

COMPREHENSIVE TRANSPORTATION REVIEW

**1000 4TH STREET, SW
STAGE 2 PUD**

WASHINGTON, DC

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ZONING COMMISSION
District of Columbia
CASE NO.02-38J
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EXECUTIVE SUMMARY

The following report is a Comprehensive Transportation Review (CTR) of the Second-Stage Planned Unit Development (PUD) for 1000 4th Street, SW. The report reviews the transportation aspects of the project's PUD application (Zoning Commission Case Number 02-38J).

The purpose of this study is to evaluate whether the project will generate a detrimental impact to the surrounding transportation network. This evaluation is based on a technical comparison of the existing conditions, background conditions, and future conditions. This report concludes that **the project will not have a detrimental impact** to the surrounding transportation network assuming that all planned site design elements and mitigation measures are implemented.

Proposed Project

The 1000 4th Street, SW site is currently undeveloped and is generally bounded by an existing church to the north, an existing building to the south, Wesley Place, SW to the east, and 4th Street, SW to the west.

The site is part of the larger Waterfront Station PUD approved in July 2003 (Zoning Commission Order No. 02-38), and the final phase of the overall project. A Modified First-Stage PUD (and Second-Stage approval for the center portion of the development) was previously approved by the Zoning Commission on November 17, 2007 by Zoning Commission Order No. 02-38A. The Modified First-Stage PUD approved for 1000 4th Street, SW, a single 400,000 square foot mixed-use multifamily residential building with ground floor retail and other neighborhood-serving service uses (Project).

The Second-Stage application proposes to develop the Project in accordance with the Modified First-Stage PUD. The proposed development program for Second-Stage consists of the following elements:

- **Residential:** Up to 456 residential units.
- **Retail/Restaurant:** Approximately 11,000 square feet of ground-floor retail and/or eating and drinking establishment space.
- **Arts/Cultural:** Approximately 9,000 square feet of arts/cultural space.
- **Educational/Daycare:** Approximately 9,000 square feet of educational/daycare space (currently

contemplated as a Pre-K/Daycare facility for approximately 176 students).

- **Parking:** Up to 233 parking spaces located in a below-grade garage.

Vehicular access to the Project's below-grade parking garage will be via a curb cut on the private extension of Wesley Place, SW on the east side of the building. This private extension will also provide access to the loading area, which will be located adjacent to the garage access.

A private drive is proposed along the north side of the site to accommodate pickup/drop-off activity for education/daycare use, as well as the residential and arts/cultural uses. The private drive will operate as one-way eastbound and will connect 4th Street, SW with Wesley Place, SW.

As part of the Project, pedestrian facilities along the perimeter of the project will be improved so that they meet or exceed DDOT and ADA standards. This includes a sidewalk along the private drive to provide additional east west connectivity and the addition of landscaped buffers along the Wesley Place, SW frontage.

The Project will supply internal, secure long-term bicycle parking and short-term bicycle parking within and around the perimeter of the site, all in compliance with or in excess of zoning requirements.

Multi-Modal Impacts and Recommendations

Transit

The site is served by four (4) Metrobus routes, one (1) DC Circulator route, a Southwest neighborhood shuttle, and additional regional commuter buses that provide connectivity to the downtown core and other areas of the District, Maryland, and Virginia. The site is located less than 0.1 miles from the Waterfront Metrorail Station.

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

Pedestrian

The 1000 4th Street, SW site is surrounded by a generally 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. There are areas to the west of the site that have inadequate pedestrian facilities under existing conditions



due to on-going construction; however, pedestrian facilities will be restored by completion of the 1000 4th Street, SW development.

As a result of the development, pedestrian facilities around the perimeter of the site will be improved to meet DDOT and ADA standards, where needed.

Bicycle

The site has adequate connectivity to existing on- and off-street bicycle facilities. The site is accessible to a cycle track along Maine Avenue, SW and bicycle lanes along 4th Street, 6th Street, and I (Eye) Street. Signed routes are located on M Street, SW, 3rd Street, SW, and Water Street, SW.

Vehicular

The site is well-connected to Interstate 395 and several principal and minor arterials such as Maine Avenue, SW, M Street, SW, and South Capitol Street and an existing network of collector and local roadways.

In order to determine impacts that the proposed Project will have on the transportation network, this report projects future conditions with and without the development of the site and performs analyses of intersection delays and queues. The results of this report's projection and analysis were compared to the acceptable levels of delay set by DDOT standards as well as existing queues to determine whether the Project will negatively impact the study area.

The vehicular capacity analysis results in the following conclusions:

- Under existing conditions, the majority of the studied intersections operate at acceptable conditions.
- Future areas of concern for roadway capacity, are primarily along commuter routes such as I Street, SW and M Street, SW.
- Four (4) study intersections met the threshold for requiring mitigation measures as a result of the Project:
 - G Street and 4th Street, SW (AM)
 - I Street and 7th Street, SW (PM)
 - I Street & 4th Street, SW (PM)
 - M Street & 3rd Street, SW (PM)
- All intersections requiring mitigation measures can be so-mitigated through the implementation of signal timing adjustments.

- Overall, this report concludes that the Project will not have a detrimental impact to the surrounding vehicular network, assuming proposed mitigation measures are implemented.

Transportation Management Plan (TMP)

A Transportation Management Plan (TMP) has been developed for the site as it relates to school pick-up/drop-off operations, private drive operations, loading, parking and transportation demand management. The elements outlined within the TMP aim to minimize the off-site impacts of the development, reduce the number of single-occupancy vehicle trips to and from the site, and improve the efficiency of the site such that all parking, loading, and pick-up/drop-off activity occurs on-site. This TMP is comprised of following five (5) components and detailed within this report:

- Pick-up/drop-off Management
- Private Drive Management
- Loading Management
- Parking Management
- Transportation Demand Management

Summary and Recommendations

Overall, this report concludes the following:

- The site is within close proximity to the Waterfront Metrorail Station and Metrobus stops along major corridors. The site also has immediate access to bike facilities and a well-connected pedestrian network. Overall, the site has excellent access to regional and local transportation options.
- The amount of parking and loading facilities proposed on-site is expected to accommodate the Project's demand.
- The Project will supply long-term and short-term bicycle facilities that meet or exceed zoning requirements.
- The Project will improve sidewalk facilities along the perimeter of the building and create a new pedestrian connection in conjunction with proposed private drive.
- The Project meets the threshold for requiring mitigation measures at four (4) intersections surrounding the site. These intersections can be adequately mitigated through the implementation of signal timing adjustments.



- A robust TMP is proposed with the goal of minimizing the off-site impacts of the Project and reducing the number of single-occupancy vehicle trips to and from the site following construction. The TMP will include components addressing pick-up/drop-off activity, private drive operations, loading, parking, and transportation demand management.

Based on these features and the technical analysis contained within, this report concludes that **the proposed Project will not have a detrimental impact** to the surrounding transportation network assuming that all planned site design elements and mitigation measures are implemented.



INTRODUCTION

This report is a CTR of the Second-Stage PUD for 1000 4th Street, SW. The report reviews the transportation aspects of the pending PUD application (Zoning Commission Case Number 02-38J).

As shown in Figure 1, 1000 4th Street, SW is located in the Southwest Waterfront neighborhood in Southwest DC. This CTR is submitted into the Zoning Commission record for the-above referenced cases, as an evaluation of the transportation impacts of the application.

PURPOSE OF STUDY

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 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 Project on all major modes of travel and the distribution of these trips on the network.
3. Determine whether the Project 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.

PROJECT SUMMARY

The 1000 4th Street, SW site is part of the larger Waterfront Station (as seen in Figure 2) PUD approved in July 2003 (Zoning Commission Order No. 02-38) and the final phase of the overall development. The development program proposed in the First-Stage PUD for the project included a 112-foot tall commercial office building with 470,000 square feet of office area at the 1000 4th Street, SW footprint.

As part of the Modified First-Stage PUD approved in November 2007 (Zoning Commission Order No. 02-38A) for 1000 4th Street, SW, the site was changed from a commercial building into a 114-foot, approximately 400,000 square foot, mixed-use multifamily residential building with ground floor retail and other neighborhood-serving uses.

The Second-Stage application proposes to develop the site in accordance with the Modified First-Stage PUD. The Second-Stage plans for 1000 4th Street, SW include up to 456 residential units, approximately 11,000 square feet of ground floor retail and/or eating and drinking establishment space, approximately 9,000 square feet of arts/cultural space, approximately 9,000 square feet of educational/daycare space (Pre-K/Daycare for 176 students), and up to 233 below-grade 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 projects, 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, including presenting mitigation measures for minimizing impacts 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 site, outlines impacts of the Project, 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 site, outlines impacts of the Project, 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 Project 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.

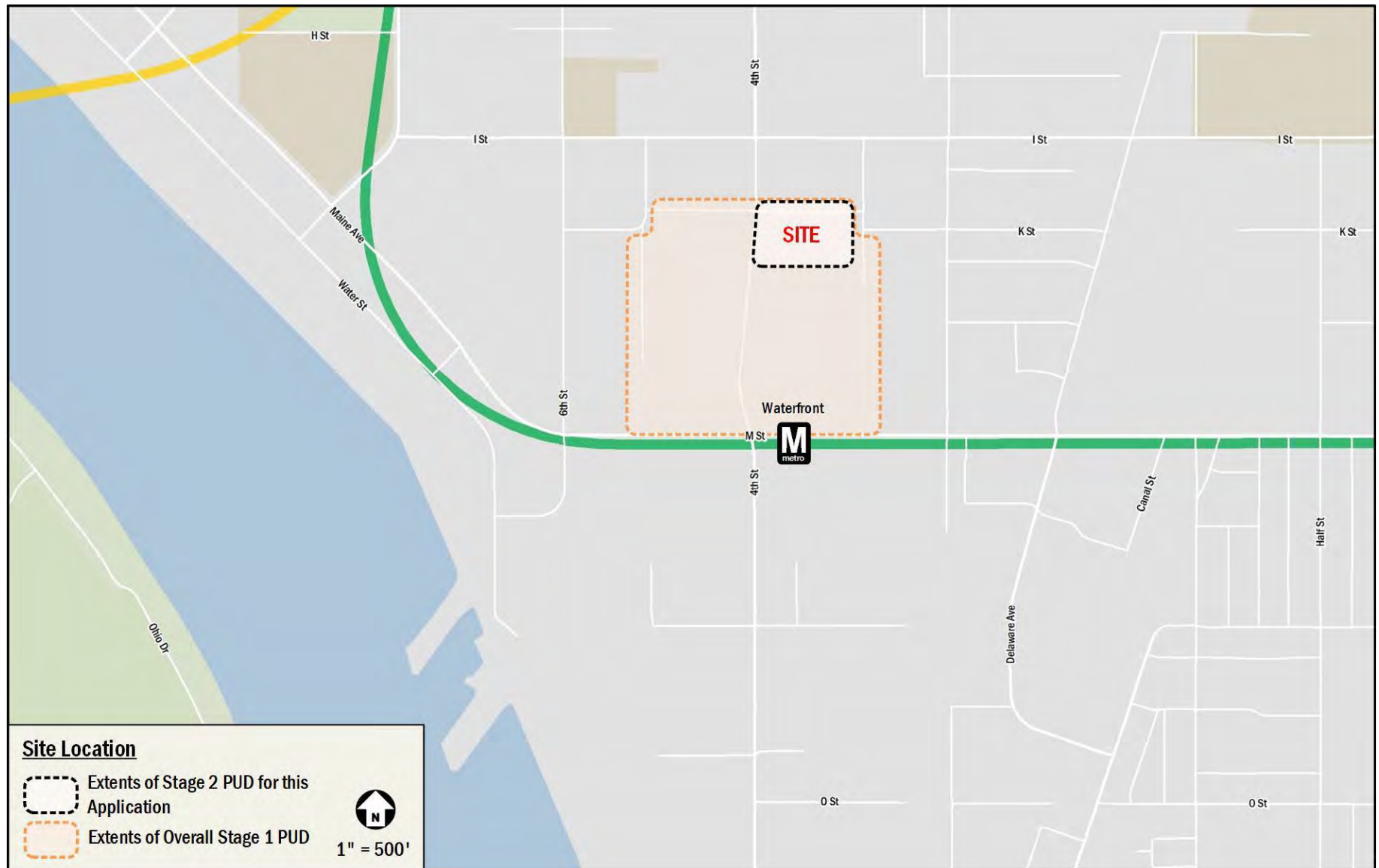


Figure 1: Site Location



Figure 2: Site Location (within Waterfront Development)



STUDY AREA OVERVIEW

This section reviews the study area and includes an overview of the 1000 4th Street, SW site, including a summary of the major transportation characteristics of the area and of future regional projects.

This chapter concludes that:

- The site is surrounded by an extensive regional and local transportation system that will connect the site to the rest of the District and surrounding areas.
- The site is served by Metrorail and Metrobus along prominent corridors such as M Street, SW and 4th Street, SW.
- There is bicycle infrastructure in the vicinity of the site, with connectivity to bike lanes on 4th Street, SW and I (Eye) Street, SW.
- Pedestrian conditions are generally sufficient, particularly along anticipated major walking routes.

MAJOR TRANSPORTATION FEATURES

Overview of Regional Access

The 1000 4th Street, SW site has ample access to regional vehicular- and transit-based transportation options, as shown in Figure 3, that connect the site to destinations within the District, Virginia, and Maryland.

The site is accessible from Interstate 395 and several principal arterials such as Maine Avenue, SW, M Street, SW, and South Capitol Street. These roadways create connectivity to the Capital Beltway (I-495) that surrounds Washington, DC and its inner suburbs, as well as providing connectivity to the District core.

The site is located near the Waterfront Metrorail station, which is served by the Green Line and connects northern and southern Prince George's County, Maryland, while providing access to the District core. In addition, the Green Line provides 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 a variety of local transportation options near the site that serve vehicular, transit, walking, and cycling trips, as shown on Figure 4. The site is served by a local vehicular network that includes several minor arterials roads such as I (Eye) Street, SW, 4th Street, SW, and 7th Street, SW. In addition, there is an existing network of collector and local roadways, such as Half Street, SW, 3rd Street, SW, and 6th Street, SW, which provide access to the site.

The Metrobus system provides local transit service in the vicinity of the site, including connections to several neighborhoods within the District and additional Metrorail stations. As shown in Figure 4 there are 10 full-time Metrobus, DC Circulator, neighborhood shuttle, and regional commuter bus routes that service the site. In the vicinity of the site, there are bus stops along I (Eye) Street, SW, M Street, SW, 3rd Street, SW, 4th Street, SW and 6th Street, SW. These bus routes connect the site to many areas of the District. A detailed review of transit stops within a quarter-mile walk of the site is provided in a later section of this report.

There are several existing bike facilities near the site that connect to areas within the District. The site has direct connectivity to the bicycle lanes on 4th Street, SW and I (Eye) Street, SW, which can connect to cycle tracks on Maine Avenue, bicycle lanes on 6th Street, SW, and signed routes on M Street, SW, 3rd Street, SW, and Water Street, SW. A detailed review of existing and proposed bicycle facilities and connectivity is provided in a later section of the report.

Anticipated pedestrian routes, such as those to public transportation stops, retail zones, and community amenities, provide excellent pedestrian facilities. A detailed review of existing and proposed pedestrian access and infrastructure is provided in a later section of this report.

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

Carsharing

Three (3) carsharing companies provide service in the District: Zipcar, Maven, and Car2Go. All three services are private companies that provide registered users access to a variety of automobiles. Of these, Zipcar and Maven have designated spaces for their vehicles. There are three (3) car-share locations



with a total of six (6) vehicles within a quarter-mile of the site, as shown in Table 1.

Carsharing is also provided by Car2Go, which provides point-to-point car-sharing. Car2Go currently has a fleet of vehicles located throughout the District and Arlington. Car2Go vehicles may park in any non-restricted metered curbside parking space or Residential 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.

Table 1: Summary of Carshare Locations

Carshare Location	Number of Vehicles
Zipcar	
I Street, SW & Makemie Place, SW	1 vehicle
4th Street, SW & I Street, SW	2 vehicles
Wesley Place, SW & K Street, SW	3 vehicles
Total	6 vehicles

Bikeshare and Scooter Share

The Capital Bikeshare program provides an additional cycling option for residents, employees, and visitors throughout the District. The Bikeshare program has placed over 500 bicycle-share stations across Washington, DC, Arlington and Alexandria, VA, and most recently Montgomery County, MD with over 4,300 bicycles provided. Within a quarter-mile of the site there are two Capital Bikeshare stations that house a total of 40 docks. Figure 4 illustrates the existing bicycle facilities in the area.

In addition to Capital Bikeshare, DDOT has engaged in pilot programs with several dockless bikeshare and scooter share companies, allowing an additional option for point-to-point transportation. Bicycle and scooter availability is tracked through mobile phone applications for each company individually.

FUTURE PROJECTS

There are several District initiatives 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 completed 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

In the vicinity of the Project, the MoveDC plan recommends pedestrian and bicycle improvements such as new sidewalks, and new bicycle trails and bicycle lanes. These recommendations would create additional multi-modal capacity and connectivity to the Project and are discussed later in the report.

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 Project offers a sizeable reduction in vehicular mode split due to the Project's proximity to local public transit options and bicycle infrastructure.

M Street SE/SW Transportation Study

The purpose of the M Street SE/SW Transportation Study is to prepare for the substantial new growth along the M Street/Maine Avenue corridor in the near Southeast and Southwest Waterfront area. The study area is projected to see in excess of 36 million square feet of development concentrated within a 0.78 square mile core area. The premise of the study is to better integrate the area of development with the surrounding neighborhoods and to improve multimodal travel and the public realm within the neighborhood. The study area encompasses an area of approximately 1.7 square miles along the M Street SE/SW corridor and the Southwest Waterfront from 12th Street, SE to 14th Street, SW. The study considers existing and future transportation conditions, reviews the planned future land uses in the study area, and develops solutions for the transportation network in order to promote livable communities and to encourage reinvestment within the study area. The study recommends improvements for three conditions: near term (2013-2016), mid-term (2015-2021), and long-term (2020 and beyond).

The Draft report recommends several potential near-term projects and policy updates. The policy updates include suggestions to improve TDM strategies, parking systems and regulations, transit policies, motor coach and commuter bus staging/parking, freight loading and truck routes, bicycle and pedestrian policies, and sustainable design. Potential low-cost operational and system management projects include signing and pavement marking improvements, signal timing optimization along M Street, pedestrian and Anacostia Riverwalk Trail connectivity improvements, bicycle network improvements, transit service improvements, parking changes, and sustainability and low-impact development improvements.

For the mid-term, three multimodal projects are proposed and investigated: Alternative 1 – M Street “Main Street”, Alternative 2 – “Balanced Links” and Alternative 3 – M Street “Mobility Arterial”. Alternative 1 includes prioritizing non-automobile transportation and establishing M Street as a core premium transit corridor, which would reduce M Street to two vehicular lanes in each direction with an exclusive outer transit lane. Alternative 2 balances the transit network to provide wider coverage to the entire study area by allocating new transit services to parallel corridors while creating new bicycle facilities along the M Street corridor. Alternative 3 focuses on preserving M Street as a primarily vehicular corridor with less emphasis on alternative modes by implementing operational improvements to maximize vehicular throughput, maintaining three vehicular travel lanes in each direction, and providing a shared outer lane for streetcar and transit. The three alternatives from the Draft report will be used to develop and analyze potential “hybrid” alternatives to be implemented in the mid-term.

The long-term improvements focus on potential new connections to complete the street grid in the study area if future development (beyond 2035) were to occur in areas not currently available. The long-term options include roadway improvements in the Buzzard Point area, as well as improvements to east-west connectivity; Metrorail station capacity improvements, along with Yellow line improvements; commuter rail enhancements; and multimodal transfer centers. These options would all require further study and significant agency coordination and public involvement. The study projects that the options could possibly be implemented between 2020 and 2040.

Alternative transportation options, such as the Southwest Shuttle and the robust TDM plan proposed for 1000 4th Street, SW will help integrate the local neighborhood and increase multimodal travel.

Special Events Addendum to M Street SE/SW Transportation Study

This traffic study was initiated by DDOT in 2013 to assess the impact of multiple entertainment venues upon the transportation network in the Buzzard Point/Waterfront area. These new developments include a 20,000 seat Soccer Stadium on Buzzard Point, a 2,000+ seat movie theater east of Nationals Park, and a 6,000 seat concert hall at The Wharf. This Study was initiated as follow-on to the M Street Southeast/Southwest



Transportation Planning Study. The purpose of the Special Events Transportation Analysis is to consider current and future transportation conditions associated with special events and stadium traffic in the Study area, to review plans for the proposed new event facilities and estimate corresponding future traffic demands, (vehicular, pedestrian, bicycle, transit); to determine potential impacts to the transportation system; and to develop strategies and solutions for improving conditions on the transportation network, including modifications to existing traffic management plans, to mitigate the impacts of event traffic within the Study area.

Several strategies were proposed within the Study area to ease the movement of people during event occurrences. Many of the suggested improvements have already been proposed as part of the M Street Study. These improvements include additional north-south transit connectivity, additional east-west vehicular connectivity, signing and pavement marking improvements, transportation systems management, parking systems improvements, and pedestrian and bicycle improvements.

The proposed development will improve upon pedestrian facilities near the M Street corridor, allowing for better north-south connectivity to and from entertainment venues.

Southwest Neighborhood Plan

Launched in 2013 and approved in 2015, the Southwest Neighborhood Plan is an effort to guide the direction of future growth of the neighborhood over the next five to ten years. The scope of the plan extends from South Capitol Street, west to Maine Avenue, SW, south to P Street, SW, and north to Interstate 395. The main purpose of this Plan is to enhance parks, pedestrian and street connections, bolster retail, integrate community amenities, and enhance transportation choices in the Southwest Waterfront neighborhood. The Plan aims to provide residents and property owners with assurances of what future development may look like, including recommendations to preserve and enhance existing assets and ensure that the neighborhood retains social and economic diversity.

The proposed Project will directly contribute to the goals of this Plan by providing several benefits in the form of arts/cultural space, a Pre-K/Daycare facility, and neighborhood retail to the local community.

Background Developments

There are several potential development projects in the vicinity of the 1000 4th Street, SW site. 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 that of the Project.

Based on these criteria and discussions with DDOT during the scoping process, 11 background developments were ultimately included and described below. Figure 5 shows the locations of these developments in relation to the proposed development.

The View at Waterfront

The View at Waterfront will consist of approximately 276 new residential dwelling units and 5,220 SF of retail. This development lies within the study area and is currently under construction.

501 I (Eye) Street

501 I (Eye) Street will consist of approximately 105 new residential dwelling units and 29,600 square feet of space for the Shakespeare Theatre Company. This development lies within the study area and is expected to be completed prior to the completion of the Project.

375 M Street

375 M Street will consist of approximately 285 new residential dwelling units, 32,400 square feet of office, 18,800 square feet of retail, and a 6,000 SF community space. This development lies within the study area and is expected to be completed prior to the completion of the Project.

425 M Street

425 M Street will consist of approximately 310 new residential dwelling units and 21,100 square feet of retail. This development lies within the study area and is expected to be completed prior to the completion of the Project.



Town Center North

Town Center East will consist of approximately 190 new residential dwelling units and approximately 16,500 square feet of retail. This development lies within the study area and is expected to be completed prior to the completion of the Project.

301 M Waterfront

301 M Waterfront will consist of approximately 187 residential dwelling units, and 1,710 SF of retail. This development lies within the study area and construction was completed shortly before collecting traffic counts for the Project.

St. Matthews Evangelical Lutheran Church Redevelopment

St. Matthews Evangelical Lutheran Church Redevelopment will consist of approximately 221 residential dwelling units and a replacement sanctuary. This development is located just outside the study area and currently under construction.

680 I (Eye) Street

680 I (Eye) Street SW will consist of approximately 167 residential dwelling units, a 11,400 SF church, 6,900 sf of

retail, and a 7,700 SF daycare. This development lies within the study area and is currently under construction.

The Wharf (Phase 2)

The Wharf (Phase 2) is a large mixed-use development with retail, residential, office, and hotel uses. This development is located just outside the study area and expected to be complete along a similar timeline as the Project.

Randall School

The Randall School redevelopment will consist of approximately 470 residential units, 18,600 square feet of office, and 31,800 square feet dedicated to museum space. This development is located just outside the study area and is expected to be completed prior to completion of the Project.

Southwest Library

The Southwest Library will be renovated and will ultimately comprise of 20,800 square feet of library space. This development lies within the study area and is expected to be completed prior to the completion of the Project.

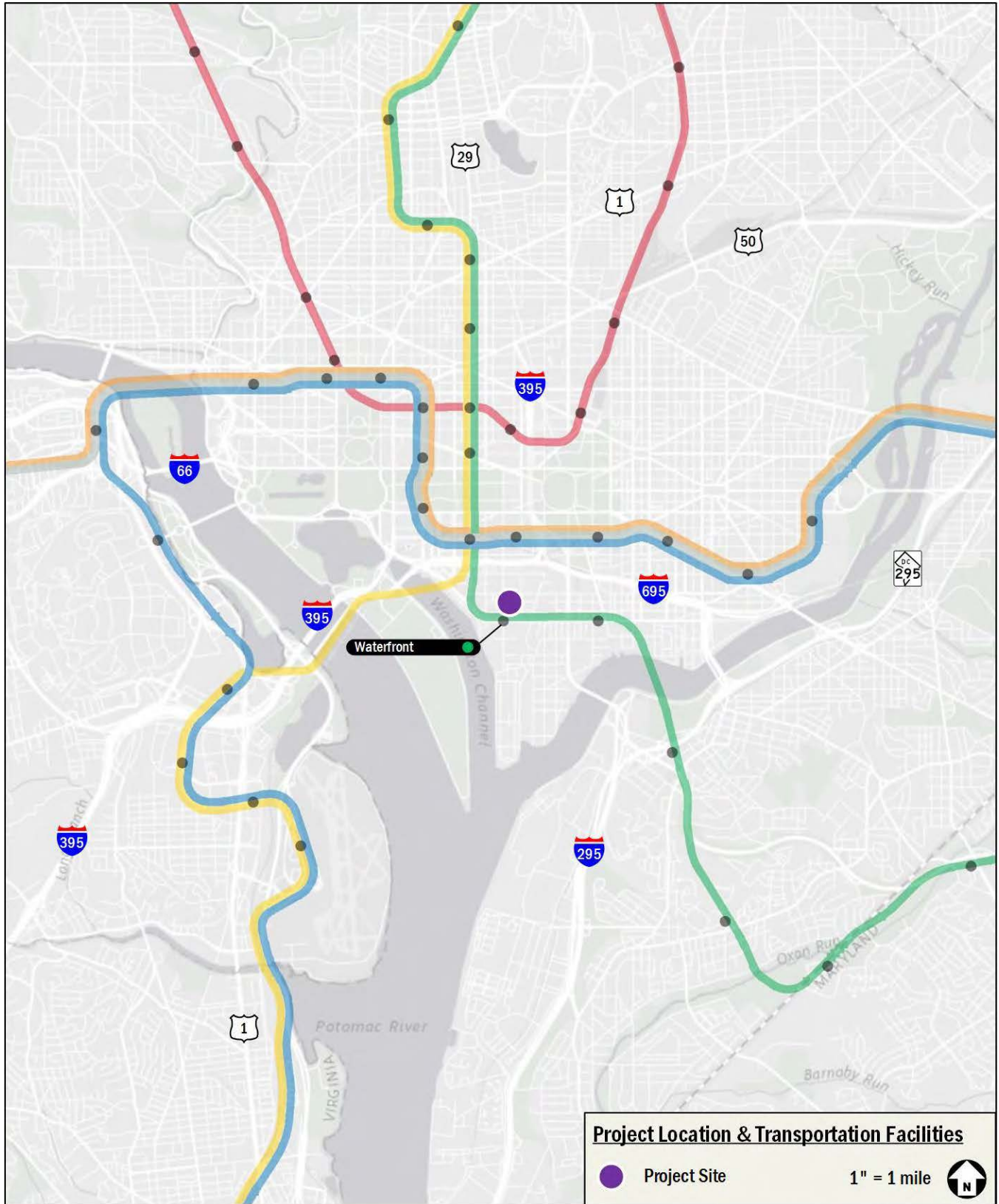


Figure 3: Major Regional Transportation Facilities

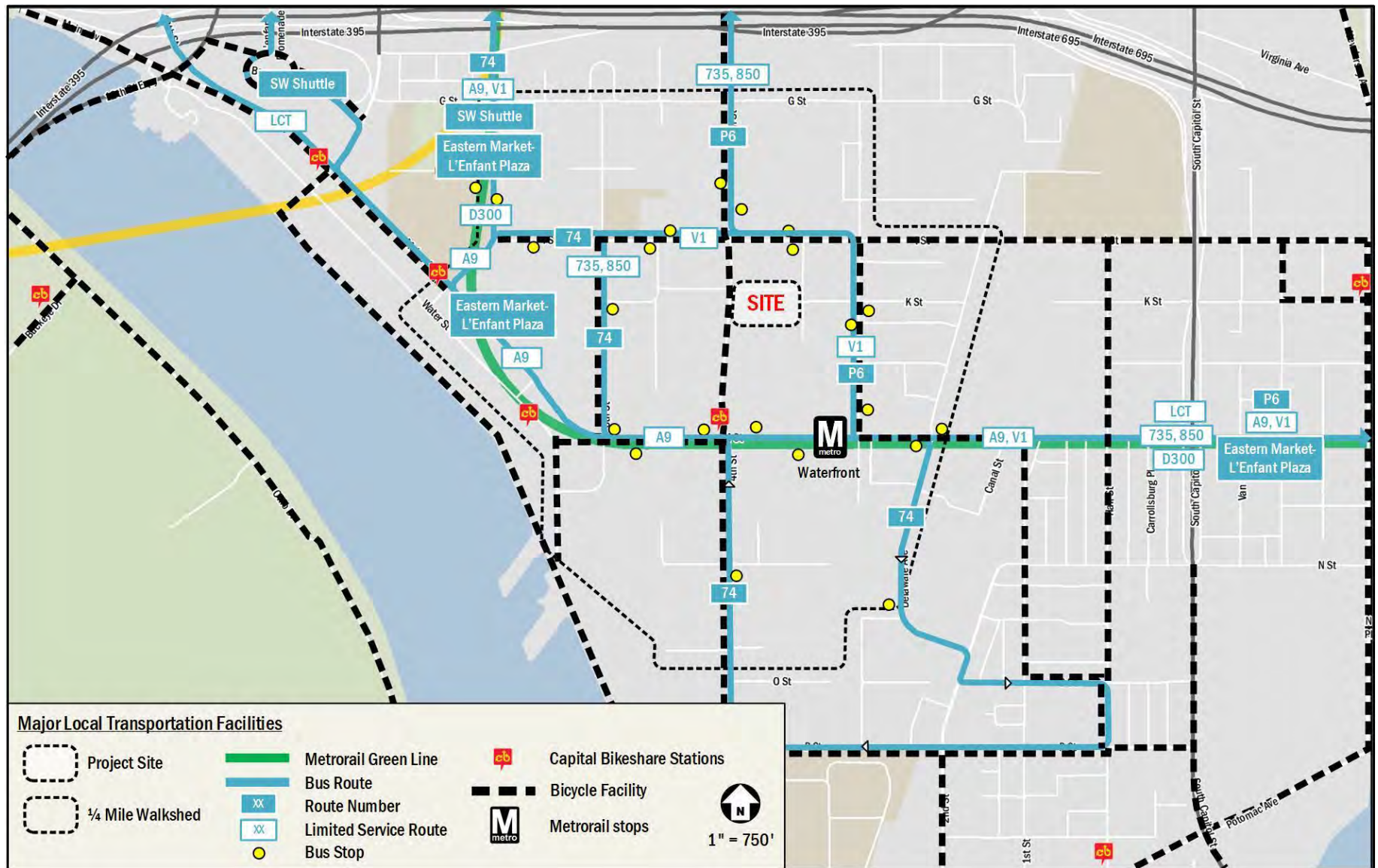


Figure 4: Major Local Transportation Facilities



Figure 5: Planned Development Map



PROJECT DESIGN

This section reviews the transportation components of the Project, including the proposed site plan and access points. It includes descriptions of the vehicular access for the site, loading, parking, bicycle and pedestrian facilities, and TMP. It also supplements the information provided in the site plans package that accompanied the Zoning Application, which includes several illustrations of site circulation and layout.

This chapter concludes that:

- The Project provides sufficient parking and loading facilities to accommodate demand.
- The Project provides long-term and short-term bicycle parking that meets or exceeds zoning requirements.
- Sidewalks surrounding the site will be improved to meet DDOT requirements and an additional pedestrian connection will be added along the private drive.
- The Applicant is proposing to implement a robust TMP that addresses pick-up/drop-off operations, private drive operations, loading management, parking management, and TDM.

PROJECT SUMMARY

The site is currently undeveloped and is generally bounded by an adjacent parcel to the north, an existing building to the south, Wesley Place, SW to the east, and 4th Street, SW to the west.

The site is part of the larger Waterfront Station PUD (as seen in Figure 2) approved in July 2003 (Zoning Commission Order No. 02-38) and the final phase of the overall development. The development program proposed in the First-Stage PUD for the project included a 112-foot tall commercial office building with 470,000 square feet of office area at the site.

A Modified First-Stage PUD (and Second-Stage approval for the center portion of the overall development) was previously approved by the Zoning Commission on November 17, 2007 by Zoning Commission Order No. 02-38A. The Modified First-Stage PUD proposed increases in residential density, increases in retail and open space square footage, and increases in building heights of the buildings lining 4th Street, SW.

As part of the Modified First-Stage PUD for 1000 4th Street, SW, the site was changed from a commercial building into a 114-

foot, approximately 400,000 square foot, mixed-use multifamily residential building with ground floor retail and other neighborhood-serving service uses.

The Second-Stage PUD application proposes to develop the Project in accordance with the Modified First-Stage PUD. The proposed development program for the Second-Stage PUD consist of the following elements:

- **Residential:** Up to 456 residential units.
- **Retail/Restaurant:** Approximately 11,000 square feet of ground floor retail and/or eating and drinking establishment space.
- **Arts/Cultural:** Approximately 9,000 square feet.
- **Educational:** Approximately 9,000 square feet of education/daycare space (currently planned as a Pre-K/Daycare facility for 176 students).
- **Parking:** Up to 233 below-grade spaces.

Figure 6 shows the proposed site plan for the Project and Figure 2 shows the overall site plan of the Waterfront Station PUD.

SITE ACCESS AND CIRCULATION

Vehicular Access

Vehicular access to the below-grade parking garage for will be via a curb-cut on the private extension of Wesley Place, SW along the east side of the building. This private extension will also facilitate trash pickup and loading operations, with a curb cut located directly south of the garage access.

A private drive is proposed along the north side of the site to accommodate pickup/drop-off activity for education/daycare use, as well as the residential and arts/cultural uses during non-peak pick-up/drop-off periods. The private drive will operate as one-way eastbound and will connect 4th Street, SW with Wesley Place, SW. The private drive will be accessible from an existing curb cut along 4th Street, SW and a relocated curb cut along Wesley Place, SW.

Pedestrian Access

The primary pedestrian access to the residential lobby of the Project is proposed to occur along 4th Street, SW. Pedestrian access points to the cultural, retail and/or eating and drinking establishment space(s), and education/daycare components are located along 4th Street, SW and the private drive. The pedestrian access for the Project is shown on Figure 6.



Bicycle Access

Bicycle access to the secure long-term bicycle storage facilities for the Project will be from the parking access along the private extension of Wesley Place, SW. The secure bicycle storage room will be located on the first level of the below-grade garage.

Short-term bicycle parking will be located along the perimeter of the building on 4th Street, SW and the private drive, primarily accessible from the existing bicycle lanes along 4th Street, SW.

LOADING

Truck routing to and from the site will be focused on designated primary truck routes such as Interstate 395, Maine Avenue, SW, M Street, SW, 9th Street, SW, and South Capitol Street. The proposed development will provide two (2) 30' loading berths which will be accessible from the private extension of Wesley Place, SW.

The amount of loading expected at the site is estimated as follows:

- As a baseline, it is expected that there will be three (3) daily truck deliveries (covering trash, general shared 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 out move out.
- Although the exact nature of individual retail and/or eating and drinking establishment spaces is unknown at this time, it is expected that such spaces will generate an additional two (2) deliveries per day in addition to the baseline shared deliveries.
- It is expected that the arts/cultural use will generate an additional one (1) to two (2) deliveries per day, in addition to the baseline shared deliveries.
- It is expected that the education/daycare space will generate an addition one (1) delivery per day, in addition to the baseline shared deliveries.

Using these estimates, the site is expected to generate seven (7) to eight (8) loading activities per day. This amount of loading is expected to be adequately served by the proposed loading facilities within the building.

PARKING

The Project's required parking totals were established in the Modified First-Stage PUD. However, for comparison, based on current zoning requirements, a building the size of the Project with its proposed mix of uses would be required to provide the following amount of vehicular parking spaces:

- Residential: 1 space for each 3 dwelling units, amounting to 152 required spaces
- Retail: 1.33 spaces per 1,000 sf, in excess of 3,000 sf, amounting to 12 required spaces
- Arts/Cultural: 2 spaces per 1,000 sf, amounting to 18 required spaces
- Education/Daycare: 0.5 spaces per 1,000 sf, amounting to 5 required spaces

The Project will meet these nominal requirements by supplying a total of up to 233 parking spaces, including up to 198 residential spaces and 35 non-residential spaces. Given the quality of transit access to the site via the adjacent Metrobus stops and Waterfront Metrorail Station, this amount of parking is sufficient to accommodate the Project's daily parking demand without the unintended consequence of encouraging driving as a mode.

Additional short-term parking demand exists as part of the school's pick-up/drop-off activity, but that parking demand only exists during peak pick-up/drop-off and is expected to be accommodated within the parking designated for non-residential uses. Additional information regarding the pick-up/drop-off operations and parking management is included later in this section.

BICYCLE AND PEDESTRIAN FACILITIES

Bicycle Facilities

Based on current zoning requirements, a building the size of the Project with its proposed mix of uses would be required to meet the following amount of long-term bicycle parking:

- Residential: 1 space for each 3 dwelling units, amounting to 152 required long-term spaces
- Retail: 1 space for each 10,000 sf, amounting to 1 required long-term space
- Arts/Cultural: 1 space for each 10,000 sf, amounting to 1 required long-term space
- Education/Daycare: 1 space for each 10,000 sf, amounting to 1 required long-term space



This results in a total nominal requirement of 155 long-term bicycle spaces. The project is proposing to include a total of approximately 161 secure long-term spaces on the first level of the garage. As such, the Project will exceed the amount of parking that would be required under current zoning.

Based on current zoning requirements, a building the size of the Project with its proposed mix of uses would be required to provide the following amount of short-term bicycle parking:

- Residential: 1 space for each 20 dwelling units, amounting to 23 required short-term spaces
- Retail: 1 space for each 3,500 sf, amounting to 3 required short-term spaces
- Arts/Cultural: 1 space for each 10,000 sf, amounting to 1 required short-term space
- Education/Daycare: 1 space for each 10,000 sf, amounting to 1 required short-term space

This results in a total requirement of 28 short-term bicycle spaces (in the form of 14 bicycle racks). These short-term spaces will be provided in the form of inverted U-racks placed along the perimeter of the property along 4th Street, SW and the private drive. The Applicant will work with DDOT to select the exact location for the racks in public space.

Pedestrian Facilities

As part of the development pedestrian facilities along the perimeter of the Project will be improved so that they meet or exceed DDOT and ADA standards. This includes a sidewalk along the private drive to provide additional east-west connectivity and the addition of landscaped buffers along the Wesley Place, SW frontage.

TRANSPORTATION MANAGEMENT PLAN

A TMP has been developed for the site as it relates to school pick-up/drop-off operations, private drive operations, loading, parking and transportation demand management. The elements outlined within this TMP aim to minimize the off-site impacts of the Project, reduce the number of single-occupancy vehicle trips to and from the site, and improve the efficiency of the site such that all parking, loading, and pick-up/drop-off activity occurs on-site. This TMP consists of five (5) components, as detailed below:

School Pick-up/Drop-Off Plan

- Pick-up/drop-off operations will have the flexibility to take place along the private drive, within the parking garage, or a combination of both, depending on the ultimate needs of the school/daycare.
- During the morning drop-off period and afternoon pick-up period, parents may use the private drive only when staffed by employees. At all other times, parents are expected to park in designated parking spaces in the garage and walk their student into the school.
- A staff member will monitor queues along the private drive during the morning drop-off period and afternoon pick-up period. During these times, if queues begin to extend past the point in which vehicles can comfortably pass standing vehicles, parents will be directed to continue to the garage.
- To accommodate parents parking in the garage for pick-up/drop-off activity, a minimum of 10 spaces will be designated for short-term pick-up/drop-off parking and will be allocated as such in the parking garage. These parking spaces will be free up to 30 minutes.
- Parents will be informed that parking for pick-up/drop-off activity is to occur within the garage and not within on-street parking spaces surrounding the school on 4th Street, SW, Wesley Place, SW, or K Street, SW.
- Pick-up/drop-off operations will be monitored during the first year of operation and adjusted as needed.

Private Drive Management Plan

- The private drive will be designed to include a designated pick-up/drop-off zone that is wide enough to allow through traffic to pass standing vehicles.
- The residential and commercial pick-up/drop-off zone will be located along the private drive as opposed to 4th Street, SW, Wesley Place, SW or K Street, SW.
- Vehicles will be restricted from parking along the private drive through the use of signage.
- The private drive may be closed to vehicular traffic for special events but only during times that do not coincide with school pick-up/drop-off activity.

Loading Management Plan

- A loading facility manager will be designated by property management and the current contact information (including the cell phone number and e-mail address) for such loading manager shall be given to the property manager for the adjacent office building at 1100 4th Street, SW. The loading facility manager shall communicate



regularly and work cooperatively with the property and loading managers of that adjacent building to avoid conflicts in the private alley and to comply with all written agreements between the property owners.

- The loading facility manager will schedule deliveries such that the loading facility's capacity is not exceeded. In the event that an unscheduled delivery vehicle arrives while the facility is full, that driver will be directed to return at a later time when the loading facility will be available.
- All tenants will be provided with information regarding loading dock restrictions, rules, and suggested truck routes at lease signing.
- All tenants will be required to use trucks 30' in length or shorter.
- All residential tenants will be required to schedule move ins/move outs.
- The property management will instruct deliveries (UPS, FedEx, USPS, etc.) to be made within the provided loading docks and not along the private drive, 4th Street, SW, K Street, SW, Wesley Place, SW, or the private extension of Wesley Place, SW.
- The Applicant will coordinate with the property management of other buildings within the overarching Waterfront Station development to instruct deliveries be made within the provided loading docks.
- No tenants or delivery trucks serving the property shall (i) permit any vehicle accessing the loading area to park, stand, load, or unload in the restricted "Access Area" in the private extension of Wesley Place, SW, (ii) store or otherwise permit any trash, refuse, rubbish, debris, structure, or equipment within the Access Area, (iii) cause or permit any use of the Access Area that would otherwise conflict with loading dock operations for the Safeway or other tenants of the adjacent office building, or (iv) use or permit to be used the Access Area in a manner that interferes with or disturbs use and enjoyment of the Access Area by the Safeway or other tenants of the adjacent office building.
- Trucks using the loading facility will not be allowed to idle and must follow all District guidelines for heavy vehicle operation including but not limited to DCMR 20 – Chapter 9, Section 900 (Engine Idling), the regulations set forth in DDOT's Freight Management and Commercial Vehicle Operations document, and the primary access routes listed in the DDOT Truck and Bus Route System.
- The loading facility manager will be responsible for disseminating suggested truck routing maps to drivers

from delivery services that frequently utilize the loading facility. The facility manager will also distribute materials such as DDOT's Freight Management and Commercial Vehicle Operations document to drivers as needed to encourage compliance with idling laws.

Parking Management Plan

- A minimum of 35 spaces will be allocated to non-residential uses. These spaces will be located in a publicly accessible area of the garage and will be signed as such. The non-residential parking spaces may be used by the retail/restaurant patrons, the arts/cultural space patrons, and the daycare/education space.
- The arts/cultural use is expected to generate parking demand primarily during the evenings and weekends therefore a shared parking strategy can be implemented to supply sufficient parking for pick-up/drop-off activity during the peak pick-up/drop-off periods.
- Non-residential parking will be free for the first 30 minutes to encourage pick-up/drop-off activity to take place within the garage and not on-street.

Transportation Demand Management Plan

- The Applicant will identify a TDM Leader (for planning, construction, and operations). The TDM Leader will work with residents and tenants of the building to distribute and market various transportation alternatives and options. This includes providing TDM materials to new residents and tenants in a welcome package.
- The Applicant will provide TDM Leader contact information to DDOT and report TDM efforts and amenities to goDCgo staff once per year.
- The Applicant will post all TDM commitments online, publicize availability, and allow the public to see what commitments have been promised.
- The Applicant will provide website links to CommuterConnections.com and goDCgo.com on property websites.
- The Applicant will unbundle all parking from the cost of the lease or purchase of residential units. Parking costs will be set at the average market rate within a ¼ mile, at a minimum.
- The Applicant will install a Transportation Information Center Display (electronic screen) within the residential lobby, containing information related to local transportation alternatives.



- The Applicant will meet or exceed the Zoning Regulations' requirements for bicycle parking. This includes secure interior bicycle parking and short-term exterior bicycle parking around the perimeter of the site.
- The Applicant will meet or exceed the Zoning Regulations' requirements for showers and lockers. These facilities will be available for use by employees of the Project's ground floor uses.

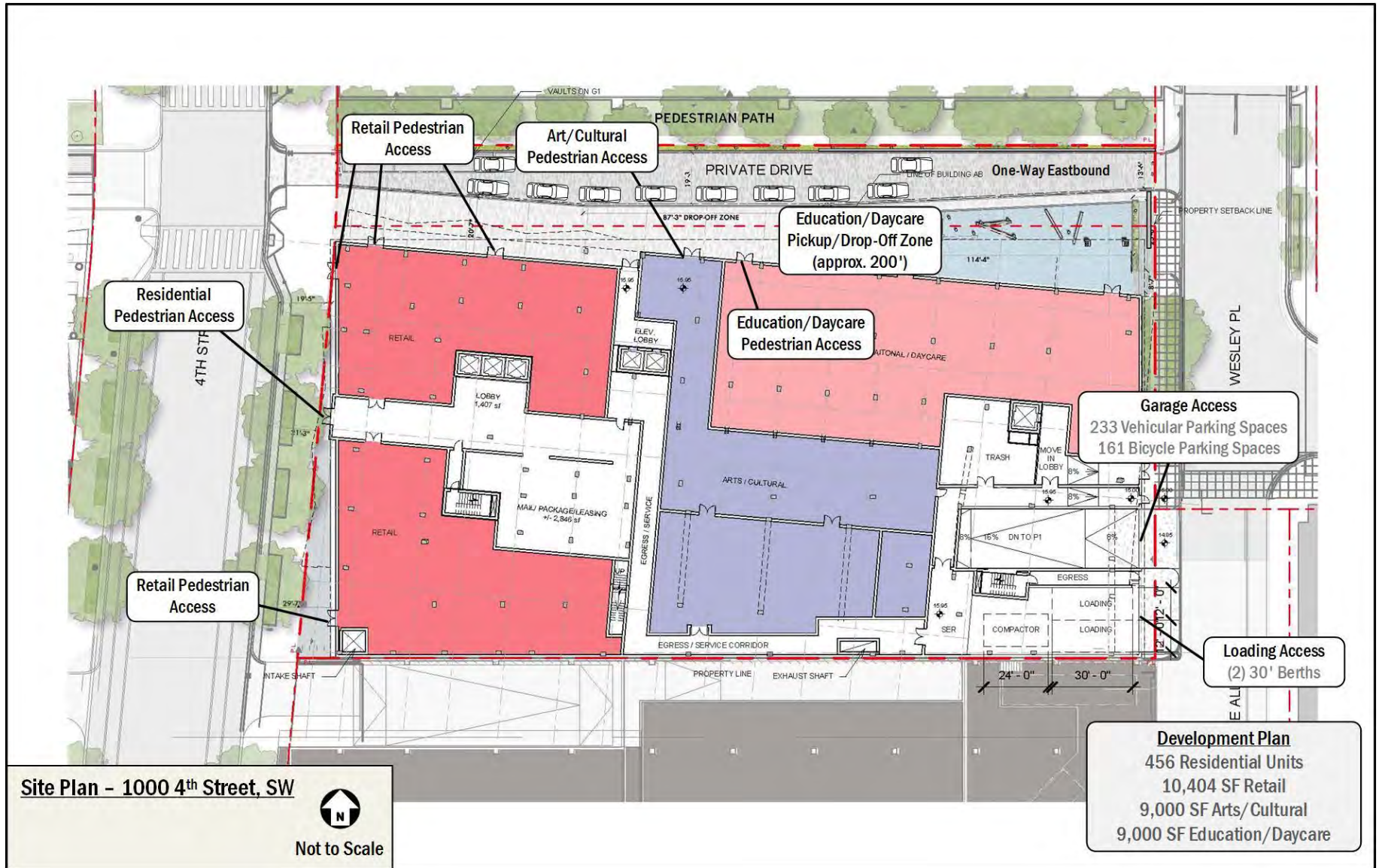


Figure 6: Proposed Site Plan



TRIP GENERATION

This section outlines the transportation demand of the Project. It summarizes the projected trip generation of the site by mode and land use, which forms the basis for the chapters that follow. These assumptions were vetted and approved by DDOT as a part of the scoping process for the study.

The proposed trip generation for the Project assumed 456 residential units, 11,000 square feet of retail and/or restaurant space, 9,000 square feet of arts/cultural space, and a 176-student education/daycare facility.

Given that the most recent analysis for this building was completed in 2007, updated methodology was used to determine the projected trip generation. As an update to the 2007 trip generation analysis, a multi-modal trip generation methodology was applied using ITE 9th Edition rates for all land uses. Mode split assumptions were based on census data and other resources.

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.

Although the specific use of the Arts/Cultural space is not known at this time, the trip generation was conservatively calculated based on ITE land use 444, Theatre, splitting trips into different modes using assumptions derived ridership data. The vehicular mode split was then adjusted to reflect the

parking supply and other developments with similar proximity to Metrorail.

Trip generation for retail was broken out into two different types of retail: general retail that could draw regional trips and neighborhood retail that is intended to serve the immediate neighborhood. Trip generation for both types of retail was calculated based on ITE land use 820, Shopping Center, with neighborhood retail generating a significantly higher percentage of walking trips as compared to general retail.

Education/Daycare trip generation was calculated based on ITE land use 565, Daycare, splitting trips into different modes based on information provided by the school and comparable education sites in the District.

A summary of the sites mode splits assumptions are shown in Table 2. A summary of the multimodal trip generation is provided in Table 3 for both peak hours. The Project is expected to generate 173 trips in the morning peak hour (58 inbound, 115 outbound) and 204 trips in the afternoon peak hour (122 inbound, 82 outbound). Detailed calculations are included in the Technical Attachments.

Table 2: Proposed Mode Split – 1000 4th Street, SW

Land Use	Mode			
	Drive	Transit	Bike	Walk
Residential	45%	35%	5%	15%
General Retail	30%	35%	5%	30%
Neighborhood Retail	15%	15%	10%	60%
Arts/Cultural	45%	25%	5%	25%
Education	50%	15%	0%	35%



Table 3: 2018 Trip Generation Summary – 1000 4th Street, SW

Mode	Land Use	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Auto	<i>Apartments</i>	20 veh/hr	83 veh/hr	103 veh/hr	79 veh/hr	41 veh/hr	120 veh/hr
	<i>General Retail</i>	1 veh/hr	0 veh/hr	1 veh/hr	2 veh/hr	2 veh/hr	4 veh/hr
	<i>Neighborhood Retail</i>	1 veh/hr	0 veh/hr	1 veh/hr	2 veh/hr	1 veh/hr	3 veh/hr
	<i>Arts/Cultural</i>	1 veh/hr	0 veh/hr	1 veh/hr	10 veh/hr	5 veh/hr	15 veh/hr
	<i>Education</i>	35 veh/hr	32 veh/hr	67 veh/hr	29 veh/hr	33 veh/hr	62 veh/hr
	Total		58 veh/hr	115 veh/hr	173 veh/hr	122 veh/hr	82 veh/hr
Transit	<i>Apartments</i>	18 ppl/hr	72 ppl/hr	90 ppl/hr	69 ppl/hr	37 ppl/hr	106 ppl/hr
	<i>General Retail</i>	1 ppl/hr	1 ppl/hr	2 ppl/hr	5 ppl/hr	5 ppl/hr	10 ppl/hr
	<i>Neighborhood Retail</i>	1 ppl/hr	1 ppl/hr	2 ppl/hr	3 ppl/hr	3 ppl/hr	6 ppl/hr
	<i>Arts/Cultural</i>	1 ppl/hr	0 ppl/hr	1 ppl/hr	10 ppl/hr	5 ppl/hr	15 ppl/hr
	<i>Education</i>	22 ppl/hr	20 ppl/hr	42 ppl/hr	18 ppl/hr	21 ppl/hr	39 ppl/hr
	Total		43 ppl/hr	94 ppl/hr	137 ppl/hr	105 ppl/hr	71 ppl/hr
Bike	<i>Apartments</i>	3 ppl/hr	10 ppl/hr	13 ppl/hr	10 ppl/hr	5 ppl/hr	15 ppl/hr
	<i>General Retail</i>	0 ppl/hr	0 ppl/hr	0 ppl/hr	1 ppl/hr	0 ppl/hr	1 ppl/hr
	<i>Neighborhood Retail</i>	1 ppl/hr	0 ppl/hr	1 ppl/hr	2 ppl/hr	2 ppl/hr	4 ppl/hr
	<i>Arts/Cultural</i>	0 ppl/hr	0 ppl/hr	0 ppl/hr	2 ppl/hr	1 ppl/hr	3 ppl/hr
	<i>Education</i>	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr
	Total		4 ppl/hr	10 ppl/hr	14 ppl/hr	15 ppl/hr	8 ppl/hr
Walk	<i>Apartments</i>	8 ppl/hr	31 ppl/hr	39 ppl/hr	30 ppl/hr	15 ppl/hr	45 ppl/hr
	<i>General Retail</i>	1 ppl/hr	1 ppl/hr	2 ppl/hr	4 ppl/hr	4 ppl/hr	8 ppl/hr
	<i>Neighborhood Retail</i>	4 ppl/hr	3 ppl/hr	7 ppl/hr	12 ppl/hr	11 ppl/hr	23 ppl/hr
	<i>Arts/Cultural</i>	1 ppl/hr	0 ppl/hr	1 ppl/hr	10 ppl/hr	5 ppl/hr	15 ppl/hr
	<i>Education</i>	51 ppl/hr	47 ppl/hr	98 ppl/hr	43 ppl/hr	48 ppl/hr	91 ppl/hr
	Total		65 ppl/hr	82 ppl/hr	147 ppl/hr	99 ppl/hr	83 ppl/hr



TRAFFIC OPERATIONS

This section provides a summary of an analysis of the existing and future roadway capacity surrounding the site. Included is an analysis of potential vehicular impacts of the Project and a discussion of potential mitigation measures.

The purpose of the capacity analysis is to:

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

This analysis was accomplished by determining the traffic volumes and roadway capacity for existing conditions, background conditions, and future conditions.

The capacity analysis focuses on the weekday morning peak hour and afternoon peak hour, as determined by the existing traffic volumes in the study area.

This chapter concludes that:

- Under existing conditions, the majority of intersections in the study area operate at acceptable conditions.
- Future areas of concern for roadway capacity, are primarily along commuter routes such as I Street, SW and M Street, SW.
- Four (4) study intersections met the threshold for requiring mitigation measures as a result of the development:
 - G Street and 4th Street, SW (AM)
 - I Street and 7th Street, SW (PM)
 - I Street & 4th Street, SW (PM)
 - M Street & 3rd Street, SW (PM)
- All intersections requiring mitigation measures can be so-mitigated through the implementation of signal timing adjustments.
- The Project will not have a detrimental impact to the surrounding vehicular network, assuming the proposed mitigation measures are implemented.

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 coordinated 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 capacity analyses are performed to determine whether the proposed 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 Project (referred to as the Background condition) and (2) with the Project approved and constructed (referred to as the Future condition).

Specifically, the roadway capacity analysis examined the following scenarios:

1. 2018 Existing Conditions (Existing Conditions);
2. 2022 Future Conditions without the Project (2022 Background Conditions); and
3. 2022 Future Conditions with the Project (2022 Total Future Conditions).

Study Area

The study area of the analysis is a set of intersections where detailed capacity analyses were 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 Project. 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 and agreed upon by DDOT for analysis:

1. 4th Street, SW & G Street, SW
2. I Street, SW & 7th Street, SW
3. I Street, SW & 6th Street, SW



4. I Street, SW & 4th Street, SW
5. I Street, SW & Wesley Place, SW
6. I Street, SW & 3rd Street, SW
7. 4th Street, SW & Private Drive, SW
8. Private Drive & Wesley Place, SW (Future)
9. K Street, SW & Wesley Place, SW
10. K Street, SW & 3rd Street, SW
11. Maine Avenue, SW & 7th Street, SW
12. M Street, SW / Maine Avenue & 6th Street, SW
13. M Street, SW & 4th Street, SW
14. M Street, SW & 3rd Street, SW

- The channelized southbound right turn lane at Maine Avenue, SW/M Street, SW & 6th Street, SW will be removed, resulting in a southbound approach of one left/through lane and one right lane.
- Improvements made to surrounding intersections and roadways as part of Phase 2 of The Wharf development.

Figure 7 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 12.

2022 Background 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, three (3) background improvements were included in the 2022 Background conditions.

- The intersection of 7th Street, SW & I Street, SW will be improved as part of the 680 Eye Street development. The channelized northbound right turn lane will be removed, resulting in a northbound approach of one thru lane and one thru-right lane.

The lane configurations and traffic controls for the 2022 Background conditions are shown on Figure 13.

2022 Total Future Geometry and Operations Assumptions

The configurations and traffic controls for the 2022 Total Future conditions are based on those for the 2022 Background conditions, including the three (3) previously described background improvements. In addition, the Total Future conditions include construction of the private drive as part of the proposed development.

The lane configurations and traffic controls for the 2022 Total Future Conditions and shown on Figure 14.

Traffic Volume Assumptions

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

Existing Traffic Volumes

The existing traffic volumes are comprised of turning movement count data, which was collected on Thursday, September 27, 2018 between the hours of 6:30 and 9:30 AM and 4:00 and 7:00 PM. The results of the traffic counts are included in the Technical Attachments. The existing peak hour traffic volumes are shown Figure 8. For all intersections, the individual morning, afternoon peak hours were used.

2022 Background Traffic Volumes without the project (2022 Background)

The traffic projections for the 2022 Background conditions consist of the existing volumes with two additions:

- Traffic generated by developments within the vicinity of the site and expected to be completed prior, or close to 2022 (known as background developments); and
- Inherent growth on the roadway (representing regional traffic growth).



Following national and DDOT methodologies, a background development should 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 that of the Project.

Based on these criteria, and as discussed with and agreed to with DDOT, the following developments were included in the 2022 Background scenario:

1. The View at Waterfront
2. 501 I (Eye) Street
3. 375 M Street
4. 425 M Street
5. Town Center North
6. 301 M Waterfront
7. St. Matthews Evangelical Lutheran Church Redevelopment
8. 680 I (Eye) Street SW
9. The Wharf (Phase 2)
10. Randall School
11. Southwest Library

Existing studies were available for all background developments. Trip generation and distribution assumptions for the background developments were based on their respective studies and altered where necessary based on updated travel patterns. Mode split and trip generation assumptions for the background developments are shown in Table 4.

While the background developments represent local traffic changes, regional traffic growth is typically accounted for using growth rates. The growth rates used in this analysis are derived using the Metropolitan Washington Council of Government's (MWCOCG) currently adopted regional transportation model, comparing the difference between the year 2017 and 2020 model scenarios. The growth rates observed in this model served as a basis for analysis assumptions, and where negative growth was observed, a conservative 0.10 percent annual growth rate was applied to the roadway. Annual growth rates were also capped at 0.5% in the peak direction and 0.8% in the non-peak direction. The applied growth rates are shown in Table 5.

The traffic volumes generated by the inherent growth along the network were added to the existing traffic volumes in order to establish the 2022 Background traffic volumes. The traffic volumes for the 2022 Background conditions are shown on Figure 9.

2022 Total Future Traffic Volumes with the project (2022 Total Future)

The 2022 Total Future traffic volumes consist of the 2022 Background volumes with the addition of the traffic volumes generated by the proposed Project (site-generated trips). Thus, the 2022 Total Future traffic volumes include traffic generated by: the existing volumes, background developments, the inherent growth on the study area roadways, and site-generated trips of the proposed Project.

Trip distribution for the site-generated trips was determined based on: (1) CTPP TAZ data, (2) existing and future travel patterns in the study area, and (3) the location of the parking access. Trip distribution was determined for each land use individually.

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 flow information showed significant commuting patterns to downtown DC, Arlington County, MD, and Prince George's County, MD. The origin of outbound and destination of inbound residential vehicular trips was the below-grade parking garage for the building, accessible along the private extension of Wesley Place, SW.

The arts/cultural and education/daycare distributions were influenced partially 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 vehicular trips was the below-grade parking garage for arts/cultural drivers and the private drive for the education/daycare drivers.

The general retail distribution was primarily based on locations of other nearby retail centers and residential communities, with some influence on the CTPP flow data for drivers commuting to the site's TAZ (representing retail employees that drive). The general retail trip distribution is more heavily weighted towards the neighborhoods north and west of the development. The neighborhood retail distribution was



weighted more towards the immediate neighborhood the site resides in. The origin of outbound and destination of inbound retail vehicular trips was the below-grade parking garage for the building.

The inbound and outbound trip distribution for the Project is shown on Figure 10 and Figure 11, respectively.

The traffic volumes for the 2022 Total Future conditions were calculated by adding the development-generated traffic volumes for the Project to the 2022 Background traffic volumes. Thus, the future condition with the proposed development scenario includes traffic generated by: existing volumes, background developments through the year 2022, inherent growth on the network, and the proposed Project. The Project-generated traffic volumes are shown on Figure 15. The 2022 Total Future traffic volumes are shown on Figure 16.

Peak Hour Factors

The TRB *Highway Capacity Manual* (HCM) and the AASHTO *Policy on Geometric Design of Highways and Intersections* recommend evaluating traffic conditions during the worst 15 minutes of either a design hour or a typical weekday rush hour. Peak Hour Factor (PHF) is used to convert the hourly volume into the volume rate representing the busiest 15 minutes of the hour. The existing guidelines provide typical values of PHF and advise using the PHF calculated from vehicle counts at analyzed or similar locations. The HCM recommends a PHF of 0.88 for rural areas and 0.92 for urban areas and presumes that capacity constraints in congested areas reduce the short-term traffic fluctuation. The HCM postulates 0.95 as the typical PHF for congested roadways.

For the Existing Conditions analysis, PHF were calculated from the turning movement data that was collected in the field, using a minimum PHF of 0.85.

To account for the significant increase in peak hour traffic generated by local development on side streets, and regional growth along major corridors, a default PHF minimum of 0.92 was assumed in the Background Conditions and Total Future Conditions analyses.

VEHICULAR ANALYSIS RESULTS

Intersection Capacity Analysis

Intersection capacity analyses were performed for the 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 *Synchro* software). The average delay of each approach and LOS is shown for the signalized and all-way stop-controlled 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 study scenarios. The capacity analysis results are shown on Figure 17 for the morning peak hour, and Figure 18 for the afternoon peak hour.

The study intersections generally operate at acceptable conditions during the morning and afternoon peak hours for all study scenarios. However, six (6) intersections have at least one approach that operates under unacceptable conditions during at least one study scenario and during at least one of the peak hours:

- G Street, SW & 4th Street, SW
 - Eastbound approach: AM (EX, BG, TF)
- I Street, SW & 7th Street, SW
 - Overall intersection: PM (BG, TF)
 - Eastbound approach: AM (EX, BG, TF)
 - Southbound approach: PM (BG, TF)
- I Street, SW & 4th Street, SW



- Overall intersection: PM (BG, TF)
- Eastbound approach: PM (BG, TF)
- Maine Avenue, SW & 7th Street, SW
 - Southbound approach: AM/PM (BG, TF)
- M Street, SW & 4th Street, SW
 - Overall intersection: AM (BG, TF)
 - Westbound approach: AM/PM (EX, BG, TF)
 - Southbound approach: PM (BG, TF)
- M Street, SW & 3rd Street, SW
 - Southbound approach: PM (EX, BG, TF)

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 intersection, 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. HCM 2000 does not calculate queuing for all-way stops.

Table 7 shows the queuing results for the study area intersections. Four (4) of the study intersections have one or more lanes group that exceed the given storage length during at least one peak hour in all of the study scenarios. These intersections are as follows:

- I Street, SW & 4th Street, SW
 - Eastbound Left/Through/Right: PM (EX, BG, TF)
- Maine Avenue, SW & 7th Street, SW
 - Eastbound Left: PM (BG, TF)
 - Eastbound Through/Right: PM (EX, BG, TF); AM (BG, TF)
 - Southbound Left: AM/PM (BG, TF)
- Maine Avenue, SW /M Street, SW & 6th Street, SW
 - Eastbound Left/Through/Right: PM (EX, BG, TF)
- M Street, SW & 4th Street, SW
 - Southbound Through: PM (EX, BG, TF)

MITIGATIONS AND IMPROVEMENTS

Based on DDOT standards, the Project is considered to have an impact at an intersection within the study area if any of the following conditions are met:

- The capacity analyses show a LOS E or F at an intersection or along an approach where one does not exist in the Existing Conditions or Background Conditions;
- There is an increase in delay at any approach or overall intersection operating under LOS E or F of greater than 5 percent when compared to the Background Conditions; or
- There is an increase in the 95th percentile queues by more than 150 feet at an intersection or along an approach in the Total Future Conditions with the proposed development where one does not exist in the Background Conditions.

Following these guidelines, there are impacts to four (4) intersections as a result of the Project. Mitigation measures were tested at these intersections, with results shown on Table 8 and detailed Synchro reports included in the Technical Attachments. The following conclusions apply:

- G Street, SW & 4th Street, SW
The eastbound approach of G Street, SW is shown to operate under LOS F during the afternoon peak period for all study scenarios. The delay observed under the Total Future Conditions increases by more than 5 percent when compared to the Background Conditions. Therefore, mitigation measures were evaluated.

The large number of vehicles making an unprotected eastbound left turn at the intersection (165 during existing conditions) contributes to the poor LOS observed in all three scenarios. The impact can be mitigated through signal timing adjustments. This will give the concurrent eastbound/westbound phase of G Street, SW more green time to allow for more vehicles to pass the signal. This mitigation will reduce delays to levels observed in Background Conditions.
- I Street, SW & 7th Street, SW
The southbound approach of 7th Street is shown to operate under LOS F during the afternoon peak period for the Background and Total Future Conditions. The delay observed under the Total Future Conditions increases by more than 5 percent when compared to the Background Conditions. Therefore, mitigation measures were evaluated.

A high number of vehicles (347 during Background Conditions) making an unprotected southbound left turn at the intersection contributes to the poor LOS observed.



Project-generated trips making this turning movement are minimal, with 15 trips making a southbound left. The signal operates with two main phases: a concurrent northbound/southbound phase and a concurrent eastbound/westbound phase. There are no protected left turn phases, resulting in southbound left-turning vehicles waiting for a suitable gap in northbound thru traffic. The impact can be mitigated through signal timing adjustments. This will give the concurrent northbound/southbound phase of 7th Street, SW more green time to allow for more southbound vehicles to pass the signal. This measure will reduce delay to levels observed in Background Conditions.

Additionally, the current cycle length at the intersection is 75 seconds during the afternoon peak period. Increasing the cycle length of the intersection from 75 seconds to 120 seconds (the same amount allocated in the morning peak period) may also reduce delay along the southbound approach. Changes to the cycle length are not necessary to mitigate the impacts of the proposed Project; as such, this report defers to DDOT on implementation of cycle length adjustments.

- *I Street, SW & 4th Street, SW*

The eastbound approach of I Street, SW is shown to operate under LOS F during the afternoon peak period for the Background and Total Future Conditions. The delay observed under the Total Future Conditions increases by more than 5 percent when compared to the Background Conditions. Therefore, mitigation measures were evaluated.

I (Eye) Street, SW is used as a main route to enter the site from the north and west. Approximately 32 vehicles are routed along the eastbound through movement of this intersection, exacerbating saturated conditions observed at this approach during Background Conditions. All movements from the eastbound approach are made with a single lane, leading to additional delay when eastbound left-turning vehicles are waiting for a suitable gap in westbound through traffic.

The impact can be mitigated through signal timing adjustments. This will give the concurrent eastbound/westbound phase of I Street, SW more green time to allow for more eastbound vehicles to pass the

signal. This measure will reduce delay to levels observed in Background Conditions.

- *M Street, SW & 3rd Street, SW*

The southbound approach of 3rd Street, SW is shown to operate under LOS E during the afternoon peak period for all study scenarios. The delay observed under the Total Future Conditions increases by more than 5 percent when compared to the Background Conditions. Therefore, mitigation measures were evaluated.

The overall intersection, westbound and northbound approaches of M Street, SW are shown to operate under LOS E during the morning peak period for the Background and Total Future Conditions. The delay observed under the Total Future Conditions for the westbound approach and overall intersection increases by more than 5 seconds when compared to the Background Conditions. Therefore, mitigation measures were evaluated.

This is a result of the large volume of southbound vehicles utilizing M Street, SW as a commuter route in the afternoon peak hour. All southbound turning movements are made from a single lane at this intersection, which utilizes a concurrent northbound/southbound and eastbound/westbound phasing. During the Background Conditions, 274 vehicles are making a southbound left. Approximately 26 site-generated trips are routed through this movement, slightly exacerbating delay.

The impact can be mitigated through signal timing adjustments. This will give the concurrent northbound/southbound phase of 3rd Street, SW more green time to allow for more vehicles to pass the signal. The measure will reduce delay to mitigated levels; however, it will slightly increase delay in the eastbound and westbound approach.



Table 4: Summary of Background Development Trip Generation

Background Development	Trip Generation Source	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
View at Waterfront	Approved TIS	11 veh/hr	57 veh/hr	68 veh/hr	75 veh/hr	41 veh/hr	116 veh/hr
375 M Street	Approved CTR	31 veh/hr	60 veh/hr	91 veh/hr	70 veh/hr	52 veh/hr	122 veh/hr
425 M Street	Approved CTR	29 veh/hr	59 veh/hr	88 veh/hr	66 veh/hr	52 veh/hr	118 veh/hr
301 M Waterfront/Town Center North	Approved TIS	8 veh/hr	36 veh/hr	44 veh/hr	31 veh/hr	22 veh/hr	53 veh/hr
St. Matthews	Approved TIS	10 veh/hr	35 veh/hr	45 veh/hr	35 veh/hr	19 veh/hr	54 veh/hr
680 Eye Street SW	Approved TIS	42 veh/hr	69 veh/hr	111 veh/hr	70 veh/hr	54 veh/hr	124 veh/hr
501 Eye Street SW	Draft Scoping Document	35 veh/hr	19 veh/hr	54 veh/hr	44 veh/hr	19 veh/hr	63 veh/hr
The Wharf Phase 2	Approved CTR	384 veh/hr	122 veh/hr	506 veh/hr	196 veh/hr	408 veh/hr	602 veh/hr
Randall School	Approved CTR	45 veh/hr	104 veh/hr	149 veh/hr	102 veh/hr	67 veh/hr	169 veh/hr
Southwest Library	Approved Transportation Study	8 veh/hr	1 veh/hr	9 veh/hr	0 veh/hr	6 veh/hr	6 veh/hr
Net Background Site Trips		603 veh/hr	562 veh/hr	1165 veh/hr	689 veh/hr	740 veh/hr	1427 veh/hr

Table 5: Applied Annual and Total Growth Rates

Road & Direction of Travel	Proposed Annual Growth Rate		Total Growth between 2018 and 2022	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
7th Street, SW – Northbound	0.20%	0.80%	0.80%	3.24%
7th Street, SW – Southbound	0.80%	0.50%	3.24%	2.02%
I Street, SW - Eastbound	0.10%	0.50%	0.40%	2.02%
I Street, SW - Westbound	0.50%	0.80%	2.02%	3.24%
Maine Avenue, SW - Eastbound	0.80%	0.50%	3.24%	2.02%
Maine Avenue, SW - Westbound	0.50%	0.80%	2.02%	3.24%
M Street SW - Eastbound	0.80%	0.10%	3.24%	0.40%
M Street SW - Westbound	0.10%	0.80%	0.40%	3.24%
6th Street, SW – Northbound	0.50%	0.10%	2.02%	0.40%
6th Street, SW – Southbound	0.10%	0.50%	0.40%	2.02%
4th Street, SW – Northbound	0.50%	0.10%	2.02%	0.40%
4th Street, SW – Southbound	0.80%	0.50%	3.24%	2.02%



Figure 7: Study Area Intersections

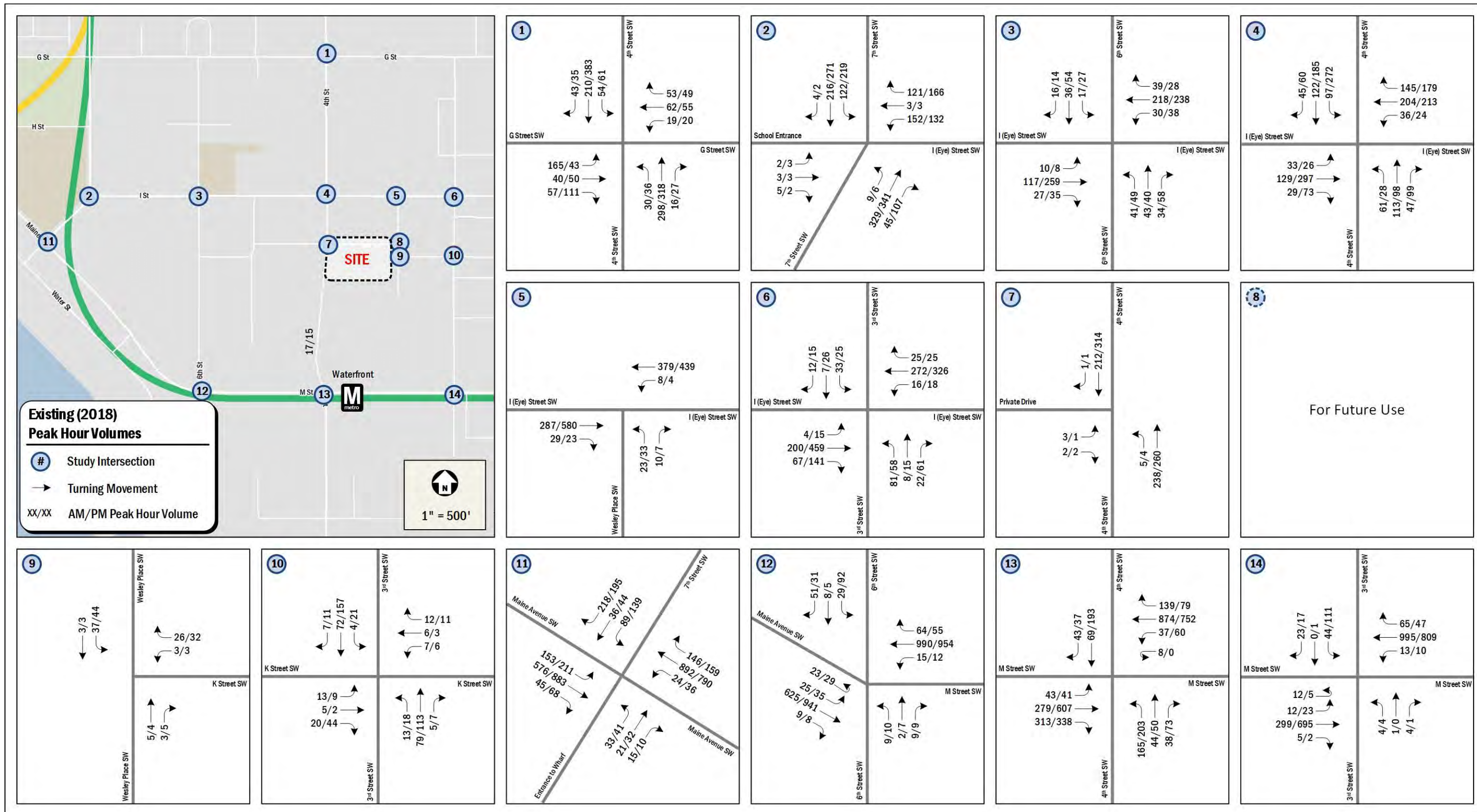


Figure 8: Existing Peak Hour Traffic Volumes (2018)

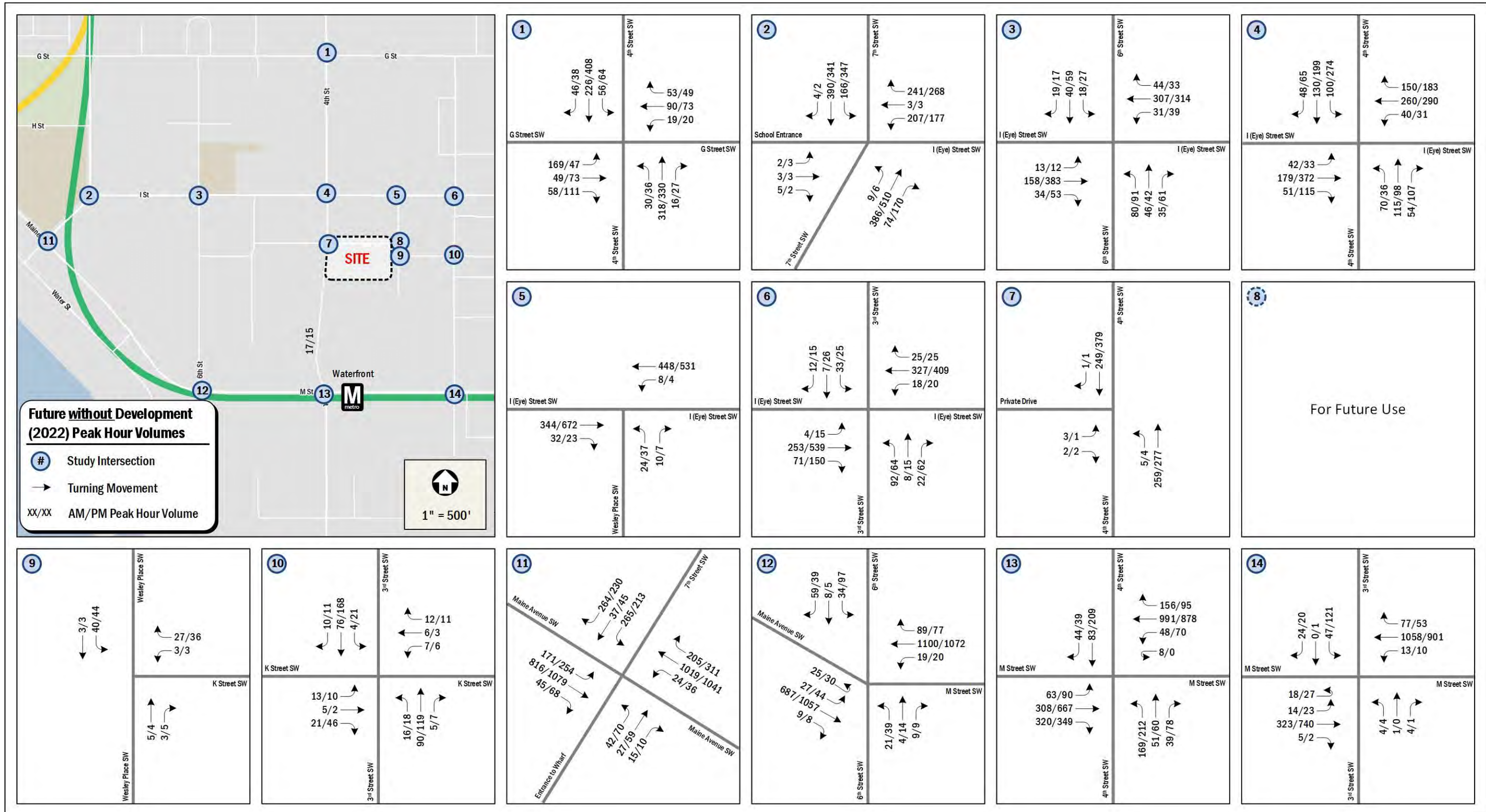


Figure 9: Background Peak Hour Traffic Volumes (2022)

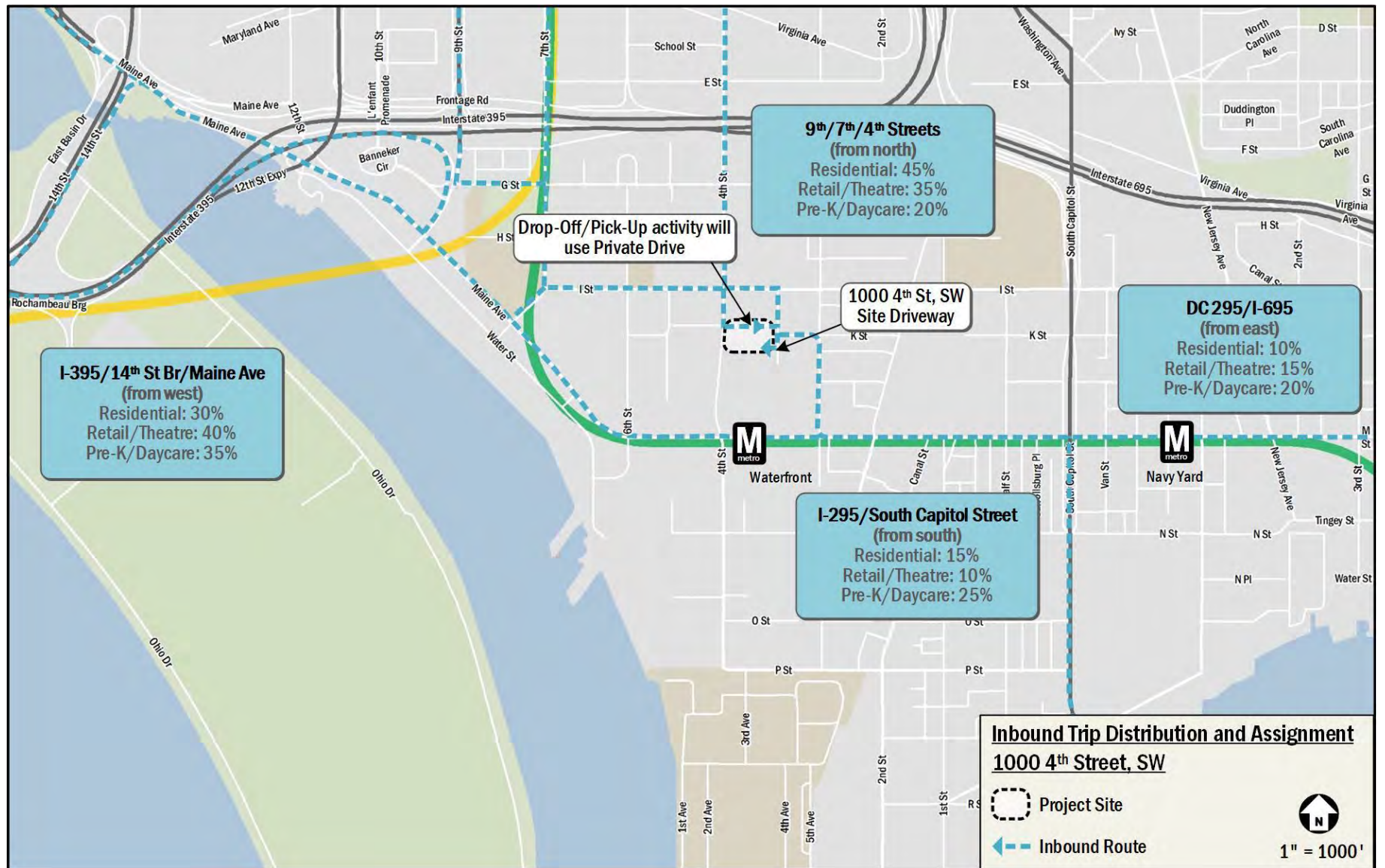


Figure 10: Inbound Trip Distribution and Routing

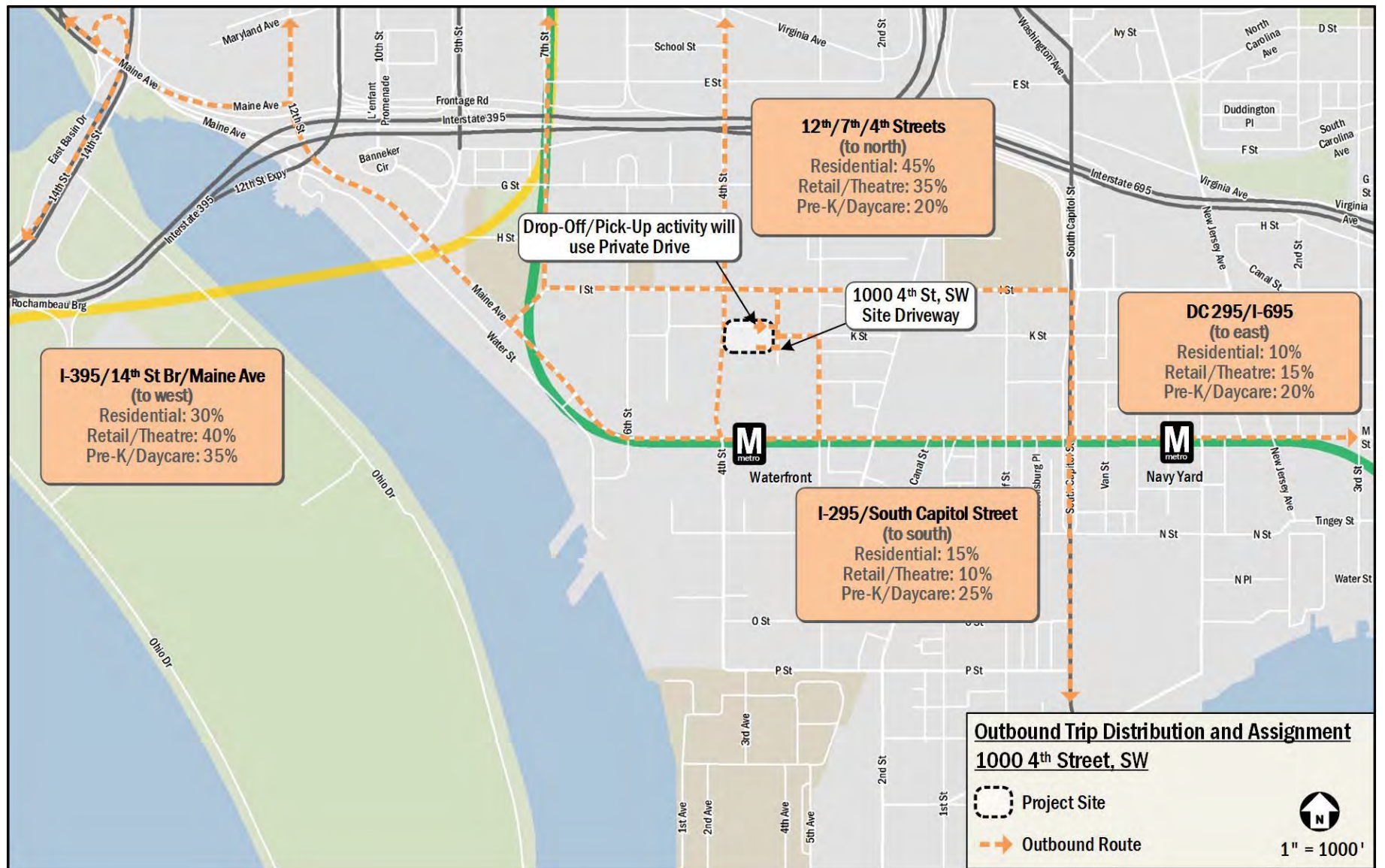


Figure 11: Outbound Trip Distribution and Routing

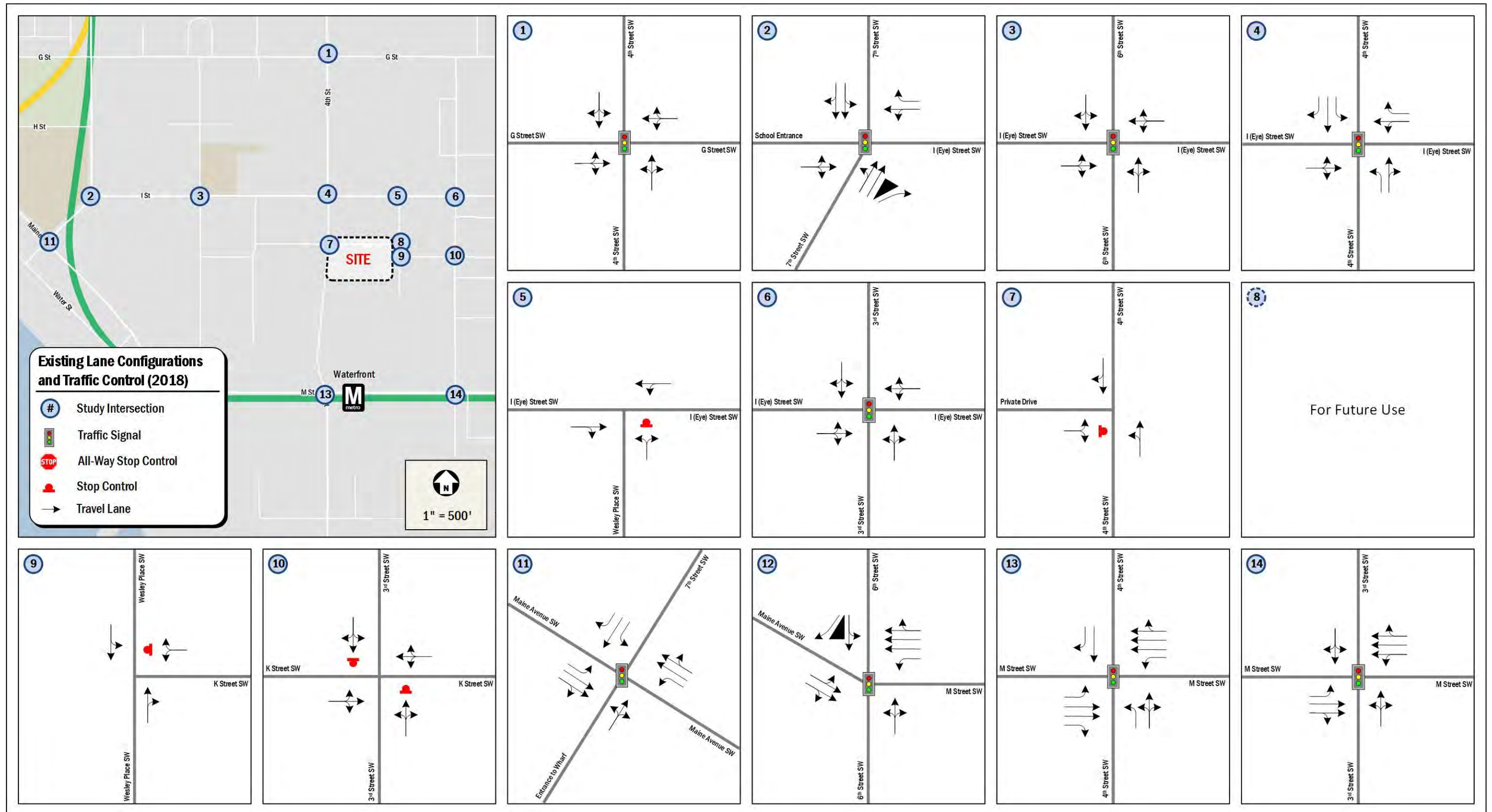


Figure 12: Existing Lane Configuration and Traffic Control (2018)

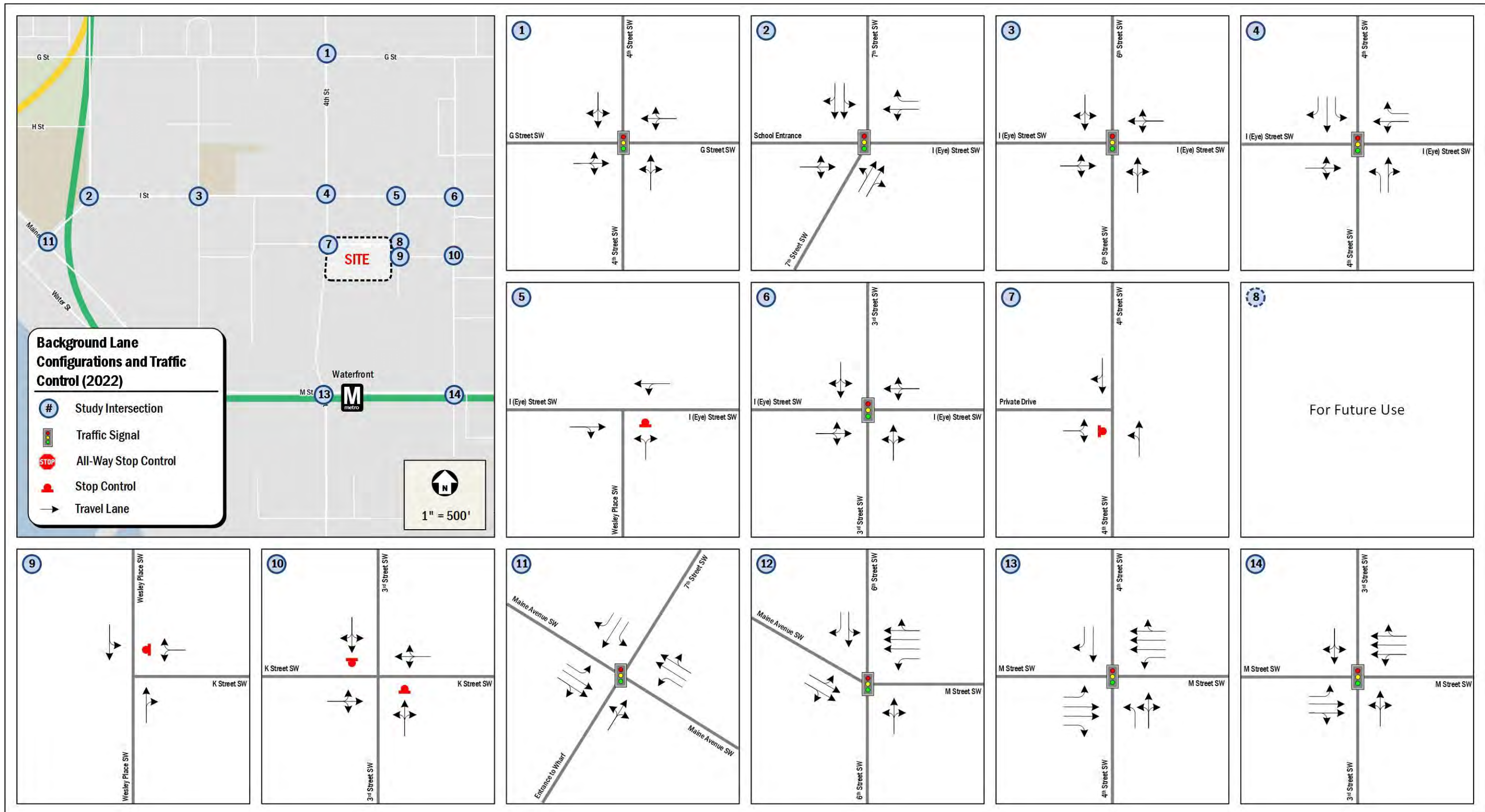


Figure 13: Background Lane Configuration and Traffic Control (2022)

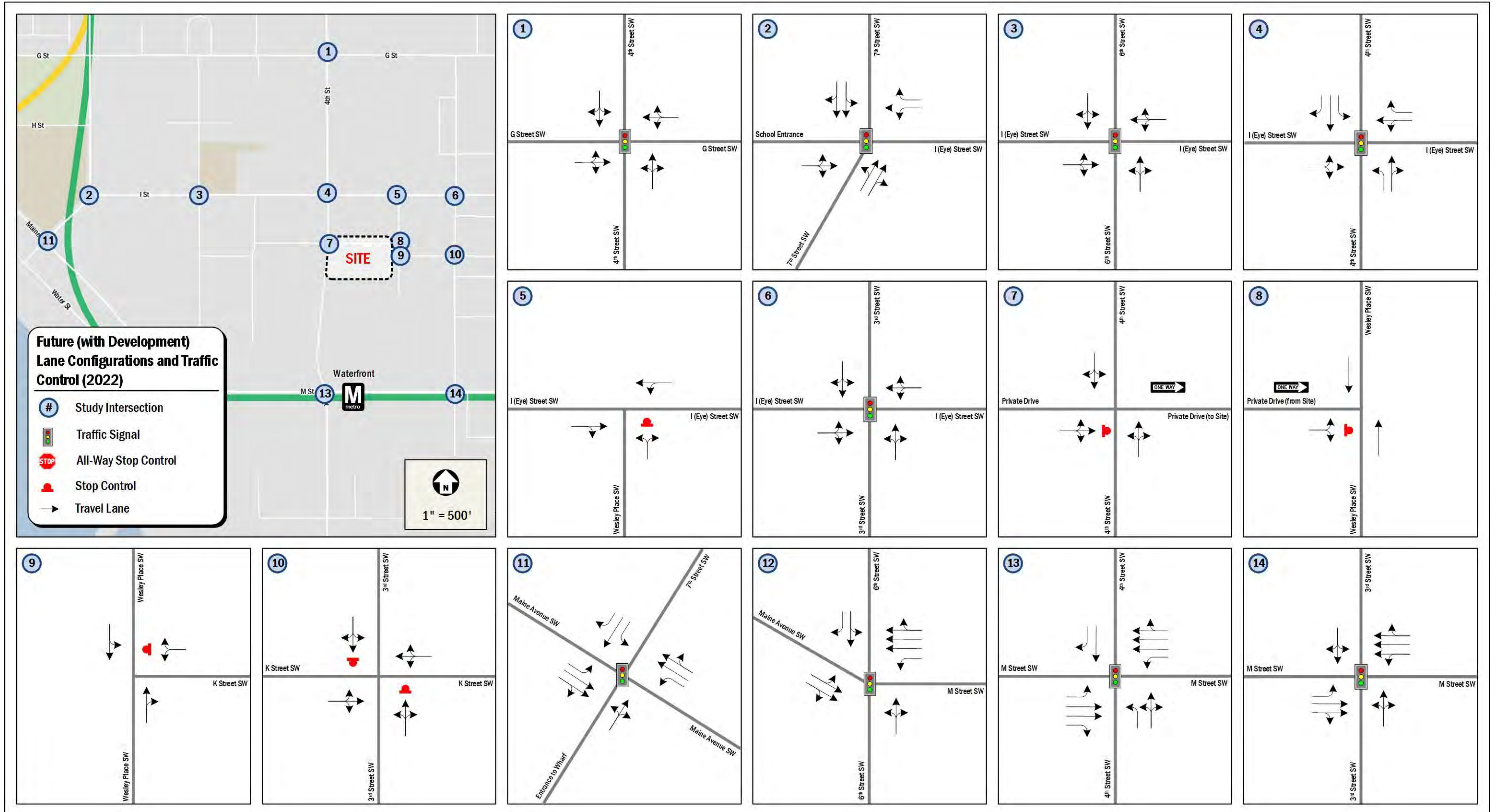


Figure 14: Future Lane Configuration and Traffic Control (2022)

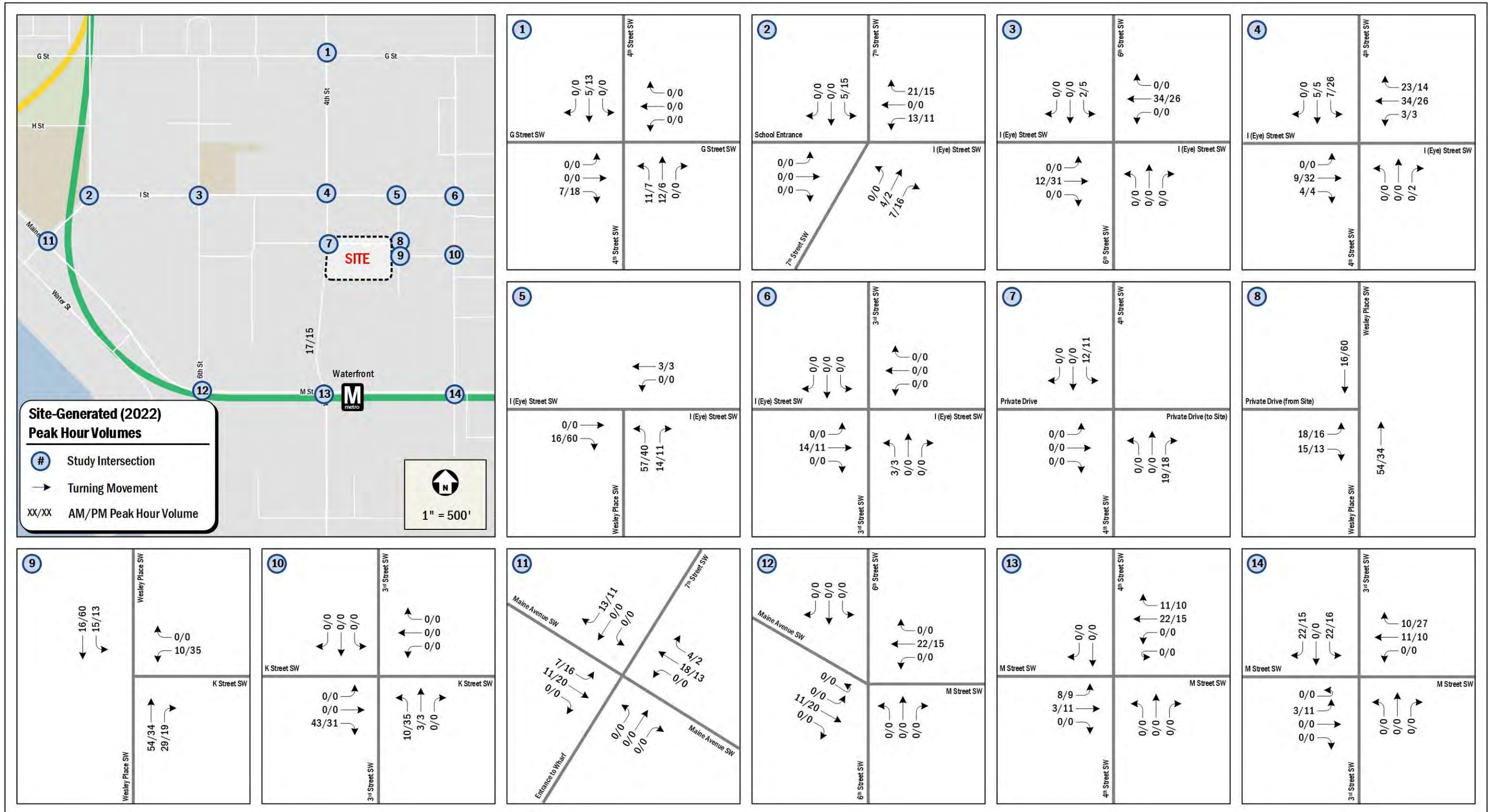


Figure 15: Site-Generated Peak Hour Traffic Volumes (2022)

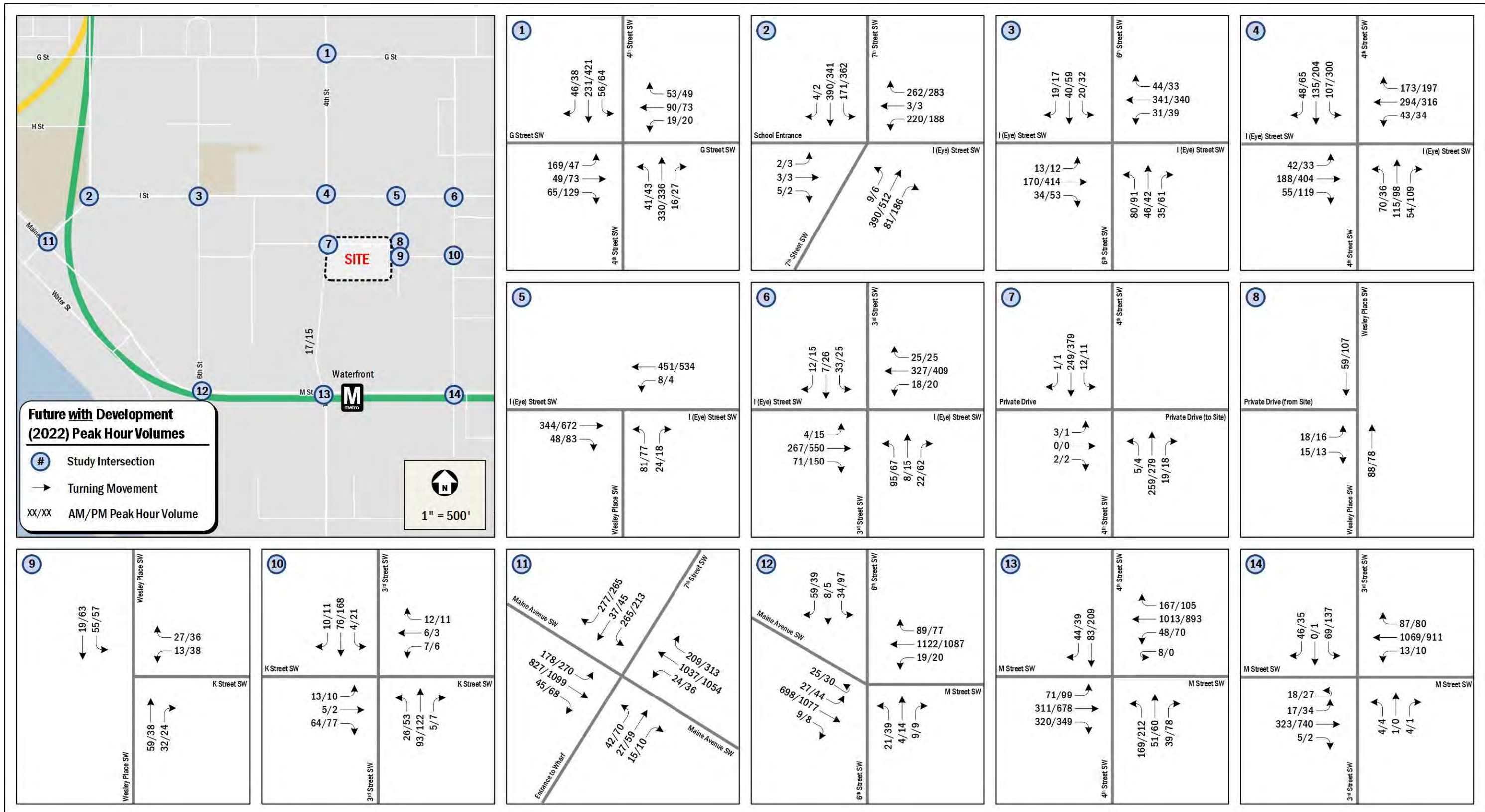


Figure 16: Future Peak Hour Traffic Volumes (2022)



Table 6: LOS Results

Intersection	Approach	Existing Conditions				Future without Development Conditions (2022)				Future with Development Conditions (2022)			
		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
G Street & 4th Street, SW	Overall	31.4	C	16.8	B	33.7	C	17.2	B	35.1	D	17.7	B
	Eastbound	83.3	F	30.6	C	93.6	F	32.2	C	99.3	F	33.5	C
	Westbound	26.2	C	25.9	C	27.5	C	26.4	C	27.5	C	26.4	C
	Northbound	10.0	A	7.7	A	10.5	B	7.0	A	11.1	B	7.1	A
	Southbound	12.3	B	15.6	B	12.1	B	15.7	B	12.2	B	16.1	B
I Street & 7th Street, SW	Overall	22.3	C	22.2	C	24.8	C	64.9	E	25.1	C	67.8	E
	Eastbound	65.4	E	53.5	D	94.1	F	49.1	D	94.1	D	49.1	D
	Westbound	35.9	D	7.0	A	37.7	D	9.8	A	38.3	D	10.8	A
	Northbound	14.8	B	20.3	C	13.8	B	26.9	C	13.5	B	27.4	C
	Southbound	18.5	B	32.8	C	22.4	C	138.5	F	22.7	C	146.7	F
I Street & 6th Street, SW	Overall	11.8	B	13.9	B	12.5	B	14.2	B	12.1	B	14.3	B
	Eastbound	7.0	A	5.0	A	7.3	A	5.4	A	7.4	A	6.0	A
	Westbound	4.4	A	11.4	B	4.4	A	12.0	B	4.2	A	12.2	B
	Northbound	27.5	C	29.1	C	32.4	C	33.3	C	32.2	C	33.4	C
	Southbound	23.9	C	24.8	C	24.1	C	24.6	C	24.2	C	25.0	C
I Street & 4th Street, SW	Overall	24.9	C	30.6	C	27.4	C	60.9	E	30.2	C	85.1	F
	Eastbound	32.0	C	45.2	D	39.4	D	143.6	F	46.3	D	218.0	F
	Westbound	24.1	C	31.8	C	25.6	C	37.6	D	29.0	C	43.9	D
	Northbound	21.4	C	23.1	C	21.2	C	22.6	C	21.2	C	22.7	C
	Southbound	23.7	C	22.7	C	23.9	C	20.9	C	23.7	C	23.1	C
I Street & Wesley Place, SW	Eastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Westbound	0.2	A	0.2	A	0.2	A	0.1	A	0.2	A	0.2	A
	Northbound	14.1	B	21.0	C	14.7	B	23.9	C	17.4	C	34.4	D
I Street & 3rd Street, SW	Overall	13.8	B	12.2	B	14.0	B	11.6	B	14.0	B	11.6	B
	Eastbound	11.1	B	7.8	A	11.5	B	7.4	A	11.3	B	7.2	A
	Westbound	10.6	B	7.6	A	11.3	B	8.2	A	11.3	B	8.2	A
	Northbound	25.3	C	35.0	C	25.7	C	35.2	D	26.0	C	36.0	D
	Southbound	21.2	C	28.5	C	21.2	C	28.1	C	21.2	C	28.1	C
4th Street & Alley, SW	Eastbound	14.7	B	13.6	B	15.1	C	14.7	B	17.7	C	16.3	C
	Northbound	0.2	A	0.2	A	0.2	A	0.2	A	0.2	A	0.2	A
	Southbound	0.0	A	0.0	A	0.0	A	0.0	A	0.5	A	0.3	A
Wesley Place & Private Drive, SW	Eastbound									9.2	A	9.5	A
	Northbound									0.0	A	0.0	A
	Southbound									0.0	A	0.0	A
K Street & Wesley Place/Alley, SW	Westbound	8.7	A	8.7	A	8.7	A	8.7	A	9.5	A	9.9	A
	Northbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Southbound	6.8	A	6.8	A	6.9	A	6.9	A	5.7	A	3.7	A
K Street & 3rd Street, SW	Eastbound	10.7	B	10.7	B	10.6	B	10.6	B	10.6	B	10.8	B
	Westbound	10.5	B	11.2	B	10.5	B	11.1	B	11.0	B	12.0	B
	Northbound	1.1	A	1.1	A	1.2	A	1.1	A	1.7	A	2.5	A
	Southbound	0.4	A	1.0	A	0.3	A	0.9	A	0.3	A	0.9	A
Maine Avenue & 7th Street, SW	Overall	18.7	B	22.5	C	28.1	C	33.4	C	28.6	C	34.7	C
	Eastbound	19.9	B	19.3	B	22.7	C	27.4	C	23.2	B	30.2	C
	Westbound	8.6	A	17.6	B	11.5	B	29.2	C	12.2	B	29.6	C
	Northbound	39.8	D	41.1	D	40.7	D	46.0	D	40.7	D	46.0	D
	Southbound	41.4	D	38.6	D	72.8	E	58.4	E	72.6	E	58.0	E
Maine Avenue/M Street & 6th Street, SW	Overall	11.9	B	15.8	B	10.8	B	16.8	B	10.9	B	17.1	B
	Eastbound	20.4	C	24.4	C	18.7	B	26.7	C	19.1	B	27.4	C
	Westbound	5.4	A	4.6	A	4.9	A	4.5	A	4.8	A	4.4	A
	Northbound	34.7	C	35.7	D	35.3	D	37.8	D	35.3	D	37.8	D



	Southbound	15.1	B	31.8	C	15.2	B	30.0	C	15.2	B	30.0	C
M Street & 4th Street, SW	Overall	53.6	D	51.9	D	55.7	E	53.3	D	56.5	E	53.3	D
	Eastbound	44.1	D	47.0	D	46.6	D	48.3	D	47.4	D	48.9	D
	Westbound	60.8	E	55.2	E	63.0	E	57.8	E	63.9	E	57.1	E
	Northbound	54.3	D	54.9	D	53.5	D	54.7	D	53.5	D	54.7	D
	Southbound	40.9	D	55.0	D	41.1	D	55.0	E	41.1	D	55.0	E
M Street & 3rd Street, SW	Overall	14.2	B	14.8	B	14.3	B	14.9	B	15.4	B	16.6	B
	Eastbound	0.9	A	6.0	A	1.1	A	6.1	A	1.2	A	6.0	A
	Westbound	16.3	B	14.9	B	16.6	B	15.4	B	16.8	B	15.6	B
	Northbound	40.8	D	40.5	D	40.7	D	40.5	D	40.7	D	40.5	D
	Southbound	41.4	D	59.2	E	41.4	D	60.0	E	44.8	D	70.6	E

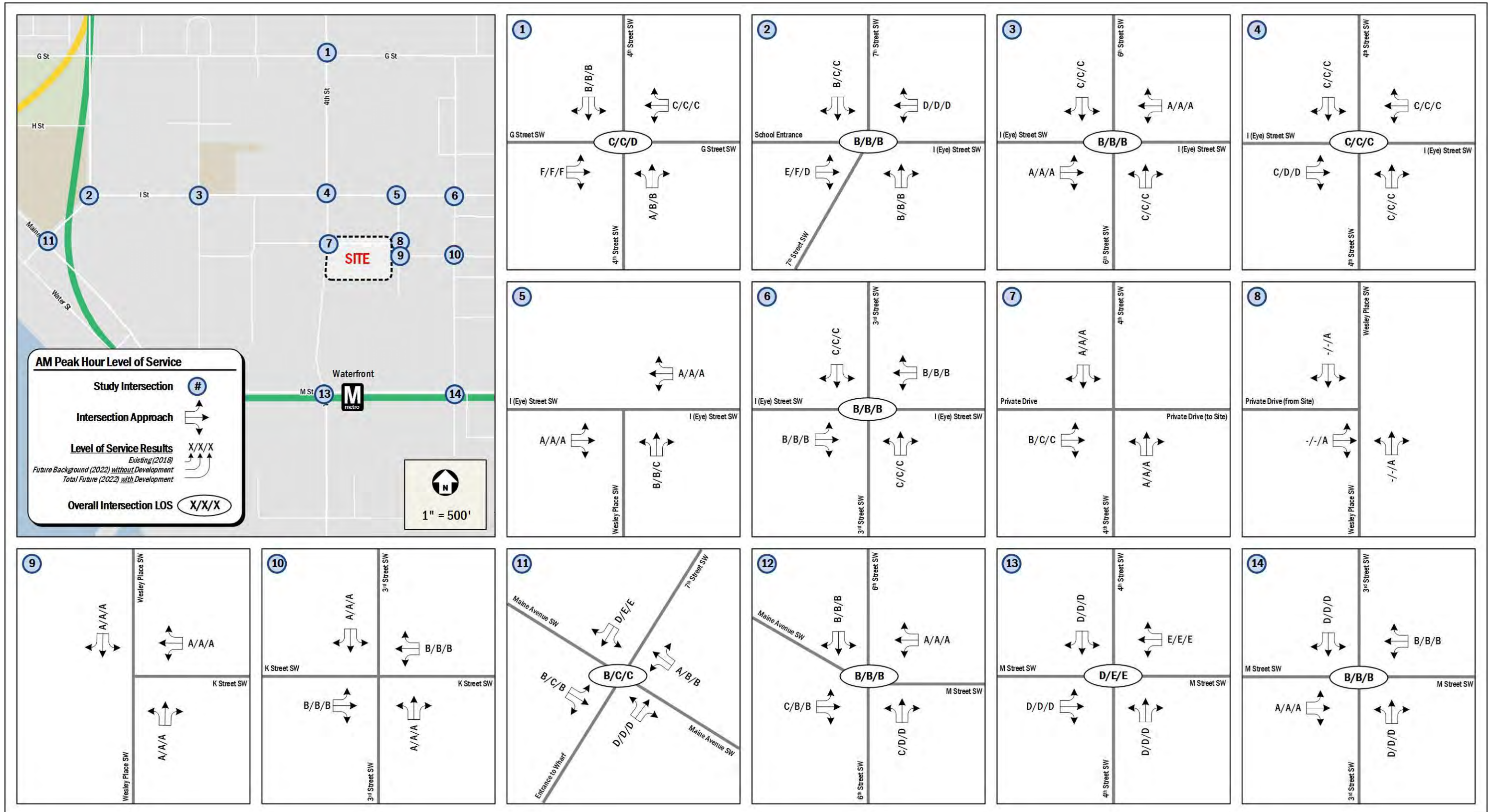


Table 7: Queueing Results (in feet)

Intersection	Lane Group	Storage Length (ft)	Existing Conditions				Future without Development Conditions (2022)				Future with Development Conditions (2022)			
			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 %
G Street & 4th Street, SW	Eastbound LTR	565	~137	#274	67	127	~147	#296	80	156	~153	#304	85	#167
	Westbound LTR	540	43	91	41	83	57	114	47	98	57	114	47	98
	Northbound LTR	620	113	168	44	m78	125	183	38	m73	141	m198	39	m72
	Southbound LTR	620	90	140	164	251	88	150	165	269	90	153	172	281
I Street & 7th Street, SW	Eastbound LTR	50	5	24	4	17	4	23	3	16	4	23	3	16
	Westbound Left	460	115	171	29	48	148	228	38	m82	158	242	38	90
	Westbound Right	140	0	42	3	11	0	74	10	19	0	78	10	24
	Northbound LT	250	114	118	75	107	--	--	--	--	--	--	--	--
	Northbound Right	250	0	m5	0	14	--	--	--	--	--	--	--	--
	Northbound LTR	250	--	--	--	--	129	m141	146	208	126	m139	150	215
	Southbound Thru	630	92	124	128	#178	164	222	~229	#336	167	226	~236	#344
I Street & 6th Street, SW	Eastbound LTR	460	34	57	36	m67	42	74	3	m2	45	78	3	m2
	Westbound LTR	245	24	50	135	207	34	58	178	m244	35	m59	193	m239
	Northbound LTR	225	54	98	69	119	71	135	87	157	71	134	87	158
	Southbound LTR	275	30	61	42	79	31	67	42	84	32	69	44	88
I Street & 4th Street, SW	Eastbound LTR	290	84	154	208	#346	134	#229	~332	#526	147	#263	~388	#587
	Westbound LT	565	103	174	123	179	133	216	159	#281	152	#264	172	#327
	Westbound Right	370	61	117	93	143	64	120	89	148	74	138	95	157
	Northbound Left	110	18	38	8	21	19	42	10	26	19	42	10	26
	Northbound TR	140	58	104	59	112	55	109	54	115	55	109	54	116
	Southbound Left	165	20	m46	57	#106	20	m47	53	#102	22	m48	60	#116
	Southbound Thru	625	51	m89	56	110	55	m95	56	m114	57	m96	60	m116
	Southbound Right	120	0	m3	0	m1	0	m5	0	m1	0	m3	0	m0
I Street & Wesley Place, SW	Eastbound TR	295	--	0	--	0	--	0	--	0	--	0	--	0
	Westbound LT	200	--	1	--	0	--	1	--	0	--	1	--	0
	Northbound LR	245	--	7	--	15	--	7	--	18	--	29	--	57
I Street & 3rd Street, SW	Eastbound LTR	200	78	111	89	m143	99	145	88	m117	104	m142	97	m115
	Westbound LTR	530	75	125	81	124	94	153	100	160	94	153	101	160
	Northbound LTR	225	42	84	46	97	44	94	45	104	46	97	47	#108
	Southbound LTR	175	15	42	24	57	15	42	22	57	15	42	22	57
4th Street & Private Drive, SW	Eastbound LR	100	--	1	--	1	--	1	--	1	--	1	--	1
	Northbound LTR	75	--	0	--	0	--	0	--	0	--	0	--	0
	Southbound LTR	175	--	0	--	0	--	0	--	0	--	1	--	1
Wesley Place & Private Drive, SW	Eastbound LR	205	--	3	--	3	--	2	--	3	--	4	--	8
	Northbound Thru	100	--	0	--	0	--	0	--	0	--	0	--	0
	Southbound Thru	250	--	2	--	3	--	2	--	2	--	3	--	3
K Street & Wesley Place/Alley, SW	Westbound LR	205	--	3	--	3	--	2	--	3	--	4	--	8
	Northbound TR	100	--	0	--	0	--	0	--	0	--	0	--	0
	Southbound LT	250	--	2	--	3	--	2	--	2	--	3	--	3
	Eastbound LTR	205	--	5	--	8	--	5	--	7	--	10	--	12
K Street & 3rd Street, SW	Westbound LTR	455	--	3	--	3	--	3	--	3	--	4	--	3
	Northbound LTR	260	--	1	--	1	--	1	--	1	--	2	--	3
	Southbound LTR	235	--	0	--	1	--	0	--	1	--	0	--	1
	Eastbound Left	170	64	104	83	128	73	126	139	#292	76	139	158	#331
Maine Avenue & 7th Street, SW	Eastbound TR	245	152	195	240	297	236	293	317	388	240	298	326	398
	Westbound Left	205	2	m4	10	m23	2	m5	10	m23	2	m5	10	m23
	Westbound TR	1015	146	161	411	478	182	238	582	656	196	212	589	664
	Northbound LTR	240	43	84	57	107	54	103	101	170	54	103	101	170



	Southbound Left	235	78	127	115	178	~253	#433	178	#338	~253	#434	178	#338
	Southbound Thru	235	30	62	33	64	28	m49	31	65	28	m47	31	65
	Southbound Right	235	131	196	58	109	92	166	88	157	107	182	95	167
Maine Aveune/M Street & 6th Street, SW	Eastbound LTR	415	200	244	403	468	196	m235	450	m541	201	m239	465	m561
	Westbound Left	195	2	m3	2	m4	2	m3	4	m6	2	m3	4	m5
	Westbound TR	535	54	63	69	79	53	60	72	82	53	60	72	82
	Northbound LTR	420	8	28	12	36	16	45	37	78	16	45	37	78
	Southbound LT	590	26	55	74	124	28	61	72	128	28	61	72	128
	Southbound Right	110	0	0	0	0	0	0	0	0	0	0	0	0
M Street & 4th Street, SW	Eastbound Left	170	19	47	20	m37	28	65	50	m72	33	72	56	m79
	Eastbound Thru	545	113	156	232	290	121	170	255	320	123	172	261	326
	Eastbound Right	325	162	311	216	295	174	314	228	313	175	315	229	m312
	Westbound Left	190	18	46	53	m96	25	56	58	m109	26	57	57	m106
	Westbound TR	565	280	332	284	316	322	376	314	363	334	389	319	369
	Northbound Left	410	110	172	146	216	106	177	144	228	106	177	144	228
	Northbound TR	540	109	172	144	216	105	178	143	#242	105	178	143	#242
	Southbound Thru	160	53	93	166	239	59	107	166	255	59	107	166	255
	Southbound Right	100	33	66	29	60	31	66	28	62	31	66	28	62
M Street & 3rd Street, SW	Eastbound Left	125	1	m8	3	m5	1	m15	5	m8	2	m18	6	m9
	Eastbound TR	570	7	6	38	46	7	6	41	49	7	6	40	48
	Westbound LTR	275	189	226	140	171	202	241	158	191	206	246	166	200
	Northbound LTR	50	4	20	0	0	3	18	0	0	3	18	0	0
	Southbound LTR	300	0	33	106	170	0	36	109	#195	26	85	134	#257



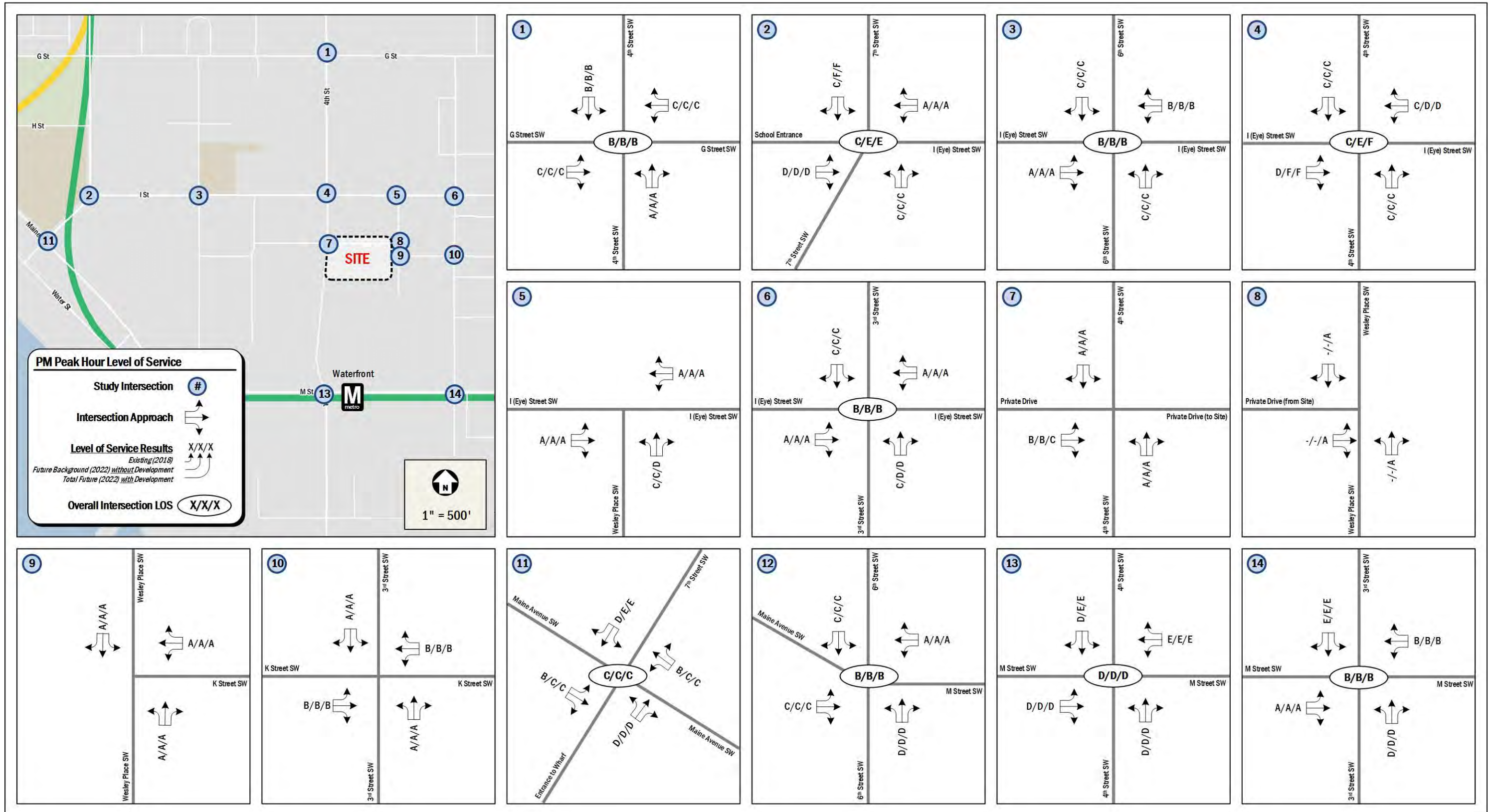


Figure 18: Afternoon Peak Hour Capacity Analysis Results



Table 8: Vehicular Capacity Analysis Results with Mitigations

Intersection	Approach	Future without Development Conditions (2022)				Future with Development Conditions (2022)				Future with Development Conditions, With Mitigations (2022)			
		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
G Street & 4th Street, SW	Overall	33.7	C	17.2	B	35.1	D	17.7	B	30.2	C	--	--
	Eastbound	93.6	F	32.2	C	99.3	F	33.5	C	78.6	E	--	--
	Westbound	27.5	C	26.4	C	27.5	C	26.4	C	26.3	C	--	--
	Northbound	10.5	B	7.0	A	11.1	B	7.1	A	11.4	B	--	--
	Southbound	12.1	B	15.7	B	12.2	B	16.1	B	13.0	B	--	--
I Street & 7th Street, SW	Overall	24.8	C	64.9	E	25.1	C	67.8	E	--	--	60.7	E
	Eastbound	94.1	F	49.1	D	94.1	D	49.1	D	--	--	49.1	D
	Westbound	37.7	D	9.8	A	38.3	D	10.8	A	--	--	11.4	B
	Northbound	13.8	B	26.9	C	13.5	B	27.4	C	--	--	25.7	C
	Southbound	22.4	C	138.5	F	22.7	C	146.7	F	--	--	129.0	F
I Street & 4th Street, SW	Overall	27.4	C	60.9	E	30.2	C	85.1	F	--	--	57.7	E
	Eastbound	39.4	D	143.6	F	46.3	D	218.0	F	--	--	125.6	F
	Westbound	25.6	C	37.6	D	29.0	C	43.9	D	--	--	35.8	D
	Northbound	21.2	C	22.6	C	21.2	C	22.7	C	--	--	25.0	C
	Southbound	23.9	C	20.9	C	23.7	C	23.1	C	--	--	27.3	C
M Street & 3rd Street, SW	Overall	14.3	B	14.9	B	15.4	B	16.6	B	--	--	16.4	B
	Eastbound	1.1	A	6.1	A	1.2	A	6.0	A	--	--	6.1	A
	Westbound	16.6	B	15.4	B	16.8	B	15.6	B	--	--	16.8	B
	Northbound	40.7	D	40.5	D	40.7	D	40.5	D	--	--	38.8	D
	Southbound	41.4	D	60.0	E	44.8	D	70.6	E	--	--	61.8	E



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 of the 1000 4th Street, SW project.

This chapter concludes that:

- The Project has adequate access to local and regional transit.
- The Project is located adjacent to the Waterfront Metrorail Station.
- The Project is surrounded by four (4) Metrobus routes, one (1) DC Circulator Route, a Southwest neighborhood shuttle, and additional regional

commuter buses, that provide connectivity to the downtown core and other areas of the District, Maryland, and Virginia.

- The site is expected to generate a manageable number of transit trips, and the existing service is capable of handling these new trips.

EXISTING TRANSIT SERVICE

The study area is well served by Metrorail, Metrobus, DC Circulator, Wharf shuttle, and several regional commuter buses. Combined, these transit services provide local, city-wide, and regional transit connections that link the site with major cultural, residential, employment, and commercial destinations throughout the region. Figure 19 identifies the major transit routes, stations, and stops in the study area.

Table 9: Metrobus and Regional Commuter Bus Route Information

Route Number	Route Name	Service Hours	Headway	Walking Distance to Nearest Bus Stop
74	Convention Center-Southwest Waterfront Line	Weekdays: 4:45 AM-12:14 AM Weekend: 4:50 AM-12:21 AM	12-26 min	0.1 miles, 2 minutes
A9	Martin Luther King Jr. Avenue Limited Line	Weekdays: Northbound 5:50 AM-9:45 AM Southbound 3:30 PM-7:40 PM	10-21 min	0.2 miles, 3 minutes
P6	Anacostia-Eckington Line	Weekdays: 4:10 AM-3:35 AM Weekend: 4:08 AM-3:12 AM	6-45 min	0.1 miles, 2 minutes
V1	Benning Heights-M Street Line	Weekdays: Eastbound 2:55 PM-7:44 PM Westbound 5:04 AM-9:33 AM	16-29 min	0.1 miles, 2 minutes
735	Charlotte Hall/Waldorf to Washington, D.C. MTA Line	Weekdays: Northbound 12:15 PM-7:14 PM Southbound 4:20 AM-8:51 AM	15-30 min	0.2 miles, 3 minutes
850	Prince Frederick/Dunkirk to Suitland/Washington, D.C. MTA Line	Weekdays: Northbound 4:50 AM-9:17 AM Southbound 2:48 PM-6:59 PM	30-31 min	0.2 miles, 3 minutes
PRTC D-300	Dale City-Washington Navy Yard Omni-Ride Line	Weekdays: Eastbound 4:38 AM-8:28 AM Westbound 12:13 PM-9:03 PM	16-102 min	0.2 miles, 3 minutes
LCT	Loudoun County Transit	Weekdays: Eastbound 5:20 AM-9:35 AM Westbound 12:45 PM-7:39 PM	1-38 min	0.2 miles, 3 minutes
DC Circulator	Eastern Market-L'Enfant Plaza Line	Weekdays: 6:00 AM-9:00 PM Weekend: 7:00 AM-9:00 PM	10 min	0.2 miles, 3 minutes
N/A	Southwest Neighborhood Shuttle	Weekdays: 6:30 AM-1:00 AM Weekend: 9:00 AM-1:00 AM	10 min	0.4 miles, 9 minutes



Table 10: Transit Stop Requirements

Feature	Basic Stop	Enhanced Service Bus Stop	Transit Center
Bus Stop Sign	Yes	Yes	Yes
ADA 5'x8' Landing Pad - at a minimum, a clear, unobstructed, paved boarding area that is 8 feet deep (perpendicular to the curb) by 5 feet wide (parallel to the curb) and compliant with the ADA Accessibility Guidelines (ADAAG)	Yes	Yes	Yes
Sidewalk - connected by a paved sidewalk that is at least 4 feet wide	Yes	Yes	Yes
Lighting - adequate lighting either from street lights, lights from an adjacent business, or shelter lighting (particularly stops that are served in the evenings)	Evening Service	Yes	Yes
Seating	Trip Generator Based	Yes	Yes
Information Case - detailed schedule information on services	Yes	Yes	Yes
Trash Receptacle - trash receptacle (particularly at locations that are close to fast food establishments and convenient stores)	Site Specific	Yes	Yes
Shelter(s) - shelter with interior seating if there are 50 or more boardings per day (including transfers)	1 (50+ boardings/day)	1	2+
System Map	Contingent on Shelter	Yes	Yes
Real-time Display (LED + Audio)	Optional	Yes	Yes
Interactive Phone System On-Site - real time bus arrival information through an interactive phone and push button audio system	No	No	Yes
Expanded Boarding & Alighting Area (Rear-door Access)	No	Site Specific	Yes
Bus Bay (Pull Off)	No	Site Specific	Yes

The site is located adjacent to the Waterfront Metrorail Station, located at the intersection of 4th Street, SW and M Street SW, and is served by the Green Line, providing direct connections to areas in the District, Maryland, and Virginia.

The Green Line connects the site to Greenbelt, MD to the north, extending through downtown Washington via Gallery Place-Chinatown and L'Enfant Plaza, and to Suitland, MD (Branch Avenue) to the south. Metrorail trains run frequently during the weekday morning and afternoon peak hours between 5:00 AM to 9:30 AM and 3:00 PM to 7:00 PM and approximately every 12 minutes during the weekday midday hours from 9:30 AM to 3:00 PM and every 8 to 20 minutes during the weekday off-peak periods and on weekends.

The site is also serviced by local Metrobus and Circulator routes, the Southwest Neighborhood shuttle, and additional regional bus service, providing connectivity to the downtown

core and other areas of the District, Maryland, and Virginia. Table 9 shows a summary of the bus route information for the routes within a quarter-mile walkshed of the site, including service hours, headway, and distance to the nearest bus stop.

Figure 19 shows a detailed inventory of the existing Metrobus stops within a quarter-mile walkshed of the site. Each stop is evaluated based on the guidelines set forth by WMATA's *Guidelines for the Design and Placement of Transit Stops*, as shown in Table 10. A detailed breakdown of individual bus stop amenities and conditions is included in the Technical Appendix.

PROPOSED TRANSIT SERVICE

MoveDC

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. *MoveDC* is a long-range plan that provides a vision for the future of DC's 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

Outlined in the *MoveDC* plan in the vicinity of the site, the North-South Corridor Streetcar line connecting Buzzard Point and Takoma/Silver Spring, MD is proposed along Georgia

Avenue/7th Street, two blocks west of the site. Currently there are no plans to advance the recommendations from this study.

WMATA and DDOT Transit Studies

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 Waterfront station can currently accommodate future growth at all access points.

SITE-GENERATED TRANSIT IMPACTS

The Project is projected to generate 137 transit trips (43 inbound, 94 outbound) during the morning peak hour, and 176 transit trips (105 inbound, 71 outbound) during the afternoon peak hour.

Given the existing capacity of the surrounding transit facilities, site-generated transit trips will not cause detrimental impacts to Metrobus or Metrorail service.

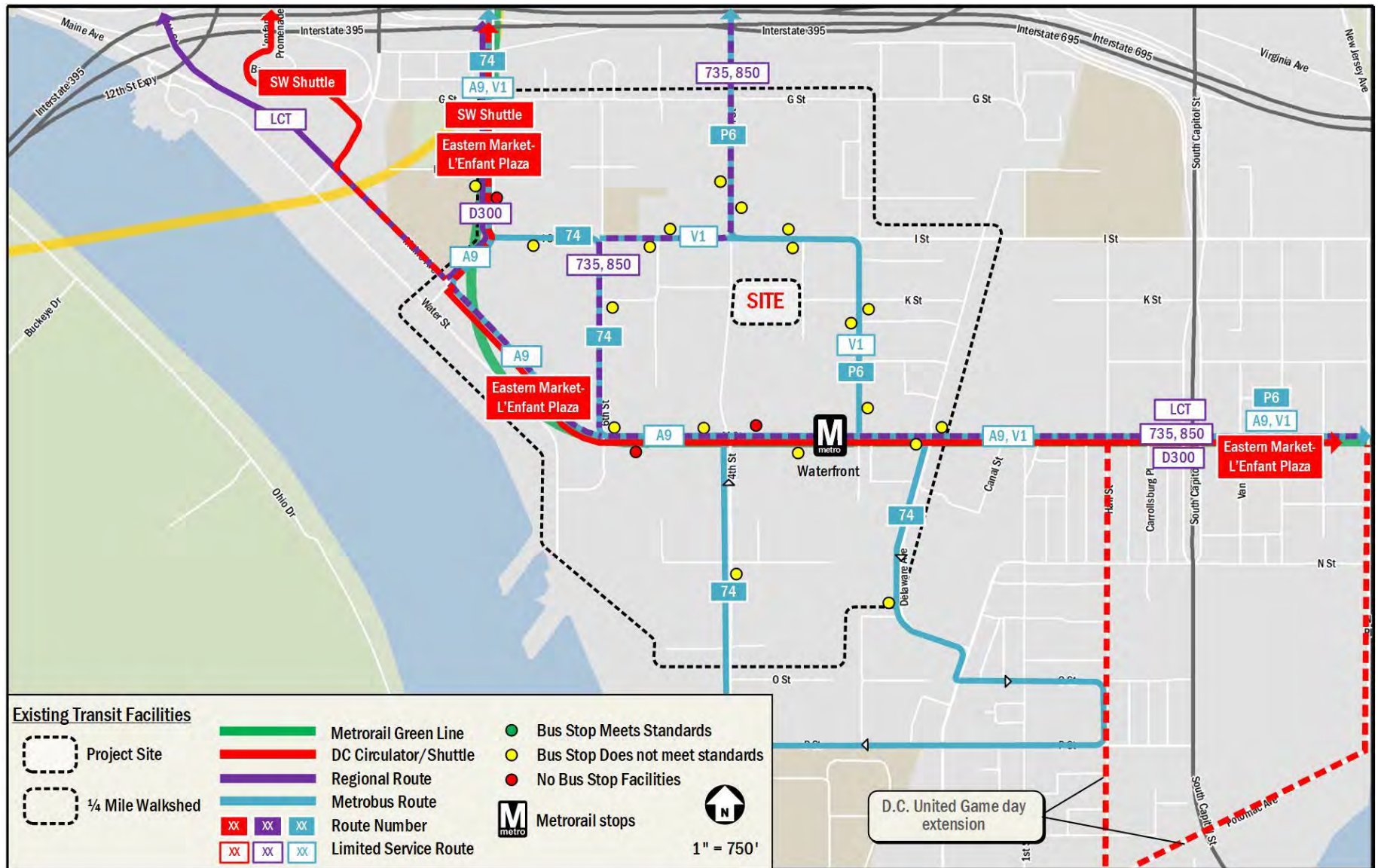


Figure 19: Existing Transit Service



PEDESTRIAN FACILITIES

This section summarizes the existing and future pedestrian access to the site and reviews walking routes to and from 1000 4th Street, SW.

This chapter concludes that:

- The existing pedestrian infrastructure surrounding the site provides an adequate walking environment. There are some gaps in the system, but there are sidewalks along the majority of primary routes to pedestrian destinations.
- Some sidewalks along 6th Street, SW and 7th Street, SW are temporarily closed due to the construction of developments near the site. Pedestrian detours have been provided and marked and are expected to be reopened prior to completion of the Project.
- The Project is expected to generate a manageable number of pedestrian trips; however, the pedestrian trips generated by walking to and from transit will be more substantial, particularly to and from the Waterfront Metrorail Station.
- The Project will improve pedestrian facilities along the private drive, and Wesley Place, SW frontage.

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 an adjacent Metrorail station and bus stops directly in the vicinity of the site along I (Eye) Street, SW, M Street, SW, and 3rd Street, SW. There are some areas of concern within the study area that negatively impact the quality of and attractiveness of the walking environment. This includes roadway conditions that reduce the quality of walking conditions, narrow or nonexistent sidewalks, proximity to the interstate, and incomplete or insufficient crossings at busy

intersections. Figure 20 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 21 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 *Design and Engineering Manual (2017)* in addition to ADA standards. Sidewalk widths and requirements for the District are shown below in Table 11.

Within the area shown, the majority of roadways are considered residential with a low to moderate density. Most of the sidewalks surrounding the site comply with DDOT standards; however, areas along 6th Street, SW and 7th Street, SW to the west have sidewalks at all, with insufficient or no buffer due to on-going construction. All will meet DDOT standards once construction is completed, before completion of the Project. All primary pedestrian destinations are accessible via routes with sidewalks, most of which meet DDOT standards.

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 21, under existing conditions crosswalks and curb ramps with detectable warnings are present adjacent to the site.

Pedestrian Infrastructure Improvements

As a result of the background developments, pedestrian facilities throughout the neighborhood will be improved to meet DDOT and ADA standards. This includes sidewalks that

Table 11: Sidewalk Requirements

Street Type	Min. Buffer Width	Min. Sidewalk Unobstructed Width	Total Min. Sidewalk Width
Low- to Moderate-Density Residential	4-6 ft	6 ft	10 ft
High-Density Residential	4-8 ft	8 ft	13 ft
Central DC and Commercial Areas	4-10 ft	10 ft	16 ft



meet or exceed the width requirements, crosswalks at all necessary locations, curb ramps with detectable warnings. The inclusion of benches, planting beds, and additional streetlights will result in improvements over existing conditions.

SITE IMPACTS

Pedestrian Trip Generation

The Project is projected to generate 147 walking trips (65 inbound, 82 outbound) during the morning peak hour, and 182 walking trips (99 inbound, 83 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;

- Surrounding residential areas that will utilize the education/daycare;
- 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.

On-Site Pedestrian Infrastructure

As part of the Project, pedestrian facilities along the perimeter of the Project will be improved so that such facilities meet or exceed DDOT and ADA standards. These improvements include a sidewalk along the private drive to provide additional east west connectivity and the addition of landscaped buffers along the Wesley Place, SW frontage.



Figure 20: Pedestrian Pathways

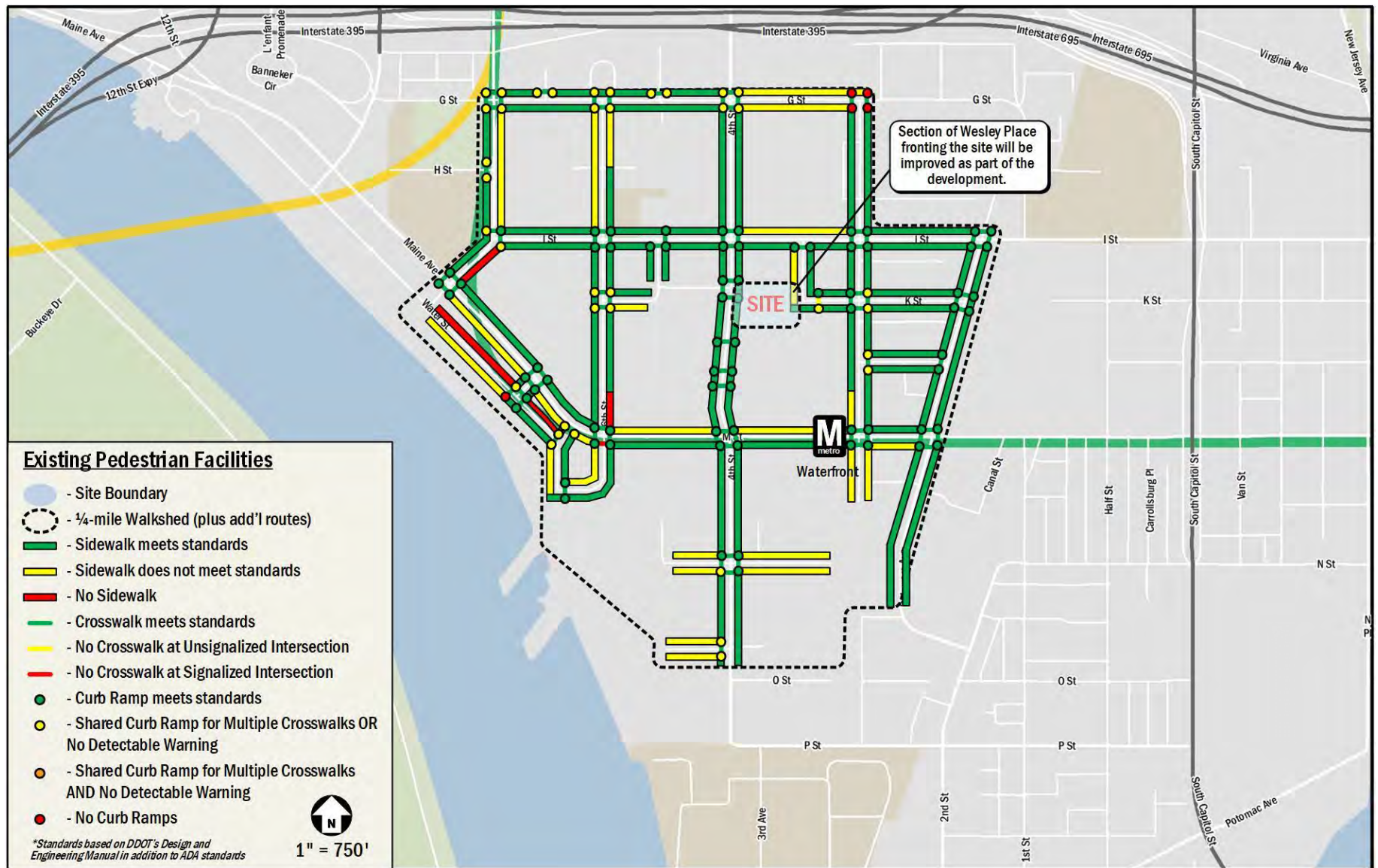


Figure 21: Existing Pedestrian Infrastructure

BICYCLE FACILITIES

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

This chapter concludes that:

- The site has access to several on- and off-street bicycle facilities including bicycle lanes on 4th Street, SW and I (Eye) Street, SW.
- The Project is not expected to generate a significant amount of bicycle trips; therefore, all site-generated bike trips can be accommodated on existing infrastructure.
- The Project will include secure bicycle parking on site for residents and employees of the Project.
- The Project will include short-term bicycle racks along the perimeter of the site.

EXISTING BICYCLE FACILITIES

The site has excellent connectivity to existing on- and off-street bicycle facilities. Residential low volume streets surrounding the site provide connectivity to existing bicycle facilities nearby. The site is adjacent to bicycle lanes along 4th Street, SW, I (Eye) Street, SW to the north, and 6th Street, SW to the west. Signed routes are located on M Street, SW and 3rd Street, SW. A new cycle track has been opened along the south side of Maine Avenue, SW in conjunction with the opening of the Wharf Phase 1. These bicycle facilities provide the site with connectivity to areas within the District, Maryland and Virginia. Figure 22 illustrates the existing bicycle facilities in the area.

Under existing conditions, short-term bicycle parking is located south and west of the site along 4th Street, SW.

The Capital Bikeshare program provides additional cycling options for residents, employees, and patrons of the planned development. The Bikeshare program has placed over 500 Bikeshare stations across Washington, DC, Arlington, Alexandria, VA, Fairfax County, VA, Montgomery County, MD, and most recently Prince George's County, MD with over 4,300 bicycles provided. Capital Bikeshare currently has an existing Capital Bikeshare station with 23 available bicycle docks south of the site at 4th Street, SW and M Street, SW. An additional bikeshare station is located at 7th Street, SW and Maine

Avenue, SW with 19 available bicycle docks. Figure 22 illustrates the existing Capital Bikeshare facilities in the area.

PROPOSED BICYCLE FACILITIES

MoveDC

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 Transportation Improvement Program (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. These investments 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.

There are two (2) Tier 1 additions that will positively affect bicycle connectivity to and from the site. Improvements to 4th Street, SW and P Street, SW south of M Street, SW are planned, which will create a bicycle link from the site to Audi Field and other destinations. These facilities will further improve the bicycle connectivity near the site.



There are two (2) Tier 2 additions that will positively affect bicycle connectivity to and from the site. A bicycle trail/bridge extending from Water Street, SW to Ohio Drive, SW at Hains Point spanning the Washington Channel, and improvements to 4th Street, SW/NW between I Street, SW and Pennsylvania Avenue, NW are planned. This facility will further improve the bicycle connectivity near the site.

SITE IMPACTS

Bicycle Trip Generation

The 1000 4th Street, SW project is projected to generate 14 bicycle trips (4 inbound, 10 outbound) during the morning peak hour, and 23 bicycle trips (15 inbound, 8 outbound) during the afternoon peak hour.

Although bicycling will be 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 impacts from bicycling will be relatively less than impacts for other modes.

On-Site Bicycle Elements

The Project will provide amenities that cater to cyclists including secure long-term bicycle parking and short-term bicycle racks.

The Project will provide 161 secure, long-term bicycle parking spaces within the parking garage, in excess of the 155 long-term bicycle parking spaces that would be required for a building with a similar size and mix of uses under the current zoning regulations. As such, the proposed Project greatly exceeds zoning requirements.

The Project will include short-term bicycle racks at street level along the perimeter of the site. These short-term spaces will include inverted U-racks placed in a high-visibility area. The Applicant is coordinating with DDOT to locate these racks in public space and within publicly accessible private space.



Figure 22: Existing and Proposed 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 2015 to 2017, 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 12.

According to the Institute of Transportation Engineers' *Transportation Impact Analysis for Site Development*, a crash rate of 1.0 or higher is an indication that further study is required. As shown in Table 12, one (1) intersection in this study area meets this criterion. The Project should be developed in a manner to help alleviate, or at a 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 deficiencies. Additionally, the crash data does not provide detailed location information. In

Table 12: Intersection Crash Rates

Intersection	Total Crashes	Ped Crashes	Bike Crashes	Rate per MEV*
1. G Street & 4th Street, SW	4	1	0	0.25
2. I Street & 7th Street, SW	8	0	1	0.50
3. I Street & 6th Street, SW	6	1	0	0.57
4. I Street & 4th Street, SW	17	5	1	0.91
5. I Street & Wesley Place, SW	1	0	0	0.06
6. I Street & 3rd Street, SW	5	0	2	0.36
7. 4th Street & Private Drive, SW^	-	-	-	-
8. Private Drive & Wesley Place, SW^	-	-	-	-
9. K Street & Wesley Place, SW^	-	-	-	-
10. K Street & 3rd Street, SW	3	1	0	0.65
11. Maine Avenue & 7th Street, SW	20	2	1	0.58
12. Maine Avenue/M Street & 6th Street, SW	12	0	0	0.43
13. M Street & 4th Street, SW	44	5	2	1.39
14. M Street & 3rd Street, SW	4	0	0	0.18

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

^ - Crash Data Unavailable

Table 13: 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
4th Street & M Street, SW	1.39	0	0	1	3	16	0	3	1	0	1	3	0	0	16	44
		0%	0%	2%	7%	36%	0%	7%	2%	0%	2%	7%	0%	0%	36%	



some cases, the crashes were located near the intersections and not necessarily within the intersection.

For the one (1) intersection with elevated crash rates, 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 possible causes. Table 13 contains a breakdown of crash types reported for the one (1) intersection with a crash rate over 1.0 per MEV.

POTENTIAL IMPACTS

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

- *M Street, SW & 4th Street, SW*

This intersection is over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.39 crashes per MEV over the course of the 3-year study period. The majority of specified crashes at this intersection were sideswipes. Sideswipe crashes can often occur when a vehicle makes a last-second lane change or in a location with a significant presence of on-street parking.

The safety concerns at this intersection are primarily due to the existing lane configurations and operations. The site-generated traffic at this intersection is minimal with most vehicles passing through M Street, SW and not expected to degrade the safety; thus, no improvements are recommended as part of the proposed development. Additionally, DDOT is planning to complete a safety study at this intersection to further evaluate potential improvements at this location.



SUMMARY AND CONCLUSIONS

This report is a Comprehensive Transportation Review (CTR) of the Second-Stage PUD for 1000 4th Street, SW (Zoning Commission Case Number 02-38J). The report reviews the transportation aspects of the Project. This report concludes that **the project will not have a detrimental impact** to the surrounding transportation network assuming that all TDM measures are implemented.

Proposed Project

The 1000 4th Street, SW site is currently undeveloped and is generally bounded by an existing church to the north, an existing building to the south, Wesley Place, SW to the east, and 4th Street, SW to the west.

The site is part of the larger Waterfront Station PUD approved in July 2003 (Zoning Commission Order No. 02-38), and the final phase of the overall project. A Modified First-Stage PUD (and Second-Stage approval for the center portion of the development) was previously approved by the Zoning Commission on November 17, 2007 by Zoning Commission Order No. 02-38A. The Modified First-Stage PUD approved for 1000 4th Street, SW, a single 400,000 square foot mixed-use multifamily residential building with ground floor retail and other neighborhood-serving service uses (Project).

The Second-Stage application proposes to develop the Project in accordance with the Modified First-Stage PUD. The proposed development program for Second-Stage consists of the following elements:

- **Residential:** Up to 456 residential units.
- **Retail/Restaurant:** Approximately 11,000 square feet of ground-floor retail and/or eating and drinking establishment space.
- **Arts/Cultural:** Approximately 9,000 square feet of arts/cultural space.
- **Educational/Daycare:** Approximately 9,000 square feet of educational/daycare space (currently contemplated as a Pre-K/Daycare facility for approximately 176 students).
- **Parking:** Up to 233 parking spaces located in a below-grade garage.

Vehicular access to the Project's below-grade parking garage will be via a curb cut on the private extension of Wesley Place, SW on the east side of the building. This private extension will also provide access to the loading area, which will be located adjacent to the garage access.

A private drive is proposed along the north side of the site to accommodate pickup/drop-off activity for education/daycare use, as well as the residential and arts/cultural uses. The private drive will operate as one-way eastbound and will connect 4th Street, SW with Wesley Place, SW.

As part of the Project, pedestrian facilities along the perimeter of the project will be improved so that they meet or exceed DDOT and ADA standards. This includes a sidewalk along the private drive to provide additional east west connectivity and the addition of landscaped buffers along the Wesley Place, SW frontage.

The Project will supply internal, secure long-term bicycle parking and short-term bicycle parking within and around the perimeter of the site, all in compliance with or in excess of zoning requirements.

Multi-Modal Impacts and Recommendations

Transit

The site is served by four (4) Metrobus routes, one (1) DC Circulator route, a Southwest neighborhood shuttle, and additional regional commuter buses that provide connectivity to the downtown core and other areas of the District, Maryland, and Virginia. The site is located less than 0.1 miles from the Waterfront Metrorail Station.

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

Pedestrian

The 1000 4th Street, SW site is surrounded by a generally 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. There are areas to the west of the site that have inadequate pedestrian facilities under existing conditions due to on-going construction; however, pedestrian facilities will be restored by completion of the 1000 4th Street, SW development.



As a result of the development, pedestrian facilities around the perimeter of the site will be improved to meet DDOT and ADA standards, where needed.

Bicycle

The site has adequate connectivity to existing on- and off-street bicycle facilities. The site is accessible to a cycle track along Maine Avenue, SW and bicycle lanes along 4th Street, 6th Street, and I (Eye) Street. Signed routes are located on M Street, SW, 3rd Street, SW, and Water Street, SW.

Vehicular

The site is well-connected to Interstate 395 and several principal and minor arterials such as Maine Avenue, SW, M Street, SW, and South Capitol Street and an existing network of collector and local roadways.

In order to determine impacts that the proposed Project will have on the transportation network, this report projects future conditions with and without the development of the site and performs analyses of intersection delays and queues. The results of this report's projection and analysis were compared to the acceptable levels of delay set by DDOT standards as well as existing queues to determine whether the Project will negatively impact the study area.

The vehicular capacity analysis results in the following conclusions:

- Under existing conditions, the majority of the studied intersections operate at acceptable conditions.
- Future areas of concern for roadway capacity, are primarily along commuter routes such as I Street, SW and M Street, SW.
- Four (4) study intersections met the threshold for requiring mitigation measures as a result of the Project:
 - G Street and 4th Street, SW (AM)
 - I Street and 7th Street, SW (PM)
 - I Street & 4th Street, SW (PM)
 - M Street & 3rd Street, SW (PM)
- All intersections requiring mitigation measures can be so-mitigated through the implementation of signal timing adjustments.
- Overall, this report concludes that the Project will not have a detrimental impact to the surrounding vehicular network, assuming proposed mitigation measures are implemented.

Transportation Management Plan (TMP)

A Transportation Management Plan (TMP) has been developed for the site as it relates to school pick-up/drop-off operations, private drive operations, loading, parking and transportation demand management. The elements outlined within the TMP aim to minimize the off-site impacts of the development, reduce the number of single-occupancy vehicle trips to and from the site, and improve the efficiency of the site such that all parking, loading, and pick-up/drop-off activity occurs on-site. This TMP is comprised of following five (5) components and detailed within this report:

- Pick-up/drop-off Management
- Private Drive Management
- Loading Management
- Parking Management
- Transportation Demand Management

Summary and Recommendations

Overall, this report concludes the following:

- The site is within close proximity to the Waterfront Metrorail Station and Metrobus stops along major corridors. The site also has immediate access to bike facilities and a well-connected pedestrian network. Overall, the site has excellent access to regional and local transportation options.
- The amount of parking and loading facilities proposed on-site is expected to accommodate the Project's demand.
- The Project will supply long-term and short-term bicycle facilities that meet or exceed zoning requirements.
- The Project will improve sidewalk facilities along the perimeter of the building and create a new pedestrian connection in conjunction with proposed private drive.
- The Project meets the threshold for requiring mitigation measures at four (4) intersections surrounding the site. These intersections can be adequately mitigated through the implementation of signal timing adjustments.
- A robust TMP is proposed with the goal of minimizing the off-site impacts of the Project and reducing the number of single-occupancy vehicle trips to and from the site following construction. The TMP will include components addressing pick-up/drop-off activity,



private drive operations, loading, parking, and transportation demand management.

Based on these features and the technical analysis contained within, this report concludes that **the proposed Project will not have a detrimental impact** to the surrounding transportation network assuming that all planned site design elements and mitigation measures are implemented.