Transportation Impact Study

One M Street

Washington, DC

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GOROVE / SLADE

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EXECUTIVE SUMMARY

The following report presents the findings of a Transportation Impact Study (TIS) performed for the One M Street development. Located in Ward 6 in Southeast Washington, DC, south of M Street SE and north of N Street SE between Van Street SE and South Capitol Street, the proposed site plan consists of office development and on-street retail, with approximately 328,000 square feet of overall development.

Design Review

The proposed site is located within a high-quality transportation network, with excellent access to local and regional roadways, both rail and bus transit, quality bicycle connections, and pedestrian accommodations. The transportation features of the site plans were designed to take advantage of the transportation network surrounding the site and conform to DDOT's general guidelines.

The development program consists of an office-based development with on-street retail, with approximately 328,000 square feet of overall development. The development program consists of approximately 311,000 square feet of office uses and 17,000 square feet of street-level retail uses. In summary, the site plans include the following features:

- Vehicular access to the site will be located along Van Street SE, a local roadway. This includes two curb cuts, which will provide access to the underground parking garage and the loading area.
- By providing vehicular access from a local, low-volume roadway, the site design minimizes negative impacts to public space.
- There will be one loading dock located along Van Street.
- The amount of loading facilities contained within the development will be able to accommodate the expected truck activity.
- The amount of parking provided will be sufficient without the unintended consequence of encouraging driving as a mode.
- The project will include short-term public bicycle spaces on streets, near building entrances, and in public places.
- The project will also include secured long-term bicycle parking within the parking garages, and showers/changing facilities for office and retail employees.

The Transportation Demand Management (TDM) plan for One M Street is based on the DDOT expectations for TDM programs, modified to allow for performance monitoring. The Applicant proposes the following TDM measures:

- The Applicant will comply with Zoning requirements to provide bicycle parking/storage facilities. This includes secure parking located in the garage for office commuters.
- The Applicant will identify a project's TDM Leader (for planning, construction, and operations). The TDM Leader will work with tenants in the office building and their office managers to distribute and market various transportation alternatives and options.
- The Applicant will dedicate two spaces in the garage for car sharing services to use with right of first refusal. These spaces will be convenient to the garage entrance, available to members of the car sharing 24 hours a day, seven days a week, without restrictions (the garage may be gated – members of the service would have access to the spaces via a key pad combinations to a pass code system or other similar device).

- The Applicant will provide reserved spaces for carpools and vanpools that are conveniently located with respect to the elevators serving the buildings.
- The Applicant agrees to host a transportation mobility fair six months after both the office building has opened. The transportation fair will be advertised to all office workers. The onsite TDM coordinator will work with DDOT's goDCgo team to organize representatives that are experts in the non-auto transportation options that serve the site. Each person that attends the event will be educated on the various options and representatives will work with attendees to help them tailor the use of non-auto options to their specific transportation needs. Based on the turnout of the transportation fair and feedback gleaned by the onsite TDM coordinator, a determination will be made if the event will be repeated the following year.
- Two years after the project is 90% occupied, the Applicant will perform a monitoring study of site trip generation. The site trips will be compared to the projected trip generation contained in this report. If the measured trip generation exceeds the projections, the Applicant will supplement the above TDM measures with additional ones, such as those from in *Incorporation of Transportation Demand Management (TDM) into the Development Review Process* suggested for a project of this size not listed above.

Roadway Capacity Review

In order to determine if the proposed development will have a negative impact on the transportation network, this report projects future conditions with and without development of the site and performs analyses of intersection delays. These delays are compared to the acceptable levels of delay set by DDOT standards to determine if the site will negatively impact the study area.

The analyses concluded that the One M Street development will not have an adverse impact on the surrounding transportation network. All of the locations in the study with unacceptable levels of delay occur in scenarios with and without the development of the project -- these capacity issues will occur regardless of development.

Traffic conditions are generally favorable within the study area, both with and without development, with the following exceptions:

- The intersection of M Street and South Capitol Street is projected to operate at poor levels of service. This intersection falls within the scope of the District's South Capitol Street EIS and the preferred alternative developed for that study contains improvements to this intersection. This report defers to the conclusions from the EIS.
- The intersection of N Street and South Capitol Street is projected to operate at poor levels of service. This intersection falls within the scope of the District's South Capitol Street EIS and the preferred alternative developed for that study contains improvements to this intersection. This report defers to the conclusions from the EIS.
- The intersection of Potomac Avenue and South Capitol Street is projected to operate at a very unacceptable level of service. This intersection falls within the scope of the District's South Capitol Street EIS and the preferred alternative developed for that study contains improvements to this intersection. This report defers to the conclusions from the EIS.

As stated above, all of these intersections are studied in the South Capitol Street FEIS. The FEIS preferred alternative contains improvements at each of these intersections, although they are expected to be in place after 2015 (and are thus

not incorporated into the analysis). The goal of the South Capitol Street FEIS is to address the problems of the corridor in a way that both addresses the transportation issues, while also revitalizing the surrounding neighborhoods south of the National Mall and transforming the roadway into a grand urban gateway in to the District. The future South Capitol Street corridor will correct design deficiencies, improving safety issues for all users, including drivers, transit riders, pedestrians, and bicyclists, as well as providing key connections in the local, regional, and national transportation network. Since the goals of the FEIS are not solely based on improving vehicular levels of service, the delays shown along South Capitol Street are not necessarily expected to be mitigated after construction of the preferred alternative. This report defers to the conclusions reached in the FEIS and recommends the preferred alternative be implemented in the long-term. This analysis did reach the conclusion that regular signal timing updates of the corridor as background developments are constructed and traffic patterns change could alleviate some of the projected delays at these intersections, in the years prior to implementation of the FEIS preferred alternative.

To reiterate, all of the locations in the study with unacceptable levels of delay occur in scenarios with and without the development of the project -- these capacity issues will occur regardless of development. The Transportation Demand Management (TDM) Plan and well designed site plan lead to minimal trip generation for the proposed One M Street development. Thus, the impacts of the proposed development are negligible and non-detrimental to the study area.

Impact to Non-Auto Modes Review

In addition to the vehicular capacity analysis the following report examines transportation demand for all major modes of travel and includes trip generation projections for transit, bicycling and walking. A review of projected demand and the local services came to the following conclusions:

- The One M Street development will not have a negative impact to local transit service. Based on findings presented in transit studies from WMATA and DDOT, both the Navy Yard Metrorail station and local bus services can accommodate the projected future ridership generated by the One M Street development.
- Based on the trip generation estimates for walking, the quality of the routes near the project's location taking into account the streetscapes that will be redeveloped and improved, the One M Street development will not have a negative impact to pedestrian facilities in the study area.
- Based on the trip generation estimates for bicycling, and the quality of the routes near the project's location, the One M Street development will not have a negative impact to bicycle facilities in the study area.

1: INTRODUCTION & SITE REVIEW

This report presents the findings for the One M Street development. The development is located in Ward 6 in near Southeast Washington, DC, south of M Street SE, and north of N Street SE between Van Street SE and South Capitol Street. The proposed site plan consists of an office-based development with on-street retail, with approximately 328,000 square feet of overall development. The development program consists of approximately 311,000 square feet of office uses and 17,000 square feet of street-level retail uses.

The purpose of this report is to:

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

This report contains three sections as follows:

- *Introduction & Site Review*
  This section provides a summary of major transportation features near and adjacent to the One M Street site. This includes reviewing roadways, transit facilities, bicycle facilities, and future developments and District initiatives. This section contains information on the site to help establish a reference for the following sections.

- *Design Review*
  This section provides a summary of the internal transportation features of the One M Street site. This section is meant to supplement the details provided in the site plan package contained in the development application and reviews such items as the general parking strategy of the site, bicycle accommodations, and transportation demand management (TDM).

- *Impacts Review*
  This section provides a review of the impacts development of the One M Street site could have to each mode within the transportation network. For each mode, and where necessary, a list of recommendations and mitigation measures are compiled.

1.1 Site Location and Major Transportation Features

The One M Street development is located in the near Southeast portion of Washington, DC, in Ward 6. The proposed development is located in an area of the District near several major private and public developments and roadway infrastructure projects, including the Yards at Southwest Federal Center, the Southwest Waterfront Development, the South Capitol Street infrastructure project, and the 11th Street Bridges project.

The project site, as shown in Figure 1, is bounded by M Street SE to the north, private development to the south, Van Street SE to the east, and South Capitol Street to the west. The site is served by many regional roadways including Interstate 395 (I-395), Interstate 295 (I-295), and several interchanges and bridges. Arterials near the site include South Capitol Street and M Street. Major collector roadways include 1st Street and 8th Street. The site is also served by several public transportation sources, including Metrorail, Metrobus, and the DC Circulator bus system.

The project site also features a pedestrian network consisting of sidewalks and crosswalks along the local streets surrounding the project site. In addition to pedestrian accommodations, the site is also served by the on- and off-street bicycle network, which consists of bike lanes and signed bicycle routes along local roadways.

The One M Street development is located adjacent to several other recently constructed or approved developments. Figure 2 shows the developments located adjacent to the proposed One M Street development, including the Monument Ballpark, Akridge Square 700, Ballpark Square, and Hampton Ballpark developments. Section 1.7.2 provides an outline of the other projects that are proposed, approved, or under construction located in the vicinity of the proposed development.

1.2 Roadways

As stated previously, the site is accessible via arterials, collector, and local streets. Figure 3 shows the roadway network hierarchy for the roadways in the vicinity of the proposed development. The immediate study area of the proposed development has several key local access roads. These include the following:

- *South Capitol Street*
  South Capitol Street is a six- to eight-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a principal arterial with an average daily traffic of 58,600 vehicles in the vicinity of the proposed development. Within the limits of the study area, South Capitol Street runs from the Frederick Douglas Memorial Bridge and Potomac Avenue to I Street and the I-395 freeway ramps. North of M Street, South Capitol Street functions as a grade-separated roadway, and on-street parking is prohibited. South of M Street, South Capitol Street has been reconfigured from a grade-separated facility to a boulevard. On-street parking is prohibited south of M Street as well.

- *M Street SE/SW*
  M Street is a six-lane east-west minor arterial that connects Maine Avenue SW to 11th Street SE. It has an average daily traffic volume of 19,200 vehicles in the vicinity of the proposed development. M Street has a six-lane cross-section with a median, which is converted into center turn lanes at several intersections. Limited parking is available along both sides of the street, but parking is generally prohibited at these locations during peak hours.

Figure 1: Site Location - Aerial

Figure 2: Site Location and Adjacent Developments

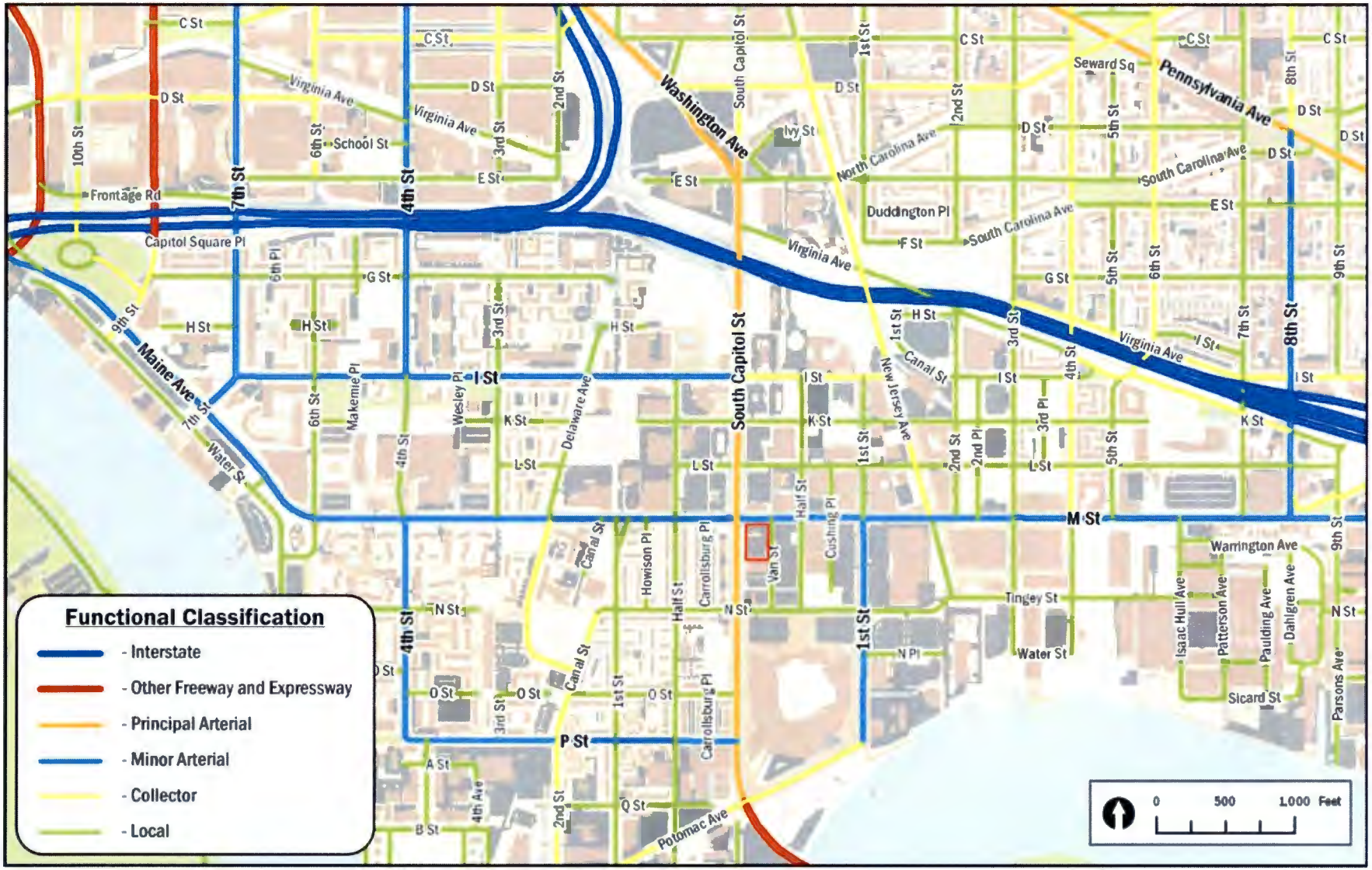

Figure 3: Roadway Functional Classification

- *Potomac Avenue SE/SW*

  Potomac Avenue is a four-lane roadway that runs east-west in the vicinity of the site. DDOT classifies it as a collector roadway in the vicinity of the proposed development. Within the limits of the study area, Potomac Avenue connects 1st Street SW to 1st Street SE. On-street parking is permitted on Potomac Avenue at all times on a portion of the roadway. Bike lanes are also provided on both sides of the roadway.

- *I (Eye) Street SE/SW*

  DDOT classifies I (Eye) Street as a minor arterial with average daily traffic volumes of 4,600 vehicles per day. I (Eye) Street has a four-lane cross-section and operates east-west between 7th Street SW to New Jersey Avenue SE. Restricted residential parking and limited public parking line both sides of the roadway.

- *N Street/Tingey Street*

  N Street is a two-lane roadway that runs east-west in the vicinity of the site. DDOT classifies it as a local roadway in the vicinity of the proposed development. Within the limits of the study area, N Street runs from South Capitol Street to the Washington Navy Yard. West of New Jersey Avenue, the roadway is named "N Street." Within the limits of The Yards, east of New Jersey Avenue, the roadway is named "Tingey Street". On-street parking is permitted on N Street during off-peak periods.

- *1st Street SE*

  First Street is a four-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a local roadway in the vicinity of the proposed development. Within the limits of the study area, 1st Street intersects M Street north of the proposed development and connects to Potomac Avenue east of the site. On-street parking is permitted on 1st Street at all times on the eastern side of the roadway. Bike lanes also provided on both sides of the roadway.

- *New Jersey Avenue SE*

  New Jersey Avenue is a two-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a local roadway with an average daily traffic of 3,000 vehicles in the vicinity of the proposed development. Within the limits of the study area, New Jersey Avenue intersects M Street northeast of the proposed development. South of M Street, on-street parking is permitted on New Jersey Avenue at all times on the eastern side of the roadway; on-street parking is also permitted at all times on both sides of New Jersey Avenue north of M Street.

- *3rd Street SE*

  Third Street is a two-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a local roadway with an average daily traffic of 3,000 vehicles in the vicinity of the proposed development. Within the limits of the study area, 3rd Street intersects M Street northeast of the proposed development. The portion of 3rd Street between Tingey Street and M Street is closed to through-traffic due to security at the USDOT headquarters. Vehicles may not travel southbound on 3rd Street at M Street. At Tingey Street, vehicles accessing the USDOT may enter through security gates to on-site parking facilities. South of Tingey Street, 3rd Street continues through Washington Navy Yard. North of M Street, on-street parking is permitted on 3rd Street at all times on both sides of the roadway; on-street parking is also prohibited at all times on both sides of 3rd Street south of Tingey Street.

- *4th Street SE*

  Fourth Street is a two- to four-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a collector roadway with an average daily traffic of 2,500 vehicles in the vicinity of the proposed development. Within the limits of the study area, 4th Street intersects M Street northeast of the proposed development. North of M Street, 4th Street is a two-lane one-way southbound roadway. On-street parking is provided on the western side of 4th Street at all times; on the eastern side of 4th Street, on-street parking is provided at all times except the afternoon peak period, reducing the roadway to a one-lane cross-section. South of M Street, 4th Street is a four-lane two-way roadway. On-street parking is provided at all times except morning peak period on the western side and afternoon peak period on the eastern side of the roadway, reducing the roadway to a 3-lane cross-section during peak periods and a two-lane cross-section during off-peak periods.

- *5th Street SE*

  Fifth Street is a two-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a local roadway in the vicinity of the proposed development. Within the limits of the study area, 5th Street intersects M Street at the northeast corner of the proposed development. On-street parking is permitted on 5th Street at all times on both sides of the roadway.

- *8th Street SE*

  Eighth Street is a two-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a minor arterial with an average daily traffic of 11,000 vehicles in the vicinity of the proposed development. Within the limits of the study area, 8th Street intersects M Street east of the proposed development. The portion of 8th Street south of M Street is closed to through-traffic due to security at the Washington Navy Yard. Vehicles may not travel southbound on 8th Street at M Street. South of M Street, 8th Street operates within Washington Navy Yard. North of M Street, on-street parking is permitted on 8th Street at all times on the western side of the roadway; on the eastern side of the roadway, on-street back-in angled parking is provided at all times.

- *Half SW*

  Half Street is a local street that is one-way southbound from M Street SW to P Street SW. Beyond M Street, Half Street becomes a two-way roadway as it extends to I Street northbound and V Street southbound where it terminates. Restricted residential parking lines both sides of the roadway. The posted speed limit in the vicinity of the site is 25 mph.

Two major infrastructure projects are located near the proposed development: the 11th Street Bridges Improvement Project and the South Capitol Street Improvement Project. The majority of the future roadway changes outlined by these projects will not affect the roadway network immediately surrounding the project site. However, both projects will improve access to the proposed development by reducing congestion on the roadway network and providing additional mobility in the study area. These projects are outlined in greater detail in Section 1.7.1.

The study area for the M Street SE/SW Transportation Study also encompasses the proposed One M Street development. The Draft study was published for public comment a the time of this study and includes potential improvements for the near-, mid-, and long-term in order to address the current and future transportation challenges along M Street SE/SW and in the surrounding area. The study is outlined in greater detail in Section 1.7.1.

1.3 Car-Sharing

Three car sharing companies serve the District: Zipcar, Hertz on Demand, and Daimler's Car2Go. All three services are private companies that provide registered users access to a variety automobiles. Zipcar has a few locations adjacent to the project site, but Hertz on Demand does not. Table 1 lists the car-sharing locations provided by Zipcar in the study area and the number of vehicles available.

Table 1: Carshare Location and Vehicles (Zipcar)

Carshare Location	Number of Vehicles
1st & N Streets SE (Lot H/I at The Yards)	2 vehicles
3rd & N Streets SE (Lot L at The Yards)	1 vehicle
Total Number of Carshare Vehicles in Study Area	**3 vehicles**

Car-sharing is also provided by Car2Go in DC. Car2Go is new to the District and provides point-to-point car sharing. Unlike Zipcar, which requires a two-way trip, Car2Go can be used for one-way rentals. Car2Go currently has a small fleet of vehicles located throughout the District. Car2Go vehicles may park in any non- restricted Metered curbside parking space or Residential Parking Permit location in any zone throughout the defined "Home Area". Members do not have to pay the meters or pay stations. Vehicle availability is tracked through their website. While no Car2Go car-sharing vehicles are permanently located within the study area, they provide an additional option for car-sharing patrons.

1.4 Transit

The study area is served by heavy rail, commuter bus, DC Circulator bus, and local bus service. Combined, these transit services provide local, city wide, and regional transit connections and link the site with major cultural, residential, employment, and commercial destinations throughout the region. Figure 4 identifies the major transit routes, stations, and stops in the study area.

The Metrobus and Metrorail systems provide public transportation access to the One M Street development site. The nearest Metrorail station is Navy Yard, located approximately 250 feet from the northeast corner of the proposed development at the intersection of Half Street and M Street. An additional portal is provided at the intersection of New Jersey Avenue and M Street, less than ¼ mile away. The Green line serves the Navy Yard station running approximately every 6 minutes during the morning and afternoon peak periods and every 15 to 20 minutes during the weekday off-peak periods and on weekends.

Metrobus service is accessible to the site, with stops adjacent to the site on M Street and near the site on other surrounding roadways. The majority of the Metrobus lines that serve the site converge at the Navy Yard Metrorail station. These routes connect the site with several destinations throughout downtown DC and the surrounding areas. The DC Circulator bus is also accessible to the site, with stops provided near the intersection of 4th Street and M Street. Table 2 shows a summary of the bus route information for the lines that serve the site, including service hours, headways, and average weekday ridership.

Table 2: Bus Route Information

Route Number	Route Name	Service Hours[1]	Headway[1]	Average Weekday Ridership[2]
74	Convention Center-Southwest Waterfront Line	5:00 am – 1:00 am	15-20 min	No data available (new route in 2011)
A9	South Capitol Street Line	Weekdays 6:00 – 9:30 am, 3:00 – 7:00 pm	15-20 min	422
A42, 46, 48	Anacostia-Congress Heights Line	Late night extension of A2, 6, 8 line Weekdays: 12:00 am – 6:00 am Weekends: 12:00 am – 8:00 am	30 min	11,577 (includes A2, A6, A7, A8, A42, A46, and A48)
P1, 2	Anacostia-Eckington Line	Primarily provides northbound service Weekdays 6:30 AM – 12:00 AM Weekends 8:30 AM – 2:30 AM	20-40 min for each route	3,388 (includes P1, P2, and P6)
V7, 8, 9	Minnesota Ave-M Street Line	4:30 am – 1:30 am	30 min	3,745
P17, 19	Oxon Hill-Fort Washington Line	Monday – Saturday NB: 5:00 am – 10:00 am Monday – Saturday SB: 3:00 pm – 8:00 pm	20-30 min for each route	1,267
W13	Bock Road Line	Monday – Saturday NB: 5:00 am – 9:00 am Monday – Saturday SB: 3:30 pm – 8:00 pm	20-30 min	740 (includes W13 and W14)
DC Circulator	Union Station-Navy Yard	Winter Hours (October 1 – March 31) Weekdays: 6:00 am – 7:00 pm Summer Hours (April 1 – September 30) Weekdays: 6:00 am – 9:00 pm Saturdays: 7:00 am – 9:00 pm Extended service on Nationals game days	10 min	1,708

There are several methodologies for calculating bus Level of Service (LOS). One such method is based on peak period service frequencies, or how many times per hour a user can catch a bus. Higher frequencies contribute to more convenient service and lower overall travel time for riders because wait time is reduced. Under this method, which is described in Transit Cooperative Research Program (TCRP) Transit Capacity and Quality of Service Manual, 2nd Edition, 2003, LOS A is defined by an average headway of less than 10 minutes (more than 6 buses per hour), which is a service level that is frequent enough that passengers generally do not need to consult route schedules. LOS F is defined by an average headway of more than 60 minutes (less than one bus per hour). Peak hour LOS for each route within the study area is presented in Table 3.

[1] WMATA route schedules, http://wmata.com/bus/timetables/

[2] For WMATA routes, WMATA FY 2011 Weekday Average Ridership, http://wmata.com/pdfs/planning/FY11_Average_Weekday_Bus_Ridership.pdf
For DC Circulator, DC Circulator Dashboard, Average Ridership by Day of Week, 1/1/2011 to 12/31/2011, http://circulatordashboard.dc.gov/

Table 3: Bus Route Level of Service

Route Number	Route Name	Peak Hour Headway[1]	Transit LOS[2]
74	Convention Center-Southwest Waterfront Line	15-20 min	C
A9	South Capitol Street Line	15-20 min	C
A42, 46, 48	Anacostia-Congress Heights Line	n/a (late-night service only)	n/a
P1, 2	Anacostia-Eckington Line	20 min	C
V7, 8, 9	Minnesota Ave-M Street Line	10-15 min	B
P17, 19	Oxon Hill-Fort Washington Line	20 min	C
W13	Bock Road Line	20 min	C
DC Circulator	Union Station-Navy Yard	10 min	B

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

The streetcar system element of the plan includes three routes that travel near the project site. The streetcar system will consist of modern low-floor vehicles that operate on surface tracks embedded in the roadways, which will mostly operate in travel lanes that are shared with automobiles. Stops will generally be located every ¼- to ½-mile along the routes. The future planned routes serving the study area will connect the site to several areas in the District including Buzzard Point, Congress Heights, Woodley Park, Adams Morgan, and Washington Circle.

The Metro Express limited-stop bus service element of the plan includes one route that travel near the project site. The network of new limited-stop bus service ("Metro Express") will consist of high-frequency bus services using specially marked vehicles, operated by WMATA, which will supplement the four existing Metro Express routes that operate along Georgia Avenue, 16th Street, Wisconsin Avenue, and Pennsylvania Avenue. Stops will generally be located every ¼- to ½-mile along the routes. The Metro Express bus services will also include traffic signal priority and real-time Next Bus arrival displays. The future planned corridor near the site travels along the 11th Street Bridges, M Street, and 8th Street.

[1] WMATA route schedules, http://wmata.com/bus/timetables/
[2] Transit Cooperative Research Program (TCRP) Transit Capacity and Quality of Service Manual, 2nd Edition, 2003. Exhibit 3-12.

1.5 Bicycle Facilities

Within the study area, bicyclists have access to multi-use trails, on-street bike lanes, signed bike routes, and local and residential streets that facilitate cycling. The site is directly served by multi-use trails, signed bicycle routes, and local streets that accommodate cycling. The bicycle network generally provides good conditions for local trips and there are several routes for trips between the study area and Northern Virginia, Northwest Washington DC, and destinations south of the Anacostia River.

For cyclists, the most attractive routes are those that have good cycling conditions and provide direct routing between origins and destinations. Conditions in the study area that contribute to good cycling conditions includes minimal changes in topography, multi-use trails that separate bicycle traffic from vehicle traffic, on-street bicycle lanes that designate bicycle rights-of-way, multiple Capital Bikeshare stations, local and collector streets with low traffic volumes and speeds, sidewalks that permit bicycle traffic and provide routing through barriers, and bicycle parking.

Within the existing study area, cycling conditions are good and provide attractive conditions for commuters and recreational riders alike. The existing conditions provide a good environment for cycling include low traffic volumes and speeds, wide travel lanes, the Anacostia Riverwalk Trail, three Capital Bikeshare stations, and ample bicycle parking. Bike lanes are provided along 1st Street, near the site. A direct connection to the Anacostia Riverwalk Trail is provided along Potomac Avenue at South Capitol Street to cross the Frederick Douglass Bridge across the Anacostia River. A second connection to the Trail is provided along Potomac Avenue at Diamond Teague Park to travel along the Anacostia River and through The Yards Park. On weekdays, the Trail is open south of the Navy Yard to provide connection to the Trail further east and across the 11th Street Bridge. A portion of the Trail to connect to Diamond Teague Park and travel along the Anacostia River and 2nd Street SW is proposed. In addition to bike lanes and the off-street trail, on-street signed bicycle routes are provided along P Street SW west of the site and along I (Eye) and K Streets north of the site.

This portion of the District has several major roads with high traffic volumes and speeds, man-made and natural barriers, and a lack of existing bicycle facilities. Generally, poor cycling conditions in the study area result when bicycle routes use or cross streets with high traffic volumes and speeds, barriers that increase the distance between origins and destinations or block access, intersection geometries that create conflicting bicycle, vehicle and pedestrian desire lines, freeway access ramps, and gaps in the bicycle network. These conditions reduce the attractiveness of cycling in the study area and may discourage people from using bicycles. There are some routes with barriers to cycling along them and entire roadway corridors that have poor cycling conditions that reduce the overall quality of cycling conditions and limit the number of routes that directly link the site with destinations throughout the District and region. Figure 5 illustrates bicycle facilities in the study area. In the study area, the greatest barrier to cycling is South Capitol Street, which is difficult to cross due to high traffic volumes.

Some bicycle parking was observed in the study area though most cyclists typically use street signs, parking meters, or similar objects to secure their bicycles. This indicates that there is demand for additional bicycle parking facilities in the study area.

As shown in the *DC Bicycle Master Plan* from April 2005, DDOT's proposed bicycle infrastructure for the roadways in the vicinity of the proposed development includes several multi-use trails, on-street bike lanes, and signed bicycle routes. The facilities will significantly improve bicycling conditions in the study area and may lead to higher rates of cycling. They also link the site with major residential and commercial destination in near Southeast, DC and beyond. The proposed extension of the bike lanes along 4th and 5th Street, as well as other planned facilities.

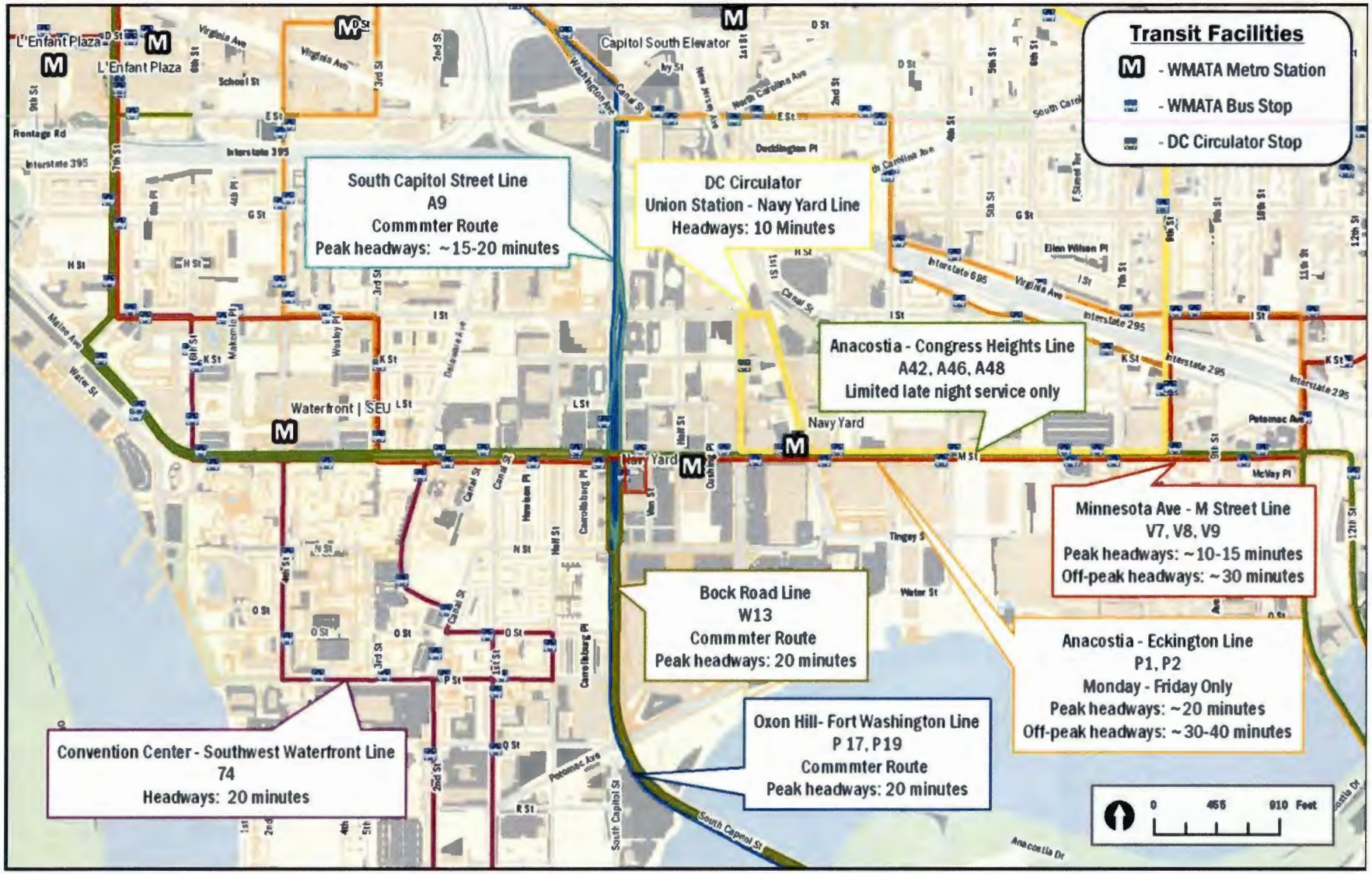

Figure 4: Existing Transit Routes, Stations, and Stops

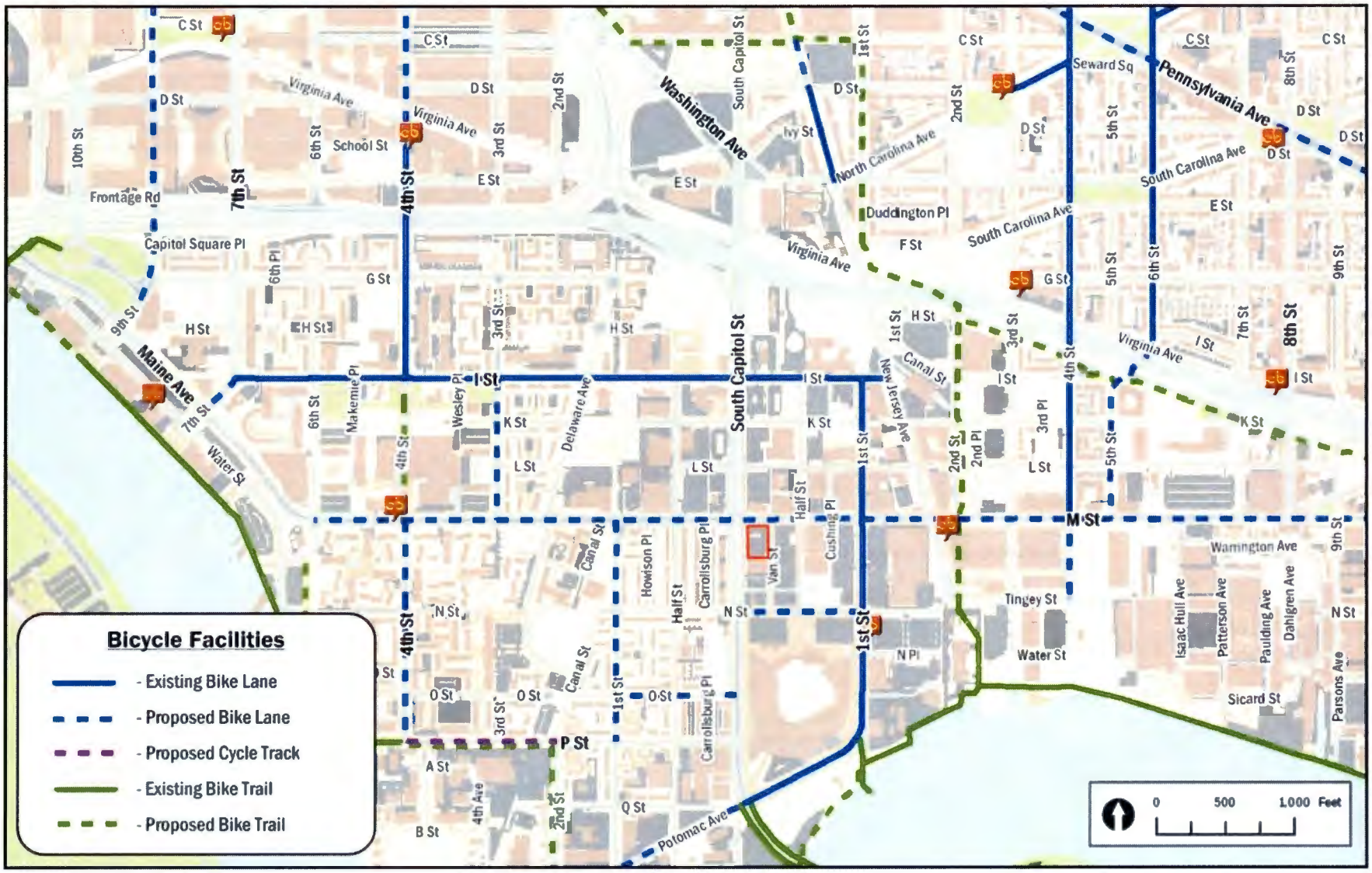

Figure 5: Existing and Planned Bicycle Facilities

The newly formed Capital Bikeshare was launched in late September 2010 to replace the DC SmartBike program. This program has placed over 175 bicycle-share stations across Washington, DC and Arlington, VA with approximately 1,675 bicycles provided. In the vicinity of the proposed development, Capital Bikeshare stations have been placed along 1st Street at N Street, along M Street at New Jersey Avenue, and along 1st Street at K Street [1], as shown in Table 4. In conjunction with the improvements proposed in the *Bicycle Master Plan*, the Capital Bikeshare program will increase accessibility of bicycles to the proposed development. Bikeshare makes bicycling an attractive and convenient option. Capital Bikeshare has plans to expand the system and potential new station locations and expanded locations have been identified. There is not an official timeline for when potential stations will be installed. The DDOT map of "Capital Bikeshare Proposed and Expanded Locations" shows a proposed additional location along N Street near 3rd Street.

Table 4: Bikeshare Location and Docking Stations

Bikeshare Location	Number of Docking Stations
1st Street & N Street SE	23 docking stations
M Street & New Jersey Avenue SE	17 docking stations
1st street & K Street SE	15 docking stations
Total Number of Bikeshare Docking Stations Study Area	**55 docking stations**

1.6 Pedestrian Facilities

Overall, the pedestrian facilities within the study area provide a good walking environment. Pedestrian access to the site is provided along M Street SE. Sidewalks, crosswalks, and curb ramps with detectable warnings are provided at most intersections in the study area. Pedestrian activity within the study area occurs along transit access routes, in the vicinity of transit stops, at commercial nodes along M Street, and, to a lesser extent, between residential neighborhoods and transit and commercial nodes. Nearly all streets in the study area have adequate sidewalks, planted buffers between sidewalks and the curb, and on-street parking that provides an additional buffer between pedestrians and vehicular traffic.

The bus stops located along M Street serve bus routes that provide local and commuter service between the study area and destinations downtown and in the surrounding area. Pedestrians access these bus stops along the local pedestrian network at the site and within the residential and commercial neighborhoods located adjacent to the site. There is some pedestrian activity between transit stops and residential areas throughout the day.

There are some barriers and areas of concern within the study area that negatively impact the quality and attractiveness of walking, including walking distances between the site and some major destinations, manmade and natural barriers that increase walking distances, and roadway conditions that reduce the quality of walking conditions, including narrow sidewalks along several streets, lengthy freeway underpasses, and lengthy crossings at some intersections. Walking distances between the site and major transit and commercial destinations in the area, such as Half Street and M Street, will not have a significant impact on the pedestrian activity because access routes generally provide good walking conditions and walking is a convenient and quick option as compared to other modes.

[1] Capital Bikeshare: www.capitalbikeshare.com

1.7 Future Projects & Developments

1.7.1 District Initiatives

Both the 11th Street Bridges project and the South Capitol Street Improvement project are currently underway in the vicinity of the project site. These projects are summarized below.

11th Street Bridges Project

The purpose of the 11th Street Bridges project is to reduce congestion and improve mobility across the Anacostia River on the 11th Street Bridges (11th Street Bridge and Officer Welsh Bridge) and on the local streets in the vicinity of the project. Additionally, the project will increase the safety of vehicular, pedestrian, and bicycle traffic in the Anacostia area; correct design deficiencies in the existing infrastructure; and upgrade evacuation routes for security movements into and out of the nation's capital and military installations.

The Phase I Alternative Design includes complete construction of three new river crossings and two new Anacostia Freeway interchanges on the east and west sides of the Anacostia River. The proposed improvements will no longer require traffic to use the neighborhood streets (Martin Luther King, Jr. Avenue, Good Hope Road, and Minnesota Avenue) to access the 11th Street Bridges because there will be a direct connection for trips between the Southeast/Southwest Freeway (I-395) and the Anacostia Freeway (I-295) from the north and a seamless connection to I-295 northbound at the southern end of the 11th Street Bridges complex where none exists today. In addition to the vehicular improvements, a 14-foot shared-use path will be provided on the downstream side (southwest) of the 11th Street Bridge from O Street to Good Hope Road. No sidewalk will be provided on the upstream side of the bridge due to safety concerns for pedestrians. Direct pedestrian access will be maintained between the bridges and the waterfront on both sides of the river, and bicycle facilities will be connected to the Anacostia Riverwalk Trail along both banks of the river. The DC Bicycle Master Plan will also be implemented in the study area. All pathways for pedestrians and bicycles will meet AASHTO policy and ADA standards for construction.

The 11th Street Bridges project will also improve transit connectivity in the study area by providing movements that are currently missing from the 11th Street Bridge complex to the Anacostia Freeway (I-295). The project will also remove some traffic from the local street system, particularly in the historic Anacostia area, allowing for transit to operate under more favorable traffic conditions. In addition to proposed improvements, the low-speed local bridge will be designed and constructed so as not to preclude the implementation of a possible future streetcar system on 11th Street between M Street and Martin Luther King, Jr. Avenue.

South Capitol Street Project

The purpose of the South Capitol Street project is to improve safety, mobility, and accessibility and to support economic development in the vicinity of the project. The project will: (1) correct the design and deteriorating condition of the transportation infrastructure which creates safety concerns for vehicular, pedestrian, and bicycle traffic and transit riders; (2) construct missing critical regional roadway connections for vehicles, pedestrians, and bicycles; (3) correct mobility barriers that limit access to activity centers in the study area; and (4) support economic growth in order to improve the density of employment and residential development. Ultimately, the goal of the South Capitol Street projects is to address the problems of the corridor in a way that both addresses the transportation issues, while also revitalizing the surrounding neighborhoods south of the National Mall and transforming the roadway into a grand urban gateway in to the District. The future South Capitol Street corridor will correct design deficiencies, improving safety issues for all users, including drivers,

transit riders, pedestrians, and bicyclists, as well as providing key connections in the local, regional, and national transportation network.

The Preferred Alternative from the Final Environmental Impact Statement includes rebuilding South Capitol Street as a six-lane boulevard with a landscaped median west of the Anacostia River. Along South Capitol Street, at-grade intersections will be reconstructed at I, N, O, P, K, L, and M Streets. The existing ramp from northbound South Capitol Street to I-395 will also be reconstructed as an at-grade interaction. A four- to five-lane traffic oval will be constructed to connect South Capitol Street, Potomac Avenue, R Street, and Q Street. The existing Frederick Douglas Memorial Bridge will be replaced and will include bicycle and pedestrian access. An additional traffic circle will be constructed to connect South Capitol Street, Suitland Parkway, and Howard Road, and several other roadway improvements are included on the eastern/southern side of the Anacostia River.

In addition to vehicular improvements, streetscape design features will be added to project area streets, including South Capitol Street, New Jersey Avenue, and Suitland Parkway. The reconstruction of South Capitol Street will also include pedestrian and bicycle facilities, which will consist of widened sidewalks, widened curbside lanes on some streets for bicycle travel, and increased pedestrian- and bicycle-oriented elements such as street trees, benches, and decorative streetlights. The proposed bicycle routes through the project area will consist primarily of signed bicycle routes that connect to local activity centers, as well as other area facilities such as the Anacostia Riverwalk Trail.

The South Capitol Street project will also improve access to transit already in the corridor by providing additional pedestrian and bicycle facilities, streetscape, and pedestrian-friendly amenities. The Preferred Alternative will also provide linkages between transit nodes and the local and regional bicycle network, and will support future transit (streetcar and bus service) throughout the corridor. The Preferred Alternative will be better equipped to accommodate the proposed future Anacostia Line of the streetcar transit system due to the proposed wide sidewalks, streetlights, signed bike routes, and multi-use trails.

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 suggestion to improve travel demand management (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.

1.7.2 Developments

There are several other projects proposed, approved, or under construction located in the vicinity of the proposed development. The majority of these projects are mixed-use, consisting of office, residential, and retail development, as outlined below. A map of the locations of these developments is included as Figure 6.

- *Akridge Half Street/Square 700*
  The Akridge Half Street development is currently approved and awaiting construction. It consists of a mix of office, residential, and retail uses located south of M Street SE between Van Street SE and Half Street SE. The development is projected to be completed in 2014.

- *Arthur Capper/Carrollsburg and Capitol Quarter*
  The Arthur Capper/Carrollsburg development is currently under construction and a significant portion of the project has been completed. It consists of a mix of residential sites located north of M Street SE and office sites located along M Street SE between 2nd Street SE and 7th Street SE. The development is projected to be fully completed between 2012 and 2019.

- *The Yards at Southeast Federal Center*
  The Yards at Southeast Federal Center development is currently under construction and partially completed. It consists of a mix of office, residential, and retail sites located south of M Street SE between 1st Street SE and 5th Street SE. The development is projected to be completed between 2012 and 2025.

- *1015 Half Street*
  The 1015 Half Street development consists of a mix of office and retail uses located north of K Street SE between South Capitol Street and Half Street SE. The development was completed in 2011. However, it is still included as a background development because the development was not fully complete and occupied at the time of the existing data collection.

- *The Plaza on K*

  The Place on K development consists of a mix of office and retail uses located north of K Street SE between Half Street SE and 1st Street SE. The first phase of the development is expected to be completed by 2014, with a second phase to be completed in 2016.

- *Square 699/Velocity*

  The Square 699N/Velocity development is a hotel building located north of L Street SE between Half Street SE and 1st Street SE. The development is anticipated to be completed by 2014. A second phase of development, which consists of office and retail uses, is expected to be completed by 2020.

- *1111 New Jersey Avenue*

  The 1111 New Jersey Avenue development consists of a mix of office and retail uses located along New Jersey Avenue north of M Street SE. The development is projected to be completed by 2014.

- *Half Street Phase II/Monument Properties*

  The Half Street Phase II development is currently approved and awaiting construction, following the construction of Phase I of the development. Phase II consists of a mix of residential, retail, and hotel uses located north of N Street SE at Half Street SE, which is projected to be completed by 2015.

- *50 M Street*

  The 50 M Street development is a mix of office and retail uses located north of M Street SE between Half Street SE and 1st Street SE. The development is anticipated to be completed by 2015.

- *1100 South Capitol Street*

  The 1100 South Capitol Street development is an office building located north of M Street SE between South Capitol Street and Half Street SE. The development is anticipated to be completed by 2015.

- *Admiral at Barracks Row*

  The Admiral at Barracks Row development consists of a mix of office and retail uses located north of M Street SE east of 9th Street SE. The development is projected to be completed by 2015.

- *225 Virginia Avenue*

  The 225 Virginia Avenue development is an office building located south of Virginia Avenue between 2nd Street SE and 3rd Street SE. The development is anticipated to be completed in 2012.

- *Historic Car Barn*

  The Historic Car Barn development is a renovated retail building located north of M Street SE between 7th Street SE and 8th Street SE. The development is anticipated to be completed by 2014.

- *Waterfront Station*

  The Waterfront Station development is currently under construction and partially completed, located north of M Street SW between 3rd Street SW and 5th Street SW. The remaining development consists of a residential building from Phase I, which is projected to be completed in 2013. The future phases of Waterfront Station, consisting of office and residential uses, are projected to be completed in 2020.

- *The Randall School*
  The Randall School development is a renovated building consisting of a mix of residential and hotel uses located north of I Street SW at Half Street SW. The development is anticipated to be completed by 2014.

- *St. Matthew's Church and Community Center*
  The St. Matthew's Church and Community Center development is a mix of church and residential uses located south of M Street SW at the intersection with Delaware Avenue SW. The development is anticipated to be completed by 2014.

- *Camden South Capitol*
  The Camden South Capitol development is a mix of residential and retail uses located west of South Capitol Street between N and O Streets SW. The development is currently under construction and anticipated to be completed in 2013.

- *L'Enfant Plaza*
  The L'Enfant Plaza development consists of expanding the existing development located north of the Southwest Freeway, between 9th and 10th Streets SW. The final L'Enfant Plaza development will contain approximately 2.2 million square feet of office uses, 115,000 square feet of retail uses, and 370 hotel rooms. The expansion is anticipated to be completed by 2015.

- *Homewood Suites*
  The Homewood Suites development consists of constructing a 234-room hotel on the southeast corner of 9th and D Streets SW. Construction of the development is anticipated to begin in 2012, with completion by 2014.

- *The View at Waterfront*
  The View at Waterfront (Fairfield at Marina View) development is located on the northeast corner of 6th and M Streets SW. The development, which consists of residential and retail uses, is projected to be completed in 2014.

- *Parcel 69*
  The Parcel 69 development, located at 400 E Street SW, consists of office uses. The development is projected to be completed in 2013.

- *Square 494*
  The Square 494 development, located at 555 E Street SW, consists of a mix of office and retail uses. The development is projected to be completed in 2015.

- *National Community Church*
  The National Community Church development, located at 733 Virginia Avenue SE, consists of the redevelopment of the property to contain a mix of office and retail uses. The development is projected to be completed in 2015.

- *Square 737*
  The Square 737 development is a mix of residential, and retail uses located between H Street SE and I Street SE, west of 2nd Street SE. The first phase of development is anticipated to be completed in 2014, with a final completion in 2020.

- *Florida Rock/RiverFront on the Anacostia*

  The Florida Rock development consists of office, residential, retail and hotel uses located along Potomac Avenue east of South Capitol Street. The first phase of the development, which includes the residential and a portion of the retail uses, is expected to be completed in 2015. The later phases of the development, which include the office, hotel, and remainder of the retail uses, are expected to be completed by 2020.

- *Square 701*

  The Square 701 development consists of office, residential, retail and hotel uses located south of M Street SE between Cushing Place SE and 1st St. SE. The development is projected to be completed in 2015.

- *Ballpark Hotel*

  The Ballpark Hotel development is located south of M Street SE between Cushing Place SE and 1st St. SE. The development is projected to be completed in 2015.

Figure 6: Location of Future Developments

2: DESIGN REVIEW

This report section provides an overview of the on-site transportation features of the proposed One M Street development. It supplements the information provided in the site plans package that accompanied the Zoning Application, which includes several illustrations of site circulation and layout.

The proposed One M Street development will replace an existing vacant site owned by Monument Realty. There is currently one curb-cut located along Van Street, which was used for previous site access, as well as one curb-cut located along the South Capitol Street northbound ramp. No on-street parking is provided along the roadways surrounding the site. Figure 7 identifies the existing curb cuts and on-street parking surrounding the site.

The proposed One M Street development consists of one building of office development with ground-level retail. Figure 8 provides an overview of the project's development program. Figure 9 shows the site access plan.

2.1 Site Access and Internal Circulation

2.1.1 Vehicular Access

All vehicular access to the site will be located from Van Street, which is a small local roadway constructed between Half Street and South Capitol Street. Van Street connects M and N Streets and travels north of M Street to L Street as an alley. As shown in Figure 8, one curb cut is proposed to provide vehicular access to the One M Street development. This curb cut will provide access to the underground parking garage. Changes to the on-street parking regulations surrounding the site are not proposed.

Vehicular access is placed along Van Street as it is the lowest hierarchy roadway in the study area. In the study area, Van Street acts like an alley: site access and loading facilities for neighboring parcels is located along Van Street. For the proposed development, access of off Van Street is also the most logical option, as curb cuts cannot be provided from the South Capitol Street northbound ramp along the west side of the site or from M Street along the north side of the site.

2.1.2 Loading

Section 2201.1 of the Zoning Regulations requires the Applicant to provide three 30-foot deep berths, one 20-foot deep service/delivery space, and three 100-square-foot loading platforms[1]. The proposed development will provide two 30-foot deep berths, one 20-foot deep service/delivery space, and two 100-square foot loading platforms. One loading area will service the project, as noted on Figure 9.

Office buildings are expected to receive approximately 15 van-sized and three 30-foot truck deliveries per week. General retail stores are expected to receive three van-sized delivers per week, and restaurants are expected to have two van-sized and four 30-foot truck deliveries per week. Based on the assumption that the proposed development will contain one office building, one retail store, and one restaurant, approximately 5-6 truck deliveries per day are expected. The amount of loading facilities contained within the development will be able to accommodate the expected truck activity. Access for the loading facilities will be provided from a curb cut located along Van Street, north of the parking garage entry. All loading will be accessed from Van Street. Figure 10 shows turning diagrams for trucks accessing the proposed site. These diagrams show the most typical large truck, a 30' single-unit truck, accessing the loading docks without difficulties.

[1] Zoning requirement is based on the regulations for office developments since office uses total greater than 90% of the proposed development.

Figure 7: Existing Site Condition

Figure 8: Summary of Development Program

Figure 9: Site Access and Circulation

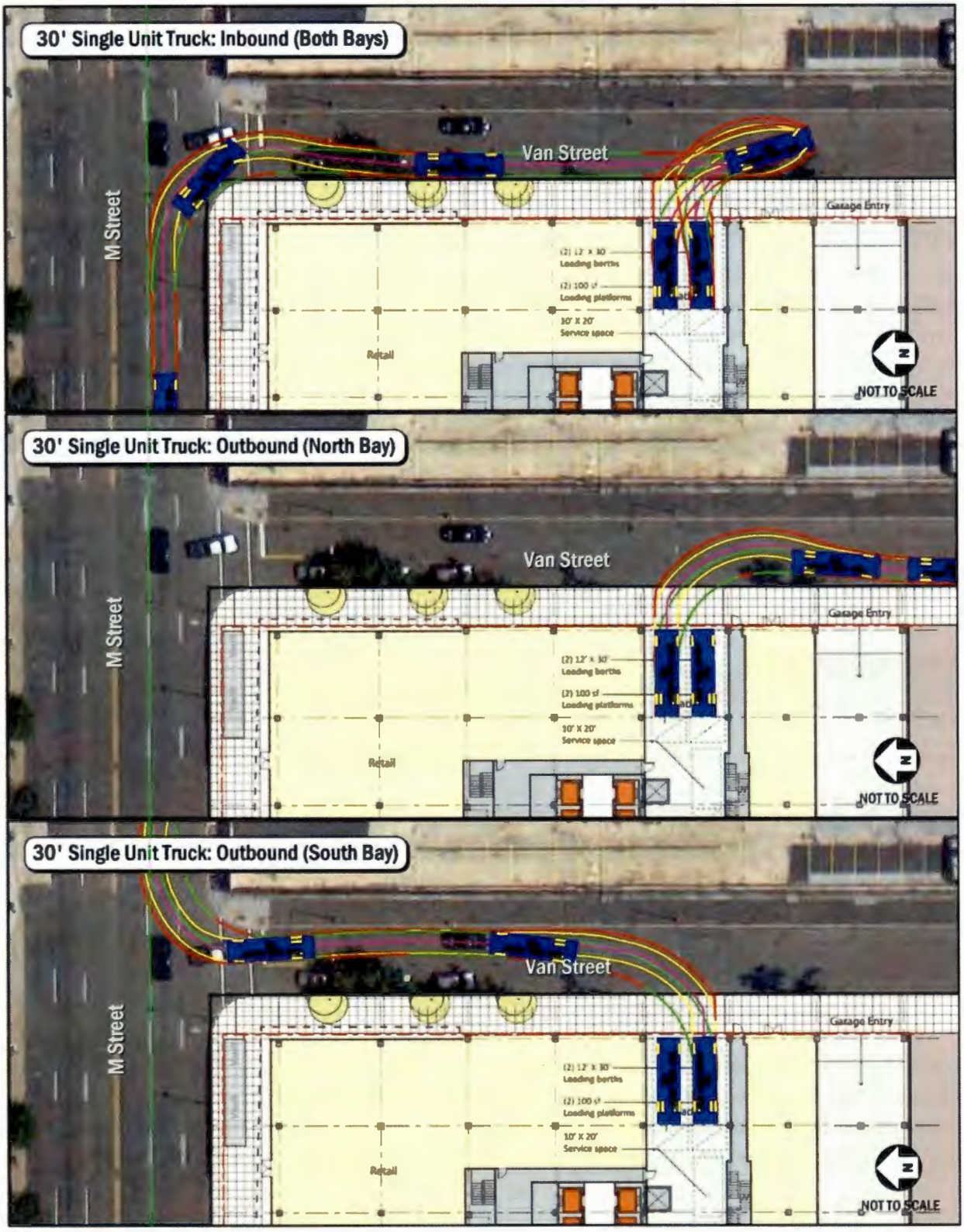

Figure 10: Truck Access

2.1.3 Parking

The amount of parking on site supply reaches a balance between accommodating all users while not encouraging driving as a mode. Based on current District zoning laws for office and retail developments in the study area, the minimum parking for the project is one space per 1,800 square feet in excess of 2,000 square feet for the office uses and one space per 750 square feet in excess of 3,000 square feet for the retail uses. This leads to a minimum requirement of 172 spaces for the office uses and 19 spaces for the retail uses or a total of 191 spaces. The proposed development will satisfy the zoning requirements by supplying 310 parking spaces.

However, the zoning regulations are not based on real data, so the peak parking demand estimates were used to determine the proposed parking demand. In order to determine peak parking demand, rates were obtained from the Institute of Transportation Engineers' (ITE) *Parking Generation*, 4th Edition for the office and retail land uses. These rates were then adjusted to account for the use of alternative modes. Many people going to and from the proposed One M Street development will choose not to drive, as is commonplace throughout the District.

Table 5 provides a summary of the parking demand ratios assumed in this report. *Parking Generation* gives a suburban parking ratio of 2.55 vehicles per 1,000 square feet for retail land uses. Based on a conservative mode split of 40% vehicular trips (explained in more detail in Section 3.1.2 later in this report), the parking demand ratio for the One M Street development is calculated at approximately 1.02 vehicles per 1,000 square feet for retail land uses. For the office uses, *Parking Generation* gives a suburban parking ratio of 2.84 vehicles per 1,000 square feet. Based on a mode split of 40% vehicular trips (explained in more detail in Section 3.1.2 later in this report), the parking demand ratio for the One M Street development is calculated at approximately 1.14 vehicles per 1,000 square feet for retail land uses.

Table 5: Parking Demand Ratios

Land Use	Land Use Code[1]	Parking Ratio	Assumed Urban Ratio
General Retail[2]	820	2.55/1,000 square feet	1.02/1,000 square feet
Office[3]	701	2.84/1,000 square feet	1.14/1,000 square feet

Table 6 shows the peak parking demand for the proposed One M Street development based on the above peak parking demand ratios. Based on the assumed parking demand ratios, the on-street retail will have a peak parking demand of approximately 18 spaces, and the office uses will have a peak parking demand of approximately 355 spaces.

Table 6: Parking Demand Calculations

Land Use	Size	Assumed Urban Ratio	Peak Parking Demand
General Retail	17,260 Square Feet	1.02/1,000 square feet	18 spaces
Office	311,542 Square Feet	1.14/1,000 square feet	355 spaces

Based on the calculations shown in Table 6, the parking demand for the One M Street development will peak at approximately 373 parking spaces. The proposed development will contain 310 below-grade parking spaces to be shared between the office and retail uses, which is slightly less than the peak parking demand based on the assumed mode split. As shown in Section 3.1.2, the mode split assumptions for the office uses are conservative based on the WMATA ridership

[1] *Parking Generation*, Institute of Transportation Engineers, 4th Edition
[2] Based on the Average Peak Period Parking Demand on a Non-Friday Weekday (Non-December)
[3] Based on the Average Peak Period Parking Demand on a Weekday for Suburban Locations

survey mode split for office locations in the Central Business District and are about equal to the mode split for all commuters employed in the District based on the *State of the Commute* report.

The One M Street development is proposing a robust Transportation Demand Management (TDM) plan, as outlined in Section 2.2.2 later in this report, in order to reduce the transportation demand of the proposed development. Based on the conservative assumed vehicular mode split of approximately 40% and the TDM plan proposed for the development, the peak parking demand is expected to be reduced below the assumed parking demand ratio for the office uses. Additionally, the parking demand will be slightly reduced by the synergy between the office and retail uses. For example, when an office worker that drove to work goes to lunch in a restaurant on site, they only use one parking space instead of two.

Based on these assumptions, the proposed parking supply of 310 below-grade parking spaces shared between the office and retail uses will be sufficient to handle the peak parking demand of the proposed One M Street development. Figure 9 shows the location of the proposed parking on site. As stated previously, all site access is located off of Van Street.

2.1.4 Bicycle Facilities

As stated in Section 1, the site is directly served by multi-use trails, signed bicycle routes, and local streets that accommodate cycling. Notably, adjacent to the site are bike lanes on Potomac Avenue and 1st Street SE, and the Anacostia Riverwalk Trail.

The project will include short-term public bicycle spaces on streets, near building entrances, and public places. These short term spaces will include inverted U-racks placed in high-visibility areas. The Applicant is willing to work with DDOT in selecting locations for the racks in Public Space. The project will also include secured long-term bicycle parking within the parking garage, and changing facilities for office and retail employees. At the time of this report, the garage plans identified 38 secure, long-term spaces in the parking garage.

2.2 Transportation Demand Management

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

TDM's importance within the District is highlighted within section T-3.1 of the DC Comprehensive Plan, where it has its own dedicated section including TDM policies and actions. As stated in the Plan, the Washington DC, metropolitan region is a leader in developing and implementing TDM strategies. Typical TDM programs include:

- Carpooling/vanpooling, employee shuttles, and improvements that encourage bicycling and walking
- Financial incentives, such as preferential parking for ride-sharers and transit subsidies
- Congestion avoidance strategies, such as compressed work weeks, flexible work schedules and telecommuting

2.2.1 DDOT TDM Expectations for District Development Proposals

The District of Columbia is quickly growing and attracting new residential, commercial, and retail development and redevelopment, which are generating significant additional vehicular traffic to, from, and within the District. In order to meet the District's goals of reducing automobile trips and accommodation travel through the complete transportation network, DDOT is developing a systematic approach and process for integrating TDM in to the development and redevelopment permit process.

Currently, TDM is handled on a project-to-project basis, with a one-size-fits-all framework to development. This approach does not allow for maximization of TDM opportunities or provide a process for consistent application of TDM goals. To address these issues, DDOT initiated an analysis of TDM in the development review process conducted by Michael Baker Jr., Inc. with the assistance of Nelson/Nygaard Consulting Associates; Strategic Transportation Initiatives, Inc.; and Patton Harris Rust & Associates, which is documented in *Incorporation of Transportation Demand Management (TDM) into the Development Review Process, Final Report and Recommendations* from July 2010.

This Final Report includes a *TDM Recommendations Matrix,* which outlines the expected TDM measures that development proposed are expected to include. The matrix breaks down development proposals by their type (for example by-right vs. PUD), and by the amount of peak hour trip generation.

This report recommends that detailed TDM plans be submitted at the time of their application submissions. It is highly likely that DDOT TDM expectations and requirements, as well as changes in transportation options (for example, the growth of Capitol Bikeshare and the DC Circulator in recent years); will change the landscape of TDM planning.

The trip generation for places it within the "Proposal consistent with the Zoning Code and project generates Between 50 and 200 peak hour auto trips" category of the TDM Recommendations Matrix (Table 2) from the DDOT TDM report.

According to the TDM Recommendations Matrix, the following five TDM measures are required based on the type of development.

- During construction, maintain or coordinate relocation of any existing bus stops at the developer's expense.
- Comply with Zoning requirements to provide bicycle parking/storage facilities.
- Require all parking costs be unbundled from the cost of lease or purchase. Parking costs must be set at no less than the charges of the lowest fee garage located within ¼ mile.
- Post all TDM commitments on-line, publicize availability, and allow the public to see what commitments have been promised.
- Identify a project's TDM Leader (for planning, construction, and operations). Provide DDOT/Zoning Enforcement with annual TDM Leader contact updates.

In addition to the five measures above, three TDM measures are designated as expected with the option to substitute potential other TDM measures.

- Provide website links to CommuterConnections.com and goDCgo.com on developer and property management websites.
- Provide an on-site business center to residents with access to copier, fax, and internet services.
- Install a Transportation Information Center Display (kiosk) containing printed materials related to local transportation alternatives, and maintain a stock of materials at all times.

2.2.2 Proposed TDM Plan

The Transportation Demand Management (TDM) plan for One M Street is based on the DDOT expectations for TDM programs, modified to allow for performance monitoring. The Applicant proposes that the upon construction, the project incorporate several TDM measures, including some listed above but also including some not suggested in the DDOT report.

At a certain point after opening, the success of the TDM measures will be measured, and the TDM plan adjusted if the plan is judged to not meet expectations.

The Applicant proposes the following TDM measures:

- The Applicant will comply with Zoning requirements to provide bicycle parking/storage facilities. This includes secure parking located in the garage for office commuters.
- The Applicant will identify a project's TDM Leader (for planning, construction, and operations). The TDM Leader will work with tenants in the office building and their office managers to distribute and market various transportation alternatives and options.
- The Applicant will dedicate two spaces in the garage for car sharing services to use with right of first refusal. These spaces will be convenient to the garage entrance, available to members of the car sharing 24 hours a day, seven days a week, without restrictions (the garage may be gated – members of the service would have access to the spaces via a key pad combinations to a pass code system or other similar device).
- The Applicant will provide reserved spaces for carpools and vanpools that are conveniently located with respect to the elevators serving the buildings.
- The Applicant agrees to host a transportation mobility fair six months after both the office building has opened. The transportation fair will be advertised to all office workers. The onsite TDM coordinator will work with DDOT's goDCgo team to organize representatives that are experts in the non-auto transportation options that serve the site. Each person that attends the event will be educated on the various options and representatives will work with attendees to help them tailor the use of non-auto options to their specific transportation needs. Based on the turnout of the transportation fair and feedback gleaned by the onsite TDM coordinator, a determination will be made if the event will be repeated the following year.
- Two years after the project is 90% occupied, the Applicant will perform a monitoring study of site trip generation. The site trips will be compared to the projected trip generation contained in this report. If the measured trip generation exceeds the projections, the Applicant will supplement the above TDM measures with additional ones, such as those from in *Incorporation of Transportation Demand Management (TDM) into the Development Review Process* suggested for a project of this size not listed above.

2.3 Compliance with Comprehensive Plan

The following table lists the transportation policies and actions from DC's Comprehensive Plan that are relevant to the development review process. As noted in the table, the One M Street development complies with all of the relevant policies and actions from the Comprehensive Plan.

Table 7: Relevant Comprehensive Plan Policies & Actions

DC Comprehensive Plan Policy/Action related to transportation and development projects	Comments
Policy T-1.1.2: Land Use Impact Assessment Assess the transportation impacts of development projects using multimodal standards rather than traditional vehicle standards to more accurately measure and more effectively mitigate development impacts on the transportation network.	This transportation study includes discussion and analysis of transit, pedestrian, and bicycle traffic that exceeds a traditional transportation study, especially those performed in suburban environments.
Action T-1.1.A: Transportation Measures of Effectiveness Develop new measures of effectiveness such as a multi-modal level of service standard to quantify transportation service and assess land use impacts on the transportation system.	DDOT has yet to develop a standard level of service standard to access land use impacts. The transportation engineering industry has no readily available metrics that can be easily used in the development review process beyond traditional vehicular capacity metrics. As stated above, this study includes discussion and analysis of transit, pedestrian and bicycle traffic that exceeds a traditional transportation study.
Action T-1.1.B: Transportation Improvements Require transportation demand management measures and transportation support facilities such as crosswalks, bus shelters, and bicycle facilities in large development projects and major trip generators, including projects that go through the Planned Unit Development (PUD) Process.	This application includes many improvements to the site, including bicycle parking. In addition, the application meets and exceeds DDOT's stated expectations for TDM measures.
Policy T-1.2.3: Discouraging Auto-Oriented Uses Discourage certain uses, like "drive-through" businesses or stores with large surface parking lots, along key boulevards and pedestrian streets, and minimize the number of curb cuts in new developments. Curb cuts and multiple vehicle access points break-up the sidewalk, reduce pedestrian safety, and detract from pedestrian-oriented retail and residential areas.	The development contains no surface parking lots. The existing curb cut will be removed and replaced with two new curb cuts for vehicular and loading access from Van Street.
Action T-2.3.A: Bicycle Facilities Wherever feasible, require large new commercial and residential buildings to be designed with features such as secure bicycle parking and lockers, bike racks, shower facilities, and other amenities that accommodate bicycle users.	As described above, the development contains a significant amount of bicycle features. This includes short- and long-term parking, as well as showers in the commercial building parking garages.

DC Comprehensive Plan Policy/Action related to transportation and development projects	Comments
Action T-3.1.A: TDM Strategies Develop strategies and requirements that reduce rush hour traffic by promoting flextime, carpooling, transit use; encouraging the formation of Transportation Management Associations; and undertaking other measures that reduce vehicular trips, particularly during peak travel periods. Identify TDM measures and plans as appropriate conditions for large development approval. Transportation Management Plans should identify quantifiable reductions in vehicle trips and commit to measures to achieve those reductions. Encourage the federal and District governments to explore the creation of a staggered workday for particular departments and agencies in an effort to reduce congestion.	The application has proposed to include TDM measures meeting DDOT's expectations contained within *Incorporation of Transportation Demand Management (TDM) into the Development Review Process.*
Action T-3.2.D: Unbundle Parking Cost Find ways to "unbundle" the cost of parking from residential units, allowing those purchasing or renting property to opt out of buying or renting parking spaces. "Unbundling" should be required for District-owned or subsidized development, and the amount of parking in such development should not exceed that required by Zoning. Further measures to reduce housing costs associated with off-street parking requirements, including waived or reduced parking requirements in the vicinity of Metrorail stations and along major transit corridors, should be pursued during the revision of the Zoning Regulations. These efforts should be coupled with programs to better manage residential street parking in neighborhoods of high parking demand, including adjustments to the costs of residential parking permits.	This does not apply is this case as the project has no residential units.

3: IMPACTS REVIEW

This section of the report focuses on the influence and impact site generated traffic will have on the local transportation network, with the following purpose:

- To provide information to the District Department of Transportation (DDOT) and other agencies on how the development of the site will influence the local transportation network. This report accomplishes this by identifying the potential trips generated by the site on all major modes of travel and where these trips are expected to travel to and from.
- To determine if development of the site will lead to adverse impacts on the local transportation network. This report accomplishes this by projecting future conditions with and without development of the site and performing analysis of intersection delays. These delays are compared to the acceptable levels of delay set by DDOT standards to determine if the site will negatively impact the study area. The report describes what improvements to the transportation network are needed to mitigate adverse impacts.

3.1 Site Transportation Demand

3.1.1 Base Trip Generation

Traditionally, trip generation for a proposed development is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation*, 8th Edition. For this report, the methodology was supplemented to account for the urban nature of the site (*Trip Generation* provides data for non-urban, low transit use sites) and to generate trips for multiple modes. The following summarizes the methodology that was used in this study.

First, ITE *Trip Generation* was used to develop base vehicular-trip rates, not accounting for reductions due to mode split. The *Trip Generation Handbook*, 2nd Edition was also consulted for guidelines for estimating trip generation. The following summarizes the trip generation projections:

- The Office trips were projected based on LU 710 for General Office, which is a building that houses multiple office tenants. The land use represents a location where affairs of businesses, commercial or industrial organizations, or professional persons or firms are conducted. An office building can contain a mixture of tenants including professional services, insurance companies, investment brokers and tenant services, such as a bank or saving and loan institution, a restaurant or cafeteria, and service retail facilities. The total weekday trips, as well as the morning and afternoon peak hour trips were generated using the regression equations provided based on average vehicle trip ends per 1,000 square feet of gross floor area. The regression equation was chosen for the Office projections, due to the high (over 0.75) coefficient of determination (R^2). For the Office uses, the morning and afternoon peak hours of the Generator correspond to the peak hours of the adjacent street traffic.
- For the Retail trips, LU 820 for Shopping Center was applied in lieu of individual trip rates, such as bank, pharmacy, and supermarket, for the retail uses because applying individual rates would not account for interaction between the retail uses (shoppers visiting more than one store). The Shopping Center trip rate accounts for these uses and interactions. Unlike the other land uses, the total weekday trips, as well as the morning and afternoon peak hour trips, were generated based on the average rates provided based on average vehicle trip ends per 1,000 square feet of gross leasable area. According to the *Trip Generation Handbook*, the weighted average rate should be used to estimate trip rates for land uses with low value independent values

This is due to the y-intercept of the regression equation, which can yield an illogical trip projection. Although the coefficient of determination (R^2) for the regression equations provided is high (above 0.75), the average rates were used due to the low square footage of retail provided (under 50,000 SF).

Following the base vehicular- trip rate calculations, the vehicle-trips were converted to person-trips by assuming an average vehicle occupancy of 1.1 persons per vehicle, based on the Census Data Transportation Planning Package (CTPP) 2000. Table 8 shows the base number of trips generated by the proposed development.

3.1.2 Mode Split

Following the base trip generation shown in Section 3.1.1, the trips were split into each mode: transit (consisting of both Metrorail and Metrobus/DC Circulator), walking, biking, and vehicle. Each land use was analyzed by mode separately in order to account for varying mode splits. The mode split estimates for the One M Street development were developed using survey information contained in several sources, WMATA's *2005 Development-Related Ridership Survey*, WMATA's *Station Site and Access Planning Manual*, Commuter Connections' *2010 State of the Commute Survey Report*, results from the 2000 U.S. Census, and files from Gorove/Slade's library. The following describes in detail how the mode split assumptions were assembled based on information from these sources.

Table 8: Base Vehicle- and Person-Trip Generation

Land Use	Size[1]		Trip Generation						
			AM Peak Hour			PM Peak Hour			Weekday Total
			In	*Out*	*Total*	*In*	*Out*	*Total*	
Vehicle Trips									
Retail	17,260	Square Feet	10	7	17	31	33	64	742
Office	311,542	Square Feet	410	56	466	73	355	428	3,202
Total Vehicle-Trips			**420**	**63**	**483**	**104**	**388**	**492**	**3,944**
Person-Trips									
Retail	1,1	Persons/Vehicle	11	8	19	34	36	70	816
Office	1,1	Persons/Vehicle	451	62	513	80	391	471	3,522
Total Person-Trips			**462**	**70**	**532**	**114**	**427**	**541**	**4,338**

Office Uses

WMATA's *2005 Development-Related Ridership Survey* has generally been used as the standard source for developing mode split estimates. Information provided within the report shows that office sites in the central business district and all office sites surveyed had the following mode splits, shown in Table 9.

Table 9: WMATA *Ridership Survey* Mode Split for Office Sites

Office Location	Mode			
	Metrorail	*Metrobus & Other Transit*	*Auto*	*Walk & Other*
Central Business District	63%	12%	21%	5%
All sites surveyed	25%	9%	62%	6%

The central business district mode split is an average of several sites surveyed. Applying it to the One M Street development may not be appropriate because the sites surveyed do not have similar characteristics, such as the amount of

[1] At the time of scoping with DDOT on August 7, 2012, this program reflected the latest update provided. The program in this TIS may vary slightly from the final program submitted to the Zoning Commission, but these variations will not affect the overall conclusions of the analysis contained herein.

parking per square foot of space, walking distance to Metrorail and employee benefits for non-auto commuters. Using data from other office sites surveyed in WMATA's report would also not be appropriate, because they also differ greatly. Each site has significantly more parking spaces per square foot of office space. Even more notable is that the *Ridership Survey* notes that 72% of the office commuters that responded to the survey were offered subsidized or free parking by their employers. The Transportation Demand Management (TDM) plan for the One M Street site contains measures that will ensure that the parking garage will be priced at market rate for the majority of users, including office workers.

Information contained within the *2010 State of the Commute* report shows why only offering market rate pricing will have a large influence on the office mode split. Table 10 shows the mode split difference between all commuters surveyed in the State of the Commute surveys split between whether the commuter was offered free parking.

Table 10: Mode Split Difference Based on Free Parking (Entire DC Area)

Parking Benefit	Mode				
	Drive Alone	*Carpool*	*Bus*	*Train*	*Walk/Bike*
Free Parking	82%	6%	3%	5%	4%
No Free Parking	42%	10%	11%	32%	6%

The *State of the Commute* report also contains responses of mode splits for all commuters employed in the District, as follows:

- Drive alone: 42%
- Carpool: 11%
- Bus: 10%
- Metrorail: 31%
- Commuter Rail: 2%
- Bike: 1%
- Walk: 3%

Because these surveys are from sites averaged across the entire District, and do not represent several sites that have dissimilar characteristics to the One M Street as those in the WMATA *Ridership Survey* do, this study uses these mode splits as a starting point for building assumptions for the One M Street development.

The following steps were taken to assemble the mode split estimates, starting with the *State of Commute's* average for all office sites within the District. The amount of transit use was assumed to be 50%, because it is expected that the One M Street development will have similar transit use to both all employment sites in the District (43%) and of all sites surveyed that charge for parking (42%) per the *State of the Commute* survey. The amount of cycling was set to 3%, to reflect the site's location near the Anacostia Riverfront Trail and the amount of residents located within a 10-15 minute bicycle ride from the site. Similarly, the walk mode split was increased to reflect the amount of existing and future resident in walking distance of the site, compared to the District average as a whole.

Thus, the assumptions on office mode split for the One M Street development are as follows:

- Vehicle: 40%
- Transit: 50%

- Walk: 7%
- Bike: 3%

Retail Uses

The main source of mode split information for retail sites is WMATA's *Ridership Survey*. Contained within the report are summaries of mode splits for five retail sites within the Metropolitan area, and one within the District. The one site within the District was the U Street area, which of all of the sites surveyed is the closest in characteristics to the One M Street development, as it is a 'main street' retail area with ground floor retail mixed in with other land uses (as opposed to destination retail). Table 11 summarizes the mode split information for the U Street site, and all of the retail sites surveyed.

Table 11: WMATA *Ridership Survey* Mode Split for Retail Sites

Retail Location	Mode			
	Metrorail	*Metrobus & Other Transit*	*Auto*	*Walk & Other*
Central Business District	44%	13%	19%	25%
All sites surveyed	29%	8%	36%	27%

Although the U Street site is closest in characteristics to the One M Street development, in order to maintain a conservative assumption, this report uses the mode splits for the all retail sites surveyed as a basis for assumptions. This report uses the following mode split assumptions for retail:

- Vehicle: 40%
- Transit: 40%
- Walk: 15%
- Bike: 5%

Summary

Table 12 summarizes the mode split assumptions.

Table 12: Mode Split Assumptions

Land Use	Mode Split			
	Vehicle	*Transit*	*Walk*	*Bike*
Retail	40%	40%	15%	5%
Office	40%	50%	7%	3%

3.1.3 Multi-Modal Trip Generation

Based on the trip generation calculations outlined in Section 3.1.1 and the mode split assumptions shown in Section 3.1.2 (and summarized in Table 12), Table 13 shows the resulting calculations by mode. The proposed development will generate approximately 192 vehicular trips, 265 transit trips, 39 walking trips, and 16 bicycle trips during the morning peak hour; 196 vehicular trips, 264 transit trips, 44 walking trips, and 18 bicycle trips during the afternoon peak hour; and 1,577 vehicular trips, 2,087 transit trips, 369 walking trips, and 147 bicycle trips during a typical weekday.

Table 13: Trip Generation for Proposed Development by Mode

Land-Use/Mode	Trip Generation by Mode						
	AM Peak Hour			PM Peak Hour			Daily
	In	*Out*	*Total*	*In*	*Out*	*Total*	**Total**
Vehicle Trips							
Retail	4	2	6	12	13	25	297
Office	163	23	186	29	142	171	1,280
Total New Vehicle Trips	*167*	*25*	*192*	*41*	*155*	*196*	*1,577*
Transit Person-Trips							
Retail	4	4	8	14	14	28	326
Office	226	31	257	40	196	236	1,761
Total New Transit Person-Trips	*230*	*35*	*265*	*54*	*210*	*264*	*2,087*
Walking Person-Trips							
Retail	2	1	3	5	6	11	122
Office	32	4	36	6	27	33	247
Total New Walking Person-Trips	*34*	*5*	*39*	*11*	*33*	*44*	*369*
Bicycling Person-Trips							
Retail	1	-	1	2	2	4	41
Office	14	1	15	2	12	14	106
Total New Bicycling Person-Trips	*15*	*1*	*16*	*4*	*14*	*18*	*147*
Total Trips*	**451**	**168**	**619**	**271**	**481**	**752**	**7,379**

** - Combination of person-trips and vehicle-trips*

3.2 Roadway Capacity and Operations

This section details the vehicular trips generated in the study area along the vehicular access routes, defines the analysis assumptions, analyzes the vehicular impacts of the proposed development, and makes recommendations for improvements where needed.

3.2.1 Scope of Analysis

The purpose of the vehicular capacity analysis is to determine the existing conditions of the intersections located in the immediate vicinity of the proposed development. The following intersections were selected, as shown in Figure 11:

1. South Capitol Street & Potomac Avenue
2. South Capitol Street & N Street
3. South Capitol Street Southbound & M Street
4. South Capitol Street Northbound & M Street
5. Van Street SE & M Street
6. Van Street SE & N Street
7. Half Street SE & M Street
8. Half Street SE & N Street
9. 1st Street SE & M Street
10. 1st Street SE & N Street
11. New Jersey Avenue SE & M Street
12. Half Street SW & M Street

Figure 11: Study Intersections

Intersection capacity analyses were performed for the existing conditions at each intersection within the study area during the morning and afternoon peak hours, as well as for future conditions with and without the proposed development. The study scenarios are as follows:

- Existing Conditions
- Future Conditions without Development (2015 Background)
- Future Conditions with Development (2015 Future)

The *Synchro, Version 7.0* software package was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology. The *Synchro* model was compiled using signal timings provided by DDOT and with lane configurations and traffic volumes collected by Gorove/Slade. The following sections review the assumptions made for the technical analyses, as summarized in Table 17.

3.2.2 Traffic Volume Assumptions

The following section reviews the traffic volume assumptions made and methodologies used in the roadway capacity analyses, summarized in Table 17.

Existing Conditions

The overall purpose of this study is to show what effect the proposed development will have on the transportation system in the study area. The existing conditions in and around the site are characterized in order to provide a foundation for assessing the transportation implications of the proposed development. This is determined by examining the peak traffic hours, which are directly associated with the peaking characteristics of the site and the adjacent transportation system. These peaking characteristics are found through analysis of existing count data.

DDOT and National standards require that traffic counts be conducted on a weekday, not including Monday or Friday, when traffic conditions can be described as "typical". This includes the consideration for adjacent uses, such as retail, special events, and recreation facilities and for major traffic generators, such as the area public school system or any large public or private institutions. Weekend and other off-peak periods are also often reviewed if the study area includes other uses that may be relatively inactive during the "typical" weekday.

The traffic counts conducted on "typical" day are used to determine the morning and afternoon "peak hour" of traffic within the study area. According to the Highway Capacity Manual (HCM) methodologies, a one-hour analysis period is preferred. Analysis periods that exceed one hour are not usually used because traffic conditions are typically not steady for long time periods and because the adverse impact of short peaks in traffic demand may not be detected in a long time period. The "peak hour" represents the worst-case scenario, when the system traffic volumes are the highest. The use of a "typical" weekday morning and afternoon peak hours are used to ensure that conclusions regarding adverse impacts and their respective mitigation measures would apply to the vast majority of time roadways are used in the study area. Although there may be times when volume flows exceed these conditions, such as during special events, holiday weekends, or other times depending on the study area and site location, it is the industry standard to design transportation infrastructure for the peak times during "typical" weekdays.

In order to ensure that the data collected contains the peak hour, traffic counts are taken for a period of several hours during the morning and afternoon peak periods. From these peak periods, a peak hour is derived for both the morning and the afternoon time periods. According to the Transportation Impact Analyses for Site Development Manual published by

the Institute of Transportation Engineers (ITE), data is generally collected during the weekday morning (7:00 to 9:00 AM) and afternoon (4:00 to 6:00 PM) peak hours. Although this is the standard, Gorove/Slade usually collects data for a three-hour (or longer) period to ensure that the peak hour is contained within the data collection timeframe.

The peak period counts are analyzed to determine the one hour during the morning and afternoon periods that contains the highest cumulative directional traffic demands. From each peak period count, the morning and afternoon "peak hours" are determined by summing up the four fifteen-minute consecutive time periods in the study area that experience the highest cumulative traffic volumes. These morning and afternoon "peak hours" are analyzed for the system of intersections investigated, choosing the "peak hour" of the entire system instead of each individual intersection.

Following the above guidelines, traffic counts, including vehicular and pedestrian volumes, were conducted by Gorove/Slade at the key study intersections between the hours of 6:30 and 9:30 AM and between 4:00 and 7:00 PM on Wednesday, March 28, 2012 and Tuesday, November 27, 2012. A few of the study intersections in the study area were counted previously by Gorove/Slade on Wednesday, March 28, 2012; Wednesday, September 28, 2011; and Tuesday, September 14, 2010 These count dates represent "typical" weekdays when the DC public school systems were in session, as well as the surrounding counties in Maryland and Virginia. These "typical" weekdays also represent time periods that include normal operation for other major traffic generators in the study area. The results of the traffic counts are included in the Technical Attachments. The morning and afternoon peak hours for the system of intersections being studied occurred between 7:45 – 8:45 AM and 4:30 – 5:30 PM, respectively. Peak hour traffic volumes are shown on Figure 14 and Figure 15 for the morning and afternoon peak hours, respectively. Figure 16 shows the peak hour pedestrian volumes collected.

Future Conditions without Development (2015 Background)

The One M Street development is anticipated to be complete in 2015. The traffic projections for the future condition without the development consist of the traffic generated by background developments with planned completion by 2015, listed in the Section 1.7.2 of this report, added to the existing traffic volumes.

Available background development traffic studies were used to determine the number of trips added for the background developments. This included the "Maritime Plaza Traffic Impact Study" performed by Gorove/Slade in October 2005, the "Monument Ballpark – Square 700 & 701 Transportation Impact Study" performed by Wells & Associates in December 2006, the "Waterfront Development Traffic Impact Study" performed by Gorove/Slade in May 2007, the "Square 700 Development Traffic Impact Assessment" performed by Gorove/Slade in January 2009, the "L'Enfant Plaza Traffic Impact Study" performed by Gorove/Slade in March 2011, the "Square 737 Traffic Impact Study" performed by Gorove/Slade in June 2011, the "St. Matthew's Church and Community Center Planned Unit Development Traffic Impact Study" performed by Gorove/Slade in February 2012, the "Southwest Waterfront Stage 1 PUD Transportation Impact Study" performed by Gorove/Slade in June 2011, the "Square 701 Transportation Impact Study" performed by Gorove/Slade in September 2012, and the "Ballpark Hotel Transportation Impact Study" performed by Gorove/Slade in October 2012. These documents were used to determine the number of trips generated, the mode split percentages, and the trip routing for the following background developments, as available. Table 14 shows a summary of the background data collected.

Table 14: Summary of Background Development Data

Background Development	Data Assumptions		
	Development Year	*Background Study? Y/N*	*Study/Data Source*
Akridge Half Street/Square 700	2014	Yes	"Square 700 Development Traffic Impact Assessment" performed by Gorove/Slade in January 2009
Arthur Capper/Carrollsburg and Capitol Quarter	2012, 2014	No	Projected based on trip gen and mode split assumptions as explained below
The Yards at Southeast Federal Center	2012-2015	Yes	"The Yards – Parcel D Traffic Impact Study" performed by Gorove/Slade in November 2010. Other parcels projected based on trip gen and mode split assumptions as explained below
1015 Half Street	2011	No	Projected based on trip gen and mode split assumptions as explained below
The Plaza on K	2014	No	Projected based on trip gen and mode split assumptions as explained below
Square 699/Velocity	2014	No	Projected based on trip gen and mode split assumptions as explained below
1111 New Jersey Avenue	2014	No	Projected based on trip gen and mode split assumptions as explained below
Half Street Phase II/Monumental Properties	2013	Yes	"Monument Ballpark – Square 700 & 701 Transportation Impact Study" performed by Wells & Associates in December 2006
50 M Street	2015	No	Projected based on trip gen and mode split assumptions as explained below
1100 South Capitol Street	2015	No	Projected based on trip gen and mode split assumptions as explained below
Admiral at Barracks Row	2015	No	Projected based on trip gen and mode split assumptions as explained below
225 Virginia Avenue	2012	No	Projected based on trip gen and mode split assumptions as explained below
Historic Car Barn	2015	No	Projected based on trip gen and mode split assumptions as explained below
Waterfront Station	2013	Yes	"Maritime Plaza Traffic Impact Study" performed by Gorove/Slade in October 2005
The Randall School	2014	No	Projected based on trip gen and mode split assumptions as explained below
St. Matthew's Church and Community Center	2014	Yes	St. Matthew's Church and Community Center Planned Unit Development Traffic Impact Study" performed by Gorove/Slade in February 2012
Camden South Capitol	2013	No	Projected based on trip gen and mode split assumptions as explained below
L'Enfant Plaza	2015	Yes	"L'Enfant Plaza Traffic Impact Study" performed by Gorove/Slade in March 2011
Homewood Suites	2014	No	Projected based on trip gen and mode split assumptions as explained below
The View at Waterfront	2014	No	Projected based on trip gen and mode split assumptions as explained below
Parcel 69	2013	No	Projected based on trip gen and mode split assumptions as explained below

Background Development	Data Assumptions		
	Development Year	*Background Study? Y/N*	*Study/Data Source*
Square 494	2015	No	Projected based on trip gen and mode split assumptions as explained below
National Community Church	2015	No	Projected based on trip gen and mode split assumptions as explained below
Square 737	2014	Yes	"Square 737 Traffic Impact Study" performed by Gorove/Slade in June 2011
Florida Rock/RiverFront on the Anacostia	2015	Yes	"RiverFront on the Anacostia Planned Unit Development Transportation Impact Study" performed by Gorove/Slade in August 2012
Square 701	2015	Yes	"Square 701 Transportation Impact Study" performed by Gorove/Slade in September 2012
Ballpark Hotel	2015	Yes	"Ballpark Hotel Transportation Impact Study" performed by Gorove/Slade in October 2012

When approved studies were not available, trip generation for the background developments was calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation*, 8th Edition. The Shopping Center trip rate was applied in lieu of individual trip rates, such as bank, pharmacy and supermarket, for the retail uses because applying individual rates would not account for interaction between the retail uses (shoppers visiting more than one store), and the Shopping Center trip rate does account for these uses and interactions. Additionally, the General Office Building, Residential Apartments, and Residential Condominiums/Townhomes rates were applied for office and residential uses to estimate trips generated by the background developments.

For developments consisting of a mix of retail uses with office, residential, or hotel uses, a 20% internal capture reduction was applied for retail trips originating from within the proposed development. Because individual traffic studies were not available for a significant number of background developments, an average internal capture reduction of 20% was developed to account for the internal retail trips. This 20% reduction was applied only to the retail trips generated by mixed-use developments during the afternoon peak hour, as well as the total daily trips.

Additionally, for this report, the *Trip Generation* methodology was supplemented to account for the urban nature of the site (Trip Generation provides data for non-urban, low transit use sites). The WMATA Ridership Survey was used to determine transit reduction rates in order to account for trips taken by walking, bicycling, and transit. The mode split assumptions were based on the patterns and general findings from that document, observations of existing traffic, and the type and density of surrounding land uses. It was assumed that retail uses would generate a lot of local demand and therefore, have the highest assumed percentage of walking and biking trips. Residential based trips would be the most likely to use public transit, since they will be regular users that will be able to figure out and take advantage of the various routes and schedules. Although the location of the site near several major highways could lead to driving mode splits, the Metrorail, Metrobus, and DC Circulator service will be utilized to reach destinations in downtown areas of the District and to surrounding areas.

Table 15, shown below, summarizes the mode split assumptions for the background developments with no available approved study. The mode splits were averaged for all of the background developments, as presented in several other approved studies performed by Gorove/Slade, including the "Square 700 Development Traffic Impact Assessment", the "St. Matthew's Church and Community Center Planned Unit Development Traffic Impact Study", the "Southwest Waterfront

Stage 1 PUD Transportation Impact Study", the "Square 701 Transportation Impact Study", and the "Ballpark Hotel Transportation Impact Study". The mode split assumptions were applied to the base trip generation for the background developments as a reduction to the vehicular trips estimated by *Trip Generation.*

Table 15: Average Mode Split Assumptions for Background Developments

Land Use	Mode Split			
	Vehicle	*Transit*	*Walk*	*Bike*
Office	50%	35%	10%	5%
Retail/Restaurant	25%	35%	30%	10%
Residential	35%	45%	15%	5%
Hotel	35%	45%	15%	5%
Church	50%	35%	10%	5%
Marina	35%	45%	15%	5%

Based on the available background studies and the trips estimated following the methodology outlined above, Table 16 shows the total number of trips generated by the background developments. The trips generated for each background development are shown in the Technical Appendix. (Of note, Table 16 shows a reduction of existing trips due to the L'Enfant Plaza development. These existing trips are subtracted according to the trip generation presented in the "L'Enfant Plaza Traffic Impact Study" performed by Gorove/Slade in March 2011.)

Table 16: Year 2015 Background Development Trip Generation

Land Use	Size		Trip Generation						
			AM Peak Hour			PM Peak Hour			Weekday Total
			In	*Out*	*Total*	*In*	*Out*	*Total*	
Vehicle Trips									
Retail	164,121	Square Feet	249	146	395	678	627	1,305	14,539
Residential	4,489	Dwelling Units	173	589	762	583	320	903	9,868
Office	4,758,000	Square Feet	2,615	355	2,970	493	2,394	2,887	20,548
Hotel	1,472	Rooms	253	137	390	219	230	449	5,452
Church	8,746	Square Feet	2	1	3	1	2	3	44
Subtotal			**3,292**	**1,228**	**4,520**	**1,974**	**3,573**	**5,547**	**50,451**
*Existing Trips (L'Enfant Plaza)**			*-507*	*-141*	*-648*	*-114*	*-515*	*-629*	*-6,290*
Total Vehicle-Trips			**2,785**	**1,087**	**3,972**	**1,860**	**3,058**	**4,918**	**44,161**

**Existing trips removed according to Table 3 in "L'Enfant Plaza Traffic Impact Study" performed by Gorove/Slade on March 25, 2011*

These trips were then distributed and assigned to the network. Where a background study was not available, trips generated by the background developments were distributed using an analysis based on Metropolitan Washington Council of Governments (MWCOG) transportation planning models. Data from Traffic Analysis Zones (TAZs), including home-based and non-home-based trips, were used to determine the inbound and outbound vehicular trip distribution. The data used encompassed trips to and from the Southwest Waterfront development in 2010 and 2030. The data obtained from the MWCOG model was used in order to estimate the directions of approach for the study area. The major routes originate from the Francis Case Memorial Bridge/Southwest Freeway (I-395) and the George Mason Memorial Bridge/14th Street Bridge (Route 1) from the west, Maine Avenue SW from the west, 9th Street/12th Street from the north, 7th Street from the north, I-395 from the north, the Southeast Freeway/John Philip Sousa Bridge from the south and east, the 11th Street Bridges (I-295) from the south and east, and the Frederick Douglas Bridge/South Capitol Street from the south. Some trips will also originate from the local area roadways as well.

One trip distribution was assumed for all land uses because the MWCOG data for Southwest Waterfront aggregated all land uses for each TAZ. Figure 12 shows the direction of approach for the background developments. As stated previously, this methodology was adopted as presented in several other approved studies performed by Gorove/Slade, including the "Square 700 Development Traffic Impact Assessment", the "St. Matthew's Church and Community Center Planned Unit Development Traffic Impact Study", and the "Southwest Waterfront Stage 1 PUD Transportation Impact Study".

Typically, a percent growth rate is applied to the existing traffic volumes in order to account for other traffic increases, including inherent growth in the roadway network. However, due to the number of background developments included in the analysis, no additional percent growth was added. It was assumed that the growth added to the study area would be generated by the background developments and that including an inherent growth rate would overestimate the future traffic volumes without the proposed development.

The traffic volumes generated by the background developments were added to the 2011 existing traffic volumes in order to establish the 2015 background traffic volumes. The traffic volumes for the 2015 background conditions are shown on Figure 14 and Figure 15 for the morning and afternoon peak hours, respectively.

Future Conditions with Development (2015 Future)

Existing traffic volumes and travel patterns in the study area were analyzed and combined with the data obtained from the MWCOG for Southwest Waterfront in order to determine the trip distribution for the trips added by the proposed development, as shown in Figure 13. Based on this review and the proposed site access locations shown previously on Figure 9, the site-generated trips shown in Section 3.1 were distributed through the study area intersections, as shown on Figure 14 and Figure 15 for the morning and afternoon peak hours, respectively.

The traffic volumes for the 2015 future conditions were calculated by adding the development-generated traffic volumes to the 2015 background traffic volumes. Thus the future condition with the proposed development scenario includes traffic generated by: existing volumes, background development through the year 2015, and the proposed One M Street development. The 2015 future traffic volumes are shown on Figure 14 and Figure 15 for the morning and afternoon peak hours, respectively.

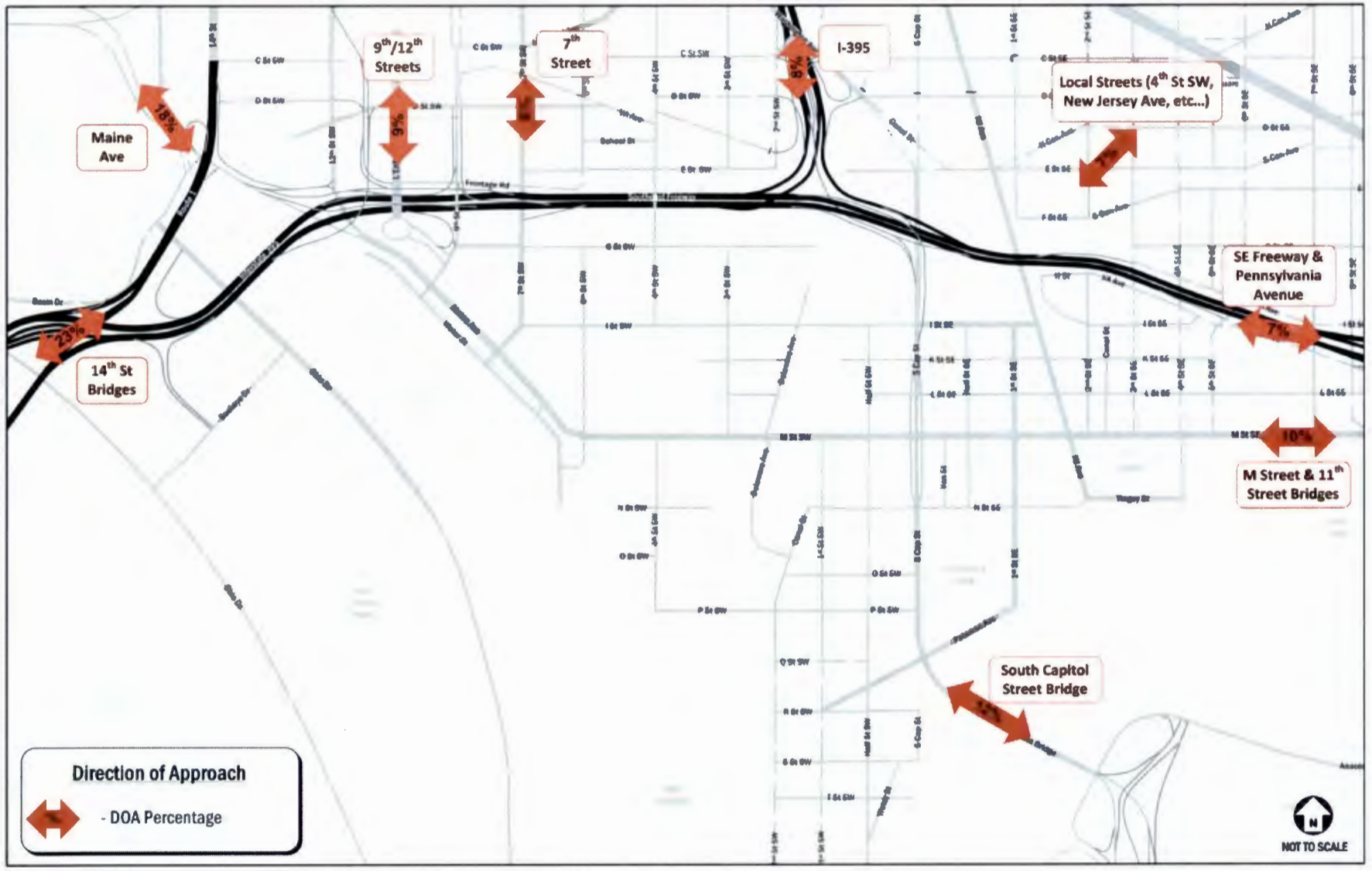

Figure 12: Direction of Approach for Background Developments

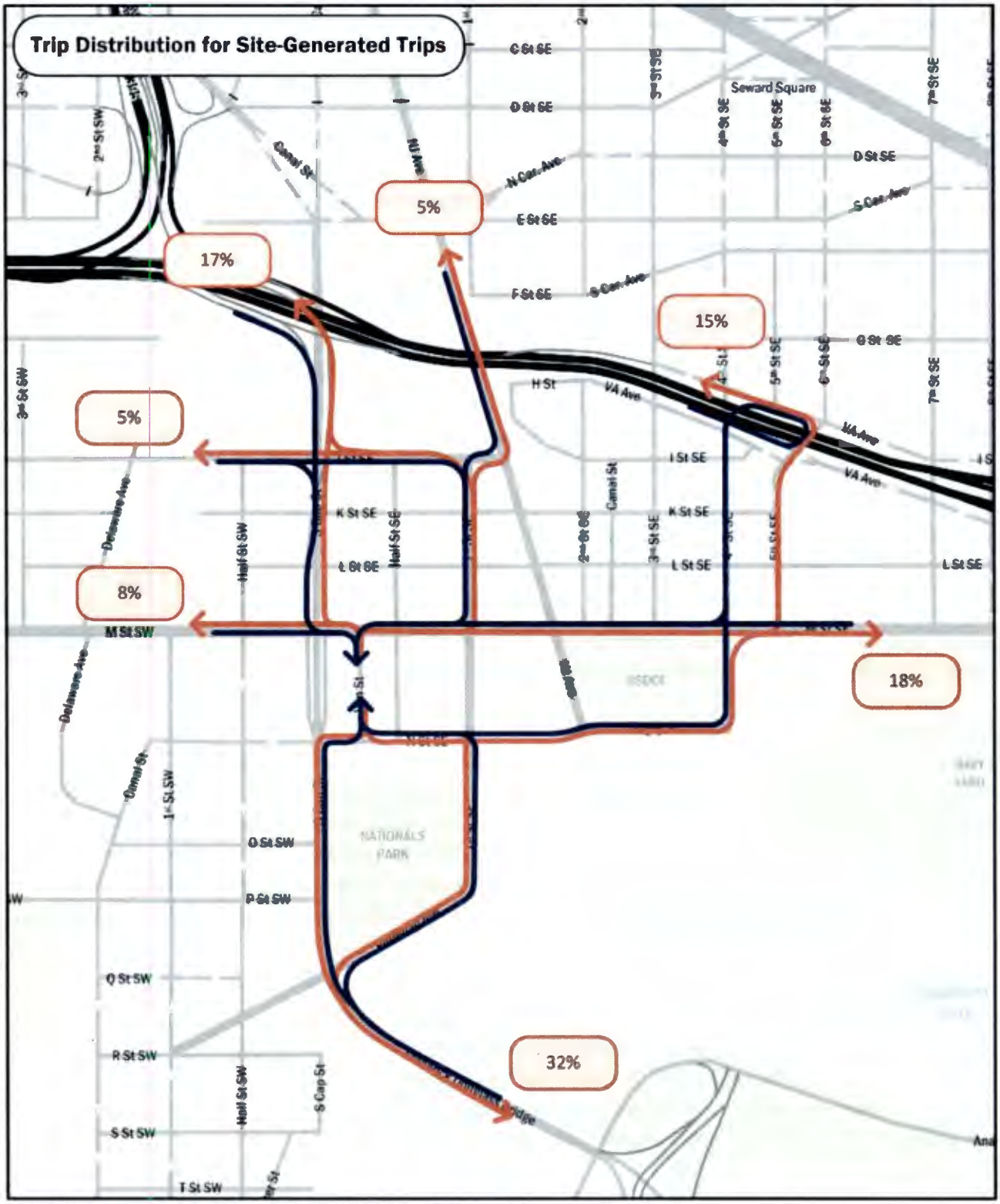

Figure 13: Trip Distribution for Site-Generated Trips

3.2.3 Geometry and Operations Assumptions

The following section reviews the roadway geometry and operations assumptions made and the methodologies used in the roadway capacity analyses, summarized in Table 17.

Existing Conditions

Gorove/Slade conducted field reconnaissance to confirm the existing lane configurations and traffic controls at the intersections within the study area, shown on Figure 17. Existing signal timings and offsets were obtained from DDOT and confirmed during field reconnaissance.

Future Conditions without Development (2015 Background)

The lane configurations for the 2015 future conditions without the proposed development are based on the existing lane configurations. While the M Street SE/SW Transportation Study, as outlined in Section 1.7.1, proposes several roadway and operational improvements in the study area, no roadway infrastructure changes were assumed for the future conditions without development for 2015. At the time of this analysis, the Draft study was published for public comment and specific plans for implementation had not been developed. Even once the report is finalized and specific improvement plans are made, no major roadway infrastructure changes will likely be implemented at the study area intersections by 2015. The lane configurations and traffic controls for the 2015 background conditions are shown on Figure 17.

Future Conditions with Development (2015 Future)

The lane configurations for the 2015 future conditions with the proposed development are based on the lane configurations for the 2015 conditions without the proposed development. No roadway infrastructure or signal timing changes were assumed for the future conditions with development for 2015. The lane configurations and traffic controls for the 2015 future conditions are shown on Figure 17.

3.2.4 Vehicular Analysis Results

Intersection capacity analyses were performed for the three scenarios outlined in Section 3.2.1 at the intersections contained within the study area during the morning and afternoon peak hours. *Synchro, Version 7.0* was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology. The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from "A" being the best to "F" being the worst. LOS E is typically used as the acceptable LOS threshold in the District; although LOS F is sometimes accepted in urbanized areas.

The LOS capacity analyses were based on: (1) the peak hour traffic volumes outlined in Section 3.2.2; (2) the lane use and traffic controls outlined in Section 3.2.3; and (3) the Highway Capacity Manual (HCM) methodologies (using *Synchro 7* software). The average delay of each approach and LOS is shown for the signalized intersections in addition to the overall average delay and intersection LOS grade. The HCM does not give guidelines for calculating the average delay for a two-way stop-controlled intersection, as the approaches without stop signs would technically have no delay. Detailed LOS descriptions and the analysis worksheets are contained in the Appendix.

Table 17: Summary of Vehicular Capacity Analysis Assumptions

Existing Conditions

• Dates of data collection:
  o Tuesday, September 14, 2010
  o Wednesday, September 28, 2011
  o Wednesday, March 28, 2012
  o Tuesday, November 27, 2012
  o Counts taken from 6:30 – 9:30 AM and 4:00 – 7:00 PM
  o Count sheets in Technical Appendix
• System Peak: 7:45 – 8:45 AM, 4:30 – 5:30 PM
• Geometries and lane configurations based on existing conditions
• Signal timings/phasings/offsets provided by DDOT

Future Conditions without Development (2015 Background)

• Background developments:
  o Developments assumed completed by 2015 listed in Section 1.7.2
  o Mode split & assignment assumptions taken from individual transportation studies for each development, where possible. If no study was on record, mode split assumptions shown in Table 15 and assignment methodologies were similar to those used for the site, based on trip distribution shown in Figure 12.
  o Total AM peak hour trips assigned: 3,972; Total PM peak hour trips assigned: 4,918
• Background growth percentage:
  o None assumed due to comprehensive list of background developments
  o In addition, existing LOS results show very high delays on South Capitol Street, indicating that regional growth will be unlikely to increase.
• No roadway infrastructure or signal timing improvements assumed.

Future Conditions with Development (2015 Future)
• Site trip generation and mode split assumptions are detailed in Section 3.1 of report • Trip distribution for vehicles based on existing traffic volumes and travel patterns in the study area, along with MWCOG model origin/destination data, as shown on Figure 13. • No external roadway infrastructure or signal timing changes assumed.

In addition to the capacity analyses presented above, a queuing analysis was performed at the study intersections. The queuing analysis was performed using the *Synchro 7.0* software. The 50th percentile and 95th percentile maximum queue lengths are shown for each lane group at the study area signalized intersections. The 50th percentile maximum queue is the maximum back of queue on a typical cycle. The 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes. For unsignalized intersection, the 95th percentile queue is reported for each lane group (including free-flowing left turns and stop-controlled movements) based on the HCM calculations. The HCM does not give guidelines for calculating queues for an all-way stop-controlled intersection, so this information is not reported.

Table 18 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds) for the 2011 Existing and 2015 Background and Future scenarios. The capacity analysis results for the morning peak hour are shown on Figure 18 and for the afternoon peak hour are shown on Figure 19. Queuing results for the study intersection are shown in Table 19.

The majority of study intersections operate at acceptable conditions during the morning and afternoon peak hours for the Existing, 2015 Background, and 2015 Future scenarios. However, the following intersections operate under unacceptable conditions during one or more peak hour:

- South Capitol Street South and Northbound M Street
- South Capitol Street South and Southbound M Street
- South Capitol Street South and N Street
- South Capitol Street and Potomac Avenue

Generally speaking, the proposed development is considered to have an impact at an intersection within the study area if the capacity analyses show an LOS F at an intersection or along an approach in the future conditions with the proposed development where one does not exist in the future conditions without the proposed development. Table 20 summarizes the results of the capacity analyses including discussion of what is generating the delays and potential mitigation.

All of the intersections with failing levels of service (regardless of scenario) are studied in the South Capitol Street FEIS. The FEIS preferred alternative contains improvements at each of these intersections, although they are expected to be in place after 2015 and are thus not incorporated into the analysis. As stated in Section 1, the goal of the South Capitol Street FEIS is to address the problems of the corridor in a way that both addresses the transportation issues, while also revitalizing the surrounding neighborhoods south of the National Mall and transforming the roadway into a grand urban gateway in to the District. The future South Capitol Street corridor will correct design deficiencies, improving safety issues for all users, including drivers, transit riders, pedestrians, and bicyclists, as well as providing key connections in the local, regional, and national transportation network. Since the goals of the FEIS are not solely based on improving vehicular levels of service, the delays shown along South Capitol Street are not necessarily expected to be mitigated after construction of the preferred alternative. This report defers to the conclusions reached in the FEIS and recommends the preferred alternative be implemented in the long-term.

Additionally, the intersections of Van Street with M Street and N Street are projected to operate under acceptable conditions in the 2015 Future conditions. Based on the capacity analysis, traffic volumes, and traffic signal spacing along M Street a signal is not warranted or feasible at the M Street intersection.

As stated previously, a queuing analysis was performed in addition to the capacity analysis. Table 22 shows the queuing results for the study area intersections. No significant impacts to the queuing results are seen with the addition of the proposed One M Street development. During the morning peak hour, queues are slightly increased at all of the study intersections, but no major impacts are seen. The most significant impact is seen at the intersection of South Capitol Street and N Street, for the westbound shared through/left-turn lane. Due to the addition of the site-generated traffic, the 95th percentile volume exceeds capacity, and the queue may be longer than that shown in Table 19. However, with the signal timing improvements proposed during the afternoon peak hour for the existing, background, and future scenarios, this impact is not seen. The queue is only increased for the westbound through/left-turn movement. In addition, the extremely long queues at the intersection of South Capitol Street and Potomac Avenue that are present in the existing conditions are exacerbated with the addition of the background trips, as well as the site-generated trips. A slight increase in queuing is also seen along the northbound approach of Cushing Place at M Street, but the queue is still relatively short (under 50 feet). Overall, the site does not have a significant impact on queuing in the study area.

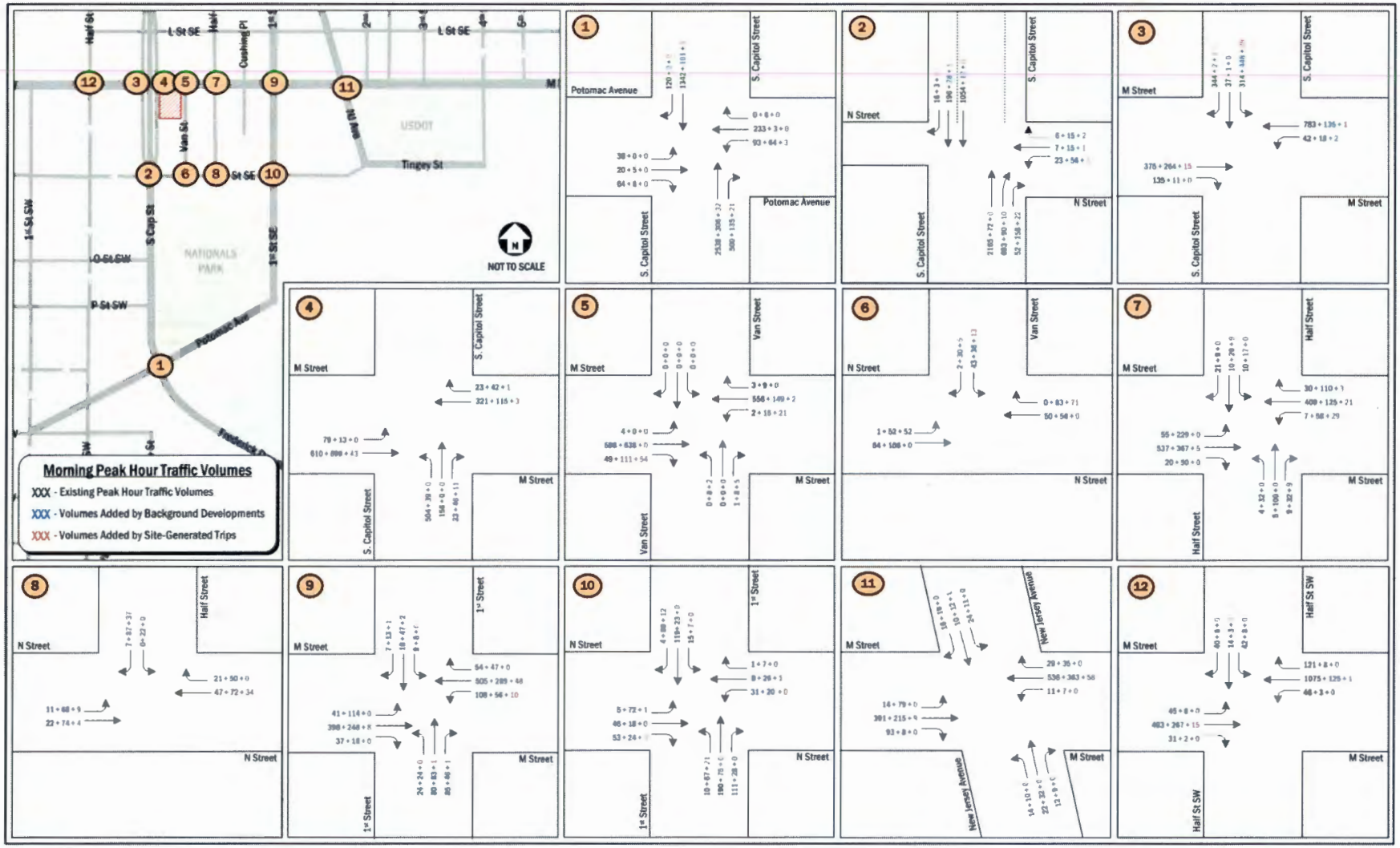

Figure 14: Morning Peak Hour Traffic Volumes for Existing and 2015 Background/Future

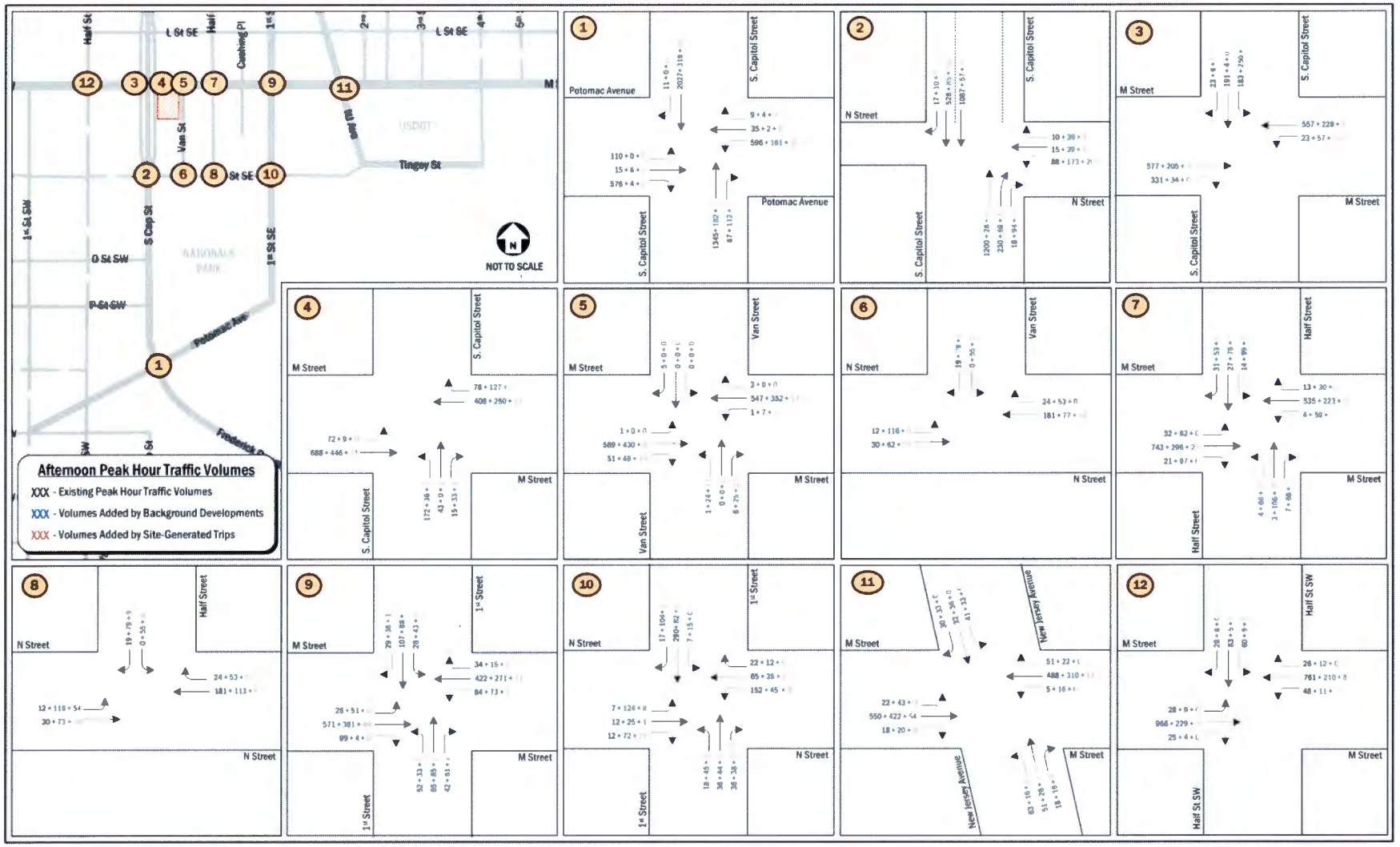

Figure 15: Afternoon Peak Hour Traffic Volumes for Existing and 2015 Background/Future

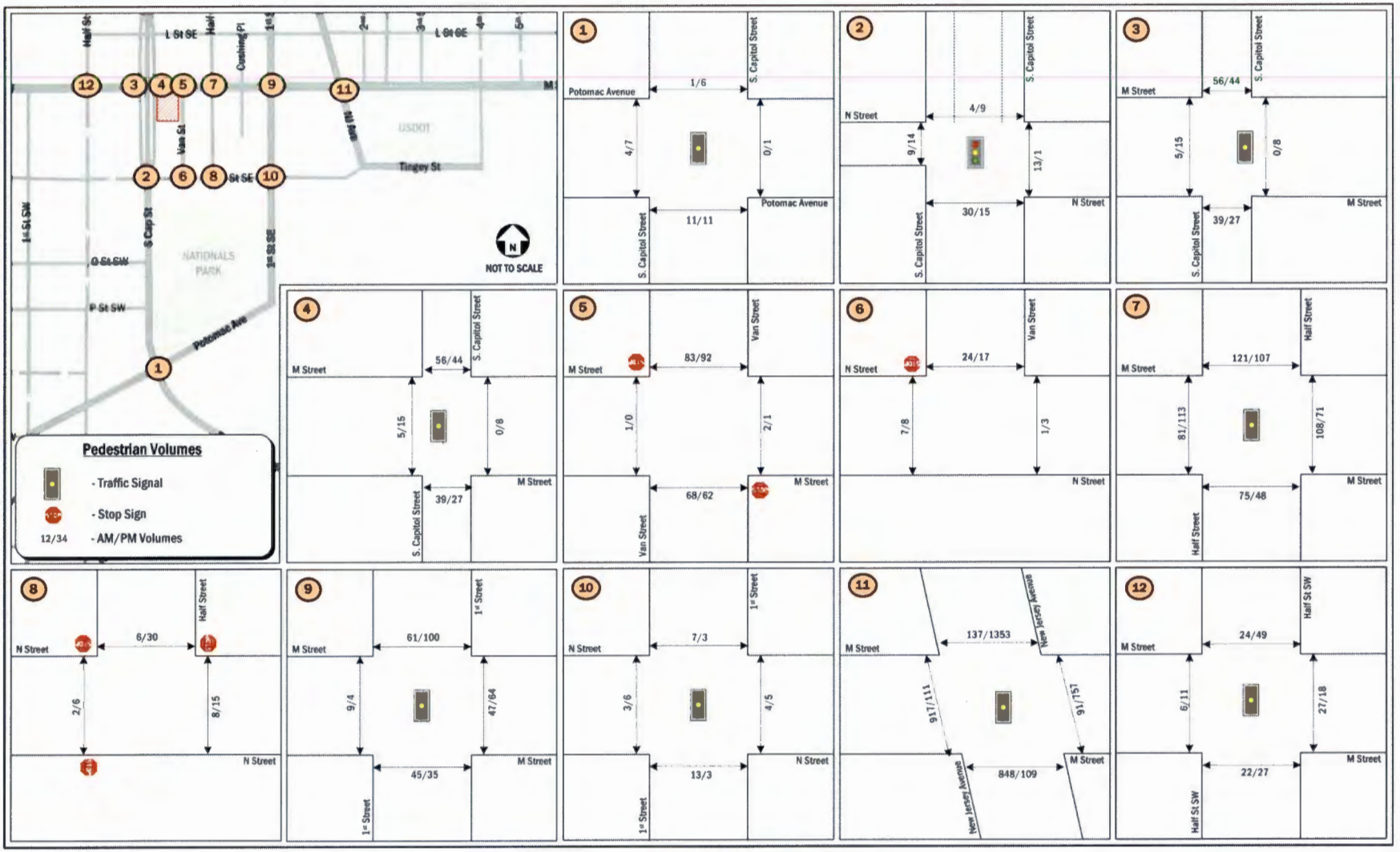

Figure 16: Morning and Afternoon Peak Hour Pedestrian Volumes for Existing

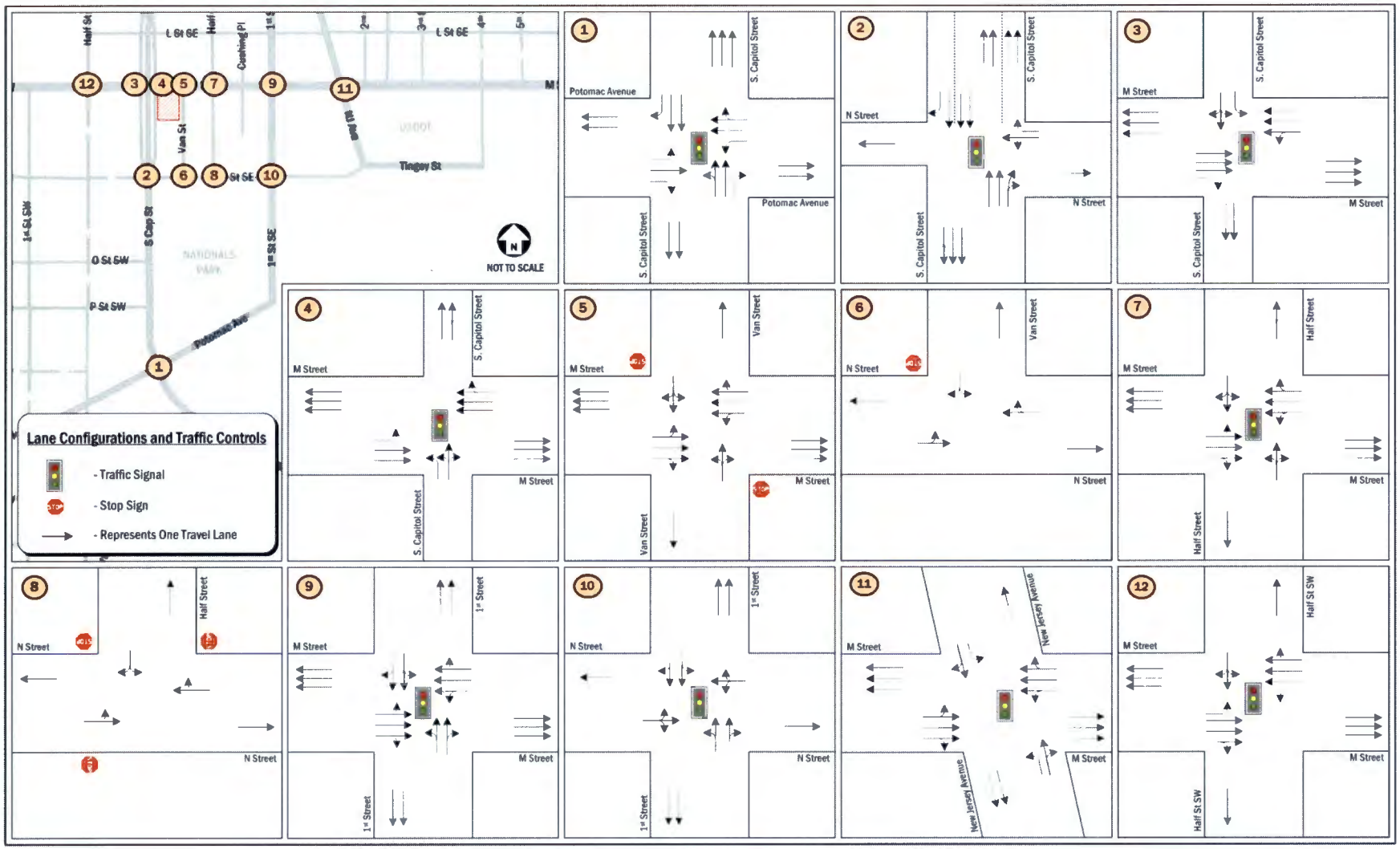

Figure 17: Existing, 2015 Background, and 2015 Future Lane Configurations

Table 18: Vehicular Level of Service Results for Existing and 2015 Background/Future Conditions

Intersection	Approach	Existing Conditions				Future Background Conditions (2015)				Total Future Conditions (2015)			
		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
M Street & Half Street SW	**Overall**	**10.0**	**A**	**8.7**	**A**	**10.0**	**B**	**8.7**	**A**	**10.0**	**A**	**8.7**	**A**
	Eastbound	8.1	A	8.9	A	8.8	A	9.7	A	8.9	A	9.7	A
	Westbound	9.3	A	3.4	A	9.1	B	3.1	A	9.0	B	3.0	A
	Southbound	29.6	C	32.9	C	30.2	C	33.9	C	30.2	C	33.9	C
M Street & South Capitol Street Southbound	**Overall**	**25.4**	**C**	**17.3**	**B**	**104.2**	**F**	**21.3**	**C**	**112.5**	**F**	**21.4**	**C**
	Eastbound	31.1	A	20.0	B	44.5	D	19.8	B	46.9	D	19.8	B
	Westbound	0.4	A	0.7	A	1.1	A	1.0	A	1.1	A	1.0	A
	Southbound	50.8	D	35.6	D	233.3	F	50.6	D	250.2	F	51.4	D
M Street & South Capitol Street Northbound	**Overall**	**21.4**	**C**	**18.2**	**B**	**24.9**	**C**	**17.6**	**B**	**25.4**	**C**	**17.8**	**B**
	Eastbound	1.4	A	1.3	A	2.8	A	2.2	A	3.5	A	2.3	A
	Westbound	55.1	E	35.9	D	84.8	F	32.0	C	86.3	F	32.1	C
	Northbound	24.5	C	36.5	D	26.2	C	38.7	D	26.5	C	38.7	D
N Street & South Capitol Street	**Overall**	**9.6**	**A**	**87.0**	**F**	**19.0**	**B**	**121.3**	**F**	**21.7**	**C**	**125.5**	**F**
	Westbound	58.8	E	55.2	E	54.7	D	61.1	E	54.5	D	64.9	E
	Northbound	5.8	A	14.7	B	16.2	B	26.7	C	19.8	B	27.9	C
	Southbound	9.3	A	13.6	B	13.4	B	24.3	C	13.6	B	25.2	C
	Southeastbound	56.1	E	432.2	F	63.5	E	571.9	F	64.4	E	587.0	F
Potomac Avenue & South Capitol Street	**Overall**	**63.6**	**E**	**242.9**	**F**	**109.4**	**F**	**294.9**	**F**	**113.9**	**F**	**302.0**	**F**
	Eastbound	55.2	E	902.2	F	**55.2**	E	913.8	F	55.2	E	915.5	F
	Westbound	56.4	E	319.5	F	56.1	E	504.9	F	55.9	E	528.8	F
	Northbound	88.3	F	29.2	C	157.1	F	36.7	D	163.6	F	37.1	D
	Southbound	14.4	B	141.6	F	21.4	C	224.6	F	21.6	C	232.7	F
M Street & Half Street SE	**Overall**	**3.1**	**A**	**7.1**	**A**	**6.9**	**A**	**26.0**	**C**	**7.1**	**A**	**28.4**	**C**
	Eastbound	0.4	A	6.9	A	1.3	A	23.8	C	1.4	A	24.7	C
	Westbound	1.2	A	1.6	A	3.1	A	13.4	B	3.3	A	14.4	B
	Northbound	45.2	D	41.9	D	45.0	D	36.4	D	45.0	D	45.0	D
	Southbound	46.7	D	44.9	D	37.5	D	62.6	E	37.4	D	68.9	E
N Street & Half Street SE	**Overall**	**7.1**	**A**	**8.0**	**A**	**8.5**	**A**	**11.3**	**B**	**9.0**	**A**	**12.6**	**B**
	Eastbound	7.3	A	7.5	A	8.9	A	10.6	B	9.3	A	12.7	B
	Westbound	7.1	A	8.2	A	8.5	A	12.3	B	9.1	A	13.4	B
	Southbound	6.6	A	7.0	A	8.0	A	9.7	A	8.5	A	10.3	B

Intersection	Approach	Existing Conditions				Future Background Conditions (2015)				Total Future Conditions (2015)			
		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
M Street & 1st Street SE	**Overall**	**12.7**	**B**	**11.8**	**B**	**13.9**	**B**	**22.7**	**C**	**13.9**	**B**	**23.3**	**C**
	Eastbound	3.4	A	8.5	A	6.4	A	24.9	C	6.9	A	26.2	C
	Westbound	1.7	A	5.0	A	2.1	A	5.7	A	2.2	A	5.7	A
	Northbound	71.9	E	29.6	C	63.8	E	46.8	D	64.0	E	47.1	D
	Southbound	31.7	C	30.4	C	32.8	C	36.1	C	32.8	C	36.3	D
N Street & 1st Street SE	**Overall**	**20.5**	**C**	**19.0**	**B**	**22.9**	**C**	**22.9**	**C**	**23.5**	**C**	**23.3**	**C**
	Eastbound	15.0	B	15.5	B	17.6	B	22.2	B	17.7	B	23.3	C
	Westbound	14.7	B	20.2	C	15.6	B	26.9	C	15.6	B	27.7	C
	Northbound	19.4	B	17.1	B	22.2	C	18.6	B	22.8	C	18.8	B
	Southbound	28.8	C	19.3	B	31.4	C	22.8	C	32.5	C	22.9	C
M Street & New Jersey Avenue SE	**Overall**	**10.9**	**B**	**11.2**	**B**	**15.4**	**B**	**15.8**	**B**	**13.4**	**B**	**15.7**	**B**
	Eastbound	9.6	A	5.9	A	13.0	B	14.4	B	13.0	B	14.3	B
	Westbound	9.4	A	9.5	A	10.9	B	10.9	A	11.1	B	11.0	B
	Northbound	26.8	C	28.3	C	27.9	C	29.7	C	27.9	C	29.7	C
	Southbound	26.7	C	28.4	C	27.4	C	31.3	C	27.4	C	31.3	C
M Street & Van Street SE	Eastbound Left	0.3	A	0.1	A	0.2	A	0.1	A	0.2	A	0.1	A
	Westbound Left	0.1	A	0.1	A	1.0	A	0.5	A	2.0	A	0.8	A
	Northbound	8.9	A	10.9	B	13.7	C	14.6	B	13.7	B	14.8	A
	Southbound	0.0	A	10.3	B	0.0	A	9.3	A	0.0	A	9.3	A
N Street & Van Street SE	Eastbound Left	0.1	A	1.5	A	2.2	A	2.1	A	3.0	A	2.4	A
	Southbound	9.6	A	9.3	A	12.9	B	16.3	C	17.4	B	25.7	D

Table 19: Queuing Results for Existing and 2015 Background/Future Conditions

Intersection	Approach	Existing Conditions				Future Background Conditions (2015)				Total Future Conditions (2015)			
		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 %
M Street & Half Street SW	Eastbound Left	12	34	7	19	16	47	10	26	16	47	10	26
	Eastbound TR	48	64	107	131	80	101	141	170	82	103	142	171
	Westbound Left	13	m25	5	m10	14	m24	5	m11	14	m24	5	m11
	Westbound TR	136	m167	27	33	150	m168	28	34	150	m166	28	34
	Southbound LTR	35	79	92	156	44	92	105	174	44	92	105	174

Intersection	Approach	Existing Conditions				Future Background Conditions (2015)				Total Future Conditions (2015)			
		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 %
M Street & South Capitol Street Southbound	Eastbound Thru	82	123	106	130	162	#235	154	180	167	#243	155	181
	Eastbound Right	0	23	55	150	0	24	28	170	0	24	27	171
	Westbound LT	1	0	2	2	2	m4	5	5	2	m5	5	5
	Southbound Left	187	289	100	167	~600	#826	223	#380	~621	#850	227	#389
	Southbound LTR	204	#400	144	229	~472	#698	225	#381	~501	#728	227	#384
M Street & South Capitol Street Northbound	Eastbound Left	0	m1	0	m0	1	m1	0	m0	1	m1	0	m0
	Eastbound Thru	7	m10	17	23	53	m11	48	43	55	m11	48	43
	Westbound TR	80	119	103	138	12	#206	191	m241	124	#208	199	m247
	Northbound Left	182	277	72	129	216	324	97	167	225	337	98	169
	Northbound LTR	183	278	67	125	207	314	81	147	208	316	80	146
N Street & South Capitol Street	Westbound LT	25	58	84	139	83	137	252	#399	85	141	276	#446
	Westbound Right	5	21	8	25	16	41	32	68	18	44	39	78
	Northbound Thru	681	m255	514	592	1045	m386	544	m583	1047	m378	544	m581
	Northbound Right	203	m98	118	m160	888	m689	337	m365	~947	m704	343	m371
	Southbound	209	275	253	349	245	338	385	468	247	342	385	468
	Southeastbound	96	#145	~396	#524	112	#184	~490	#626	113	#188	~501	#636
Potomac Avenue & South Capitol Street	Eastbound Left	31	68	89	152	31	68	89	152	31	68	89	152
	Eastbound Thru	17	44	11	33	20	51	16	42	20	51	16	42
	Eastbound Right	0	46	~859	#1090	0	49	~875	#1106	0	49	~876	#1107
	Westbound Left	76	131	~724	#951	130	196	~1006	#1247	132	199	~1041	#1284
	Westbound TR	101	142	12	28	103	138	13	30	102	138	13	30
	Northbound Thru	~1363	#1562	492	594	~1680	#1901	617	#796	~1712	#1933	622	#803
	Northbound Right	82	177	5	33	152	323	21	62	164	348	21	64
	Southbound Thru	333	495	~1080	m#963	465	704	~1373	m#1175	472	707	~1400	m#1193
	Southbound Right	5	m51	2	m5	22	m69	1	m2	23	m68	1	m2
M Street & Half Street	Eastbound	3	6	91	134	11	17	277	331	12	19	283	338
	Westbound	13	18	27	35	24	32	156	198	26	36	160	205
	Northbound	5	27	4	23	108	169	169	232	113	175	181	#325
	Southbound	13	47	26	70	45	89	186	#348	53	97	191	#364

Intersection	Approach	Existing Conditions				Future Background Conditions (2015)				Total Future Conditions (2015)			
		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 %
N Street & Half Street	Eastbound	--	--	--	--	--	--	--	--	--	--	--	--
	Westbound	--	--	--	--	--	--	--	--	--	--	--	--
	Southbound	--	--	--	--	--	--	--	--	--	--	--	--
M Street & 1st Street	Eastbound	10	14	23	43	33	55	194	251	35	77	207	m264
	Westbound	12	16	27	35	17	23	45	54	17	23	46	55
	Northbound	43	81	37	68	93	143	102	152	94	143	104	155
	Southbound	7	22	40	70	24	48	96	145	25	49	97	146
N Street & 1st Street	Eastbound	19	49	7	25	76	132	104	180	78	134	119	204
	Westbound	15	34	105	170	33	65	169	275	33	65	171	180
	Northbound	45	76	21	41	104	151	44	73	114	163	46	76
	Southbound	39	66	66	96	49	80	122	165	51	82	121	164
M Street & New Jersey Avenue	Eastbound	49	71	34	48	94	123	131	135	95	120	134	141
	Westbound	61	80	59	78	118	147	109	137	128	158	112	140
	Northbound Left	7	24	33	69	12	34	43	86	12	34	43	86
	Northbound TR	14	38	27	63	37	75	49	97	37	75	49	98
	Southbound Left	12	33	22	52	18	44	41	85	18	44	41	85
	Southbound TR	5	26	32	67	11	44	71	126	12	44	71	126
M Street & Van Street	Eastbound	--	--	--	--	--	--	--	--	--	--	--	--
	Westbound	--	--	--	--	--	--	--	--	--	--	--	--
	Northbound	--	--	--	--	--	--	--	--	--	--	--	--
	Southbound	--	--	--	--	--	--	--	--	--	--	--	--
N Street & Van Street	Eastbound	--	--	--	--	--	--	--	--	--	--	--	--
	Southbound	--	--	--	--	--	--	--	--	--	--	--	--

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. In practice, the 95th percentile queue shown will rarely be exceeded, and the queues shown are acceptable for the design of storage bays.

~ - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. Blocking problems may occur due to long queues.

m - Volume for 95th percentile queue is metered by upstream signal. Due to upstream metering, the 95th percentile queue may be less than the 50th percentile queue.

Table 20: Roadway Capacity Results Review for Existing and 2015 Background/Future

Intersection	Locations & Scenarios with LOS F *EX = Existing Conditions* *BG = 2015 Background (without Dev'l)* *TF = 2015 Total Future (with Dev'l)*	Percent of Future Vehicular Traffic Attributable to Dev'l (in TF scenario)		Discussion & Recommendations
		AM Peak	*PM Peak*	
M Street & South Capitol Street Southbound	EB M Street AM Peak: EX, BG, TF SB S Capitol Street AM Peak: BG, TF	1.7%	1.2%	The delays at these two intersections are due to how the existing signal timings favor regional commuter patterns. The addition of the trips generated by the background developments and the site-generated trips exacerbates the existing failing operation on the eastbound approach. The addition of the trips generated by the background developments also causes the southbound approach to operate under unacceptable conditions. This is also exacerbated by the addition of the site-generated trips. Retiming the signal and adjusting the offsets during the morning peak period will improve the operation of the intersection and allow it to operate under acceptable conditions during all scenarios. This report recommends that DDOT consider these changes. Signal timings updates may be needed as traffic patterns shift from regional-dominant to a mix of regional and local traffic.
M Street & South Capitol Street Northbound	WB M Street AM Peak: BG, TF	2.1%	1.7%	
N Street & South Capitol Street	Overall intersection PM Peak: EX, BG, TF Southeastbound South Capitol Street ramp PM Peak: EX, BG, TF	0.8%	1.4%	The delays at this intersection are due to how the existing signal timings favor regional commuter patterns. The addition of the trips generated by the background developments and the site-generated trips exacerbates the existing failing operation on the southeastbound approach. Retiming the signal and adjusting the offsets during the afternoon peak period will improve the operation of the intersection and allow it to operate under acceptable conditions during all scenarios. This report recommends that DDOT consider these changes. Signal timings updates may be needed as traffic patterns shift from regional-dominant to a mix of regional and local traffic.
Potomac Avenue & South Capitol Street	Overall intersection AM Peak: FB, TF NB S Capitol Street AM Peak: FB, TF Overall intersection PM Peak: EX, FB, TF EB Potomac Avenue PM Peak: EX, FB, TF WB Potomac Avenue PM Peak: EX, FB, TF SB S Capitol Street PM Peak: EX, FB, TF	1.1%	1.1%	The delays at the intersection are due to the existing lane configurations and signal timings. Southbound operations are much worse in the afternoon peak period due than northbound operations during the morning peak period to the existing configuration of the Frederick Douglas Bridge as two lanes southbound and three lanes northbound. Similar to the intersections at M Street, this intersection carries a significant volume of regional through traffic, so signal timings are programmed in order to favor the South Capitol Street vehicular traffic over that on Potomac Avenue. The addition of the trips generated by the background developments and the site-generated trips exacerbates the existing failing operation during the afternoon peak hour. The addition of the trips generated by the background developments and the site-generated trips also leads to the failing operation of the intersection in the morning peak hour due to the northbound approach. However, no signal timing or infrastructure changes are available to improve the existing operation of the intersection. These issues were directly studied in the South Capitol Street FEIS, including recommendations such as the planned traffic oval.

Table 21: Vehicular Level of Service Results with Proposed Improvements for Existing and 2015 Background/Future

Intersection	Approach	Existing Conditions				Future Background Conditions (2015)				Total Future Conditions (2015)			
		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
M Street & South Capitol Street Southbound	**Overall**	**25.4**	**C**	**17.3**	**B**	**104.2**	**F**	**21.3**	**C**	**112.5**	**F**	**21.4**	**C**
	Eastbound	31.1	A	20.0	B	44.5	D	19.8	B	46.9	D	19.8	B
	Westbound	0.4	A	0.7	A	1.1	A	1.0	A	1.1	A	1.0	A
	Southbound	50.8	D	35.6	D	233.3	F	50.6	D	250.2	F	51.4	D
Improvements:	***Overall***	--	--	--	--	***31.5***	***C***	--	--	***33.9***	***C***	--	--
AM - Retime signal and adjust offsets	*Eastbound*	--	--	--	--	*32.9*	*C*	--	--	*33.4*	*C*	--	--
	Westbound	--	--	--	--	*0.8*	*A*	--	--	*0.8*	*A*	--	--
	Southbound	--	--	--	--	*56.9*	*E*	--	--	*62.0*	*E*	--	--
M Street & South Capitol Street Northbound	**Overall**	**21.4**	**C**	**18.2**	**B**	**24.9**	**C**	**17.6**	**B**	**25.4**	**C**	**17.8**	**B**
	Eastbound	1.4	A	1.3	A	2.8	A	2.2	A	3.5	A	2.3	A
	Westbound	55.1	E	35.9	D	84.8	F	32.0	C	86.3	F	32.1	C
	Northbound	24.5	C	36.5	D	26.2	C	38.7	D	26.5	C	38.7	D
Improvements:	***Overall***	***32.1***	***C***	--	--	***32.6***	***C***	--	--	***33.5***	***C***	--	--
AM - Retime signal and adjust offsets	*Eastbound*	*0.6*	*A*	--	--	*1.9*	*A*	--	--	*2.0*	*A*	--	--
	Westbound	*50.4*	*D*	--	--	*56.4*	*E*	--	--	*56.9*	*D*	--	--
	Northbound	*54.2*	*D*	--	--	*72.3*	*E*	--	--	*75.8*	*E*	--	--
N Street & South Capitol Street	**Overall**	**9.6**	**A**	**87.0**	**F**	**19.0**	**B**	**121.3**	**F**	**21.7**	**C**	**125.5**	**F**
	Westbound	58.8	E	55.2	E	54.7	D	61.1	E	54.5	D	64.9	E
	Northbound	5.8	A	14.7	B	16.2	B	26.7	C	19.8	B	27.9	C
	Southbound	9.3	A	13.6	B	13.4	B	24.3	C	13.6	B	25.2	C
	Southeastbound	56.1	E	432.2	F	63.5	E	571.9	F	64.4	E	587.0	F
Improvements:	***Overall***	--	--	***19.9***	***B***	--	--	***33.7***	***C***	--	--	***36.3***	***D***
PM - Retime signal and adjust offsets	*Westbound*	--	--	*55.2*	*E*	--	--	*70.8*	*E*	--	--	*78.8*	*E*
	Northbound	--	--	*1.4*	*A*	--	--	*2.6*	*B*	--	--	*2.7*	*B*
	Southbound	--	--	*26.4*	*C*	--	--	*47.3*	*D*	--	--	*49.7*	*D*
	Southeastbound	--	--	*49.0*	*D*	--	--	*68.2*	*E*	--	--	*71.7*	*E*

Table 22: Queuing Results with Proposed Improvements for Existing and 2015 Background/Future

Intersection	Approach	Existing Conditions				Future Background Conditions (2015)				Total Future Conditions (2015)			
		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 %
M Street & South Capitol Street Southbound	Eastbound Thru	82	123	106	130	162	#235	154	180	167	#243	155	181
	Eastbound Right	0	23	55	150	0	24	28	170	0	24	27	171
	Westbound LT	1	0	2	2	2	m4	5	5	2	m5	5	5
	Southbound Left	187	289	100	167	~600	#826	223	#380	~621	#850	227	#389
	Southbound LTR	204	#400	144	229	~472	#698	225	#381	~501	#728	227	#384
Improvements:	*Eastbound Thru*	--	--	--	--	*156*	*201*	--	--	*160*	*206*	--	--
AM - Retime signal and adjust offsets	*Eastbound Right*	--	--	--	--	*0*	*23*	--	--	*0*	*23*	--	--
	Westbound LT	--	--	--	--	*2*	*m2*	--	--	*2*	*m2*	--	--
	Southbound Left	--	--	--	--	*422*	*#672*	--	--	*~444*	*#696*	--	--
	Southbound LTR	--	--	--	--	*350*	*#589*	--	--	*367*	*#613*	--	--
M Street & South Capitol Street Northbound	Eastbound Left	0	m1	0	m0	1	m1	0	m0	1	m1	0	m0
	Eastbound Thru	7	m10	17	23	53	m11	48	43	55	m11	48	43
	Westbound TR	80	119	103	138	12	#206	191	m241	124	#208	199	m247
	Northbound Left	182	277	72	129	216	324	97	167	225	337	98	169
	Northbound LTR	183	278	67	125	207	314	81	147	208	316	80	146
Improvements:	*Eastbound Left*	--	--	--	--	*0*	*m0*	--	--	*0*	*m0*	--	--
AM - Retime signal and adjust offsets	*Eastbound Thru*	--	--	--	--	*48*	*m22*	--	--	*52*	*m20*	--	--
	Westbound TR	--	--	--	--	*116*	*168*	--	--	*117*	*170*	--	--
	Northbound Left	--	--	--	--	*283*	*#488*	--	--	*~297*	*#508*	--	--
	Northbound LTR	--	--	--	--	*274*	*#480*	--	--	*272*	*#477*	--	--
N Street & South Capitol Street	Westbound LT	25	58	84	139	83	137	252	#399	85	141	276	#446
	Westbound Right	5	21	8	25	16	41	32	68	18	44	39	78
	Northbound Thru	681	m255	514	592	1045	m386	544	m583	1047	m378	544	m581
	Northbound Right	203	m98	118	m160	888	m689	337	m365	~947	m704	343	m371
	Southbound	209	275	253	349	245	338	385	468	247	342	385	468
	Southeastbound	96	#145	~396	#524	112	#184	~490	#626	113	#188	~501	#636
Improvements:	*Westbound LT*	--	--	*84*	*139*	--	--	*261*	*#434*	--	--	*286*	*#481*
PM - Retime signal and adjust offsets	*Westbound Right*	--	--	*8*	*25*	--	--	*34*	*70*	--	--	*40*	*81*
	Northbound Thru	--	--	*25*	*43*	--	--	*26*	*m55*	--	--	*26*	*m55*
	Northbound Right	--	--	*0*	*m0*	--	--	*0*	*m0*	--	--	*0*	*m0*
	Southbound	--	--	*363*	*482*	--	--	*483*	*#628*	--	--	*483*	*#628*

Intersection	Approach	Existing Conditions				Future Background Conditions (2015)				Total Future Conditions (2015)			
		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 %
	Southeastbound	--	--	*245*	*#328*	--	--	*301*	*#439*	--	--	*308*	*#449*

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. In practice, the 95th percentile queue shown will rarely be exceeded, and the queues shown are acceptable for the design of storage bays.

~ - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. Blocking problems may occur due to long queues.

m - Volume for 95th percentile queue is metered by upstream signal. Due to upstream metering, the 95th percentile queue may be less than the 50th percentile queue.

Figure 18: Morning Peak Hour Level of Service Results for 2011/2012 Existing and 2015 Background/Future

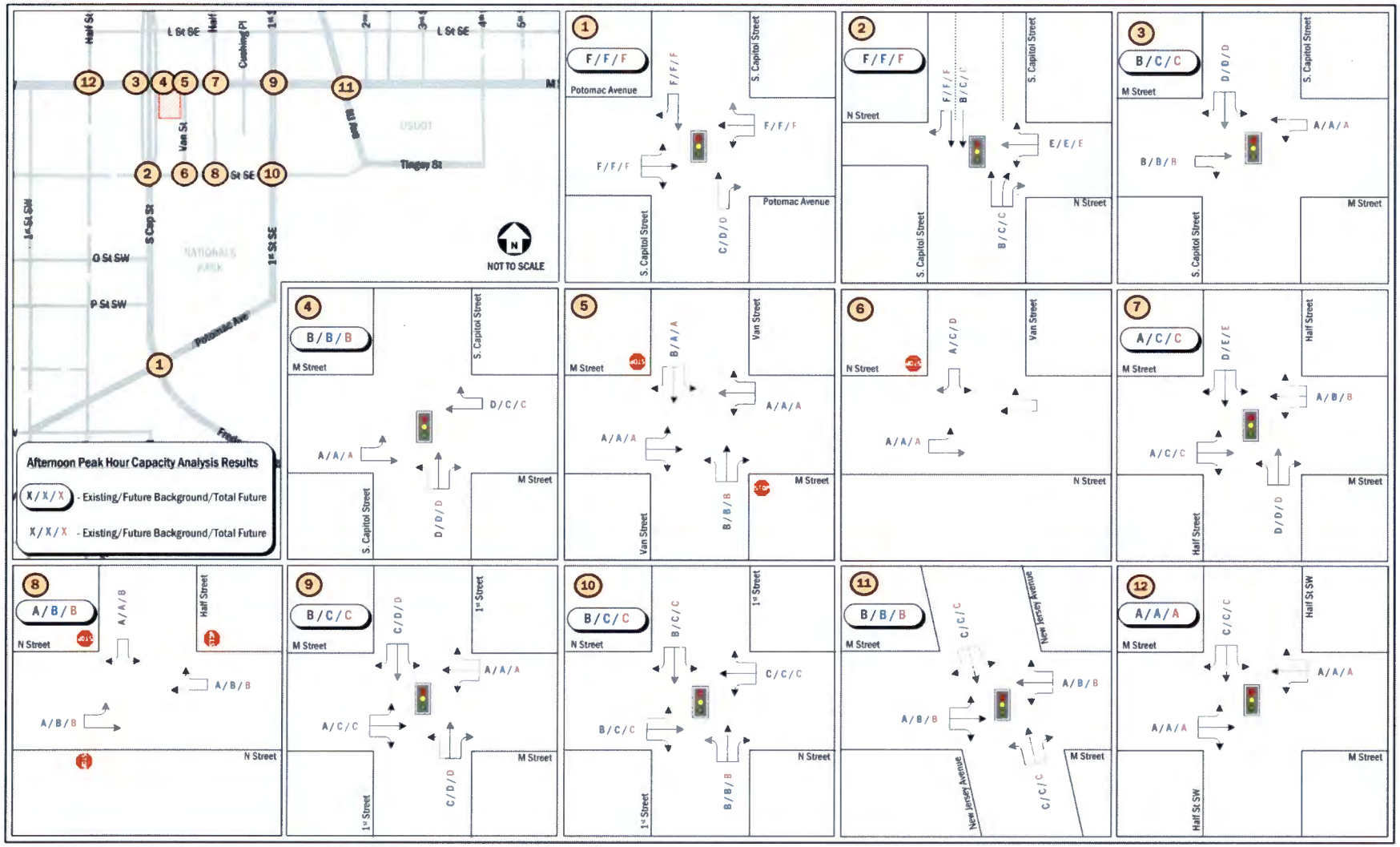

Figure 19: Afternoon Peak Hour Level of Service Results for 2011/2012 Existing and 2015 Background/Future

3.3 Non-Auto Impacts

3.3.1 Transit

The trip generation estimates for the One M Street development show that a significant amount of new transit riders will be generated. The proposed development is projected to generate over 2,000 transit trips on a weekday. The One M Street development will likely generate more transit ridership to rail than bus. Office workers, who will be coming from over a large area, will likely be heavily weighted towards Metrorail, possibly in the range of 75% rail versus 25% bus.

As stated in Section 1, there is a significant amount of transit service nearby, including the Metrorail Green line and several bus routes. The Navy Yard Metrorail station is approximately a 250-foot walk from the site. A similar distance separates the development from major bus service along M Street. Two routes have frequent service on every day of the week, the DC Circulator Union Station-Navy Yard route, and Metrobus' Minnesota Avenue-M Street line. The bus service in the area near the development is of high enough quality that census data shows slightly more bus commuters than rail commuters living in the census tract containing the development site.

WMATA studied capacity of Metrorail stations in its *Station Access & Capacity Study*[1]. The study analyzed 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 farecard gates. For both analyses, vertical transportation and farecard gates, volume to capacity ratios were calculated for existing data (from 2005) and projections for the year 2030.

Based on findings presented in the *Station Access & Capacity Study,* the Navy Yard station can accommodate the additional riders generated by the One M Street development. The study did not find any high volume to capacity ratios at the station, with the exception of the farecard gates at the eastern end of the Navy Yard mezzanine, which had a volume to capacity ratio of 0.61, which WMATA does not consider a problem worthy of improvement but instead a concern that should be reevaluated in the future. The transit riders generated by the development will likely be using the western Navy Yard farecard gates, so this concern does not affect the project. The WMATA study does note that the capacity analyses were performed prior to the expansion of the western Navy Yard portal in anticipation of National's Park, and thus the concerns noted for 2030 at the eastern farecard gates may not be observed in future studies.

WMATA also studies capacity for its bus routes. *DC's Transit Future System Plan*[2], lists the bus routes with the highest load factor (a ratio of passenger volume to bus capacity). None of the Metrobus routes that travel near the One M Street site are cited for having unacceptable load factors. Table 3, shown previously, also includes the bus Level of Service (LOS) for several bus routes located near the site. The table shows that all of the study area bus routes have a Transit LOS of either B or C. Thus, the local bus service can accommodate the future riders generated by the One M Street development.

3.3.2 Bicycle

Of all of the modes analyzed in this report, the trip generations estimates for cycling are the lowest. The projected trips are around 150 per weekday for the One M Street development. Although bicycling will be an important mode for getting to and from the site, with significant bicycle facilities located on site and quality routes to and from the site, the impacts from bicycling will be relatively less than impacts to other modes.

[1] *Station Access & Capacity Study Final Report*, April 2008, Washington Metropolitan Area Transit Authority
[2] *DC's Transit Future System Plan Final Report*, April 2010, District of Columbia Department of Transportation

The cyclists traveling to and from the site area expected to take advantage of the existing and planned routes that exist. Cyclists can use the bike lanes on 1st Street SE to access M Street and other local destinations. Continuing north past M Street on 1st Street SE, cyclists can use K and I Streets to travel east/west to both 4th Street SW, and the one-way pair of 4th and 6th Streets SE. These north-south routes provide quality access to downtown and Capitol Hill. Additional, P Street SW, across South Capitol Street from the site can also be used to access 4th Street SW, and via the Anacostia Riverwalk Trail, 15th Street and other major facilities near the National Mall.

Based on the trip generation estimates for bicycling, and the quality of the routes near the project's location, the One M Street development will not have a negative impact to bicycle facilities in the study area.

3.3.3 Pedestrian

The One M Street development is located in a walkable area, with connections to major existing and future retail locations, residential neighborhoods, and transit connections. The trip generation estimates project around 350 trips per weekday for the development.

The origins and destinations of these trips are likely to be:

- Residential neighborhoods and buildings where office employees can walk to work, such as across South Capitol Street, and apartment/condo buildings at The Yards and north of M Street.
- Retail locations, such the planned restaurants and shops at The Yards, and other retail sites along the M Street corridor.
- Nationals' Park, where retail patrons and employees can walk.

Based on these origins/destinations, most pedestrians generated by the One M Street development will walk along Van Street SE to reach destinations on the M Street corridor. There will also be use of Tingey & N Streets SE to walk to The Yards and other developments in near SE.

In addition to these trips, the transit trips generated by the site will also generate pedestrian demand between the One M Street site and nearby transit stops. The vast majority of these transit riders will not travel farther than approximately one block, as they will use the Navy Yard Metro.

Most of the sidewalks surrounding the site are of high quality, although there are significant gaps in the network. A summary of sidewalk availability and quality and is shown on Figure 20. The sidewalks closest to the One M Street development, such as those along Potomac Avenue SE, and 1st Street SE north until N Street SE, and all sidewalks surrounding Nationals' Park are of high quality.

Outside of this area, some sidewalks are narrow or of sub-par quality, including:

- East side of 1st Street NE between N and M Streets
- Tingey/N Streets within The Yards
- Half Street SE between M and N Street

Fortunately, the gaps within the network will be filled in with planned redevelopment projects. The Yards will reconstruct and upgrade Tingey Street, N Street, and the eastern side of 1st Street SE. Redevelopment on both sides of Half Street will create a high quality pedestrian experience adjacent to the Navy Yard Metrorail portal. Redevelopment of several sites on Buzzard Point along with improvements from the South Capitol Street EIS preferred alternative will vastly improve sidewalk

conditions along Buzzard Point. Additionally, construction of the proposed development will include installing a sidewalk adjacent to the development, along the west side of Van Street SE where there is currently no sidewalk.

The capacity of sidewalks to handle the projected number of pedestrians will not be negatively impacted by this project, as long as future redevelopments build sidewalks to DDOT standards. DDOT requires that all sidewalks are a minimum of 6 feet wide, with sidewalks on arterial streets 8 to 10 feet wide depending on the location. The proposed widths of the sidewalks adjacent to the site property meet the District standard. The *Highway Capacity Manual* (HCM) outlines methodologies for calculating capacity of sidewalks based on the sidewalk widths. According to methodologies contained in the HCM, the LOS grade on a 6 foot wide sidewalk does not reach LOS D until the sidewalk volumes reach 2,000 pedestrians per hour. Similarly, LOS E is not reached until volumes reach 3,000 pedestrians per hour. The existing pedestrian counts adjacent to the site combined with the projected pedestrian trips associated with the site will not approach these thresholds. Thus, the sidewalk capacity will not be exceeded, and there will be no detrimental impacts.

Based on the trip generation estimates for walking, the quality of the routes near the project's location taking into account the streetscapes that will be redeveloped and improved, the One M Street development will not have a negative impact to pedestrian facilities in the study area.

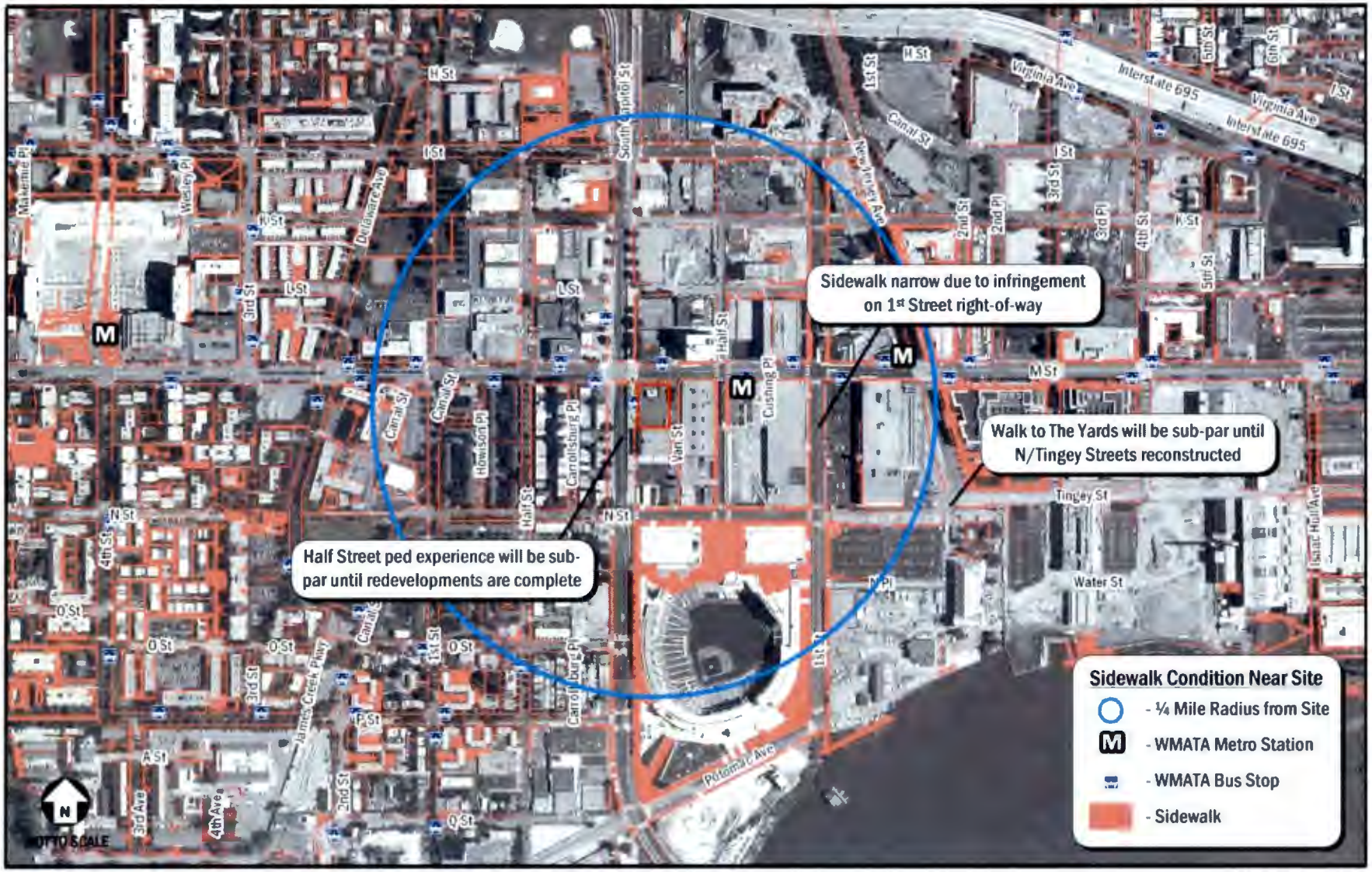

Figure 20: Sidewalk Condition near Site

3.4 Crash 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.

3.4.1 Summary of Available Crash Data

A safety analysis was performed to determine if there was an abnormally high accident rate at any study area intersection. The District Department of Transportation (DDOT) provided the last three years of intersection accident data; from 2008 to 2010. This data set included all signalized intersections adjacent to the site. This data was reviewed and analyzed to determine the accident rate at each location. For intersections, the accident rate is measured in accidents per million-entering vehicles (MEV). The accident rates per intersection are shown in Table 23.

According to the Institute of Transportation Engineer's *Transportation Impact Analysis for Site Development*, an accident rate of 1.0 or higher is an indication that further study is required. Three intersections in the study area meet this criterion (as shown in red in Table 23 and detailed in Table 24). The proposed site needs to be developed in a manner to help alleviate, or at minimum not add to, the conflicts at these intersections.

Table 23: Intersection Crash Rates

Intersection	Total Crashes	Pedestrian Crashes	Bike Crashes	Rate per MEV*
M Street SW & Half Street SW	13	0	1	0.57
M Street & South Capitol Street	76	2	0	**3.69**
N Street & South Capitol Street	43	0	0	**1.06**
Potomac Avenue & South Capitol Street	45	0	0	0.84
M Street & Half Street	10	1	0	0.72
N Street & Half Street	0	0	0	0.00
M Street & 1st Street	12	1	0	0.75
N Street & 1st Street	2	0	0	0.28
M Street & New Jersey Avenue	16	0	0	**1.15**

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

The crash summary data in Table 23 shows three intersections with a crash rate over 1.0 crashes per million entering vehicles–the rate which is considered a threshold for further analysis. A rate over 1.0 does not necessarily mean there is a significant problem at an intersection, but rather it is a threshold used to identify which intersections may have higher crash rates due to operational, geometric, or other issues.

For these three intersections, the crash type information from the DDOT crash data was reviewed to see if there is a high percentage of certain crash types. Generally, the reasons for why an intersection has a high crash rate cannot be derived from crash data, as the exact details of each crash are not represented. However, some summaries of crash data can be used to develop general trends or eliminate some possible causes.

Table 24 contains a breakdown of crash types reported for the three intersections with a crash rate over 1.0 per MEV.

Table 24: High Crash Rate Intersections by Crash Type

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	Unspecified	Total
M Street & South Capitol Street	3.69	11	12	1	11	25	1	0	2	0	2	5	0	76
		14%	*16%*	*1%*	*14%*	*33%*	*1%*	*0%*	*3%*	*0%*	*3%*	*7%*	*0%*	
N Street & South Capitol Street	1.06	3	2	1	25	9	0	2	0	0	0	0	0	43
		0%	*13%*	*6%*	*31%*	*19%*	*0%*	*6%*	*6%*	*0%*	*0%*	*0%*	*0%*	
M Street & New Jersey Avenue	1.15	0	2	1	5	3	0	1	1	0	0	0	0	16
		0%	*13%*	*6%*	*31%*	*19%*	*0%*	*6%*	*6%*	*0%*	*0%*	*0%*	*0%*	

3.4.2 Potential Impacts

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

- *South Capitol Street & M Street*

  This intersection was found to have a significantly high crash rate, with 3.69 crashes per MEV over the course of the 3-year study period. The majority of the crashes at this intersection were side swiped vehicles, turning vehicles, rear-end crashes, and right-angle crashes. Sideswipe crashes can often occur when a vehicle going straight through an intersection makes a last-second lane change to get around a vehicle waiting for a gap to make a left turn from a shared through/left lane, as is the case in this location since this section of M Street does not have separate turning lanes at this intersection in both directions. Additionally, the configuration of this intersection as a grade-separated diamond intersection leads to a high concentration of turning vehicles. However, this report does not recommend mitigation measures at this intersection due to future changes proposed in the South Capitol Street FEIS. Additionally, the proposed development is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- *South Capitol Street & N Street*

  This intersection is just over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.06 crashes per MEV. The majority of crashes at this intersection were side rear-end crashes and swiped vehicles. Sideswipe crashes can often occur when a vehicle going straight through an intersection makes a last-second lane change to get around a vehicle waiting for a gap to make a left turn from a shared through/left lane, as is the case in this location since this section of M Street does not have separate turning lanes at this intersection. Elevated rear-end collision rates are typical at intersections controlled by a traffic signal. However, this report does not recommend mitigation measures at this intersection due to future changes proposed in the South Capitol Street FEIS. Additionally, the proposed development is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- *M Street & New Jersey Avenue*

  This intersection is just over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.15 crashes per MEV. The majority of crashes at this intersection were side swiped vehicles and rear-end crashes. Sideswipe crashes can often occur when a vehicle going straight through an intersection makes a last-second lane change to get around a vehicle waiting for a gap to make a left turn from a shared through/left lane, as is the case in this location since this section of M Street does not have separate turning lanes at this intersection. Elevated rear-end collision rates are typical at intersections controlled by a traffic signal. This report does not recommend mitigation measures at this intersection as the proposed development is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

3.4.3 Leading Pedestrian Intervals

The proposed One M Street development will not have a significant effect on many of these intersections, as it will not directly influence commuter traffic patterns or change operations and geometry at most intersections. However, the changes introduced by the proposed development will have a significant impact on pedestrian crossings of South Capitol Street and M Street. As the crash data shows pedestrian crashes at a few of intersections along M Street, this report recommends that DDOT consider adding Leading Pedestrian Intervals (LPI) to the signalized intersections within the study area.

LPIs are a signal-timing-based pedestrian safety measure. Intersections with pedestrian and car traffic often experience conflict between these two groups, with potentially dangerous consequences for the pedestrians. The term LPI refers to when the 'Walk' signal appears approximately three or four seconds before the green traffic signal for vehicles. The 'Walk' signal then remains active for the duration of the green signal. This brief timing adjustment allows pedestrians more time to cross the street and increases their visibility to drivers, especially those making turns[1].

[1] http://www.walkinginfo.org/engineering/crossings-signals.cfm