- The inclusion of electric vehicle (EV) parking spaces within the parking garage.
- 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.

This report analyzed the potential impacts of the development, and concluded that the development will not have a detrimental impact to the surrounding transportation network, as long as the project implements the recommendations as follows:

- Signal timing improvements to the intersection of Wisconsin Avenue and Van Ness Street.
- Signal timing improvements to the intersection of Wisconsin Avenue and Upton Street.
- Signal timing improvements and peak parking restrictions at the intersection of Wisconsin Avenue and the existing Fannie Mae/proposed North Lane driveway.
- Signal timing improvements to the intersection of Wisconsin Avenue and Quebec Street.
- Signal timing improvements and peak parking restrictions at the intersection of Wisconsin Avenue and Porter Street.
- A new traffic signal at the intersection of Wisconsin Avenue and the proposed south site driveway, which is tied into and coordinated with the existing traffic signal at the intersection of Wisconsin Avenue and Rodman Street.
- Installing/upgrading curb ramps and crosswalks as necessary around the site.
- Implementing the Transportation Demand Management (TDM) plan detailed within the body of this report.

The following summarizes the overall conclusions of the vehicular analysis as it relates to the roadway network as a whole:

- The overall change in use of the Fannie Mae campus results in vehicular traffic that is spread out over a larger amount of time, but generally less concentrated than the existing office use. The change in use also results in a significant increase in weekend traffic compared to that of an office use.
- There is minimal change in overall operations during the morning and afternoon peak hours, with signal timing adjustments able to mitigate the majority of issues. This is because the net increase in traffic on weekdays is more minimal compared to Saturday, but there is a change in the directionality of the traffic.
- More significant changes to the surrounding roadway network are required on Saturday including the removal of parking along some roadways segments for specific time periods. This makes sense given the increase in traffic on Saturday for the proposed use mix as compared to an office use.
- The overall design of the 3900 Wisconsin Avenue site is expected to operate efficiently, such that the majority of vehicular traffic is processes at the signalized intersections, and the internal roadway network is more pedestrian-oriented.

INTRODUCTION

This report reviews the multi-modal transportation elements of the 3900 Wisconsin Avenue development project and the vehicular impacts of the overall Fannie Mae Campus redevelopment. The site, shown in Figure 1, is located just north of the McLean Gardens neighborhood in northwest DC.

Under existing conditions, the project site is part of the overall Fannie Mae campus, which consists of approximately 720,000 total square feet of office space along the surrounding Wisconsin Avenue corridor. This includes the 3900 Wisconsin Avenue site as well as adjacent properties at 4000 Wisconsin Avenue to the north of the site and 3939 Wisconsin Avenue to the east of the site. Fannie Mae currently employs approximately 3,213 employees in these three buildings.

This Application proposes to redevelop the existing Fannie Mae headquarters located at 3900 Wisconsin Avenue NW into a multi-building, mixed-use development consisting of residential, hotel, retail, office, and other uses with a three-level below-grade parking garage. Overall the development will contain approximately 702 residential units, 34,488 square feet of general retail, just under 86,000 square feet of grocery space, approximately 6,500 square feet of restaurant space to be operated by the grocer, a 650-seat movie theater, 34,056 square feet of office, 37,566 square feet of fitness club space, 34,056 square feet of cultural/arts space, and 140 hotel rooms with an approximately 1,400 space below-grade parking garage. The development will also construct an internal street network consisting of North Lane, East Lane, South Lane, and West Lane.

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 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. The report discusses what improvements to the transportation network are needed to alleviate adverse impacts. For this analysis specifically, the overall Fannie Mae Campus redevelopment was analyzed in its entirety. Therefore, vehicular impacts were appropriately and proportionately distributed amongst the two redevelopment projects at 3900 Wisconsin Avenue NW (this application) and 4000 Wisconsin Avenue NW (the adjacent application).

CONTENTS OF STUDY

This report contains nine sections as follows:

- *Study Area Overview*
  This section reviews the area near and adjacent to the proposed project and includes an overview of the site location.
- *Project Design*
  This section 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.
- *Trip Generation*

  This section outlines the travel demand of the proposed project. It summarizes the proposed trip generation of the project.
- *Traffic Operations*
  This section 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 improvements to the transportation network.
- *Transit*
  This section 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 section 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 section 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 section 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 section presents a summary of the recommended mitigation measures by mode and presents overall report findings and conclusions.

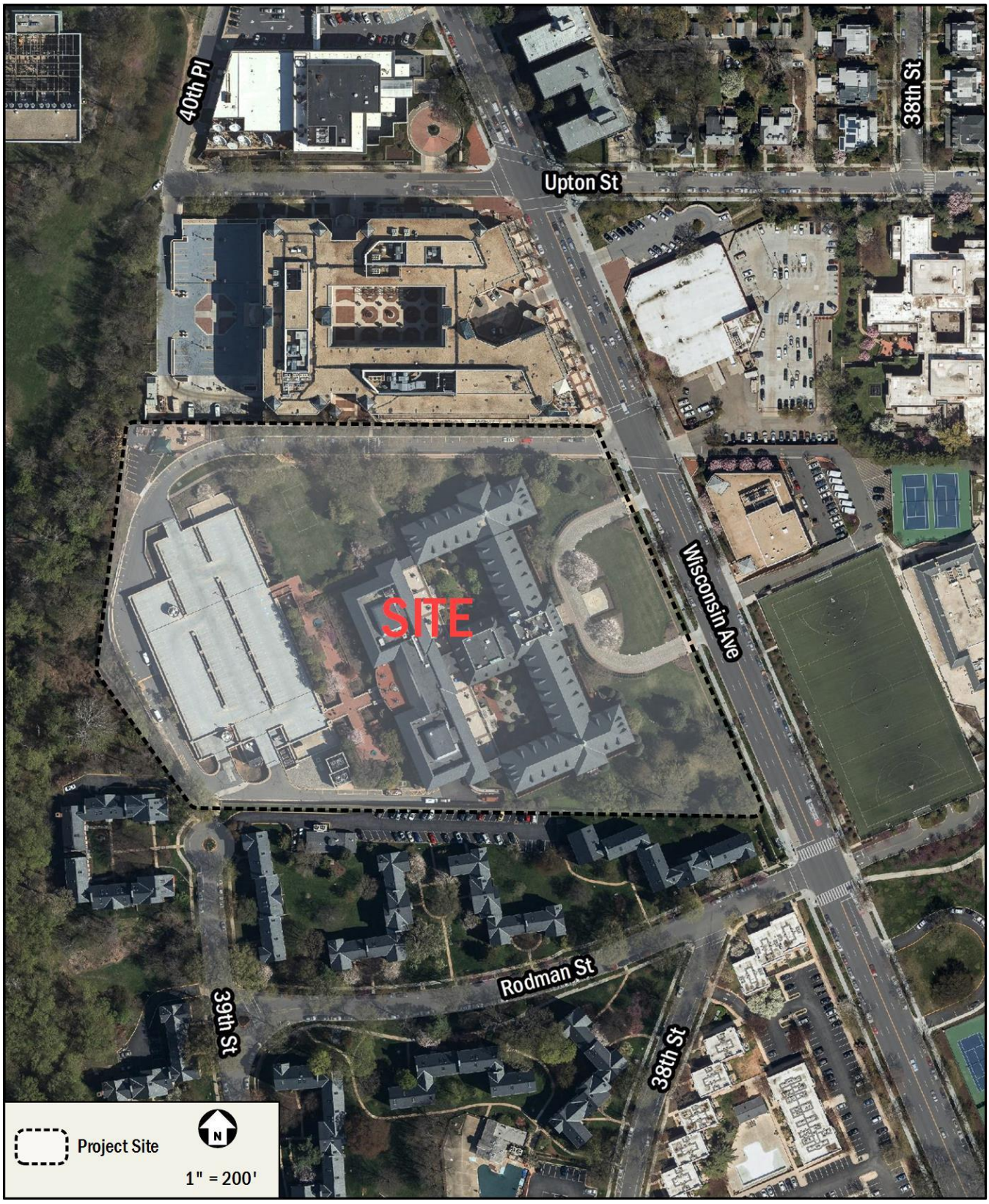

Figure 1: Site Location

STUDY AREA OVERVIEW

This section 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 connects the residents, employees, and patrons of the proposed development to the District and surrounding areas.
- The site has access to public transportation with service to the Metrorail Red Line and several local and regional Metrobus lines.
- There is some existing bicycle infrastructure including bike lanes and shared lanes along Van Ness Street and signed routes in the vicinity of the site.
- Pedestrian conditions generally meet the District standard, particularly along anticipated major walking routes.

MAJOR TRANSPORTATION FEATURES

Overview of Regional Access

The 3900 Wisconsin Avenue site has ample access to regional vehicular- and transit-based transportation options, as shown in Figure 3, that connect the site to destinations within the District, Virginia, and Maryland.

The site is accessible from several US interstates such as I-495 and I-66. The interstates create connectivity to the Capital Beltway (I-495) that surrounds Washington, DC and its inner suburbs as well as regional access to I-95. All of these roadways bring vehicular traffic within a half-mile of the site, at which point arterials and local roads can be used to access the site directly.

The site has access to the Metrorail Red Line which provides connections to areas in the District and Maryland. The Red Line connects stations in 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, including a connection to Union Station which acts as a primary hub for Amtrak, VRE, and MARC rail services, 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

There are several local transportation options near the site that serve vehicular, transit, walking, and cycling trips, as shown on Figure 4.

The site is served by a local vehicular network that includes several primary and minor arterials such as Wisconsin Avenue, Connecticut Avenue, and Massachusetts Avenue. In addition, there is an existing network of connector and local roadways that provide access to the site.

The Metrobus system provides local transit service in the vicinity of the site. As shown in Figure 4, there are nine (5) bus routes along five (5) lines that service the site. In the vicinity of the site the majority of routes travel along Wisconsin Avenue. These bus routes connect the site to many areas of the District and Maryland, including several Metrorail stations.

There are existing bicycle facilities that connect the site to areas within the District, most notably the shared lanes on Van Ness Street which provides connection to other bicycle facilities. Other facilities include signed routes along 36th and 37th Street, which lie to the east of the site.

In the vicinity of the site, nearly all roadways provide sidewalks with crosswalks present at most intersections. Anticipated pedestrian routes, such as those to public transportation stops, retail zones, and community amenities, provide excellent pedestrian facilities. A detailed review of existing and proposed pedestrian access and infrastructure is provided in a later section of this report.

Overall, the site is surrounded by an extensive 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, Enterprise Carshare, Maven, and Car2Go. All four services are private companies that provide registered users access to a variety of automobiles. Of these, Zipcar, Enterprise Carshare, and Maven have designated spaces for their vehicles. There are five (5) car-share locations with nine (9) total vehicles

within a half-mile of the site. These locations and the number of available vehicles are listed in Table 1.

Carsharing is also provided by Car2Go, which provides point-to-point car sharing. Unlike Enterprise Carshare and Maven, which require two-way trips, Car2Go and to a lesser extent Zipcar can be used for one-way rentals. Car2Go currently has a fleet of vehicles located throughout the District and Arlington. Car2Go 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 meters or pay stations. Car2Go does 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 Cathedral-Wesley Heights-McLean Gardens neighborhood. This project location itself has a walk score of 78 (or "Very Walkable"), transit score of 62 (or "Good Transit"), and a bike score of 67 (or "Bikeable"). Figure 2 shows the neighborhood borders in relation to the site location and displays a heat map for walkability and bikeability.

As shown in Figure 2, the site is situated in a neighborhood that encompasses some good and some average walk scores. The site is situated in an area with average bike scores given its proximity to bike facilities. Overall, the Cathedral-Wesley Heights-McLean Gardens neighborhood has above average walk, transit, and bike scores.

Table 1: Carshare Locations within 0.5 miles of the Site

Carshare Location	Number of Vehicles
Zipcar	
40th Street & Albemarle Street NW	2 vehicles
4300 Nebraska Avenue NW	1 vehicles
3401 38th Street NW	2 vehicles
3333 Wisconsin Avenue NW	1 vehicles
3336 Wisconsin Avenue NW	3 vehicles
Total	**9 vehicles**

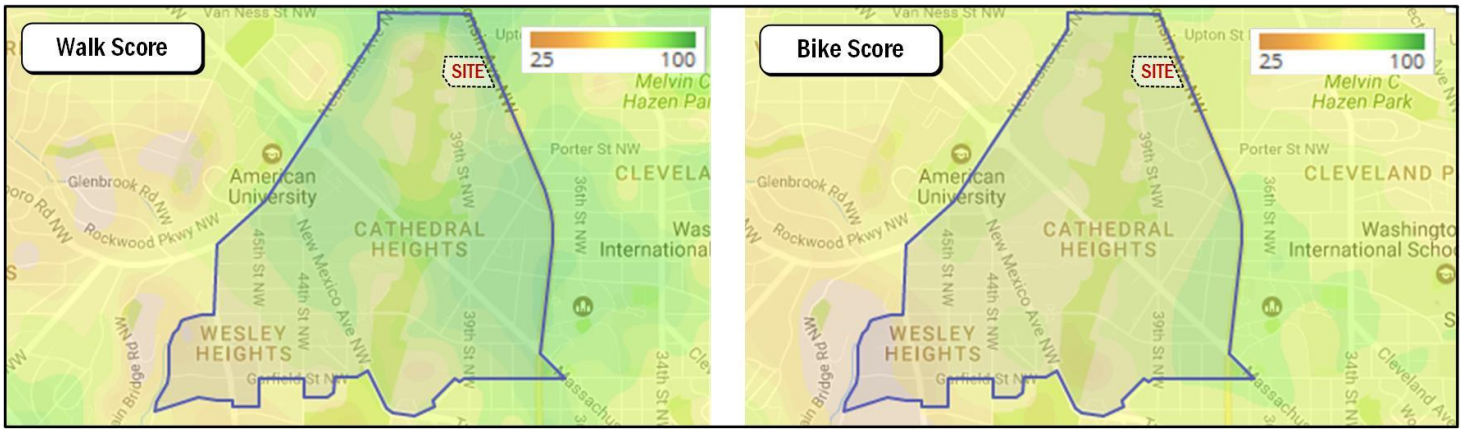

Figure 2: Summary of Walkscore and Bikescore

FUTURE REGIONAL PROJECTS

There are several District initiatives and background 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 an implementation-based 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 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
- A new downtown Metrorail loop
- Expanded commuter rail
- Water taxis

Three of these planned transportation improvements are located in the vicinity of the site:

- 4.6 miles of high-frequency bus service along Wisconsin Avenue from Friendship Heights to Dupont Circle
- 3.4 miles of high-capacity transit along Wisconsin Avenue from Tenleytown to Georgetown
- 1 mile of bike lanes along Nebraska Avenue NW from Rockwood Parkway NW to Wisconsin Avenue NW, which will connect to existing bike lanes along New Mexico Avenue NW from Nebraska Avenue NW to Georgetown

Planned Developments

There are several potential development projects in the vicinity of the 3900 Wisconsin Avenue. For the purpose of this analysis, only approved developments expected to be complete prior to planned development with an origin/destination within the study area were included. A detailed list of all background developments considered and a description of their applicability for incorporation in the study is included in the Technical Attachments. Of the background developments considered, two were ultimately included and are described below. Figure 5 shows the location of these developments in relations to the proposed development.

Sidwell Friends School

The Upper/Middle School campus of Sidwell Friends School is located adjacent to the site on Wisconsin Avenue. The school proposes to relocate its Lower School, currently located off-site, to the Upper/Middle School campus location. The project will include the redevelopment of the existing school site and the renovation of a building adjacent to the school site currently occupied by the Washington Home. As part of the project, the school will increase its total enrollment cap from 850 students to 1250 students, and its faculty/staff cap from 190 to 260. The development plan also includes an additional 20 surface parking spaces at the Lower School campus location for short-term/visitor parking.

4000 Wisconsin Ave

The 4000 Wisconsin Avenue site is currently part of the Fannie Mae campus and includes 404,457 square feet of office space, 40,998 square feet of retail space, and 37,916 square feet of health club space, and a conference center. There are 1,035 parking spaces provided in a parking garage on-site, with access from Upton Street. The site will be redeveloped in conjunction the relocation of Fannie Mae and is proposed to include 716 residential units, 60,200 square feet of grocery, 49,388 square feet of health club space, and 22,598 square feet of retail space. The project will retain the below-grade parking garage, which will supply 900 parking spaces and loading facilities for the redevelopment.

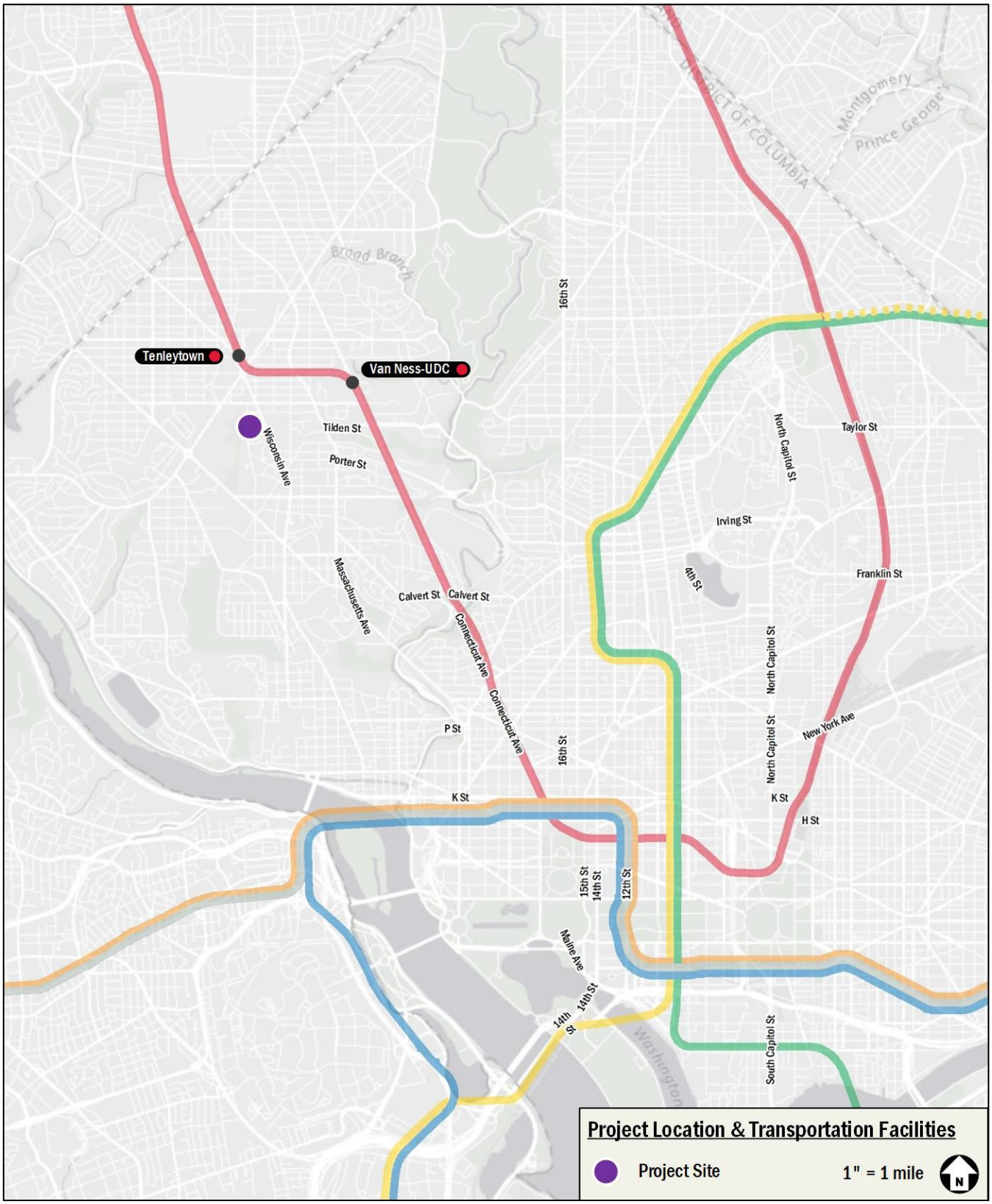

Figure 3: Major Regional Transportation Facilities

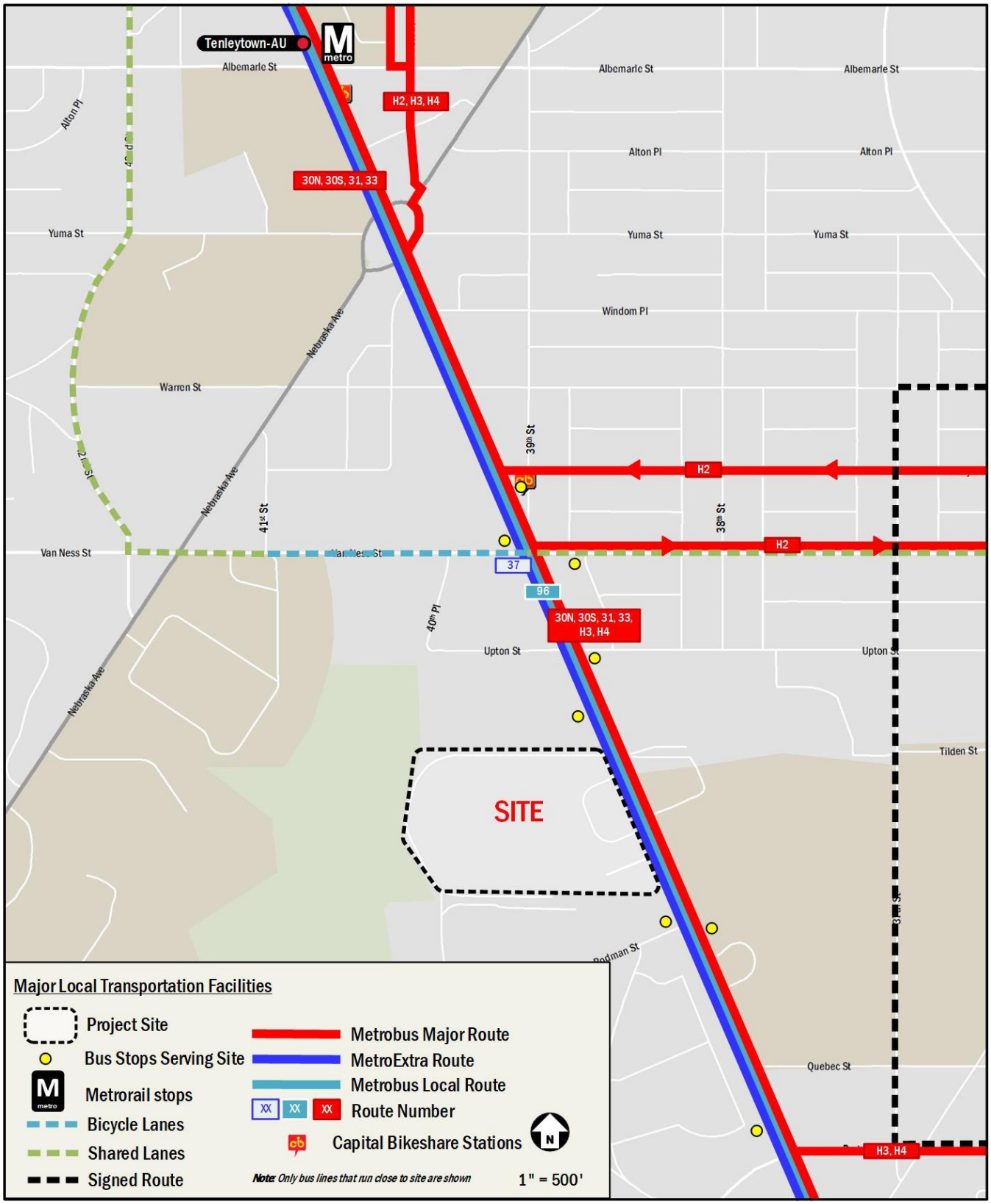

Figure 4: Major Local Transportation Facilities

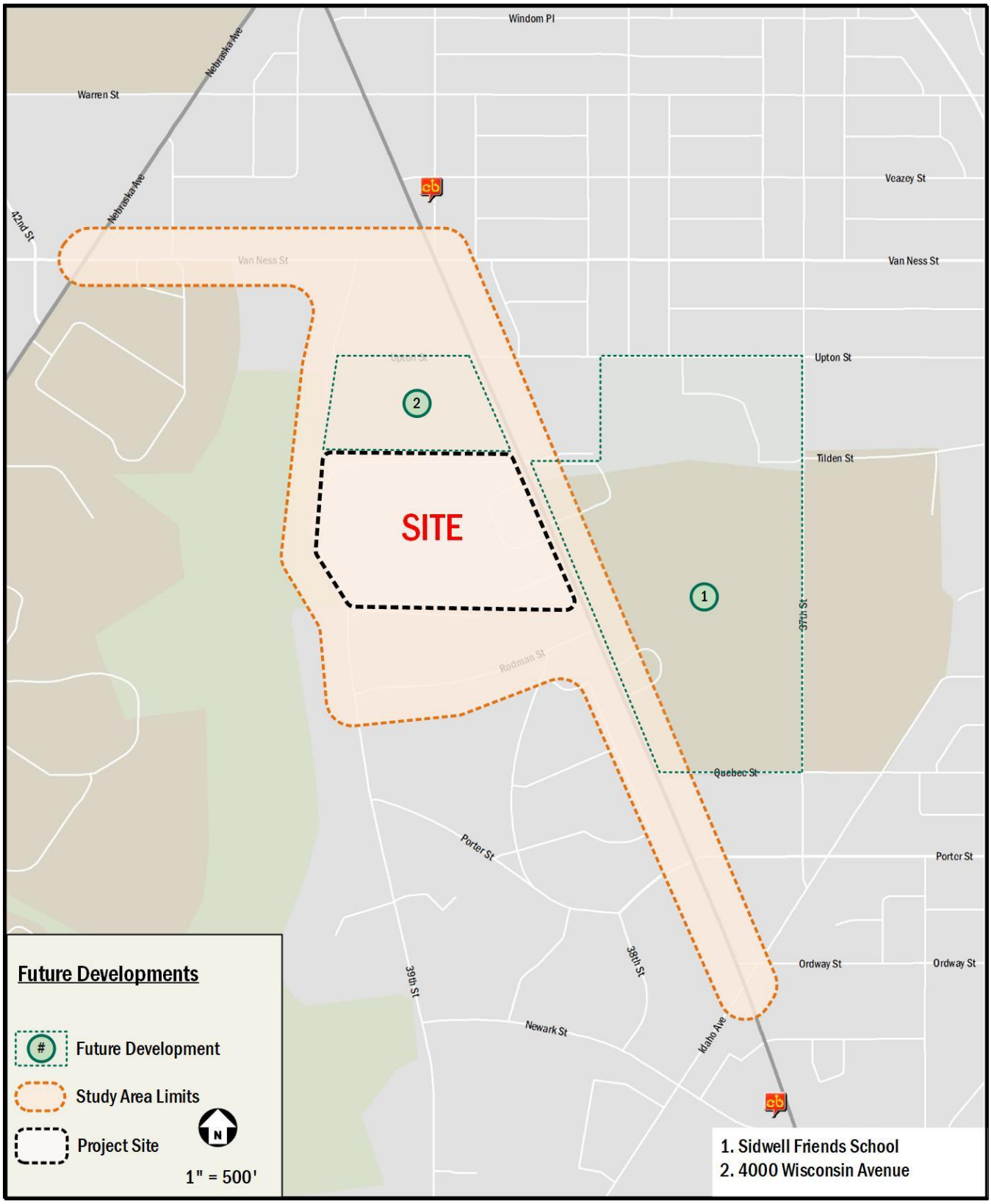

Figure 5: Planned Development Map

PROJECT DESIGN

This section reviews the transportation components of the 3900 Wisconsin Avenue development, including the proposed site plan and access points. It includes descriptions of the site's vehicular access, loading, parking, bicycle and pedestrian accommodations, and Transportation Demand Management (TDM) plan.

Under existing conditions, the project site is part of the overall Fannie Mae campus, which consists of approximately 720,000 total square feet of office space along the surrounding Wisconsin Avenue corridor. This includes the 3900 Wisconsin Avenue site as well as adjacent properties at 4000 Wisconsin Avenue to the north of the site and 3939 Wisconsin Avenue to the east of the site. Fannie Mae currently employs approximately 3,213 employees in these three buildings. The employee and parking breakdown for the existing Fannie Mae building within the campus is presented in Table 2. Fannie Mae is planning to vacate all three existing buildings and as such all three buildings will be redeveloped.

Table 2: Fannie Mae Existing Employee and Parking Breakdown

Land Use	Number of Employees	Parking Supply
3900 Wisconsin Avenue	1,038 employees	523 spaces
4000 Wisconsin Avenue	1,946 employees	1,029 spaces
3939 Wisconsin Avenue	229 employees	54 spaces
Total	3,213 employees	1,606 spaces

This Application proposes to redevelop the existing Fannie Mae headquarters located at 3900 Wisconsin Avenue NW into a multi-building, mixed-use development consisting of residential, hotel, retail, office, and other uses with a three-level below-grade parking garage. Overall the development will contain approximately 702 residential units, 34,488 square feet of general retail, just under 86,000 square feet of grocery space, approximately 6,500 square feet of restaurant space to be operated by the grocer, a 650-seat movie theater, 34,056 square feet of office, 37,566 square feet of fitness club space, 34,056 square feet of cultural/arts space, and 140 hotel rooms with an approximately 1,400 space below-grade parking garage. The development will also construct an internal street network consisting of North Lane, East Lane, South Lane, and West Lane. The development program is broken down by parcel as follows and illustrated in Figure 8:

- Parcel A of the development will be located in the eastern portion of the site with frontage on Wisconsin Avenue, and will include the existing building. Parcel A will include 140 hotel rooms and approximately 12,000 square feet grocery space including ground-floor mechanical area and approximately 6,500 square feet of restaurant space to be operated by the grocer.
- Parcel B of the development will be located southwest of Parcel A, with frontage along East Lane. Parcel B will include 174 mid-rise residential units, and approximately 80,000 square feet of grocery space.
- Parcel C of the development will be located southwest of Parcel B, with frontage along South Lane. Parcel C will include 42 mid-rise residential units.
- Parcel D will be located to the north of Parcel C, in the center of the internal roadway network. Parcel D will include 34,056 square feet of office space, a 37,566-square foot fitness center, and 34,488 square foot of retail space. Parcel D will include an additional 34,056 square feet of cultural/arts space.
- Parcel E1 will be located to the west of Parcel D with frontage along West Lane. Parcel E1 will include approximately 198 mid-rise residential units.
- Parcel E2 will be located to the north of Parcel D with frontage on North Lane. Parcel E2 will include 215 mid-rise residential units and a 650-seat movie theater.
- Parcel F will be located to the east of Parcel E2 with frontage on North Lane. Parcel F will include 12,949 square feet of retail space and 74 mid-rise residential units.
- Parcel G will be located in the southwest corner of the site with frontage on Wisconsin Avenue. Parcel G will include 35,680 square feet of hotel amenity space.

A total of approximately 1,400 parking spaces will be shared in a below-grade parking garage. The garage will consist of three (3) levels and will accommodate approximately 600 parking spaces for the residential components and the remaining parking for retail and other commercial components.

The development will include a new pedestrian-friendly roadway network, as well as minor modifications to internal roadways that intersect Wisconsin Avenue under existing conditions. Existing site and roadway configuration is shown on

Figure 6. The proposed site and roadway configuration is shown on Figure 7.

Site Access

External Vehicular Access

Under current conditions, there are four (4) curb cuts that provide vehicular access to the site: three (3) along Wisconsin Avenue and one (1) along 39th Street, shown in Figure 6. Along Wisconsin Avenue the northernmost curb cut is signalized and provides full access to the site. The two (2) southern curb cuts on Wisconsin Avenue provide access to an existing semi-circular driveway and are both unsignalized, with free-flowing traffic on Wisconsin Avenue. The curb cut on 39th Street provides full access at an unsignalized intersection which functions as a roundabout. It should be noted that this access point is only open during the morning and afternoon weekday peak periods to help process existing office traffic, due to Fannie Mae's traffic control measures.

Under full buildout conditions, the existing half-circle driveway along Wisconsin Avenue will be reconfigured such that the northern curb cut is removed and the driveway is realigned to connect with the internal roadway network. The driveway, which fronts the existing building, is still expected to be used primarily for drop-off/pick-up activity. As such, it will be converted to one-way traffic such that the southern curb cut serves outbound traffic only.

An additional access point is proposed along Wisconsin Avenue that will provide access to below-grade loading and parking activity, but will not connect to the internal roadway network. In order for this proposed access to function as a primary processing point for development-related traffic, it is planned to be signalized, with exclusive outbound left and right turn lanes at the site driveway. This helps to reduce the amount of vehicles traveling through the adjacent neighborhood to access the site via the 39th Street access point, as well as to reduce the amount of vehicles traveling through the internal street network, which is meant to cater more towards pedestrians.

Minimal changes will be made to the existing signalized access at Wisconsin Avenue on the northern end of the site. The overall curb cut will stay the same, but the internal roadway approach will be reconfigured to allow a separate shared thru-left lane and a right-turn lane.

No changes will be made to the access point on 39th Street. This unsignalized curb cut will primarily provide access for the residential component, but its use will not be restricted only to residents or limited to peak periods.

Figure 9 shows the external vehicular access points and circulation under full build-out conditions.

Internal Vehicular Circulation

The existing internal roadways within the site primarily serve traffic entering and exiting the garage. The internal vehicular circulation will be reimagined such that the new roadways provide a town center type feel. These roadways will provide access to the site by way of curbside pick-up/drop-off areas and additional garage access points. The internal roadway network will be accessed from Wisconsin Avenue and 39th Street and will provide primarily one-way circulation within the site as shown on Figure 10.

Bicycle and Pedestrian Access

Pedestrian access to the development is expected to occur via Wisconsin Avenue and 39th Street. Additional connections to the adjacent neighborhoods along the north and south sides of the site are possible, but must be coordinated with the neighbors. A connection to the existing trail within Glover Archbold Park will also be available pending coordination with National Park Service.

Internal to the site, much of the space is dedicated to pedestrian circulation and urban plaza area, such that pedestrians can easily traverse between the sites buildings and the adjoining roadway network. There will also be extensive green space that can be used as pedestrian gathering areas. Overall, the pedestrian connectivity and circulation within the site is expected to deliver an ideal pedestrian environment. Pedestrian access and circulation is shown on Figure 11.

Bicycle access to the development is expected to occur via Wisconsin Avenue and 39th Street. Short-term and long-term bicycle parking will be provided throughout the site that meets or exceeds zoning requirements. The exact location of short-term bicycle parking and the proposed access to long-term bicycle parking has not yet been determined. Bicycle access and circulation is shown on Figure 12.

LOADING

Truck routing to and from the site will be focused on designated primary truck routes, such as Wisconsin Avenue. There are a few truck restricted routes to north of the site along Upton Street and Van Ness Street, and to the south of the site along Porter Street; however, truck activity to and from the site will not require use of these roadways given the loading access along Wisconsin Avenue. Turning maneuvers into and out of the Wisconsin Avenue curb cut are included in the Technical Attachments.

There will be three loading areas throughout the site: one will serve the hotel use, one will serve the grocery use, and the third loading area will serve all remaining uses. The exact orientation and number of loading berths within each loading area has not been finalized, but will exceed the amount of loading spaces required by zoning and meet the anticipated loading demands.

The amount of loading expected at the site is estimated as follows:

- As a baseline, it is assumed that there will be three (3) daily truck deliveries within each loading area (covering trash, general shared delivery, and mail). The grocery loading area is excluded from this assumption as the loading estimates for the grocery use are based on specific grocery store loading demand data.
- Typically, residential loading activity is estimated assuming an expected rental turnover of 18 months, with two (2) trucks per move – one move in and one move out. Given the mix of rental and for-sale residential units in the development, this analysis assumes an average residential unit turnover of 24 months.
- Although the exact nature of individual retail spaces is unknown at this time, it is expected that retail stores will generate an additional two (2) deliveries per day in addition to the baseline shared deliveries.
- Grocery loading activity is estimated at approximately 12 to 16 truck deliveries per day, including three WB-67 semi-trucks, 3 to 5 WB-50 semi-trucks, and 6 to 8 box trucks.
- Hotel loading activity is estimated at 2 to 3 truck deliveries per day, in addition to the baseline shared deliveries.
- Office loading activity is estimated at 1 to 2 deliveries per day, in addition to the baseline shared deliveries.
- Movie Theatre loading activity is estimated at 2 truck deliveries per day, in addition to the baseline shared deliveries.

Using these estimates, the anticipated loading activity for each loading area is as follows:

- The grocery store loading area, located adjacent to the grocery space in the below-grade garage, is expected to generate a total loading demand of 12 to 16 trucks per day, including 6 to 8 semi-trucks and 6 to 8 box trucks.
- The hotel loading area, located adjacent to the hotel space in the below-grade garage, is expected to generate a total loading demand of 5 to 6 trucks per day, including approximately 3 to 4 box trucks and 2 to 3 delivery vehicles.
- The loading area serving the remaining uses of the development, located on the P2 level of the below-grade garage, is expected to generate a total loading demand of 19 to 21 trucks per day, including 1 to 2 residential deliveries, 12 retail deliveries, 1 to 2 office deliveries, 2 movie theatre deliveries, and 3 shared deliveries. These deliveries are expected to be served by approximately 14 to 16 box trucks and 6 to 8 delivery vehicles.

This amount of loading is expected to be adequately accommodated within the site.

PARKING

Off-Street Parking

Based on the 2016 Zoning Regulations, the following outlines the parking requirements for all land uses of the development:

- *Residential (Multi-family Units)*
  1 space per 3 dwelling units in excess of 4 dwelling units
- *Retail (General, Grocery, Fitness Center, and Cultural/Arts)*
  1.33 spaces per 1,000 sf in excess of 3,000 sf
- *Hotel*
  0.5 spaces per 1,000 sf in excess of 3,000 sf
- *Movie Theatre*
  2 spaces per 1,000 sf
- *Office*
  0.5 spaces per 1,000 sf in excess of 3,000 sf

The Applicant coordinated with Walker Parking to determine the specific parking needs of the site, based on the demand for each of the project's proposed uses. The below-grade parking garage will supply shared parking spaces for the development with approximately 1,400 spaces. Approximately 600 spaces will be designated for the residential uses and approximately 800 spaces will be designated for the retail, office, hotel, and movie theater uses. The parking garage is connected internally so that all users are able to move freely within the garage, but the locations of the designated parking areas leads to a fairly even distribution between the two access points on Wisconsin Avenue. While the majority of parking access will occur from these two locations, some residential users will utilize the 39th Street access point as well.

Bicycle Facilities

The development will meet or exceed the amount of long-term and short-term bicycle parking, as well as support space including the amount of showers and changing facilities that are required by the 2016 Zoning Regulations.

Pedestrian Facilities

As a result of the development pedestrian facilities along the perimeter of the site will be improved. The development will improve sidewalks adjacent to the site such that they meet or exceed DDOT requirements and provide an improved pedestrian environment.

Pedestrian facilities along all internal roadways are expected to meet or exceed DDOT and ADA requirements with an emphasis on pedestrian safety and comfort. This includes sidewalks that meet or exceed the width requirements, crosswalks at all necessary locations, curb ramps with detectable warnings, and additional design elements such as curb extensions and room for outdoor seating. These private internal streets will be open to the public and may provide pedestrian connections to the surrounding developments. The inclusion of plazas, improved streetscape, and improved porosity and circulation for pedestrians throughout the site will be a great improvement over existing conditions.

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 planned development is based on the DDOT expectations for TDM programs. The Applicant proposes the following TDM measures:

- The Applicant will unbundle the cost of residential parking from the cost of lease or purchase.
- The Applicant will identify TDM Leaders (for planning, construction, and operations). The TDM Leaders will work with residents and employees in each building 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 Transportation Information Center Displays (electronic screens) within residential, office, and hotel lobbies, containing real-time information related to local transportation alternatives.
- The Applicant will provide bicycle repair stations within the bicycle rooms in the development.
- The Applicant will install electric vehicle (EV) parking spaces within the parking garage.

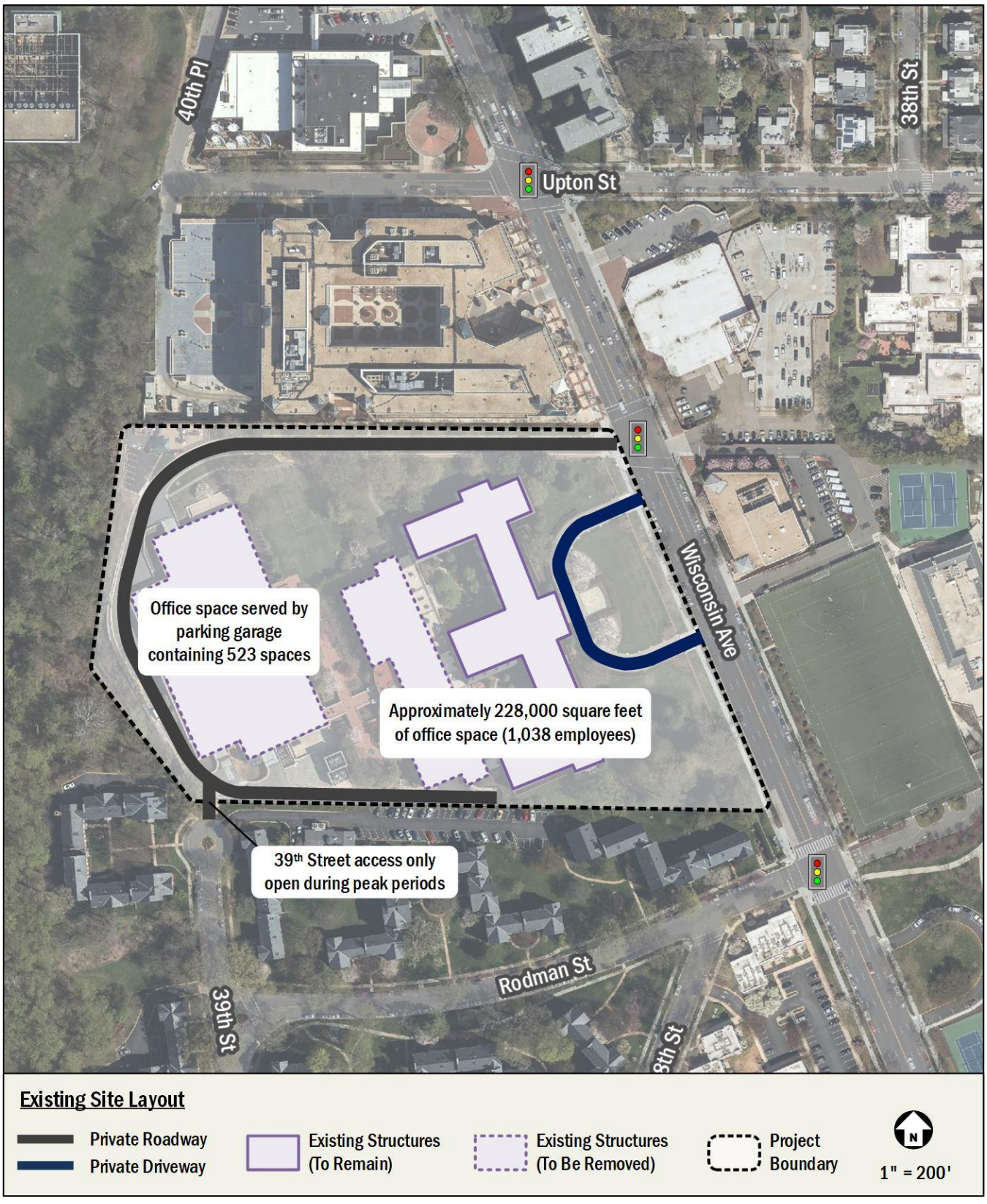

Figure 6: Existing Site Layout

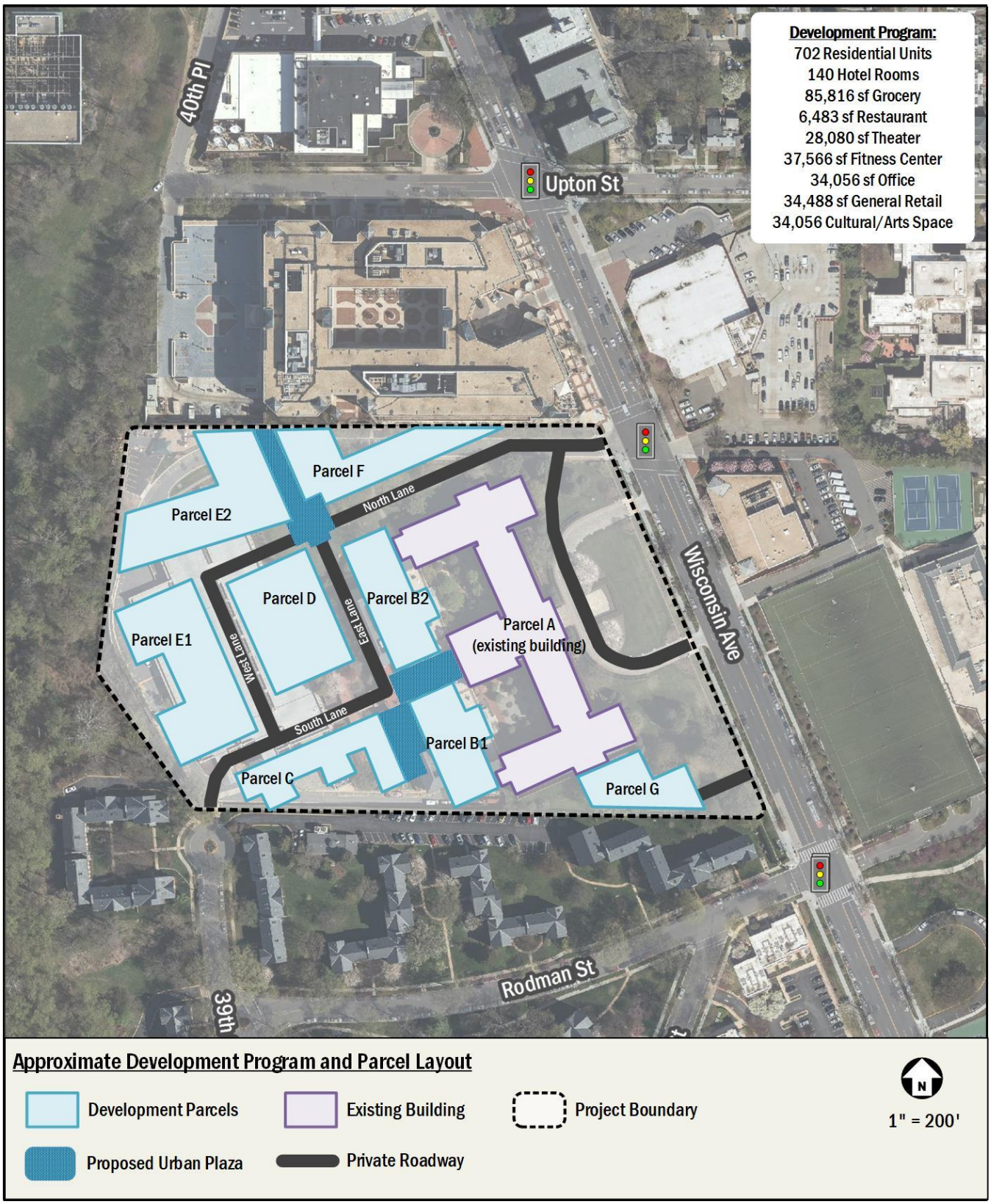

Figure 7: Site Plan

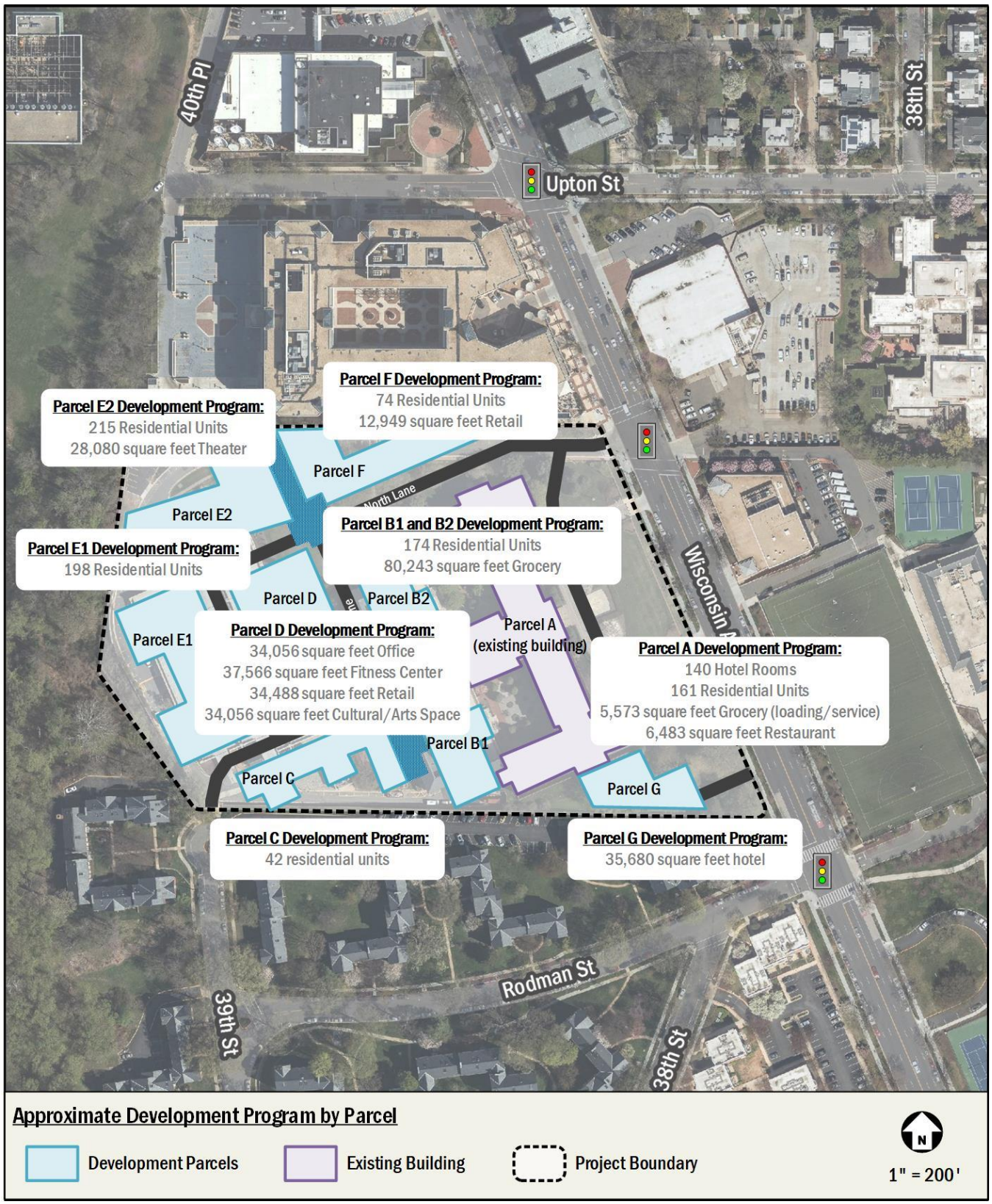

Figure 8: Development Program by Parcel

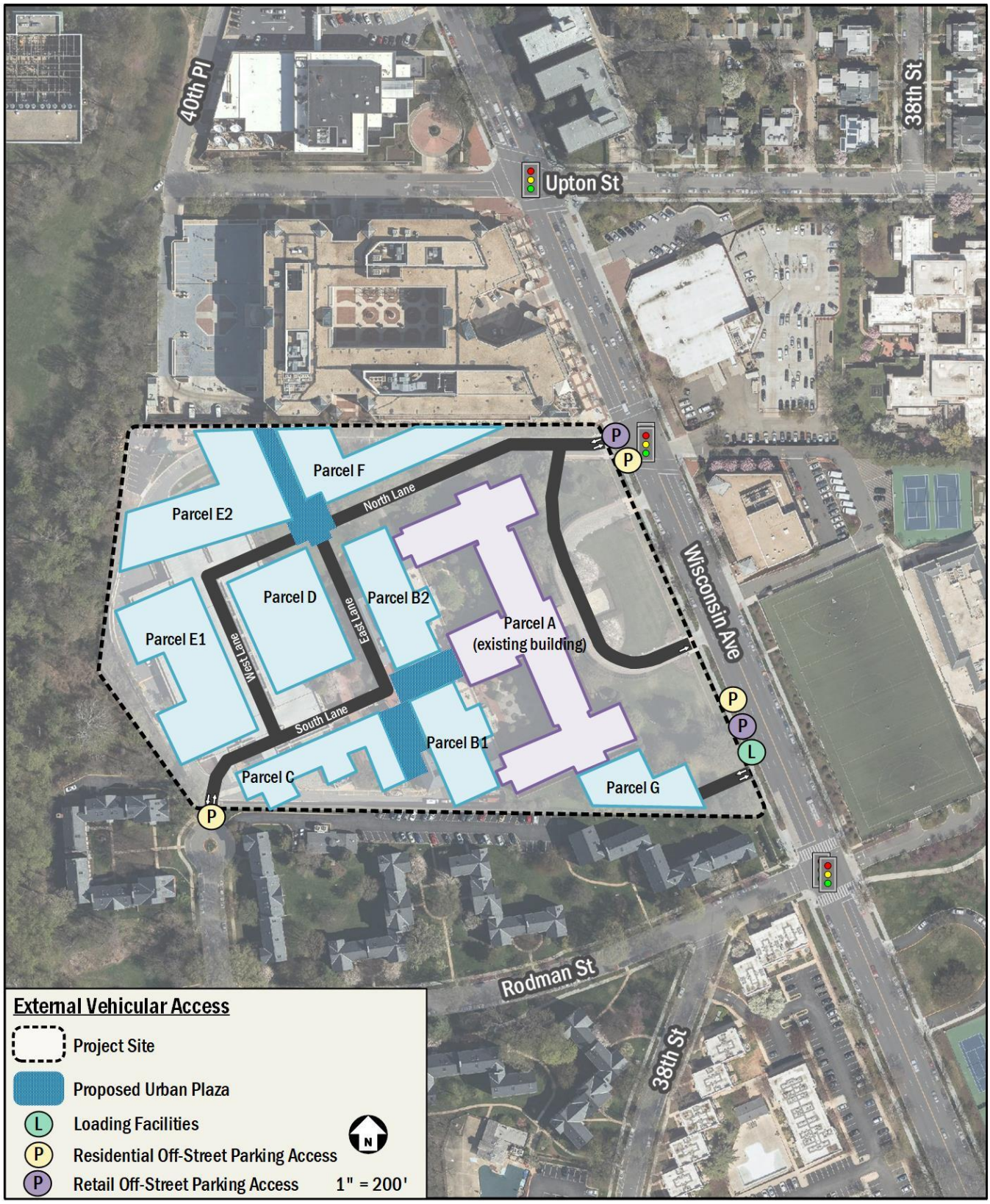

Figure 9: External Vehicular Access

Figure 10: Internal Vehicular Access and Circulation

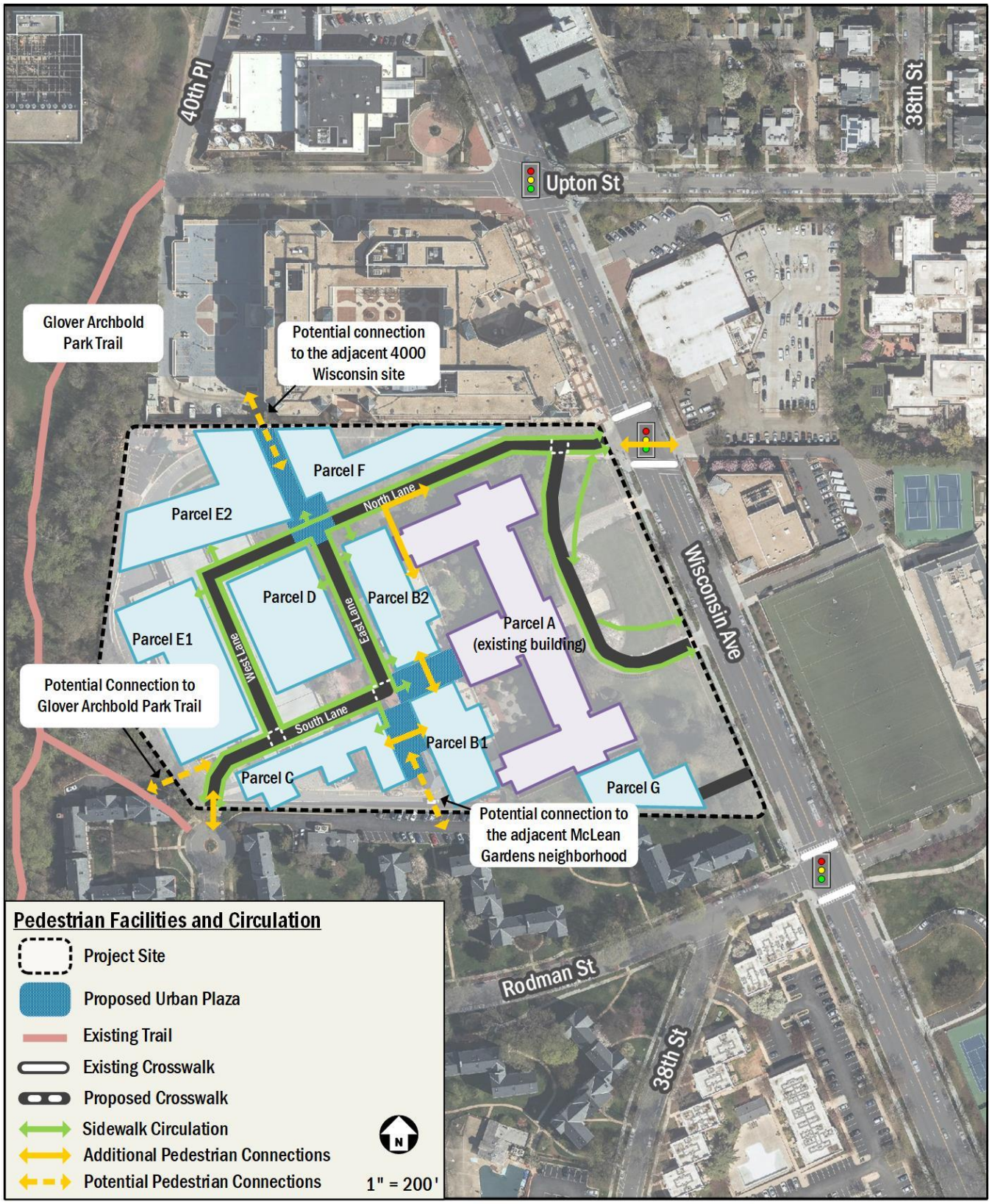

Figure 11: Pedestrian Facilities and Circulation

Figure 12: Bicycle Facilities and Circulation

TRIP GENERATION

This section outlines the transportation demand of the proposed 3900 Wisconsin Avenue project. It summarizes the projected trip generation of the site by land use and by mode, which forms the basis for the chapters that follow.

The weekday peak hour trip generation was based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation*, 9th 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.

Residential trip generation was calculated based on ITE land use 220, Apartments, splitting trips into different modes using assumptions derived from census data for the residents that currently live near the site.

Retail trip generation was calculated based on ITE land use 850, Supermarket, for grocery, 492, Health/Fitness Club for the fitness center and cultural arts center, 445, Multiplex Movie Theater for movie theater, and 820, Shopping Center for general retail. Mode splits for the retail portions of the site were based on mode splits used for retail uses of nearby developments that have recently been studied and information contained in WMATA's 2005 *Development-Related Ridership Survey*, with a higher auto share due to the site location being farther from Metrorail and in a slightly less dense residential environment.

Hotel trip generation was calculated based on ITE land use 310, Hotel. Mode splits for the hotel portion of the site were based on information contained in WMATA's 2005 *Development-Related Ridership Survey.*

Of note, the 60% auto mode split for hotels includes pass-by trips for hired vehicles. Of this mode split, 40% of these auto trips (24% of total hotel trips) are assumed to park in the garage and the remaining 60% (36% of total hotel trips) are hired vehicles that make an inbound and outbound trip. These vehicular splits are consistent with data collected at various hotels in the District.

Office trip generation was calculated based on ITE land use 710, General Office. Mode splits were based on assumptions derived from census data for employees that currently live near the site, with a lower auto share based on the existing trip generation of Fannie Mae employees.

The trips generated by the redevelopment of the 4000 Wisconsin Avenue site were based on the proposed trip generation in the existing study for the project by Wells and Associates, dated August 2017. The site trip generation presented in the study assumes that the project will include 700 residential units, 22,598 square feet of retail space, 60,200 square feet of grocery space, and 49,388 square feet of health/fitness club space.

The mode split assumptions for all land uses within the 3900 Wisconsin Avenue and 4000 Wisconsin Avenue developments are summarized in Table 3 and Table 4, respectively. A summary of the multimodal trip generation for the morning, afternoon, and Saturday peak hours is provided in Table 5 for the overall 3900 Wisconsin Avenue development and in Table 6 for the overall 4000 Wisconsin Avenue development. Detailed calculations are included in the Technical Appendix.

Table 3: Summary of 3900 Wisconsin Avenue Mode Split Assumptions

Land Use	Mode			
	Auto	Transit	Bike	Walk
Residential	45%	45%	3%	7%
Retail	40%	30%	5%	25%
Grocery	62%	25%	3%	10%
Fitness Center	45%	25%	10%	20%
Movie Theater	60%	30%	3%	7%
Hotel	60%	25%	3%	12%
Office	50%	40%	3%	7%
Cultural Arts Center	50%	30%	5%	25%

Table 4: Summary of 4000 Wisconsin Avenue Mode Split Assumptions

Land Use	Mode			
	Auto	Transit	Bike	Walk
Residential	45%	45%	3%	7%
Retail	40%	30%	5%	25%
Grocery	62%	25%	3%	10%
Fitness Center	60%	25%	5%	10%

Of note, the specific characterization of the retail space in Parcel D was not known at the time the analysis was conducted based on the trip generation shown in Table 5. The development program has since been updated to reassign 34,056 square feet of the originally assumed general retail space to space designated for a cultural arts center. The difference in trip generation between the original development

program and the updated development program is minimal: an increase of 9 trips during the AM peak hour, an increase of 3 trips during the PM peak hour, and a decrease of 23 trips during the Saturday peak hour. Since the updated development program will result in minimal change to the trip generation, there will not be a significant adverse impact associated with the development beyond that originally studied in the analysis presented in this report.

Table 5: 3900 Wisconsin Avenue Multi-Modal Trip Generation Summary

Mode	Land Use	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Auto	Residential	32 veh/hr	125 veh/hr	157 veh/hr	119 veh/hr	63 veh/hr	182 veh/hr	72 veh/hr	70 veh/hr	142 veh/hr
	Office	24 veh/hr	3 veh/hr	27 veh/hr	4 veh/hr	22 veh/hr	26 veh/hr	4 veh/hr	4 veh/hr	8 veh/hr
	Retail	16 veh/hr	10 veh/hr	26 veh/hr	49 veh/hr	53 veh/hr	102 veh/hr	69 veh/hr	63 veh/hr	132 veh/hr
	Grocery	97 veh/hr	59 veh/hr	156 veh/hr	186 veh/hr	178 veh/hr	364 veh/hr	249 veh/hr	239 veh/hr	488 veh/hr
	Grocery Pass-by	24 veh/hr	15 veh/hr	39 veh/hr	46 veh/hr	45 veh/hr	91 veh/hr	62 veh/hr	60 veh/hr	122 veh/hr
	Fitness	12 veh/hr	12 veh/hr	24 veh/hr	34 veh/hr	25 veh/hr	59 veh/hr	21 veh/hr	26 veh/hr	47 veh/hr
	Movie Theater	0 veh/hr	0 veh/hr	0 veh/hr	51 veh/hr	32 veh/hr	83 veh/hr	60 veh/hr	19 veh/hr	79 veh/hr
	Hotel	37 veh/hr	35 veh/hr	72 veh/hr	40 veh/hr	40 veh/hr	80 veh/hr	75 veh/hr	72 veh/hr	147 veh/hr
	Total	**242 veh/hr**	**259 veh/hr**	**501 veh/hr**	**529 veh/hr**	**458 veh/hr**	**987 veh/hr**	**612 veh/hr**	**553 veh/hr**	**1165 veh/hr**
Transit	Residential	36 ppl/hr	141 ppl/hr	177 ppl/hr	134 ppl/hr	72 ppl/hr	206 ppl/hr	81 ppl/hr	80 ppl/hr	161 ppl/hr
	Office	21 ppl/hr	3 ppl/hr	24 ppl/hr	4 ppl/hr	19 ppl/hr	23 ppl/hr	4 ppl/hr	3 ppl/hr	7 ppl/hr
	Retail	22 ppl/hr	13 ppl/hr	35 ppl/hr	65 ppl/hr	71 ppl/hr	136 ppl/hr	92 ppl/hr	84 ppl/hr	176 ppl/hr
	Grocery	90 veh/hr	55 veh/hr	145 veh/hr	172 veh/hr	166 veh/hr	338 veh/hr	231 veh/hr	221 veh/hr	452 veh/hr
	Fitness	11 veh/hr	11 veh/hr	22 veh/hr	31 veh/hr	24 veh/hr	55 veh/hr	20 veh/hr	24 veh/hr	44 veh/hr
	Movie Theater	0 veh/hr	0 veh/hr	0 veh/hr	57 veh/hr	34 veh/hr	91 veh/hr	65 veh/hr	22 veh/hr	87 veh/hr
	Hotel	24 ppl/hr	17 ppl/hr	41 ppl/hr	24 ppl/hr	22 ppl/hr	46 ppl/hr	47 ppl/hr	38 ppl/hr	85 ppl/hr
	Total	**204 ppl/hr**	**240 ppl/hr**	**444 ppl/hr**	**487 ppl/hr**	**408 ppl/hr**	**895 ppl/hr**	**540 ppl/hr**	**472 ppl/hr**	**1012 ppl/hr**
Bike	Residential	2 ppl/hr	10 ppl/hr	12 ppl/hr	9 ppl/hr	5 ppl/hr	14 ppl/hr	5 ppl/hr	6 ppl/hr	11 ppl/hr
	Office	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
	Retail	4 ppl/hr	2 ppl/hr	6 ppl/hr	11 ppl/hr	12 ppl/hr	23 ppl/hr	15 ppl/hr	14 ppl/hr	29 ppl/hr
	Grocery	11 ppl/hr	6 ppl/hr	17 ppl/hr	21 ppl/hr	20 ppl/hr	41 ppl/hr	28 ppl/hr	26 ppl/hr	54 ppl/hr
	Fitness	5 veh/hr	4 veh/hr	9 veh/hr	13 veh/hr	9 veh/hr	22 veh/hr	8 veh/hr	9 veh/hr	17 veh/hr
	Movie Theater	0 veh/hr	0 veh/hr	0 veh/hr	6 veh/hr	3 veh/hr	9 veh/hr	7 veh/hr	2 veh/hr	9 veh/hr
	Hotel	3 ppl/hr	2 ppl/hr	5 ppl/hr	3 ppl/hr	3 ppl/hr	6 ppl/hr	6 ppl/hr	4 ppl/hr	10 ppl/hr
	Total	**25 ppl/hr**	**24 ppl/hr**	**49 ppl/hr**	**63 ppl/hr**	**52 ppl/hr**	**115 ppl/hr**	**69 ppl/hr**	**61 ppl/hr**	**130 ppl/hr**
Walk	Residential	6 ppl/hr	22 ppl/hr	28 ppl/hr	21 ppl/hr	11 ppl/hr	32 ppl/hr	13 ppl/hr	12 ppl/hr	25 ppl/hr
	Office	4 ppl/hr	0 ppl/hr	4 ppl/hr	1 ppl/hr	3 ppl/hr	4 ppl/hr	1 ppl/hr	0 ppl/hr	1 ppl/hr
	Retail	18 ppl/hr	11 ppl/hr	29 ppl/hr	54 ppl/hr	59 ppl/hr	113 ppl/hr	77 ppl/hr	70 ppl/hr	147 ppl/hr
	Grocery	36 ppl/hr	22 ppl/hr	58 ppl/hr	69 ppl/hr	66 ppl/hr	135 ppl/hr	92 ppl/hr	89 ppl/hr	181 ppl/hr
	Fitness	9 veh/hr	9 veh/hr	18 veh/hr	25 veh/hr	19 veh/hr	44 veh/hr	16 veh/hr	19 veh/hr	35 veh/hr
	Movie Theater	0 veh/hr	0 veh/hr	0 veh/hr	13 veh/hr	8 veh/hr	21 veh/hr	15 veh/hr	5 veh/hr	20 veh/hr
	Hotel	12 ppl/hr	8 ppl/hr	20 ppl/hr	11 ppl/hr	11 ppl/hr	22 ppl/hr	23 ppl/hr	18 ppl/hr	41 ppl/hr
	Total	**85 ppl/hr**	**72 ppl/hr**	**157 ppl/hr**	**194 ppl/hr**	**177 ppl/hr**	**371 ppl/hr**	**237 ppl/hr**	**213 ppl/hr**	**450 ppl/hr**

Table 6: 4000 Wisconsin Avenue Multi-Modal Trip Generation Summary

Mode	Land Use	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Auto	Residential	31 veh/hr	125 veh/hr	156 veh/hr	118 veh/hr	63 veh/hr	181 veh/hr	69 veh/hr	69 veh/hr	138 veh/hr
	Retail	16 veh/hr	10 veh/hr	26 veh/hr	42 veh/hr	46 veh/hr	88 veh/hr	69 veh/hr	63 veh/hr	132 veh/hr
	Supermarket	63 veh/hr	38 veh/hr	101 veh/hr	135 veh/hr	130 veh/hr	265 veh/hr	171 veh/hr	164 veh/hr	335 veh/hr
	Health/Fitness Club	16 veh/hr	16 veh/hr	32 veh/hr	44 veh/hr	33 veh/hr	77 veh/hr	28 veh/hr	34 veh/hr	62 veh/hr
	Total	**126 veh/hr**	**189 veh/hr**	**315 veh/hr**	**339 veh/hr**	**272 veh/hr**	**611 veh/hr**	**337 veh/hr**	**330 veh/hr**	**667 veh/hr**
Transit	Residential	31 ppl/hr	125 ppl/hr	156 ppl/hr	118 ppl/hr	64 ppl/hr	182 ppl/hr	69 ppl/hr	69 ppl/hr	138 ppl/hr
	Retail	11 ppl/hr	7 ppl/hr	18 ppl/hr	32 ppl/hr	34 ppl/hr	66 ppl/hr	52 ppl/hr	48 ppl/hr	100 ppl/hr
	Supermarket	32 ppl/hr	20 ppl/hr	52 ppl/hr	68 ppl/hr	66 ppl/hr	134 ppl/hr	86 ppl/hr	83 ppl/hr	169 ppl/hr
	Health/Fitness Club	9 ppl/hr	9 ppl/hr	18 ppl/hr	24 ppl/hr	18 ppl/hr	42 ppl/hr	16 ppl/hr	19 ppl/hr	35 ppl/hr
	Total	**83 ppl/hr**	**161 ppl/hr**	**244 ppl/hr**	**242 ppl/hr**	**182 ppl/hr**	**424 ppl/hr**	**223 ppl/hr**	**219 ppl/hr**	**442 ppl/hr**
Bike	Residential	2 ppl/hr	8 ppl/hr	10 ppl/hr	8 ppl/hr	4 ppl/hr	12 ppl/hr	4 ppl/hr	4 ppl/hr	8 ppl/hr
	Retail	2 ppl/hr	1 ppl/hr	3 ppl/hr	5 ppl/hr	6 ppl/hr	11 ppl/hr	9 ppl/hr	8 ppl/hr	17 ppl/hr
	Supermarket	4 ppl/hr	2 ppl/hr	6 ppl/hr	8 ppl/hr	8 ppl/hr	16 ppl/hr	10 ppl/hr	10 ppl/hr	20 ppl/hr
	Health/Fitness Club	3 ppl/hr	3 ppl/hr	6 ppl/hr	10 ppl/hr	7 ppl/hr	17 ppl/hr	6 ppl/hr	7 ppl/hr	13 ppl/hr
	Total	**11 ppl/hr**	**14 ppl/hr**	**25 ppl/hr**	**31 ppl/hr**	**25 ppl/hr**	**56 ppl/hr**	**29 ppl/hr**	**29 ppl/hr**	**58 ppl/hr**
Walk	Residential	5 ppl/hr	20 ppl/hr	25 ppl/hr	18 ppl/hr	10 ppl/hr	28 ppl/hr	11 ppl/hr	11 ppl/hr	22 ppl/hr
	Retail	10 ppl/hr	6 ppl/hr	16 ppl/hr	27 ppl/hr	29 ppl/hr	56 ppl/hr	43 ppl/hr	40 ppl/hr	83 ppl/hr
	Supermarket	12 ppl/hr	8 ppl/hr	20 ppl/hr	28 ppl/hr	26 ppl/hr	54 ppl/hr	35 ppl/hr	33 ppl/hr	68 ppl/hr
	Health/Fitness Club	7 ppl/hr	7 ppl/hr	14 ppl/hr	19 ppl/hr	15 ppl/hr	34 ppl/hr	12 ppl/hr	15 ppl/hr	27 ppl/hr
	Total	**34 ppl/hr**	**41 ppl/hr**	**75 ppl/hr**	**92 ppl/hr**	**80 ppl/hr**	**172 ppl/hr**	**101 ppl/hr**	**99 ppl/hr**	**200 ppl/hr**

TRAFFIC OPERATIONS

This section 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 3900 Wisconsin Avenue project and a discussion of potential improvements.

As discussed previously, under existing conditions, the project site is part of the overall Fannie Mae campus, which consists of approximately 720,000 total square feet of office space along the surrounding Wisconsin Avenue corridor. This includes the 3900 Wisconsin Avenue site as well as adjacent properties at 4000 Wisconsin Avenue to the north of the site and 3939 Wisconsin Avenue to the east of the site. Fannie Mae is planning to vacate all three existing buildings and as such all three buildings will be redeveloped or repurposed. 3939 Wisconsin Avenue will be absorbed by the adjacent Sidwell Friends School, while 3900 Wisconsin Avenue and 4000 Wisconsin Avenue will be transformed into mixed-use developments.

Because of the campus nature of Fannie Mae under existing conditions, and the assumption that all buildings will be vacated simultaneously and subsequently redeveloped or repurposed, this report analyzes the complete redevelopment of the Fannie Mae campus and appropriately and proportionately allocates impacts to the 3900 Wisconsin Avenue site and 4000 Wisconsin Avenue site. This allocation of impacts is primarily based on the net trip generation for each building, and the proportion of site trips at each study intersection.

The purpose of the capacity analysis is to:

- Determine the existing capacity of the study area roadways;
- Determine the overall impact of the project on the study area roadways; and
- Discuss potential improvements to accommodate the additional vehicular trips.

This analysis was accomplished by determining the traffic volumes and roadway capacity for the following scenarios:

1. 2017 Existing Conditions
2. 2022 Future with the Fannie Mae campus (2022 Background)
3. 2022 Future Conditions with the redevelopment of the Fannie Mae Campus (2022 Total Future)

The capacity analysis focuses on the morning and afternoon commuter peak hours, as well as the Saturday midday peak hour as determined by the existing traffic volumes in the study area.

The following conclusions are reached within this chapter:

- The existing study area intersections generally operate at an acceptable level of service during all analysis scenarios for the morning, afternoon, and Saturday peak hours with the exception of four intersections which currently operate at unacceptable levels.
- Existing areas of concern for roadway capacity are primarily focused along Wisconsin Avenue, a heavily trafficked commuter route.
- The addition of trips generated by background developments and inherent growth on the study area cause some intersections to experience unacceptable levels of delay and queuing.
- There are seven (7) intersections that operate at an unacceptable level of service as a result of the overall Fannie Mae Campus redevelopment.
- Improvements can be made to the majority of these intersections by adjusting signal timings and restricting parking at some areas adjacent to the site during peak hours.
- Overall, this report concludes that the project will not have a detrimental impact to the surrounding transportation 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 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, unless stated otherwise.

Capacity Analysis Scenarios

The vehicular analyses are performed to determine if the proposed development of the 3900 Wisconsin Avenue project 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 for this analysis, the roadway capacity analysis examined the following scenarios:

1. 2017 Existing Conditions
2. 2022 Future with the Fannie Mae campus (2022 Background)
3. 2022 Future Conditions with the redevelopment of the Fannie Mae Campus (2022 Total Future)

As such, the total future scenario will include the removal of the existing trips associated with all Fannie Mae buildings (3900 Wisconsin Avenue NW, 4000 Wisconsin Avenue NW, and 3939 Wisconsin Avenue NW) with the addition of regional growth, background developments, and the new trips associated with both the 3900 Wisconsin site and the 4000 Wisconsin site.

Study Area

The study area of the analysis is a set of intersections where detailed capacity analyses are 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 for analysis:

1. Van Ness Street & Nebraska Ave NW
2. Van Ness Street & 40th Place NW
3. Wisconsin Ave & Van Ness Street & 39th Street NW
4. Wisconsin Ave & Upton Street NW
5. Wisconsin Ave & Fannie Mae/Sidwell Driveway NW
6. Wisconsin Ave & Fannie Mae Circular Driveway (N) NW
7. Wisconsin Ave & Fannie Mae Circular Driveway (S) NW
8. Wisconsin Ave & Rodman Street/Sidwell Driveway NW
9. Wisconsin Ave & Quebec Street NW
10. Wisconsin Ave & Porter Street NW
11. Wisconsin Ave & Idaho Avenue NW
12. 39th Street & Fannie Mae Dwy/Parking Lot Dwy NW
13. 39th Street & Rodman Street NW
14. Proposed Site Driveway & Wisconsin Avenue NW (Future)

All internal site driveways were also included in the vehicular capacity analyses. Figure 13 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 Saturday, April 1, 2017, Tuesday, April 4, 2017, and Saturday, May 20, 2017. The results of the traffic counts are included in the Technical Attachments. The existing peak hour traffic volumes are shown on Figure 14. For all intersections the morning, afternoon, and Saturday system peak hours were used. System peaks were used due to the significant removal of existing trips as part of a campus. The use of intersection peaks may over or underestimate the removal of existing trips if the peak hour of the generator differs from the peak hour of the adjacent roadway network.

2022 Background Traffic Volumes (without the project)

The traffic projections for the 2022 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 2022 Background scenario. This development is:

1. Sidwell Friends School

Trip generation and trip distribution for this development were based on an existing study by Wells and Associates, dated February 2016. Mode split and trip generation assumptions for the background development are shown in Table 7.

While the background development represents local traffic changes, regional traffic growth is typically accounted for using percentage growth rates. The growth rates used in this analysis are derived using the Metropolitan Washington Council of Government's (MWCOG) currently adopted regional transportation model, comparing the difference between the year 2015 and 2020 model scenarios. The growth rates observed in this model served as a basis for analysis assumptions. A regional growth rate of 0.25 percent was applied to Wisconsin Avenue and Nebraska Avenue, and a regional growth rate of 0.5 percent was applied to other roadways in the study area. The applied growth rates are shown in Table 7.

The traffic volumes generated by the inherent growth along the network and the background project were added to the existing traffic volumes in order to establish the 2022 Background traffic volumes. The traffic volumes for the 2022 Background conditions are shown on Figure 19.

2022 Total Future Traffic Volumes (with the project)

The 2022 Future traffic volumes consist of the 2022 Background traffic volumes with the following:

- The removal of traffic generated by the existing Fannie Mae campus, located at 3900 Wisconsin Avenue NW, 4000 Wisconsin Avenue NW, and 3939 Wisconsin Avenue NW;
- The addition of traffic generated by the redevelopment of the 3900 Wisconsin Avenue site; and
- The addition of traffic generated by the redevelopment of the 4000 Wisconsin Avenue site

Table 7: Summary of Background Development Trip Generation

Background Development		Trip Generation					
		AM Peak Hour			PM Peak Hour		
		In	*Out*	*Total*	*In*	*Out*	*Total*
Sidwell Friends School (with expansion to Washington Home)	Based on approved TIS	224	228	452	57	41	98
Existing Washington Home trips to be removed		-37	-13	-50	-8	-25	-33
Total Trips		**187**	**215**	**402**	**49**	**16**	**65**

Table 8: Assumed Applied Annual Growth Rates

Road & Direction	Applied Annual Growth Rate			Total Growth between 2015 and 2022		
	AM Peak	PM Peak	Sat Peak	AM Peak	PM Peak	Sat Peak
Wisconsin Avenue NW - Northbound	0.25%	0.25%	0.25%	1.26%	1.26%	1.26%
Wisconsin Avenue NW - Southbound	0.25%	0.25%	0.25%	1.26%	1.26%	1.26%
Upton Street NW - Eastbound	0.50%	0.50%	0.50%	2.53%	2.53%	2.53%
Upton Street NW - Westbound	0.50%	0.50%	0.50%	2.53%	2.53%	2.53%
Porter Street NW - Eastbound	0.50%	0.50%	0.50%	2.53%	2.53%	2.53%
Porter Street NW - Westbound	0.50%	0.50%	0.50%	2.53%	2.53%	2.53%
Van Ness Street NW - Eastbound	0.50%	0.50%	0.50%	2.53%	2.53%	2.53%
Van Ness Street NW - Westbound	0.50%	0.50%	0.50%	2.53%	2.53%	2.53%
Nebraska Avenue NW - Northbound	0.25%	0.25%	0.25%	1.26%	1.26%	1.26%
Nebraska Avenue NW - Southbound	0.25%	0.25%	0.25%	1.26%	1.26%	1.26%
Idaho Avenue NW - Northbound	0.50%	0.50%	0.50%	2.53%	2.53%	2.53%
Idaho Avenue NW - Southbound	0.50%	0.50%	0.50%	2.53%	2.53%	2.53%

The trips generated by the existing Fannie Mae campus were based on turning movement counts conducted on Saturday, April 1, 2017, Tuesday, April 4, 2017, and Saturday, May 20, 2017 and based on the system peak hours of the morning weekday, afternoon weekday, and Saturday. Table 8 outlines the existing trips associated with the existing Fannie Mae campus buildings during each peak hour. For 3900 Wisconsin Avenue, this includes three driveways along Wisconsin Avenue and the driveway at 39th Street; for 4000 Wisconsin Avenue, this includes two driveways along Upton Street and one driveway along Wisconsin Avenue; and for 3939 Wisconsin Avenue, this includes one driveway along Wisconsin Avenue.

These trips were removed throughout the network of study intersections primarily based on existing commuter travel pattern and similar distribution assumptions as the project's site-generated office trips, as well as an existing study for the 4000 Wisconsin Avenue development by Wells and Associates, dated August 2017.

Trip distribution for the site was determined based on: (1) CTPP TAZ data, (2) existing travel patterns in the study area, and (3) the allotted parking locations of various users of the development.

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 existing traffic volumes and patterns surrounding the site. The origin of outbound and destination of inbound vehicular trips is the below-grade parking garage. Based on the anticipated location of residential parking within the garage, residential vehicular trips are expected to use the garage entrance locations along South

The retail, grocery, fitness center, movie theater, and cultural arts center distribution was mostly based on locations and proximity of other retail centers, with some influence on the CTPP TAZ flow data for drivers commuting to the site's TAZ (representing employees that drive). Thus, the retail trip distribution is weighted more towards nearby residential areas and less on regional origins. The origin of outbound and destination of inbound retail vehicular trips is the below-grade parking garage. Based on the anticipated location of retail parking within the garage, retail vehicular trips are expected to use the garage entrance locations along North Lane and Wisconsin Avenue.

The hotel distribution was mostly based on the locations of major routes used by visitors to the District, the locations of major airports in the area such as BWI, DCA, and IAD, major through routes such as I-95/I-495, and the locations of popular tourist attractions, mostly located to the southeast of the site. The origin of outbound and destination of inbound hotel vehicular trips was the half-circle driveway along Wisconsin Avenue. Hotel trips were broken down between hired vehicle trips and valet trips. Hired vehicle trips were expected to enter the half-circle driveway from North Lane and exit the half-circle driveway onto Wisconsin Avenue, resulting in two vehicle trips. Inbound valet trips were expected to enter the half-circle driveway from North Lane, exit the half-circle driveway onto Wisconsin Avenue, and enter the parking garage from the Wisconsin Avenue driveway. Outbound valet trips were expected to exit the parking garage from the North Lane driveway, enter the half-circle driveway from North Lane, and exit the half-circle driveway onto Wisconsin Avenue.

The office trip distribution was significantly influenced by the CTPP TAZ flow data for drivers commuting to the site's TAZ, and adjusted based on traffic volumes and patterns. The origins of outbound and destinations of inbound vehicular trips were the below-grade parking garage. Based on the anticipated location of office parking within the garage, office vehicular trips are

Table 9: Existing Fannie Mae Campus Trip Generation

Fannie Mae Campus Building	Existing Trip Generation								
	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	*Out*	*Total*	*In*	*Out*	*Total*	*In*	*Out*	*Total*
3900 Wisconsin Avenue	155	28	183	21	225	246	5	6	11
4000 Wisconsin Avenue	280	34	314	50	365	383	32	37	54
3939 Wisconsin Avenue	10	0	10	0	11	11	0	0	0
Total Trips	**445**	**62**	**507**	**71**	**601**	**640**	**25**	**40**	**65**

expected to use the garage entrance locations along North Lane and Wisconsin Avenue.

Based on traffic patterns and a comprehensive review of the site access locations, the site-generated trips were distributed through the study area intersections. A summary of trip distribution assumptions and routing for each element of the development is provided on Figure 15 for inbound trips and Figure 16 for outbound trips.

The residential, retail, grocery, and fitness center trip distribution and assignment for the 4000 Wisconsin Avenue site was based on the site trip distribution for each land use presented in an existing study for the development by Wells and Associates, dated August 2017. A summary of the trip distribution for each element of the development is provided in Table 10.

Table 10: 4000 Wisconsin Avenue Site Trip Distributions

Roadway	Direction	Residential	Retail	Grocery
Wisconsin Avenue	North	20%	30%	20%
	South	45%	30%	20%
Van Ness Street	East	10%	10%	10%
	West	10%	25%	40%
Porter Street	East	15%	5%	10%

A detailed breakdown of the existing Fannie Mae trips removed from the campus and the new trips associated with the redevelopment of the site presented in Table 11. The net traffic volumes generated by 3900 Wisconsin Avenue are shown in Figure 20 and the net traffic volumes generated by 4000 Wisconsin Avenue are shown in Figure 21. The net traffic volumes generated by the Fannie Mae campus, including the removal of all existing trips associated with 3900 Wisconsin Avenue, 4000 Wisconsin Avenue, and 3939 Wisconsin Avenue, and the addition of trips generated by the 3900 and 4000 Wisconsin Avenue redevelopments, are shown in Figure 22. The 2022 Total Future traffic volumes are shown in Figure 23.

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 17. Of note, the intersection of Wisconsin Avenue and 39th Street was analyzed as the fifth leg of the intersection of Wisconsin Avenue/Van Ness Street.

Background 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

Table 11: Fannie Mae Campus Net Trip Generation

		Net Trip Generation								
		AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	*Out*	*Total*	*In*	*Out*	*Total*	*In*	*Out*	*Total*
3900 Wisconsin Avenue	*Existing Site Trips*	*-155*	*-28*	*-183*	*-21*	*-225*	*-246*	*-5*	*-6*	*-11*
	New Site Trips	242	259	501	529	458	987	612	553	1165
	Net New Site Trips	**87**	**231**	**318**	**508**	**233**	**741**	**607**	**547**	**1154**
4000 Wisconsin Avenue	*Existing Site Trips*	*-280*	*-34*	*-314*	*-50*	*-365*	*-383*	*-32*	*-37*	*-54*
	New Site Trips	126	189	315	339	272	611	337	330	667
	Net New Site Trips	**-154**	**155**	**1**	**289**	**-93**	**228**	**305**	**293**	**613**
3939 Wisconsin Avenue	*Existing Site Trips*	*-10*	*0*	*-10*	*0*	*-11*	*-11*	*0*	*0*	*0*
	New Site Trips	0	0	0	0	0	0	0	0	0
	Net New Site Trips	**-10**	**0**	**-10**	**0**	**-11**	**-11**	**0**	**0**	**0**
Total Net New Site Trips		**-77**	**386**	**309**	**797**	**129**	**958**	**912**	**840**	**1767**

- Have a construction completion date prior or close to the proposed development.

Based on these criteria, one background improvement was included. This improvement consists of the signal timing and operational adjustments to the intersection of Wisconsin Ave & Fannie Mae/Sidwell Driveway NW as part of the proposed mitigations for the Sidwell Friends School expansion.

Total Future Geometry and Operations Assumptions

The geometry and operations assumed in the total future conditions are based on the background conditions with the following changes to accommodate the site:

- Reconfiguration of the site to include the proposed internal roadway network.
- Reconfiguration of the existing half-circle driveway along Wisconsin Avenue, including the relocation of the northern driveway access from Wisconsin Avenue to North Lane and one-way southbound operations.
- Redesign of North Lane (formerly the Fannie Mae Driveway) to include two outbound lanes at Wisconsin Avenue, with an exclusive left turn lane and a 100-foot exclusive right turn lane. This change *does not* result in an increase in the curb cut width.
- A new curb cut will be constructed along Wisconsin Avenue to provide access to the below-grade parking and loading area. This access will require two outbound lanes and one inbound lane to efficiently process all vehicular traffic and allow flexible maneuvering space for grocery deliveries. Additionally, due to the amount of traffic expected to utilize this curb cut, it is proposed that this access be signalized and coordinate with the adjacent signal at Rodman Street.

The lane configurations and traffic controls for the Future conditions are shown on Figure 18.

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, afternoon, and Saturday peak hours. *Synchro*, version 9.0 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 the *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, 2022 Background, and 2022 Total Future scenarios. The capacity analysis results are shown on Figure 25 for the morning peak hour, on Figure 26 for the afternoon peak hour, and on Figure 27 for the Saturday peak hour. The majority of the study intersections operate at acceptable conditions during the morning, afternoon, and Saturday peak hours for the Existing, 2022 Background, and 2022 Future scenarios; however, eight (8) intersections operate under unacceptable conditions during one or more peak hour:

- Van Ness Street & 40th Place NW
- Wisconsin Ave & Van Ness Street/39th Street NW
- Wisconsin Ave & Upton Street
- Wisconsin Ave & Fannie Mae/Sidwell Friends Dwy
- Wisconsin Ave & Semi-Circle Site Driveway
- Wisconsin Ave & Rodman Street/Sidwell Dwy NW
- Wisconsin Ave & Quebec Street NW
- Wisconsin Ave & Porter Street NW

Four (4) of these intersections operate at unacceptable conditions under existing conditions. Table 13 summarizes the capacity analysis results for each failing scenario for the intersections listed above.

Queueing Analysis

In addition to the capacity analyses presented above, a queuing analysis was performed at the study intersections. The queuing analysis was performed using the *Synchro* software. The 50th percentile and 95th percentile maximum queue lengths are shown for each lane group at the study area signalized intersections. The 50th percentile maximum queue is the maximum back of queue on a typical cycle. The 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes. For unsignalized intersections, 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 does not report queuing for all-way stop.

Table 14 shows the queuing results for the study area intersections. Several 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:

- Van Ness Street & Nebraska Avenue NW
- Wisconsin Avenue & Van Ness Street NW
- Wisconsin Avenue and Upton Street NW
- Wisconsin Avenue NW & Fannie Mae/Sidwell Friends Driveway
- Wisconsin Avenue & Rodman Street NW
- Wisconsin Avenue & Porter Street NW
- Wisconsin Avenue & Idaho Avenue NW
- Wisconsin Avenue & Proposed Site Driveway

With the addition of the site-generated traffic, queues are slightly increased at all of the study intersections, but impacts generally aligned with those observed in the capacity analyses.

Mitigations

Generally speaking, an intersection is expected to have an impact if the capacity analyses show an LOS E or LOS F, or where the 95th percentile queues increase 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 existing or background conditions. An intersection is also expected to have an impact if there is an increase in delay at any approach or the overall intersection operating under LOS E or F of greater than 5 seconds, when compared to the background condition. Following these guidelines there are impacts to seven (7) intersections as a result of the overall Fannie Mae campus redevelopment. As stated previously, the total future scenario includes the removal of the existing Fannie Mae trips and the addition of site-generated trips for both 3900 Wisconsin Avenue and 4000 Wisconsin Avenue. As such, these seven (7) intersections are impacted by the combination of the redevelopments and the applicability of mitigation measures as a result of the 3900 Wisconsin Avenue development was appropriately and proportionately reviewed. Mitigation measures were tested at these intersections, with results shown on Table 15 and Table 16, with detailed *Synchro* reports included in the Appendix. The following conclusions were made:

- *Van Ness Street & 40th Place*

  Under the 2022 Future conditions, the delay for the northbound approach increases by more than the 5 second threshold over the unacceptable 2022 Background conditions during the morning study period.

  As this intersection is located adjacent to 4000 Wisconsin Avenue, the trips added at the northbound approach are generated exclusively by that development. As such, no mitigations are proposed as part of the 3900 Wisconsin Avenue development.

- *Wisconsin Avenue & Van Ness Street*

  Under the 2022 Future conditions, the delay for the westbound approach increases by more than the 5 second threshold over the unacceptable 2022 Background conditions during the morning and afternoon study periods, and for the eastbound approach during the afternoon study period. Additionally, the 95th percentile queue for the northbound approach increases to more than the storage length during the Saturday peak hour.

  There are six (6) additional westbound left turns and 26 additional eastbound left turns at this approach in the Future conditions, all generated by the 4000 Wisconsin redevelopment. The impacts of these trips primarily contribute to the degradation of LOS during the morning and afternoon peak periods, and can be mitigated by adjusting the signal timings, as recommended in the existing study for the development by Wells and Associates, dated August 2017. As such, no additional improvements to the intersection are recommended as part of the 3900 Wisconsin redevelopment.

The northbound queue lengths at this intersection during the Saturday peak hour can be mitigated by shifting one second of green time from the southbound protected left turn to the northbound movement.

- *Wisconsin Avenue & Upton Street*
  Under the 2022 Future conditions, the 95th percentile queuing for the southbound thru/right lane increases by more than 150 feet during the afternoon and Saturday study periods.

  The intersection can be improved by adjusting signal timings. Signal timings can be adjusted such that green time is shifted from the northbound protected left turn to the southbound movement.

- *Wisconsin Avenue & Fannie Mae/Sidwell Friends Driveway*
  Under the 2022 Future conditions, delay for the westbound approach from the Sidwell Friends driveway is projected to increase to LOS E during the morning study period, and the northbound approach is projected to increase to LOS E during the Saturday peak hour. Additionally, 95th percentile queuing for the northbound left/thru/right lanes increases by more than 150 feet during the Saturday study period.

  The operations of the Sidwell Friends driveway can be improved during the morning peak period by shifting one second of green time from the northbound/southbound movements to the northwestbound movement.

  Similar signal timing adjustments were explored during the Saturday peak hour, but the timings have already been adjusted to optimize green time for the northbound movement. Given the volume of northbound left turns during this study period, the left lane acts as a de facto left turn lane, leaving one lane to process thru traffic as parking along the northbound approach is unrestricted on Saturday. As such, the most effective improvement at this approach would be to restrict parking, adding a second lane to increase capacity for the northbound thru movement.

  The advantage of this approach is that it allows the de facto left turn lane work better by providing a second thru lane. This approach is also generally appropriate given the change in use from primarily office to mixed-use with large amounts of retail. The disadvantages of this approach are that it results in the loss of parking and decreases the pedestrian buffer between the sidewalk and the nearest travel lane. It should also be noted that this approach is only necessary on Saturday, and the Saturday analysis in particular may be overly conservative given the inclusion of a grocery use in both redevelopments.

  Implementing this change would need to be coordinated with DDOT and the surrounding community, particularly concerning the transition zone that would need to be determined downstream of the intersection to allow vehicles to merge from the third lane.

- *Wisconsin Avenue & Quebec Street*
  Under the 2022 Future conditions, the delay for the westbound approaches increases to LOS F during the afternoon study period.

  Although there are no new trips generated at this approach, there are 126 additional southbound thru trips generated by the 3900 Wisconsin Avenue redevelopment and 67 additional trips generated by the 4000 Wisconsin Avenue redevelopment. These additional trips contribute to the delay at the westbound approach, as the increase in volumes along Wisconsin Avenue reduces the effective gap for westbound turning vehicles.

  The intersection was evaluated to determine if it triggers a traffic signal, but the volumes turning from Quebec Street are not high enough to warrant a signal. The possibility of restriping separate westbound left and right turn lanes was also explored, but the approach is not wide enough to do so. However, it is expected that turning vehicles will naturally form some separation at this approach based on observations of this behavior under existing conditions. Additionally, it is likely that left-turning vehicles would either turn right and reroute or accept shorter gaps. Given this, no mitigations are proposed at this intersection.

- *Wisconsin Avenue & Porter Street*
  Under the 2022 Future conditions, overall delay and delay along the southbound approach is projected to increase by more than 5 seconds over the unacceptable 2022 Background conditions during the afternoon period, and along the westbound approach during all study periods. Additionally, the 95th percentile queuing for the

westbound left/thru/right lane increases by more than 150 feet during the afternoon and Saturday study periods.

The intersection can be improved during the morning by adjusting signal timings. Signal timings can be adjusted such that the westbound approach receives more green time. This analysis assumed a shifting of green time that resulted in delay similar to that of the existing conditions.

Signal timing adjustments also improve operations at this intersection during the afternoon and Saturday peak periods, but the amount of time necessary to shift from the southbound approach to accommodate the westbound approach compromises the southbound approach such that it operates under unacceptable conditions. During these study periods, the southbound approach is effectively reduced to a de facto left turn lane and one thru lane due to unrestricted parking. In order to improve operations at both approaches, it is recommended that parking be restricted along the southbound approach during all peak periods. Implementing this change would need to be coordinated with DDOT and the surrounding community, particularly concerning the transition zone that would need to be determined downstream of the intersection to allow vehicles to merge from the third lane.

- *Wisconsin Avenue & Semi-Circle Site Driveway*
  Under the 2022 Future conditions, the delay for the eastbound approach at the existing southern site driveway operate at unacceptable conditions during the morning and Saturday peak periods.

  The number of trips at this approach is relatively low and the queues, which are contained on-site, are reasonable lengths during these periods. Additionally, if southbound traffic is heavy enough that left-turning vehicles experience significant delays, these vehicles will likely turn right and reroute rather than waiting for an acceptable gap. Given this, no mitigations are proposed at this intersection.

Of note, the intersection of Wisconsin Avenue & Rodman Street, NW was shown to operate under unacceptable levels of service during the existing and background conditions. However, under future conditions this intersection was assumed to be tied into and coordinated with the proposed Wisconsin Avenue site driveway such that both intersections operate under acceptable conditions. As such, no additional mitigations are proposed outside of the project-related operational changes.

The intersections impacted by the redevelopment of the Fannie Mae campus are generally able to be improved with signal timing adjustments. In some cases further mitigations are necessary, including parking restrictions in some areas close to the site. A summary of the improvements recommended for the study area, including improvements that are proposed as part of background developments and the redevelopment of the Fannie Mae campus, in addition to the mitigations outlined previously, is shown in Figure 24.

Summary of Traffic Operations

The following summarizes the overall conclusions of the vehicular analysis as it relates to the roadway network as a whole:

- The overall change in use of the Fannie Mae campus results in vehicular traffic that is spread out over a larger amount of time, but generally less concentrated than the existing office use. The change in use also results in a significant increase in weekend traffic compared to that of an office use.
- There is minimal change in overall operations during the morning and afternoon peak hours, with signal timing adjustments able to mitigate the majority of issues. This is because the net increase in traffic is more minimal compared to Saturday, but there is a change in the directionality of the traffic.
- More significant changes to the surrounding roadway network are required on Saturday including the removal of parking along some roadways segments. This makes sense given the more significant increase in traffic on Saturday as compared to an office use.
- The overall design of the 3900 Wisconsin Avenue site is expected to operate efficiently, such that the majority of vehicular traffic is processes at the signalized intersections, and the internal roadway network is more pedestrian-oriented.

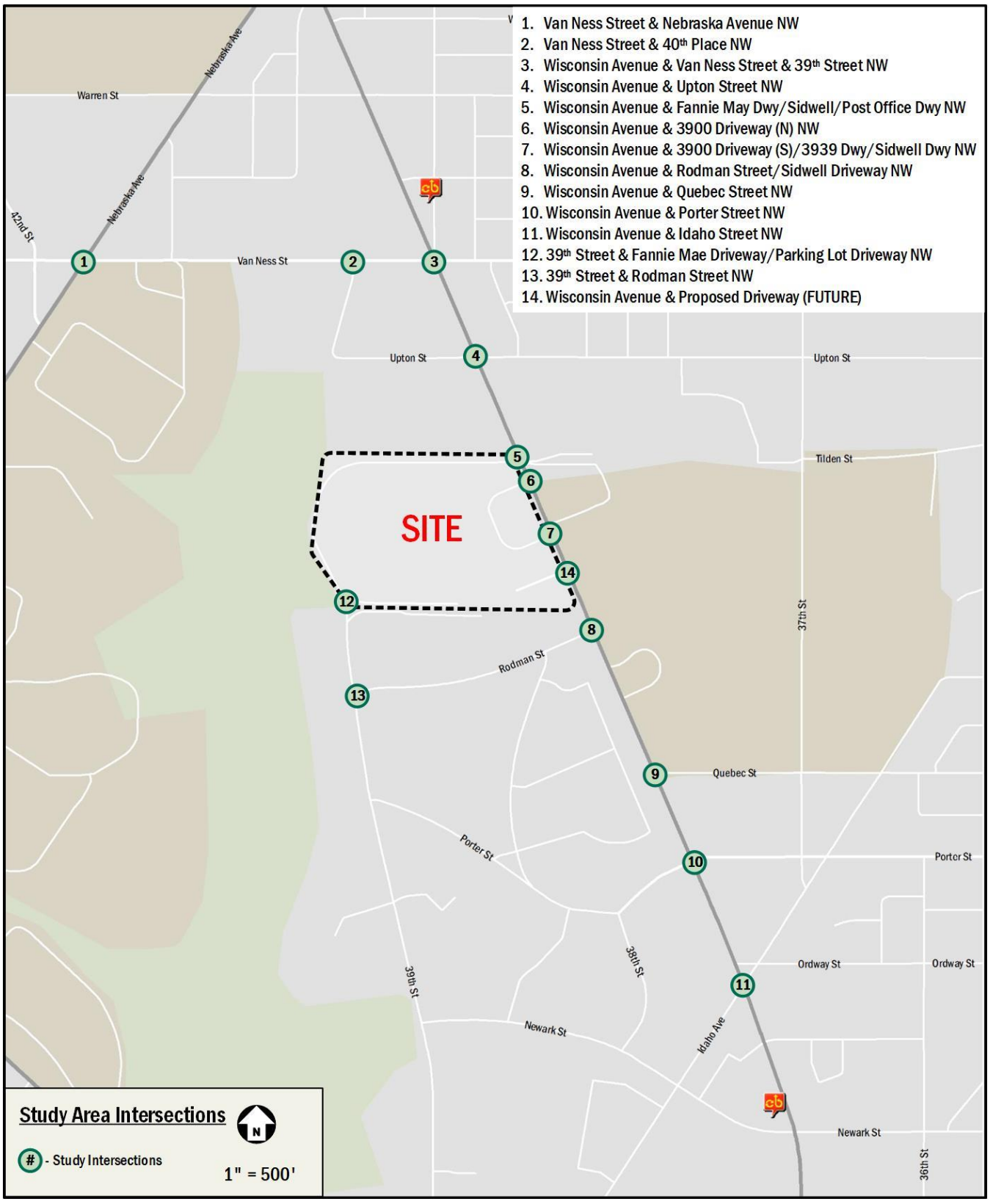

Figure 13: Study Area Intersections

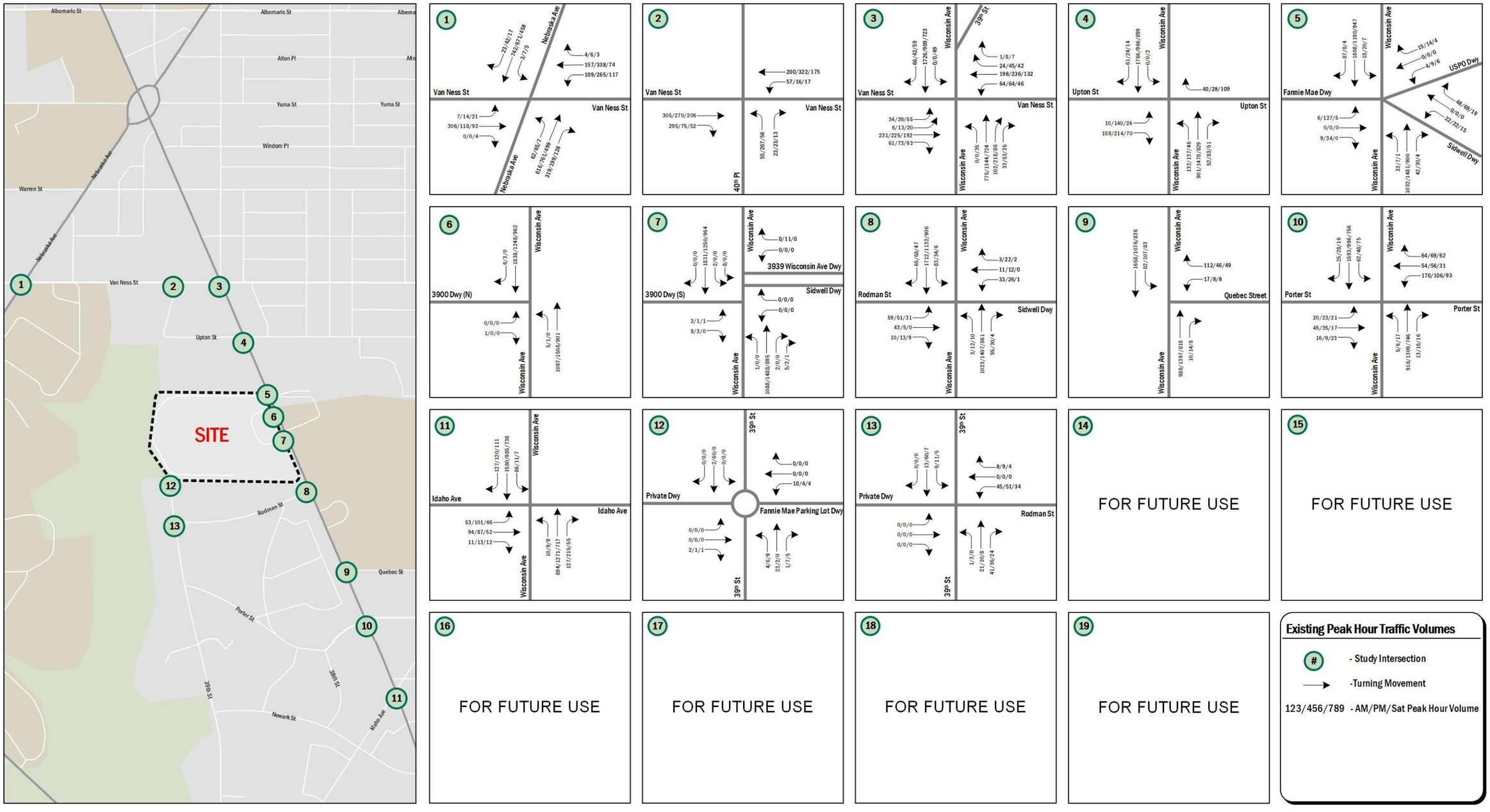

Figure 14: Existing Peak Hour Traffic Volumes

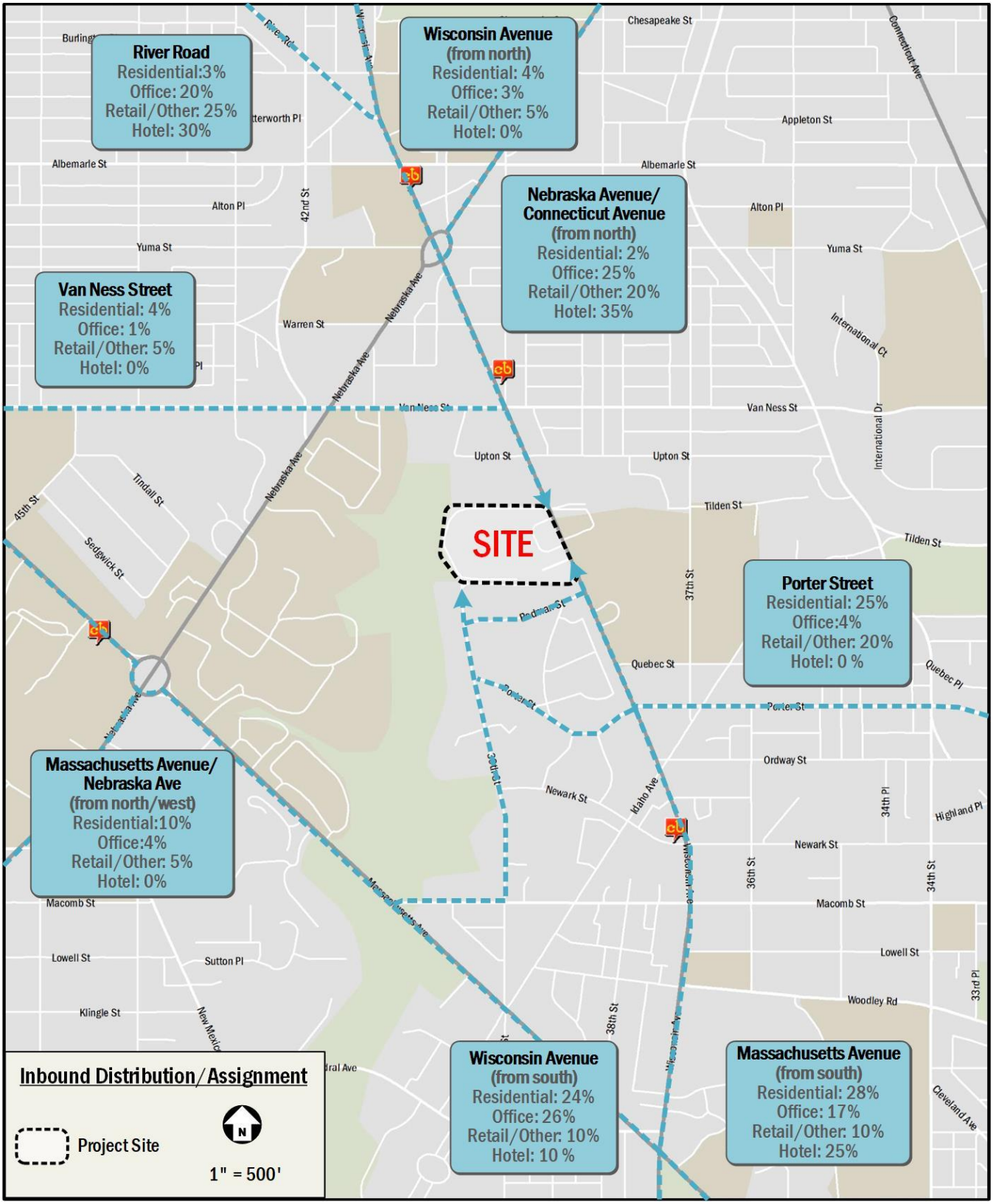

Figure 15: Inbound Distribution and Routing

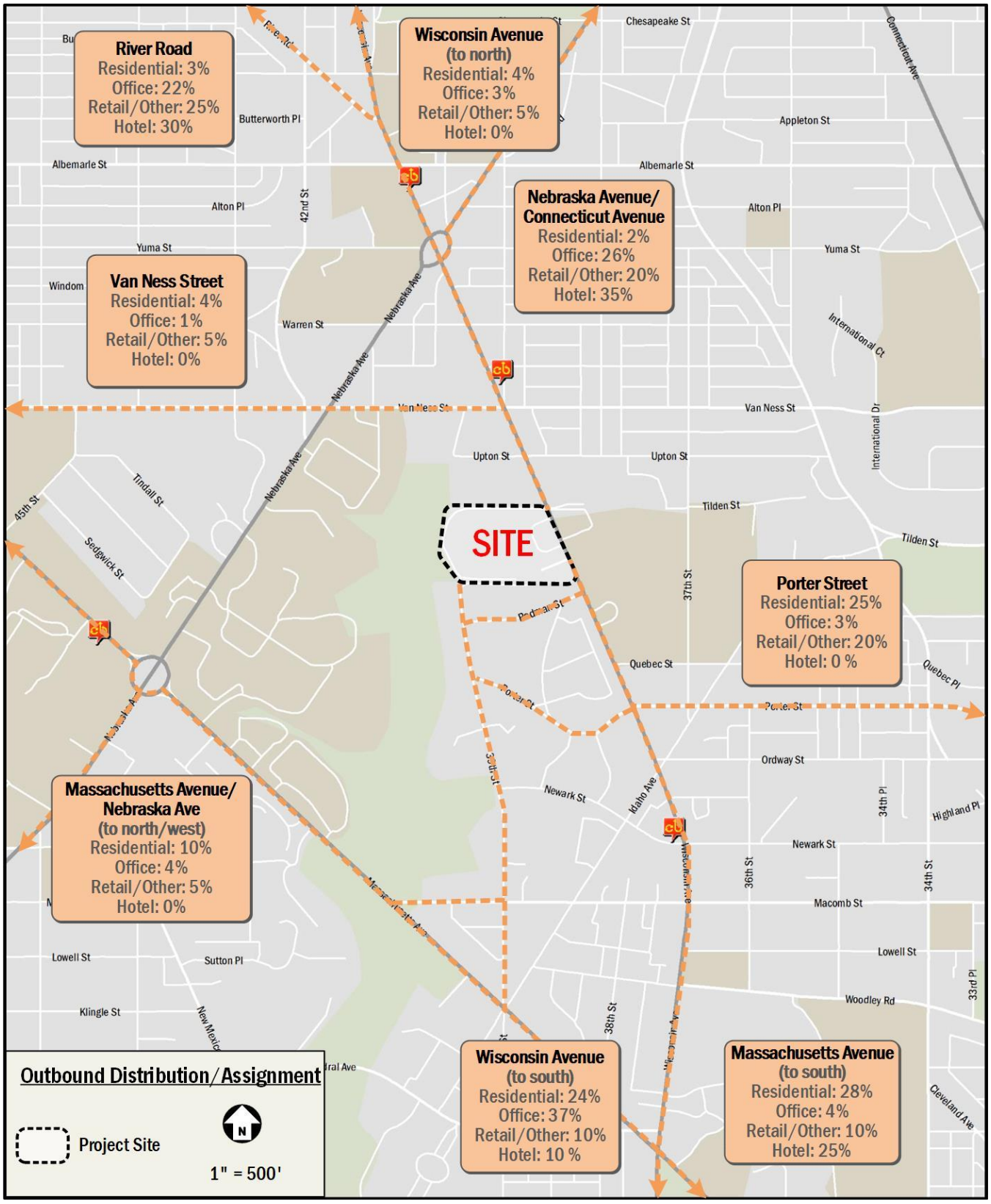

Figure 16: Outbound Distribution and Routing

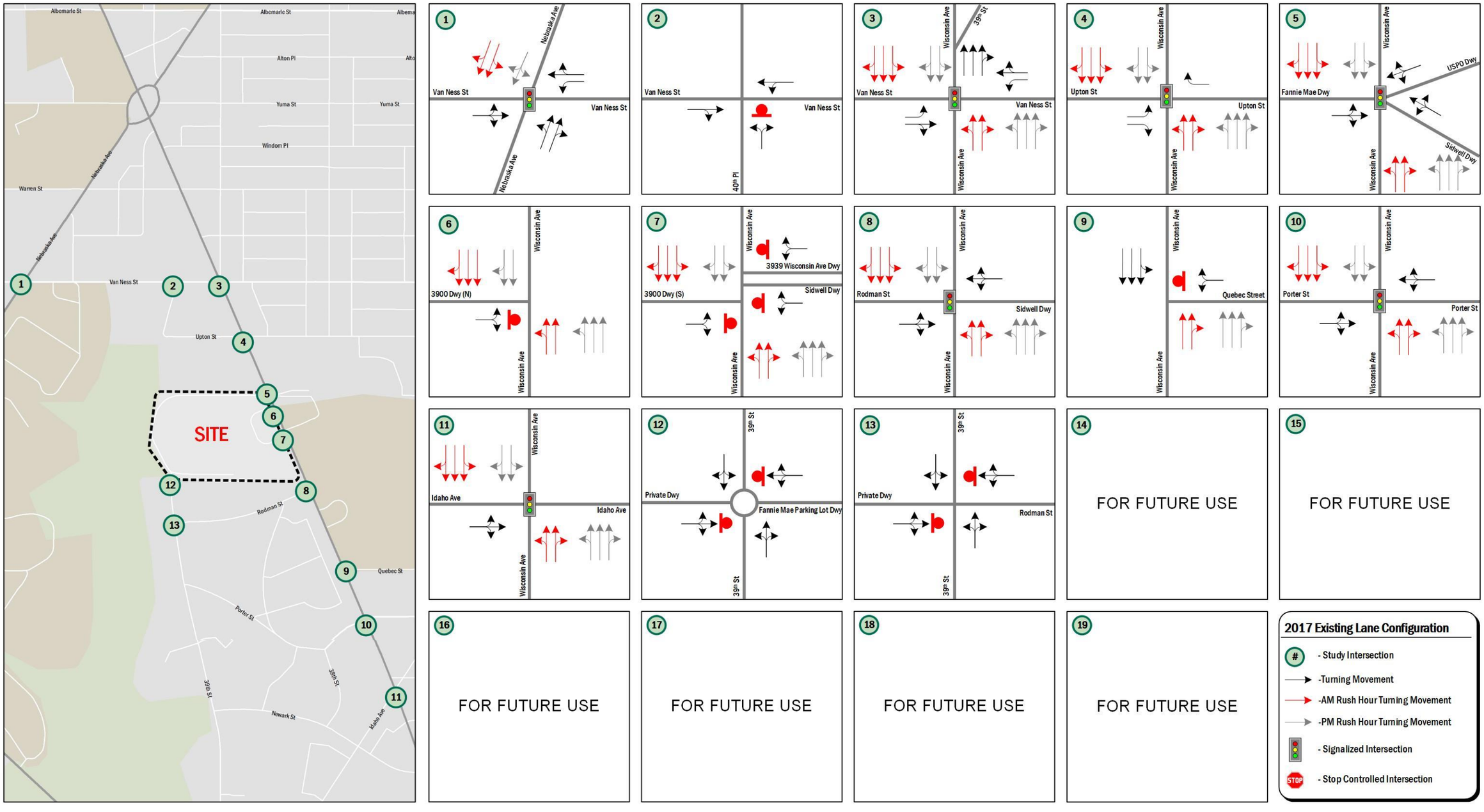

Figure 17: Current Lane Configuration and Traffic Control

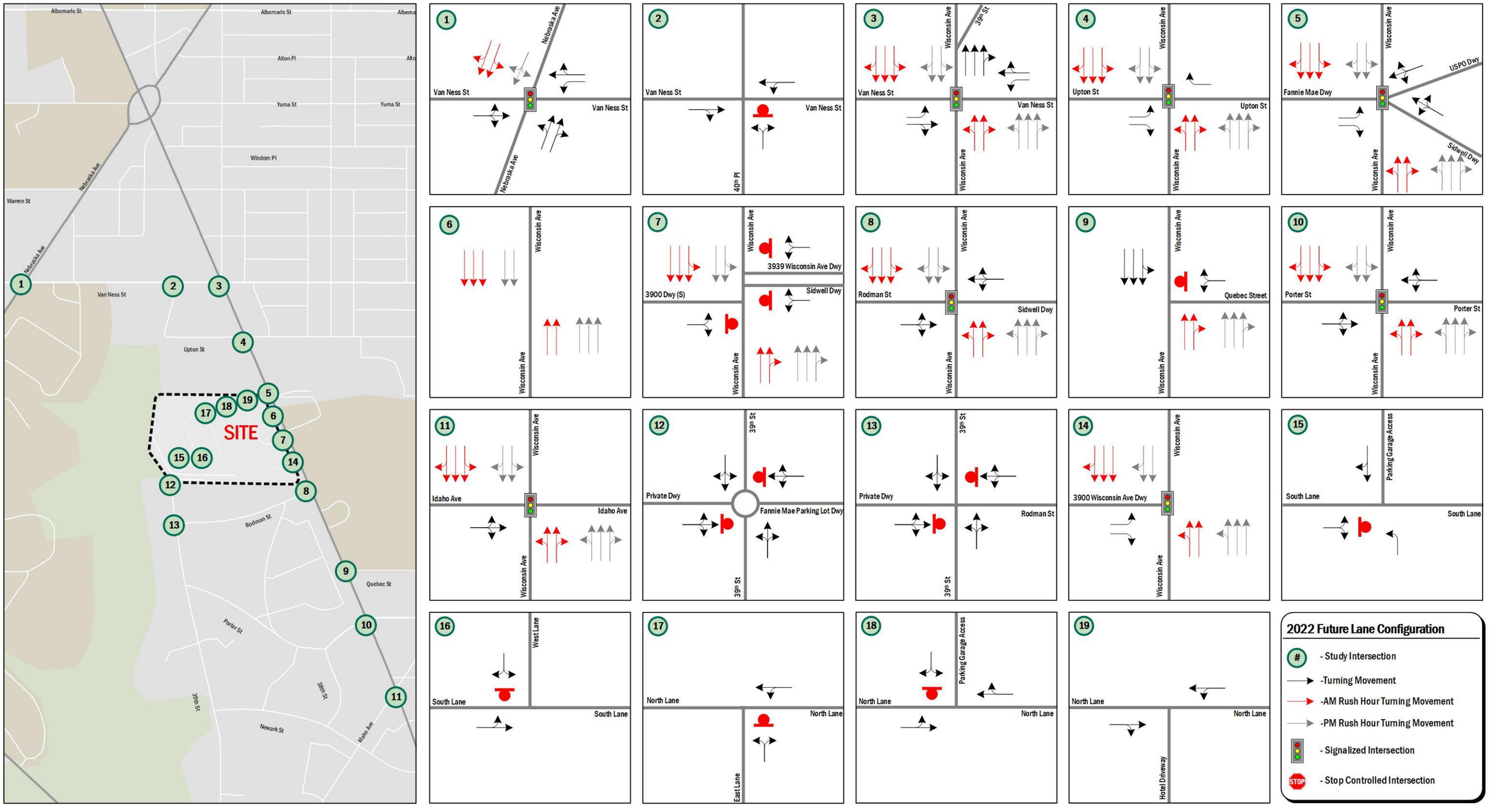

Figure 18: Planned Lane Configuration and Traffic Control