
Comprehensive Transportation Review

DC Water

Planned Unit Development

Washington, DC

October 6, 2015



GOROVE / SLADE

Transportation Planners and Engineers

ZONING COMMISSION
District of Columbia
CASE NO.15-14
EXHIBIT NO.20B

Prepared by:



1140 Connecticut Avenue NW
Suite 600
Washington, DC 20036
Tel: 202.296.8625
Fax: 202.785.1276

3914 Centreville Road
Suite 330
Chantilly, VA 20151
Tel: 703.787.9595
Fax: 703.787.9905

7001 Heritage Village Plaza
Suite 220
Gainesville, VA 20155
Tel: 703.787.9595
Fax: 703.787.9905

www.goroveslade.com

This document, together with the concepts and designs presented herein, as an instrument of services, is intended for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization by Gorove/Slade Associates, Inc., shall be without liability to Gorove/Slade Associates, Inc.

TABLE OF CONTENTS

List of Figures	ii
List of Tables	iii
Executive Summary	iv
1: Introduction	1
1.1 Site Location and Major Transportation Features	2
1.2 Roadways	2
1.3 Car-Sharing	6
1.4 Transit	7
1.5 Bicycle Facilities	11
1.6 Pedestrian Facilities	12
1.7 Future Projects & Developments	15
1.7.1 District Initiatives	15
1.7.2 Developments	17
2: Design Review	22
2.1 Site Access and Internal Circulation	23
2.1.1 Vehicular Access	23
2.1.2 Loading	23
2.1.3 Parking	29
2.1.4 Bicycle Facilities	29
2.2 Transportation Demand Management	29
2.2.1 Proposed TDM Plan	29
3: Impacts Review	30
3.1 Site Transportation Demand	30
3.1.1 Base Trip Generation	30
3.1.2 Mode Split	31
3.1.3 Multi-Modal Trip Generation	31
3.2 Roadway Capacity and Operations	33
3.2.1 Scope of Analysis	33
3.2.2 Traffic Volume Assumptions	34
3.2.3 Geometry and Operations Assumptions	39
3.2.4 Vehicular Analysis Results	41
3.2.5 Summary of Analysis Results and Mitigation Measures	41
3.3 Non-Auto Impacts	69

3.3.1 Transit	69
3.3.2 Bicycle	69
3.3.3 Pedestrian	70
3.4 Crash Analysis	71
3.4.1 Summary of Available Crash Data.....	71
3.4.2 Potential Impacts	72
4: Conclusions	74

LIST OF FIGURES

Figure 1: Site Location	3
Figure 2: Roadways Network and Functional Classification	4
Figure 3: Existing Transit Facilities	10
Figure 4: Existing Bicycle Facilities	13
Figure 5: Existing Pedestrian Facilities	14
Figure 6: Background Developments.....	19
Figure 7: Existing Site Diagram	24
Figure 8: Site Plan	25
Figure 9: Post Forest City Access	26
Figure 10: Pre Forest City Access	27
Figure 11: Truck Turning Maneuvers	28
Figure 12: Direction of Approach for Background Developments.....	40
Figure 13: Existing Peak Hour Traffic Volumes (Sheet 1 of 2).....	42
Figure 14: Existing Peak Hour Traffic Volumes (Sheet 2 of 2).....	43
Figure 15: Existing Peak Hour Pedestrian Volumes (Sheet 1 of 2).....	44
Figure 16: Existing Peak Hour Pedestrian Volumes (Sheet 2 of 2).....	45
Figure 17: Background Peak Hour Traffic Volumes with Canal Street (Sheet 1 of 2)	46
Figure 18: Background Peak Hour Traffic Volumes with Canal Street (Sheet 2 of 2)	47
Figure 19: Background Peak Hour Traffic Volumes without Canal Street (Sheet 1 of 2)	48
Figure 20: Background Peak Hour Traffic Volumes without Canal Street (Sheet 2 of 2)	49
Figure 21: Background Peak Hour Traffic Volumes with Tingey Square.....	50
Figure 22: Direction of Approach for Site-Generated Traffic Volumes.....	50
Figure 23: Site-Generated Peak Hour Traffic Volumes for Development with Canal Street (Sheet 1 of 2).....	51
Figure 24: Site-Generated Peak Hour Traffic Volumes for Development with Canal Street (Sheet 2 of 2).....	52
Figure 25: Future Peak Hour Traffic Volumes with Canal Street (Sheet 1 of 2).....	53
Figure 26: Future Peak Hour Traffic Volumes with Canal Street (Sheet 2 of 2).....	54

Figure 27: Site-Generated Peak Hour Traffic Volumes for Development without Canal Street (Sheet 1 of 2)	55
Figure 28: Site-Generated Peak Hour Traffic Volumes for Development without Canal Street (Sheet 2 of 2)	56
Figure 29: Future Peak Hour Traffic Volumes without Canal Street (Sheet 1 of 2)	57
Figure 30: Future Peak Hour Traffic Volumes without Canal Street (Sheet 2 of 2)	58
Figure 31: Site-Generated Peak Hour Traffic Volumes for Development with Tingey Square	59
Figure 32: Future Peak Hour Traffic Volumes with Tingey Square	59
Figure 33: Existing, Background, and Future Peak Hour Traffic Controls and Lane Configurations without Canal Street (Sheet 1 of 2)	60
Figure 34: Existing, Background, and Future Peak Hour Traffic Controls and Lane Configurations without Canal Street (Sheet 2 of 2)	61
Figure 35: Background and Future Peak Hour Traffic Controls and Lane Configurations with Canal Street (Sheet 1 of 2)	62
Figure 36: Background and Future Peak Hour Traffic Controls and Lane Configurations with Canal Street (Sheet 2 of 2)	63
Figure 37: Background and Future Peak Hour Traffic Controls and Lane Configurations with Tingey Square	64

LIST OF TABLES

Table 1: Carshare Location and Vehicles	6
Table 2: Bus Route Information	7
Table 3: Bus Route Level of Service	8
Table 4: Bikeshare Location and Docking Stations	12
Table 5: Modal Split Assumptions	31
Table 6: Trip Generation	32
Table 7: Mode Split Assumptions for Background Developments	36
Table 8: Background Development Trip Generation	37
Table 9: Vehicular Level of Service Results (Existing, Background)	65
Table 10: Vehicular Level of Service Results (Total Future with Canal Street, Total Future without Canal Street)	66
Table 11: Roadway Capacity Results Review for Existing, Background, and Future	68
Table 12: Intersection Crash Rates	71
Table 13: High Crash Rate Intersections by Crash Type	72

EXECUTIVE SUMMARY

The following report presents the findings of a Comprehensive Transportation Review (CTR) performed for the DC Water Planned Unit Development (PUD). The proposed PUD is located within Ward 6 on the site of the existing DC Water O Street Pumping Station, approximately one block east of First Street and two blocks south of N Street near the Anacostia River and Nationals Park. The proposed site plan consists of a headquarters building to be constructed around the existing O Street Pumping Station and containing 152,076 square feet (sf) of office space in addition to the existing 22,197 sf pumping station.

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 a 152,076 sf office building that will be built around the existing 22,197 sf pumping station, which will remain operational throughout and beyond construction of the DC Water PUD. In summary, the site plans include the following features:

- Vehicular access to the site will be provided via N Place and private streets to be constructed as O Street and 1½ Street that are planned to intersect 1st Street and N Place. The private streets planned to be constructed near the site are planned as a part of the previously planned DC Water Occupied Sites PUD which is proposed for construction after DC Water vacates those parcels surrounding the proposed DC Water PUD.
- Ultimately, one curb cut from public streets will be provided via N Place and one curb cut is planned from the proposed private 1½ Street, once it is completed. Until buildout of the proposed DC Water Occupied Sites PUD, access will be provided from public streets via a curb cut from N Place as well as an existing curb cut from First Street, approximately one block west of the site. The curb cut from First Street in the near term (and 1½ Street in the long term) will serve delivery and truck traffic while the curb cut from N Place will serve as the primary vehicular access point.
- The PUD plans to provide 20 parking spaces on-site. As noted above, these parking spaces are planned to be accessed from N Place. In addition, a minimum of 50 off-street parking spaces will be provided on adjacent property owned or controlled by DC Water for the life of the building. As a result, a minimum of 70 total parking spaces will be provided on or adjacent to the site for the life of the building, satisfying the 69 parking space requirement as noted in Zoning Regulations.
- The project will include short-term public bicycle spaces and bicycle parking within the secured portion of the property. Short term bicycle parking will be provided on 6 racks outside of the security perimeter on the western side of the building. Similarly, bicycle parking will be provided within the security perimeter on 7 covered racks near the guard booth at N Place as well as on 17 outdoor racks near the parking spaces closest to the building.

The Transportation Demand Management (TDM) plan for the DC Water PUD is based on the DDOT expectations for TDM programs. The Applicant proposes the following TDM measures:

- The Applicant will provide 30 bicycle racks. Of these, 7 racks will be covered.

- The Applicant will provide 20 off-street parking spaces on the subject property and will provide a minimum of 50 off-street parking spaced on property owned or controlled by DC Water.
- The Applicant will identify a project's TDM Leader.
- The Applicant will promote alternative transportation options including transit, bicycling, and carsharing and carpooling/vanpooling services.
- The Applicant's SmartTrip Transit Benefits Program will be expanded to cover employees working at the Headquarters building.

Roadway Capacity Review

Impacts were evaluated for the typical AM and PM weekday peak periods, given the proposed use of the site. As discussed with DDOT, analysis used in the October 1, 2013 Transportation Impact Study (TIS) for the DC Water Occupied Sites PUD was utilized as the basis for review of the DC Water PUD. The DC Water Occupied Sites PUD TIS examined a scenario in which additional office trips would be induced by the availability of parking within the planned PUD and examined the impact of those trips across a localized study area encompassing five existing intersections and four future intersections (an overall nine intersection study area). Given that the trips analyzed within this condition were similar to those expected to be generated by the DC Water PUD development, the results of the October 1, 2013 PUD TIS were noted to directly correlate with the impacts that might be expected with the development of the DC Water PUD (and are noted in the appendix of this report). However, in order to more directly determine any impact of the trips associated with the DC Water PUD, the new trips generated by the development were added to the Total Future scenario in the October 1, 2013 PUD TIS.

In order to determine the impact of the proposed development on the transportation network, future conditions with and without development of the site were compared based on the analyses of intersection delays under all of the conditions described above. These delays are compared to the acceptable levels of delay set by DDOT standards to determine the site's impact on the study area. In addition, scenarios were examined with and without the construction of Canal Street in place between N Street and N Place.

The analyses concluded that the DC Water PUD will not have an adverse impact on the surrounding transportation network. Traffic conditions are generally favorable within the study area, both with and without development, with minimal impacts beyond those described in the previously approved October 1, 2013 DC Water Occupied Sited PUD.

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 DC Water PUD 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 PUD.
- Based on the trip generation estimates for walking and the quality of the routes near the project's location, taking into account the streetscapes that will be redeveloped and improved, the PUD 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 PUD will not have a negative impact to bicycle facilities in the study area.

Conclusions

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 following conclusions have been determined based on a review of the transportation aspects of the project:

- A minimum of 70 total parking spaces will be provided on or adjacent to the site (20 on-site and a minimum of 50 on adjacent DC Water property), satisfying the 69 parking space requirement as noted in Zoning Regulations.
- Bicycle parking for will be available on-site on 30 bicycle racks.
- Given the extensive nearby transit, pedestrian, and bicycle networks as well as the limited parking and extensive bicycle parking provided on-site, the development will not have an adverse impact on the surrounding transportation network.
- The 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 PUD.
- Based on the trip generation estimates for walking and the quality of the routes near the project's location, taking into account the streetscapes that will be redeveloped and improved, the 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 development will not have a negative impact to bicycle facilities in the study area.

1: INTRODUCTION

This report presents the findings of a Comprehensive Transportation Review performed for the DC Water PUD. The proposed PUD is located within Ward 6 on the site of the existing DC Water O Street Pumping Station, approximately one block east of First Street and two blocks south of N Street near the Anacostia River and Nationals Park. The proposed site plan consists of a headquarters building to be constructed around the existing O Street Pumping Station and containing 152,076 square feet (sf) of office space in addition to the existing 22,197 sf pumping station.

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 policies 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 DC Water PUD. 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 DC Water PUD. 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 DC Water PUD 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 DC Water PUD is located in the near Southeast portion of Washington, DC, in Ward 6. The project site, as shown in Figure 1, is bounded by 1st Street to the west, N Place to the north, the Anacostia River to the south, and an existing coal slip along the Anacostia Riverfront to the east. The site is served by one north-south principal arterial, South Capitol Street, as well as the east-west minor arterial, M Street. The site is within close proximity to Interstates 395 and 295. In addition, the site location is well connected to the city's grid of minor arterial, collector, and local roadways.

The site is served by several public transportation sources, including Metrorail and Metrobus. 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.

1.2 Roadways

As stated previously, one major arterial serves the proposed development site: South Capitol Street. The DC street grid provides thorough connectivity between the site and surrounding regions with minor arterials and collector roadways like M Street and 4th Street SE, enhancing the ease of travel across the local roadway network to the major arterials. Figure 2 shows the roadway network hierarchy for the roadways near the proposed development.

The immediate study area of the DC Water PUD has several key local access roads. These include:

- *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 61,600 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*

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 17,200 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.

- *Potomac Avenue SE*

Potomac Avenue is a four-lane roadway that runs east-west in the vicinity of the site. DDOT classifies it as a collector roadway with an average daily traffic of 5,800 vehicles 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 also provided on both sides of the roadway.

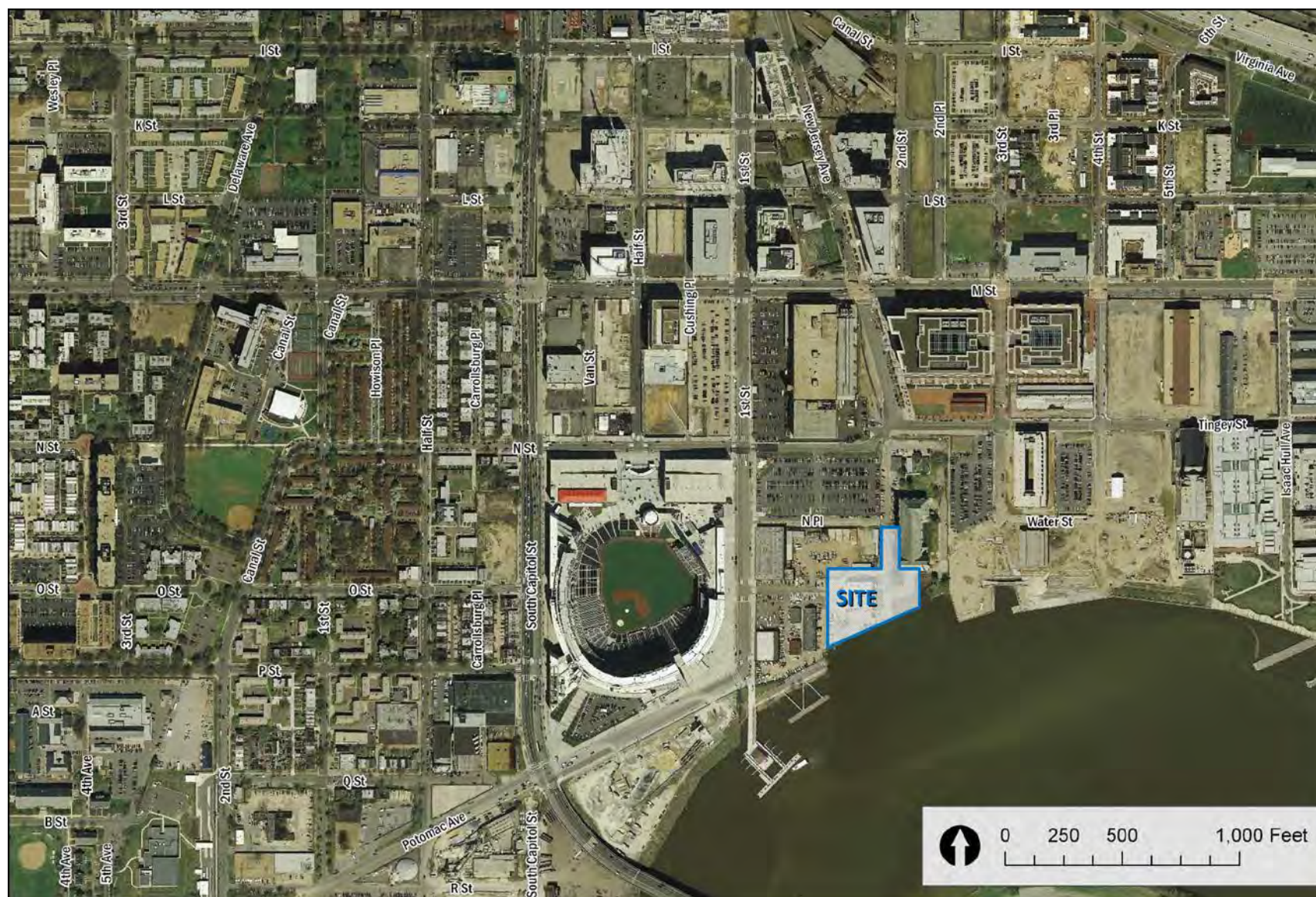


Figure 1: Site Location

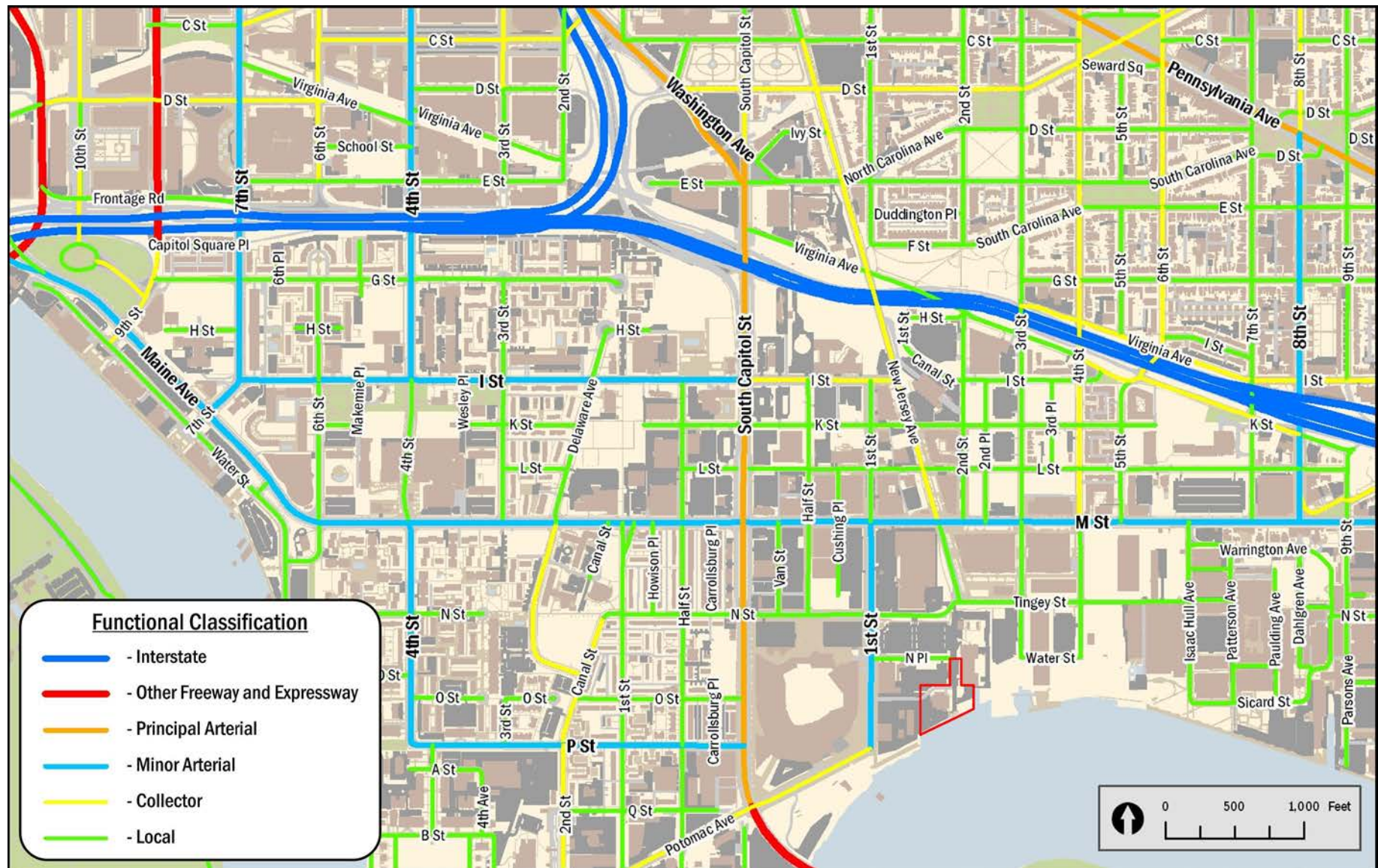


Figure 2: Roadways Network and Functional Classification

- *I (Eye) Street SE*
DDOT classifies I (Eye) Street as a minor arterial with average daily traffic volumes of 6,200 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*
1st 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 5,200 vehicles in the vicinity of the proposed development. Within the limits of the study area, New Jersey Avenue intersects M Street north 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 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 2,900 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 10,800 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.

One major infrastructure project is located near the proposed development: the South Capitol Street Improvement Project. The majority of the future roadway changes outlined by this project will not affect the roadway network immediately surrounding the project site. However, the project will improve access to the proposed development by reducing congestion on the roadway network and providing additional mobility in the study area. This project is outlined in greater detail in Section 1.7.1.

The study area for the M Street SE/SW Transportation Study also encompasses the proposed DC Water development. The study 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, Enterprise Carshare, and Car2Go. All three services are private companies that provide registered users access to a variety of automobiles. Table 1 lists the car-sharing locations provided by Zipcar and Enterprise Carshare in the study area and the number of vehicles available.

Table 1: Carshare Location and Vehicles

Carshare Location	Number of Vehicles
Zipcar - 3 rd & N Streets SE (Lot L at The Yards)	1 vehicle
Zipcar - 300 M Street SE	4 vehicles
Zipcar - Capitol Skyline Hotel (10 I Street SE)	2 vehicles
Enterprise – 1 st Street & N Place SE	5 vehicles
Enterprise – 1 st & K Streets SE	6 vehicles
Total Number of Carshare Vehicles in Study Area	18 vehicles

Car-sharing is also provided by Car2Go in DC. Car2Go provides point-to-point car sharing. Unlike Zipcar and Enterprise Carshare, 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 3 identifies the major transit routes, stations, and stops in the study area.

The Metrobus and Metrorail systems provide public transportation access to the DC Water PUD site. The nearest Metrorail station is Navy Yard, located approximately one quarter of a mile from the northeast corner of the proposed development at the intersection of New Jersey Avenue and M Street. An additional portal is provided at the intersection of Half Street and M Street, approximately three tenths of a mile away from the northwest corner of the site. 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	Distance to nearest bus stop
74	Convention Center-Southwest Waterfront Line	5:00 am – 1:00 am	15-20 min	0.25 miles
A9	Martin Luther King Jr Ave Limited Line	Weekdays: 6:00 – 9:45 am, 3:30– 7:30 pm	15-20 min	0.30 miles
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	0.10 miles
V7, 8, 9	Minnesota Ave-M Street Line	4:30 am – 1:30 am	30 min	0.10 miles
P6	Anacostia-Eckington Line	Weekdays: 5:00 am – 2:00 am Saturday: 5:30 am – 2:00 am Sunday: 6:30 am – 12:30 am	15-30 min	0.10 miles
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	0.15 miles

¹ WMATA route schedules, <http://wmata.com/bus/timetables/>

Route Number	Route Name	Service Hours ¹	Headway ¹	Distance to nearest bus stop
W9	South Capitol Street Limited Line	Weekdays: 6:15 – 9:30 am, 3:15 – 6:30 pm	15-30 min	0.15 miles
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	0.15 miles
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	0.30 miles

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.

Table 3: Bus Route Level of Service

Route Number	Route Name	Peak Hour Headway ²	Transit LOS ³
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
V7, 8, 9	Minnesota Ave-M Street Line	10-15 min	B
P6	Anacostia-Eckington Line	15-20 min	C
P17, 19	Oxon Hill-Fort Washington Line	20 min	C
W9	South Capitol Street Limited Line	15-30 min	D
W13	Bock Road Line	20 min	C

² WMATA route schedules, <http://wmata.com/bus/timetables/>

³ Transit Cooperative Research Program (TCRP) Transit Capacity and Quality of Service Manual, 2nd Edition, 2003. Exhibit 3-12.

Route Number	Route Name	Peak Hour Headway ²	Transit LOS ³
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.

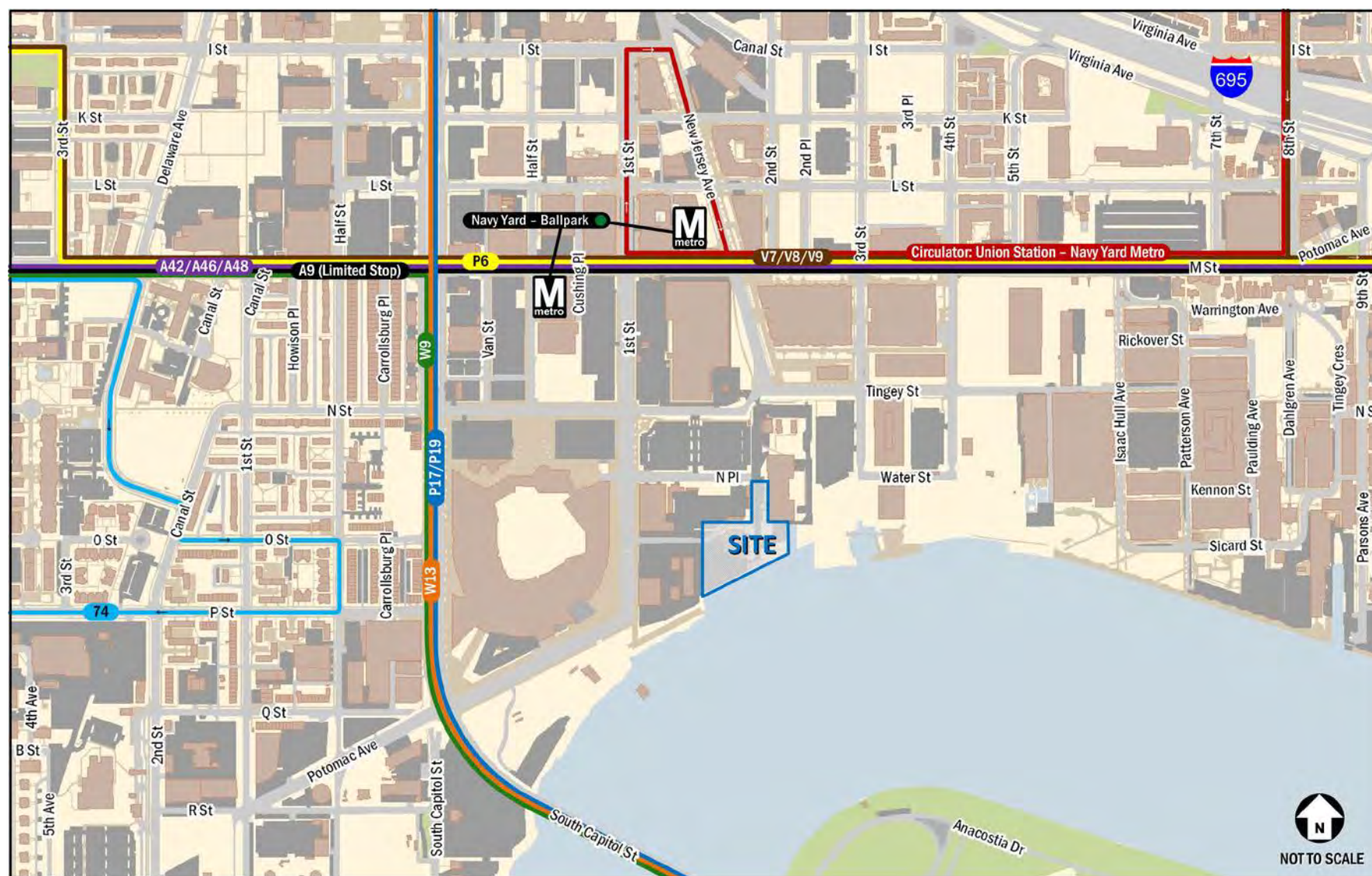


Figure 3: Existing Transit Facilities

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 District's streetcar plan includes two planned lines that are expected to terminate in Buzzard Point. The planned routes for these lines will connect Buzzard Point with Takoma to the north and with Anacostia to the south. They are part of the 22 mile priority system that also includes the Georgetown Waterfront to Benning Road Line. The two pertinent streetcar lines have an estimated completion date of 2020.

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 these facilities. 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, four Capital Bikeshare stations, and ample bicycle parking. Bike lanes are provided along 1st Street and I Street, near the site, with bike lanes at 4th Street SW, 4th Street SE, and 6th Street SE that provide connections to the north side of the District. 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 and Half Street SW west 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 4 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 vehicular speeds and traffic volumes, as well as limited roadway connections.

There is ample bicycle parking directly surrounding Nationals Park; however, in most other areas bike parking is limited. 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.

In addition to personal bike use, the Capital Bikeshare program has placed 300 bicycle share stations across Washington, DC, Arlington and Alexandria, VA, and most recently Montgomery County, MD with over 2,500 bicycles provided. In the vicinity of the proposed development, Capital Bikeshare stations have been placed in four locations. The locations and number of docks at each station are provided 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.

Table 4: Bikeshare Location and Docking Stations

Bikeshare Location	Number of Docking Stations
1 st & N Street, SE	39 docks
3 rd & Tingey Street, SE	19 docks
M Street & New Jersey Avenue, SE	17 docks
1 st & K Street, SE	15 docks
Total Number of Bikeshare Docking Stations Study Area	90 docking stations

1.6 Pedestrian Facilities

Overall, the pedestrian facilities within the study area provide a good walking environment and are reviewed on Figure 5. Pedestrian access to the site is provided along 1st Street SE and N Place 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.

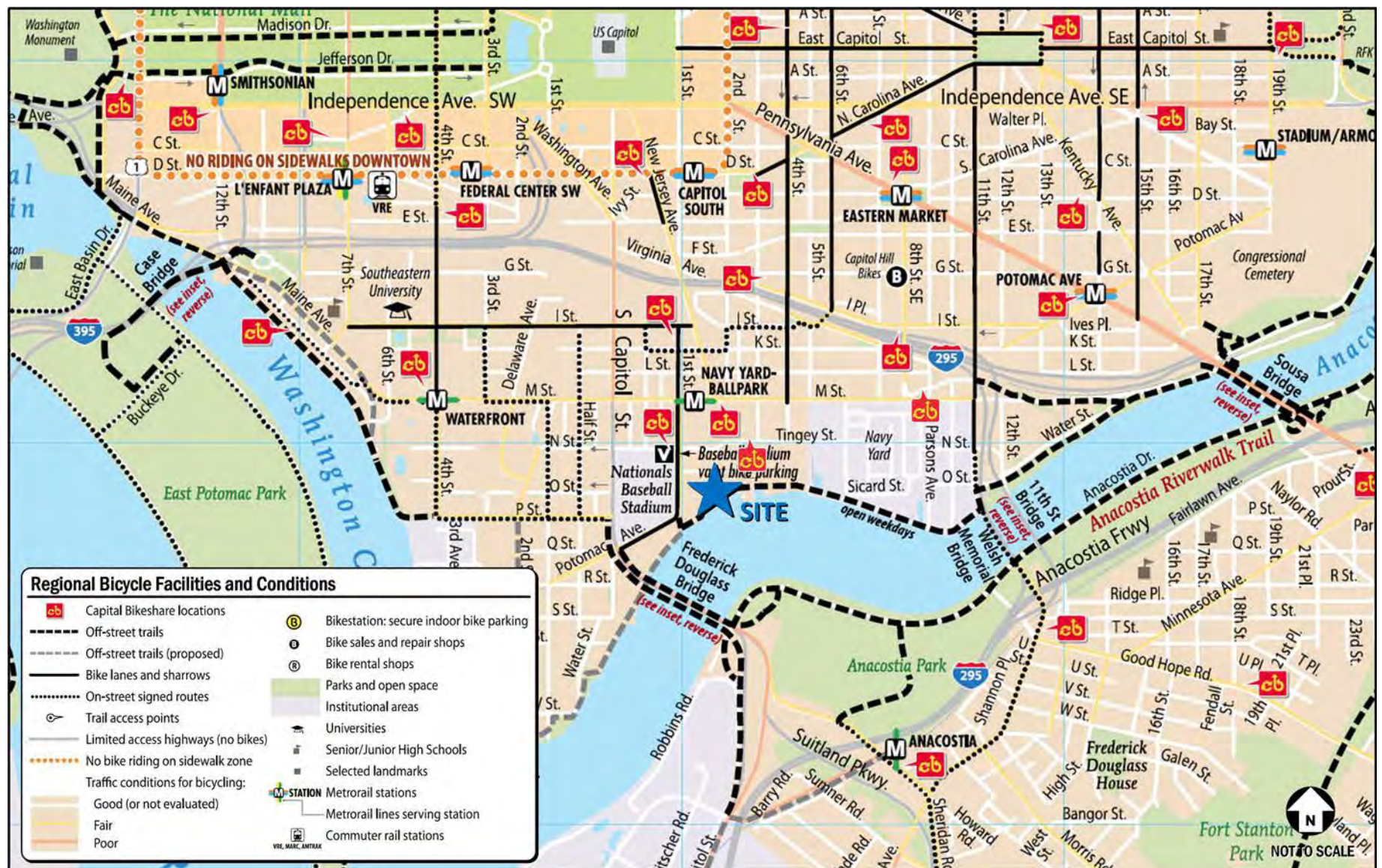


Figure 4: Existing Bicycle Facilities

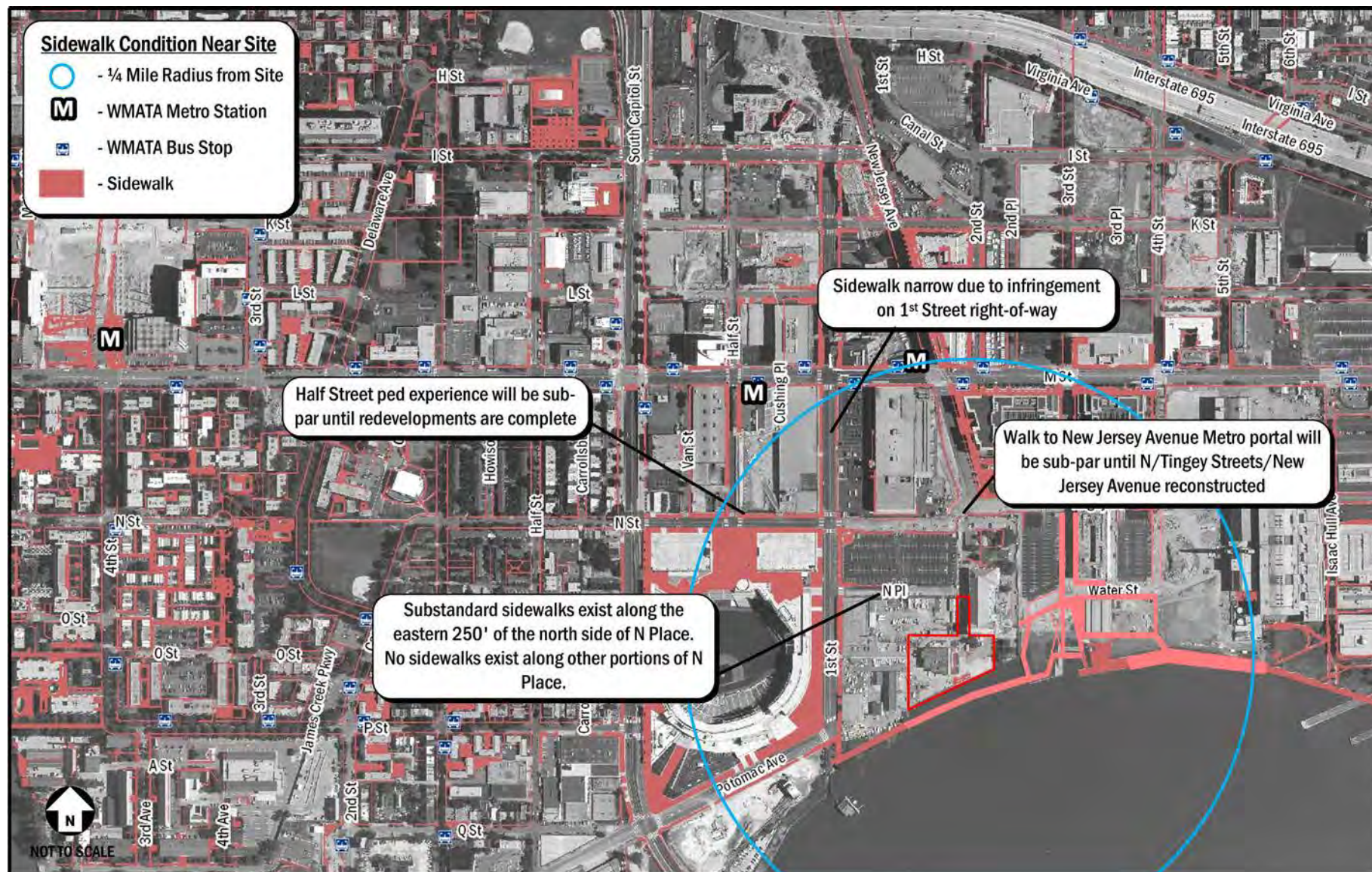


Figure 5: Existing Pedestrian Facilities

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.

1.7 Future Projects & Developments

1.7.1 District Initiatives

The South Capitol Street Improvement project is currently underway in the vicinity of the project site. This project is summarized below. In addition to this project, the M Street SE/SW Transportation Study was recently completed. This study is also summarized below.

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 Final 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 report will be used to inform and guide the formal Project Scoping process as the project progressed from preliminary transportation planning to detailed alternatives development and preliminary design engineering.

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

Since the capacity analysis associated with this document examined a buildout year of 2016 based on existing 2013 data, several background developments were included that have been approved and/or built since the existing 2013 scenario. Aside from the DC Water PUD, there are several other projects proposed, approved, built, 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 was assumed to be completed in 2014.
- *Arthur Capper/Carrollsborg and Capitol Quarter*
The Arthur Capper/Carrollsborg 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 by 2022.
- *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 remaining portions of the development are projected to be completed by 2027.
- *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 2015, with a second phase to be completed in 2018.
- *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 699/Velocity*
The Square 699N/Velocity development is a residential building located north of L Street SE between Half Street SE and 1st Street SE. The development was assumed to be completed by 2014. A second phase of development, which consists of office and retail uses, is planned, with an expected completion in 2019.

- Maritime Plaza Phases III, IV, & V

The Maritime Plaza development consists of a mix of office and hotel uses located south of M Street SE east of 12th Street SE. The development is currently under construction, with the remaining phases of the development projected to be completed by 2020.

- 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 was assumed to be completed in 2014, with a final completion in 2019.

- 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 2015.

- 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 was assumed to be completed by 2014.

- DC Water Occupied Sites PUD

The DC Water Occupied Sites PUD is currently approved and awaiting construction, pending the relocation of DC Water activities currently ongoing on the related parcels. Phase I is planned to contain a 16-screen movie theater as well as structured parking for 337 vehicles and was initially planned to be completed by 2016. The remainder of the site is planned to include approximately 50,000 sf of retail space and 600 residential units as well as 300 additional parking spaces and is planned to be completed by 2027.

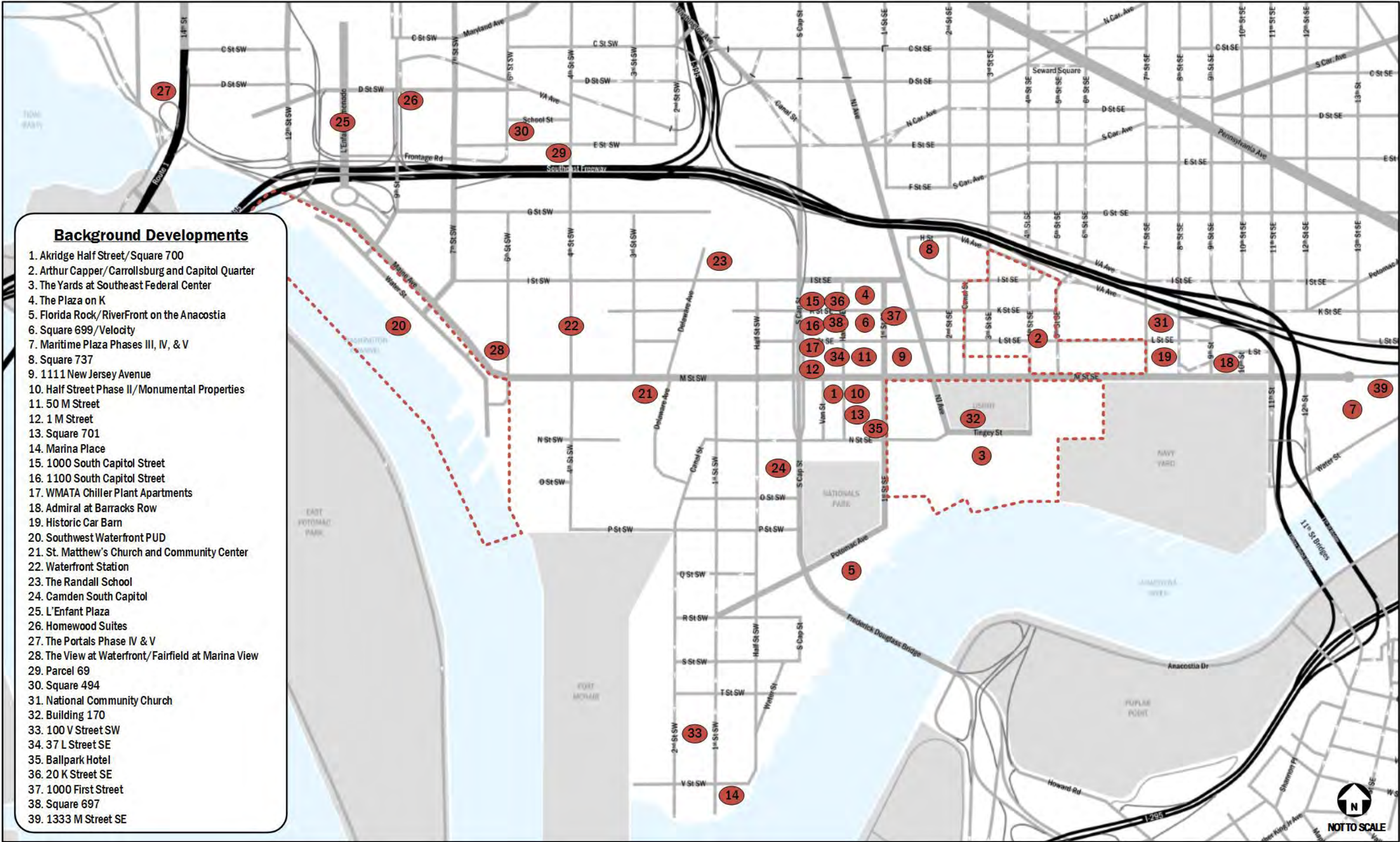


Figure 6: Background Developments

- 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 2018.
- 1 M Street
The 1 M Street development is a mix of office and retail uses located south of M Street SE between South Capitol Street and Van Street SE. The development is anticipated to be completed by 2018.
- Square 701
The Square 701 development is an office building located south of M Street SE between Half Street SE and 1st Street SE. The development is anticipated to be completed by 2015. A second phase, which consists of a hotel, is projected to be completed in 2016.
- Marina Place
The Marina Place development consists of a mix of residential and retail uses located west of South Capitol Street near Buzzard Point. The development is anticipated to be completed by 2019.
- 1000 South Capitol Street
The 1000 South Capitol Street development is an office building located north of K Street SE between South Capitol Street and Half Street SE. The development is anticipated to be completed by 2018.
- 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 2018.
- WMATA Chiller Plant Apartments
The WMATA Chiller Plant Apartments are a mix of residential and retail uses located north of M Street SE between South Capitol Street and Half Street SE. The development is anticipated to be completed by 2018.
- 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 2018.
- 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 2016.
- Southwest Waterfront PUD
The Southwest Waterfront Development is located southwest of Maine Avenue SW between the I-395 Freeway and 6th Street SW. The proposed development contains a mix of retail, residential, office, hotel, church, cultural, and marina uses. The first phase of development is anticipated to be completed by 2015, and the full development is projected to be completed by 2018.

- *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 was assumed 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 was assumed 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 2015.
- *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 was assumed 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. The development was assumed to be completed in 2014.
- *The Portals Phase IV & V*
Phases IV and V of the Portals development consists of a mix of office and retail uses located at the southeast corner of 14th and D Streets SW. The development is currently under construction, with the two remaining phases of the development projected to be completed by 2020 and 2025.
- *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, was assumed to be completed in 2014.
- *Parcel 69*
The Parcel 69 development, located at 400 E Street SW, consists of office uses. The development was assumed 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 2018.
- Building 170
The Building 170 redevelopment, which is located at 250 Tingey Street SE, adjacent to The Yards at Southeast Federal Center development, consists of retail uses. The building redevelopment is projected to be completed in 2016.
- 100 V Street SW
The 100 V Street SW development, located west of 1st Street SW, between T and V Streets SW, consists of office uses. The development is projected to be completed in 2020.
- 37 L Street SE
The 37 L Street SE development consists of office uses and is located south of L Street SE, between South Capitol Street and Half Street SE. The development is anticipated to be completed by 2028.
- Ballpark Hotel
The Ballpark hotel development consists of hotel located south of M Street SE between Half Street SE and 1st Street SE. The development is anticipated to be completed by 2015.
- 20 K Street SE
The 20 K Street SE development consists of residential uses and is located north of K Street, between South Capitol Street and Half Street SE. The development is anticipated to be completed by 2016.
- 1000 1st Street
The 1000 1st Street development is currently proposed, with no specified development plan. However, the development is anticipated to be completed by 2018.
- Square 697
The Square 697 development is currently proposed, with no specified development plan. However, the development is anticipated to be completed by 2028.
- 1333 M Street SE
The 1333 M Street SE development is currently proposed, with no specified development plan. However, the development is anticipated to be completed by 2020.

2: DESIGN REVIEW

This report section provides an overview of the on-site transportation features of the proposed DC Water PUD. 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 PUD will be constructed surrounding the existing O Street

Pumping Station. There are currently three curb cuts located on 1st Street, at and south of O Street, and four curb cuts located along N Place between 1st Street and the Main Pumping Station. On-street parking is provided along all of the existing public roadways that border the site. Figure 7 identifies the existing conditions surrounding the project site.

The proposed DC Water PUD consists of a 152,076 sf office building that will be built around the existing 22,197 sf pumping station, which will remain operational throughout and beyond construction of the DC Water PUD. The site plan is included as Figure 8. The site is located on a portion of Lots 801 and 805 of Square 744SS and is zoned CR. Access to the site will be provided externally via existing N Place and existing 1st Street and with internal future private streets constructed as O Street and 1½ Street.

2.1 Site Access and Internal Circulation

2.1.1 Vehicular Access

The site will be accessed via the existing N Place and newly constructed future private O Street and 1½ Street. Ultimately, curb cuts will be provided via existing N Place and at the future intersection of 1½ Street (proposed as a private street) and O Street (also proposed as a private street). The private streets planned to be constructed near the site are planned as a part of the previously planned DC Water Occupied Sites PUD which is proposed for construction after DC Water vacates those parcels surrounding the proposed DC Water PUD. Figure 8 shows the ultimate locations of the site access points, as well as the configuration of each intersection, when surrounding developments are completed. It should be noted that access to the existing N Place and existing 1st Street will be maintained regardless of the development of adjacent parcels (as well as the future private 1½ Street and O Street) are constructed, as described in further detail below.

Ultimately, one curb cut from public streets will be provided via N Place and one curb cut is planned from the proposed private 1½ Street, once it is completed, as shown on Figure 9. Until buildout of the proposed DC Water Occupied Sites PUD, access will be provided from public streets via a curb cut from N Place as well as an existing curb cut from First Street, approximately one block west of the site. The curb cut from First Street in the near term (and 1½ Street in the long term) will serve delivery and truck traffic while the curb cut from N Place will serve as the primary vehicular access point, as shown on Figure 10.

No changes to the existing on-street parking are proposed, with the exception of the reconfiguration of the on-street parking along N Place as it's reconstructed with the DC Water Properties PUD project. Additional on-street parking will be constructed along private streets within the DC Water Properties PUD project as it develops.

2.1.2 Loading

All loading activity will take place on-site and no back-up maneuvers from 1st Street or N Place will be necessary for trucks to access their loading docks. Access for the loading facilities will be provided via the site access point along 1st Street and future 1½ Street as outlined above for vehicular access. Trucks will approach the site from M Street and South Capitol Street via 1st Street as shown on Figure 9 and Figure 10. Zoning Regulations require the Applicant to provide two 30 foot loading berths, two 100 sf loading platforms, and one 20 foot service/delivery space. The site is planned to meet or exceed all of these requirements. Figure 11 shows the vehicle accessing the loading area without any turning maneuvers necessary from public or private space.



Figure 7: Existing Site Diagram

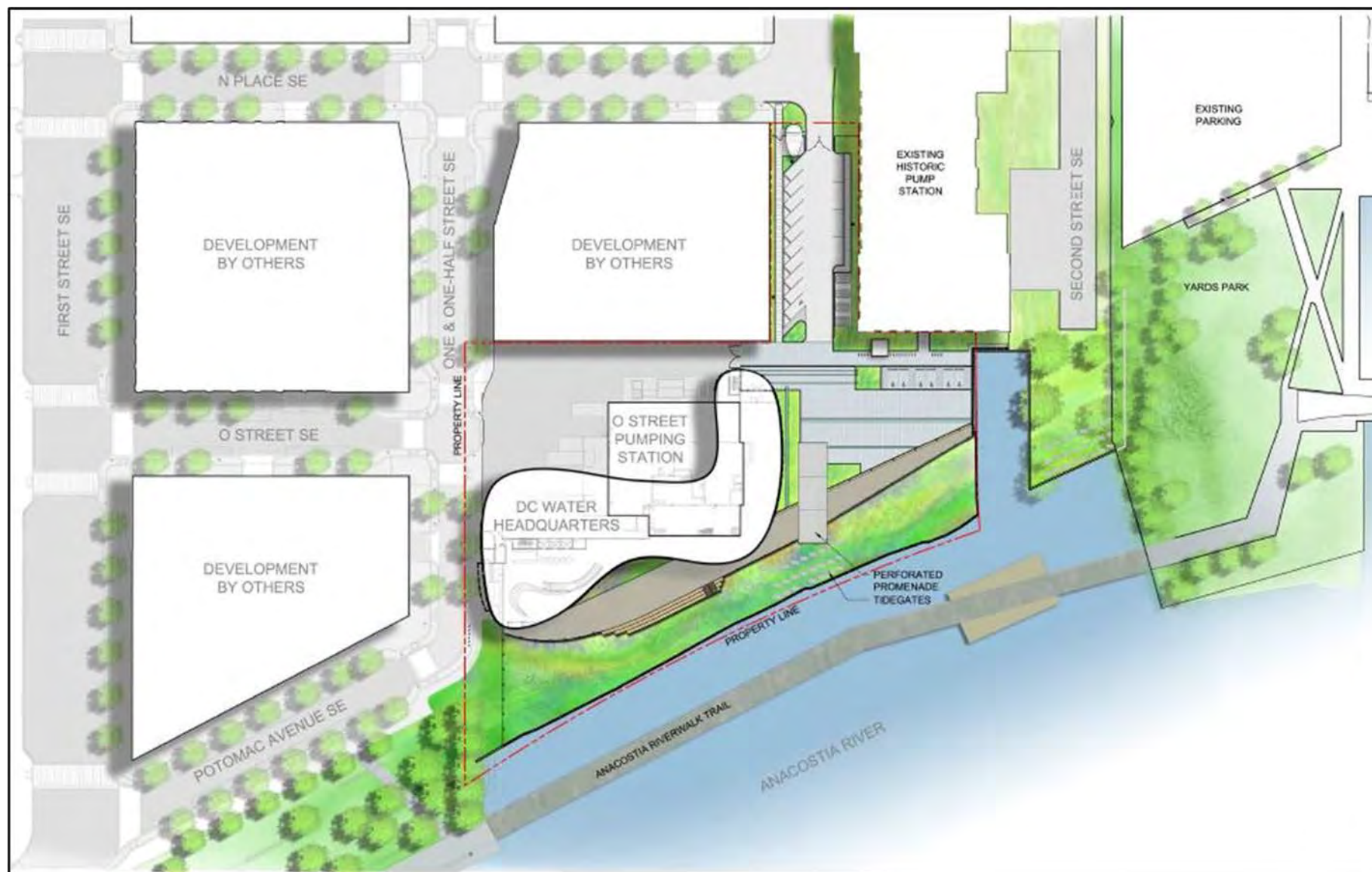


Figure 8: Site Plan

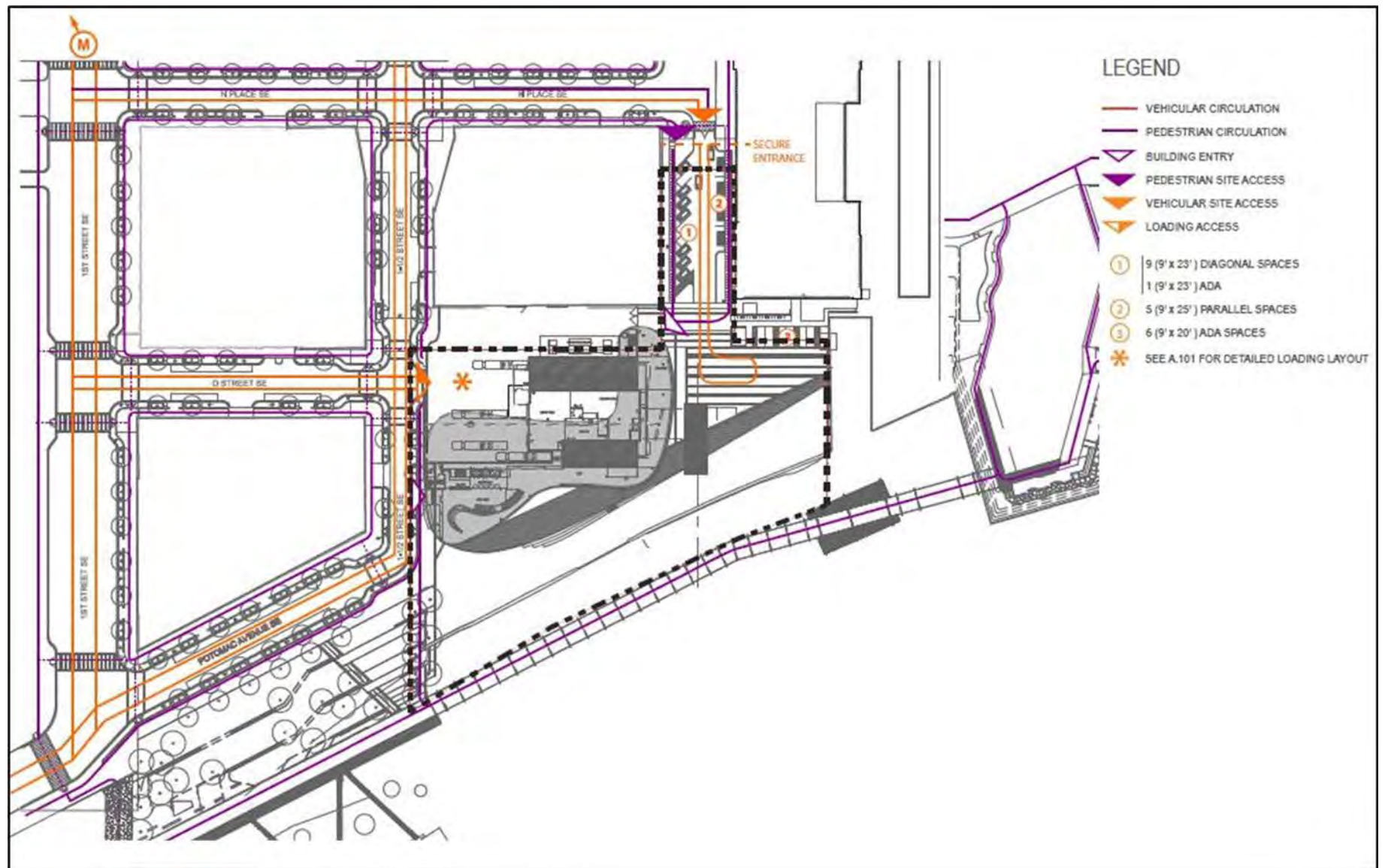


Figure 9: Post Forest City Access

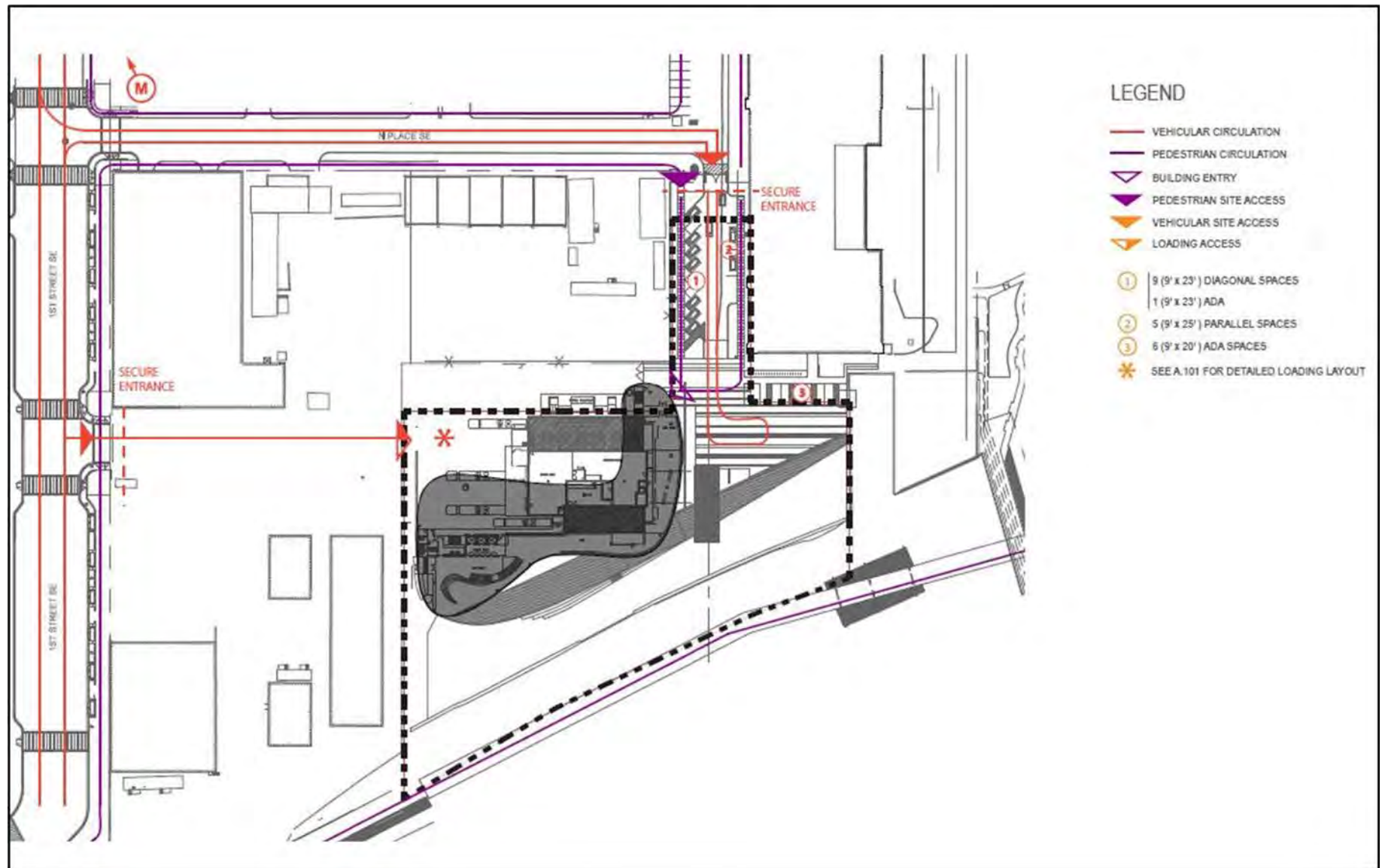


Figure 10: Pre Forest City Access

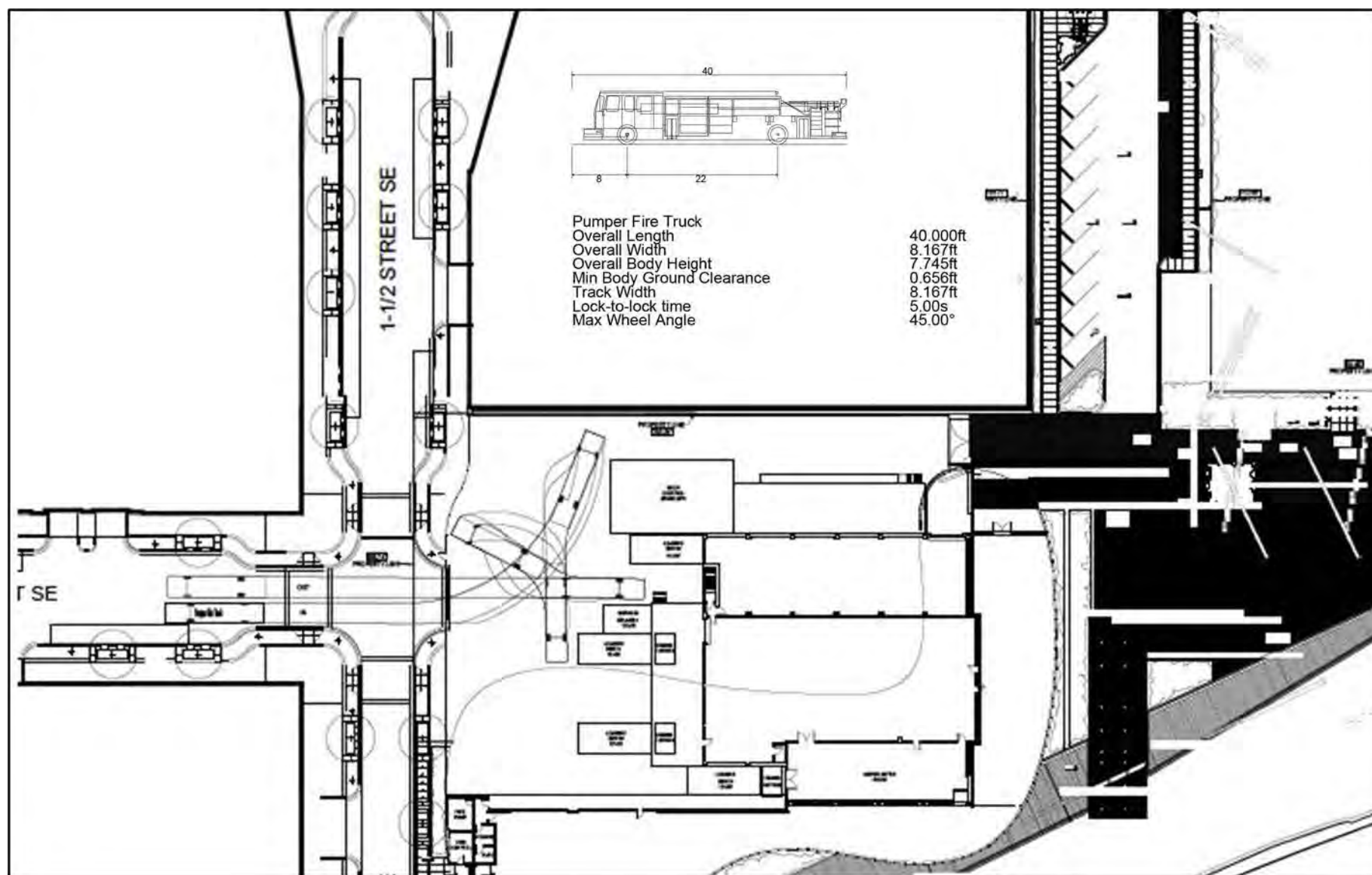


Figure 11: Truck Turning Maneuvers

2.1.3 Parking

Based on current District Zoning laws, the minimum parking for the project is as follows:

- 75 percent of the total of one space per 1,800 sf of office space in excess of 2,000 sf

The zoning code requires a minimum of 69 parking spaces for the development. The proposed development is requesting a variance from parking requirements as the site will only be able to accommodate 20 parking spaces on-site. It should be noted that a minimum of 50 off-street parking spaces will be provided on adjacent property owned or controlled by DC Water for the life of the building. As such, a total minimum of 70 parking spaces will be provided on-site and on adjacent property owned or controlled by DC Water for the life of the building, thus satisfying the zoning requirements for the site.

2.1.4 Bicycle Facilities

As stated in Section 1, the site is directly served by signed bicycle routes and local streets that accommodate cycling. In order to accommodate and encourage cycling, 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 project will include short-term public bicycle spaces and bicycle parking within the secured portion of the property. Short term bicycle parking will be provided on 6 racks outside of the security perimeter on the western side of the building. Similarly, bicycle parking will also be provided within the security perimeter on 7 covered racks near the guard booth at N Place as well as on 17 outdoor racks near the parking spaces closest to the building.

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.

2.2.1 Proposed TDM Plan

The Transportation Demand Management (TDM) plan for the DC Water PUD is based on the DDOT expectations for TDM programs, modified to allow for performance monitoring. The Applicant proposes that upon construction, the project incorporate several TDM measures. At a certain point after opening, the success of the TDM measures will be measured, and the TDM plan adjusted if it is judged to not meet expectations.

The Applicant proposes the following TDM measures:

- The Applicant will provide 30 bicycle racks. Of these, 7 racks will be covered.
- The Applicant will provide 20 off-street parking spaces on the subject property and will provide a minimum of 50 off-street parking spaced on property owned or controlled by DC Water.
- The Applicant will identify a project's TDM Leader.
- The Applicant will promote alternative transportation options including transit, bicycling, and carsharing and carpooling/vanpooling services.
- The Applicant's SmartTrip Transit Benefits Program will be expanded to cover employees working at the Headquarters building.

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*, 9th 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, which was approved by DDOT per the Scoping Form contained in the Technical Attachments.

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 Land Use (LU) 715 for Single Tenant Office Building. The total weekday trips, as well as the morning and afternoon weekday peak hour trips, were generated using the regression equations provided based on average vehicle trip ends per square foot of office space. The regression equations were chosen for the Office projections, due to the high (over 0.75) coefficient of determinations (R^2) for each time period. The weekday morning and afternoon peak hours generally correspond to the peak hours of the adjacent roadway network – one hour between 7:00 and 9:00 AM and between 4:00 and 6:00 PM, respectively. Based on this, the peak hour of the adjacent roadway network was used for the trip generation projection instead of the peak hours of the Generator.

Following the base vehicular- trip rate calculations, the vehicle-trips were converted to person-trips based on the estimated average vehicle occupancy (AVO). AVO rates were obtained from the *Summary of Travel Trends – 2009 National Household Travel Survey* performed by the U.S. Department of Transportation Federal Highway Administration⁴.

⁴ AVO rates obtained from "Table 16: Average Vehicle Occupancy for Selected Trip Purpose 1977, 1983, 1990, and 1995 NPTS, and 2001 and 2009 NHTS (Person Miles per Vehicle Mile" for 2009 data. AVO for Retail uses based on "Shopping" Trip Purpose. AVO for Office and Residential uses based on "To or From Work" Trip Purpose.

3.1.2 Mode Split

Following the base trip generation discussed in Section 3.1.1, the trips were split into each mode: transit (consisting of both Metrorail and Metrobus), walking, biking, and vehicle. The mode split estimates for the DC Water PUD were developed using survey information contained in several sources: WMATA's *2005 Development-Related Ridership Survey*, U.S. Department of Transportation's *2009 National Household Travel Survey (NHTS) Summary of Travel Trends*, Commuter Connections' *2010 State of the Commute Survey Report*, estimates from studies for nearby approved developments, and files from Gorove/Slade's library. These assumptions were approved by DDOT per the Scoping Form contained in the Technical Attachments.

Several sources provide mode split information that can be used to develop estimates for future residents of the DC Water Site PUD, including results from the 2007-2011 American Community Survey, WMATA's *Ridership Survey* of office sites within the District, and studies for other nearby developments, as shown below on Table 5. WMATA Ridership Survey data for Office sites within the CBD noted office auto modal splits of 21 percent while studies for other nearby developments noted auto modal splits of 40 to 50 percent (with higher auto modal splits for developments further from Metro, such as the Riverfront on the Anacostia development). The modal splits assumed for the DC Water PUD office space is noted on Table 5 below is noted to be similar to that assumed for other nearby developments. Therefore, the office mode splits assumed for the DC Water Site will provide a conservative analysis.

Table 5: Modal Split Assumptions

Pertinent Mode Split data from other sources:					
Information Source	Mode				
	SOV	Carpool	Transit	Bike	Walk
WMATA Ridership Survey (average for <i>Suburban-Inside the Beltway</i>)	66%		30%	6%	
WMATA Ridership Survey (average for <i>CBD</i>)	21%		75%	4%	
Square 701 (Ballpark Square) PUD	40%		50%	7%	3%
Riverfront on the Anacostia (Florida Rock) PUD	50%		40%	7%	3%
Other Studies (Background Development Assumptions)	50%		35%	10%	5%
Mode Split assumed in TIS:					
Information Source	Mode				
	Drive		Transit	Bike	Walk
Office Mode Split	45%		45%	5%	5%

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 5) Table 6 shows the resulting calculations by mode. It should be noted that due to the conservative modal split assumptions discussed above, the trip generation calculations noted below should be considered conservative for the purpose of determining site-related impacts and not be construed as an estimate of parking demand.

Table 6: Trip Generation

Step 1: Base trip generation using ITEs' <i>Trip Generation</i>								
Land Use	Land Use Code	Quantity	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Single Ten. Office	715	152,789 sf	247 veh/hr	30 veh/hr	277 veh/hr	40 veh/hr	227 veh/hr	267 veh/hr
Step 2: Convert to people per hour, before applying mode splits								
Land Use	People/Car (from 2009 NHTS, Table 16)		AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Office	1.13 ppl/veh		279 ppl/hr	34 ppl/hr	313 ppl/hr	45 ppl/hr	257 ppl/hr	302 ppl/hr
Step 3: Split between modes, per assumed Mode Splits								
Land Use	Mode	Split	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Office	Auto	45%	126 ppl/hr	15 ppl/hr	141 ppl/hr	21 ppl/hr	115 ppl/hr	136 ppl/hr
Office	Transit	45%	126 ppl/hr	15 ppl/hr	141 ppl/hr	21 ppl/hr	115 ppl/hr	136 ppl/hr
Office	Bike	5%	14 ppl/hr	2 ppl/hr	16 ppl/hr	3 ppl/hr	13 ppl/hr	16 ppl/hr
Office	Walk	5%	14 ppl/hr	2 ppl/hr	16 ppl/hr	3 ppl/hr	13 ppl/hr	16 ppl/hr
Step 4: Convert auto trips back to vehicles/hour								
Land Use	People/Car (from 2009 NHTS, Table 16)		AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Office	1.13 ppl/veh		112 veh/hr	13 veh/hr	125 veh/hr	19 veh/hr	102 veh/hr	120 veh/hr
Trip Gen Summary for Office								
Mode			AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Auto			112 veh/hr	13 veh/hr	125 veh/hr	19 veh/hr	102 veh/hr	120 veh/hr
Transit			126 ppl/hr	15 ppl/hr	141 ppl/hr	21 ppl/hr	115 ppl/hr	136 ppl/hr
Bike			14 ppl/hr	2 ppl/hr	16 ppl/hr	3 ppl/hr	13 ppl/hr	16 ppl/hr
Walk			14 ppl/hr	2 ppl/hr	16 ppl/hr	3 ppl/hr	13 ppl/hr	16 ppl/hr

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, consistent with the analysis presented in the October 1, 2013 DC Water Occupied Sites PUD TIS:

- South Capitol Street and I Street
- 1st Street SE and I Street SE
- New Jersey Avenue SE and I Street SE
- South Capitol Street Southbound and M Street
- South Capitol Street Northbound and M Street
- Half Street SE and M Street SE
- 1st Street SE and M Street SE
- New Jersey Avenue SE and M Street SE
- 4th Street SE and M Street SE
- 5th Street SE and M Street SE
- South Capitol Street and N Street
- 1st Street SE and N Street SE
- New Jersey Avenue SE and N Street SE
- 1st Street SE and N Place SE
- 1st Street SE and O Street SE
- South Capitol Street and Potomac Avenue

In addition to the study intersections listed above, the following intersection are included in the future analyses:

- 1½ Street SE and N Place SE
- 1½ Street SE and DC Water Occupied Sites Parcel F1 Driveway
- DC Water Occupied Sites Parcel F1 Driveway and N Place SE
- DC Water PUD and N Place SE

Intersection capacity analyses were examined from the October 1, 2013 DC Water Occupied Sites PUD TIS for the existing conditions at each intersection within the study area during the morning and afternoon peak hours, as well as for future conditions without the proposed development. Given the age of the existing data analyzed in the October 1, 2013 TIS, a review of updated existing count data as presented in the October 13, 2014 Transportation Impact Study for 1244 South Capitol Street SE noted 2014 through volumes along M Street and South Capitol Street noted that the 2014 existing volumes at most locations were less than the 2016 background volumes noted in the October 1, 2013 TIS. Given the residential developments that were occupied at the time of the 2014 data that were included in the 2016 background analysis the forecasts from the October 1, 2013 TIS were noted to still be valid for purposes of this analysis. It should also be noted that given the future uncertainty of the completion of Canal Street between N Street and N Place as well as the completion of Tingey Square, separate scenarios depicting the presence of these two infrastructure improvements were reviewed for impacts.

As such, the study scenarios are as follows:

- Existing Conditions
- Future Conditions without Development and with Canal Street

- Future Conditions without Development and without Canal Street
- Future Conditions without Development and with Tingey Square
- Future Conditions with Development and Canal Street
- Future Conditions with Development and without Canal Street
- Future Conditions with Development and with Tingey Square

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.

3.2.2 Traffic Volume Assumptions

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

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 a “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 most conservative scenario, when the system traffic volumes are the highest. The use of “typical” weekday morning and afternoon peak hours are used to ensure that conclusions regarding adverse impacts and their respective mitigation measures 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 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 “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 Thursday, March 21, 2013, as reported in the October 1, 2013 DC Water Occupied Sites PUD TIS. In addition to these traffic counts, additional volumes were obtained from the files of Gorove/Slade for several of the study area intersections. These traffic volumes were collected on Tuesday, September 14, 2010; Wednesday, September 15, 2010; Wednesday, October 6, 2011; and Wednesday, March 28, 2012, also as reported in the October 1, 2013 DC Water Occupied Sites PUD TIS. These count dates represent “typical” weekdays and weekends when the DC public school systems were in session, as well as the surrounding counties in Maryland and Virginia. The “typical” weekdays also represent time periods that include normal operation for other major traffic generators in the study area.

The morning and afternoon weekday peak hours for the system of intersections being studied occurred between 7:45 – 8:45 AM and 4:30 – 5:30 PM, respectively. Existing peak hour traffic volumes as reported in the October 1, 2013 DC Water Occupied Sites PUD TIS are shown on Figure 13 and Figure 14 for the morning and afternoon peak hours. Figure 15 and Figure 16 show the peak hour pedestrian volumes collected and reported in the October 1, 2013 DC Water Occupied Sites PUD TIS.

Future Conditions without Development and with Canal Street

The traffic projections for the future condition without the development consist of the traffic generated by background developments from the list in the Section 1.7.2 of this report and inherent traffic growth on the roadways added to the existing traffic volumes. Of the developments listed in Section 1.7.2 and as reported in the October 1, 2013 DC Water Occupied Sites PUD TIS, only those that meet the criteria of being approved and having an origin/destination within the study area were included in the Background scenario. The following developments fit the criteria for inclusion in the Background scenario:

- Akridge Half Street/Square 700
- Arthur Capper/Carrollsborg and Capitol Quarter (those parcels projected to be completed by 2016)
- The Yards at Southeast Federal Center (those parcels projected to be completed by 2016)
- Florida Rock/RiverFront on the Anacostia (those parcels projected to be completed by 2016)
- Square 699/Velocity (Phase 2)
- 1111 New Jersey Avenue
- Half Street Phase II/Monument Properties
- Square 701
- Camden South Capitol

- Building 170
- Ballpark Hotel
- DC Water Occupied Sites PUD (F1 Parcel)

Available background development traffic studies were used to determine the number of trips added for the background developments when developed for the October 1, 2013 DC Water Occupied Site PUD TIS. This includes the “Monument Ballpark – Square 700 & 701 Comprehensive Transportation Review” performed by Wells + Associates in December 2006, the “Square 700 Development Traffic Impact Assessment” performed by Gorove/Slade in January 2009, the “RiverFront on the Anacostia PUD Comprehensive Transportation Review” performed by Gorove/Slade in August 2012, the “Square 701 Development Comprehensive Transportation Review” performed by Gorove/Slade in September 2012, the “Ballpark Hotel Comprehensive Transportation Review” performed by Gorove/Slade in October 2012, and the “One M Street Development Comprehensive Transportation Review” performed by Gorove/Slade in December 2012. These documents were used to determine the number of trips generated by the aforementioned background developments, the mode split percentages, and the trip routing.

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). 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 7, shown below, summarizes the mode split assumptions for the background developments. Table 8 shows the total number of trips generated by the background developments. (Of note, the methodology outlined above for the background trip generation was utilized in previous studies, as approved by DDOT. This includes the Transportation Impact Studies performed for the RiverFront on the Anacostia PUD, the Square 701 Development, the Ballpark Hotel Development, the One M Street Development, and the DC Water Occupied Sites PUD.)

Table 7: Mode Split Assumptions for Background Developments

Land Use	Mode Split			
	<i>Vehicle</i>	<i>Transit</i>	<i>Walk</i>	<i>Bike</i>
Office	50%	35%	10%	5%
Retail/Restaurant	25%	35%	30%	10%
Residential	35%	45%	15%	5%
Hotel	35%	45%	15%	5%

Table 8: Background Development Trip Generation

Land Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Vehicle Trips						
Retail	119	76	195	324	314	638
Residential	98	351	449	337	187	524
Office	687	94	781	127	617	744
Hotel	80	51	131	74	77	151
Total Vehicle Trips	984	572	1,556	862	1,195	2,057

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 (MWCOC) 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 MWCOC 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 MWCOC data for Southwest Waterfront aggregated all land uses for each TAZ. Figure 12 shows the direction of approach for the background developments.

In addition to the background developments, other traffic increased due to inherent growth on the study area roadways were accounted for with a 1.5% per year growth rate compounded annually over the study period, as reported in the October 1, 2013 DC Water Occupied Sites PUD TIS. This rate was estimated based on a comparison between existing and past average annual weekday traffic volumes obtained from DDOT for 2002-2010. This growth rate was applied to all traffic volumes in the study area, with the exception of those traveling along South Capitol Street. The traffic volumes obtained for South Capitol Street show a negative percent growth rate over the 2002-2010 period. However, a 0.25% per year growth rate, compounded annually over the study period, was applied to the South Capitol Street volumes in order to provide a conservative analysis.

The traffic volumes generated by the background development and the inherent growth were added to the existing traffic volumes in order to establish the future traffic volumes without the proposed development. The traffic volumes for the Background Conditions are shown on Figure 17 and Figure 18 for the morning and afternoon peak hours with the inclusion of Canal Street.

Future Conditions without Development without Canal Street

Since the date of completion for Canal Street between N Place and N Street at New Jersey Avenue is unknown, an additional scenario examining the future impacts without the construction of Canal Street was also examined. Based on the omission of this connection the background trips were developed, as shown on Figure 19 and Figure 20, for the morning and afternoon peak hours.

Future Conditions without Development with Tingey Square

As with Canal Street, since the date of completion for Tingey Square at New Jersey Avenue, N Street, 2nd Street, and Tingey Street is unknown, an additional scenario examining the future impacts without the construction of Tingey Square was also examined. Based on the omission of this connection the background trips were developed, as shown on Figure 21Figure 27, for the morning and afternoon peak hours.

Future Conditions with Development and Canal Street

As reported in the October 1, 2013 DC Water Occupied Sites PUD TIS, 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 22. This trip distribution assumes full buildout of the road network immediately north of the site, including the connection of Canal Street from N Place to N Street at New Jersey Avenue. Based on this review and the proposed site access locations shown previously on Figure 8, the site-generated trips shown in Section 3.1 were distributed through the study area intersections, as shown on Figure 23 and Figure 24 for the morning and afternoon peak hours. It should be noted that for purposes of this analysis, the trips associated with the development of the DC Water PUD were distributed to both the 20-space on-site parking lot as well as to the future DC Water Occupied Sites Parcel F1 parking garage. It is also noted that while the DC Water PUD plans to provide parking on the location of the DC Water Occupied Site Parcel F1, the trip distribution to and from this parking lot would be similar to that of those that would be distributed to the Parcel F1 garage, with the trips entering and exiting N Place from First Street at a similar location in either scenario.

The traffic volumes for the Future conditions with Canal Street were calculated by adding the development-generated traffic volumes to the Background traffic volumes with Canal Street. Thus the future condition with the proposed development scenario includes traffic generated by: existing volumes, background development through the year 2016, inherent growth on the study area roadways, rerouted existing surface parking trips, and the proposed DC Water PUD. The Future traffic volumes with Canal Street are shown on Figure 25 and Figure 26 for the morning and afternoon peak hours.

Future Conditions with Development without Canal Street

As with the background condition described above, an additional scenario examining the impacts of the development without the construction of Canal Street was also examined since the date of completion for Canal Street between N Place and N Street at New Jersey Avenue is unknown. Based on the omission of this connection 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 27 and Figure 28 for the morning and afternoon peak hours.

The traffic volumes for the Future conditions without Canal Street were calculated by adding the development-generated traffic volumes to the Background traffic volumes without Canal Street. Thus the future condition with the proposed development scenario includes traffic generated by: existing volumes, background development through the year 2016, inherent growth on the study area roadways, and the proposed DC Water PUD. The Future traffic volumes without Canal Street are shown on Figure 29 and Figure 30 for the morning and afternoon peak hours.

Future Conditions with Development with Tingey Square

As with the background condition described above, an additional scenario examining the impacts of the development with the construction of Tingey Square was also examined since the date of completion for Tingey Square is unknown. Based on this new connection 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 31 for the morning and afternoon peak hours.

The traffic volumes for the Future conditions with Tingey Square were calculated by adding the development-generated traffic volumes to the Background traffic volumes with Tingey Square. Thus the future condition with the proposed development scenario includes traffic generated by: existing volumes, background development through the year 2016, inherent growth on the study area roadways, and the proposed DC Water PUD. The Future traffic volumes without Canal Street are shown on Figure 32 for the morning and afternoon peak hours.

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.

Existing Conditions

As reported in the October 1, 2013 DC Water Occupied Sites PUD TIS, Gorove/Slade conducted field reconnaissance to confirm the existing lane configurations and traffic controls at the intersections within the study area, shown on Figure 33 and Figure 34. Existing signal timings and offsets were obtained from DDOT and confirmed during field reconnaissance.

Future Conditions with and without Development and without Canal Street

The lane configurations for the future conditions with and 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. At the time of this analysis, no specific plans for implementation had been developed. Even once specific improvement plans are made, no major roadway infrastructure changes will likely be implemented at the study area intersections. However, the roadway network did assume the completion of Canal Street for these scenarios. The new site driveway, as described previously in Section 2.1.1 and as shown on Figure 8 was also added to the roadway network for the future condition. The lane configurations and traffic controls for the conditions without Canal Street are shown on Figure 33 and Figure 34.

Future Conditions with and without Development and with Canal Street

The lane configurations for the future conditions with the proposed development and Canal Street are based on the lane configurations for the existing conditions with Canal Street. No roadway infrastructure or signal timing changes were assumed for the future conditions with development beyond those previously assumed. However, the new site driveway, as described previously in Section 2.1.1 and as shown on Figure 8 was added to the roadway network for the future condition. The lane configurations and traffic controls for the Future conditions with Canal Street are shown on Figure 35 and Figure 36.

Future Conditions with and without Development with Tingey Square

The lane configurations for the future conditions with the proposed development and Canal Street and Tingey Square are based on the lane configurations for the existing conditions with Canal Street and Tingey Square. No roadway infrastructure or signal timing changes were assumed for the future conditions with development beyond those previously assumed. The lane configurations and traffic controls for the Future conditions with Canal Street are shown on Figure 37.



Figure 12: Direction of Approach for Background Developments

3.2.4 Vehicular Analysis Results

Intersection capacity analyses were performed for the four 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 assumed 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 Technical Attachments. Table 9 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds) for the Existing and Background scenarios (with and without Canal Street). Table 10 shows the results of the capacity analyses for the Total Future scenarios with and without Canal Street.

3.2.5 Summary of Analysis Results and Mitigation Measures

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.

As reported in the October 1, 2013 DC Water Occupied Site PUD TIS, the majority of study intersections operate at acceptable conditions during the morning and afternoon peak hours for the Existing, Background, and Future scenarios. However, the following intersections operate under unacceptable conditions during one or more peak hour (although not as a result of the development of the DC Water PUD):

- South Capitol Street and I Street
- South Capitol Street (Ramp) and N Street
- South Capitol Street and M Street Northbound
- South Capitol Street and Potomac Avenue
- M Street and 5th Street

Recommendations for improvements at intersections with LOS F conditions are shown underlined. If needed, all improvements associated with the proposed DC Water PUD are shown as **bold underline**.

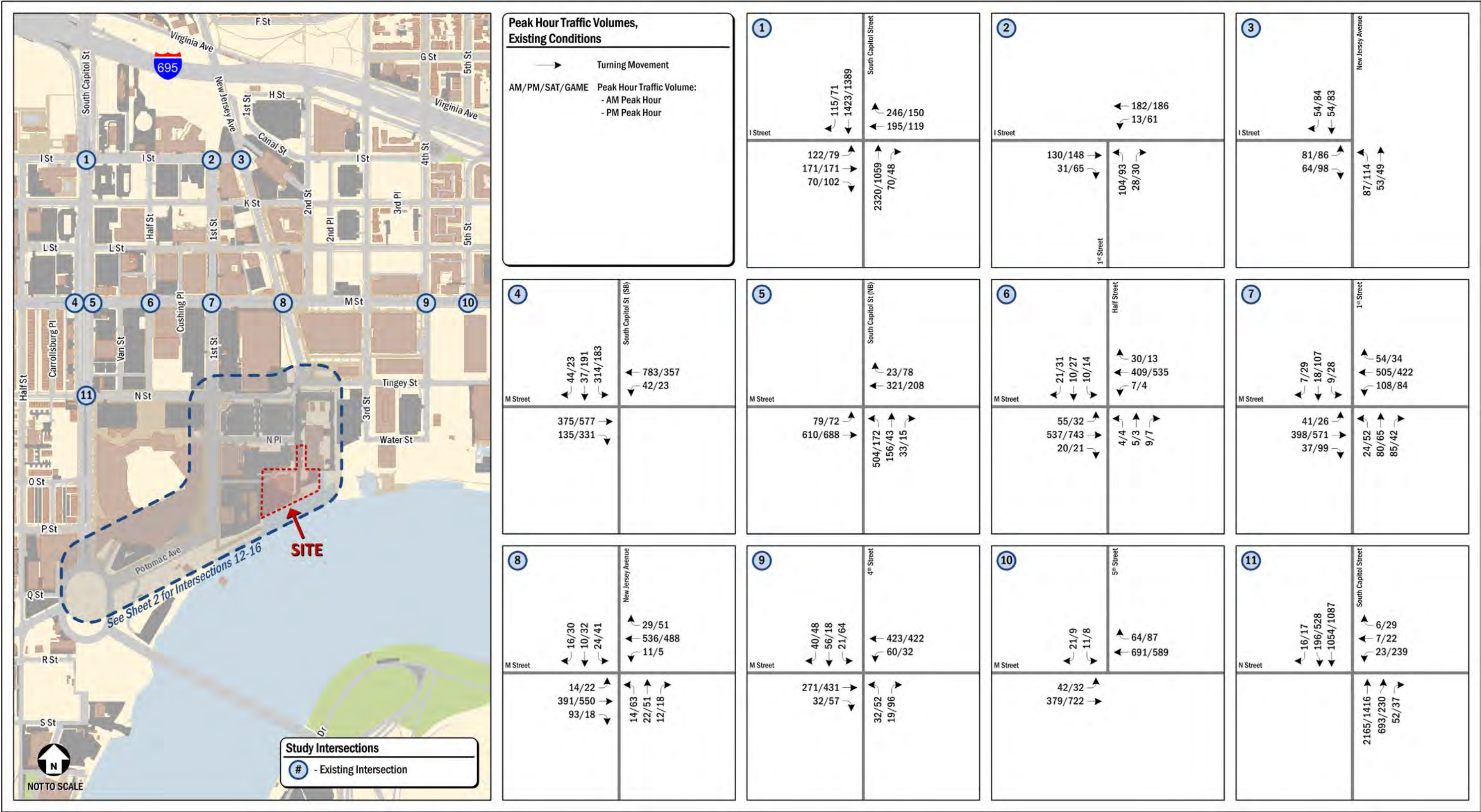


Figure 13: Existing Peak Hour Traffic Volumes (Sheet 1 of 2)

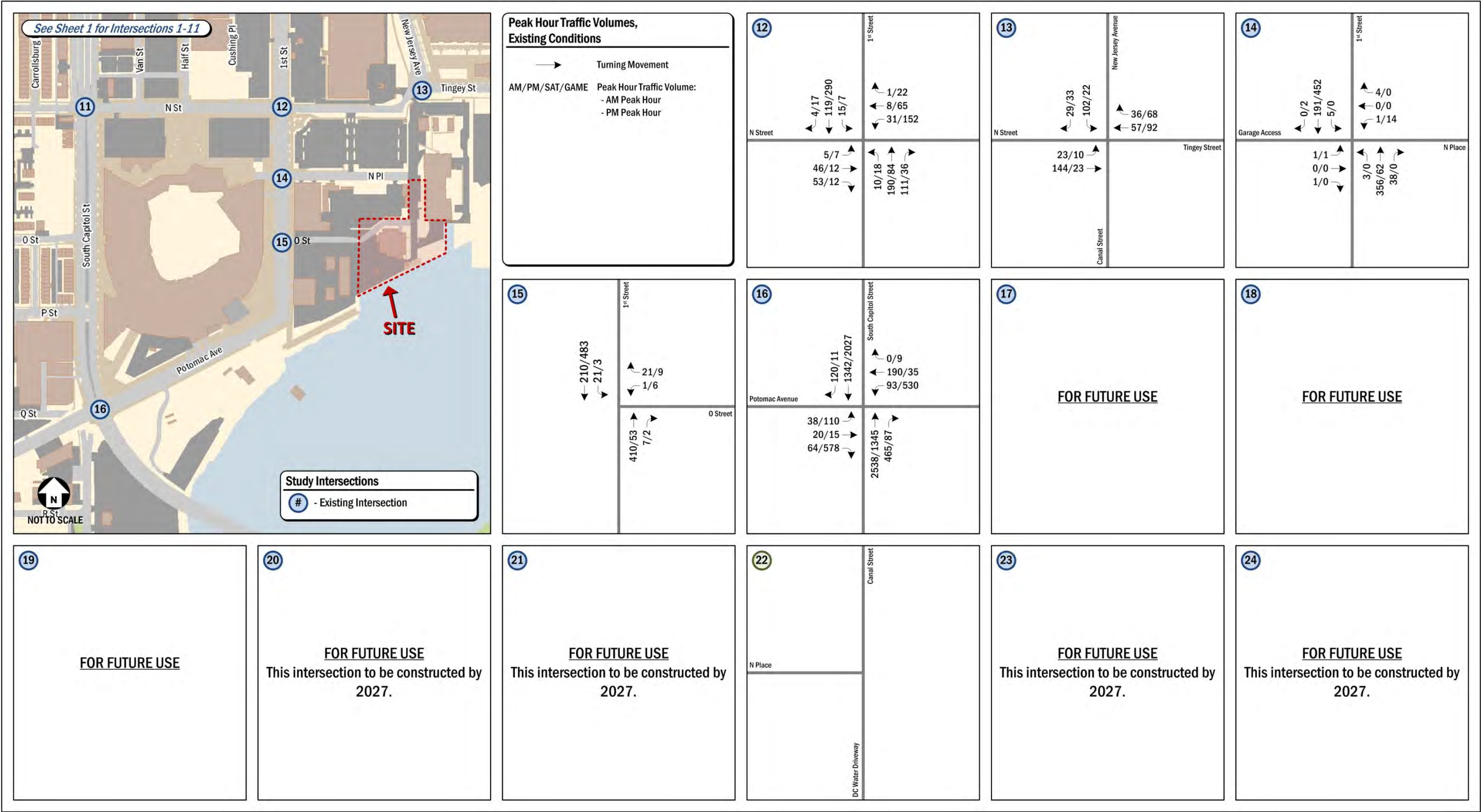


Figure 14: Existing Peak Hour Traffic Volumes (Sheet 2 of 2)

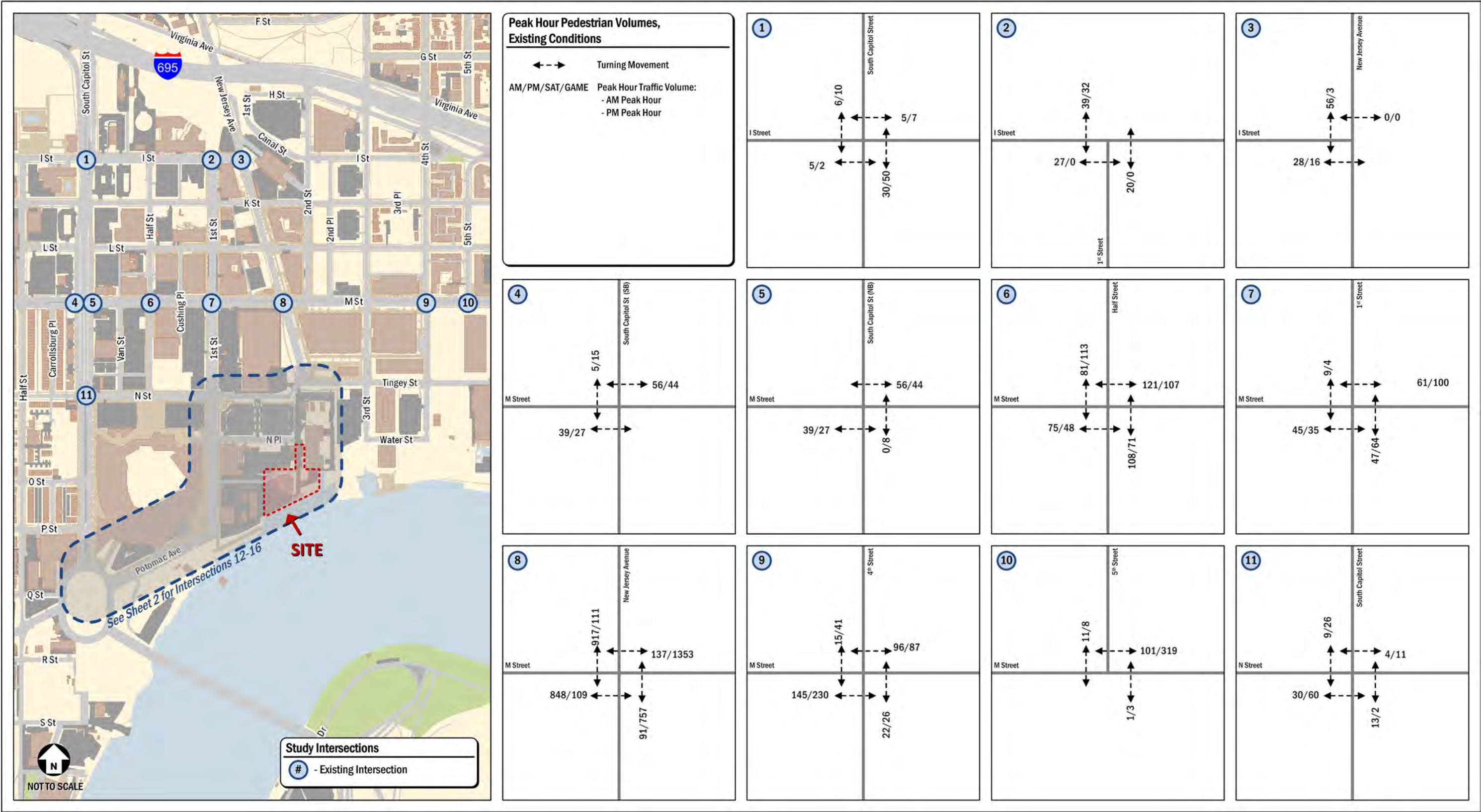


Figure 15: Existing Peak Hour Pedestrian Volumes (Sheet 1 of 2)

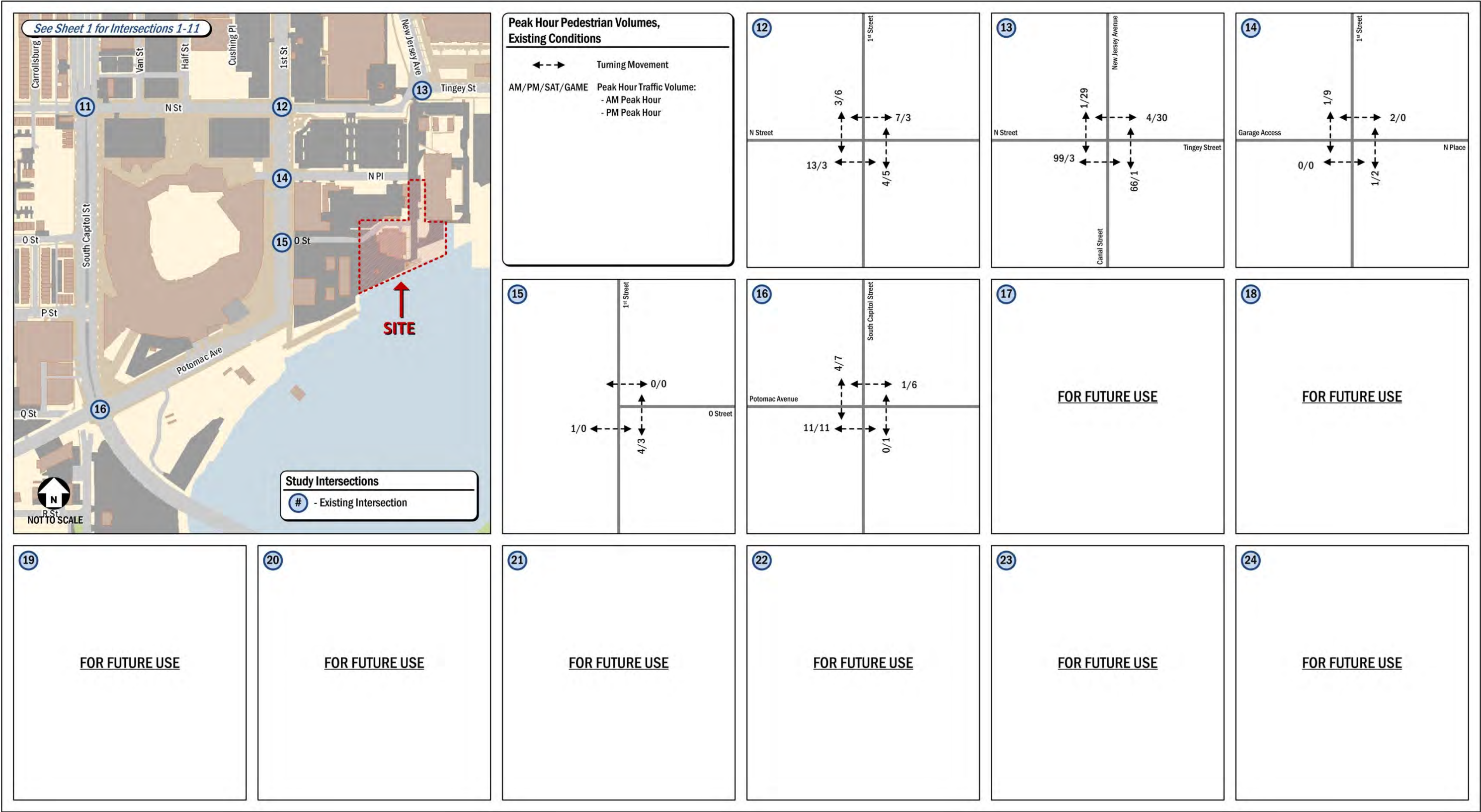


Figure 16: Existing Peak Hour Pedestrian Volumes (Sheet 2 of 2)



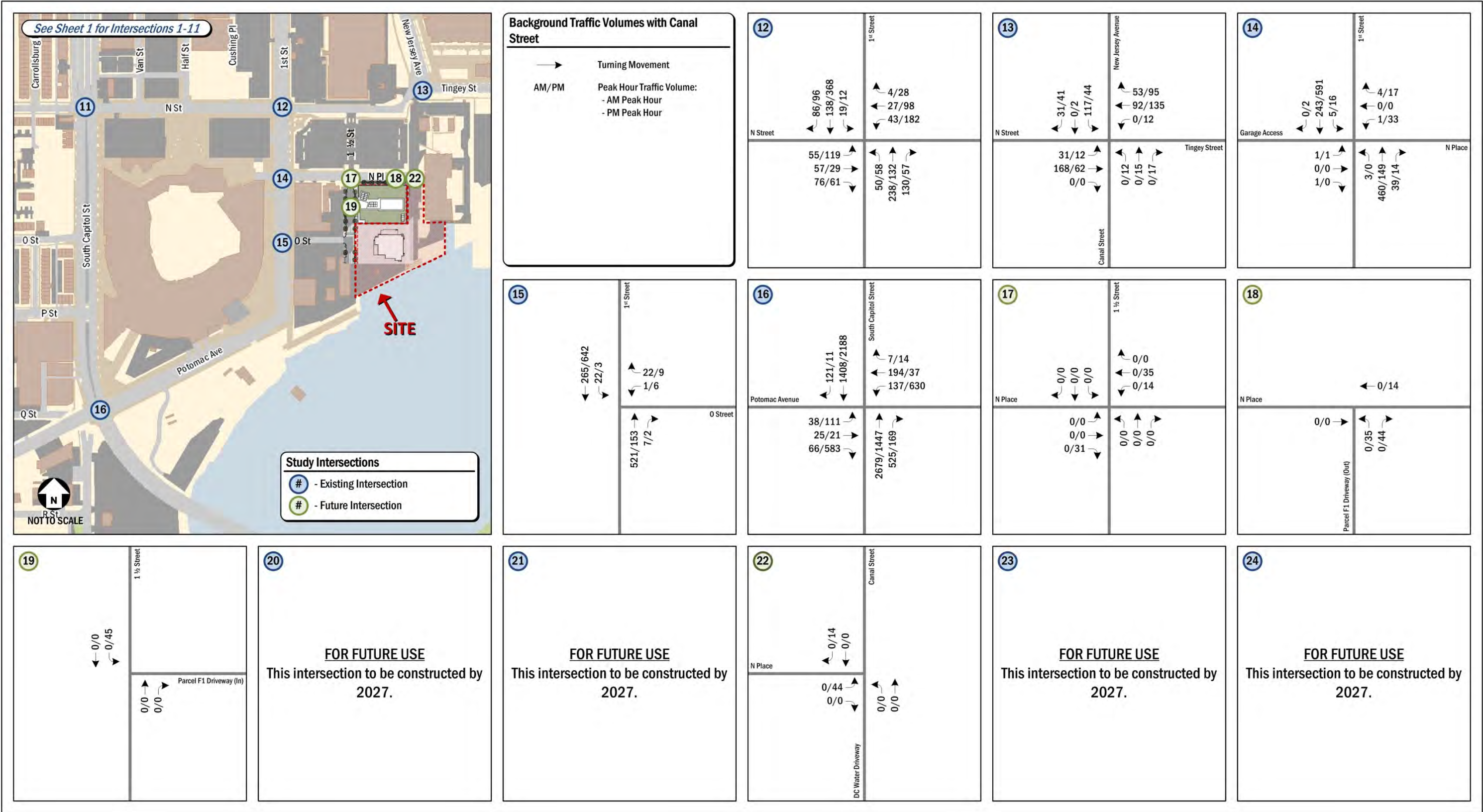


Figure 18: Background Peak Hour Traffic Volumes with Canal Street (Sheet 2 of 2)

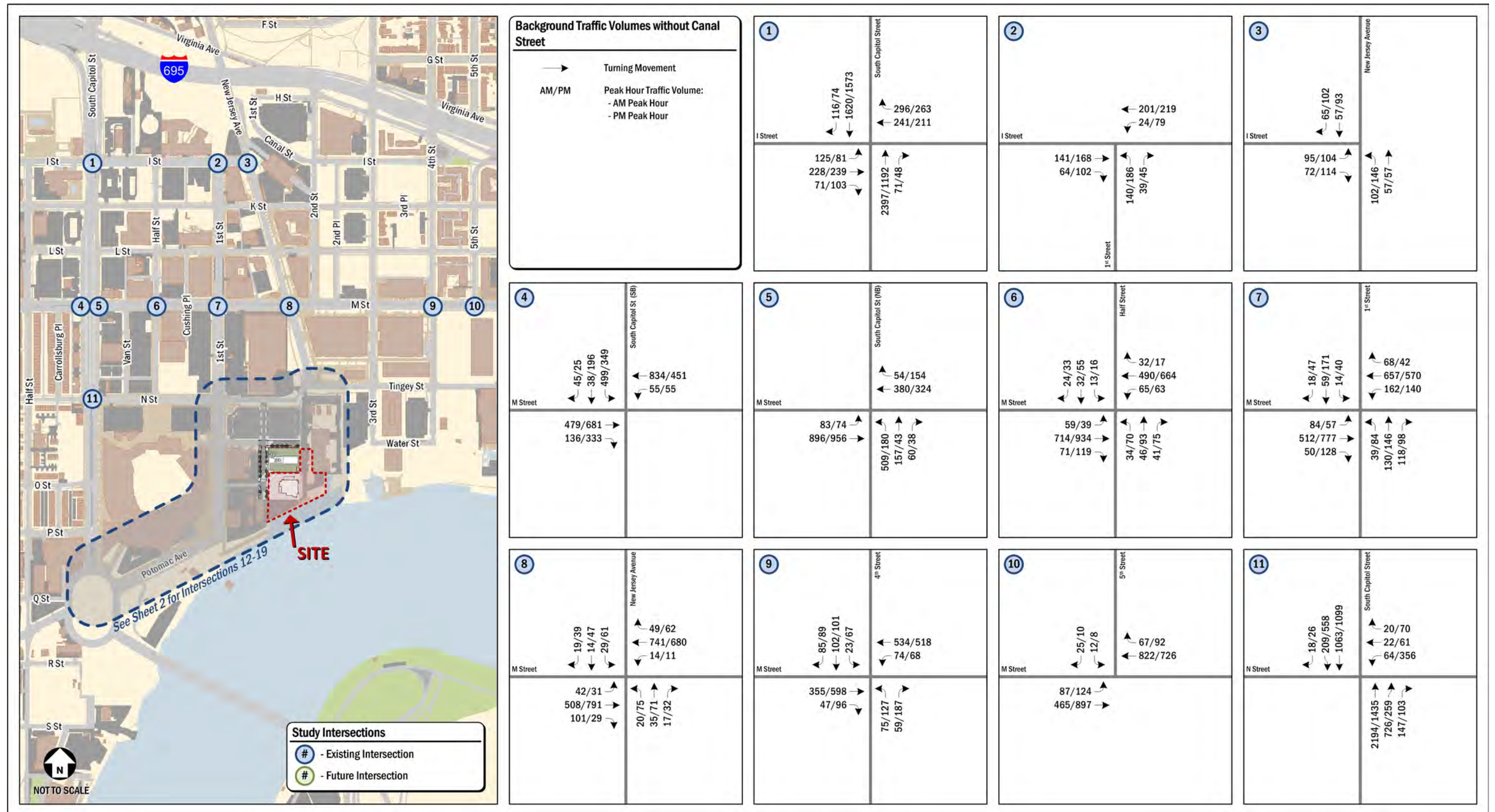


Figure 19: Background Peak Hour Traffic Volumes without Canal Street (Sheet 1 of 2)

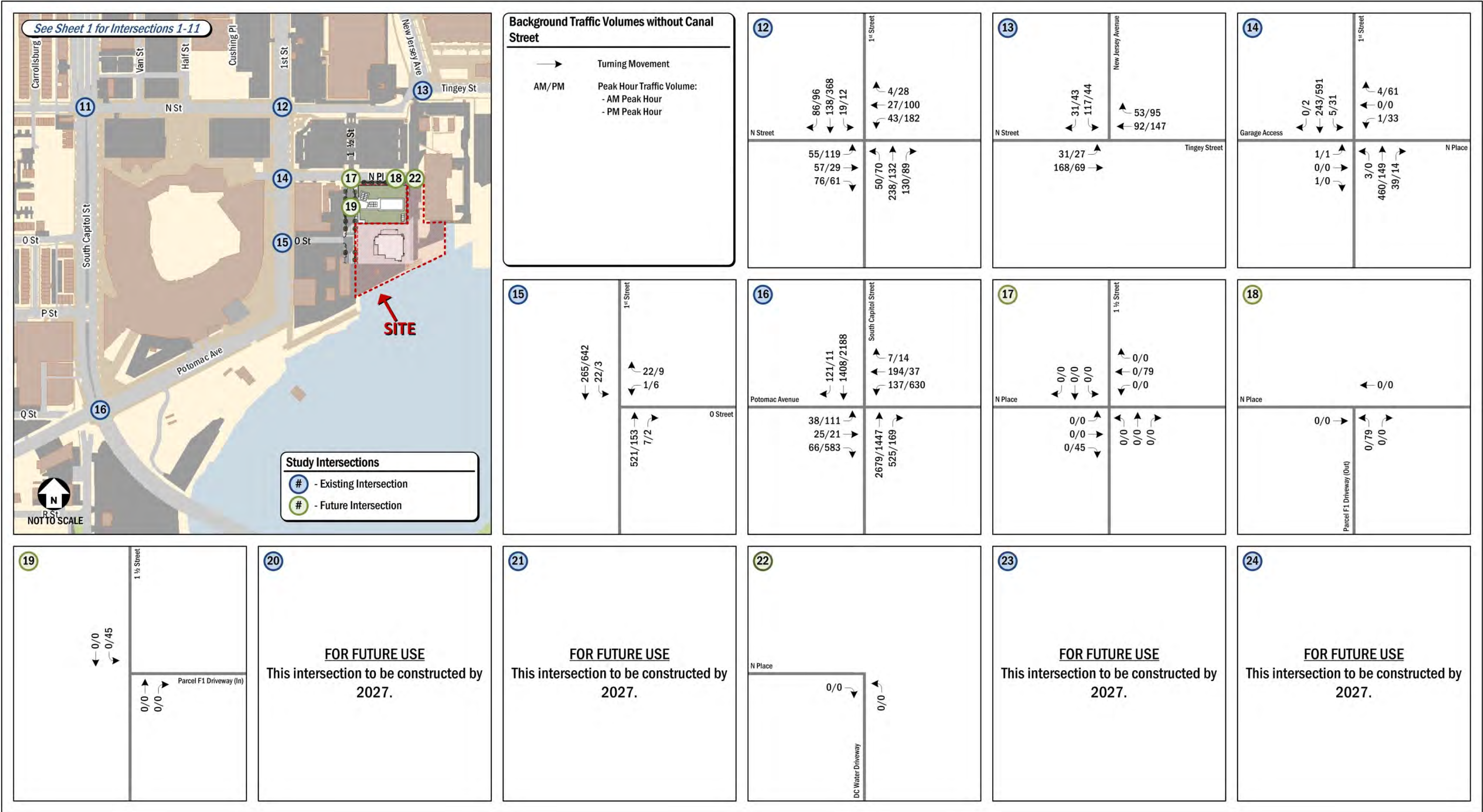


Figure 20: Background Peak Hour Traffic Volumes without Canal Street (Sheet 2 of 2)

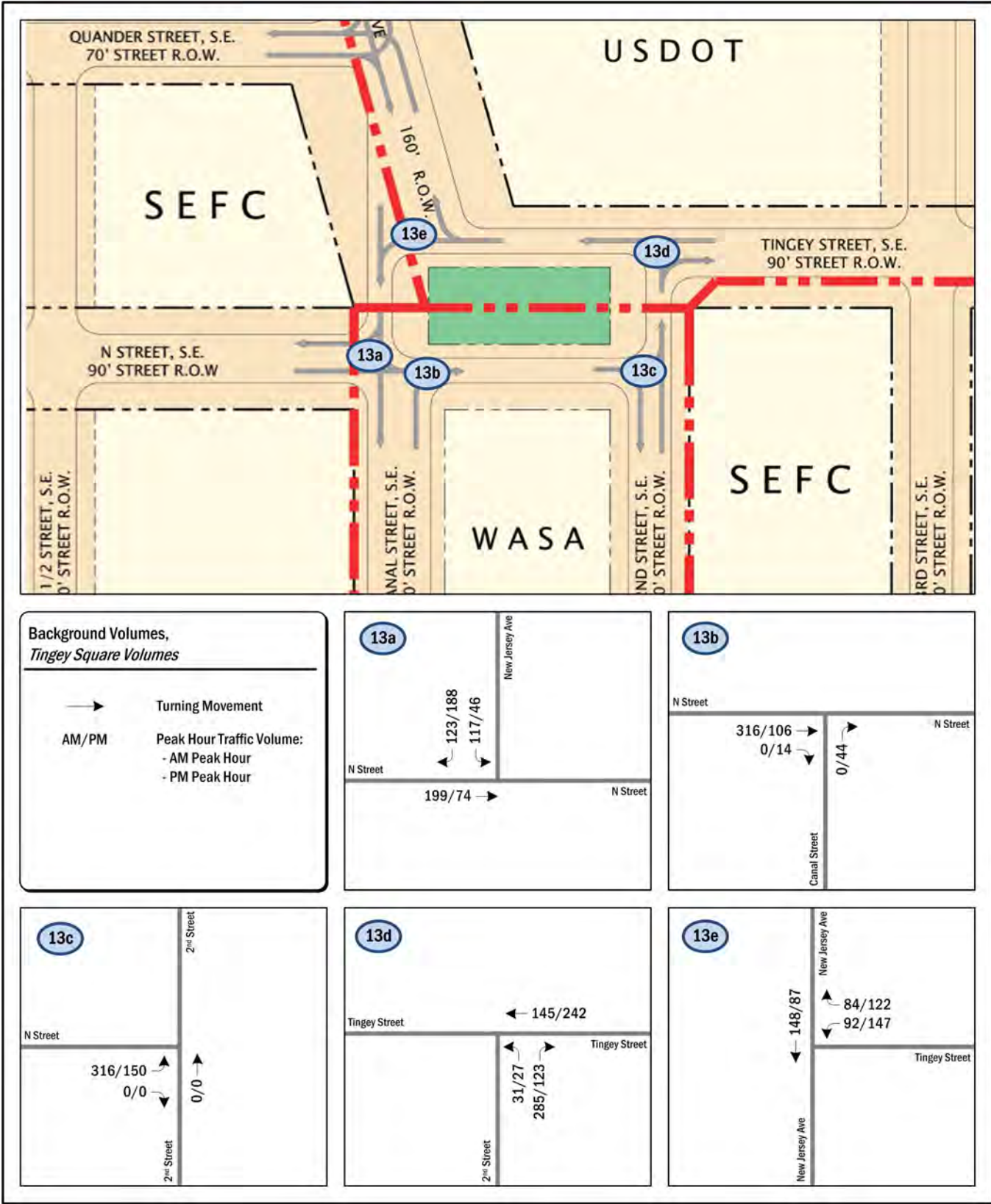


Figure 21: Background Peak Hour Traffic Volumes with Tingey Square

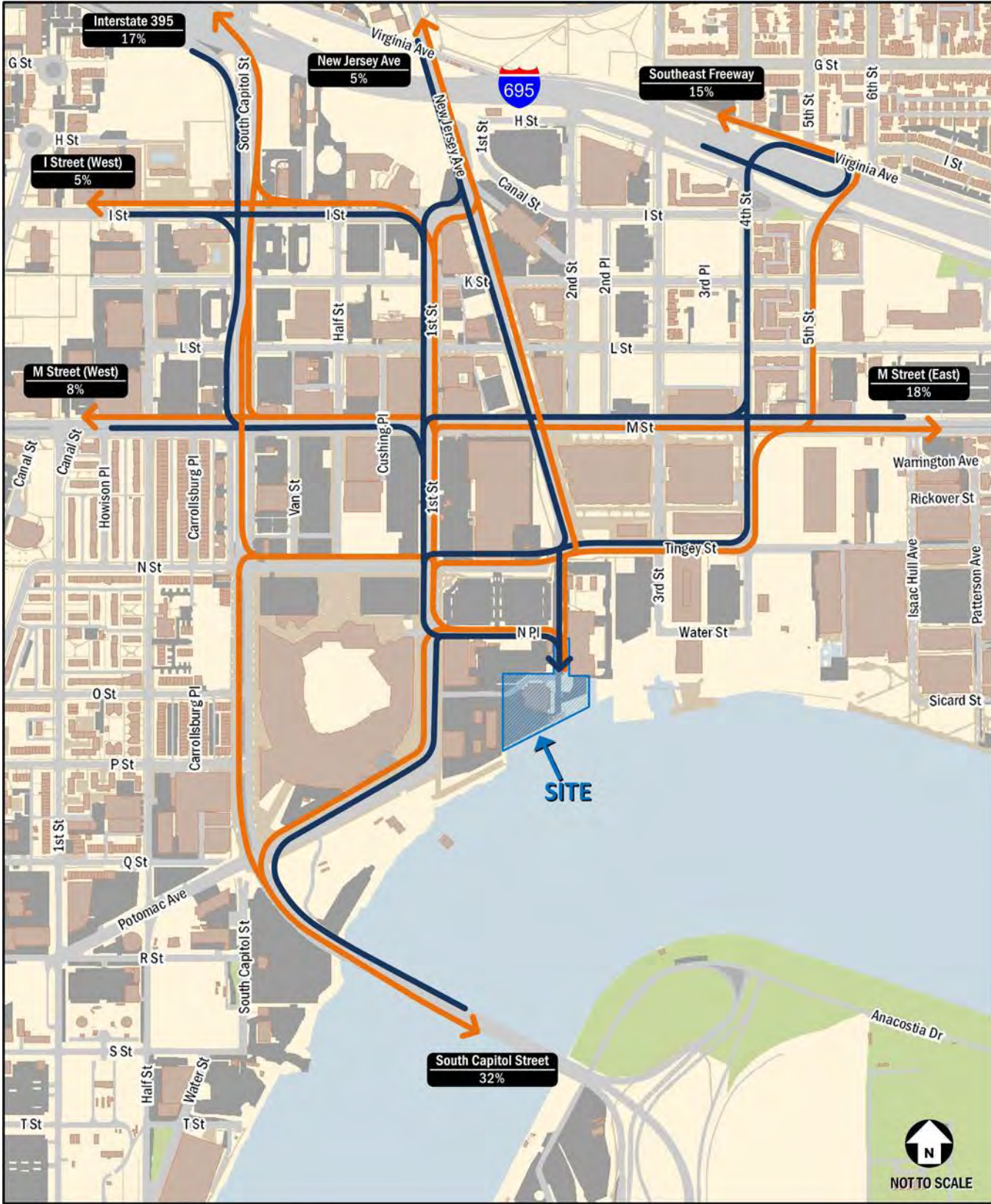


Figure 22: Direction of Approach for Site-Generated Traffic Volumes

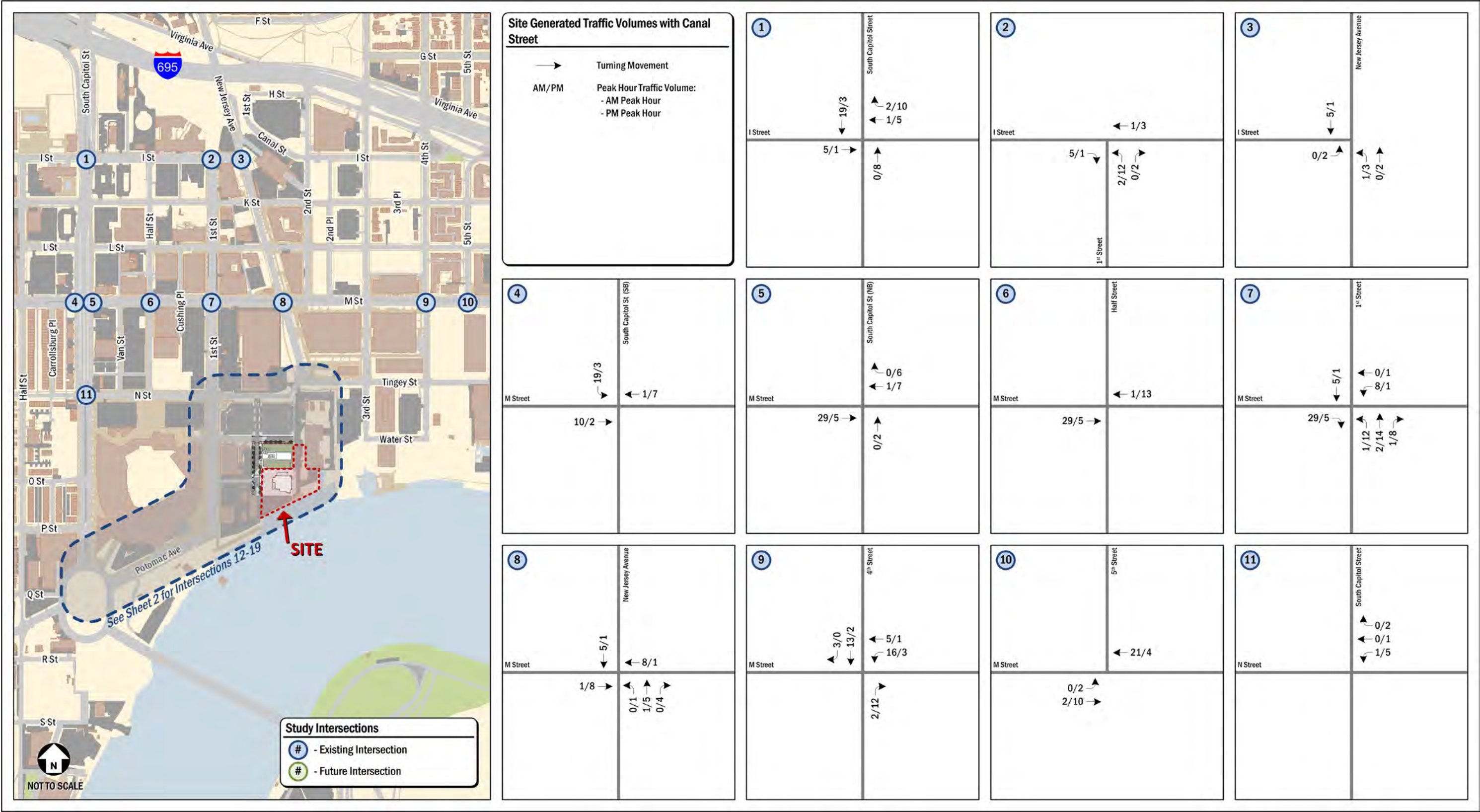


Figure 23: Site-Generated Peak Hour Traffic Volumes for Development with Canal Street (Sheet 1 of 2)

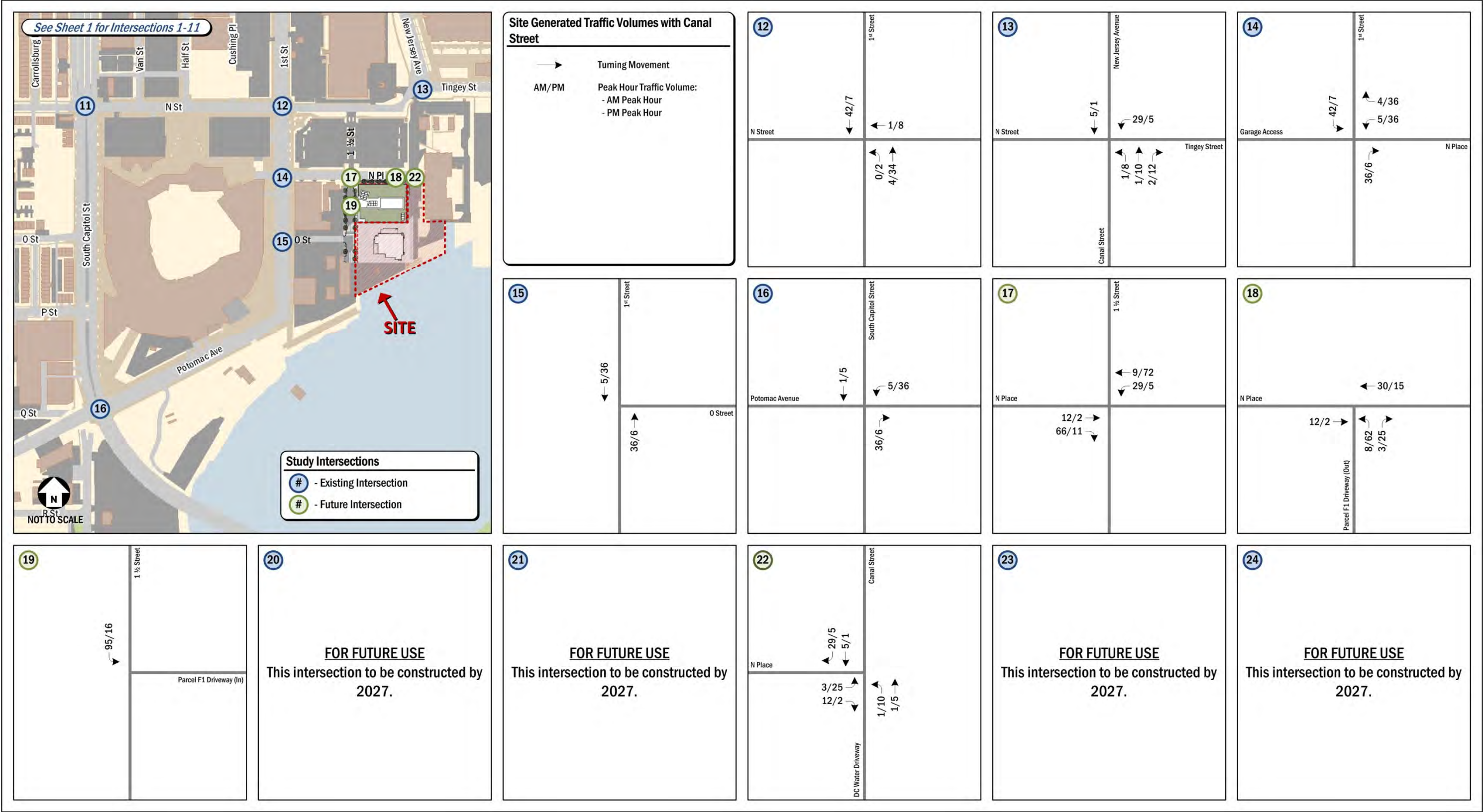


Figure 24: Site-Generated Peak Hour Traffic Volumes for Development with Canal Street (Sheet 2 of 2)

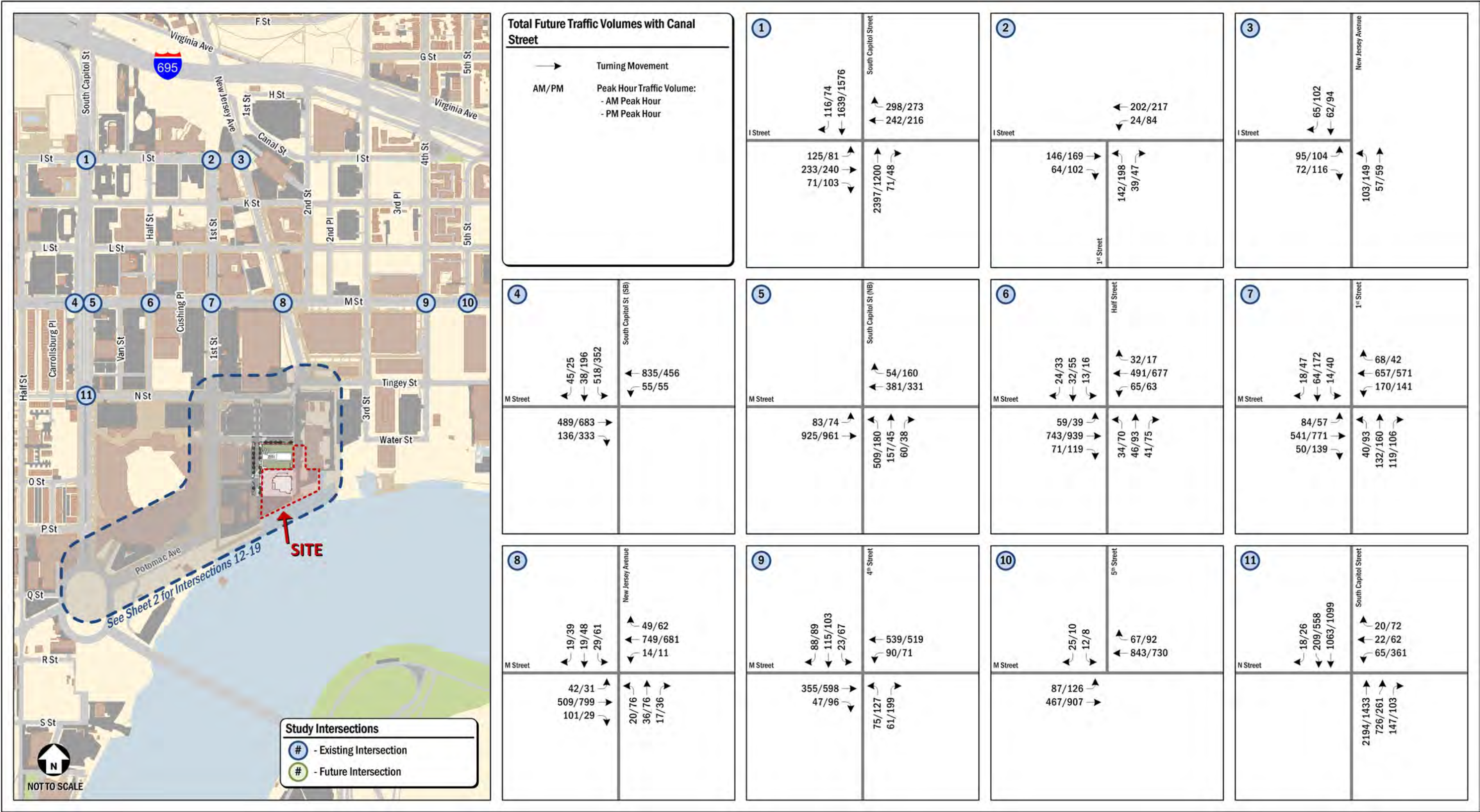


Figure 25: Future Peak Hour Traffic Volumes with Canal Street (Sheet 1 of 2)

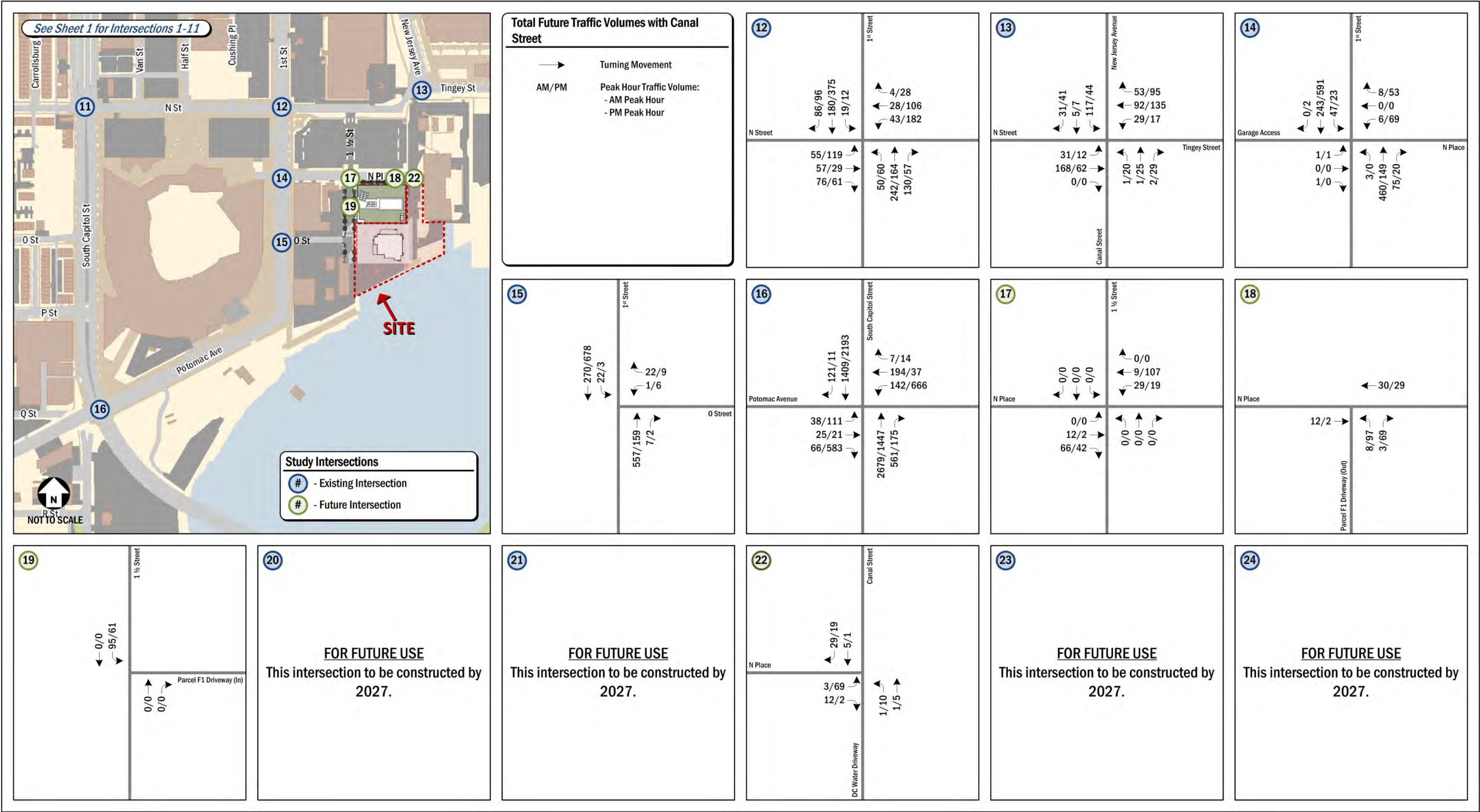


Figure 26: Future Peak Hour Traffic Volumes with Canal Street (Sheet 2 of 2)

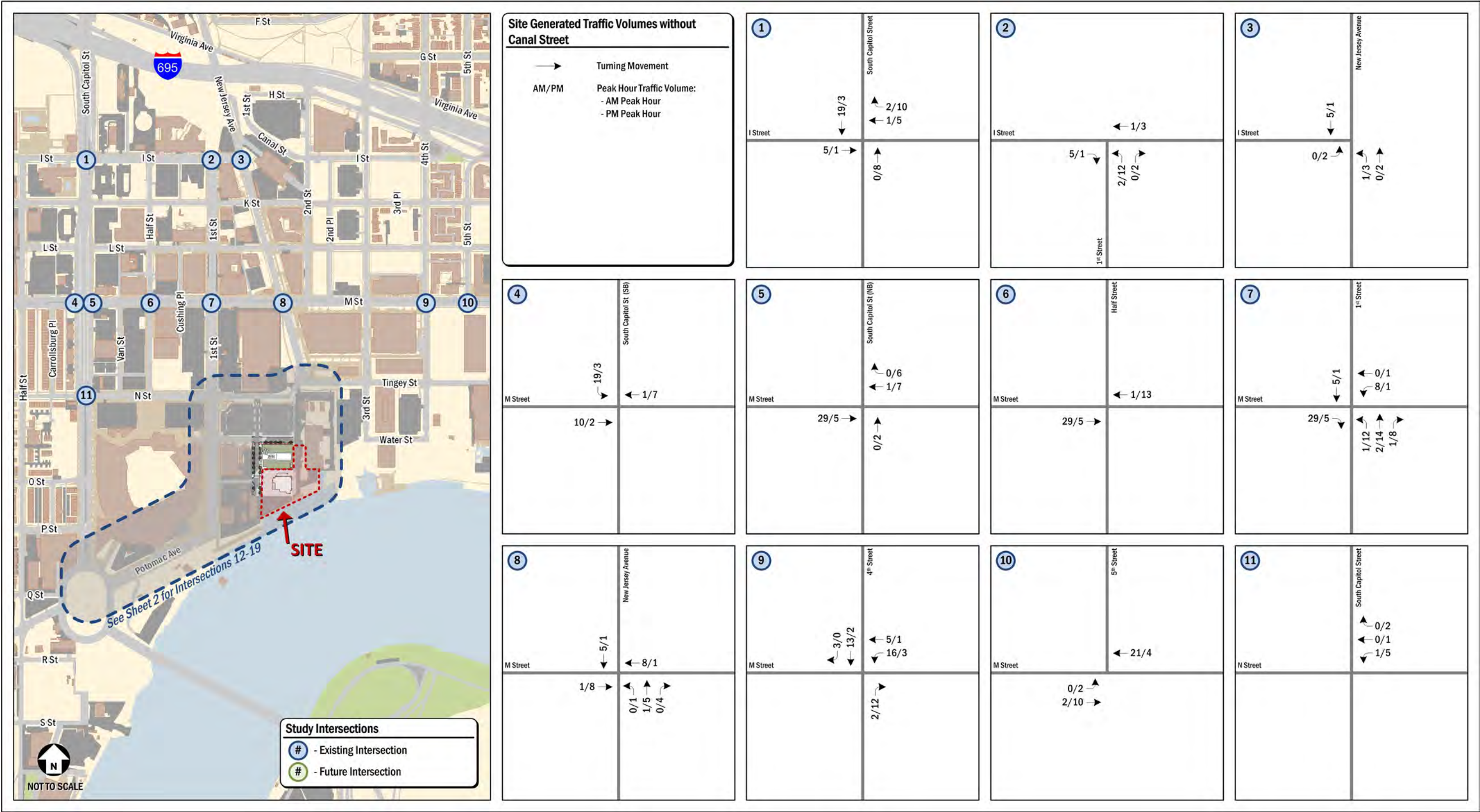


Figure 27: Site-Generated Peak Hour Traffic Volumes for Development without Canal Street (Sheet 1 of 2)

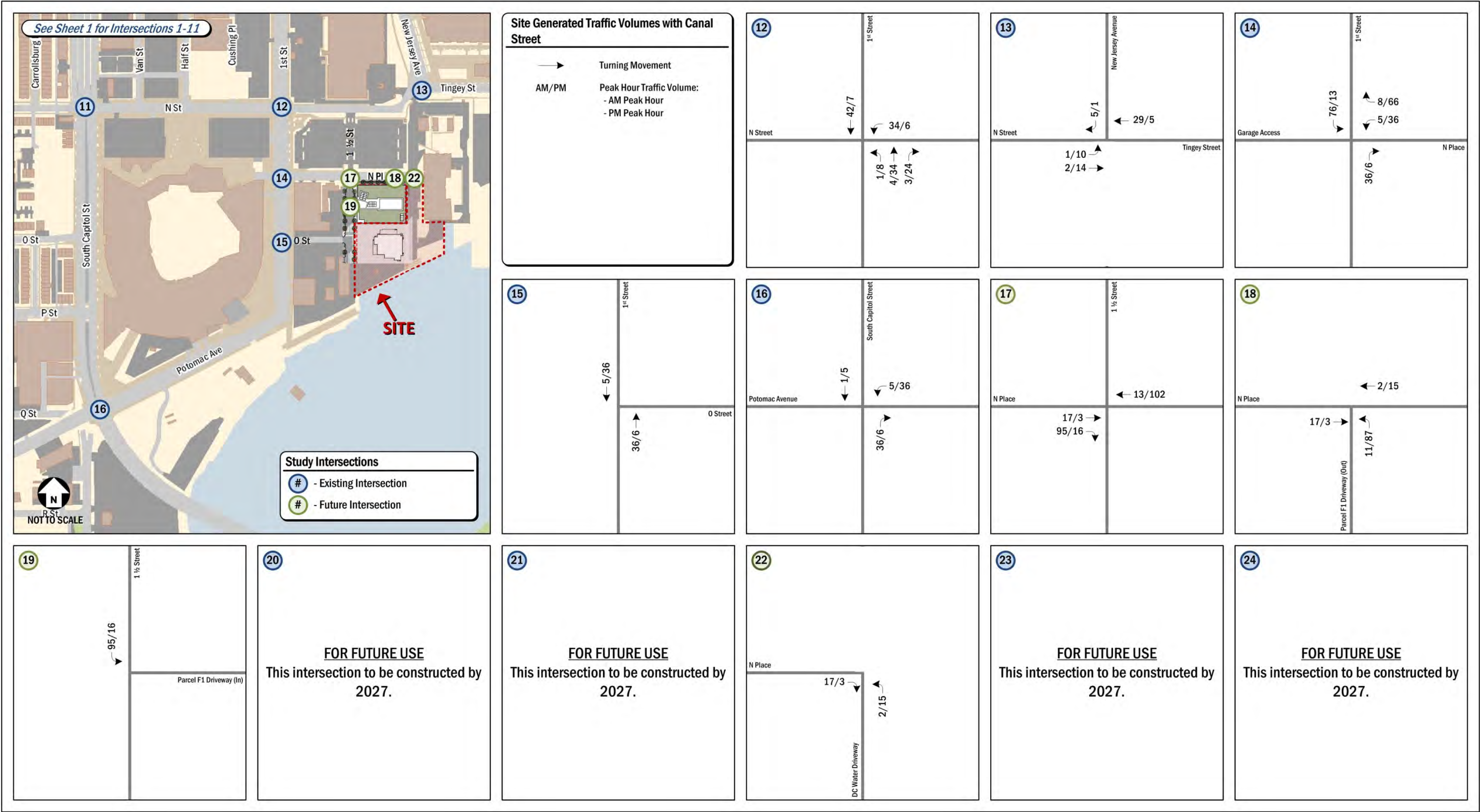
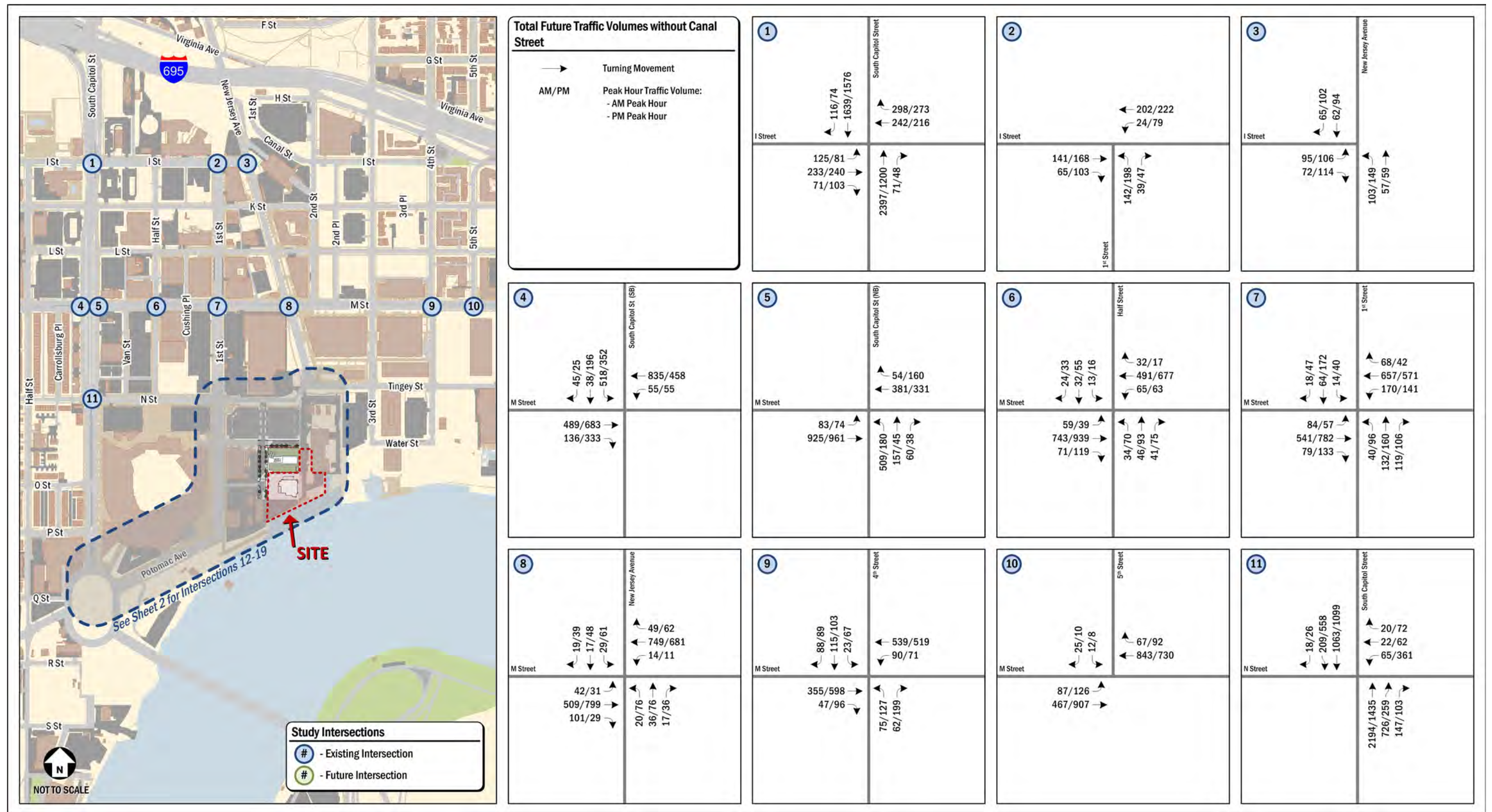
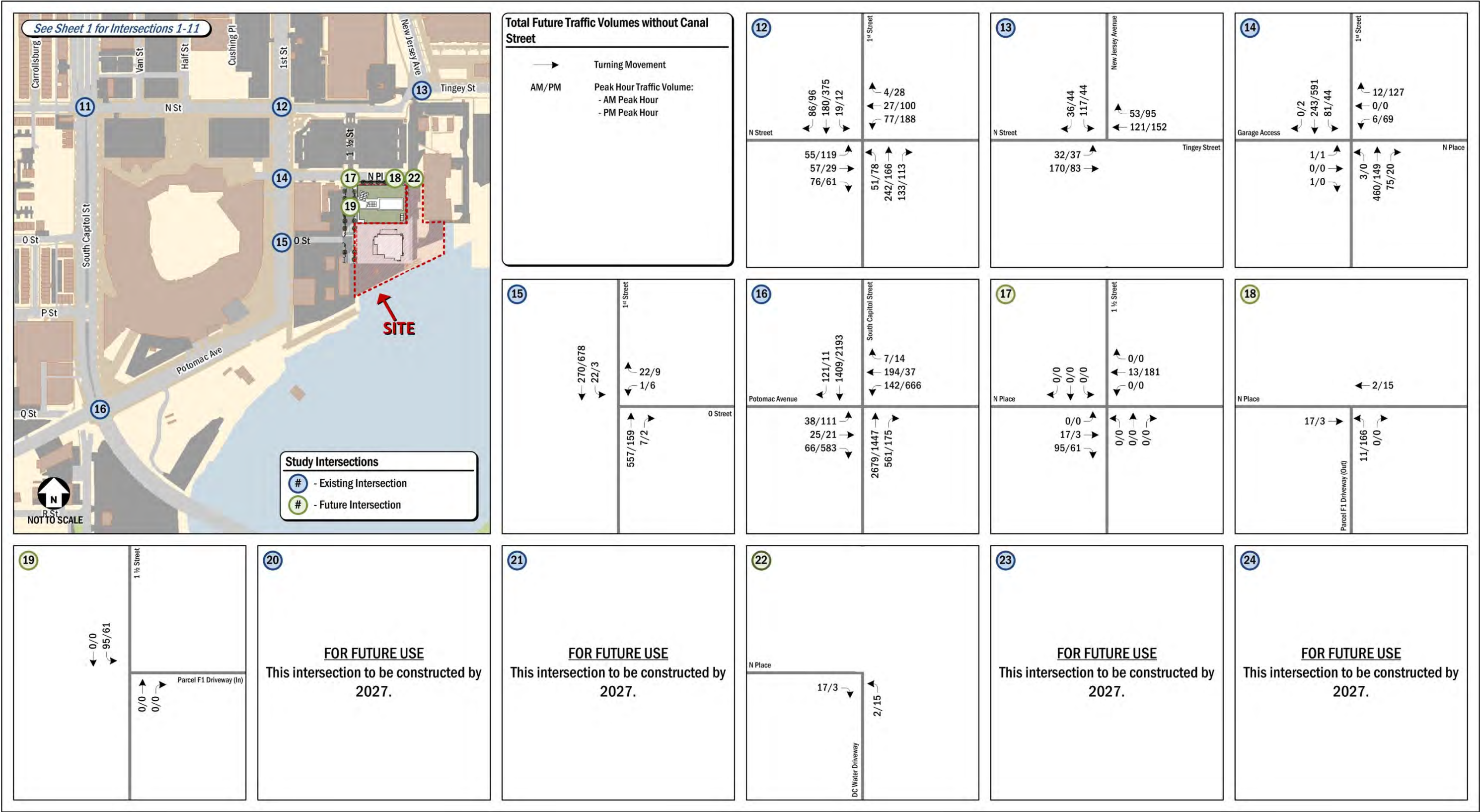


Figure 28: Site-Generated Peak Hour Traffic Volumes for Development without Canal Street (Sheet 2 of 2)



57



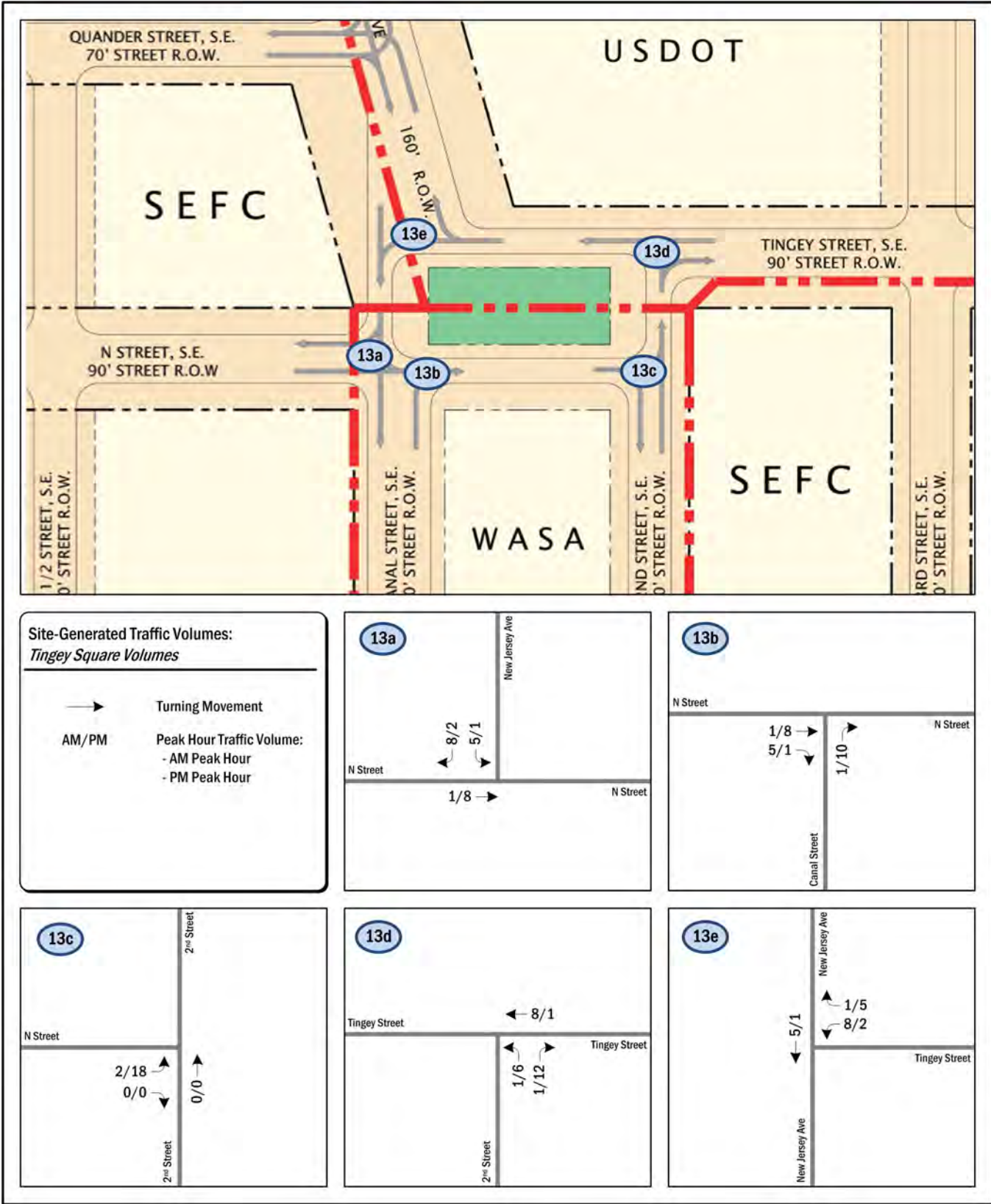


Figure 31: Site-Generated Peak Hour Traffic Volumes for Development with Tingey Square

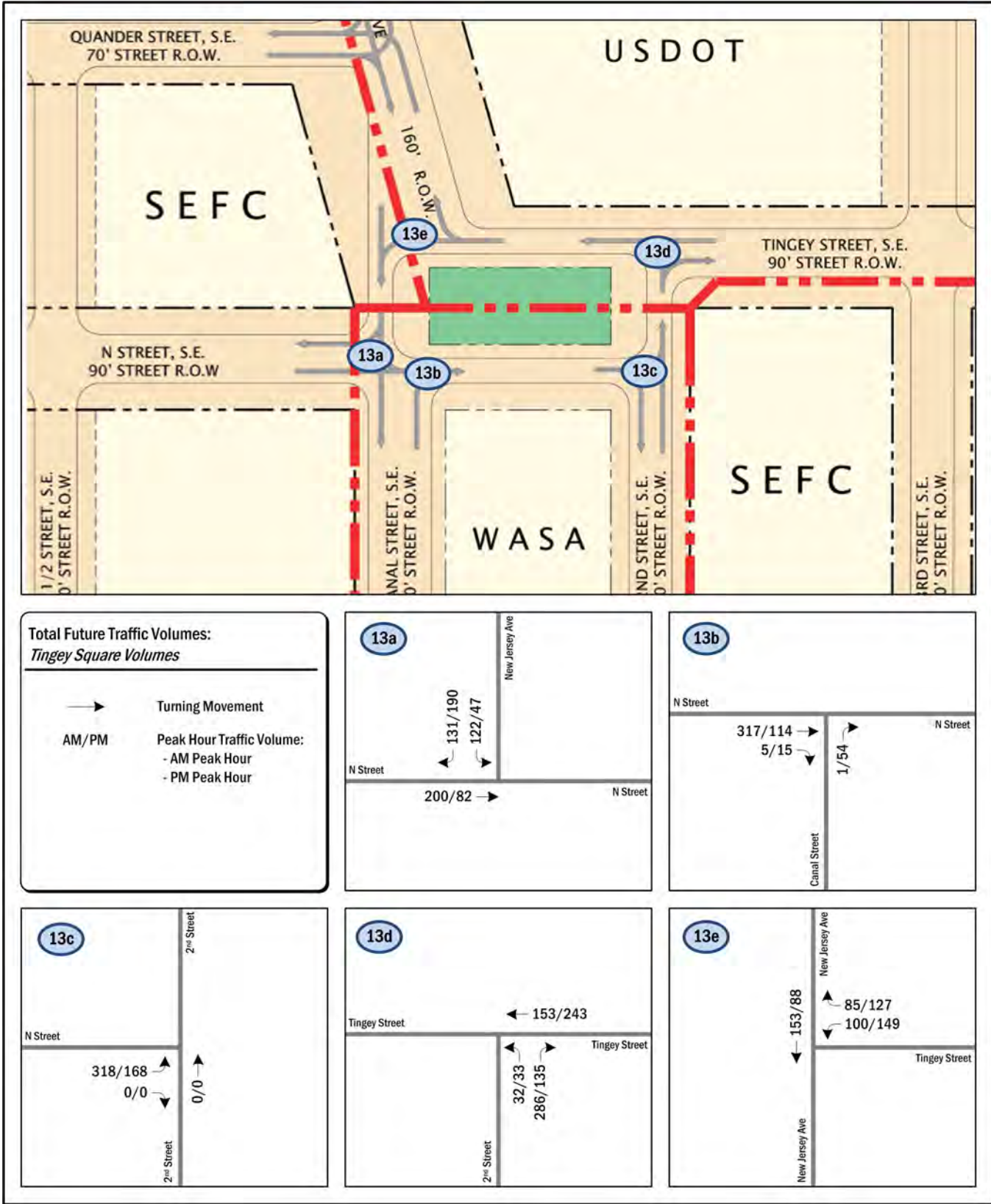


Figure 32: Future Peak Hour Traffic Volumes with Tingey Square

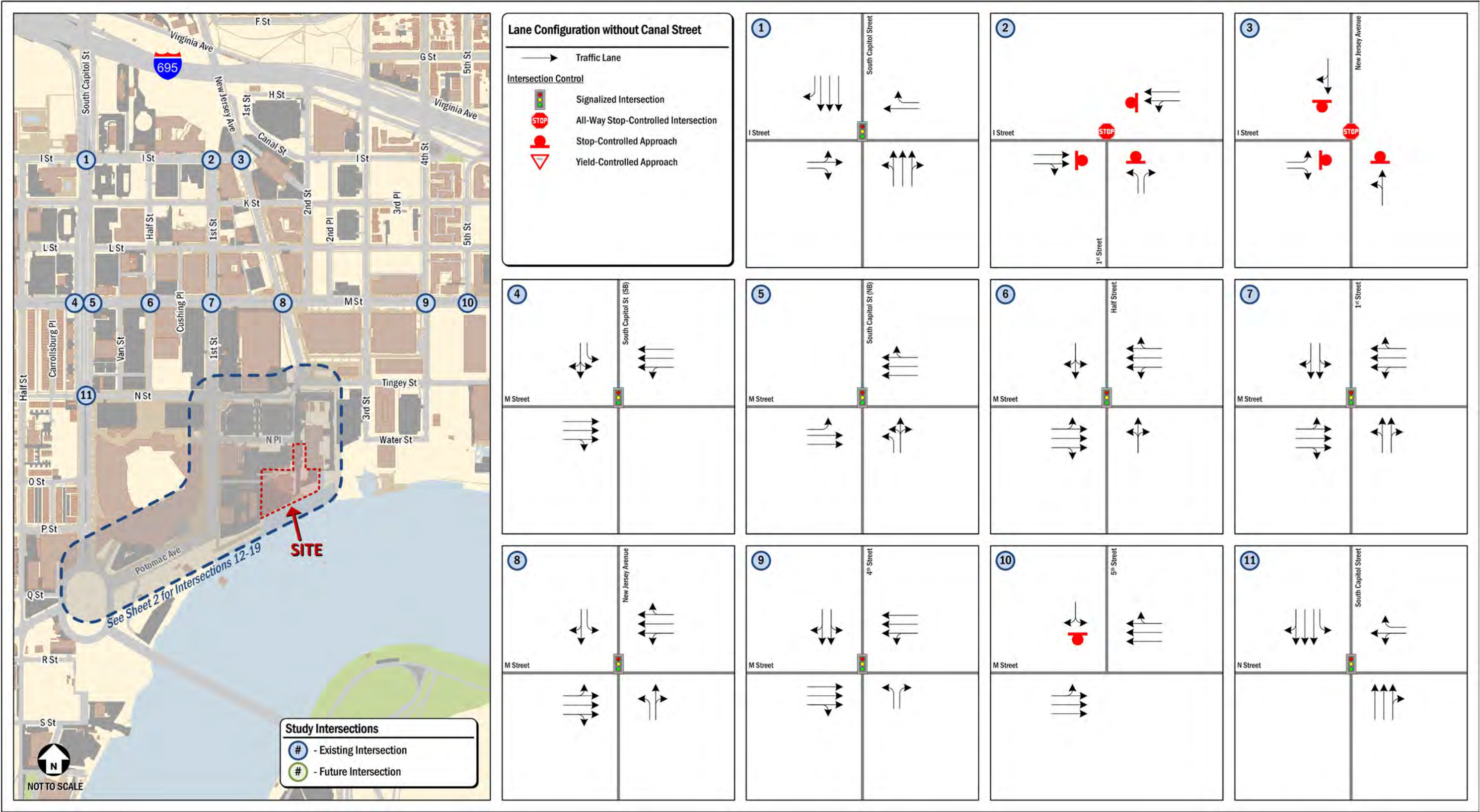


Figure 33: Existing, Background, and Future Peak Hour Traffic Controls and Lane Configurations without Canal Street (Sheet 1 of 2)

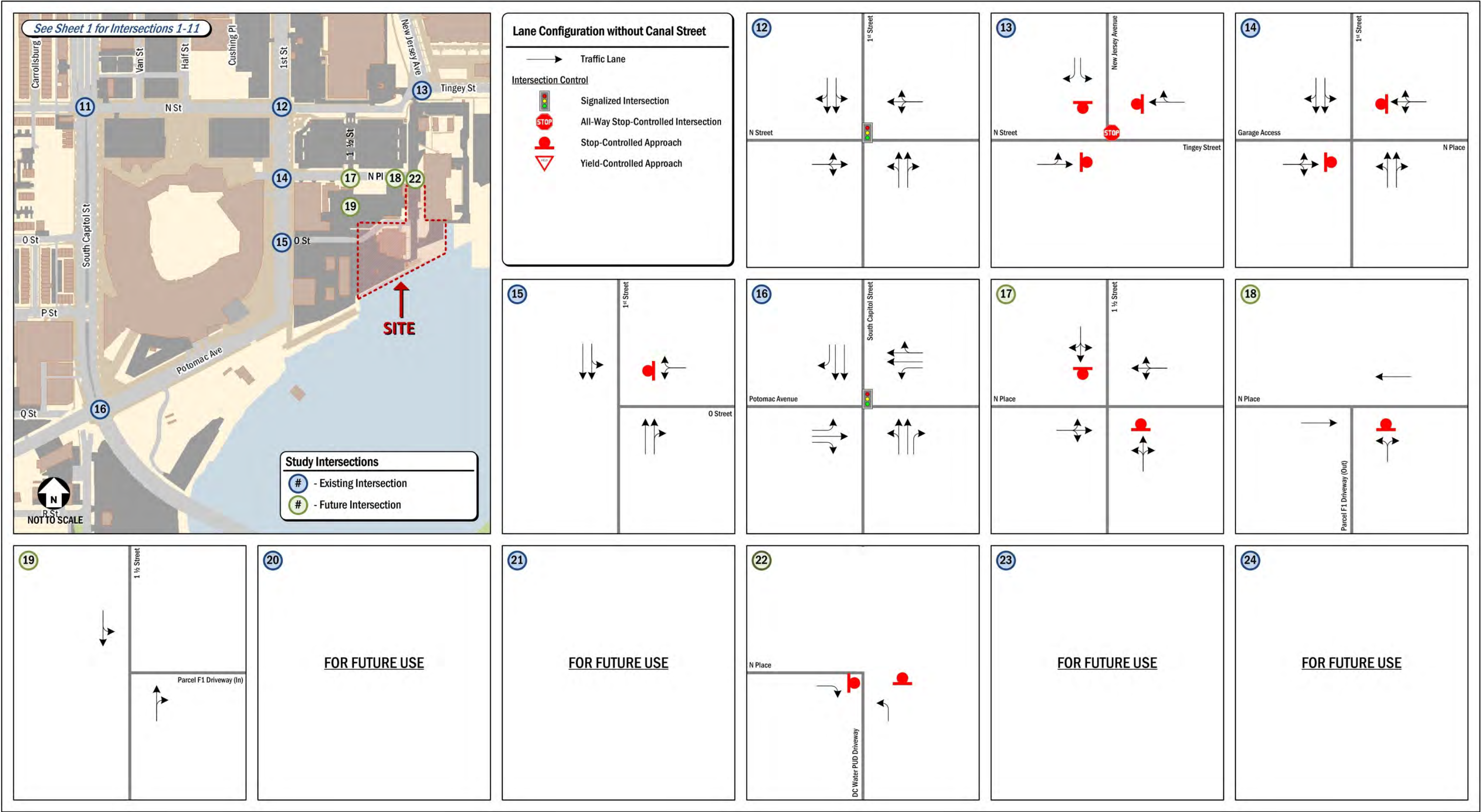


Figure 34: Existing, Background, and Future Peak Hour Traffic Controls and Lane Configurations without Canal Street (Sheet 2 of 2)

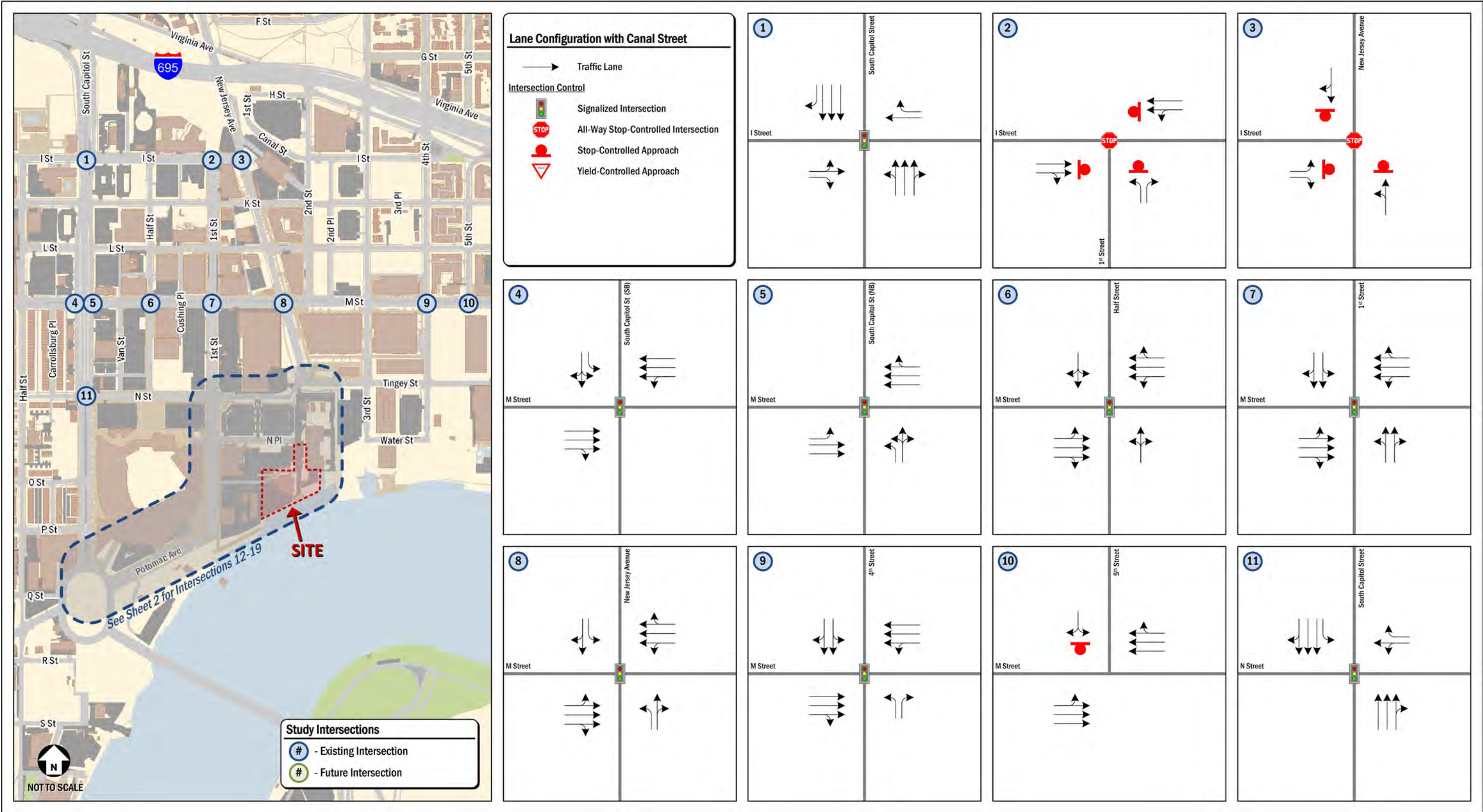


Figure 35: Background and Future Peak Hour Traffic Controls and Lane Configurations with Canal Street (Sheet 1 of 2)

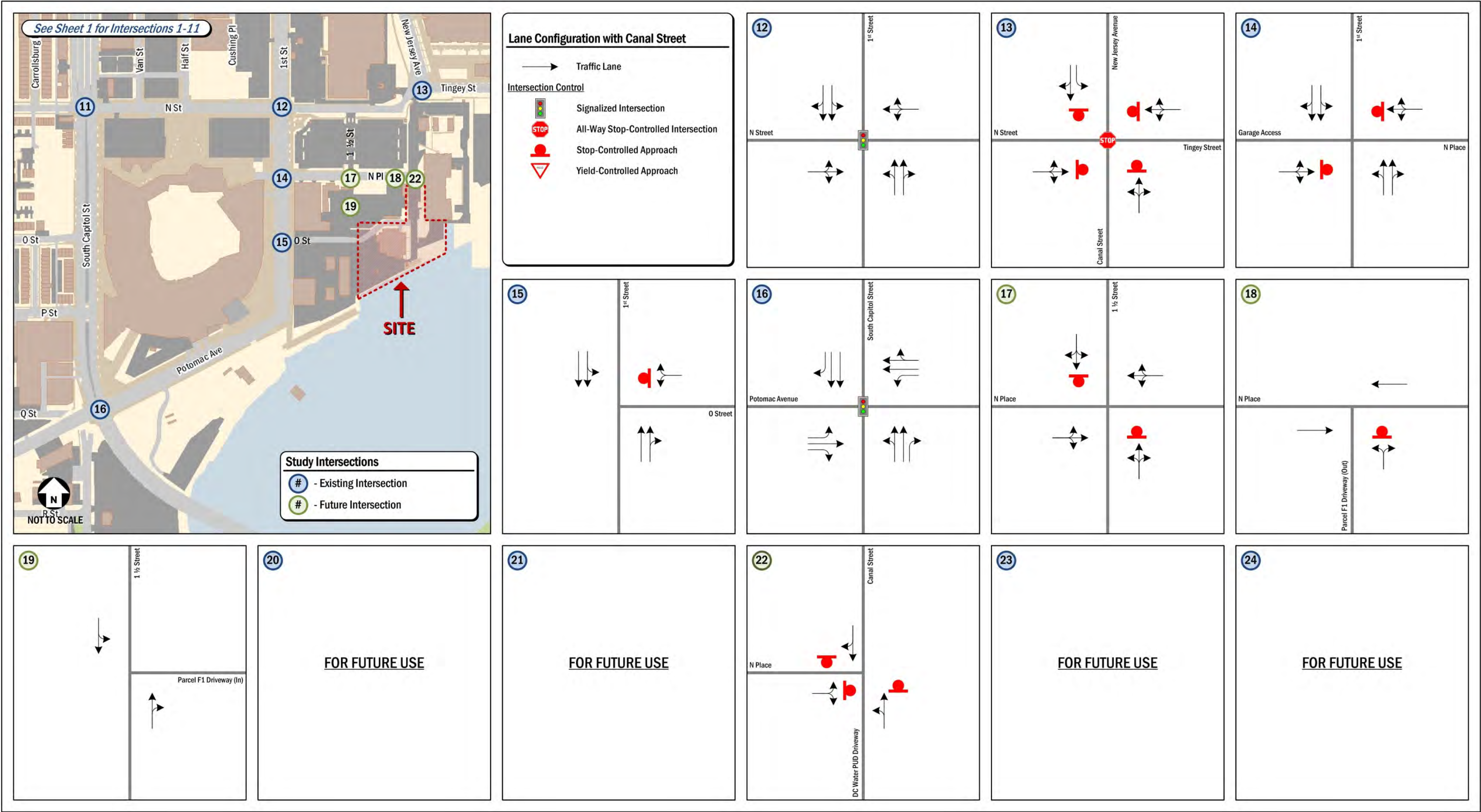


Figure 36: Background and Future Peak Hour Traffic Controls and Lane Configurations with Canal Street (Sheet 2 of 2)

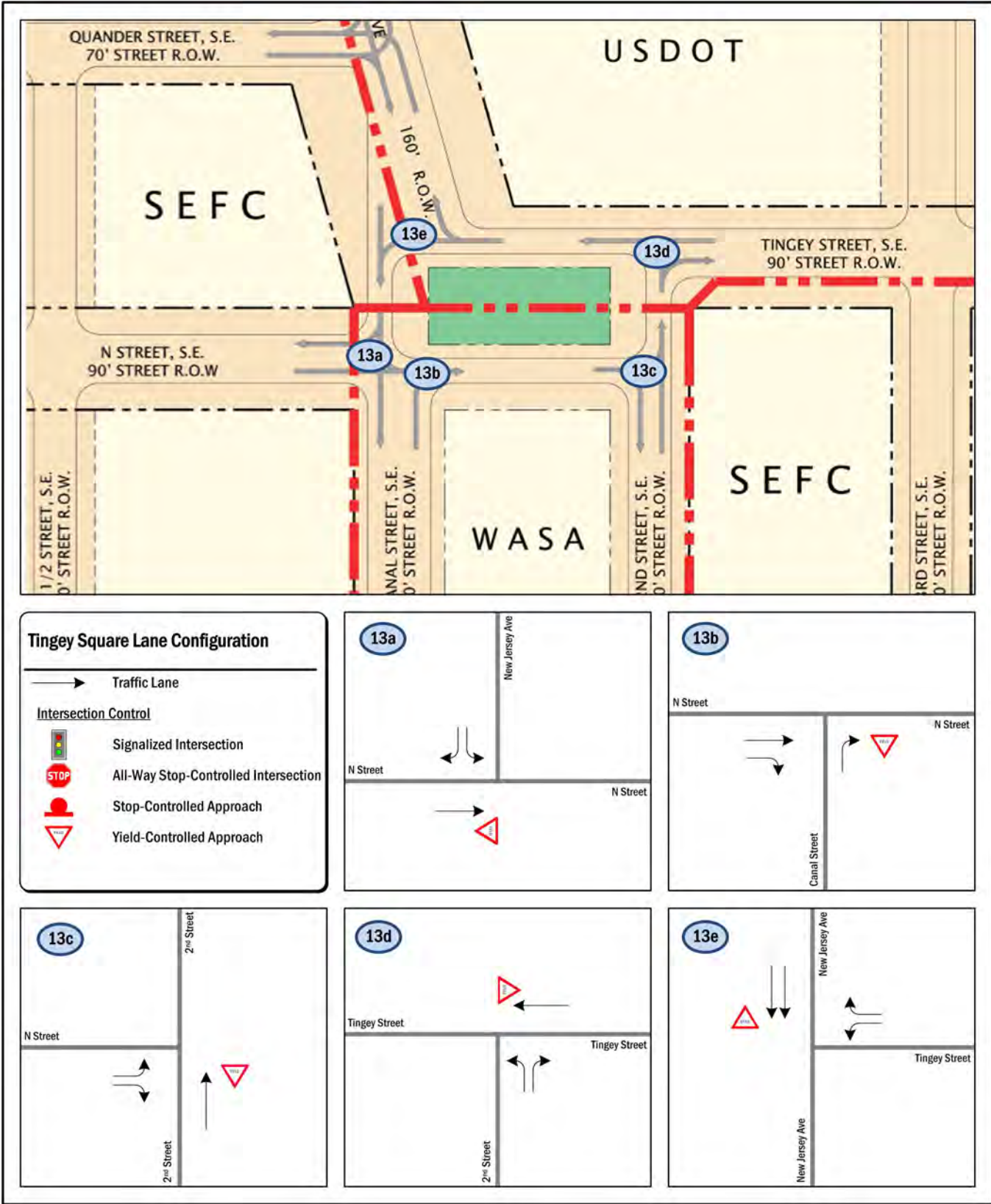


Figure 37: Background and Future Peak Hour Traffic Controls and Lane Configurations with Tingey Square

Table 9: Vehicular Level of Service Results (Existing, Background)

Intersection	Approach	Existing				Background with Canal				Background without Canal			
		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
I Street & South Capitol Street	Overall	30.0	C	18.9	B	41.8	D	24.6	C	41.8	D	24.6	C
	Eastbound	75.9	E	45.3	D	178.0	F	76.0	E	178.0	F	76.0	E
	Westbound	50.6	D	39.3	D	63.4	E	47.6	D	63.4	E	47.6	D
	Northbound	26.2	C	7.8	A	28.9	C	7.7	A	28.9	C	7.7	A
	Southbound	19.0	B	17.3	B	20.2	C	17.6	B	20.2	C	17.6	B
M Street & South Capitol Street SB <i>Intersection reconfigured further in future</i>	Overall	20.5	C	21.4	C	27.8	C	25.7	C	27.8	C	25.7	C
	Eastbound	37.5	D	21.6	C	39.3	D	22.1	C	39.3	D	22.1	C
	Westbound	0.4	A	1.0	A	0.5	A	1.3	A	0.5	A	1.3	A
	Southbound	40.3	D	40.6	D	57.3	E	53.8	D	57.3	E	53.8	D
M Street & South Capitol Street NB <i>Intersection reconfigured further in future</i>	Overall	21.8	C	17.1	B	21.1	C	14.3	B	21.1	C	14.3	B
	Eastbound	1.5	A	1.2	A	2.1	A	1.6	A	2.1	A	1.6	A
	Westbound	56.0	E	40.1	D	56.0	E	29.0	C	56.1	E	28.9	C
	Northbound	25.1	C	37.6	D	25.7	C	37.5	D	25.7	C	37.5	D
N Street & South Capitol Ramp <i>Intersection reconfigured further in future</i>	Overall	9.5	A	49.2	D	14.7	B	68.3	E	14.7	B	68.3	E
	Westbound	58.9	E	62.3	E	54.3	D	149.8	F	54.3	D	149.8	F
	Northbound	7.9	A	22.7	C	14.1	B	25.7	C	14.1	B	25.7	C
	Southbound	3.5	A	24.9	C	4.2	A	27.2	C	4.2	A	27.2	C
	Southeastbound	51.9	D	172.3	F	53.5	D	209.0	F	53.5	D	209.0	F
Potomac Avenue & South Capitol Street <i>Intersection reconfigured further in future</i>	Overall	56.4	E	240.3	F	82.0	F	287.9	F	82.0	F	287.9	F
	Eastbound	55.1	E	297.2	F	55.2	E	304.6	F	55.2	E	304.6	F
	Westbound	57.1	E	304.1	F	56.1	E	428.0	F	56.1	E	428.0	F
	Northbound	77.0	E	80.4	F	116.4	F	106.5	F	116.4	F	106.5	F
	Southbound	14.2	B	315.1	F	17.8	B	372.6	F	17.8	B	372.6	F
M Street & Half Street	Overall	2.9	A	7.3	A	5.9	A	17.4	B	5.9	A	17.3	B
	Eastbound	0.3	A	7.2	A	0.6	A	15.6	B	0.6	A	15.6	B
	Westbound	0.8	A	1.7	A	1.6	A	8.7	A	1.6	A	8.6	A
	Northbound	45.2	D	41.8	D	44.5	D	45.8	D	44.5	D	45.8	D
	Southbound	46.9	D	44.7	D	39.1	D	32.4	C	39.1	D	32.4	C
M Street & 1st Street	Overall	12.9	B	10.8	B	15.2	B	17.9	B	15.2	B	17.9	B
	Eastbound	6.2	A	8.0	A	8.2	A	16.2	B	8.2	A	16.3	B
	Westbound	1.9	A	3.9	A	2.1	A	5.2	A	2.1	A	5.2	A
	Northbound	65.2	E	27.5	C	66.2	E	41.1	D	66.4	E	41.7	D
	Southbound	30.1	C	29.6	C	30.9	C	31.6	C	30.9	C	31.6	C
N Street & 1st Street	Overall	20.8	C	19.3	B	23.0	C	21.8	C	23.0	C	22.0	C
	Eastbound	15.1	B	15.5	B	16.9	B	20.8	C	16.9	B	20.8	C
	Westbound	14.7	B	20.4	C	15.3	B	24.9	C	15.3	B	24.9	C
	Northbound	19.5	B	17.1	B	21.1	C	18.5	B	21.1	C	18.9	B
	Southbound	29.9	C	19.8	B	33.4	C	22.0	C	33.4	C	22.5	C
M Street & New Jersey Avenue	Overall	12.9	B	14.0	B	14.6	B	17.2	B	14.7	B	17.2	B
	Eastbound	15.9	B	8.9	A	17.3	B	16.3	B	17.5	B	16.2	B
	Westbound	7.8	A	13.9	B	10.2	B	13.6	B	10.2	B	13.6	B
	Northbound	27.7	C	26.7	C	28.2	C	27.6	C	28.2	C	27.7	C
	Southbound	27.5	C	26.8	C	27.8	C	28.1	C	27.8	C	28.1	C
N Street & New Jersey Avenue	Overall	8.6	A	7.7	A	9.1	A	8.5	A	9.1	A	8.5	A
	Eastbound	8.8	A	7.5	A	9.5	A	8.2	A	9.4	A	8.2	A
	Westbound	7.9	A	7.8	A	8.6	A	9.1	A	8.5	A	8.8	A
	Northbound	--	--	--	--	0.0	A	8.1	A	--	--	--	--
	Southbound	8.7	A	7.4	A	8.8	A	7.5	A	9.3	A	8.2	A
Tingey Square	EB N Street	--	--	--	--	14.6	B	10.3	B	--	--	--	--
	SB Tingey Sq.	--	--	--	--	3.6	A	1.4	A	--	--	--	--
	EB Tingey Sq.	--	--	--	--	0.0	A	0.0	A	--	--	--	--
	NB Canal Street	--	--	--	--	0.0	A	9.1	A	--	--	--	--
	EB Tingey Sq.	--	--	--	--	7.9	A	7.5	A	--	--	--	--
	NB 2 nd Street	--	--	--	--	0.0	A	0.0	A	--	--	--	--
	WB Tingey Street	--	--	--	--	10.6	B	11.6	A	--	--	--	--
	NB Tingey Sq.	--	--	--	--	0.7	A	1.3	A	--	--	--	--
	WB Tingey Sq.	--	--	--	--	3.9	A	4.1	A	--	--	--	--
	SB NJ Avenue	--	--	--	--	11.4	B	12.4	A	--	--	--	--
M Street & 4th Street	Overall	14.0	B	14.6	B	15.1	B	19.8	B	15.1	B	19.7	B
	Eastbound	14.9	B	12.3	B	11.9	B	19.0	B	11.9	B	18.8	B
	Westbound	8.4	A	8.3	A	8.9	A	8.8	A	8.9	A	8.8	A
	Northbound	28.4	C	29.0	C	30.4	C	33.7	C	30.4	C	33.7	C
	Southbound	28.5	C	28.7	C	29.4	C	30.1	C	29.4	C	30.1	C
M Street & 5th Street	Eastbound Left	4.4	A	3.3	A	7.2	A	11.2	B	7.2	A	11.2	B
	Southbound	18.2	C	28.8	D	24.2	C	57.5	F	24.2	C	57.5	F
I Street & 1st Street	Overall	9.0	A	9.6	A	9.9	A	12.0	B	9.9	A	12.0	B
	Eastbound	8.9	A	9.3	A	9.6	A	11.5	B	9.6	A	11.5	B

Intersection	Approach	Existing				Background with Canal				Background without Canal			
		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
I Street & New Jersey Avenue	Westbound	9.4	A	10.2	B	10.3	B	12.8	B	10.3	B	12.8	B
	Northbound	8.7	A	8.8	A	9.6	A	11.4	B	9.6	A	11.4	B
	Overall	8.2	A	8.6	A	8.5	A	9.3	A	8.5	A	9.3	A
	Eastbound	7.7	A	8.0	A	8.0	A	8.5	A	8.0	A	8.5	A
	Northbound	8.8	A	9.4	A	9.2	B	10.2	B	9.2	B	10.2	B
	Southbound	8.0	A	8.7	A	8.2	A	9.3	A	8.2	A	9.2	A
N Place & 1st Street	Eastbound	10.6	B	12.4	B	11.5	B	16.0	C	11.5	B	18.6	C
	Westbound	10.5	B	10.2	B	11.3	B	11.3	B	11.3	B	10.8	B
	Northbound Left	0.1	A	0.0	A	0.1	A	0.0	A	0.1	A	0.0	A
	Southbound Left	0.2	A	0.0	A	0.4	A	0.5	A	0.4	A	0.9	A
O Street & 1st Street	Westbound	10.1	B	9.5	B	10.7	B	10.9	B	10.7	B	10.3	B
	Southbound Left	0.8	A	0.1	A	1.9	A	0.1	A	1.9	A	0.1	A
N Place & 1 1/2 Street	Eastbound Left	--	--	--	--	0.0	A	0.0	A	0.0	A	0.0	A
	Westbound Left	--	--	--	--	8.4	A	2.1	A	0.0	A	0.0	A
1 1/2 Street & F1 Driveway	Southbound Left	--	--	--	--	0.0	A	7.3	A	0.0	A	7.3	A
N Place & F1 Driveway	Northbound	--	--	--	--	0.0	A	8.8	A	0.0	A	8.9	A

Table 10: Vehicular Level of Service Results (Total Future with Canal Street, Total Future without Canal Street)

Intersection	Approach	Total Future with Canal Street				Total Future without Canal Street			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
I Street & South Capitol Street	Overall	42.5	D	25.3	C	42.5	D	25.3	C
	Eastbound	184.2	F	80.2	F	184.2	F	80.2	F
	Westbound	64.1	E	48.6	D	64.1	E	48.6	D
	Northbound	28.9	C	7.7	A	28.9	C	7.8	A
	Southbound	20.2	D	17.6	B	20.2	D	17.6	B
M Street & South Capitol Street SB <i>Intersection reconfigured further in future</i>	Overall	29.2	C	25.8	C	29.2	C	25.8	C
	Eastbound	39.5	D	22.1	C	39.5	D	22.1	C
	Westbound	0.5	A	1.3	A	0.5	A	1.3	A
	Southbound	60.9	E	54.3	D	60.9	E	54.3	D
M Street & South Capitol Street NB <i>Intersection reconfigured further in future</i>	Overall	20.9	C	14.3	B	20.9	C	14.3	B
	Eastbound	2.2	A	1.7	A	2.2	A	1.7	A
	Westbound	56.0	E	28.6	C	56.0	E	28.5	C
	Northbound	25.7	C	37.6	D	25.7	C	37.5	D
N Street & South Capitol Ramp <i>Intersection reconfigured further in future</i>	Overall	14.7	B	69.1	E	14.7	B	69.1	E
	Westbound	54.5	D	155.1	F	54.5	D	155.1	F
	Northbound	14.1	B	25.7	B	14.1	B	25.7	B
	Southbound	4.2	A	27.2	C	4.2	A	27.2	C
Potomac Avenue & South Capitol Street <i>Intersection reconfigured further in future</i>	Southeastbound	53.5	D	209.0	F	53.5	D	209.0	F
	Overall	82.8	F	295.0	F	82.8	F	295.9	F
	Eastbound	55.2	E	305.3	F	55.2	E	305.3	F
	Westbound	56.3	E	474.1	F	56.3	E	474.1	F
	Northbound	117.3	F	106.2	F	117.3	F	106.2	F
M Street & Half Street	Southbound	18.0	B	372.6	F	18.0	B	374.6	F
	Overall	5.8	A	17.3	B	5.8	A	17.3	B
	Eastbound	0.6	A	15.6	B	0.6	A	15.6	B
	Westbound	1.6	A	8.6	A	1.6	A	8.5	A
	Northbound	44.5	D	45.8	D	44.5	D	45.8	D
M Street & 1st Street	Southbound	39.1	D	32.4	C	39.1	D	32.4	C
	Overall	15.2	B	18.0	B	15.1	B	18.1	B
	Eastbound	8.1	A	16.3	B	8.1	A	16.4	B
	Westbound	2.2	A	5.2	A	2.2	A	5.2	A
	Northbound	66.8	E	39.4	D	66.6	E	40.2	D
N Street & 1st Street	Southbound	31.0	C	31.6	C	31.0	C	31.7	C
	Overall	23.0	C	21.9	C	22.9	C	22.1	C
	Eastbound	16.9	B	20.9	C	16.9	B	20.8	C
	Westbound	15.3	B	25.1	C	16.3	B	25.3	C
	Northbound	21.3	C	18.9	B	21.3	C	19.8	B
M Street & New Jersey Avenue	Southbound	31.7	C	22.1	C	31.9	C	22.3	C
	Overall	14.8	B	17.3	B	15.0	B	17.3	B
	Eastbound	17.7	B	16.3	B	18.1	B	16.3	B
	Westbound	10.3	B	13.6	B	10.3	B	13.6	B
	Northbound	28.3	C	27.8	C	28.3	C	27.8	C
N Street & New Jersey Avenue	Southbound	27.8	C	28.1	C	27.8	C	28.1	C
	Overall	9.6	A	8.7	A	9.3	A	8.7	A
	Eastbound	9.6	A	8.3	A	9.6	A	8.4	A
	Westbound	9.1	A	9.3	A	8.9	A	8.9	A

Intersection	Approach	Total Future with Canal Street				Total Future without Canal Street			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Tingey Square	Northbound	8.1	A	8.4	A	--	--	--	--
	Southbound	9.0	A	7.6	A	9.4	A	8.3	A
	EB N Street	14.9	B	10.4	B	--	--	--	--
	SB Tingey Sq.	3.6	A	1.5	A	--	--	--	--
	EB Tingey Sq.	0.0	A	0.0	A	--	--	--	--
	NB Canal Street	10.2	B	9.2	A	--	--	--	--
	EB Tingey Sq.	7.9	A	7.5	A	--	--	--	--
	NB 2 nd Street	0.0	A	0.0	A	--	--	--	--
	WB Tingey Street	10.7	B	11.8	A	--	--	--	--
	NB Tingey Sq.	0.7	A	1.4	A	--	--	--	--
WB Tingey Sq.	4.0	A	4.1	A	--	--	--	--	
SB NJ Avenue	11.6	B	12.5	A	--	--	--	--	
M Street & 4th Street	Overall	15.2	B	20.0	B	15.1	B	19.9	B
	Eastbound	11.5	B	19.0	B	11.1	B	18.9	B
	Westbound	9.0	A	8.9	A	9.0	A	8.9	A
	Northbound	30.4	C	33.9	C	30.4	C	33.9	C
	Southbound	29.6	C	30.2	C	29.6	C	30.2	C
M Street & 5th Street	Eastbound Left	7.3	A	3.4	A	7.3	A	3.4	A
	Southbound	25.0	C	59.2	F	25.0	C	59.2	F
I Street & 1st Street	Overall	9.9	A	12.3	B	9.9	A	12.3	B
	Eastbound	9.7	A	11.7	B	9.7	A	11.7	B
	Westbound	10.3	B	13.1	B	10.3	B	13.1	B
	Northbound	9.6	A	11.9	B	9.6	A	11.8	B
I Street & New Jersey Avenue	Overall	8.5	A	9.4	A	8.5	A	9.4	A
	Eastbound	8.0	A	8.5	A	8.0	A	8.6	A
	Northbound	9.2	A	10.3	B	9.2	A	10.3	B
	Southbound	8.3	A	9.3	A	8.3	A	9.3	A
N Place & 1st Street	Eastbound	12.5	B	17.7	C	13.5	B	22.7	C
	Westbound	14.2	B	12.1	B	14.2	B	12.4	B
	Northbound Left	0.1	A	0.0	A	0.1	A	0.0	A
	Southbound Left	1.7	A	0.4	A	2.6	A	0.7	A
O Street & 1st Street	Westbound	10.9	B	11.1	B	10.9	B	10.4	B
	Southbound Left	0.8	A	0.1	A	0.8	A	0.1	A
N Place & 1 1/2 Street	Eastbound Left	0.0	A	0.0	A	0.0	A	0.0	A
	Westbound Left	5.7	A	1.2	A	0.0	A	0.0	A
	Northbound	0.0	A	0.0	A	0.0	A	0.0	A
	Southbound	0.0	A	0.0	A	0.0	A	0.0	A
1 1/2 Street & F1 Driveway	Southbound Left	7.4	A	7.3	A	7.4	A	7.3	A
N Place & F1 Driveway	Northbound	8.7	A	9.3	A	8.7	A	9.4	A
N Place & DC Water Driveway	Eastbound	6.7	A	7.6	A	0.0	A	0.0	A
	Northbound	7.2	A	7.4	A	0.0	A	0.0	A
	Southbound	6.7	A	6.7	A	--	--	--	--

Table 11: Roadway Capacity Results Review for Existing, Background, and Future

Intersection	Locations & Scenarios with LOS F <i>EX = Existing Conditions</i> <i>BG = Background (without Development)</i> <i>TF = Total Future (with Development)</i>	Percent of Vehicular Traffic Attributable to Development		Discussion & Recommendations
		<i>AM Peak</i>	<i>PM Peak</i>	
South Capitol Street & I Street	EB I Street AM Peak: BG, TF	0.6%	1.7%	The delays at this intersection are due to the existing intersection configuration. The delays projected for the eastbound movement along I Street are at LOS E during the existing AM Peak Period and degrade to LOS F under background conditions, without the site. The AM Peak Period LOS on eastbound I Street is further exacerbated in the Total Future scenarios. The intersection operates under overall acceptable conditions during the morning and afternoon peak hours in the Total Future conditions. The reconfiguration of the eastbound approach from separate left-through and right turn lanes to separate left and through-right lanes could alleviate some of the delays experienced at this intersection, although this improvement would be necessary regardless of the development of the site.
Potomac Avenue & South Capitol Street	Overall intersection AM Peak: BG, TF NB S Capitol Street AM Peak: EX, BG, TF Overall intersection PM Peak: EX, BG, TF EB Potomac Avenue PM Peak: EX, BG, TF WB Potomac Avenue PM Peak: EX, BG, TF NB S Capitol Street PM Peak: EX, BG, TF SB S Capitol Street PM Peak: EX, BG, TF	0.9%	2.2%	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. 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.
South Capitol Street & N Street	WB N Street PM Peak: BG, TF SEB S Capitol Street PM Peak: EX, BG, TF	0.3%	0.4%	As noted previously in this study, this intersection is planned to be redesigned in the future. The delays at this intersection are due to the existing intersection configuration. The delays projected for the southeastbound movement along S Capitol Street exist during the PM peak period as local, S. Capitol Street ramp traffic merges with through S. Capitol Street traffic at the intersection. This condition is exacerbated during the 2016 background and total future scenarios. In addition, through volumes on S. Capitol Street cause the westbound N Street approach to operate beyond capacity during the background and total future PM peak periods. The redesign of the intersection is expected to improves operations in the years beyond completion of the DC Water PUD.
M Street & 5 th Street	SB 5 th Street PM Peak: TF	1.4%	2.6%	As identified in previous studies, the delay along the stop-controlled southbound approach is due to the addition of trips generated along M Street by the background developments during the afternoon peak hour. Although no site-generated trips are added to the southbound leg of this intersection, the addition of the site-generated through trips on M Street exacerbates this failing operation. As noted in the October 1, 2013 DC Water Occupied Sites PUD TIS, constructing a signal at this intersection allows for it to operate under acceptable conditions during all scenarios, however this improvement would be needed regardless of the development of the site.

3.3 Non-Auto Impacts

3.3.1 Transit

The trip generation estimates for the DC Water PUD show that a significant amount of new transit riders will be generated. The development is projected to generate over 1,300 transit trips on a weekday.

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 quarter-mile walk from the PUD. A similar distance separates the site from major bus service along M Street. Several routes have frequent service on every day of the week, including the DC Circulator Union Station-Navy Yard route and Metrobus' U Street- Garfield line.

WMATA's studied capacity of Metrorail stations in its *Station Access & Capacity Study*⁵. 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 DC Water PUD. 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 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*⁶, 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 RiverFront PUD site are cited for having unacceptable load factors. Thus, the local bus service can accommodate the future riders generated by the DC Water PUD.

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 over 150 per weekday. 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.

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 Potomac Avenue and 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.

⁵ *Station Access & Capacity Study Final Report*, April 2008, Washington Metropolitan Area Transit Authority

⁶ *DC's Transit Future System Plan Final Report*, April 2010, District of Columbia Department of Transportation

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

3.3.3 Pedestrian

The DC Water PUD is located in a walkable area, with connections to major existing and future retail locations, employment sites, residential neighborhoods, and transit. The trip generation estimates project over 150 walking trips per weekday.

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

- Nearby residential developments where residents can walk to work.
- Retail locations, such the planned restaurants and shops at The Yards, and other retail sites along the M Street corridor.

Based on these origins/destinations, most pedestrians generated by the DC Water PUD will walk along 1st 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, USDOT, and Navy Yard.

In addition to these trips, the transit trips generated by the site will also generate pedestrian demand between the site and nearby transit stops. The vast majority of these transit riders will walk north/south on 1st Street SE to reach bus stops and the Navy Yard Metrorail station portal.

Most of the sidewalks surrounding the site are of high quality, although there are significant gaps in the network. The sidewalks closest to the DC Water PUD 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:

- Most streets on Buzzard Point south of Q Street SW;
- East side of 1st Street NE between N and M Streets;
- Tingey/N Streets within The Yards; and
- 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.

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 DC Water PUD will not have a negative impact to pedestrian facilities in the study area.

3.4 Crash Analysis

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

3.4.1 Summary of Available Crash Data

As previously reported in the October 1, 2013 DC Water Occupied Sites PUD TIS, a safety analysis was performed to determine if there was an abnormally high accident rate at any study area intersection. Accident data was obtained from the files of Gorove/Slade, previously provide by the District Department of Transportation (DDOT). This data set included all signalized intersections adjacent to the site from 2008 to 2010. (No new data was provided to Gorove/Slade by DDOT in time to be included in this study.) 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 12.

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 12 and detailed in Table 13). The PUD needs to be developed in a manner to help alleviate, or at minimum not add to, the conflicts at these intersections.

Table 12: Intersection Crash Rates

Intersection	Total Crashes	Pedestrian Crashes	Bike Crashes	Rate per MEV*
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
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
M Street & 4th Street	12	1	0	1.01
M Street & 5th Street	5	0	0	0.34
I Street & 1st Street	2	0	0	0.34

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

The crash summary data in Table 18 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 13 contains a breakdown of crash types reported for the four intersections with a crash rate over 1.0 per MEV.

Table 13: 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 14%	12 16%	1 1%	11 14%	25 33%	1 1%	0 0%	2 3%	0 0%	2 3%	5 7%	0 0%	76
M Street & New Jersey Avenue	1.15	0 0%	2 13%	1 6%	5 31%	3 19%	0 0%	1 6%	1 6%	0 0%	0 0%	0 0%	0 0%	16
N Street & South Capitol Street	1.06	3 0%	2 13%	1 6%	25 31%	9 19%	0 0%	2 6%	0 6%	0 0%	0 0%	0 0%	0 0%	43
M Street & 4th Street	1.01	1 8%	0 0%	0 0%	4 33%	2 17%	0 0%	1 8%	0 0%	0 0%	1 8%	2 17%	0 0%	12

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.

- **M Street & South Capitol 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 PUD is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- *N Street & South Capitol 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 PUD is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- *M Street & 4th Street*

This intersection is barely over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.01 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 PUD is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

4: CONCLUSIONS

This report has presented the findings of a Comprehensive Transportation Review (CTR) performed for the DC Water Planned Unit Development (PUD). The proposed PUD is located within Ward 6 on the site of the existing DC Water O Street Pumping Station, approximately one block east of First Street and two blocks south of N Street near the Anacostia River and Nationals Park. The proposed site plan consists of a headquarters building to be constructed around the existing O Street Pumping Station and containing 152,076 square feet (sf) of office space in addition to the existing 22,197 sf pumping station.

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 a 152,076 sf office building that will be built around the existing 22,197 sf pumping station, which will remain operational throughout and beyond construction of the DC Water PUD. In summary, the site plans include the following features:

- Vehicular access to the site will be provided via N Place and private streets to be constructed as O Street and 1½ Street that are planned to intersect 1st Street and N Place. The private streets planned to be constructed near the site are planned as a part of the previously planned DC Water Occupied Sites PUD which is proposed for construction after DC Water vacates those parcels surrounding the proposed DC Water PUD.
- Ultimately, one curb cut from public streets will be provided via N Place and one curb cut is planned from the proposed private 1½ Street, once it is completed. Until buildout of the proposed DC Water Occupied Sites PUD, access will be provided from public streets via a curb cut from N Place as well as an existing curb cut from First Street, approximately one block west of the site. The curb cut from First Street in the near term (and 1½ Street in the long term) will serve delivery and truck traffic while the curb cut from N Place will serve as the primary vehicular access point.
- The PUD plans to provide 20 parking spaces on-site. As noted above, these parking spaces are planned to be accessed from N Place. In addition, a minimum of 50 off-street parking spaces will be provided on adjacent property owned or controlled by DC Water for the life of the building. As a result, a minimum of 70 total parking spaces will be provided on or adjacent to the site for the life of the building, satisfying the 69 parking space requirement as noted in Zoning Regulations.
- The project will include short-term public bicycle spaces and bicycle parking within the secured portion of the property. Short term bicycle parking will be provided on 6 racks outside of the security perimeter on the western side of the building. Similarly, bicycle parking will also be provided within the security perimeter for on 7 covered racks near the guard booth at N Place as well as on 17 outdoor racks near the parking spaces closest to the building.

The Transportation Demand Management (TDM) plan for the DC Water PUD is based on the DDOT expectations for TDM programs. The Applicant proposes the following TDM measures:

- The Applicant will provide 30 bicycle racks. Of these, 7 racks will be covered.

- The Applicant will provide 20 off-street parking spaces on the subject property and will provide a minimum of 50 off-street parking spaces on property owned or controlled by DC Water.
- The Applicant will identify a project's TDM Leader.
- The Applicant will promote alternative transportation options including transit, bicycling, and carsharing and carpooling/vanpooling services.
- The Applicant's SmartTrip Transit Benefits Program will be expanded to cover employees working at the Headquarters building.

Roadway Capacity Review

Impacts were evaluated for the typical AM and PM weekday peak periods, given the proposed use of the site. As discussed with DDOT, analysis used in the October 1, 2013 Transportation Impact Study (TIS) for the DC Water Occupied Sites PUD was utilized as the basis for review of the DC Water PUD. The DC Water Occupied Sites PUD TIS examined a scenario in which additional office trips would be induced by the availability of parking within the planned PUD and examined the impact of those trips across a localized study area encompassing five existing intersections and four future intersections (an overall nine intersection study area). Given that the trips analyzed within this condition were similar to those expected to be generated by the DC Water PUD development, the results of the October 1, 2013 PUD TIS were noted to directly correlate with the impacts that might be expected with the development of the DC Water PUD (and are noted in the appendix of this report). However, in order to more directly determine any impact of the trips associated with the DC Water PUD, the new trips generated by the development were added to the Total Future scenario in the October 1, 2013 PUD TIS.

In order to determine the impact of the proposed development on the transportation network, future conditions with and without development of the site were compared based on the analyses of intersection delays under all of the conditions described above. These delays are compared to the acceptable levels of delay set by DDOT standards to determine the site's impact on the study area. In addition, scenarios were examined with and without the construction of Canal Street in place between N Street and N Place.

The analyses concluded that the DC Water PUD will not have an adverse impact on the surrounding transportation network. Traffic conditions are generally favorable within the study area, both with and without development, with minimal impacts beyond those described in the previously approved October 1, 2013 DC Water Occupied Sites PUD.

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 DC Water PUD 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 PUD.
- Based on the trip generation estimates for walking and the quality of the routes near the project's location, taking into account the streetscapes that will be redeveloped and improved, the PUD 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 PUD will not have a negative impact to bicycle facilities in the study area.

Conclusions

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 following conclusions have been determined based on a review of the transportation aspects of the project:

- A minimum of 70 total parking spaces will be provided on or adjacent to the site (20 on-site and a minimum of 50 on adjacent DC Water property), satisfying the 69 parking space requirement as noted in Zoning Regulations.
- Bicycle parking will be available on-site in 30 bicycle racks.
- Given the extensive nearby transit, pedestrian, and bicycle networks as well as the limited parking and extensive bicycle parking provided on-site, the development will not have an adverse impact on the surrounding transportation network.
- The 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 PUD.
- Based on the trip generation estimates for walking and the quality of the routes near the project's location, taking into account the streetscapes that will be redeveloped and improved, the 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 development will not have a negative impact to bicycle facilities in the study area.