

---

---

**Transportation Impact Study**

**Capitol Gateway PUD**

**Washington, DC**

**May 7, 2013**

**Revised May 23, 2013**



**GOROVE / SLADE**

Transportation Planners and Engineers

---

**Prepared by:**



**GOROVE / SLADE**

Transportation Planners and Engineers

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](http://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 ..... iii

List of Tables ..... iv

Executive Summary ..... v

Introduction ..... 1

    1.1 Site Location and Major Transportation Features ..... 2

    1.2 Roadways ..... 2

    1.3 Car-Sharing ..... 5

    1.4 Transit ..... 6

    1.5 Bicycle Facilities ..... 9

    1.6 Pedestrian Facilities ..... 11

    1.7 Future Projects & Developments ..... 13

        1.7.1 District Initiatives ..... 13

        1.7.2 Developments ..... 13

2: Design Review ..... 14

    2.1 Site Access and Internal Circulation ..... 19

        2.1.1 Vehicular Access ..... 19

        2.1.2 Loading ..... 19

        2.1.3 Parking ..... 22

        2.1.4 Bicycle Facilities ..... 28

    2.2 Transportation Demand Management ..... 29

        2.2.1 Proposed TDM Plan ..... 29

    2.3 Compliance with Comprehensive Plan ..... 30

3: Impacts Review ..... 32

    3.1 Site Transportation Demand ..... 32

        3.1.1 Base Trip Generation ..... 32

        3.1.2 Mode Split ..... 35

        3.1.3 Multi-Modal Trip Generation ..... 37

    3.2 Roadway Capacity and Operations ..... 38

        3.2.1 Scope of Analysis ..... 38

        3.2.2 Traffic Volume Assumptions ..... 38

        3.2.3 Geometry and Operations Assumptions ..... 42

        3.2.4 Vehicular Analysis Results ..... 43

        3.2.5 Summary of Analysis Results and Mitigation Measures ..... 44

---

---

3.2.6 Signal Warrant Analysis .....	65
3.3 Non-Auto Impacts.....	66
3.3.1 Transit .....	66
3.3.2 Bicycle .....	66
3.3.3 Pedestrian .....	67
3.4 Crash Analysis .....	71
3.4.1 Summary of Available Crash Data.....	71
3.4.2 Potential Impacts .....	72
3.4.3 Leading Pedestrian Intervals.....	73

**LIST OF FIGURES**

Figure 1: Site Location ..... 3

Figure 2: Functional Classification and AADT..... 4

Figure 3: Existing Transit Facilities ..... 8

Figure 4: Existing Bicycle Facilities ..... 10

Figure 5: Existing Pedestrian Infrastructure ..... 12

Figure 6: Existing Site Diagram ..... 15

Figure 7: Proposed Site Plan ..... 16

Figure 8: Annotated Site Plan ..... 17

Figure 9: Proposed Vehicular Site Access ..... 18

Figure 10: Truck Routing and Internal Maneuvering ..... 20

Figure 11: Proposed Loading Facilities..... 23

Figure 12: Parcel 2 Truck Turning Diagram ..... 24

Figure 13: Parcels 1, 3, and 4 Truck Turning Diagram..... 25

Figure 14: Study Intersections ..... 39

Figure 15: Existing Peak Hour Traffic Volumes ..... 45

Figure 16: Existing Peak Hour Pedestrian Volumes ..... 46

Figure 17: Existing Peak Hour Bicycle Volumes ..... 47

Figure 18: 2019 Background Peak Hour Traffic Volumes ..... 48

Figure 19: Direction of Approach for Site-Generated Traffic Volumes..... 49

Figure 20: Site-Generated Peak Hour Traffic Volumes ..... 51

Figure 21: Site-Generated Pass-By Traffic Volumes..... 52

Figure 22: 2019 Future Peak Hour Traffic Volumes ..... 53

Figure 23: 2040 Horizon Peak Hour Traffic Volumes ..... 54

Figure 24: Existing and 2019 Background Peak Hour Traffic Controls and Lane Configurations..... 55

Figure 25: 2019 Future and 2040 Horizon Peak Hour Traffic Controls and Lane Configurations ..... 56

Figure 26: Morning Peak Hour Level of Service Results ..... 59

Figure 27: Afternoon Peak Hour Level of Service Results..... 60

Figure 28: Future Pedestrian Facilities..... 69

**LIST OF TABLES**

Table 1: Carshare Location and Vehicles (Zipcar) .....6

Table 2: Bus Route Information .....7

Table 3: Sidewalk Requirements.....11

Table 4: Proposed Loading.....21

Table 5: Proposed Parking .....22

Table 6: Parking Demand Ratios .....27

Table 7: Parking Demand Calculations.....28

Table 8: Comparison of Parking Demand and Supply.....28

Table 9: Relevant Comprehensive Plan Policies & Actions .....30

Table 10: Trip Generation Rate Comparison .....33

Table 11: Base Trip Generation Comparison .....34

Table 12: Base Vehicle- and Person-Trips Generated.....34

Table 13: WMATA *Ridership Survey* Mode Split for Retail Sites .....35

Table 14: Mode Split Information for Residential Uses .....36

Table 15: Mode Split Assumptions .....37

Table 16: Trip Generation for Proposed Development by Mode .....37

Table 17: Trip Generation for Background Developments .....41

Table 18: Summary of Vehicular Capacity Analysis Assumptions.....43

Table 19: Vehicular Level of Service Results .....57

Table 20: Roadway Capacity Results Review for Existing and 2019 Background/Future .....61

Table 21: Vehicular Level of Service Results with Proposed Improvements .....63

Table 22: Summary of Signal Warrant Analysis .....65

Table 23: Intersection Crash Rates .....71

Table 24: High Crash Rate Intersections by Crash Type.....72

## EXECUTIVE SUMMARY

The following report presents the findings of a Transportation Impact Study (TIS) performed for the Capitol Gateway Planned Unit Development (PUD). The proposed PUD is located along East Capitol Street in Ward 7 in Northeast Washington, DC. The site is bounded by East Capitol Street to the south, with private development flanking the north, east, and west. The proposed site plan consists of four parcels of mixed-use development containing a restaurant, a Walmart store, and a residential building with on-street retail. The PUD includes approximately 506,000 square feet of overall development.

### Design Review

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

The development program consists of a mixed-use development, with approximately 506,000 square feet of overall development. The development program consists of 159,500 SF retail uses (including a Walmart store); 8,800 SF restaurant uses; and 290 residential dwelling units. In summary, the site plans include the following features:

- The PUD is divided into four parcels. Parcel 1 will contain the Restaurant use, Parcel 2 will contain the Walmart, Parcel 3 will contain green space, and Parcel 4 will contain the Residential and on-street Retail uses.
- Vehicular access to the site will be provided via 58<sup>th</sup> Street, "Private Street 1" (extension of Blaine Street as a private street into the site), and "Private Street 2" (to be constructed).
- Curb cuts will be provided via 58<sup>th</sup> Street, Private Street 1 (Blaine Street extended as a private street into the site), Private Street 2 (to be constructed). One curb cut is proposed along 58<sup>th</sup> Street north of East Capitol Street, which will provide access to Parcel 1 and replace the existing curb cut. The other curb cuts will be internal to the site, including three curb cuts proposed along Private Street 1 and two proposed along Private Street 2 to provide access to Parcels 2 and 4.
- Loading docks will be provided for each developed parcel. Loading and service facilities will be designed and located to minimize conflicts with the pedestrian environment or vehicular and bicycle traffic. Loading and service entrances are located on the internal streets and not on East Capitol Street, 58<sup>th</sup> Street, and the main public spaces of the project.
- The amount of parking provided will be sufficient without the unintended consequence of encouraging driving as a mode. The proposed development will provide 184 parking spaces for the residential uses and 667 spaces for the non-residential uses (851 spaces total).
- The project will include short-term public bicycle spaces on streets, near building entrances, and in public places and secured long-term bicycle parking within the parking garages. Short term parking will be provided in Parcels 1-4, with 4 spaces on Parcel 1, 20 on Parcel 2, and 10 on Parcel 4. An additional 50 long-term parking spaces are planned for Parcel 4, located within the residential parking garage.

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

- The Applicant will maintain or coordinate relocation of any existing bus stops during construction of the development.
- The Applicant will comply with Zoning requirements to provide bicycle parking/storage facilities. This includes secure parking located in the garage for retail employees and long-term storage for residents.
- The Applicant will unbundle all parking costs from the cost of lease or purchase of residential units. Parking costs will be set at no less than the charges of the lowest fee garage located within ¼ mile.
- The Applicant will post all TDM commitments on-line, publicize availability, and allow the public to see what commitments have been promised.
- The Applicant will identify separate TDM Leaders for the mixed-use and Wal-mart portions of the development (for planning, construction, and operations) and provide this information to DDOT and Zoning Enforcement.
- The Applicant will install a Transportation kiosk in the residential lobbies which will contain printed materials related to local transportation alternatives and will maintain a stock of materials at all times.
- The Applicant will provide website links to CommuterConnections.com and goDCgo.com on developer and property management websites.
- The Applicant will dedicate two spaces for car sharing services to use with right of first refusal.
- The Applicant will provide reserved spaces for carpools and vanpools that are conveniently located with respect to the elevators serving the buildings.
- The Applicant will provide an on-site business center available to residents, which will provide access to copier, fax, and internet services.
- Wal-mart will provide a Capital Bikeshare station and ongoing funding for the program. The Applicant will also provide 1-year Capital Bikeshare memberships for each new resident.
- The Applicant agrees to host a transportation mobility fair six months after the development has opened. The transportation fair will be advertised to all on-site workers and residents. The onsite TDM coordinator will work with DDOT's goDCgo team to organize representatives that are experts in the non-auto transportation options that serve the site. Each person that attends the event will be educated on the various options and representatives will work with attendees to help them tailor the use of non-auto options to their specific transportation needs. Based on the turnout of the transportation fair and feedback gleaned by the onsite TDM coordinator, a determination will be made if the event will be repeated the following year.
- Two years after the project is 90% occupied, the Applicant will perform a monitoring study of site trip generation. The site trips will be compared to the projected trip generation contained in this report. If the measured trip generation exceeds the projections, the Applicant will supplement the above TDM measures with additional ones, such as those from in *Incorporation of Transportation Demand Management (TDM) into the Development Review Process* suggested for a project of this size not listed above.

### **Roadway Capacity Review**

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

The analyses concluded that the Capitol Gateway 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 in 2019, with the following exceptions:

- The intersection of East Capitol Street and 58<sup>th</sup> Street is projected to operate under unacceptable condition during the morning and afternoon peak period due to the addition of the site-generated traffic. However, the intersection can operate under acceptable conditions with the addition of the following improvements: add protected left-turn phase (with permitted operation as well) to the eastbound approach of East Capitol Street, retime the intersection, and optimize the intersection offsets. This report recommends that the Applicant coordinate with DDOT to reconstruct and retime the traffic signal at this intersection to include these proposed improvements.
- The eastbound left turn movements at the intersection of East Capitol Street and 61<sup>st</sup> Street are projected to operate under unacceptable condition during the morning peak period, as it does under existing conditions. Since the number of left turns that are present are minimal (less than 10) and access to the neighborhoods north of East Capitol Street that are fed by 61<sup>st</sup> Street is provided via Banks Place and Southern Avenue, the restriction of these left turns could improve the operation of this intersection. This report recommends that the Applicant coordinate with DDOT to close the median that allows left turns from eastbound East Capitol Street to northbound 61<sup>st</sup> Street.
- The intersection of East Capitol Street and Southern Avenue is projected to operate under unacceptable condition during the morning and afternoon peak period due to the existing intersection configuration, which is exacerbated by the addition of the site-generated traffic. However, the intersection can operate under acceptable conditions with the addition of the following improvements: retime the intersection, and optimize the intersection offsets. This report recommends that the Applicant coordinate with DDOT to retime the traffic signal at this intersection to include these proposed improvements.

Additional intersections are projected to operate under unacceptable conditions during one or more peak hour during the 2040 horizon scenario. This includes the following list:

- East Capitol Street and 55<sup>th</sup> Street
- Southern Avenue and Davey Street
- Central Avenue and Central Avenue
- East Capitol Street and 59<sup>th</sup> Street

However, no improvements are proposed to be implemented by the Applicant at these intersections. This report recommends some improvements, but that the intersections listed above are studied by DDOT outside the scope of this TIA in order to determine if the improvements are warranted at these intersections.

**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 Capitol Gateway PUD will not have a negative impact to local transit service. Based on findings presented in transit studies from WMATA and DDOT, both the Capitol Heights 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.

## INTRODUCTION

This report presents the findings of a transportation impact study performed for the Capitol Gateway PUD. The development is located in Ward 7 along East Capitol Street, near the District line and the Capitol Heights Metrorail Station. The proposed site plan consists of a mixed-use development with a small Walmart store, on-street retail, restaurant uses, and residential apartments, with approximately 506,000 square feet of overall development. In total, the development will include approximately 159,500 SF retail uses (including the Walmart store); 8,800 SF restaurant uses; and 290 residential dwelling units.

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 Capitol Gateway 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 Capitol Gateway 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 Capitol Gateway 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 Capitol Gateway PUD is located in the near Southeast portion of Washington, DC, in Ward 7. The project site, as shown in Figure 1, is bounded by East Capitol Street to the south, 58<sup>th</sup> Street to the west, and private development to the north and east. The site is served by many regional roadways including East Capitol Street, Southern Avenue, Eastern Avenue, and Martin Luther King, Jr. Highway.

The site is also 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**

The PUD is accessible via arterials, collector, and local streets. Figure 2 shows the roadway network hierarchy and the average daily traffic for the roadways in the vicinity of the proposed development. The immediate study area of the proposed development has several key local access roads. These include the following:

- *East Capitol Street*  
East Capitol Street is a six-lane roadway that runs east-west in the vicinity of the site. DDOT classifies it as a principal arterial with an average daily traffic of 27,800 vehicles in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of East Capitol Street.
- *Southern Avenue*  
Southern Avenue is a two- to four-lane roadway that runs along the southeastern border of the District. DDOT classifies it as a minor arterial with an average daily traffic of 10,100 vehicles in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of Southern Avenue.
- *Eastern Avenue*  
Eastern Avenue is a two- to four-lane roadway that runs along the northeastern border of the District. DDOT classifies it as a minor arterial with an average daily traffic of 9,000 vehicles in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of Eastern Avenue.
- *Central Avenue*  
Central Avenue is a two-lane roadway that runs east-west in the vicinity of the site. DDOT classifies it as a minor arterial with an average daily traffic of 7,800 vehicles in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of Central Avenue.
- *Nannie Helen Burroughs Avenue*  
Nannie Helen Burroughs (NHB) Avenue is a two-lane roadway that runs east-west in the vicinity of the site. DDOT classifies it as a minor arterial with an average daily traffic of 11,100 vehicles in the vicinity of the proposed development. In the study area, bicycle lanes and on-street parking are generally provided along both sides of NHB Avenue.



Figure 1: Site Location

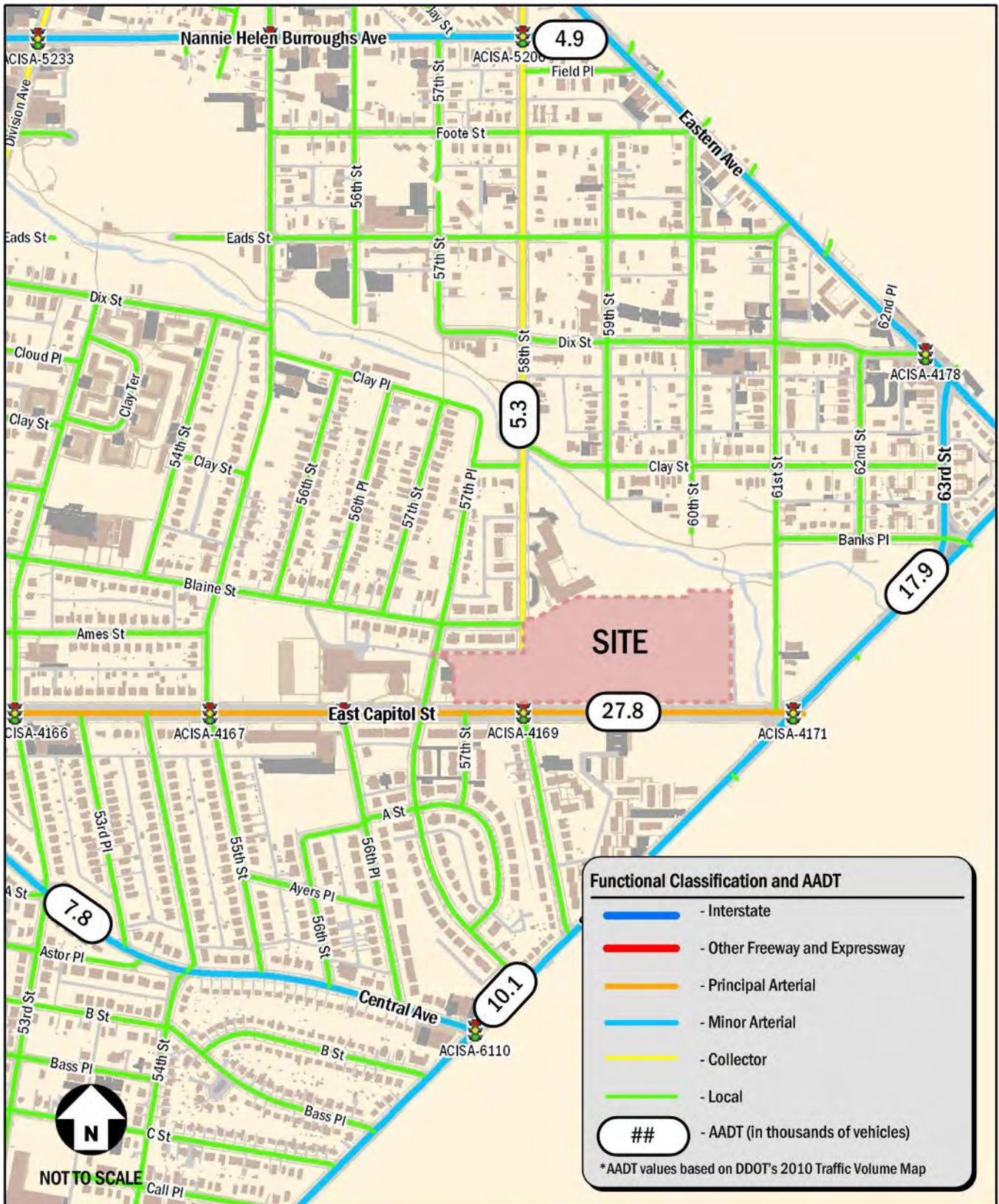


Figure 2: Functional Classification and AADT

- 58<sup>th</sup> Street  
58<sup>th</sup> Street is a two-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 5,300 vehicles in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of 58th Street.
- Division Avenue  
Division Avenue is a two-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 5,700 vehicles in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of Division Avenue.
- Blaine Street  
Blaine Street is a two-lane roadway that runs east-west in the vicinity of the site. DDOT classifies it as a local roadway. Traffic volume estimates for the roadway are not available in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of Blaine Street.
- 55<sup>th</sup> Street  
55<sup>th</sup> Street is a two-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a local roadway. Traffic volume estimates for the roadway are not available in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of 55<sup>th</sup> Street.
- 56<sup>th</sup> Place  
56<sup>th</sup> Place is a two-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a local roadway. Traffic volume estimates for the roadway are not available in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of 56<sup>th</sup> Place.
- 57<sup>th</sup> Place  
57<sup>th</sup> Place is a two-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a local roadway. Traffic volume estimates for the roadway are not available in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of 57<sup>th</sup> Place.
- 61<sup>st</sup> Street  
61<sup>st</sup> Street is a two-lane roadway that runs north-south in the vicinity of the site. DDOT classifies it as a local roadway. Traffic volume estimates for the roadway are not available in the vicinity of the proposed development. In the study area, on-street parking is generally provided along both sides of 61<sup>th</sup> Street.

Two minor infrastructure projects are located near the proposed development: the East Capitol Street Pedestrian Safety Project and the Nannie Helen Burroughs Project. The majority of the improvements outlined by these projects will not affect the roadway network immediately surrounding the project site. However, the East Capitol Street Pedestrian Safety Project includes several improvements proposed to enhance the pedestrian conditions along the corridor. These projects are outlined in greater detail in Section 1.7.1.

### **1.3 Car-Sharing**

Three car sharing companies serve the District: Zipcar, Hertz on Demand, and Daimler's Car2Go. All three services are private companies that provide registered users access to a variety of automobiles. Zipcar has a few locations adjacent to the

project site, but Hertz on Demand does not. Table 1 lists the car-sharing locations provided by Zipcar in the study area and the number of vehicles available.

**Table 1: Carshare Location and Vehicles (Zipcar)**

Carshare Location	Provider	Number of Vehicles
Capitol Heights Metro	Zipcar	4 vehicles
<b>Total Number of Carshare Vehicles in Study Area</b>		<b>4 vehicles</b>

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

**1.4 Transit**

The study area is served by heavy rail 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 Capitol Gateway PUD. The nearest Metrorail station is Capitol Heights, which is less than 1,000 feet from PUD, near the intersection of East Capitol Street and Southern Avenue. The Blue line serves the Capitol Heights Metrorail 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 along East Capitol Street and near the site on other surrounding roadways. The majority of the Metrobus lines that serve the site provide service to the Capitol Heights Metrorail station. These routes connect the site with several destinations throughout downtown DC and the surrounding areas. Table 2 shows a summary of the bus route information for the lines within a half-mile that serve the site, including service hours, headways, and average weekday ridership.

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.

**Table 2: Bus Route Information**

Route Number	Route Name	Service Hours <sup>1</sup>	Headway <sup>1</sup>	Average Weekday Ridership <sup>2</sup>
96/97	East Capitol Street-Cardozo Line	24 hours	10-25 min	4,752
W4	Deanwood-Alabama Avenue			4,986
The Bus 24	Capitol Heights/District Heights	5:30 AM – 8:30 PM	30 min	Ridership not available. Route is not operated by WMATA.
The Bus 25	Capitol Heights	6:00 AM – 7:30 PM	35 min	Ridership not available. Route is not operated by WMATA.
X9	Benning Road-H Street Express	Weekdays 6:00 – 10:00 AM, 3:30 – 7:00 PM	15 min	686
U8	Capitol Heights-Benning Heights	24 hours	10 min	4,956
F14	Benning Road-H Street Express			
U5/6	Mayfair-Marshall Heights	24 hours	10-20 min	3,123

The streetcar system element of the plan does not include any routes that travel near the project site. However, the Georgetown to Benning Road Metrorail Station Line will terminate at the Benning Road Metrorail station, which is approximately one mile from the PUD. 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 Metro Express limited-stop bus service element of the plan includes one route that travels near the project site. The network of new limited-stop bus service (“Metro Express”) will consist of high-frequency bus services using specially marked vehicles, operated by WMATA, which will supplement the four existing Metro Express routes that operate along Georgia Avenue, 16<sup>th</sup> Street, Wisconsin Avenue, and Pennsylvania Avenue. Stops will generally be located every ¼- to ½-mile along the routes. The Metro Express bus services will also include traffic signal priority and real-time Next Bus arrival displays. The future planned corridor near the site travels along Minnesota Avenue and Nannie Helen Burroughs Avenue and connects to the Capitol Heights Metrorail station.

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

<sup>2</sup> For WMATA routes, WMATA FY 2011 Weekday Average Ridership, [http://wmata.com/pdfs/planning/FY11\\_Average\\_Weekday\\_Bus\\_Ridership.pdf](http://wmata.com/pdfs/planning/FY11_Average_Weekday_Bus_Ridership.pdf)  
 For DC Circulator, DC Circulator Dashboard, Average Ridership by Day of Week, 1/1/2011 to 12/31/2011, <http://circulatordashboard.dc.gov/>

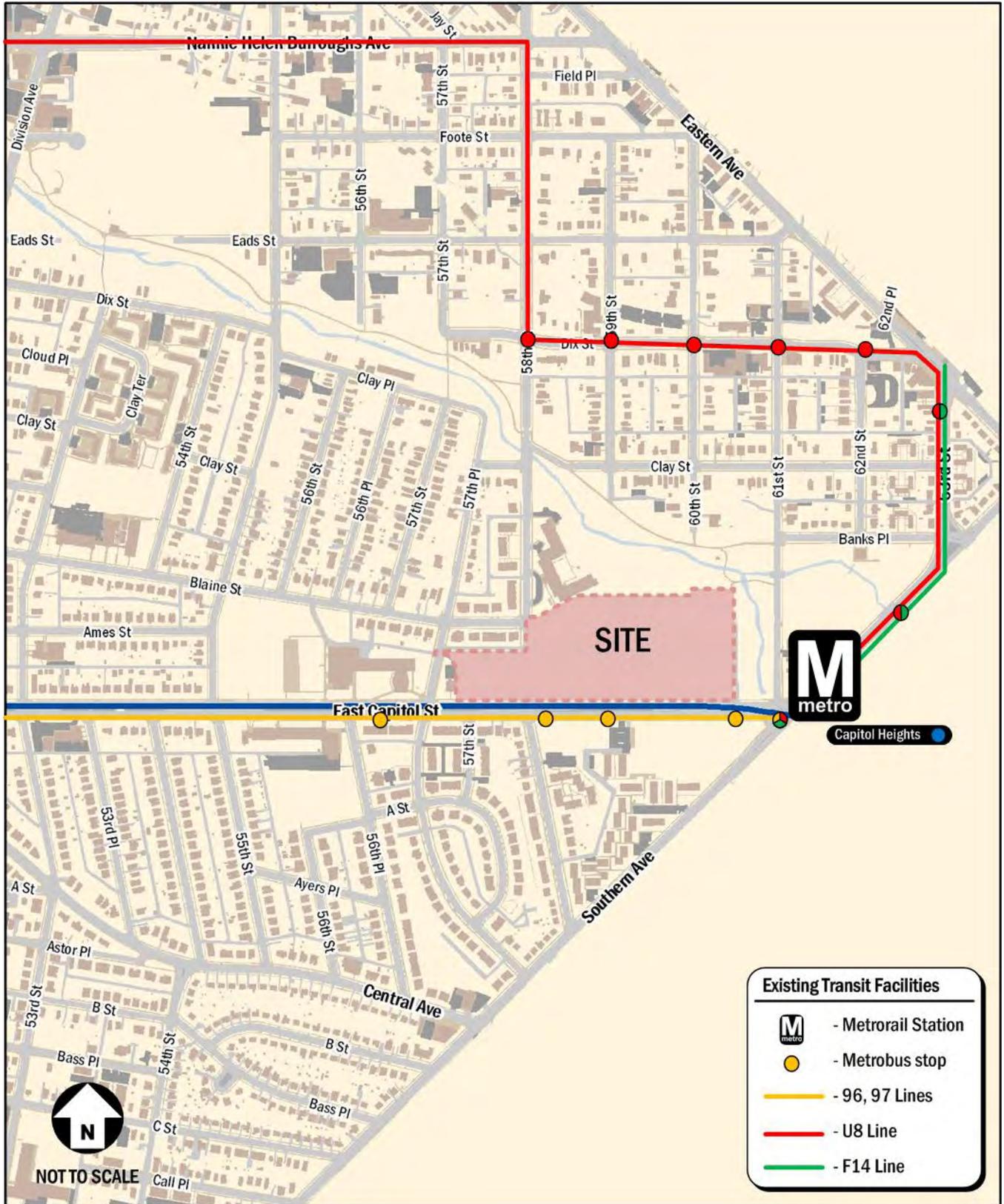


Figure 3: Existing Transit Facilities

## 1.5 Bicycle Facilities

Within the study area, bicyclists have access to multi-use trails, signed bike routes, and local and residential streets that facilitate cycling. The site is directly served by multi-use trails, signed bicycle routes, and local streets that accommodate cycling. The bicycle network generally provides fair conditions for local trips.

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 fair to poor along major roadways. However, the existing conditions on local roadways provide a good environment for cycling include low traffic volumes and speeds, as well as wide travel lanes. Additionally, the site is connected to the Marvin Gaye Trail. On-street signed bicycle routes are provided along 54<sup>th</sup> and 55<sup>th</sup> Streets west of the site, in addition to the off-street Marvin Gaye Trail.

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. Figure 4 illustrates bicycle facilities in the study area. In the study area, the greatest barrier to cycling is East Capitol Street, which is difficult to cross due to high traffic volumes.

Some bicycle parking was observed in the study area though most cyclists typically use street signs, parking meters, or similar objects to secure their bicycles. This indicates that there is demand for additional bicycle parking facilities in the study area. A small amount of bicycle parking is provided at the Capitol Heights Metrorail station.

As shown in the *DC Bicycle Master Plan* from April 2005, DDOT's proposed bicycle infrastructure for the roadways in the vicinity of the proposed development includes several multi-use trails, on-street bike lanes, and signed bicycle routes. These facilities will significantly improve bicycling conditions in the study area and may lead to higher rates of cycling. The plan includes proposed bicycle lanes along East Capitol Street, Nannie Helen Burroughs Avenue, Southern Avenue, as well as an extension to the 55<sup>th</sup> Street bicycle lanes. Extensions to the Marvin Gaye Trail are also proposed.

Capital Bikeshare was launched in late September 2010 to replace the DC SmartBike program. This program has placed over 175 bicycle-share stations across Washington, DC and Arlington, VA with approximately 1,675 bicycles provided. The only Capital Bikeshare station in the vicinity of the proposed development is located at the Benning Road Metrorail station, approximately one mile from the PUD. 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 existing locations have been identified. There is not an official timeline for when potential stations will be installed. The DDOT map of "Capital Bikeshare Proposed and Expanded Locations" shows two proposed Bikeshare stations located along Nannie Helen Burroughs Avenue, approximately one mile from the PUD.

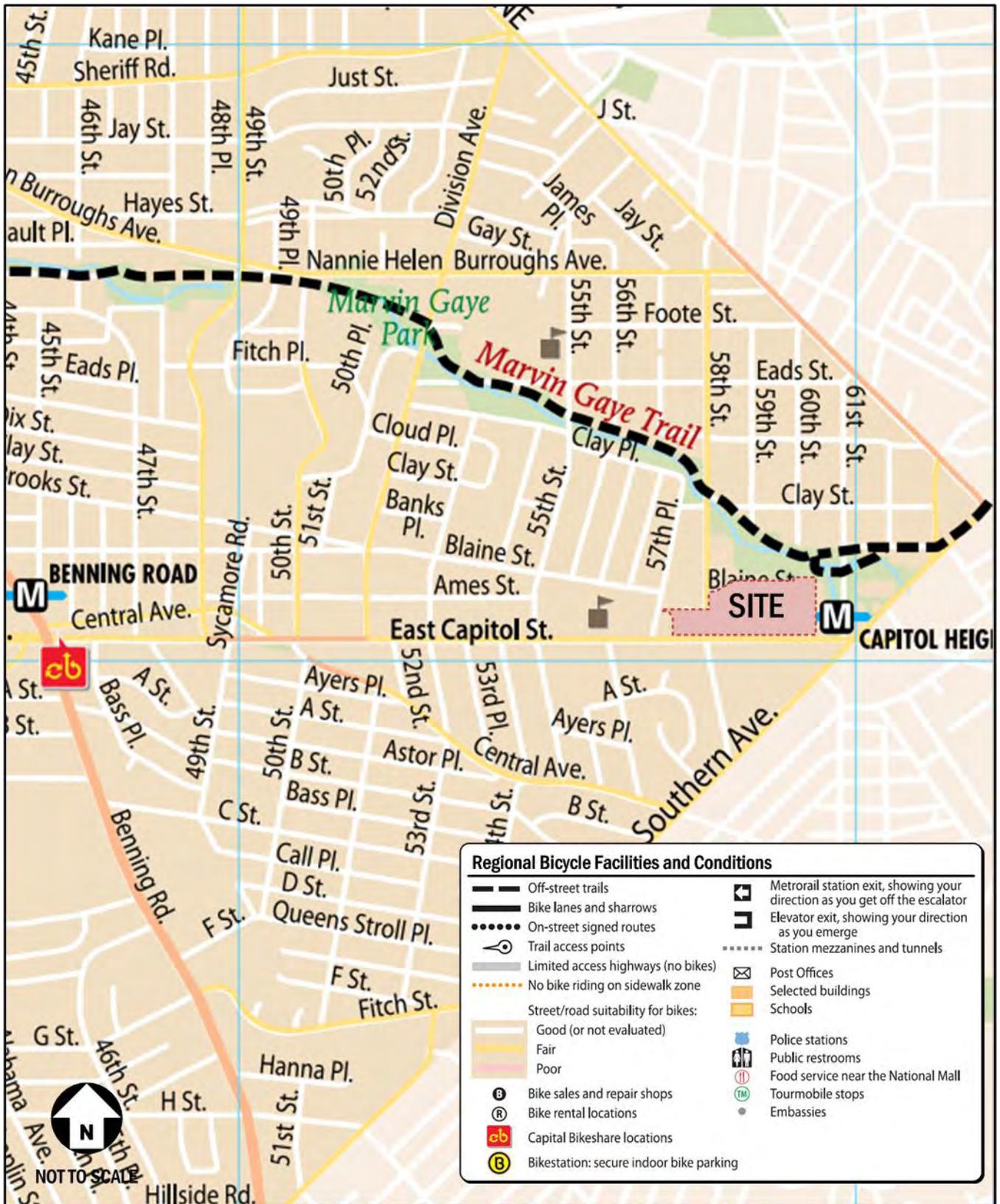


Figure 4: Existing Bicycle Facilities

### 1.6 Pedestrian Facilities

Overall, the pedestrian facilities within the study area provide a good walking environment. Pedestrian activity within the study area generally occurs along transit access routes and in the vicinity of transit stops. Nearly all streets in the study area have adequate sidewalks and on-street parking that provides a buffer between pedestrians and vehicular traffic.

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

There are some barriers and areas of concern within the study area that negatively impact the quality and attractiveness of walking, including walking distances between the site and some major destinations, manmade and natural barriers that increase walking distances, and roadway conditions that reduce the quality of walking conditions, including narrow sidewalks along several streets, and lengthy crossings at some intersections.

A review of pedestrian facilities near the site shows that most facilities meet DDOT standards, and provide a quality walking environment. Figure 5 shows a detailed inventory of the existing pedestrian infrastructure in the vicinity of the development site. Sidewalks, crosswalks, and curb ramps are evaluated based on the guidelines set forth by DDOT’s *Public Realm Design Manual* in addition to ADA standards. Sidewalk width and buffer requirements for the District are shown below in Table 3. Within the area shown, most roads are considered residential with a low to moderate density, thus a 6 foot sidewalk with a 4 foot buffer is required.

As can be seen in the figure, most sidewalks in the vicinity of the site comply with these standards, however there are a few areas that do not meet the minimum width or have no sidewalk at all. Many of the areas that do not have sidewalks are adjacent to wooded areas thus the addition of a sidewalk is not very feasible; however, in nearly all locations there is a sidewalk on at least one side of the roadway. Additionally, the sidewalks directly surrounding the development site will be improved as a part of the proposed plans.

ADA standards require that all curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, curb ramps shared between two crosswalks is not desired. As shown in the figure, under existing conditions there are some issues with crosswalks and curb ramps near within the study area.

**Table 3: Sidewalk Requirements**

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

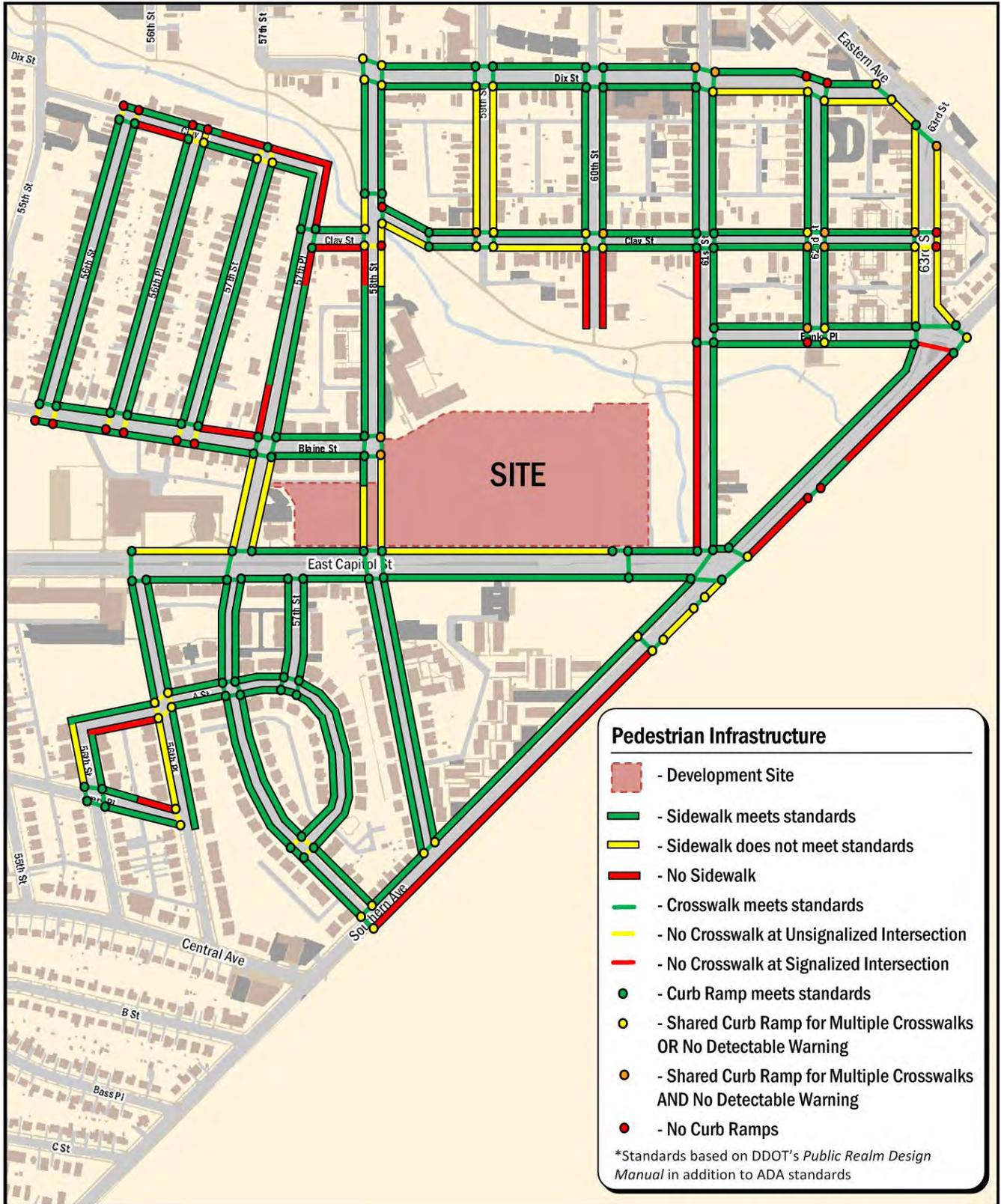


Figure 5: Existing Pedestrian Infrastructure

## **1.7 Future Projects & Developments**

### **1.7.1 District Initiatives**

As stated previously, the planned East Capitol Street Pedestrian Safety Project and the planned Nannie Helen Burroughs Project are currently underway in the vicinity of the project site. These projects are summarized below.

#### **East Capitol Street Pedestrian Safety Project**

The East Capitol Street Pedestrian Safety Project focuses on improving safety for pedestrians, bicyclists, motorists, and transit users along East Capitol Street. The study focuses on the corridor between Stoddert Place and Southern Avenue. The study is currently underway, with a goal of 30% preliminary design plans in Spring 2013. However, construction is currently unfunded. The project will potentially include the following improvements:

- Widening of sidewalks, landscaping, streetscaping, and pedestrian facilities;
- Installation of traffic calming measures;
- Design of new intersection geometry to reduce curb radii, realign crosswalks, and include bike lanes;
- Construction of new traffic signal and retiming existing signals; and
- Relocation of existing transit stops to facilitate pedestrian safety.

#### **Nannie Helen Burroughs Project**

The Nannie Helen Burroughs Project will transform Nannie Helen Burroughs (NHB) Avenue NE between Minnesota and Eastern Avenues by enhancing the neighborhood and improving pedestrian accessibility, mobility, and safety. The design will improve mobility through the construction of continuous sidewalks, curb extensions, and bicycle lanes. Additionally, NHB Avenue will be reconfigured to a single travel lane in each direction to allow for traffic calming. New traffic signals will be installed at several intersections. Other improvements include landscaped medians, additional sidewalk lighting, and design upgrades of the storm-water infrastructure to reduce pollutants from the street run-off.

### **1.7.2 Developments**

There are two projects located in the vicinity of the Capitol Gateway PUD that are either proposed, approved, or under construction. Eden Place is a residential development located at 400-414 Eastern Avenue NE. The first phase of development is currently under construction, with a second phase anticipated in 2013-2014. The first phase of development contains 29 townhomes, and the second phase will include an additional 34 townhomes. An additional unnamed development is located south of East Capitol Street, directly across from the Capitol Gateway PUD. No firm program or time frame has been proposed at this time.

## 2: DESIGN REVIEW

This report section provides an overview of the on-site transportation features of the proposed Capitol Gateway 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 replace an existing vacant site. There is currently one curb cut located on 58<sup>th</sup> Street, north of East Capitol Street, and six curb cuts located along Blaine Street between 58<sup>th</sup> and 60<sup>th</sup> Streets, which have been previously abandoned as this portion of the roadway is designated as a private street. On-street parking is provided along all of the existing public roadways that border the site. Figure 6 identifies the existing conditions surrounding the project site.

The proposed Capitol Gateway PUD consists of mixed-use development of retail and residential space. The site plan is included as Figure 7. The site occupies four parcels within Squares 5276, 5277, 5273, and 5246. In total, the development will include approximately 159,500 SF retail uses (including the Walmart store); 8,800 SF restaurant uses; and 290 residential dwelling units. The four parcels, shown on Figure 8, are as follows:

- Parcel 1 – Lot 110 on Square 5246, which is currently zoned R-2. The lot will be developed to include an 8,800 SF restaurant and a surface parking lot containing 91 parking spaces.
- Parcel 2 – Square 5276, currently zoned R-5-A, will be developed to include a 135,551 SF building that will house a Walmart store on the west side of the Square. The building will also include one level of underground parking containing 388 parking spaces. The parcel will also be served by an additional 96 parking spaces located in the Parcel 4 garage.
- Parcel 3 – Lot 67 on Square 5273, which is currently zoned R-5-A and previously included in the New East Capitol Senior Building PUD (Zoning Case No. 02-04), will be preserved as green space.
- Parcel 4 – On the east side of Square 5276 and the western portion of Square 5277 (Lots 22-33), one additional building will be constructed containing approximately 24,000 SF of street-level retail uses that is anticipated to house three to five retailers and approximately 290 residential dwelling units. The building will also include two levels of partially below-ground parking (one each for the retail and residential portions) to provide approximately 372 parking spaces (184 spaces designated for the residential portion and 188 spaces designated for the retail uses). As noted above, 96 of the parking spaces designated for the retail portion of the site are provided to serve the parking demand from Parcel 2.

Figure 8 provides an overview of the project's development program. Figure 9 shows the site access plan. Access to the site will be provided via 58<sup>th</sup> Street, Private Street 1 (Blaine Street extended on-site as a private street), and Private Street 2 (to be constructed).

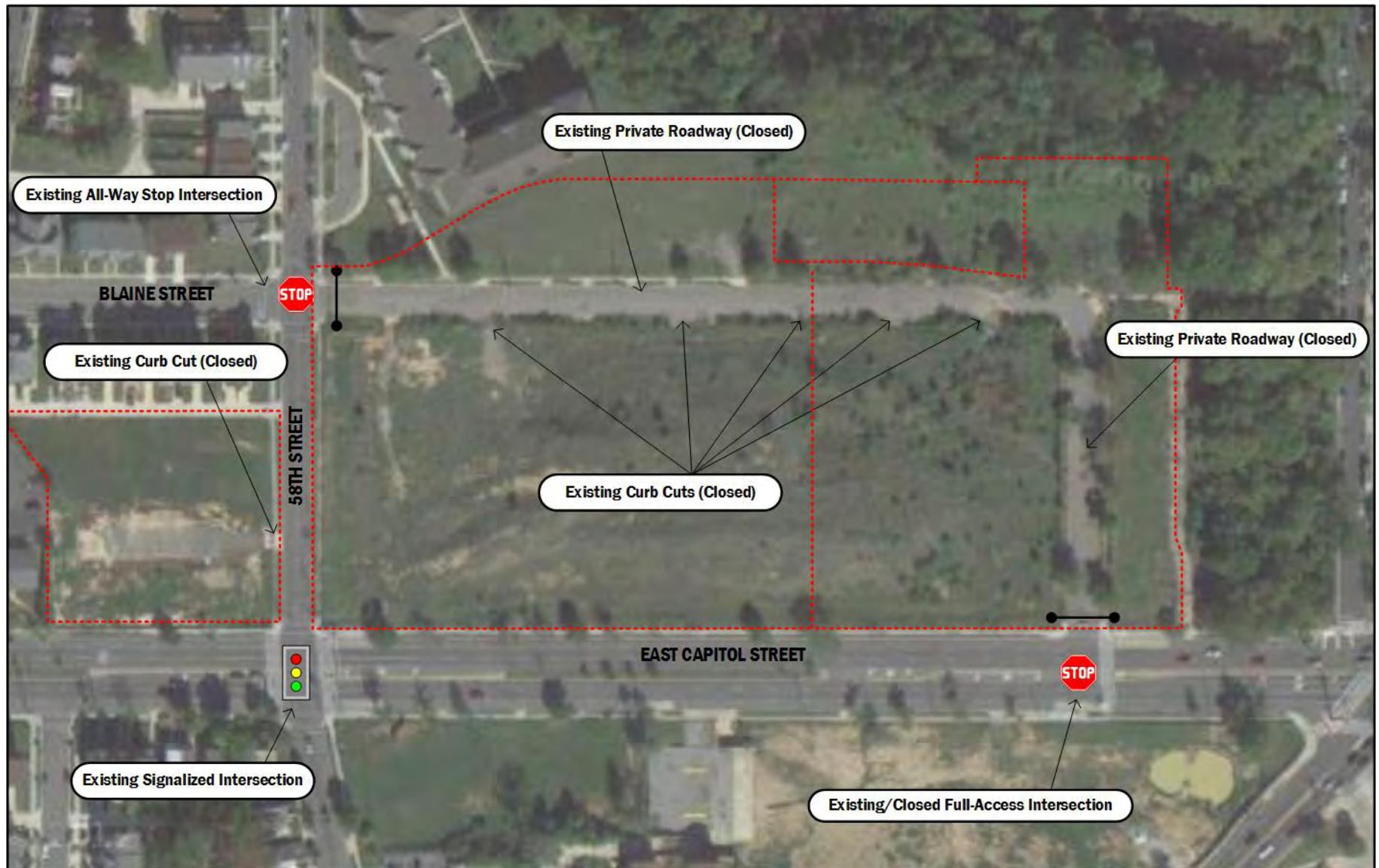


Figure 6: Existing Site Diagram

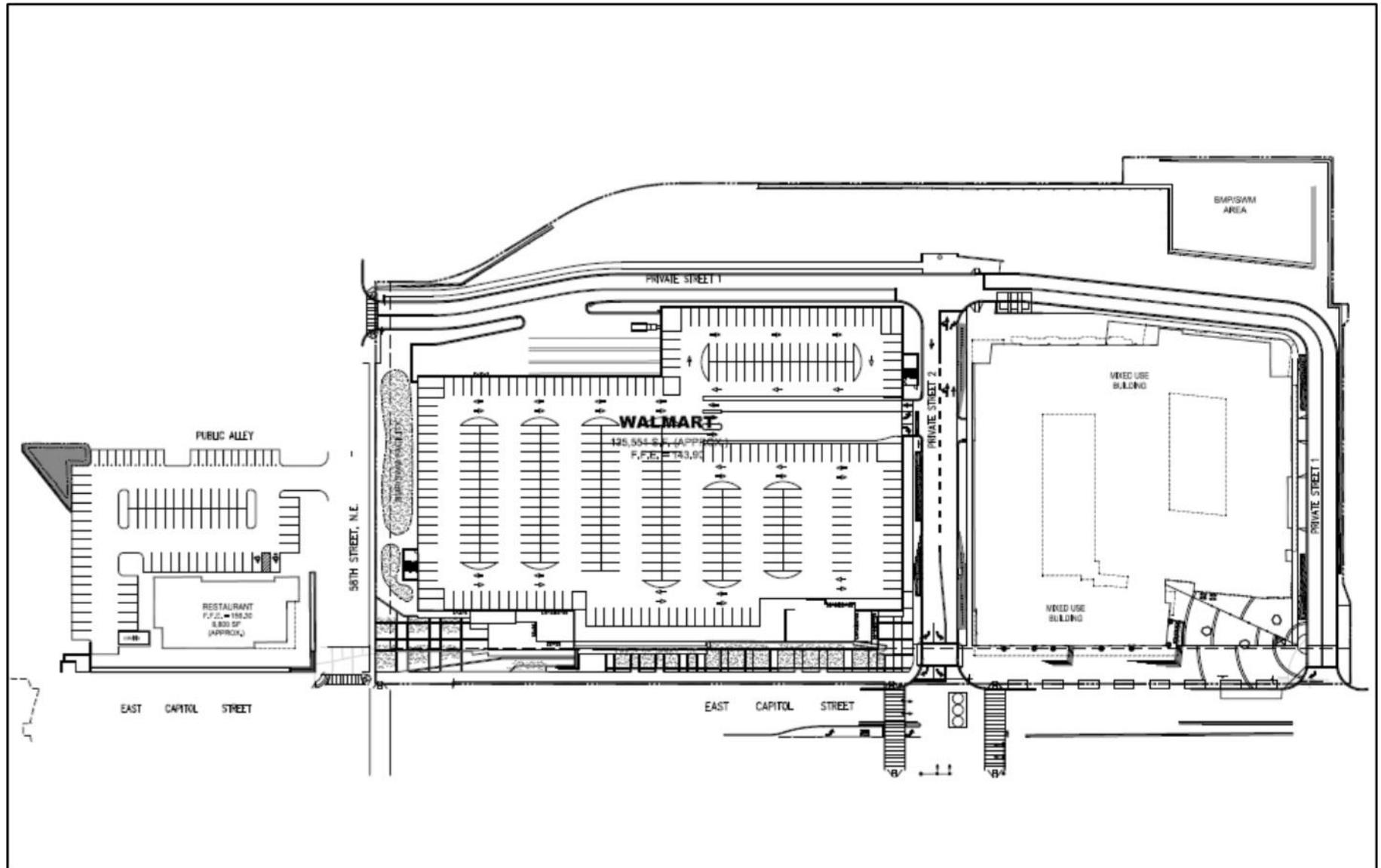


Figure 7: Proposed Site Plan

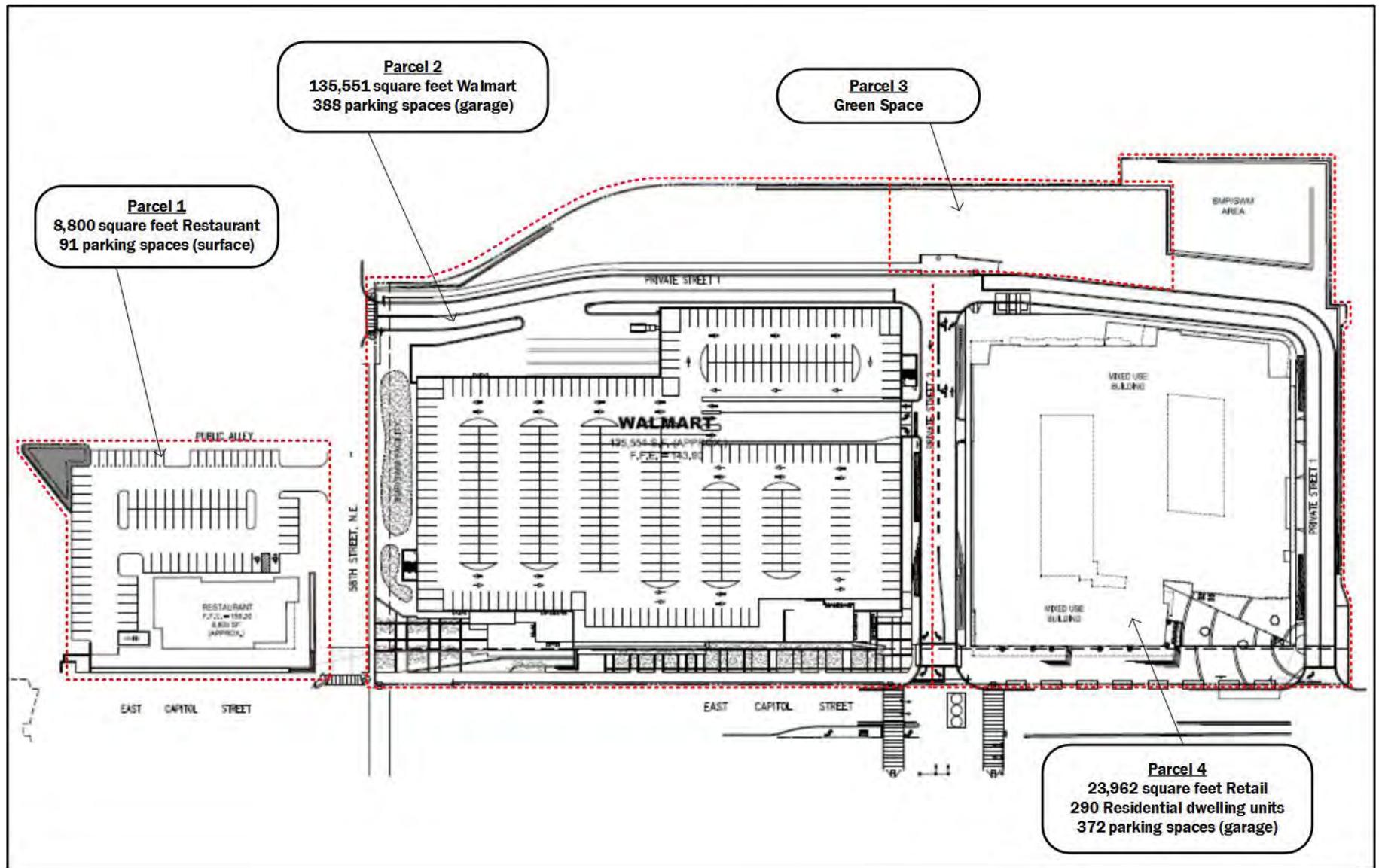


Figure 8: Annotated Site Plan

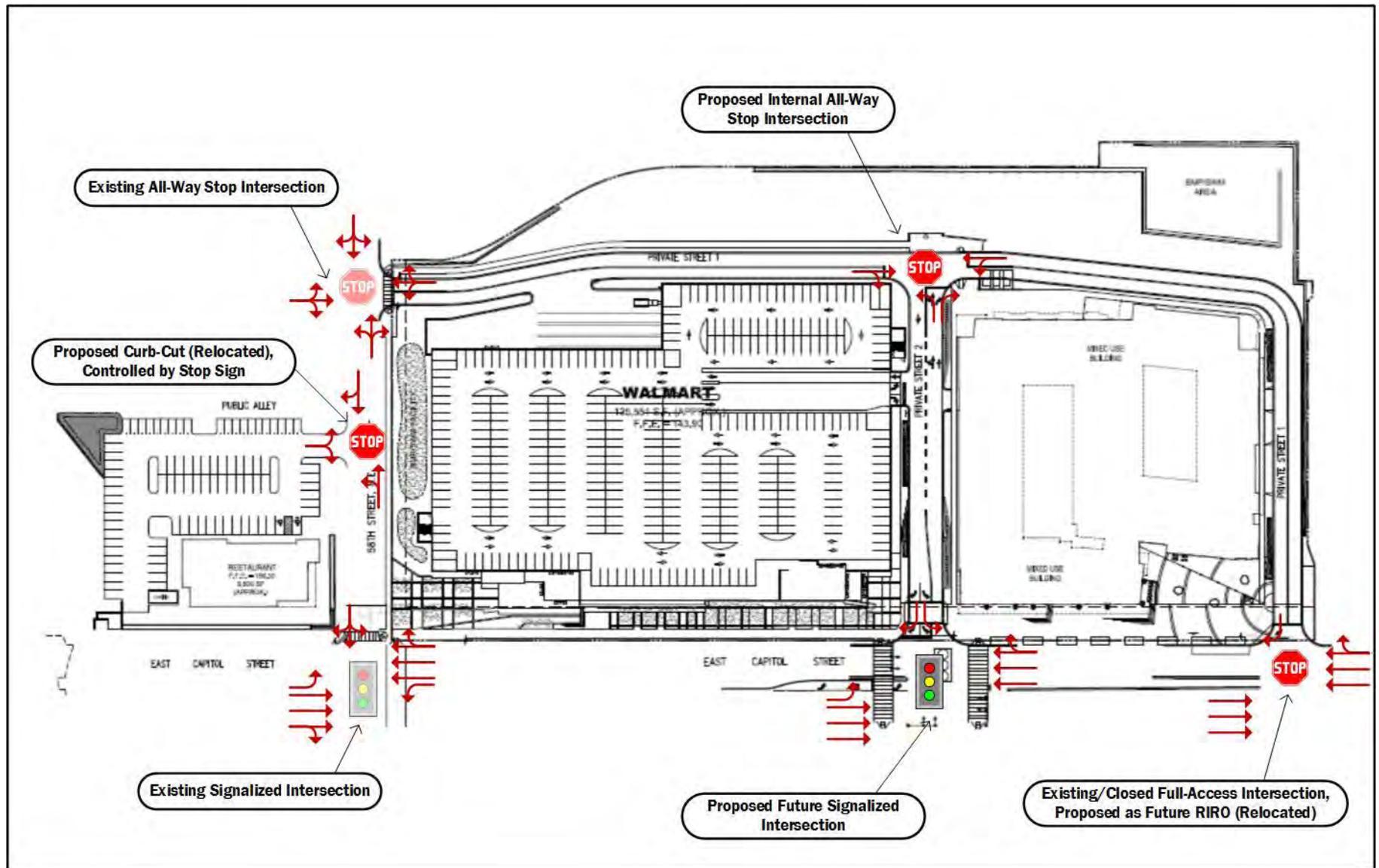


Figure 9: Proposed Vehicular Site Access

## **2.1 Site Access and Internal Circulation**

### **2.1.1 Vehicular Access**

The site will be accessed via the intersections of 58<sup>th</sup> Street and East Capitol Street (existing signalized intersection), 58<sup>th</sup> Street, Blaine Street, and Private Street 1 (existing all-way stop intersection), Private Street 2 and East Capitol Street (proposed future signalized intersection), and Private Street 1 and East Capitol Street (existing/closed full-access unsignalized intersection, proposed as relocated unsignalized right-in/right-out intersection). All vehicular access to the site's parcels, with one exception, will be located along private streets within the proposed PUD. Curb cuts will be provided via 58<sup>th</sup> Street, Private Street 1 (Blaine Street extended on site as a private street), and Private Street 2 (to be constructed). Figure 9 shows the locations of the site access points, as well as the configuration of each intersection.

As shown in Figure 9, one curb cut is proposed along 58<sup>th</sup> Street north of East Capitol Street, which will provide access to Parcel 1. The proposed curb cut will replace the existing curb cut provided along 58<sup>th</sup> Street. Internal to the site, three curb cuts are proposed along Private Street 1, and two are proposed along Private Street 2 to provide access to Parcels 2 and 4. As noted on Figure 9, a new traffic signal is proposed at the intersection of East Capitol Street and Private Street 2. At the request of DDOT, a signal warrant analysis was compiled for the proposed traffic signal and is included in Section 3.2.6.

No changes to the existing on-street parking are proposed, with the exception of the reconfiguration of the on-street parking along the west side of 58<sup>th</sup> Street due to the relocation of the existing curb cut. Additional on-street parking will be constructed along private streets within the PUD, as outlined in Section 2.1.3.

No pick-up/drop-off facilities are proposed for the development.

### **2.1.2 Loading**

As described below, all loading activity will take place within internal streets. No back-up maneuvers from East Capitol Street or other external streets will be necessary for trucks to access their loading docks.

Access for the loading facilities will be provided via the site access points outlined above for vehicular access. Figure 10 shows routing maps for how trucks will access the site from the surrounding roadways, as well as the internal truck maneuvering for inbound and outbound trucks. As shown in Figure 10, trucks originating from Route 50 to the north will travel along Eastern Avenue to access the site from East Capitol Street, via Southern Avenue. Trucks originating from Interstate 95 to the east will travel along Central Avenue/East Capitol Street to access the site.

Internal to the site, trucks will access the loading docks for Parcel 1 by traveling through the proposed surface parking lot. For Parcel 2, 3, and 4, trucks will travel along the internal private roadways (Private Street 1) to access the loading docks. Internal truck maneuvering is shown on Figure 10, which also notes where right turns with sweeps will occur.

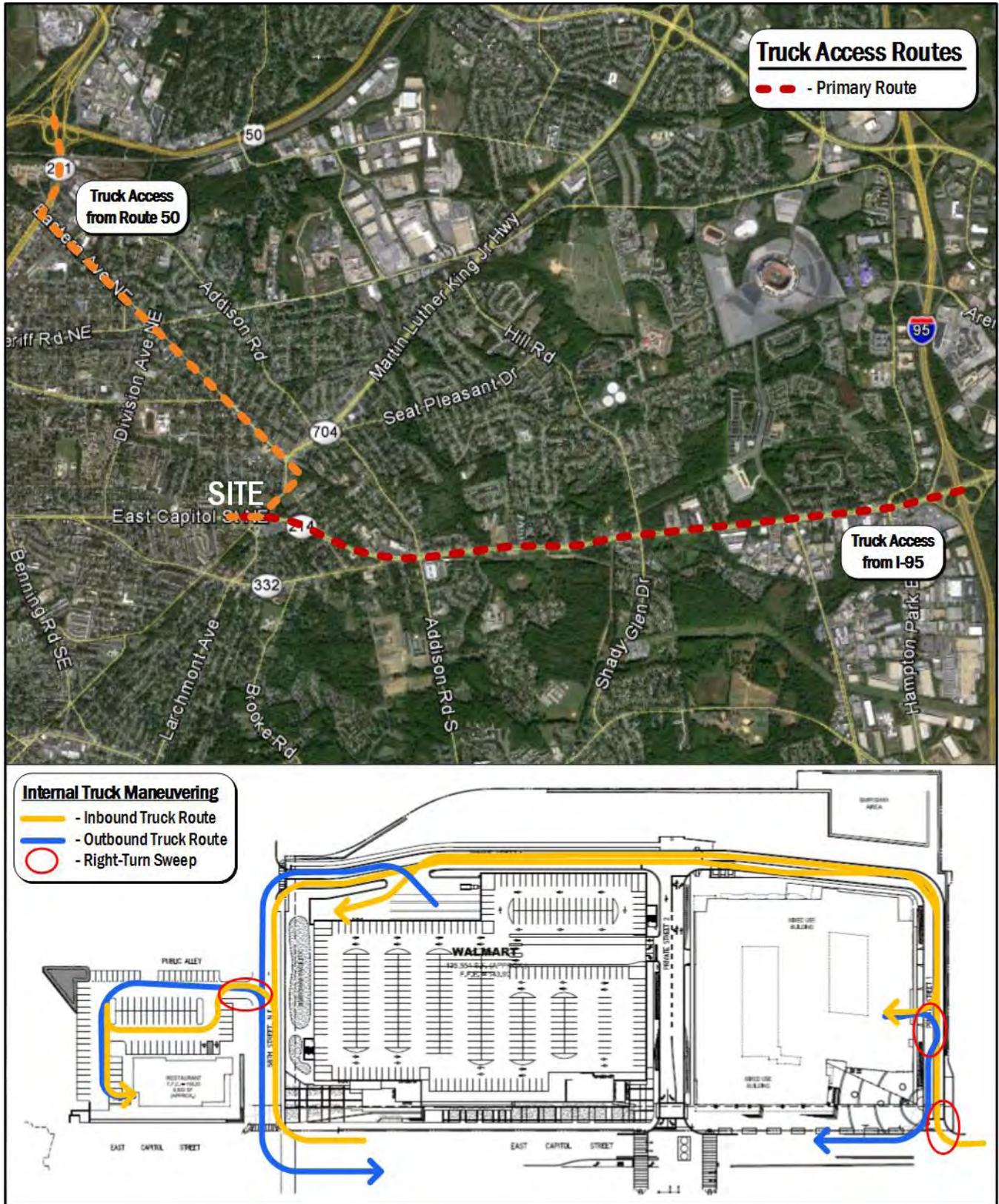


Figure 10: Truck Routing and Internal Maneuvering

Zoning Regulations require the Applicant to provide loading facilities, as outlined in Table 4. Table 4 also shows the loading provided by the proposed PUD. Three loading areas will serve the PUD, as noted on Figure 11. Each building will have an individual service area. Figure 12 and Figure 13 show turning diagrams for trucks accessing the proposed loading areas. These diagrams show the design vehicles accessing the loading docks without difficulties.

**Table 4: Proposed Loading**

Loading	Zoning Requirement	Proposed
<b>Parcel 1</b>	<i>Loading Berth</i>	1 @ 30'
	<i>Loading Platform</i>	1 @ 100 SF
	<i>Service/Delivery</i>	--
<b>Parcel 2</b>	<i>Loading Berth</i>	2 @ 55'
		1 @ 30'
	<i>Loading Platform</i>	2 @ 200 SF
	<i>Service/Delivery</i>	1 @ 100 SF
<b>Parcel 3</b>	<i>Loading Not Required</i>	
<b>Parcel 4 Residential</b>	<i>Loading Berth</i>	1 @ 55'
	<i>Loading Platform</i>	1 @ 200 SF
	<i>Service/Delivery</i>	1 @ 20'
<b>Parcel 4 Non-Residential</b>	<i>Loading Berth</i>	2 @ 30'
	<i>Loading Platform</i>	2 @ 100 SF
	<i>Service/Delivery</i>	1 @ 20'
<b>Total Residential</b>	<i>Loading Berth</i>	1 @ 55'
	<i>Loading Platform</i>	1 @ 200 SF
	<i>Service/Delivery</i>	1 @ 20'
<b>Total Non-Residential</b>	<i>Loading Berth</i>	2 @ 55'
		4 @ 30'
	<i>Loading Platform</i>	2 @ 200 SF
	<i>Service/Delivery</i>	4 @ 100 SF
	2 @ 20 SF	1 @ 20 SF*

\* Relief requested

As noted in Table 4 and on Figure 11, the Applicant is requesting relief from the Zoning requirement to provide two 30-foot loading berths, two 100-square-foot loading platforms, and one 20-foot service/delivery space for the Parcel 4 Retail; the Applicant is proposing to provide one 30-foot loading berth and one 100-square-foot loading platform.

The expected overall loading demand for each loading dock and loading area throughout the Capitol Gateway PUD was computed in order to determine the adequacy of these proposed facilities and their ability to handle the expected demand as designed. The number of loading operations at each location was computed based the number of tenants served by each loading facility in conjunction with standard shipping frequencies for retail and restaurant uses, the expected number of deliveries for residential uses, and the projected unit turnover rate and moving truck size for the residential uses. Assumptions include the following, obtained from the files of Gorove/Slade:

- Rental apartments have an average turnover of 18 months, with two trucks expected per turnover (one move out and one move in).

- General retail stores are expected to have three (3) van-sized deliveries a week and restaurants are expected to have two (2) van-sized and four (4) 30’ truck deliveries a week. Although exact retail tenants aren’t known at this time, the retail plan was used to develop the loading estimates based on the anticipated types of retail stores desired at each parcel. It should be noted that the retail space contained in Parcel 4 is anticipated to house three to five retailers.
- The Walmart is expected to have approximately 45 truck deliveries per day, consisting of primarily 30-foot trucks. Of these, it is anticipated that approximately four 50-foot trucks will make deliveries to Walmart per day

Based on the above assumptions, the loading dock for Parcel 1 will receive approximately one (1) truck delivery per day. For Parcel 2, the loading dock will receive approximately 45 truck deliveries per day, primarily from 30-foot trucks. For Parcel 4, the residential load dock will receive approximately one moving truck per day, and the retail loading dock will receive approximately 1-2 deliveries per day. Therefore, the amount of loading facilities contained within the development will be able to accommodate the expected truck activity.

### 2.1.3 Parking

#### Parking Supply

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

- One space per 100 square feet in excess of 1,500 square feet for the restaurant uses;
- One space per 300 square feet in excess of 3,000 square feet for the retail uses; and
- One space per two dwelling units for the residential uses.

Table 5 shows a summary of the parking requirements and the proposed parking supply. As shown in the table, the Zoning laws require a minimum of 145 parking spaces for the residential uses and 585 spaces for the non-residential uses (730 spaces total). The proposed development will satisfy the Zoning requirements by supplying 184 parking spaces for the residential uses and 667 spaces for the non-residential uses (851 spaces total).

**Table 5: Proposed Parking**

Parking	Zoning Requirement	Proposed
Parcel 1	73	91
Parcel 2	442	484*
Parcel 3	N/A^	N/A^
Parcel 4 Residential	145	184
Parcel 4 Non-Residential	70	92~
<b>Total Residential</b>	<b>145</b>	<b>184</b>
<b>Total Non-Residential</b>	<b>585</b>	<b>667</b>

\* 388 spaces provided on Parcel 2, 96 spaces located on Parcel 4

^ No parking required for Parcel 3

~ Excludes 96 spaces for use by Parcel 2

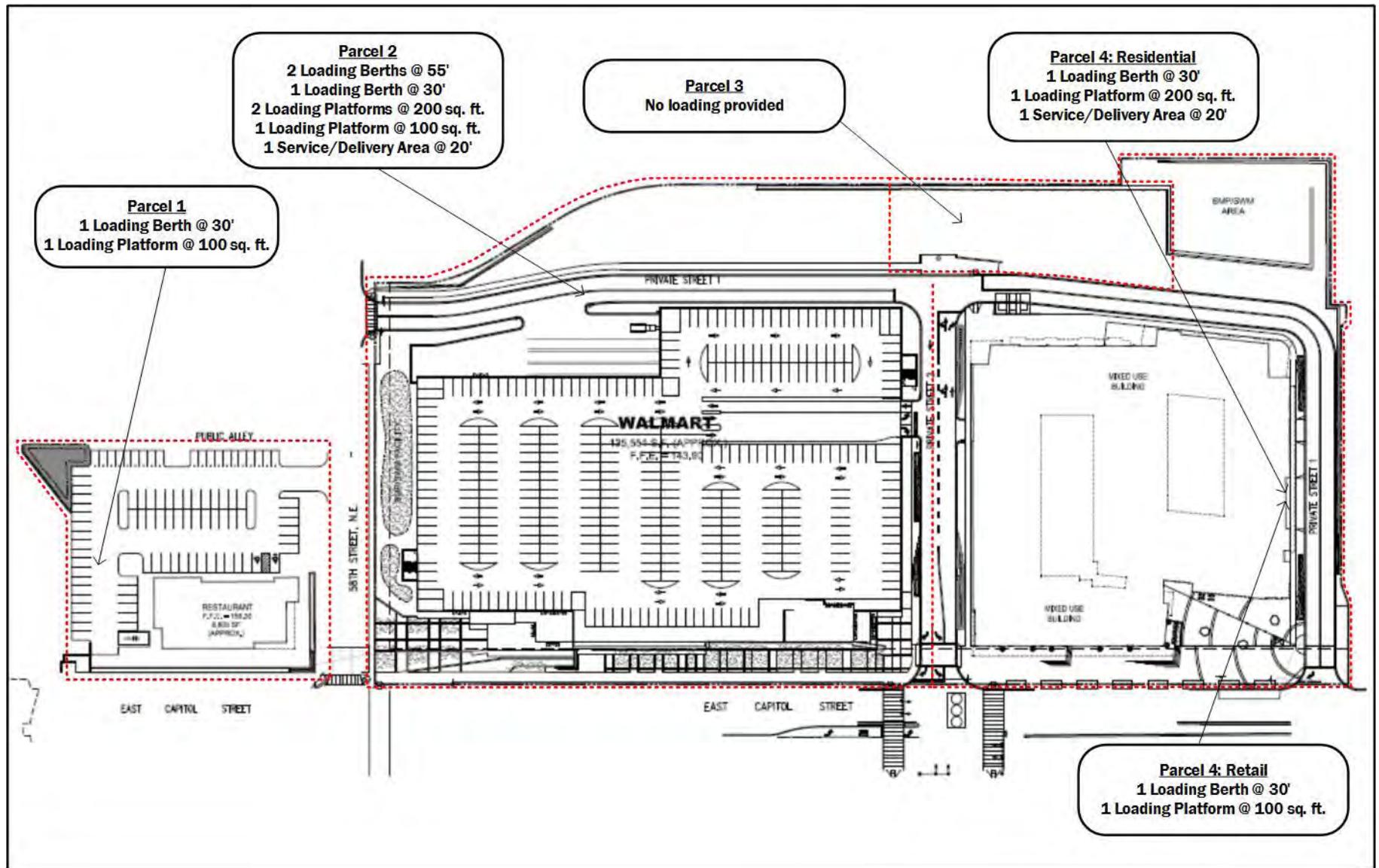


Figure 11: Proposed Loading Facilities

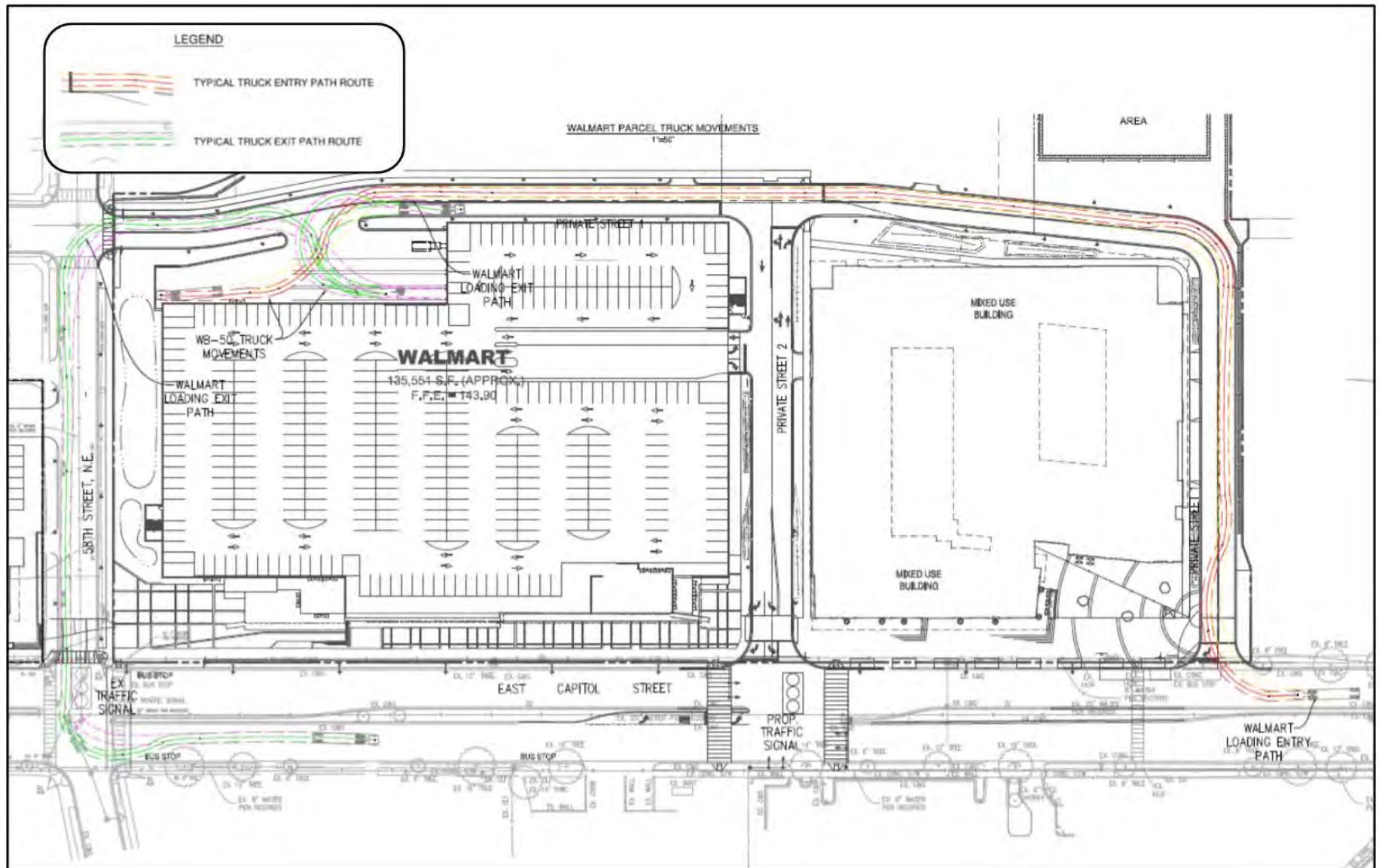


Figure 12: Parcel 2 Truck Turning Diagram

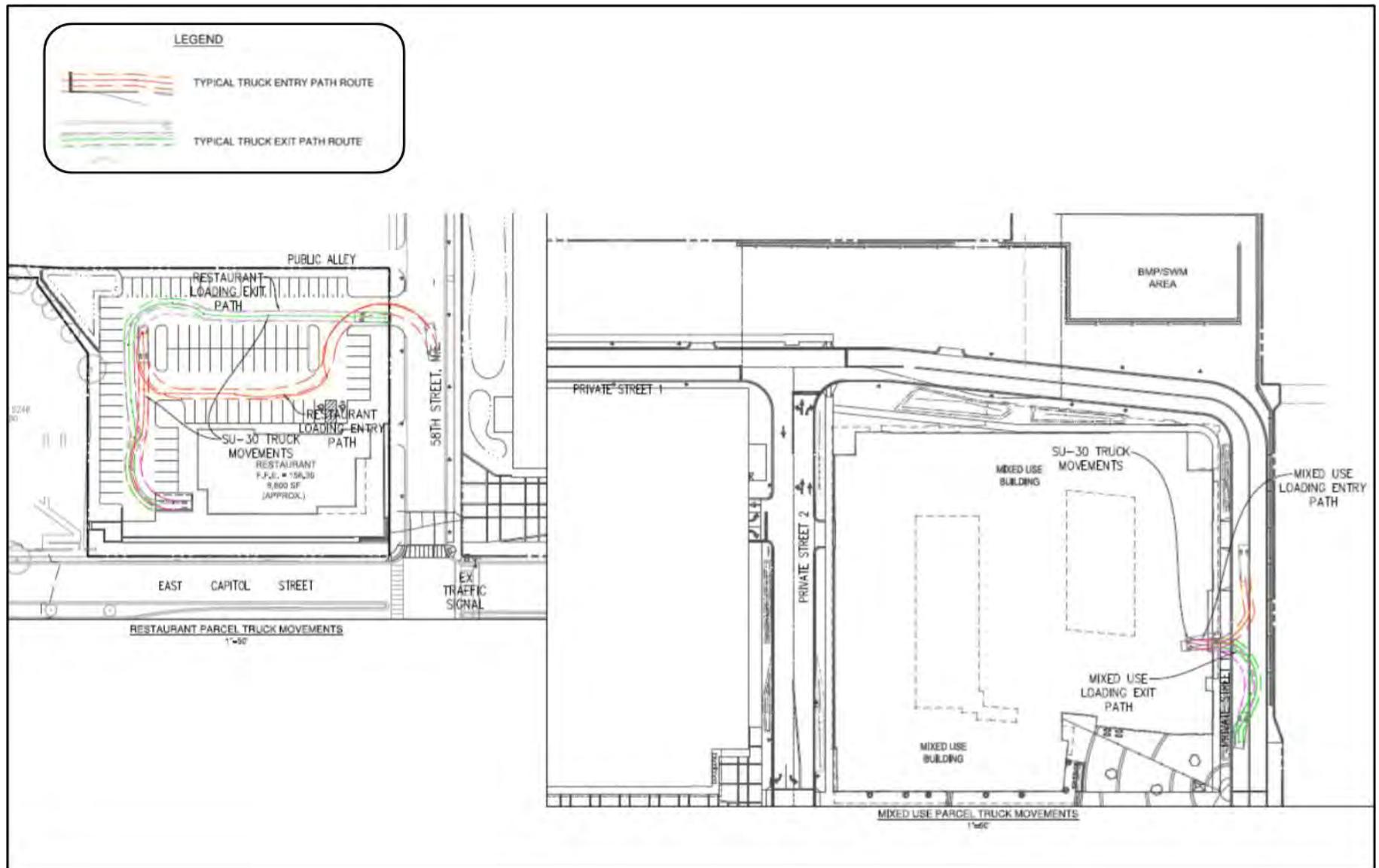


Figure 13: Parcels 1, 3, and 4 Truck Turning Diagram

*(Page Intentionally Blank)*

**Parking Demand**

In order to calculate the peak parking demand, rates were obtained from the Institute of Transportation Engineers’ (ITE) *Parking Generation*, 4<sup>th</sup> Edition for the Residential and Retail land uses. These rates were then adjusted to account for the use of alternative modes. Many people going to and from the proposed PUD will choose not to drive, as is commonplace throughout the District. In addition, parking ratios can overestimate parking when synergy between uses exists.

Table 6 provides a summary of the parking demand ratios assumed in this report. *Parking Generation* gives a suburban parking ratio of 1.23 vehicles per 1,000 square feet for the Residential land uses. In order to adjust the suburban parking ratio for the proposed PUD, the car ownership rates for the 2006-2010 American Community Survey portion of the U.S. Census for the Census tract containing the PUD (Census Tract 78.08) were investigated. Census data shows that approximately 46% of those surveyed did not own a private vehicle. Based on the vehicle ownership rates for the Census Tract and the proposed TDM program (outlined in Section 2.2.2), the suburban parking demand was assumed to be reduced by approximately 50%, yielding a parking ratio of 0.62 vehicles per 1,000 square feet.

For the Walmart store, *Parking Generation* gives a peak suburban parking ratio of 4.49 vehicles per 1,000 square feet. Based on a mode split of 70% vehicular trips (explained in more detail in Section 3.1.2 later in this report), the parking demand ratio is calculated at approximately 3.14 vehicles per 1,000 square feet for the Walmart store.

For the other Retail uses, *Parking Generation* gives a suburban parking ratio of 4.67 vehicles per 1,000 square feet. Based on a mode split of 70% vehicular trips, the parking demand ratio for the PUD is calculated at approximately 3.27 vehicles per 1,000 square feet for Retail land uses.

For the Restaurant uses, *Parking Generation* gives a suburban parking ratio of 16.30 vehicles per 1,000 square feet. Based on a mode split of 70% vehicular trips, the parking demand ratio for the PUD is calculated at approximately 11.41 vehicles per 1,000 square feet for Restaurant land uses.

**Table 6: Parking Demand Ratios**

Land Use	Land Use Code <sup>1</sup>	Parking Ratio	Assumed Urban Ratio
Parcel 1 – High-Turnover (Sit-Down) Restaurant <sup>2</sup>	932	16.30/1,000 square feet	11.41/1,000 square feet
Parcel 2 – Free-Standing Discount Store <sup>3</sup>	815	4.49/1,000 square feet	3.14/1,000 square feet
Parcel 4 – Low/Mid-Rise Apartment <sup>4</sup>	221	1.23/1,000 square feet	0.62/1,000 square feet
Parcel 4 – General Retail <sup>5</sup>	820	4.67/1,000 square feet	3.27/1,000 square feet

Table 7 shows the peak parking demand for the proposed Capitol Gateway PUD based on the above peak parking demand ratios. Based on the assumed parking demand ratios shown in Table 6, the Residential uses will have a peak parking demand of approximately 174 spaces, the Walmart will have a peak parking demand of approximately 426 spaces, the other Retail uses will have a peak parking demand of approximately 79 spaces, and the Restaurant uses will have a peak parking demand of approximately 101 spaces.

<sup>1</sup> *Parking Generation*, Institute of Transportation Engineers, 4<sup>th</sup> Edition

<sup>2</sup> Based on the Average Peak Period Parking Demand on a Saturday for Suburban Locations (Bar/Lounge Restaurant)

<sup>3</sup> Based on the Average Peak Period Parking Demand on a Saturday (December)

<sup>4</sup> Based on the Average Peak Period Parking Demand on a Weekday for Suburban Locations

<sup>5</sup> Based on the Average Peak Period Parking Demand on a Saturday (December)

**Table 7: Parking Demand Calculations**

Land Use	Size	Assumed Urban Ratio	Peak Parking Demand
Parcel 1 – High-Turnover (Sit-Down) Restaurant	8,800 Square Feet	11.41/1,000 square feet	101 spaces
Parcel 2 – Free-Standing Discount Store	135,551 Square Feet	3.14/1,000 square feet	426 spaces
Parcel 4 – Low/Mid-Rise Apartment	280,325 Square Feet	0.62/1,000 square feet	174 spaces
Parcel 4 – General Retail	23,962 Square Feet	3.27/1,000 square feet	79 spaces
<b>Total</b>	<b>505,731 Square Feet</b>	--	<b>780 spaces</b>

Based on the calculations shown in Table 7, the parking demand for the proposed Capitol Gateway PUD will peak at approximately 780 parking spaces. The proposed PUD will contain 184 parking spaces for the Residential land uses, which will accommodate the peak parking demand of approximately 174 parking spaces. The PUD will also contain 694 parking spaces for the non-residential (Restaurant, Retail, and Walmart) uses, which will accommodate the peak parking demand of approximately 606 parking spaces. It should be noted that shared usage amongst the parking areas is expected and, as such, demand that exceeds the supply in certain parcels will be met by available parking in adjacent parcels. Table 8 shows a comparison of the parking demand and parking supply.

**Table 8: Comparison of Parking Demand and Supply**

Land Use	Peak Parking Demand	Parking Supply
Parcel 1 – High-Turnover (Sit-Down) Restaurant	101 spaces	91 spaces
Parcel 2 – Free-Standing Discount Store	426 spaces	484 spaces
Parcel 4 – Low/Mid-Rise Apartment	174 spaces	184 spaces
Parcel 4 – General Retail	79 spaces	92 spaces
<b>Total</b>	<b>780 spaces</b>	<b>851 spaces</b>

#### 2.1.4 Bicycle Facilities

As stated in Section 1, the site is directly served by multi-use trails, signed bicycle routes, and local streets that accommodate cycling. 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 Applicant is willing to work with DDOT in selecting locations for the racks in Public Space. The project will also include secured long-term bicycle parking within the parking garage, and changing facilities for retail employees.

The site planning package identifies a total of 84 bicycle parking spaces provided on site. Short term parking will be provided in Parcels 1-4, with 4 spaces on Parcel 1, 20 on Parcel 2, and 10 on Parcel 4. An additional 50 long-term parking spaces are planned for Parcel 4, located within the residential parking garage. In addition, a Capitol Bikeshare station is planned on Parcel 2 in conjunction with the Walmart.

## **2.2 Transportation Demand Management**

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

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

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

### **2.2.1 Proposed TDM Plan**

The Transportation Demand Management (TDM) plan for the Capitol Gateway 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 maintain or coordinate relocation of any existing bus stops during construction of the development.
- The Applicant will comply with Zoning requirements to provide bicycle parking/storage facilities. This includes secure parking located in the garage for retail employees and long-term storage for residents.
- The Applicant will unbundle all parking costs from the cost of lease or purchase of residential units. Parking costs will be set at no less than the charges of the lowest fee garage located within ¼ mile.
- The Applicant will post all TDM commitments on-line, publicize availability, and allow the public to see what commitments have been promised.
- The Applicant will identify separate TDM Leaders for the mixed-use and Wal-mart portions of the site (for planning, construction, and operations) and provide this information to DDOT and Zoning Enforcement.
- The Applicant will install a Transportation kiosk in the residential lobbies, which will contain printed materials related to local transportation alternatives and will maintain a stock of materials at all times.
- The Applicant will provide website links to [CommuterConnections.com](http://CommuterConnections.com) and [goDCgo.com](http://goDCgo.com) on developer and property management websites.
- The Applicant will dedicate two spaces on site for car sharing services to use with right of first refusal.
- The Applicant will provide reserved spaces for carpools and vanpools that are conveniently located with respect to the elevators serving the buildings.
- The Applicant will provide an on-site business center available to residents, which will provide access to copier, fax, and internet services.

- Wal-mart will provide a Capital Bikeshare station and ongoing funding for the program. The Applicant will also provide 1-year Capital Bikeshare memberships for each new resident.
- The Applicant agrees to host a transportation mobility fair six months after the development has opened. The transportation fair will be advertised to all retail workers and residents. The onsite TDM coordinator will work with DDOT’s goDCgo team to organize representatives that are experts in the non-auto transportation options that serve the site. Each person that attends the event will be educated on the various options and representatives will work with attendees to help them tailor the use of non-auto options to their specific transportation needs. Based on the turnout of the transportation fair and feedback gleaned by the onsite TDM coordinator, a determination will be made if the event will be repeated the following year.
- Two years after the project is 90% occupied, the Applicant will perform a monitoring study of site trip generation. The site trips will be compared to the projected trip generation contained in this report. If the measured trip generation exceeds the projections, the Applicant will supplement the above TDM measures with additional ones, such as those from in *Incorporation of Transportation Demand Management (TDM) into the Development Review Process* suggested for a project of this size not listed above.

**2.3 Compliance with Comprehensive Plan**

The following table lists the transportation policies and actions from DC’s Comprehensive Plan that are relevant to the development review process. As noted in the table, the Capitol Gateway PUD complies with all of the relevant policies and actions from the Comprehensive Plan.

**Table 9: Relevant Comprehensive Plan Policies & Actions**

DC Comprehensive Plan Policy/Action related to transportation and development projects	Comments
<p><i>Policy T-1.1.2: Land Use Impact Assessment</i> Assess the transportation impacts of development projects using multimodal standards rather than traditional vehicle standards to more accurately measure and more effectively mitigate development impacts on the transportation network.</p>	<p>This transportation study includes discussion and analysis of transit, pedestrian, and bicycle traffic that exceeds a traditional transportation study, especially those performed in suburban environments.</p>
<p><i>Action T-1.1.A: Transportation Measures of Effectiveness</i> Develop new measures of effectiveness such as a multi-modal level of service standard to quantify transportation service and assess land use impacts on the transportation system.</p>	<p>DDOT has yet to develop a standard level of service standard to access land use impacts. The transportation engineering industry has no readily available metrics that can be easily used in the development review process beyond traditional vehicular capacity metrics. As stated above, this study includes discussion and analysis of transit, pedestrian and bicycle traffic that exceeds a traditional transportation study.</p>
<p><i>Action T-1.1.B: Transportation Improvements</i> Require transportation demand management measures and transportation support facilities such as crosswalks, bus shelters, and bicycle facilities in large development projects and major trip generators, including projects that go through the Planned Unit Development (PUD) Process.</p>	<p>This application includes many improvements to the site, including bicycle parking. In addition, the application meets and exceeds DDOT’s stated expectations for TDM measures.</p>

DC Comprehensive Plan Policy/Action related to transportation and development projects	Comments
<p><i>Policy T-1.2.3: Discouraging Auto-Oriented Uses</i> Discourage certain uses, like “drive-through” businesses or stores with large surface parking lots, along key boulevards and pedestrian streets, and minimize the number of curb cuts in new developments. Curb cuts and multiple vehicle access points break-up the sidewalk, reduce pedestrian safety, and detract from pedestrian-oriented retail and residential areas.</p>	<p>The development does not contain any “drive-through” businesses and places a significant amount of parking in underground structures. Additionally all proposed curb cuts, with one exception, will be placed on private roadways internal to the PUD.</p>
<p><i>Action T-2.3.A: Bicycle Facilities</i> Wherever feasible, require large new commercial and residential buildings to be designed with features such as secure bicycle parking and lockers, bike racks, shower facilities, and other amenities that accommodate bicycle users.</p>	<p>As described above, the development contains a significant amount of bicycle features. This includes short- and long-term parking for retail and residential users.</p>
<p><i>Action T-3.1.A: TDM Strategies</i> Develop strategies and requirements that reduce rush hour traffic by promoting flextime, carpooling, transit use; encouraging the formation of Transportation Management Associations; and undertaking other measures that reduce vehicular trips, particularly during peak travel periods. Identify TDM measures and plans as appropriate conditions for large development approval. Transportation Management Plans should identify quantifiable reductions in vehicle trips and commit to measures to achieve those reductions. Encourage the federal and District governments to explore the creation of a staggered workday for particular departments and agencies in an effort to reduce congestion.</p>	<p>The application has proposed to include TDM measures meeting DDOT’s expectations contained within <i>Incorporation of Transportation Demand Management (TDM) into the Development Review Process</i>.</p>
<p><i>Action T-3.2.D: Unbundle Parking Cost</i> Find ways to “unbundle” the cost of parking from residential units, allowing those purchasing or renting property to opt out of buying or renting parking spaces. “Unbundling” should be required for District-owned or subsidized development, and the amount of parking in such development should not exceed that required by Zoning. Further measures to reduce housing costs associated with off-street parking requirements, including waived or reduced parking requirements in the vicinity of Metrorail stations and along major transit corridors, should be pursued during the revision of the Zoning Regulations. These efforts should be coupled with programs to better manage residential street parking in neighborhoods of high parking demand, including adjustments to the costs of residential parking permits.</p>	<p>The applicant will unbundle all parking from the cost of renting residential units, as outlined above in the TDM measures.</p>

### 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*, 8<sup>th</sup> 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*, 2<sup>nd</sup> Edition was also consulted for guidelines for estimating trip generation. The following summarizes the trip generation projections:

- For the Retail trips generated by the on-street retail, LU 820 for Shopping Center was applied in lieu of individual trip rates, such as bank, pharmacy, and supermarket, for the retail uses because applying individual rates would not account for interaction between the retail uses (shoppers visiting more than one store). The Shopping Center trip rate accounts for these uses and interactions. Unlike the other land uses, the total weekday trips, as well as the morning and afternoon peak hour trips, were generated based on the average rates provided based on average vehicle trip ends per 1,000 square feet of gross leasable area. According to the *Trip Generation Handbook*, the weighted average rate should be used to estimate trip rates for land uses with low value independent values. This is due to the y-intercept of the regression equation, which can yield an illogical trip projection. Although the coefficient of determination ( $R^2$ ) for the regression equations provided is high (above 0.75), the average rates were used due to the low square footage of retail provided (under 50,000 SF). For the land use, the morning and afternoon peak hours were based on the peak hour of the adjacent street traffic.
- For the trips generated by the restaurant use, trips were projected based on LU 932 for High-Turnover (Sit-Down) Restaurant. This land use consists of sit-down, full-service restaurants that are usually moderately priced and frequently belong to a restaurant chain. These restaurants typically serve lunch and dinner but may also be open for breakfast. Some facilities within the land use may also contain a bar area for serving food and alcoholic drinks. The total weekday trips, as well as the morning and afternoon peak hour trips were generated using the average

trip generation rates provided based on average vehicle trip ends per 1,000 square feet of gross floor area. Regressions equations were not used because they are not provided in the *Trip Generation Handbook*. For the land use, the morning and afternoon peak hours were based on the peak hour of the adjacent street traffic.

- For the Retail trips generated by the Walmart store, trip generation data was obtained from the *Nationwide Supercenter Traffic Study* published by the Texas Transportation Institute (TTI). The study was performed in 2008 in order to determine if the trip generation rates published by ITE and typically used for trip generation estimates accurately represent Walmart supercenter trip generation characteristics on a nationwide basis. Data was collected for 32 randomly selected stores that fit the following criteria in order to ensure typical conditions:
  - Standard superstores (no new concept or special market stores);
  - Located in a metropolitan area;
  - At least two years old;
  - Annual transactions within two standard deviations of the mean (to omit extreme outliers);
  - Free-standing stores (to isolate trip generation for the store); and
  - No construction or special promotions/events that disrupt normal activity.

Table 10 shows the trip generation rates obtained by the TTI, as published in the study. The table also includes a comparison to the rates provided in ITE *Trip Generation*, 9<sup>th</sup> Edition for Land Use 815: Free-Standing Discount Superstore.

**Table 10: Trip Generation Rate Comparison**

Time Period	TTI Rates <i>(Directional Distribution)</i>		ITE Rates for LU 815 <i>(Directional Distribution)</i>	
Weekday	53.04 trips/1,000 SF		57.24 trips/1,000 SF	
Weekday, AM Peak Hour of Adjacent Street Traffic	1.46 trips/1,000 SF		1.06 trips/1,000 SF	
	<i>Inbound: 56%</i>	<i>Outbound: 44%</i>	<i>Inbound: 68%</i>	<i>Outbound: 32%</i>
Weekday, PM Peak Hour of Adjacent Street Traffic	4.50 trips/1,000 SF		4.98 trips/1,000 SF	
	<i>Inbound: 50%</i>	<i>Outbound: 50%</i>	<i>Inbound: 50%</i>	<i>Outbound: 50%</i>

Gorove/Slade estimated trip generation for the proposed Capitol Gateway PUD based on both the TTI and ITE rates, as shown in Table 11.

The TTI rates were chosen for the preliminary trip generation in order to provide a conservative analysis during the morning peak period, for which traffic volumes in the study area are at the highest along East Capitol Street. Additionally, the Walmart-specific data provided in the TTI study provides a more accurate projection of trips generated by the proposed Walmart due to the criteria used to select the random sample. The ITE rates include data submitted by individual between the 1970s and 2000s throughout the United States, with no criteria for randomly selecting stores or ensuring typical conditions. In contrast, the TTI study used data collected in 2007 from randomly selected stores following the above criteria to ensure typical conditions. For the land use, the morning and afternoon peak hours were based on the peak hour of the adjacent street traffic.

**Table 11: Base Trip Generation Comparison**

Time Period	TTI Rates (Directional Distribution)		ITE Rates for LU 815 (Directional Distribution)	
Weekday	7,190		7,760	
Weekday, AM Peak Hour of Adjacent Street Traffic	198		144	
	<i>Inbound: 111</i>	<i>Outbound: 87</i>	<i>Inbound: 98</i>	<i>Outbound: 46</i>
Weekday, PM Peak Hour of Adjacent Street Traffic	610		675	
	<i>Inbound: 305</i>	<i>Outbound: 305</i>	<i>Inbound: 338</i>	<i>Outbound: 337</i>

- The Residential trips were projected based on LU 220 for Apartments, which are rental dwellings located within the same building with at least three other dwelling units. The total weekday trips, as well as the morning and afternoon peak hour trips were generated using the regression equations provided based on average vehicle trip ends per dwelling unit. The regression equation was chosen for the Residential projections, due to the high (over 0.75) coefficient of determination ( $R^2$ ). For the Residential uses, the morning and afternoon peak hours of the Generator generally correspond to the peak hours of the adjacent street traffic.

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 Administration. Based on the information contained in the report, Table 12 shows the AVO assumed for each land use<sup>1</sup> and the base number of trips generated by the proposed development.

**Table 12: Base Vehicle- and Person-Trips Generated**

Land Use	Size	Trip Generation						Weekday Total	
		AM Peak Hour			PM Peak Hour				
		<i>In</i>	<i>Out</i>	<i>Total</i>	<i>In</i>	<i>Out</i>	<i>Total</i>		
<b>Vehicle Trips</b>									
<i>Walmart</i>	135,551	<i>Square Feet</i>	111	87	198	305	305	610	7,190
<i>Other Retail</i>	23,962	<i>Square Feet</i>	14	9	23	43	46	89	1,024
<i>Restaurant</i>	8,800	<i>Square Feet</i>	52	43	95	52	35	87	1,120
Total Retail Trips			177	139	316	400	386	786	9,334
Residential	290	Dwelling Units	29	117	146	115	62	177	1,882
<b>Total Vehicle-Trips</b>			<b>206</b>	<b>256</b>	<b>462</b>	<b>515</b>	<b>448</b>	<b>963</b>	<b>11,216</b>
<b>Person-Trips</b>									
Retail	1.78	Persons/Vehicle	315	247	562	715	687	1,399	16,615
Residential	1.13	Persons/Vehicle	33	132	165	130	70	200	2,127
<b>Total Person-Trips</b>			<b>348</b>	<b>379</b>	<b>727</b>	<b>845</b>	<b>757</b>	<b>1,599</b>	<b>18,742</b>

<sup>1</sup> 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 shown in Section 3.1.1, the trips were split into each mode: transit (consisting of both Metrorail and Metrobus), walking, biking, and vehicle. Each land use was analyzed by mode separately in order to account for varying mode splits. The mode split estimates for the Capitol Gateway 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*, results from the 2006-2010 American Community Survey, and files from Gorove/Slade’s library. The following describes in detail how the mode split assumptions were assembled based on information from these sources. These assumptions were approved by DDOT per the Scoping Form contained in the Technical Attachments

#### **Retail and Restaurant Uses**

The main source of mode split information for retail sites is WMATA’s *Ridership Survey*. Contained within the report are summaries of mode splits for five retail sites within the Metropolitan area and one within the District. Data provided for the “Silver Spring Neighborhood Center” was chosen as most likely to represent the conditions of the proposed PUD. The following table summarizes the mode split information for the Silver Spring Neighborhood Center and an average for all of the retail sites surveyed.

**Table 13: WMATA Ridership Survey Mode Split for Retail Sites**

Retail Location <sup>1</sup>	Mode			
	Metrorail	Metrobus & Other Transit	Auto	Walk & Other
Silver Spring Neighborhood Center	9%	10%	67%	14%
All retail sites surveyed	29%	8%	36%	27%

Based on the above information, the mode split for the Retail and Restaurant trips is broken down as follows:

- Drive: 70%
- Total transit: 20%
- Walk: 7%
- Bike: 3%

Pass-by trips were also applied to the Retail portion of the Capitol Gateway PUD. The TTI *Nationwide Supercenter Traffic Study* was used in order to determine the applicable pass-by trip percentage. According to the study, pass-by data was collected at 10 stores, with an average of 26% during the afternoon peak hour and 21% during the Saturday mid-day peak hour. Based on the study, a 26% pass-by rate was applied to the Retail trips during the afternoon peak hour and to the total daily trips.

For reference, Gorove/Slade compared the proposed mode split for the Retail portion of the Capitol Gateway PUD to the mode split used previously for the Walmart on Georgia Avenue, which was approved by DDOT in 2011. According to a memorandum submitted by Gorove/Slade on May 16, 2011 in response to DDOT Comments for Large Tract Review No. 2011-03, the mode split for the Walmart on Georgia Avenue was assumed to be 25% transit, 60% auto, and 15% walk/bike. For the Walmart on Georgia Avenue, an aggressive mode split in favor of transit and walk/bike trips was used. In

<sup>1</sup> Mode split data obtained from “Table 4: Commute Mode Share at Office Sites by Concentric Location Typology”.

comparison, the proposed mode split for the Capitol Gateway PUD, which is located significantly closer to a Metrorail station, provides a conservative projection.

**Residential Uses**

Several sources provide mode split information that can be used to develop estimates for future residents of the Capitol Gateway PUD, including results from the 2006-2010 American Community Survey portion of the U.S. Census, WMATA’s *Ridership Survey* of residential sites within the District, and The *State of the Commute* report, which contains the average mode split of commuters that live in the District. The mode splits from these three sources are shown in Table 14.

**Table 14: Mode Split Information for Residential Uses**

Information Source	Mode			
	Metrorail/Train	Metrobus & Other Transit	Auto	Walk & Other
2000 U.S. Census <sup>1</sup>	10%	31%	59%	0%
State of the Commute <sup>2</sup>	27%	14%	48%	11%
WMATA Ridership Survey <sup>3</sup>	43%	6%	39%	14%

Of these three sources of information, the one that most closely contains the transportation characteristics of the Capitol Gateway PUD would be the census information from the tract where the site is located (Census Tract 78.08). The sites that comprise the *Ridership Survey’s* average mode splits do not compare well based on location and distance from the Metrorail station. The *State of the Commute* is an average for the entire District making it less likely to represent the project compared to the census data.

Thus, this report uses the census information as a starting point for assembling residential mode split assumptions. The percentages listed in the above table were simplified in order to compare the three sources to each other. The census data has a more detailed breakdown as follows:

- Drive alone: 52%
- Carpool: 7%
- Bus: 31%
- Metrorail: 10%
- Walk: 0%
- Bike: 0%

As stated previously, the mode split assumptions are primarily based on the Census information. However, the Census information does not show the mode split includes any walk or bike trips. Based on the proposed mixed-use development, some walk and bike trips are expected. Thus, the assumptions on Residential mode split for the PUD are as follows:

- Drive: 60%
- Total Transit: 35%

<sup>1</sup> Based on information from the “Means of Transportation” table for Census Tract 78.08, which contains the site. Answers for ‘telecommuting’ and ‘other’ were not included.

<sup>2</sup> Survey respondents that live within the District

<sup>3</sup> Mode split data obtained from “Table 10: Residential Mode Share for All Trips by Concentric Location Typology” for ‘Suburban-Inside the Beltway’

- Walk: 4%
- Bike: 1%

**Summary**

Table 15 summarizes the mode split assumptions.

**Table 15: Mode Split Assumptions**

Land Use	Mode Split			
	Vehicle	Transit	Walk	Bike
Retail & Restaurant	70%	20%	7%	3%
Residential	60%	35%	4%	1%

**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 15), Table 16 shows the resulting calculations by mode. The proposed development will generate approximately 307 vehicular trips, 170 transit trips, 47 walking trips, and 19 bicycle trips during the morning peak hour; 656 vehicular trips, 350 transit trips, 106 walking trips, and 45 bicycle trips during the afternoon peak hour; and 7,663 vehicular trips, 4,068 transit trips, 1,249 walking trips, and 520 bicycle trips during a typical weekday.

**Table 16: Trip Generation for Proposed Development by Mode**

Land-Use/Mode	Trip Generation by Mode						Daily Total
	AM Peak Hour			PM Peak Hour			
	In	Out	Total	In	Out	Total	
<b>Vehicle Trips</b>							
Retail	124	96	220	208	199	407	4,834
Retail Pass-by Trips	--	--	--	72	71	143	1,699
Residential	18	69	87	69	37	106	1,130
<i>Total New Vehicle Trips</i>	<i>142</i>	<i>165</i>	<i>307</i>	<i>349</i>	<i>307</i>	<i>656</i>	<i>7,663</i>
<b>Transit Person-Trips</b>							
Retail	64	48	112	143	137	280	3,324
Residential	12	46	58	46	24	70	744
<i>Total New Transit Person-</i>	<i>76</i>	<i>94</i>	<i>170</i>	<i>189</i>	<i>161</i>	<i>350</i>	<i>4,068</i>
<b>Walking Person-Trips</b>							
Retail	23	17	40	50	48	98	1,164
Residential	1	6	7	5	3	8	85
<i>Total New Walking Person-</i>	<i>24</i>	<i>23</i>	<i>47</i>	<i>55</i>	<i>51</i>	<i>106</i>	<i>1,249</i>
<b>Bicycling Person-Trips</b>							
Retail	10	7	17	21	22	43	499
Residential	-	2	2	1	1	2	21
<i>Total New Bicycling Person-</i>	<i>10</i>	<i>9</i>	<i>19</i>	<i>22</i>	<i>23</i>	<i>45</i>	<i>520</i>
<b>Total Trips*</b>	<b>252</b>	<b>291</b>	<b>543</b>	<b>615</b>	<b>542</b>	<b>1,157</b>	<b>13,500</b>

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

### 3.2 Roadway Capacity and Operations

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

#### 3.2.1 Scope of Analysis

The purpose of the vehicular capacity analysis is to determine the existing conditions of the intersections located in the immediate vicinity of the proposed development. The following intersections were selected, as shown in Figure 14:

- |  |  |
|--|--|
| 1. East Capitol Street & 55 <sup>th</sup> Street | 10. Nannie Helen Burroughs Avenue & 58 <sup>th</sup> Street  |
| 2. East Capitol Street & 56 <sup>th</sup> Place  | 11. Dix Street & Eastern Avenue                              |
| 3. East Capitol Street & 57 <sup>th</sup> Place  | 12. Eastern Avenue & Martin Luther King Junior Highway       |
| 4. East Capitol Street & 58 <sup>th</sup> Street | 13. Eastern Avenue & 57 <sup>th</sup> Place                  |
| 5. East Capitol Street & 61 <sup>st</sup> Street | 14. Blaine Street/Private Street 1 & 58 <sup>th</sup> Street |
| 6. East Capitol Street & Southern Avenue         | 15. East Capitol Street & Private Street 2 (Future)          |
| 7. Southern Avenue & Davey Street                | 16. East Capitol Street & Private Street 1 (Future)          |
| 8. 58 <sup>th</sup> Street & Southern Avenue     | 17. Private Street 1 & Private Street 2 (Future)             |
| 9. Central Avenue & Southern Avenue              | 18. 58 <sup>th</sup> Street & Parcel 1 Driveway (Future)     |

These intersections were previously approved by DDOT per the Scoping Form presented in the Technical Attachments. Intersection capacity analyses were performed for the existing conditions at each intersection within the study area during the morning and afternoon peak hours, as well as for future conditions with and without the proposed development. The study scenarios are as follows:

- Existing Conditions
- Future Conditions without Development (2019 Background)
- Future Conditions with Development (2019 Future)
- Horizon Year Conditions with Development (2040 Horizon)

The *Synchro, Version 7.0* software package was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology. The *Synchro* model was compiled using signal timings provided by DDOT and with lane configurations and traffic volumes collected by Gorove/Slade. The following sections review the assumptions made for the technical analyses, as summarized in Table 18.

#### 3.2.2 Traffic Volume Assumptions

The following section reviews the traffic volume assumptions made and methodologies used in the roadway capacity analyses, summarized in Table 18.

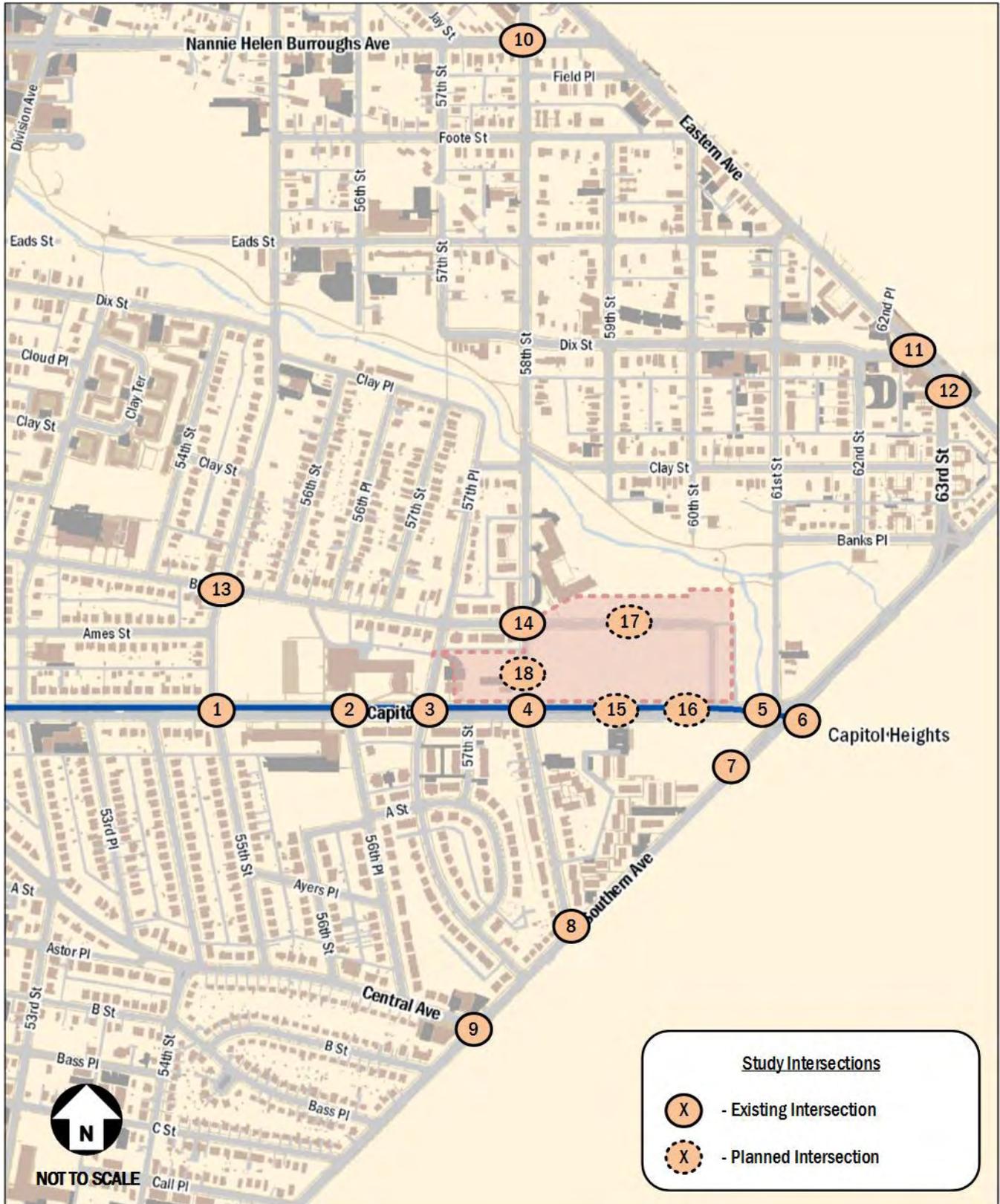


Figure 14: Study Intersections

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

Following the above guidelines, traffic counts, including vehicular and pedestrian volumes, were conducted by Gorove/Slade at the key study intersections between the hours of 6:30 and 9:30 AM and between 4:00 and 7:00 PM on Tuesday, December 11, 2012 and Thursday, February 7, 2013. These count dates represent “typical” weekdays when the DC public school systems were in session, as well as the surrounding counties in Maryland and Virginia. These “typical” weekdays also represent time periods that include normal operation for other major traffic generators in the study area. The results of the traffic counts are included in the Technical Attachments. The morning and afternoon peak hours for the system of intersections being studied occurred between 7:30 – 8:30 AM and 4:45 – 5:45 PM, respectively. During the data collection period, queuing was noted along westbound East Capitol Street during the morning peak period, primarily at the

intersection of East Capitol Street and Southern Avenue/Eastern Avenue. These queues were visible during the majority of the peak period, and the queue was not served during each cycle. Queuing was also noted during the morning peak period at the eastbound left-turn at the intersection of East Capitol Street and 61<sup>st</sup> Street. This queuing was primarily due to the lack of adequate gaps in the westbound vehicular traffic along East Capitol Street. During the afternoon peak period, queuing was observed along eastbound East Capitol Street. However, the queues were largely served by the available green time at each intersection.

Existing peak hour traffic volumes are shown on Figure 15 for the morning and afternoon peak hours. Figure 16 shows the peak hour pedestrian volumes collected. Bicycle counts were also collected during the data collection period. However, very few bicycles were observed, as shown on Figure 17.

**Future Conditions without Development (2019 Background)**

The Capitol Gateway PUD is anticipated to be completed in 2019. The traffic projections for the future condition without the development consist of the traffic generated by background developments located near the site and inherent growth on the roadways. Growth from these two sources is added to the existing traffic volumes in order to determine the traffic projections for the future without the proposed PUD.

For this report, the Eden Place development, described previously in Section 1.7.2, was assumed as a background development. Trip generation was calculated based on the methodology outlined in the Institute of Transportation Engineers’ (ITE) *Trip Generation*, 8<sup>th</sup> 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). Trips generated by the Eden Place development were projected based on the assumptions for the Residential use, as outlined in Section 3.1, using LU 230 Residential Condominium/Townhouse. Table 17 shows the trips generated by the background development. These trips were distributed through the study area based on the trip distribution outlined below.

**Table 17: Trip Generation for Background Developments**

Land Use	Size	Trip Generation						
		AM Peak Hour			PM Peak Hour			Weekday Total
		In	Out	Total	In	Out	Total	
Eden Place II	34 Dwelling Units	4	18	22	17	8	25	252
<i>Transit Reduction</i>	<i>40% Reduction</i>	-2	-7	-9	-7	-3	-10	-101
<b>Total Vehicular Trips</b>		<b>2</b>	<b>11</b>	<b>13</b>	<b>10</b>	<b>5</b>	<b>15</b>	<b>151</b>

In addition to the background developments, other traffic increased due to inherent growth on the study area roadways were accounted for with a 1% per year growth rate compounded annually over the study period (2012/2013-2019). This rate was estimated based on a comparison between existing and past average annual weekday traffic volumes obtained from DDOT for 2006-2009 and was approved by DDOT per the Scoping Form contained in the Technical Attachments. This growth rate was applied to through traffic along major study area roadways, including East Capitol Street, Central Avenue, Southern Avenue, Eastern Avenue, and Martin Luther King, Jr. Highway.

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 2019 Background conditions are shown on Figure 18 for the morning and afternoon peak hours.

### **Future Conditions with Development (2019 Future)**

Existing traffic volumes and travel patterns in the study area were analyzed in order to determine the trip distribution for the trips added by the proposed development, as shown in Figure 19. Based on this review and the proposed site access locations shown previously on Figure 9, the site-generated trips shown in Section 3.1 were distributed through the study area intersections, as shown on Figure 20 for the morning and afternoon peak hours. Pass-by volumes, shown in Table 16, were also distributed through the roadway network as shown on Figure 21.

The traffic volumes for the 2019 Future conditions were calculated by adding the development-generated traffic volumes to the 2019 Background traffic volumes. Thus, the future condition with the proposed development scenario includes traffic generated by: existing volumes, background development (Eden Place II), inherent growth on the roadways, and the proposed Capitol Gateway PUD. The 2019 Future traffic volumes are shown on Figure 22 for the morning and afternoon peak hours.

### **Horizon Conditions with Development (2040 Horizon)**

In addition to the Year 2019 analyses, additional analyses were performed for the horizon year of 2040. For the Horizon conditions, traffic increases in the study area were accounted for with a 1% per year growth rate compounded annually over the horizon period (2019-2040). This rate was estimated based on a comparison between existing and past average annual weekday traffic volumes obtained from DDOT for 2006-2009 and was approved by DDOT per the Scoping Form contained in the Technical Attachments. This growth rate was applied to through traffic along major study area roadways, including East Capitol Street, Central Avenue, Southern Avenue, Eastern Avenue, and Martin Luther King, Jr. Highway.

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 2019 Background conditions are shown on Figure 23 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, summarized in Table 18.

#### **Existing Conditions**

Grove/Slade conducted field reconnaissance to confirm the existing lane configurations and traffic controls at the intersections within the study area, shown on Figure 24. Existing signal timings and offsets were obtained from DDOT and confirmed during field reconnaissance.

#### **Future Conditions without Development (2019 Background)**

The lane configurations for the 2019 future conditions without the proposed development are based on the existing lane configurations. While several background infrastructure studies/projects are outlined in Section 1.7.1, none of these studies will alter the existing lane configurations in the study area. At the time of this analysis, no infrastructure changes are planned and funded that will affect the lane configurations in the study area. The lane configurations and traffic controls for the 2019 Background conditions are shown on Figure 24.

**Future Conditions with Development (2019 Future)**

The lane configurations for the 2019 future conditions with the proposed development are based on the lane configurations for the 2019 conditions without the proposed development. However, the new internal site roadways and site driveways, as described previously in Section 2.1.1 and as shown on Figure 9, were added to the roadway network. The lane configurations and traffic controls for the 2019 Future conditions are shown on Figure 25.

**Horizon Conditions with Development (2040 Horizon)**

The lane configurations for the 2040 horizon conditions with the proposed development are based on the lane configurations for the 2019 conditions with the proposed development. No roadway infrastructure or signal timing changes were assumed for the horizon year conditions. The lane configurations and traffic controls for the 2040 Horizon conditions are shown on Figure 25.

**Table 18: Summary of Vehicular Capacity Analysis Assumptions**

<b>Existing Conditions</b>
<ul style="list-style-type: none"> <li>• Dates of data collection:                             <ul style="list-style-type: none"> <li>○ Tuesday, December 11, 2012</li> <li>○ Thursday, February 7, 2013</li> <li>○ Counts taken from 6:30 – 9:30 AM and 4:00 – 7:00 PM</li> <li>○ Count sheets in Technical Attachments</li> </ul> </li> <li>• System Peak: 7:30 – 8:30 AM and 4:45 – 5:45 PM</li> <li>• Geometries and lane configurations based on existing conditions</li> <li>• Signal timings/phasing/offsets provided by DDOT</li> </ul>
<b>Future Conditions without Development (2019 Background)</b>
<ul style="list-style-type: none"> <li>• Background developments:                             <ul style="list-style-type: none"> <li>○ Developments assumed completed by 2019 listed in Section 1.7.2</li> <li>○ Mode split &amp; assignment methodologies were similar to those used for the site, based on trip distribution shown in Figure 19.</li> <li>○ Total AM peak hour trips assigned: 13; Total PM peak hour trips assigned: 15</li> </ul> </li> <li>• Background growth percentage:                             <ul style="list-style-type: none"> <li>○ Assumed to be 1% per year</li> <li>○ Applied to through movements on major roadways</li> </ul> </li> <li>• No roadway infrastructure or signal timing improvements assumed.</li> </ul>
<b>Future Conditions with Development (2019 Future)</b>
<ul style="list-style-type: none"> <li>• Site trip generation and mode split assumptions are detailed in Section 3.1 of report</li> <li>• Trip distribution for vehicles based on existing traffic volumes and travel patterns in the study area, as shown on Figure 19.</li> <li>• Site driveways and internal roadway improvements added, as shown in Figure 25.</li> <li>• No external roadway infrastructure or signal timing changes assumed.</li> </ul>

**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 19 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds) for the Existing, 2019 Background and Future, and 2040 Horizon scenarios. The capacity analysis results for the morning peak hour are shown on Figure 26 and for the afternoon peak hour are shown on Figure 27.

### 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.

The majority of study intersections operate at acceptable conditions during the morning and afternoon peak hours for the Existing and 2019 Background and Future scenarios. However, the following intersections operate under unacceptable conditions during one or more peak hour:

- East Capitol Street & 58<sup>th</sup> Street
- East Capitol Street & 61<sup>st</sup> Street
- East Capitol Street & Southern Avenue

Additionally, the majority of the study intersections operate under acceptable conditions during the morning and afternoon peak hours for the 2040 Horizon scenario. However, in addition to those listed previously, the following intersections are projected to operate under unacceptable conditions during one or more peak hour:

- East Capitol Street & 55<sup>th</sup> Street
- Southern Avenue & Davey Street
- Central Avenue & Southern Avenue
- East Capitol Street & Private Street 2

Table 20 summarizes the results of the capacity analyses including discussion of what is generating the delays and potential mitigation. Recommendations for improvements at intersections with LOS F conditions are shown underlined. All improvements associated with the proposed Capitol Gateway PUD are shown as **bold underline**. Table 21 shows the capacity analysis results with the improvements shown in Table 20.



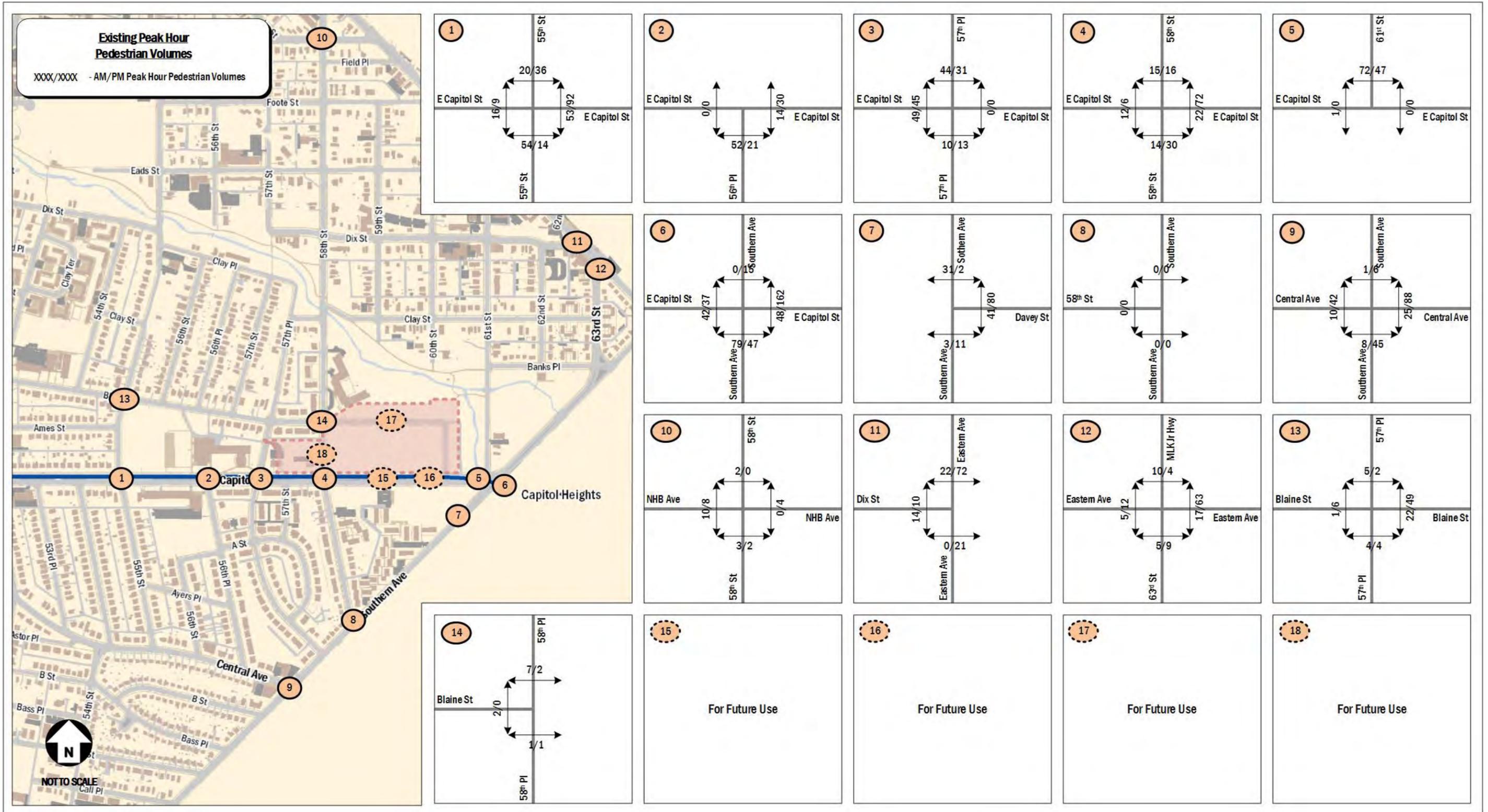


Figure 16: Existing Peak Hour Pedestrian Volumes

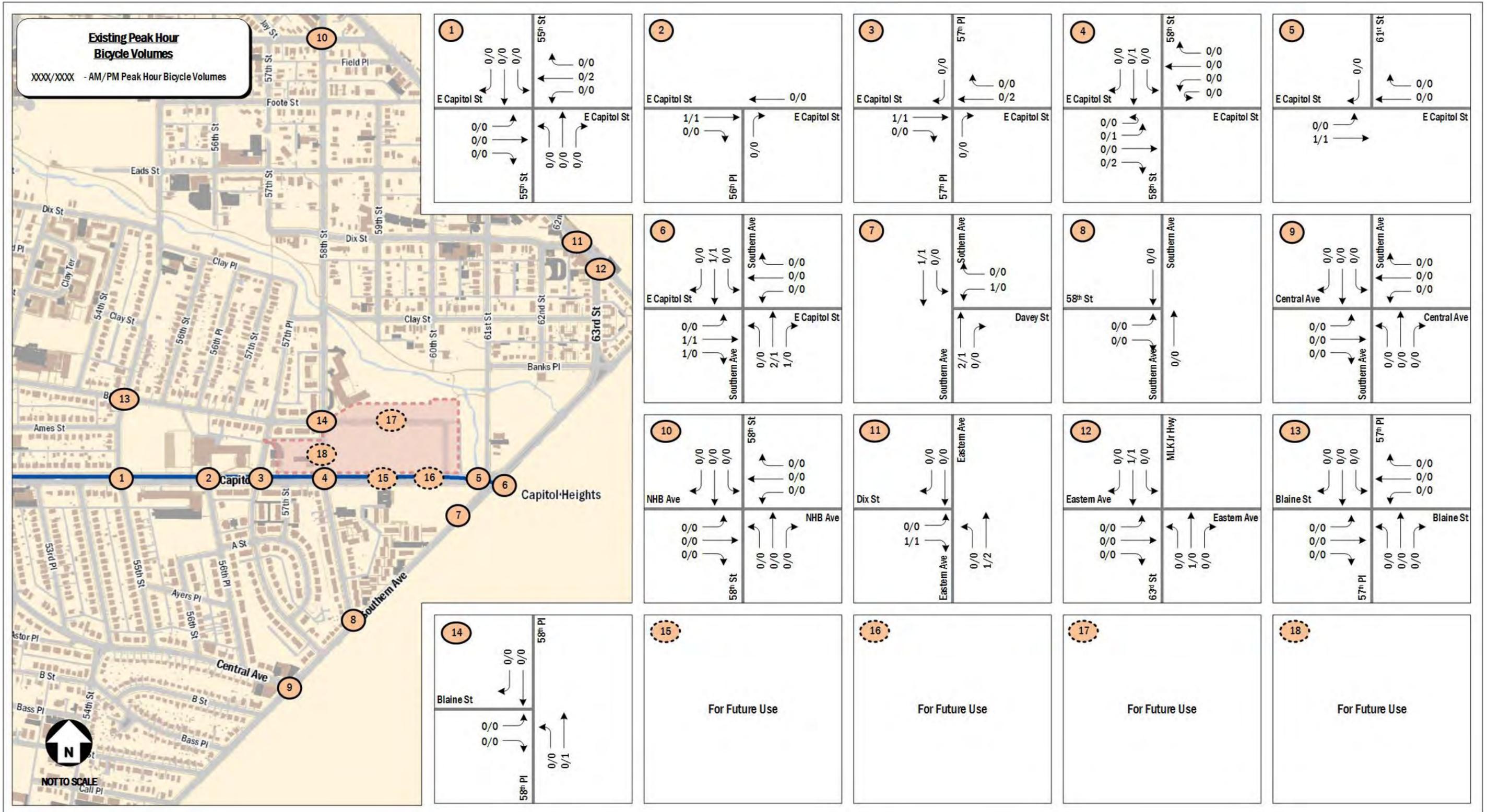


Figure 17: Existing Peak Hour Bicycle Volumes

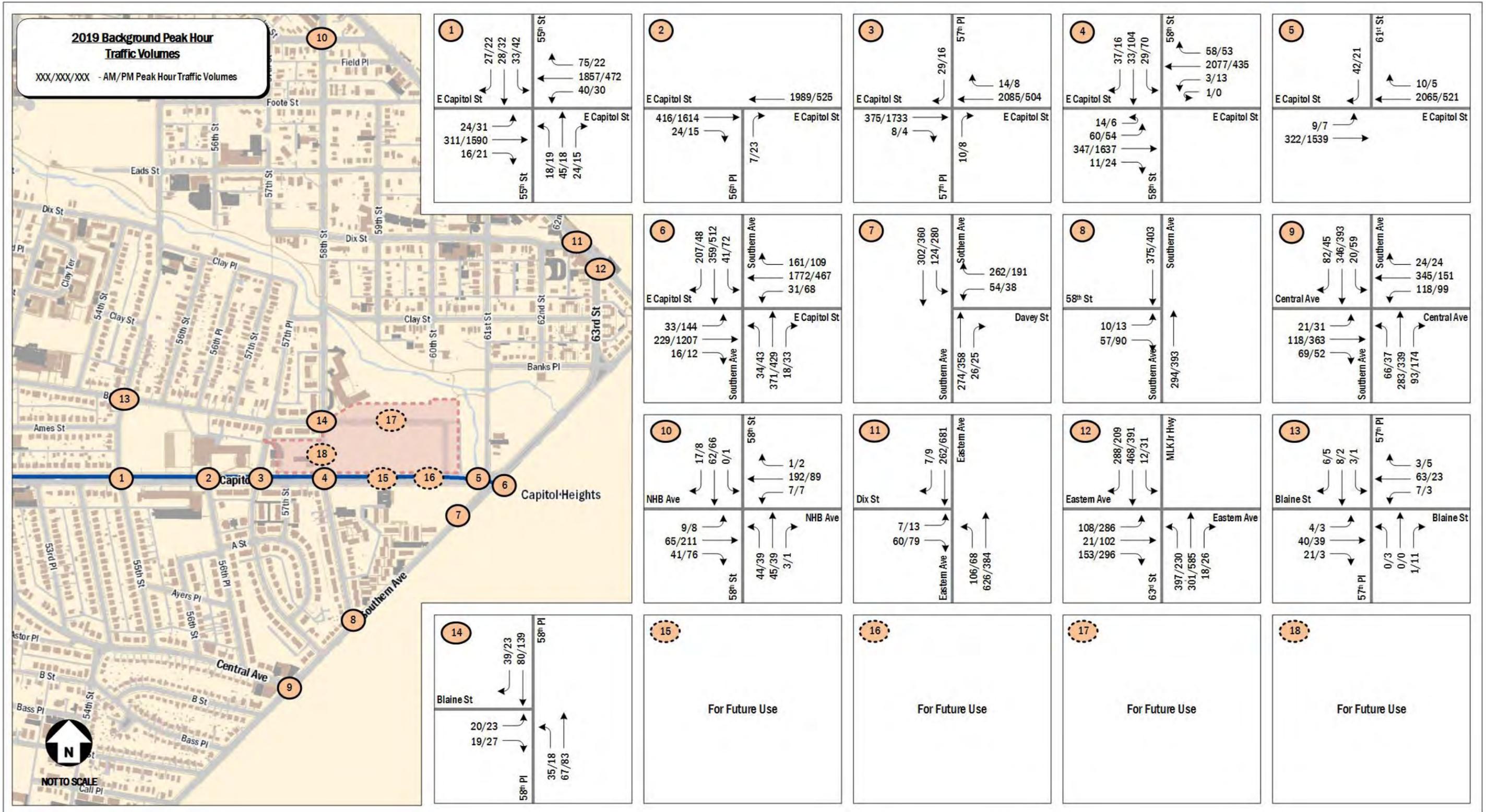


Figure 18: 2019 Background Peak Hour Traffic Volumes

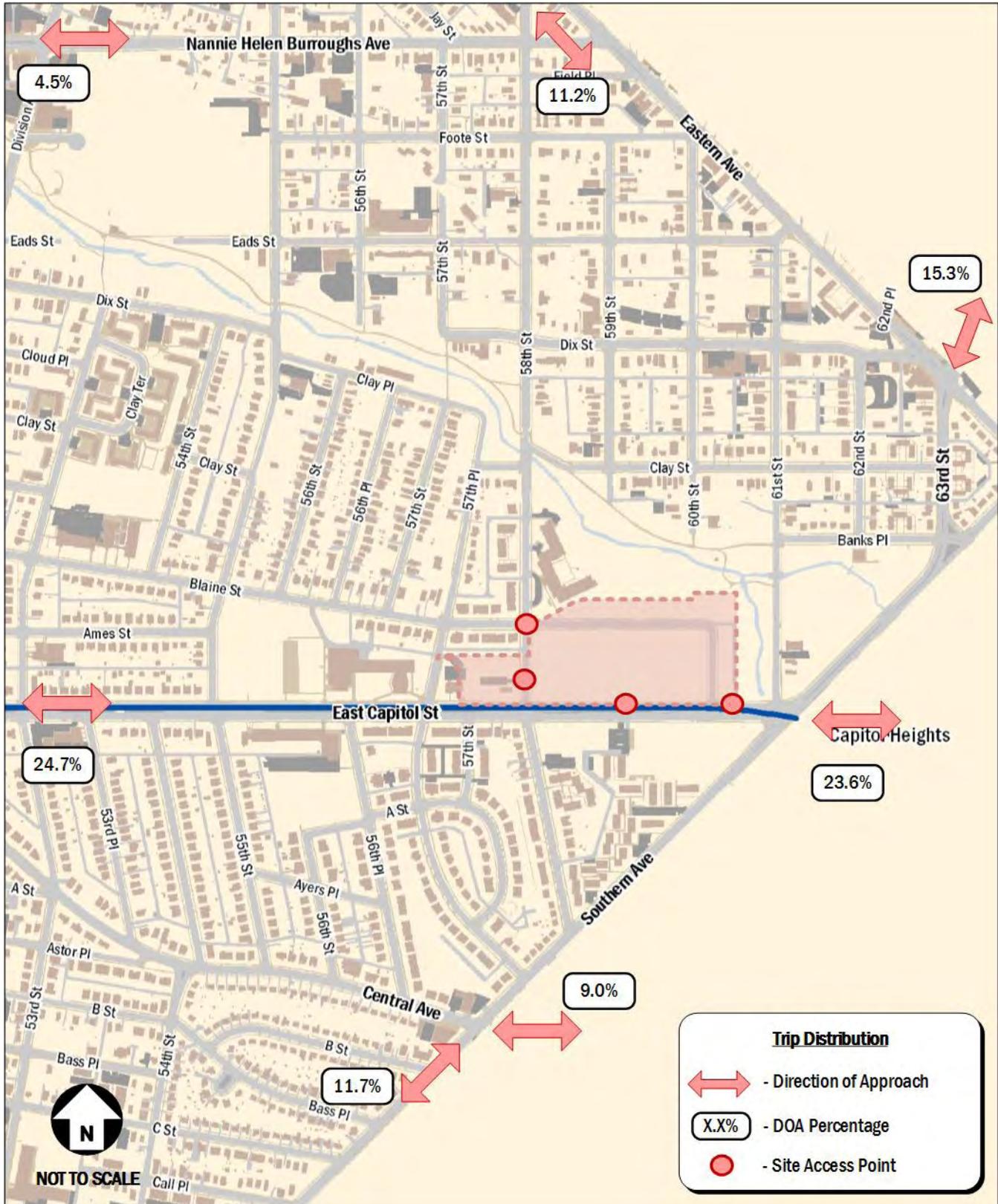


Figure 19: Direction of Approach for Site-Generated Traffic Volumes

*(Page Intentionally Blank)*

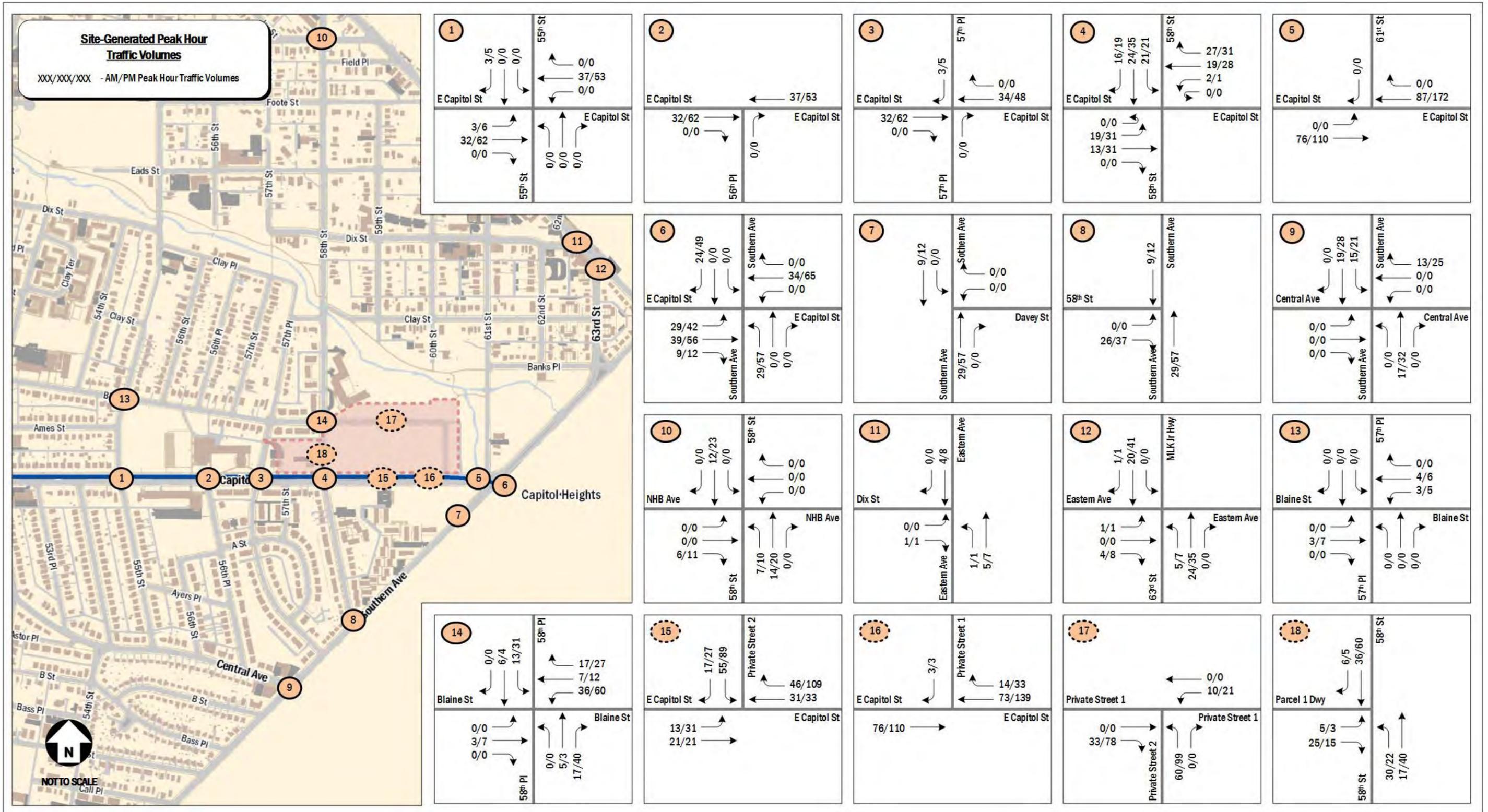


Figure 20: Site-Generated Peak Hour Traffic Volumes

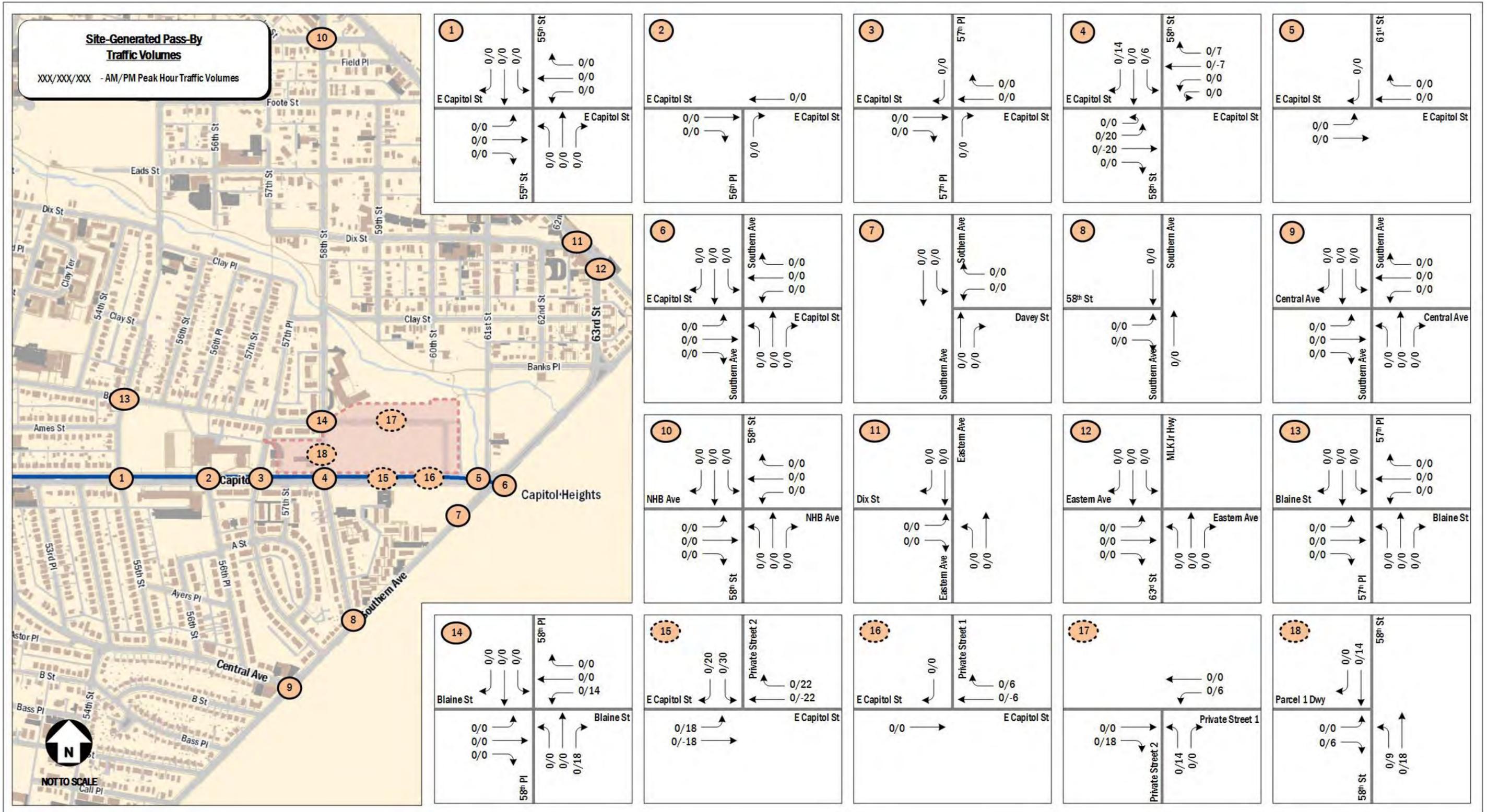


Figure 21: Site-Generated Pass-By Traffic Volumes



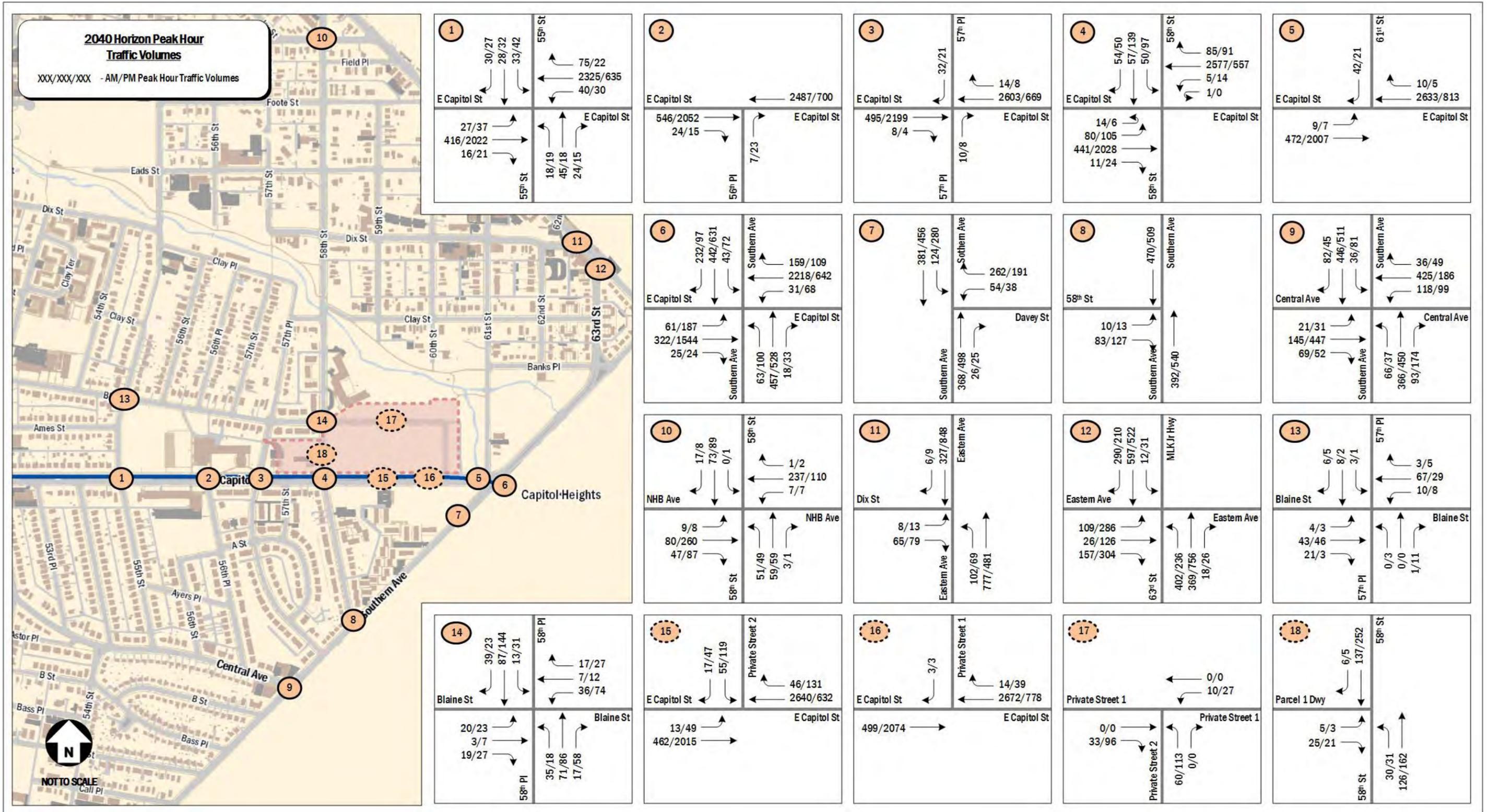


Figure 23: 2040 Horizon Peak Hour Traffic Volumes

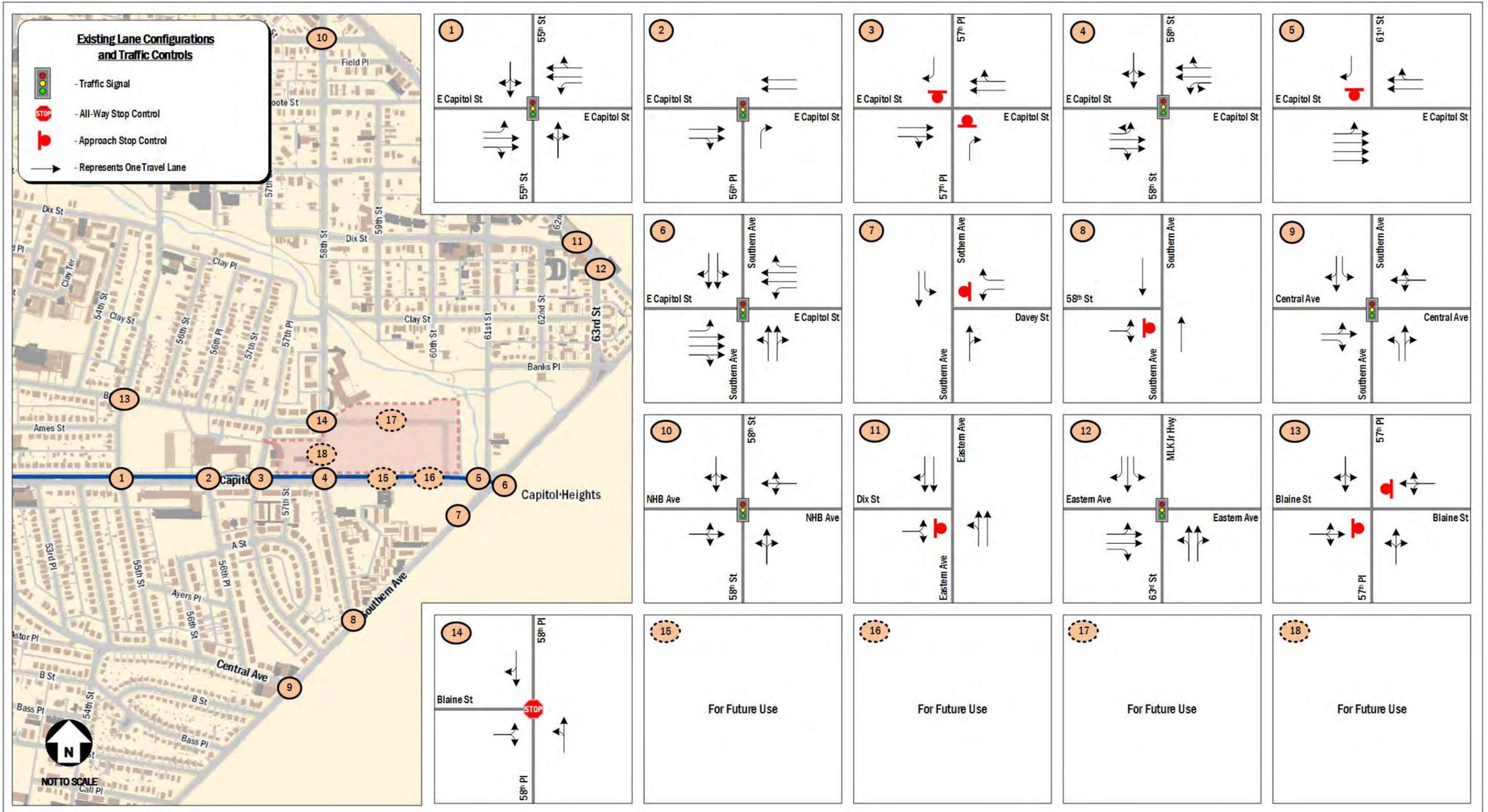


Figure 24: Existing and 2019 Background Peak Hour Traffic Controls and Lane Configurations

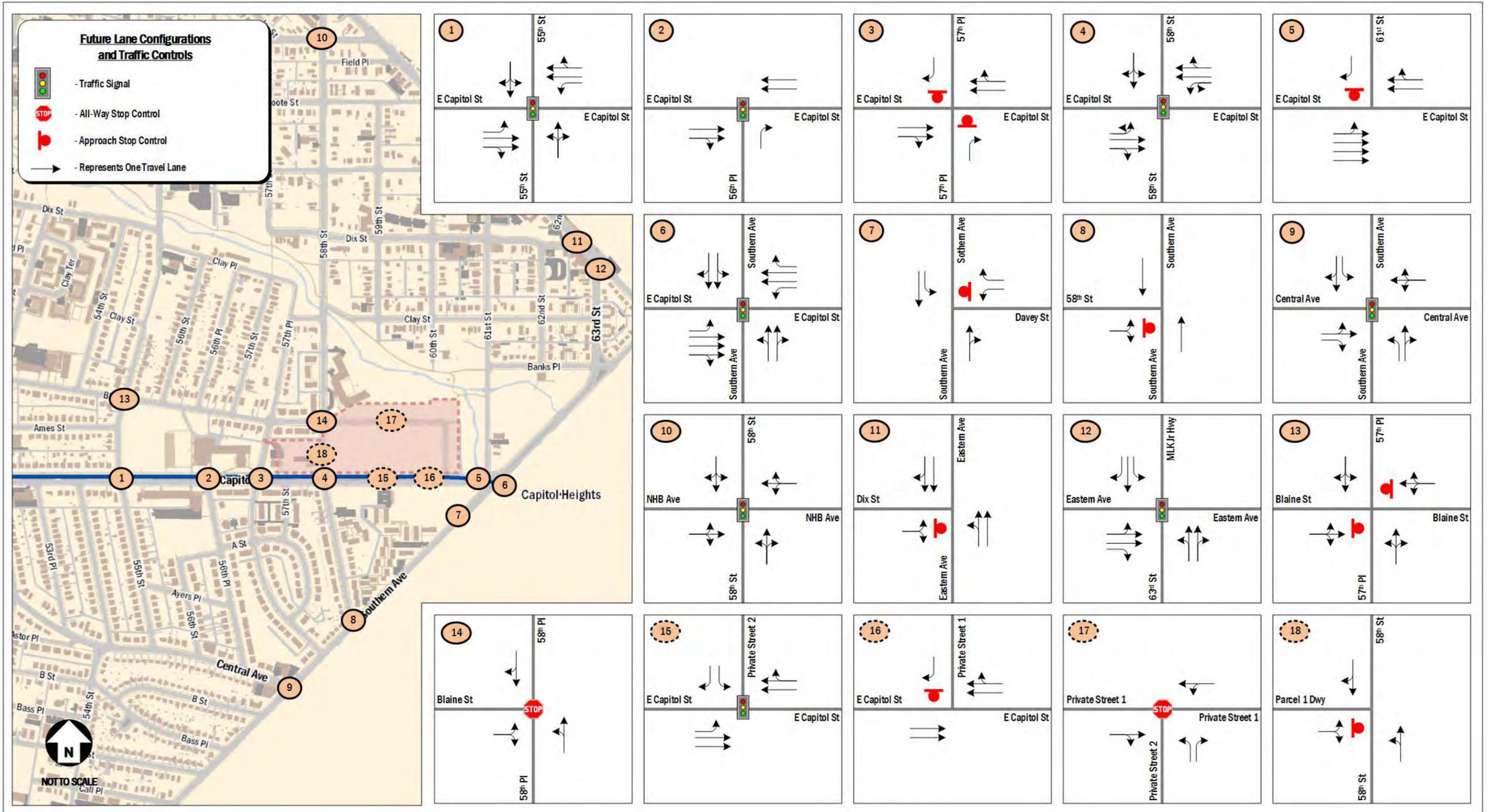


Figure 25: 2019 Future and 2040 Horizon Peak Hour Traffic Controls and Lane Configurations

Table 19: Vehicular Level of Service Results

Intersection	Approach	Existing Conditions				Future Background Conditions (2019)				Total Future Conditions (2019)				Horizon Year Conditions (2040)			
		AM Peak Hour		PM Peak Hour		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	Delay	LOS	Delay	LOS
East Capitol Street & 55 <sup>th</sup> Street	<b>Overall</b>	<b>25.2</b>	<b>C</b>	<b>15.3</b>	<b>B</b>	<b>34.4</b>	<b>C</b>	<b>16.7</b>	<b>B</b>	<b>38.5</b>	<b>D</b>	<b>17.9</b>	<b>B</b>	<b>109.2</b>	<b>F</b>	<b>44.4</b>	<b>D</b>
	v/c Ratio	0.78		0.66		0.82		0.70		0.84		0.72		1.00		0.86	
	Eastbound	9.0	A	16.6	B	9.0	A	18.6	B	9.3	A	20.3	C	9.4	A	58.0	E
	Westbound	27.4	C	4.8	A	39.3	D	4.9	A	45.0	D	5.7	A	135.8	F	5.1	A
	Northbound	32.2	C	30.4	C	32.2	C	30.4	C	32.2	C	30.5	C	32.2	C	30.8	C
	Southbound	33.1	C	33.2	C	33.2	C	33.2	C	33.5	C	33.4	C	33.8	C	33.4	C
East Capitol Street & 56 <sup>th</sup> Place	<b>Overall</b>	<b>4.7</b>	<b>A</b>	<b>2.5</b>	<b>A</b>	<b>5.7</b>	<b>A</b>	<b>2.6</b>	<b>A</b>	<b>5.6</b>	<b>A</b>	<b>1.9</b>	<b>A</b>	<b>20.8</b>	<b>C</b>	<b>2.6</b>	<b>A</b>
	v/c Ratio	0.69		0.52		0.74		0.56		0.76		0.58		0.93		0.71	
	Eastbound	1.1	A	1.1	A	1.1	A	1.2	A	1.2	A	1.2	A	1.3	A	2.2	A
	Westbound	5.2	A	4.7	A	6.4	A	4.8	A	6.3	A	2.0	A	25.2	C	2.0	A
	Northbound	46.7	D	43.5	D	46.7	D	43.7	D	46.7	D	44.0	D	46.7	D	44.8	D
East Capitol Street & 57 <sup>th</sup> Place	Northbound	9.7	A	14.0	B	9.9	A	14.2	B	10.0	B	14.2	B	10.4	B	23.0	C
	Southbound	14.8	B	10.4	B	14.9	B	10.4	B	15.0	C	10.7	B	15.0	C	10.7	B
East Capitol Street & 58 <sup>th</sup> Street	<b>Overall</b>	<b>33.6</b>	<b>C</b>	<b>24.8</b>	<b>C</b>	<b>50.8</b>	<b>D</b>	<b>26.5</b>	<b>C</b>	<b>59.8</b>	<b>E</b>	<b>32.4</b>	<b>C</b>	<b>140.3</b>	<b>F</b>	<b>56.5</b>	<b>E</b>
	v/c Ratio	1.08		0.78		1.08		0.82		1.41		0.92		1.41		1.06	
	Eastbound	48.1	D	26.1	C	46.0	D	28.6	C	81.4	F	28.3	C	70.5	E	65.8	E
	Westbound	30.1	C	10.4	B	52.7	D	10.6	B	56.2	E	6.9	A	163.7	F	6.9	A
	Southbound	36.7	D	47.3	D	36.9	D	47.3	D	43.3	D	98.1	F	43.8	D	98.1	F
East Capitol Street & 61 <sup>st</sup> Street	Eastbound Left	66.5	F	0.8	A	147.7	F	0.8	A	253.1	F	1.4	A	1736.5	F	2.2	A
	Southbound	24.4	C	12.1	B	34.1	D	12.5	B	43.6	E	15.1	C	284.4	F	17.0	C
East Capitol Street & Southern Avenue	<b>Overall</b>	<b>77.9</b>	<b>E</b>	<b>21.6</b>	<b>C</b>	<b>97.8</b>	<b>F</b>	<b>24.0</b>	<b>C</b>	<b>102.9</b>	<b>F</b>	<b>40.9</b>	<b>D</b>	<b>179.1</b>	<b>F</b>	<b>84.2</b>	<b>F</b>
	v/c Ratio	0.91		0.76		0.98		0.84		1.05		0.95		1.28		1.37	
	Eastbound	16.4	B	12.2	B	16.2	B	12.3	B	21.6	C	14.6	B	20.6	C	16.4	B
	Westbound	107.7	F	21.3	C	141.3	F	22.1	C	151.2	F	23.5	C	274.1	F	36.1	D
	Northbound	31.4	C	35.6	D	32.4	C	38.3	D	40.8	D	98.4	F	66.7	E	214.4	F
	Southbound	51.8	D	31.8	C	52.9	D	40.9	D	54.6	D	70.1	E	62.0	E	180.7	F
Southern Avenue & Davey Street	Westbound	16.9	C	29.2	D	29.9	D	33.7	D	18.9	C	43.0	E	23.3	C	83.2	F
	Southbound Left	8.5	A	10.2	B	8.5	A	10.4	B	8.6	A	10.9	B	8.9	A	11.7	B
58 <sup>th</sup> Street & Southern Avenue	Eastbound	12.2	B	13.0	B	12.6	B	13.5	B	13.1	B	14.6	B	15.0	B	17.7	C
Central Avenue & Southern Avenue	<b>Overall</b>	<b>20.7</b>	<b>C</b>	<b>21.7</b>	<b>C</b>	<b>22.4</b>	<b>C</b>	<b>23.9</b>	<b>C</b>	<b>23.8</b>	<b>C</b>	<b>28.1</b>	<b>C</b>	<b>37.1</b>	<b>D</b>	<b>47.3</b>	<b>D</b>
	v/c Ratio	0.75		0.75		0.79		0.79		0.82		0.84		0.95		1.03	
	Eastbound	11.3	B	15.3	B	11.4	B	15.9	B	11.4	B	16.0	B	11.8	B	19.2	B
	Westbound	30.1	C	20.1	C	34.0	C	22.1	C	37.2	D	23.9	C	69.7	E	54.3	D
	Northbound	17.4	B	29.9	C	18.2	B	34.2	C	19.1	B	43.3	D	24.0	C	80.0	E
	Southbound	18.1	B	18.5	B	19.1	B	19.7	B	19.9	B	23.0	C	26.2	C	30.0	C

Intersection	Approach	Existing Conditions				Future Background Conditions (2019)				Total Future Conditions (2019)				Horizon Year Conditions (2040)			
		AM Peak Hour		PM Peak Hour		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	Delay	LOS	Delay	LOS
Nannie Helen Burroughs Avenue & 58 <sup>th</sup> Street	<b>Overall</b>	<b>20.0</b>	<b>B</b>	<b>18.5</b>	<b>B</b>	<b>19.5</b>	<b>B</b>	<b>18.5</b>	<b>B</b>	<b>23.8</b>	<b>C</b>	<b>21.6</b>	<b>C</b>	<b>21.8</b>	<b>C</b>	<b>19.9</b>	<b>C</b>
	v/c Ratio	0.24		0.31		0.25		0.32		0.27		0.37		0.31		0.41	
	Eastbound	2.7	A	2.7	A	2.7	A	2.8	A	3.1	A	3.9	A	3.2	A	4.2	A
	Westbound	3.0	A	2.0	A	3.0	A	2.0	A	3.5	A	2.9	A	3.7	A	3.0	A
	Northbound	54.1	D	72.0	E	54.1	D	74.8	E	65.1	E	72.9	E	65.1	E	72.9	E
	Southbound	46.1	D	44.9	D	41.6	D	45.2	D	40.4	D	41.3	D	40.4	D	41.3	D
Dix Street & Eastern Avenue	Eastbound	11.3	B	15.6	C	11.6	B	16.5	C	11.7	B	16.7	C	12.7	B	21.0	C
	Northbound Left	3.3	A	3.7	A	3.3	A	4.0	A	3.4	A	4.0	A	3.2	A	4.1	A
Eastern Avenue & Martin Luther King, Jr. Highway	<b>Overall</b>	<b>25.8</b>	<b>C</b>	<b>19.6</b>	<b>B</b>	<b>26.9</b>	<b>C</b>	<b>20.1</b>	<b>C</b>	<b>27.1</b>	<b>C</b>	<b>21.5</b>	<b>C</b>	<b>39.9</b>	<b>D</b>	<b>26.7</b>	<b>C</b>
	v/c Ratio	0.52		0.55		0.54		0.58		0.55		0.66		0.65		0.77	
	Eastbound	19.1	B	23.2	C	19.2	B	23.4	C	19.3	B	23.6	C	19.6	B	24.3	C
	Northbound	22.3	C	8.4	A	22.7	C	8.9	A	20.9	C	10.0	A	21.6	C	11.6	B
	Southbound	31.4	C	28.7	C	33.5	C	29.9	C	35.6	D	32.7	C	61.0	E	46.7	D
Blaine Street & 57 <sup>th</sup> Place	Eastbound	9.7	A	10.1	B	9.7	A	10.1	B	9.8	A	10.1	B	9.8	A	10.1	B
	Westbound	10.3	B	9.9	A	10.3	B	9.9	A	10.4	B	10.1	B	10.4	B	10.1	B
	Northbound Left	0.0	A	1.6	A	0.0	A	1.6	A	0.0	A	1.6	A	0.0	A	1.6	A
	Southbound Left	1.3	A	0.9	A	1.3	A	0.9	A	1.3	A	0.9	A	1.3	A	0.9	A
Blaine Street/Private Street 1 & 58 <sup>th</sup> Street	<b>Overall</b>	<b>8.0</b>	<b>A</b>	<b>8.2</b>	<b>A</b>	<b>8.0</b>	<b>A</b>	<b>8.2</b>	<b>A</b>	<b>8.4</b>	<b>A</b>	<b>9.2</b>	<b>A</b>	<b>8.4</b>	<b>A</b>	<b>9.2</b>	<b>A</b>
	Eastbound	7.7	A	7.9	A	7.7	A	7.9	A	8.0	A	8.6	A	8.0	A	8.6	A
	Westbound	--	--	--	--	--	--	--	--	8.2	A	9.1	A	8.2	A	9.1	A
	Northbound	8.2	A	8.0	A	8.2	A	8.0	A	8.6	A	8.9	A	8.6	A	8.9	A
	Southbound	7.8	A	8.4	A	7.8	A	8.4	A	8.3	A	9.8	A	8.3	A	9.8	A
East Capitol Street & Private Street 2	<b>Overall</b>	--	--	--	--	--	--	--	--	<b>66.0</b>	<b>E</b>	<b>7.7</b>	<b>A</b>	<b>153.8</b>	<b>F</b>	<b>13.8</b>	<b>B</b>
	v/c Ratio	--		--		--		--		0.84		0.68		1.01		0.81	
	Eastbound	--	--	--	--	--	--	--	--	4.2	A	3.2	A	4.0	A	11.9	B
	Westbound	--	--	--	--	--	--	--	--	77.8	E	13.5	B	<b>183.5</b>	<b>F</b>	14.9	B
	Southbound	--	--	--	--	--	--	--	--	29.5	C	31.2	C	29.6	C	31.2	C
East Capitol Street & Private Street 1	Southbound	--	--	--	--	--	--	--	--	10.7	B	10.9	B	14.6	B	11.4	B
Private Street 1 & Private Street 2	<b>Overall</b>	--	--	--	--	--	--	--	--	<b>7.2</b>	<b>A</b>	<b>7.8</b>	<b>A</b>	<b>7.2</b>	<b>A</b>	<b>7.8</b>	<b>A</b>
	Eastbound	--	--	--	--	--	--	--	--	6.7	A	7.2	A	6.7	A	7.2	A
	Westbound	--	--	--	--	--	--	--	--	7.4	A	7.8	A	7.4	A	7.8	A
	Northbound	--	--	--	--	--	--	--	--	7.4	A	8.3	A	7.4	A	8.3	A
58 <sup>th</sup> Street & Parcel 1 Driveway	Eastbound	--	--	--	--	--	--	--	--	9.5	A	10.2	B	9.5	A	10.2	B
	Northbound Left	--	--	--	--	--	--	--	--	1.6	A	1.5	A	1.6	A	1.5	A

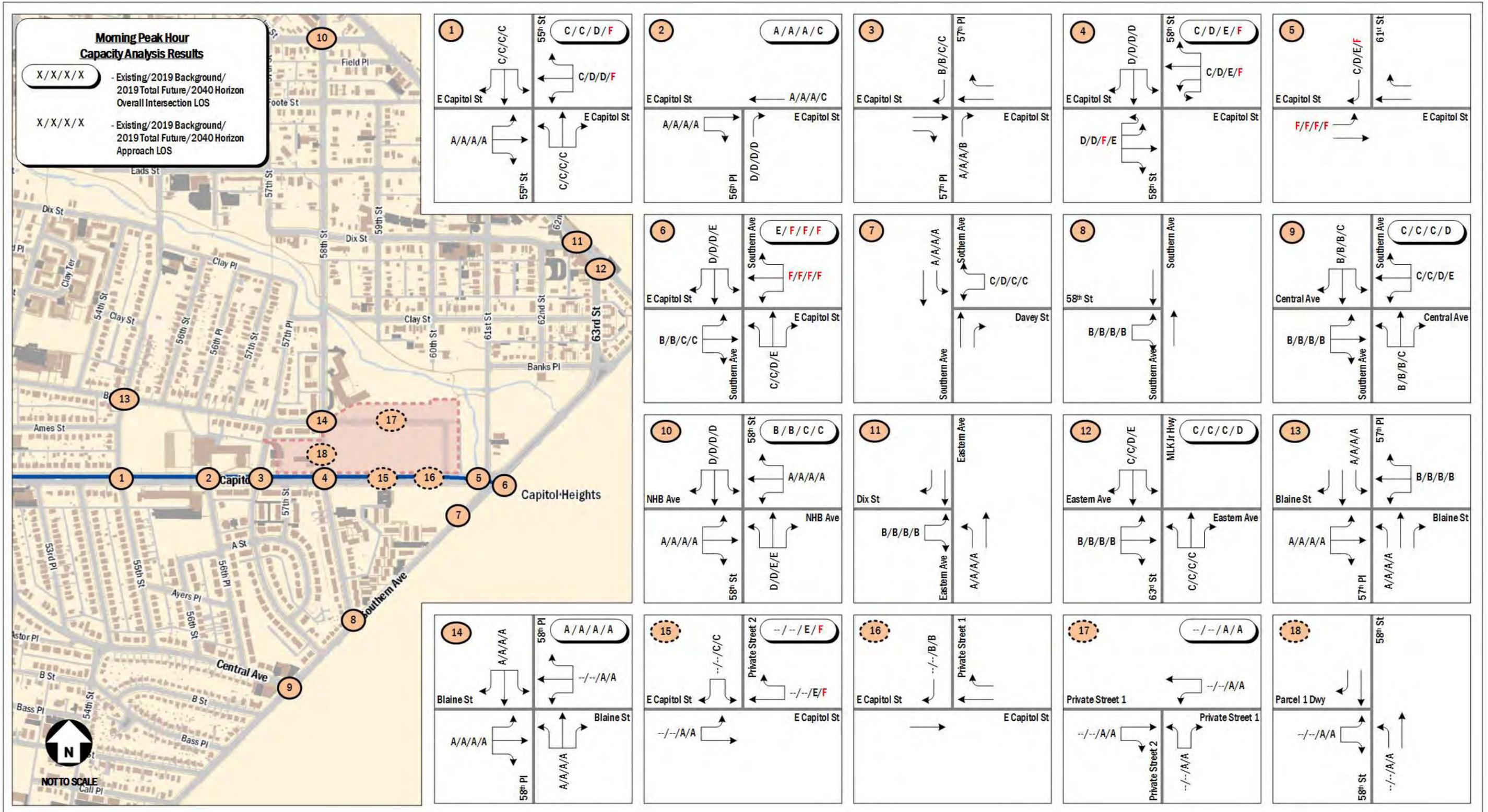
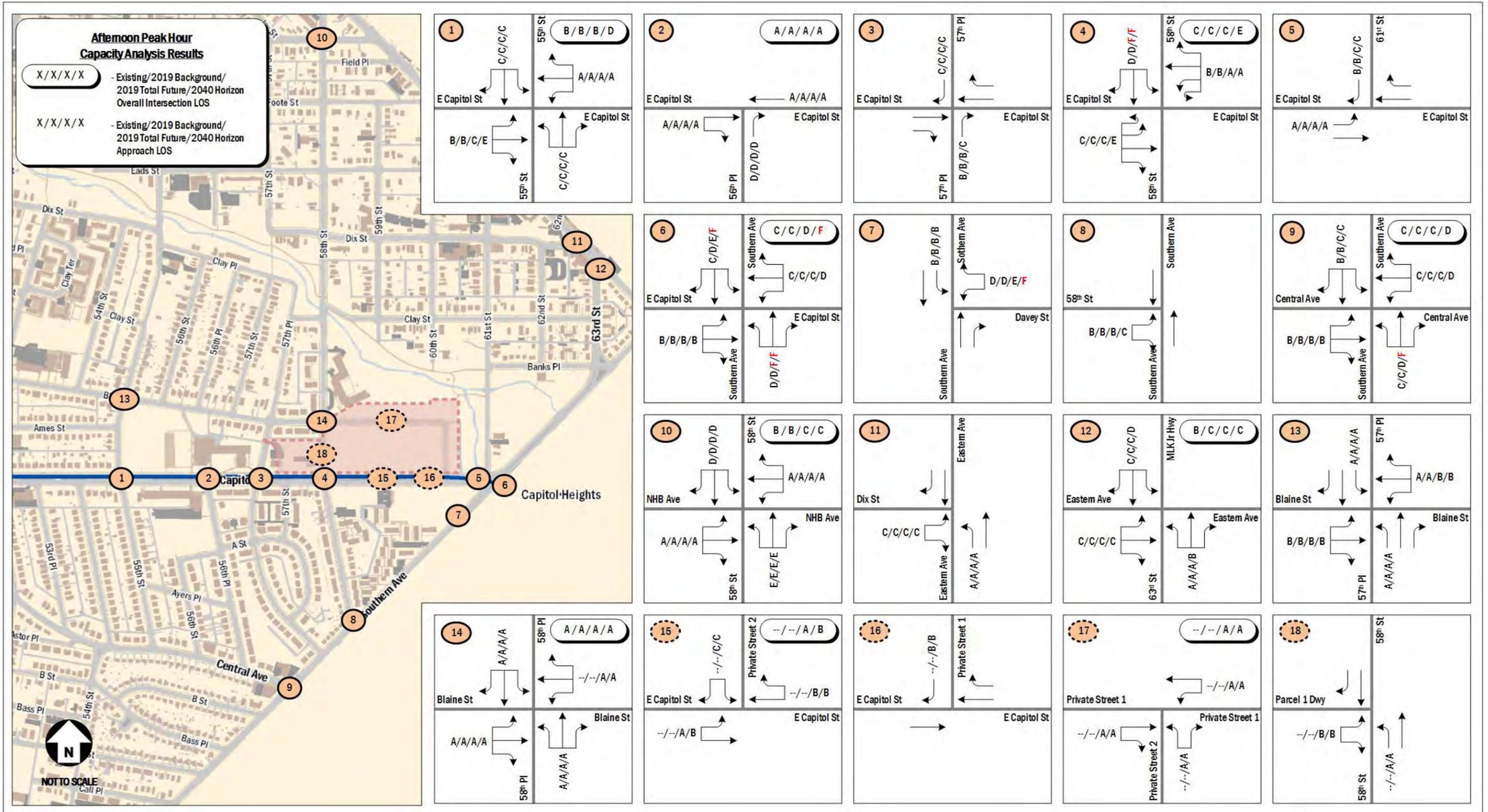


Figure 26: Morning Peak Hour Level of Service Results



**Table 20: Roadway Capacity Results Review for Existing and 2019 Background/Future**

Intersection	Locations & Scenarios with LOS F <i>EX = Existing Conditions</i> <i>BG = 2019 Background (without Development)</i> <i>TF = 2019 Total Future (with Development)</i>	Percent of Vehicular Traffic Attributable to Development (in TF/HZ scenario)		Discussion & Recommendations
		AM Peak	PM Peak	
<b>East Capitol Street &amp; 55<sup>th</sup> Street</b>	Overall intersection AM Peak: HZ WB E Capitol Street AM Peak: HZ	3.4%/2.3%	6.1%/4.1%	The delays at this intersection are due to the addition of background traffic in the 2040 Horizon year scenario. The intersection operates under overall acceptable conditions during both the morning and afternoon peak hours in the 2019 Total Future conditions. With the addition of the inherent growth along East Capitol Street to 2040, the westbound approach degrades to unacceptable conditions during the morning peak hour, which causes the intersection to operate under unacceptable conditions as well. <u>Peak period restriction of curbside parking to allow traffic to utilize the outside lanes of westbound East Capitol Street could allow this intersection to operate within acceptable levels in 2040. This report recommends that this improvement be studied by DDOT outside the scope of this TIA in order to determine if it or other future improvements are necessary as the area is developed.</u>
<b>East Capitol Street &amp; 58<sup>th</sup> Street</b>	EB E Capitol Street AM Peak: TF SB 58 <sup>th</sup> Street PM Peak: TF  Overall intersection AM Peak: HZ WB E Capitol Street AM Peak: HZ	5.5%/4.2%	9.7%/6.3%	<p>The delays at this intersection during the Total Future scenarios are due to the addition of the site generated traffic. The intersection operates under acceptable conditions during both the morning and afternoon peak hours in the 2019 Background conditions. With the addition of the site-generated traffic, the eastbound and southbound approaches are projected to operate under unacceptable conditions during the morning and afternoon peak hours, respectively. However, the intersection can operate under acceptable conditions with the addition of the following improvements: add protected left-turn phase (with permitted operation as well) to the eastbound approach of East Capitol Street, retime the intersection, and optimize the intersection offsets. Retiming of the signal would not result in reduced crossing times for pedestrians. The results of these improvements are shown in Table 21. <b><u>This report recommends that the Applicant coordinate with DDOT to reconstruct and retime the traffic signal at this intersection to include these proposed improvements upon buildout of the site.</u></b></p> <p>In the 2040 Horizon year scenario, the delays at this intersection are due to the addition of background traffic. With the addition of the inherent growth along East Capitol Street to 2040, the westbound approach of East Capitol Street degrades to unacceptable conditions during the morning peak hour, which causes the intersection to operate under unacceptable conditions as well. With the addition of the proposed future improvements outlined above, the intersection continues to operate under unacceptable conditions during the morning peak hour, and operates under unacceptable conditions during the afternoon peak hour due to eastbound approach of East Capitol Street, as shown in Table 21. <u>Peak period restriction of curbside parking to allow traffic to utilize the outside lanes of westbound East Capitol Street could allow this intersection to operate within acceptable levels in 2040. This report recommends that this improvement be studied by DDOT outside the scope of this TIA in order to determine if it or other future improvements are necessary as the area is developed.</u></p>
<b>East Capitol Street &amp; 61<sup>st</sup> Street</b>	EB E Capitol Street AM Peak: EX, BG, TF, HZ SB 61 <sup>st</sup> Street AM Peak: HZ	7.3%/5.2%	13.6%/9.9%	The delays at this intersection are due to the existing intersection configuration which allows eastbound left turning traffic. The delays projected for the eastbound left-turn movement along East Capitol Street are present in the existing morning peak hour. The addition of the traffic generated by background development, inherent growth on the roadway, and site-generated traffic exacerbates the existing operation. In the 2040 Horizon year, the addition of the inherent growth along East Capitol Street causes the southbound approach of 61 <sup>st</sup> Street to also operate under unacceptable conditions during the morning peak hour. The restriction eastbound left turns by closing this median opening could improve the operation of this intersection. Given the connectivity available via Southern Avenue and Banks Place to the north and the relatively minimal number of left turning vehicles that would be displaced (less than 10 in any peak hour), this improvement could be implemented with minimal inconvenience to the neighborhoods accessed via 61 <sup>st</sup> Street. <b><u>This report recommends that the Applicant coordinate with DDOT to include this proposed improvement upon buildout of the site.</u></b>

Intersection	Locations & Scenarios with LOS F <i>EX = Existing Conditions</i> <i>BG = 2019 Background (without Development)</i>	Percent of Vehicular Traffic Attributable to Development (in TF/HZ scenario)		Discussion & Recommendations
<b>East Capitol Street &amp; Southern Avenue</b>	Overall intersection AM Peak: FB, TF, HZ WB E Capitol Street AM Peak: EX, FB, TF, HZ NB Southern Avenue AM Peak: HZ  Overall intersection PM Peak: HZ NB Southern Avenue PM Peak: TF, HZ SB Eastern Avenue PM Peak: HZ	5.5%/4.0%	9.4%/7.0%	<p>The delays at this intersection during the morning peak period are due to the existing signal timings. The delays projected for the westbound approach of East Capitol Street are present in the existing morning peak hour. The addition of the traffic generated by background development, inherent growth on the roadway, and site-generated traffic exacerbates the existing failing operation, causing the overall intersection to operate under unacceptable conditions in the 2019 Background and Total Future scenarios. The addition of the inherent growth to 2040 further exacerbates the existing failing operation and causes the northbound approach of Southern Avenue to operate under unacceptable conditions during the morning peak period. For the afternoon peak period, the delays along northbound Southern Avenue in the 2019 Total Future scenario are due to the addition of the site traffic to the intersection. The addition of the inherent growth to 2040 further exacerbates the failing operation and causes the southbound approach of Eastern Avenue and the overall intersection to operate under unacceptable conditions during the afternoon peak period. However, the intersection can operate under acceptable conditions during the afternoon peak hour with the addition of the following improvements: retime the intersection and optimize the intersection offsets. Retiming the intersection during the morning peak hour also allows the intersection to operate under conditions similar to those projected for the 2019 Background scenario without improvements, within a 10% marginal increase in delay along the westbound approach of East Capitol Street. Retiming of the signal would not result in reduced crossing times for pedestrians. No infrastructure improvements are available due to existing right-of-way constraints. The results of these improvements are shown in Table 21. <b><u>This report recommends that the Applicant coordinate with DDOT to retime the traffic signal at this intersection to include this proposed improvements upon buildout of the site.</u></b></p> <p>The intersection will continue to operate under unacceptable conditions during the morning and afternoon peak hours in the 2040 Horizon year scenario due to the inherent growth on the roadway to 2040. Additional capacity is necessary to accommodate the future volumes. <u>Improvements including the addition of a third westbound through lane and north and southbound left turn lanes could improve the operations of this intersection in 2040. Therefore, this report recommends that these improvements be studied by DDOT outside the scope of this TIA in order to determine if they or other future improvements are necessary as the area is developed.</u></p>
<b>Southern Avenue &amp; Davey Street</b>	WB Davey Street PM Peak: HZ	4.2%/3.1%	5.8%/4.6%	<p>The delays at this intersection are due to the addition of background traffic in the 2040 Horizon year scenario. The intersection operates under acceptable conditions during both the morning and afternoon peak hours in the 2019 Total Future conditions. With the addition of the inherent growth along Southern Avenue to 2040, the westbound approach degrades to unacceptable conditions during the afternoon peak hour. <u>Signalization of this intersection could improve its operations in 2040. This report recommends that this improvement be studied by DDOT outside the scope of this TIA in order to determine if it or other future improvements are necessary as the area is developed.</u></p>
<b>Central Avenue &amp; Southern Avenue</b>	NB Southern Avenue PM Peak: HZ	4.4%/3.4%	6.6%/4.9%	<p>The delays at this intersection are due to the addition of background traffic in the 2040 Horizon year scenario. The intersection operates under acceptable conditions during both the morning and afternoon peak hours in the 2019 Total Future conditions. With the addition of the inherent growth along Southern and Central Avenues to 2040, the northbound approach degrades to unacceptable conditions during the afternoon peak hour. <u>The addition of a northbound right turn lane could improve its operations in 2040. This report recommends that this improvement be studied by DDOT outside the scope of this TIA in order to determine if it or other future improvements are necessary as the area is developed.</u></p>
<b>East Capitol Street &amp; Private Street 2</b>	Overall intersection AM Peak: HZ WB E Capitol Street AM Peak: HZ	5.8%/5.7%	15.4%/10.4%	<p>The delays at this intersection are due to the addition of background traffic in the 2040 Horizon year scenario. The intersection operates under acceptable conditions during both the morning and afternoon peak hours in the 2019 Total Future conditions. As seen with other intersections along East Capitol Street, with the addition of the inherent growth along East Capitol Street to 2040, the westbound approach degrades to unacceptable conditions during the morning peak hour, which causes the intersection to operate under unacceptable conditions as well. <u>Peak period restriction of curbside parking to allow traffic to utilize the outside lanes of westbound East Capitol Street could allow this intersection to operate within acceptable levels in 2040. This report recommends that this improvement be studied by DDOT outside the scope of this TIA in order to determine if it or other future improvements are necessary as the area is developed.</u></p>

Table 21: Vehicular Level of Service Results with Proposed Improvements

Intersection	Approach	Existing Conditions				Future Background Conditions (2019)				Total Future Conditions (2019)			
		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
East Capitol Street & 58 <sup>th</sup> Street	<b>Overall</b>	<b>33.6</b>	<b>C</b>	<b>24.8</b>	<b>C</b>	<b>50.8</b>	<b>D</b>	<b>26.5</b>	<b>C</b>	<b>59.8</b>	<b>E</b>	<b>32.4</b>	<b>C</b>
	v/c Ratio	1.08		0.78		1.08		0.82		1.41		0.92	
	Eastbound	48.1	D	26.1	C	46.0	D	28.6	C	81.4	F	28.3	C
	Westbound	30.1	C	10.4	B	52.7	D	10.6	B	56.2	E	6.9	A
	Southbound	36.7	D	47.3	D	36.9	D	47.3	D	43.3	D	98.1	F
<i>Improvements</i>	<b>Overall</b>	--	--	--	--	--	--	--	--	<b>68.0</b>	<b>E</b>	<b>33.9</b>	<b>C</b>
	v/c Ratio	--		--		--		--		1.06		0.92	
	Eastbound	--	--	--	--	--	--	--	--	23.9	C	36.0	D
	Westbound	--	--	--	--	--	--	--	--	79.4	E	13.9	B
	Southbound	--	--	--	--	--	--	--	--	57.3	E	57.7	D
East Capitol Street & 61 <sup>st</sup> Street	Eastbound Left	66.5	F	0.8	A	147.7	F	0.8	A	253.1	F	1.4	A
	Southbound	24.4	C	12.1	B	34.1	D	12.5	B	43.6	E	15.1	C
<i>Improvements</i>	Eastbound Left	--	--	--	--	--	--	--	--	--	--	--	--
	Southbound	24.4	C	12.1	B	34.1	D	12.5	B	43.6	E	15.1	C
East Capitol Street & Southern Avenue	<b>Overall</b>	<b>77.9</b>	<b>E</b>	<b>21.6</b>	<b>C</b>	<b>97.8</b>	<b>F</b>	<b>24.0</b>	<b>C</b>	<b>102.9</b>	<b>F</b>	<b>40.9</b>	<b>D</b>
	v/c Ratio	0.91		0.76		0.98		0.84		1.05		0.95	
	Eastbound	16.4	B	12.2	B	16.2	B	12.3	B	21.6	C	14.6	B
	Westbound	107.7	F	21.3	C	141.3	F	22.1	C	151.2	F	23.5	C
	Northbound	31.4	C	35.6	D	32.4	C	38.3	D	40.8	D	98.4	F
<i>Improvements</i>	<b>Overall</b>	--	--	--	--	<b>84.0</b>	<b>F</b>	--	--	<b>89.1</b>	<b>F</b>	<b>27.3</b>	<b>C</b>
	v/c Ratio	--		--		0.98		--		1.04		0.96	
	Eastbound	--	--	--	--	17.5	B	--	--	20.4	C	15.7	B
	Westbound	--	--	--	--	129.5	F	--	--	139.1	F	27.9	C
	Northbound	--	--	--	--	32.4	C	--	--	40.8	D	53.0	D
	Southbound	--	--	--	--	15.1	B	--	--	16.8	B	31.2	C

*(Page Intentionally Blank)*

### 3.2.6 Signal Warrant Analysis

A signal warrant analysis was requested by DDOT for the intersection of East Capitol Street and Private Street 2. The results of the signal warrant are outlined below, and the full signal warrant analysis can be found in the Technical Attachments.

The analysis presented follows the methodology outlined in the *Manual of Uniform Traffic Control Devices (MUTCD)*, 2009 Edition. The MUTCD provides standards for nine (9) traffic signal warrants that include factors related to the operation and safety of a study location and the potential to improve these conditions. All applicable warrants were tested in order to determine the need for a traffic control signal. This includes Warrants 1, 2, 3, 4, 6, 7, and 8. Warrant 5 was not included in this analysis because this intersection is not a school crossing for elementary through high school students. Warrant 9 was not included because this intersection is not near a railroad grade crossing. As stated in the MUTCD, Chapter 4, the warrant analysis helps determine whether installation of a traffic control signal is justified at a particular location. Only one of the warrants must be met to justify the need for a traffic control signal.

Traffic volumes for the signal warrant are based on the traffic volumes computed for the future scenarios, as outlined in Section 3.2.2. Table 22 shows the results of the signal warrant analysis. As stated previously, the full warrant analysis can be found in the Technical Attachments. Based on the signal warrant analysis, the signal is warranted based on Warrant 3 for the peak hour traffic volumes. The afternoon peak hour volumes exceed the minimum threshold for Warrant 3.

**Table 22: Summary of Signal Warrant Analysis**

Warrant	Is Criteria Met?
Warrant 1 – Eight-Hour Vehicular Volume	Does not apply
Warrant 2 – Four-Hour Vehicular Volume	Does not apply
Warrant 3 – Peak Hour	Does meet
Warrant 4 – Pedestrian Volume	Does not meet
Warrant 6 – Coordinated Signal System	Does not meet
Warrant 7 – Crash Experience	Does not apply
Warrant 8 – Roadway Network	Does not apply

The signal timing sheets from the *Synchro, Version 7* Software Package are also included in the Technical Attachments to show the coordination plan for the East Capitol Street corridor. The attachments include the timing plans for the proposed signalized intersection, along with the time-space diagrams for the entire East Capitol Street corridor included in the analysis presented previously.

With the addition of the proposed signal at the intersection of East Capitol Street and Private Street 2, the coordinated signal system along East Capitol Street will need to be modified to include the additional signal. This report recommends that the intersection be timed according to DDOT signal timing standards for minimum signal timing for vehicles and pedestrians, as shown in the timing plans included in the Technical Appendices. Additionally, the signal should be programmed on a 100-second cycle to ensure coordination with the up- and downstream intersections, which are also set on a 100-second cycle during the morning and afternoon peak hours.

### 3.3 Non-Auto Impacts

#### 3.3.1 Transit

The trip generation estimates for the Capitol Gateway PUD show that a significant amount of new transit riders will be generated. The proposed development is projected to generate over 4,000 transit trips on a weekday.

As stated in Section 1, there is a significant amount of transit service nearby, including the Metrorail Blue line and several bus routes. The Capitol Heights Metrorail station is approximately a 1,000-foot walk from the site. Bus stops are also located adjacent to the site along East Capitol Street. Several routes have frequent service on every day of the week, with additional less-frequent service provided by other bus routes. The bus service in the area near the development is of high enough quality that census data shows significantly more bus commuters than rail commuters living in the census tract containing the development site.

WMATA studied capacity of Metrorail stations in its *Station Access & Capacity Study*<sup>1</sup>. The study analyzed the capacity of Metrorail stations for their vertical transportation, for example the capacity of the station at elevators, stairs, and escalators to shuttle patrons between the street, mezzanine, and platforms. The study also analyzed stations' capacity to process riders at 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 Capitol Heights station can accommodate the additional riders generated by the Capitol Gateway PUD. The study did not identify Capitol Heights as a station with existing or future station capacity issues.

WMATA also studies capacity for its bus routes. *DC's Transit Future System Plan*<sup>2</sup> 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 Capitol Gateways site are cited for having unacceptable load factors. Thus, the local bus service should be able to accommodate the future riders generated by the Capitol Gateway 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 bicycle trips are approximately 50 per weekday for the Capitol Gateway PUD. 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 are expected to take advantage of the existing and planned routes that exist. Cyclists can use the signed bicycle routes, multi-use trails, and local streets to travel to and from the site. As stated previously, the existing conditions on local roadways provide a good environment for cycling include low traffic volumes and speeds, as well as wide travel lanes. In addition to the off-street trail, on-street signed bicycle routes are provided along 54<sup>th</sup> and 55<sup>th</sup> Streets west of the site, and the site is connected to the Marvin Gaye Trail.

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

---

<sup>1</sup> *Station Access & Capacity Study Final Report*, April 2008, Washington Metropolitan Area Transit Authority

<sup>2</sup> *DC's Transit Future System Plan Final Report*, April 2010, District of Columbia Department of Transportation

### 3.3.3 Pedestrian

The Capitol Gateway PUD is located in a walkable area, with connections to existing retail locations, residential neighborhoods, and transit connections. The trip generation estimates project approximately 100 pedestrian trips per weekday for the development.

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

- Residential neighborhoods and buildings where retail employees can walk to work, including those immediately adjacent to the north and west and those to the south across East Capitol Street.
- Retail locations, such as the existing retail near the Benning Road Metrorail station, and other retail sites along the East Capitol Street corridor.

Based on these origins/destinations, most pedestrians generated by the PUD will travel along East Capitol Street or cross East Capitol Street at 58<sup>th</sup> Street or Private Street 2. There will also be use of the local roadways north and west of the site to access the adjacent residential neighborhoods.

In addition to these trips, the transit trips generated by the PUD will also generate pedestrian demand between the site and nearby transit stops. The vast majority of these transit riders will travel along East Capitol Street to access the adjacent bus stops and to travel to the Capitol Heights Metrorail station.

Most of the sidewalks surrounding the site are of satisfactory quality, and there are few gaps in the network. The sidewalks closest to the Capitol Gateway PUD, such as those along East Capitol Street and 58<sup>th</sup> Street are of satisfactory quality and those constructed by the PUD along Private Street 1, 58<sup>th</sup> Street, and Private Street 2 will be of high quality. Additionally, the planned District initiatives outlined in Section 1.7.2 include improvements to the pedestrian network surrounding the site. Primarily, the planned East Capitol Street Pedestrian Safety Project will improve the corridor between Stoddert Place and Southern Avenue, including widening of sidewalks, installation of traffic claiming measures, design of new intersection geometry, construction of new traffic signals, and relocation of existing transit stops.

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 Capitol Gateway PUD will not have a negative impact to pedestrian facilities in the study area.

*(Page Intentionally Blank)*

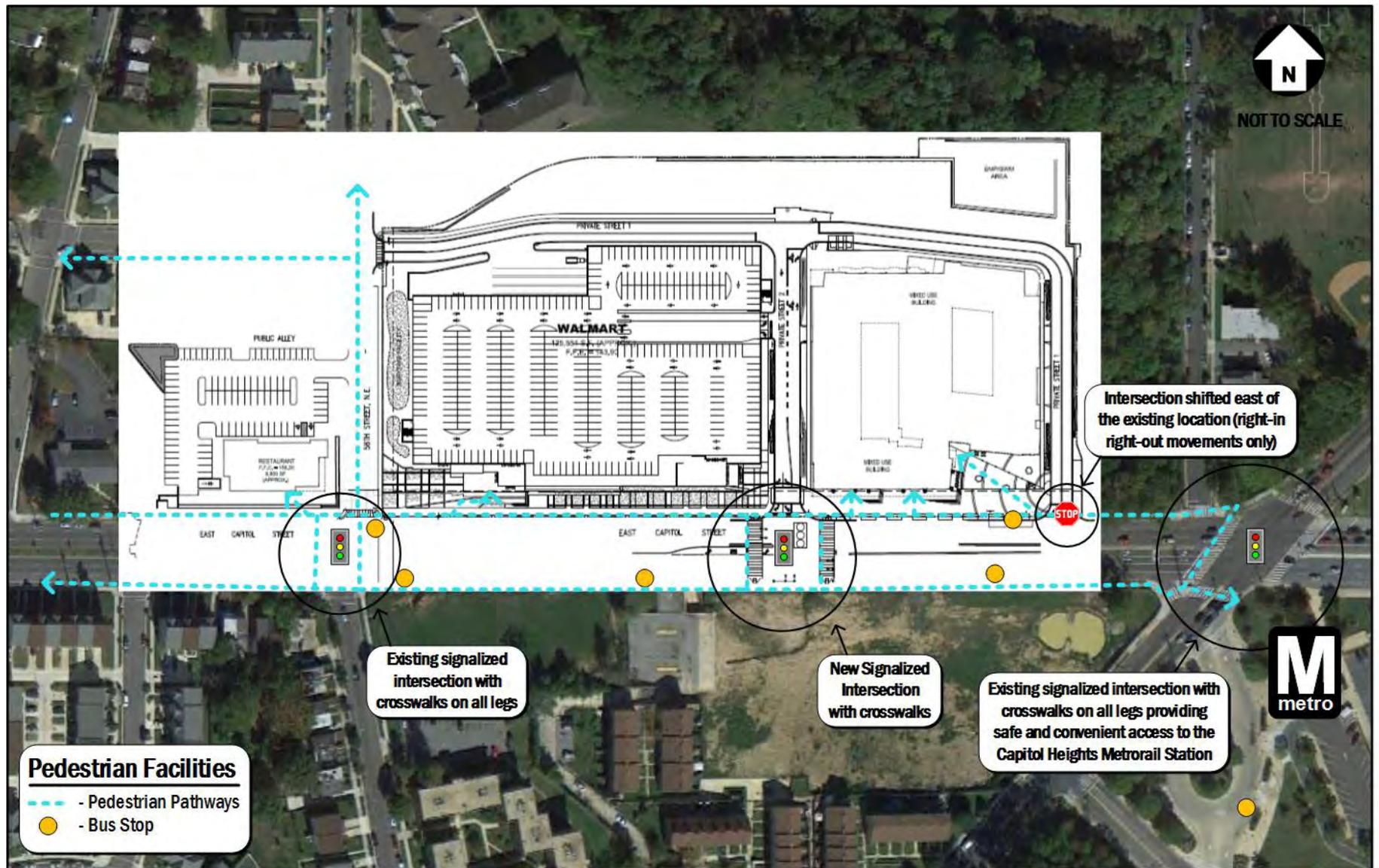


Figure 28: Future Pedestrian Facilities

*(Page Intentionally Blank)*

### 3.4 Crash Analysis

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

#### 3.4.1 Summary of Available Crash Data

A safety analysis was performed to determine if there was an abnormally high accident rate at any study area intersection. The District Department of Transportation (DDOT) provided the last three years of intersection accident data; from 2010 to 2012. This data set included all of the study intersections listed in Section 3.2.1. This data was reviewed and analyzed to determine the accident rate at each location. For intersections, the accident rate is measured in accidents per million-entering vehicles (MEV). The accident rates per intersection are shown in Table 23.

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

**Table 23: Intersection Crash Rates**

Intersection	Total Crashes	Pedestrian Crashes	Bike Crashes	Rate per MEV*
East Capitol Street & 55 <sup>th</sup> Street	13	1	0	0.52
East Capitol Street & 56 <sup>th</sup> Place	4	0	0	0.17
East Capitol Street & 57 <sup>th</sup> Place	4	0	1	0.16
East Capitol Street & 58 <sup>th</sup> Street	16	0	0	0.61
East Capitol Street & 61 <sup>st</sup> Street	3	0	0	0.13
East Capitol Street & Southern Avenue	49	1	0	<b>1.48</b>
Southern Avenue & Davey Street	5	0	0	0.41
58 <sup>th</sup> Street & Southern Avenue	9	0	0	<b>1.06</b>
Central Avenue & Southern Avenue	20	0	0	<b>1.14</b>
Nannie Helen Burroughs Avenue & 58 <sup>th</sup> Street	7	0	0	<b>1.28</b>
Dix Street & Eastern Avenue	6	1	0	0.51
Eastern Avenue & MLK Jr Highway	12	4	0	0.58
Blaine Street & 57 <sup>th</sup> Place	0	0	0	0.00
Blaine Street & 58 <sup>th</sup> Street	4	0	0	<b>1.28</b>

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

The crash summary data in Table 23 shows five 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 five intersections, the crash type information from the DDOT crash data was reviewed to see if there is a high percentage of certain crash types. Generally, the reasons for why an intersection has a high crash rate cannot be derived from crash data, as the exact details of each crash are not represented. However, some summaries of crash data can be used to develop general trends or eliminate some possible causes.

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

**Table 24: High Crash Rate Intersections by Crash Type**

Intersection	Rate per MEV	Right Angle	Left Turn	Right Turn	Rear End	Side Swiped	Head On	Parked	Fixed Object	Ran Off Road	Ped. Involved	Backing	Unspecified	Total
East Capitol Street & Southern Avenue	<b>1.48</b>	9	10	1	13	5	2	0	6	0	1	1	0	<b>49</b>
		18%	20%	2%	27%	10%	4%	0%	12%	0%	2%	2%	0%	
58 <sup>th</sup> Street & Southern Avenue	<b>1.06</b>	0	1	0	3	0	1	4	0	0	0	0	0	<b>9</b>
		0%	11%	0%	33%	0%	11%	44%	0%	0%	0%	0%	0%	
Central Avenue & Southern Avenue	<b>1.14</b>	8	0	1	3	8	0	0	0	0	0	0	0	<b>20</b>
		40%	0%	5%	15%	40%	0%	0%	0%	0%	0%	0%	0%	
Nannie Helen Burroughs Avenue & 58 <sup>th</sup> Street	<b>1.28</b>	3	0	0	1	1	0	0	1	0	0	1	0	<b>7</b>
		43%	0%	0%	14%	14%	0%	0%	14%	0%	0%	14%	0%	
Blaine Street & 58 <sup>th</sup> Street	<b>1.28</b>	0	0	0	0	1	1	0	2	0	0	0	0	<b>4</b>
		0%	0%	0%	0%	25%	25%	0%	50%	0%	0%	0%	0%	

### 3.4.2 Potential Impacts

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

- East Capitol Street & Southern Avenue

This intersection was found to have a moderately elevated crash rate with 1.48 crashes per MEV over the course of the three-year study period. The majority of the crashes at this intersection were rear-end crashes, turning vehicles, and right-angle crashes. Elevated rear-end collision rates are typical at intersections controlled by a traffic signal. Left turn crashes occur when vehicles make left turns without sufficient clearance time to execute the maneuver. Right-angle crashes are typically the result of one vehicle failing to yield the right-of-way or running a red light. However, this report does not recommend mitigation measures at this intersection as the proposed development is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- 58<sup>th</sup> Street & Southern Avenue

This intersection is just over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.06 crashes per MEV over the course of the three-year study period. The majority of the crashes at this intersection were crashes involved a parked vehicle or rear-end crashes. This report does not recommend mitigation measures at this intersection as the proposed development is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- Central Avenue & Southern Avenue

This intersection is just over the threshold of 1.0 crashes per MEV, with a rate of approximately 1.14 crashes per MEV over the course of the three-year study period. The majority of the crashes at this intersection were right-angle or sideswipe crashes. Right-angle crashes are typically the result of one vehicle failing to yield the right-of-

way or running a red light. 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 turn from a shared lane or can occur in areas where vehicles must merge when a lane is dropped from the roadway. This report does not recommend mitigation measures at this intersection as the proposed development is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- *Nannie Helen Burroughs Avenue & 58<sup>th</sup> Street*

This intersection was found to have a slightly elevated crash rate with 1.28 crashes per MEV over the course of the three-year study period. The majority of the crashes at this intersection were right-angle crashes. Right-angle crashes are typically the result of one vehicle failing to yield the right-of-way or running a red light. However, this report does not recommend mitigation measures at this intersection as the proposed development is not projected to make significant changes to the commuting patterns, operations, or geometry of this intersection.

- *Blaine Street & 58<sup>th</sup> Street*

This intersection was found to have a slightly elevated crash rate with 1.28 crashes per MEV over the course of the three-year study period. Very few crashes were reported at this intersection (four crashes over a three-year period). However, due to low traffic volumes, the crash rate is calculated to fall above the threshold. This report does not recommend mitigation measures at this intersection as the intersection will be reconstructed during construction of the proposed PUD.

### *3.4.3 Leading Pedestrian Intervals*

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

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

---

<sup>1</sup> <http://www.walkinginfo.org/engineering/crossings-signals.cfm>