

COMPREHENSIVE TRANSPORTATION REVIEW

8TH & O STREET NW PUD

WASHINGTON, DC

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EXECUTIVE SUMMARY

The following report is a Comprehensive Transportation Review (CTR) for the 8th & O Street NW Planned Unit Development (PUD). This report reviews the transportation aspects of the project's PUD application. The Zoning Commission Case Number is 16-24.

This study reviews the design of the project and evaluates whether the project will generate a detrimental impact to the surrounding transportation network. This evaluation is based on a review of existing and future multi-modal functionality. This report concludes that **the project will not have a detrimental impact** to the surrounding transportation network assuming that all planned site design elements are implemented.

Proposed Project

The 8th & O Street NW site is currently occupied by a surface parking lot, located approximately two blocks from the Mount Vernon Square Metrorail Station. The site is generally bound by O Street to the north, a public alley to the west, adjacent properties to the south, and 8th Street to the east.

The application plans to develop the site into a mixed-use development including approximately 80 residential dwelling units, approximately 3,500 square feet of retail space, and approximately 1,200 square feet of office space for the adjacent church. The development will also include an underground parking facility containing approximately 23 parking spaces serving the residential and retail uses. No on-site parking will be supplied for the church office use.

Parking will be accessed from an existing alley that links O Street and N Street west of the site via a single entrance. Loading will also be accessible via the existing alley. The parking and loading provided by the development will adequately serve the demands set forth by the development program.

Pedestrian facilities along the perimeter of the site will be improved to include sidewalk and buffer widths that meet or exceed DDOT requirements. The parking garage will supply 27 secure long-term bicycle parking spaces which meets the current zoning requirements. The development will also supply short-term bicycle parking in the form of U-racks along the perimeter of the site.

Multi-Modal Impacts and Recommendations

Transit

The site is served by regional and local transit services such as Metrorail and Metrobus. The site is 0.3 miles from the Mount Vernon Square Metrorail Station portal at 7th Street NW and M Street NW, and many Metrobus stops are located within a few blocks of the site along 7th Street, 9th Street, and P Street.

Although the development will be generating new transit trips, existing facilities have enough capacity to handle the new trips.

Pedestrian

The site is surrounded by a well-connected pedestrian network. Most roadways within a quarter-mile radius provide sidewalks and acceptable crosswalks and curb ramps, particularly along the primary walking routes.

The development will provide sidewalk facilities along the perimeter of the site that meet or exceed DDOT requirements.

Bicycle

The site is surrounded by several bicycle facilities such as bike lanes on 7th Street, 10th Street, 5th Street, Q Street, and R Street. These bike facilities provide access to other major bike connections such as cycle tracks on 15th Street, M Street, and L Street. Multiple Capital Bikeshare stations are located within a quarter-mile of the site.

On site, the development will meet requirements for short-term bicycle parking and secure long-term bicycle parking. Although the development will be generating new bicycle trips, existing facilities have enough capacity to handle the new trips.

Vehicular

The site is well-connected to regional roadways such as I-395 primary and minor arterials such as Rhode Island Avenue and 7th Street, and a network of collector and local roadways.

In order to determine if the proposed development will have a negative impact on this transportation network, this report projected future conditions with and without the development and performed analyses of intersection delays. These delays were compared to the acceptable levels set forth by DDOT standards. The analyses concluded that the planned development will not have adverse impacts to the surrounding transportation network. This outcome is consistent with the fact that projected future trips were similar in magnitude to existing trips.



INTRODUCTION

This report reviews the transportation elements of the 8th & O Street NW development, Zoning Case number 16-24. The, shown in Figure 1 and Figure 2, is located in the Logan Circle – Shaw neighborhood in northwest DC.

The purpose of this report is to:

1. Review the transportation elements of the development site plan and demonstrate that the site conforms to DDOT’s general policies of promoting non-automobile modes of travel and sustainability.
2. Provide information to the District Department of Transportation (DDOT) and other agencies on how the development of the site will influence the local transportation network. This report accomplishes this by identifying the potential trips generated by the site on all major modes of travel and where these trips will be distributed on the network.
3. Determine if development of the site will lead to adverse impacts on the local transportation network. This report accomplishes this by projecting future conditions with and without development of the site and performing analyses of vehicular delays. These delays are compared to the acceptable levels of delay set by DDOT standards to determine if the project will negatively impact the study area. The report discusses what improvements to the transportation network are needed to mitigate adverse impacts.

PROPOSED PROJECT

The proposed development is located at 8th Street and O Street, NW, and is currently occupied by a surface parking lot. The site will be redeveloped to include approximately 80 residential dwelling units, approximately 3,500 square feet of retail space, and approximately 1,200 square feet of office space with an underground parking facility containing approximately 23 parking spaces.

CONTENTS OF STUDY

This report contains nine sections as follows:

- Study Area Overview

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

- Project Design

This section reviews the transportation components of the project, including the site plan and access. This chapter also contains the proposed Transportation Demand Management (TDM) plan for the site.

- Trip Generation

This section outlines the travel demand of the proposed project. It summarizes the proposed trip generation of the project.

- Traffic Operations

This section provides a summary of the existing roadway facilities and an analysis of the existing and future roadway capacity in the study area. This section highlights the vehicular impacts of the project, and presents recommendations as needed.

- Transit

This section summarizes the existing and future transit service adjacent to the site, reviews how the project’s transit demand will be accommodated, outlines impacts, and presents recommendations as needed.

- Pedestrian Facilities

This section summarizes existing and future pedestrian access to the site, reviews walking routes to and from the project site, outlines impacts, and presents recommendations as needed.

- Bicycle Facilities

This section summarizes existing and future bicycle access to the site, reviews the quality of cycling routes to and from the project site, outlines impacts, and presents recommendations as needed.

- Safety/Crash Analysis

This section reviews the potential safety impacts of the project. This includes a review of crash data at intersections in the study area and a qualitative discussion on how the development will influence safety.

- Summary and Conclusions

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

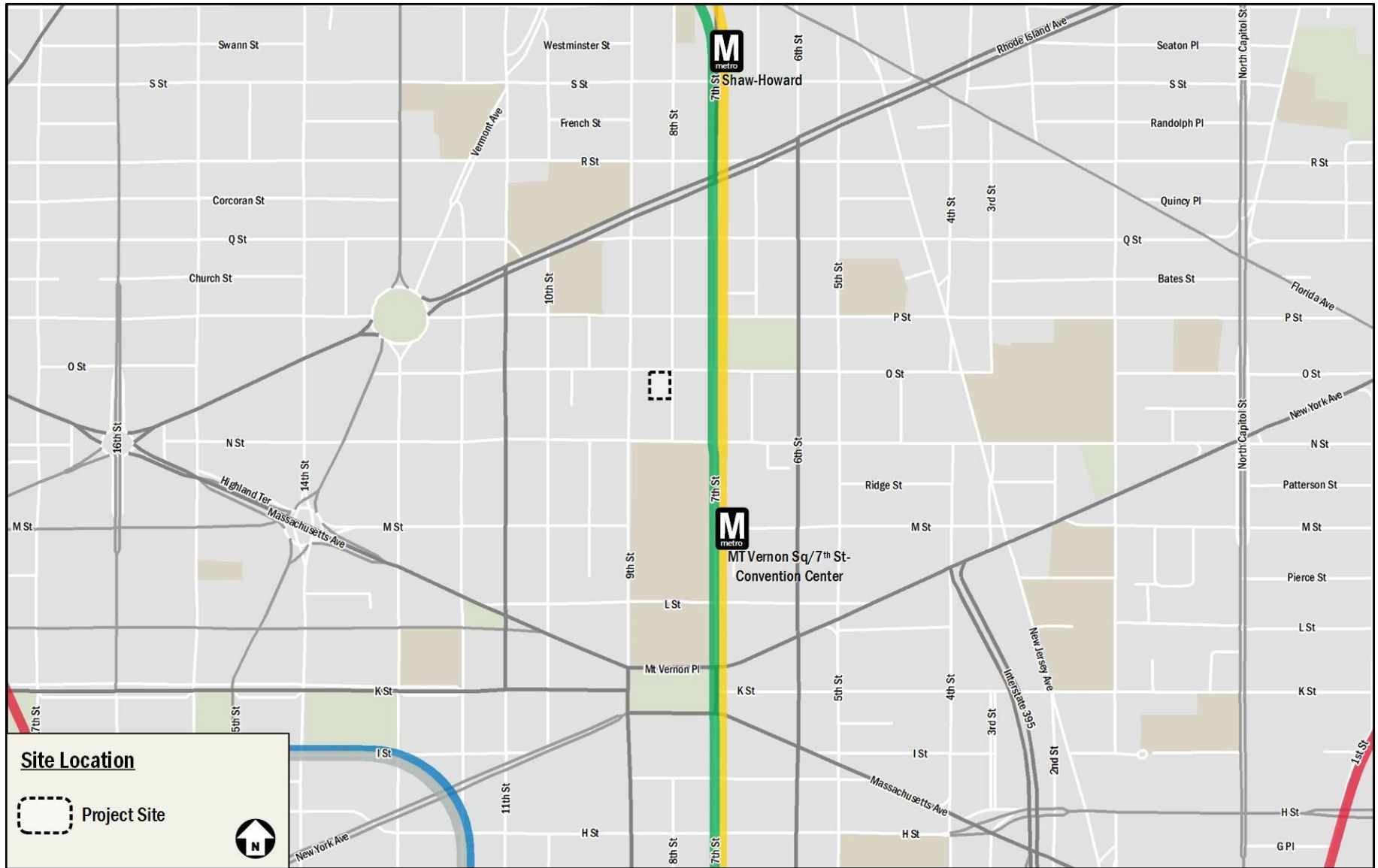


Figure 1: Site Location



Figure 2: Site Aerial



STUDY AREA OVERVIEW

This section reviews the study area and includes an overview of the site location, including a summary of the major transportation characteristics of the area and of future regional projects.

The following conclusions are reached within this chapter:

- The site is surrounded by an extensive regional and local transportation system that will connect the residents, employees, and patrons to the proposed development.
- The site is well-served by public transportation with access to Metrorail, and several local and regional Metro bus lines.
- There is existing bicycle infrastructure including several bike lanes and shared lanes in the vicinity of the site.
- Pedestrian conditions are generally good, particularly along anticipated major walking routes.

MAJOR TRANSPORTATION FEATURES

Overview of Regional Access

The 8th & O Street NW site has ample access to regional vehicular- and transit-based transportation options, as shown in Figure 4, that connect the site to destinations within the District, Virginia, and Maryland.

The site is accessible from several primary arterials such as 7th Street, Rhode Island Avenue, New York Avenue, and Massachusetts Avenue, as well as Interstate 395. The highways and interstates create connectivity to the Capital Beltway (I-495) that surrounds Washington, DC and its inner suburbs. All of these roadways bring vehicular traffic within half-mile of the site, at which point arterials and local roads can be used to access the site directly.

Along this site there are several local and regional bus stops that connect the city limits with the innermost roads of Washington, DC. The multiple bus route options allow for more frequent bus pickups, and specified travel destination options, as shown in Figure 5.

The 8th & O Street NW site is located 0.3 miles from the Mount Vernon Square Metrorail station which serves the Green and Yellow lines which provide connections to areas in the District, Virginia, and Maryland. The Green Line connects Greenbelt

with Branch Avenue while providing access to the District core. The Yellow Line connects Greenbelt to Huntington as well as Franconia-Springfield while providing access to the District core. In addition, the Green and Yellow Lines provide connections to all additional Metrorail lines allowing for access to much of the DC Metropolitan area.

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

Overview of Local Access

There are several local transportation options near the site that serve vehicular, transit, walking, and cycling trips, as shown on Figure 5.

The site is served by a local vehicular network that includes several minor arterials such as 9th Street and Q Street. In addition, there is an existing network of connector and local roadways that provide access to the site.

The Metrobus system provides local transit service in the vicinity of the site, including a connection to Union Station which acts as a primary hub for Amtrak, VRE, and Marc services. As shown in Figure 5, there are 4 bus routes that service the site. In the vicinity of the site the bus routes travel primarily along 7th Street, P Street, 9th Street, and 11th Street. These bus routes connect the site to many areas of the District.

There are existing bicycle facilities that connect the site to areas within the District. North-south connectivity is primarily provided by bike lanes on 7th Street, 10th Street, and 5th Street. East-west connectivity is primarily provided by bike lanes along Q Street and R Street. These bike facilities provide access to other major bike facilities such as the cycle tracks on 15th Street, M Street, and L Street.

In the vicinity of the site, most roadways provide sidewalks with crosswalks present at most intersections. Anticipated pedestrian routes, such as those to public transportation stops, retail zones, and community amenities provide acceptable pedestrian facilities. A detailed review of existing and proposed pedestrian access and infrastructure is provided in a later section of this report.

Overall, the 8th & O Street NW site is surrounded by an expansive local transportation network that allows for efficient



transportation options via transit, bicycle, walking, or vehicular modes.

Car-sharing

Four car-sharing companies provide service in the District: Zipcar, Enterprise Carshare, Maven, and Car2Go. All four services are private companies that provide registered users access to a variety of automobiles. Of these, Zipcar has designated spaces for their vehicles close to the site. There are four Zipcar car-share locations within a half-mile of the site. Table 1 breaks down the different locations that are made available to the public.

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

Walkscore

Walkscore.com is a website that provides scores and rankings for the walking, biking, and transit conditions within neighborhoods of the District. Based on this website the planned development is located in the Logan Circle-Shaw neighborhood. The project location itself has a walk score of 95 (or “Walker’s Paradise”), a transit score of 91 (or “Rider’s Paradise”), and a bike score of 93 (or “Biker’s Paradise”). Figure 3 shows the neighborhood borders in relation to the site location and displays a heat map for walkability and bikeability.

The site is situated in an area with good walk scores because of the abundance of neighborhood serving retail locations, where most errands can be completed by walking. The site is situated

Table 1: Car-share within 0.5 miles of the Site

Carshare Location	Number of Vehicles
Zipcar	
City Market at O (Colonial Parking Garage)	4 vehicle
Behind 1544 Marion St NW	2 vehicles
13th/N St NW	1 vehicles
Shaw/Howard Univ. Metro @ 7th & R St NW	1 vehicles
Total	8 vehicles

in an area with good bike scores due to its proximity to bike facilities and flat topography. The high transit score was based on the proximity to the Mount Vernon Square Metrorail station, car share, and multiple bus lines.

Overall, the Logan Circle - Shaw neighborhood has a high walk, high transit, and high bike scores. Additionally, other planned developments and roadway improvements will help increase the walk and bike scores in the Logan Circle - Shaw neighborhood.

FUTURE REGIONAL PROJECTS

There are a few District initiatives and background developments located in the vicinity of the site. These planned and proposed projects are summarized below.

Local Initiatives

MoveDC: Multimodal Long-Range Transportation Plan

MoveDC is a long-range plan that provides a vision for the future of DC’s transportation system. As the District grows, so must the transportation system, specifically in a way that expands transportation choices while improving the reliability of all transportation modes.

The MoveDC report outlines recommendations by mode with the goal of having them complete by 2040. The plan hopes to achieve a transportation system for the District that includes:

- 70 miles of high-capacity transit (streetcar or bus)
- 200 miles of on-street bicycle facilities or trails
- Sidewalks on at least one side of every street
- New street connections
- Road management/pricing in key corridors and the Central Employment Area
- A new downtown Metrorail loop
- Expanded commuter rail
- Water taxis

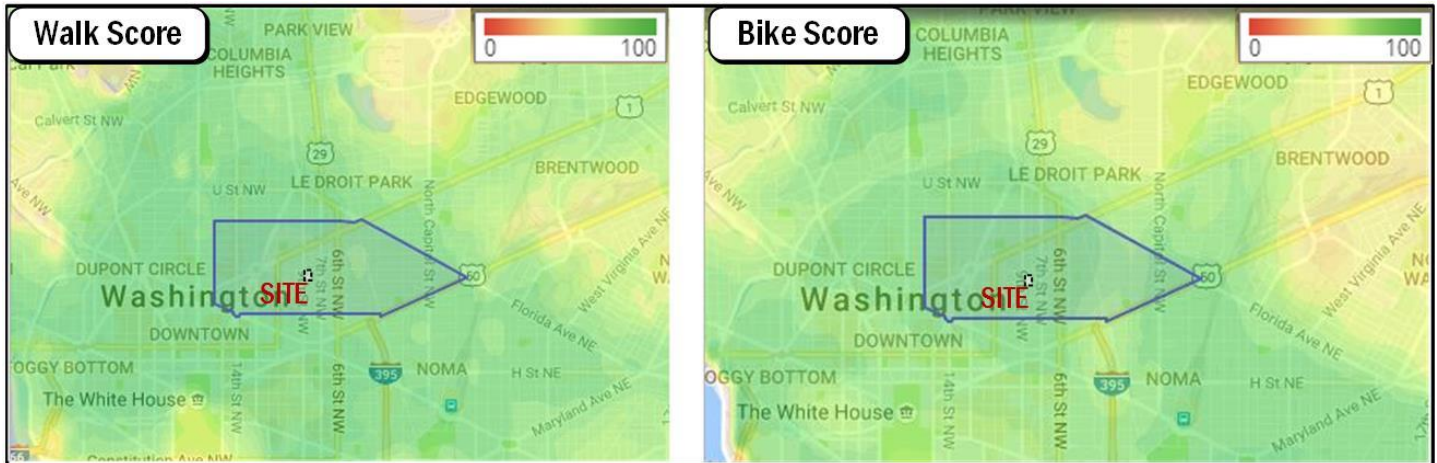


Figure 3: Summary of Walkscore and Bikescore

In direct relation to the proposed development, the MoveDC plan outlines recommended pedestrian, bicycle, and transit improvements including extensions of the M Street and L Street cycle tracks, a new north-south cycle track along 6th Street and/or 5th Street, a cycle track along Rhode Island Avenue, and a Streetcar route. These recommendations would create additional multi-modal capacity and connectivity to the proposed development.

SustainableDC: Sustainable DC Plan

SustainableDC is a planning effort initiated by the Department of Energy & Environment and the Office of Planning that provides the District with a framework of leading Washington DC to become the most sustainable city in the nation. The 2012 report proposes a 20-year timeframe to answer challenges in areas of: (1) Jobs & the economy; (2) Health & Wellness; (3) Equity & Diversity; (4) Climate & Environment; (5) Built Environment; (5) Energy; (6) Food; (7) Nature; (8) Transportation; (9) Waste; and (10) Water. With respect to transportation, the sustainability goals targeted in 20 years include:

- Improving connectivity and accessibility through efficient, integrated, and affordable transit systems
- Expanding provision of safe, secure infrastructure for cyclists and pedestrians
- Reducing traffic congestion to improve mobility
- Improving air quality along major transportation routes

A combination of increasing public transit and decreasing vehicular mode shares has been suggested to meet the transportation targets. The high walk and bike scores in the

Logan Circle - Shaw neighborhood are examples of the reduction in vehicle use and the need to expand safe and secure infrastructure for cyclists and pedestrians. The development will address these concerns in the form of long-term bicycle spaces that meet zoning requirements and its proximity to the Mount Vernon Metrorail Station.

Planned Developments

There are many development projects in the vicinity of the 8th & O Street site. A review of development activity (included in the technical attachments) found two developments that are approved and located within, or less than a block away from the vehicular study area of this CTR (defined later in this report). Figure 6 shows the location of the developments. The following describes the approved developments within the study area:

City Market at O

City Market at O consists of a multiple mixed-use buildings constructed over several phases. The final phase of the City Market at O development will include approximately 142 residential units and is currently under construction. The development has an expected delivery date of 2017.

810 O Street NW

The proposed 810 O Street development consists of a 9-story mixed-use building with approximately 66 residential units above 6,988 square feet of ground floor retail space. An approximately 57-space parking garage is proposed to serve the site (52 spaces are proposed to serve the residential units and 5 spaces are proposed to serve the retail space). This development has an expected delivery date of 2019.

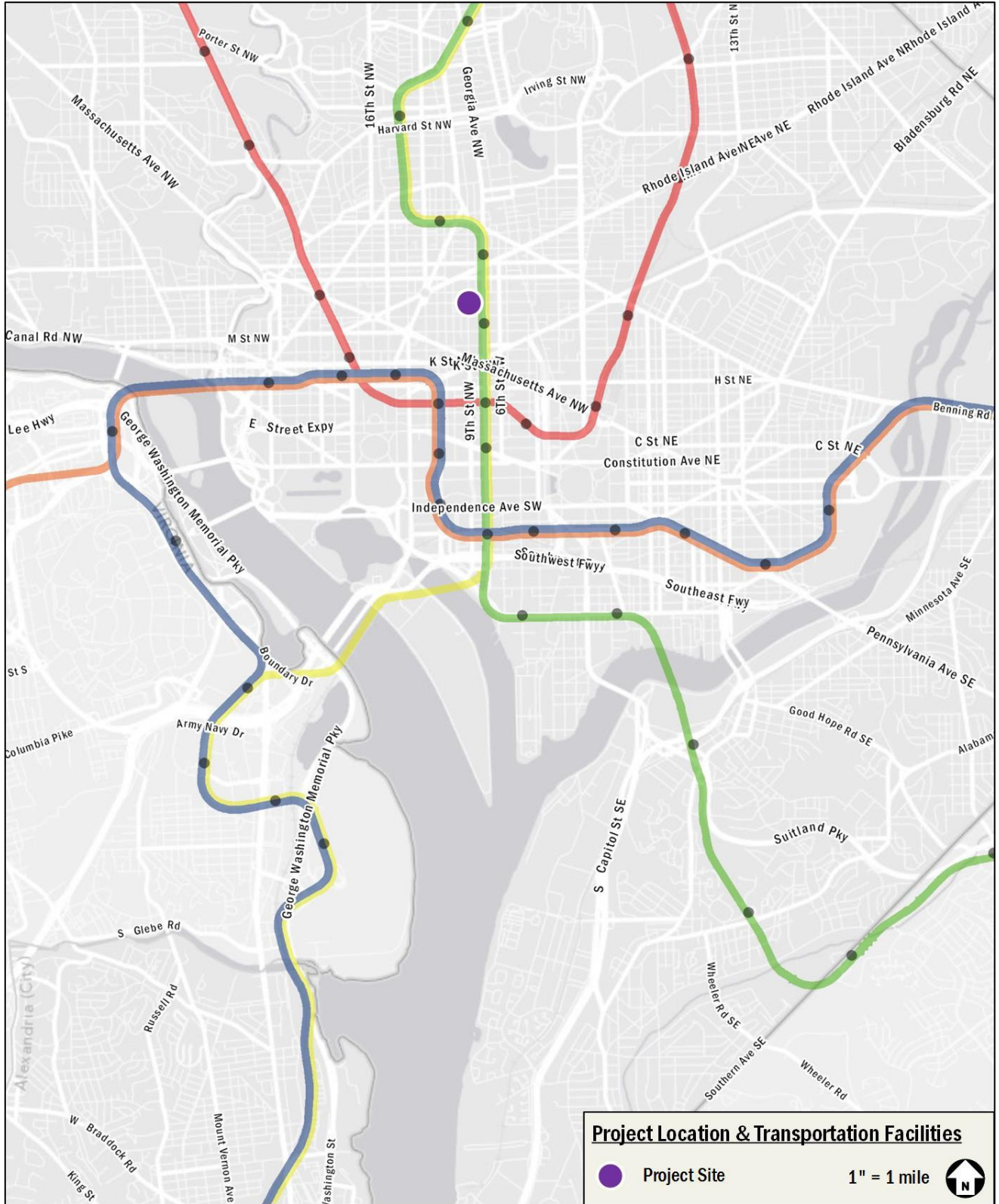


Figure 4: Major Regional Transportation Facilities

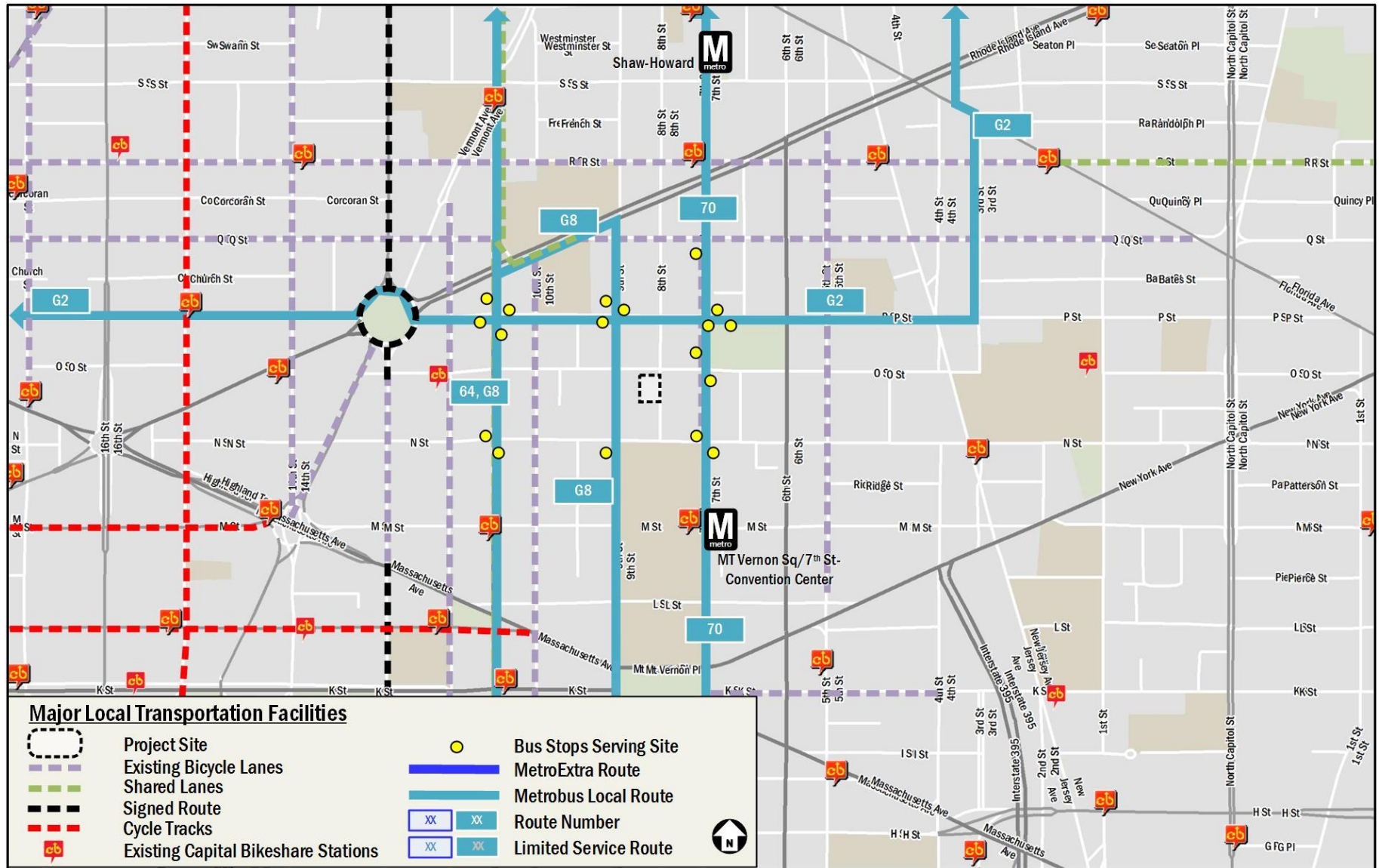


Figure 5: Major Local Transportation Facilities

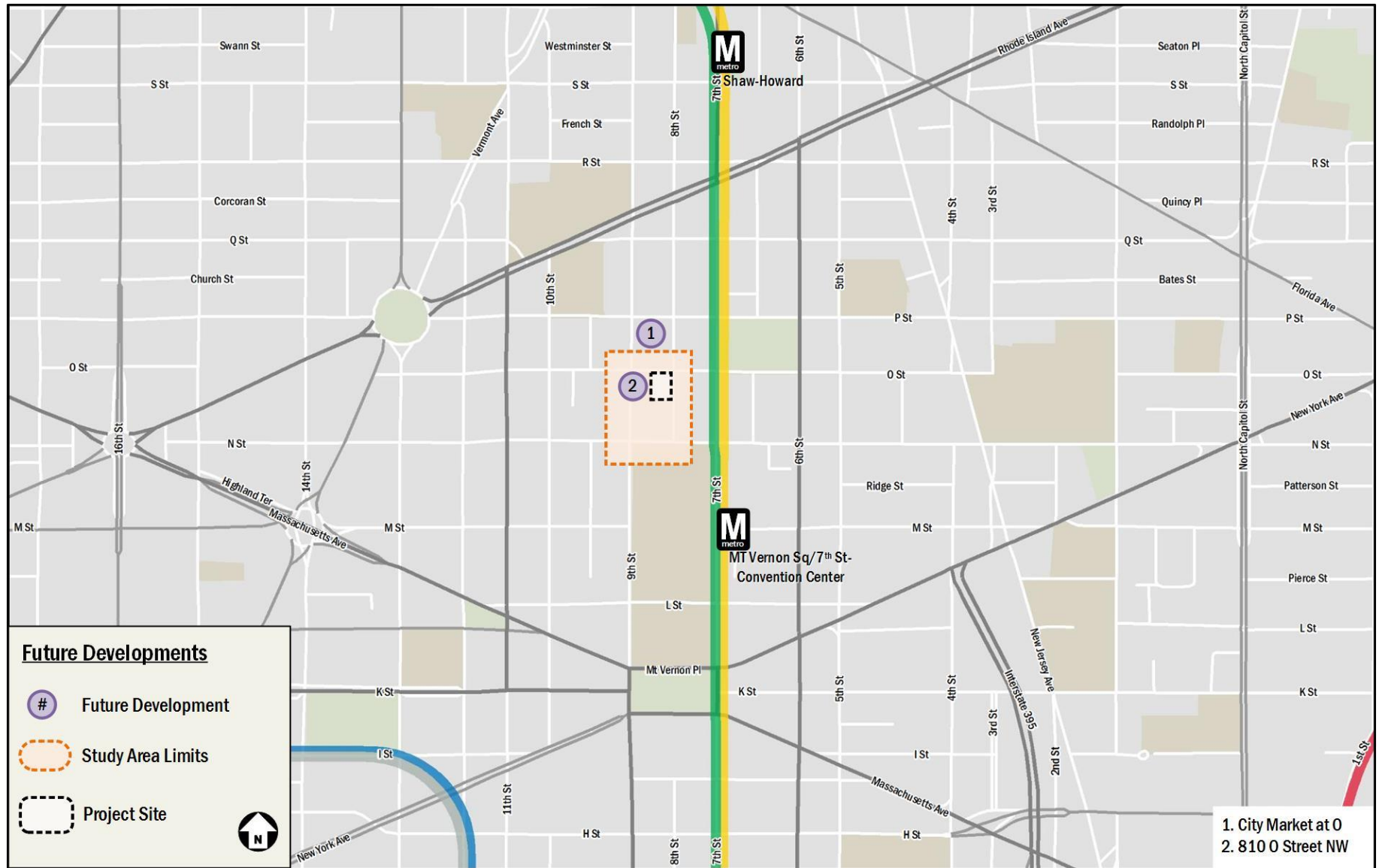


Figure 6: Background Developments



PROJECT DESIGN

This section reviews the transportation components of 8th & O Street NW, including the proposed site plan and access points. It includes descriptions of the site's vehicular access, loading, parking, and Transportation Demand Management (TDM) plan.

The 8th & O Street NW site is generally bounded by O Street to the north, a public alley to the west, adjacent parcels to the south, and 8th Street to the east. The site is currently occupied by an approximately 25-space surface parking lot that serves a nearby church. The existing parking lot is accessible from the existing alley as well as a curb cut along 8th Street. The 8th Street curb cut will be abandoned as part of the development.

The 8th & O Street NW project will include approximately 80 residential dwelling units, approximately 3,500 square feet of retail space, and approximately 1,200 square feet of office space for the adjacent church. The development will also include an underground parking facility containing approximately 23 parking spaces serving the residential and retail uses. No on-site parking will be supplied for the church office use. Figure 7 shows an overview of the development program and site plan elements.

ACCESS AND LOADING

Vehicular Access

Vehicular access to the site will be from an existing two-way alley which is accessible from O Street and N Street, both of which are local roadways. The alley is currently 10 feet, which is generally consistent with other residential-serving alleys in the District. Although this is the case, the northern end of the alley will be widened as a result of the 8th & O Street development and the adjacent 810 O Street development to improve overall maneuverability. Under future conditions, the 8th & O Street building will be set back 5 feet and the 810 O Street building will be set back 10 feet in order to effectively widen the alley to 25 feet, as shown on Figure 7. This will allow for better access to the parking ramp and the loading area, in addition to improved maneuverability for passing vehicles.

It should be noted that the building setbacks for both developments are not granting public easements. Therefore,

it was confirmed that all maneuvering associated with the 8th & O Street development could feasibly take place in the existing 10 foot alley and the 5 foot setback, without using the 10 foot setback of the 810 O Street development.

Pedestrian and Bicycle Access

Pedestrian access to the residential component of the development will occur predominately via 8th Street, with individual entrances to the townhouse units. For the retail component, pedestrian access will be primarily along O Street. Pedestrian access points are outlined on the site plan in Figure 7.

Access to secure long-term bicycle parking will be from the alley while short-term bicycle parking will be supplied along the perimeter of the site.

PARKING

On-Site Parking

Based on the current zoning regulations, the following outlines the parking requirements for all land uses of the development:

- Residential
1 space per 3 dwelling units in excess of 4 units, amounting to a minimum requirement of 26 parking spaces.
- Retail
1.33 spaces per 1,000 square feet of retail space in excess of 3,000 square feet, amounting to a minimum requirement of 2 parking spaces.

Additionally, this development qualifies for an exemption from minimum parking requirements. The development is located within one half-mile of a Metrorail station thus the minimum vehicle parking is reduced by 50 percent. As such, the development is required to supply a minimum of 14 parking spaces.

Up to 23 parking spaces will be supplied in a below-grade parking garage, therefore the development complies with zoning requirements. It is expected that one of these spaces will be used for retail use and the remaining 22 spaces will be used for residential use, resulting in a parking ratio of 0.28 parking spaces per unit. Given the multi-modal nature of the site location, it is expected that this amount of parking will be



sufficient to serve the needs of the site, without promoting driving as a primary mode of travel.

LOADING

According to DC zoning requirements, the site use is required to provide one 30-foot loading berth and one 20-foot service and delivery space. The proposed development will contain one 30-foot loading berth, therefore the Applicant is seeking relief for the requirements set forth by District zoning laws for the service and delivery space.

The amount of loading expected is estimated as follows:

- As a baseline, it is expected that there will be three (3) daily truck deliveries (covering trash, general delivery, and mail).
- Residential loading activity is estimated assuming an expected rental turnover of 18 months, with two (2) trucks per move – one move-in and one move-out.
- Although the exact nature of the retail space is unknown at this time, it is expected that general each retail store will generate an additional two (2) deliveries per day in addition to the baseline deliveries.

Using these estimates the proposed development is expected to generate 5 to 6 truck trips per day. The loading facilities provided by the development will be sufficient to accommodate this demand.

Truck routing to and from the site will be focused on 9th Street and 7th Street which are DDOT designated primary truck routes. The existing alley with addition of the 5 foot set back of the building will serve as an adequate amount of space for trucks to maneuver in and out of the site in a safe manner. The truck turning diagrams illustrating the accessible inbound and outbound paths for 8th & O Street NW can be found in the Technical Attachments.

BICYCLE AND PEDESTRIAN FACILITIES

Pedestrian facilities along the perimeter of the site will meet or exceed DDOT requirements. Sidewalks along 8th Street will be consistent with similar residential-oriented streets in the neighborhood, while sidewalks along O Street will be wider with ample space to accommodate café seating.

According to the DC zoning requirements, all residential developments must provide at least one secure bicycle

parking space for each three residential units and one space for each 10,000 square feet of retail space. Based on these regulations the development should provide a total of 27 long-term bicycle parking spaces. The plans identify 27 spaces in the proposed development, thus the requirement is met.

The project will also include short-term bicycle parking along the perimeter of the site. According to DC zoning requirements, the development must provide one space for each 20 dwelling units and 1 space for each 3,500 square feet of retail space. Based on these regulations the development should provide a total of 6 short-term bicycle parking spaces. The project is currently proposing 4 bike racks, which accommodates 8 short-term bicycle parking spaces. Therefore, the development meets these requirements.

TRANSPORTATION DEMAND MANAGEMENT (TDM)

TDM is the application of policies and strategies used to reduce travel demand or to redistribute demand to other times or spaces. TDM typically focuses on reducing the demand of single-occupancy, private vehicles during peak period travel times or on shifting single-occupancy vehicular demand to off-peak periods.

The Transportation Demand Management (TDM) plan for the 8th & O Street NW development is based on the DDOT expectations for TDM programs. The Applicant proposes the following TDM measures:

- The Applicant will identify TDM Leaders (for planning, construction, and operations). The TDM Leaders will work with residents and employees in the building to distribute and market various transportation alternatives and options.
- The Applicant will provide TDM materials to new residents in the Residential Welcome Package materials.
- The Applicant will unbundle parking costs from the price of lease or purchase.
- The Applicant will provide bicycle parking/storage facilities at the proposed development that meet or exceed zoning requirements. This includes secure parking located on-site, short-term bicycle parking around the perimeter of the site.
- The Applicant will install a transit information screen (electronic screen) within the residential lobby containing information related to local transportation alternatives.

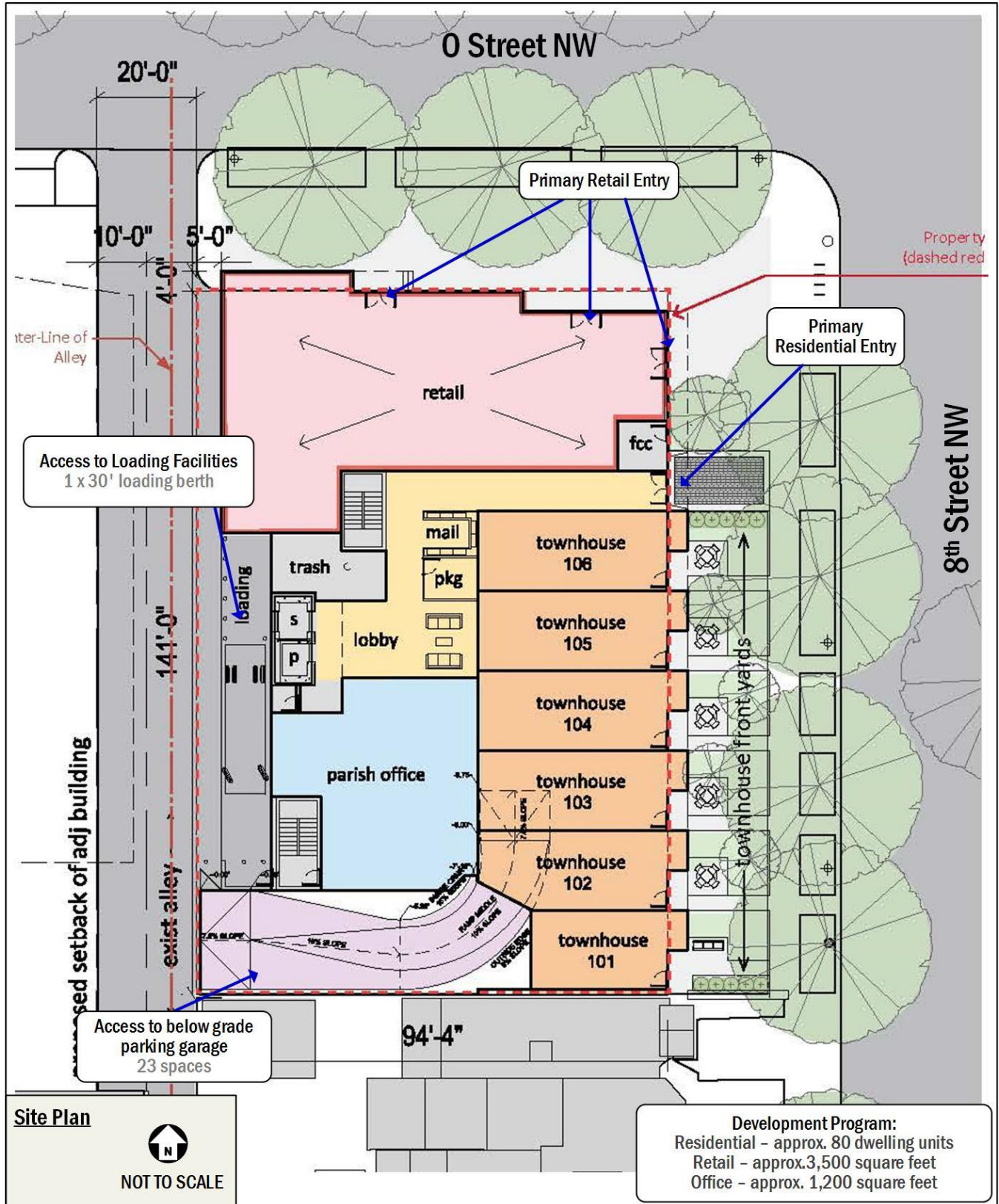


Figure 7: Site Plan



TRIP GENERATION

This section outlines the transportation demand of the proposed 8th & O Street NW project. It summarizes the projected trip generation of the site by mode, which forms the basis for the chapters that follow.

Traditionally, weekday peak hour trip generation is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 9th Edition. This methodology was supplemented to account for the urban nature of the site (the *Trip Generation Manual* provides data for non-urban, low transit use sites) and to generate trips for multiple modes.

Residential trip generation was calculated based on ITE land use 220, Apartment, splitting trips into different modes using assumptions derived from census data for the residents that currently live near the site. The vehicular mode split was then adjusted to reflect the parking supply and other developments with similar proximity to Metrorail.

Retail trip generation was calculated based on ITE land use 820, Shopping Center. Mode splits for the retail portion of the site were based on information contained in WMATA's 2005 *Development-Related Ridership Survey* and mode splits used for retail uses of nearby developments that have recently been studied. Of note, the retail trip generation used in the analysis was based off of a previous development program which included 5,000 square feet of retail space.

Office trip generation was calculated based on ITE land use 710, General Office. Mode splits for the office portion of the site were based on information contained in WMATA's 2005 *Development-Related Ridership Survey* and mode splits used for office uses of nearby developments that have recently been studied. Although the office space of the development will not supply parking on site, trip generation estimates were performed to account for trips from all modes of travel.

The mode split assumptions for all land uses within the development is summarized in Table 2. A summary of multimodal trip generation for the development is shown in Table 4 for both peak hours. Detailed calculations are included in the Technical Attachments.

Table 2: Summary of Mode Split Assumptions

Land Use	Mode			
	Auto	Transit	Bike	Walk
Residential	45%	40%	5%	10%
Retail	25%	45%	5%	25%
Office	60%	30%	5%	5%

Existing vehicular trips at the site were also determined based on traffic counts at the existing parking lot driveway along 8th Street. Given the amount of traffic generated by the existing parking lot, it is assumed that these parking spaces are not only used by people accessing the church, but also commuters and patrons of the surrounding retail. In order to accurately depict the impacts of the proposed development, the existing trips were removed from the network. A summary of existing trip generation is provided in Table 3. As shown, the existing trips are generally consistent in magnitude to the expected trip generation for the proposed development. The proposed development is expected to result in a net decrease of 4 trips during the morning peak hour and a net increase of 5 trips during the afternoon peak hour.

Table 3: Existing Trip Generation

Existing Trip Generation					
AM Peak Hour			PM Peak Hour		
In	Out	Total	In	Out	Total
19 veh/hr	8 veh/hr	27 veh/hr	18 veh/hr	12 veh/hr	30 veh/hr



Table 4: Multi-Modal Trip Generation Summary

Mode	Land Use	Trip Generation					
		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Auto	Residential	4 veh/hr	15 veh/hr	19 veh/hr	19 veh/hr	10 veh/hr	28 veh/hr
	Retail	1 veh/hr	1 veh/hr	2 veh/hr	3 veh/hr	2 veh/hr	5 veh/hr
	Office	2 veh/hr	0 veh/hr	2 veh/hr	0 veh/hr	2 veh/hr	2 veh/hr
	Total	7 veh/hr	16 veh/hr	23 veh/hr	21 veh/hr	14 veh/hr	35 veh/hr
Transit	Residential	5 ppl/hr	15 ppl/hr	20 ppl/hr	19 ppl/hr	10 ppl/hr	29 ppl/hr
	Retail	3 ppl/hr	2 ppl/hr	5 ppl/hr	8 ppl/hr	8 ppl/hr	16 ppl/hr
	Office	2 ppl/hr	0 ppl/hr	2 ppl/hr	0 ppl/hr	2 ppl/hr	2 ppl/hr
	Total	10 ppl/hr	17 ppl/hr	27 ppl/hr	27 ppl/hr	20 ppl/hr	47 ppl/hr
Bike	Residential	1 ppl/hr	2 ppl/hr	3 ppl/hr	3 ppl/hr	1 ppl/hr	4 ppl/hr
	Retail	1 ppl/hr	0 ppl/hr	1 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr
	Office	1 ppl/hr	0 ppl/hr	1 ppl/hr	0 ppl/hr	1 ppl/hr	1 ppl/hr
	Total	3 ppl/hr	2 ppl/hr	5 ppl/hr	4 ppl/hr	3 ppl/hr	7 ppl/hr
Walk	Residential	2 ppl/hr	3 ppl/hr	5 ppl/hr	5 ppl/hr	3 ppl/hr	8 ppl/hr
	Retail	2 ppl/hr	1 ppl/hr	3 ppl/hr	5 ppl/hr	4 ppl/hr	9 ppl/hr
	Office	1 ppl/hr	0 ppl/hr	1 ppl/hr	0 ppl/hr	1 ppl/hr	1 ppl/hr
	Total	5 ppl/hr	4 ppl/hr	9 ppl/hr	10 ppl/hr	8 ppl/hr	18 ppl/hr



TRAFFIC OPERATIONS

This section provides a summary of an analysis of the existing and future roadway capacity in the study area. Included is an analysis of potential vehicular impacts of the 8th and O Street NW project 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.

This analysis was accomplished by comparing traffic volumes and roadway capacity for existing, background, and future scenarios. The capacity analysis focuses on the morning and afternoon commuter peak hours, as determined by the existing traffic volumes in the study area.

The following conclusions are reached within this chapter:

- The study area intersections operate at an acceptable level of service during all analysis scenarios for both the morning and afternoon peak hours.
- The addition of trips generated by background developments and inherent growth on the study area roadways will not cause any intersections to experience unacceptable levels of delay.
- The addition of trips generated by the proposed development will slightly increase delays and queue lengths at all study area intersections, but will not result in any significant impacts.
- Overall, this report concludes that the project will not have a detrimental impact to the surrounding transportation network.

STUDY AREA, SCOPE, & METHODOLOGY

This section outlines the vehicular trips generated in the study area along the vehicular access routes and defines the analysis assumptions. The scope of the analysis contained within this report was discussed with and agreed to with DDOT. The general methodology of the analysis follows national and DDOT

guidelines on the preparation of transportation impact evaluations of site development.

Capacity Analysis Scenarios

The vehicular analyses are performed to determine if the proposed development of the 8th and O Street NW development will lead to adverse impacts on traffic operations. (A review of impacts to each of the other modes is outlined later in this report.) This is accomplished by comparing future scenarios: (1) without the proposed development (referred to as the Background condition) and (2) with the development approved and constructed (referred to as the Future condition).

Specifically, the roadway capacity analysis examined the following scenarios:

1. 2017 Existing Conditions
2. 2020 Background Conditions without the development (2020 Background)
3. 2020 Future Conditions with the development (2020 Total Future)

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 decided upon during the study scoping process with DDOT are those intersections most likely to have potential impacts or require changes to traffic operations to accommodate the proposed development. Although it is possible that impacts will occur outside of the study area, those impacts are not significant enough to be considered a detrimental impact nor worthy of mitigation measures.

Based on the projected future trip generation and the location of the site access points, the following intersections were chosen for analysis:

1. 9th Street NW and O Street NW
2. 8th Street NW and O Street NW
3. 9th Street NW and N Street NW
4. 8th Street NW and N Street NW

Figure 8 shows a map of the study area intersections.



Geometry and Operations Assumptions

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

Existing Geometry and Operations Assumptions

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. Existing signal timings and offsets were obtained from DDOT and confirmed during field reconnaissance.

The lane configurations and traffic controls for the Existing conditions are shown on Figure 15.

Future Geometry and Operations Assumptions

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

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

Based on these criteria, no background improvements were included in the future scenario.

Traffic Volume Assumptions

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

Existing Traffic Volumes

The existing traffic volumes are comprised of turning movement count data collected on Wednesday, February 15, 2017. The results of the traffic counts are included in the Technical Attachments. The existing peak hour traffic volumes are shown on Figure 9. For all intersections the individual morning and afternoon peak hours were used.

2020 Background Traffic Volumes (without the project)

The traffic projections for the 2020 Background conditions consist of the existing volumes with two additions:

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

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

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

Based on these criteria, and as discussed previously, two developments were included in the 2020 Background scenario. Of note, given the small study area, background developments within the study area, as well as those within a block of the study area intersections were included. These developments are as follows:

1. City Market at O Street NW
2. 810 O Street NW

Trip generation for these developments was calculated based on the Institute of Transportation Engineers' *Trip Generation Manual*, 9th Edition, with mode splits based on those used for similar developments in the Logan Circle – Shaw neighborhood. Trip distribution assumptions for the background developments were based on those determined for the 8th and O Street NW development and altered where necessary based on anticipated travel patterns and proposed access locations. Trip generation assumptions for the background developments

Table 5: Summary of Background Development Trip Generation

Background Development	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
City Market at O	8 veh/hr	32 veh/hr	40 veh/hr	32 veh/hr	17 veh/hr	49 veh/hr
810 O Street	1 veh/hr	1 veh/hr	2 veh/hr	3 veh/hr	3 veh/hr	6 veh/hr
Total 2020 Background Trips	9 veh/hr	32 veh/hr	42 veh/hr	35 veh/hr	20 veh/hr	54 veh/hr



are shown Table 5. Detailed mode split and trip generation details are included in the Technical Attachments.

While the background developments represent local traffic changes, regional traffic growth is typically accounted for using percentage growth rates. Due to the local nature of the roadways in the study area, historic volume data was not readily available. Therefore a conservative 0.25 percent annual growth rate was applied to all roadways in the study area.

The traffic volumes generated by background developments, background roadway improvements, and the inherent growth along the network were added to the existing traffic volumes in order to establish the 2020 Background traffic volumes. The traffic volumes for the 2020 Background conditions are shown on Figure 10.

2020 Total Future Traffic Volumes (with the project)

The 2020 Total Future traffic volumes consist of the 2020 Background volumes with the addition of the traffic volumes generated by the proposed development (site-generated trips) and the removal existing trips. Thus, the 2020 Total Future traffic volumes include traffic generated by: the existing volumes, background developments, the inherent growth on the study area roadways, the removal of existing trips, and the proposed project.

Trip distribution for the site-generated trips was determined based on: (1) CTPP TAZ data, (2) existing travel patterns in the study area, and (3) the allotted parking locations of various users of the development.

The residential trip distribution was significantly influenced by the CTPP TAZ flow data for drivers commuting from the site's TAZ, and adjusted based on traffic volumes and patterns. The origin of outbound and destination of inbound residential vehicular trips was the below-grade parking garage along the public alley to the west of the site.

The retail distribution was primarily based on locations and proximity of other retail centers, with some influence on the CTPP TAZ flow data for drivers commuting to the site's TAZ (representing retail employees that drive). Thus, the retail trip distribution is weighted more towards nearby residential areas and less on regional origins. The origin of outbound and destination of inbound retail vehicular trips was the below-

grade parking garage along the public alley to the west of the site.

The office distribution was significantly influenced by the CTPP TAZ flow data for drivers commuting to the site's TAZ and adjusted based on traffic volumes and patterns. The origin of outbound and destination of inbound trips was the below-grade parking garage along the public alley to the west of the site.

Based on this review and the site access locations, the site-generated trips were distributed through the study area intersections. A summary of trip distribution assumptions and specific routing is provided on Figure 11 for outbound trips and on Figure 12 for inbound trips.

The traffic volumes for the 2020 Total Future conditions were calculated by adding the development-generated traffic volumes to the 2020 Background traffic volumes. Thus, the future condition with the proposed development scenario includes traffic generated by: existing volumes, background developments through the year 2020, inherent growth on the network, and the proposed development. The site-generated traffic volumes are shown on Figure 13 and the 2020 Total Future traffic volumes are shown on Figure 14

Vehicular Analysis Results

Intersection Capacity Analysis

Intersection capacity analyses were performed for the three scenarios outlined previously at the intersections contained within the study area during the morning and afternoon peak hours. Synchro version 9.1 was used to analyze the study intersections based on the *Highway Capacity Manual (HCM) 2000* methodology.

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

The LOS capacity analyses were based on: (1) the peak hour traffic volumes; (2) the lane use and traffic controls; and (3) the



Highway Capacity Manual (HCM) methodologies (using the *Synchro* software). The average delay of each approach 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.

Table 6 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds) for the Existing, 2020 Background, and 2020 Future scenarios. The capacity analysis results are shown on Figure 16 for the morning peak hour, and Figure 17 for the afternoon peak hour.

All study intersections generally operate at acceptable conditions during the morning and afternoon peak hours for the Existing, 2020 Background, and 2020 Future scenarios.

Queuing Analysis

In addition to the capacity analyses presented above, 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 50th percentile queue is the maximum back of queue on a median cycle. The 95th percentile queue is the maximum back of queue that is exceeded 5% of the time. For unsignalized intersections, only the 95th percentile queue is reported for each lane group (including free-flowing left turns and stop-controlled movements) based on the HCM calculations.

Table 7 shows the queuing results for the study area intersections. Only the intersections of 9th Street and O Street NW has a queue length that exceeds its storage length during one peak hour in all of the study scenarios.

With the addition of the site-generated traffic, queues are slightly increased at all of the study intersections, but no major impacts are seen as a result of the development.

Mitigations

Generally speaking, the proposed development is considered to have an impact at an intersection within the study area if: (1) the capacity analyses show an LOS E or F at an intersection or along an approach where one does not exist in the existing or

background conditions; (2) there is an increase in delay at any approach or the overall intersection operating under LOS E or F of greater than 5 seconds, when compared to the background conditions; or (3) there is an increase in queue length of 150 feet for any lane group. Following these guidelines there are no major impacts to any intersections as a result of the development.

Study Intersections

- 1. 9th Street & O Street, NW
- 2. 8th Street & O Street, NW
- 3. 9th Street & N Street, NW
- 4. 8th Street & N Street, NW

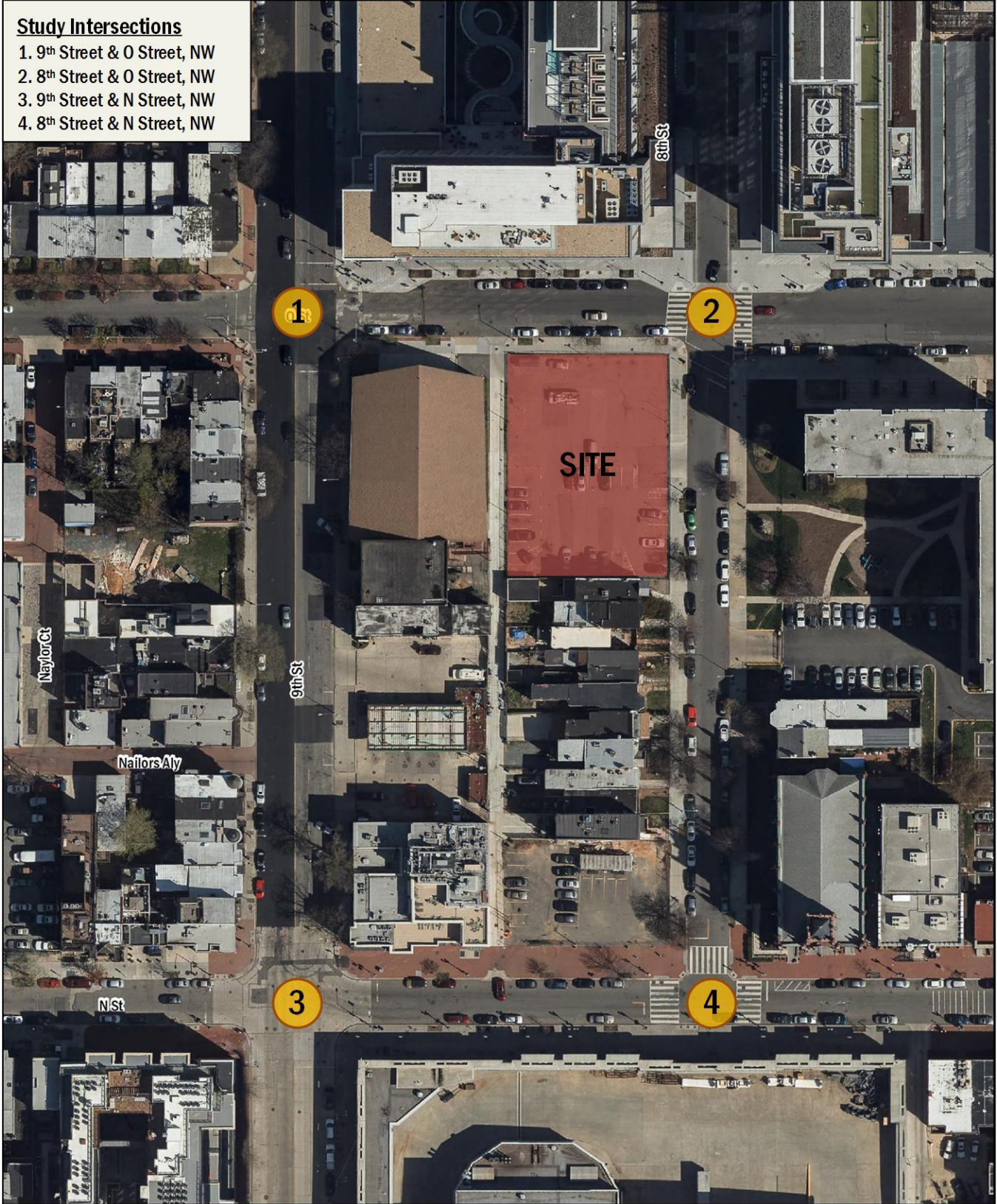


Figure 8: Study Area

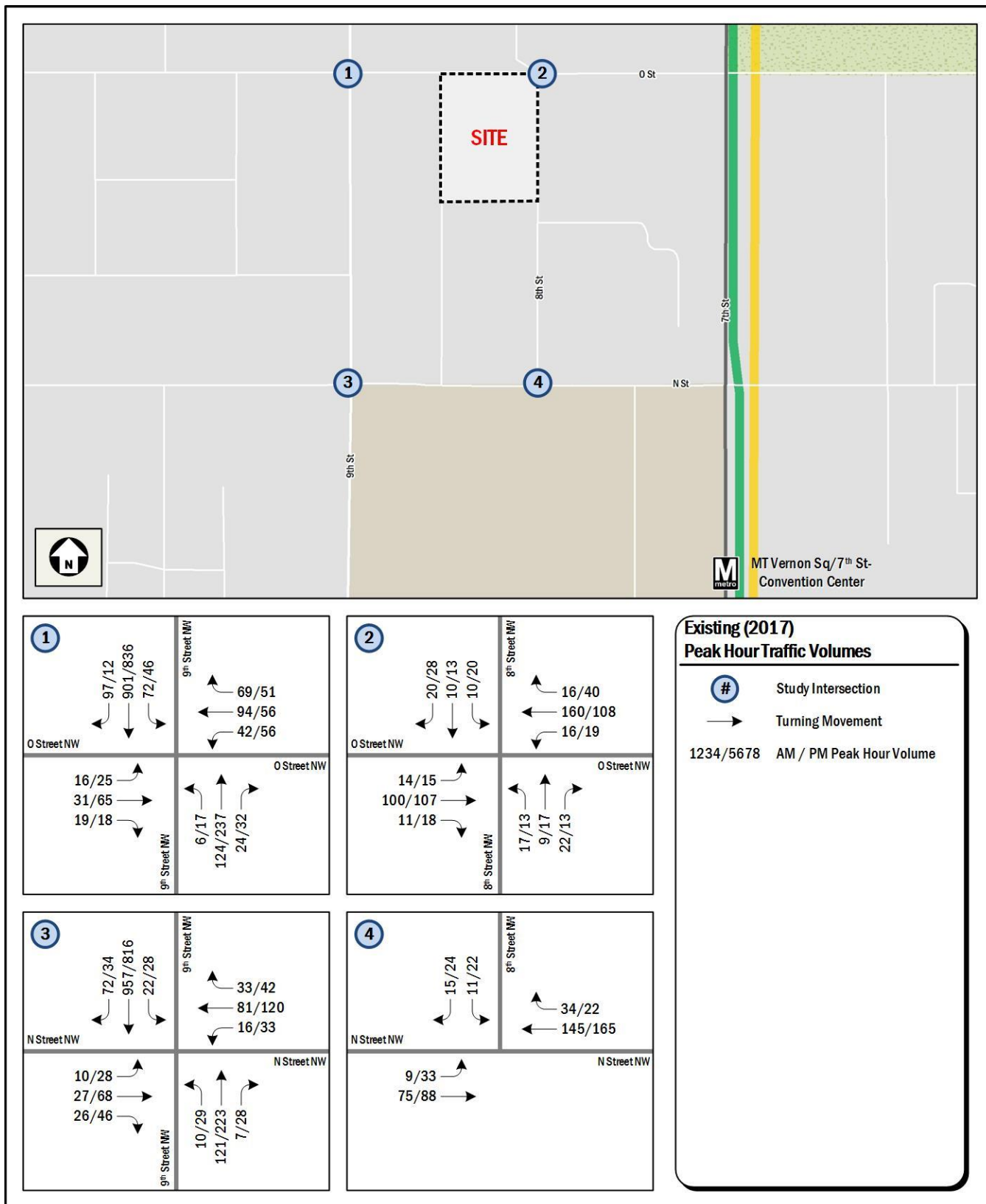


Figure 9: Existing Peak Hour Traffic Volumes

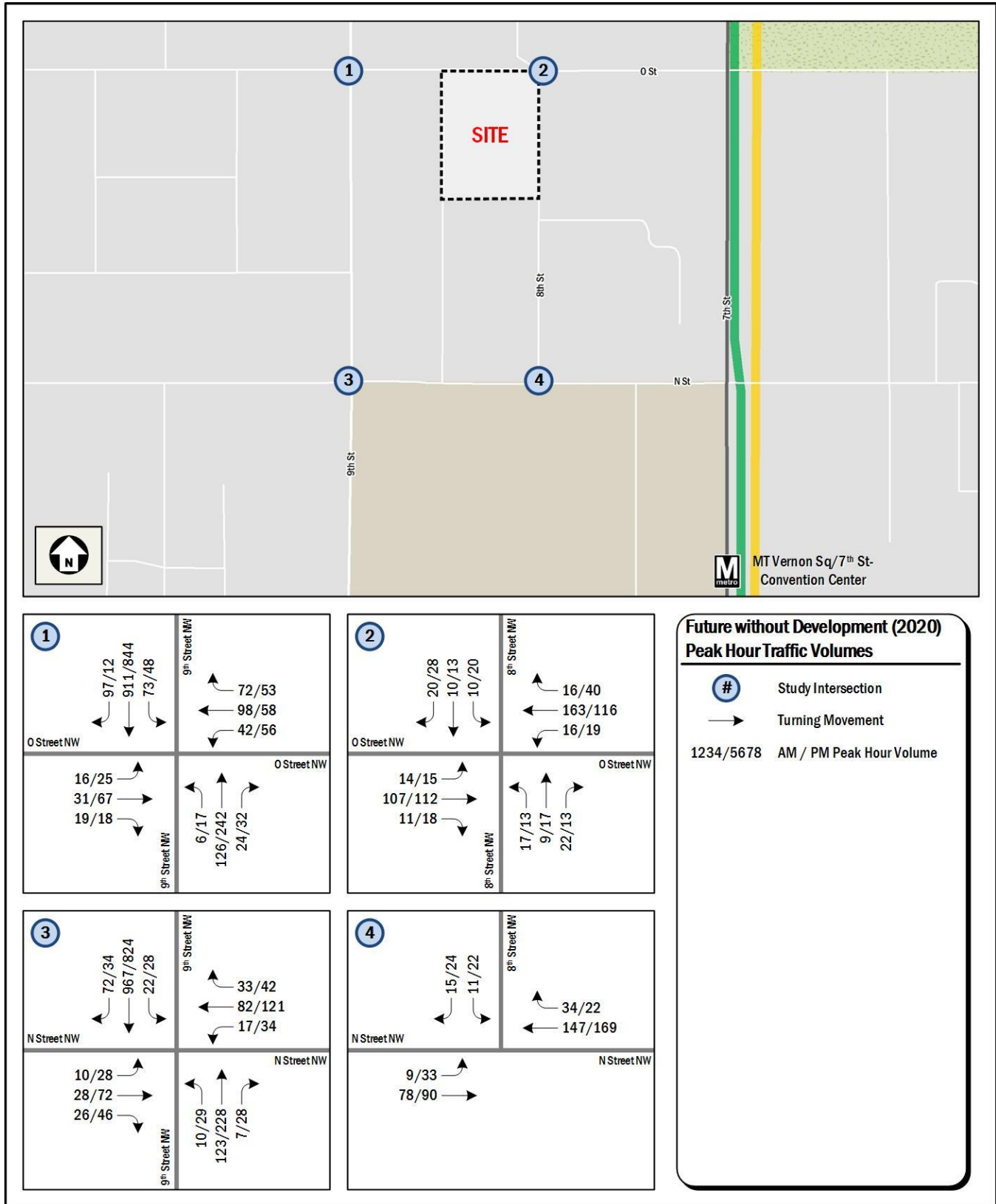


Figure 10: Background Peak Hour Volumes

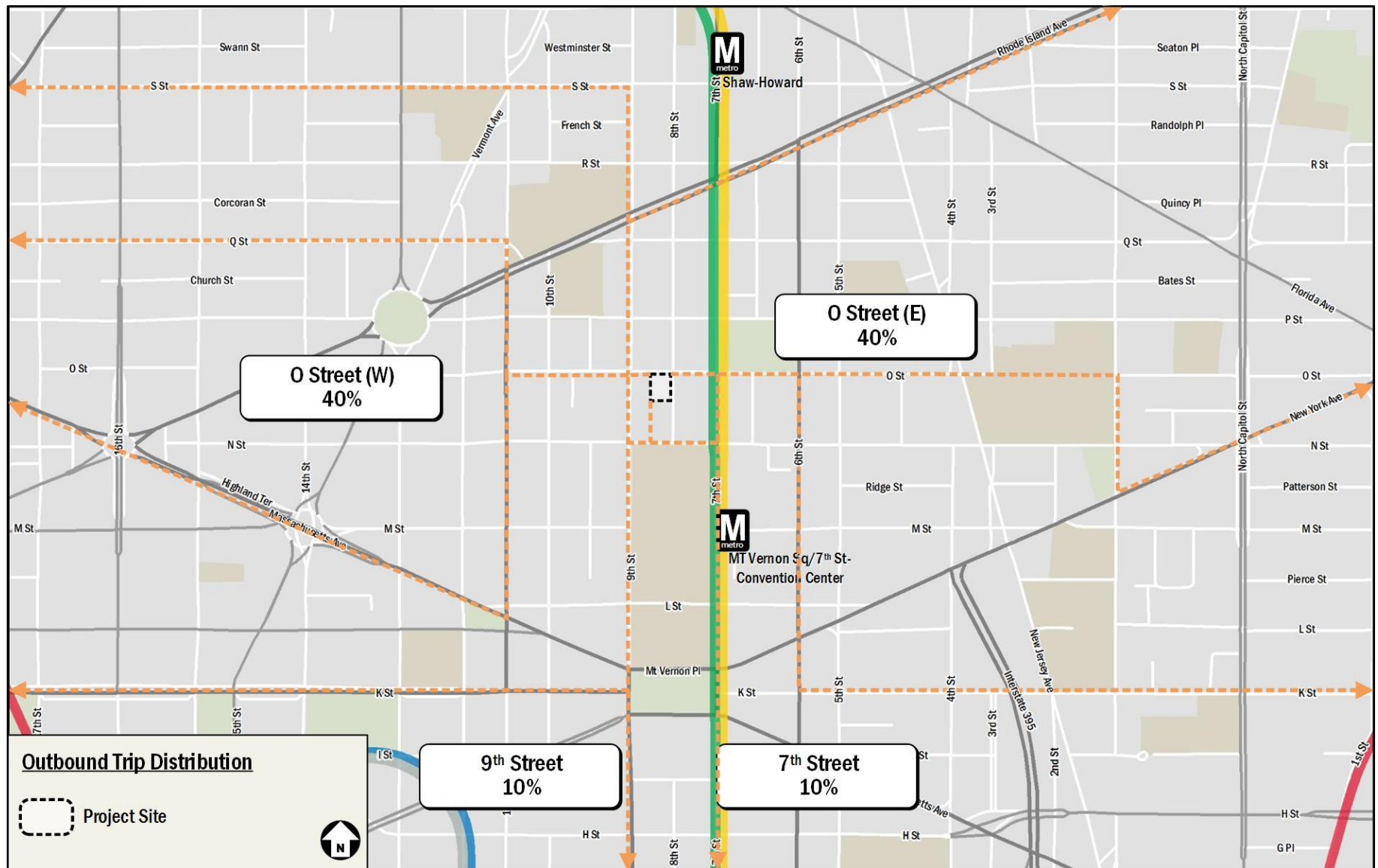


Figure 11: Outbound Trip Distribution and Routing

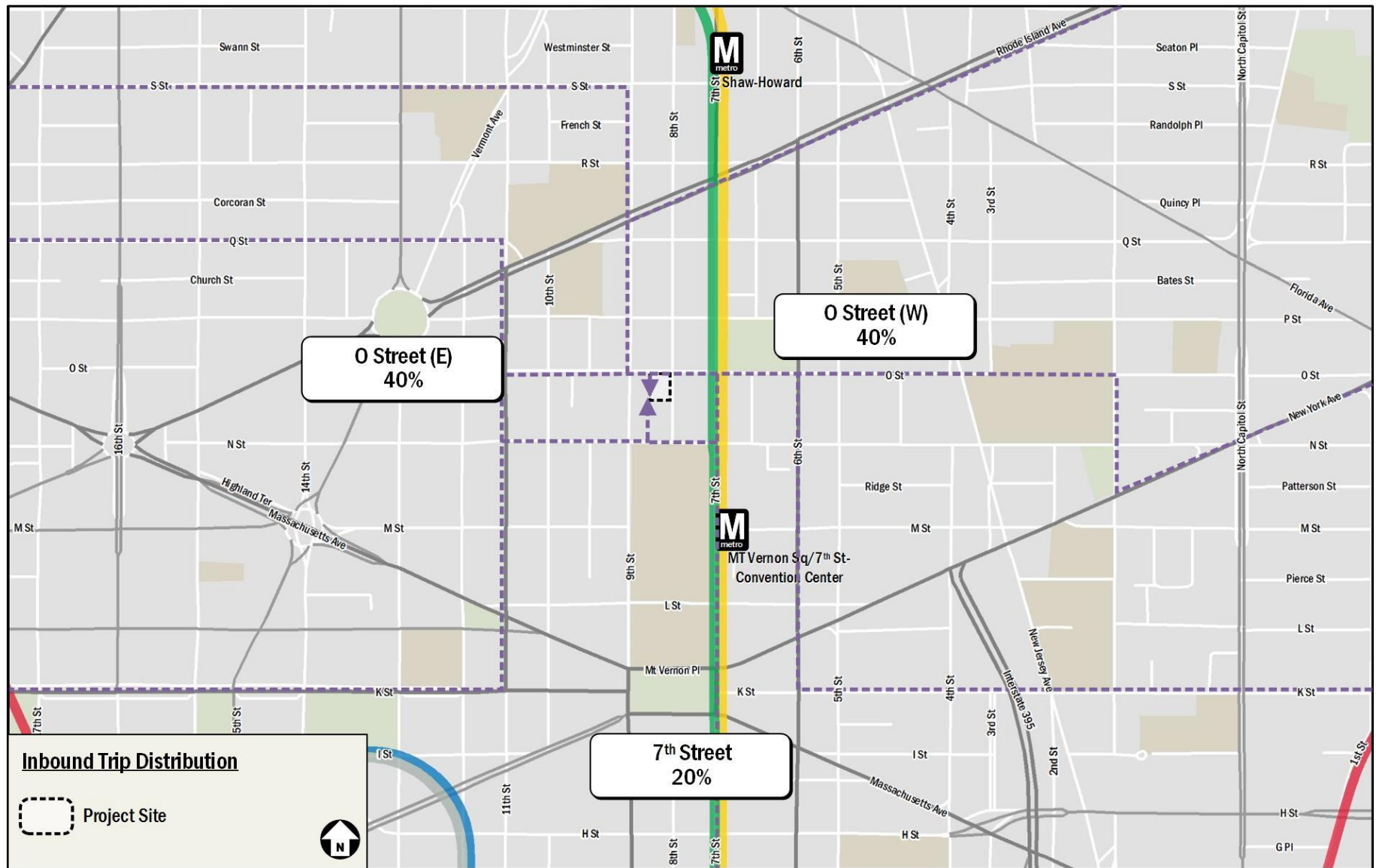


Figure 12: Inbound Trip Distribution and Routing

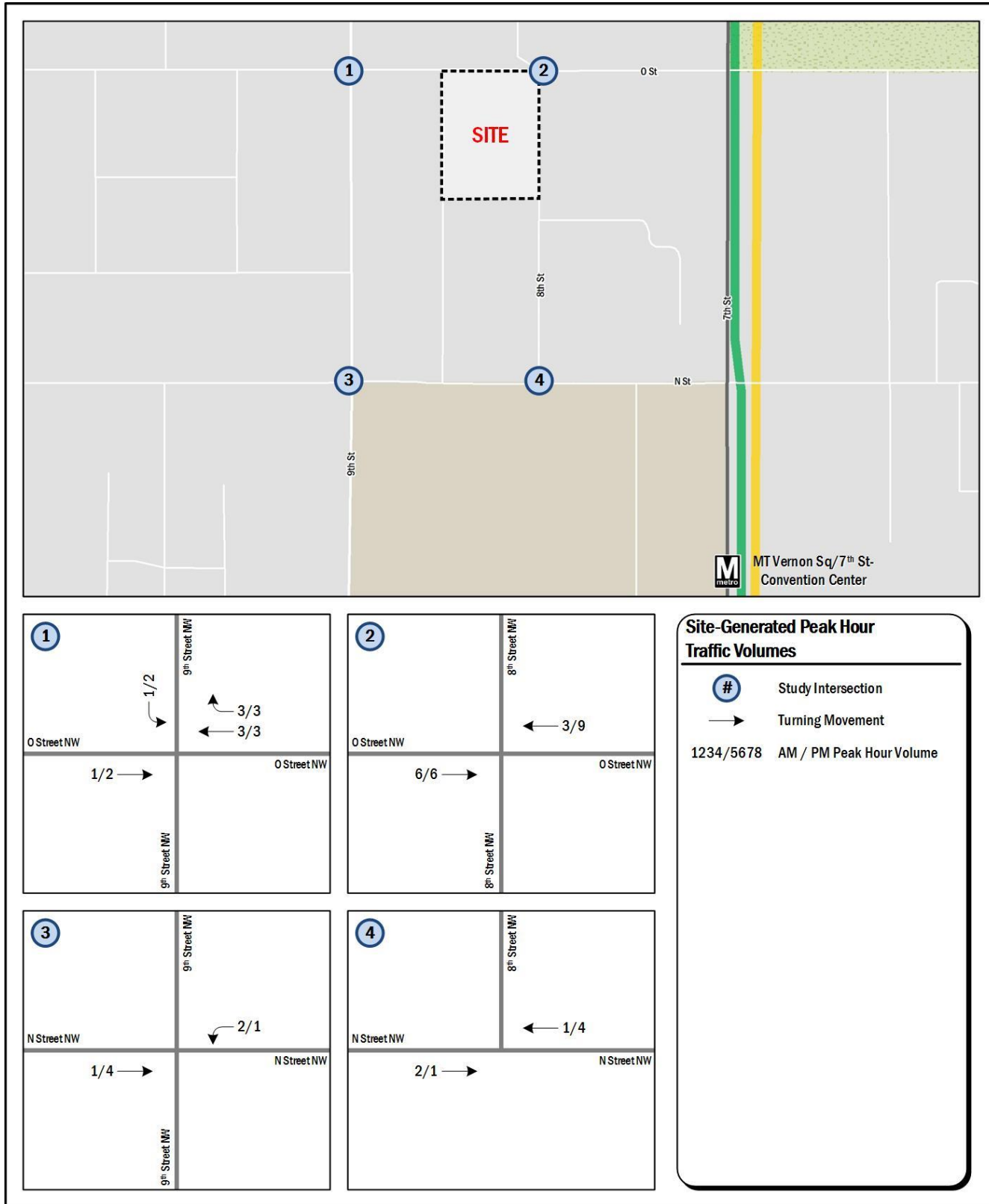


Figure 13: Site Generated Peak Hour Traffic Volumes

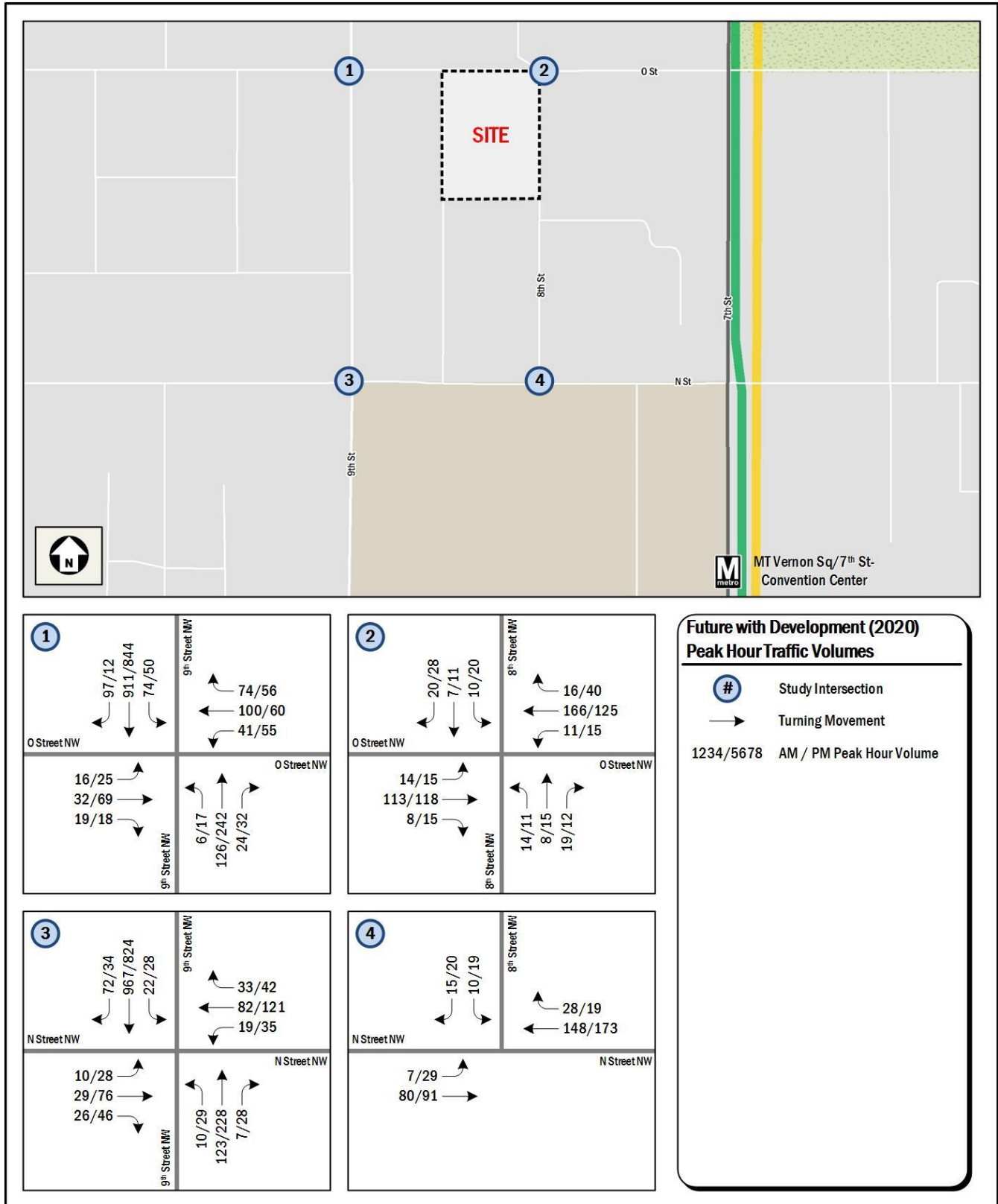


Figure 14: Future Peak Hour Traffic Volumes

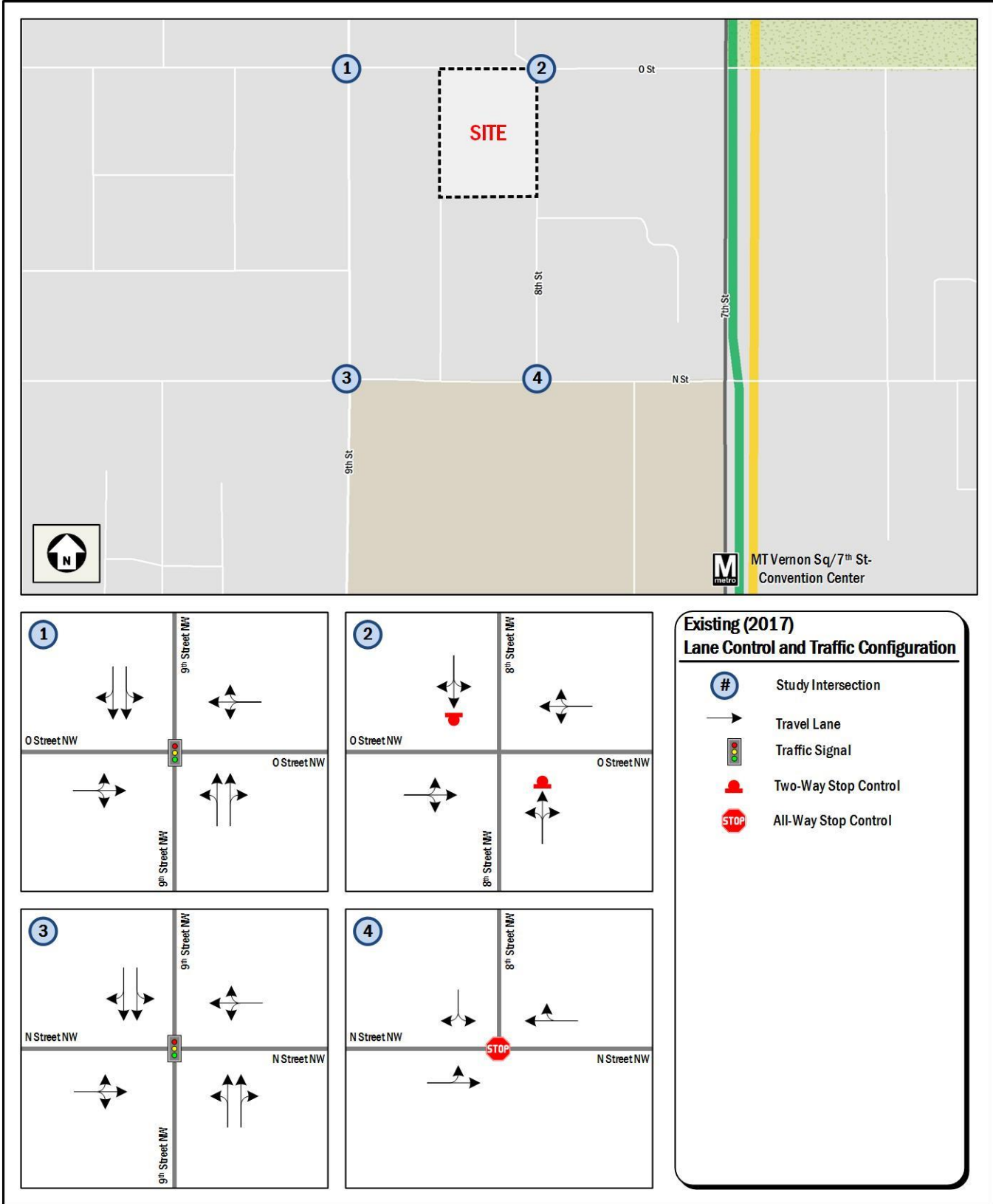


Figure 15: Current Lane Configuration and Traffic Controls



Table 6: LOS Results

Intersection	Approach	Existing Conditions (2017)				Background Conditions (2020)				Total Future Conditions (2020)			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
9th Street and O Street, NW	Overall	18.7	B	15.2	B	18.9	B	15.3	B	19.0	B	15.4	B
	Eastbound	27.3	C	32.0	C	27.3	C	32.0	C	27.3	C	32.1	C
	Westbound	32.3	C	34.8	C	32.6	C	35.0	C	32.8	C	35.1	D
	Northbound	8.6	A	6.6	A	8.6	A	6.5	A	8.6	A	6.5	A
	Southbound	17.1	B	12.7	B	17.2	B	12.8	B	17.2	B	12.9	B
8th Street and O Street, NW	Eastbound Left	1.0	A	0.8	A	1.0	A	1.0	A	0.9	A	1.0	A
	Westbound Left	0.8	A	1.0	A	0.8	A	1.0	A	0.8	A	0.8	A
	Northbound	16.5	C	15.4	C	16.7	C	15.8	C	16.2	C	15.5	C
	Southbound	14.8	B	15.3	C	14.9	B	15.6	C	14.6	B	15.5	C
9th Street and N Street, NW	Overall	10.2	B	14.5	B	10.2	B	14.6	B	10.3	B	14.6	B
	Eastbound	29.2	C	27.2	C	29.2	C	27.3	C	29.2	C	27.4	C
	Westbound	31.8	C	27.8	C	31.8	C	27.9	C	32.0	C	28.0	C
	Northbound	9.2	A	13.6	B	9.2	A	13.6	B	9.2	A	13.6	B
	Southbound	6.4	A	9.9	A	6.4	A	9.9	A	6.4	A	9.8	A
8th Street and N Street, NW	Overall	8.0	A	8.2	A	8.0	A	8.3	A	8.0	A	8.2	A
	Eastbound	7.8	A	8.2	A	7.8	A	8.2	A	7.8	A	8.1	A
	Westbound	8.2	A	8.4	A	8.2	A	8.4	A	8.2	A	8.4	A
	Southbound	7.5	A	7.8	A	7.5	A	7.8	A	7.5	A	7.7	A



Table 7: Queuing Results

Intersection	Lane Group	Storage Length (ft)	Existing Conditions (2017)				Background Conditions (2020)				Total Future Conditions (2020)			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %
1. 9th Street and O Street, NW	Eastbound LTR	465	28	61	61	111	28	61	62	112	29	63	64	115
	Westbound LTR	215	109	182	84	149	113	188	87	153	116	192	89	156
	Northbound LTR	400	22	35	28	37	22	35	28	37	22	35	28	37
	Southbound LTR	315	255	323	186	236	259	328	189	240	259	329	190	240
2. 8th Street and O Street, NW	Eastbound LTR	215	--	1	--	1	--	1	--	1	--	1	--	1
	Westbound LTR	215	--	1	--	1	--	1	--	1	--	1	--	1
	Northbound LTR	400	--	13	--	9	--	14	--	10	--	11	--	8
	Southbound LTR	100	--	10	--	14	--	10	--	15	--	9	--	14
3. 9th Street and N Street, NW	Eastbound LTR	465	23	55	72	120	23	55	75	124	24	56	78	127
	Westbound LTR	200	75	123	97	161	76	124	98	163	78	127	99	164
	Northbound LTR	500	22	34	57	78	22	35	58	80	22	35	58	80
	Southbound LTR	400	53	61	90	106	53	61	90	107	53	61	90	106
4. 8th Street and N Street, NW	Eastbound LT	200	--	--	--	--	--	--	--	--	--	--	--	--
	Westbound TR	200	--	--	--	--	--	--	--	--	--	--	--	--
	Southbound LR	400	--	--	--	--	--	--	--	--	--	--	--	--

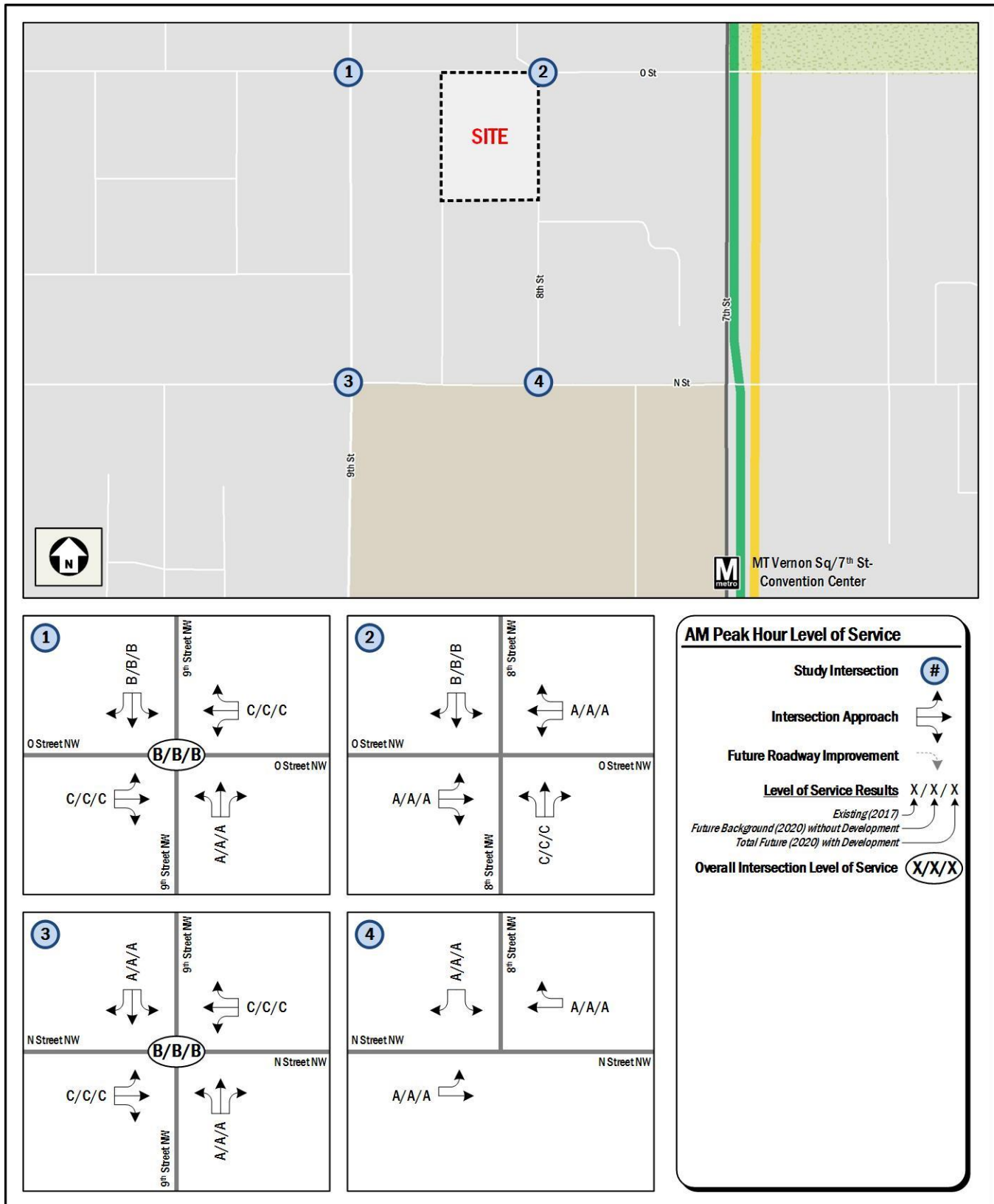


Figure 16: Morning Peak Hour Capacity Analysis Results

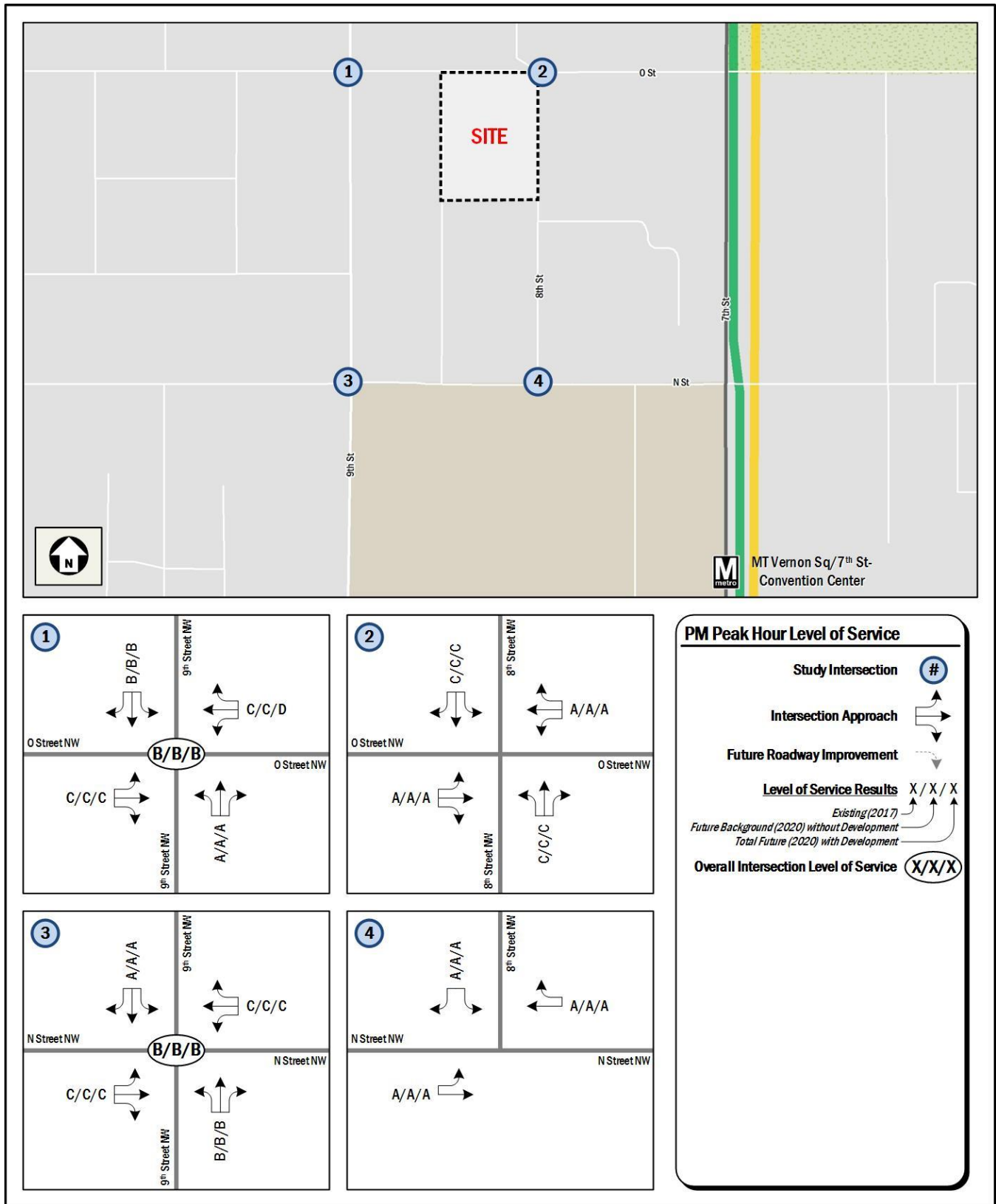


Figure 17: Afternoon Peak Hour Capacity Analysis Results



TRANSIT

This section discusses the existing and proposed transit facilities in the vicinity of the site, accessibility to transit, and evaluates the overall transit impacts due to the 8th & O Street NW project.

The following conclusions are reached within this chapter:

- The development has excellent access to transit
- The development site is surrounded by several Metrobus routes that travel along multiple primary corridors
- The site is expected to generate a manageable amount of transit trips, and the existing service is capable of handling these new trips

EXISTING TRANSIT SERVICE

The study area is well served by Metrobus, Circulator, and Metrorail. Combined, these transit services provide local, city wide, and regional transit connections and link the site with major cultural, residential, employment, and commercial destinations throughout the region. Figure 18 identifies the major transit routes, stations, and stops in the study area.

The Mount Vernon Square Metrorail station is located 0.3 miles from the development site and is served by the Green and Yellow lines which provide connections to areas in the District and Maryland. The Green Line connects Greenbelt with Branch Avenue while providing access to the District core. The Yellow Line connects Greenbelt with Huntington and Franconia-Springfield while providing access to the District core. Trains run approximately every three to six minutes during the morning and afternoon peak hours. They run about every 12 minutes during weekday non-peak hours, every 20 minutes on weekday evenings after 9:30PM and 12 to 20 minutes on the

weekends. The site is also serviced by Metrobus along multiple primary corridors. These bus lines connect the site to many areas of the District, Maryland and Virginia, including several Metrorail stations. Table 8 shows a summary of the bus route information for the routes that serve the site, including service hours, headway, and distance to the nearest bus stop.

PROPOSED TRANSIT SERVICE

Due to growth of population, jobs, and retail in several neighborhoods in the District and the potential for growth in other neighborhoods, the District’s infrastructure is challenged with the need for transportation investments to support the recent growth and to further strengthen neighborhoods. In order to meet these challenges and capitalize on future opportunities, DDOT has developed a plan to identify transit challenges and opportunities and to recommend investments. This is outlined in DC’s *Transit Future System Plan* report published by DDOT in April 2010, which includes the reestablishment of streetcar service in the District.

Additionally, WMATA and local transportation agencies in the District, Maryland, and Virginia have been reviewing Metrobus lines and system wide facilities for service improvements since 2009. In direct relation to this development, routes 64 and 70 were studied.

WMATA and DDOT published the *Fort Totten-Petworth/Takoma-Petworth Lines Study* in March 2016. With approximately 9,500 passengers and 359 one-way trips during the average weekday, the Fort Totten-Petworth and Takoma-Petworth Lines provide an important link between the Georgia Avenue-Petworth Metrorail station and either Takoma or Fort Totten Metrorail station. These lines also provide an important link between the Petworth neighborhood and Downtown Washington. The main purpose of this study was to conduct a comprehensive review of methods for improving the

Table 8: Metrobus Route Information

Route Number	Route Name	Service Hours	Headway	Walking Distance to Nearest Bus Stop
64	Fort Totten-Petworth Line	Weekdays: 5:35AM – 2:07AM Weekends: 4:15AM – 3:14AM	10-20 min	0.3 miles, 6 minutes
70	Georgia Avenue-7th Street Line	Weekdays: 4:04AM – 3:09AM Weekends: 4:27PM – 2:20AM	12-20 min	0.2 miles, 2 minutes
G2	P Street-LeDroit Park Line	Weekdays: 5:21AM – 12:37AM Weekends: 6:16AM – 1:11 AM	5-35 min	0.1 miles, 3 minutes
G8	Rhode Island Avenue Line	Weekdays: 5:40AM – 1:30AM Weekends: 5:44AM – 1:12 AM	20-30 min	0.1 miles, 2 minutes



performance of transit for the Fort Totten-Petworth Line and the Takoma-Petworth Line, and to develop an improvement strategy that would include service operations, and customer enhancements. Issues identified by riders included long wait times, crowded buses, low frequency of service, and inconvenient hours of service. In an effort to solve these issues, rider surveys, open houses, and review sessions of the existing line services were conducted. It was found that most of the riders utilize Route 64, which passes near the site, more than any other 60s Line. Recommended improvements included bus stop consolidation and higher peak period frequency.

WMATA and DDOT published the *Georgia Ave & 30s Line Evaluation* in December 2009. The 30s line and the 70s line are, respectively, the highest and second highest ridership lines in the WMATA system. The study mentions restructuring the 30s line and 70s line in order to improve schedule adherence, reduce travel times and speeds, reduce overcrowding, enhance customer experience, and maintain productivity and efficiency. Recommendations included re-instating dedicated field supervisors, adding peak period capacity on the 79 Line, expedite running way improvements, implementing physical treatments along 70s Line, developing 70s Line Supervisor Playbook, and expanding driver training.

SITE-GENERATED TRANSIT IMPACTS

The proposed development is projected to generate 26 transit trips (9 inbound, 17 outbound) during the morning peak hour and 46 transit trips (27 inbound, 19 outbound) during the afternoon peak hour.

US Census data was used to determine the distribution of those taking Metrorail and those taking Metrobus. The site lies in TAZ 10194 which shows that approximately 80 percent of transit riders used Metrorail and the remainder use Metrobus. That said, approximately 21 people will use Metrorail and 5 will use Metrobus during the morning peak hour; approximately 37 people will use Metrorail and 9 will use Metrobus during the afternoon peak hour.

WMATA studied capacity of Metrorail stations in its *Station Access & Capacity Study (2008)*. The study analyzed the capacity of Metrorail stations for their vertical transportation, for example the capacity of the station at elevators, stairs, and escalators to shuttle patrons between the street, mezzanine, and platforms. The study also analyzed stations capacity to process riders at fare card gates. For both analyses, vertical

transportation and fare card gates, volume-to-capacity ratios were calculated for existing data (from 2005) and projections for the year 2030. According to the study, the Mount Vernon Square Station can currently accommodate future growth at all access points.

WMATA studied capacity along Metrobus routes. DC's *Transit Future System Plan (2010)* lists the bus routes with the highest load factor (a ratio of passenger volume to bus capacity). A load factor is considered unacceptable if it is over 1.2 during peak periods or over 1.0 during off-peak or weekend periods. According to this study Metrobus routes that travel near the site operate at an acceptable load factor during all periods of the day. Based on this information and the extensive Metrobus and Metrorail service surrounding the site, site-generated transit trips will not cause detrimental impacts to Metrobus or Metrorail service.

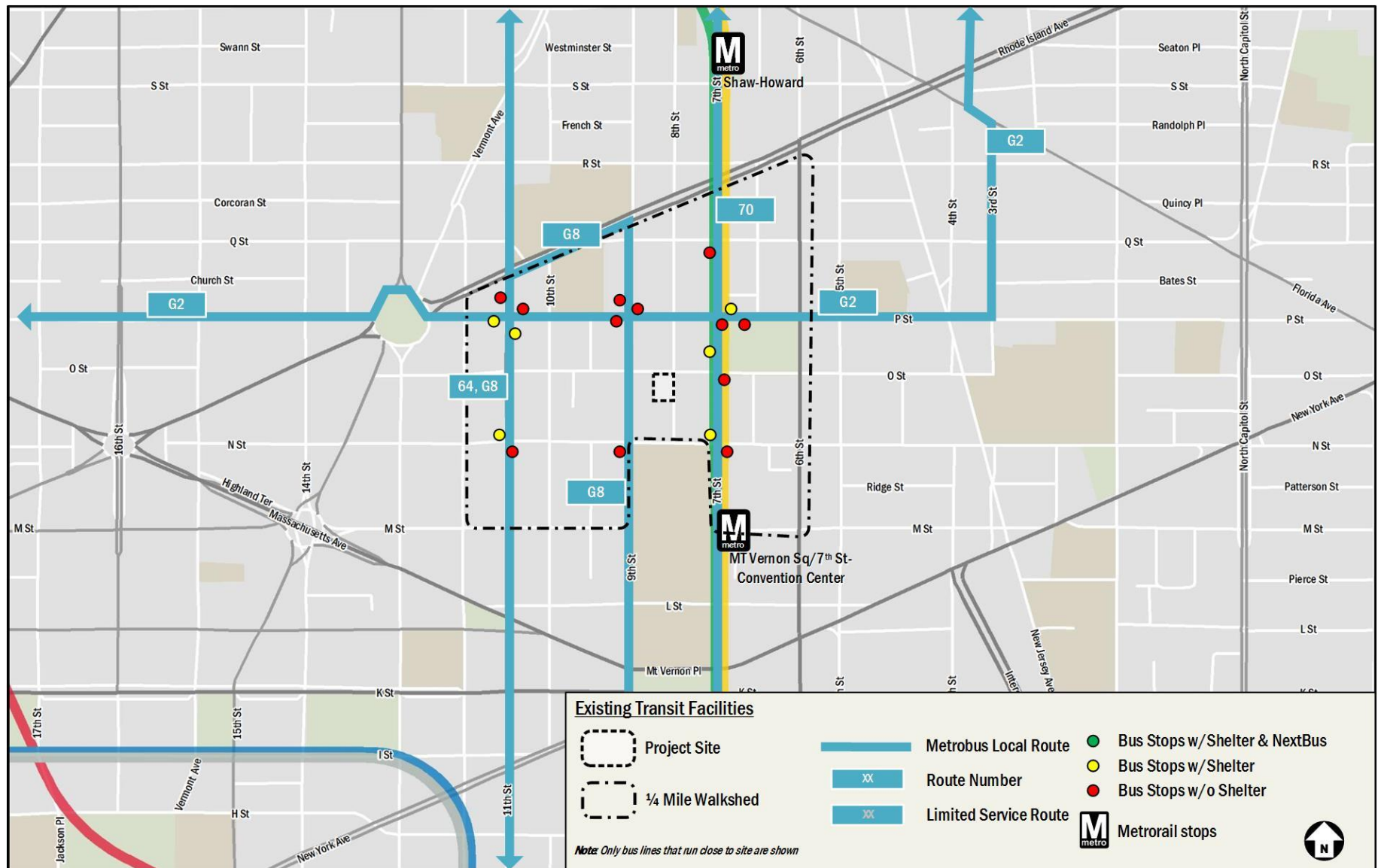


Figure 18: Existing Transit Service



PEDESTRIAN FACILITIES

This section 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 good walking environment. There are some gaps in the system, but there are sidewalks along all primary routes to pedestrian destinations.
- The site is not expected to generate a significant amount of pedestrian trips; however, the pedestrian trips generated by walking to and from transit will be more substantial, particularly along O Street.

PEDESTRIAN STUDY AREA

Facilities within a quarter-mile of the site were evaluated as well as routes to nearby transit facilities and prominent retail and neighborhood destinations. The site is easily accessible to transit options such as bus stops along P Street, 7th Street, 9th Street, and 11th Street as well as the Mount Vernon Square Metrorail Station. Figure 19 shows suggested pedestrian pathways, walking time and distances, and barriers and areas of concern.

PEDESTRIAN INFRASTRUCTURE

This section outlines the existing and proposed pedestrian infrastructure within the pedestrian study area.

Existing Conditions

A review of pedestrian facilities surrounding the proposed development shows that most facilities meet DDOT standards and provide a quality walking environment. Figure 20 shows a detailed inventory of the existing pedestrian infrastructure surrounding the site. Sidewalks, crosswalks, and curb ramps are evaluated based on the guidelines set forth by DDOT's *Public Realm Design Manual* in addition to ADA standards. Sidewalk widths and requirements for the District are shown below in

Table 9: Sidewalk Requirements

Street Type	Minimum Sidewalk Width	Minimum Buffer Width
Residential (Low to Moderate Density)	6 ft	4 ft (6 ft preferred for tree space)
Residential (High Density)	8 ft	4 ft (6 ft preferred for tree space)
Commercial (Non-downtown)	10 ft	4 ft
Downtown	16 ft	6 ft

Table 9. Within the area shown, most roadways are considered residential with a low to moderate density. Meanwhile some areas along 7th Street and O Street are considered commercial and thus require wider sidewalks. Most of the sidewalks surrounding the site comply with DDOT standards. All primary pedestrian destinations are accessible via routes with sidewalks, most of which meet DDOT standards. ADA standards require that all curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, curb ramps shared between two crosswalks is not desired. As shown in the figure, under existing conditions there are some issues with crosswalks and curb ramps near the site.

SITE IMPACTS

This section summarizes the impacts of the development on the overall pedestrian operations in the vicinity of the site.

Pedestrian Trip Generation

The 8th & O Street NW development is expected to generate 9 walking trips (5 inbound, 4 outbound) during the morning peak hour and 18 walking trips (10 inbound, 8 outbound) during the afternoon peak hour. The origins and destinations of these trips are likely to be:

- Employment opportunities where residents can walk to work;
- Retail locations outside of the site; and
- Neighborhood destinations such as schools, libraries, and parks in the vicinity of the site.

In addition to these trips, the transit trips generated by the site will also generate pedestrian demand between the site and nearby transit stops. Currently the existing pedestrian network has the capacity to absorb the newly generated trips from the site.

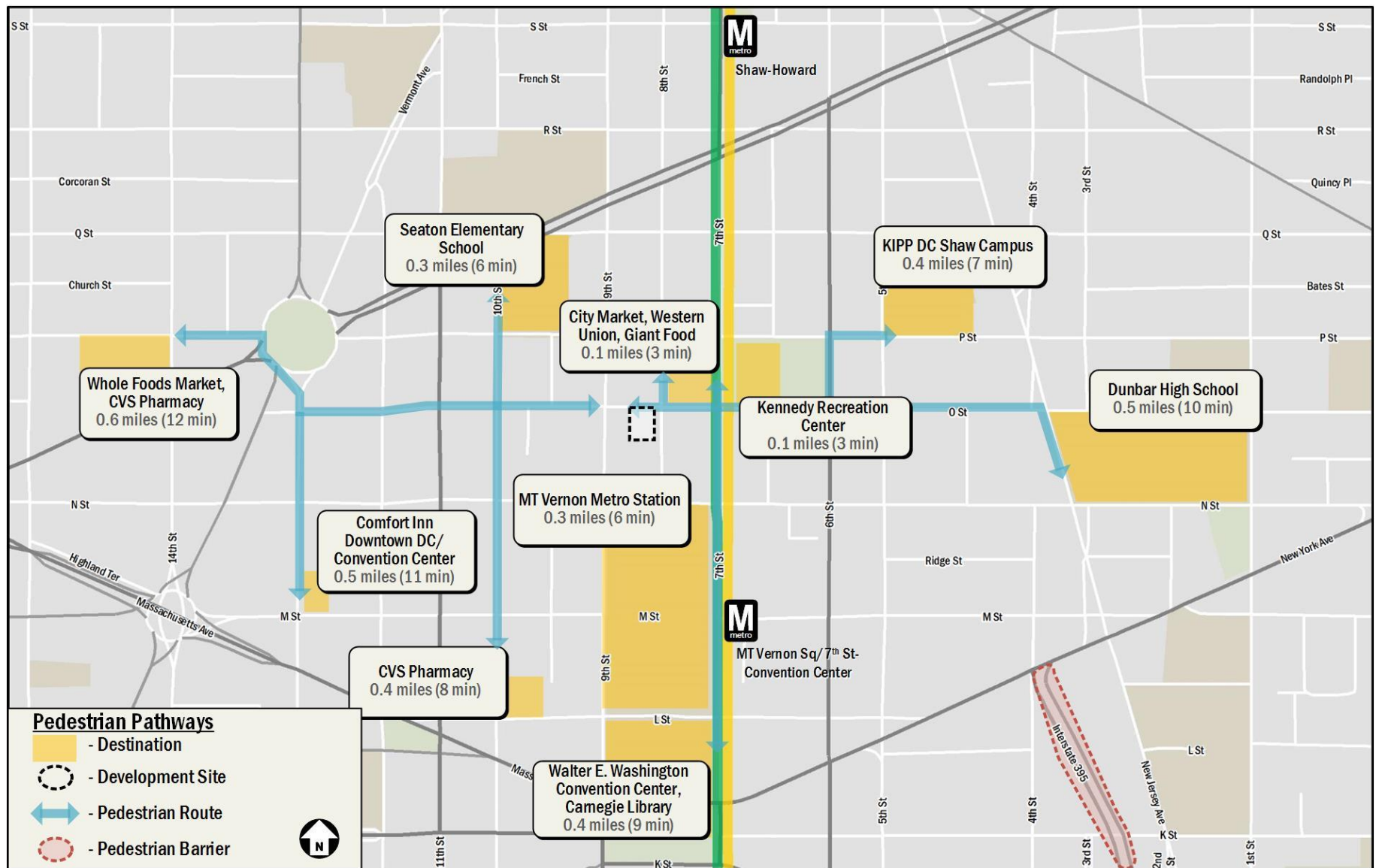


Figure 19: Pedestrian Pathways

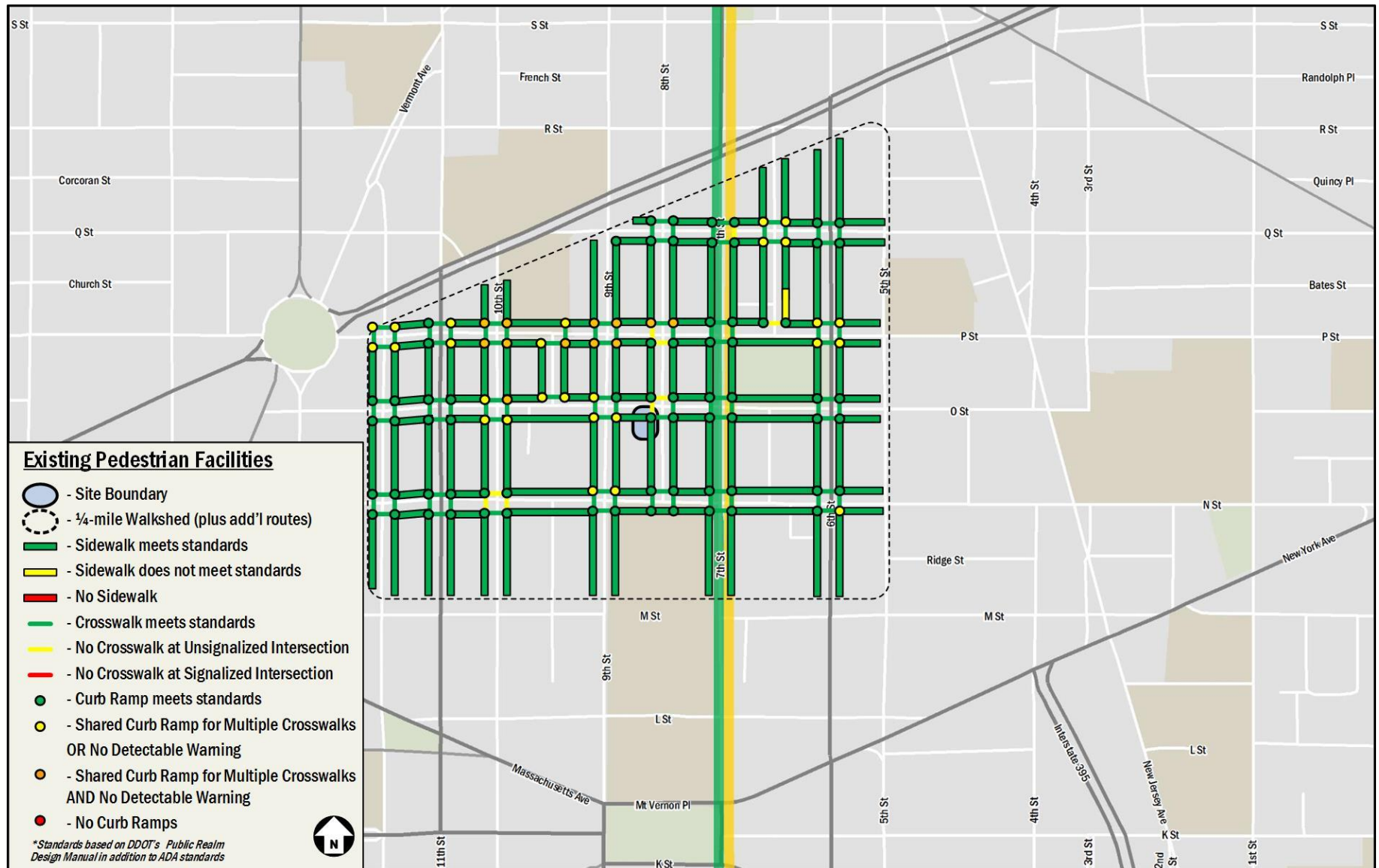


Figure 20: Existing Pedestrian Infrastructure



BICYCLE FACILITIES

This section summarizes existing and future bicycle access, reviews the quality of cycling routes to and from the site, and presents recommendations.

The following conclusions are reached within this chapter:

- The site has access to one bike trail located to the southeast of the site, as well as bike lane to the east and west.
- The site is not expected to generate a significant amount of bicycle trips, therefore all site-generated bike trips can be accommodated on existing infrastructure.
- The development will include secure bicycle parking on site, and short-term bicycle racks along the perimeter of the site.

EXISTING BICYCLE FACILITIES

The site has excellent connectivity to existing on-street bicycle facilities. North-south connectivity is primarily provided by bike lanes on 7th Street, 10th Street, and 5th Street. East-west connectivity is primarily provided by bike lanes along Q Street and R Street. These bike facilities provide access to other major bike facilities such as the cycle tracks on 15th Street, M Street, and L Street. Figure 21 illustrates existing bicycle facilities in the area.

In addition to personal vehicles, the Capital Bikeshare program provides an additional cycling option for residents and patrons of the development. The Bikeshare program has placed over 440 bicycle-share stations across Washington, DC, Arlington, Alexandria and Fairfax County, VA, and Montgomery County MD with over 3,700 bicycles provided. There are three Capital Bikeshare stations within a quarter mile of the site supplying a total of 56 docks. These stations are located at the NE corner of 8th Street and O Street, the NW corner of 7th Street and M Street, and the SW corner of 11th Street and O Street. Figure 21 identifies existing station locations in the study area.

PROPOSED BICYCLE FACILITIES

The MoveDC plan outlines several bicycle improvements in the vicinity of the site. These improvements are broken up into four tiers that rank the priority for implementation. The four tiers are broken down as follows:

- Tier 1
Investments should be considered as part of DDOT's 6-year TIP and annual work program development, if they are not already included. Some projects may be able to move directly into construction, while others become high priorities for advancement through the Project Development Process.
- Tier 2
Investments within this tier are not high priorities in the early years of MoveDC implementation. They could begin moving through the Project Development Process if there are compelling reasons for their advancement.
- Tier 3
Investments within this tier are not priorities for DDOT-led advancement in the early years of MoveDC's implementation. They could move forward earlier under circumstances such as real estate development initiatives and non-DDOT partnerships providing the opportunity for non-District-led completion of specific funding.
- Tier 4
Generally, investments within this tier are not priorities for DDOT-led advancement and are lower priority for project development in the early years of implementation.

Due to the timeline of the proposed development, this report will focus on the Tier 1 and Tier 2 recommendations within the vicinity of the site. These include an extension of the M cycle track and an eastern downtown cycle track (potentially along 6th Street/and or 5th Street).

Although these projects are discussed in the MoveDC plan, they are not currently funded or included in DDOT's Transportation Implementation Plan thus they will not be assumed as complete for this analysis.

SITE IMPACTS

This section summarizes the impacts of the development on the overall bicycle operations surrounding the site and develops recommendations for connectivity improvements.

Bicycle Trip Generation

The 8th & O Street NW development is expected to generate 5 bicycle trips (3 inbound, 2 outbound) during the morning peak hour and 7 bicycle trips (4 inbound, 3 outbound) during the afternoon peak hour. Although bicycling is an important mode for getting to and from the site, with significant facilities



located on site, and existing and planned routes to and from the site, the project is well positioned to take full advantage of any future expansion of bicycle infrastructure in the area. In the meantime, the surrounding low volume neighborhood streets provide suitable interim connectivity for bicycles.

On-Site Bicycle Elements

The project will provide amenities that cater to cyclists including 27 secure long-term bicycle parking within its garage, and short-term bicycle parking along the perimeter of the site.

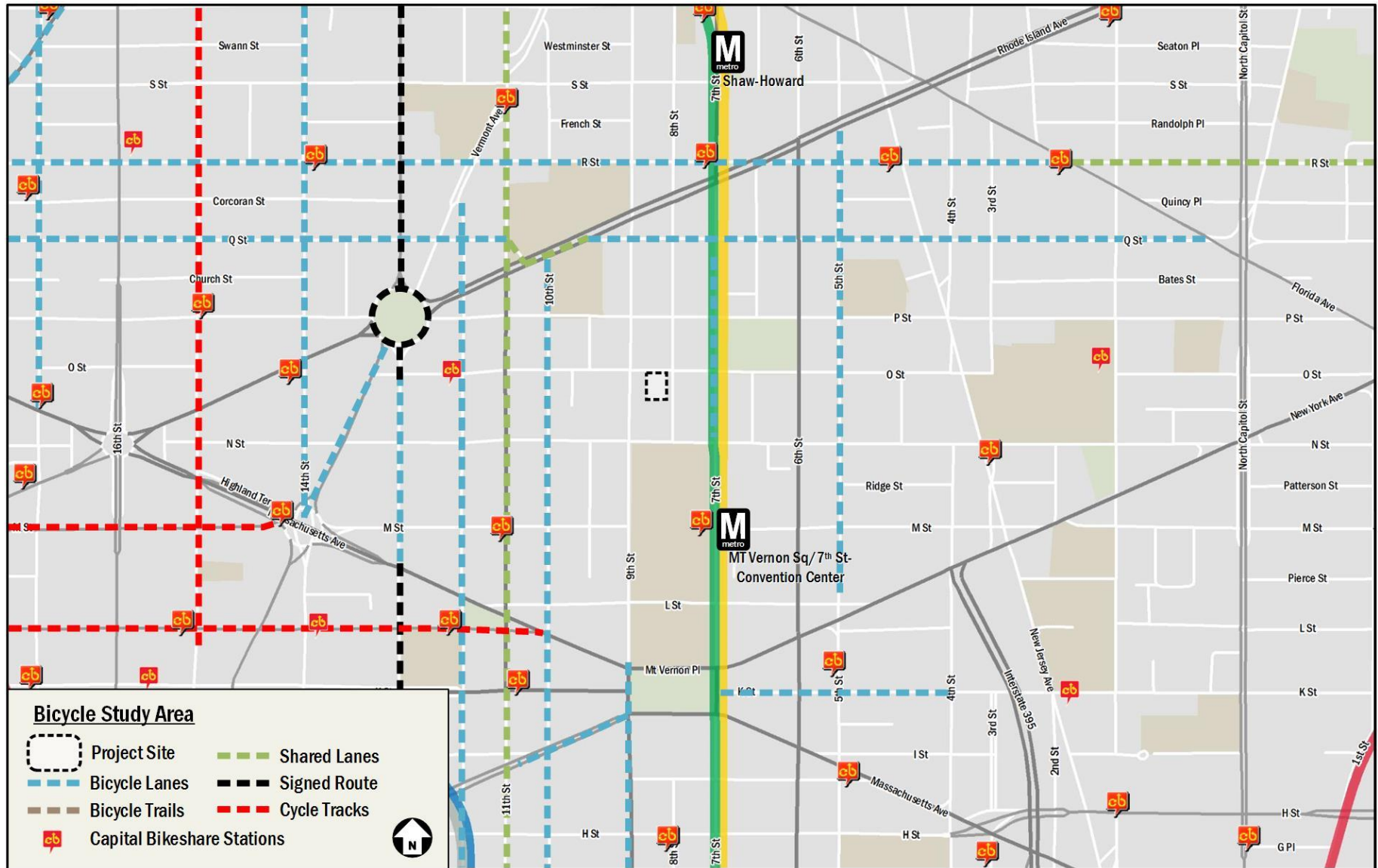


Figure 21: Existing Bicycle Facilities



CRASH DATA ANALYSIS

This section of the report reviews available crash data within the study area, reviews potential impacts of proposed development on crash rates, and makes recommendations for mitigation measures where needed.

SUMMARY OF AVAILABLE CRASH DATA

A crash analysis was performed to determine if there was an abnormally high crash rate at any study area intersection. DDOT provided the last three years of intersection crash data, from 2013 to 2015 for the study area. This data was reviewed and analyzed to determine the crash rate at each location. For intersections, the crash rate is measured in crash per million-entering vehicles (MEV). The crash rates per intersections are shown in Table 10.

According to the Institute of Transportation Engineer's *Transportation Impact Analysis for Site Development*, a crash rate of 1.0 or higher is an indication that further study is required. One (1) intersection in this study area meet this criterion (as shown in red in Table 10 and detailed in Table 11)

The 8th & O Street NW development should be developed in a manner to help alleviate, or at minimum not add to, the conflicts at this intersection.

A rate over 1.0 does not necessarily mean there is a significant problem at an intersection, but rather it is a threshold used to identify which intersections may have higher crash rates due to operational, geometric, or other issues. Additionally, the crash

data does not provide detailed location information. In some cases, the crashes were located near the intersections and not necessarily within the intersection.

For this intersection, the crash type information from the DDOT crash data was reviewed to see if there is a high percentage of certain crash types. Generally, the reasons for why an intersection has a high crash rate cannot be derived from crash data, as the exact details of each crash are not represented. However, some summaries of crash data can be used to develop general trends or eliminate some possible causes. Table 11 contains a breakdown of crash types reported for the one intersection with a crash rate over 1.0 per MEV.

POTENTIAL IMPACTS

This section reviews the location with an existing crash rate over 1.0 MEV and reviews potential impacts of the proposed development.

▪ 9th Street & N Street NW

This intersection is over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.22 crashes per MEV over the course of the 3-year study period. The majority of crashes at this intersection were side-swiped vehicles. Side-swiped vehicles may be particularly high due to the prevalence of on-street parking and shared thru-left turn lanes. Safety concerns at this intersection are primarily due to this existing geometry. Site-generated traffic is not expected to degrade the safety at this intersection; thus no improvements are recommended as part of the PUD.

Table 10: Intersection Crash Rates

Intersection	Total Crashes	Ped Crashes	Bike Crashes	Rate per MEV*
9th Street & O Street NW	23	0	0	0.74
8th Street & O Street NW	4	1	0	0.69
9th Street & N Street NW	25	3	0	1.22
8th Street & N Street NW	3	0	0	0.66

* - Million Entering Vehicles; Volumes estimated based on turning movement count data

Table 11: Crash Type Breakdown

Intersection	Rate per MEV	Right Angle	Left Turn	Right Turn	Rear End	Side Swiped	Head On	Parked	Fixed Object	Ran Off Road	Ped. Involved	Backing	Non-Collision	Under/Over Ride	Unspecified	Total
9th Street & N Street NW	1.22	1	2	1	1	9	0	3	1	0	2	4	0	0	1	25
		4%	8%	4%	4%	36%	0%	12%	4%	0%	8%	16%	0%	0%	4%	



SUMMARY AND CONCLUSIONS

The following report has presented a Comprehensive Transportation Review (CTR) for the 8th & O Street NW project and reviewed the transportation aspects of the Planned Unite Development (PUD) application. The Zoning Commission Case Number is 16-24.

The purpose of this study has been to evaluate whether the project will generate a detrimental impact to the surrounding transportation network. This evaluation is based on the existing multi-modal functions of the site. This report concludes that **the project will not have a detrimental impact** to the surrounding transportation network assuming that all planned site design elements are implemented.

Proposed Project

The 8th & O Street NW site is currently occupied by a surface parking lot, located approximately two blocks from the Mount Vernon Square Metrorail Station. The site is generally bound by O Street to the north, a public alley to the west, adjacent properties to the south, and 8th Street to the east.

The application plans to develop the site into a mixed-use development including approximately 80 residential dwelling units, approximately 3,500 square feet of retail space, and approximately 1,200 square feet of office space for the adjacent church. The development will also include an underground parking facility containing approximately 23 parking spaces serving the residential and retail uses. No on-site parking will be supplied for the church office use.

Parking will be accessed from an existing alley that links O Street and N Street west of the site via a single entrance. Loading will also be accessible via the existing alley. The parking and loading provided by the development will adequately serve the demands set forth by the development program.

Pedestrian facilities along the perimeter of the site will be improved to include sidewalk and buffer widths that meet or exceed DDOT requirements. The parking garage will supply 27 secure long-term bicycle parking spaces which meets the current zoning requirements. The development will also supply short-term bicycle parking in the form of U-racks along the perimeter of the site.

Multi-Modal Impacts and Recommendations

Transit

The site is served by regional and local transit services such as Metrorail and Metrobus. The site is 0.3 miles from the Mount Vernon Square Metrorail Station portal at 7th Street NW and M Street NW, and many Metrobus stops are located within a few blocks of the site along 7th Street, 9th Street, and P Street.

Although the development will be generating new transit trips, existing facilities have enough capacity to handle the new trips.

Pedestrian

The site is surrounded by a well-connected pedestrian network. Most roadways within a quarter-mile radius provide sidewalks and acceptable crosswalks and curb ramps, particularly along the primary walking routes.

The development will provide sidewalk facilities along the perimeter of the site that meet or exceed DDOT requirements.

Bicycle

The site is surrounded by several bicycle facilities such as bike lanes on 7th Street, 10th Street, 5th Street, Q Street, and R Street. These bike facilities provide access to other major bike connections such as cycle tracks on 15th Street, M Street, and L Street. Multiple Capital Bikeshare stations are located within a quarter-mile of the site.

On site, the development will meet requirements for short-term bicycle parking and secure long-term bicycle parking. Although the development will be generating new bicycle trips, existing facilities have enough capacity to handle the new trips.

Vehicular

The site is well-connected to regional roadways such as I-395 primary and minor arterials such as Rhode Island Avenue and 7th Street, and a network of collector and local roadways.

In order to determine if the proposed development will have a negative impact on this transportation network, this report projected future conditions with and without the development and performed analyses of intersection delays. These delays were compared to the acceptable levels set forth by DDOT standards. The analyses concluded that the planned development will not have adverse impacts to the surrounding transportation network. This outcome is consistent with the fact that projected future trips were similar in magnitude to existing trips.