TRANSPORTATION IMPACT STUDY

3RD & MASS

WASHINGTON, DC

February 28, 2013

GOROVE / SLADE
Transportation Planners and Engineers

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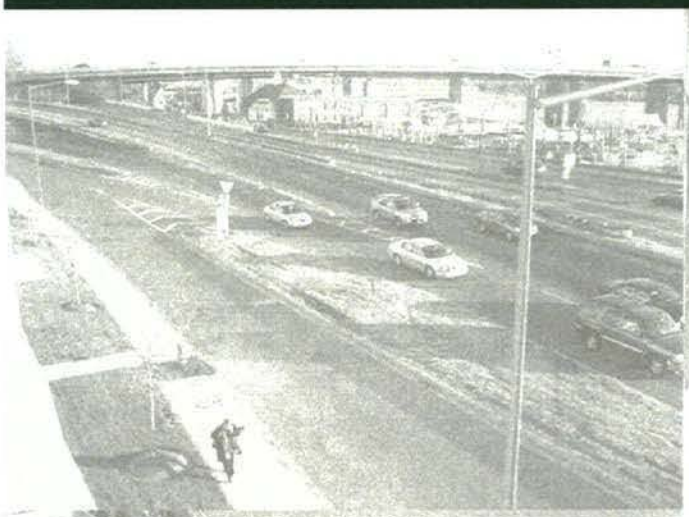

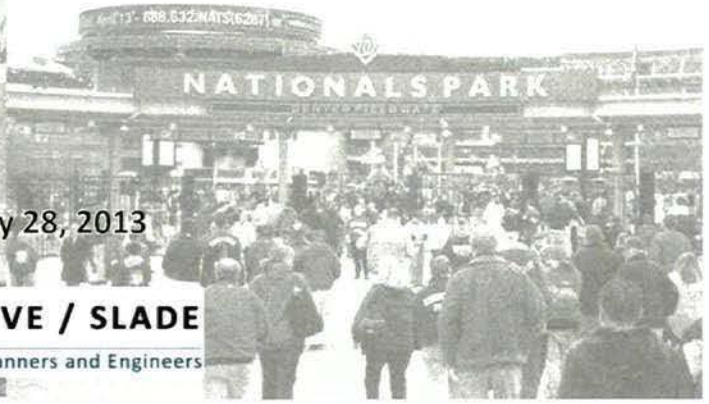

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EXECUTIVE SUMMARY

The following report is a TIS (Transportation Impact Study) for the Heritage Foundation's BZA (Board of Zoning Adjustment) application, also known as 3rd & Mass.

The Heritage Foundation is located at 214 Massachusetts Avenue between Union Station and Stanton Park. Heritage currently resides in 214 and 208 Massachusetts Avenue. The overall goal of the application is to improve on and expand the quality of Heritage's facilities and restore the surrounding neighborhood. The graphic below summarizes the plan elements and major changes.

Mode Split

Since there is an existing population of employees on the site today, a survey was used to help project future transportation needs. Mode split surveys showed that the existing population has a very low percentage of people that drive alone to work. Heritage employees have a Drive Alone mode split of 31.8% compared to the DC average of 42%. Transit is the highest mode used at 42.4%, very close to the DC average of 43%. The main difference between Heritage employees and the DC average is their bike/walk mode split, which is much higher than average.

Building(s)	Existing Use		Proposed Use
208 Mass Ave	Office (Heritage) & Residential (Heritage Interns)	⇨	Office (Heritage), with some improvements & modernization
214 Mass Ave	Office (Heritage)	⇨	Office (Heritage), with some improvements & modernization
236 Mass Ave	Office (not Heritage) & ground floor retail	⇨	Residential (Heritage interns), ground floor retail
3rd St Properties	Former church, vacant residential lot, 8 unit apartment building	⇨	6 townhomes, underground parking (parts of structure are under other properties)

Component	Existing Amount		Proposed Amount
Approx. Office SF	125,700	→	124,900
Approx. Retail SF	2,500	→	5,100
Residential Units	8 Apartments 34 Intern Units	→	6 Townhomes 28 Intern Units
Commuting Employees (excludes interns)	423	→	383
On-Site Parking	34 Spaces (plus 55 spaces in an annex lot across 3rd St)	→	105 Spaces

Project Summary

Applicant: The Heritage Foundation

Location: Several Properties located near the intersection of Massachusetts Ave and 3rd Street NE

Case Type: BZA, requesting: a variance from the FAR requirements, a variance from roof structure height provisions, a variance from the nonconforming structure dedicated to a conforming use provisions, a variance from the vehicle location and lot line requirements for an underground accessory parking facility, and a special exception for accessory parking.

Case Number: 18531

Site Access: Existing and proposed access is from 3rd St NE

Parking Provided: 105 spaces on-site (55 in annex lot across 3rd St)

Bicycle Parking: 60 spaces (50 long-term, 10 short-term)

Parking

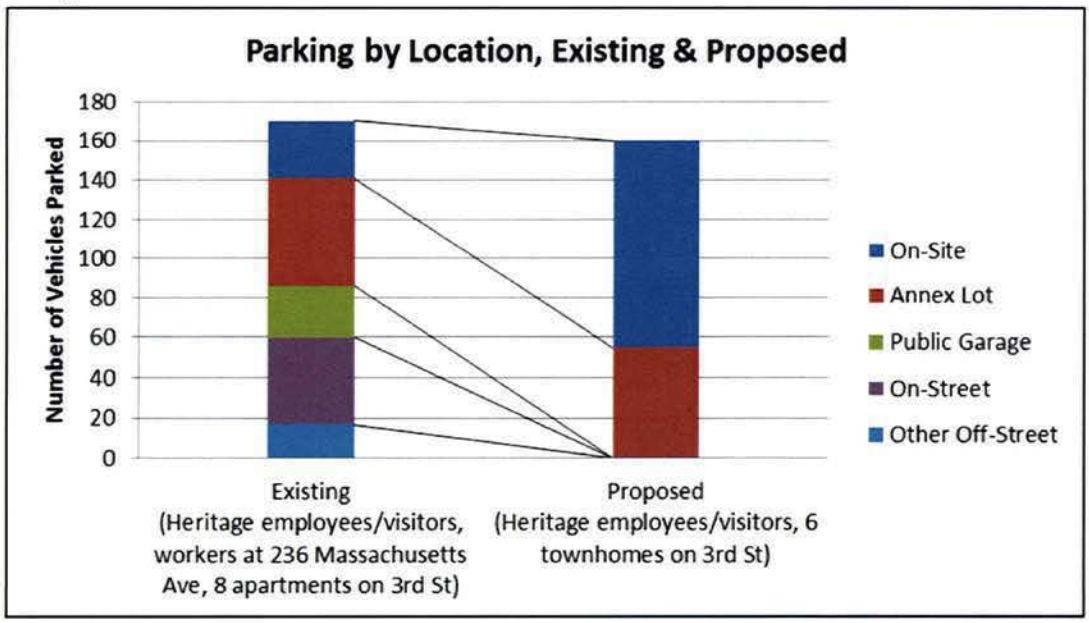
The survey was also used to determine where employees of Heritage and 236 Massachusetts Avenue (presently non-Heritage) park. The surveys show that most Heritage employees and all employees of 236 Massachusetts Avenue do not park on-site. In addition, survey information was used to estimate existing and proposed parking demand. The chart below combines the parking location and demand projections, and shows how the overall parking demand is expected to go down (due to fewer commuting employees overall), and how the proposed parking supply will accommodate all users on site and across 3rd Street in the annex lot (the calculated parking demand of 160 spaces matches the proposed supply of 160 spaces).

Although the total supply of 160 spaces may seem large, it is actually a relatively small amount of parking when compared to the currently proposed Heritage population of 473 employees (including interns). The proposed parking supply was chosen as a balance between providing quality transportation options for Heritage employees so they do not overspill onto neighborhood streets, while not encouraging driving as a mode.

Based on the data collected, approximately 39 on-street parking spaces are used by the existing uses on the project site during the day. These cars that now park on-street during the day will shift to parking in the new underground accessory parking facility.

This could be a benefit to the local Residential Parking Permit (RPP) program, as RPP parking within a quarter-mile walkshed of the site is very full with a utilization rate of 88% to 89% during the morning, afternoon, and evening (any occupancy rate approaching 90% is considered practically full). The main component of this potential removal of cars from on-street parking is the current population at 236 Massachusetts Avenue.

Overall, the implementation of more off-street parking spaces for the Heritage Foundation employees, and the removal of 236 Massachusetts employees benefits the surrounding on-street parking facilities. In an area where parking utilization for RPP spaces is extremely high, the community may benefit by seeing an increase of available on-street parking spaces.



Vehicular Capacity

Taken as a whole, the changes proposed in this application will result in an overall decrease in transportation demand generated. Although there is an expected regional decrease, local impacts could occur from the concentration of parking on 3rd Street that was previously spread out to different locations. The TIS contained an analysis using tailored and conservative assumptions to test whether a local impact would occur from this project. The results of the vehicular capacity analysis showed that although some additional trips would pass through intersections near the site driveway, these trips would be negligible compared to the existing traffic and therefore would not generate a negative impact. No mitigation measures are needed to alleviate impacts due to traffic generated by the project.

At the request of the applicant, GoroveSlade reviewed in further detail the intersections of Massachusetts Avenue, 3rd Street and D Street. This request was made due to concerns from Heritage staff and community members regarding frequent congestion and queuing at the intersection. The following TIS contains a section reviewing potential short and long term strategies for alleviating congestion at this intersection. All ideas would require more study to determine their impact to other adjacent intersections and the corridor as a whole. Thus, this TIS provides a discussion of these options in order to begin dialogue between DDOT and the community if they desire to explore such ideas further, but this TIS does not contain a formal recommendation on any short or long term improvements for these intersections.

Conclusions

Based on the following analyses, the TIS concluded that approval of this BZA application would not lead to detrimental impacts to the surrounding transportation network, for the following reasons:

- The existing population has a very low drive-alone mode split.
- The site is located in an area of the District well served by non-auto modes of travel, and there are no impediments for the project's residents, employees and visitors from using these modes and maintaining a low drive-alone mode split.
- The future parking demand, which for all properties contained in the application is expected to have a net decrease, is entirely accommodated on-site and in a Heritage controlled parking lot across 3rd Street.
- The relocation of traffic from existing parking locations spread out in the surrounding neighborhood to the underground accessory parking facility on 3rd Street does not generate a detrimental impact to nearby intersections.

In addition, the application has positive impacts to the surrounding transportation network as follows:

- Due to the reduction in overall employees that commute to the site, the regional transportation demand will decrease slightly.
- The accommodation of all parking on-site will reduce the site's demand on nearby on-street parking including RPP parking.
- The site plan calls for removing a semi-circular drive on Massachusetts Avenue including two curb cuts. This combined with the streetscape improvements in front of 236 Massachusetts Avenue and the 6 townhomes on 3rd Street will provide a significant benefit to the pedestrian experience walking along the site.

INTRODUCTION

This report is a TIS (Transportation Impact Study) for the Heritage Foundation's BZA (Board of Zoning Adjustment) application case number 18531, also known as 3rd & Mass. It includes a summary of the transportation components of the application, and reviews potential transportation impacts.

PROJECT SUMMARY

The Heritage Foundation is located at 214 Massachusetts Avenue between Union Station and Stanton Park, shown in Figure 1. Heritage uses currently reside in 214 and 208 Massachusetts Avenue. The overall goal of the application is to improve on and expand the quality of Heritage's facilities and restore the surrounding neighborhood. Heritage will accomplish this goal through several other properties they control nearby, including 236 Massachusetts Avenue, and several parcels on 3rd Street NE, around the corner. The end result contains improved existing facilities, the extension of Heritage use to 236 Massachusetts Avenue, the development of six townhouses on 3rd Street, an underground parking facility to serve all Heritage buildings, and an improved public realm. The plan is described in detail later in this report.

PURPOSE OF STUDY

This report's purpose is to review the project for potential negative impacts to transportation. A negative impact occurs when the project creates an unacceptable level of service to a component of the surrounding transportation network. This report determines if a negative impact occurs by comparing two project future scenarios, (1) without the proposed application being approved (referred to as *background conditions*), and (2) with the application approved and constructed (referred to as *total future conditions*).

Thus, the analyses contained in the TIS are tailored to reach this comparison. They are not designed to analyze general neighborhood congestion, existing concerns, or long-term construction impacts.

In addition to searching for impacts by comparing these two future scenarios, another component of the TIS is to review how the application minimizes potential impacts. In an urban setting like the District, it is important for new projects, regardless of whether they generate negative impacts, to minimize their impacts. This report addresses this by reviewing the application's site plans and TDM (Transportation Demand Management) measures and identifying ways that the project minimizes impacts.

CONTENTS OF STUDY

This report contains three sections as follows:

- Site Review – A summary of major transportation features near and adjacent to the project, provided for background information and as a reference for the following sections.
- Design Review – A section reviewing the transportation components of the project, including reviewing the site plan and TDM elements.
- Impacts Review – A section reviewing the potential impacts of the project, through a comparison of two future scenarios, one with the project and one without. For each mode of transportation, the negative impacts of the project are discussed and mitigation measures suggested. In addition, this TIS per a request of the applicant, contains a review of potential improvements to the intersection of Massachusetts Avenue with 3rd and D Streets, NE.

What is the BZA?

The Board of Zoning Adjustment (BZA) is an independent, quasi-judicial body. It is empowered to grant relief from the strict application of the Zoning Regulations (variances), approve certain uses of land (special exceptions), and hear appeals of actions taken by the Zoning Administrator at DCRA.

This application is seeking a number of variances and special exceptions. In summary, the above ground improvements and the new townhomes meet zoning requirements, but the proposed underground accessory parking facility does not. Details are included in other application documents.

TIS Scoping

In order to ensure that this TIS provides a sufficient review and conforms to DDOT (District Department of Transportation) guidelines, GoroveSlade and DDOT had a scoping meeting on January 25, 2013 and GoroveSlade submitted a scoping form. DDOT responded to the scoping form on February 20, 2013.

Figure 1: Site Location

SITE REVIEW

ROADWAYS & CAR SHARING

The Heritage Foundation is located at 214 Massachusetts Avenue between Union Station and Stanton Park. The site is served by many regional roadways and arterials including Interstate 395 (I-395), H Street NE, Independence Ave SE, North Capitol Street, Massachusetts Avenue NE, Constitution Avenue NE, Maryland Avenue NE, and K Street NE. The site is accessible via these roadways, along with a network of collector and local streets. Figure 2 shows the roadway network hierarchy and the average daily traffic volumes for the roadways in the vicinity of the proposed development.

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. Both Zipcar and Hertz on Demand have locations adjacent to the project site. Table 1 lists the car-sharing locations in the study area and the number of vehicles available with stations closest to the site listed first.

Table 1: Carsharing Locations & Vehicles

Carshare Location	Number of Vehicles
Zipcar	
Behind 202 F St NE	1 Vehicle
Behind 637 3rd St NE	1 vehicle
Behind 406 F St	1 Vehicle
Union Station Garage	6 Vehicles
Hertz on Demand	
Behind 637 3rd St NE	1 Vehicle
Union Station Garage	1 Vehicle
Total	**11 Vehicles**

Car-sharing is also proved by Car2Go, which is relatively new to the District and provides point-to-point car sharing. Unlike Zipcar, which requires two-way trips, Car2Go can be used for on-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. Car2Go does not have permanent designated spaces for their vehicles; however availability is tracked through their website, which provides an additional option for car-sharing patrons.

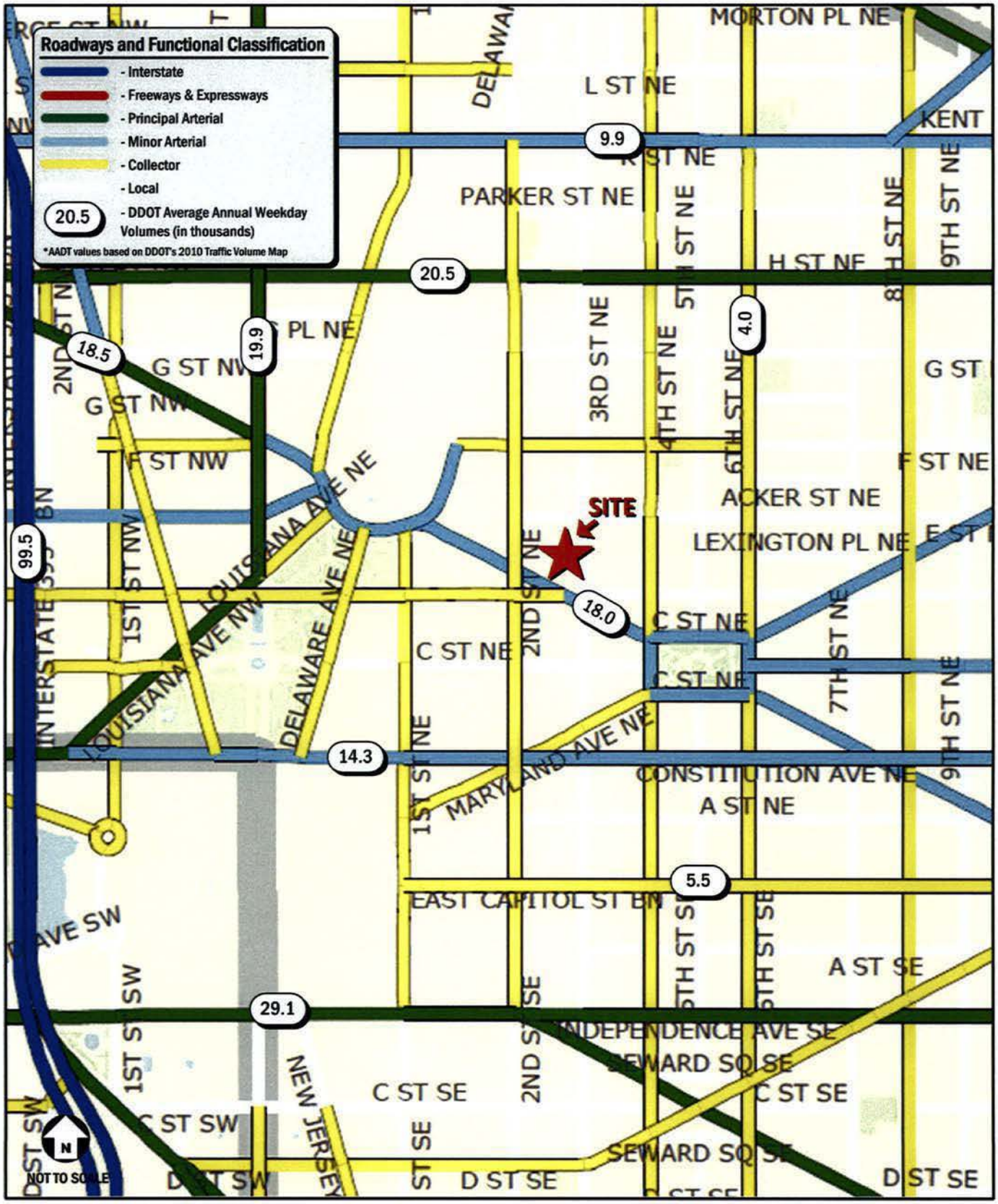


Figure 2: Roadway Classification and Average Daily Traffic

TRANSIT

The site is well served by transit including heavy rail, commuter rail, DC Circulator bus, and local bus service. Notably, Union Station, with a myriad of transit services and connections available, is a short walk from the site.

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.

Metrorail and Metrobus services connect the site with other District neighborhoods and the Washington-Metropolitan region. The site is primarily serviced by Metrobus and Circulator bus service along Massachusetts Avenue, which is within walking distance of the site. The routes serving this area connect the site to various locations throughout the District and the downtown business core. Table 2 shows a summary of the bus route information for the Lines that serve the site vicinity, including service hours, headway and walking distance to nearest bus stop.

The Union Station Metrorail station is less than half a mile from the development site and serves the Red Line. The Red Line travels south from Shady Grove, travels through downtown DC and continues north to Glenmont. Trains run frequently during the morning and afternoon peak hours. They run approximately every 5-6 minutes during weekday non-peak hours, every 10-15 minutes on weekday evenings after 7:00 pm and 6-15 minutes on the weekends.

A major initiative for the District of Columbia is the addition of the DC Streetcar. The streetcar will make traveling through the District of Columbia significantly easier for all persons including those who will be working for The Heritage Foundation and the people who will be living in the provided residency. Two routes are projected to travel within the vicinity of the site. These include the Georgetown to Benning Road Metrorail Station Line and the Congress Heights to Washington Circle Line. Both of these lines will travel along H Street NE which is approximately a 0.4 mile or 7 minute walk from the site.

Table 2: Bus Route Information

Route Number	Route Name	Service Hours[1]	Headway[1]	Walking Distance to Nearest Bus Stop
D6	Sibley Hospital – Stadium-Armory Line	Weekdays: 4:15 am – 2:30 am Saturday: 4:45 am – 3:15 am Sunday: 5:15 am – 1:15 am	30-40 min	< 0.1 miles, 1 minute
X8	Maryland Avenue Line	Weekdays: 6:00 am – 10:30 pm Weekends: 7:00 am – 10:00 pm	15-30 min	< 0.1 miles, 1 minute
DC Circulator	Union Station-Navy Yard	Winter Hours (October 1 – March 31) Weekdays: 6:00 am – 7:00 pm Summer Hours (April 1 – September 30) Weekdays: 6:00 am – 9:00 pm Saturdays: 7:00 am – 9:00 pm Extended service on Nationals game days	10 min	0.2 miles, 5 minutes

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

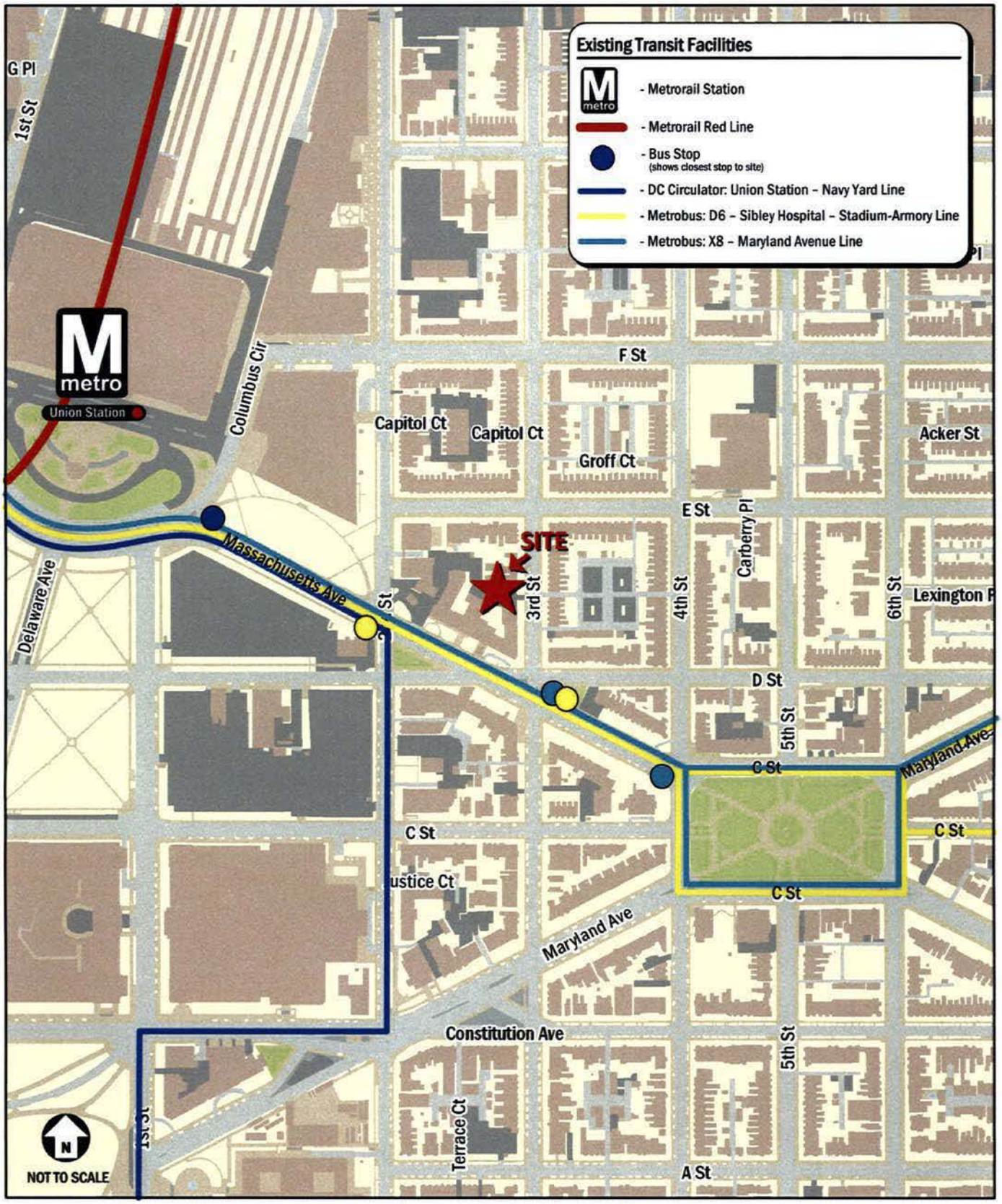


Figure 3: Transit Facilities

BICYCLE FACILITIES

Surrounding the site, bicycles have access to multi-use trails, on-street bike lanes, signed bike routes, and local and residential streets that facilitate cycling. The bicycle network provides good conditions for local trips and there are several routes for trips between the study area and other areas within the District.

Near the site, 4th Street and 6th Street NE provide southbound and northbound bike lanes, respectively. Additionally, the Metropolitan Branch Trail begins near Union Station and runs along the Metrorail Red Line, which adds a safe and convenient way to travel throughout the northeast quadrant of DC. D Street and C Street provide eastbound and westbound bike lanes, respectively to the east of the site. West of the site, east-west connectivity is best supplied via bike lanes on E Street NW and Pennsylvania Avenue NW, in addition to the National Mall Trails along Madison Drive and Jefferson Drive. Overall, bicycle facilities in the vicinity are very good. There are some roadways with poor conditions near the study area; however they are easily avoidable by use of bike lanes and trails in addition to other safer roadways. A map of the existing and proposed bicycle facilities near the site as well as routes to and from these facilities is shown in Figure 4.

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.

The Capital Bikeshare program, launched in late September 2010, has placed over 175 bicycle-share stations across Washington, DC and Arlington and Alexandria, VA with approximately 1,670 bicycles provided. There are two stations within a quarter-mile radius of the site located at Columbus Circle/Union Station and D Street/Maryland Avenue NE contributing to a total of 54 docking stations as summarized in Table 3.

Table 3: Bikeshare Stations

Bikeshare Location	Number of Docks
Columbus Circle	31 docks
D St/Maryland Ave	23 docks
Total	**54 Vehicles**

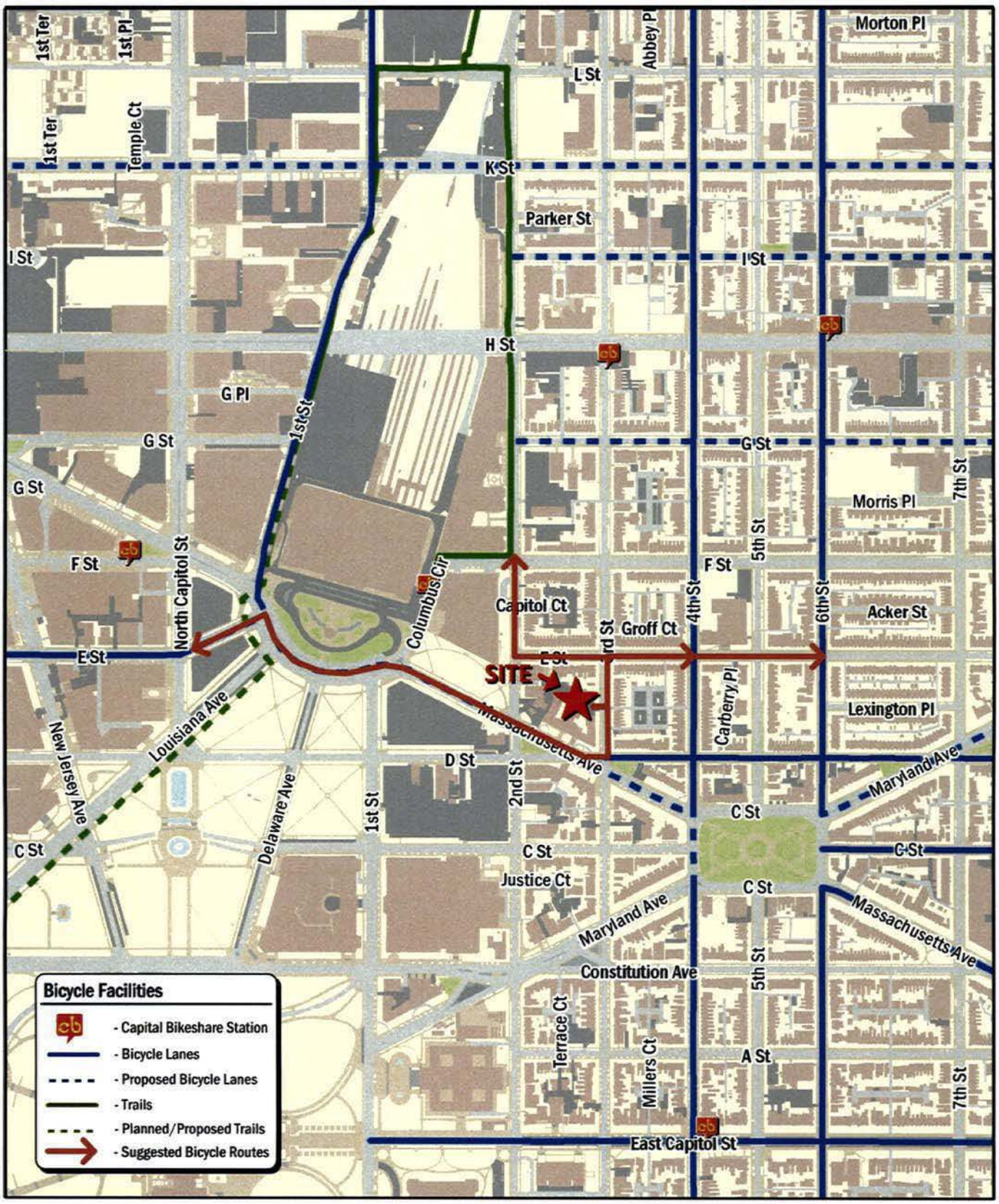


Figure 4: Bicycle Facilities

PEDESTRIAN FACILITIES

Pedestrian access to the site is provided along 3rd Street NE and the pedestrian facilities within the study area provide a good walking environment. Sidewalks, crosswalks, and curb ramps with detectable warnings are provided at most locations near the site and nearly all intersections within a quarter-mile walkshed of the site.

The site has good pedestrian access to nearby transit service. The bus stops located on Massachusetts Avenue serve routes that provide local and commuter service between the study area and destinations throughout the District. In addition, pedestrians can safely and conveniently access the Union Station Metro Station, which is located just a few blocks west of the site. Pedestrians also have safe and convenient access to popular pedestrian generators near the vicinity such as the Senate buildings, the Capitol Building, and Eastern Market. Figure 5 shows suggested pedestrian pathways to these locations along with the walking time and distance.

A detailed review of pedestrian facilities near the site shows that most facilities meet DDOT standards, and provide a quality walking environment. Figure 6 shows a detailed illustration of the existing pedestrian infrastructure within a quarter-mile walkshed 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 4. Within the quarter-mile walkshed most roads are considered residential with a high density due to the proximity to Union Station, the presence of multiple elementary and middle schools, and the frequency of commercial buildings that serve the neighborhood. The majority of sidewalks comply with an 8 foot sidewalk width and most have a 4 to 6 foot buffer. Even if no buffer exists between the edge of the sidewalk and the roadway, most roadways allow on-street parking which creates an additional buffer between pedestrians and vehicular traffic. 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 occasional issues regarding curb ramps. For the most part, these issues are due to a lack of detectable warning strips.

Table 4: 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: Pedestrian Routes

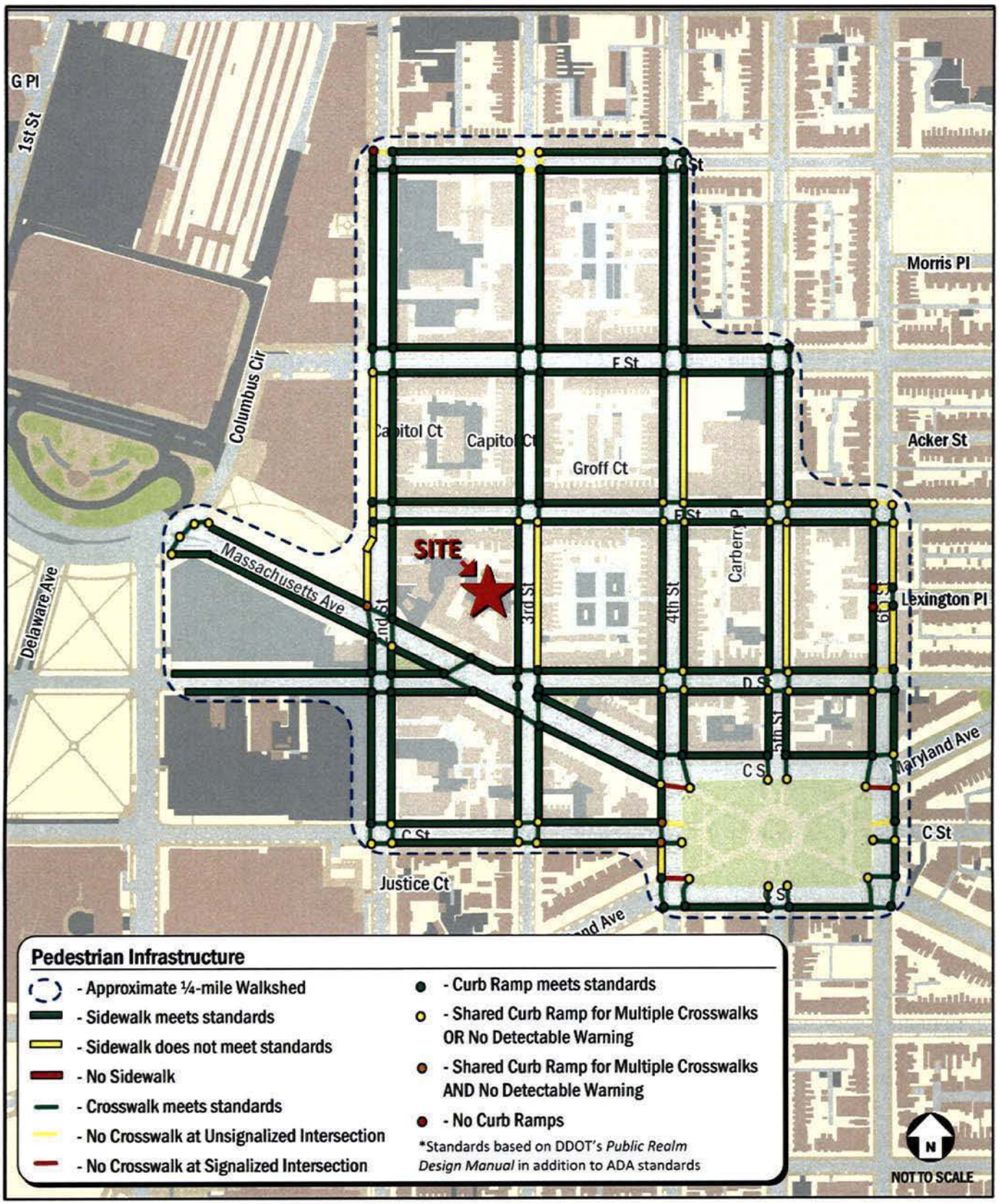


Figure 6: Existing Pedestrian Infrastructure

DESIGN REVIEW

The Heritage Foundation is located at 214 Massachusetts Avenue between Union Station and Stanton Park. Heritage uses currently reside in 214 and 208 Massachusetts Avenue. The overall goal of the application is to improve on and expand the quality of Heritage's facilities and restore the surrounding neighborhood. Heritage will accomplish this goal through several other properties they control nearby, including 236 Massachusetts Avenue, and several parcels on 3rd Street NE, around the corner. The end result contains improved existing facilities, the extension of Heritage use to 236 Massachusetts Avenue, the development of six townhouses on 3rd Street, and an underground accessory parking facility to serve all Heritage buildings and townhouses. Figure 7 shows a summary of the site plan, and Figure 8 contains a summary of the proposed changes. Table 5 contains a summary of the project.

Table 5: Summary of Program Changes

Component	Existing	Proposed
Office Space	125,700 SF (approx.)	124,900 SF (approx.)
Residential Units	8 apartments 34 intern apartments	6 townhomes 28 intern apartments
Retail Space	2,500 SF (approx.)	5,100 SF (approx.)
Total Commuting Employees*	323 Heritage 90-100 in 236 Mass.	383 Heritage

** Excludes interns*

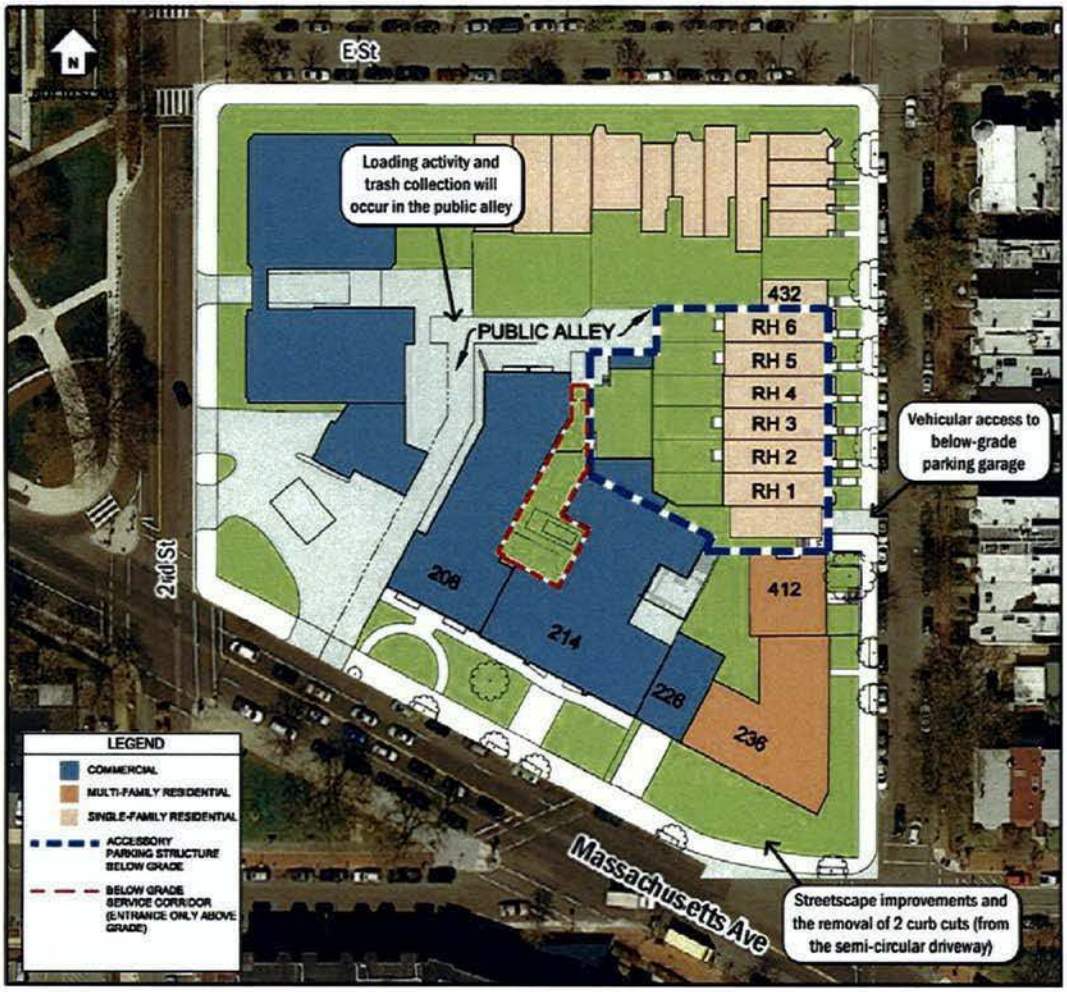


Figure 7: Summary of Site Plan

Note: The graphics in this TIS are included for diagrammatical purposes only, and are not intended to represent the latest design drawings for the project. The latest set of site plans submitted with the BZA application should be referred to when looking for design details and plans to scale.

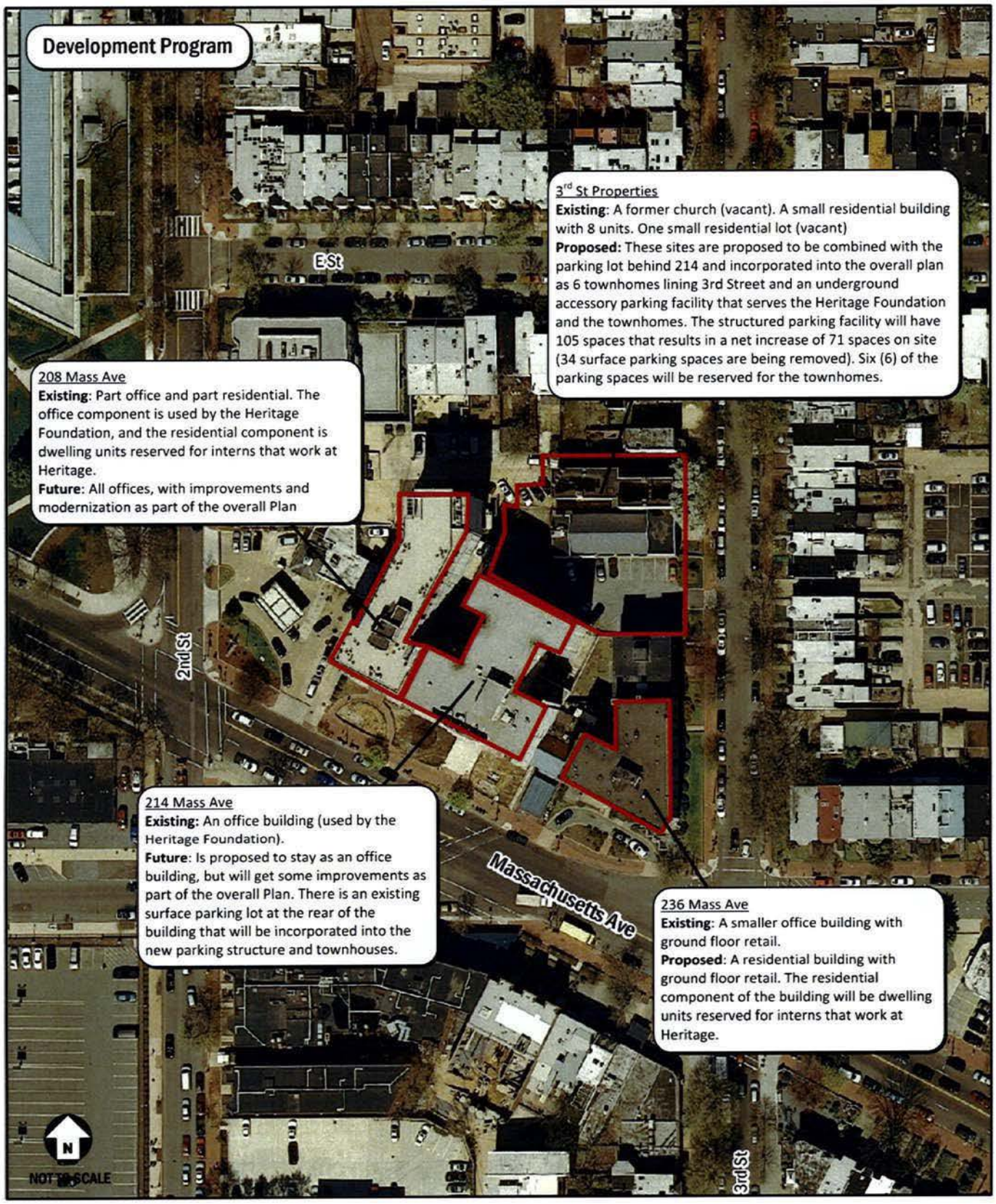


Figure 8: Summary of Proposed Changes

EXISTING TRAVEL PATTERNS

Since there is an existing population of employees on the site today, this TIS used a survey of the existing population to help project future transportation demand of the project. This section summarizes the survey results for mode splits and parking, a detailed list of questions and answers from the survey is contained in the Technical Appendix.

Two surveys were distributed, one to employees of the Heritage Foundation, and one to employees who work at 236 Massachusetts Avenue (presently non-Heritage office workers). The Heritage survey had a very high response rate, 208 responses for an employee population of 323, and thus the survey results have a high confidence interval. Twenty-six (26) responses were received from the approximately 100 employees from 236 Massachusetts Avenue, an adequate response rate.

Mode Split

The mode split surveys showed that the existing population has a very low percentage of people that drive alone to work. Figure 9 shows a comparison of the mode split surveys from Heritage and 236 Massachusetts Avenue to averages reported in the *2010 State of the Commute* report by the MWCOG (the Metropolitan Washington Council of Governments). The 'DC Metro' percentages represent the mode split of survey respondents throughout the Metropolitan area, the "DC Only" mode split represents just commuters that work in the District. Details on the mode split surveys follows on the next two pages.

Heritage employees have a low Drive Alone mode split, 31.8%, compared to the DC average of 42%. Transit is the highest mode at 42.4%, very close to the DC average of 43%. The main difference between Heritage employees and the DC average is their bike/walk mode split, which is much higher.

The survey of employees of 236 Massachusetts Avenue contained similar results, although with an even higher amount of responders stating they bike/walk to work.

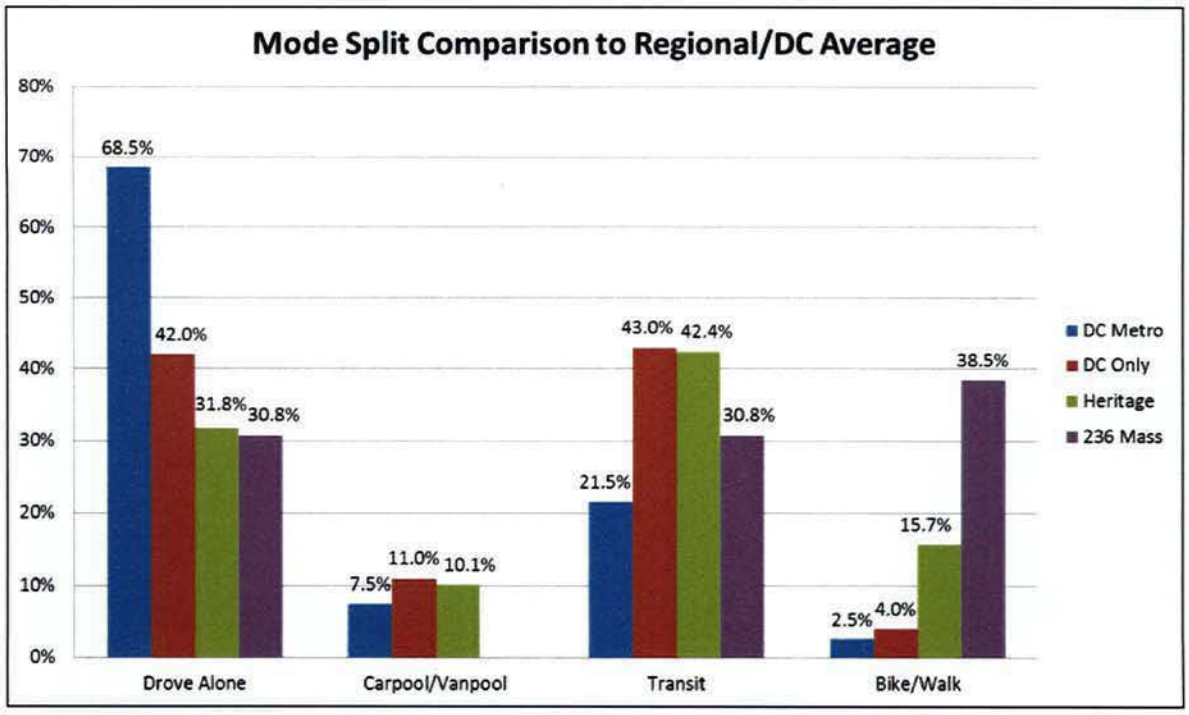


Figure 9: Mode Split Comparison

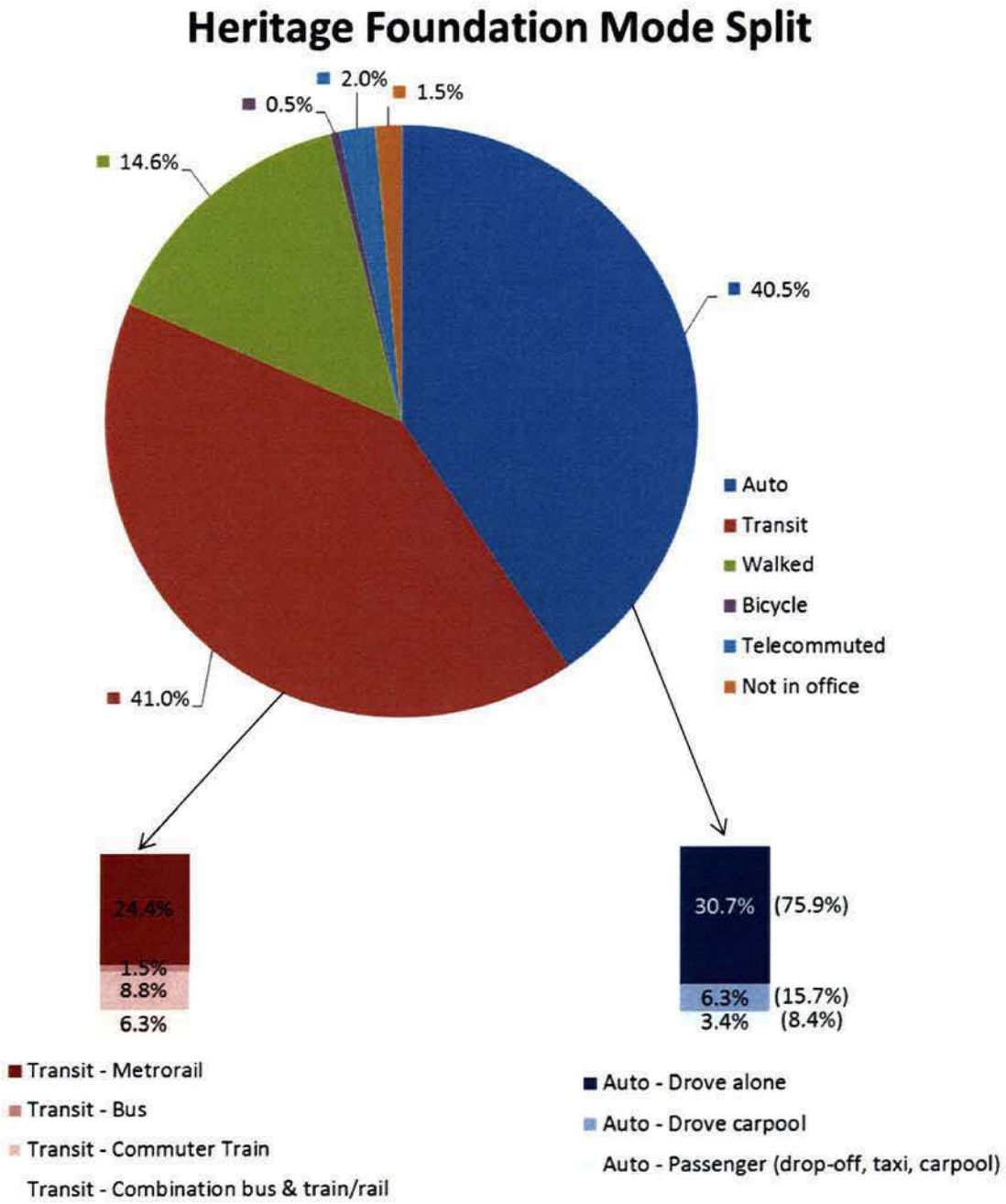


Figure 10: Existing Heritage Foundation Mode Split

Note: These are slightly different numbers than those presented in Figure 9 because they account for employees not in the office, and telecommuting

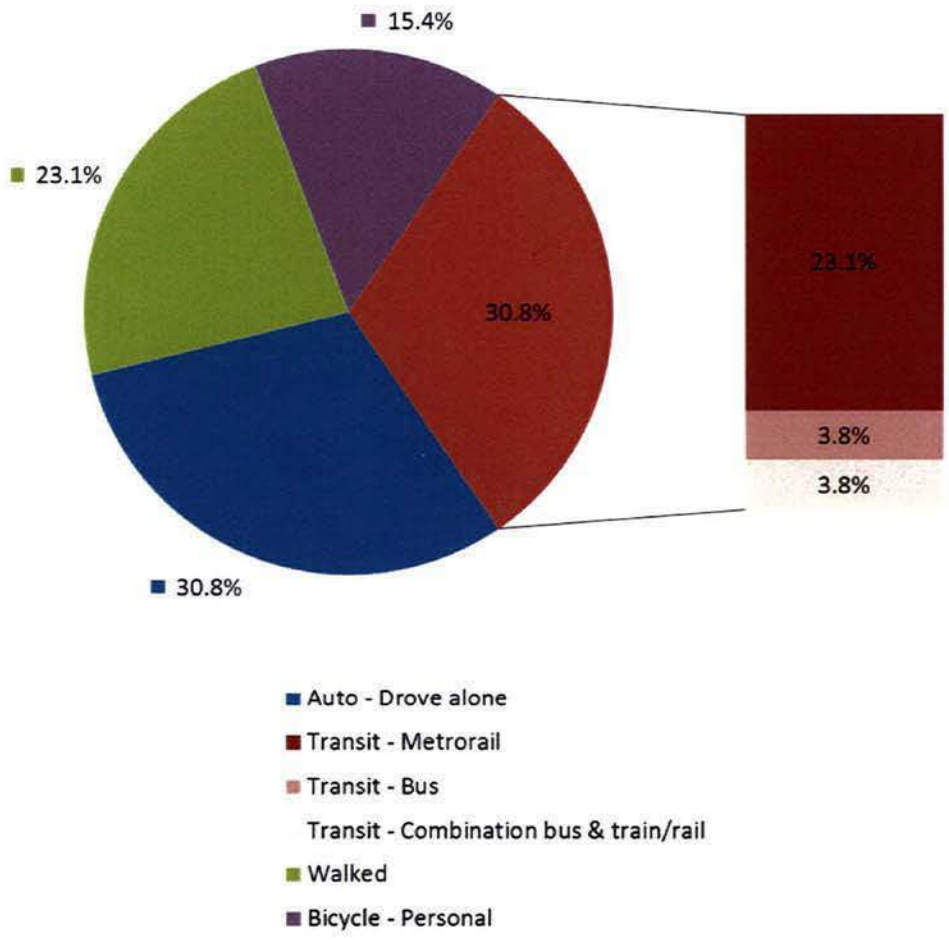


Figure 11: Existing 236 Massachusetts Ave Mode Split

Note: There is no auto-breakdown for 236 Mass Ave because all auto respondents drove alone.

Parking

The survey was also used to determine where employees of Heritage and 236 Massachusetts Avenue park.

The parking locations available for Heritage employees include:

- On-Site – Heritage has 34 parking spaces currently on-site.
- Annex Lot – this is a surface parking lot across 3rd Street from Heritage that provides 55 parking spaces.
- Public Garages – the closest public garages that offer daily/monthly commuter parking are approximately 6 blocks away, and several are located on the west side of Union Station
- On-Street – includes both RPP and metered spaces
- Private Parking Spaces Off-Street – arrangements made to park in other off street facilities

Currently, the majority of Heritage visitors (during office-hours) do not have a designated place to park. The residents of the apartment building on 3rd Street are accommodated through four off-site spaces and the on-street parking only.

Employees of 236 Massachusetts Avenue do not have a dedicated parking supply.

The surveys show that most Heritage employees and all employees of 236 Massachusetts Avenue do not park on-site.

The existing parking demand for the properties included in the BZA application is estimated as 170 spaces, as follows:

- Heritage – 120 spaces for employees (based on population of 323 commuting employees and 37% drive mode split), 10 spaces for visitors (an estimate)
- 236 Massachusetts – 31 spaces for employees (based on population of 100 employees and 31% drive mode split)
- 3rd Street Apartments – 9 spaces (based on the 2011 ACS 5-Year estimate of 1.07 cars per household in census tract 3.01)

Based on the survey results, approximately 24 employees park on street, 6 from Heritage, and 18 from 236 Massachusetts Avenue. In addition, Heritage visitors (10 spaces) and the existing apartment (5 spaces) generate 15 spaces on-street parking demand. Thus, a total of 39 on-street parking spaces are used by the existing uses on the project site.

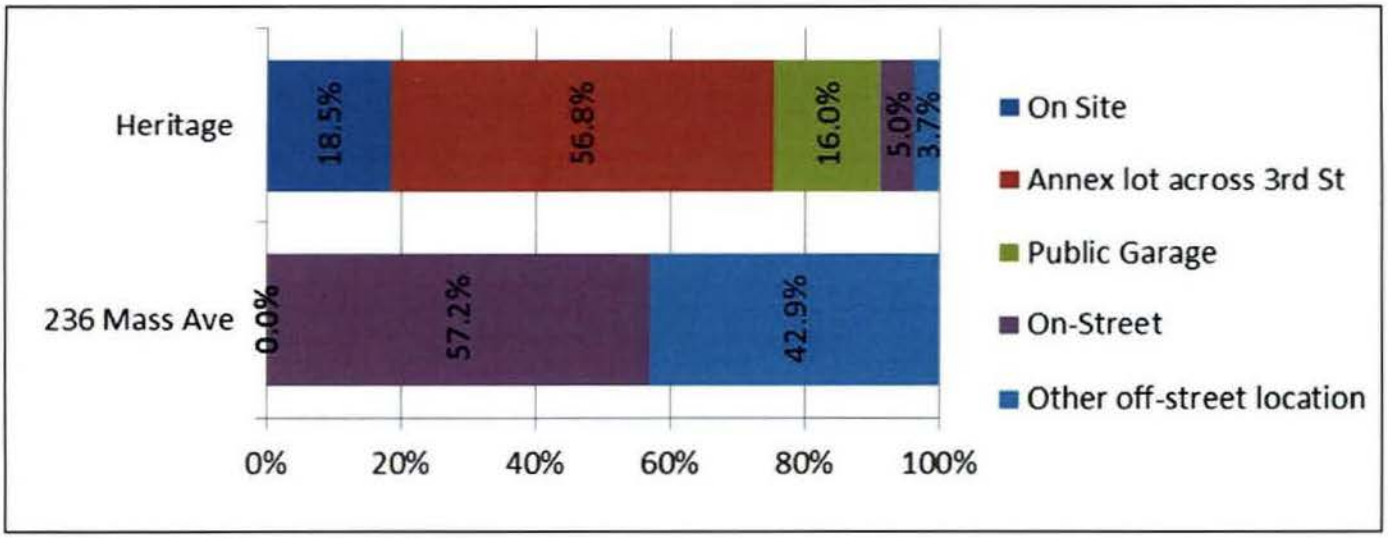


Figure 12: Parking Location for Existing Employees

PROPOSED PARKING

The parking demand after the project is complete is 160 spaces, as follows:

- Heritage – 142 spaces for employees (based on population of 383 commuting employees and 37% drive mode split), 10 spaces for visitors (an estimate)
- 3rd Street Townhomes – 8 spaces (based on the 2011 ACS 5-Year estimate of 1.31 cars per household in census tract 3.01, for households greater than one person).

The proposed parking supply includes the new underground accessory parking facility, with 105 spaces, and the annex lot across 3rd street, with 55 spaces, for a total of 160 spaces. The amount of parking proposed in the application matches the estimated demand.

Although the total supply of 160 spaces may seem large, it is actually a relatively small amount of parking when compared to the currently proposed Heritage population of 473 employees (including interns). The proposed parking supply was chosen as a balance between providing quality transportation options for Heritage employees so they do not overspill onto neighborhood streets, while not encouraging driving as a mode.

Additionally, DC zoning requirements specify that office space of approximately 124,900 SF, retail space of 5,100 SF, and 34 residential units with a zoning of C-2-A, would have a zoning requirements of 229 parking spaces. Parking under what would be the zoning minimum highlights how Heritage is not proposing an excess of parking to serve its buildings.

VEHICULAR ACCESS

All access to the underground parking accessory facility will be located from one driveway with full access on 3rd Street NE. This access will replace the current access on 3rd Street NE, shifting it slightly to the south to better facilitate the proposed site plan. Under existing conditions this curb cut was used to access a surface parking lot, but in the proposed plan it will be used to access the below-grade parking facility.

Additionally, two curb cuts along Massachusetts Avenue, which currently serve a circular driveway, are being removed. By reducing the number of curb cuts serving the property from three to one, the project's design allows for minimal impacts to public space and improves pedestrian facilities.

Loading and service access for the site occurs from a public alley adjacent to 208 Massachusetts Avenue. Currently, 214 Massachusetts Avenue loads from the street or the existing surface parking lot, but as part of the renovation the building will now be able to accommodate more loading activity through the alley. Per the zoning regulations, no loading facilities are proposed for the six dwelling units although all trash will be collected within the parking facility and loaded out through the alley.

The proposed application is not expected to significantly change the amount, type, or frequency of existing loading activity. The amount of trash trucks serving the site is expected to decrease, as the two different trash trucks that serve 208 and 214 Massachusetts Avenue will be replaced with a single truck picking up trash for both buildings during the same trip.

The public alley is constrained, limiting movement for larger vehicles. The width of the alley is approximately 10 feet, and no additional space is provided where the alley bends to help provide room for vehicles to turn. In addition, all commercial buildings on the block use the alley for trash, one property uses it as access to underground parking, and many properties (including residential buildings) use it as access to surface parking. Figure 13 below, shows the current conditions and constraints within the public alley.

Smaller delivery vehicles, such as passenger cars and vans, enter the alley and have sufficient room to maneuver to their destination without the need for backing maneuvers to or from Massachusetts Avenue. Larger vehicles, such as trash trucks or 30' delivery vehicles currently back-in from Massachusetts Avenue down the alley and drive out to depart. The trash trucks that serve 208 Massachusetts Avenue (and will serve 214 Massachusetts Avenue in the future) are rear-loading.

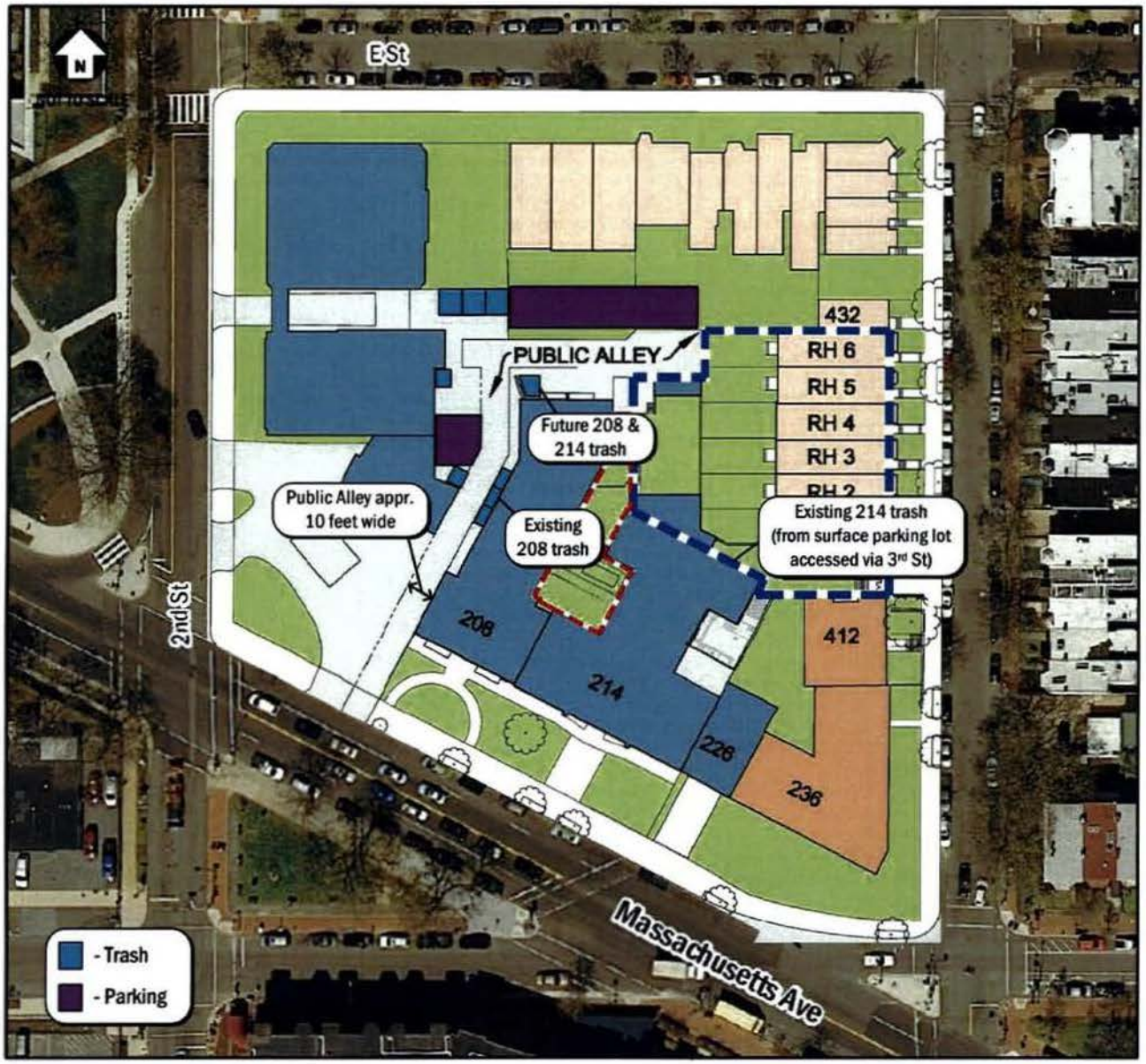


Figure 13: Conditions of Existing Public Alley

PEDESTRIAN FACILITIES

The project contains high quality streetscape plans that will improve pedestrian conditions adjacent to the site. All sidewalks are designed to meet DDOT's standards and minimums.

The landscape plan includes two significant improvements to public space adjacent to the Heritage Foundation:

1. The removal of the curb cuts in front of 236 Massachusetts Avenue will remove car/vehicular conflicts at these locations and provide additional space for pedestrians. In addition, the landscaping for this space at the corner of Massachusetts and 3rd Streets will be much improved over the existing conditions.
2. The section of 3rd Street NE adjacent to the proposed new townhomes will have a significantly improved street frontage. Six new townhomes of the same character of the surrounding homes will replace a vacant church and surface parking lot fronting the street.

BICYCLE FACILITIES

Heritage currently has approximately 10 secured and covered bicycle parking spaces located under 208 Massachusetts Avenue. Showers and lockers are also available to employees.

The proposed project's requirement for bicycle parking (zoning plus District law) is 5% of the commercial requirement plus 1 space for every three dwelling units. This equates to 11 spaces for commercial tenants and 12 for residents. The proposed project will exceed these minimums.

As part of Heritage's desire to provide quality options for their employees, they have included significantly more bicycle parking than required, a total of 60 parking spaces. The proposed plans include 5 inverted 'U' racks on the streetscape adjacent to the project to serve as short-term bike parking. Heritage will also include 40 long-term bicycle parking spaces within the underground accessory parking facility serving as long-term parking (for commuters and residents), providing a total of 50 long-term spaces on site.

TDM

TDM (Transportation Demand Management) is the application of policies and strategies used to reduce travel demand or to redistribute demand to other times of day when there is capacity. 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

Existing TDM Programs

The Heritage Foundation currently employs a TDM program that includes the following elements:

- The Heritage Foundation charges employees $90 per month to park in the parking lot on-site or the annex lot across 3rd Street.
- Heritage is enrolled in the SmartBenefits program which allows employers to assign the dollar value of employees' monthly commuting benefit directly the employees' SmarTrip cards.
- There are approximately 10 secured and covered bicycle parking spaces located under 208 Massachusetts Avenue. Showers and lockers are also available to employees.

Proposed TDM Programs

The Heritage Foundation's existing mode splits, presented earlier, show that many of its employees are already taking advantage of the excellent non-auto commuting options nearby and the existing TDM programs. Thus, the proposed TDM plan does not contain any significant changes, as follows:

- Heritage will continue to charge for parking on-site, within the new underground accessory parking facility and in the annex loss across 3rd Street.
- Heritage will maintain the SmartBenefits program
- Heritage will expand bicycle parking via the addition of 40 spaces in the new underground accessory parking facility designed to accommodate additional commuters, and 10 spaces in the landscape adjacent to buildings to serve as short-term parking.

IMPACTS REVIEW

This section of the TIS includes a review of potential impacts of the application to the surrounding transportation network. It includes:

- A summary of the project's **multi-modal trip generation**. This information is used as an input to the remaining analyses, and provides a general level of potential impacts just through summarizing the amount of trips on each mode the project will generate.
- A summary of a **vehicular capacity analysis** designed to determine if the project creates a negative impact on the roadway network. A negative impact occurs when the project creates an unacceptable level of service to a component of the surrounding transportation network. This report determines impacts by comparing two project future scenarios, (1) without the proposed application being approved (referred to as background conditions), and (2) with the application approved and constructed (referred to as total future conditions).
- A review of impacts to **on-street parking** near the project, including a summary of an inventory and occupancy count of on-street parking spaces, and a review of impacts based on the survey data presented earlier.
- A review of **crash rates**, using data provided by the District and the turning movement counts collected to determine a crash rate for each study intersection.

MULTI-MODAL TRIP GENERATION

The first step in a review of project impacts is to determine how the project will affect transportation demand. This calculation is referred to as the project's trip generation. It is calculated for the main hours of analysis of the TIS, which in this case is the weekday AM and PM peak hours of commuting traffic.

This project will impact transportation demand in several ways:

- The overall commuting-employee population of the properties in the application will decrease, leading to slightly fewer trips (on all modes) in the peak hours of commuting travel.
- The vehicular trips of Heritage employees will have different origins and destinations, as those who park off-site and in on-street spaces will now be accommodated in the underground accessory parking facility.
- Drivers that formerly parked on-street and now park in the new underground accessory parking facility will not be circling blocks looking for parking, which reduces traffic slightly.
- The slight change in residential units will have a negligible impact.
- The slight change in retail space will have a negligible impact.

The following table shows how, based on the employee population counts and the mode split surveys, the overall number of commuters will decrease for each mode of travel.

Table 6: Net Change in Commuters to Site

Mode	Population	Existing - Heritage	Existing - 236 Mass	Existing - Total	Proposed - Heritage	Net Difference
	No. of Employees	*323*	*100*	*423*	*383*	*-40*
Vehicle	Mode Split	41.9%	30.8%	39.2%	41.9%	---
	Vehicle Commuters	135	31	166	160	-6
	Persons/Vehicle	1.17	1.00	1.14	1.17	---
	Commuting Vehicles	115	31	146	137	-9
Transit	Mode Split	42.4%	30.8%	39.7%	42.4%	---
	Transit Commuters	137	31	168	162	-6
Walking	Mode Split	15.2%	23.1%	17.0%	15.2%	---
	Walking Commuters	49	23	72	58	-14
Bike	Mode Split	0.5%	15.4%	4.0%	0.5%	---
	Biking Commuters	2	15	17	2	-15

Note: This is not a peak hour trip calculation showing ins and outs, but rather a calculation of the total number of commuting employees based on buildings contained in the BZA application today and as proposed. Vehicle mode split includes drive alone, drive carpool, and passenger. Vehicle occupancies based on survey results assuming all carpools are two-person.

Thus, taken as a whole, these changes will result in an overall decrease in transportation demand generated by the properties included in the BZA application. However, the analysis contained in this TIS are designed to determine if any impact occurs, and since some traffic will be concentrated to 3rd Street that would otherwise be dispersed in a several block radius, there may be some local impacts on 3rd Street, even though the global trip generation may decrease.

The trip generation calculations take a conservative approach. They do not subtract trips that may occur from the project, and use a conservatively high estimate of potential new trips to the underground accessory parking facility. Thus, trips for the new project were projected as follows:

- New vehicular trips to the site were based on the net new parking spaces. To be conservative, 70 spaces were assumed to be reserved for Heritage employees, and 6 spaces for the townhomes (this accounts for commuter-based trips generated by the visitor parking in the accessory facility). *(It should be noted that the analyses were completed when the net new parking number was not finalized, which is why the analysis assumes a net increase of 76 spaces instead of the current amount of 71.)*
- No vehicular trips were subtracted from the network due to the relocation of trips from Heritage employees parking in other locations or from the removal of trips from employees at 236 Massachusetts Avenue.
- Non-auto trips were based on the 60 net new commuting Heritage employees.
- No non-auto trips were subtracted based on the removal of the employees working in 236 Massachusetts Avenue.

By taking this conservative approach, the analysis contained in the TIS will be able to highlight any negative impact from the new underground accessory parking facility. However, the results should be taken in the context that regionally, vehicular trip generation is likely to decrease due to this project.

The following lists and tables review the methodology and calculations used to determine the project's trip generation.

Residential/Retail Component:

- Base trips were generated using Institute of Transportation Engineers' (ITE) *Trip Generation*, 9th Ed. The Residential trips were based on Land Use (LU) 230 for Residential Condo/Townhomes. The morning and afternoon peak hour trips were generated using the average rate provided based on average vehicle trip ends per dwelling unit. According to the Trip Generation Handbook, the weighted average rate should be used to estimate trip rates for land uses with low value independent variables. This is due to the y-intercept of the regression equation, which can yield an illogical trip generation. For residential uses, the morning and afternoon peak hours correspond to the peak hours of the adjacent roadway network – one hour between 7:00 and 9:00 AM and between 4:00 and 6:00 PM, respectively – instead of the peak hours of the Generator due to the peak hours analyzed in this study. The resulting base trips are shown in Table 7.
- Trips were converted from vehicular-trips to person trips using data from *National Household Travel Survey*(1.1 persons per residential vehicle, 1.8 persons per retail vehicle)
- Then, the person-trips were converted to multi-modal trips using mode split derived from WMATA's *2005 Development-Related Ridership Survey Report* (average of all study areas). The results of this calculation are shown in Table 8.
  - Vehicular: 40%
  - Transit: 45%
  - Walk: 10%

    Bike: 5%
- Vehicular-person trips were converted back to vehicle trips using the same occupancy rates as before.

Heritage (office) Component:

- Vehicular trips were based on the net increase of 70 Heritage-parking spaces on-site, and survey data indicating 52% of employees arrive to work in the AM peak hour, and 50% depart in the PM peak hour. It was assumed that all trips would be unidirectional commuting trips (no outbound in AM, no inbound in PM).
- Non-auto trips were based on net new Heritage commuting-employees (60) and the mode split surveys of the existing Heritage population.
- The results of these calculations are shown in Table 9.

Finally, the two components were added to each other to ultimately reach the project's trip generation, as shown in Table 10.

Table 7: Base Trip Gen (Residential/Retail)

Land Use	ITE Land Use Code		Quantity		AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Residential	230	Condo/Townhome (rate)	6	DUs	1	2	3	2	1	3
Retail	820	Shopping Center (rate)	3,921*	SF	2	2	4	7	8	15
Base Vehicular Trips (Retail/Residential)					**3**	**4**	**7**	**9**	**9**	**18**

** The net increase in retail was calculated using a prior design than the current one, which has a smaller net increase of 2,600 SF*

Table 8: Multi-Modal Trip Gen (Residential/Retail)

Trip Generation by Land Use & Mode		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Residential							
Transit Person-Trips	45%	1	1	2	1	1	2
Walking Person-Trips	10%	0	0	0	0	0	0
Bicycling Person-Trips	5%	0	0	0	0	0	0
Vehicular Person-Trips	40%	0	1	1	1	0	1
Vehicle-Trips		***0***	***1***	***1***	***1***	***0***	***1***
Retail							
Transit Person-Trips	45%	2	2	4	6	6	12
Walking Person-Trips	10%	0	0	0	1	1	2
Bicycling Person-Trips	5%	0	0	0	1	1	2
Vehicular Person-Trips	40%	1	1	3	5	6	11
Vehicle-Trips		***1***	***1***	***2***	***3***	***3***	***6***
Total Trips							
Transit Person-Trips		3	3	6	7	7	14
Walking Person-Trips		0	0	0	1	1	2
Bicycling Person-Trips		0	0	0	1	1	2
Vehicular Person-Trips		1	2	4	6	6	12
Total Vehicle-Trips		***1***	***2***	***3***	***4***	***3***	***7***

Table 9: Multi-Modal Trip Gen (Heritage)

Heritage Trips by Mode		AM Peak Hour			PM Peak Hour		
		In	Out	Total	Out	In	Total
Transit Person-Trips	42.4%	25	0	25	0	25	25
Walking Person-Trips	15.2%	9	0	9	0	9	9
Bicycling Person-Trips	0.5%	0	0	0	0	0	0
Vehicle-Trips		***36***	***0***	***36***	***0***	***35***	***35***

Table 10: Summary of Project Trip Gen

Trip Generation by Mode	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Transit Person-Trips	28	3	31	7	32	39
Walking Person-Trips	9	0	9	1	10	11
Bicycling Person-Trips	0	0	0	1	1	2
Vehicle Trips	37	2	39	4	38	42

VEHICULAR CAPACITY ANALYSIS

The vehicular capacity analysis is the main component of this TIS used to determine if the project generates a negative impact. A negative impact occurs when the project creates an unacceptable level of service to a component of the surrounding transportation network. This report determines if a negative impact occurs by comparing two project future scenarios, (1) without the proposed application being approved (referred to as background conditions), and (2) with the application approved and constructed (referred to as total future conditions).

Study Area

The study area is a set of intersections selected because they represent locations where impacts from the project are most likely to occur. They include intersections where a significant percentage of future traffic will be attributable to the project, intersections where the project will generate a large amount of turning traffic, and intersections close to the project's parking access. They do not necessarily include all congested intersections near the project.

For this TIS, since the potential impacts of the project are extremely local in nature, the following intersections were selected, as they represent the closest intersections to the proposed underground accessory parking facility driveway:

1. 3rd Street & E Street NE
2. 3rd Street & D Street NE
3. 3rd Street & Massachusetts Avenue NE
4. Massachusetts Avenue & D Street NE

In addition to a set of study intersections, a TIS also selects multiple scenarios to evaluate. Typically, the differences between the scenarios are minor, so as to determine the incremental impact of each variable added from scenario to scenario.

For this TIS, the study scenarios are as follows:

- **2012 Existing Conditions** – this scenario represents the existing conditions at the time the vehicular data was collected in late 2012. It is used as a basis for the future scenarios.
- **2016 Background Conditions** - this scenario adds to the existing scenario (1) traffic generated by any approved project that has an origin or destination within the study area intersections and is planned to be complete by 2016, and (2) a background growth percentage to account for other development outside of the study area passing through. It also adjusts the roadway geometry and operations to account for any funded improvements in the study area intersections.
- **2016 Total Future Conditions** – this scenario adds to the background scenario the vehicular trip generation attributable to the project, as shown in the prior section.

The following Table 11 summarizes the assumptions and inputs in the vehicular capacity analyses. A detailed description is provided after the summary. Following the summary are a series of figures that graphically show the roadway geometry assumptions, volumes, and project trip distribution assumptions.

Table 11: Summary of Analysis Assumptions

2012 Existing Conditions

- Volumes
  - Existing Turning Movement Counts
    - Conducted: Wednesday, December 12, 2013, US Congress in session
    - Counts taken from 6:30 – 9:30 AM and 4:00 – 7:00 PM
    - System Peak: 8:15 – 9:15 AM, 5:15 – 6:15 PM
    - Count sheets in Technical Appendix
- Geometry/Operations
  - Geometries and lane configurations based on existing conditions
  - Signal timings/phasings/offsets provided by DDOT

2016 Future Conditions without Development (2016 Background)

- Volumes: 2012 Existing Conditions, **PLUS**
  - Background Developments
    - None, there are no developments that (1) are approved and (2) planned to be constructed by 2016 and (3) have an origin or destination within the study area
  - Background Growth
    - 1% per year, compounded annually,
    - Applied to through traffic on Massachusetts Avenue
- Geometry/Operations
  - Same as existing conditions

2016 Future Conditions with Development (2016 Total Future)

- Volumes: 2016 Background Conditions, **PLUS**
  - Site trips, as described earlier in trip generation section of report
  - Trips distributed based on survey results in which employees were asked to specify the zip code in which they travel to and from on a typical work day. From this an overall direction of approach was determined based on the most likely route from each zip code. This analysis used just the zip code responses from employees that commuted by vehicle.
- Geometry/Operations
  - Same as existing conditions

Volume Assumptions

The basis of the existing conditions analysis is a set of turning movement counts at the study area intersections. DDOT and National standards require that traffic be counted on a weekday, not including Monday or Friday, when traffic conditions can be described as typical. This includes 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 often reviewed if the study area includes other uses that may be relatively inactive during the typical weekday.

Traffic counts conducted on typical days are used to determine the morning and afternoon peak hour of traffic within the study area. The peak hour represents the worst-case scenario, when the system traffic volumes are the highest. The use of a typical weekday morning and afternoon peak hours are used to ensure that conclusions regarding adverse impacts and their respective mitigation measures would apply to the vast majority of time roadways are used in the study area.

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, GoroveSlade usually collects data for a three-hour (or longer) period to ensure that the peak hour is contained within.

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

Following these guidelines, traffic counts, including vehicular and pedestrian volumes, were conducted by GoroveSlade between the hours of 6:30 and 9:30 AM and 4:00 and 7:00 PM on December 12, 2012. The results of the traffic counts are included in the Technical Appendix. The morning and afternoon peak hours for the system of intersections being studied occurred between 8:15 and 9:15 AM and 5:15 – 6:15 PM, respectively. These volumes are given in Figure 14.

The 2016 Background scenario adds to the existing scenario (1) traffic generated by any approved project that has an origin or destination within the study area intersections and is planned to be complete by 2016, and (2) a background growth percentage to account for other development outside of the study area passing through.

This analysis does not include any background developments as there are no developments that (1) are approved and (2) planned to be constructed by 2016 and (3) have an origin or destination within the study area. It does include a 1% background growth rate, compounded annually to the year 2016, and applied on Massachusetts Avenue though traffic. The 2016 Background volumes are given if Figure 15.

The 2016 Total Future scenario adds to the background scenario the vehicular trip generation attributable to the project, as shown in the prior section. These trips were distributed based on survey results in which employees were asked to specify the zip code in which they travel to and from on a typical work day. From this, an overall direction of approach was determined based on the most likely route from each zip code. This analysis used just the zip code responses from employees that commuted by vehicle. The direction of approach used to assign site trips is shown in Figure 16, with the site trips given in Figure 17 and resulting 2016 Total Future volumes given if Figure 18.

Roadway Geometry and Operations

GoroveSlade conducted field reconnaissance to confirm the existing lane configurations and traffic controls at the intersections within the study area. Existing signal timings and offsets were obtained from DDOT and confirmed during field reconnaissance.

The lane configurations for the 2016 future conditions without the proposed development are based on the existing lane configurations. No roadway infrastructure changes were assumed for the future conditions without development for 2016.

The lane configurations for the 2016 future conditions with the proposed development are based on the lane configurations for the 2016 conditions without the proposed development as shown in Figure 19.

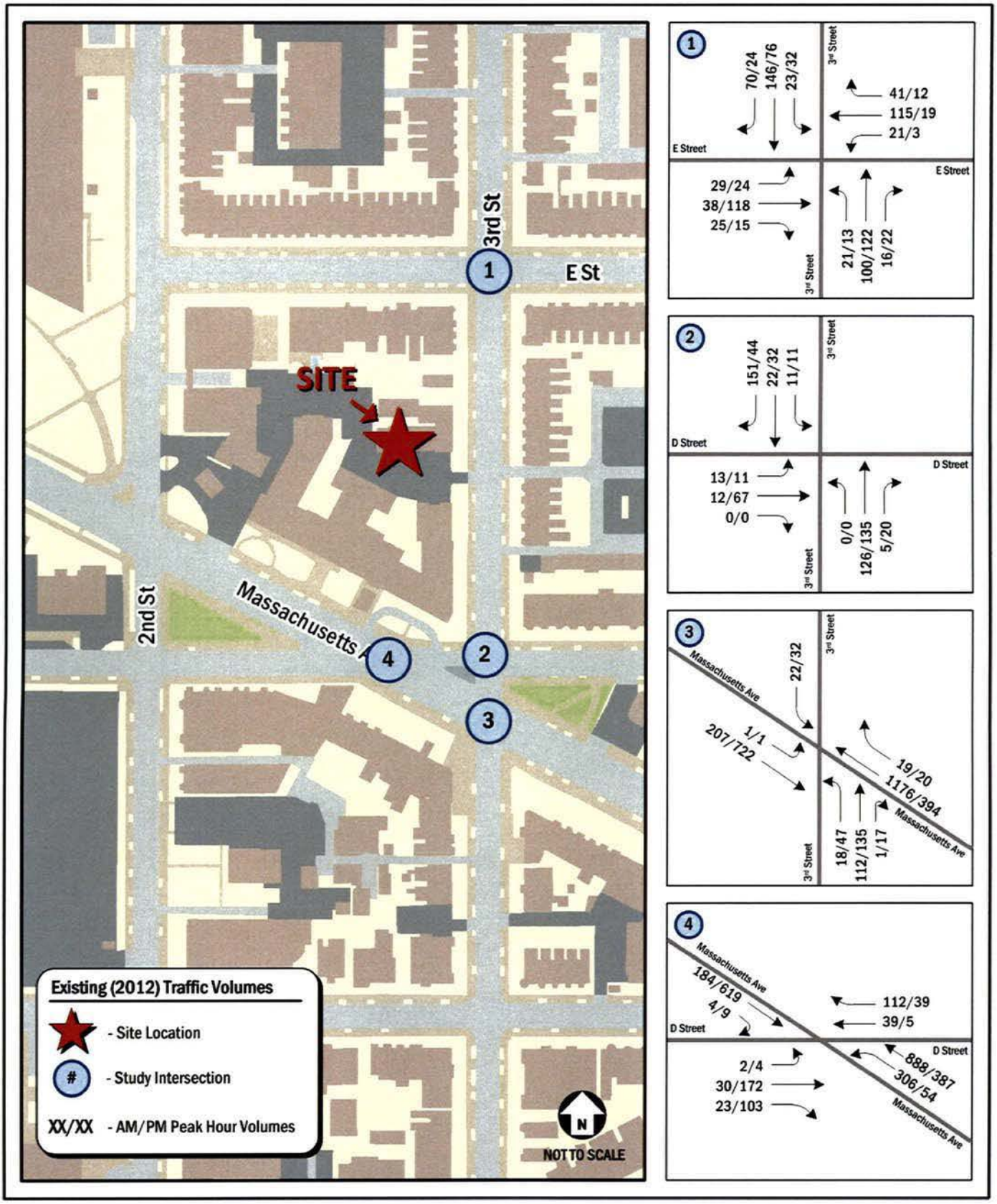


Figure 14: Existing Peak Hour Traffic Volumes

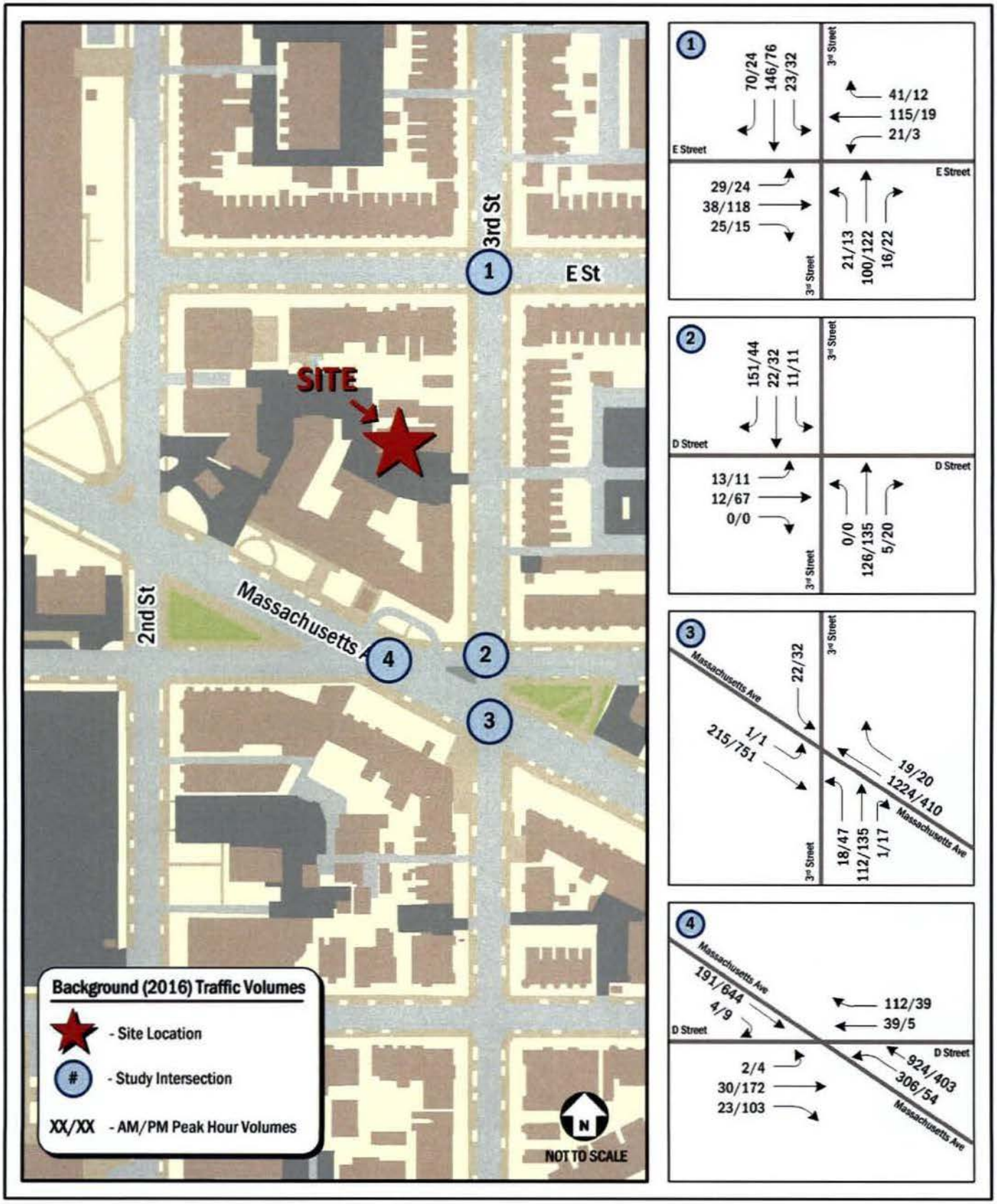


Figure 15: Background Peak Hour Traffic Volumes

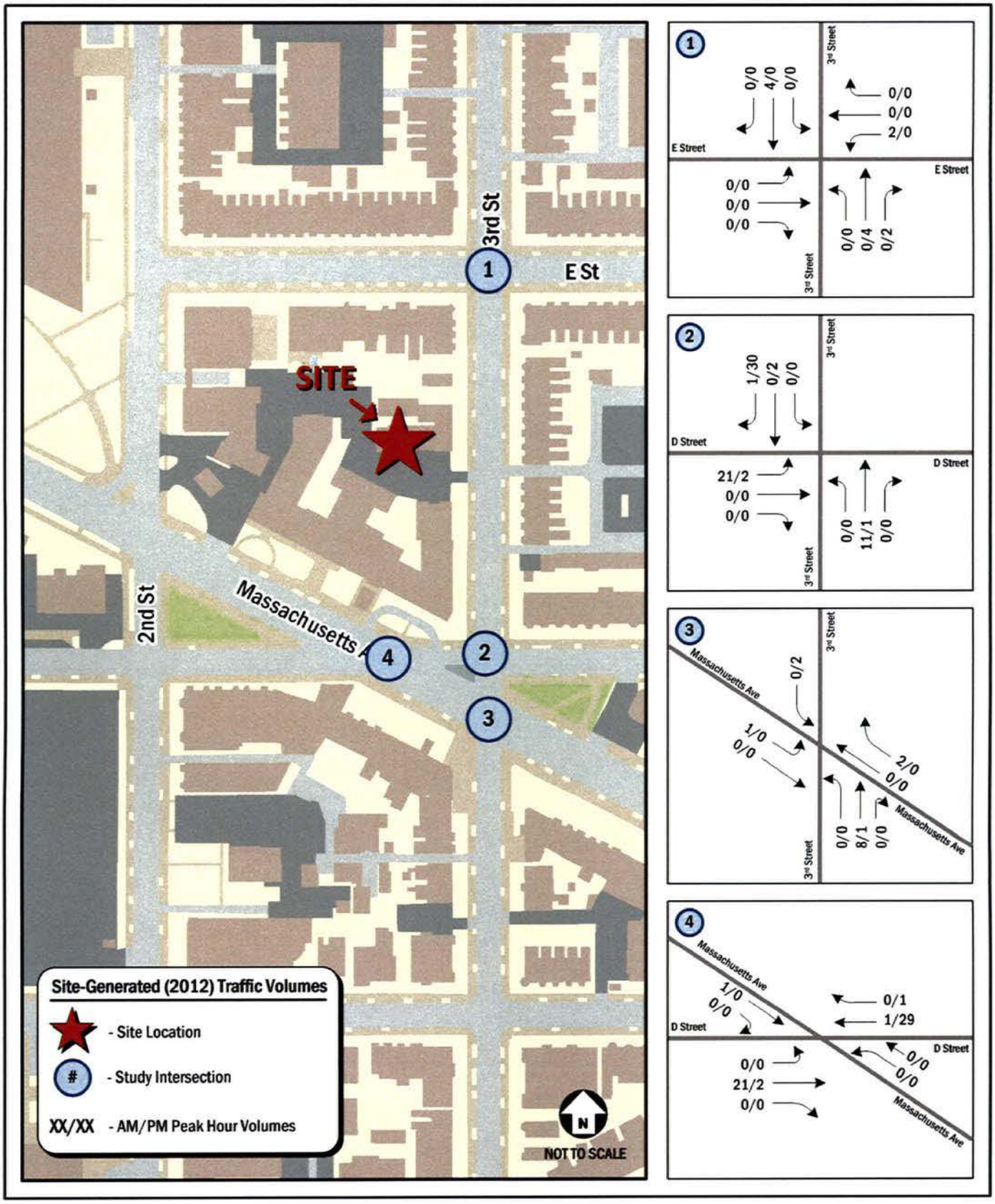


Figure 17: Project Generated Trips

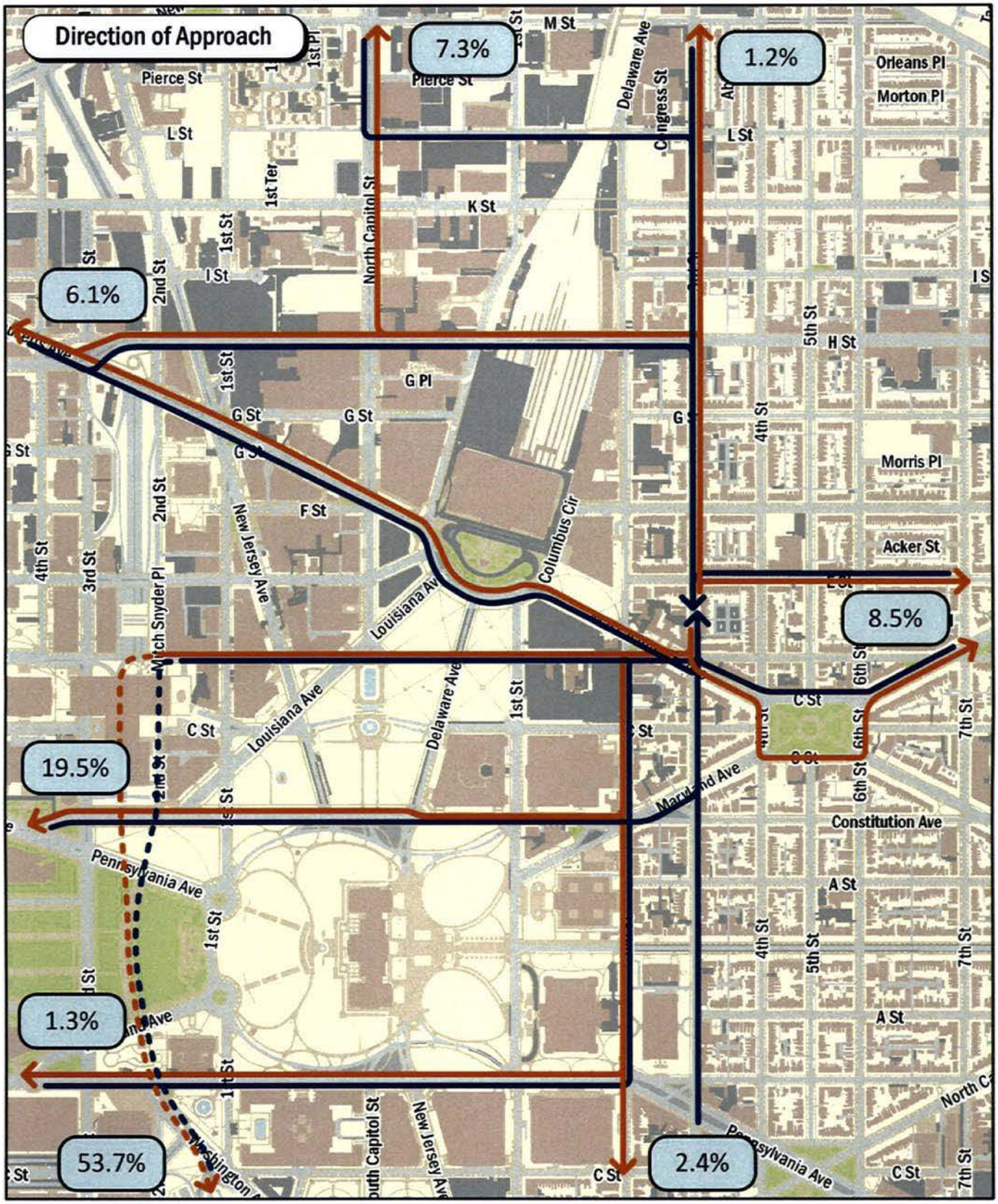


Figure 16: Trip Distribution for Project Trips

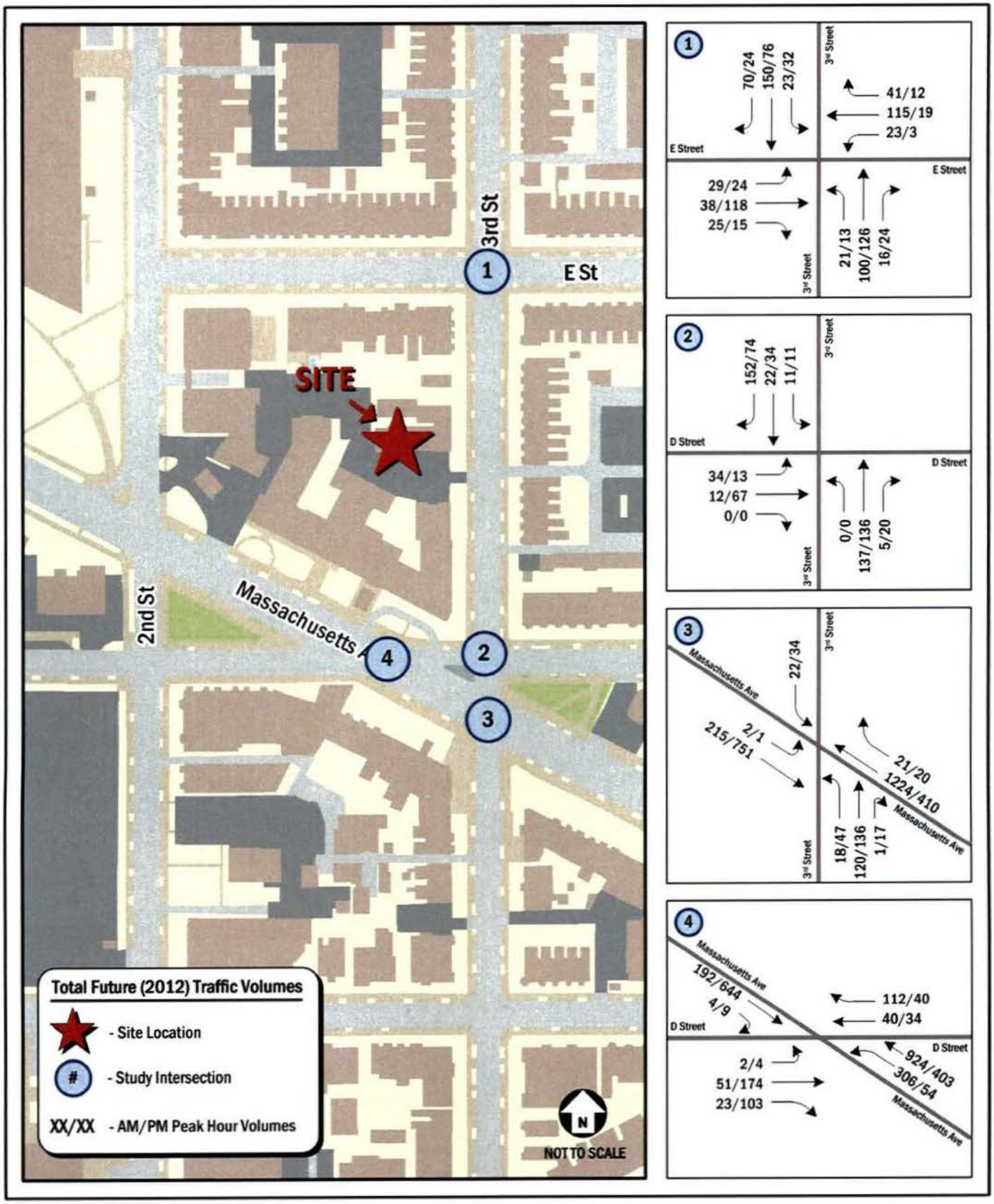


Figure 18: Total Future Peak Hour Trips

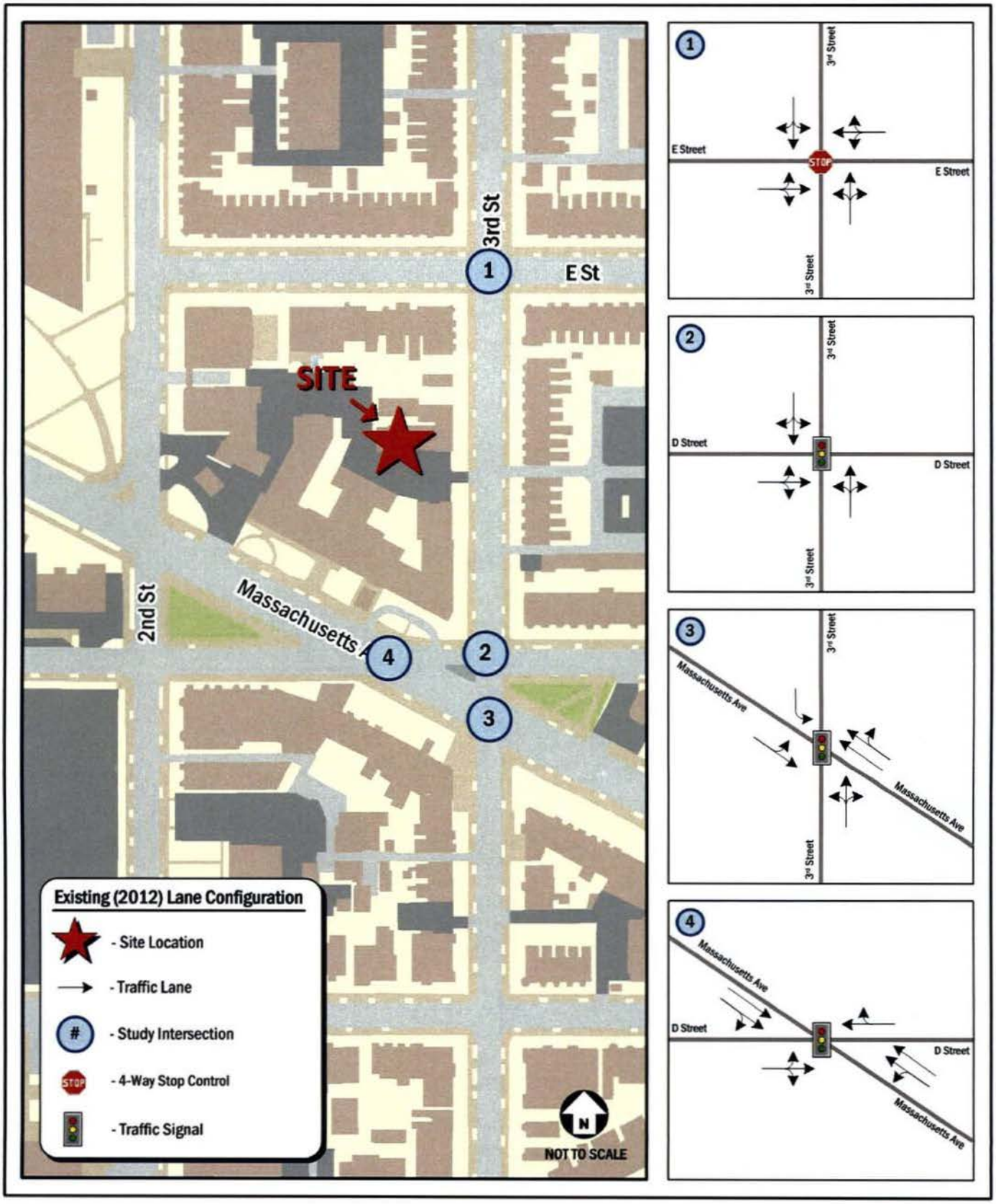


Figure 19: Lane Configurations and Traffic Controls

Analysis Results

Using the assumptions, volumes, and roadway geometry and operations assembled for each scenario, this TIS performed a capacity analysis for each study intersection, for each scenario, for the AM and PM peak hours.

These analyses generate results in vehicular delay per intersection approach, and for an overall intersection. This delay represents the average delay for each vehicle travelling through the intersection compared to if the intersection did not exist. These delay numbers are then related to a LOS (Level of Service) grade, a qualitative letter-grade assigned to the average delay. LOS E represents 'capacity' of an intersection or approach, and LOS F refers to a failing situation, where motorists need to wait for multiple green lights before they can proceed through an intersection.

The threshold for acceptable delays in the Districts is typically LOS E. A roadway facility in an urban area that reaches capacity during peak times, but does not exceed it, is acceptable. A result where a scenario studied shows a LOS F condition, but did not in the prior scenario is considered a negative impact generated by that scenario. Thus, this report focuses on identifying places where this may occur for the 2016 Total Future Conditions.

Table 12 contains the results of the delay and LOS analyses and Figure 20 and Figure 21 show it graphically. In order to generate the delay and LOS results, this study used *Highway Capacity Manual* methodologies, using the *Synchro, Version 7.0* software package. The average delay of each approach and LOS is shown for the signalized intersections in addition to the overall average delay and intersection LOS grade. The HCM does not give guidelines for calculating the average delay for a two-way stop-controlled intersection, as the approaches without stop signs would technically have no delay. Detailed LOS descriptions and the analysis worksheets are contained in the Appendix.

The LOS show that all of the study intersections operate at acceptable conditions during the morning and afternoon peak hours for the 2012 Existing, 2016 Background, and 2016 Future scenarios. Thus, the project will not have a negative impact on surrounding roadways.

Table 12: Capacity Analysis Results

Intersection	Existing Conditions				Background Conditions				Total Future Conditions			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
3rd Street & E Street NE												
Overall	**10.2**	**B**	**9.6**	**A**	**10.2**	**B**	**9.6**	**A**	**10.3**	**B**	**9.6**	**A**
Eastbound E St	9.4	A	10.3	B	9.4	A	10.3	B	9.4	A	10.3	B
Westbound E St	10.4	B	8.3	A	10.4	B	8.3	A	10.5	B	8.3	A
Northbound 3rd St	9.8	A	9.3	A	9.8	A	9.3	A	9.8	A	9.4	A
Southbound 3rd St	10.6	B	9.1	A	10.6	B	9.1	A	10.7	B	9.1	A
D Street & 3rd Street NE												
Overall	**25.5**	**C**	**13.7**	**B**	**25.5**	**C**	**13.6**	**B**	**24.0**	**C**	**16.5**	**B**
Eastbound D St	3.0	A	1.4	A	3.0	A	1.4	A	2.5	A	1.4	A
Northbound 3rd St	6.1	A	6.4	A	6.0	A	6.4	A	6.7	A	6.4	A
Southbound 3rd St	42.3	D	37.6	D	42.3	D	37.6	D	42.6	D	40.0	D
Massachusetts Avenue & 3rd Street NE												
Overall	**21.6**	**C**	**29.2**	**C**	**22.4**	**C**	**29.5**	**C**	**22.5**	**C**	**29.6**	**C**
Southeastbound Mass Ave	1.8	A	29.1	C	1.9	A	29.7	C	1.8	A	29.7	C
Northwestbound Mass Ave	23.6	C	21.9	C	24.6	C	22.1	C	24.7	C	22.1	C
Northbound 3rd St	35.6	D	47.7	D	35.6	D	47.7	D	36.0	D	47.7	D
Southbound 3rd St	19.0	B	12.8	B	19.0	B	12.8	B	19.0	B	15.2	B
D Street & Massachusetts Avenue NE												
Overall	**8.4**	**A**	**34.3**	**C**	**8.4**	**A**	**34.6**	**C**	**8.9**	**A**	**34.3**	**C**
Eastbound D St	38.1	D	35.6	D	38.1	D	35.6	D	39.7	D	35.7	D
Westbound D St	18.9	B	78.3	E	18.9	B	78.3	E	19.2	B	54.1	D
Northwestbound Mass Ave	4.2	A	33.7	C	4.3	A	34.1	C	4.3	A	34.1	C
Southeastbound Mass Ave	18.0	B	31.1	C	18.1	B	31.6	C	18.1	B	31.6	C

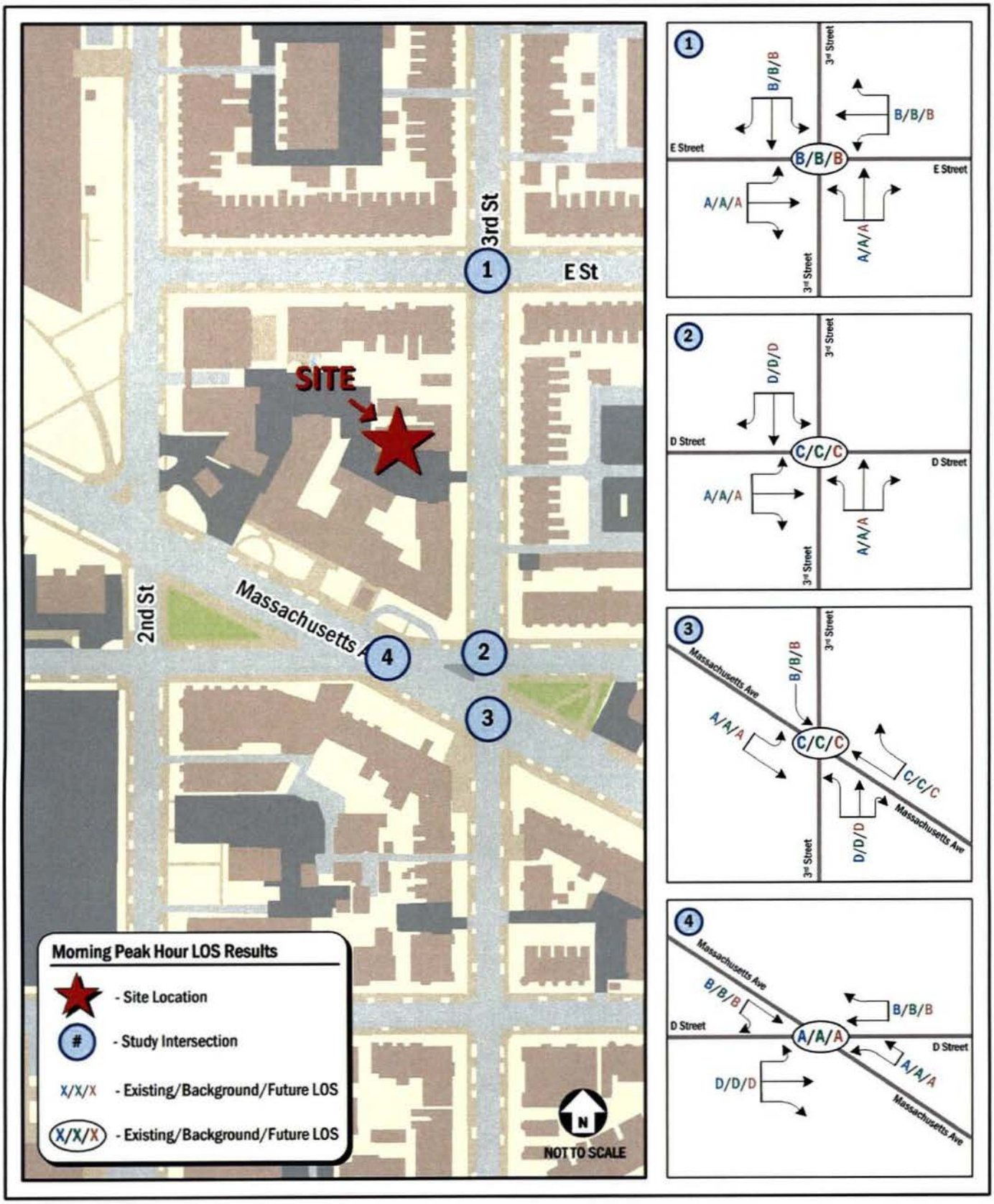


Figure 20: AM Peak Hour LOS Results

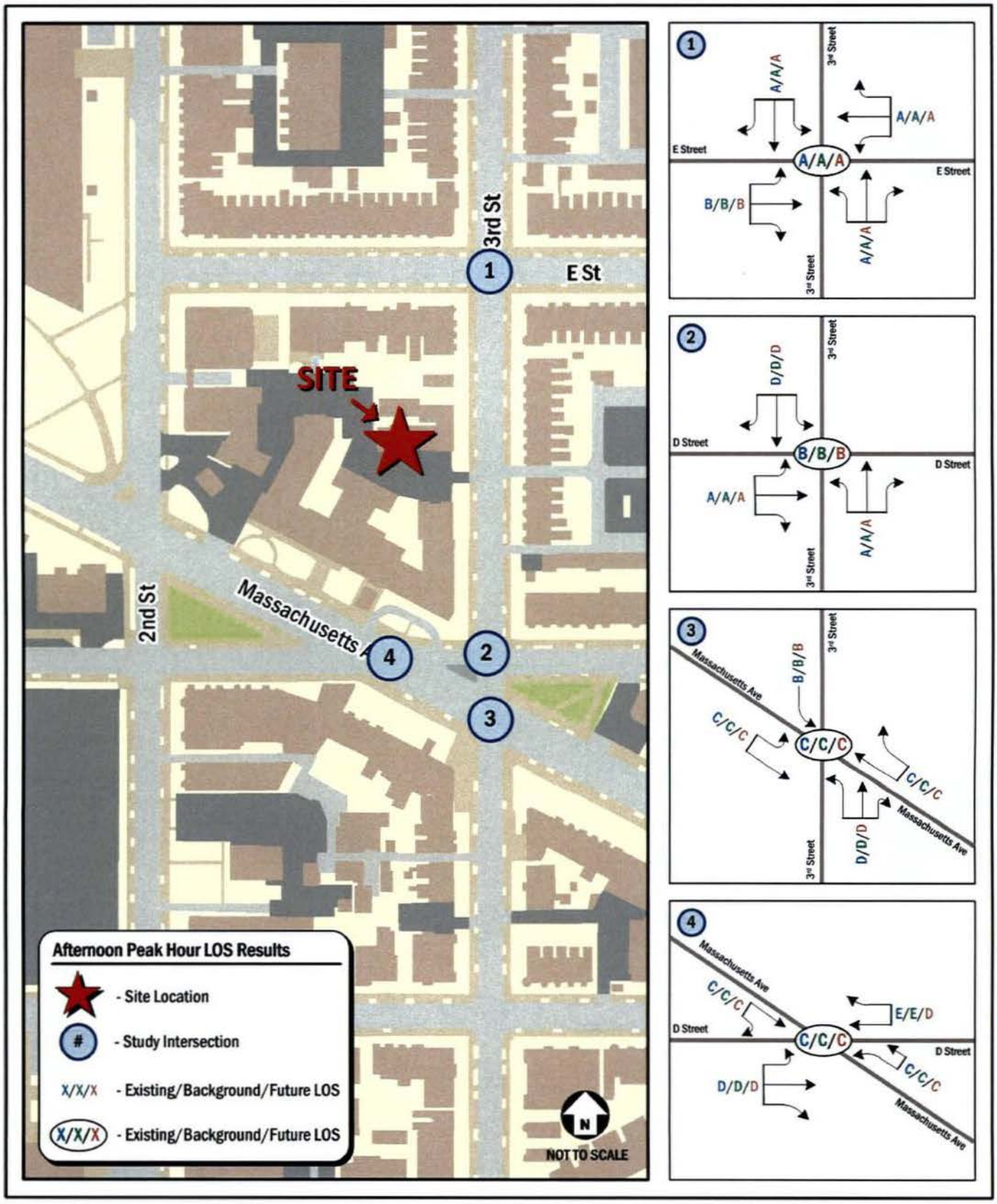


Figure 21: PM Peak Hour LOS Results

Further Review of Mass/3rd/D St NE

The results of the vehicular analysis do not necessary align with reports from community members, Heritage staff, and GoroveSlade observations of the site. In particular, delays and queues were observed and reported along southeastbound Massachusetts Avenue in the PM peak hour, whereas the capacity analyses show at most a LOS C along this stretch of roadway.

Although the analysis does not show an impact at this intersection and the project's impacts are negligible, the Applicant asked GoroveSlade to investigate this further.

Although the scope of this TIS is not sufficient to enable GoroveSlade to make a firm conclusion as to why observations do not match the capacity analysis results, there are two likely reasons that this disconnect exists:

- Parking is restricted during PM peak hours along Massachusetts Avenue southeastbound, which allows for two lanes of vehicular traffic as opposed to one during the non-PM peak times. Observations during the PM peak hour showed that these restrictions are not always followed, and occasionally a vehicle will be blocking one of the through lanes by either parking or standing in the restricted area. A quick analysis of this scenario, where Massachusetts Avenue has only one southeastbound lane during the PM peak hour, shows the approach operating at an LOS F as opposed to an LOS C and therefore would match observations.
- It is possible that an intersection further upstream, for example at Stanton Park, has excessive delays causing traffic to back up on Massachusetts Avenue to D Street where queuing is observed. The scope of this TIS did not extend this far, so this cannot be confirmed.

In GoroveSlade's experience in the District, it is very common to find that capacity analysis results do not match observations where City arterials have on-street parking that is restricted during the peak hours. These arterials are considered to be *sensitive* to conditions such that if drivers and parkers do not comply with regulations, than a normally non-congested scenario becomes quickly congested.

Potential solutions for these conditions are cumbersome to implement, as they would require reworking the curbside management and operations of arterials to somehow eliminate this activity or reduce it through rigorous enforcement. Thus, it is recommended that DDOT and the community investigate potential ways to prevent illegal parking and similar activities from occurring that add an undue amount of congestion to the corridor.

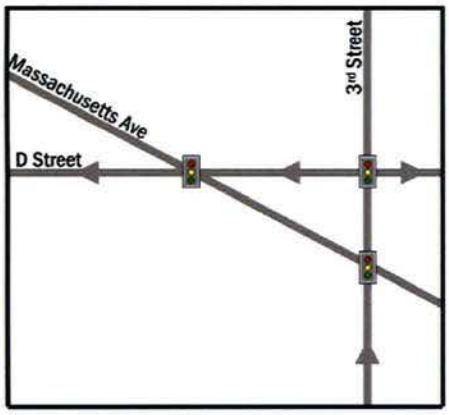
In addition, it is recommended that the Heritage Foundation distribute preferred driving routes to employees and visitors that drive to the site, informing them of routes that do not take them through this congested intersection. These routes can easily avoid the combined intersection of Massachusetts Avenue with 3rd and D Streets NE by arriving on southbound 3rd Street and making a right turn into the underground accessory parking facility, and leaving by making a left turn onto northbound 3rd Street. The street grid within Capitol Hill allows for all connections to regional roadways in this direction with quick connections to arterial roadways with minimal use of neighborhood streets.

GoroveSlade also reviewed potential ways that delays could be reduced at this set of intersections. A quick review found that due to the complicated nature of the intersection(s), short-term strategies such as signal timing/phasing adjustments or lane restriping techniques would not have a

significant impact. All three traffic signals that make up the combined intersection are controlled from a single point, leaving little room for small adjustments in operations.

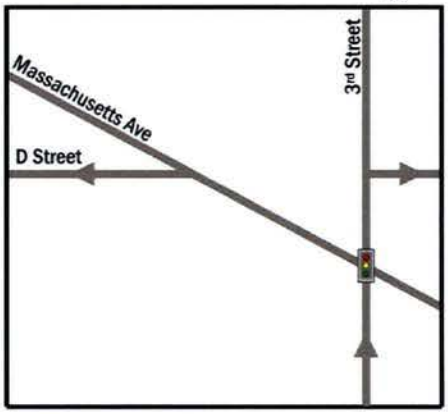
Further exploration of the intersection operations did show that more long-term and intrusive changes could have a significant impact at reducing delay at the combined intersection of Massachusetts Avenue with 3rd and D Streets NE. Both of these concepts are based on the idea that reducing delays could be accomplished by simplifying of the intersection, through the removal of some of turns and movements. The two concepts are as follows:

- Option 1: This option involves converting D Street between 3rd and 2nd Streets to one-way eastbound. This option results in small improvements to both AM and PM peak hour delays and LOS, however some traffic must be rerouted due to the one-way conversion. The impacts of rerouting traffic on the surrounding intersections is unknown; therefore further study would be needed in order to reach a final conclusion on the merit of this strategy.



Option 1

- Option 2: This option involves closing the section of D Street between Massachusetts Avenue and 3rd Street in addition to converting D Street between 3rd and 2nd Street to one-way eastbound. This option greatly simplifies the intersection by eliminating the need for two of the three traffic signals. It also allows the option to enhance the streetscape at the corner of Massachusetts and 3rd Street. This option results in large improvements to both the AM and PM peak hour delays and LOS, but like Option 1 some traffic must be rerouted due to the new roadway configuration. The impacts of rerouting traffic on the surrounding intersections is unknown; therefore further study would be needed in order to reach a final conclusion on the merit of this strategy.



Option 2

Both of these options would require more study to determine their impact to other adjacent intersections and the corridor as a whole. In addition, if congestion is a result of illegal parking and queues from downstream intersections, then any improvements at this location may not arise from either of these options.

Thus, this TIS has provided a discussion of these options in order to begin dialogue between DDOT and the community if they desire to explore such ideas further, but this TIS does not contain a formal recommendation on any short or long term improvements for these intersections.

ON-STREET PARKING

This section of the TIS presents a review of on-street parking near the site. The purpose of this section is to present a summary of the inventory and occupancy counts conducted to help identify existing issues, and to examine potential changes to on-street parking demand due to the proposed BZA application. Notably, this analysis was looking for evidence of existing overspill parking from Heritage and the employees of 236 Massachusetts Avenue.

The on-street parking study was conducted across an area consisting of a quarter-mile walkshed from the site location, chosen because it is a likely area where Heritage and 236 Massachusetts Avenue employees could try to park. Figure 22 is a map showing the quarter-mile walkshed and location of all 98 block faces.

An inventory of available on-street parking facilities was conducted on Wednesday, December 12, 2012 that included tabulating the number of spaces by blockface and identifying the parking permitted in that area along with relevant parking restrictions. Morning, mid-day, and evening parking occupancy counts were also conducted on this day at 10 AM, 2 PM, and 9 PM. Table 13 gives a summary of the inventory and occupancy results. The on-street parking information is very data intensive, so a complete review of data collected per blockface is provided in the Technical Appendix, along with a series of maps of parking occupancy throughout the day.

The parking inventory identified 1,172 to 1,338 spaces depending on the time of day within the site's walkshed. The majority of these spaces have residential parking restrictions through the DC DMV's RPP (Residential Permit Parking) program. The RPP program is designed to provide on-street parking for local residents by limiting the number of hours that vehicles from outside the neighborhood/District ward may be parked on street.

A small portion of the spaces within the study area are governed by parking meters with a variety of enforcement hours and permitted parking durations. Most metered spaces are located in the vicinity of the commercial areas along Massachusetts Avenue. Another small portion of the spaces do not have RPP restrictions or parking meters and are therefore open to all vehicles; however, most of these spaces still provide limits during peak periods and/or business hours.

The occupancy and utilization data that was summarized in Table 13 was used in the analysis of existing parking management that follows.

The parking occupancy study shows that RPP parking within a quarter-mile walkshed of the site is very full with a utilization rate of 88% to 89% during the morning, afternoon, and evening (any occupancy rate approaching 90% is considered practically full).

Table 13: Summary of On-Street Parking Counts

Space Type	Spaces Available			Typical Weekday					
				Morning (10am)		*Afternoon (2pm)*		*Evening (9pm)*	
	10am	2pm	9pm	Occupancy	Utilization	Occupancy	Utilization	Occupancy	Utilization
RPP (Zone 6)	1,104	1,104	1,104	971	88%	986	89%	971	88%
Metered	52	58	69	50	96%	45	78%	32	46%
Open to All Vehicles	16	19	165	10	63%	12	63%	84	51%
All On-Street Spaces	**1,172**	**1,181**	**1,338**	**1,031**	**88%**	**1,043**	**88%**	**1,087**	**81%**

As shown below, there is a considerable amount of people parking in RPP spaces that do not have a Zone 6 permit, amounting to 25% in the morning, 24% in the afternoon, and 16% in the evening. It is of specific interest that this percentage drops in the evening, which could indicate that non-resident drivers are parking on these blocks during the typical work hours. This equates to 86 more non-permit holders using these blocks during the day than during the evening.

As discussed earlier, this project will allow potentially up to 39 cars that now park in on-street parking during the day to shift to parking in the new underground accessory parking facility. This could reduce the amount of parking activity by non-permit holders who utilize RPP spaces specifically during the day by 47%.

The main component of this potential removal of cars from on-street parking is the current population at 236 Massachusetts Avenue. As a part of the BZA application, this building will be incorporated into the Heritage Foundation.

Overall, the implementation of more off-street parking spaces for the Heritage Foundation employees, and the removal of 236 Massachusetts employees benefits the surrounding on-street parking facilities. In an area where parking utilization for RPP spaces is extremely high, the community may benefit by seeing an increase of available on-street parking spaces.

Table 14: Parking Utilization by Non-Ward 6 Permits

Space Type	Typical Weekday: Non-Zone 6 Permit Holders								
	Morning (10am)			*Afternoon (2pm)*			*Evening (9pm)*		
	Overall Occupancy	Occupancy of Non-Permit Holders	% w/o Zone 6 Permits	Overall Occupancy	Occupancy of Non-Permit Holders	% w/o Zone 6 Permits	Overall Occupancy	Occupancy of Non-Permit Holders	% w/o Zone 6 Permits
RPP (Zone 6)	971	238	25%	986	233	24%	971	152	16%

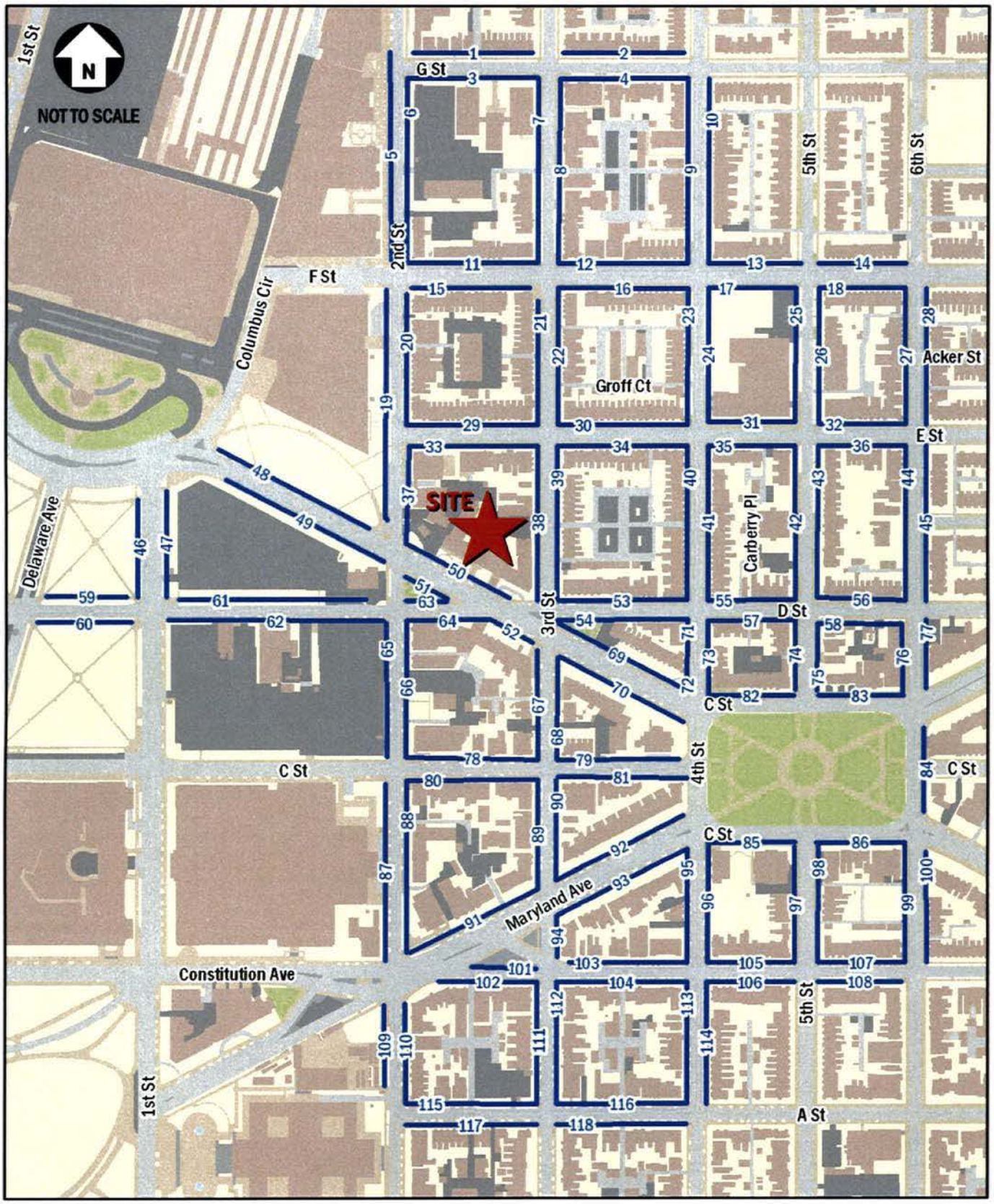


Figure 22: Extents of On-Street Parking Study

CRASH DATA

This section of the report reviews available crash data within the study area, and reviews how the project may influence or impact crash rates. The first step in the crash analysis was to assemble crash rates for the study area intersections. Two factors go into the calculation for crash rates; (1) crash data provided by DDOT from the last three years available (2010 to 2012), and (2) the intersection turning movement counts. For each intersection, the crash rate was calculated in crashes per million-entering vehicles (MEV). The rates per intersection are shown below.

Table 15: Intersection Crash Rates

Intersection	Total Crashes	Pedestrian Crashes	Bike Crashes	Rate per MEV
D St & Mass Ave	5	0	0	0.31
D St & 3rd St	9	0	1	**2.49**
Mass Ave & 3rd St	11	0	0	0.69
E St & 3rd St	2	0	0	0.32

Although crash rates are not an exact measure of safety, they can help identify where a safety problem may exist. 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. 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.

One intersection in the study area meets this criterion. Thus, the project needs to be developed in a manner to help alleviate, or at minimum not add to, the conflicts at this intersection. For this intersection, the crash type information from the DDOT crash data was reviewed to see if there is a high percentage of certain crash types. Generally, the reasons for why an intersection has a high crash rate cannot be derived from crash data, as the exact details of each crash are not represented. However, some summaries of crash data can be used to develop general trends or eliminate some possible causes.

Table 16: Crash Type Breakdown

Intersection	Rate per MEV	Right Angle	Side Swiped	Parked	Backing
D St & 3rd St	**2.49**	4	2	1	1
		44%	*22%*	*11%*	*11%*

D Street & 3rd Street NE

This intersection has a high crash rate of 2.49 per MEV over the course of the 3-year period. The majority of the crashes were right-angle and side swipe. Right-angle crashes are typically the result of a driver who failed to either stop or yield right-of-way, ran a red light, or was not cleared from the intersection upon the onset of the conflicting movement's green signal. Sideswipe crashes often occur when a vehicle makes a last-second lane change around a turning vehicle or fails to leave space when passing another vehicle.

This report does not recommend mitigation measures at this intersection due to the recent striping and other improvements of the 3rd Street, D Street, and Massachusetts Avenue intersection. Because of these recent changes, the crash data used in the analysis is likely out-of-date and may not reflect current conditions. It is also possible that the project's removal of the curb cuts along Massachusetts Avenue near this intersection may help reduce conflicts between vehicles within the intersection and vehicles using the curb-cuts. Thus change will slight adjust intersection operations, most likely in a manner that reduces overall crashes.