

COMPREHENSIVE TRANSPORTATION REVIEW

THE LADY BIRD PUD

WASHINGTON, DC

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ZONING COMMISSION
District of Columbia
CASE NO.19-10
EXHIBIT NO.26A

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EXECUTIVE SUMMARY

The following report is a Comprehensive Transportation Review (CTR) for the Lady Bird development. The report reviews the transportation aspects of the project’s Planned Unit Development (PUD) application. The Zoning Commission Case Number is 19-10.

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

Proposed Project

The Project Site is located in the AU Park/ Spring Valley neighborhood of Upper Northwest, Washington, DC, and consists of Lots 802, 803, 806, and 807 in Square 1499. The Project Site is generally bound by Yuma Street on the north; Massachusetts Avenue on the south, 48th Street on the east, and the Spring Valley Exxon station on the west.

The Project Site is currently improved with the following exiting structures:

- on Lots 802 and 803, the historic Avenue Parking Shops (“MAPS”);
- on Lot 806, the former American University Law School building (the “AU Building”); and
- on Lot 807, a surface and below-grade parking lot, a vacant grocery store, and additional retail uses that are currently in operation (the “Valor Lot”).

The proposed development will redevelop the Valor Lot to include a mixed-use development consisting of five townhomes, one mixed-use building with 214 residential dwelling units, and 18,198 square feet of grocery/retail space.

As part of the proposed development, sections of the roadway network surrounding the site will be improved. Pedestrian facilities along the perimeter of the project on Yuma Street, 48th Street, and along the public and private alleys to the south of the site will be improved so that they meet or exceed DDOT

and ADA standards. Existing curb cuts along Yuma Street and 48th Street will be closed, providing more continuity to sidewalks along the site’s perimeter that does not exist under current conditions.

The Applicant has also committed to significantly improve the public alley to the west of the site as follows:

- The installation of a 3-foot wide delineated pedestrian path (where none exists today);
- Converting the intersection of the alleys to an all-way stop;
- Adding textured pavement to the intersection of the alley to make drivers aware of a “shared-space” with pedestrians;
- Adding mirrors to utility poles to increase visibility around the corner of the intersection of the alley; and
- Extending the sidewalk along the western section of the alley adjacent to MAPS near Massachusetts Avenue (where none exists today).

The Applicant has committed to upgrade substandard curb ramps, stripe missing crosswalks, and install curb extensions at the intersections of Yuma Street and 49th Street, Yuma Street and 48th Street, Windom Place and 48th Street, and Warren Street and 48th Street; subject to DDOT approval. The Applicant has also committed to fund and construct a High-intensity Activated crossWalk (HAWK) signal on Massachusetts Avenue between 48th Street and 49th Street, subject to DDOT approval.

Vehicular and loading access for the project will be provided primarily via Yuma Street, 48th Street, and Massachusetts Avenue, which provide access to the public alley that connects to the loading facilities, the service and delivery space, and the below-grade parking garage.

The proposed development will provide approximately 370 parking spaces in three levels of below-grade parking. The first level of parking will contain approximately 86 parking spaces that are intended to be for grocery/retail uses. The second level of parking will contain approximately 179 parking spaces, of which approximately 56 will be reserved for those that hold a monthly parking pass from American University, and the remaining 123 parking spaces will be for residents of the development that choose to lease a parking space. The third level of parking will contain approximately 105 parking spaces for residents of the development that choose to lease a parking space. Parking is planned to be priced, at minimum, at the average market-rate.



The development will supply long-term bicycle parking within the below-grade garage and short-term bicycle parking around the perimeter of the site. The amount of short-term and long-term bicycle parking being provided exceeds what is required by zoning.

Multi-Modal Impacts and Recommendations

Transit

The site is served by regional and local transit services via Metrobus and Metrorail. The site is 0.8 miles from the Tenleytown – AU Metrorail Station entrance at Albemarle Street and Wisconsin Avenue, and four Metrobus stops are located within a block of the site along Massachusetts Avenue.

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

Pedestrian

The site is surrounded by a well-connected pedestrian network. Most roadways within a quarter-mile radius provide sidewalks and acceptable crosswalks and curb ramps, particularly along the primary walking routes. There are residential streets to the north and southeast of the site which lack sidewalks, curb ramps, or crosswalks that meet DDOT and ADA standards.

As a result of the development, pedestrian facilities along the perimeter of the site will be improved by the removal of two existing curb cuts and improving sidewalks adjacent to the site such that they meet or exceed DDOT requirements. In addition, the Applicant has committed to make a number of significant pedestrian related improvements to the alley, to upgrade substandard curb ramps, stripe missing crosswalks, and install curb extensions at four (4) proximate intersections (subject to DDOT approval), and fund and construct a High-intensity Activated crossWalk (HAWK) signal on Massachusetts Avenue between 48th Street and 49th Street, subject to DDOT approval.

Bicycle

Bicycle infrastructure in the vicinity of the site is limited. The site is 0.6 miles from the nearest designated bicycle facility, which are shared-lanes along 43rd Street. However, low volume residential streets surrounding the site provide bicycle connectivity where official facilities are lacking.

No Capital Bikeshare stations are located within a half-mile of the site; however, one station is identified within DDOT's Capital Bikeshare Development Plan to be installed in the

vicinity of the site. According to DDOT, DDOT plans to install a new Capital Bikeshare station near the intersections of Massachusetts and 48th Street NW or Massachusetts and 49th Street NW in 2019 pending equipment supply, location availability, and an upcoming review of the Bikeshare Development plan.

The proposed development will provide short-term bicycle parking along the perimeter of the site and on-site secure long-term bicycle parking within the below-grade garage for residents and employees of the development.

Vehicular

The site is well-connected to regional roadways such as Massachusetts Avenue and Western Avenue, principal and minor arterials such as Nebraska Avenue and Wisconsin Avenue, and an existing network of collector and local roadways.

In order to determine the potential impacts 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 and queues. These are compared to the acceptable levels of delay set by DDOT standards to determine if the site will negatively impact the study area. The analysis concluded that no intersections would require mitigation as a result of the development.

Summary and Recommendations

This report concludes that **the proposed development will not have a detrimental impact on the surrounding transportation network assuming that all planned site design and TDM elements are implemented.**

The development has several positive elements contained within its design that minimize potential transportation impacts, including:

- The inclusion of secure long-term bicycle parking spaces within the development that meet or exceed zoning requirements.
- The installation of short-term bicycle parking spaces around the perimeter of the site that meet or exceed zoning requirements.
- The creation of wide pedestrian sidewalks that meet or exceed DDOT and ADA requirements.



- The installation of a HAWK signal on Massachusetts Avenue between 48th Street and 49th Street.
- The upgrading of substandard curb ramps, striping of missing crosswalks, and installation of curb extensions at four (4) proximate intersections.
- The significant improvements to the alley to provide additional pedestrian facilities surrounding the site.
- The inclusion of publicly accessible spaces.
- The provision of \$100,000 on means for connecting residents to the Tenleytown Metro station through geofence with ride hailing services.
- The inclusion of eight (8) electric vehicle charging and four (4) car-share parking spaces.
- A robust Transportation Demand Management (TDM) plan that reduces the demand of single-occupancy, private vehicles during peak period travel times or shifts single-occupancy vehicular demand to off-peak periods.



INTRODUCTION

PURPOSE OF STUDY

This report reviews the transportation elements of the Lady Bird development. The site, shown in Figure 1 and Figure 2, is located in the American University Park neighborhood and is adjacent to the Spring Valley neighborhood in Northwest DC.

The purpose of this report is to:

1. Review the transportation elements of the development site plan and demonstrate that the site conforms to DDOT's general policies of promoting non-automobile modes of travel and sustainability.
2. Provide information to DDOT and other agencies on how the development of the site will influence the local transportation network. This report accomplishes this by identifying the potential trips generated by the site on all major modes of travel and where these trips will be distributed on the network.
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. In those areas where adverse impacts are identified and require mitigation, the report provides recommendations for improvements to the transportation network to mitigate the adverse impacts.

PROJECT SUMMARY

The Lady Bird development will be a mixed-use development consisting of five townhomes, one mixed-use building with 214 residential dwelling units, and 18,198 square feet of grocery/retail space.

CONTENTS OF STUDY

This report contains nine chapters as follows:

- Study Area Overview

This chapter reviews the area near and adjacent to the proposed project and includes an overview of the site location.

- Project Design

This chapter reviews the transportation components of the project, including the site plan and access. This chapter also contains the proposed Transportation Demand Management (TDM) plan for the site.

- Travel Demand Assumptions

This chapter outlines the travel demand of the proposed project. It summarizes the proposed trip generation of the project.

- Traffic Operations

This chapter provides a summary of the existing roadway facilities and an analysis of the existing and future roadway capacity in the study area. This section highlights the vehicular impacts of the project, including presenting mitigation measures for minimizing impacts as needed.

- Transit

This chapter summarizes the existing and future transit service adjacent to the site, reviews how the project's transit demand will be accommodated, outlines impacts, and presents recommendations as needed.

- Pedestrian Facilities

This chapter summarizes existing and future pedestrian access to the site, reviews walking routes to and from the project site, outlines impacts, and presents recommendations as needed.

- Bicycle Facilities

This chapter summarizes existing and future bicycle access to the site, reviews the quality of cycling routes to and from the project site, outlines impacts, and presents recommendations as needed.

- Safety/Crash Analysis

This chapter reviews the potential safety impacts of the project. This includes a review of crash data at intersections in the study area and a qualitative discussion on how the development will influence safety.

- Summary and Conclusions

This chapter presents a summary of the recommended mitigation measures by mode and presents overall report findings and conclusions.



Figure 1: Site Location



Figure 2: Site Aerial



STUDY AREA OVERVIEW

This chapter reviews the study area and includes an overview of the site location, including a summary of the major transportation characteristics of the area and of future regional projects.

The following conclusions are reached within this chapter:

- The site is surrounded by an extensive regional and local transportation system that will connect the residents, employees, and patrons of the proposed development to the rest of the District and surrounding areas.
- The site is served by public transportation with access to two local Metrobus lines.
- There is limited bicycle infrastructure in the vicinity of the site, although low volume residential streets surrounding the site provide connectivity
- Pedestrian conditions are generally good, particularly along anticipated major walking routes.

MAJOR TRANSPORTATION FEATURES

Overview of Regional Access

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

The site is accessible from several principal and minor arterials such as Massachusetts Avenue, Nebraska Avenue and Western Avenue. The roadways create connectivity to the Capital Beltway (I-495) that surrounds Washington, DC and its inner suburbs, as well as providing connectivity to the District core.

There are several local bus routes near the site that connect the site with various areas in Washington, DC. The multiple bus route options allow for more frequent bus pickups and specified travel destination options, as shown in Figure 5.

The site is located 0.8 miles from the Tenleytown-AU Metrorail station, which is serviced by the Red line which provides connections to areas in the District and Maryland. The Red Line connects Prince George's County and Montgomery County, Maryland while providing access to the District core. In addition, the Red Line provides connections to all additional

Metrorail lines allowing for access to much of the DC Metropolitan area.

Overall, the site has access to several regional roadways and transit options, making it convenient to travel between the site and destinations in the District, Virginia, and Maryland.

Overview of Local Access

The site is served by a local vehicular network that includes several local streets Yuma Street and 48th Street, and collectors such as 49th Street, 46th Street and Van Ness Street, all of which provide vehicular access to the site.

The Metrobus system provides local transit service in the vicinity of the site, including connections to several neighborhoods within the District and additional Metrorail stations. As shown in Figure 5, there are two bus routes that service the site. In the vicinity of the site, the majority of Metrobus routes travel along Massachusetts Avenue. These bus routes connect the site to many areas of the District. A detailed review of transit stops within a quarter-mile walk of the site is provided in a later section of this report.

Limited bicycle facilities connect the site to areas within the District. However, low-volume residential streets surrounding the site provide connectivity to shared-lane facilities on 43rd Street and River Road to the east of the site. A detailed review of existing and proposed bicycle facilities and connectivity is provided in a later chapter of the report.

Anticipated pedestrian routes, such as those to public transportation stops, retail zones, and community amenities, provide adequate pedestrian facilities; however, there are some sidewalks and curb cuts that do not meet DDOT standards. A detailed review of existing and proposed pedestrian access and infrastructure is provided in a later chapter of this report.

Overall, the Lady Bird site is surrounded by a good local transportation network that allows for efficient transportation options via transit, bicycle, walking, or vehicular modes.

Car-sharing

Four car-sharing companies provide service in the District: Zipcar, Maven, Car2Go, and Free2Move. All four services are private companies that provide registered users access to a variety of automobiles. Of these, Zipcar and Maven have



designated spaces for their vehicles. There are no dedicated car-share locations within a quarter-mile of the site.

Car-sharing is also provided by Car2Go and Free2Move, which provide point-to-point car-sharing. Free2Move currently has a fleet of vehicles located throughout the District, and Car2Go is present in both the District and Arlington. Car2Go and Free2Move vehicles may park in any non-restricted metered curbside parking space or Residential Parking Permit (RPP) location in any zone throughout the defined “Home Area”. Members do not have to pay the meters or pay stations. Car2Go and Free2Move do not have permanent designated spaces for their vehicles; however, availability is tracked through their website and mobile phone application, which provides an additional option for car-sharing patrons.

Walkscore

Walkscore.com is a website that provides scores and rankings for the walking, biking, and transit conditions within neighborhoods of the District. Based on this website the planned development is located in the AU Park – Friendship Heights – Tenley neighborhood. The site location has a walk score of 75 (or “Very Walkable”), a transit score of 41 (or “Some Transit”), and a bike score of 65 (or “Bikeable”). Figure 3 shows the neighborhood borders in relation to the site location and displays a heat map for walkability and bikeability.

The site is situated in an area with good walk scores because of the abundance of neighborhood serving retail locations that are in close proximity, where errands can be completed by walking.

The modest transit score was based on the proximity to multiple bus lines, and distance to the nearest Metrorail stop which is located 0.8 miles from the site.

The site is situated in an area with good bike scores due to its proximity to low volume residential roadways

Overall, the AU Park – Friendship Heights – Tenley neighborhood has high walk, good transit, and good bike scores. Additionally, other planned developments and roadway improvements will help increase the walk and bike scores in the AU Park – Friendship Heights – Tenley neighborhood.

FUTURE PROJECTS

There are a few District initiatives and approved developments located in the vicinity of the site. These planned and proposed projects are summarized below.

Local Initiatives

MoveDC: Multimodal Long-Range Transportation Plan

MoveDC is a long-range plan that provides a vision for the future of DC’s transportation system. As the District grows, so must the transportation system, specifically in a way that expands transportation choices while improving the reliability of all transportation modes.

The MoveDC report outlines recommendations by mode with the goal of having them completed by 2040. The plan hopes to achieve a transportation system for the District that includes:

- 70 miles of high-capacity transit (streetcar or bus)
- 200 miles of on-street bicycle facilities or trails
- Sidewalks on at least one side of every street

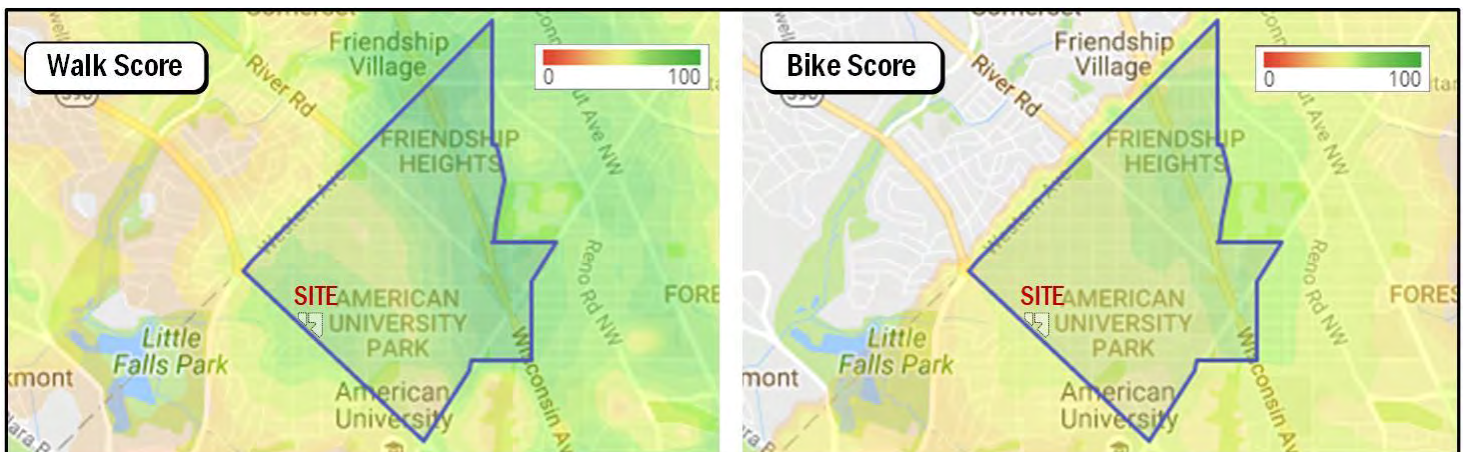


Figure 3: Summary of Walkscore and Bikescore



- New street connections
- Road management/pricing in key corridors and the Central Employment Area
- A new downtown Metrorail loop
- Expanded commuter rail
- Water taxis

In direct relation to the proposed development, the MoveDC plan outlines recommended pedestrian and bicycle improvements such as new sidewalks, and new bicycle trails and bicycle lanes. These recommendations would create additional multi-modal capacity and connectivity to the proposed development and are discussed further down in the report.

SustainableDC: Sustainable DC Plan

SustainableDC is planning effort initiated by the Department of Energy & Environment and the Office of Planning that provides the District with a framework for leading Washington DC to become the most sustainable city in the nation. The 2012 report proposes a 20-year timeframe to answer challenges in areas of: (1) Jobs & the economy; (2) Health & Wellness; (3) Equity & Diversity; (4) Climate & Environment; (5) Built Environment; (5) Energy; (6) Food; (7) Nature; (8) Transportation; (9) Waste; and (10) Water. With respect to transportation, the sustainability goals targeted in 20 years include:

- Improving connectivity and accessibility through efficient, integrated, and affordable transit systems
- Expanding provision of safe, secure infrastructure for cyclists and pedestrians
- Reducing traffic congestion to improve mobility
- Improving air quality along major transportation routes

In direct relation to the development, a combination of increasing public transit and decreasing vehicular mode shares through Transportation Demand Management has been suggested to meet the transportation targets.

Rock Creek West II Livability Study

Published in 2011, the purpose of this DDOT study was to examine the street network and identify concrete actions to increase transportation and safety options in Ward 3. The study area includes the community-oriented neighborhoods of American University Park, Chevy Chase, Forest Hills, Friendship Heights, and Tenleytown.

A number of transportation issues in the study area were identified by DDOT and residents, including: aggressive driving such as speeding and blocking crosswalks, insufficient pedestrian crossing times at intersections, unsignalized crosswalks, cut-through traffic on residential streets, missing sidewalks, and wide streets and intersections. These conditions cause pedestrians and bicycle safety issues, particularly for the elderly and children.

The Study identifies the following recommendations:

- Installing curb extensions along local streets to reduce crossing distances and slow turning vehicles
- Traffic calming measures such as mini-roundabouts, chicanes, speed humps, distinctive paving and streetscape material, and lane narrowing
- Adding bicycle facilities such as shared-lane (“Sharrow”) facilities, bike lanes, or cycle tracks
- Installing HAWK signals and medians at pedestrian crosswalks along high volume street

In direct relation to the Lady Bird development, the Rock Creek West II Livability Study identifies Yuma Street as a roadway in need of a bicycle boulevard.

Rock Creek Far West Livability Study

The Rock Creek Far West Livability Study will examine the street network and identify recommended interventions to increase transportation safety in this area. The Rock Creek Far West study area is bound my Massachusetts Avenue, Whitehaven Street, Whitehaven Parkway, Archbold Parkway, Foundry Branch Valley Park, the Potomac River, and the DC/Maryland border. The proposed development is not in the study area but does border it.

This study is ongoing and is expected to be published in 2019 or 2020. At the end of the study, DDOT will provide recommendations addressing:

- Enhanced transportation safety;
- Improving pedestrian crossings and sidewalks;
- Improving the bicycle network;
- Making intersections safer;
- Improving driver signage;
- Making bus stops more accessible;
- Incorporating milestones consistent with Vision Zero.



The Rock Creek Far West Livability Study is ongoing, and no specific recommendations have been produced as of yet. However, a number of elements that are included as part of the proposed development are consistent with the overall goals outlined above. This includes improvements to nearby intersections, improvements to sidewalks adjacent to the site, and improvements to the adjacent alley.

Planned Developments

There is one development project in the vicinity of the Lady Bird site. For the purpose of this analysis and consistent with DDOT and industry standards, only approved developments expected to be complete prior to the planned development with an origin/destination within the study area were included. Figure 6 shows the location of the background development in relations to the Lady Bird development.

The Spring Valley Shopping Center Expansion

The expansion of the Spring Valley Shopping Center will add approximately 15,000 sf of retail to the existing site. The Spring Valley Shopping Center Expansion lies within the study area, is partially complete, and is expected to fully open before the completion of the Lady Bird development and will thus be included in the analysis.

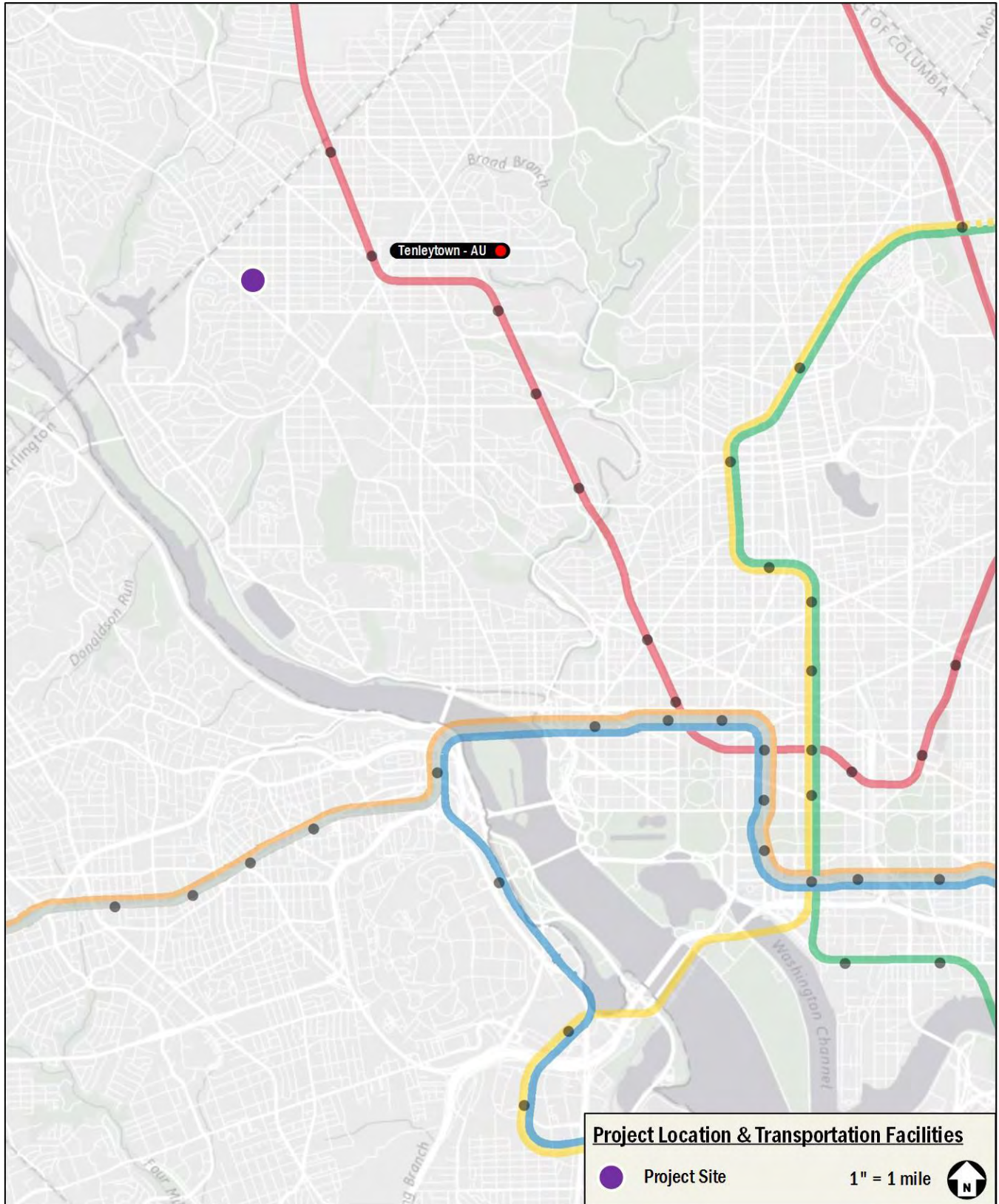


Figure 4: Major Regional Transportation Facilities

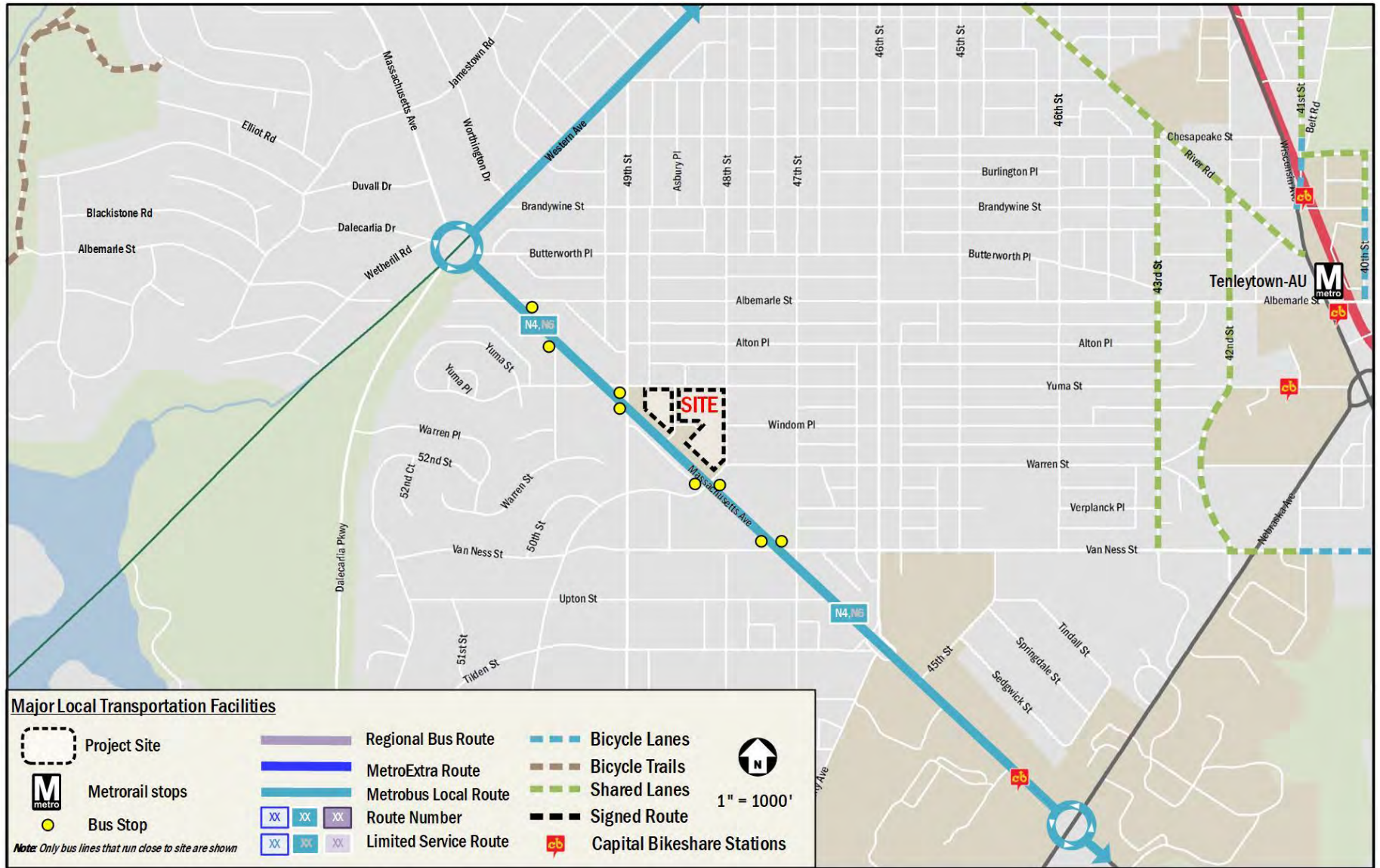


Figure 5: Major Local Transportation Facilities

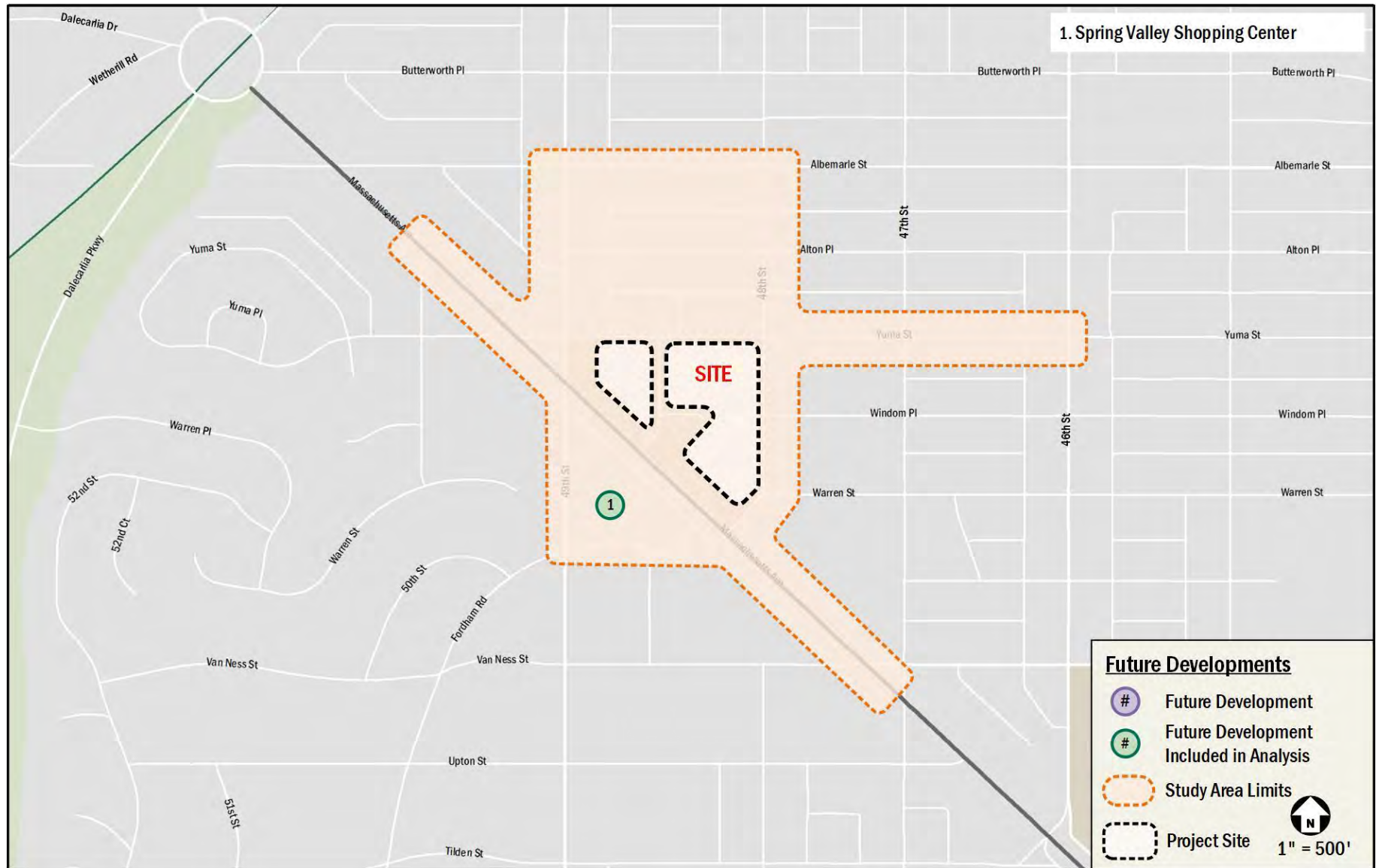


Figure 6: Planned Development Map



PROJECT DESIGN

This chapter reviews the transportation components of the Lady Bird development, including the proposed site plan and access points. It includes descriptions of the site's vehicular access, loading, parking, bicycle and pedestrian facilities, and Transportation Demand Management (TDM) plan. It supplements the information provided in the site's plan package that accompanied the Zoning Application, which includes several illustrations of site circulation and layout.

The Project Site is located in the AU Park/ Spring Valley neighborhood of Upper Northwest, Washington, DC, and consists of Lots 802, 803, 806, and 807 in Square 1499. As shown in Figure 2, the Project Site is generally bound by Yuma Street on the north; Massachusetts Avenue on the south, 48th Street on the east, and the Spring Valley Exxon station on the west.

The Project Site is currently improved with the following existing structures:

- on Lots 802 and 803, the historic Avenue Parking Shops ("MAPS");
- on Lot 806, the former American University Law School building (the "AU Building"); and
- on Lot 807, a surface and below-grade parking lot, a vacant grocery store, and additional retail uses that are currently in operation (the "Valor Lot").

The proposed development will redevelop the Valor Lot to include a mixed-use development consisting of five townhomes, one mixed-use building with 214 residential dwelling units, and 18,198 square feet of grocery/retail space. The development will provide 370 below-grade parking spaces. Figure 7 8, and 9 show an overview of the development program and site plan elements.

SITE ACCESS AND CIRCULATION

Pedestrian Access

Primary pedestrian access to the residential component of the development is provided along Yuma Street for the multifamily residential building, and along 48th Street for the five (5) residential townhomes. Pedestrian access for the grocery component is expected to occur along Yuma Street. A circulation plan showing expected pedestrian routes is shown in Figure 10.

Bicycle Access

Bicycle access to the secure long-term bicycle parking will be from the alley abutting the western portion of the site. Short-term bicycle parking will be located around the perimeter of the site, along Yuma Street, 48th Street, and the public alleys along the western and southern portions of the site. Bicycle access to the site is primarily expected to occur via Yuma Street and 48th Street, and along the alleys to the south and west of the site. A circulation plan showing expected bicycle routes is shown in Figure 10.

Vehicular Access

All of the vehicular access to the site will be via 48th Street, Yuma Street, and Massachusetts Avenue, all of which provide access to the public alley that connects to the below-grade parking garage. A circulation plan showing expected vehicular routes is shown in Figure 10.

Two 40-foot pick-up and drop-off areas ("entrance zones" along Yuma Street and 48th Street are proposed to facilitate pick-up/drop-off and food delivery operations, subject to DDOT approval. The Applicant will coordinate with DDOT in regard to the pick-up and drop-off areas.

ALLEY OPERATIONS

The property is bounded by alleys on its west and south sides. The north-south alley on the property's western edge, connects Massachusetts Avenue to Yuma Street, and the east-west alley on the property's southern edge connects the north-south alley with 48th Street. Approximately 200 feet of the east-west alley on the property's southern edge is private property. Trucks, cars, bicycles, and pedestrians were observed using these alleys.

Improvements to the Alley

As part of the proposed development, trash enclosures for the Massachusetts Avenue Parking Shops to the west of the Lady Bird development, which shares the north-south alley, will be added, which will improve alley operations and minimize the number of objects protruding into the alley. To maintain a 20-foot width through this part of the alley, the proposed development will expand the north-south alley that abuts the site by four (4) feet from the existing 20 feet to a total width of 24 feet, as well as provide a three (3) foot delineated pedestrian path where none exists today. Figure 11 shows the improvements to the north-south alley that are proposed as part of the development.



Along the east-west alley that abuts the site, the Applicant will add a six (6) foot delineated pedestrian path where none exists now, while maintaining the 20-foot alley which will create a safer interaction between pedestrians and vehicles using this space.

At the T-intersection of the two public alleys, the Applicant proposes installing all-way stop signs and stop lines at each approach, installing mirrors to present utility poles to increase visibility, and installing textured pavement to make drivers aware of “shared space” with pedestrians.

In addition, a new sidewalk abutting the western side of the alley is proposed, which will extend from Massachusetts Avenue to the intersection of the alleys, where there is none under existing conditions. The presence of existing equipment and the Massachusetts Avenue Parking Shops (“MAPS”) structure on the western side of the alley will limit how far the sidewalk can extend. At the intersection of the alley with Massachusetts Avenue a stop sign will be added to the alley approach and a “Do Not Enter” sign will be removed to facilitate two-way circulation.

Figure 12 shows the conceptual alley intersection improvements. The proposed alley improvements are rarely seen in alleys in the District and are considered a significant infrastructure improvement as compared to existing conditions.

Existing Alley/Loading Operations

In addition to the typical traffic study elements outlined in DDOT’s CTR standards, this CTR includes a study of alley operations. The Applicant has chosen to undertake this effort in order to ensure that the proposed development’s garage and loading will function effectively given current traffic conditions in the public alley that the proposed development’s loading facilities and garage abut, as well as to address concerns expressed by neighbors of the project who use the public alley, particularly regarding the existing loading activities that take place there.

The alley operation study was conducted over two days from 6:00AM to 9:00PM on Tuesday, January 29, 2019 and Wednesday, January 30, 2019, totaling 30 hours of data. Over the course of the data collection, a total of 65 deliveries were observed, 48 deliveries in the north-south alley and 17 deliveries taking place curbside on Yuma Street, with the vast majority of deliveries taking place in the morning hours

(6:30AM to 9:30AM). Table 1 summarizes the observed loading operations in the north-south alley.

Table 1: Existing Alley Operations Summary Statistics

Statistic	Day 1	Day 2
	Tue. 1/29/2019 6:00AM-9:00PM	Wed. 1/30/2019 6:00AM-9:00PM
Total Deliveries	34	31
<i>To MAPS</i>	16	15
<i>To Existing Lady Bird Tenants</i>	18	16
Peak Hour	8:30AM - 9:30AM	6:30AM - 7:30AM
<i>Total Deliveries</i>	8	7

No incidences of alley blockages were observed over the two-day 30-hour study period due to the presence and operations of deliveries in the alley. The alley was empty of delivery vehicles approximately 55 percent of the time. The prevailing operations of the alley are aligned with commercial deliveries that primarily take place in the early hours of the morning outside of the expected peak hour of the proposed grocer on the Lady Bird site. The proposed Lady Bird development would vacate the existing retail tenants on its site and replace them with a full-service grocer that would use loading facilities that are internal to the proposed development. Thus, as a result of the redevelopment of the Lady Bird site, there will be a reduction in deliveries that currently take place in the alley or on Yuma Street of 52%.

The majority of delivery vehicles observed making deliveries (63 of 65 delivery vehicles) over the two-days of data collection were approximately 40-feet or less and were able to successfully navigate the alley while making a delivery. Two 50-foot tractor-trailers were observed making deliveries curbside on Yuma Street to existing tenants of the MAPS. Given the geometric constraints of the alley, the Applicant will continue coordinating with existing and future tenants of the MAPS to minimize the number of deliveries that are made curbside on Yuma Street.

Proposed improvements to the alley as part of the Lady Bird development include consolidating recycling and trash receptacles belonging to the MAPS, reducing the number of trucks that can be expected to service the alley and reducing the number of protruding objects in the alley. The Applicant has committed to implement improvements by widening the alley to a total width of 35 feet, to include a 12-foot trash enclosure, a 20-foot drive-aisle, and a three (3) foot delineated pedestrian path. The widening of the alley will be made



possible by the Applicant providing 10 feet (3 feet for the sidewalk and 7 feet for the paved alley) within the site to public use.

The Applicant is committed to working with the community, DDOT, and others nearby to ensure minimal impacts to existing alley operations. The alley operation study is included in the Technical Attachments.



Figure 7: Site Plan – Lower Level / G1 Floor Plan



Figure 8: Site Plan – Lower Level Residential Floor Plan



Figure 9: Site Plan – First Floor Plan

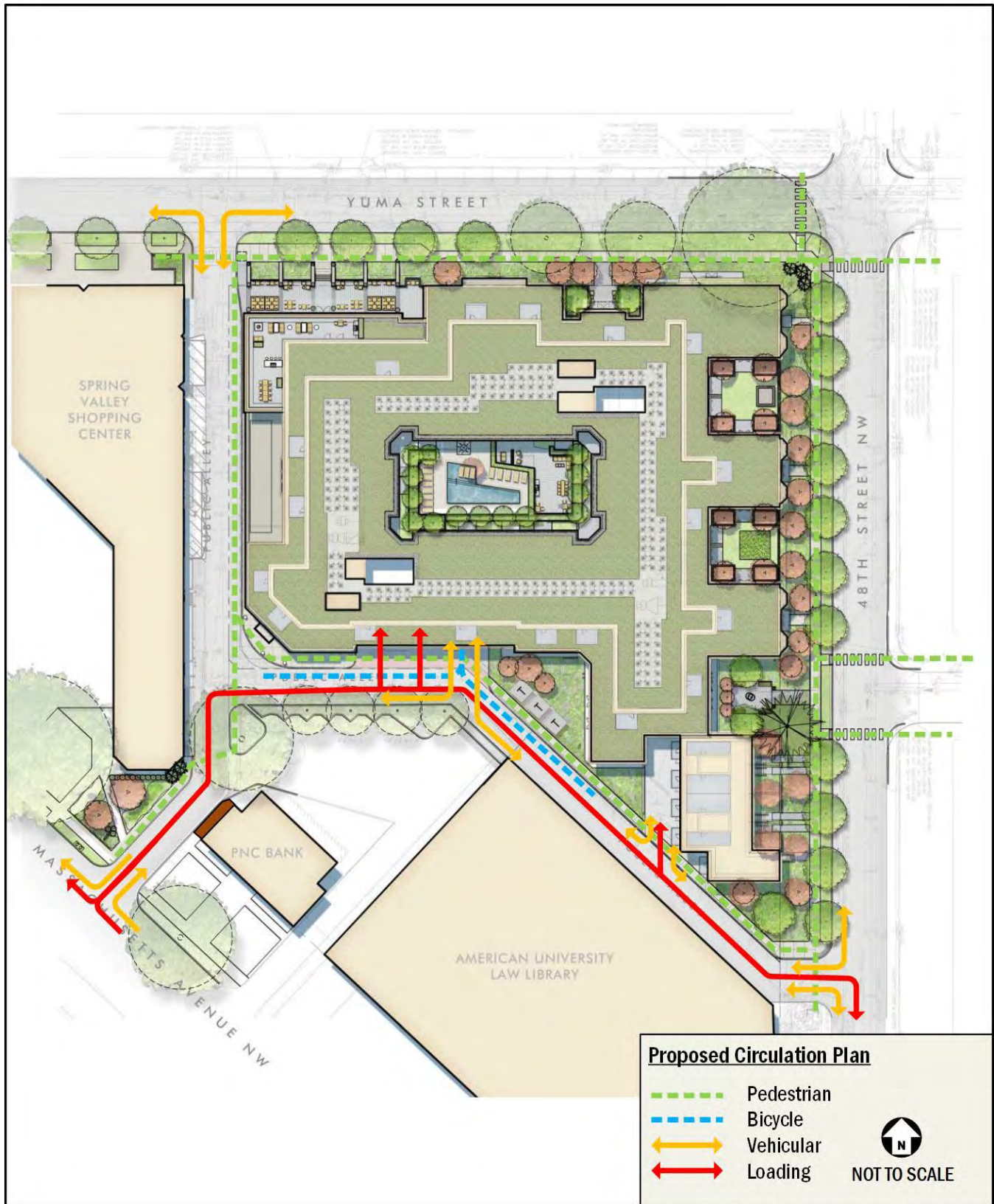


Figure 10: Circulation Plan



LOADING

Loading Facilities

The proposed loading facilities in the development are in compliance with the minimum loading requirements of 11-C DCMR § 901.1 and will accommodate all delivery demand.

Figure 7 shows the locations of the loading berths and service/delivery spaces.

The mixed-use building containing the 214 multifamily residential dwelling units and the 18,198 square feet of grocery/retail will contain two (2) 30-foot berths (one of which will contain a trash compactor), one (1) 55-foot berth, and one (1) 20-foot delivery space. The five (5) townhomes do not have a minimum loading requirement.

The proposed development is expected to generate approximately 13 truck trips per day. This includes daily trash removal services, mail and parcel delivery, produce delivery, retail delivery, and residential move-in and move-out trips. One (1) trash removal truck, two (2) mail and parcel delivery trucks, eight (8) grocery delivery trucks, one (1) general retail pick-up and delivery trucks, and approximately one (1) residential move-in or -out trucks (conservatively calculated using an average of 18 months average turnover per unit) will service the development on a daily basis. The loading facilities provided by the development will be sufficient to accommodate this demand.

Truck Routes

Truck routing to and from the site will be focused on designated primary truck routes, such as Massachusetts Avenue. The majority of truck restricted routes are to the east of the site on Yuma Street east of 48th Street, on 48th Street north of Yuma Street, on Windom Place, and on Warren Street. Of note, the segment of 49th Street to the west of the site that lies between Massachusetts Avenue and Yuma Street is restricted to trucks. As such, any outbound trucks from the development will exit onto 48th Street or Massachusetts Avenue via the alley. Turning maneuvers into and out of the site are shown in Figure 14, Figure 15, Figure 16, Figure 17, Figure 18, and Figure 19.

Loading Management Plan (LMP)

The Applicant has proposed the following measures to offset any potential impacts that the loading activities of the proposed development might have on the surrounding intersections and neighborhood:

- A loading dock manager will be designated by the building management. The dock manager will coordinate with vendors and tenants to schedule deliveries and will be on duty during delivery hours.
- All tenants will be required to schedule deliveries that utilize the loading docks – defined here as any loading operation conducted using a truck 20' in length or larger.
- Commercial deliveries will be scheduled between 7 AM – 7 PM (7 days a week), and discouraged from making deliveries after 4PM on weekdays
- Waste collection (both commercial & residential) allowed 7 AM – 4 PM (7 days a week)
- Residential move-ins/outs allowed 9 AM – 4 PM (7 days a week)
- The dock manager(s) will schedule deliveries such that the dock's capacity is not exceeded. In the event that an unscheduled delivery vehicle arrives while the dock is full, that driver will be directed to return at a later time when a berth will be available so as to not impede the drive aisle that passes in front of the loading dock.
- The dock manager(s) will monitor inbound and outbound truck maneuvers and will ensure that trucks accessing the loading dock do not block vehicular traffic except during those times when a truck is actively entering or exiting the alley.
- The loading manager(s) will monitor the alley to keep the designated loading areas clear for deliveries, keep the alley from being blocked due to vehicle loading/unloading activity, and enforce the no parking restrictions.
- Trucks using the loading dock will not be allowed to idle and must follow all District guidelines for heavy vehicle operation including but not limited to DCMR 20 – Chapter 9, Section 900 (Engine Idling), the regulations set forth in DDOT's Freight Management and Commercial Vehicle Operations document, and the primary access routes listed in the DDOT Truck and Bus Route System.
- The Applicant has agreed to continue coordination with DDOT and Massachusetts Avenue Parking Shops (Lot 802 and 803) regarding loading operations for the Massachusetts Avenue Parking Shops site.
- All trash bins and dumpsters belonging to Massachusetts Avenue Parking Shops (Lot 802 and 803) currently located along Yuma Street NW will be relocated to the alley and placed in the proposed enclosures.
- Trucks traveling to the Massachusetts Avenue Parking Shops will be directed not to pick-up or drop-off on Yuma



Street NW and will be directed to use the rear alley network.

PARKING

Based on current District zoning laws, the following outlines the vehicular parking requirements for all land uses of the development:

- Residential, Multifamily
1 space per 3 dwelling units in excess of 4 dwelling units, amounting to a minimum requirement of 70 spaces; and
- Residential, Single Dwelling Unit
1 space per principal dwelling unit, amounting to a minimum requirement of 5 spaces; and
- Grocer/Retail
1.33 spaces per 1,000 square feet in excess of 3,000 square feet, amounting to a minimum requirement of 20 spaces

American University Covenant

An existing covenant between American University and the site lot requires the Lady Bird development to carry forth 236 non-exclusive parking spaces for the use of American University. American University has agreed to lease 180 parking spaces back to the Applicant, reducing the number of spaces available to American University pass holders to 56 parking spaces.

The 56 parking spaces will be available to parking pass holders of American University, in addition to the 269 parking spaces already available in the below-grade parking garage belonging to the AU Administrative Building. As of June 2019, a monthly parking pass at American University costs \$126.

Proposed Parking Allocation

Three levels of below-grade parking will contain 370 total parking spaces. The first level of parking will contain approximately 86 parking spaces that are intended to be devoted to the grocery/retail use. The second level of parking will contain approximately 177 parking spaces, 121 spaces of which will be for residential use and 56 parking spaces for monthly parking pass holders from American University. The third level of parking contain approximately 107 residential parking spaces. Parking is planned to be priced at the market-rate. Table 2 summarizes distribution of parking spaces and user groups in the proposed development.

Table 2: Summary of Proposed Parking

Level	Parking Spaces	User Group
G1	86 spaces	Grocery/Retail
G2	121 spaces	Residential
G3	56 spaces	American University Parking*
G3	107 spaces	Residential
Total	370 spaces	

*parking for monthly pass holders from American University

Parking Management Plan (PMP)

A Parking Management Plan (PMP) was prepared by the Applicant in order to provide greater detail regarding layout of the garage, parking access and controls, car-share parking, the American University Administrative Building overflow parking agreement considerations, parking rates, bicycle parking, and enforcement. The Applicant is working with DDOT to finalize the PMP. A draft of the PMP is included in the Technical Attachments.

Electric Vehicle (EV) Parking

As part of the proposed development, the Applicant will install electric vehicle (EV) charging stations to serve eight (8) parking spaces.

BICYCLE AND PEDESTRIAN FACILITIES

Bicycle Facilities

Based on current District zoning laws, the following outlines the bicycle parking requirements for all land uses of the development:

- Residential, Multifamily
1 short-term space per 20 dwelling units, amounting to a minimum requirement of 11 short-term spaces; and 1 long-term space per 3 dwelling units, amounting to a minimum requirement of 61 long-term spaces. Please note that after the first 50 bicycle parking spaces are provided for a use, additional spaces are required at one-half (0.5) the ratio specified.
- Residential, Single Dwelling Unit
No short-term or long-term bicycle spaces are required for this use.
- Grocer/Retail
1 short-term space per 3,500 square feet, amounting to a minimum requirement of 5 short-term spaces; and 1 long-term space per 10,000 square feet, amounting to a minimum requirement of 2 long-term spaces.



The project will include 27 short-term bicycle spaces at street level along the perimeter of the site on 48th Street, Yuma Street, and along the segment of public alley to the south of the site. These short-term spaces will include inverted U-racks placed in high-visibility areas. The Applicant is working in conjunction with DDOT to select locations for the racks in public space.

The project will also include secure long-term bicycle parking. The plans identify a total of 83 long-term spaces in two separate areas located in the first level of the below-grade parking garage. The first storage and maintenance space will house 77 long-term bicycle spaces for residents of the proposed development. The second storage space will house six (6) long-term bicycle spaces for use of the grocery/retail employees so that they may store their bicycles securely.

The 83 secure long-term bicycle parking spaces will exceed the amount of bicycle parking that is required by Zoning Regulations.

Pedestrian Facilities

As discussed previously, pedestrian facilities will be improved around the site. As part of the development, pedestrian facilities around the perimeter of the site will be improved to meet DDOT and ADA standards. This includes sidewalks that meet or exceed the width requirements, crosswalks at all necessary locations, and curb ramps with detectable warnings.

As a result of the development, pedestrian facilities along the perimeter of the site will be improved by the removal of two existing curb cuts and improving sidewalks adjacent to the site such that they meet or exceed DDOT requirements. In addition, the Applicant has committed to make a number of significant pedestrian related improvements to the alley, and to upgrade substandard curb ramps, stripe missing crosswalks, and install curb extensions at four (4) proximate intersections (subject to DDOT approval). In addition, the Applicant has committed to fund and construct a High-intensity Activated crossWalk (HAWK) signal on Massachusetts Avenue between 48th Street and 49th Street, subject to DDOT approval. Figure 13 shows the planned streetscape and pedestrian improvements to the area surrounding the project.

TRANSPORTATION DEMAND MANAGEMENT (TDM)

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.

The Transportation Demand Management (TDM) plan for the Lady Bird development is based on the DDOT expectations for TDM programs. The Applicant proposes the following TDM measures:

Overall Site (excluding townhomes)

- The Applicant will fund a new HAWK (High-Intensity Activated crosswalk) signal on Massachusetts Avenue between 48th Street and 49th Street, pending DDOT approval.
- The Applicant will fund and construct pedestrian network improvements in the immediate vicinity of the site to encourage walking and offset the impacts of being over-parked. Specifically, upgrade substandard curb ramps, stripe missing crosswalks, and install curb extensions, subject to DDOT approval, at the following intersections:
 - a. 49th Street and Yuma Street NW
 - b. 48th Street and Yuma Street NW
 - c. 48th Street and Windom Place NW
 - d. 48th Street and Warren Street NW
- The Applicant will exceed Zoning requirements to provide bicycle parking/storage facilities at the proposed development. This includes secure parking located on-site and short-term bicycle parking around the perimeter of the site.
- The Applicant will provide bicycle repair stations in each of the long-term bicycle storage facilities.
- The Applicant will dedicate four (4) parking spaces in the below-grade parking garage for car-sharing services to use with right of first refusal. If an agreement has not been reached with a car sharing service to occupy the four (4) dedicated car sharing spaces in the garage, then the Applicant will provide an additional year of Capital Bikeshare memberships to new residents.
- No free parking shall be offered to any resident, employee, student, or otherwise. Only daily, weekly, and monthly rates will be made available for purchase.
- The Applicant will work with DDOT and goDCgo (DDOT's TDM program) to implement TDM measures at the site.
- The Applicant will share the full contact information of the TDM Leaders for the site with DDOT and goDCgo (info@godcgo.com).



- The Applicant will post all TDM commitments online for easy reference.

Multifamily Residential

- The Applicant will identify TDM Leaders (for planning, construction, and operations). The TDM Leaders will work with residents in the development to distribute and market various transportation alternatives and options.
- The Applicant will provide TDM materials to new residents in the Residential Welcome Package materials.
- The Applicant will install a Transportation Information Center Display (electronic screen) within the residential lobby containing information related to local transportation alternatives.
- The Applicant will offer either a one-year membership to Capital Bikeshare or a one-year membership to a car-sharing service to each residential unit for the initial lease up of each unit.
- The Applicant will restrict residents of the building from obtaining a Residential Parking Permit (“RPP”), with penalty of lease termination.
- The Applicant will provide one (1) shopping cart for grocery shopping and running errands for every 30 residential dwelling units.
- The Applicant will unbundle the cost of residential parking from the cost of lease or purchase of each unit. Unbundled cost of parking will be based at a minimum on the average market rate within a quarter mile.
- The Applicant will provide \$100,000 on means for connecting residents to the Tenleytown Metro station through shuttle or geofence with ride hailing services

Grocery/Retail

- The Applicant will identify TDM Leaders (for planning, construction, and operations). The TDM Leaders will work with grocery/retail employees in the development to distribute and market various transportation alternatives and options.
- The Applicant will provide residents and grocery/retail employees who wish to carpool with detailed carpooling information and will be referred to other carpool matching services sponsored by the Metropolitan Washington Council of Governments (MWCOG).

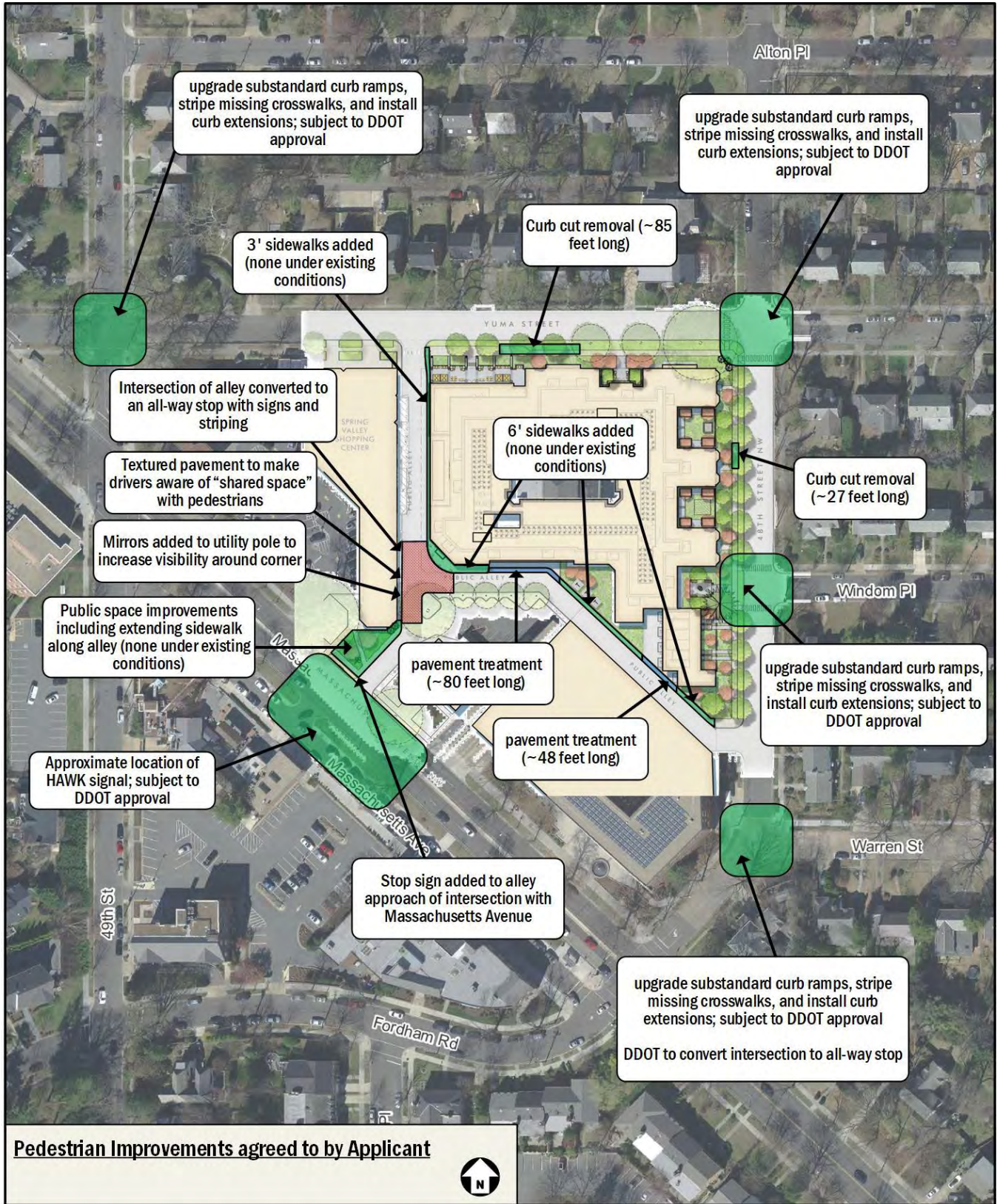


Figure 13: Pedestrian Improvements agreed to by Applicant

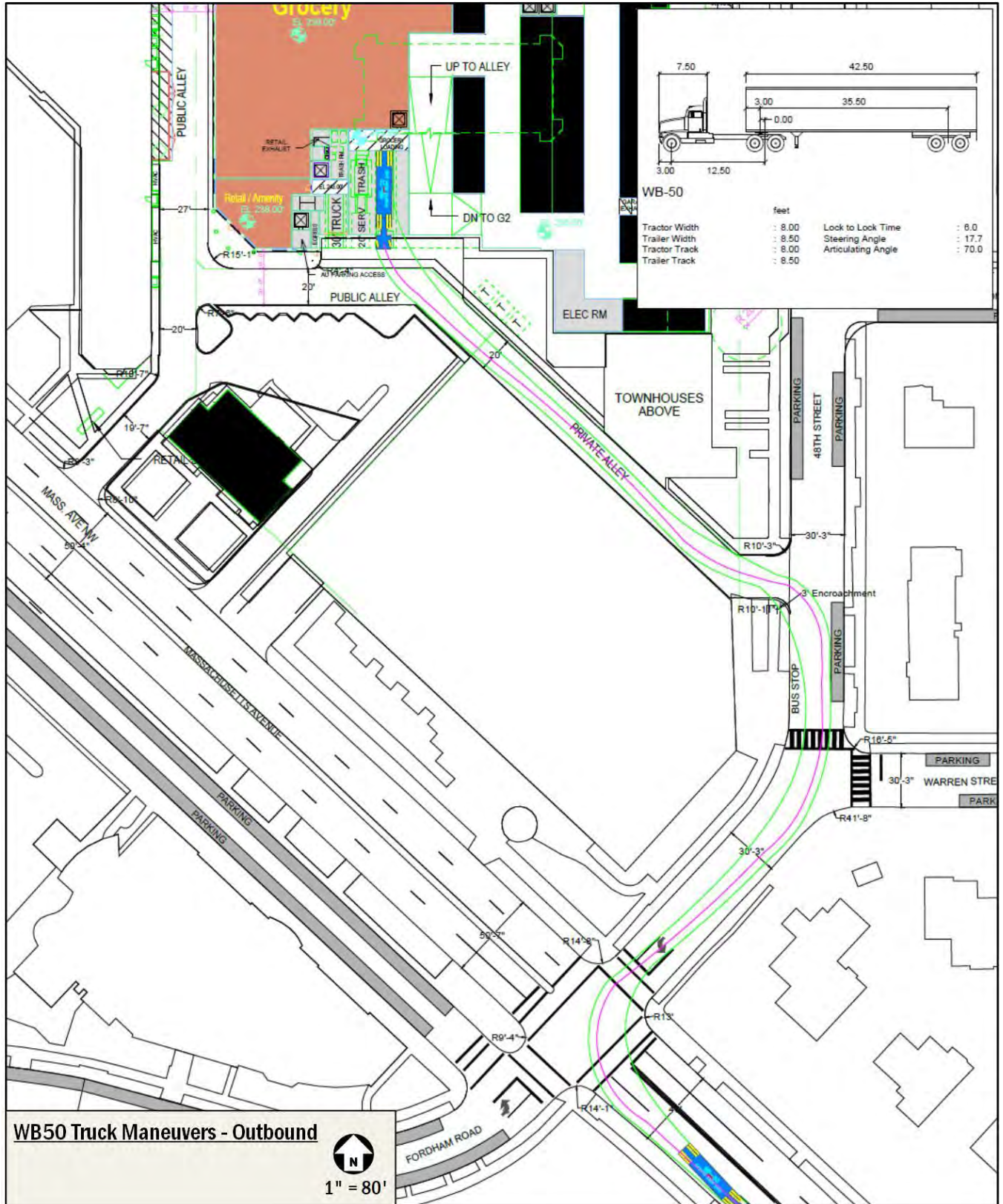


Figure 15: WB50 Truck Maneuvers – Outbound

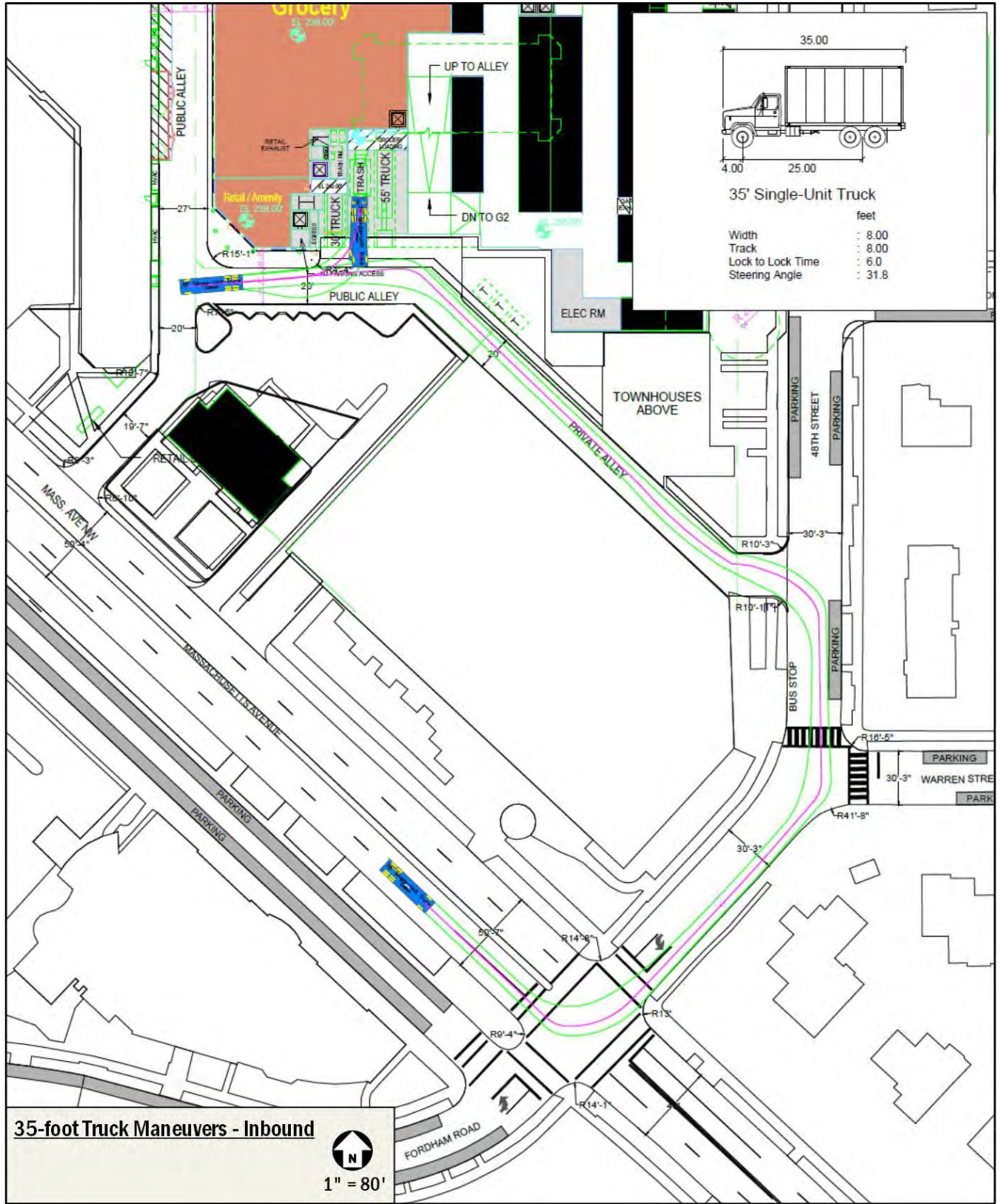


Figure 16: 35-foot Truck Maneuvers – Inbound

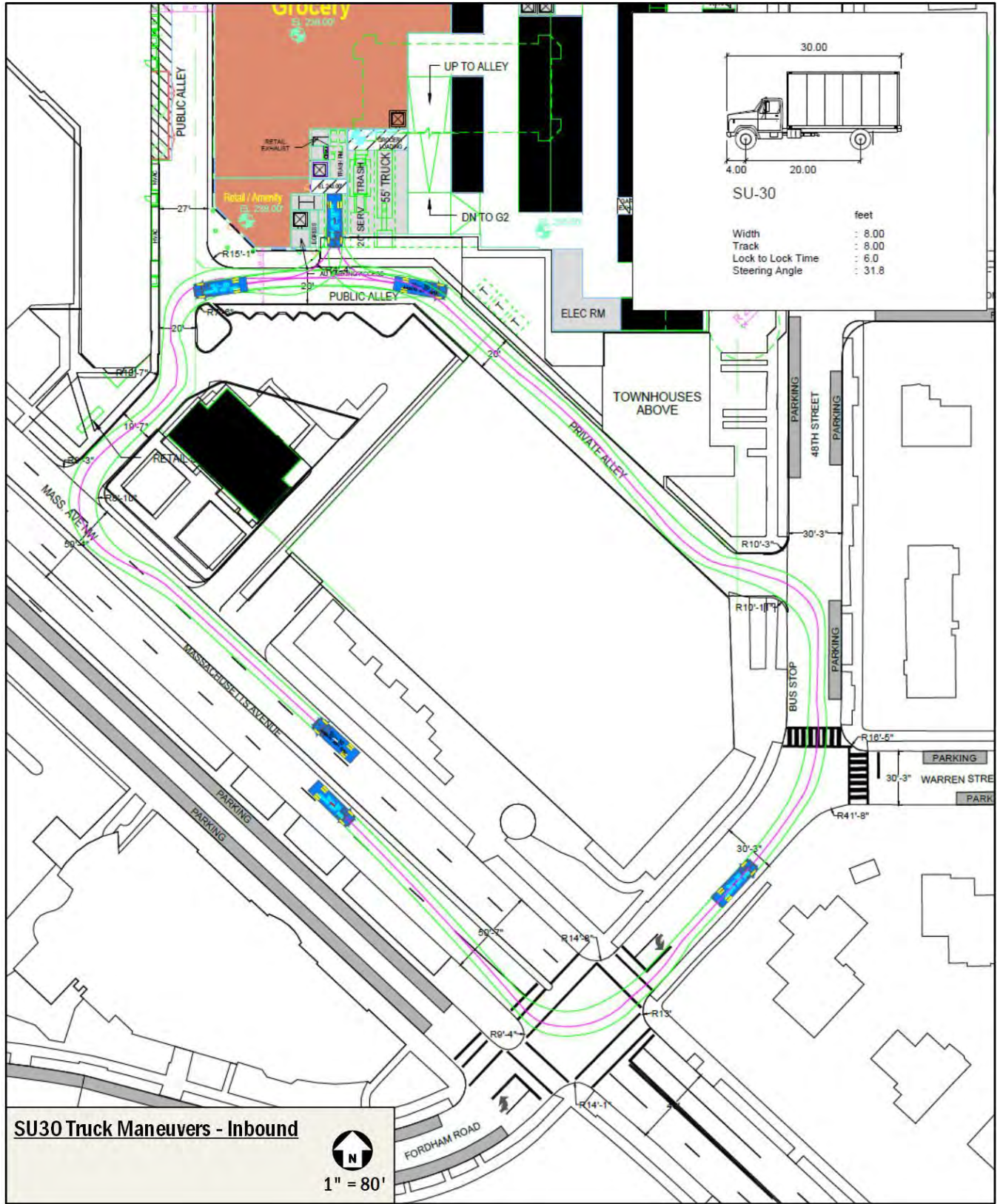


Figure 18: SU30 Truck Maneuvers – Inbound



TRAVEL DEMAND ASSUMPTIONS

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

Two trip generation scenarios are presented below. The first assumes a ‘worst case’ trip generation scenario with significantly higher auto mode splits than Census data suggests due to the relatively high parking ratio. The second assumes an auto mode split that is more in line with Census data and is more likely to materialize. The capacity analysis that was conducted as part of this CTR uses the first trip generation scenario, which is more conservative.

MODE SPLIT METHODOLOGY

Mode split (also called mode share) is the percentage of travelers using a particular type (or mode) of transportation when traveling. The main source of mode split information for this report was based on Census data using Census Tracts, Transportation Analysis Zones (TAZs), and data contained in the WMATA Ridership Survey.

Residential Mode Splits

Residential mode splits were primarily based on Census data at the Census Tract and TAZ level for residents that live near the site. Figure 20 shows the Census Tracts used in this analysis in relation to the proposed development and Figure 21 shows the TAZs used in the analysis in relation to the proposed development. Table 3 summarizes the data that was used to establish residential mode split assumptions for this report.

Table 3: Summary of Residential Mode Split Data

Information Source	Mode				
	Auto	Transit	Bike	Walk	Telecommute/Other
Census Data - Census Tract (10.01/9.01)	46%	27%	5%	8%	14%
CTPP - TAZ Residents (10096)	60%	25%	9%	2%	4%
State of the Commute (of District residents)	48%	41%	11%		---
WMATA Ridership Survey (residential sites inside the Beltway)	39%	49%	14%		---

Grocery/Retail Mode Splits

Grocery/retail mode splits were primarily based on information contained in WMATA’s 2005 *Development-Related Ridership Survey* and mode splits used for grocery uses of nearby developments that have recently been studied. Figure 20 shows the Census Tracts used in this analysis in relation to the proposed development and Figure 21 shows the TAZs used in the analysis in relation to the proposed development. Table 4 summarizes the data that was used to establish the grocery/retail mode split assumptions for this report.

Table 4: Summary of Grocery Mode Split Data

Information Source	Mode				
	Auto	Transit	Bike	Walk	Other
WMATA Ridership Survey (Ballston Common)	43%	30%	27%		---
WMATA Ridership Survey (Crystal City - Plaza Shops)	24%	41%	35%		---
WMATA Ridership Survey (Silver Spring N'hood Center)	67%	19%	14%		---

The mode split assumptions for the residential and grocery/retail components of the proposed development that were used in the capacity analysis contained in this report are shown in Table 5. These mode splits were adjusted to reflect the amount of parking provided by the development and adjusted to account for the site’s proximity to Metrorail.

Please note that the 90% auto mode splits shown in Table 5 that are used as a basis for analysis are significantly higher than Census data for the area surrounding the proposed development would suggest and represents a “worst case” scenario.

Table 5: Summary of Mode Split Assumptions

Land Use	Mode			
	Auto	Transit	Bike	Walk
Residential	90%	5%	2%	3%
Grocer/Retail	90%	0%	2%	8%



TRIP GENERATION METHODOLOGY

Traditionally, weekday and Saturday peak hour trip generation is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 10th Edition. This methodology was supplemented to account for the urban nature of the site (the *Trip Generation Manual* provides data for non-urban, low transit use sites) and to generate trips for multiple modes, as vetted and approved by DDOT.

Residential trip generation for the 214 multifamily residential dwelling units was calculated based on ITE land use 221, Multifamily Mid Rise, splitting trips into different modes using assumptions outlined in the mode split section of this report.

Residential trip generation for the five (5) townhomes was calculated based on ITE land use 220, Multifamily Low Rise, splitting trips into different modes using assumptions outlined in the mode split section of this report.

Grocery/retail trip generation was calculated based on ITE land use 850, Supermarket, splitting trips into different modes using the assumptions outlined in the mode split section of this report. Trip generation for the retail component of the site was calculated using the same trip generation rate as the grocery component, which results in a higher more conservative trip generation than using the traditional retail trip generation rate.

A summary of the multimodal trip generation for the overall development is provided in Table 6 for the weekday morning, weekday afternoon, and Saturday peak hours. Detailed trip generation calculations are included in the Technical Attachments.

A second trip generation scenario is shown in Table 7, which assumes a lower auto mode split (70% vs 90%), is more in line with Census data, and is more likely to materialize. This trip generation scenario is for illustrative purposes only and was not used for capacity analysis.

Trip Generation of Existing Uses on Site

There is approximately 24,114 square feet of existing grocery space and 19,990 square feet of existing retail space on the site of the proposed development. Table 8 shows a comparison of the auto trip generation for the proposed development and of the existing uses on site for the weekday morning, weekday afternoon, and Saturday peak hours, as if the existing retail was

fully occupied. As can be seen the proposed development program would result in 31 additional vehicular trips in the weekday morning peak hour, 108 fewer vehicular trips in the weekday afternoon peak hour, and 121 fewer vehicular trips in the Saturday peak hour, when compared to existing uses on-site. Detailed trip generation calculations are included in the Technical Attachments.



Table 6: Multi-Modal Trip Generation Summary Used in Analysis (assuming 90% Auto Mode Split)

Mode	Land Use	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Auto	Residential	18 veh/hr	50 veh/hr	68 veh/hr	53 veh/hr	34 veh/hr	87 veh/hr	45 veh/hr	46 veh/hr	91 veh/hr
	Grocery/Retail	37 veh/hr	26 veh/hr	63 veh/hr	100 veh/hr	96 veh/hr	196 veh/hr	87 veh/hr	82 veh/hr	169 veh/hr
	Total	55 veh/hr	76 veh/hr	131 veh/hr	153 veh/hr	130 veh/hr	283 veh/hr	132 veh/hr	128 veh/hr	260 veh/hr
Transit	Residential	1 ppl/hr	3 ppl/hr	4 ppl/hr	3 ppl/hr	2 ppl/hr	5 ppl/hr	3 ppl/hr	3 ppl/hr	6 ppl/hr
	Grocery/Retail	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr
	Total	1 ppl/hr	3 ppl/hr	4 ppl/hr	3 ppl/hr	2 ppl/hr	5 ppl/hr	3 ppl/hr	3 ppl/hr	6 ppl/hr
Bike	Residential	0 ppl/hr	2 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr
	Grocery/Retail	2 ppl/hr	1 ppl/hr	3 ppl/hr	4 ppl/hr	4 ppl/hr	8 ppl/hr	4 ppl/hr	3 ppl/hr	7 ppl/hr
	Total	2 ppl/hr	3 ppl/hr	5 ppl/hr	5 ppl/hr	5 ppl/hr	10 ppl/hr	5 ppl/hr	4 ppl/hr	9 ppl/hr
Walk	Residential	1 ppl/hr	2 ppl/hr	3 ppl/hr	2 ppl/hr	1 ppl/hr	3 ppl/hr	2 ppl/hr	1 ppl/hr	3 ppl/hr
	Grocery/Retail	6 ppl/hr	4 ppl/hr	10 ppl/hr	16 ppl/hr	16 ppl/hr	32 ppl/hr	14 ppl/hr	13 ppl/hr	27 ppl/hr
	Total	7 ppl/hr	6 ppl/hr	13 ppl/hr	18 ppl/hr	17 ppl/hr	35 ppl/hr	16 ppl/hr	14 ppl/hr	30 ppl/hr

Table 7: Multimodal Trip Generation Summary (assuming 70% Auto Mode Split)

Mode	Land Use	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Auto	Residential	14 veh/hr	40 veh/hr	54 veh/hr	42 veh/hr	25 veh/hr	67 veh/hr	35 veh/hr	36 veh/hr	71 veh/hr
	Grocery/Retail	29 veh/hr	20 veh/hr	49 veh/hr	77 veh/hr	76 veh/hr	153 veh/hr	68 veh/hr	63 veh/hr	131 veh/hr
	Total	43 veh/hr	60 veh/hr	103 veh/hr	119 veh/hr	101 veh/hr	220 veh/hr	103 veh/hr	99 veh/hr	202 veh/hr
Transit	Residential	3 ppl/hr	11 ppl/hr	14 ppl/hr	11 ppl/hr	6 ppl/hr	17 ppl/hr	9 ppl/hr	9 ppl/hr	18 ppl/hr
	Grocery/Retail	11 ppl/hr	8 ppl/hr	19 ppl/hr	30 ppl/hr	30 ppl/hr	60 ppl/hr	26 ppl/hr	25 ppl/hr	51 ppl/hr
	Total	14 ppl/hr	19 ppl/hr	33 ppl/hr	41 ppl/hr	36 ppl/hr	77 ppl/hr	35 ppl/hr	34 ppl/hr	69 ppl/hr
Bike	Residential	0 ppl/hr	2 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr
	Grocery/Retail	2 ppl/hr	1 ppl/hr	3 ppl/hr	4 ppl/hr	4 ppl/hr	8 ppl/hr	4 ppl/hr	3 ppl/hr	7 ppl/hr
	Total	2 ppl/hr	3 ppl/hr	5 ppl/hr	5 ppl/hr	5 ppl/hr	10 ppl/hr	5 ppl/hr	4 ppl/hr	9 ppl/hr
Walk	Residential	3 ppl/hr	9 ppl/hr	12 ppl/hr	10 ppl/hr	5 ppl/hr	15 ppl/hr	7 ppl/hr	9 ppl/hr	16 ppl/hr
	Grocery/Retail	10 ppl/hr	7 ppl/hr	17 ppl/hr	26 ppl/hr	26 ppl/hr	52 ppl/hr	23 ppl/hr	21 ppl/hr	44 ppl/hr
	Total	13 ppl/hr	16 ppl/hr	29 ppl/hr	36 ppl/hr	31 ppl/hr	67 ppl/hr	30 ppl/hr	30 ppl/hr	60 ppl/hr

Table 8: Comparison of Vehicular Trip Generation of Existing On-Site Uses and Proposed Development Program

Development Program	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Existing On-Site Uses	60 veh/hr	40 veh/hr	100 veh/hr	195 veh/hr	196 veh/hr	391 veh/hr	195 veh/hr	186 veh/hr	381 veh/hr
Proposed Uses	55 veh/hr	76 veh/hr	131 veh/hr	153 veh/hr	130 veh/hr	283 veh/hr	132 veh/hr	128 veh/hr	260 veh/hr
Change	-5 veh/hr	36 veh/hr	31 veh/hr	-42 veh/hr	-66 veh/hr	-108 veh/hr	-63 veh/hr	-58 veh/hr	-121 veh/hr

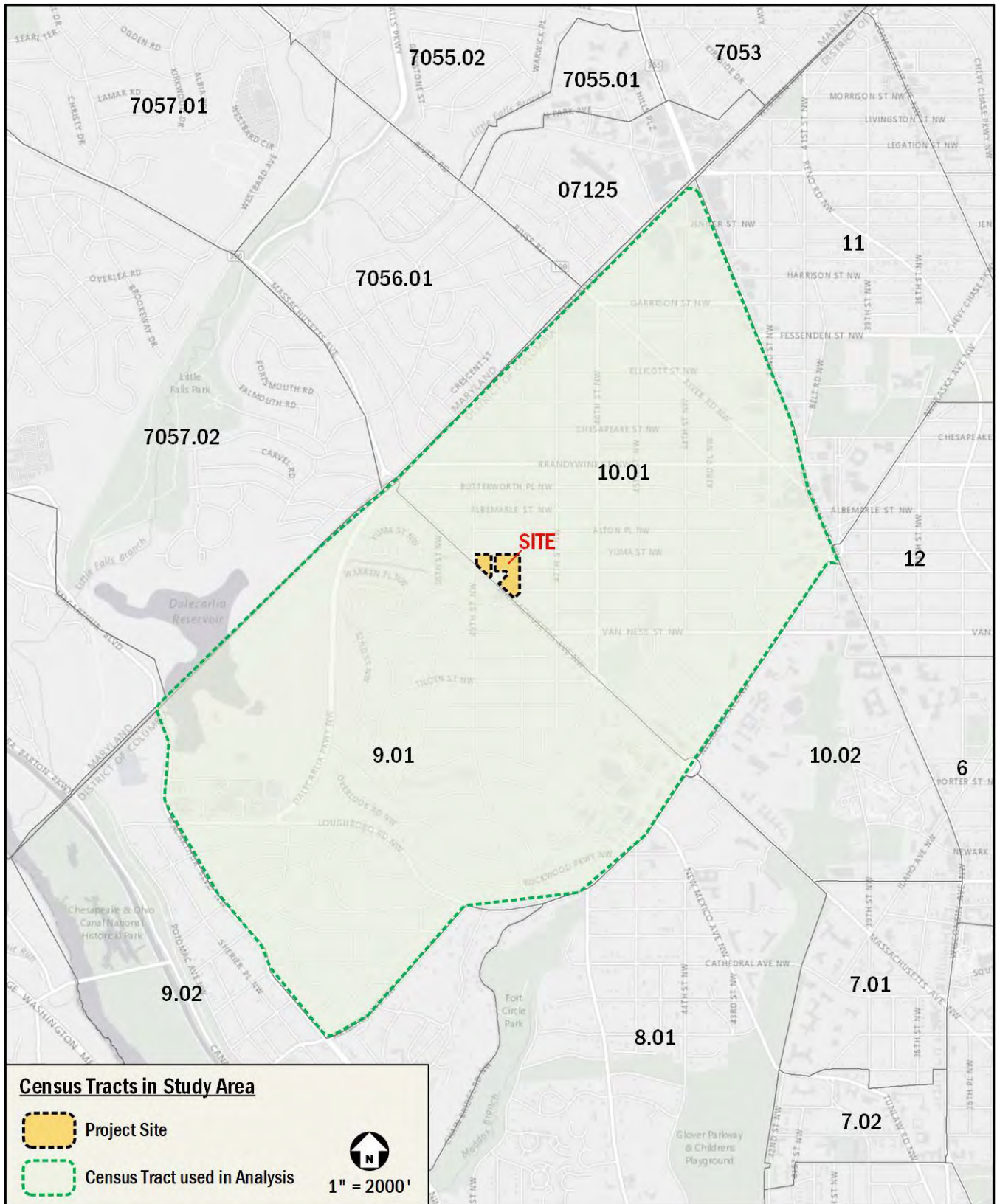


Figure 20: Census Tracts in Study Area

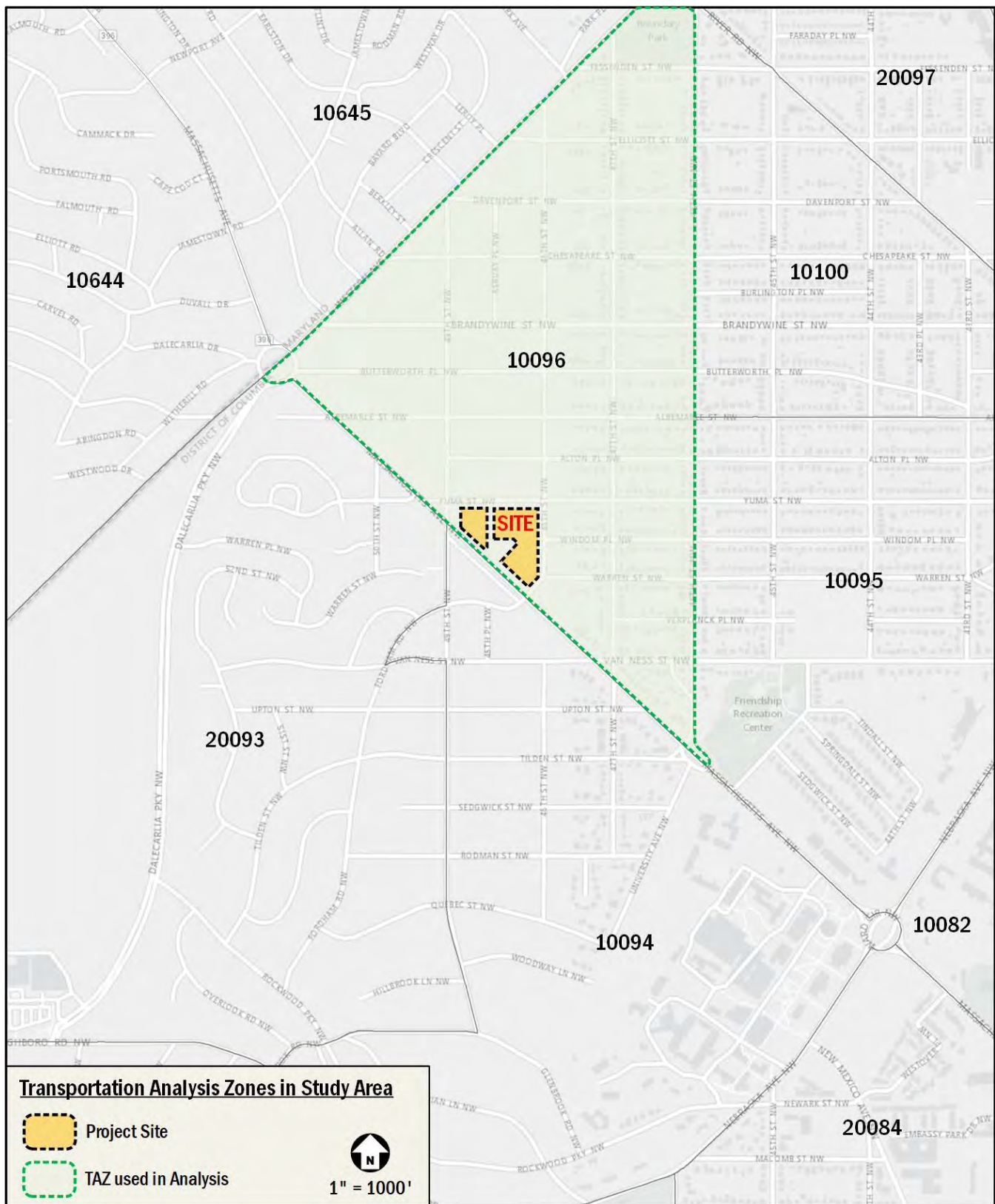


Figure 21: Transportation Analysis Zones in Study Area



TRAFFIC OPERATIONS

This chapter provides a summary of an analysis of the existing and future roadway capacity in the study area. Included is an analysis of potential vehicular impacts of the Lady Bird development and a discussion of potential improvements.

The purpose of the capacity analysis is to:

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

The capacity analysis focuses on the weekday morning and weekday afternoon peak hours, as determined by the existing traffic volumes in the study area. The scope of the capacity analysis was developed based on DDOT guidelines and agreed to by DDOT staff.

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

- The capacity analyses show a LOS E or F at an intersection or along an approach in the future conditions with the proposed development where one does not exist in the background conditions without development;
- There is an increase in delay at any approach or overall intersection operating under LOS E or F of greater than 5 percent when compared to the background conditions; or
- There is an increase in the 95th percentile queues by more than 150 feet at an intersection or along an approach in the future conditions with the proposed development where one does not exist in the background scenario.

The following conclusions are reached within this chapter:

- The existing study area intersections operate at an acceptable level of service during all analysis scenarios for both the weekday morning and weekday afternoon peak hours.
- Existing areas of concern for roadway capacity are primarily focused along the heavily trafficked commuter routes such as Massachusetts Avenue.

- The addition of trips generated by background developments and inherent growth on the study area roadways slightly increase the levels of delay and queuing, but not to unacceptable levels.
- There are no study intersections that operate at an unacceptable level of service as a result of the proposed development.
- Overall, this report concludes that the project will not have a detrimental impact to the surrounding vehicular network.

STUDY AREA, SCOPE, & METHODOLOGY

This section outlines the vehicular trips generated in the study area along the vehicular access routes and defines the analysis assumptions.

The scope of the analysis contained within this report was extensively discussed with and agreed to with DDOT. The general methodology of the analysis follows national and DDOT guidelines on the preparation of transportation impact evaluations of site development.

Capacity Analysis Scenarios

The vehicular capacity analyses are performed to determine if the proposed development will lead to adverse impacts on traffic operations. A review of impacts to each of the other modes is outlined later in this report. This is accomplished by comparing future scenarios: (1) without the proposed development (referred to as the Background condition) and (2) with the development approved and constructed (referred to as the Future condition).

Specifically, the roadway capacity analysis examined the following scenarios:

1. 2019 Existing Conditions
2. 2024 Future Conditions without the development (2024 Background)
3. 2024 Future Conditions with the development (2024 Future)

Study Area

The study area of the analysis is a set of intersections where detailed capacity analyses were performed for the scenarios listed above. The set of intersections decided upon during the study scoping process with DDOT are those intersections most likely to have potential impacts or require changes to traffic



operations to accommodate the proposed development. Although it is possible that impacts will occur outside of the study area, those impacts are not significant enough to be considered a detrimental impact nor worthy of mitigation measures.

Based on the projected future trip generation and the location of the site access points, the following intersections were chosen and agreed upon by DDOT for analysis:

1. Massachusetts Avenue/50th Street NW
2. Massachusetts Avenue/Yuma Street NW (western side of Massachusetts Avenue)
3. Massachusetts Avenue/Yuma Street NW (eastern side of Massachusetts Avenue)
4. Massachusetts Avenue/49th Street NW
5. Massachusetts Avenue NW/Alley
6. Massachusetts Avenue/48th Street/Fordham Road NW
7. Massachusetts Avenue/Van Ness Street NW
8. Yuma Street/49th Street NW
9. Yuma Street NW/Alley
10. Yuma Street/48th Street NW
11. Windom Place/48th Street NW
12. 48th Street NW/Alley
13. Warren Street/48th Street NW
14. Fordham Road/49th Street NW
15. Albemarle Street/49th Street NW
16. Albemarle Street/48th Street NW
17. Yuma Street/46th Street NW

Figure 22 shows a map of the study area intersections.

Traffic Volume Assumptions

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

Existing Traffic Volumes

The existing traffic volumes are comprised of turning movement count data, which was collected on Tuesday, March 29, 2019 from 6:30 AM to 9:30 AM and 4:00 PM to 7:00 PM. The results of the traffic counts are included in the Technical Attachments. The existing peak hour traffic volumes are shown on Figure 23 and Figure 24. For all intersections, the individual morning and afternoon peak hours were used.

Weekday and Saturday Traffic Volume Comparison

As shown in Table 6 in the Trip Generation section of this report, the most intensive peak hour trip generation for the

proposed development occurs during the weekday PM peak hour (131 veh/hr in the AM peak hour, 283 veh/hr in the PM peak hour, and 260 veh/hr in the Saturday peak hour).

As agreed to by DDOT, in order to determine whether a Saturday peak hour capacity analysis would be needed, spot counts were taken at the intersections of 48th Street and Massachusetts Avenue, and 49th Street and Massachusetts Avenue on Saturday, March 30, 2019 from 11:00 AM to 2:00 PM. If the overall peak hour volumes going through these intersections was higher on Saturday than the overall peak hour volumes going through these intersections during either the AM peak hour or PM peak hour then a Saturday peak hour capacity analysis would be conducted as part of this report.

A comparison of the peak hour volumes is shown in Table 9. The results of the peak hour volume comparison show that vehicular volumes during the weekday AM peak hour and PM peak hour at the intersection of 48th Street and Massachusetts Avenue, and 49th Street and Massachusetts Avenue are higher than the Saturday peak hour volumes at those intersections. As such, the capacity analysis in this report will not include the Saturday peak hour.

Table 9: Comparison of Peak Hour Volumes

Intersection	AM Peak Hour (8:00-9:00AM)	PM Peak Hour (5:30-6:30PM)	Sat Peak Hour (12:45-1:45PM)
48 th St & Mass Ave	1816 vehicles	2007 vehicles	1532 vehicles
49 th St & Mass Ave	2003 vehicles	2159 vehicles	1708 vehicles

2024 Background Traffic Volumes (without the project)

The traffic projections for the 2024 Background conditions consist of the existing volumes with two additions:

- Traffic generated by developments expected to be completed prior to the project (known as background developments); and
- Inherent growth on the roadway (representing regional traffic growth).

Following national and DDOT methodologies, a background development must meet the following criteria to be incorporated into the analysis:



- Be located in the study area, defined as having an origin or destination point within the cluster of study area intersections;
- Have entitlements; and
- Have a construction completion date prior or close to the proposed development.

Based on these criteria, and as discussed previously, one development was included in the 2024 Background scenario. This development is the Spring Valley Shopping Center Expansion. Although the Spring Valley Shopping Center Expansion was partially constructed and occupied at the time counts were collected, this analysis included the Spring Valley Shopping Center as if it were unoccupied, which is more conservative.

Trip generation for the Spring Valley Shopping Center Expansion was calculated based on the Institute of Transportation Engineers' *Trip Generation Manual*, 10th Edition, with mode splits based on information contained in WMATA's 2005 *Development-Related Ridership Survey* and mode splits used for nearby developments that have recently been studied. Trip distribution assumptions was based on those determined for the Lady Bird development and altered where necessary based on anticipated travel patterns. Mode split and trip generation assumptions for the Spring Valley Shopping Center Expansion are shown Table 10.

While the background developments represent local traffic changes, regional traffic growth is typically accounted for using growth rates. The growth rates used in this analysis are derived using the Metropolitan Washington Council of Government's (MWCOCG) currently adopted regional transportation model, comparing the difference between the year 2019 and 2025 model scenarios as vetted and agreed to by DDOT. The growth rates observed in this model served as a basis for analysis assumptions, and where negative growth was observed, a conservative 0.10 percent annual growth rate was applied to the roadway. The applied growth rates are shown in Table 11. Figures showing the traffic volumes generated by the inherent regional traffic growth are included in the Technical Attachments.

The traffic volumes generated by background developments and by the inherent growth along the network were added to the existing traffic volumes in order to establish the 2024

Background traffic volumes. The traffic volumes for the 2024 Background conditions are shown on Figure 25 and Figure 26.

2024 Total Future Traffic Volumes (with the project)

The 2024 Total Future traffic volumes consist of the 2024 Background volumes with the addition of the traffic volumes generated by the proposed development (site-generated trips). Thus, the 2024 Total Future traffic volumes include traffic generated by: the existing volumes, background developments, the inherent growth on the study area roadways, and the proposed project.

Trip distribution for the site-generated trips was determined based on: (1) CTPP TAZ data, (2) existing and future travel patterns in the study area, and (3) the location of the underground parking garage of the development. Trip distributions were extensively vetted and agreed to by DDOT.

The residential trip distribution was significantly influenced by the CTPP TAZ flow data for drivers commuting from the site's TAZ and adjusted based on traffic volumes and patterns. The origin of outbound and destination of inbound residential vehicular trips was the below-grade parking garage of the Lady Bird development.

The grocery and retail trip distribution was primarily based on the locations and proximity of other full-service grocers. Thus, the grocery and retail trip distribution is weighted more towards nearby residential areas than regional origins. The origin of outbound and destination of inbound grocery and retail vehicular trips was the below-grade parking garage of the Lady Bird development.

Based on this review and the site access locations, the site-generated trips were distributed through the study area intersections. A summary of trip distribution assumptions and specific routing is provided on Figure 27 for outbound trips and on Figure 28 for inbound trips.

Existing site trips, representing traffic generated by parking demand of the American University Admin building to the south of the site, were rerouted to account for the change in the location of the access to the below-grade parking. Figures showing the rerouted traffic volumes are included in the Technical Attachments.

The traffic volumes for the 2024 Total Future conditions were calculated by adding the development-generated traffic



volumes to the 2024 Background traffic volumes and rerouting the existing American University trips. Thus, the future condition with the proposed development scenario includes traffic generated by: existing volumes, background developments through the year 2024, inherent growth on the network, and the proposed development. The site-generated traffic volumes are shown on Figure 31 and Figure 32 and the 2024 Total Future traffic volumes are shown on Figure 33 and Figure 34.

Geometry and Operations Assumptions

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

Existing Geometry and Operations Assumptions

The geometry and operations assumed in the existing conditions scenario are those present when the main data collection occurred. Gorove/Slade made observations and confirmed the existing lane configurations and traffic controls at the intersections within the study area. Existing signal timings and offsets were obtained from DDOT and confirmed during field reconnaissance.

The lane configurations and traffic controls for the Existing conditions are shown on Figure 29 and Figure 30.

Future Geometry and Operations Assumptions

Following national and DDOT methodologies, a background improvement must meet the following criteria to be incorporated into the analysis:

- Be funded; and
- Have a construction completion date prior or close to the proposed development.

Based on these criteria, no background improvements were included in the future scenario.

VEHICULAR ANALYSIS RESULTS

Intersection Capacity Analysis

Intersection capacity analyses were performed for the three scenarios outlined previously at the intersections contained within the study area during the morning and afternoon peak hours. Synchro version 9.2 was used to analyze the study intersections based on the *Highway Capacity Manual* (HCM) 2000 methodology.

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from “A” being the best to “F” being the worst. LOS D is typically used as the acceptable LOS threshold in the District; although LOS E or F is sometimes accepted in urbanized areas if vehicular improvements would be a detriment to safety or non-auto modes of transportation.

The LOS capacity analyses were based on: (1) the peak hour traffic volumes; (2) the lane use and traffic controls; and (3) the Highway Capacity Manual (HCM) methodologies (using *Synchro* software). The average delay of each approach and LOS is shown for the signalized 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 12 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds) for the Existing, 2024 Background, and 2024 Future scenarios. The capacity analysis results are shown on Figure 35 and Figure 36 for the morning peak hour, and Figure 37 and Figure 38 for the afternoon peak hour.

All of the study intersections operate at acceptable conditions during the morning and afternoon peak hours for the Existing, 2024 Background, and 2024 Future scenarios.

Queuing Analysis

In addition to the capacity analyses presented above, a queuing analysis was performed at the study intersections. The queuing analysis was performed using Synchro software. The 50th percentile and 95th percentile queue lengths are shown for each lane group at the study area signalized intersections. The 50th percentile queue is the maximum back of queue on a median cycle. The 95th percentile queue is the maximum back of queue that is exceeded 5% of the time. For unsignalized intersection, only the 95th percentile queue is reported for each lane group (including free-flowing left turns and stop-controlled movements) based on the HCM 2000 calculations. HCM 2000 does not calculate queuing for all-way stops.



Table 13 shows the queuing results for the study area intersections. Two of the study intersections have a lane group that exceeds its storage length during at least one peak hour in all of the study scenarios. These intersections are as follows:

- Massachusetts Avenue & 50th Street NW (Existing AM, Background AM, Future AM)
- Massachusetts Avenue & 49th Street NW (Existing PM, Background PM, Future PM)

With the addition of the site-generated traffic, queues are slightly increased at all of the study intersections, but no major impacts are seen as a result of the development.

MITIGATIONS

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

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

Following these guidelines, no intersections require mitigation as a result of the planned development.

Recommendations

Although no intersections require mitigation as a result of the development, field observations noted that existing operations at the intersection of Massachusetts Avenue and 49th Street were being impacted as a result of vehicles attempting to turn left out of the driveway that is to the north of the intersection, which serves the Massachusetts Avenue Parking Shops and Exxon Station, in order to then turn left onto Massachusetts Avenue. Observations noted that these vehicles oftentimes block the northbound lane, resulting in operational issues. This report recommends that DDOT study whether channelizing or

limiting left turns out of the driveway would be a feasible solution to this problem.

Table 10: Summary of Background Development Trip Generation

Background Development	ITE Land Use Code Trip Generation, 10 th Ed.	Quantity	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Spring Valley Expansion	820 Shopping Center (Rate)	15,000 sf	9	5	14	27	30	57
	Non-Auto Reduction: 30%		-3	-1	-4	-8	-9	-17
	Total Trips		6	4	10	19	21	40
Net Background Site Trips			6	4	10	19	21	40

Table 11: Applied Annual and Total Growth Rates

Road & Direction	Annual Growth Rate		Total Growth between 2019 and 2024	
	AM Peak	PM Peak	AM Peak	PM Peak
Massachusetts Avenue NW – Northbound	0.10%	0.50%	0.50%	2.53%
Massachusetts Avenue NW – Southbound	0.25%	0.75%	1.26%	3.81%
49 th St NW – Northbound	0.75%	0.10%	3.81%	0.50%
49 th St NW – Southbound	0.10%	0.25%	0.50%	1.26%
46 th St NW – Northbound	0.10%	0.10%	0.50%	0.50%
46 th St NW – Southbound	0.10%	0.10%	0.50%	0.50%
All Other	0.10%	0.10%	0.50%	0.50%

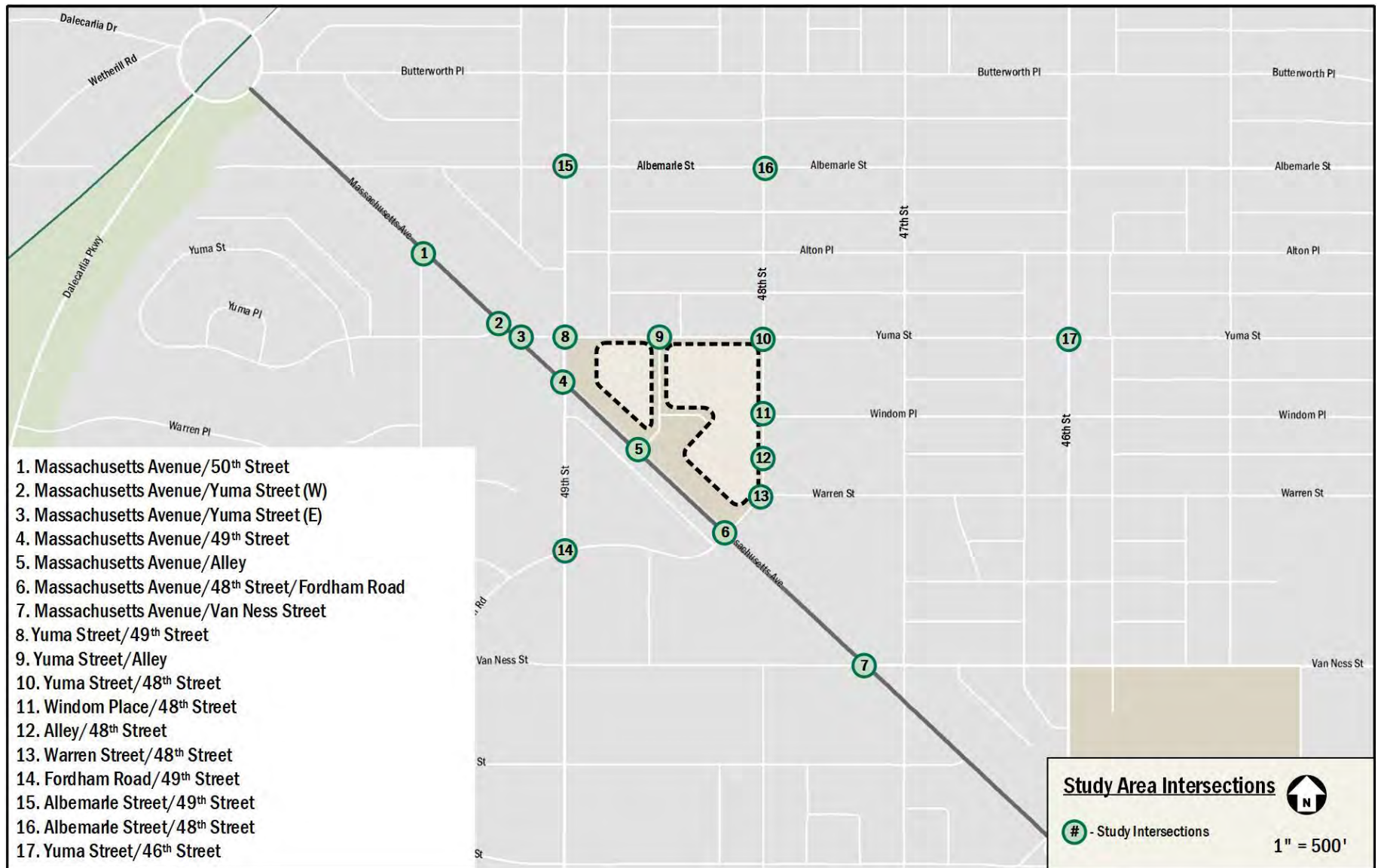


Figure 22: Study Area Intersections

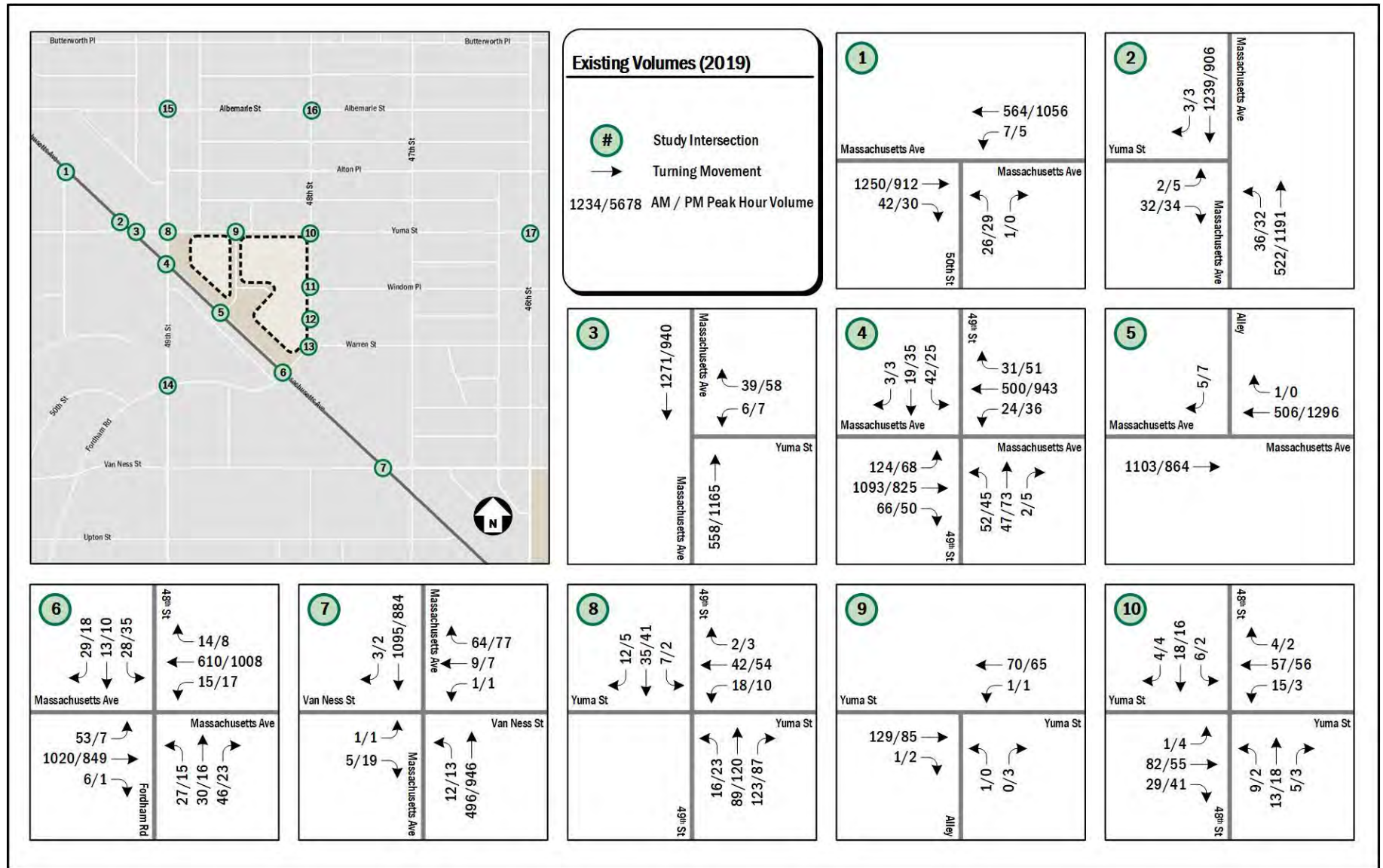


Figure 23: Existing Peak Hour Traffic Volumes (1 of 2)

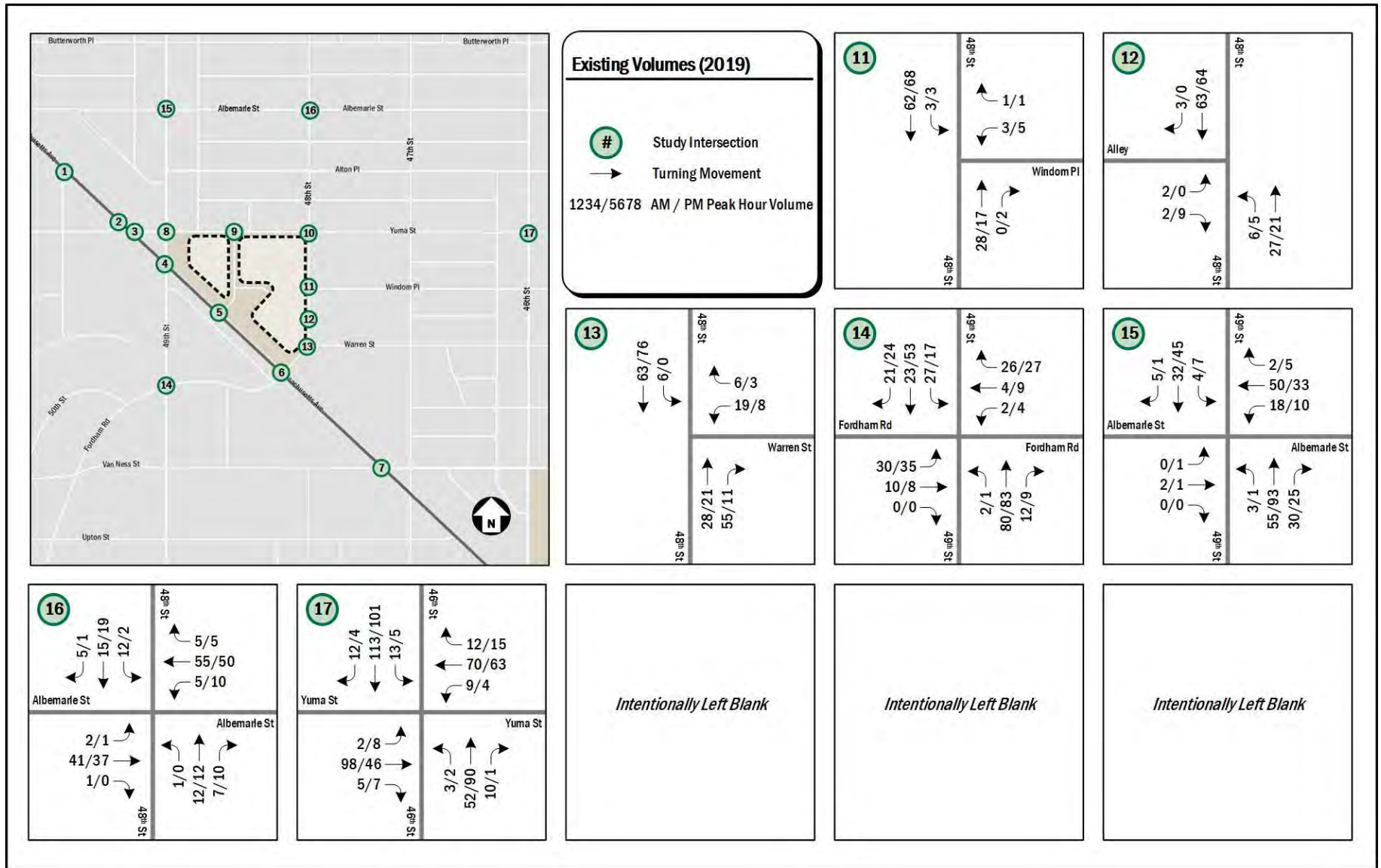


Figure 24: Existing Peak Hour Traffic Volumes (2 of 2)

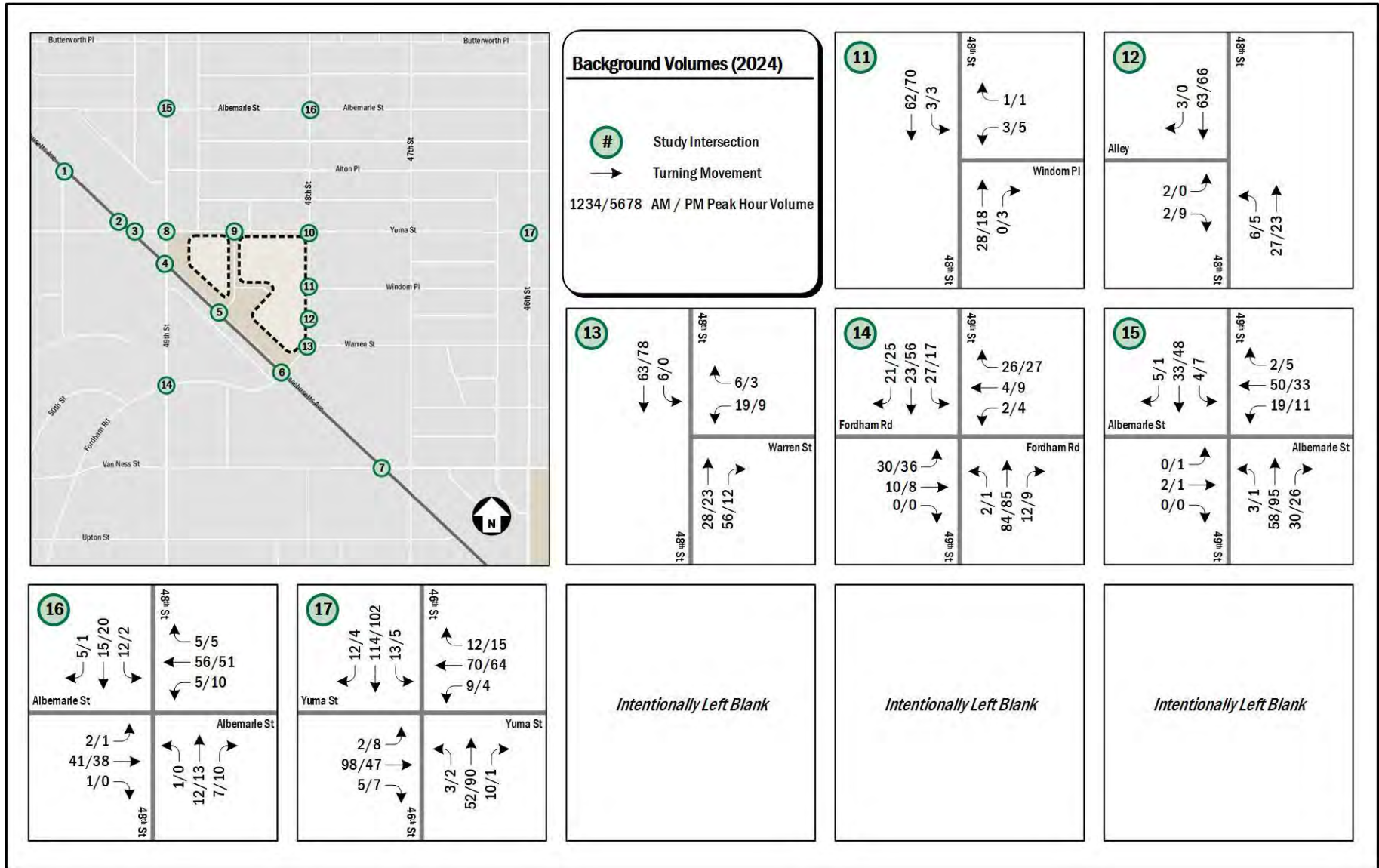


Figure 26: 2024 Background Peak Hour Traffic Volumes (2 of 2)

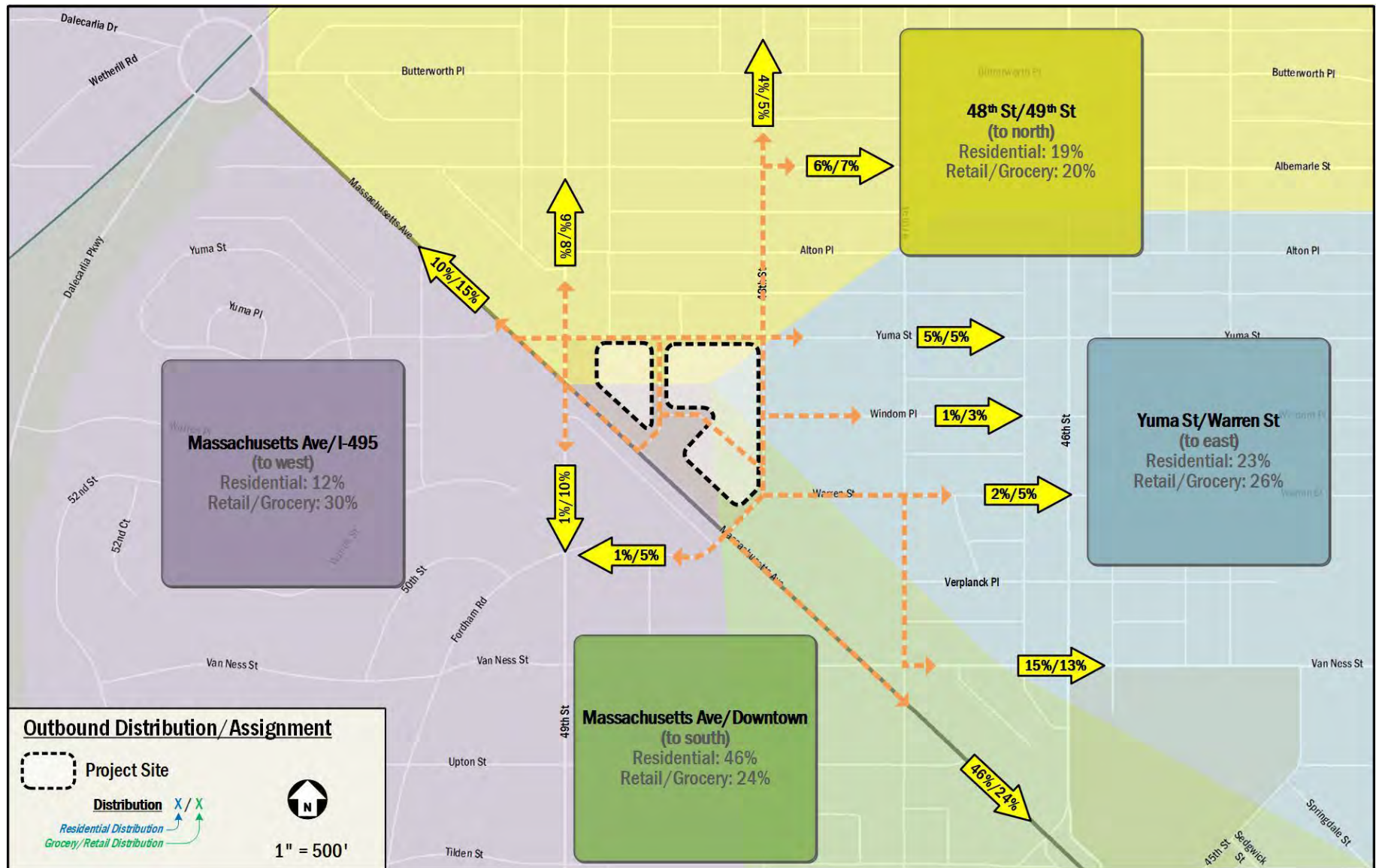


Figure 27: Outbound Trip Distribution and Routing

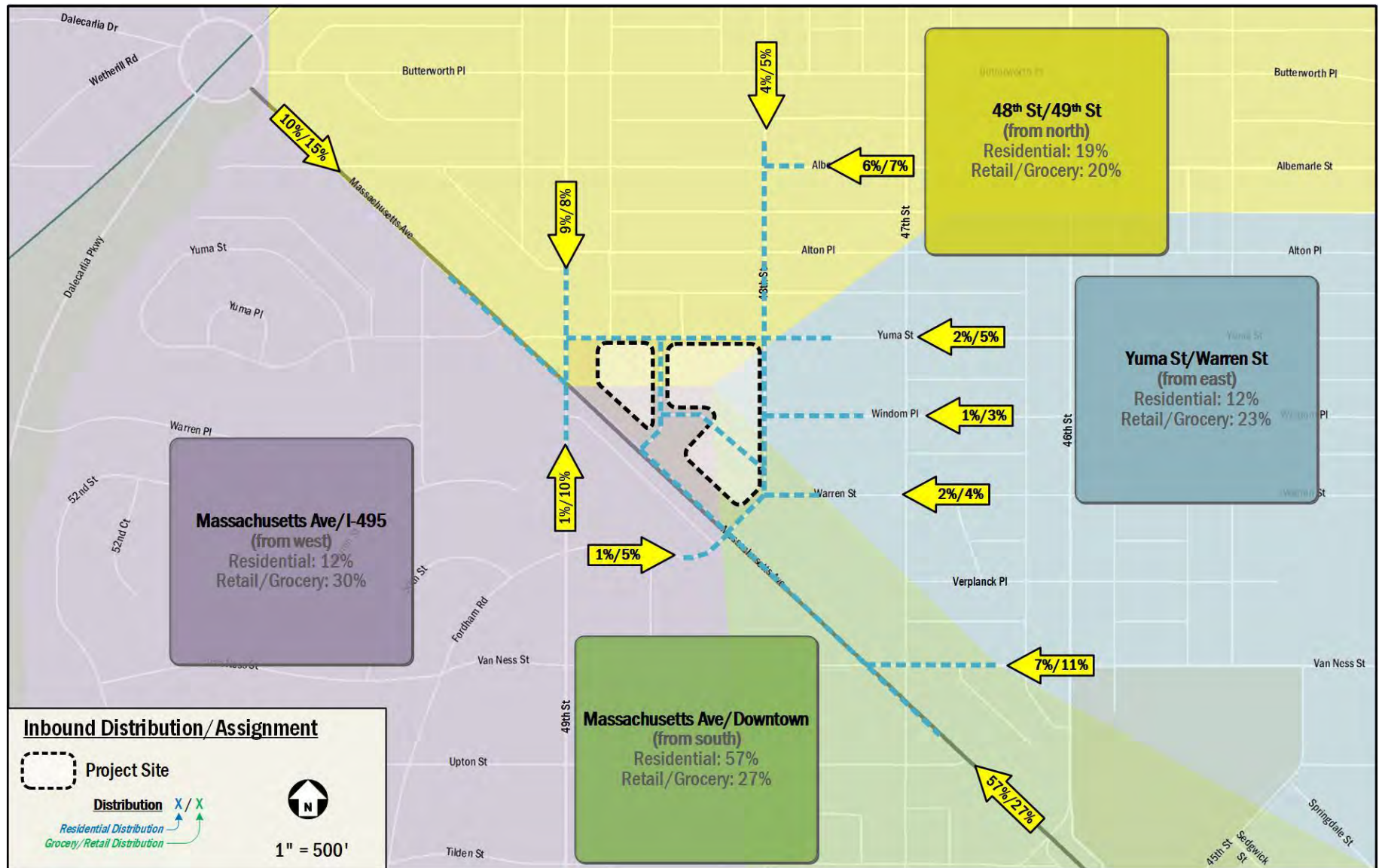


Figure 28: Inbound Trip Distribution and Routing

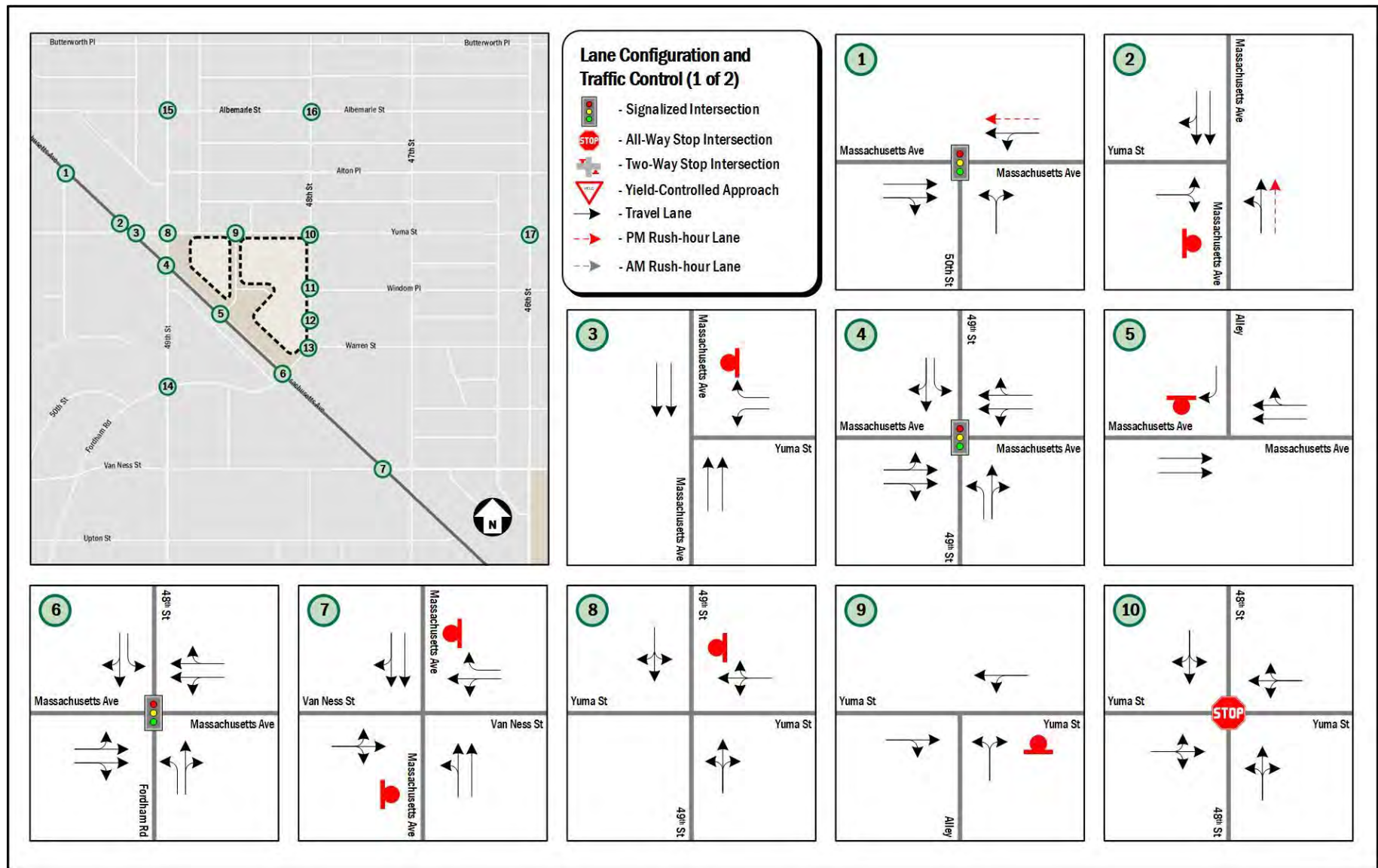


Figure 29: Lane Configuration and Traffic Control (1 of 2)

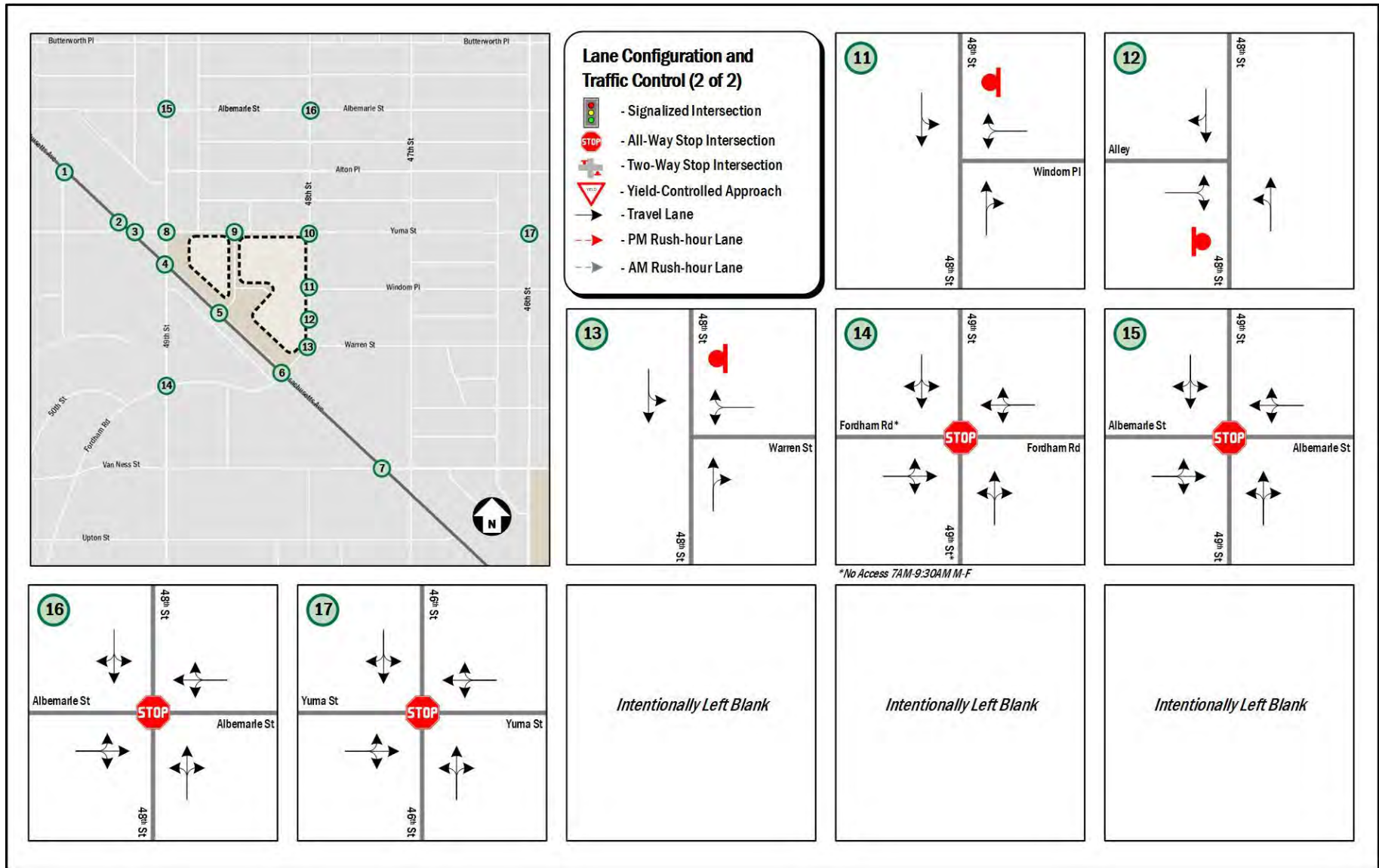


Figure 30: Lane Configuration and Traffic Control (2 of 2)

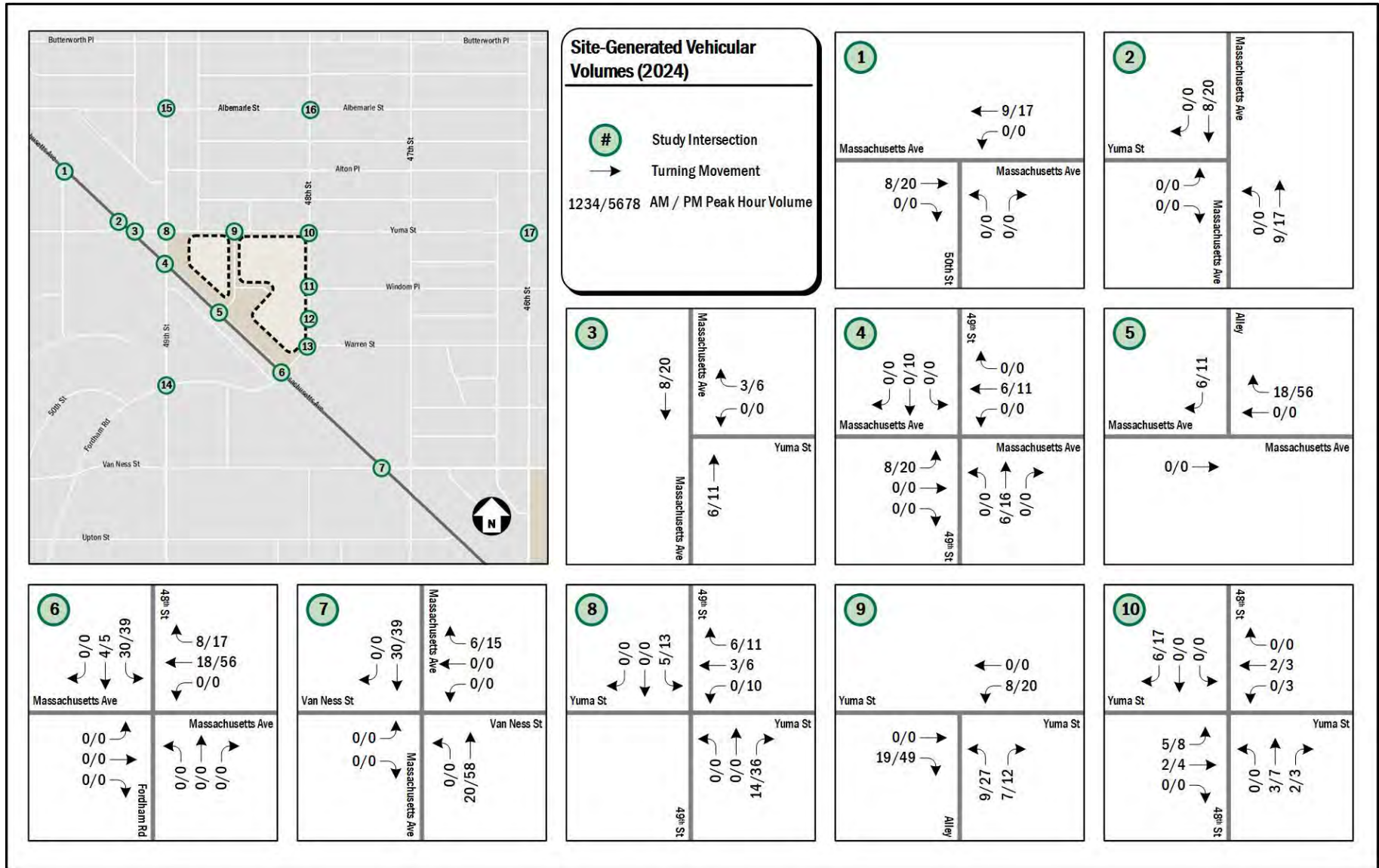


Figure 31: Site-Generated Peak Hour Traffic Volumes (1 of 2)

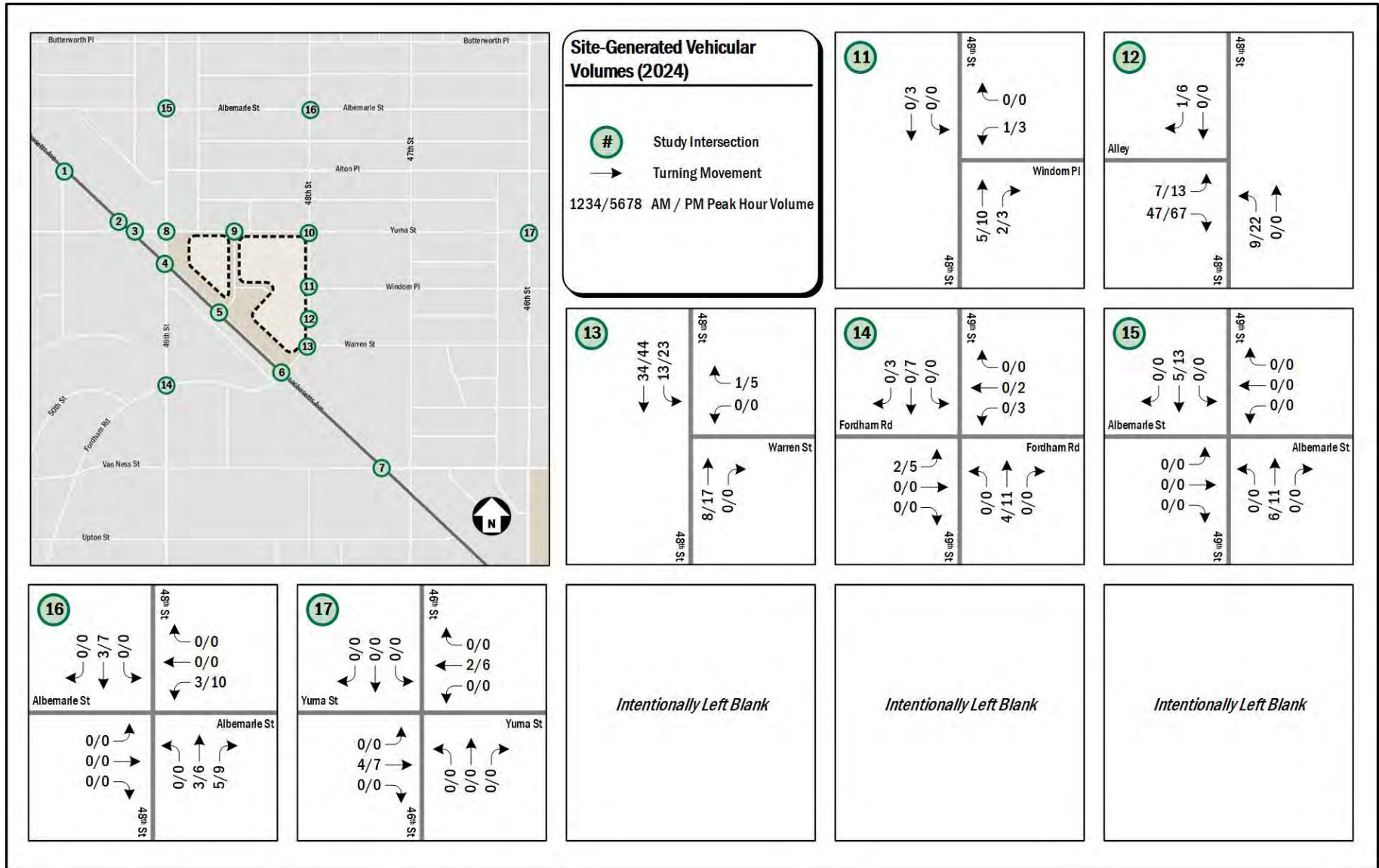


Figure 32: Site-Generated Peak Hour Traffic Volumes (2 of 2)

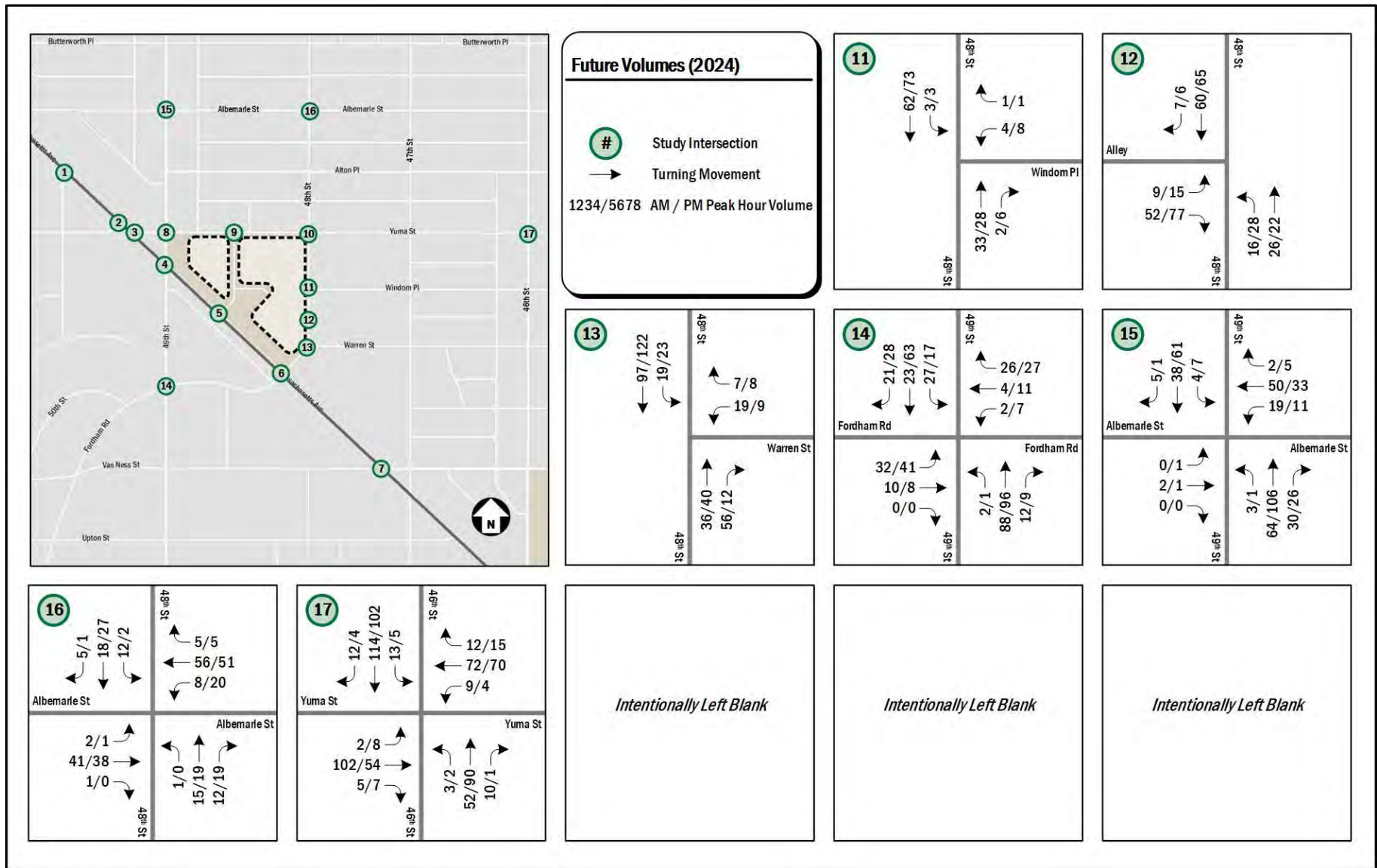


Figure 34: 2021 Future Peak Hour Traffic Volumes (2 of 2)



Table 12: LOS Results

Intersection	Approach	Existing Conditions (2019)				Background Conditions (2024)				Future Conditions (2024)			
		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
Massachusetts Avenue & 50th Street NW	Overall	12.5	B	8.1	A	12.6	B	8.2	A	12.7	B	8.3	A
	Northbound	33.0	C	33.9	C	33.0	C	33.9	C	33.0	C	33.9	C
	Southeastbound	14.7	B	10.1	B	14.9	B	10.3	B	14.9	B	10.4	B
	Northwestbound	6.5	A	5.6	A	6.6	A	5.7	A	6.6	A	5.7	A
Massachusetts Avenue & Yuma Street (W) NW	Eastbound	11.1	B	11.1	B	11.1	B	11.1	B	11.2	B	11.2	B
	Southeastbound	1.6	A	0.4	A	1.6	A	0.0	A	0.0	A	0.0	A
	Northwestbound	0.0	A	0.0	A	0.0	A	0.4	A	1.6	A	0.4	A
Massachusetts Avenue & Yuma Street (E) NW	Westbound	9.2	A	11.5	B	9.2	A	11.6	B	9.2	A	11.5	B
	Southeastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Northwestbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Massachusetts Avenue & 49th Street NW	Overall	13.7	B	12.3	B	13.9	B	12.5	B	14.1	B	13.0	B
	Northbound	41.5	D	41.9	D	41.6	D	42.0	D	41.7	D	42.6	D
	Southbound	40.9	D	40.3	D	40.9	D	40.4	D	40.9	D	40.7	D
	Southeastbound	8.6	A	7.0	A	8.7	A	7.2	A	8.9	A	7.8	A
	Northwestbound	17.3	B	11.9	B	17.3	B	12.1	B	17.4	B	11.8	B
Massachusetts Avenue NW & Alley	Southeastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Northwestbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Southwestbound	9.9	A	12.7	B	9.9	A	12.8	B	9.9	A	13.1	B
Massachusetts Avenue & 48th Street & Fordham Road NW	Overall	7.8	A	7.3	A	7.8	A	7.5	A	8.4	A	8.4	A
	Southeastbound	3.7	A	3.9	A	3.7	A	3.9	A	3.7	A	3.9	A
	Northwestbound	6.8	A	6.4	A	6.8	A	6.6	A	6.9	A	6.9	A
	Northeastbound	36.8	D	39.2	D	36.8	D	39.4	D	36.8	D	39.4	D
	Southwestbound	36.5	D	39.9	D	36.5	D	40.0	D	38.2	D	42.5	D
Massachusetts Avenue & Van Ness Street NW	Eastbound	16.8	C	12.8	B	17.0	C	13.3	B	18.1	C	14.2	B
	Westbound	15.0	C	17.7	C	15.1	C	18.5	C	15.5	C	19.5	C
	Southeastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Northwestbound	0.3	A	0.2	A	0.3	A	0.2	A	0.3	A	0.2	A
49th Street & Yuma Street NW	Westbound	11.2	B	11.5	B	11.3	B	11.6	B	11.4	B	12.2	B
	Northbound	0.6	A	0.8	A	0.6	A	0.8	A	0.6	A	0.7	A
	Southbound	1.0	A	0.3	A	1.0	A	0.3	A	1.6	A	1.9	A
Yuma Street NW & Alley	Eastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Westbound	0.1	A	0.1	A	0.1	A	0.1	A	1.8	A	2.0	A
	Northbound	9.8	A	9.0	A	9.8	A	9.0	A	9.9	A	10.3	B



Intersection	Approach	Existing Conditions (2019)				Background Conditions (2024)				Future Conditions (2024)			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Yuma Street & 48th Street NW	Overall	7.7	A	7.5	A	7.7	A	7.5	A	7.8	A	7.6	A
	Eastbound	7.8	A	7.5	A	7.8	A	7.5	A	7.9	A	7.8	A
	Westbound	7.7	A	7.5	A	7.7	A	7.5	A	7.8	A	7.7	A
	Northbound	7.6	A	7.4	A	7.6	A	7.4	A	7.7	A	7.5	A
	Southbound	7.6	A	7.4	A	7.6	A	7.4	A	7.6	A	7.3	A
Windom Place & 48th Street NW	Westbound	9.0	A	9.0	A	9.0	A	9.1	A	9.1	A	9.2	A
	Northbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
	Southbound	0.4	A	0.4	A	0.4	A	0.4	A	0.4	A	0.3	A
48th Street NW & Alley	Eastbound	9.6	A	8.9	A	9.6	A	8.9	A	9.8	A	9.6	A
	Northbound	1.5	A	1.5	A	1.5	A	1.4	A	3.1	A	4.3	A
	Southbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Warren Street & 48th Street NW	Westbound	9.3	A	9.0	A	9.3	A	9.0	A	9.7	A	9.5	A
	Southbound	0.7	A	0.0	A	0.7	A	0.0	A	1.3	A	1.3	A
	Northeastbound	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
Fordham Road & 49th Street NW	Overall	7.6	A	7.7	A	7.6	A	7.8	A	7.6	A	7.9	A
	Eastbound	7.8	A	7.9	A	7.8	A	8.0	A	7.8	A	8.1	A
	Westbound	7.0	A	7.3	A	7.0	A	7.3	A	7.1	A	7.5	A
	Northbound	7.7	A	7.8	A	7.7	A	7.9	A	7.7	A	8.0	A
	Southbound	7.5	A	7.7	A	7.5	A	7.8	A	7.6	A	7.9	A
Albemarle Street & 49th Street NW	Overall	7.5	A	7.7	A	7.5	A	7.7	A	7.5	A	7.8	A
	Eastbound	7.3	A	7.5	A	7.3	A	7.6	A	7.3	A	7.6	A
	Westbound	7.7	A	7.6	A	7.7	A	7.7	A	7.7	A	7.8	A
	Northbound	7.4	A	7.7	A	7.4	A	7.8	A	7.5	A	7.9	A
	Southbound	7.4	A	7.5	A	7.4	A	7.6	A	7.4	A	7.7	A
Albemarle Street & 48th Street NW	Overall	7.4	A	7.4	A	7.4	A	7.4	A	7.4	A	7.5	A
	Eastbound	7.4	A	7.4	A	7.4	A	7.4	A	7.4	A	7.5	A
	Westbound	7.5	A	7.5	A	7.5	A	7.5	A	7.5	A	7.6	A
	Northbound	7.2	A	7.1	A	7.2	A	7.1	A	7.2	A	7.2	A
	Southbound	7.4	A	7.3	A	7.4	A	7.4	A	7.4	A	7.5	A
Yuma Street & 46th Street NW	Overall	8.5	A	8.1	A	8.5	A	8.1	A	8.5	A	8.2	A
	Eastbound	8.5	A	8.0	A	8.5	A	8.0	A	8.5	A	8.0	A
	Westbound	8.3	A	8.0	A	8.3	A	8.0	A	8.4	A	8.1	A
	Northbound	8.1	A	8.1	A	8.1	A	8.1	A	8.1	A	8.2	A
	Southbound	8.7	A	8.2	A	8.7	A	8.2	A	8.8	A	8.3	A



Table 13: Queuing Results (in feet)

Intersection	Lane Group	Storage Length (ft)	Existing Conditions (2016)				Background Conditions (2021)				Future Conditions (2021)			
			AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
			50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %
Massachusetts Avenue & 50th Street NW	Northbound LR	240	15	39	16	41	15	39	16	41	15	39	16	41
	Southeastbound TR	330	279	350	153	195	285	357	162	205	288	360	166	211
	Northwestbound LT	265	132	190	117	148	133	192	122	154	137	196	125	157
Massachusetts Avenue & Yuma Street (W) NW	Eastbound LR	235	--	4	--	5	--	4	--	5	--	4	--	5
	Northbound LT	30	--	5	--	3	--	5	--	3	--	5	--	3
	Southbound TR	265	--	0	--	0	--	0	--	0	--	0	--	0
Massachusetts Avenue & Yuma Street (E) NW	Westbound Left	80	--	1	--	2	--	1	--	2	--	1	--	2
	Westbound Right	80	--	3	--	7	--	3	--	7	--	4	--	8
	Northbound Thru	160	--	0	--	0	--	0	--	0	--	0	--	0
	Southbound Thru	30	--	0	--	0	--	0	--	0	--	0	--	0
Massachusetts Avenue & 49th Street NW	Northbound Left	475	35	74	30	65	36	76	32	69	36	76	32	69
	Northbound TR	475	31	67	51	98	34	71	54	101	38	78	66	119
	Southbound Left	75	28	62	17	43	28	62	17	43	28	62	17	43
	Southbound TR	75	13	36	23	55	14	39	25	57	14	39	32	69
	Southeastbound LTR	230	193	235	121	150	196	238	127	157	198	242	131	162
	Northwestbound LTR	300	83	126	236	315	83	128	242	326	85	130	202	274
Massachusetts Avenue NW & Alley	Southeastbound Thru	300	--	0	--	0	--	0	--	0	--	0	--	0
	Northwestbound TR	375	--	0	--	0	--	0	--	0	--	0	--	0
	Southwestbound Right	110	--	1	--	1	--	1	--	1	--	1	--	3
Massachusetts Avenue & 48th Street & Fordham Road NW	Southeastbound LTR	670	29	32	60	70	29	32	62	72	29	32	62	72
	Northwestbound LTR	585	89	115	141	174	90	116	148	184	95	122	164	203
	Northeastbound Left	215	17	43	9	29	17	43	9	29	17	43	9	29
	Northeastbound TR	215	20	62	10	41	20	63	12	47	20	63	12	47
	Southwestbound Left	135	18	45	23	54	18	45	23	54	39	79	51	99
	Southwestbound TR	135	8	40	6	32	8	40	8	36	11	44	11	41
Massachusetts Avenue & Van Ness Street NW	Eastbound LTR	280	--	1	--	3	--	1	--	3	--	2	--	4
	Westbound Left	76	--	8	--	9	--	8	--	10	--	9	--	12
	Westbound Right	76	--	8	--	13	--	8	--	14	--	9	--	18
	Southeastbound TR	100	--	0	--	0	--	2	--	1	--	2	--	1
	Northwestbound TL	585	--	1	--	1	--	0	--	0	--	0	--	0



Intersection	Lane Group	Storage Length (ft)	Existing Conditions (2016)				Background Conditions (2021)				Future Conditions (2021)			
			AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
			50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %
49th Street & Yuma Street NW	Westbound LTR	75	--	8	--	10	--	8	--	10	--	10	--	15
	Northbound LTR	260	--	1	--	1	--	1	--	1	--	1	--	1
	Southbound LTR	315	--	0	--	0	--	0	--	0	--	1	--	1
Yuma Street NW & Alley	Eastbound TR	320	--	0	--	0	--	0	--	0	--	0	--	0
	Westbound LT	260	--	0	--	0	--	0	--	0	--	1	--	1
	Northbound LR	240	--	0	--	0	--	0	--	0	--	2	--	8
Yuma Street & 48th Street NW*	Eastbound LTR	335	--	--	--	--	--	--	--	--	--	--	--	--
	Westbound LTR	440	--	--	--	--	--	--	--	--	--	--	--	--
	Northbound LTR	255	--	--	--	--	--	--	--	--	--	--	--	--
	Southbound LTR	265	--	--	--	--	--	--	--	--	--	--	--	--
Windom Place & 48th Street NW	Westbound LR	460	--	0	--	1	--	0	--	1	--	1	--	1
	Northbound TR	155	--	0	--	0	--	0	--	0	--	0	--	0
	Southbound LT	245	--	0	--	0	--	0	--	0	--	0	--	0
48th Street NW & Alley	Eastbound LR	385	--	0	--	1	--	2	--	1	--	7	--	10
	Northbound LT	105	--	0	--	0	--	0	--	0	--	1	--	2
	Southbound TR	155	--	0	--	0	--	0	--	0	--	0	--	0
Warren Street & 48th Street NW	Westbound LR	460	--	2	--	1	--	2	--	1	--	3	--	2
	Southbound LR	95	--	0	--	0	--	0	--	0	--	1	--	1
	Northeastbound LR	135	--	0	--	0	--	0	--	0	--	0	--	0
Fordham Road & 49th Street NW*	Eastbound LTR	195	--	--	--	--	--	--	--	--	--	--	--	--
	Westbound LTR	260	--	--	--	--	--	--	--	--	--	--	--	--
	Northbound LTR	345	--	--	--	--	--	--	--	--	--	--	--	--
	Southbound LTR	480	--	--	--	--	--	--	--	--	--	--	--	--
Albemarle Street & 49th Street NW*	Eastbound LTR	730	--	--	--	--	--	--	--	--	--	--	--	--
	Westbound LTR	650	--	--	--	--	--	--	--	--	--	--	--	--
	Northbound LTR	275	--	--	--	--	--	--	--	--	--	--	--	--
	Southbound LTR	300	--	--	--	--	--	--	--	--	--	--	--	--
Albemarle Street & 48th Street NW*	Eastbound LTR	630	--	--	--	--	--	--	--	--	--	--	--	--
	Westbound LTR	420	--	--	--	--	--	--	--	--	--	--	--	--
	Northbound LTR	265	--	--	--	--	--	--	--	--	--	--	--	--
	Southbound LTR	300	--	--	--	--	--	--	--	--	--	--	--	--



Intersection	Lane Group	Storage Length (ft)	Existing Conditions (2016)				Background Conditions (2021)				Future Conditions (2021)			
			AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
			50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %
Yuma Street & 46th Street NW*	Eastbound LTR	545	--	--	--	--	--	--	--	--	--	--	--	--
	Westbound LTR	500	--	--	--	--	--	--	--	--	--	--	--	--
	Northbound LTR	215	--	--	--	--	--	--	--	--	--	--	--	--
	Southbound LTR	235	--	--	--	--	--	--	--	--	--	--	--	--

*HCM 2000 does not report queuing for all-way stops

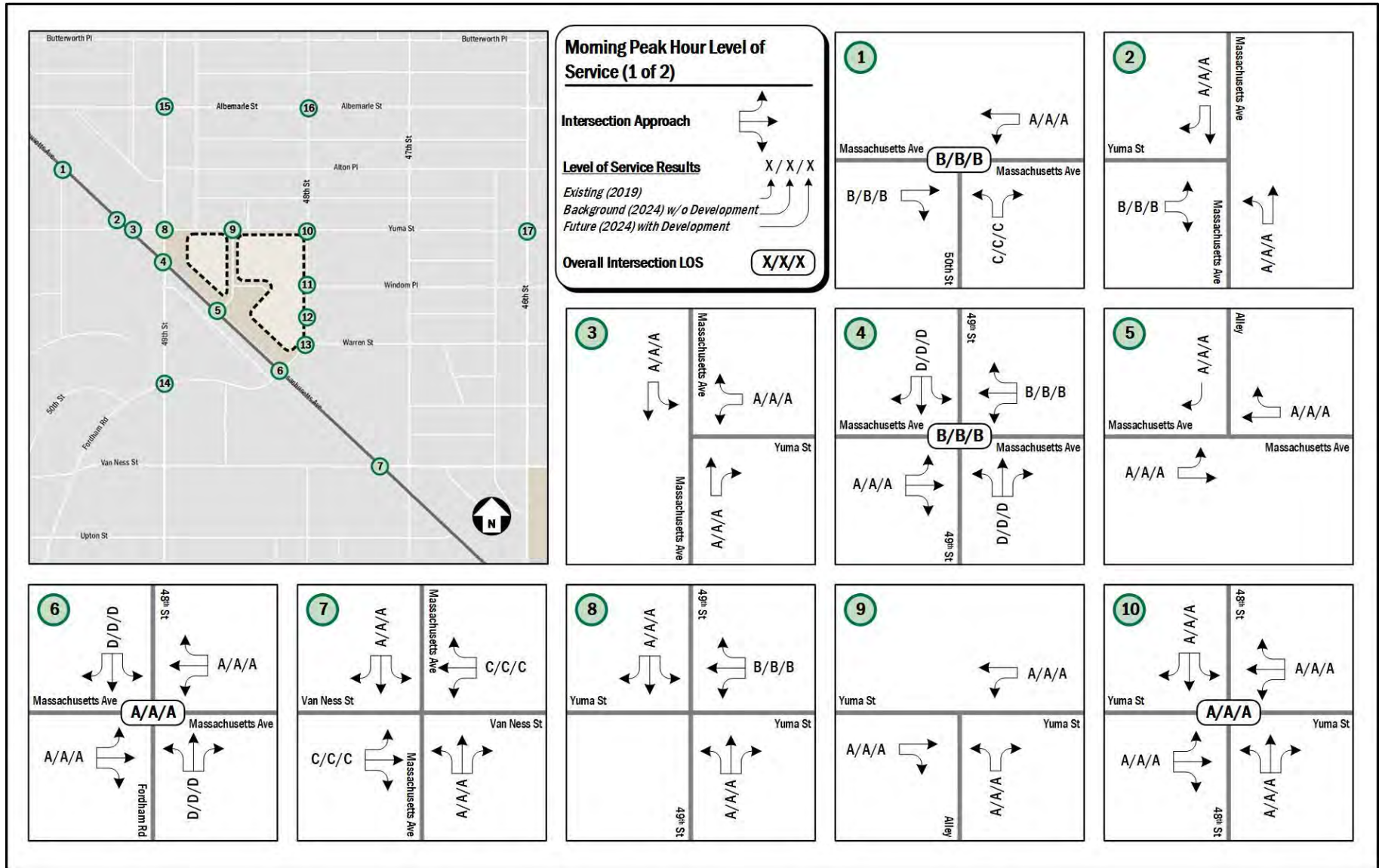


Figure 35: Morning Peak Hour Capacity Analysis Results (1 of 2)

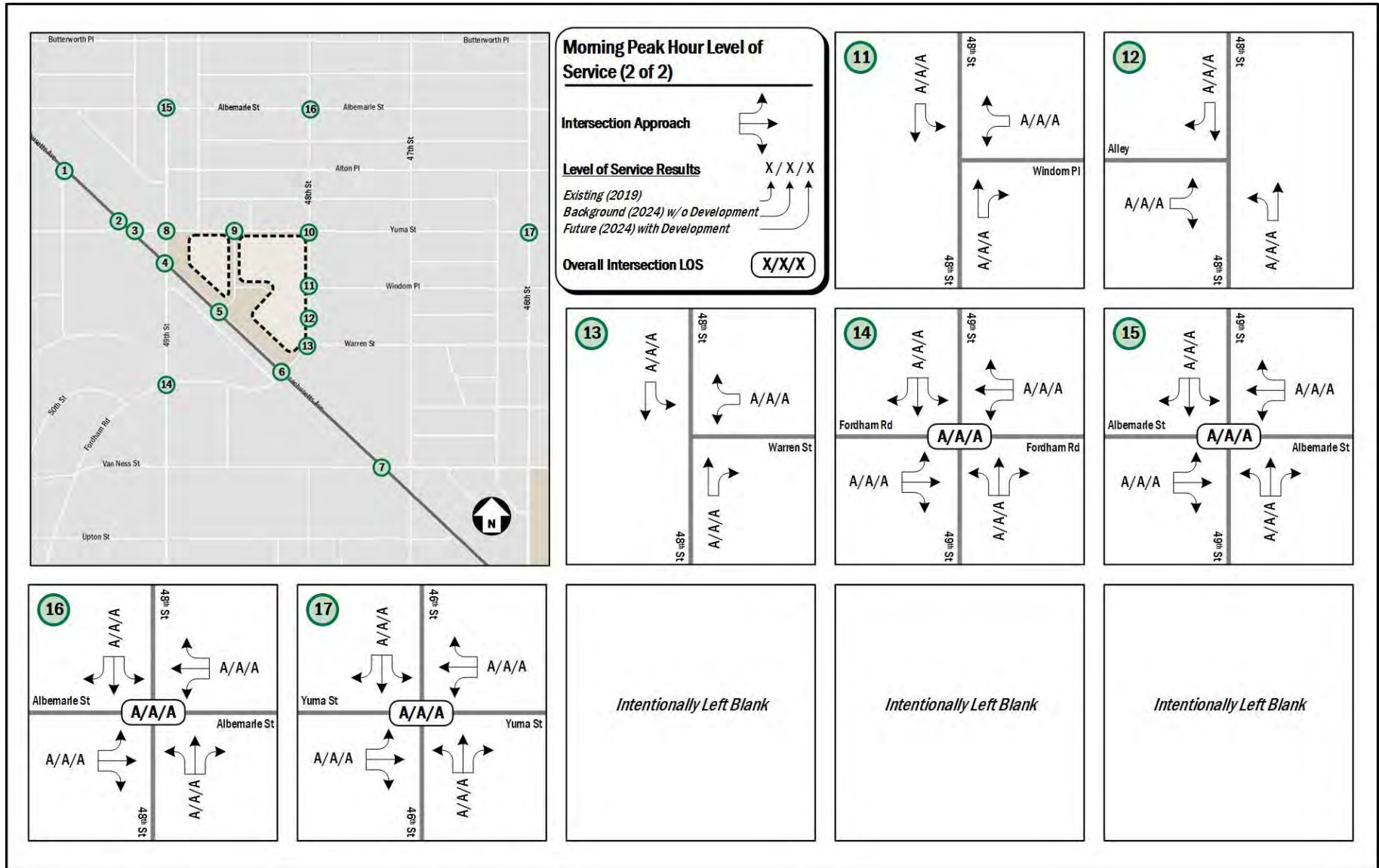


Figure 36: Morning Peak Hour Capacity Analysis Results (2 of 2)

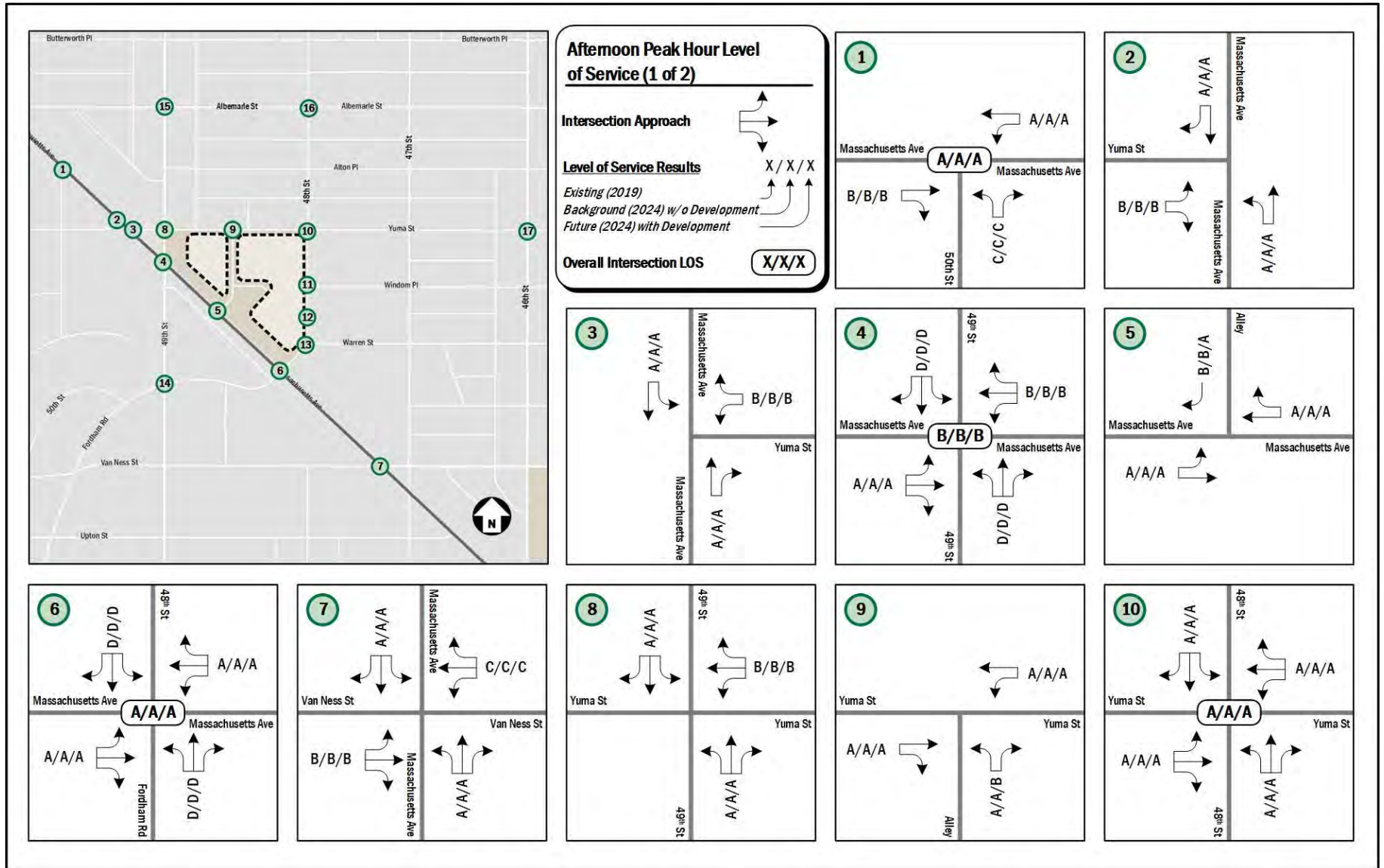


Figure 37: Afternoon Peak Hour Capacity Analysis Results (1 of 2)



Figure 38: Afternoon Peak Hour Capacity Analysis Results (2 of 2)



TRANSIT

This chapter discusses the existing and proposed transit facilities in the vicinity of the site, accessibility to transit, and evaluates the overall transit impacts of the Lady Bird project.

The following conclusions are reached within this chapter:

- The development has adequate access to transit.
- The development is located 0.8 miles from the Tenleytown-AU Metrorail station.
- The development site is surrounded by two Metrobus routes that travel along multiple primary corridors.
- The proposed development is expected to generate a manageable number of transit trips, and the existing service is capable of handling these new trips.

EXISTING TRANSIT SERVICE

The study area is well served by Metrobus and has access to Metrorail. 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 39 identifies the major transit routes, stations, and stops in the study area.

The Tenleytown-AU Metrorail station is located 0.8 miles from the development site and is served by the Red Line, which provides direct connections to areas in the District and Maryland along with access to Virginia via connecting lines. The Red Line connects Shady Grove with Glenmont while providing access to the District core in a “U” shape. Red Line trains run approximately every three to six minutes during the morning and afternoon peak hours. The Red Line runs about every 12 minutes during weekday non-peak hours, every 15 to 18 minutes on weekday evenings after 9:30 pm and 12 to 15 minutes on the weekends.

The site is also serviced by Metrobus along multiple primary corridors. These bus routes connect the site to the downtown core of the District, including Metrorail stations which provide further connections to Virginia and Maryland. Table 14 shows a summary of the bus route information for the routes that serve the site, including service hours, headway, and distance to the nearest bus stop.

Figure 39 shows a detailed inventory of the existing Metrobus stops within a quarter-mile walkshed of the site. Each stop is evaluated based on the guidelines set forth by WMATA’s *Guidelines for the Design and Placement of Transit Stops*, as detailed in Table 15. A detailed breakdown of individual bus stop amenities and conditions is included in the Technical Attachments.

PLANNED TRANSIT SERVICE

MoveDC

Due to growth of population, jobs, and retail in several neighborhoods in the District and the potential for growth in other neighborhoods, the District’s infrastructure is challenged with the need for transportation investments to support the recent growth and to further strengthen neighborhoods. In order to meet these challenges and capitalize on future opportunities, DDOT has developed a plan to identify transit challenges and opportunities and to recommend investments. *MoveDC* is a long-range plan that provides a vision for the future of DC’s transportation system, specifically in a way that expands transportation choices while improving the reliability of all transportation modes.

The MoveDC report outlines recommendations by mode with the goal of having them complete by 2040. The plan hopes to achieve a transportation system for the District that includes:

- 70 miles of high-capacity transit (streetcar or bus)
- 200 miles of on-street bicycle facilities or trails
- Sidewalks on at least one side of every street
- New street connections
- Road management/pricing in key corridors and the Central Employment Area

Table 14: Metrobus Route Information

Route Number	Route Name	Service Hours	Headway	Walking Distance to Nearest Bus Stop
N4, N6	Massachusetts Avenue Line	Weekdays: 5:35AM – 12:46 AM Weekends: 5:33AM – 12:52 AM	5-30 min	<0.1 miles, 1 minute



Table 15: Transit Stop Requirements

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

- A new downtown Metrorail loop
- Expanded commuter rail
- Water taxis

No transit related improvements were outlined in the MoveDC plan that directly affect the proposed development.

WMATA and DDOT Transit Studies

WMATA studied capacity of Metrorail stations in its *Station Access & Capacity Study (2008)*. The study analyzed the capacity of Metrorail stations for their vertical transportation, for example the capacity of the station at elevators, stairs, and escalators to shuttle patrons between the street, mezzanine, and platforms. The study also analyzed stations capacity to process riders at fare card gates. For both analyses, vertical transportation and fare card gates, volume-to-capacity ratios were calculated for existing data (from 2005) and projections for the year 2030. According to the study, the Tenleytown-AU

station can currently accommodate future growth at all access points.

In 2014, WMATA and DDOT initiated the Tenleytown-AU Metrorail Station Access Study to identify station access improvements and to redesign WMATA owned property to better accommodate all modes of access to the station. The study specifically examined WMATA and DDOT owned property on Fort Drive and 40th Street, the adjacent street grid to the eastern station entrance, in order to provide a higher level of service for all modes of access to the station. The study found that: (1) Public realm enhancements and pedestrian safety improvements are needed at locations surrounding the Tenleytown-AU Metrorail Station; (2) Provisions of benches, covered areas, and other transit amenities are needed to accommodate the large numbers of bus transit users; (3) Provisions of bicycle parking are needed to accommodate existing and planned bicycle mode share to the Tenleytown-AU Station; and (4) Improvements are needed to eliminate



awkward vehicular movements and reduce automobile-pedestrian conflicts.

In 2016, Phase II of the Tenleytown-AU Metrorail Station Access Study was initiated, which presented three draft station area concepts for consideration. All three concepts provide: (1) Better crosswalk design at 40th Street, Fort Drive, and Albemarle Street; (2) Better disability access with curb cuts at crosswalks; (3) Angled bus parking spots for easier vehicle entry and exit from the station; (4) Bus shelters with improved customer information and weather protection; (5) Better sidewalk designs for easier pedestrian, ADA, and cyclist access; (6) More green space and tree box landscaping; (7) More bicycle racks as well as secure bike storage; (8) High visibility pedestrian and bicycle crossing at intersections; and (8) Expanded sidewalk space in front of 40th St NW retail to provide pedestrian plaza opportunity. As of this report, no alternative has been selected. The District of Columbia Statewide Transportation Improvement Program (DC STIP) identifies funding in FY2019 for developing preliminary and final design for improvements based on completed Tenleytown-AU Metrorail Station Access Improvements Study.

WMATA has also studied capacity along Metrobus routes. DC's *Transit Future System Plan* (2010) lists the bus routes with the highest load factor (a ratio of passenger volume to bus capacity). A load factor is considered unacceptable if it is over 1.2 during peak periods or over 1.0 during off-peak or weekend periods. According to this study Metrobus routes that travel near the site operate at a load factor that is at or below its capacity during peak periods of the day. As it is expected that the majority of new trips will be made via the Metrorail, site-generated transit trips will not cause detrimental impacts to Metrobus or Metrorail service.

SITE-GENERATED TRANSIT IMPACTS

Transit Trip Generation

The proposed development is projected to generate 4 transit trips (1 inbound, 3 outbound) during the weekday morning peak hour, 5 transit trips (3 inbound, 2 outbound) during the weekday afternoon peak hour, and 6 transit trips (3 inbound, 3 outbound) during the Saturday peak hour.

US Census data was used to determine the distribution of those taking Metrorail and those taking Metrobus. The site lies in TAZ 10096 and data shows that approximately 86 percent of transit riders used Metrorail and the remainder use Metrobus. That

said, approximately 3 people will use Metrorail and 1 person will use Metrobus during the weekday morning peak hour, approximately 4 people will use Metrorail and 1 people will use Metrobus during the weekday afternoon peak hour, and approximately 5 people will use Metrorail and 1 person will use Metrobus during the Saturday peak hour.

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



Figure 39: Existing Transit Service



PEDESTRIAN FACILITIES

This chapter summarizes the existing and future pedestrian access to the site and reviews walking routes to and from the site.

The following conclusions are reached within this chapter:

- The existing pedestrian infrastructure surrounding the site provides an adequate walking environment. There are some gaps in the system, but there are sidewalks along all primary routes to pedestrian destinations.
- The site is expected to generate a manageable number of pedestrian trips.
- Substantial improvements to pedestrian infrastructure as part of the proposed development will improve pedestrian comfort and connectivity.

PEDESTRIAN STUDY AREA

Facilities within a quarter-mile of the site were evaluated as well as routes to nearby transit facilities and prominent retail and neighborhood destinations. The site is easily accessible to bus stops along Massachusetts Avenue. There are some areas of concern within the study area that negatively impact the quality of and attractiveness of the walking environment. This includes roadway conditions that reduce the quality of walking conditions, narrow or nonexistent sidewalks, and incomplete or insufficient crossings at some intersections. Figure 40 shows suggested pedestrian pathways, walking time and distances, and barriers and areas of concern.

PEDESTRIAN INFRASTRUCTURE

This section outlines the existing and proposed pedestrian infrastructure within the pedestrian study area.

Existing Conditions

A review of pedestrian facilities surrounding the proposed development shows that most facilities meet DDOT standards and provide a quality walking environment. Figure 41 shows a detailed inventory of the existing pedestrian infrastructure surrounding the site. Sidewalks, crosswalks, and curb ramps are evaluated based on the guidelines set forth by DDOT's *Design Engineering Manual (2019)* in addition to ADA standards. Sidewalk widths and requirements for the District are shown below in Table 16.

Within the area shown, the majority of roadways are considered residential with a low to moderate density. Most of the sidewalks surrounding the site to the south comply with DDOT standards; however, to the north and southeast there are areas which have inadequate sidewalks or no sidewalks at all, with insufficient or no buffer. All primary pedestrian destinations are accessible via routes with sidewalks, most of which meet DDOT standards.

ADA standards require that curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, curb ramps shared between two crosswalks are not desired. As shown in Figure 41, under existing conditions crosswalks and curb ramps are mostly present near the site.

Table 16: Sidewalk Requirements

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



Pedestrian Infrastructure Improvements

As part of the proposed development, sections of the roadway network surrounding the site will be improved. Pedestrian facilities along the perimeter of the project on Yuma Street, 48th Street, and along the public and private alleys to the south of the site will be improved so that they meet or exceed DDOT and ADA standards. Existing curb cuts along Yuma Street and 48th Street will be closed, providing more continuity to sidewalks along the site's perimeter that does not exist under current conditions. The inclusion of outdoor seating, planting beds, and additional streetlights will be a great improvement over existing conditions. A landscape and open space plan as included in the submission is shown on Figure 42.

The Applicant has also committed to significantly improve the public alley to the west of the site as follows:

- The installation of a 3-foot wide delineated pedestrian path (where none exists today);
- Converting the intersection of the alleys to an all-way stop;
- Adding textured pavement to the intersection of the alley to make drivers aware of a “shared-space” with pedestrians;
- Adding mirrors to utility poles to increase visibility around the corner of the intersection of the alley; and
- Extending the sidewalk along the western section of the alley adjacent to MAPS, near Massachusetts Avenue (where none exists today).

The Applicant has committed to upgrade substandard curb ramps, stripe missing crosswalks, and install curb extensions at the intersections of Yuma Street and 49th Street, Yuma Street and 48th Street, Windom Place and 48th Street, and Warren Street and 48th Street; subject to DDOT approval. The Applicant has also committed to fund and construct a High-intensity Activated crossWalk (HAWK) signal on Massachusetts Avenue between 48th Street and 49th Street, subject to DDOT approval. Figure 13 shows the planned streetscape and pedestrian improvements to the area surrounding the project.

SITE IMPACTS

Pedestrian Trip Generation

The Lady Bird development is expected to generate 13 walking trips (7 inbound, 6 outbound) during the weekday morning peak hour, 35 walking trips (18 inbound, 17 outbound) during the weekday afternoon peak hour, and 30 walking trips (16 inbound, 14 outbound) during the Saturday peak hour. The origins and destinations of these trips are likely to be:

- Employment opportunities where residents can walk to work;
- Employees and patrons of the development;
- Retail locations outside of the site; and
- Neighborhood destinations such as schools, libraries, and parks in the vicinity of the site.

In addition to these trips, the transit trips generated by the site will also generate pedestrian demand between the site and nearby transit stops.

Currently the existing pedestrian network has the capacity to absorb the newly generated trips from the site. The planned sidewalk and pedestrian landscape improvements along the site frontage on 48th Street, Yuma Street, and the alley will further improve and expand the pedestrian network in the vicinity of the site.

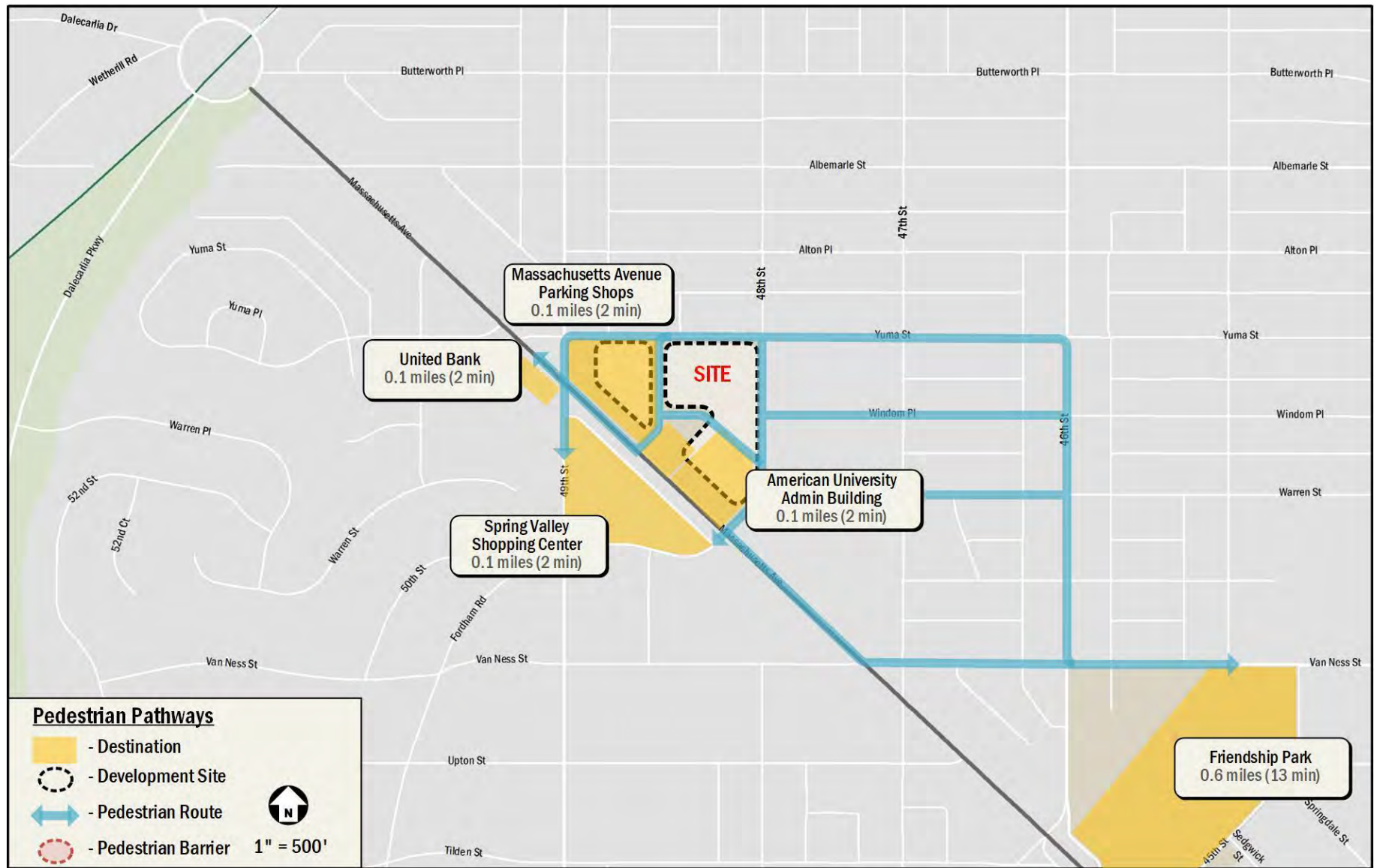


Figure 40: Pedestrian Pathways

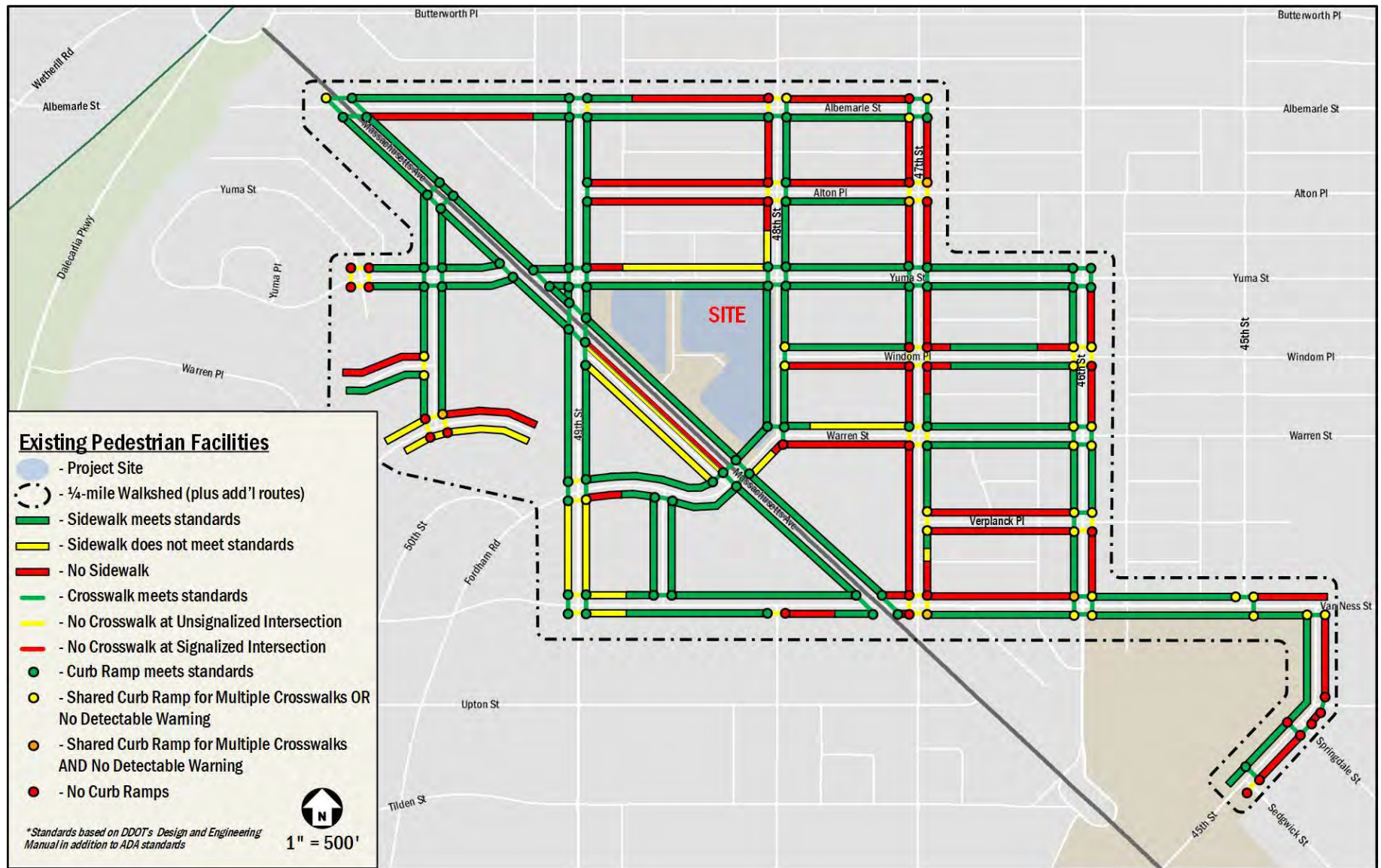


Figure 41: Existing Pedestrian Infrastructure

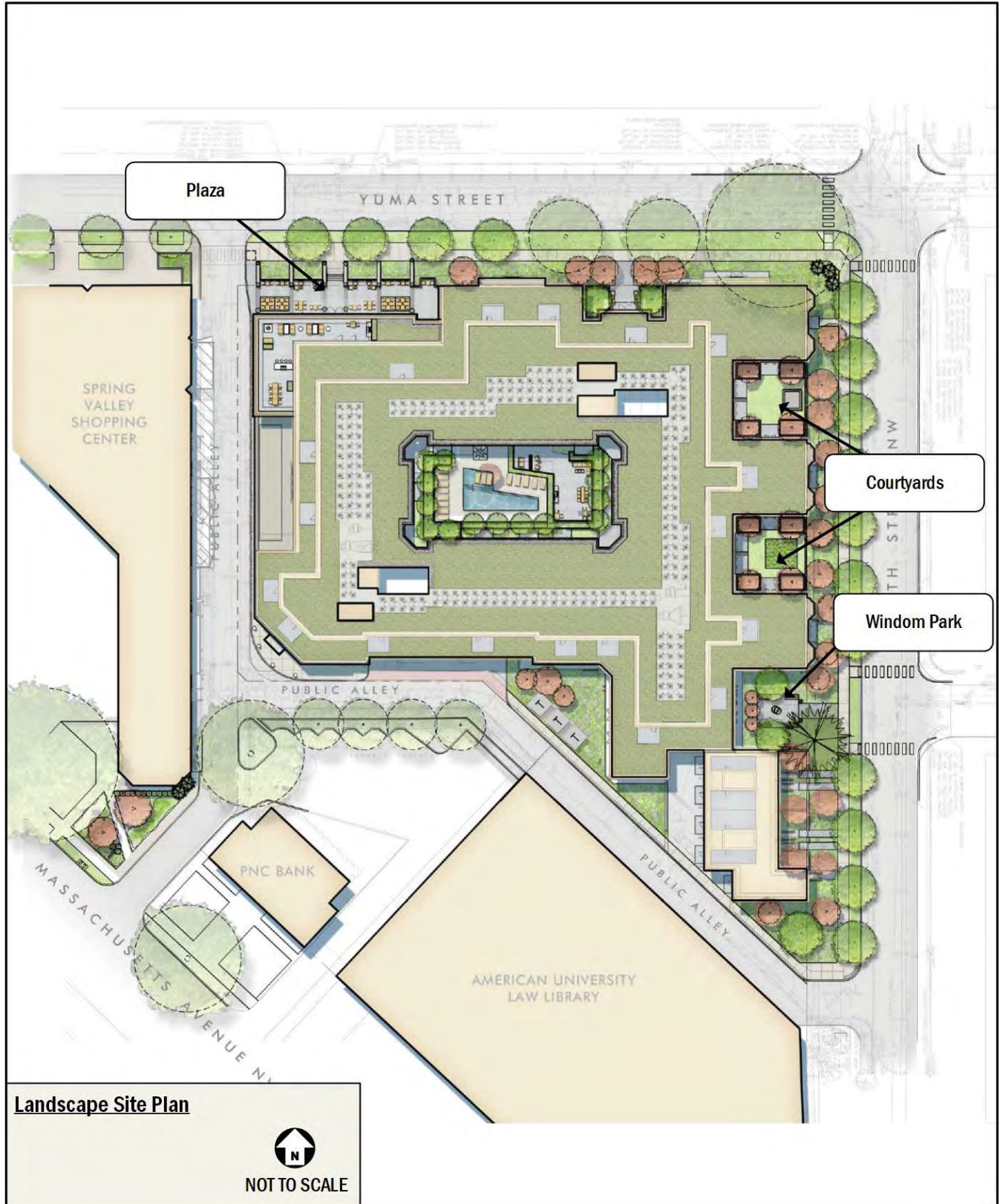


Figure 42: Landscape Site Plan



BICYCLE FACILITIES

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

The following conclusions are reached within this chapter:

- Limited existing bicycle infrastructure surrounds the site.
- The site is not expected to generate a significant amount of bicycle trips; therefore, all site-generated bike trips can be accommodated on the residential low-volume streets surrounding the site.
- The development will include secure bicycle parking on site for residents and employees of the development.
- The development will include short-term bicycle racks along the perimeter of the site.

EXISTING BICYCLE FACILITIES

Limited bicycle infrastructure exists surrounding the site. The site is 0.6 miles from the nearest designated bicycle facility, which are shared-lanes along 43rd Street. However, low volume residential streets surrounding the site provide bicycle connectivity where designated facilities are lacking. Figure 43 illustrates the existing bicycle facilities in the area.

Under existing conditions there is no short-term bicycle parking located around the perimeter of the site.

PLANNED BICYCLE FACILITIES

MoveDC

The MoveDC plan outlines several bicycle improvements in the vicinity of the site. These improvements are broken up into four tiers that rank the priority for implementation. Due to the timeline of the proposed development, this report will focus on the Tier 1 and Tier 2 recommendations within the vicinity of the site. The four tiers are broken down as follows:

- Tier 1
Investments should be considered as part of DDOT's 6-year Transportation Improvement Program (TIP) and annual work program development, if they are not already included. Some projects may be able to move directly into construction, while others become high priorities for advancement through the Project Development Process.

There are two tier 1 additions that will positively affect bicycle connectivity to and from the site. A bicycle trail from Western Avenue to R Street NW along Massachusetts Avenue NW, and a trail from Rockwood Parkway NW to Wisconsin Avenue NW along Nebraska Avenue NW are planned. These facilities will greatly improve the bicycle connectivity near the site.

- Tier 2
Investments within this tier are not high priorities in the early years of MoveDC implementation. These investments could begin moving through the Project Development Process if there are compelling reasons for their advancement.

There is one tier 2 addition that will positively affect bicycle connectivity to and from the site. A bicycle lane extending from Linnean Avenue NW to 49th Street NW along Albemarle Street NW is planned. This facility will greatly improve the bicycle connectivity near the site.

- Tier 3
Investments within this tier are not priorities for DDOT-led advancement in the early years of MoveDC's implementation. They could move forward earlier under circumstances, such as real estate development initiatives and non-DDOT partnerships providing the opportunity for non-District-led completion of specific funding.
- Tier 4
Generally, investments within this tier are not priorities for DDOT-led advancement and are lower priority for project development in the early years of implementation.

Although these projects are discussed in the MoveDC plan, they are not currently funded nor included in DDOT's Transportation Improvement Plan thus they will not be assumed as complete for this analysis.

Capital Bikeshare

The Capital Bikeshare program provides additional cycling options for residents, employees, and patrons of the planned development. The Bikeshare program has placed over 550 Bikeshare stations across Washington, DC, Arlington County, VA, City of Alexandria, VA, Montgomery County, MD, Fairfax County, VA, Prince George's County MD, and most recently the City of Falls Church, VA, with over 4,300 bicycles provided. Within a quarter-mile of the site, there are no existing Capital Bikeshare stations.



One station is identified within DDOT's Capital Bikeshare Development Plan to be installed in the vicinity of the site. According to DDOT, DDOT plans to install a new Capital Bikeshare station near the intersections of Massachusetts and 48th Street NW or Massachusetts and 49th Street NW in 2019 pending equipment supply, location availability, and an upcoming review of the Bikeshare Development plan. Figure 43 illustrates the existing Capital Bikeshare facilities in the area.

E-Scooters and Dockless E-Bicycles

Seven (7) electric-assist scooter (e-scooter) and electric-assist bicycle (e-bike) companies provide Shared Mobility Device (SMD) service in the District: Bird, Bolt, JUMP, Lime, Lyft, Skip, and Spin. These SMDs are provided by private companies that give registered users access to a variety of e-scooter and e-bike options. These devices are used through each company-specific mobile phone application. Many SMDs do not have designated stations where pick-up/drop-off activities occur like with Capital Bikeshare; instead, many SMDs are parked in public space, most commonly in the "furniture zone" (the portion of sidewalk between where people walk and the curb, often where you'll find other street signs, street furniture, trees, parking meters, etc.). At this time, SMD pilot/demonstration programs are underway in Arlington County, the District, Fairfax County, the City of Alexandria, and Montgomery County.

On-Site Bicycle Elements

The project will include 27 short-term bicycle spaces at street level along the perimeter of the site on 48th Street, Yuma Street, and along the segment of public alley to the south of the site. These short-term spaces will include inverted U-racks placed in high-visibility areas. The Applicant is coordinating with DDOT to select locations for these racks in public space.

The project will also include secure long-term bicycle parking. The plans identify a total of 83 long-term spaces in two separate areas located in the first level of the below-grade parking garage. The first storage and maintenance space will house 77 long-term bicycle spaces for residents of the proposed development. The second storage space will house six (6) long-term bicycle spaces for use of the grocery/retail employees so that they may store their bicycles securely.

The 83-secure long-term bicycle parking spaces will exceed the amount of bicycle parking that is required by Zoning Regulations.

SITE IMPACTS

Bicycle Trip Generation

The Lady Bird development is expected to generate 5 bicycle trips (2 inbound, 3 outbound) during the weekday morning peak hour, 10 bicycle trips (5 inbound, 5 outbound) during the weekday afternoon peak hour, and 9 bicycle trips (5 inbound, 4 outbound) during the Saturday peak hour. Although the proposed development will be generating a relatively small number of peak hour bicycle trips, bicycling will be an important mode for getting to and from the site, with significant facilities located on site.

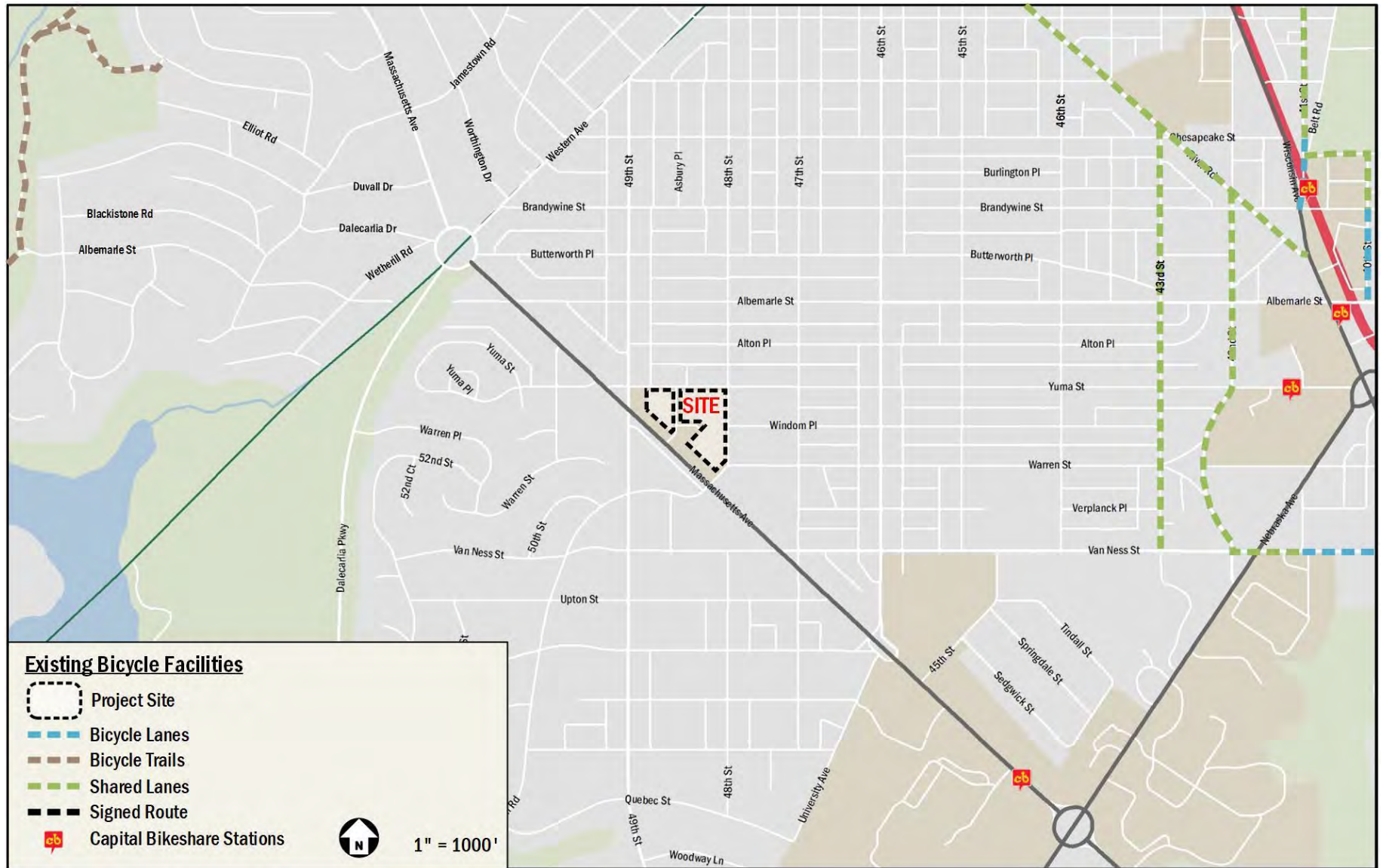


Figure 43: Existing Bicycle Facilities



CRASH DATA ANALYSIS

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

SUMMARY OF AVAILABLE CRASH DATA

A crash analysis was performed to determine if there was an abnormally high crash rate at any study area intersection. DDOT provided the last three years of intersection crash data, from 2016 to 2018 for the study area. This data was reviewed and analyzed to determine the crash rate at each location. For intersections, the crash rate is measured in crash per million-entering vehicles (MEV). The crash rates per intersections are shown in Table 17.

According to the Institute of Transportation Engineers' *Transportation Impact Analysis for Site Development*, a crash rate of 1.0 or higher is an indication that further study is required. No intersections in this study area meet this criterion, and thus further study of individual intersections was not conducted as part of this CTR.

Table 17: Intersection Crash Rates

Intersection	Total Crashes	Ped Crashes	Bike Crashes	Rate per MEV*
Massachusetts Avenue NW & 50 th Street NW	2	0	0	0.07
Massachusetts Avenue NW & Yuma Street NW (W)	1	0	0	0.04
Massachusetts Avenue NW & Yuma Street NW (E)	0	0	0	0.00
Massachusetts Avenue NW & 49 th Street NW	18	0	0	0.61
Massachusetts Avenue NW & Alley^				
Massachusetts Avenue NW & 48 th Street NW & Fordham Street NW	8	3	0	0.29
Massachusetts Avenue NW & Van Ness Street NW	1	0	0	0.04
49 th Street NW & Yuma Street NW	1	0	1	0.20
Yuma Street NW & Alley^				
Yuma Street NW & 48 th Street NW	0	0	0	0.00
Windom Place NW & 48 th Street NW	0	0	0	0.00
Alley & 48 th Street NW^				
Warren Street NW & 48 th Street NW	0	0	0	0.00
Fordham Road NW & 49 th Street NW	2	1	0	0.55
Albemarle Street NW & 49 th Street NW	0	0	0	0.00
Albemarle Street NW & 48 th Street NW	0	0	0	0.00
Yuma Street NW & 46 th Street NW	1	0	0	0.19

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

^ - Crash Data unavailable



SUMMARY AND CONCLUSIONS

This report presents the findings of a Comprehensive Transportation Review (CTR) for the Lady Bird Planned Unit Development (PUD). The purpose of this study is to evaluate whether the project will generate a detrimental impact to the surrounding transportation network. This evaluation is based on a technical comparison of the existing conditions, background conditions, and future conditions. This report concludes that **the project will not have a detrimental impact** to the surrounding transportation network assuming that all planned site design and Transportation Demand Management (TDM) elements are implemented.

The Project Site is located in the AU Park/ Spring Valley neighborhood of Upper Northwest, Washington, DC, and consists of Lots 802, 803, 806, and 807 in Square 1499. The Project Site is generally bound by Yuma Street on the north; Massachusetts Avenue on the south, 48th Street on the east, and the Spring Valley Exxon station on the west.

The Project Site is currently improved with the following existing structures:

- on Lots 802 and 803, the historic Avenue Parking Shops (“MAPS”);
- on Lot 806, the former American University Law School building (the “AU Building”); and
- on Lot 807, a surface and below-grade parking lot, a vacant grocery store, and additional retail uses that are currently in operation (the “Valor Lot”).

The proposed development will redevelop the Valor Lot to include a mixed-use development consisting of five townhomes, one mixed-use building with 214 residential dwelling units, and 18,198 square feet of grocery/retail space.

As part of the proposed development, sections of the roadway network surrounding the site will be improved. Pedestrian facilities along the perimeter of the project on Yuma Street, 48th Street, and along the public and private alleys to the south of the site will be improved so that they meet or exceed DDOT and ADA standards. Existing curb cuts along Yuma Street and 48th Street will be closed, providing more continuity to sidewalks along the site’s perimeter that does not exist under current conditions.

The Applicant has also committed to significantly improve the public alley to the west of the site as follows:

- The installation of a 3-foot wide delineated pedestrian path (where none exists today);
- Converting the intersection of the alleys to an all-way stop;
- Adding textured pavement to the intersection of the alley to make drivers aware of a “shared-space” with pedestrians;
- Adding mirrors to utility poles to increase visibility around the corner of the intersection of the alley; and
- Extending the sidewalk along the alley adjacent to Massachusetts (where none exists today).

The Applicant has committed to upgrade substandard curb ramps, stripe missing crosswalks, and install curb extensions at the intersections of Yuma Street and 49th Street, Yuma Street and 48th Street, Windom Place and 48th Street, and Warren Street and 48th Street; subject to DDOT approval. The Applicant has also committed to fund and construct a High-intensity Activated crossWalk (HAWK) signal on Massachusetts Avenue between 48th Street and 49th Street, subject to DDOT approval.

Vehicular and loading access for the project will be provided primarily via Yuma Street, 48th Street, and Massachusetts Avenue, which provide access to the public alley that connects to the loading facilities, the service and delivery space, and the below-grade parking garage.

The proposed development will provide approximately 370 below-grade parking spaces in three levels of below-grade parking. The first level of parking will contain approximately 86 parking spaces that are intended to be for grocery/retail uses. The second level of parking will contain approximately 179 parking spaces, of which approximately 56 will be reserved for those that hold a monthly parking pass from American University, and the remaining 123 parking spaces will be for residents of the development that choose to lease a parking space. The third level of parking will contain approximately 105 parking spaces for residents of the development that choose to lease a parking space. Parking is planned to be priced at the market-rate.

The development will supply long-term bicycle parking within the below-grade garage and short-term bicycle parking around the perimeter of the site. The amount of short-term and long-term bicycle parking being provided exceeds what is required by zoning.



Multi-Modal Impacts and Recommendations

Transit

The site is served by regional and local transit services via Metrobus and Metrorail. The site is 0.8 miles from the Tenleytown – AU Metrorail Station entrance at Albemarle Street and Wisconsin Avenue, and four Metrobus stops are located within a block of the site along Massachusetts Avenue.

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

Pedestrian

The site is surrounded by a well-connected pedestrian network. Most roadways within a quarter-mile radius provide sidewalks and acceptable crosswalks and curb ramps, particularly along the primary walking routes. There are residential streets to the north and southeast of the site which lack sidewalks, curb ramps, or crosswalks that meet DDOT and ADA standards.

As a result of the development, pedestrian facilities along the perimeter of the site will be improved by the removal of two existing curb cuts and improving sidewalks adjacent to the site such that they meet or exceed DDOT requirements. In addition, the Applicant has committed to make a number of significant pedestrian related improvements to the alley, to upgrade substandard curb ramps, stripe missing crosswalks, and install curb extensions at four (4) proximate intersections (subject to DDOT approval), and fund and construct a High-intensity Activated crossWalk (HAWK) signal on Massachusetts Avenue between 48th Street and 49th Street, subject to DDOT approval.

Bicycle

Bicycle infrastructure in the vicinity of the site is limited. The site is 0.6 miles from the nearest designated bicycle facility, which are shared-lanes along 43rd Street. However, low volume residential streets surrounding the site provide bicycle connectivity where official facilities are lacking.

No Capital Bikeshare stations are located within a half-mile of the site; however, one station is identified within DDOT's Capital Bikeshare Development Plan to be installed in the vicinity of the site. According to DDOT, DDOT plans to install a new Capital Bikeshare station near the intersections of Massachusetts and 48th Street NW or Massachusetts and 49th Street NW in 2019 pending equipment supply, location

availability, and an upcoming review of the Bikeshare Development plan.

The proposed development will provide short-term bicycle parking along the perimeter of the site and on-site secure long-term bicycle parking within the below-grade garage for residents and employees of the development.

Vehicular

The site is well-connected to regional roadways such as Massachusetts Avenue and Western Avenue, principal and minor arterials such as Nebraska Avenue and Wisconsin Avenue, and an existing network of collector and local roadways.

In order to determine the potential impacts 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 and queues. These are compared to the acceptable levels of delay set by DDOT standards to determine if the site will negatively impact the study area. The analysis concluded that no intersections would require mitigation as a result of the development.

Summary and Recommendations

This report concludes that **the proposed development will not have a detrimental impact on the surrounding transportation network assuming that all planned site design and TDM elements are implemented.**

The development has several positive elements contained within its design that minimize potential transportation impacts, including:

- The inclusion of secure long-term bicycle parking spaces within the development that meet or exceed zoning requirements.
- The installation of short-term bicycle parking spaces around the perimeter of the site that meet or exceed zoning requirements.
- The creation of wide pedestrian sidewalks that meet or exceed DDOT and ADA requirements.
- The installation of a HAWK signal on Massachusetts Avenue between 48th Street and 49th Street.
- The upgrading of substandard curb ramps, striping of missing crosswalks, and installation of curb extensions at four (4) proximate intersections.



- The significant improvements to the alley to provide additional pedestrian facilities surrounding the site.
- The inclusion of publicly accessible spaces.
- The provision of \$100,000 on means for connecting residents to the Tenleytown Metro station through geofence with ride hailing services.
- The inclusion of eight (8) electric vehicle charging and four (4) car-share parking spaces.
- A robust Transportation Demand Management (TDM) plan that reduces the demand of single-occupancy, private vehicles during peak period travel times or shifts single-occupancy vehicular demand to off-peak periods.