends.

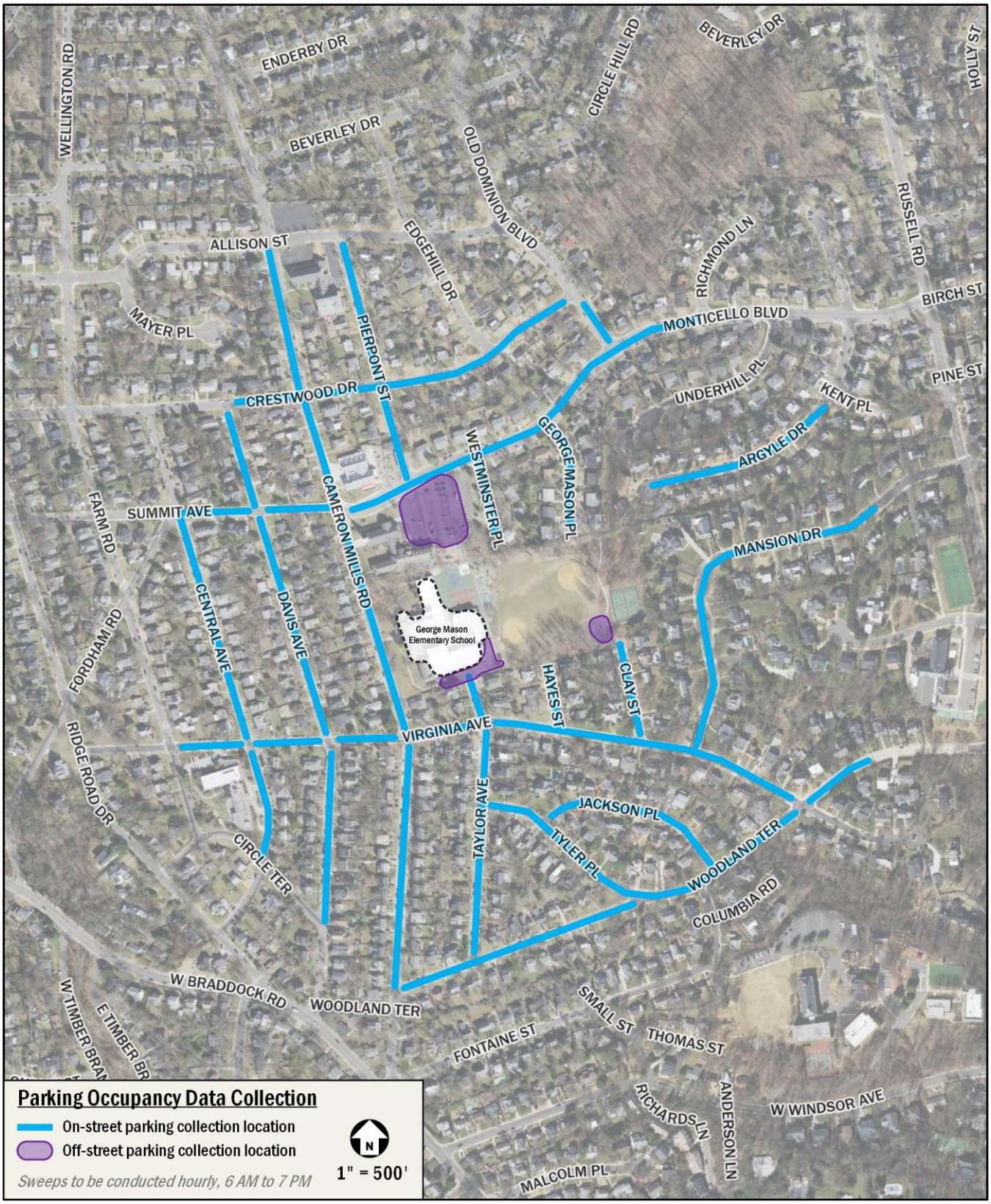

Figure 25: Parking Occupancy Data Collection

Figure 26: Parking Supply – Neighborhood Parking Study Area

Figure 27: Existing Peak Hour Parking Occupancy – Neighborhood Parking Area

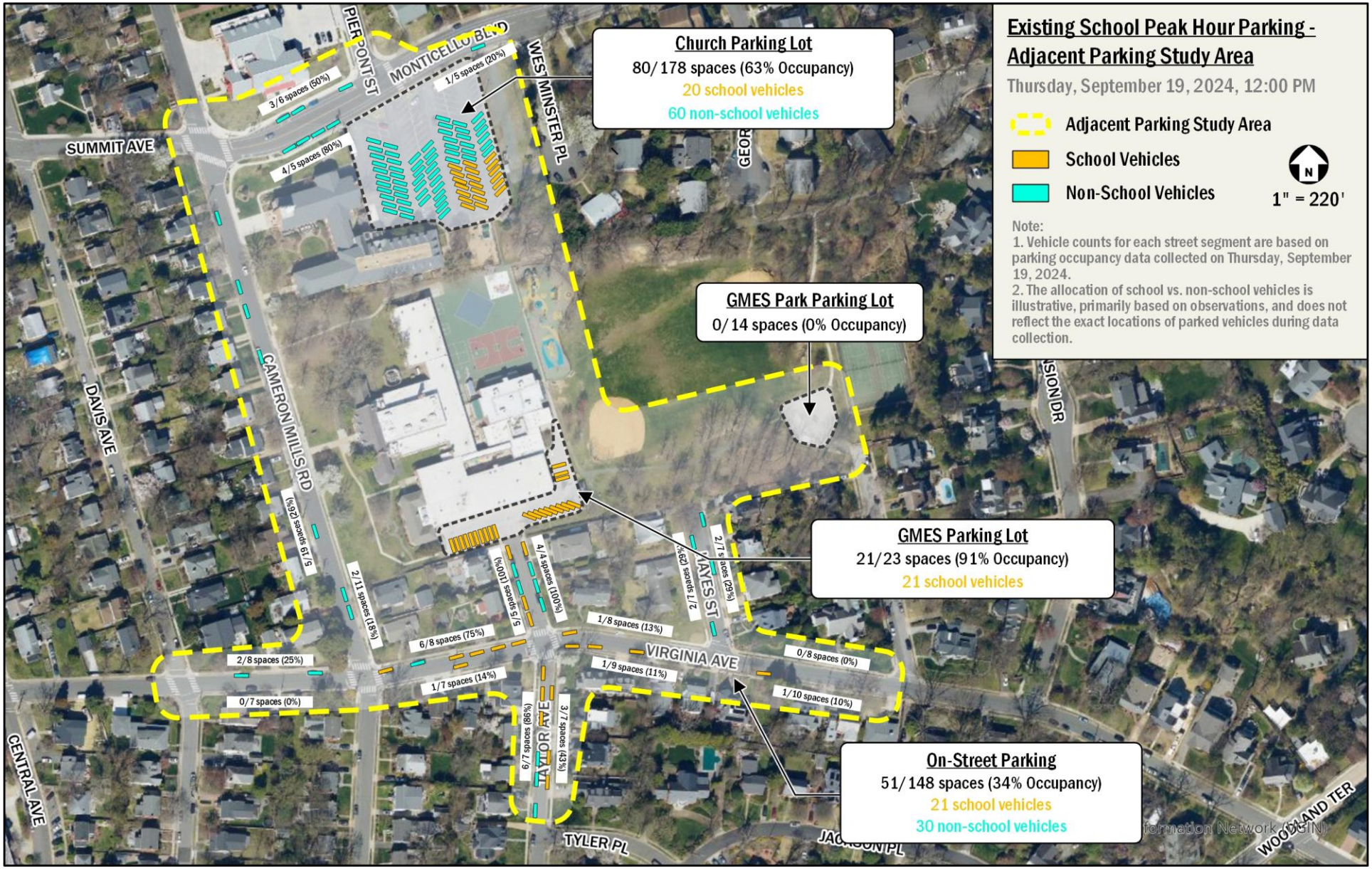

Figure 28: Existing Peak Hour Parking – Adjacent Parking Study Area

Travel Demand Assumptions

This chapter outlines the transportation demand of the proposed development. This includes a review of the expected mode splits, multimodal trip generation, and the trip distribution and routing assumptions, which form the basis for the chapters that follow.

Mode Split Methodology

Mode split (also called mode share) is the percentage of travelers using a particular type (or mode) of transportation when traveling. Vehicular mode split information for this report was based on past studies of George Mason Elementary School, similar school sites in the region, and discussions with the City during the scoping process.

Table 8 summarizes the data from comparable sites that was used to establish the school mode split assumptions for this report. Table 9 shows the mode split assumptions for the proposed development, as vetted and approved by the City of Alexandria during the scoping process.

Trip Generation Methodology

Typically, weekday peak hour trip generation is calculated based on the methodology outlined in the ITE *Trip Generation Manual*, 11th Edition. However, the ITE rates are derived from data collected at school sites with mode splits that may not align with those of the project site. To address this, a custom multi-step approach was utilized to develop a trip generation estimate based on the proposed number of students and staff and data on hourly distributions of trips from comparable sites in the region, as vetted and approved by the City of Alexandria during the scoping process.

The steps used to develop the trip generation include the following:

1. The number of total arrival and dismissal person-trips to/from the school was estimated based on the total student and staff population with a 4% absenteeism rate.
2. Mode splits were applied to the total student and staff trips.
3. Students and staff person trips were converted to vehicular trips based on the proposed mode splits and an assumed vehicular occupancy of 1.2 students per vehicle and 1.0 staff per vehicle.
4. Student and staff vehicular trips were distributed among time periods of the arrival and dismissal period based on data from comparable school sites in the region. The breakdown of trips by time period is shown in Table 7.

Table 7: Distribution of Arrival/Dismissal Trips

Time Period	Distribution of Total Arrival/Dismissal Trips[1]	
	Inbound	Outbound
Arrival Period		
75 - 90 minutes before bell time	0%	0%
60 - 75 minutes before bell time	3%	3%
45 - 60 minutes before bell time	7%	7%
30 - 45 minutes before bell time	10%	10%
15 - 30 minutes before bell time	35%	35%
0 - 15 minutes before bell time	39%	39%
0 - 15 minutes after bell time	5%	5%
15 - 30 minutes after bell time	1%	1%
30 - 45 minutes after bell time	0%	0%
Dismissal Period		
30 - 45 minutes before bell time	1%	0%
15 - 30 minutes before bell time	8%	4%
0 - 15 minutes before bell time	30%	5%
0 - 15 minutes after bell time	22%	30%
15 - 30 minutes after bell time	6%	22%
30 - 45 minutes after bell time	5%	6%
45 - 60 minutes after bell time	2%	5%
60 - 75 minutes after bell time	2%	2%
75 - 90 minutes after bell time	2%	2%
90 - 105 minutes after bell time	5%	2%
105 - 120 minutes after bell time	6%	5%
120 - 135 minutes after bell time	6%	6%
135 - 150 minutes after bell time	5%	6%
150 - 165 minutes after bell time	0%	5%
165 - 180 minutes after bell time	0%	0%

Notes:
1. During the arrival period, the distribution of outbound trips is only applied to student trips which arrive by car (pick-up/drop-off). For other modes, only inbound trips are assumed to occur. Similarly, during the dismissal period, the distribution of inbound trips is only applied to student trips departing by car.

Proposed Trip Generation

Trip generation of the proposed development is based on the program of 670 students and 80 employees. As outlined in the previous section the school trip generation was calculated based on a custom multi-step approach. Trips were split into different modes using the assumptions outlined in the mode split section of this report. A summary of the proposed trip generation is shown in Table 10 for the weekday morning peak hour, weekday afternoon dismissal peak hour, and weekday daily total.

As part of the capacity analysis included in a later chapter of this report, the net new vehicular trips were used for the future conditions analysis, as shown in Table 11. Detailed trip

generation calculations are included in the Technical Attachments.

Distribution and Assignment Methodology

Trip distribution for the site-generated trips was determined based on: (1) Alexandria City Public School Attendance Zone for student trips and (2) Census Transportation Planning Products (CTPP) Traffic Analysis Zone (TAZ) data for employee trips.

The distribution of student trips was based on the existing attendance zone boundary and the estimated distribution of trips originating from various sectors within the zone, which serves the elementary school, as shown in Figure 29. The distribution of staff trips was based on an assumption that the origins of staff commute trips would align with the home locations of employees working within the same TAZ as the school, according to the CTPP data shown in Figure 30. It is assumed that a sizable portion of staff trips originate from more local locations, while the remainder are likely to originate from distant locations within the region. For those commuting from farther distances via I-395, it is expected that the primary point of access to the site will be from the north, thereby resulting in the distribution of 45% of staff trips on Cameron Mills Road to the north.

Based on this review, the site-generated trips were distributed through the study area intersections. Trip distribution assumptions were analyzed for inbound and outbound trips. Trip distribution assumptions for the proposed development are provided in Figure 31 and Figure 32. Detailed trip assignments at each study intersection are shown in a later chapter of this report

Table 8: Summary of Mode Split Data at Comparable Sites

Information Source	Mode						
	SOV	Carpool	School Bus	Bike	Walk	Transit	Other
George Mason ES Safe Routes to School Study (2017)	32%		28%	4%	36%	---	---
McKinley ES Traffic Study - Student Travel Tally Arrival Results Average (April and October 2013)	40%	2%	33%	1%	23%	0%	1%
McKinley ES Traffic Study - Student Travel Tally Dismissal Results Average (April and October 2013)	39%	2%	32%	1%	25%	0%	1%
McKinley ES Traffic Study - Staff Survey Results (2013)	93%	4%	---	0%	1%	2%	0%
McKinley ES TIS Staff APS GO! Survey Results (2013)	93%	0%	---	0%	3%	3%	1%
Abingdon ES Traffic Study - Student Travel Survey Results (December 2014)	30%	1%	44%	1%	23%	1%	0%
Abingdon ES Traffic Study - Staff Travel Survey Results (December 2014)	91%	2%	---	0%	7%	0%	0%
Neighborhood ES APS GO! Student Tally Results (2016) (AM)	36%	2%	36%	2%	24%	0%	0%
Neighborhood ES APS GO! Student Tally Results (2016) (PM)	35%	3%	36%	2%	24%	0%	0%
Neighborhood ES APS GO! Staff Survey Results (2016)	84%	3%	---	2%	5%	6%	0%
McKinley and Swanson APS GO! Staff Survey Results (2016)	86%	3%	---	2%	7%	2%	0%

Table 9: Mode Split Assumptions

User Group	Mode					
	Drive	School Bus	Bike	Walk	Transit	Other
Students	32%	28%	4%	36%	0%	---
Employees	86%	0%	2%	7%	2%	3%

Table 10: Multimodal Trip Generation for Proposed Development Program

Mode	User Group	AM Peak Hour (6:45 AM - 7:45 AM)			PM Dismissal Peak Hour (2:00 PM - 3:00 PM)			Daily
		IB	*OB*	*Total*	*IB*	*OB*	*Total*	*Total*
Auto	Students	161 v/hr	161 v/hr	322 v/hr	117 v/hr	108 v/hr	225 v/hr	703 veh
	Employees	42 v/hr	1 v/hr	43 v/hr	3 v/hr	1 v/hr	4 v/hr	138 veh
	Total	**203 v/hr**	**162 v/hr**	**365 v/hr**	**120 v/hr**	**109 v/hr**	**229 v/hr**	**841 veh**
School Bus/Transit	Students	168 p/hr	0 p/hr	168 p/hr	0 p/hr	113 p/hr	113 p/hr	703 ppl
	Employees	1 p/hr	0 p/hr	1 p/hr	0 p/hr	0 p/hr	0 p/hr	3 ppl
	Total	**169 p/hr**	**0 p/hr**	**169 p/hr**	**0 p/hr**	**113 p/hr**	**113 p/hr**	**706 ppl**
Walk	Students	216 p/hr	0 p/hr	216 p/hr	0 p/hr	145 p/hr	145 p/hr	474 ppl
	Employees	3 p/hr	0 p/hr	3 p/hr	0 p/hr	0 p/hr	0 p/hr	11 ppl
	Total	**219 p/hr**	**0 p/hr**	**219 p/hr**	**0 p/hr**	**145 p/hr**	**145 p/hr**	**486 ppl**
Bike	Students	24 p/hr	0 p/hr	24 p/hr	0 p/hr	16 p/hr	16 p/hr	53 ppl
	Employees	1 p/hr	0 p/hr	1 p/hr	0 p/hr	0 p/hr	0 p/hr	3 ppl
	Total	**25 p/hr**	**0 p/hr**	**25 p/hr**	**0 p/hr**	**16 p/hr**	**16 p/hr**	**56 ppl**

Table 11: Net New Auto Trips

Program	AM Peak Hour (6:45 AM - 7:45 AM)			PM Dismissal Peak Hour (2:00 PM - 3:00 PM)			Daily
	IB	*OB*	*Total*	*IB*	*OB*	*Total*	*Total*
Existing	*109 v/hr*	*76 v/hr*	*185 v/hr*	*58 v/hr*	*51 v/hr*	*109 v/hr*	*439 veh*
Proposed	203 v/hr	162 v/hr	365 v/hr	120 v/hr	109 v/hr	229 v/hr	841 veh
Net New	**94 v/hr**	**86 v/hr**	**180 v/hr**	**62 v/hr**	**58 v/hr**	**120 v/hr**	**401 veh**

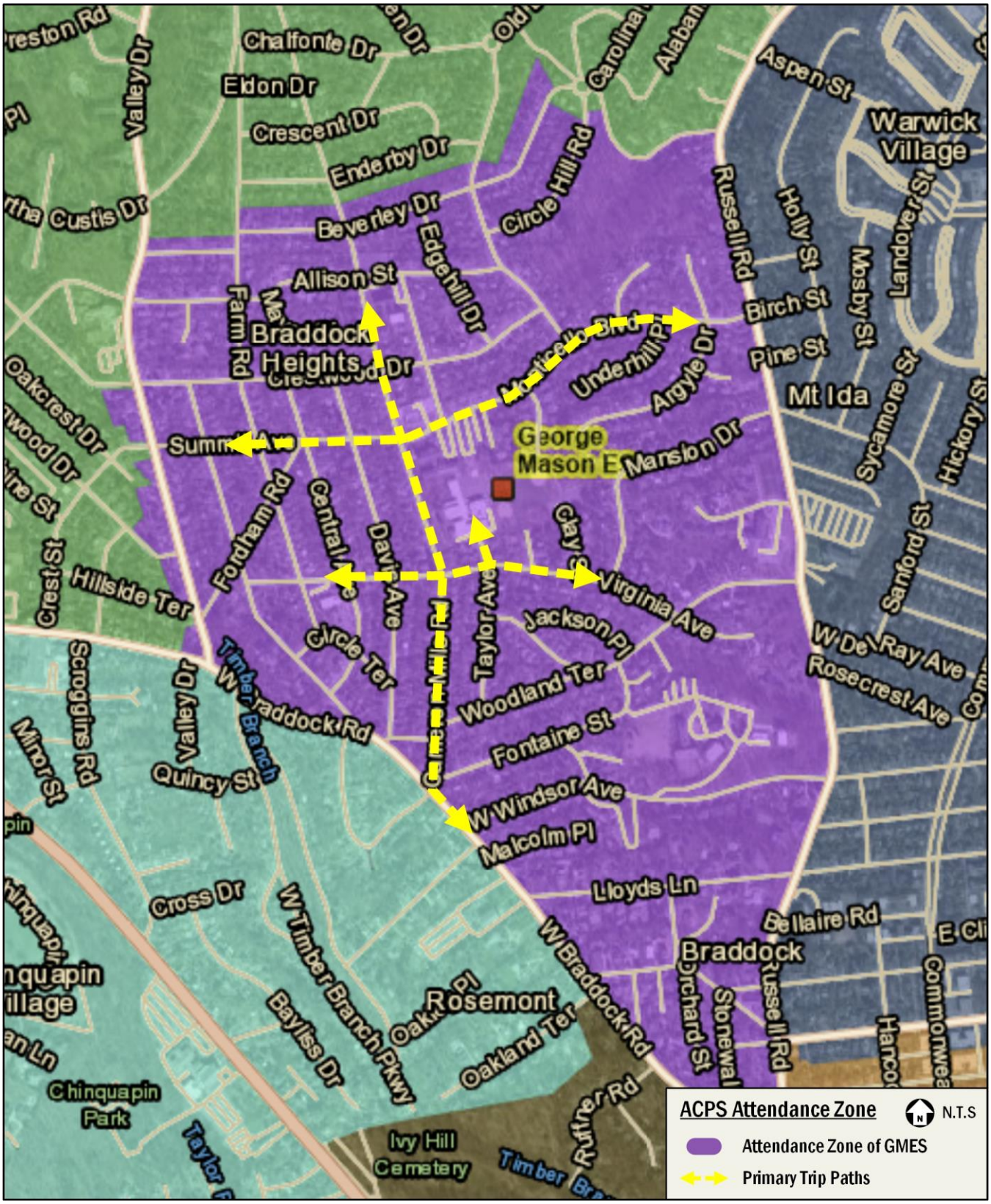

Figure 29: ACPS Attendance Zone

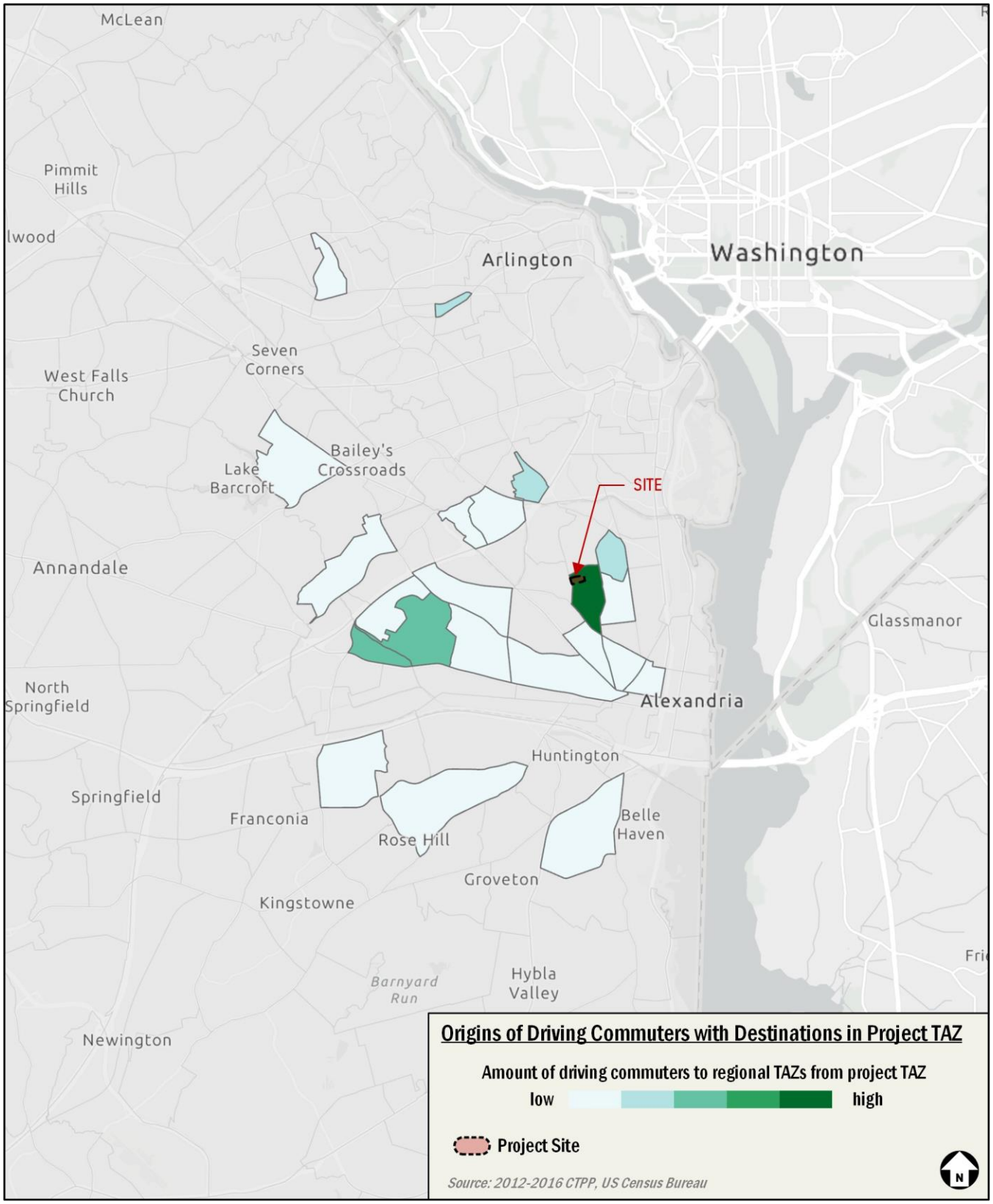

Figure 30: Origins of Driving Commuters with Destinations in Project TAZ

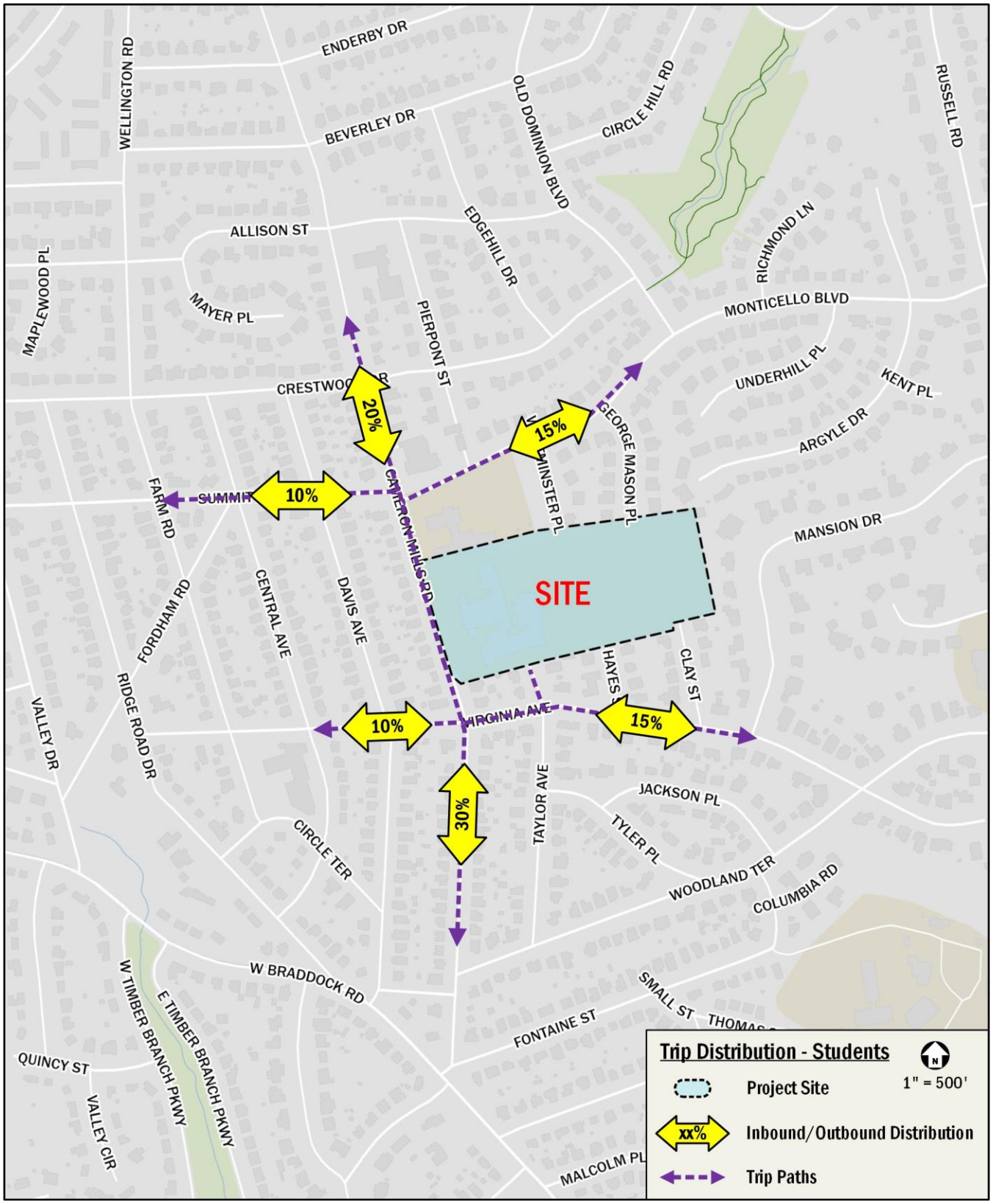

Figure 31: Inbound/Outbound Trip Distribution – Students

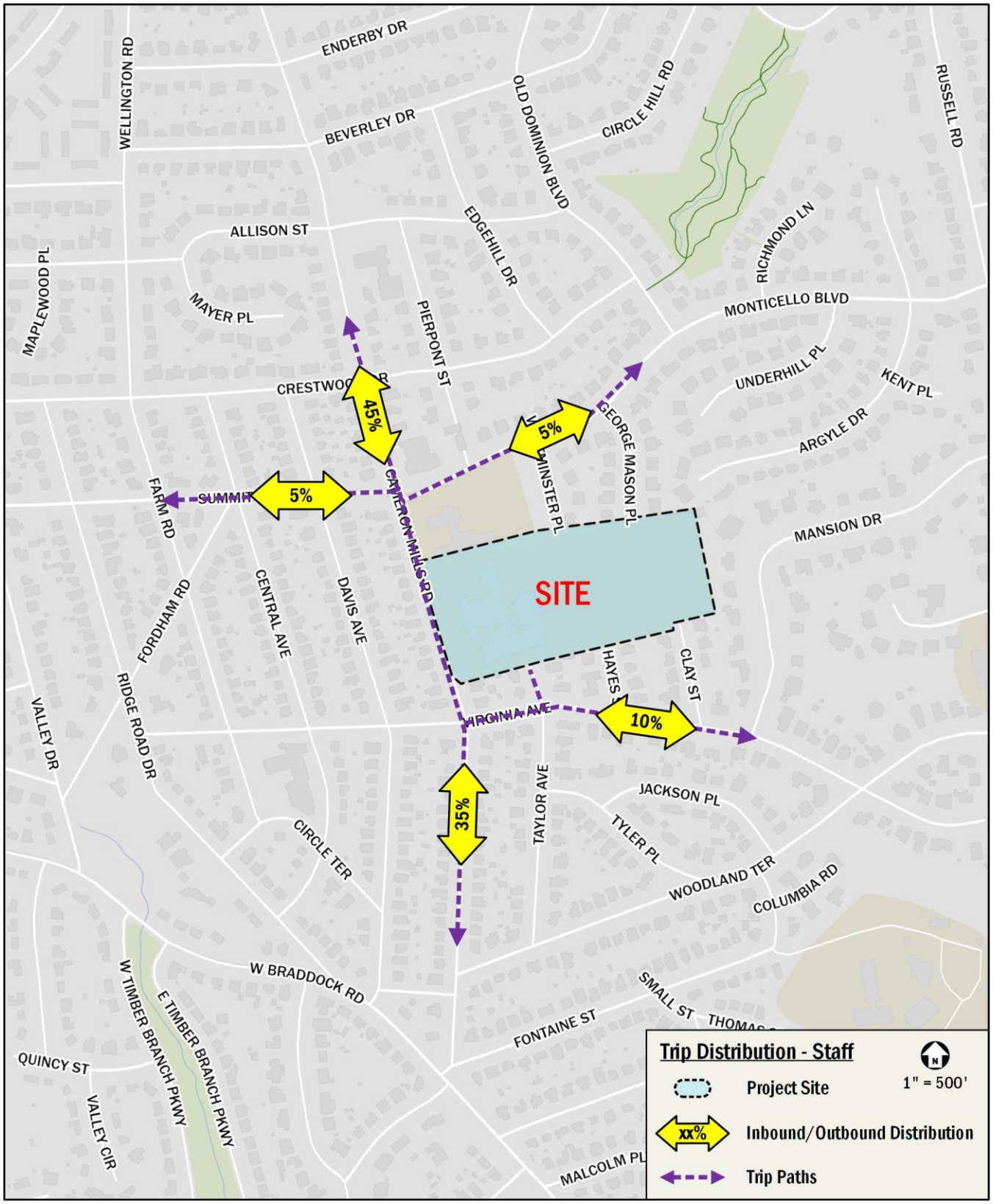

Figure 32: Inbound/Outbound Trip Distribution – Staff

Traffic Operations

This chapter provides a summary of an analysis of the existing and future roadway capacity of the study area for the 2027 analysis year. Included is an analysis of potential vehicular impacts of the George Mason Elementary School and a discussion of potential improvements.

The purpose of the capacity analysis is to:

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

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

- The capacity analyses show a LOS F at an intersection or any movement in the future where one does not exist in the background conditions;
- There is an increase in delay at any movement or overall intersection operating under LOS F of greater than 10 percent when compared to the background conditions; or
- The 95th percentile queue length in the future conditions exceeds the available capacity and increases by more than 150 feet compared to background conditions.

The following conclusions are reached within this chapter:

- There are no impacts requiring mitigation as a result of the proposed development during the Future (2027) under either peak hour.
- Overall, this report concludes that the proposed development will not have a detrimental impact on the surrounding transportation network.

Study Area, Scope, & Methodology

This section outlines the assumptions used to develop the existing and future roadway capacity analyses, including volumes, roadway geometries, and traffic operations. The scope of the analysis contained within this report was discussed with and approved by City of Alexandria staff. The general methodology of the analysis follows national and City of Alexandria guidelines on the preparation of transportation impact evaluations of site development.

Capacity Analysis Scenarios

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

For this project, however, no inherent traffic growth or background developments within the study area's roadway network were identified or assumed, as approved and vetted by the City of Alexandria. Consequently, the Background conditions are assumed to be the same as the Existing conditions, and therefore only the following two (2) scenarios were examined as part of the capacity analysis:

1. 2024 Existing Conditions
2. 2027 Future Conditions with the proposed development

Study Area

The study area of the analysis is a set of intersections where detailed capacity analyses are performed for the scenarios listed above. The set of intersections included are those intersections most likely to have potential impacts or require changes to traffic operations to accommodate the proposed development.

Based on the projected future trip generation and the location of the planned site access points, as agreed to in this report's scoping agreement, the following intersections were chosen for analysis:

1. Cameron Mills Road & Virginia Avenue
2. Taylor Avenue & Virginia Avenue
3. Cameron Mills Road & Summit Avenue/Monticello Boulevard
4. Pierpont Street & Monticello Boulevard
5. Church Driveway 1 (west) & Monticello Boulevard
6. Church Driveway 2 (east) & Monticello Boulevard
7. Cameron Mills Road & Parking Driveway (Future)
8. Cameron Mills Road & PUDO Driveway (Future)

Figure 4 shows the vehicular study area intersections. Roadway characteristics including classification, number of lanes, speed limit, the presence of on-street parking, average annual daily volumes (AADT) are outlined in Table 12.

Traffic Volume Assumptions

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

2024 Existing Traffic Volumes

The existing traffic volumes are comprised of turning movement count data, which was collected on Thursday, September 19, 2024, from 6:30 AM to 9:30 AM and 1:30 PM to 4:30 PM.

For all intersections, the weekday morning and weekday afternoon system peak hours were used to capture periods when school-related trips are anticipated to be higher. Based on the turning movement counts, the morning system peak hour was from 7:30 to 8:30 AM and the afternoon system peak hour was from 3:30 to 4:30 PM. The existing peak hour traffic volumes for intersections within the vehicular study area are shown in Figure 33. The existing turning movement counts are included in the Technical Attachments.

2027 Future Traffic Volumes with the Proposed Development

The 2027 Future Conditions traffic volumes consist of the 2024 Existing volumes with the addition of the traffic volumes generated by the proposed development (site-generated trips), as shown in Table 11.

As outlined in the previous chapter, trip distribution and assignments of site-generated traffic were primarily determined using the ACPS Attendance Zone map for student trips and CTPP TAZ data for staff trips. A summary of trip distribution assumptions is shown on Figure 31 and Figure 32. Trip distribution and assignment assumptions were vetted and approved by the City of Alexandria.

It is noted that the afternoon peak hour for school generated trips was 2:00 to 3:00 PM, whereas peak vehicular activity on the adjacent streets occurred during the period of 3:30 to 4:30 PM. For the development of 2027 Future Conditions volumes, the afternoon peak hour of school-generated trips were added to the 3:30-4:30 PM peak hour network volumes to provide a more conservative analysis.

Based on the trip distribution and assignment assumptions, site-generated trips were distributed though the study area intersections. The site trips for the proposed development are shown in Figure 34. The 2027 Future Traffic volumes (with the proposed development) are shown in Figure 35.

Geometry and Operations Assumptions

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

2024 Existing Geometry and Operations

The geometry and operations assumed in the existing conditions scenario are those present when the main data collection occurred. Gorove Slade made observations and confirmed the existing lane configurations and traffic controls at the intersections within the study area.

A description of the roadways within the study area is presented below in Table 12. The existing local roadway network including lane configurations and intersection control is detailed in and illustrated in Figure 36.

2027 Future Geometry and Operations Assumptions with the Proposed Development

The configurations and traffic controls for the 2027 Future Conditions were based on those for the 2024 Existing Conditions with the addition of the proposed development. Two (2) new intersections were added to provide vehicular access, including parking and pick-up/drop-off, to the site. The modifications of the roadway network as a result of the proposed development are as follows:

1. Cameron Mills Road and Parking Lot Driveway (Intersection #7) is a new access point that will provide unsignalized access to the proposed northern parking lot on the site. Each intersection approach is configured with the following:
    - The westbound approach (site driveway) will include a left/right lane.
    - The northbound approach will include a thru/right lane.
    - The southbound approach will include a left/thru lane.
2. Cameron Mills Road and PUDO Driveway (Intersection #8) is a new access point that will provide unsignalized access to a new pick-up/drop-off loop. Each intersection approach is configured with the following:
    - The westbound approach (site driveway) will include a left/right lane.
    - The northbound approach will include a thru/right lane.
    - The southbound approach will include a left/thru lane.

Lane configurations and traffic controls for the 2027 Future Conditions are shown in Figure 37.

Table 12: Existing Roadway Network

Roadway	Street Typology Functional Classification (VDOT & City of Alexandria)	Lanes	Speed (mph)	On-Street Parking	AADT (2022)
Cameron Mills Rd	Minor Collector	2	25	Yes	1,900
Summit Ave/Monticello Blvd	Major Collector	2	25	Yes	2,600
Virginia Ave	Local	2	25	Yes	Not Available
Pierpont St	Local	2	25	Yes	Not Available
Taylor Ave	Local	2	25	Yes	Not Available

Source: Virginia Department of Transportation (VDOT)

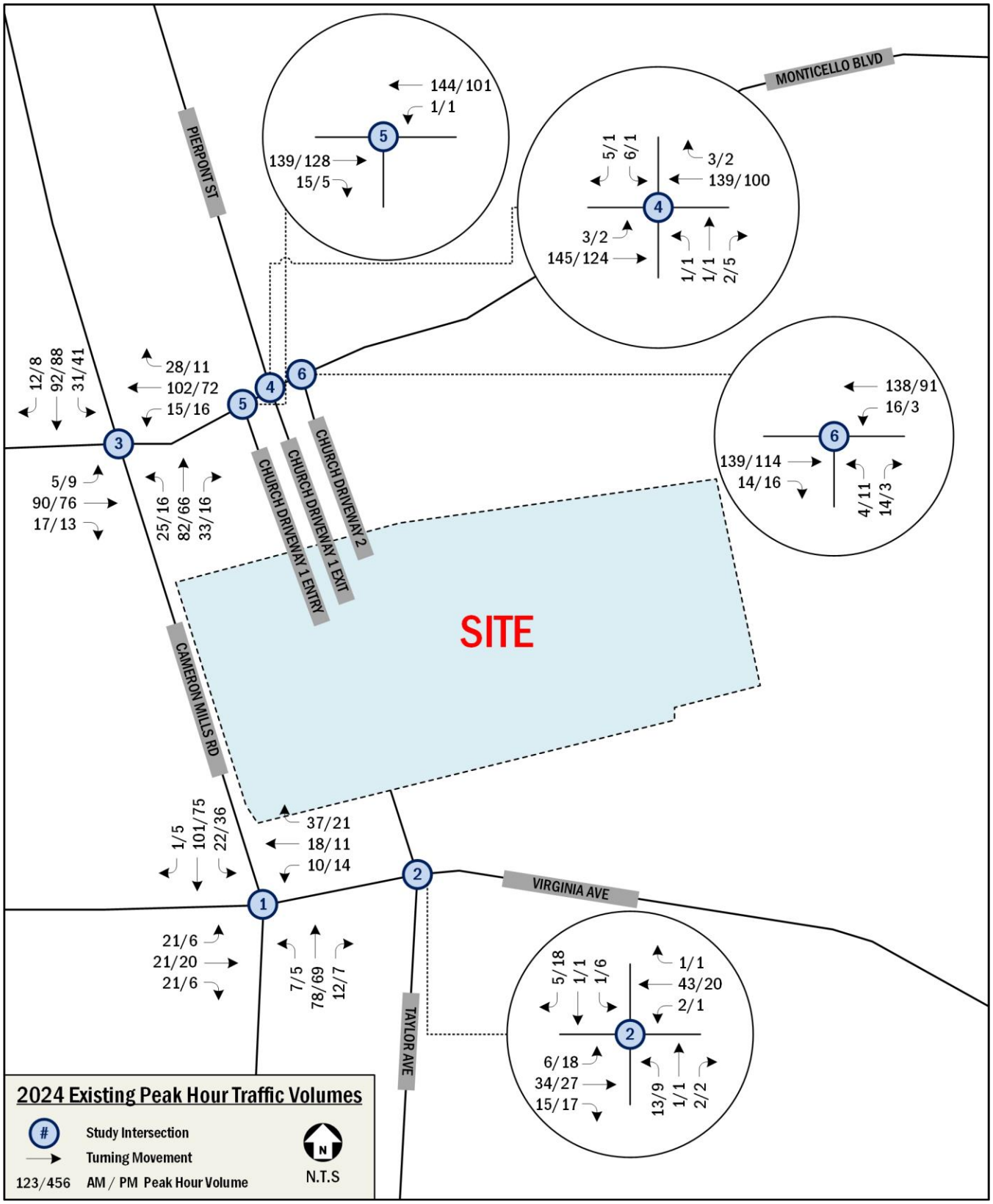

Figure 33: 2024 Existing Peak Hour Traffic Volumes

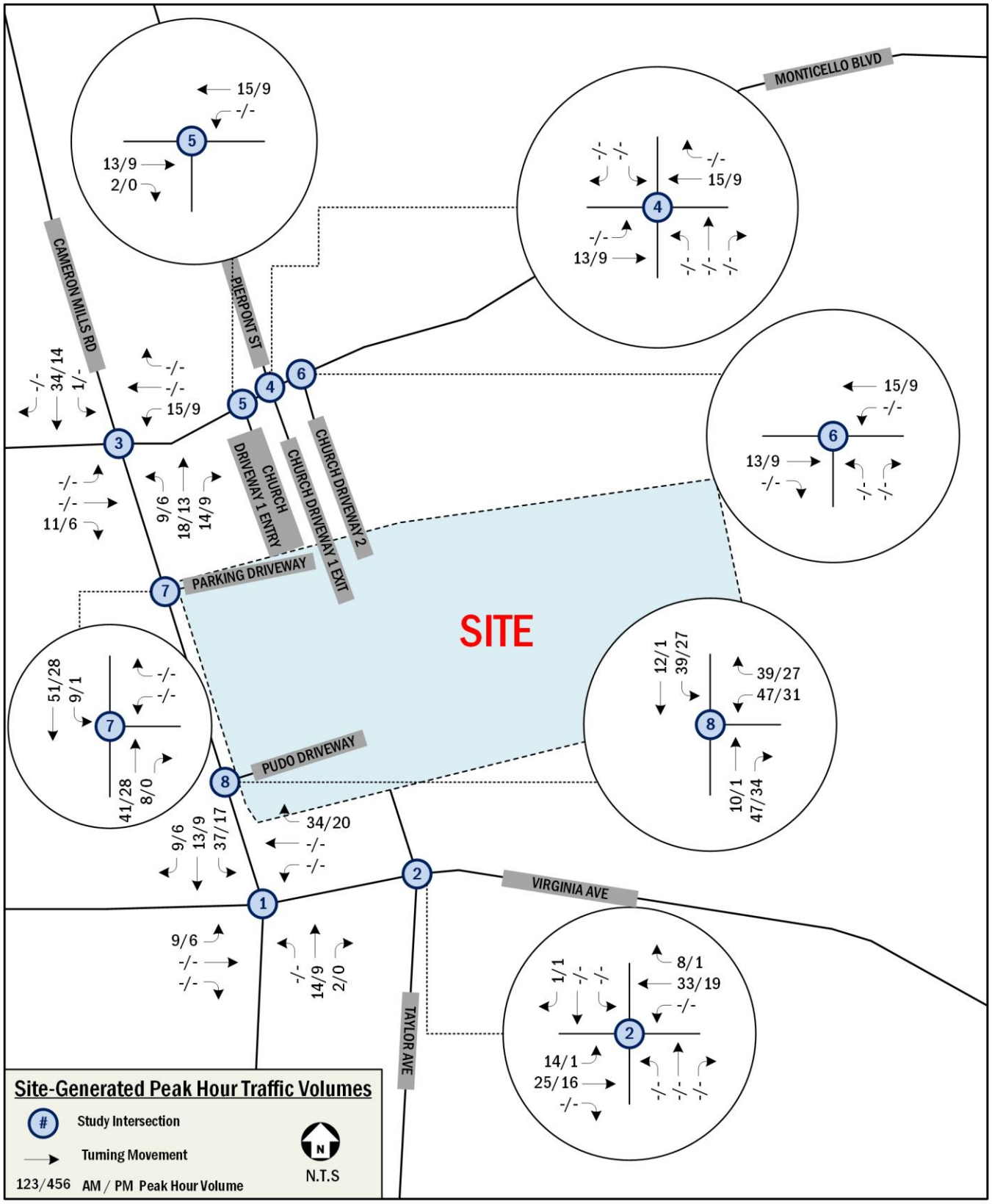

Figure 34: 2027 Site-Generated Peak Hour Traffic Volumes

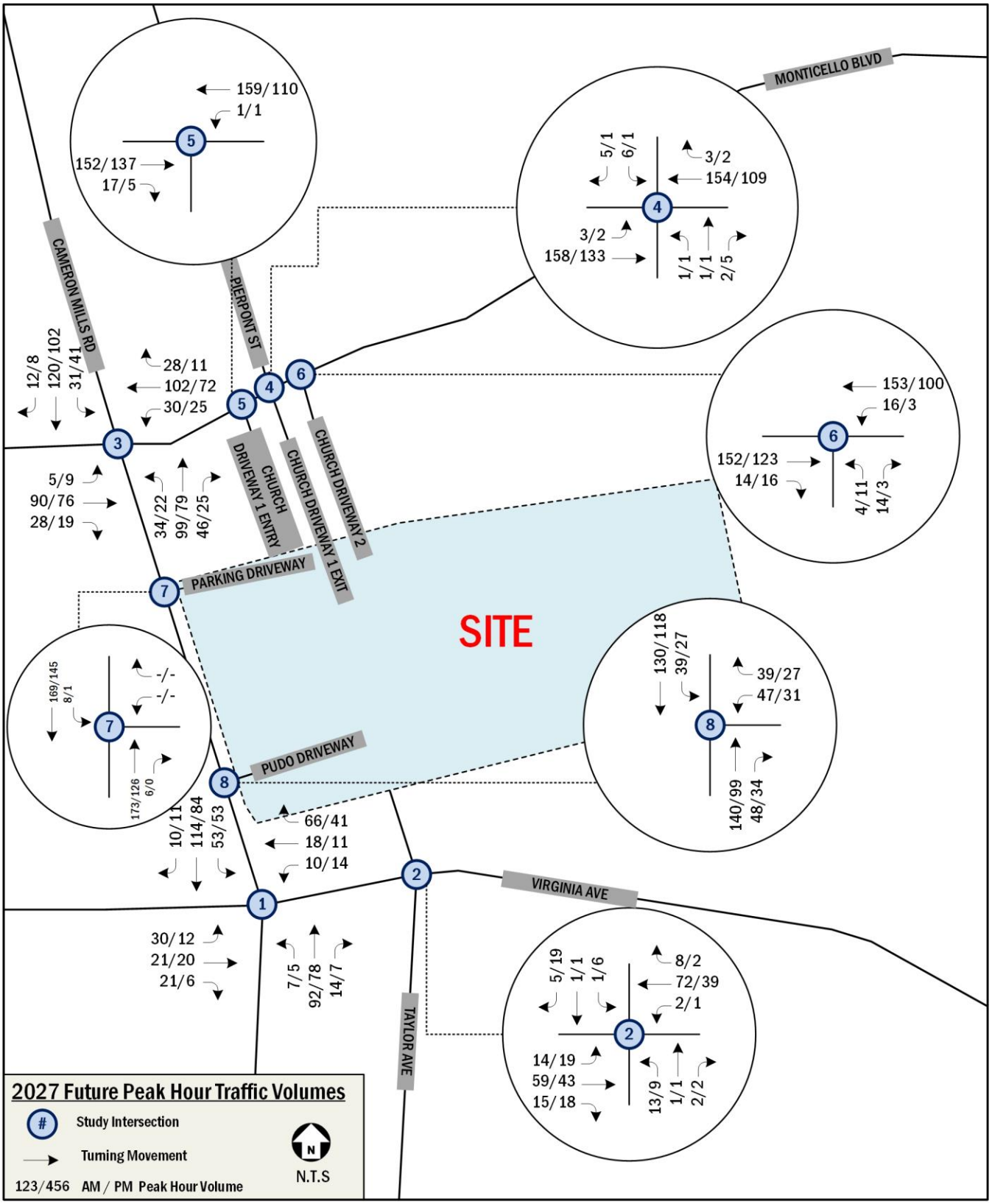

Figure 35: 2027 Future Peak Hour Traffic Volumes (with proposed development)

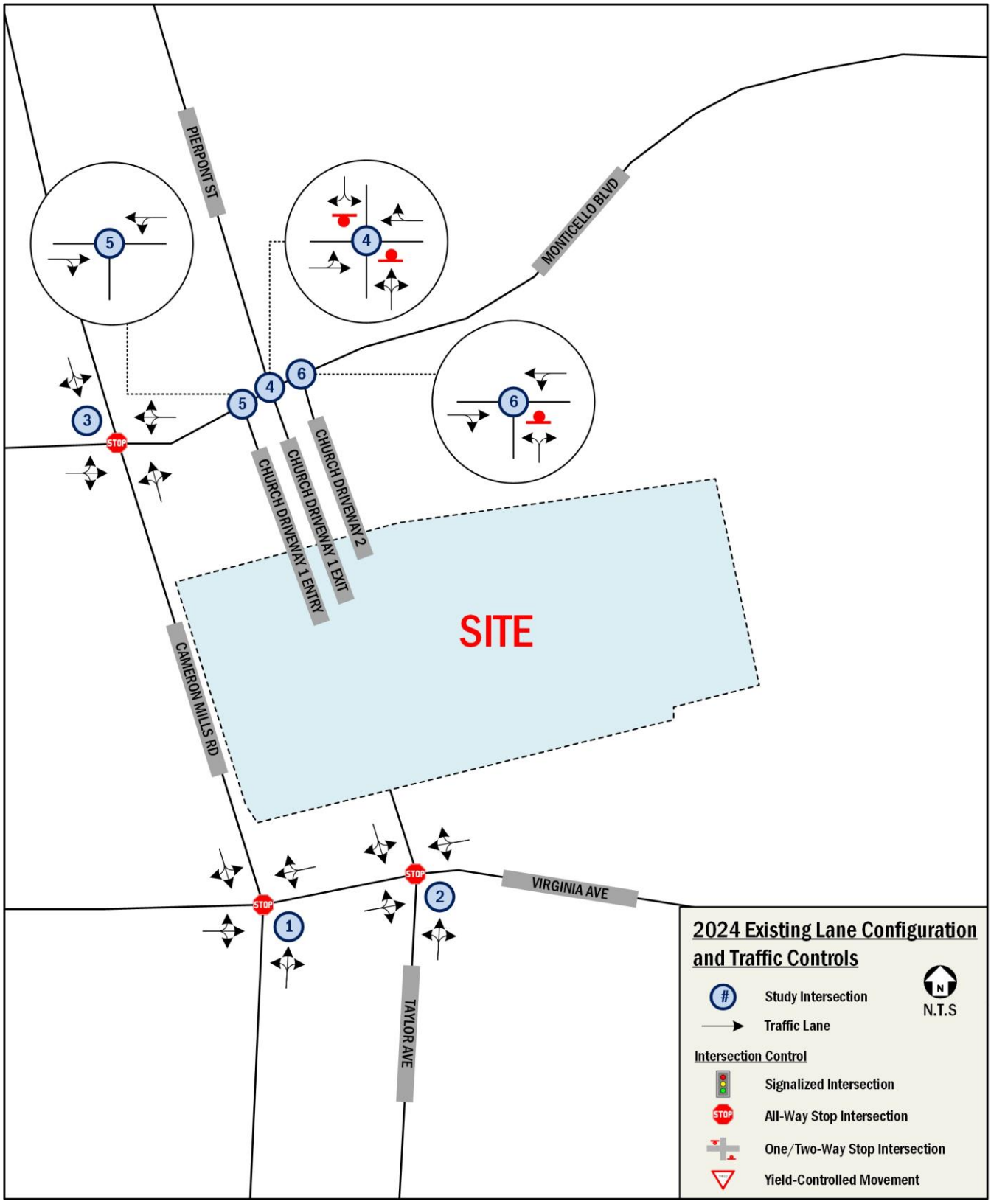

Figure 36: 2024 Existing Lane Configurations and Traffic Controls

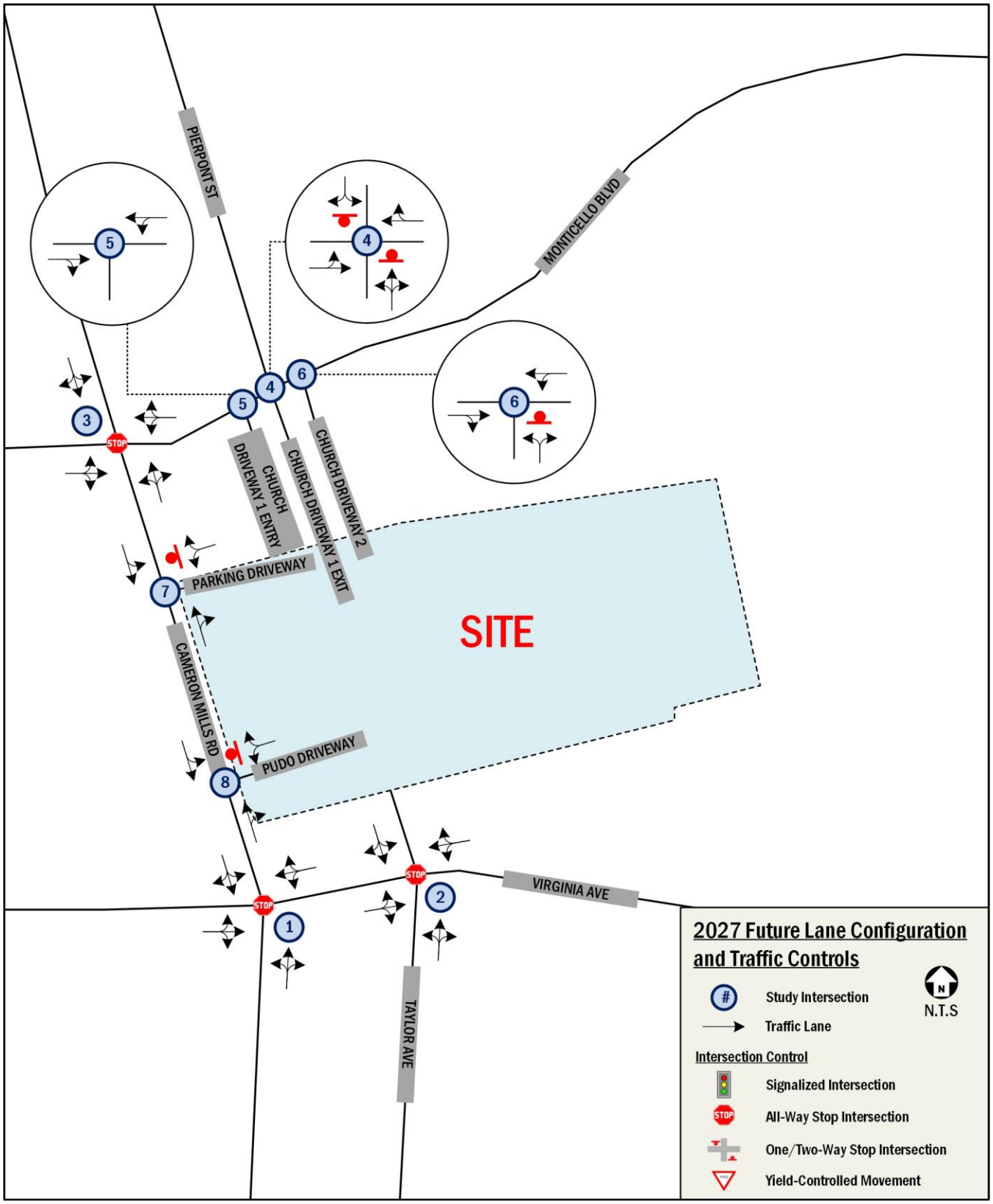

Figure 37: 2027 Future Lane Configurations and Traffic Controls

Vehicular Analysis Results

Intersection Capacity Analysis

Intersection capacity analyses were performed at the intersections contained within the study area during the morning and afternoon peak hours. *Synchro*, version 11 was used to analyze the study intersections based on the *Highway Capacity Manual (HCM) 2000* methodology and includes level of service (LOS), delay, and queue length comparisons for the turning movements analyzed. Both signalized and unsignalized intersections were evaluated using HCM 2000.

Peak Hour Factors

Peak hour factors were applied in accordance with *Traffic Operations and Safety Analysis Manual 2.0* prepared by VDOT dated February 2020. As such, peak hour factors by approach between 0.85 and 1.00 were used for the existing year analysis. Where the calculated peak hour factor based on the existing turning movement counts was greater than 0.85, the calculated factor was applied. Where the calculated factor was 0.85 or less, a factor of 0.85 was applied.

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

Heavy Vehicle Percentages

A heavy vehicle percentage of 2% was used for existing movements unless determined to be higher from the turning movement counts, in which case the higher percentage was used. A default heavy vehicle percentage of 2% was used for any new movements. A maximum heavy percentage of 10% was used except if it was a bus only lane, then the calculated percentage was used.

Level of Service and Delay

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each movement. 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 City of Alexandria; although LOS F is generally accepted in urbanized areas if vehicular improvements would be a detriment to safety or to 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 average delay of each movement and LOS is shown for the signalized intersections in addition to the overall average delay and intersection LOS grade. The HCM does not give guidelines for calculating the average delay for a two-way stop-controlled intersection, as the approaches without stop signs would technically have no delay. Detailed LOS descriptions and the analysis worksheets are contained in the Technical Attachments.

Queuing Analysis

In addition to the capacity analyses, a queuing analysis was performed at the study intersections. The queuing analysis was performed using *Synchro* software. The 50th percentile and 95th percentile queue lengths are shown for each lane group at the study area signalized intersections. The 95th percentile queue is the maximum back of queue on a median cycle. 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 2000 calculations. For unsignalized, all-way stop-controlled intersections, no queues are reported based on HCM 2000 calculations. Queuing analysis worksheets are contained in the Technical Attachments.

Existing Analysis Results

The Existing Conditions results of the intersection capacity analyses for the AM and PM peak hours are expressed in level of service (LOS) and delay (seconds per vehicle) per movement and presented in Table 13. The capacity analysis results indicate that all intersections operate at acceptable LOS (LOS E or better) under the Existing Conditions.

The Existing Conditions queuing results for the AM and PM peak hours are expressed by movement are presented in Table 14. The 95th percentile queues at all lane groups at study area intersections do not exceed the available storage length in Existing Conditions.

2027 Future Analysis Results with the Proposed Development

The Future (2027) results of the intersection capacity analyses for the AM and PM peak hours are expressed in level of service (LOS) and delay (seconds per vehicle) per movement and presented in Table 13. The capacity analysis results indicate that

all intersections operate at acceptable LOS (LOS E or better) under the Future (2027) Conditions.

The Future (2027) queuing results for the AM and PM peak hours expressed by movement are presented in Table 14. The 95th percentile queues at all lane groups at study area intersections do not exceed their available storage length in the Future (2027) Conditions.

2027 Future Mitigations

Based on City of Alexandria standards or as outlined in the approve scoping document, the proposed development is considered to have an impact at an intersection if any of the following conditions are met:

- The capacity analyses show a LOS E or F at an intersection or any movement in the future where one does not exist the background conditions;
- There is an increase in delay at any movement or overall intersection operating under LOS E or F of greater than 10 percent when compared to the background conditions; or
- The 95th percentile queue length in the future conditions exceeds the available capacity and increases by more than 150 feet compared to background conditions.

Following these guidelines, no mitigation measures are required at any study intersections under Future (2027) Conditions.

Table 13: Capacity Analysis Results

Intersection and Movement	Existing (2024)				Future (2027)			
	AM Peak		*PM Peak*		*AM Peak*		*PM Peak*	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Cameron Mills Rd & Virginia Ave								
Eastbound LTR	8.0	A	7.6	A	8.4	A	7.9	A
Westbound LTR	7.8	A	7.6	A	8.2	A	7.7	A
Northbound LTR	8.2	A	7.9	A	8.6	A	8.0	A
Southbound LTR	8.5	A	8.1	A	9.3	A	8.4	A
2. Cameron Mills Rd & Taylor Ave								
Eastbound LTR	7.2	A	7.3	A	7.5	A	7.4	A
Westbound LTR	7.3	A	7.2	A	7.5	A	7.3	A
Northbound LTR	7.4	A	7.3	A	7.6	A	7.3	A
Southbound LTR	6.8	A	6.9	A	7.0	A	6.6	A
3. Cameron Mills Rd & Summit Ave/Monticello Blvd								
Eastbound LTR	9.0	A	8.4	A	9.5	A	8.5	A
Westbound LTR	9.3	A	8.4	A	10.0	A	8.7	A
Northbound LTR	9.3	A	8.4	A	10.1	A	8.5	A
Southbound LTR	9.3	A	8.7	A	10.0	A	9.0	A
4. Monticello Blvd & Pierpont St/Church Driveway 1 Exit								
Eastbound LT	0.2	A	0.1	A	0.2	A	0.1	A
Westbound TR	0.0	A	0.0	A	0.0	A	0.0	A
Northbound LTR	10.5	B	9.5	A	10.7	B	9.6	A
Southbound LR	10.8	B	9.7	A	11.1	B	9.8	A
5. Monticello Blvd & Church Driveway 1 Entry								
Eastbound TR	0.0	A	0.0	A	0.0	A	0.0	A
Westbound LT	0.1	A	0.1	A	0.0	A	0.1	A
6. Monticello Blvd & Church Driveway 2								
Eastbound TR	0.0	A	0.0	A	0.0	A	0.0	A
Westbound LT	0.9	A	0.3	A	0.8	A	0.3	A
Northbound LR	9.8	A	9.9	A	9.9	A	10.0	B
7. Cameron Mills Rd & Parking Lot Driveway								
Westbound LR	--	--	--	--	0.0	A	0.0	A
Northbound TR	--	--	--	--	0.0	A	0.0	A
Southbound LT	--	--	--	--	0.4	A	0.1	A
8. Cameron Mills Rd & PUDO Driveway								
Westbound LR	--	--	--	--	11.1	B	10.1	B
Northbound TR	--	--	--	--	0.0	A	0.0	A
Southbound LT	--	--	--	--	2.0	A	1.5	A

Table 14: Queuing Analysis Results

Intersection and Lane Group	Storage Length (ft)	Existing (2024)				Future (2027)			
		AM Peak		*PM Peak*		*AM Peak*		*PM Peak*	
		50th	95th	50th	95th	50th	95th	50th	95th
1. Cameron Mills Rd & Virginia Ave									
Eastbound LTR	225	--	--	--	--	--	--	--	--
Westbound LTR	225	--	--	--	--	--	--	--	--
Northbound LTR	850	--	--	--	--	--	--	--	--
Southbound LTR	790	--	--	--	--	--	--	--	--
2. Cameron Mills Rd & Taylor Ave									
Eastbound LTR	230	--	--	--	--	--	--	--	--
Westbound LTR	220	--	--	--	--	--	--	--	--
Northbound LTR	250	--	--	--	--	--	--	--	--
Southbound LTR	160	--	--	--	--	--	--	--	--
3. Cameron Mills Rd & Summit Ave/Monticello Blvd									
Eastbound LTR	225	--	--	--	--	--	--	--	--
Westbound LTR	215	--	--	--	--	--	--	--	--
Northbound LTR	790	--	--	--	--	--	--	--	--
Southbound LTR	365	--	--	--	--	--	--	--	--
4. Monticello Blvd & Pierpont St/Church Driveway 1 Exit									
Eastbound LT	215	--	0	--	0	--	0	--	0
Westbound TR	200	--	0	--	0	--	0	--	0
Northbound LTR	185	--	0	--	1	--	0	--	1
Southbound LR	300	--	2	--	0	--	2	--	0
5. Monticello Blvd & Church Driveway 1 Entry									
Eastbound TR	180	--	0	--	0	--	0	--	0
Westbound LT	200	--	0	--	0	--	0	--	0
6. Monticello Blvd & Church Driveway 2									
Eastbound TR	80	--	0	--	0	--	0	--	0
Westbound LT	160	--	1	--	0	--	1	--	0
Northbound LR	225	--	2	--	2	--	2	--	2
7. Cameron Mills Rd & Parking Lot Driveway									
Westbound LR	450	--	--	--	--	--	0	--	0
Northbound TR	290	--	--	--	--	--	0	--	0
Southbound LT	255	--	--	--	--	--	0	--	0
8. Cameron Mills Rd & PUDO Driveway									
Westbound LR	95	--	--	--	--	--	12	--	7
Northbound TR	145	--	--	--	--	--	0	--	0
Southbound LT	290	--	--	--	--	--	2	--	2

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.

Summary and Conclusions

This report concludes that the proposed development will not have a detrimental impact on the surrounding transportation network, assuming that all planned site design elements are implemented.

The project site is well-connected via I-395 and principal arterials such as King Street (VA-7). These arterials ultimately create connections to the Capital Beltway (I-495) and I-66. Cameron Mills Road and Taylor Avenue bring vehicular traffic directly to the site.

The proposed development will expand the school's capacity by increasing the current enrollment from 320 to a maximum of 670 and the staff count from 65 to 80.

The proposed project will provide 56 on-site parking spaces dedicated for school use in two (2) on-site parking lots. The proposed parking spaces are expected to meet the practical needs of the site.

Three (3) vehicular access points are proposed, with two (2) for the on-site parking lots and one (1) for the pick-up/drop-off area. The access point for the northern parking lot and the access point for the PUDO area are provided on Cameron Mills Road, and the access point for the southern parking lot is located on Taylor Avenue.

Additionally, the proposed project will provide two (2) loading berths in the south parking lot. The number of on-site loading facilities will accommodate the practical needs of the site.

A capacity analysis was developed to compare the existing roadway network to the future roadway network with the proposed development. Intersection capacity analyses were performed for the morning and afternoon peak hours at study area intersections, corresponding to the periods with the greatest school-related arrival and dismissal traffic. Synchro version 11 was used to analyze the study intersections based on the *Highway Capacity Manual (HCM) 2000* methodology.

Traffic projections for 2027 are based on existing volumes and traffic generated by the proposed development.

Future traffic operations in the study area are acceptable overall. The Future 2027 conditions analysis shows that all intersections and movements operate at an acceptable level of service (LOS E or better) during the morning and afternoon peak hours. The capacity analysis results also show that all intersections have 95th percentile queues that do not exceed the available storage length in one or more peak hours in future conditions. There are no impacts requiring mitigation as a result of the project.

The proposed development has many positive elements contained within its design that minimize potential transportation impacts:

- The proposed development's proximity to a DASH bus line.
- Improvements to the pedestrian facilities adjacent and internal to the site that provide ample circulation to and around the property.
- Existing open space to remain at the east side of the site which will promote community connections and provide an enhanced pedestrian environment surrounding the site.
- Installation of short-term bicycle parking spaces around the perimeter of the site, in highly visible and accessible locations.
- Provision of on-site parking, which will meet the practical needs of the proposed development
- Provision of a bus pick-up/drop-off zone on Cameron Mills Road which will accommodate space for six (6) buses. The section of Cameron Mills Road will be widened to provide this bus loading/unloading zone, eliminating the need to switch which side of the street has parking restrictions during arrival and dismissal.
- Provision of a pick-up/drop-off (PUDO) loop, which will accommodate around half of the maximum queue expected, balancing the needs of not encouraging parents to drive students to school, while also not having students being picked-up/dropped-off too far from the school in unsafe locations.

As noted above, this report concludes that the proposed development **will not have a detrimental impact** on the surrounding transportation network.