Transportation Impact Study

Tenley Campus Further Processing

American University, Washington DC

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GOROVE / SLADE
Transportation Planners and Engineers

Prepared by:

1140 Connecticut Avenue
Suite 600
Washington, DC20036
Tel: 202.296.8625
Fax: 202.785.1276

3914 Centreville Road
Suite 330
Chantilly, VA20151
Tel: 703.787.9595
Fax: 703.787.9905

7001 Heritage Village Plaza
Suite 220
Gainesville, VA20155
Tel: 703.787.9595
Fax: 703.787.9905

www.goroveslade.com

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EXECUTIVE SUMMARY

The following report presents the findings of a Transportation Impact Study (TIS) performed for the relocation of American University's Washington College of Law (WCL) to American University's Tenley Campus. The Tenley Campus is located in Ward 3 in Northwest Washington, DC, adjacent to Tenley Circle. The 2011 American University Campus Plan for the Tenley Campus focused on creating a campus for the Washington College of Law through removal of some of the existing buildings and the addition of approximately 245,000 square feet of campus space in the approximate footprints of the existing buildings. The Tenley Campus will contain approximately 300,000 to 310,000 square feet of new and renovated facilities. The Washington College of Law is projected to increase the student enrollment to approximately 2,000, and the faculty/staff population could increase to approximately 500 with the full potential growth allowed in the 2011 Plan.

The following study concludes that the proposed relocation of the WCL to the Tenley Campus will not have an adverse impact on the transportation network. This conclusion is contingent on the following recommendations:

- That a left turn queuing lane be constructed into the new access on Nebraska Avenue to the main Tenley Campus parking garage (see discussion within Table 10 of report).
- That the Transportation Demand Management plan components listed within the report are implemented (see section 2.4).
- That the "Good Neighbor" program be extended to the Tenley Campus to minimize offsite parking impacts (see section 3.5.1).

In addition to these recommendations to mitigate potential impacts of the proposed WCL relocation, the report also contains recommendations for DDOT to consider implementing regarding roadway capacity and on-street parking management:

- The roadway capacity analyses identified several areas of congestion that are independent of the proposed relocation of the WCL to the Tenley Campus (they exist currently, or are projected in future scenarios without the relocation). For each of these areas, this report contains suggestions for DDOT to consider to alleviate delays (see Table 10 within the report).
- An inventory and occupancy count of on-street parking within a 10-minute walk of the Tenley Campus was conducted to identify places of potential impact. Within the report is a set of detailed recommendations that DDOT and the community consider to alleviate potential impacts to on-street parking (sections 3.5.2 and 3.5.3).

Transportation Characteristics of the WCL

Observations, counts and surveys of the existing WCL population were conducted during this study to determine the travel characteristics. The existing mode split of the WCL is 51% drive and 49% non-auto for students, and 88% drive and 12% non-auto for faculty/staff. One of the main considerations for selecting the Tenley Campus as a future home for the WCL was its proximity to the Tenleytown Metrorail station, as the Tenley Campus is only 1,000 feet away compared to the current distance of one mile. It is likely that the percent of non-auto use for students and faculty/staff will increase once the WCL moves to the Tenley Campus.

The data collected also shows that drivers to and from the WCL peak during traditional commuter peak hours, although compared to other land uses such as office buildings or residential buildings, additional traffic is generated off-peak. Parking demand at the existing WCL was determined to peak from Monday through Thursday during afternoons and early evenings at approximately 410 cars.

Transportation Features of Proposed Tenley Campus

- *Parking*

  This report finds that with a modest decrease in driving due to relocating the school close to the Metrorail station, the typical peak parking demand would be 400 spaces. The future supply of parking on the Tenley Campus is proposed to be 400 to 450 spaces. Approximately 400 parking spaces will be provided in two below-grade parking levels and approximately 40 to 50 parking spaces will be retained within the existing surface parking lot accessed from an existing curb cut along Yuma Street. In addition, parking on the Main Campus will be available to the Tenley Campus as needed, similar to how the Katzen garage serves a portion of the current WCL demand (the AU shuttle system provides a link between campuses).

  Additional parking demand at the proposed WCL may be generated during events such as Continuing Legal Education programs. Comparing a yearlong list of event times and attendee counts, this report found that the vast majority of event parking demand can be accommodated with the projected surplus in parking supply. This report recommends that WCL market alternative modes to all event attendees and promote parking on the Main Campus using the AU Shuttle to access the WCL.

  The amount of parking provided needs to balance the goals of not impacting the surrounding community, while not exceeded the projected demand in a manner that will undermine the TDM policies and programs of the University and encourage people to drive. Based on the demand calculations described above and the parking supply proposed, the proposed parking at the Tenley Campus meets both of these goals.

- *Yuma Street Access*

  The proposed Tenley Campus consolidates the existing six curb cuts to two access points. The proposed access on Yuma Street would be unsignalized, with all turns permitted. It would provide access to a surface parking lot with 40-50 spaces, loading facilities, and spaces reserved for ZipCar parking.

- *Nebraska Avenue Access*

  The driveway on Nebraska Avenue is proposed as an unsignalized intersection with all turns permitted. It will provide access to a parking garage with approximately 400 spaces, and also is proposed to be constructed in a manner that allows for traffic to pull-in and turn-around without advancing to the garage. This will allow the driveway to act as a pick-up/drop-off area for taxis and other vehicles.

  Although the roadway capacity analysis shows that the proposed driveway could operate without significant delays during peak hours with no proposed changes to Nebraska Avenue, some members of the community have raised concerns that vehicles turning left from northbound Nebraska Avenue into the Tenley Campus could block traffic along Nebraska Avenue. The current configuration of the northbound lanes is one permanent travel lane, and one parking lane that converts to a travel lane during the evening (4pm to 6:30pm). Thus, the possibility exists for northbound traffic to be delayed outside of the PM peak hour when traffic is turning into the garage. This report has examined potential ways to mitigate this concern:

  - By changing the parking regulations on the east side of Nebraska Avenue between Warren Street and Tenley Circle to restrict parking from 7am to 9pm. An alternative would be to completely remove parking and make the lane a permanent travel lane. Currently the on-street parking is Residential Permit Parking (RPP), 7am to 4pm M-F, with all parking restricted from 4pm to 6:30pm;

- By adding a short left turn lane to handle queues of left turning traffic.

The proposed Tenley Campus plan recommends and incorporates option (2), the left turn queuing lane.

- *Pedestrian & Bicycle Facilities*

  The site plan has two main pedestrian entrances; the Yuma Entry Court and the Nebraska Entry Court. The majority of pedestrians travelling to and from the site will be transit riders going to and from their bus stops or the Metrorail station. In addition, it is anticipated that the campus population will travel back and forth to the commercial properties within Tenleytown. The Yuma Entry Court was located and designed in part to provide a quality entrance to campus for these anticipated pedestrians travelling to and from Tenleytown and the Metrorail station. The bus stop on Nebraska Avenue is recommended to be relocated in order to be closer to the Nebraska Entry Court. Other pedestrian amenities of the site plan include a new internal path on campus along its southern boundary.

  The site plan accommodates bicycles through the inclusion of short and long term bicycle parking, shower facilities and a Capital Bikeshare station. Secured, long-term bicycle parking oriented towards commuters will be provided in the parking garage, with 115 spaces. Short-term parking for bicycles will be provided via bicycle racks located near the Yuma Entry Court and the Nebraska Entry Court. A minimum of ten bicycle parking spaces will be provided at each location. The site plan also includes space for a future Capital Bikeshare station (which the University has agreed to fund) near the Nebraska Entry Court.

- *Transportation Demand Management (TDM)*

  The TDM plan detailed in the report contains many components that help reduce potential traffic impacts of the Tenley Campus. Highlights include:

  - Marketing of non-auto modes, including for special events;
  - Carpool discounts, preferred spaces, and ride-matching services;
  - ZipCar spaces on the Tenley Campus;
  - Bicycle commuting benefits, secure long-term parking and shower access;
  - Capital Bikeshare station on Campus, the University is a corporate member of Capital Bikeshare; and
  - Annual monitoring reports.

Roadway Capacity Analysis Results

The report contains a detailed roadway capacity analysis, the scope of which was agreed to with DDOT over the course of several meetings and discussions. In essence, the analysis is an updated version of the one presented in the Campus Plan transportation study (dated March 11, 2011), with some additional study area intersections, traffic and trip generation assumptions, and incorporates some new data collected this semester.

The projected trip generation for the Tenley Campus was based on: (1) a study of the existing WCL population, (2) traffic counts to and from the existing WCL, (3) adjustments of changes to campus population, and (4) no significant changes to mode splits resulting from relocating the campus close to Metrorail (this is a conservative assumption as the non-auto

mode splits are expected to increase). These trips were distributed on the local roadway network based on answers received from the survey of the existing WCL population.

In order to help put perspective on the amount of traffic generated by the proposed relocation of the WCL, this report calculated the percent of site traffic per intersection in the future conditions with the WCL relocation. Based on these calculations, the overall percent of traffic attributable to the proposed redevelopment of the Tenley Campus, across all study area intersections is 2.2% in the AM, 2.5% in the PM, and 2.3% combined.

In addition, the site generated trip calculations were used to estimate how many additional vehicles the relocation of WCL to the Tenley Campus would generate on roadways adjacent to the Tenley Campus during the peak hours. The net new trips generated by the Tenley Campus projected to drive by the campus during peak hours are listed below. These projections all show that the proposed WCL relocation would have a minimal impact to roadway volumes on adjacent streets.

- Yuma Street:
  - 8 cars in the AM peak, or one car every 7.5 minutes
  - 7 cars in the PM peak, or one car every 8.6 minutes
- 42nd Street:
  - 7 cars in the AM peak, or one car every 8.6 minutes
  - 25 cars in the PM peak, or one car every 2.4 minutes
- Warren Street:
  - 7 cars in the AM peak, or one car every 8.6 minutes
  - 23 cars in the PM peak, or one car every 2.6 minutes

The roadway capacity analyses concluded that there were no significant impacts to traffic with the Tenley Campus traffic included in future traffic projections compared to scenarios without the new trips. This result is logical given the relatively low trip generation of the Tenley Campus compared to the commuter dominant streets within the study area.

The roadway capacity analyses identified several areas of congestion that are independent of the proposed relocation of the WCL to the Tenley Campus (they exist currently, or are projected in future scenarios without the relocation). For each of these areas, this report contains suggestions for DDOT to consider to alleviate delays.

On-Street Parking

American University employs what is known as the “Good Neighbor” program to discourage its population from parking in the surrounding community. This report reviewed this policy, current penalties, and on-street parking near the existing WCL, at 4801 Massachusetts Avenue, NW. It concluded that although there some members of the WCL population continue to park in violation of the Good Neighbor program, the Good Neighbor program does a good job of minimizing their impact. This report recommends extending the program to the Tenley Campus.

Also presented in the report is an analysis of on-street parking regulations within an 10-minute walk of the Tenley Campus. Recommendations are presented for DDOT to consider that are intended to help minimize potential impacts from the relocation of the WCL to the Tenley Campus. This analysis identified potential locations where people would be tempted to park and suggested changes to parking regulations. The recommendations include converting areas of unrestricted parking to RPP or metered parking and changing the ‘grace’ period of RPP parking to reduce non Ward 3 permit use.

1: INTRODUCTION & SITE REVIEW

This report presents the findings of a Transportation Impact Study (TIS) performed for the relocation of American University's Washington College of Law (WCL) to American University's Tenley Campus. Gorove/Slade Associates was retained by American University to prepare a transportation impact study to support the Further Processing application for the Tenley Campus under the proposed American University 2011 Campus Plan (2011 Plan). The specific element of the 2011 Plan presented for Further Processing is the relocation of the Washington College of Law from the intersection of Street and Massachusetts Avenue to the Tenley Campus, which is located at the intersection of 42nd and Warren Streets.

The Tenley Campus is located in Ward 3 in Northwest Washington, DC, adjacent to Tenley Circle. The 2011 Campus Plan for the Tenley Campus focused on creating a campus for the Washington College of Law through removal of some of the existing buildings and the addition of approximately 245,000 square feet of campus space in the approximate footprints of the existing buildings. The Tenley Campus will contain approximately 300,000 to 310,000 square feet of new and renovated facilities. The Washington College of Law is projected to increase the student enrollment to approximately 2,000, and the faculty/staff population could increase to approximately 500 with the full potential growth allowed in the 2011 Plan.

This report contains three sections as follows:

- *Introduction & Site Review*
  This section provides a summary of major transportation features near and adjacent to the American University Tenley. This includes reviewing roadways, transit facilities, bicycle facilities, and pedestrian facilities. This section contains information on the site to help establish a reference for the following sections.

- *Design Review*
  This section provides a summary of the transportation components of the 2011 Plan for the Tenley Campus. This section is meant to supplement the details provided in the Further Processing application.

- *Technical Analysis*
  This section provides a review of the potential impacts of the development of the 2011 Plan for the Tenley Campus on the surrounding transportation network. Included is an analysis of future roadway capacity, examination of on-street parking availability in the neighborhoods adjacent to the campus, and a review of crash data and potential impacts.

1.1 Site Location and Major Transportation Features

American University's Tenley Campus is located in the Northwest portion of Washington, DC, in Ward 3. The project site, as shown in Figure 1, is bounded by Nebraska Avenue, Tenley Circle, Yuma Street, 42nd Street, and Warren Street. The existing location of the Washington College of Law is identified in Figure 1. The Tenley Campus is served by several arterials, including Wisconsin Avenue and Nebraska Avenue. (For the purpose of this analysis, Nebraska Avenue is assumed to have a north-south alignment.) Major collector roadways include Van Ness Street, 45th Street, and 42nd Street. The University is served by several public transportation sources, including Metrorail and Metrobus. Additionally, the University provides shuttle service for students and faculty/staff that connects the Main Campus, Law School, Tenley Campus, and Metrorail station.

The Tenley Campus is also served by a pedestrian network consisting of sidewalks and crosswalks along the local streets surrounding the project site. In addition to pedestrian accommodations, the site is also served by the on- and off-street bicycle network, which consists of bike lanes and signed bicycle routes along local roadways.

1.2 Roadway Conditions

Regional access for the American University Tenley Campus is provided primarily by Wisconsin Avenue and Nebraska Avenue. Local access is also provided by Yuma Street, Warren Street, Van Ness Street, and 42nd Street. Figure 2 shows the street network hierarchy for the study area, as well as the average annual weekday traffic volumes for the heavily traveled roadways.

Gorove/Slade conducted field reconnaissance to obtain the existing lane usage and traffic controls at the intersections within the Tenley Campus study area. Figure 3 presents the number of travel lanes on the roadways surrounding the Tenley Campus, including travel lanes that sometimes become parking lanes. For the purpose of this report, Nebraska Avenue is assumed to have a north-south orientation. The physical and service characteristics of the key roadways providing local site access are as follows:

- *Wisconsin Avenue*
  Wisconsin Avenue is a 6-lane arterial, which runs north of the American University Tenley Campus. The roadway is classified by DDOT as a primary arterial with an average annual weekday traffic volume of 34,000 vehicles. Within the limits of the study area, Wisconsin Avenue runs through Tenley Circle.

- *Nebraska Avenue*
  Nebraska Avenue is a 4-lane arterial, which runs along the east side of the American University Tenley Campus. The roadway is classified by DDOT as a primary arterial with an average annual weekday traffic volume of 20,700 vehicles. Within the limits of the study area, Nebraska Avenue runs from Van Ness Street to Tenley Circle.

- *Albemarle Street*
  Albemarle Street is a 2-lane roadway, north of the American University Tenley Campus. The roadway is classified by DDOT as a collector roadway with an average annual weekday traffic volume of 5,100 vehicles. Within the limits of the study area, Yuma Street runs from 42nd Street to Nebraska Avenue.

- *Yuma Street*
  Yuma Street is a 2-lane roadway, north of the American University Tenley Campus. The roadway is classified by DDOT as a local road. Within the limits of the study area, Yuma Street runs from 42nd Street to Nebraska Avenue.

- *Warren Street*

  Warren Street is a 2-lane roadway, south of the American University Tenley Campus. The roadway is classified by DDOT as a local road. Within the limits of the study area, Warren Street runs from 42nd Street to Nebraska Avenue.

- *Van Ness Street*

  Van Ness Street is a 2-lane roadway, south of the American University Tenley campus. The roadway is classified by DDOT as a collector, with an average annual weekday traffic volume of 8,500 vehicles. Within the limits of the study area, Van Ness Street intersects Nebraska Avenue.

- *42nd Street*

  West of the American University Tenley Campus, 42nd Street is a 2-lane roadway. The roadway is classified by DDOT as a collector, with an average annual weekday traffic volume of 6,600 vehicles. Within the limits of the study area, 42nd Street runs from Yuma Street to Warren Street. The posted speed limit in the vicinity of the site is 25 mph.

- *45th Street*

  West of the American University Tenley Campus, 45th Street is a 2-lane roadway. The roadway is classified by DDOT as a collector, with an average annual weekday traffic volume of 2,400 vehicles. Within the limits of the study area, 42nd Street runs from Yuma Street to Warren Street. The posted speed limit in the vicinity of the site is 25 mph.

1.3 Site Access and Loading

Existing Site access for the Tenley Campus is provided by six driveways, which provide parking, loading, and pick-up/drop-off access. Figure 4 identifies the most commonly used locations for passenger drop-off and pick-up and the location of shipping and receiving facilities. Passenger drop-off and pick-up activity occurs at multiple locations for the Tenley Campus. Shipping and receiving facilities are located along Yuma Street. The driveway on Nebraska Avenue is primarily used to pick-up and drop-off activities and there are a few parking spaces. The Yuma Street driveway provides access to pick-up and drop-off facilities and a parking lot with 65 spaces as well as parking for service vehicles.

Figure 1: Campus Location

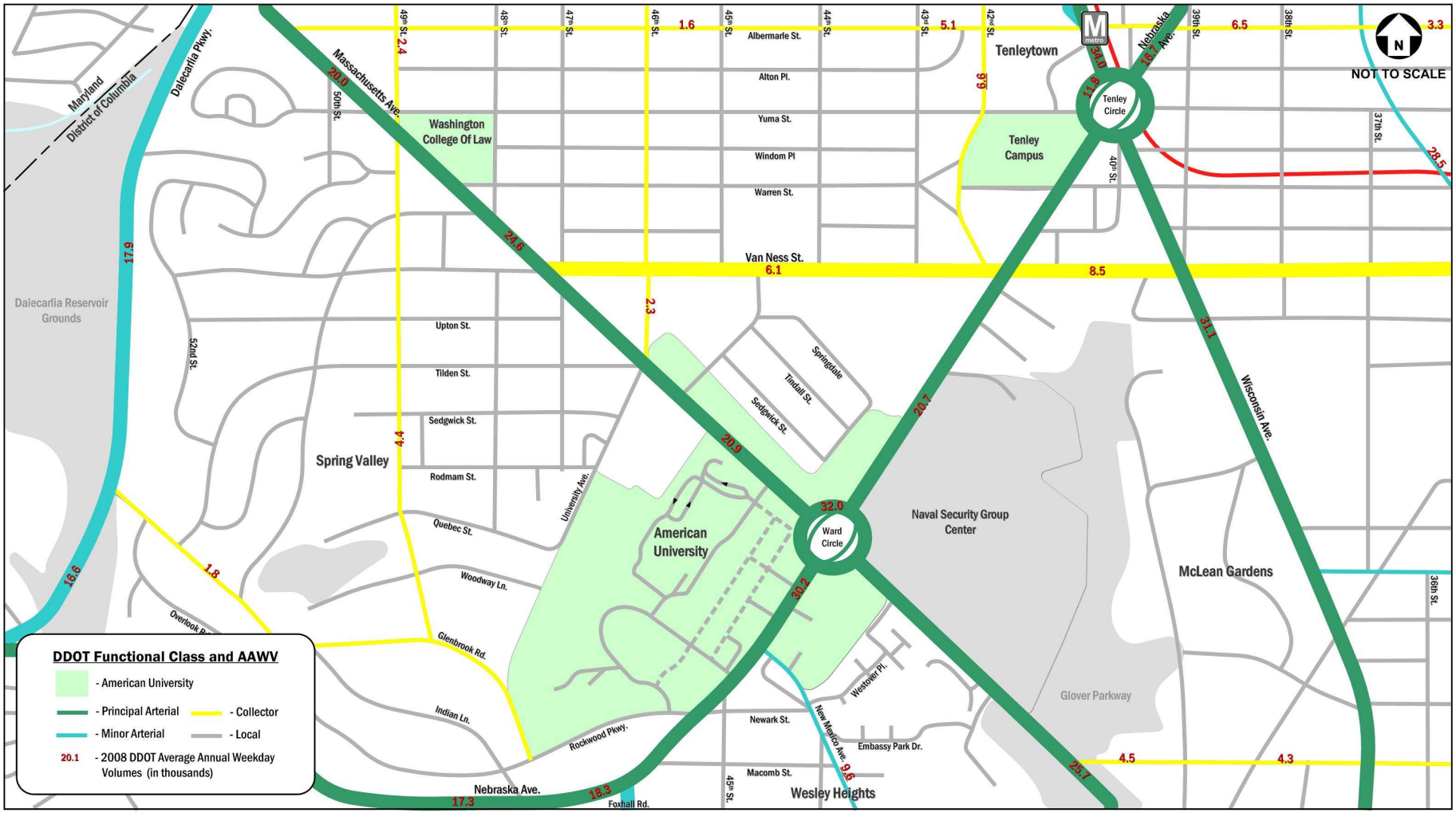

Figure 2: Roadway Classification and Average Daily Volumes

Figure 3: Existing Number of Travel Lanes

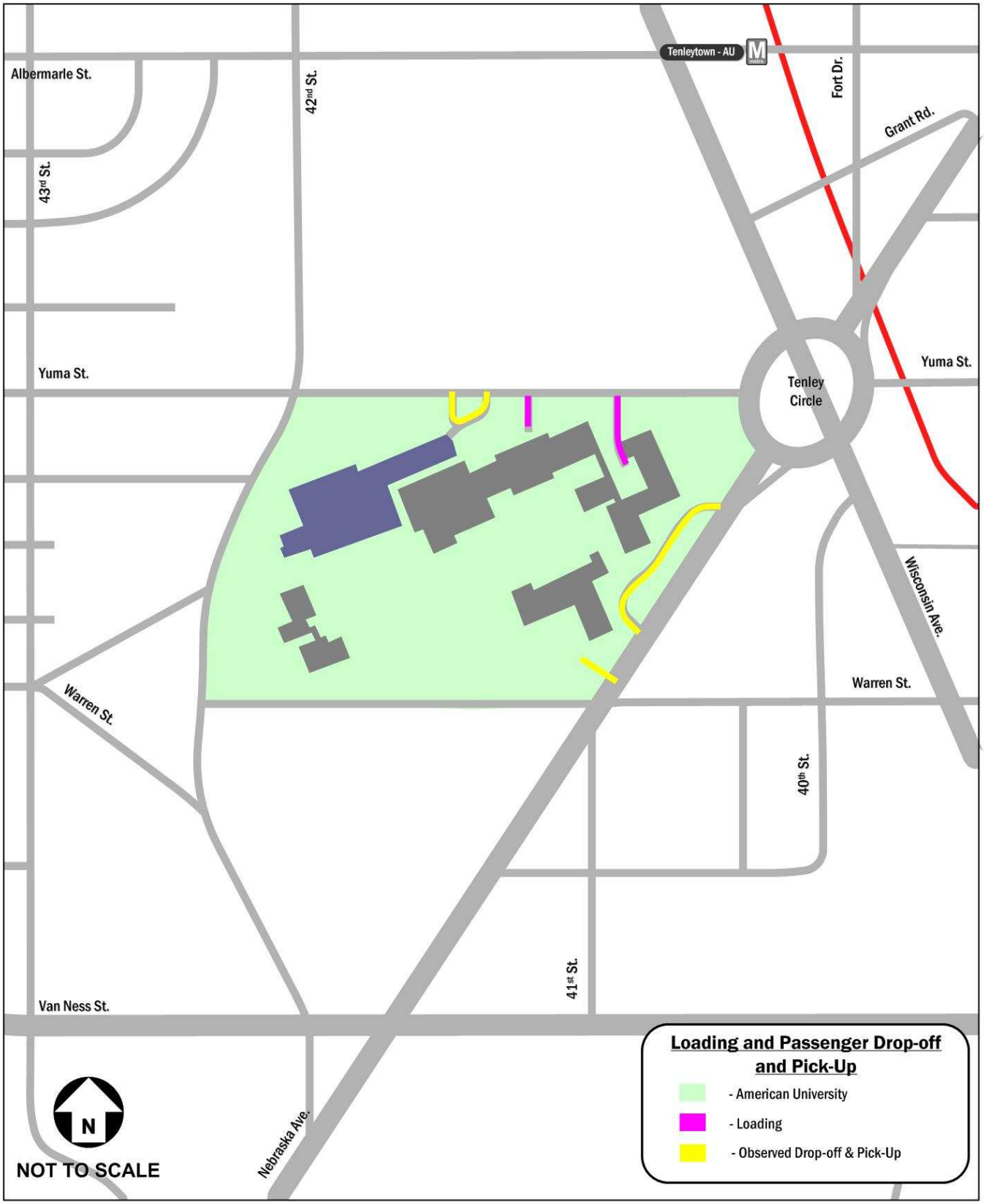

Figure 4: AU Tenley Campus Loading and Passenger Drop-off and Pick-up

1.4 Car-Sharing

AU has car-sharing on-campus provided by Zipcar. Zipcar is a private company that allows registered users to reserve cars for a minimum of 30 minutes or for longer periods up to several days. Car-sharing provides individual access to automobiles for trips made easier by car. Many universities have car-sharing programs because they reduce the number of students that bring cars to campus, which reduces the number of parking spaces that are needed.

At the Tenley Campus, two Zipcar vehicles are located in the parking lot. There are five additional vehicles available adjacent to the Tenleytown-AU Metrorail station. Table 1 lists the car-sharing locations in the study area and the number of vehicles available.

Table 1: Carshare Location and Vehicles

Carshare Location	Number of Vehicles
American University – Tenley Campus	2 vehicles
Tenleytown/AU Metro – On Street	2 vehicles
Tenleytown/AU Metro at Fort Drive NW	3 vehicles
Total Number of Carshare Vehicles in Study Area	**7 vehicles**

1.5 Transit Service

Rail and local bus service are provided by the Washington Metropolitan Area Transit Authority (WMATA), which operates the second largest heavy rail transit system (Metrorail) and the fifth largest bus network (Metrobus) in the United States[1]. Commuter bus service is provided by the Maryland Transit Administration (MTA) and the Potomac and Rappahannock Transportation Commission (PRTC).

The AU Tenley Campus is directly served by Metrobus and is within walking distance of the Red Line Tenleytown-AU Metrorail Station. Figure 5 identifies Metrobus routes and stops and the nearest Metrorail station location that serve the AU Main and Tenley Campuses. Transit connects the campus with destinations throughout the District and Maryland.

WMATA's Tenleytown-AU Metrorail Red Line station is located at Wisconsin Avenue and Albemarle Street. The Red Line connects the study area with Maryland and downtown Washington, DC. Trains run frequently during the morning and afternoon peak hours. Trains run approximately every 5-6 minutes during weekday non-peak hour, every 10-15 minutes on weekday evenings after 7:00 PM and 6-15 minutes on the weekends.

The Tenleytown-AU Station is located approximately 1,000 feet (walking distance) from the main entrance of the Tenley Campus, located on Nebraska Avenue. The station portal is located on the northeastern corner of the intersection of Wisconsin Avenue and Albemarle Street. This requires pedestrians walking between the site and the Metrorail station to cross Wisconsin Avenue. Controlled crossings are provided at all signalized crossings and crossing facilities include crosswalks, curb ramps with detectable warnings, and pedestrian countdown signals.

The site is directly served by WMATA's local bus service and express bus services operate along Wisconsin Avenue. There are some bus stops with shelters in the study area that provide rider amenities, such as shelter, benches, route maps, and schedules, while those without shelters are designated by a WMATA sign and do not have additional amenities. Some bus stops near the site are equipped with Next Bus technology, which allows customers to determine bus arrival times. Next Bus technology uses global positioning satellites and advanced computer modeling to track buses on their routes every 120

[1] American Public Transportation Association Ridership Report for the fourth quarter of 2009

seconds. Customers can obtain bus information using desktop computers, wireless devices, phones calls to Metro Customer Service, and electronic message signs, though no electronic signs are located in the study area.

1.6 AU Shuttle Service

AU provides free shuttle service between the Main Campus and the Tenley Campus, Washington College of Law and Tenleytown/AU Metro station. AU shuttle service is an essential transportation service provided by the University. Figure 6 identifies shuttle routes and stop locations. On campus, shuttles enter and exit via Fletcher and Glover gates; stops are located near these gates. Another heavily used stop is located on Nebraska Avenue adjacent to the Ward Circle Building. These stops are major sources of pedestrian traffic and high volumes of passengers waiting, boarding and alighting. The on-campus routes and stops are well located because they separate vehicle routes and pedestrian routes, which limit conflicts.

AU provides shuttle service to reduce campus vehicle trips and parking demand. Since 1995, ridership grown has grown significantly and continuously, which speaks to the quality and convenience of the service provided. In 2010, AU shuttle provide approximately 1.67 million passenger trips. Figure 7 illustrates annual ridership trends since 1995. Note that beginning in August 2010 AU began utilizing automated passenger counters, prior to that the counts were performed manually. Quality control checks by AU found that the automated counters are accurate.

A review of shuttle conditions found no major areas of concern but improvements to shuttle routes and stops are possible. Improvements could include adding amenities such as shelters, seating, and route information and eliminating some stops to reduce jaywalking. Intelligent Transportation Systems (ITS) could be implemented to enhance shuttle service. For example, shuttle stops could provide information on the time remaining until the next bus arrives. This information could also be made available on the internet, which would help passengers plan their trip before departing for the shuttle stop. Another possible improvement to the AU shuttle system would be the addition of bicycle racks to shuttle vehicles, to allow for better integration of the two modes.

1.7 Bicycle Facilities

This section provides an inventory and review of existing bicycle facilities. Bicyclists are visible throughout the campus during pleasant weather and bicycle racks are often full, regardless of weather. The Tenley campus has a bike rack located at the main entrance that is frequently occupied with bicycles. The adjacent streets at the Tenley campus have narrow lane widths, high traffic volumes, and high traffic speeds, which reduces the attractiveness of bicycling.

For cyclists, the most attractive routes are those that have good cycling conditions and provide direct routing between origins and destinations. Conditions in the study area that contribute to good cycling conditions include: sidewalks that permit bicycle traffic and provide routing through barriers; limited changes in topography changes along primary routes; local and collector streets with low traffic volumes and speeds; some bicycle lanes that designate bicycle rights-of-way; multiple Bikeshare stations; and bicycle parking.

Figure 5: Existing Transit Service

Figure 6: AU Shuttle Routes and Metro Bus Stops

Figure 7: AU Shuttle Ridership Trends Since 1995

Capital Bikeshare was launched in late September 2010 and provides bicycle sharing in the District and Northern Virginia. Capital Bikeshare placed more than 110 bicycle-share stations with approximately 1,100 bicycles provided. In the vicinity of the Tenley Campus, Capital Bikeshare stations have been placed near the Tenleytown-AU Metrorail Station and the Main AU Campus[2], as shown in Table 2. The Capital Bikeshare program increases accessibility and mobility throughout the study area, and provides and attractive option for trips beyond ideal walk distance but within comfortable cycling distance. Bikeshare makes bicycling between the site and the Main Campus and Tenley Metro an attractive and convenient option; however, a station at the Tenley Campus would improve conditions. Capital Bikeshare has plans to expand the system and potential new station locations have been identified throughout the study area. The public comment phase has ended, and Capital Bikeshare is currently selecting stations locations. There is not an official timeline for when potential stations will be installed, but Figure 8 identifies existing station locations in the study area.

Table 2: Bikeshare Location and Docking Stations

Bikeshare Location	Number of Docking Stations
Tenleytown / Wisconsin Avenue & Albemarle Street	15 docking stations
Ward Circle / American University	15 docking stations
Wisconsin Avenue & Macomb Street	15 docking stations
Total Number of Bikeshare Docking Stations Study Area	**45 docking stations**

Overall, the Tenley Campus has good bicycle amenities but some improvements are possible, particularly with parking. Long-term bicycle storage may be a solution for students that bring their bikes to campus to use and do so infrequently but often enough to want convenient parking options. Another area for improvement is sidewalks that have heavy pedestrian traffic and are also designated for bicycling, such as along Nebraska Avenue between the Tenley Campus and Main Campus. In these locations, expanding the width of the pedestrian and bicycle right-of-ways may be warranted. Coordination with DDOT could help expedite the creation of shared-use trails along Nebraska Avenue (included in the DC Bike Plan). These trails would improve conditions for bicyclists and pedestrians. AU could also coordinate with DDOT to expand Capital Bikeshare to the Tenley Campus and the Main Campus to improve connectivity and mobility.

1.7.1 Bicycle Master Plan

As shown in the *DC Bicycle Master Plan* from April 2005, DDOT's proposed bicycle infrastructure for the roadways in the vicinity of the proposed development includes several multi-use trails, on-street bike lanes, and signed bicycle routes. The facilities will significantly improve bicycling conditions in the study area and may lead to higher rates of cycling. They also provide additional links between the University and major residential and commercial destination in northwest, DC and beyond. Figure 9 illustrates future and proposed bicycle conditions from the Bicycle Master Plan. Additional improvements are included in this figure, as suggested in the *Rock Creek West II Livability Study* (discussed in section 1.9).

1.8 Pedestrian Facilities

The Tenley Campus comprises a single city block and has good pedestrian walkways between buildings and the adjacent pedestrian network. The campus is within walking distance of AU's Main Campus, the Tenley-AU Metrorail station, and commercial uses located along Wisconsin Avenue. The Tenley Campus' proximity to transit and diverse land uses allow many trips to be made by walking. Information on deficiencies and recommended improvements are provided below in the *Safety* section.

[2] Capital Bikeshare: www.capitalbikeshare.com

Figure 8: Existing Bicycle Facilities

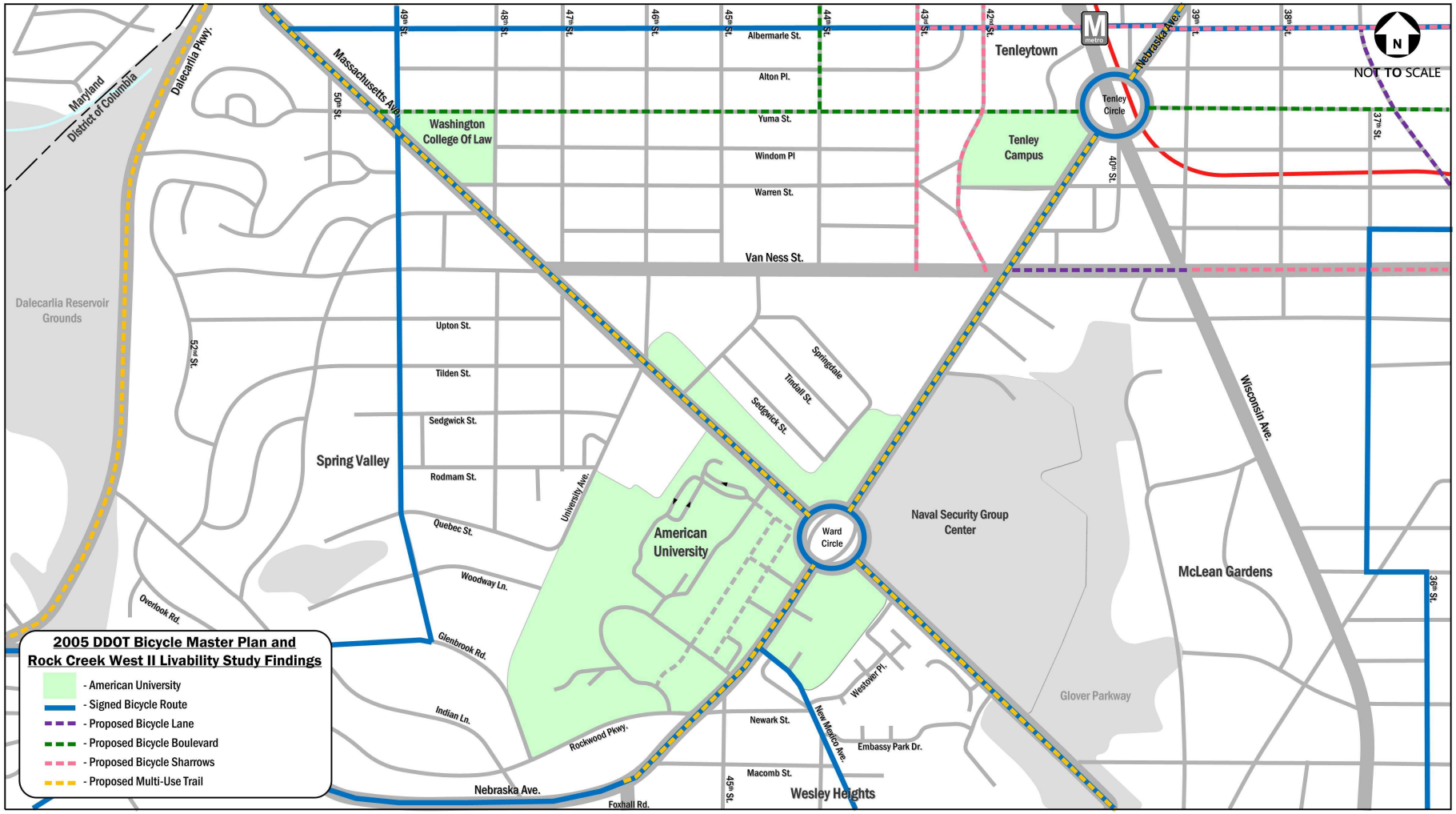

Figure 9: Bicycle Master Plan

1.9 Rock Creek West II Livability Study

The Rock Creek West II (RCW2) Livability Study was initiated by the District Department of Transportation (DDOT) to take a big picture look at the roadway network and to identify concrete actions to increase transportation and safety options, concentration on transportation safety and quality of life issues for all users.

The final report and recommendations for the RCW2 Livability Study were published in February 2011. The study includes the neighborhoods of American University Park, Chevy Chase, Forest Hills, Friendship Heights, and Tenleytown and community anchors such as public schools, recreation centers, community centers, libraries, and three universities, including AU. The study area is bounded by Rock Creek Park and the state of Maryland. Near the AU Main and Tenley Campuses, several corridors and intersections were included in the RCW2 study.

Near the Tenley Campus, several corridors and intersections were included in the RCW2 study. Figure 2 identifies many of the issues and improvements identified in the RCW2 study. Table 3 shows the reported issues, the final recommendations, and the impacts expected from the proposed changes.

Table 3: Draft Final Recommendations from Rock Creek West II Livability Study

Location	Reported Issue	Final Recommendation (12/2010)	Expected Impacts
40th Street & Albemarle Street	Awkward intersection; poor visibility; poorly marked/located crosswalks.	Paint crosswalks across 40th Street curb cuts.	Improve pedestrian environment in service vehicle area.
		Between Brandywine Street & Albemarle Street: reverse direction of 40th Street (to be NB) and Fort Drive (to be SB).	Improve visibility and safety by aligning approaching traffic to intersection. Need to relocate Metrobus and shuttle stops and parking.
		Convert metered parallel parking to angled parking along west side of 40th Street and east side of Fort Drive.	Additional on-street parking for Wilson HS and community destinations; narrowing of travel-way and traffic calming.
		Remove U-turn break in median near intersection. Add median break and new crosswalk at Whole Foods garage entrance/exit.	Relocate U-turns from intersection to where most vehicles are coming from, improving circulation.
Fort Drive near Albemarle Street	Unclear parking regulations.	Clarify parking signage.	Clarify parking regulations, reduce violations, and make more user-friendly.
42nd Street & Warren Street	Motorists speeding.	Construct neighborhood traffic circles at both connections to Warren Street.	Reduce vehicle speeds; improved pedestrian safety; landscaping/place-making opportunity.

Location	Reported Issue	Final Recommendation (12/2010)	Expected Impacts
Albemarle Street between 42nd Street and Wisconsin Avenue	Aggressive driving in school zone.	Remove mid-block crossing.	Reduce pedestrian-vehicle conflict and improve safety; direct pedestrian to cross at protected locations (intersections).
Albemarle Street from Wisconsin Avenue to Nebraska Avenue	Motorists speeding.	Refurbish centerline.	Reduce vehicle speeds due to visual narrowing of roadway.
Van Ness Street between Nebraska Avenue and Wisconsin Avenue	Motorist speeding; wider roadway.	Reconfigure road to include one travel late in each direction, a parking lane on the north side, and an eastbound bike lane.	Reduce vehicle speeds by narrowing lanes and adding other modes; improve cyclist safety; increase cyclist volumes.
Nebraska Avenue approaches to Ward Circle	Pedestrian safety, failure to yield.	Add raised islands and reconfigure crosswalks to provide pedestrian refuges (short-term).	Reduced pedestrian crossing distance; more visible crosswalks; improved pedestrian safety.
Yuma Street between Massachusetts Avenue and Connecticut Avenue	No bicycle facilities.	Designate as bicycle boulevard: add pavement markings and wayfinding signs; potential for other treatments.	Reduced vehicle speeds due to visual cues; increased cyclists.

2: DESIGN REVIEW

This report section provides an overview of the on-site transportation features of the proposed Tenley Campus redevelopment. It is meant to supplement the information provided in the site plans presented in the Further Processing application, which includes several illustrations of site circulation and layout.

2.1 Site Access and Loading

Access to the proposed underground garage will occur on Nebraska Avenue. The driveway that provides access to the below-grade parking spaces on the Tenley Campus is located along Nebraska Avenue, north of Warren Street. The driveway is proposed to be constructed in a manner that allows for traffic to pull-in and turn-around without advancing to the garage. This will allow the driveway to act as a pick-up/drop-off area for taxis and other vehicles. It is recommended that the driveway be constructed as a one-way stop-controlled intersection with the north- and southbound approaches of Nebraska Avenue free-flowing through the intersection. Additionally, a northbound left-turn lane is proposed in order to provide a queuing area for vehicles turning in to the Tenley Campus. As discussed in more detail in Table 10 (starting on page 64) of this report, the proposed driveway for the Tenley Campus is projected to operate under acceptable conditions during the morning and afternoon peak hours.

Loading facilities on the Tenley Campus will be accessed from Yuma Street. The number of trucks expected to utilize the loading facilities is expected to be approximately six to eight per day and will not typically include trucks that are longer than 40 feet.

At the end of this section of the report are a set of figures that detail the proposed access management for the Tenley Campus:

- Figure 12 shows the existing access management for the Tenley Campus.
- Figure 13 shows the proposed access management for the Tenley Campus, including the proposed new garage access and left turn lane.
- Figure 14 identifies the existing curbside restrictions on roadways adjacent to the campus.
- Figure 15 shows future changes to the curbside management on roadways adjacent to campus both from recommendations contained within the RCW2 study, and from the proposed Tenley Campus redevelopment.
- Figure 16 contains field of vision diagrams for traffic existing the proposed new vehicular access points from Tenley Campus.
- Figure 17 contains maneuvering diagrams of trucks travelling to and from the proposed loading facility and demonstrates that all turns can be accommodated on the proposed site plan.

2.2 Parking

This section of the report describes the existing parking supply on the Tenley Campus, reviews the existing parking demand at the existing WCL, and discusses projections of future demand at the proposed Tenley Campus.

2.2.1 Existing Parking

AU requires all students, faculty, staff, visitors and guests to park on-campus. To accommodate demand for parking, the university provides ample parking spaces that exceed demand and strictly enforces parking restrictions on the residential

streets surrounding AU. The Tenley Campus currently has 65 parking spaces located in a surface lot and along the driveway adjacent to Nebraska Avenue. Parking at the University is by permit-only on weekdays between the hours of 8:00 am and 5:00 pm.

To assist in determining future parking demand on the Tenley Campus, Gorove/Slade performed a parking demand analysis for WCL in 2010. Currently, the WCL provides parking for faculty, staff and students in several facilities. The main parking facility is the WCL garage located on Massachusetts Avenue. Additional parking is provided in the SuperFresh grocery parking lot, the Yuma parking lot located under the SuperFresh lot, and the Katzen garage located on the AU main campus. A limited number of spaces are also located in the public parking lot at 4910 Yuma Street. In addition, some drivers park in other off-street lots located on Massachusetts Avenue across from the WCL or in on-street parking spaces located in the vicinity of the WCL (both metered spaces and within the neighborhood). Some visitors to the WCL park in the main garage, but most visitors (notably those arriving for special events), are told to park in surrounding public lots, including the public parking lot accessed from Massachusetts Avenue located across from the WCL.

Gorove/Slade conducted two data collection efforts as part of this analysis. An online survey was distributed to the WCL population to determine the existing mode split and parking locations of the WCL users. Observations were also performed at the WCL parking facilities discussed above to determine peak parking demand at the existing WCL.

Online Survey

The online-survey was distributed to the WCL population on Tuesday, April 13, 2010. The purpose of the survey was to determine the current mode split of the WCL and the locations utilized for parking by each of the user types. Table 4 shows the mode split results. Table 5 summarizes the respondents' answers to the parking questions.

These results show that over half of the WCL students who responded to the survey currently do not drive alone, utilizing other modes such as Metrorail and walking. Faculty and staff at the WCL who responded to the survey have high percentages of driving. Thus, measures to reduce parking demand will need to focus on the populations of faculty and staff to have a significant impact.

The parking location table shows a fair percentage of survey respondents listing "on-street" as their parking location. One purpose of the survey was to help determine this proportion, and the result of approximately 15% parking on-street seems reasonable, based on field observations and the amount of tickets issued enforcing the good neighbor policy.

Parking Observations

Gorove/Slade performed parking observations of the existing WCL facilities to determine the parking accumulation patterns over the course of a day and to help determine the peak existing parking demand. Gorove/Slade staff manually counted the SuperFresh and Yuma parking facilities on Thursday, April 1, 2010. AU-based vehicles were determined through their displayed permits.

WCL staff provided Gorove/Slade with data for the WCL parking garage on Massachusetts Avenue. The data was the number of accumulated vehicles recorded each half hour between 8am and 8pm for weekdays between February 15, 2010 and March 19, 2010.

Figure 10 shows the average parking accumulation per weekday in the main WCL garage. This data is an average of the weekday data provided by WCL staff, excluding days within or influenced by Spring Break.

Table 4: Survey Results - Mode Split

Mode	Student	Adjunct Faculty	Faculty	Staff	Total
Walk	9.0%	0.0%	3.8%	0.0%	7.2%
Bike	2.5%	0.0%	0.0%	0.0%	1.9%
Drive Alone	45.8%	81.8%	94.2%	70.3%	54.2%
Scooter/Motorcycle	1.6%	4.5%	1.9%	0.0%	1.5%
Drove Carpool	3.8%	4.5%	0.0%	9.4%	4.1%
Carpool Rider/Dropped-Off	5.4%	0.0%	0.0%	3.1%	4.5%
Metrorail & Shuttle	12.4%	0.0%	0.0%	9.4%	10.5%
Metrorail & Walk	1.8%	0.0%	0.0%	0.0%	1.4%
Metrobus	13.0%	9.1%	0.0%	7.8%	11.1%
Shuttle Only	4.7%	0.0%	0.0%	0.0%	3.6%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 5: Survey Results - Parking Location

Parking Location	Student	Adjunct Faculty	Faculty	Staff	Total
Mass Ave Garage	64.9%	5.0%	32.0%	21.6%	50.4%
Katzen	11.0%	5.0%	0.0%	13.7%	9.5%
YumaLot	0.4%	40.0%	60.0%	45.1%	17.8%
SuperFresh	0.0%	30.0%	2.0%	0.0%	2.0%
4910Yuma	3.1%	0.0%	4.0%	9.8%	4.0%
Other Off-Street	1.8%	0.0%	0.0%	2.0%	1.4%
On-Street	18.9%	20.0%	2.0%	7.8%	14.9%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

The average peak demand within the garage is approximately 240 spaces, which occurs early evenings on Mondays and Wednesdays. The future demand analyses base WCL garage existing demand on an average of the Monday through Wednesday demand.

Based on the WCL parking counts, the manual counts of other facilities and the survey results, Gorove/Slade assembled a profile of parking demand over the course of a typical weekday. Figure 11 shows the results of this analysis.

The peak parking demand of the WCL on a typical weekday was determined to be around 410 spaces, occurring around 2:00 pm and again at 5:30 pm.

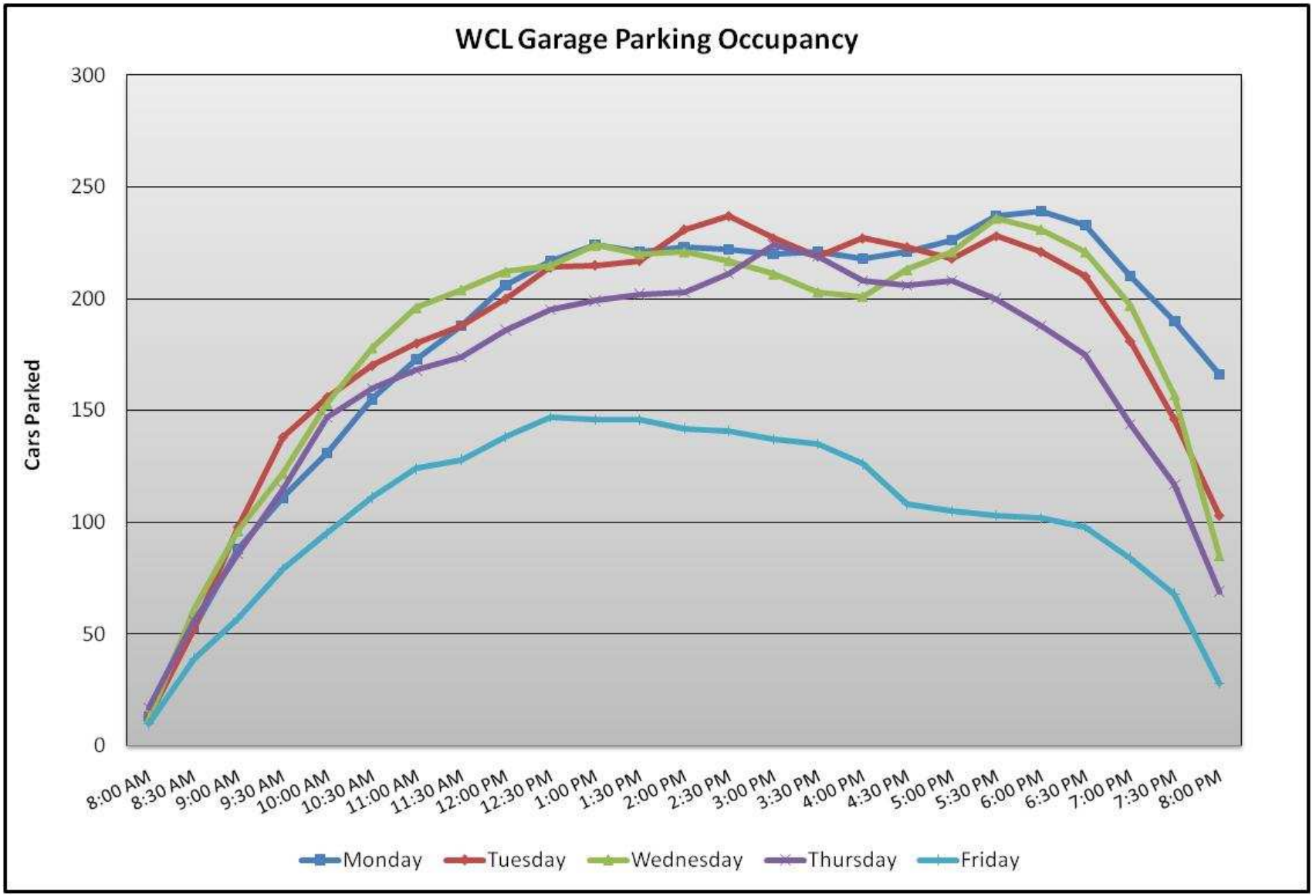

Figure 10: Average Parking Accumulation in WCL Garage

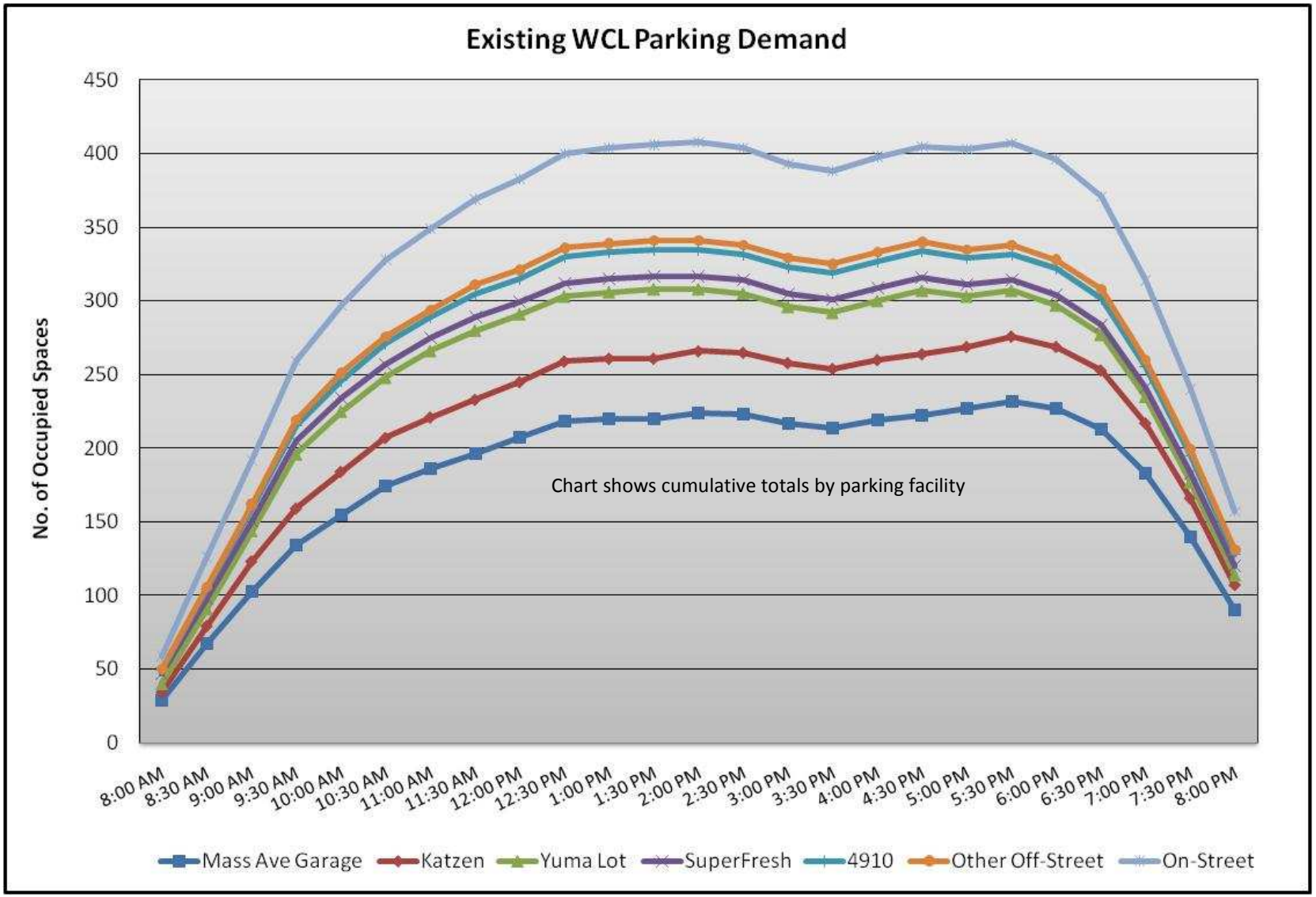

Figure 11: Existing WCL Total Parking Demand

2.2.2 Future Parking Demand

It is anticipated that mode choice and parking patterns at the Tenley Campus will be similar to those identified at the existing WCL site; however, reduced parking demand and lower drive alone trips are likely because the Tenley Campus is within walking distance a Metrorail Station and better served by Metrobus.

Using the data collected at the existing Tenley Campus, Gorove/Slade assembled a parking demand model that would help determine what the future demand would be based on changes to mode splits. Table 6 shows the results of various runs within the model, after accounting for the potential growth in population of students and faculty/staff under the proposed campus plan. Highlighted within Table 6 is the row that corresponds to the existing mode splits, where students drive 51%, and faculty/staff 88%. The resulting demand of 450 spaces is higher than the observed peak demand of 410 spaces because the model takes into account the potential growth in population.

Table 6: Parking Demand at Tenley Campus per Mode Split Assumption

Driving Mode Split Assumption		Future Parking Demand at Tenley Campus
Students	*Faculty/Staff*	
55%	90%	470
51%*	88%*	450
50%	85%	435
45%	80%	400
40%	75%	360
40%	70%	355
35%	65%	315

* Existing Mode Splits at WCL

Based on the parking demand analysis above, were there no changes to mode splits of WCL students, faculty and staff, the peak daily parking demand would be 450 spaces. A modest decrease in driving due to relocating the school close to the Metrorail station would lead to a peak demand of 400 spaces. This report recommends using a typical peak demand of 400 spaces as the design assumption for the Tenley Campus.

The future supply of parking on the Tenley Campus is proposed to be 400 to 450 spaces. Approximately 400 parking spaces will be provided in two below-grade parking levels and approximately 40 to 50 parking spaces will be retained within the existing surface parking lot accessed from an existing curb cut along Yuma Street. In addition, parking on the Main Campus will be available to the Tenley Campus as needed, similar to how the Katzen garage serves a portion of the current WCL demand (the AU shuttle system provides a link between campuses). Thus, this report concludes that the amount of parking is sufficient to accommodate the projected demand of 400 spaces.

2.2.3 Event Parking

Additional parking demand at the proposed WCL may be generated during events such as Continuing Legal Education programs. In order to help gauge this demand, the WCL provided data on events over an entire academic year including the number of external attendees (people not already on campus for other reasons) and the time of the event. The list of events was searched for events with an external attendee count over 40, which occurred Monday through Thursday. The attended amount of 40 was chosen because that equals the surplus parking supply identified above. Events held during

Fridays, Saturdays or Sundays do not overlap with the peak parking demand on campus, and therefore would not have an impact.

Of the 110 events contained in the list provided by the WCL, only 9 events had an external attendee count of at least 40 that occurred during times of peak parking demand. Thus, the vast majority of event parking demand can be accommodated with the projected surplus in parking supply, even assuming that all external attendees drive. This report recommends that for all events, and especially those with a large external attendee count occurring on a Monday through Thursday, that:

- The WCL market alternative modes to all event attendees including Metrorail, Metrobus, the AU shuttle, Capital Bikeshare and Zipcar.
- For those event attendees that drive, the WCL promote parking on the Main Campus and using the AU Shuttle to access the WCL.

With these measures in place, all event transportation needs can be accommodated on the proposed Tenley Campus.

The amount of parking provided needs to balance the goals of not impacting the surrounding community by not accommodating demand, while not exceeded the projected demand in a manner that will undermine the TDM policies and programs of the University and encourage people to drive. Based on the demand calculations described above and the parking supply proposed, the proposed parking at the Tenley Campus meets both of these goals.

2.3 Bicycle and Pedestrian Facilities

The two main pedestrian entrances to the campus will be the Yuma Entry Court and the Nebraska Entry Court. The majority of pedestrians travelling to and from the site will be transit riders going to and from their bus stops or the Metrorail station. In addition, it is anticipated that the campus population will travel back and forth to the commercial properties within Tenleytown. The Yuma Entry Court was located and designed in part to provide a quality entrance to campus for these anticipated pedestrians travelling to and from Tenleytown and the Metrorail station. The bus stop on Nebraska Avenue is recommended to be relocated in order to be closer to the Nebraska Entry Court. Other pedestrian amenities of the site plan include a new internal path on campus along its southern boundary.

The site plan accommodates bicycles through the inclusion of short and long term bicycle parking, shower facilities and a Capital Bikeshare station. Secured, long-term bicycle parking oriented towards commuters will be provided in the parking garage, with 115 spaces. Short-term parking for bicycles will be provided via bicycle racks located near the Yuma Entry Court and the Nebraska Entry Court. A minimum of ten bicycle parking spaces will be provided at each location. The site plan also includes space for a future Capital Bikeshare station (which the University has agreed to fund) near the Nebraska Entry Court.

2.4 Transportation Demand Management

The proposed TDM plan for the Tenley Campus Further Processing application follows the TDM plan and commitments contained in the 2011 American University Campus Plan. The following lists the components of the overall TDM plan for the University that apply to the Tenley Campus, and specific elements for the Tenley Campus.

- AU will compile annual monitoring reports, which will be made public and submitted to DDOT. The first report will be issued no later than one-year after approval of the campus plan. These reports will include the following information:

  - Mode split surveys of the campus population, broken down by students and employees
  - Current parking inventory and occupancy on a typical weekday
  - Number of parking permits sold per year
  - Parking availability on surrounding neighborhood streets
  - Statistics on the Good Neighborhood Program, such as number of tickets issued
  - Number of registered carpools
  - Zipcar and Capital Bikeshare usage data
  - Number of people signed up for SmartBenefits
  - AU Shuttle ridership
  - Inventory and occupancy of bike racks

- AU will improve marketing of alternative modes of transportation on websites, including AU specific transit and bicycle maps, and dedicated materials targeting each segment of campus population. AU will distribute the targeted information to new hires and accepted students.
- AU will market transportation information to attendees to special events on campus, and will not include parking subsidies in event or ticket costs.
- AU will include transportation information on its electronic message boards within campus.
- AU will promote the regional Guaranteed Ride Home program to all employees using alternative modes.
- AU will extend the Good Neighbor Policy directed at limiting campus population use of neighborhood on-street parking to the Tenley Campus.
- AU will continue to provide discounts to carpoolers and ride-matching services (Zimride), and will extend preferred parking spaces to registered carpools. For the Tenley Campus, carpoolers will receive preferred spaces within the parking garage.
- AU will maintain the Zipcar spaces currently on Tenley Campus during construction, and ensure their replacement on campus after construction. The proposed Tenley Campus site plan reserves spaces within the surface parking lot for Zipcars.
- AU will maintain the SmartBenefits program and on-campus SmarTrip vending.
- AU will maintain the student run bike-lending program, and the bike commuter benefit.
- AU will construct bicycle parking and shower facilities for the Tenley Campus, as described above. The use of these spaces will be monitored and the supply increased if average weekday use exceeds 85%.
- AU will provide the funds for a Capital Bikeshare station on the Tenley campus. The site plan reserves room for a station near the Nebraska Entry Court.
- AU will become a corporate member of Capital Bikeshare to provide memberships to employees at discounted rates.

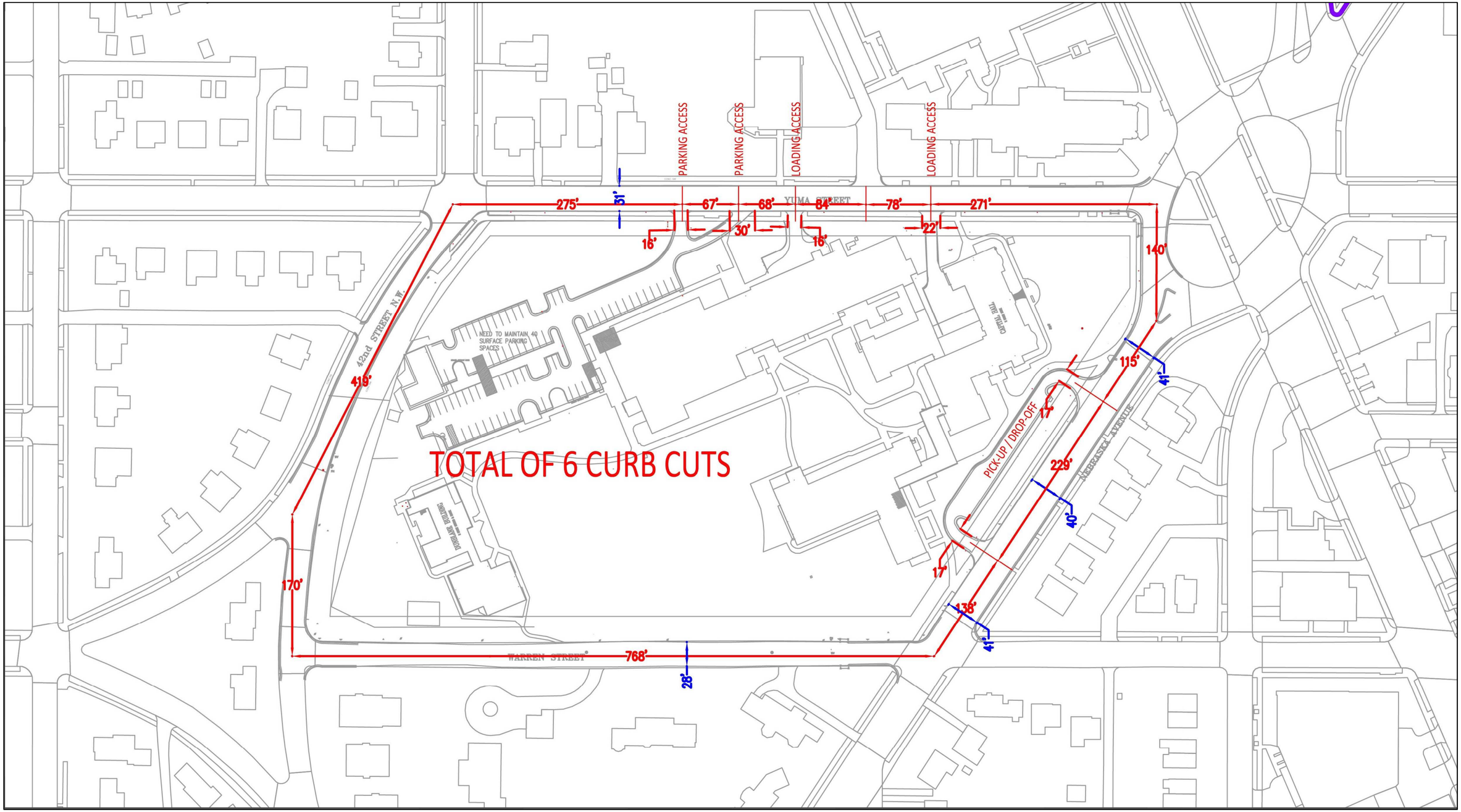

Figure 12: Existing Access Management

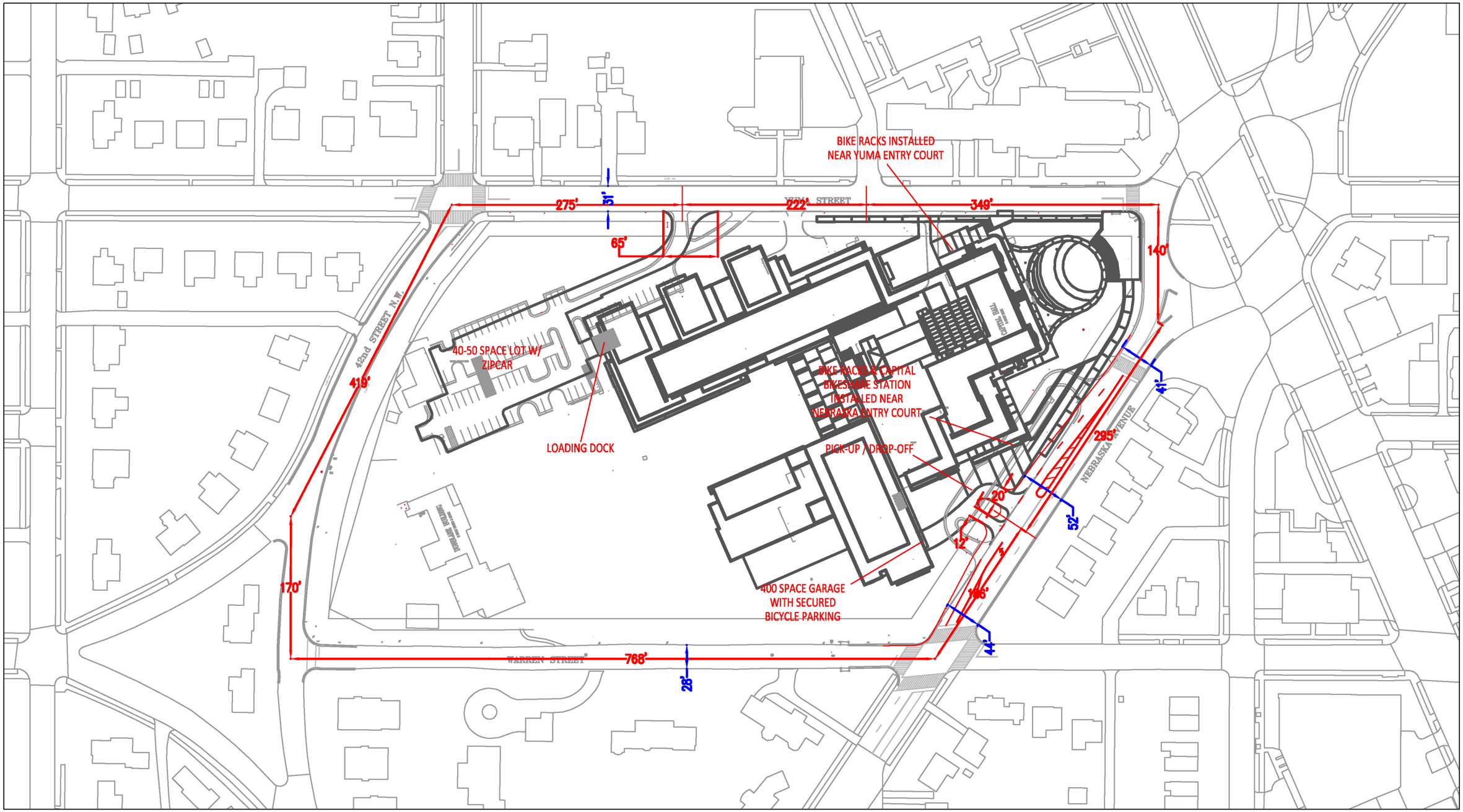

Figure 13: Proposed Access Management

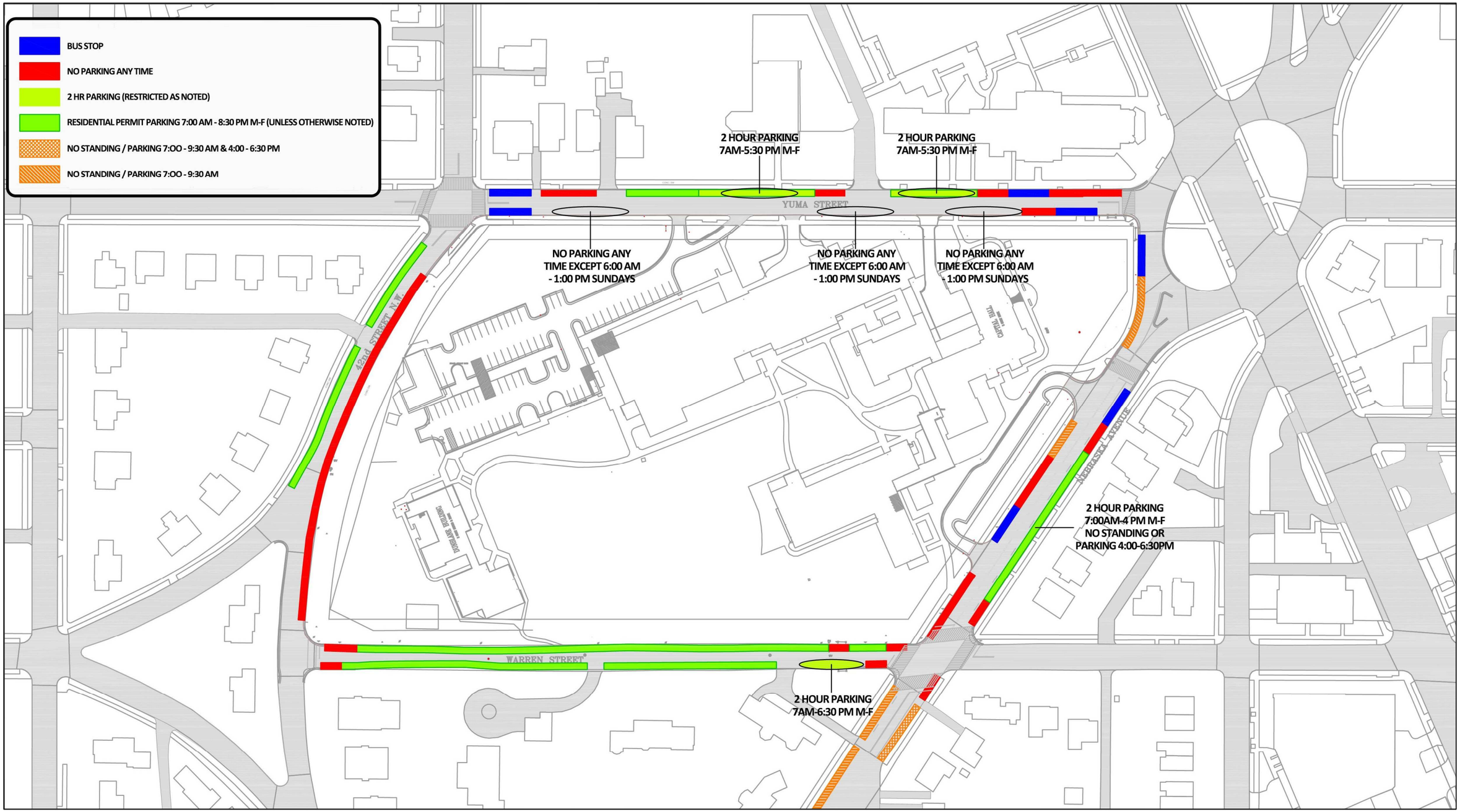

Figure 14: Existing Curbside Management

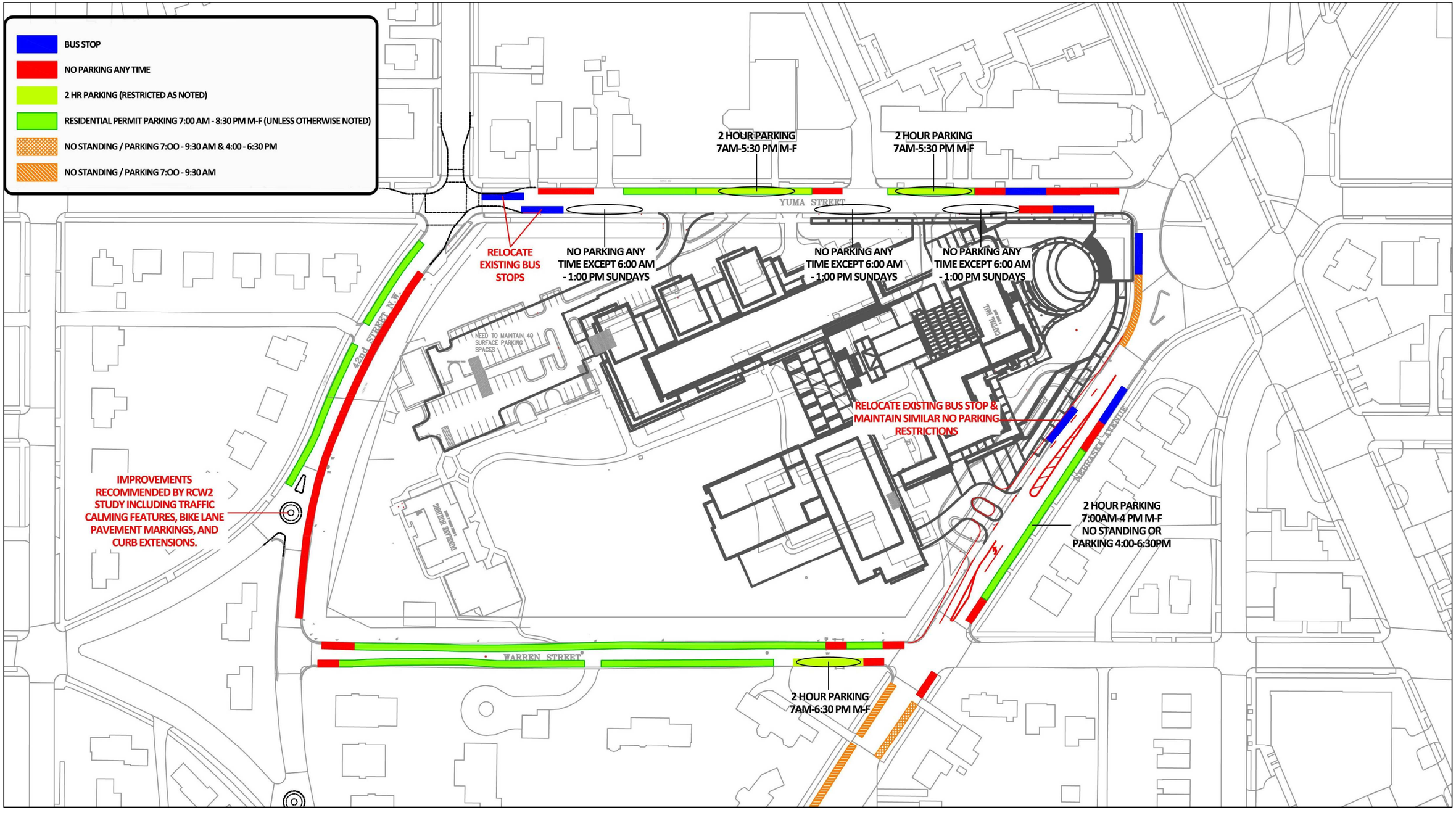

Figure 15: Proposed Curbside Management

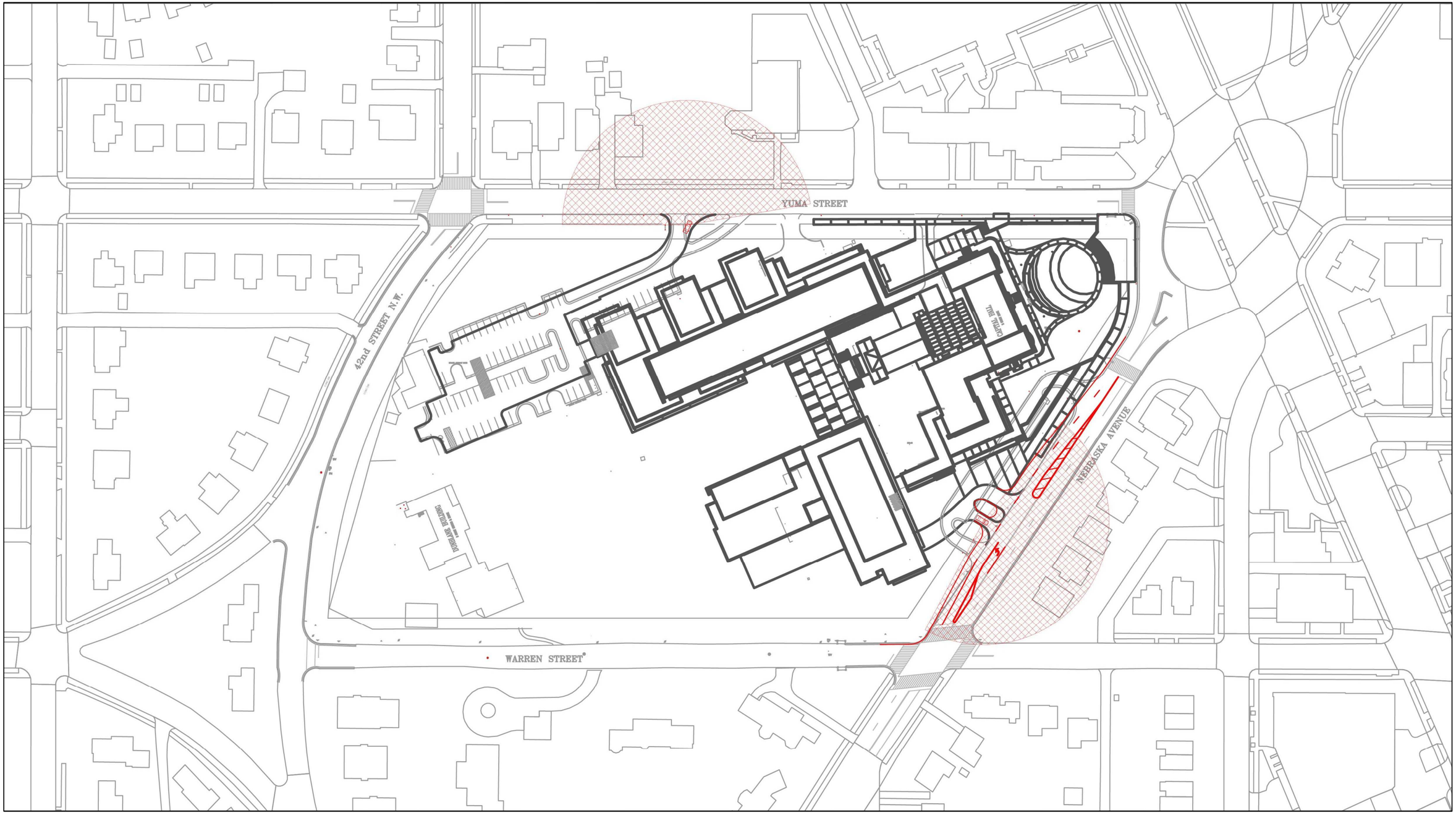

Figure 16: Field of Vision for Proposed Vehicular Access

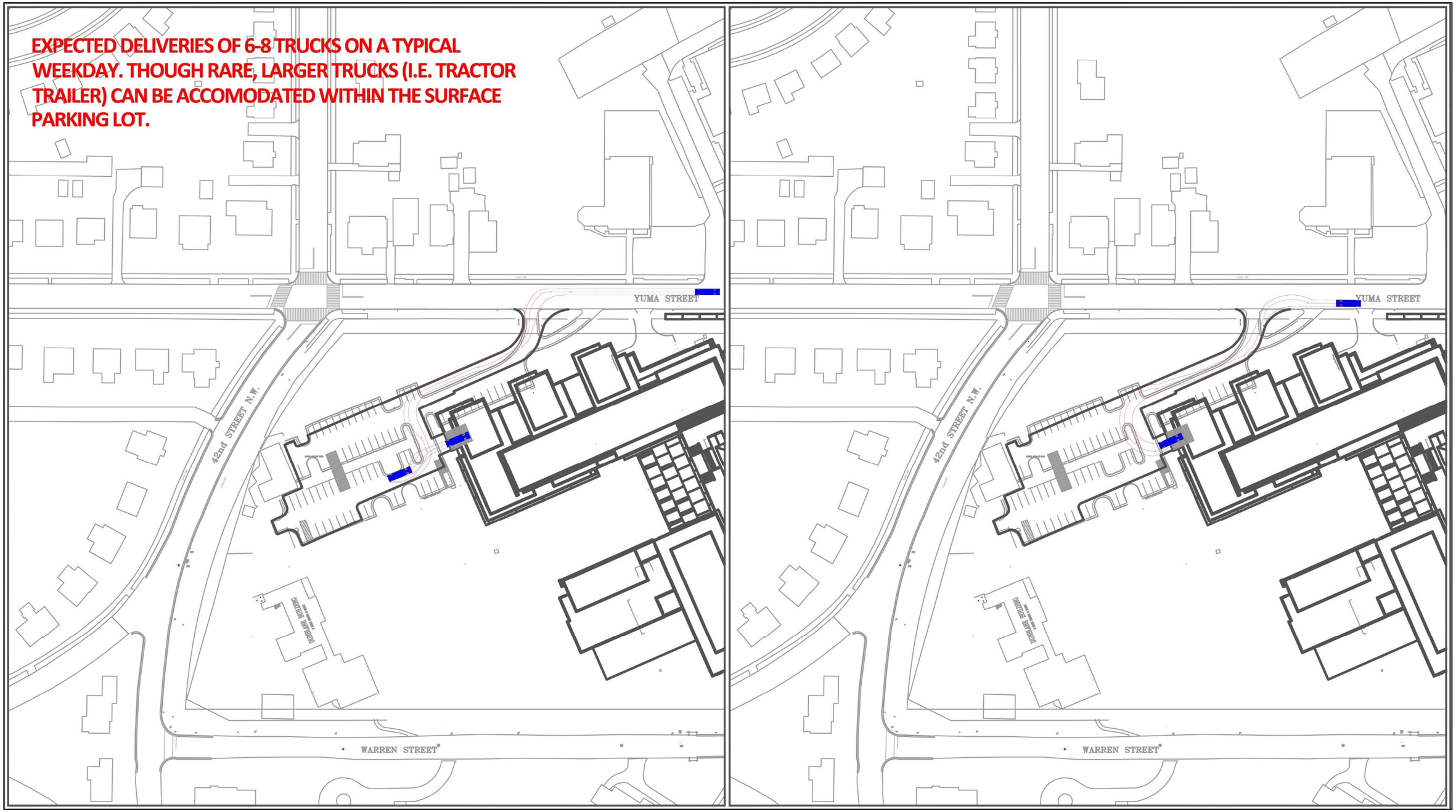

Figure 17: Proposed Loading Dock Truck Maneuvering Diagrams

3: IMPACTS REVIEW

This section of the report focuses on the influence and impact that site generated traffic will have on the local transportation network, with the following purpose:

- To provide information to DDOT and other agencies on how the development of the site will influence the local transportation network. The final transportation 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.
- To determine if development of the site will lead to adverse impacts on the local transportation network. This report accomplishes this by projecting future conditions with and without development of the site and performing analysis of crosswalk and intersection delays. These delays are compared to the acceptable levels of delay set by DDOT standards to determine if the site will negatively impact the study area. The report describes what improvements to the transportation network are needed to mitigate adverse impacts.

3.1 Site Transportation Generation

The trip generation estimates for the proposed Tenley Campus are based on a combination of a survey of the existing WCL population and counts at the main WCL parking garage. Traditionally, the ins and outs at each parking facility at the existing WCL would be used as the primary source of data for trip generation estimates, but not all of the WCL parking facilities have clear access points to count (for example, the shared parking facilities and the on-street parkers). Thus, counts at the main facility were combined with the survey answers for mode split, parking location and time of arrival/departure to develop trip generation estimates. For example, if the survey responses showed that 50% of the population parked in the main parking garage, then doubling a count of the ins and outs at the main parking garage would provide a trip generation estimate. The actual calculations used contained more variables, including estimating trips for other modes, but followed the same logic.

The proposed WCL trip generation was based on the existing WCL trip generation, with revised mode split estimates, and adjustments for population increases. In order to be conservative in the roadway capacity analyses, this report made only modest adjustments to the assumed peak hour mode splits for the Tenley Campus. Table 7 shows the results of the calculations of the existing and proposed law schools. Note that the mode split data form the survey were broken down by peak hours because the mode split varies by time of day.

Table 7: Peak Hour Mode Split & Trip Generation

Existing WCL Peak Hour Mode Split (from Survey Results)		Drove (total)	Car Passenger	Transit (total)	Bike	Walk	Total
	8am to 9am – Inbound						
	Faculty/Staff	82.5%	0.0%	17.5%	0.0%	0.0%	100%
	Students	43.4%	10.4%	36.8%	2.8%	6.6%	100%
	5pm to 6pm – Inbound						
	Faculty/Staff	66.7%	0.0%	0.0%	0.0%	33.3%	100%
	Students	64.1%	0.0%	30.8%	0.0%	5.1%	100%
	5pm to 6pm – Outbound						
	Faculty/Staff	77.5%	2.5%	20.0%	0.0%	0.0%	100%
	Students	52.6%	5.1%	32.2%	1.7%	8.4%	100%

Existing WCL Calculations]		Drove (total)	Car Passenger	Transit (total)	Bike	Walk	Total Trips
	8am to 9am – Inbound						
	Faculty/Staff	63	0	13	0	0	76
	Students	88	21	75	6	13	203
	Total	151	21	88	6	13	279
	5pm to 6pm – Inbound						
	Faculty/Staff	4	0	0	0	2	6
	Students	89	0	43	0	7	139
	Total	93	0	43	0	9	145
	5pm to 6pm – Outbound						
	Faculty/Staff	21	1	5	0	0	27
	Students	58	6	36	2	9	111
	Total	79	7	41	2	9	138

Assumptions for new WCL		Drove (total)	Car Passenger	Transit (total)	Bike	Walk	Total Trips
	8am to 9am – Inbound						
	Faculty/Staff	80%	0%	20%	0%	0%	100%
	Students	40%	10%	40%	3%	7%	100%
	5pm to 6pm – Inbound						
	Faculty/Staff	65%	0%	0%	0%	35%	100%
	Students	65%	0%	30%	0%	5%	100%
	5pm to 6pm – Outbound						
	Faculty/Staff	75%	3%	22%	0%	0%	100%
	Students	50%	5%	34%	2%	9%	100%

Proposed new WCL (adjusted for population growth)		Drove (total)	Car Passenger	Transit (total)	Bike	Walk	Total Trips
	8am to 9am – Inbound						
	Faculty/Staff	69	0	17	0	0	86
	Students	92	23	92	7	16	230
	Total	161	23	109	7	16	316
	5pm to 6pm – Inbound						
	Faculty/Staff	5	0	0	0	2	7
	Students	102	0	47	0	8	157
	Total	107	0	47	0	10	164
	5pm to 6pm – Outbound						
	Faculty/Staff	23	1	7	0	0	31
	Students	63	7	43	2	11	126
	Total	86	8	50	2	11	157

3.2 Roadway Capacity and Operations

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

3.2.1 Scope of Analysis

The purpose of the vehicular capacity analysis is to determine the existing conditions of the intersections located in the immediate vicinity of the Tenley Campus. The set of intersections was chosen to help determine the impacts to the nearest traffic signals at Tenley Circle and along Nebraska Avenue, Yuma Street, Warren Street, and 42nd Street. Based on prior studies and the influence analysis, and confirmed in discussions with DDOT, 29 total intersections were chosen for analysis. The following intersections were selected:

1. 42nd Street and Albemarle Street
2. Wisconsin Avenue and Albemarle Street
3. Albemarle Street and 40th Street
4. Albemarle Street and Fort Drive
5. Nebraska Avenue and Albemarle Street
6. Tenley Circle – Nebraska Avenue and Wisconsin Avenue with Yuma Street and Fort Drive (consisting of 10 total intersections)
7. Nebraska Avenue and Tenley Campus Pick-up/Drop-off (2 intersections)
8. 42nd Street and Yuma Street
9. Yuma Street & Tenley Campus Parking Lot Driveway
10. Yuma Street & West Loading Driveway
11. Yuma Street & East Loading Driveway
12. 42nd Street and Warren Street
13. Nebraska Avenue and Warren Street
14. 40th Street & Warren Street
15. Wisconsin Avenue and Warren Street
16. Van Ness Street and 45th Street
17. Nebraska Avenue and Van Ness Street
18. Nebraska Avenue & 42nd Street
19. Wisconsin Avenue and Van Ness Street

Intersection capacity analyses were performed for the existing conditions at each intersection within the study area during the morning and afternoon peak hours, as well as for future conditions with and without the proposed Campus Plan. An additional ten-year horizon condition was analyzed, following DDOT's request. The study scenarios are as follows:

- Existing Conditions (2010/2011)
- Future Conditions (2014) without WCL Relocation
- Future Conditions (2014) with WCL Relocation

The *Synchro, Version 7.0* software package was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology. The *Synchro* model was compiled using signal timings provided by DDOT and with lane configurations and traffic volumes collected by Gorove/Slade. The scope of analysis and proposed methodology was agreed to by DDOT over the course of several meetings leading up to the assembly of this report. The following sections review the assumptions made for the technical analyses, as summarized in Table 8.

3.2.2 Traffic Volume Assumptions

The following section reviews the traffic volume assumptions made and methodologies used in the roadway capacity analyses, summarized in Table 8.

Existing Conditions (2010/2011)

The overall purpose of this study is to show what affect the relocation of the Washington College of Law will have on the transportation system in the study area. The existing conditions in and around the Tenley Campus are characterized in order to provide a foundation for assessing the transportation implications of the redevelopment. This is determined by examining the peak traffic hours, which are directly associated with the peaking characteristics of the University and the area transportation system. The peaking characteristics of the adjacent transportation system are determined through analysis of existing count data.

DDOT and National standards require that traffic counts be conducted on a weekday, not including Monday or Friday, when traffic conditions can be described as "typical". This includes the consideration for adjacent uses, such as retail, special events, and recreation facilities and for major traffic generators, such as the area public school system or any large public or private institutions. Weekend and other off-peak periods are also often reviewed if the study area includes other uses that may be relatively inactive during the "typical" weekday.

The traffic counts conducted on "typical" day are used to determine the AM and PM "peak hour" of traffic within the study area. According to the Highway Capacity Manual (HCM) methodologies, a one-hour analysis period is preferred. Analysis periods that exceed one hour are not usually used because traffic conditions are typically not stead for long time periods and because the adverse impact of short peaks in traffic demand may not be detected in a long time period. The "peak hour" represents the worst-case scenario, when the system traffic volumes are the highest. The use of a "typical" weekday and AM and PM peak hours are used to ensure that conclusions regarding adverse impacts and their respective mitigation measures would apply to the vast majority of time roadways are used in the study area. Although there may be times when volume flows exceed these conditions, such as during special events, holiday weekends, or other times depending on the study area and site location, it is the industry standard to design transportation infrastructure for the peak times during "typical" weekdays.

In order to ensure that the data collected contains the peak hour, traffic counts are taken for a period of several hours during the morning and afternoon peak periods. From these peak periods, a peak hour is derived for both the AM and the PM. According to the Transportation Impact Analyses for Site Development Manual published by the Institute of Transportation Engineers (ITE), data is generally collected during the weekday morning (7:00 to 9:00 AM) and afternoon (4:00 to 6:00 PM) peak hours. Although this is the standard, Gorove/Slade usually collects data for a three-hour long period to ensure that the peak hour is contained within the data collection timeframe.

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

Following the above guidelines, traffic counts, including vehicular and pedestrian volumes, were conducted by Gorove/Slade at the key study intersections between the hours of 6:00 to 9:00 AM and 4:00 to 7:00 PM on Tuesday, March 16, 2010. Additional counts were performed on Thursday, September 22 and Wednesday, September 28, 2011. These count dates represent a typical weekday when classes are in session for the University. The results of the traffic counts are included in the Technical Attachments. The morning and afternoon peak hours for the system of intersections studied occur between 7:45 and 8:45 am and 5:15 and 6:15 pm, respectively. The majority of the intersections contained in the vehicular capacity analysis contain data collected by Gorove/Slade. However, data for a few of the study intersections was obtained from Kimley-Horn and Associates, Inc. from the *Transportation Study* performed for the U.S. Department of Homeland Security Nebraska Avenue Complex Master Plan "Draft Environmental Impact Statement" issued on January 14, 2011. Existing peak hour traffic volumes are shown on Figure 25, Figure 26, and Figure 27.

Future Conditions (2014) without WCL Relocation

The proposed development of the WCL on the Tenley Campus is projected to be completed in 2014. In order to determine the impact of the proposed development on campus, the future conditions without development are investigated as a benchmark.

The future conditions without the proposed 2011 Plan for the Tenley Campus include the traffic generated by background developments located near the University and inherent growth on the roadways. Growth from these two sources is added to the existing traffic volumes in order to determine the traffic projections for the in the future without the 2011 Plan for the Tenley Campus. The background developments included are the Wesley Theological Seminary Expansion, the Wisconsin Avenue Giant Planned Unit Development (PUD), the DHS Nebraska Avenue Complex Master Plan, and the Janney School Expansion, as agreed upon during several meetings with the District Department of Transportation (DDOT). The growth projected by the 2011 Plan for the Main Campus is also included as a background development.

Future site-generated traffic volumes for the Wisconsin Avenue Giant were obtained from the *Transportation Impact Study* performed by Wells & Associates, Inc. in May 2008. Future site-generated traffic volumes for the DHS Nebraska Avenue Complex (NAC) Master Plan were obtained from the *Transportation Study* performed by Kimley-Horn and Associates, Inc. in November 2010. Future site-generated traffic volumes for the Wesley Theological Seminary Expansion are not included because it is not anticipated to generate any additional vehicular trips on the adjacent street network since no additional parking will be available on-site. This is consistent with the NAC study performed by Kimley-Horn. Counts performed in September 2011 were conducted following the completion of construction at the Janney School, so no site-generated traffic volumes were included for the development. Site-generated traffic volumes for the Main Campus were obtained

from the *Transportation Report* in support of the American University 2011 Campus Plan performed by Gorove/Slade in July 2011.

In the original 2011 Plan analysis from July 2011, other traffic increases due to inherent growth was accounted for with a 1% growth rate over the 10-year period of analysis (2010 to 2020). This rate was obtained from the Kimley-Horn report for the NAC, which determined the growth factor by reviewing the Metropolitan Washington council of Governments (MWCOG) regional travel demand model forecasts contained in the *2009 Constrained Long Range Plan, Version 2.2* for the years 2010, 2020, and 2030. The traffic model review showed that the traffic volumes in the vicinity of NAC are expected to remain stable between 2010 and 2030, with an estimated increase of 1 percent. This is equal to a yearly traffic growth rate of less than 0.1 percent per year. As a result, a traffic growth factor of 1 percent from 2010 to 2020 was assumed for the NAC study. For this analysis, the 1 percent growth rate over 10 years was converted to a growth rate per year and was applied to all turning movements, with the exception of the movements entering and exiting the NAC and the University.

The traffic volumes generated by the Wisconsin Avenue Giant, the NAC, the 2011 Plan for the Main Campus, and the inherent growth were added to the existing (2010/2011) traffic volumes in order to establish the future (2014) traffic volumes without the proposed WCL relocation. The traffic volumes for the future conditions without development are shown on Figure 28, Figure 29, and Figure 30.

Future Conditions (2014) with WCL Relocation

The impact of the proposed changes to the Tenley Campus was based on changes to vehicular traffic on the campus. Section 3.1 of this report describes the methodologies and results of the vehicular trip generation calculations. In order to determine the net site trips added to the transportation network, the existing site trips were distributed through the roadway network based on the existing driveway counts and travel patterns in the study area. Additionally, the future site trips were distributed through the roadway network based on the zip code responses from the online survey performed for the WCL. These maps are shown as Figure 18 and Figure 19 for trips traveling to the WCL in the morning peak hour and away from the WCL during the afternoon peak hour. Maps for trips traveling to the WCL during the afternoon peak hour are shown as Figure 20 and Figure 21. Figure 22 and Figure 23 show the resulting morning and afternoon peak hour trip distributions based on the zip code responses for the inbound and outbound trips site-generated trips, respectively. Based on this trip distribution, the future site-generated trips were assigned to the roadway network. The net new site-generated traffic volumes are shown on Figure 31, Figure 32, and Figure 33.

The traffic volumes for the future conditions with the 2011 Plan for the Tenley Campus were calculated by subtracting the existing trips generated by the Tenley Campus and adding the trips generated by the WCL to the future without development traffic volumes. The future traffic volumes with the proposed development on the Tenley Campus are shown on Figure 34, Figure 35, and Figure 36. (Of note, the existing site trips generated by the WCL at its current location have not been subtracted from the roadway network. Hence, these traffic volumes provide a conservative estimate of the total future conditions as the WCL volumes are essentially double-counted in the roadway network.)

Percent Trips Attributable to Relocation of WCL to Tenley Campus

In order to help put perspective on the amount of traffic generated by the proposed relocation of the WCL, this report calculated the percent of site traffic per intersection in the future conditions with the WCL relocation. Table 10 presents the results of these calculations by intersection. Based on these calculations, the overall percent of traffic attributable to the proposed redevelopment of the Tenley Campus, across all study area intersections is 2.2% in the AM, 2.5% in the PM, and 2.3% combined.

In addition, the site generated trip calculations were used to estimate how many additional vehicles the relocation of WCL to the Tenley Campus would generate on roadways adjacent to the Tenley Campus during the peak hours.

The net new trips generated by the Tenley Campus projected to drive by the campus during peak hours are listed below. These projections all show that the proposed WCL relocation would have a minimal impact to roadways volumes on adjacent streets.

- Yuma Street:
  - 8 cars in the AM peak, or one car every 7.5 minutes
  - 7 cars in the PM peak, or one car every 8.6 minutes
- 42nd Street:
  - 7 cars in the AM peak, or one car every 8.6 minutes
  - 25 cars in the PM peak, or one car every 2.4 minutes
- Warren Street:
  - 7 cars in the AM peak, or one car every 8.6 minutes
  - 23 cars in the PM peak, or one car every 2.6 minutes

Table 8: Summary of Vehicular Capacity Analysis Assumptions

2010/2011 Existing Conditions

• Dates of data collection:
  • Tuesday, March 16, 2010
  • Thursday, September 22, 2011
  • Wednesday, September 28, 2011
  • Counts taken from 6:00 – 9:00 AM and 4:00 – 7:00 PM
  • Count sheets in Appendix
• System Peak: 7:45 – 8:45 AM, 5:15 – 6:15 PM
• Geometries and lane configurations based on existing conditions
• Peak hour factors based on existing count data
• Signal timings/phasings/offsets provided by DDOT
• Presence of adjacent parking lanes based on existing conditions and parking maneuvers per hour estimated for each block face by conservatively assuming each space turns over once per hour
• Bus blockages per hour based on existing WMATA routing and schedules for all WMATA bus stops in the study area
• Some existing count data and peak hour factors obtained from Kimley-Horn and Associates, Inc. from the Transportation Study performed for the U.S. Department of Homeland Security Nebraska Avenue Complex Master Plan "Draft Environmental Impact Statement" issued on January 14, 2011

2014 Future without WCL Relocation (Background Conditions)

• Background developments
  • Wesley Theological Seminary Expansion – no trips assumed due to no increase of parking
  • Wisconsin Avenue Giant Planned Unit Development (PUD) – future trips obtained from the *Transportation Impact Study* performed by Wells & Associates, Inc. in May 2008
  • DHS Nebraska Avenue Complex Master Plan – future trips obtained from the *Transportation Study* performed by Kimley-Horn and Associates, Inc. in November 2010
  • Janney School – no trips assumed due to completion of expansion
  • American University 2011 Campus Plan – future trips for the Main Campus developments obtained from the *Transportation Report* in support of the American University 2011 Campus Plan performed by Gorove/Slade in July 2011
• Background growth percentage:
  • *Transportation Report* for American University 2011 Campus Plan assumed one percent growth over 10 years
  • One percent growth rate over ten years converted to growth rate per year
  • Applied to all turning movements except those entering and exiting the University and the NAC
• No signal timing changes assumed
• Recommendations from the *Rock Creek West II Livability Study*
  • Convert 40th Street north of Albemarle Street from one-way southbound to one-way northbound
  • Convert Fort Drive north of Albemarle Street from one-way northbound to one-way southbound

2014 Future with WCL Relocation (Total Future Conditions)
• Site trip generation and mode split assumptions are detailed in Section 3.1 of report • Existing AM peak hour trips: 19 in, 13 out ; Existing PM peak hour trips: 11 in, 22 out • Total future AM peak hour trips: 161 in, 0 out ; Total future PM peak hour trips: 107 in, 86 out • Existing trip distribution based on analysis of existing traffic patterns • Future trip distribution (Figure 22) based on analysis of zip code data from WCL online survey • No signal timing or infrastructure changes assumed

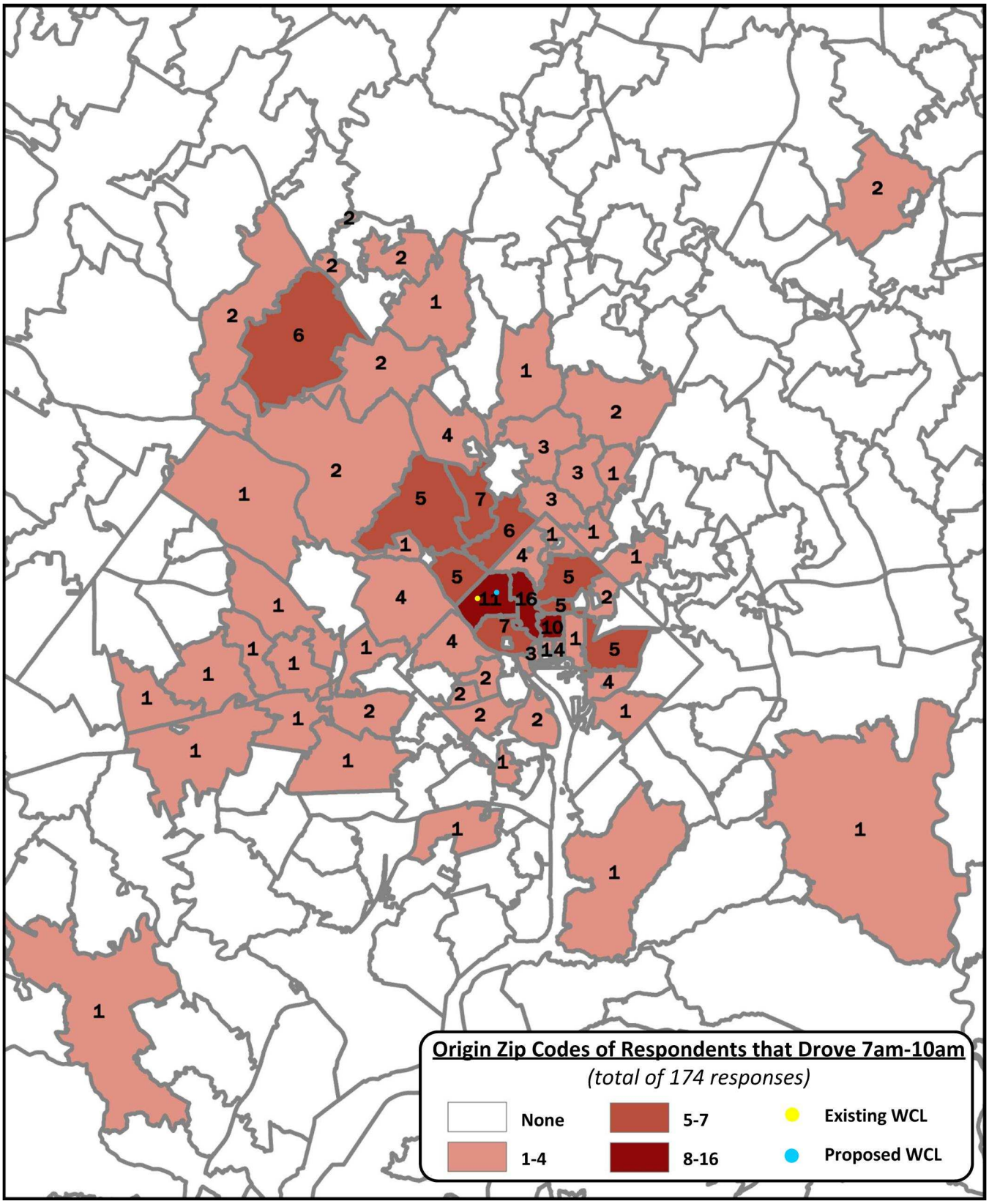

Figure 18: Vehicular Trip Distribution by Zip Code, Regional View (AM In and PM Out)

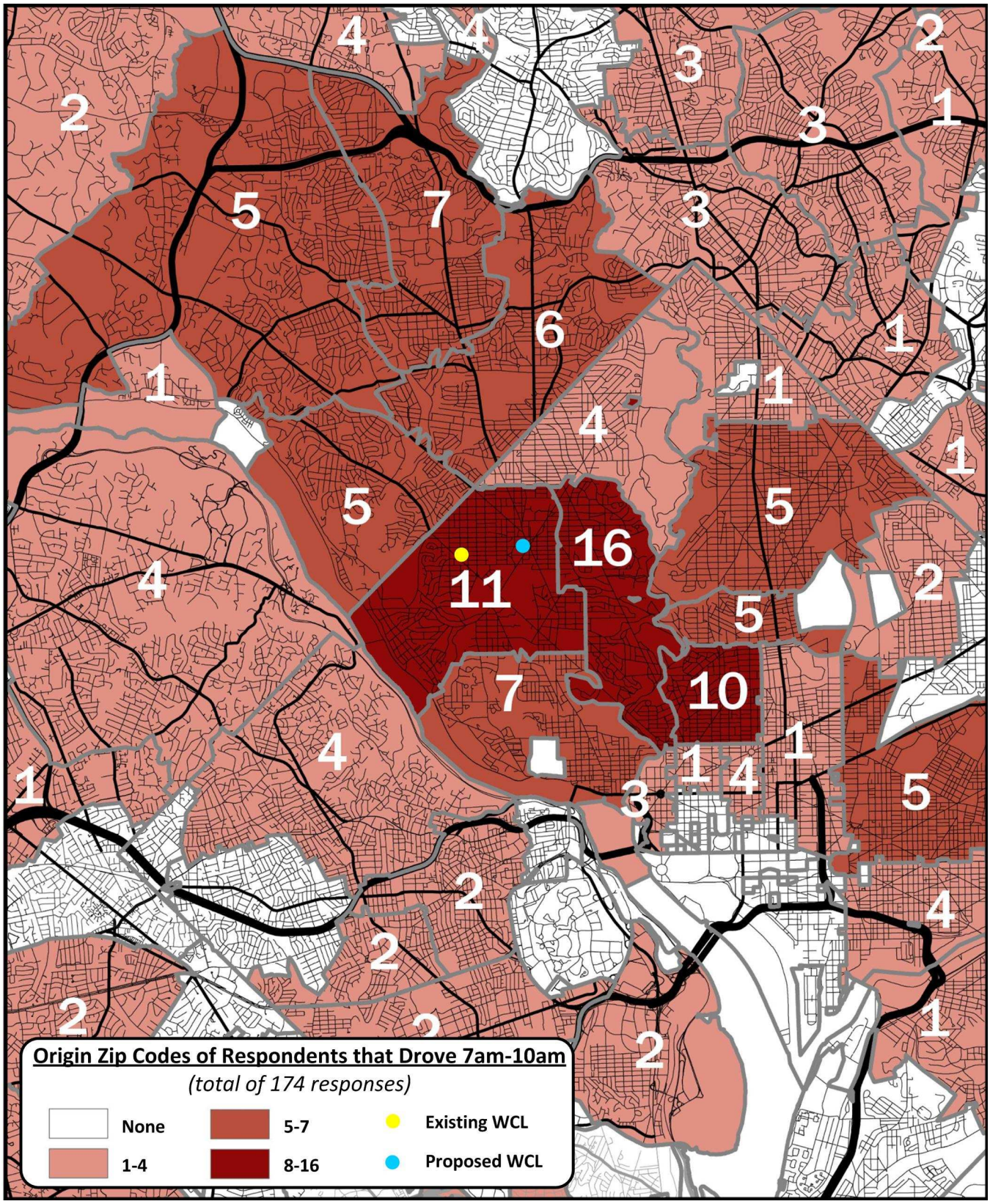

Figure 19: Vehicular Trip Distribution by Zip Code, Local View (AM In and PM Out)

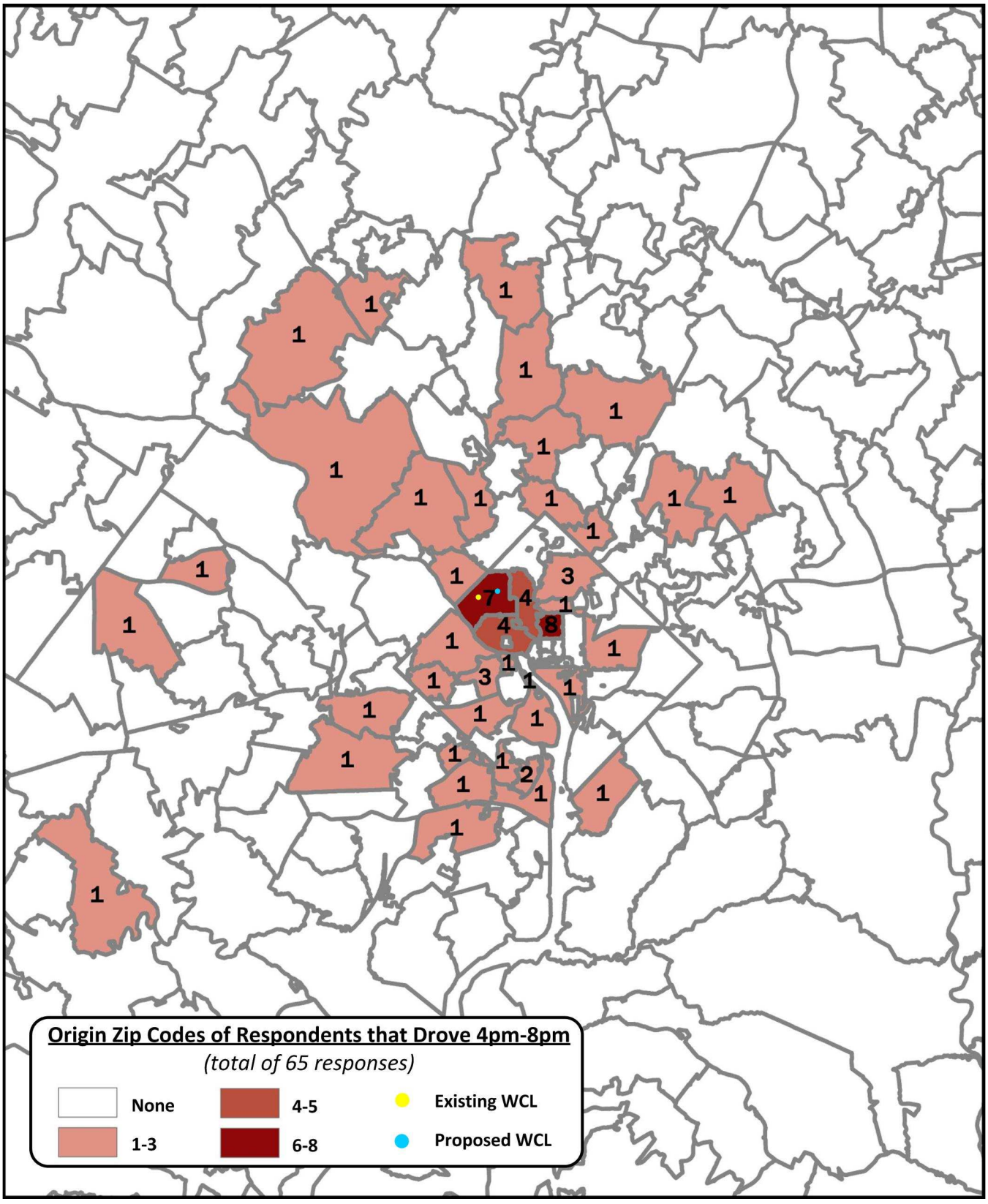

Figure 20: Vehicular Trip Distribution by Zip Code, Regional View (PM In)

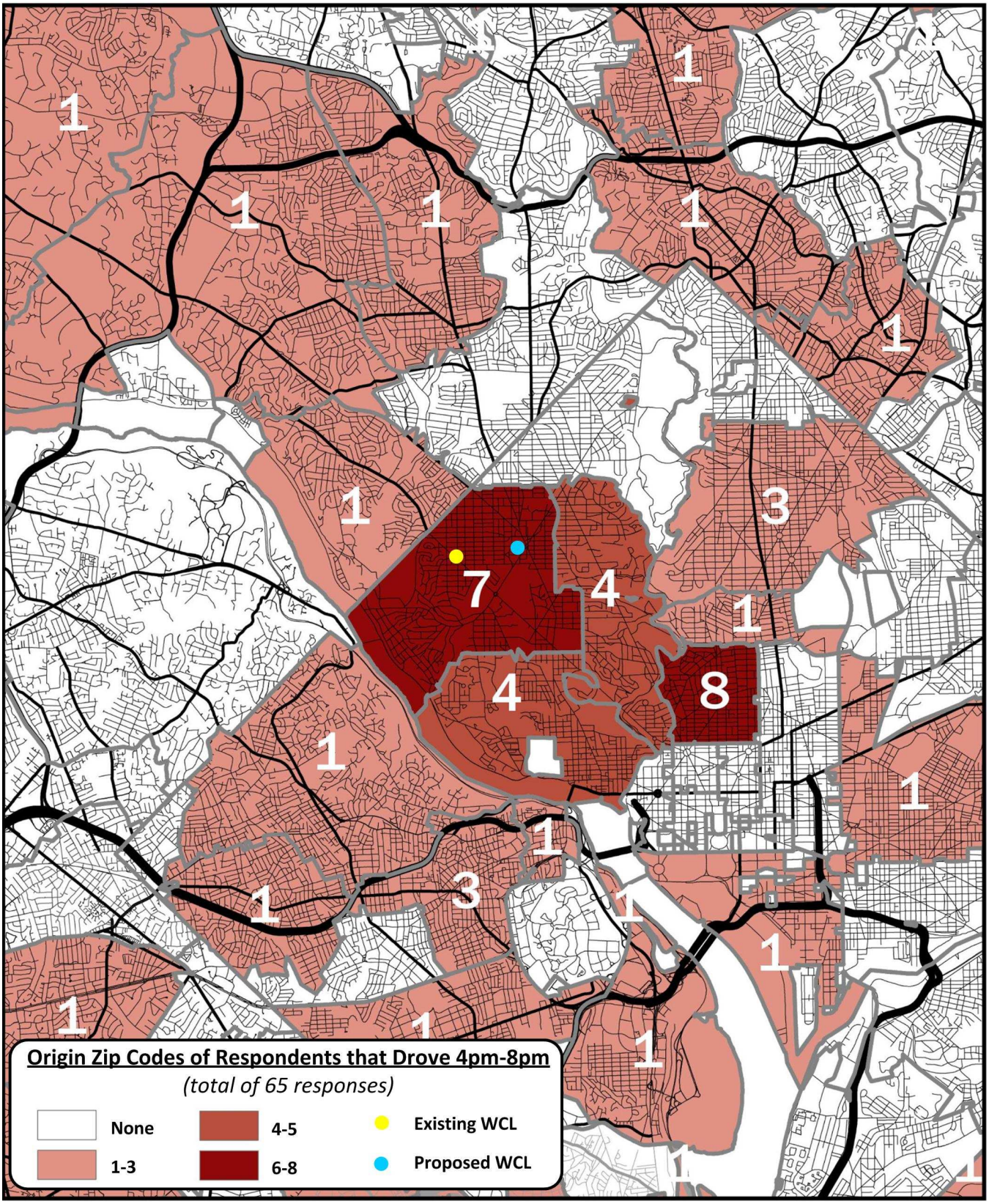

Figure 21: Vehicular Trip Distribution by Zip Code, Local View (PM In)

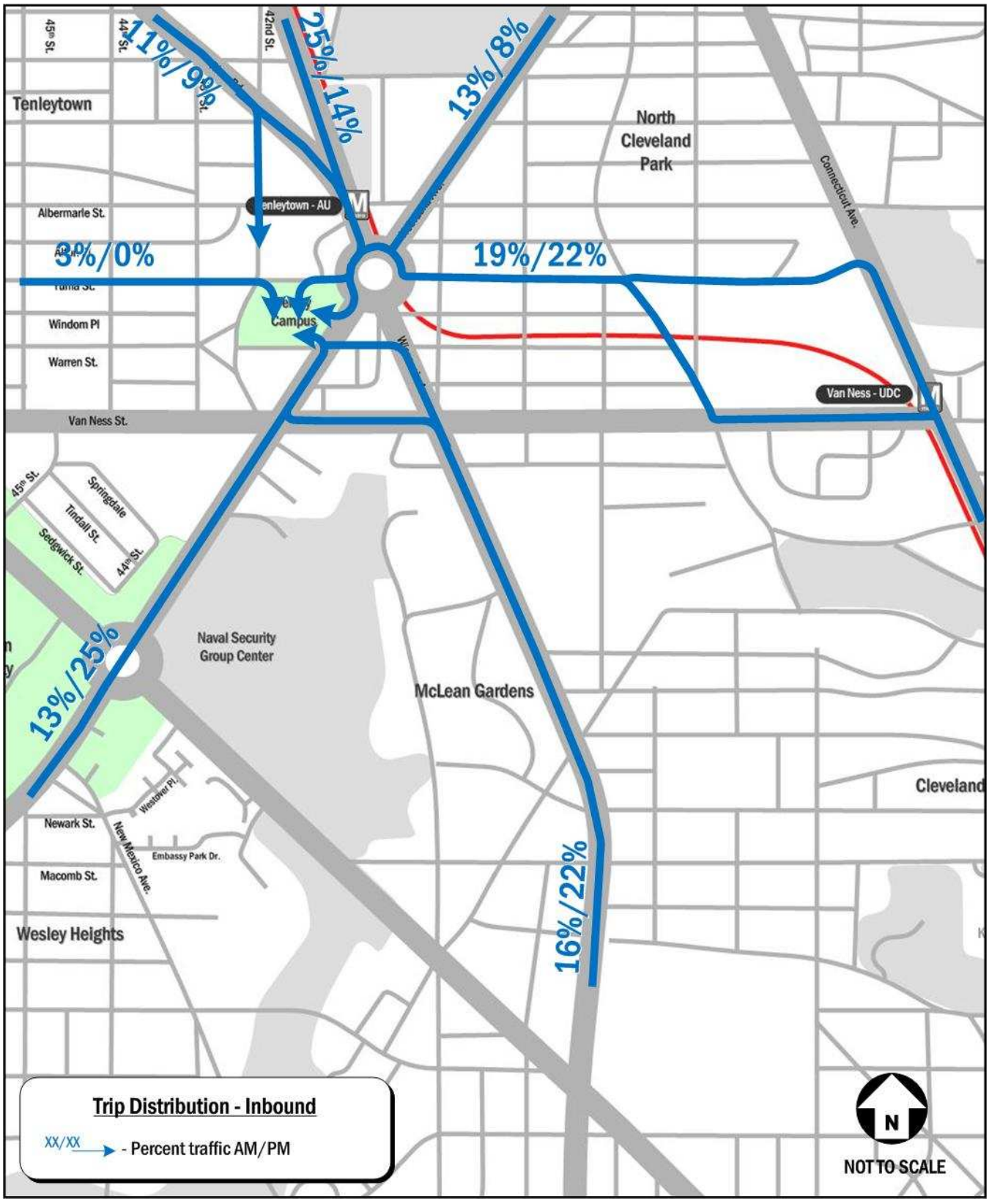

Figure 22: Trip Distribution for New Site-Generated Inbound Trips

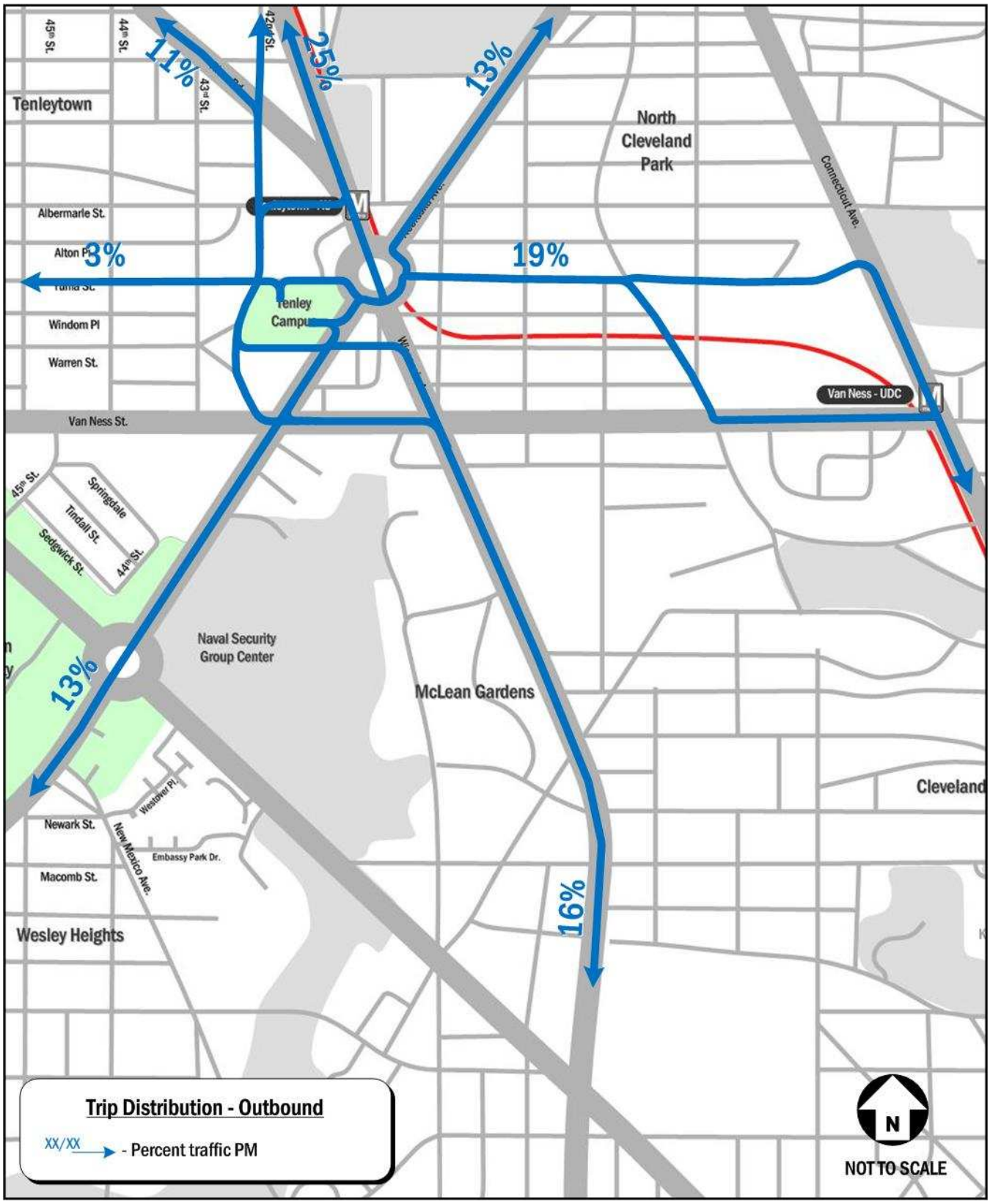

Figure 23: Trip Distribution for New Site-Generated Outbound Trips

3.2.3 Geometry and Operations Assumptions

The following section reviews the roadway geometry and operations assumptions made and methodologies used in the roadway capacity analyses, summarized in Table 8.

Gorove/Slade conducted field reconnaissance to confirm the existing lane configurations and traffic controls at the intersections within the study area, shown on Figure 25, Figure 26, and Figure 27. Existing signal timings and offsets were obtained from DDOT and confirmed during field reconnaissance.

As stated previously, the draft final recommendations for the *Rock Creek West II (RCW2) Livability Study* were consulted for future recommendations. This includes the conversion of 40th Street and Fort Drive north of Albemarle Street from one-way southbound and northbound to one-way northbound and southbound, respectively. No other infrastructure improvements are assumed for the future conditions without the proposed development on the Tenley Campus. No signal timing changes were assumed as well.

No changes to the lane configurations and traffic controls were assumed for the future conditions with the proposed relocation of the WCL, with the exception of the curb cut changes outlined in Section 2.1. This includes removing the three existing curb-cuts located along Yuma Street, and replacing them with one curb-cut that will provide access for a small parking lot and for loading. The existing pick-up/drop-off area along Nebraska Avenue will be removed (two curb-cuts) and replaces with one driveway, which will provide access to the underground parking garage, as well as pick-up and drop-off activity. The lane configurations and traffic controls for the new site driveways are shown on Figure 36. No signal timing changes were assumed for the future conditions with the proposed development.

3.2.4 Vehicular Analysis Results

Intersection capacity analyses were performed for the three scenarios outlined in Section 3.2.1 at the intersections contained within the study area during the morning and afternoon peak hours. *Synchro, Version 7.0* was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology. The majority of the intersections contained in the vehicular capacity analysis contain data collected by Gorove/Slade. However, data for a few of the study intersections was obtained from Kimley-Horn and Associates, Inc. from the *Transportation Study* performed for the U.S. Department of Homeland Security Nebraska Avenue Complex Master Plan "Draft Environmental Impact Statement" issued on January 14, 2011.

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from "A" being the best to "F" being the worst. LOS E is typically used as the acceptable LOS threshold in the District; although LOS F is sometimes accepted in urbanized areas.

The capacity analyses were based on: (1) the peak hour traffic volumes outlined in Section 3.2.2; (2) the lane use and traffic controls outlined in Section 3.2.3; and (3) the Highway Capacity Manual (HCM) methodologies (using *Synchro 7* software). An average delay (of each approach) and LOS for the signalized intersections is also shown for an overall intersection LOS grade. The HCM does not give guidelines for calculating the average delay for a two-way stop-controlled intersection, as the approaches without stop signs would technically have no delay. Detailed LOS descriptions and the analysis worksheets are contained in the Technical Attachments.

Table 9 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds). A key for the Tenley Circle intersections and movements is included as Figure 24. The capacity analysis results are also shown on the following figures:

- Existing Conditions (2010/2011) - Figure 37, Figure 38, and Figure 39
- Future Conditions (2014) without the WCL Relocation - Figure 40, Figure 41, and Figure 42
- Future Conditions (2014) with the WCL Relocation - Figure 43, Figure 44, and Figure 45

3.2.5 Summary of Analysis Results and Mitigation Measures

Generally, speaking, the proposed relocation of the WCL is considered to have an impact at an intersection within the study area if the capacity analyses show an LOS F condition in the Future with the WCL Relocation scenario where one does not exist in the Future without the WCL Relocation scenario. Table 10 summarizes the results of the capacity analyses, and Table 11 shows the capacity analysis results with the improvements proposed in Table 10.

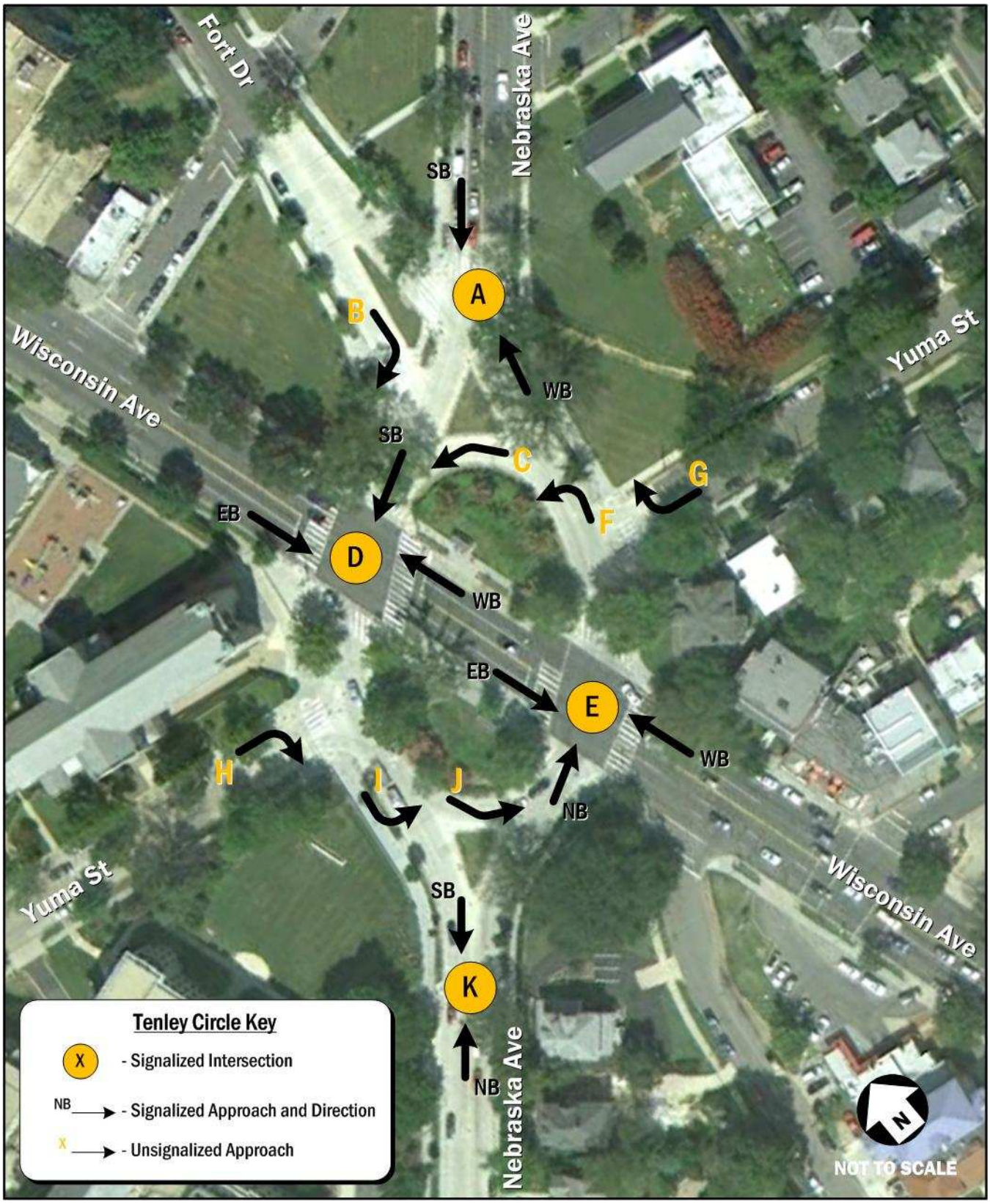

Figure 24: Tenley Circle Diagram of Intersections and Movements

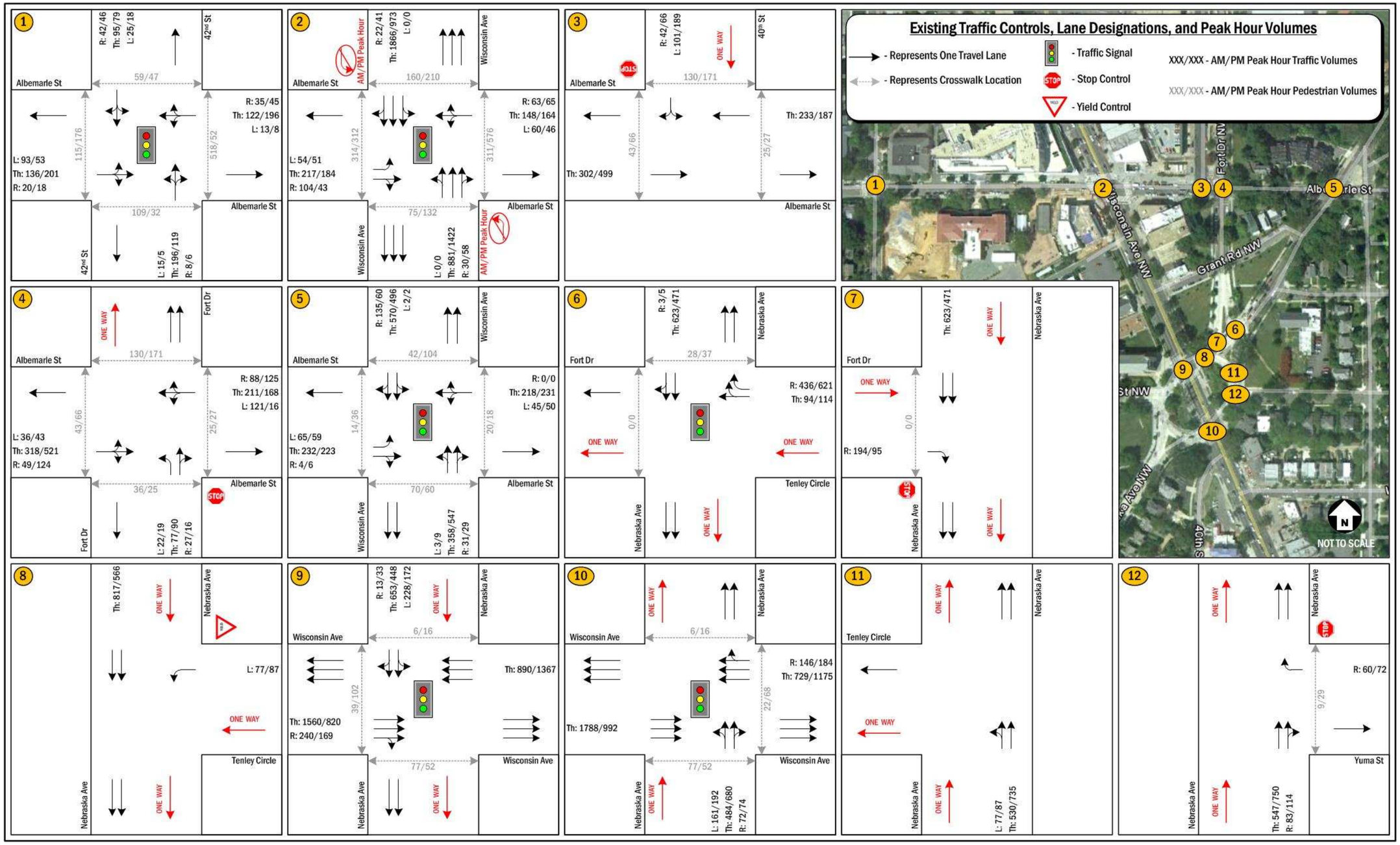

Figure 25: Existing Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (1 of 3)

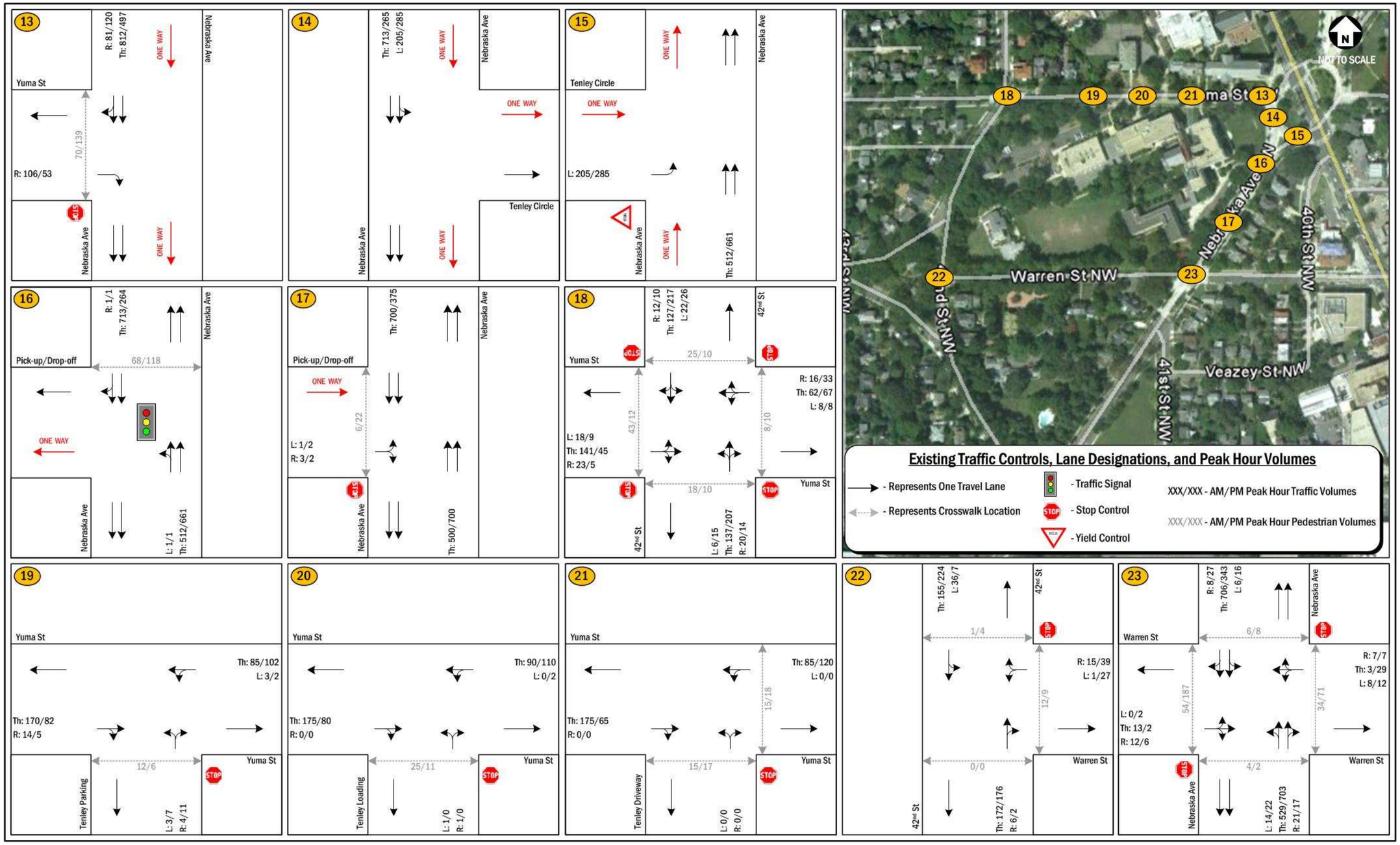

Figure 26: Existing Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (2 of 3)

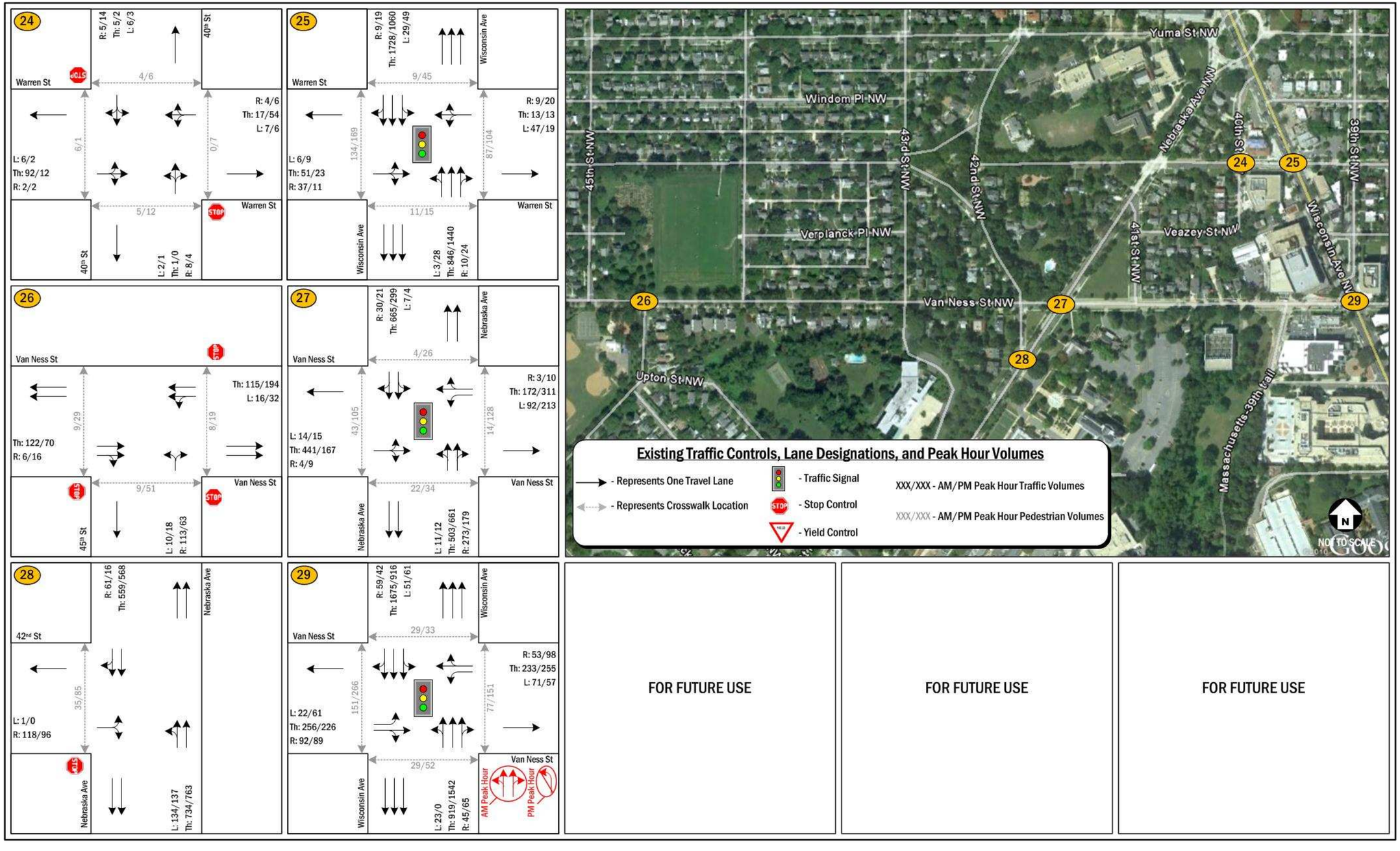

Figure 27: Existing Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (3 of 3)

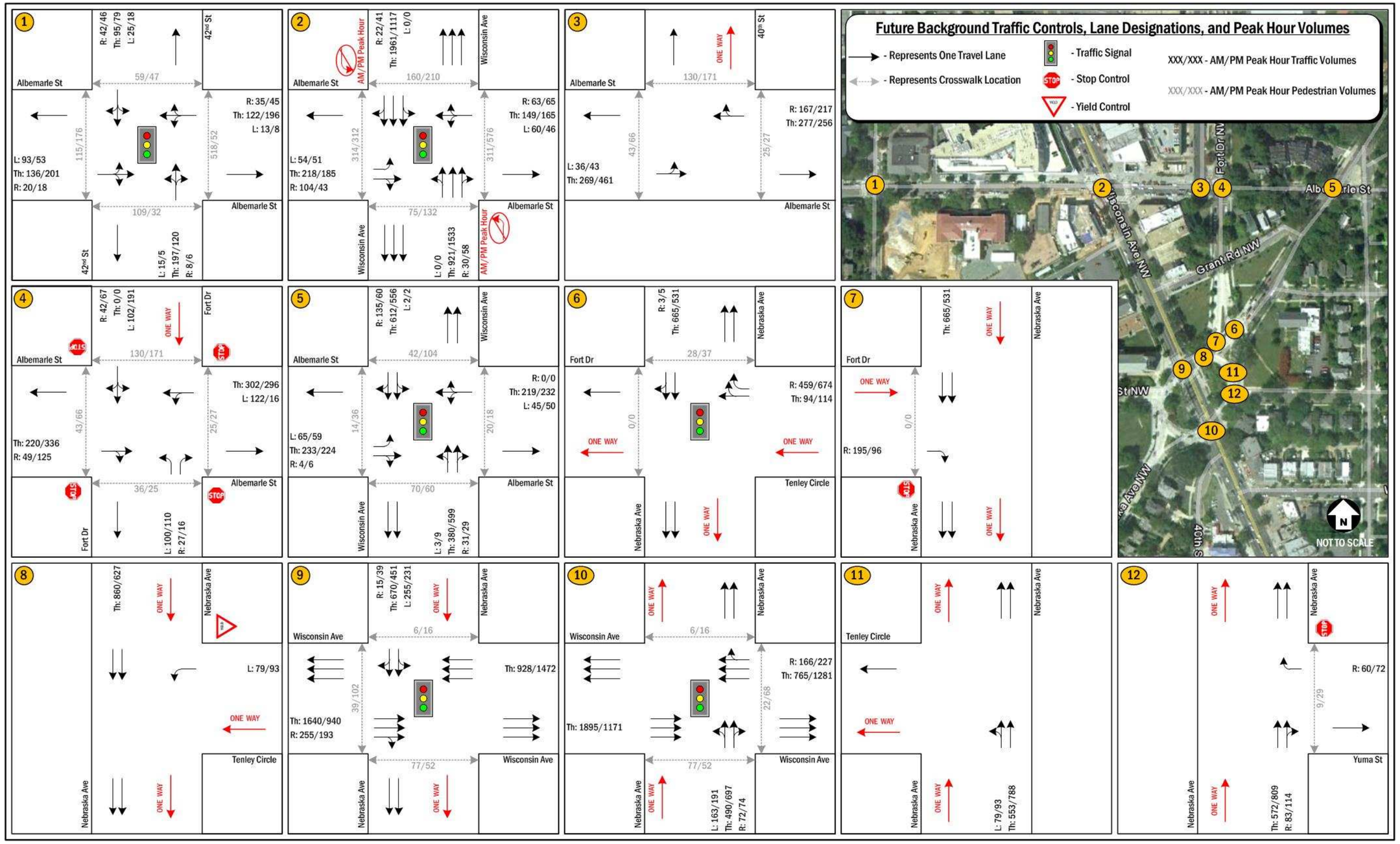

Figure 28: Future Background Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (1 of 3)

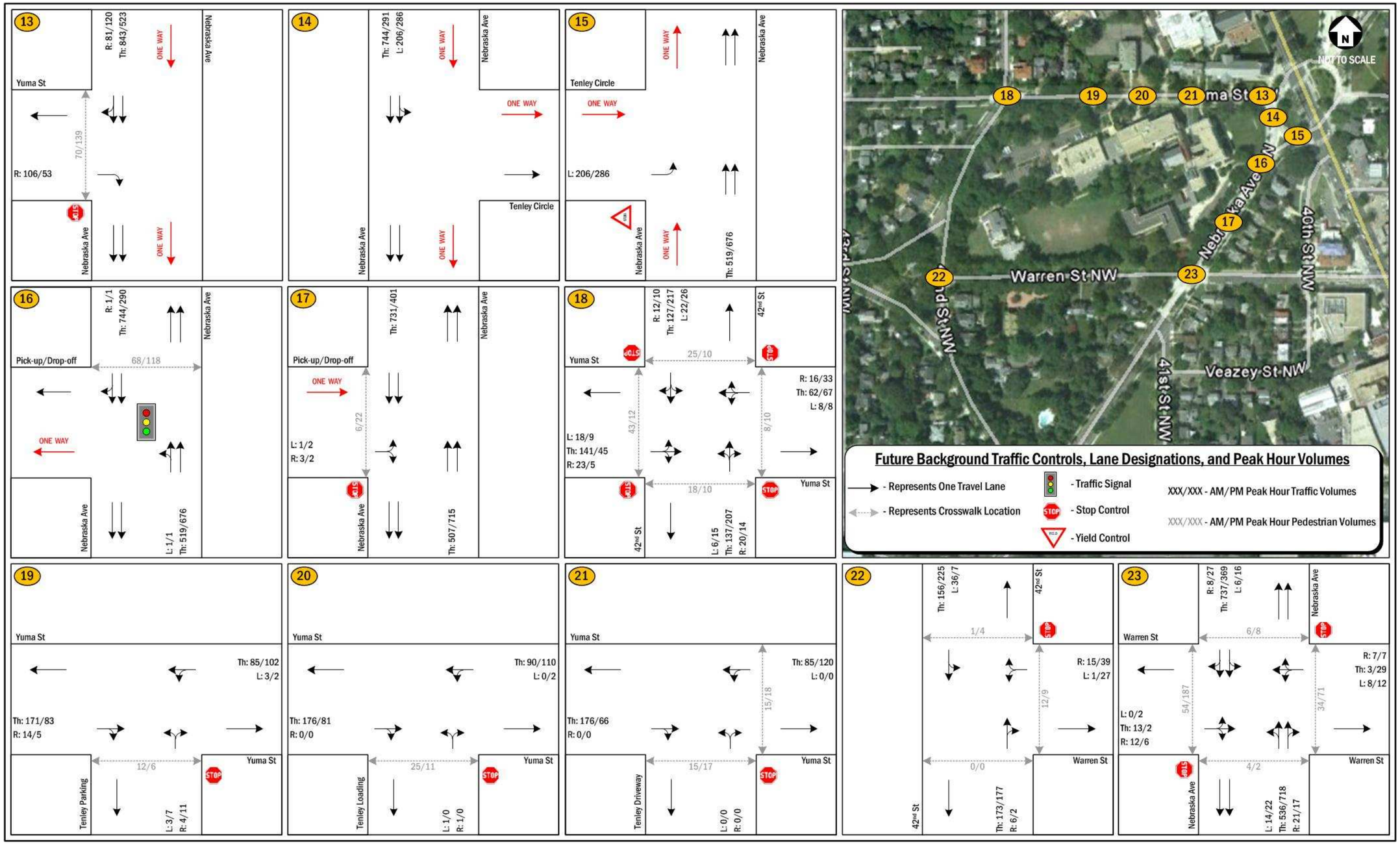

Figure 29: Future Background Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (2 of 3)

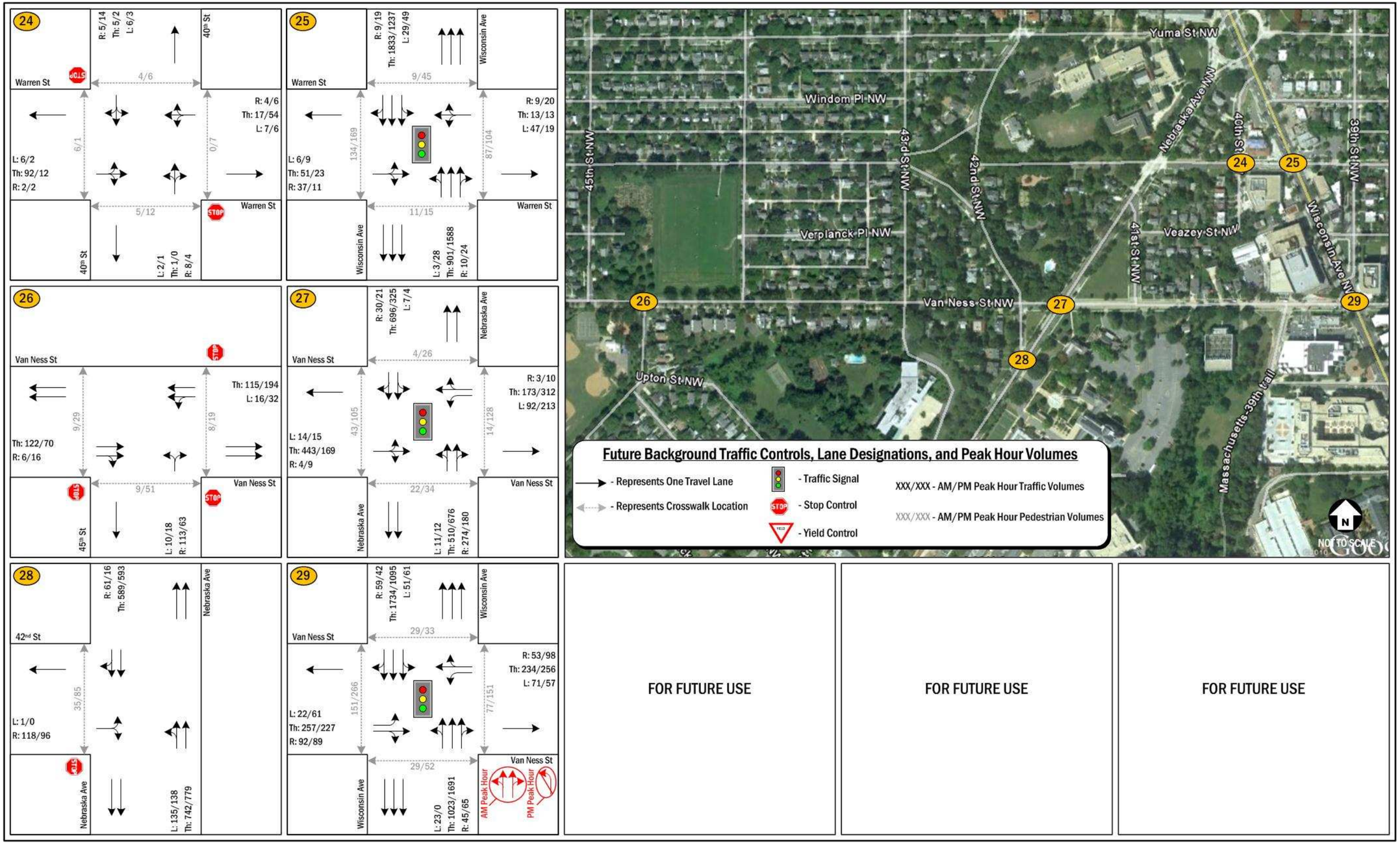

Figure 30: Future Background Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (3 of 3)

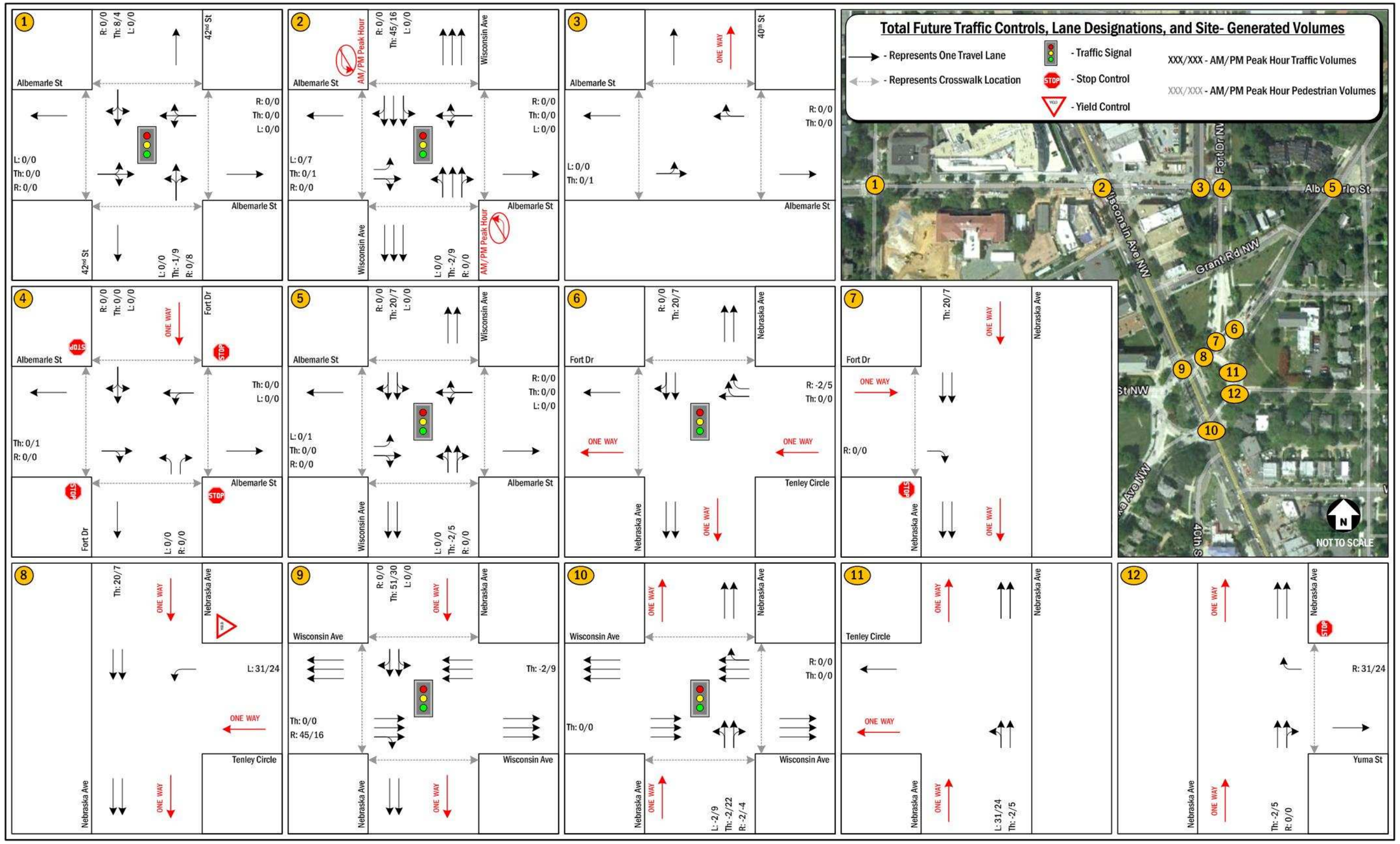

Figure 31: Total Future Lane Designations and Site-Generated Traffic Volumes (1 of 3)

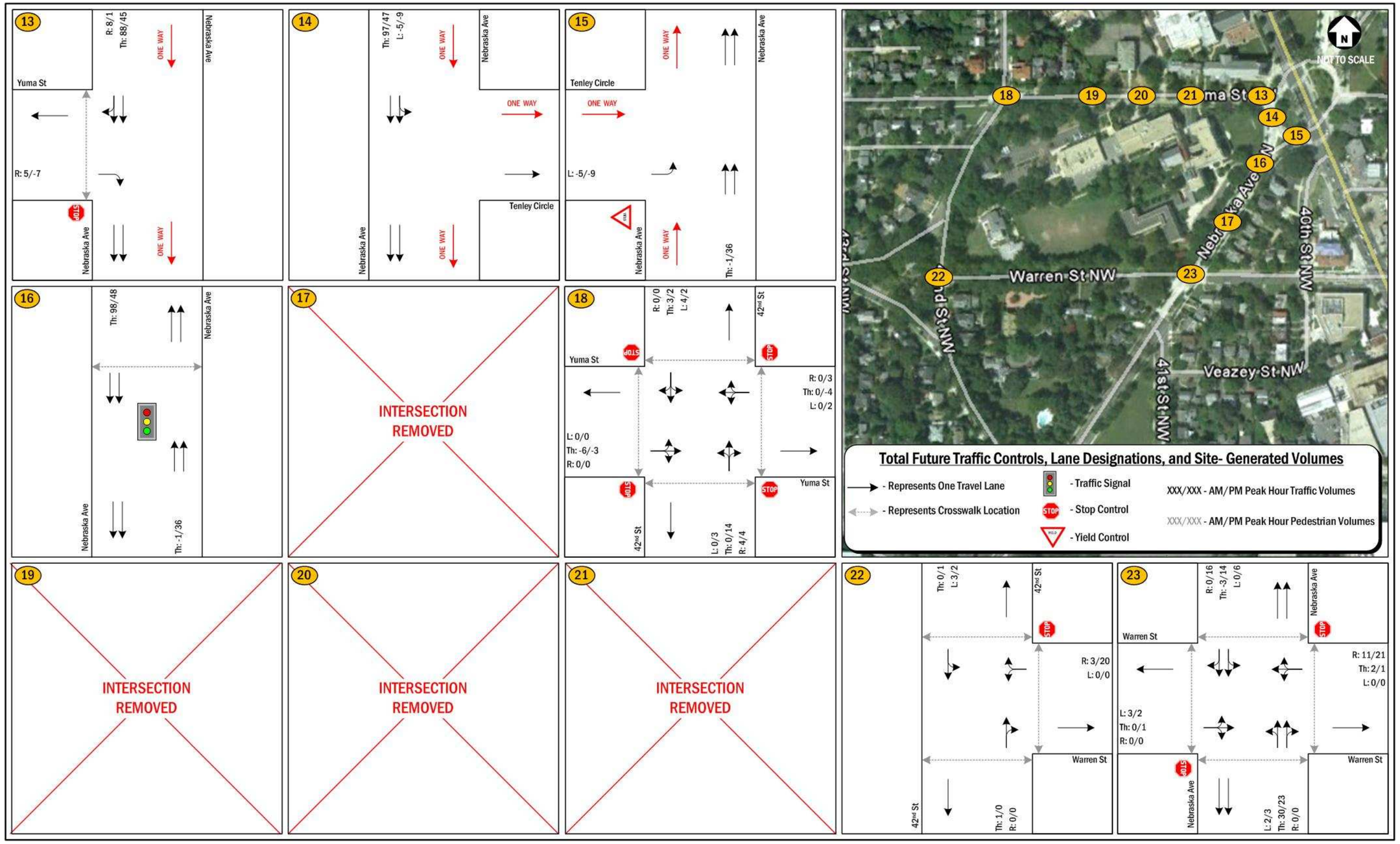

Figure 32: Total Future Lane Designations and Site-Generated Traffic Volumes (2 of 3)

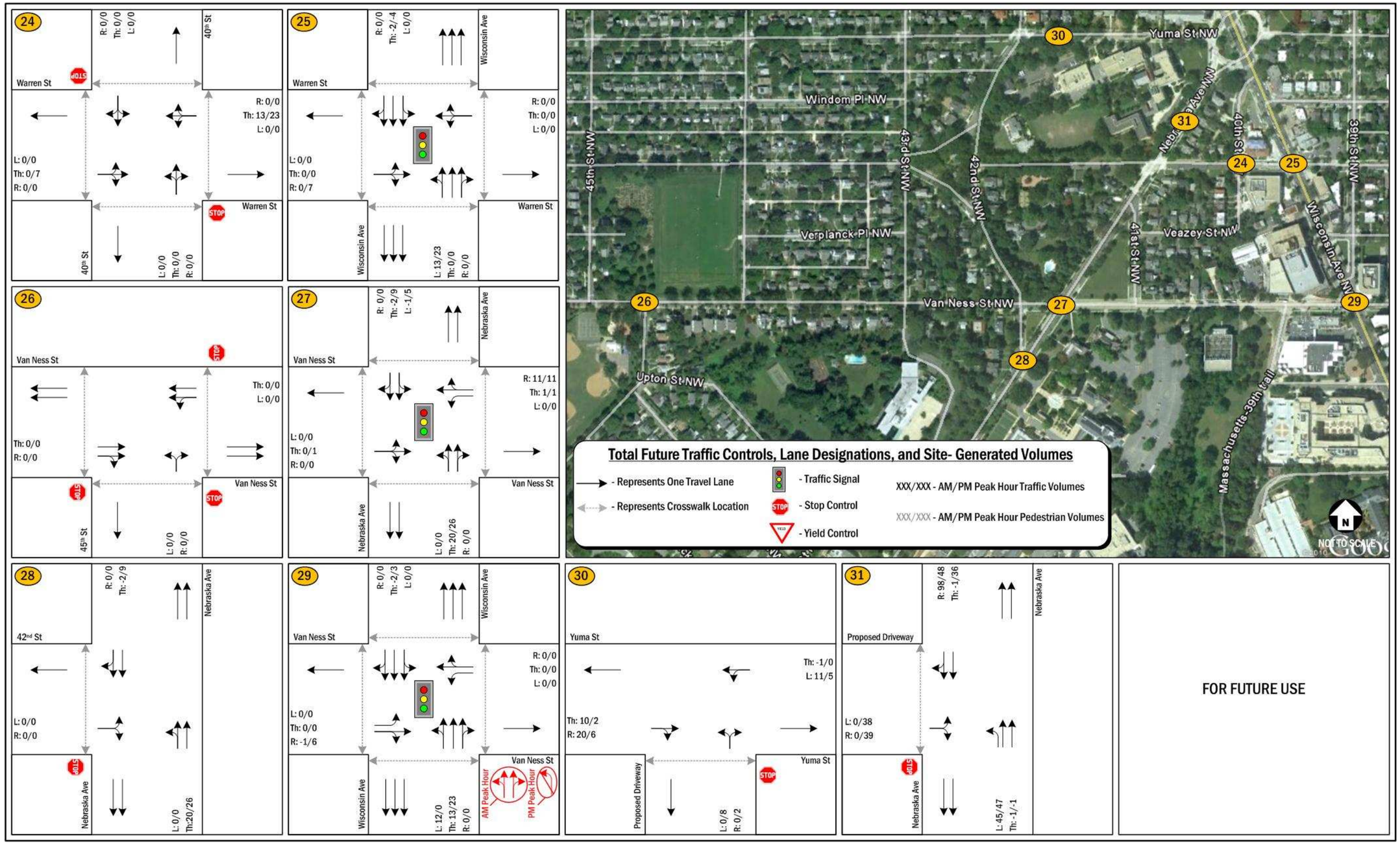

Figure 33: Total Future Lane Designations and Site-Generated Traffic Volumes (3 of 3)

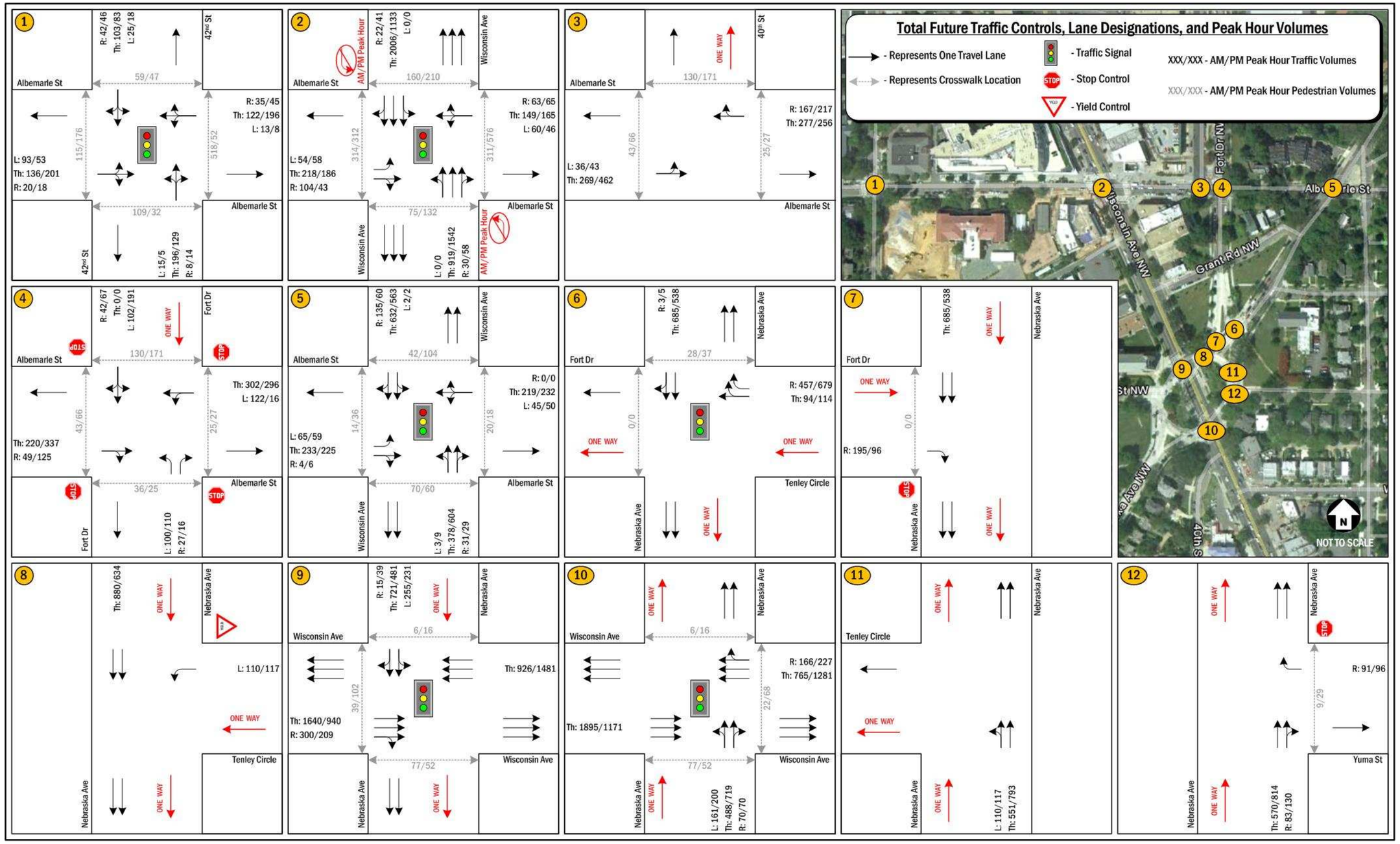

Figure 34: Total Future Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (1 of 3)

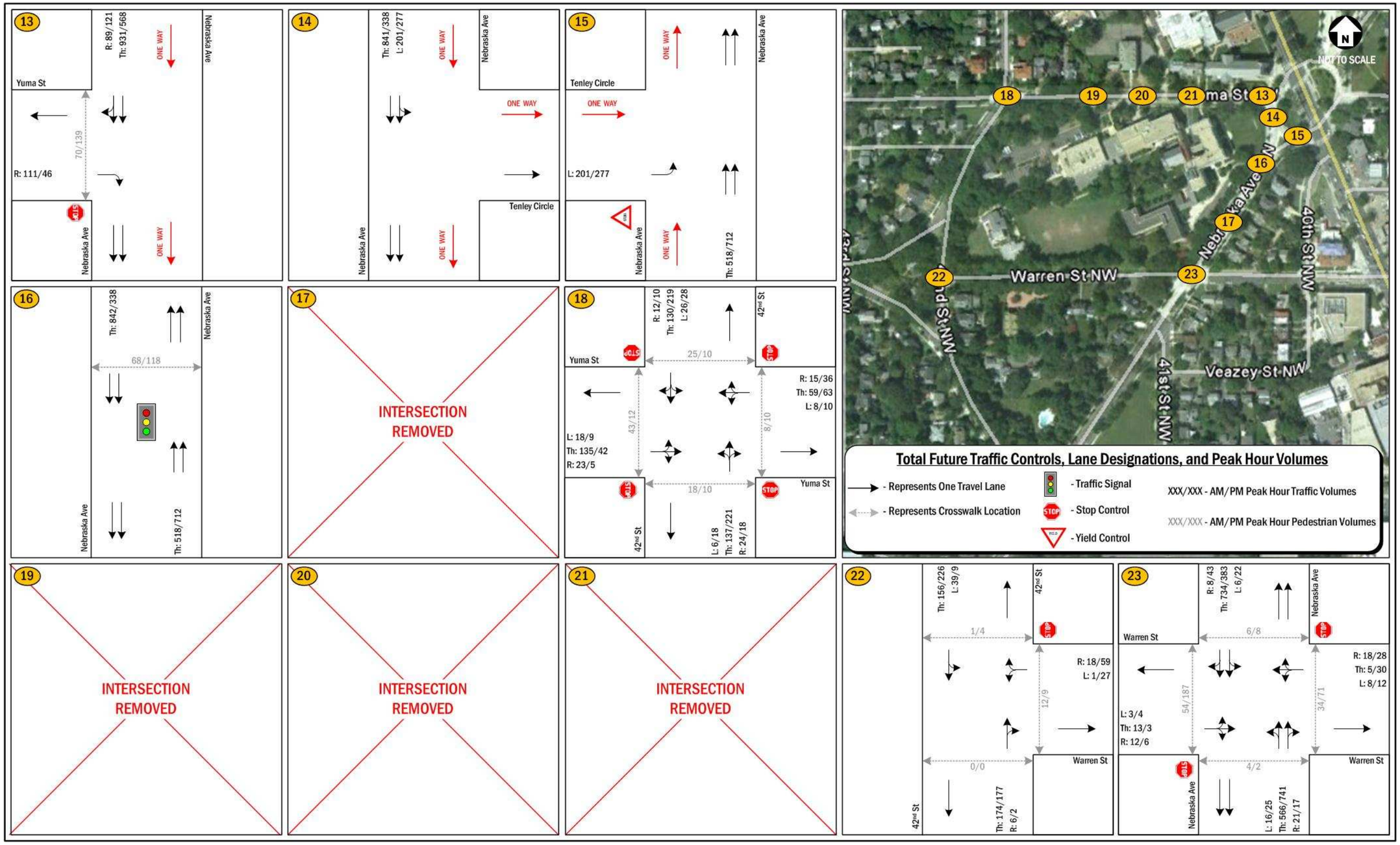

Figure 35: Total Future Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (2 of 3)

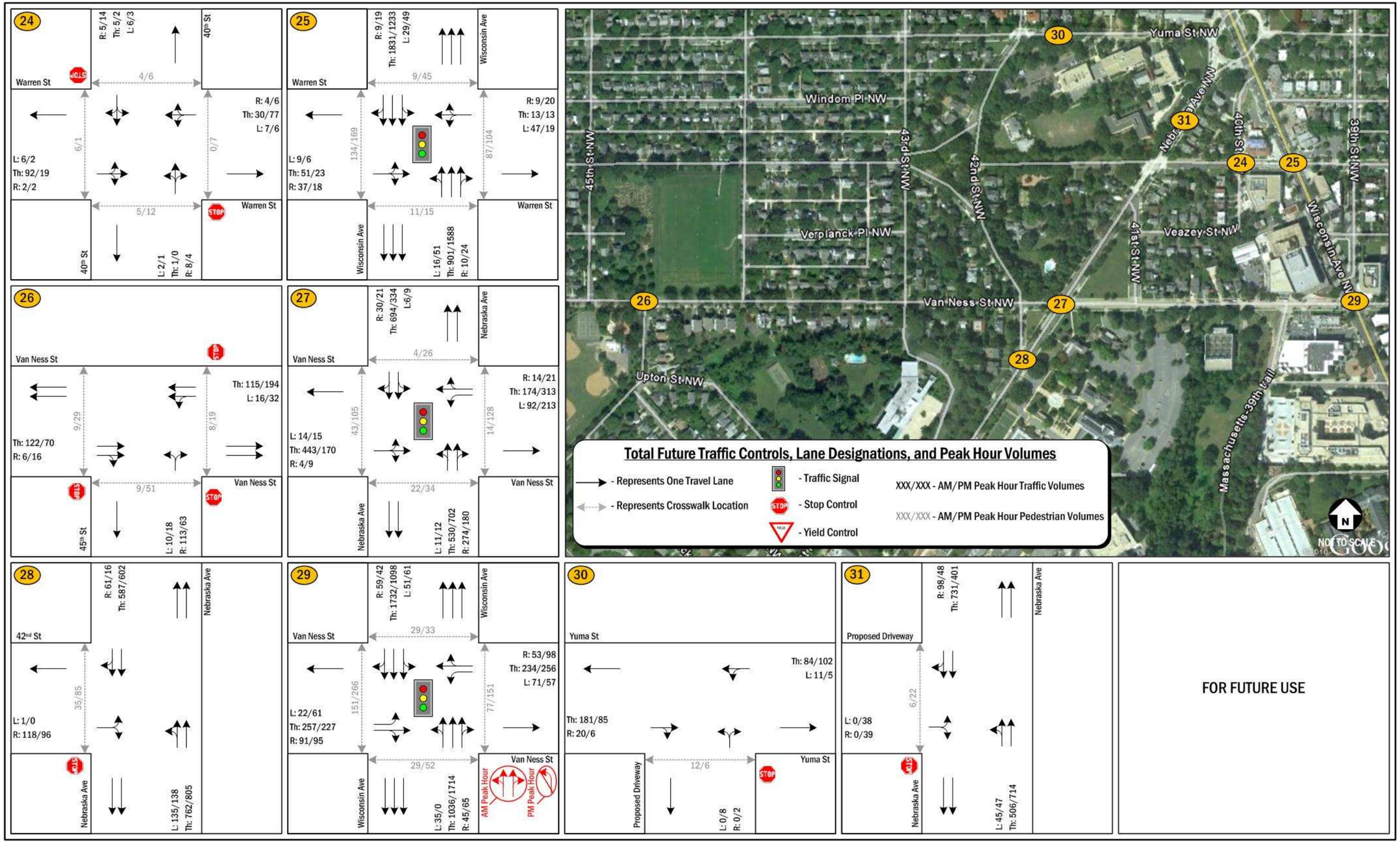

Figure 36: Total Future Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (3 of 3)

Table 9: Vehicular Levels of Service Results

Intersection	Approach	Existing Conditions (2010/2011)				Future without WCL (2014)				Future with WCL (2014)			
		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
Albemarle Street & 42nd Street	**Overall**	**19.7**	**B**	**17.0**	**B**	**19.6**	**B**	**17.0**	**B**	**19.7**	**B**	**17.6**	**B**
	Eastbound	26.6	C	15.4	B	26.6	C	15.4	B	26.6	C	15.4	B
	Westbound	14.9	B	12.3	B	14.7	B	12.1	B	14.7	B	12.1	B
	Northbound	18.0	B	20.5	C	18.1	B	20.5	C	18.0	B	22.8	C
	Southbound	16.1	B	24.0	C	16.1	B	24.0	C	16.4	B	24.4	C
Albemarle Street & Wisconsin Avenue	**Overall**	**28.5**	**C**	**20.3**	**C**	**30.4**	**C**	**20.4**	**C**	**31.4**	**C**	**20.6**	**C**
	Eastbound	31.2	C	30.4	C	31.3	C	30.4	C	31.3	C	29.9	C
	Westbound	101.1	F	101.0	F	107.0	F	102.3	F	107.0	F	102.3	F
	Northbound	12.0	B	6.6	A	13.4	B	7.3	A	14.0	B	7.6	A
	Southbound	25.4	C	15.8	B	27.9	C	16.6	B	29.5	C	16.7	B
Albemarle Street & 40th Street	Eastbound Left	--	--	--	--	1.4	A	0.7	A	1.4	A	0.7	A
	Southbound	18.1	C	52.3	F	--	--	--	--	--	--	--	--
Albemarle Street & Fort Drive	Eastbound Left	1.1	A	0.6	A	--	--	--	--	--	--	--	--
	Westbound Left	3.4	A	0.7	A	3.2	A	0.6	A	3.2	A	0.6	A
	Northbound	39.7	E	35.1	E	52.2	F	38.6	E	52.2	F	38.5	E
	Southbound	--	--	--	--	75.3	F	151.2	F	75.3	F	150.6	F
Albemarle Street & Nebraska Avenue	**Overall**	**20.4**	**C**	**17.8**	**B**	**20.2**	**C**	**17.3**	**B**	**20.1**	**C**	**17.3**	**B**
	Eastbound	33.1	C	43.6	D	33.4	C	43.6	D	33.4	C	43.6	D
	Westbound	38.9	D	44.4	D	39.1	D	44.6	D	39.1	D	44.6	D
	Northbound	15.7	B	2.6	A	15.6	B	3.0	A	15.2	B	3.1	A
	Southbound	9.4	A	6.9	A	9.6	A	7.1	A	9.7	A	7.1	A
Tenley Circle													
	Overall	**27.2**	**C**	**17.9**	**B**	**30.3**	**C**	**18.3**	**B**	**32.8**	**C**	**17.9**	**B**
A: Nebraska Avenue & Fort Drive/Tenley Circle	Westbound	10.7	B	17.0	B	10.6	B	17.1	B	10.4	B	16.5	B
	Southbound	41.9	D	19.7	B	47.6	D	20.3	C	51.8	D	20.3	C
B: Nebraska Avenue & Fort Drive	Eastbound Right	10.6	B	9.2	A	10.7	B	9.3	A	10.8	B	9.3	A
C: Nebraska Avenue & Tenley Circle	Westbound Left	9.9	A	9.4	A	10.0	B	9.6	A	10.4	B	9.7	A
	Overall	**9.6**	**A**	**13.2**	**B**	**10.5**	**B**	**14.2**	**B**	**13.2**	**B**	**14.2**	**B**
D: Nebraska Avenue & Wisconsin Ave	Eastbound	5.6	A	16.4	B	5.8	A	19.1	B	6.3	A	19.5	B
	Westbound	6.6	A	12.8	B	6.6	A	12.7	B	7.0	A	12.1	B
	Southbound	20.6	B	9.5	A	23.8	C	9.6	A	32.1	C	10.4	B
	Overall	**5.9**	**A**	**12.8**	**B**	**6.0**	**A**	**14.7**	**B**	**5.8**	**A**	**16.2**	**B**
E: Nebraska Avenue & Wisconsin Avenue	Eastbound	3.4	A	6.3	A	3.7	A	7.3	A	3.5	A	7.3	A
	Westbound	4.0	A	16.3	B	4.0	A	20.6	C	3.8	A	24.2	C
	Northbound	14.0	B	14.5	B	14.2	B	14.7	B	13.8	B	14.7	B
F: Nebraska Avenue & Fort Drive/Tenley Circle	Northbound Left	2.5	A	2.3	A	2.5	A	2.4	A	3.2	A	2.8	A
G: Nebraska Avenue & Yuma Street	Westbound Right	9.5	A	10.1	B	9.5	A	10.1	B	9.8	A	10.4	B
H: Nebraska Avenue & Yuma Street	Eastbound Right	10.6	B	12.0	B	10.8	B	11.8	B	11.0	B	11.9	B
I: Nebraska Avenue & Tenley Circle	Southbound Left	4.4	A	6.3	A	4.3	A	6.2	A	4.1	A	6.0	A

Intersection	Approach	Existing Conditions (2010/2011)				Future without WCL (2014)				Future with WCL (2014)			
		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
J: Nebraska Avenue & Tenley Circle	Eastbound Left	13.7	B	17.2	C	13.8	B	17.5	C	13.7	B	17.8	C
	Overall	**33.0**	**C**	**19.2**	**B**	**33.3**	**C**	**19.2**	**B**	**30.0**	**C**	**21.0**	**C**
K: Nebraska Avenue Pedestrian Crossing & Pick-up/Drop-off	Northbound	78.8	E	26.9	C	80.9	F	27.4	C	78.5	E	30.9	C
	Southbound	0.2	A	0.1	A	0.2	A	0.1	A	0.2	A	0.1	A
Nebraska Avenue & Pick-up/Drop-off	Eastbound	15.4	C	13.1	B	16.0	C	13.5	B	--	--	--	--
42nd Street & Yuma Street	**Overall**	**10.4**	**B**	**11.4**	**B**	**10.4**	**B**	**11.4**	**B**	**10.4**	**B**	**11.8**	**B**
	Eastbound	11.1	B	9.8	A	11.1	B	9.8	A	11.0	B	9.9	A
	Westbound	9.5	A	10.1	B	9.5	A	10.1	B	9.5	A	10.2	B
	Northbound	10.1	B	12.0	B	10.1	B	12.0	B	10.1	B	12.6	B
	Southbound	10.4	B	11.9	B	10.4	B	11.9	B	10.4	B	12.1	B
Yuma Street & Tenley Parking	Westbound Left	0.3	A	0.2	A	0.3	A	0.2	A	--	--	--	--
	Northbound	10.3	B	9.4	A	10.3	B	9.4	A	--	--	--	--
Yuma Street & Tenley Loading Access	Westbound Left	0.0	A	0.1	A	0.0	A	0.1	A	--	--	--	--
	Northbound	10.5	B	0.0	A	10.5	B	0.0	A	--	--	--	--
Yuma Street & Tenley Driveway	Westbound Left	0.0	A	0.0	A	0.0	A	0.0	A	--	--	--	--
	Northbound	0.0	A	0.0	A	0.0	A	0.0	A	--	--	--	--
42nd Street & Warren Street	Westbound	9.8	A	11.2	B	9.8	A	11.3	B	9.8	A	11.3	B
	Southbound Left	1.7	A	0.3	A	1.7	A	0.3	A	1.8	A	0.4	A
Nebraska Avenue & Warren Street	Eastbound	38.1	E	27.8	D	40.9	E	29.4	D	49.2	E	46.1	E
	Westbound	35.2	E	79.2	F	37.6	E	87.7	F	35.2	E	98.2	F
	Northbound Left	0.8	A	0.9	A	0.8	A	0.9	A	0.9	A	1.1	A
	Southbound Left	0.3	A	1.1	A	0.3	A	1.1	A	0.3	A	1.4	A
Warren Street & 40th Street	Eastbound Left	0.5	A	0.9	A	0.5	A	0.9	A	0.5	A	0.7	A
	Westbound Left	1.9	A	0.7	A	1.9	A	0.7	A	1.3	A	0.5	A
	Northbound	9.4	A	8.8	A	9.4	A	8.8	A	9.4	A	8.9	A
	Southbound	9.8	A	9.1	A	9.8	A	9.1	A	10.0	A	9.3	A
Warren Street & Wisconsin Avenue	**Overall**	**10.0**	**A**	**10.8**	**B**	**10.1**	**B**	**11.9**	**B**	**10.2**	**B**	**13.5**	**B**
	Eastbound	48.2	D	51.0	D	48.2	D	51.1	D	48.0	D	48.1	D
	Westbound	100.5	F	50.2	D	100.5	F	50.2	D	100.5	F	48.8	D
	Northbound	3.8	A	11.8	B	3.9	A	13.2	B	4.1	A	15.6	B
	Southbound	5.6	A	4.9	A	6.2	A	6.6	A	6.3	A	7.1	A
Van Ness Street & 45th Street	**Overall**	**8.1**	**A**	**8.5**	**A**	**8.1**	**A**	**8.5**	**A**	**8.1**	**A**	**8.5**	**A**
	Eastbound	8.3	A	7.8	A	8.3	A	7.8	A	8.3	A	7.8	A
	Westbound	8.4	A	9.0	A	8.4	A	9.0	A	8.4	A	9.0	A
	Northbound	7.8	A	7.8	A	7.8	A	7.8	A	7.8	A	7.8	A

Intersection	Approach	Existing Conditions (2010/2011)				Future without WCL (2014)				Future with WCL (2014)			
		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
Nebraska Avenue & Van Ness Street	**Overall**	**23.0**	**C**	**25.5**	**C**	**23.1**	**C**	**25.6**	**C**	**23.2**	**C**	**26.0**	**C**
	Eastbound	65.6	E	30.8	C	66.4	E	30.9	C	66.4	E	31.1	C
	Westbound	46.9	D	35.4	C	46.7	D	35.7	D	45.8	D	36.4	D
	Northbound	7.0	A	22.6	C	7.1	A	22.9	C	7.4	A	23.4	C
	Southbound	7.7	A	13.2	B	8.0	A	13.5	B	8.3	A	13.9	B
Nebraska Avenue & 42nd Street	Eastbound	11.2	B	23.0	C	11.2	B	24.6	C	11.2	B	25.5	D
	Northbound Left	3.9	A	6.8	A	4.0	A	7.1	A	4.0	A	7.2	A
Van Ness Street & Wisconsin Avenue	**Overall**	**20.1**	**B**	**24.5**	**C**	**20.4**	**C**	**25.4**	**C**	**20.9**	**C**	**25.6**	**C**
	Eastbound	47.1	D	41.0	D	48.5	D	41.3	D	47.5	D	41.9	D
	Westbound	52.7	D	56.4	E	53.1	D	56.8	E	52.8	D	56.9	E
	Northbound	12.1	B	12.5	B	13.3	B	13.5	B	15.3	B	13.6	B
	Southbound	12.3	B	24.4	C	12.7	B	27.2	C	12.7	B	27.4	C
Yuma Street & Proposed Access to Surface Parking Lot	Westbound Left	--	--	--	--	--	--	--	--	1.0	A	0.4	A
	Northbound	--	--	--	--	--	--	--	--	0.0	A	9.9	A
Nebraska Avenue & Proposed Access to Parking Garage	Eastbound	--	--	--	--	--	--	--	--	0.0	A	23.9	C
	Northbound Left	--	--	--	--	--	--	--	--	2.4	A	1.9	A

Table 10: Roadway Capacity Results Review

Intersection	Locations & Scenarios with LOS F *EX = 2010/2011 Existing Conditions* *BG = 2014 Background (without WCL Relocation)* *TF = 2014 Total Future (with WCL Relocation)*	Percent of Future Traffic Attributable to Tenley Campus (in TF scenario)		Discussion & Recommendations
		AM Peak	*PM Peak*	
Albemarle Street & 42nd Street	None	0.9%	2.6%	No mitigation recommended.
Albemarle Street & Wisconsin Avenue	WB Wisconsin AM & PM Peak: EX, BG & TF	1.2%	1.0%	The westbound delays shown in the capacity analysis results are mostly due to the signal timing preference to Wisconsin Avenue, the lack of the protected left turn westbound, and because westbound traffic is limited to one lane. The long delays are present in existing conditions, and the proposed WCL move to the Tenley campus has a negligible impact. A potential mitigation measure would be to shift some signal time from Wisconsin Avenue to Albemarle Street. Table 11 shows how shifting 5 seconds of green time from the north- and southbound phases (ϕ2+ ϕ6) to the east- and westbound phases (ϕ4 + ϕ8) alleviates the westbound delays. This report recommends that DDOT consider this signal timing change.
Albemarle Street & 40th Street /Fort Drive	SB 40th PM Peak: EX NB Fort AM Peak: FB & TF SB Fort AM & PM Peak: FB & TF	0.0%	0.1%	Under existing conditions, a LOS F condition exists for southbound traffic on 40th Street. In the future scenarios, after implementation of the recommendations contained in the RCW2 study, congestion shifts to the north and southbound approaches at Fort Drive. These delays are present in the future regardless of approval of the proposed Tenley Campus, and the proposed WCL move to the Tenley Campus has a negligible impact. A potential mitigation measure would be to convert the intersection of Albemarle Street & Fort Drive from a two-way stop sign controlled intersection to an all-way stop sign controlled intersection. Table 11 below shows the delay & LOS results with an all-way stop sign. This report recommends that DDOT consider this change.
Albemarle Street & Nebraska Avenue	None	1.0%	0.7%	No mitigation recommended.
Tenley Circle	NB Nebraska entering Circle at crosswalk near Tenley Campus AM Peak: FB	3.2%	2.9%	The LOS F condition entering Tenley Circle northbound on Nebraska Avenue in the AM peak hour is mitigated with the changes proposed in the application. Specifically, the removal of the left turns on Nebraska Avenue entering the existing pick-up/drop-off facility for the Tenley Campus lower the delay slightly and removes the LOS F conditions (it was slightly over the threshold under FB conditions).
Yuma Street & 42nd Street	None	0.2%	3.4%	No mitigation recommended.
Warren Street & 42nd Street	None	1.8%	4.6%	No mitigation recommended.
Nebraska Avenue & Warren Street	WB Warren PM Peak: EX, FB, TF	3.2%	6.6%	The westbound delays are due to side street traffic having difficulty entering/crossing Nebraska Avenue during the PM Peak hour. These delays are present in existing conditions, and the proposed WCL move to the Tenley campus has a negligible impact. Based on the volumes contained in the analysis, a traffic signal would not be warranted at this intersection. The delays are partly generated because westbound Warren Street is only one lane wide. The westbound approach could effectively be two lanes wide if some on-street parking is restricted near the approach. This report recommends that DDOT consider restricting on-street parking on the northern side of Warren Street two car lengths prior to the stop-bar approaching Nebraska Avenue. The resulting improvements to roadway capacity are shown in Table 11. The on-street parking on this block is RPP, and the occupancy counts show that the parking does become full during the afternoon (although with a significant amount of vehicles without Ward 3 stickers). Thus, there could be a negative impact that should be explored when considering this option.
Warren Street & 40th Street	None	7.7%	22.1%	No mitigation recommended. The high percentage of future traffic attributed to the Tenley Campus observed at this intersection compared to the other study area intersections is due to the low amount of existing traffic at this intersection.

Intersection	Locations & Scenarios with LOS F *EX = 2010/2011 Existing Conditions* *BG = 2014 Background (without WCL Relocation)* *TF = 2014 Total Future (with WCL Relocation)*	Percent of Future Traffic Attributable to Tenley Campus (in TF scenario)		Discussion & Recommendations
Warren Street & Wisconsin Avenue	WB Warren AM Peak: EX, FB, TF	0.4%	0.8%	The westbound delays are due to side street traffic having difficulty entering/crossing Wisconsin Avenue during the AM Peak hour. These delays are present in existing conditions, and the proposed WCL move to the Tenley campus has a negligible impact. The delays are partly generated because westbound Warren Street is only one lane wide. This report recommends that DDOT consider removing the two metered on-street parking spaces between the driveway leading to Chipotle and Wisconsin Avenue on the north side of Warren Street on its approach to Wisconsin Avenue to create a short left-turn lane. The resulting improvements to roadway capacity are shown in Table 11. The on-street parking on this block is metered and occupancy counts show that of the 9 parking spaces, 5 were occupied on the weekday afternoon count, and 6 were occupied during the weekday evening count.
Van Ness Street & 45th Street	None	0.0%	0.0%	No mitigation recommended.
Van Ness Street & Nebraska Avenue	None	2.7%	1.3%	No mitigation recommended.
Nebraska Avenue & 42nd Street	None	2.1%	1.1%	No mitigation recommended.
Van Ness Street & Wisconsin Avenue	None	0.8%	0.6%	No mitigation recommended.
<u>Site Driveway:</u> **Yuma Street & Proposed Access to Surface Parking Lot**	None	5.4%	-1.0%	Proposed configuration is adequate to handle site demand.
<u>Site Driveway:</u> **Nebraska Avenue & Proposed Access to Parking Garage**	None	10.0%	13.8%	Although the roadway capacity analysis shows that the proposed driveway could operate without significant delays during peak hours with no proposed changes to Nebraska Avenue, some members of the community have raised concerns that vehicles turning left from northbound Nebraska Avenue into the Tenley Campus could block traffic along Nebraska Avenue. The current configuration of the northbound lanes is one permanent travel lane, and one parking lane that converts to a travel lane during the evening (4pm to 6:30pm). Thus, the possibility exists for northbound traffic to be delayed outside of the PM peak hour when traffic is turning into the garage. This report has examined to potential ways to mitigate this concern: (1) By changing the parking regulations on the east side of Nebraska Avenue between Warren Street and Tenley Circle to restrict parking from 7am to 9pm. An alternative would be to completely remove parking and make the lane a permanent travel lane. Currently the on-street parking is RPP, 7am to 4pm M-F, with all parking restricted from 4pm to 6:30pm; (2) By adding a short left turn lane to handle queues of left turning traffic. Table 11 below shows a comparison of capacity analysis results of these alternatives. The results show that each alternative would produce acceptable capacity analysis results. The proposed Tenley Campus plan incorporates option (2), the left turn queuing lane. The proposed left turn lane is shown within the design drawings of the campus, and has an approximate capacity of 2 cars (40 feet). The HCM analyses show a maximum queue length of 1 vehicle in the left turn lane (in all analysis scenarios).

Table 11: Capacity Analysis Results with Proposed Improvements

Intersection	Approach	Existing Conditions (2010/2011)				Future without WCL (2014)				Future with WCL (2014)			
		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
Albemarle Street & Wisconsin Avenue	**Overall**	**28.5**	**C**	**20.3**	**C**	**30.4**	**C**	**20.4**	**C**	**31.4**	**C**	**20.6**	**C**
	Eastbound	31.2	C	30.4	C	31.3	C	30.4	C	31.3	C	29.9	C
	Westbound	101.1	F	101.0	F	107.0	F	102.3	F	107.0	F	102.3	F
	Northbound	12.0	B	6.6	A	13.4	B	7.3	A	14.0	B	7.6	A
	Southbound	25.4	C	15.8	B	27.9	C	16.6	B	29.5	C	16.7	B
Improvement: Shift 5 seconds of green time from north- and southbound phases to east- and westbound phases	***Overall***	***31.6***	***C***	***17.5***	***B***	***36.5***	***D***	***18.4***	***B***	***39.9***	***D***	***18.5***	***B***
	Eastbound	*25.8*	*C*	*25.5*	*C*	*25.8*	*C*	*25.6*	*C*	*25.8*	*C*	*25.1*	*C*
	Westbound	*55.3*	*E*	*52.2*	*D*	*55.6*	*E*	*55.9*	*E*	*55.6*	*E*	*55.9*	*E*
	Northbound	*17.6*	*B*	*8.3*	*A*	*18.7*	*B*	*9.2*	*A*	*18.9*	*B*	*9.5*	*A*
	Southbound	*36.1*	*D*	*19.3*	*B*	*44.5*	*D*	*20.4*	*C*	*50.2*	*D*	*20.5*	*C*
Albemarle Street & Fort Drive	Eastbound Left	1.1	A	0.6	A	--	--	--	--	--	--	--	--
	Westbound Left	3.4	A	0.7	A	3.2	A	0.6	A	3.2	A	0.6	A
	Northbound	39.7	E	35.1	E	52.2	F	38.6	E	52.2	F	38.5	E
	Southbound	--	--	--	--	75.3	F	151.2	F	75.3	F	150.6	F
Improvement: Convert from two-way stop on north- and southbound approaches to all-way stop	***Overall***	--	--	--	--	***15.2***	***B***	***22.7***	***C***	***15.2***	***C***	***22.8***	***C***
	Eastbound	--	--	--	--	*12.9*	*B*	*30.7*	*D*	*12.9*	*B*	*30.9*	*D*
	Westbound	--	--	--	--	*19.2*	*C*	*18.8*	*C*	*19.2*	*C*	*18.8*	*C*
	Northbound	--	--	--	--	*10.7*	*B*	*12.8*	*B*	*10.7*	*B*	*12.8*	*B*
	Southbound	--	--	--	--	*11.8*	*B*	*17.8*	*C*	*11.8*	*B*	*17.8*	*C*
Nebraska Avenue & Warren Street	Eastbound	38.1	E	27.8	D	40.9	E	29.4	D	49.2	E	46.1	E
	Westbound	35.2	E	79.2	F	37.6	E	87.7	F	35.2	E	98.2	F
	Northbound Left	0.8	A	0.9	A	0.8	A	0.9	A	0.9	A	1.1	A
	Southbound Left	0.3	A	1.1	A	0.3	A	1.1	A	0.3	A	1.4	A
Improvement: Remove 2 on-street metered parking spaces along the westbound approach to create a short right-turn lane	*Eastbound*	--	--	--	--	--	--	--	--	*49.1*	*E*	*45.4*	*E*
	Westbound	--	--	--	--	--	--	--	--	*31.9*	*E*	*83.7*	*F*
	Northbound Left	--	--	--	--	--	--	--	--	*0.9*	*A*	*1.1*	*A*
	Southbound Left	--	--	--	--	--	--	--	--	*0.3*	*A*	*1.4*	*A*
Warren Street & Wisconsin Avenue	**Overall**	**10.0**	**A**	**10.8**	**B**	**10.1**	**B**	**11.9**	**B**	**10.2**	**B**	**13.5**	**B**
	Eastbound	48.2	D	51.0	D	48.2	D	51.1	D	48.0	D	48.1	D
	Westbound	100.5	F	50.2	D	100.5	F	50.2	D	100.5	F	48.8	D
	Northbound	3.8	A	11.8	B	3.9	A	13.2	B	4.1	A	15.6	B
	Southbound	5.6	A	4.9	A	6.2	A	6.6	A	6.3	A	7.1	A
Improvement: Remove 2 on-street metered parking spaces along the westbound approach to create a short left-turn lane	***Overall***	***8.6***	***A***	***10.5***	***B***	***8.7***	***B***	***11.7***	***B***	***8.8***	***B***	***13.1***	***B***
	Eastbound	*53.0*	*D*	*52.7*	*D*	*53.0*	*D*	*52.8*	*D*	*52.8*	*D*	*51.9*	*D*
	Westbound	*50.3*	*D*	*44.1*	*D*	*50.3*	*D*	*44.1*	*D*	*50.3*	*D*	*43.9*	*D*
	Northbound	*3.6*	*A*	*11.7*	*B*	*3.7*	*A*	*13.1*	*B*	*3.9*	*A*	*15.2*	*B*
	Southbound	*5.8*	*A*	*4.7*	*A*	*6.3*	*A*	*6.4*	*A*	*6.4*	*A*	*6.7*	*A*

Intersection	Approach	Existing Conditions (2010/2011)				Future without WCL (2014)				Future with WCL (2014)			
		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
Nebraska Avenue & Proposed Access to Parking Garage	Eastbound	--	--	--	--	--	--	--	--	1.0	A	0.4	A
	Northbound Left	--	--	--	--	--	--	--	--	0.0	A	9.9	A
Alternative: Change parking regulations along northbound approach during morning peak period to allow for two travel lanes	*Eastbound*	--	--	--	--	--	--	--	--	0.0	A	23.9	C
	Northbound Left	--	--	--	--	--	--	--	--	2.4	A	1.9	A
Alternative: Construct short northbound left-turn lane to handle queues of left-turning traffic	*Eastbound*	--	--	--	--	--	--	--	--	*0.0*	*A*	--	--
	Northbound Left	--	--	--	--	--	--	--	--	*3.3*	*A*	--	--

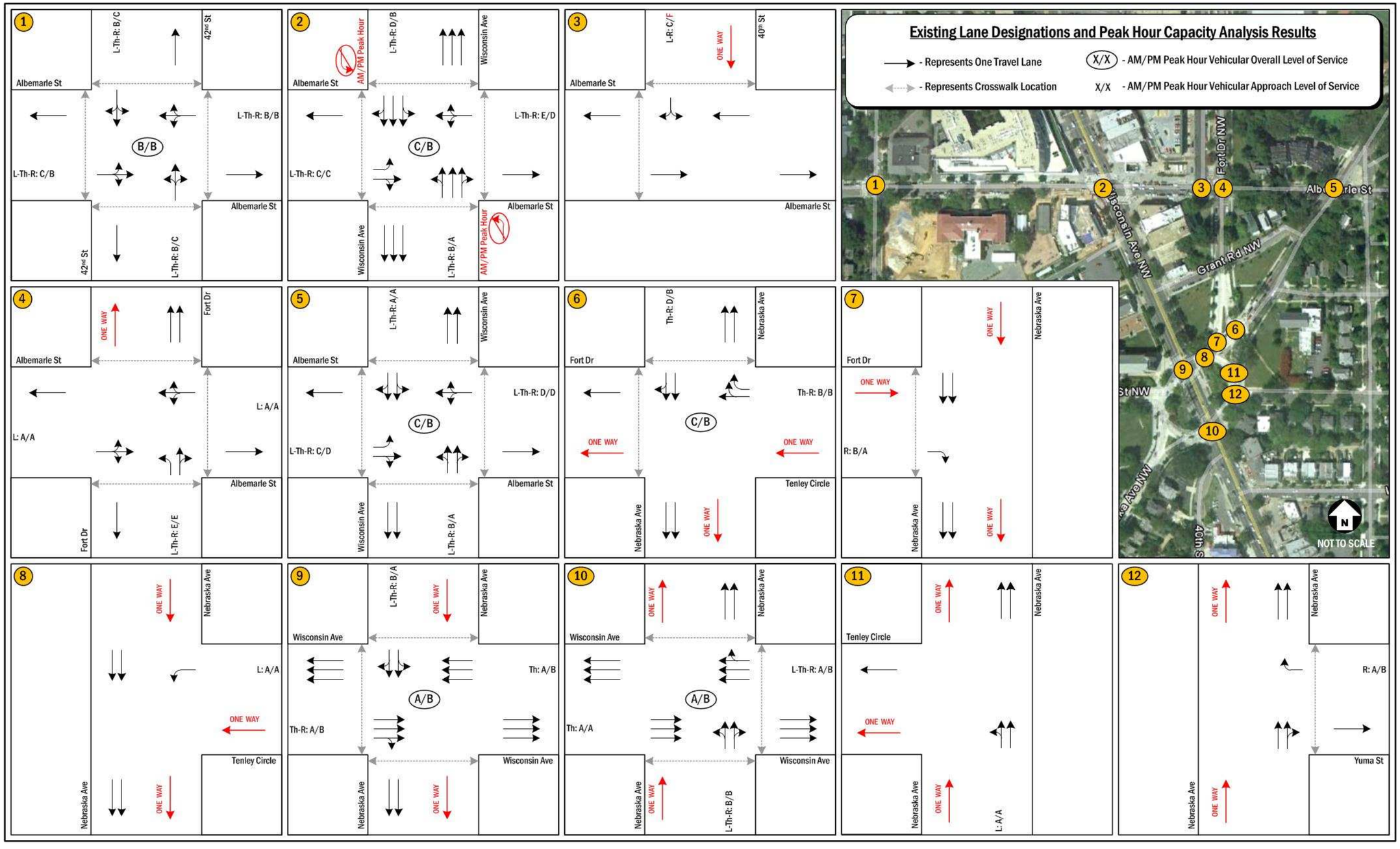

Figure 37: Existing Lane Configurations and Capacity Analysis Results (1 of 3)

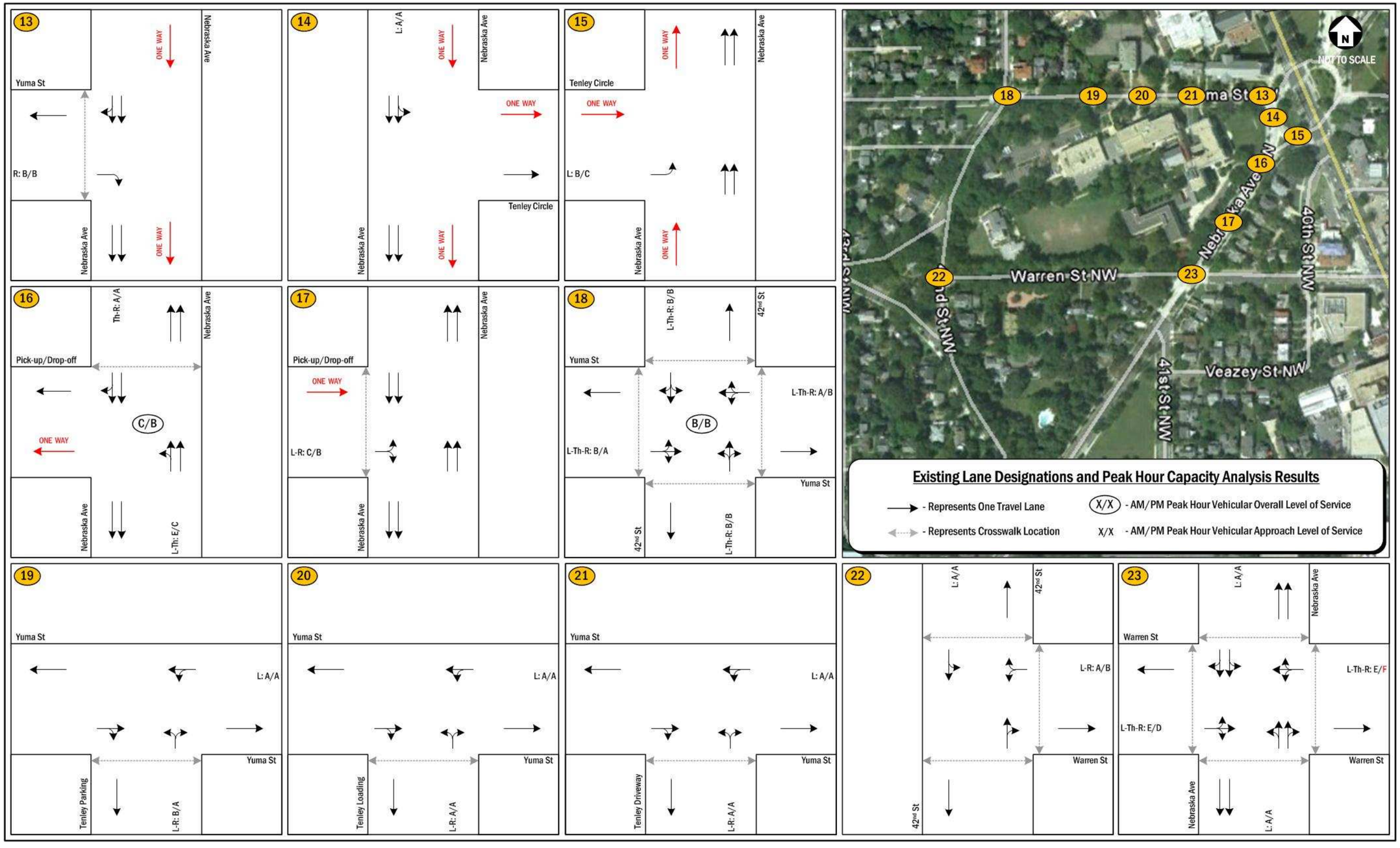

Figure 38: Existing Lane Configurations and Capacity Analysis Results (2 of 3)

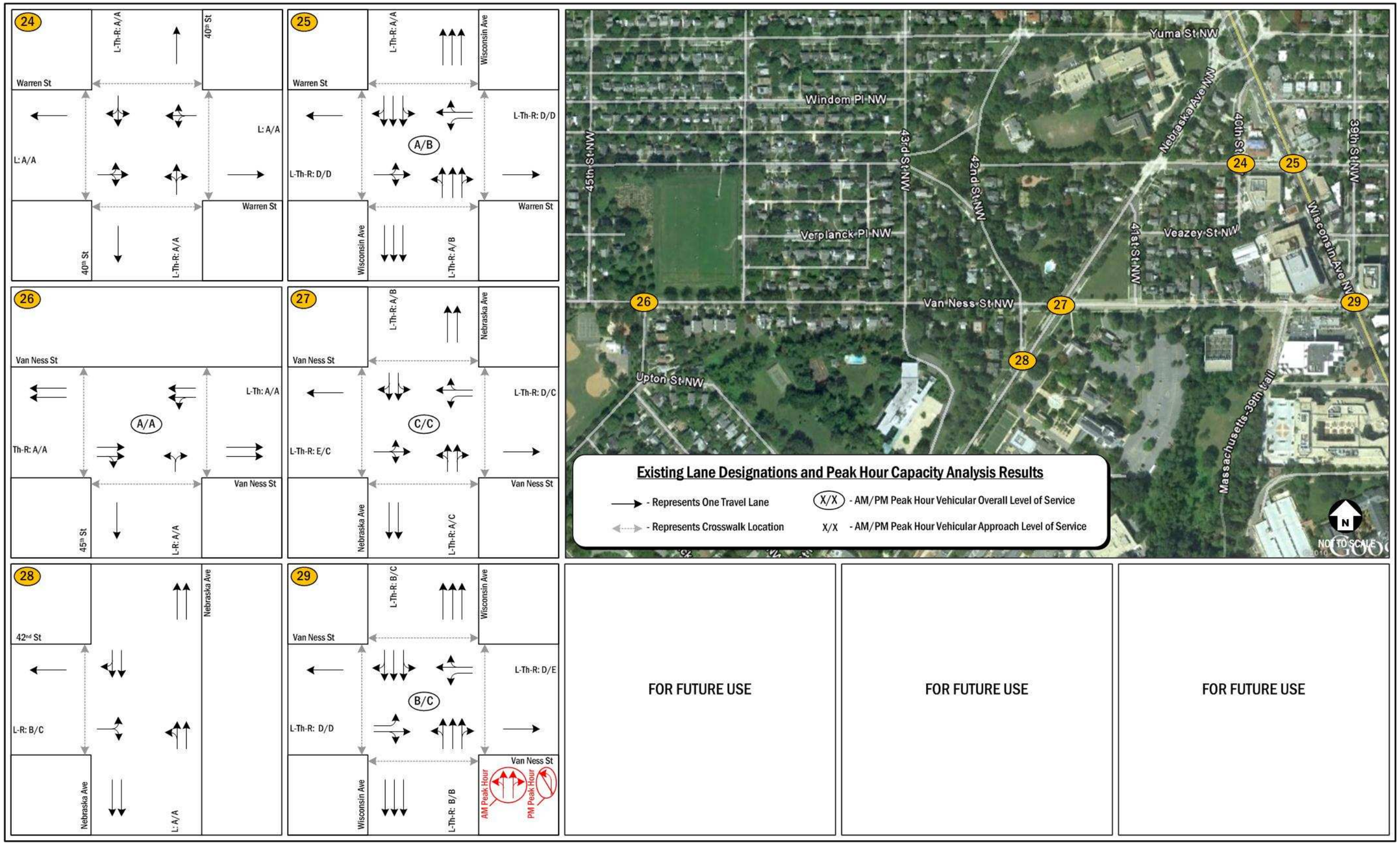

Figure 39: Existing Lane Configurations and Capacity Analysis Results (3 of 3)

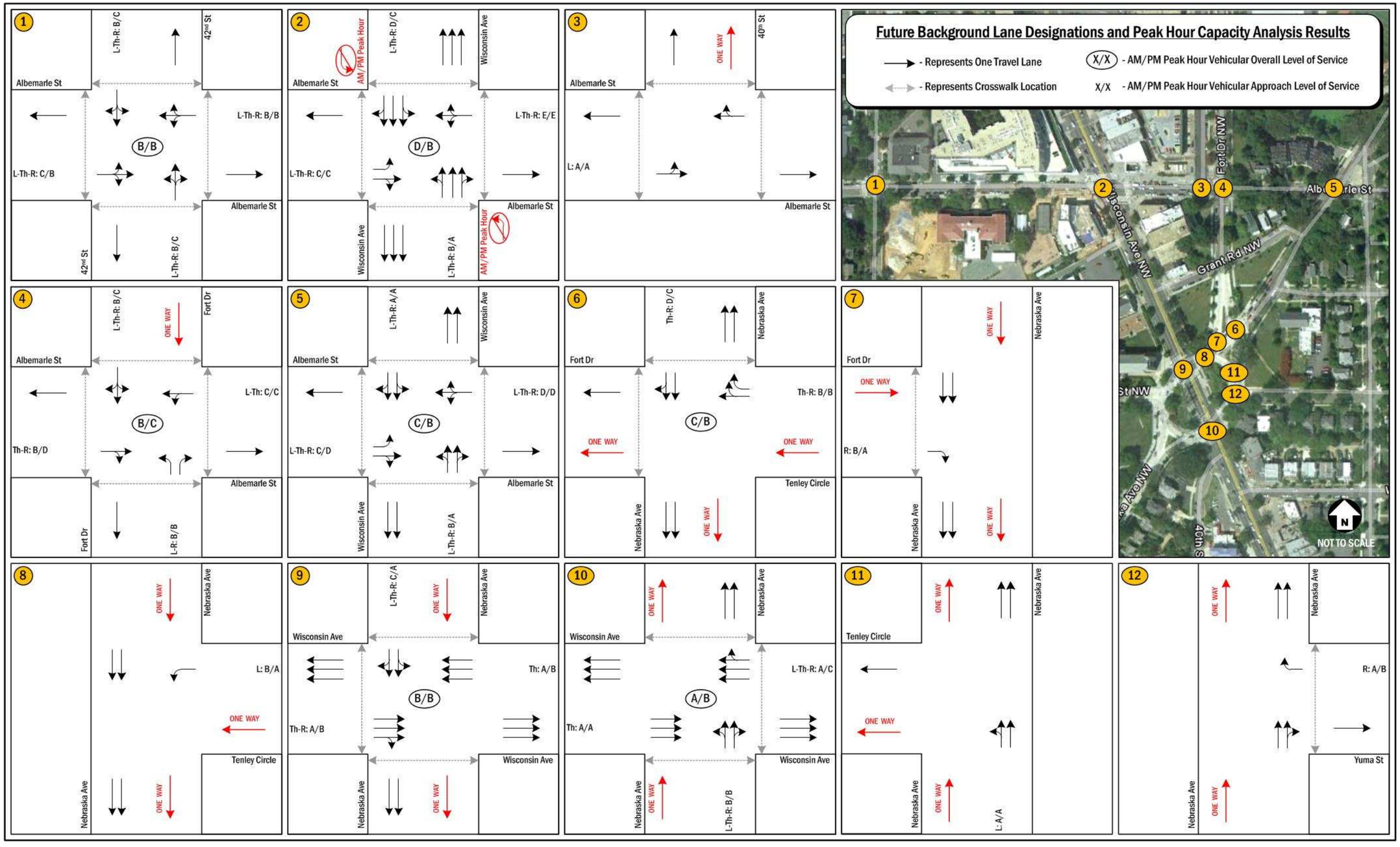

Figure 40: Future Background Lane Configurations and Capacity Analysis Results (1 of 3)

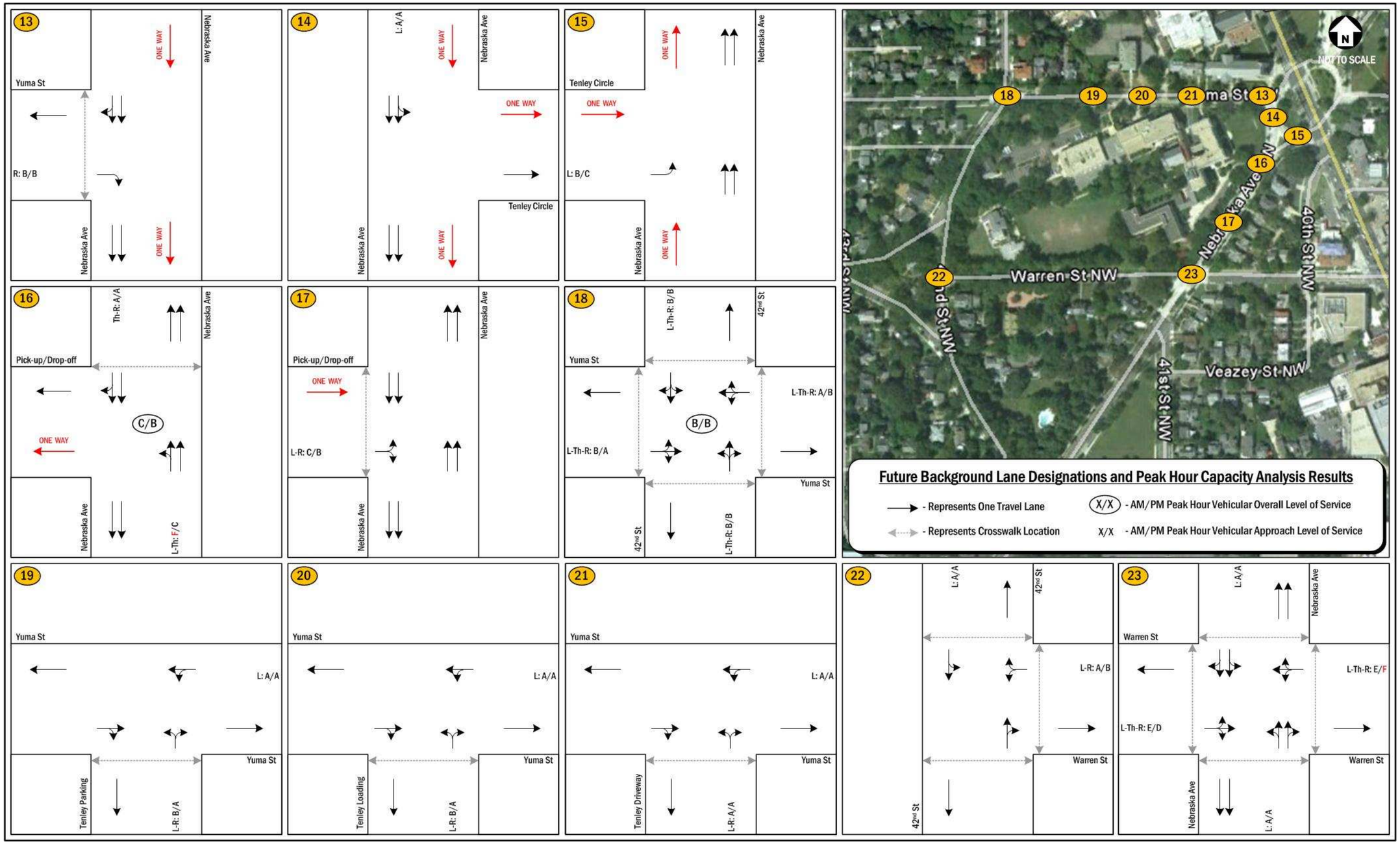

Figure 41: Future Background Lane Configurations and Capacity Analysis Results (2 of 3)

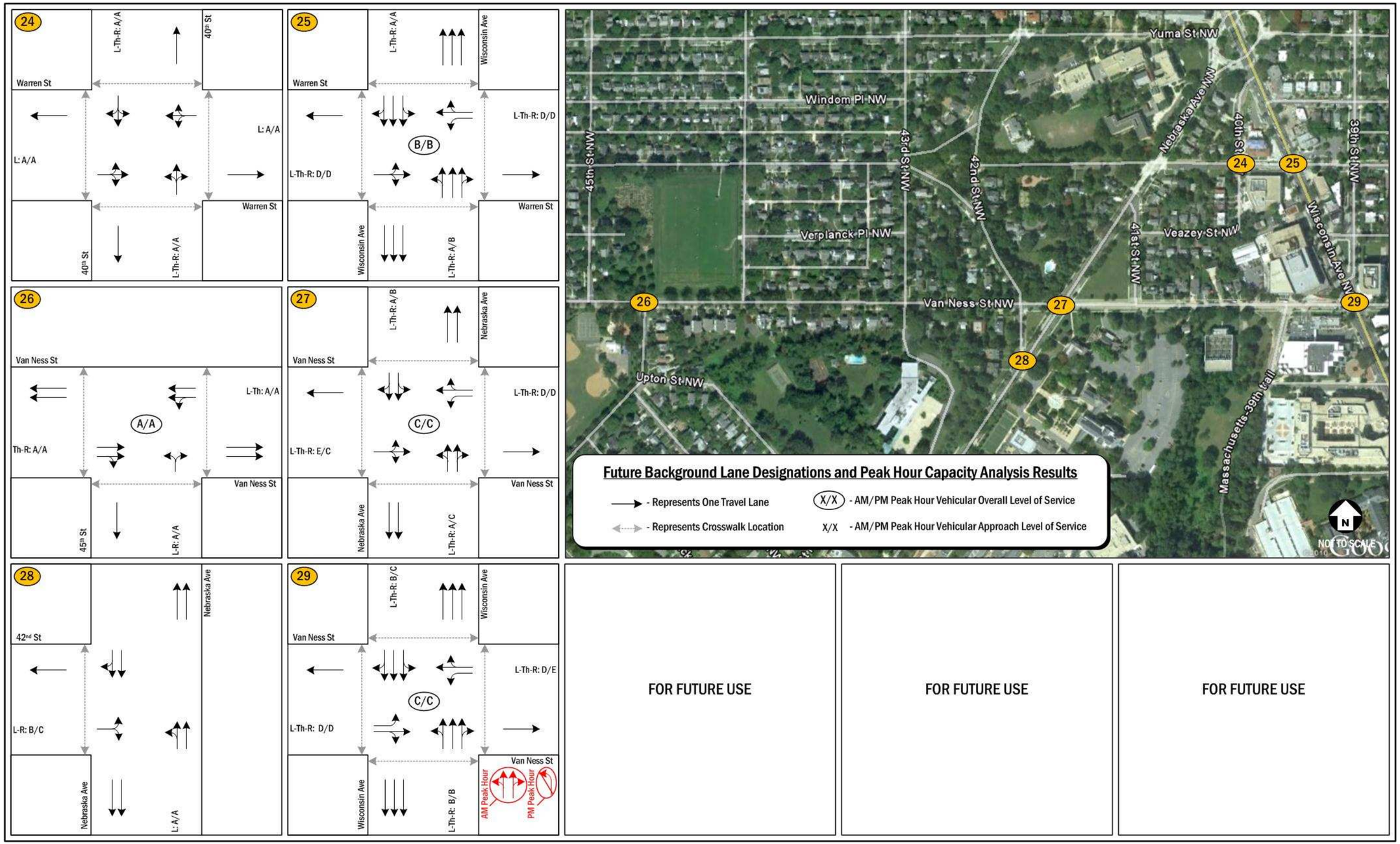

Figure 42: Future Background Lane Configurations and Capacity Analysis Results (3 of 3)

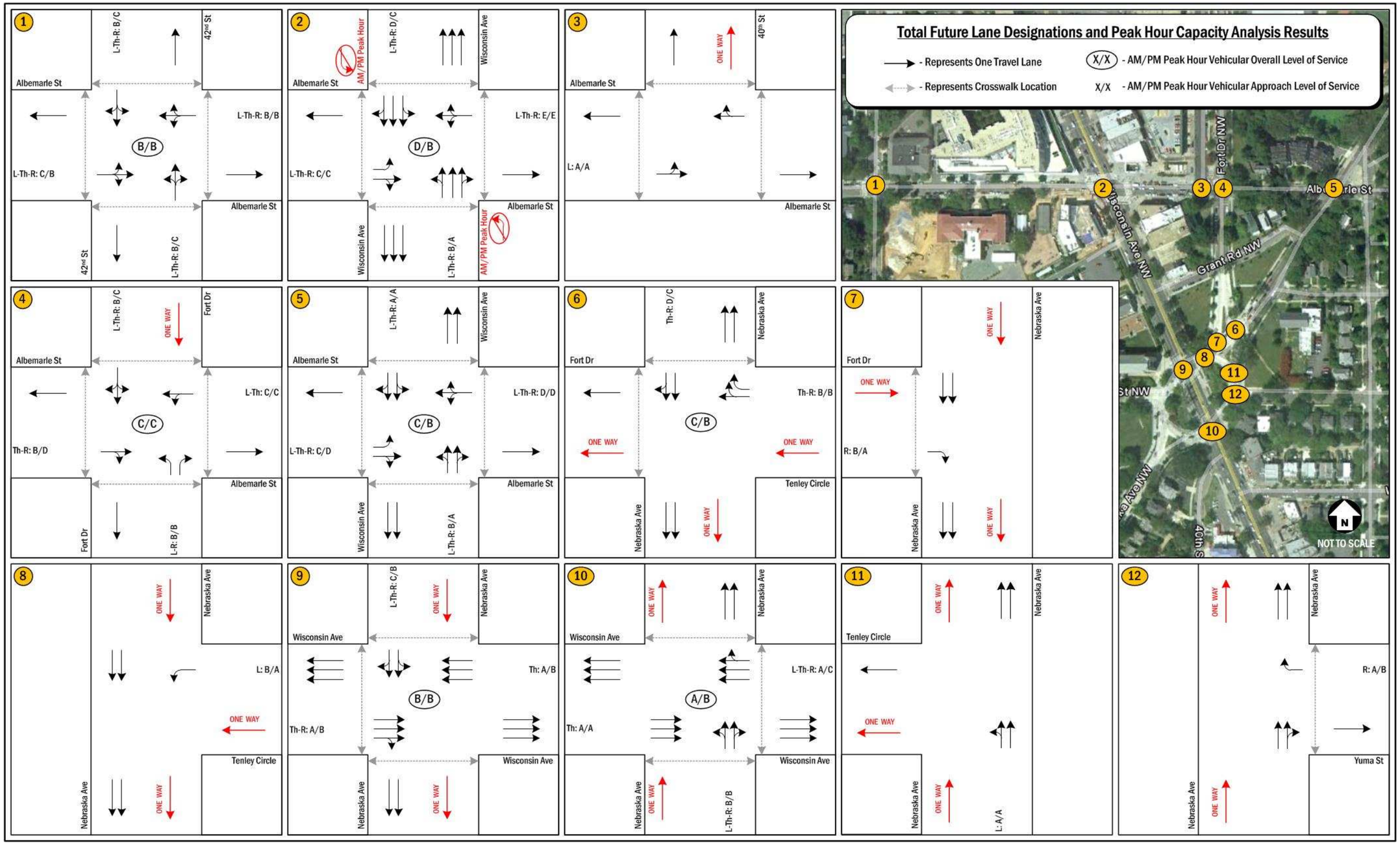

Figure 43: Total Future Lane Configurations and Capacity Analysis Results (1 of 3)

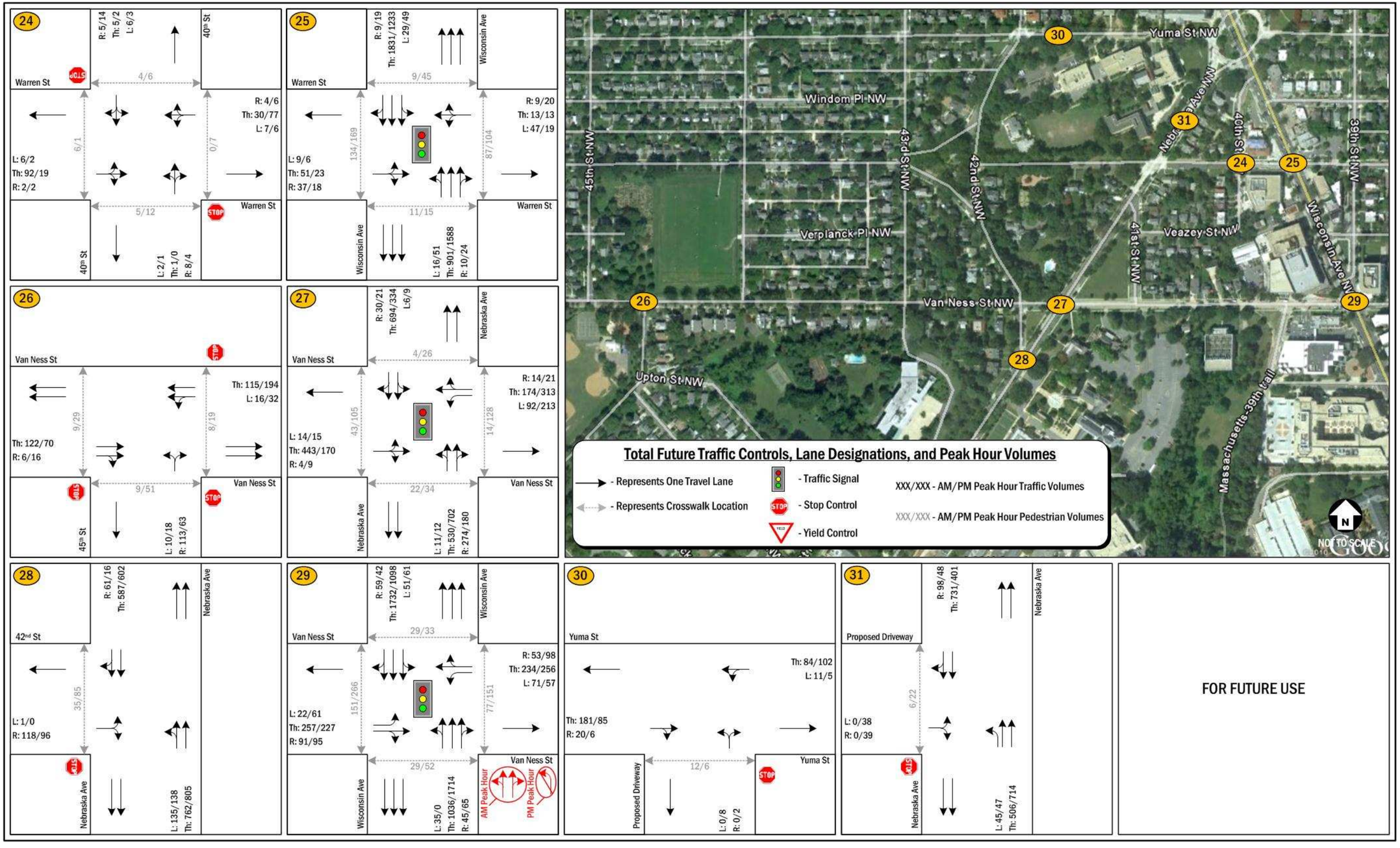

Figure 44: Total Future Lane Configurations and Capacity Analysis Results (2 of 3)

Figure 45: Total Future Lane Configurations and Capacity Analysis Results (3 of 3)

3.3 Performance of Non-Auto Modes

Because of the Tenley Campus' proximity to transit facilities relative to the existing WCL facility, it is expected that the non-auto mode share will rise with the increased convenience of bus and rail service. Enhanced pedestrian and bicycle amenities and the availability of commercial and retail establishments near the Tenleytown-AU Metro station will also increase the attractiveness of non-auto travel. This section expands on the discussions earlier in the report and reviews how non-auto modes will affect the transportation network surrounding the Tenley Campus.

The survey of WCL students, faculty, and staff that was previously discussed in Table 4 of Section 2.2.1 showed that 60% of the overall campus population chose to drive to the WCL, whether alone, by motorcycle, or as the driver of a carpool. However, the survey data also shows a significant difference in mode split between students, faculty, and staff, with only 51.2% of students choosing one of these options as their primary travel mode compared to 87.7% of the faculty and staff population. Although the assumptions made for the roadway capacity analysis were conservative and did not project a large increase in non-auto mode splits, it is likely that a change will occur and demand for these modes will increase.

3.3.1 Transit Service

The Tenley Campus is located approximately 1/5 mile away from the Tenleytown-AU Metro station (1,000 feet). In addition to hosting rail service on the WMATA Red Line, Tenleytown-AU station is also a major hub for regional express and local bus routes, as shown in Figure 5. By comparison, the existing WCL facility is located approximately 1 mile away from the nearest Metrorail station, which also happens to be Tenleytown-AU. Relocating the WCL to Tenley Campus will make travel by transit a much more attractive choice for students, faculty, and staff since transit riders will no longer be required to transfer to the AU-provided shuttle bus service in order to access the new WCL campus. It is expected that the transit mode split after the campus' relocation will be 35% for students and 20% for faculty and staff members. These percentages represent riders of Metrorail as well as local and express bus services.

When this future mode split is applied to the projected increased population at the new WCL Tenley Campus, a total of 109 AM peak hour and 97 PM peak hour transit trips are expected. The distribution of transit trip origins can be seen in Figure 46 and Figure 47. However, because Red Line Metrorail service and all bus services in the study area converge at the Tenleytown-AU Metro station, it is expected that nearly all transit trips will terminate at this location. This means that all transit riders will complete their journeys to and from the Tenley Campus on the regional sidewalk network as pedestrians, as will be discussed in Section 3.3.2.

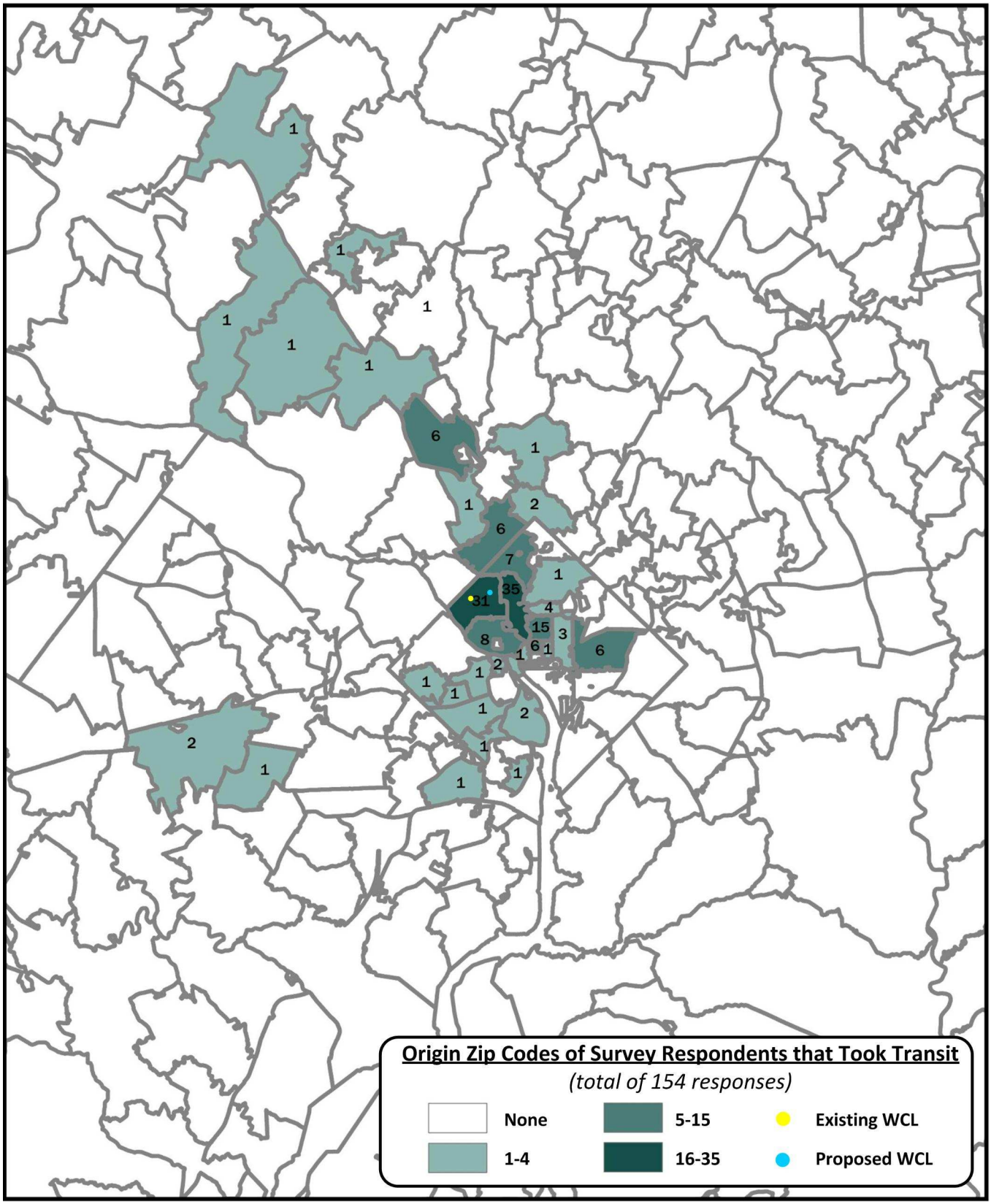

Figure 46: Transit Trip Distribution by Zip Code, Regional View

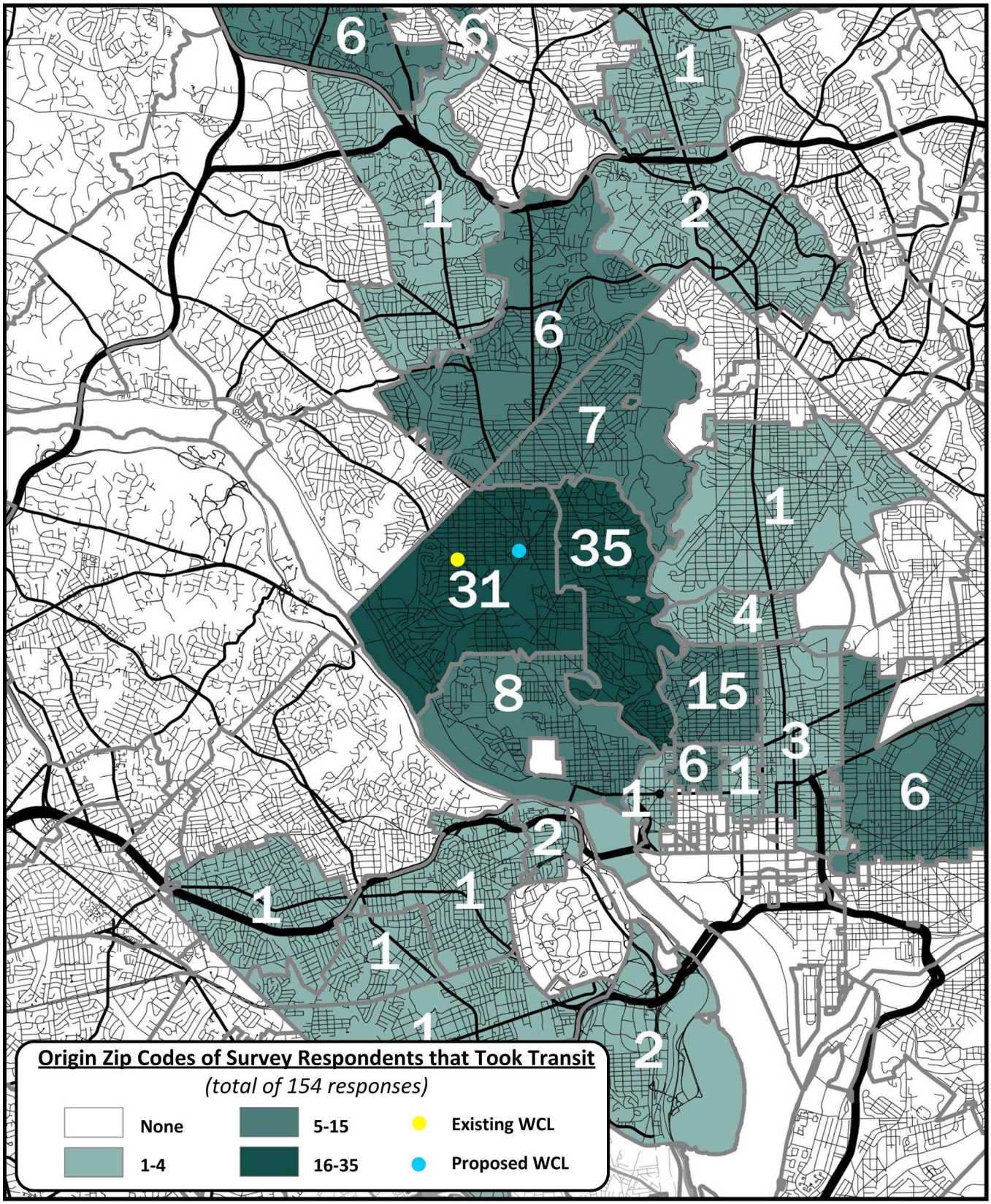

Figure 47: Transit Trip Distribution by Zip Code, Local View

Because the number of trips generated by the WCL relocation to the Tenley Campus represents a small fraction of the traffic currently served by transit modes in the vicinity, it is expected that the existing transit network should be well able to handle the increase in trips that results from the WCL expansion and modified mode split. However, as a part of the *DC's Transit Future System Plan* created by DDOT, numerous transit enhancements are planned for the District of Columbia over the coming years. Already, the area around the Tenley Campus has seen the implementation of the Wisconsin Avenue Limited Line (Route 37, shown in yellow on Figure 5), which will see further enhancement after the completion of the K Street Transitway. This route provides high-frequency service along Wisconsin Avenue and into downtown, increasing capacity and reducing delays along the popular 30s local bus lines (routes 30, 32, 34, 35, and 36). Additional transit improvements have been proposed to reduce congestion on the Metro Red Line, including increasing the minimum train length from 6 to 8 cars during peak travel periods. Because of station geometry, 8-car trains are the largest that can be served in the Metro system. However, it remains that the projected increase in site trips can be accommodated through excess capacity in existing transit services without impacting the overall performance of these networks.

3.3.2 Pedestrian Facilities

The post-relocation analysis shows a modest growth in the number of pedestrian trips. As with transit trips, this increase stems from the overall increase in population at the new Tenley Campus location with a slight alteration due to the modified pedestrian mode split. After relocation, the percentage of students and faculty/staff that walk to campus is expected to shift to by a small amount to 7% and 2%, respectively. When applied to the projected trip generation for the WCL Tenley Campus, this results in a total of 16 trips in the AM peak period and 21 trips during the PM peak period. The overall distribution of pedestrian trips to the existing WCL is shown as Figure 48. The figure shows that according to survey results, several pedestrians traveled to the campus from zip codes that are several miles away at a minimum. It is believed that some of these pedestrians chose to jog to campus and subsequently utilized on-campus shower facilities. This finding further supports the inclusion of locker and shower facilities in the proposed WCL Tenley Campus plan.

Additionally, as was noted above all transit riders will need to walk between the Tenleytown-AU station area and the Tenley Campus in order to complete their journey, resulting in a further increase of 109 AM and 97 PM peak hour trips along this 2-block section of the sidewalk network. Even with the projected high concentration of total pedestrian traffic along this corridor, it is expected that the existing sidewalk network should be well-equipped to handle these flows. Between the generous sidewalk widths and high-visibility crosswalk infrastructure present in this area, adequate capacity exists to handle the expected pedestrian traffic in a safe and efficient manner.

3.3.3 Bicycle Facilities

Bicycle trips do not represent a significant percentage of travel mode among any segment of the population. Survey data indicates that at present no faculty or staff members commute by bicycle and that only 2.5% of students ride bikes. This percentage is expected to remain largely unchanged, with the projected bicycle trip generation consisting of 7 AM peak hour trips and 2 PM peak hour trips.

Survey data indicates that the current bicycle trips to the existing WCL were generated nearby, from the local American University area as well as other neighborhoods of Northwest DC to the south and east of the Tenley Campus. The distribution of these trips, based on responses to the WCL travel survey, is shown in Figure 49. This figure shows that survey respondents chose to use ride a bicycle to campus from zip codes as far as 5 miles away, further highlighting the need for locker and showers to be included in the WCL Tenley Campus plan in addition to secure bicycle storage facilities.

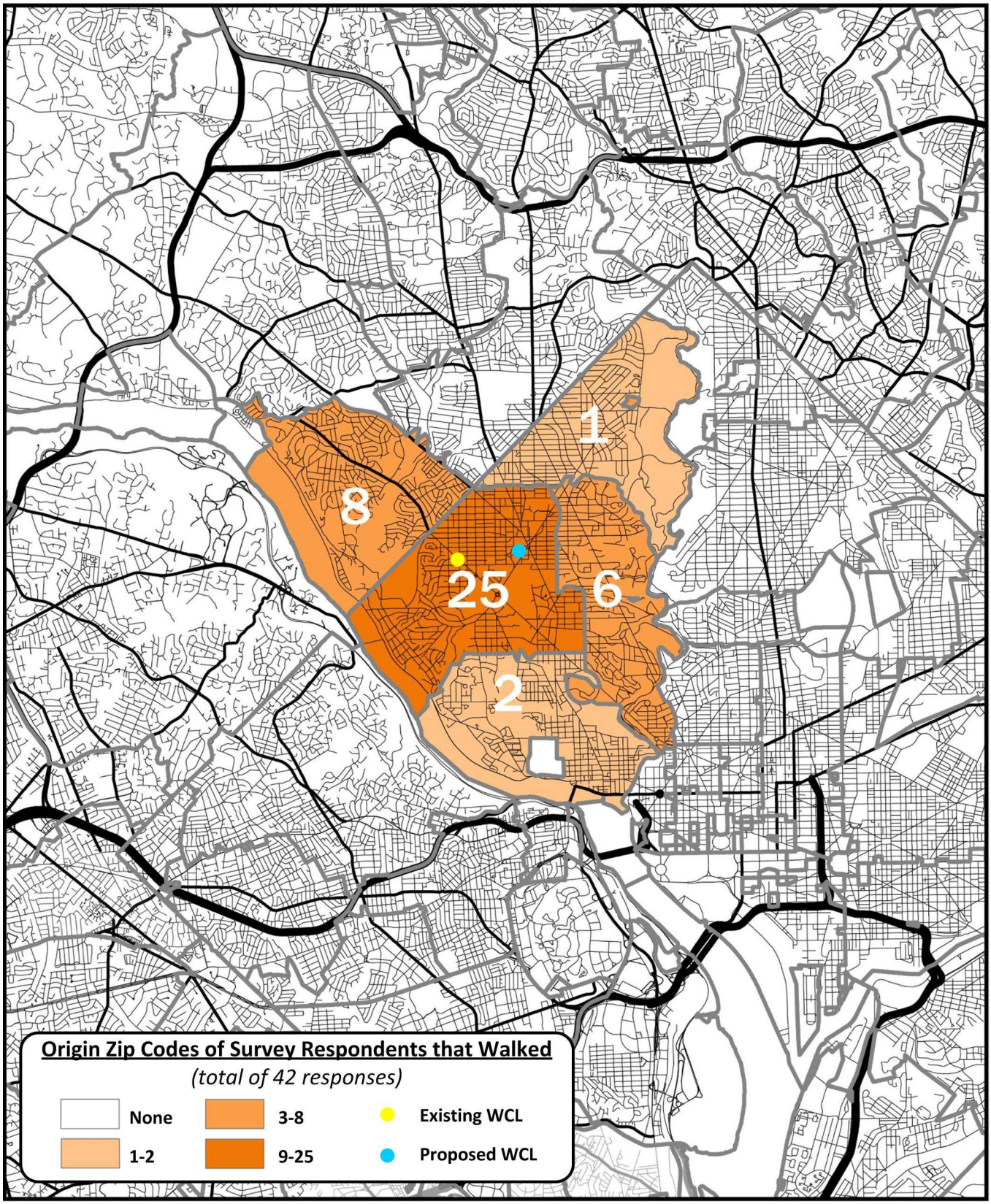

Figure 48: Pedestrian Trip Distribution by Zip Code

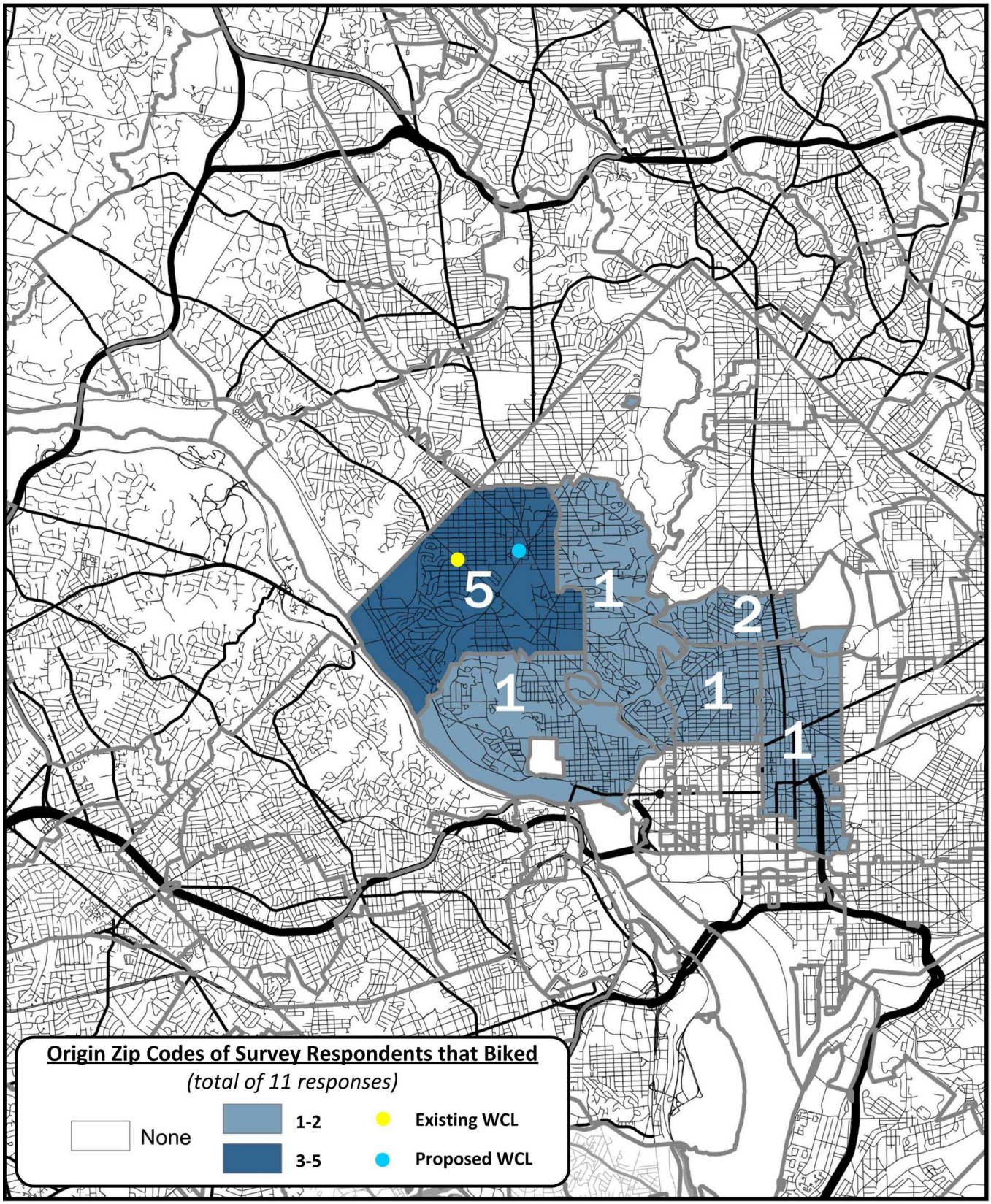

Figure 49: Bicycle Trip Distribution by Zip Code

As has been previously discussed, the proposed Tenley Campus will provide a significant improvement in long and short term bicycle storage. While there are minimal on-street bicycle lanes or other facilities present in the vicinity of the American University campuses, as shown in Figure 8, there are several signed bicycle routes in the area including several that travel along sidewalks due to the narrow nature of local thoroughfares. Improvements to these regional bicycle amenities are planned as a part of several upcoming DDOT initiatives, including the *2005 Bicycle Master Plan* and the *Rock Creek West II Livability Study*. The proposals put forward in these studies feature the creation of bicycle boulevards and bike lanes along several roadways in the vicinity of Tenley Circle as well as the addition of sharrows along several existing low-volume roadways. These future bicycle facility improvements can be found in Figure 9. Even without these improvements, the existing bicycle infrastructure is capable of adequately handling the relocated WCL bicycle traffic volumes. With the future addition of improved bicycle facilities, conditions will only improve for these cyclists.

3.4 Crash Analysis

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

3.4.1 Summary of Available Crash Data

The main source of data for this analysis is crash data statistics provided by DDOT. The study area for the crash analysis is the same set of intersection as the roadway capacity analysis. For each of these intersections, DDOT provided three years of crash statistics. In addition, the crash type information from the DDOT crash data was reviewed, to see if there is a high percentage of certain crash types. Generally, the reasons for why an intersection has a high crash rate cannot be derived from crash data, as the exact details of each crash are not represented. However, sometimes summaries of crash data can be used to develop general trends, or eliminate some possible causes. Table 12 shows a summary of the crash data, including a crash rate using the turning movement count data collected for the roadway capacity analysis.

Table 12: Summary of Study Area Intersection Crash Data

	Crash Type															
Intersection	*Right Angle*	*Left Turn (Veh)*	*Left Turn (Ped)*	*Right Turn (Veh)*	*Right Turn (Ped)*	*Rear End*	*Side Swiped*	*Head On*	*Hit Parked Veh*	*Fixed Object*	*Ran Off Road*	*Straight Hit Ped*	*Backing*	*Other*	**Total (3 years)**	**Crash Rate per MEV***
Wisconsin Ave & Albemarle Street	1	3	0	1	0	10	6	2	5	0	0	1	0	2	**31**	0.87
Albemarle Street & Fort Drive	0	1	0	0	0	0	0	0	1	0	0	0	0	0	**2**	0.20
Albemarle Street & 40th Street	1	0	0	0	1	2	1	0	2	0	0	0	0	1	**8**	1.05
Nebraska Avenue & Albemarle Street	0	1	1	1	0	2	0	0	1	0	0	0	0	0	**6**	0.32
Tenley Circle	2	3	1	1	0	5	9	1	0	0	0	0	0	1	**23**	0.53
Nebraska Avenue & Yuma Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	---
Yuma Street & 42nd Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	---
Warren Street & 42nd Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	---
Nebraska Avenue & Warren Street	1	0	0	0	0	2	1	0	1	0	0	1	0	2	**8**	0.58
Warren Street & 40th Street	0	0	0	0	0	0	2	0	0	0	0	0	1	0	**3**	2.10
Wisconsin Avenue & Warren Street	1	1	1	3	0	2	1	2	5	0	0	1	0	1	**18**	0.60
Van Ness Street & 45th Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	---
Nebraska Avenue & Van Ness Street	6	0	1	0	0	2	2	0	0	1	1	1	0	0	**14**	0.62
Van Ness Street & Wisconsin Avenue	5	2	0	0	0	2	3	0	3	0	0	0	0	3	**18**	0.48

** - Million Entering Vehicles*

The crash summary data in Table 12 shows two intersections with a Crash Rate over 1.0 crashes per million entering vehicles, which is considered a threshold for further analysis. A rate over 1.0 does not necessarily mean there is a significant problem at an intersection, but rather it is a threshold used to identify which intersections may have higher crash rates due to operational, geometric, or other issues.

3.4.2 Potential Impacts

This section reviews the two locations with existing crash rates over 1.0 MEV and reviews potential impacts of the proposed Tenley Campus.

- *Albemarle Street & 40th Street*

  There were only eight crashes within a three year period at this intersection, but the low volumes at this intersection result in a crash rate of 1.05 MEV, just over the threshold of 1.0 crashes per MEV. The types of crashes reported do not show an obvious pattern, although this intersection does have a non-standard configuration and was discussed in detail within the RCW2 Livability Study. This report does not recommend mitigation measures at this intersection, as the proposed Tenley Campus is not projected to make any of these conditions worse. In addition, the RCW2 Livability Study contains recommendations that already address some of the issues observed at this location.

- *Warren Street & 40th Street*

  There were only three crashes within a three year period at this intersection, but the low volumes at this intersection result in a crash rate of 2.10 MEV. Because of the low number of crashes at this intersection is difficult to determine the reason, although because two of the three crashes where sideswipes, this could indicate that drivers are swerving around vehicles making turns, which is a potential on the major street at a two-way stop controlled intersection without turn lanes. This report does not recommend mitigation measures at this intersection, as the proposed Tenley Campus is not projected to make any of these conditions worse.

3.5 On-Street Parking

3.5.1 Good Neighbor Program

American University employs what is known as the "Good Neighbor" program to discourage its population from parking in the surrounding community. The Good Neighbor policy for the existing WCL states:

> "In accordance with District of Columbia Zoning Order 949 and American University's Good Neighbor Policy, WCL community members and their visitors are prohibited from parking on residential streets surrounding American University's main campus, Tenley Campus, and the Washington College of Law, when engaging in a University-related activity. All WCL community members must park on University property or use public transportation when commuting to AU to engage in any University-related activity. WCL community members are responsible for informing their visitors and guests about the parking policy. Compliance with this policy is a condition of enrollment and/or employment at WCL. An electronically signed policy, see section VI, must be submitted by all accepted students prior to their arrival at WCL."

Details of the current program can be found at http://www.wcl.american.edu/facilities/policy.cfm. Current penalties for parking in the community are as follows:

- Any member of the WCL community who parks on a residential street while engaged in University related activity will receive a $75.00 fine. First offenses will NOT be waived as a warning to WCL community members.
- After the first offense, subsequent violations will be $100 instead of $75. In addition to the fines and penalties listed above, violations of this policy may result in administrative penalties, up to and including Honor Code violations and/or disciplinary action.

In order to determine the effectiveness of the program at the existing WCL, two parking counts were conducted, one on Tuesday, August 9, 2011, when the WCL was not in session, and one on Tuesday, October 4, 2011 when the WCL was in session. The counts covered a ten-minute walk surrounding the WCL, and were performed on both an afternoon (2-4pm) and evening (7-9pm). The count noted whether a parked car had a Ward 3 parking permit or not. Table 13 shows a summary of the overall occupancy of spaces; the raw data from the on-street parking counts at the existing WCL are presented in the Appendix.

Table 13: On-Street Parking Occupancy at Existing WCL

Time of Count	Percent of On-Street Spaces Occupied in 10-minute walk from WCL (total of 1,266 spaces)	
	August 9, 2011	October 14, 2011
Afternoon (2-4pm)	35.0%	38.9%
Evening (7-9pm)	38.5%	39.1%

The evening occupancy counts had almost identical results (38.5% occupied in August, 39.1% in October). Looking further at the data, the split between parked cars with Ward permits was almost the same.

The afternoon count did show different results, with 35.0% occupied in August, and 38.9% occupied in October. Examining the breakdown of cars with and without Ward 3 permits, almost all of the difference comes from cars without Ward 3 permits. There were 54 more non-Ward permit cars on-street in the October afternoon count compared to August.

The on-street parking counts show that although some members of the WCL population continue to park in violation of the Good Neighbor program, the Good Neighbor program does a good job of minimizing their impact. This report recommends extending the Good Neighbor Program to the Tenley Campus.

3.5.2 Inventory and Occupancy Counts

This section of the report summarizes an on-street parking inventory and occupancy count. The purpose of the count was to establish parking supply and demand on streets within walking distance of the Tenley Campus and identify any trends or patterns associated with neighborhood parking demand. Recommendations are presented for DDOT to consider that are intended to help minimize potential impacts from the relocation of the WCL to the Tenley Campus. The parking study was conducted across an area with walking distance of the Tenley Campus, as shown in Figure 50.

An inventory of available on-street parking facilities was conducted on Thursday, September 22, 2011 that included tabulating the number of parking spaces by block face and identifying the type of parking permitted in that area as well as any relevant parking restrictions. Mid-day and evening parking occupancy counts were conducted on the same day from 2:00-4:00 PM and 7:00-9:00 PM, respectively. Table 14 gives a summary of the inventory and occupancy results and Figure 51, Figure 52, and Figure 53 map the findings.

Table 14: Parking Inventory and Occupancy Results

Space Type	Spaces Available	Afternoon (2-4 PM)		Evening (7-9 PM)	
		Occupancy	Utilization	Occupancy	Utilization
Residential Parking Permit (Zone 3)	1,256	647	52%	539	43%
Metered	195	110	56%	144	74%
Taxi Stand / Carsharing	10	7	70%	9	90%
Open to All Vehicles	476	186	39%	191	40%
All On-Street Spaces	**1,937**	**950**	**49%**	**883**	**46%**

The parking inventory identified 1,937 on-street parking spaces within the Tenley Campus' walkshed. Of these spaces, 65% have residential parking restrictions through the DC DMV's RPP program. The RPP program is designed to provide on-street parking for local residents by limiting the number of hours that cars from other sections of the city can park in a particular ward. Within the study area, RPP spaces impose a 2-hour limit on parking between the hours of 7:00 AM and 8:30 PM unless a vehicle has a valid Zone 3 permit to prove local residency. 25% of spaces do not have RPP restrictions and are therefore open to all vehicles; however, these spaces still limit the duration that a car can park during the day. 10% of spaces within the study area are governed by parking meters with a variety of enforcement hours. Most metered spaces are located in the vicinity of the commercial developments around the Tenleytown-AU Metro station. The remainder of the on-street spaces within the parking study area are reserved for carsharing vehicles and taxis. These spaces show a much higher utilization rate than the remainder of the study area because the commercial nature of carsharing and taxi services demands that they be frequently occupied in order to provide minimal service interruptions to their patrons.

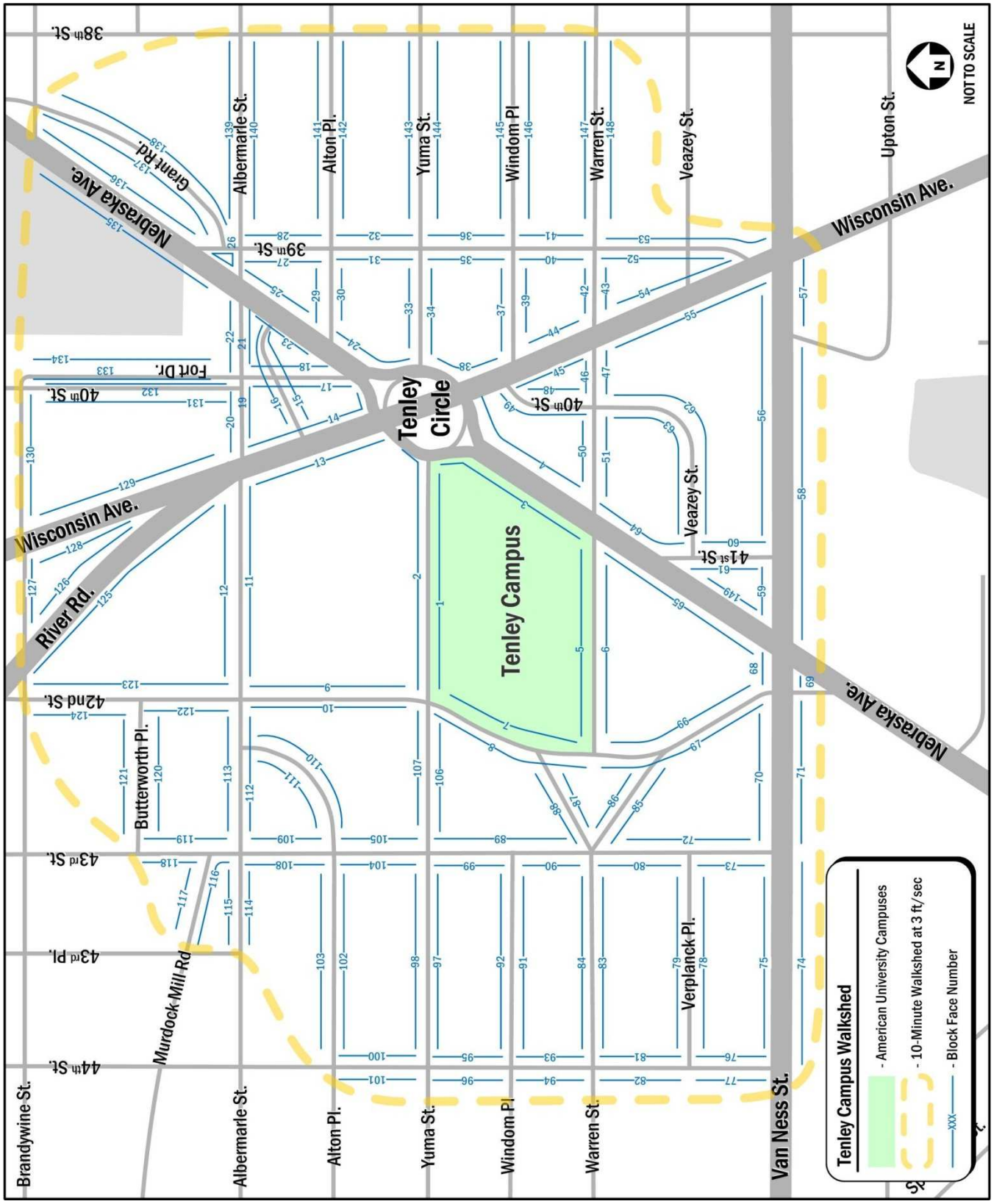

Figure 50: Tenley Campus Walkshed (including Block Face Numbering)

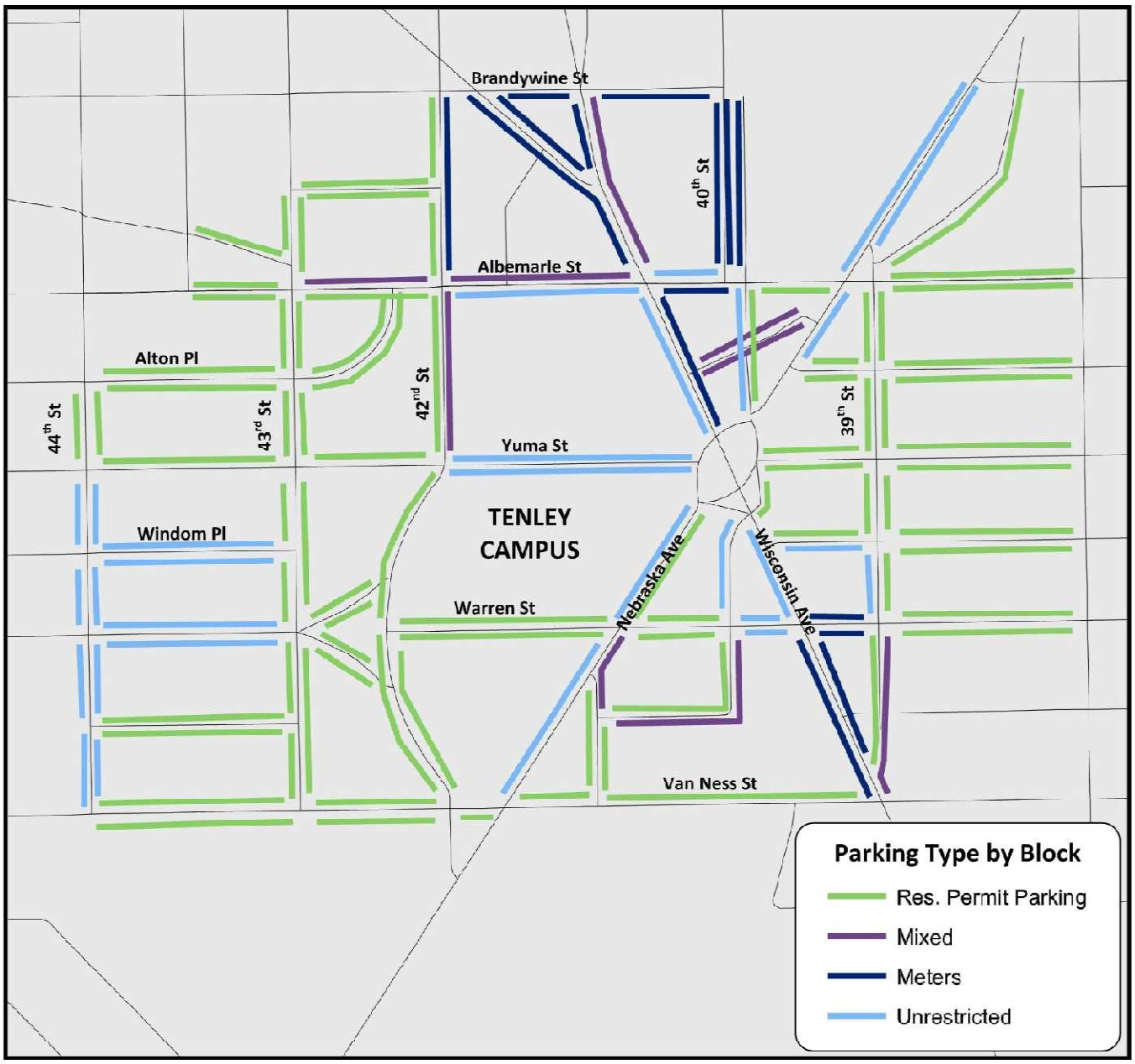

Figure 51: On-Street Parking Inventory

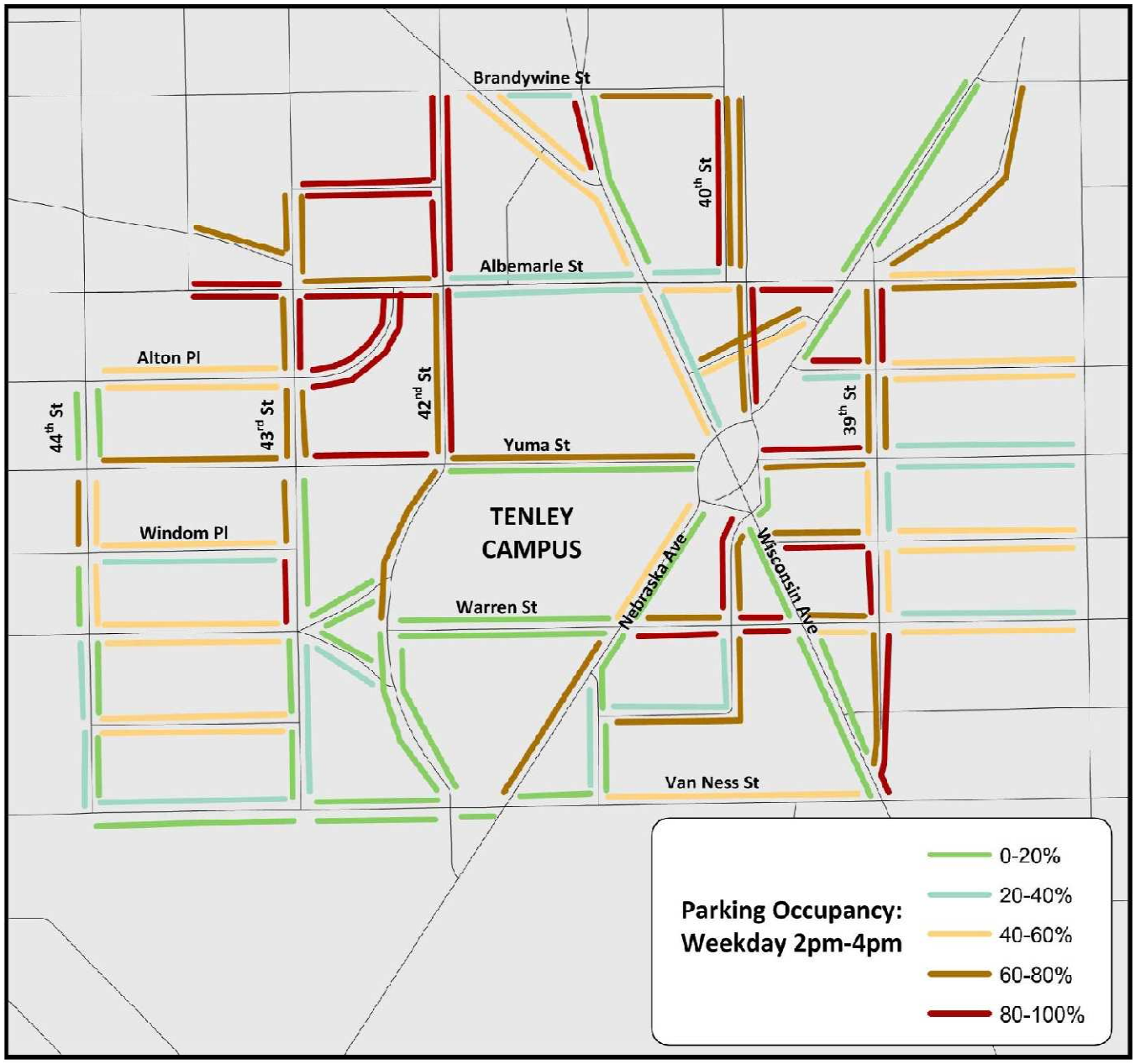

Figure 52: On-Street Parking Occupancy (2-4pm)

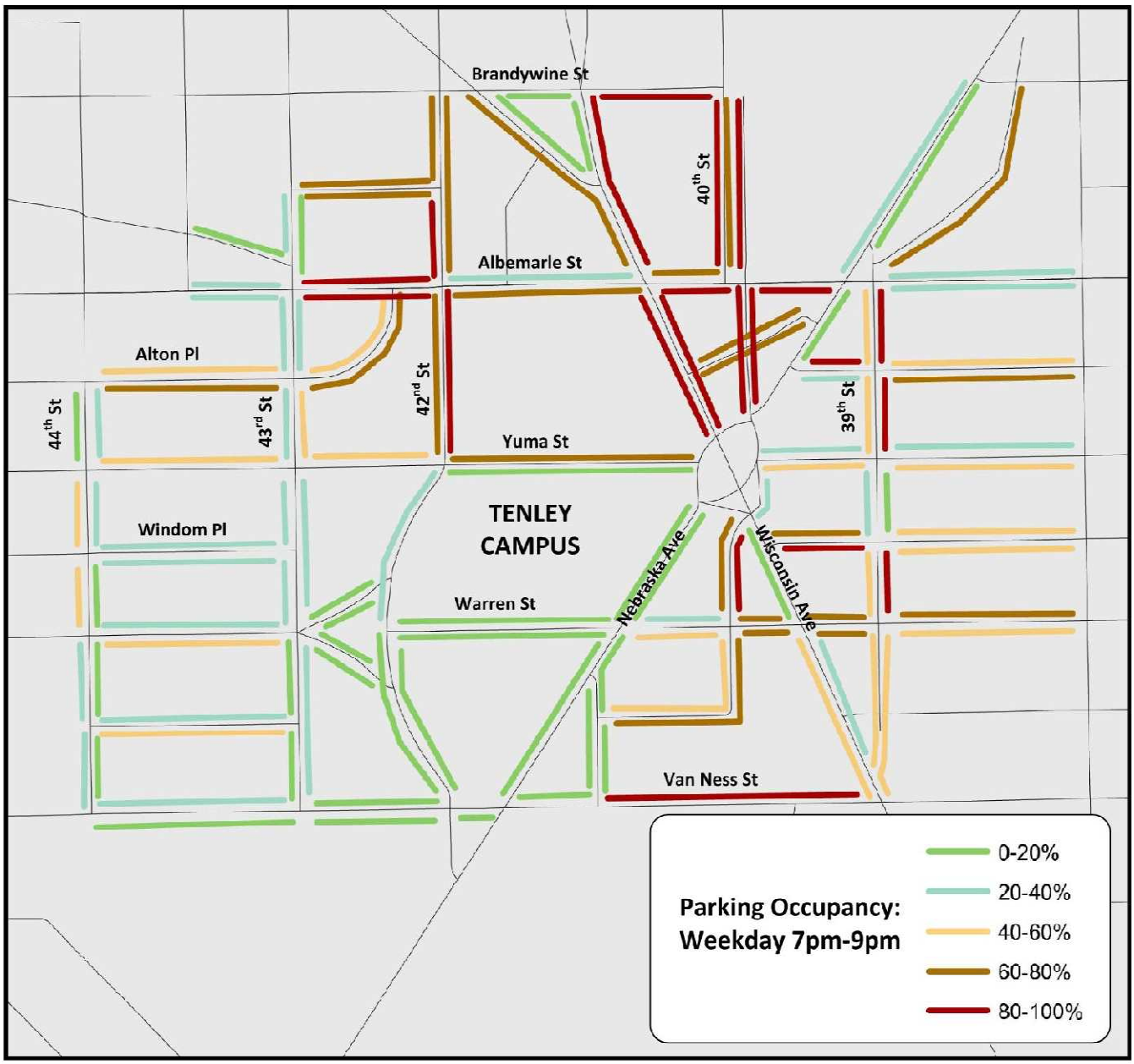

Figure 53: On-Street Parking Occupancy (7-9pm)

3.5.3 Parking Management

The WCL relocation will shift a significant number of person-trips from the existing WCL facility to the Tenley Campus. While the new location will significantly increase the attractiveness of transit, the projected mode split for the future WCL facility indicates that a number of students will still prefer to drive a private vehicle to campus. While many of these private vehicle trips will be accommodated through on-campus parking facilities, some students, faculty, and staff may consider utilizing on-street parking on the neighborhood roadway network. The occupancy data collected during the on-street parking study was analyzed and a number of proposals were developed in order to minimize the amount of site-generated traffic that uses this parking option. Several strategies to this effect are proposed below, with specific block faces identified for new restrictions in Table 15.

- *Convert Unrestricted Areas to RPP or Meters*

  The vicinity of the Tenley Campus is largely residential, and so most of the on-street parking to the south, east, and west of the Tenley campus feature RPP restrictions. However, there are several block faces in this area that do not feature residential restrictions of any type and instead allow any vehicles to park. During the parking counts, high percentages of parked non-residential vehicles – including many with out-of-District plates – were observed along these block faces. Student traffic to the WCL could potentially utilize these areas, so steps should be taken in order to discourage this practice. DDOT should consider potential mitigation measures such as:

  - Maintain unrestricted parking classification but reduce the allowed parking duration;
  - Institute Zone 3 RPP in residential zones; or
  - Install meters along commercial corridors.

  Using this methodology, the parking inventory and occupancy results were analyzed to identify specific block faces with unrestricted parking. Several regions meeting this criterion are shown in Figure 54. Additionally, Table 15 provides proposed parking restriction revisions based on the residential or commercial nature of the surrounding area on a block face-by-block face basis.

- *Extend the Effective Hours of RPP Restrictions*

  Although the majority of RPP restrictions within the study area were found to be in effect between the hours of 7:00AM and 8:30PM during the parking inventory, several block faces were observed with hours deviating from the standard. The most typical deviation was having RPP restrictions end at 4:00PM. The concern over this finding is that students and other non-residential traffic may take advantage of an early-ending RPP restriction to utilize on-street parking where it otherwise would not be permitted.

  However, further study of the deviating block faces showed that the reason the RPP restriction ended early was because of the presence of a peak-hour parking prohibition in order to provide an additional travel lane or increased safety to commuting traffic. Where applicable within the study area, PM peak hour parking restrictions last from 4:00PM to 6:30PM. Although these PM peak parking restrictions end before the RPP restrictions normally would, the parking prohibition actually has the same effect as the RPP. In the case of the all-day RPP areas, the fact that non-residential vehicles are permitted 2 hours of "grace period" parking means that an out-of-zone vehicle may arrive at 6:30 PM, use all 2 hours of free parking, and then remain parked on into the evening after the expiration of RPP restrictions. In the case of the early-ending RPP block faces, vehicles are prohibited until 6:30 but may then park for the remainder of the evening.

In this way, having RPP restrictions end at 4:00PM followed by a parking prohibition from 4:00PM to 6:30PM is functionally identical to having RPP restrictions end at 8:30 PM from the standpoint of a non-residential vehicle such as a student attending evening classes. Therefore, no action is needed to address this finding of the parking inventory and occupancy study.

- *Shorten/Eliminate RPP "Grace Period" in Areas with Saturated RPP*

  The parking inventory and occupancy study also identified several RPP areas with high utilization of available resident parking. Further analysis was conducted to determine which of these shortages was caused by an influx of non-residential traffic, defined as a total utilization of at least 80% with at least 50% of the parked vehicles coming from outside of Zone 3. Using this methodology, the regions shown in Figure 54 were identified as areas that could benefit from a modification of existing RPP restrictions. The specific block faces meeting this criterion are detailed in Table 15.

  RPP block faces that feature a high percentage of non-resident parked vehicles can be an indication that a significant amount of commercial traffic is utilizing that area instead of other designated areas like limited-term parking or meters. Depending on the level of enforcement, it is also possible that commuting traffic could be using RPP spaces despite the risk of fines or parking tickets. In either case, the overall high utilization means that the non-resident traffic is detracting from the intended use of the RPP designation. In order to counteract these effects, potential mitigation measures include the following:

  - Increase parking enforcement;
  - Shorten the grace period for Zone 3 vehicles from the existing standard of 2 hours; or
  - Eliminate the grace period entirely.

Table 15: Recommended Changes to Existing On-Street Parking Policies

Block Face (Figure 50)	Current Parking Policy	Study Finding	Proposed Parking Policy Changes
2 (east)	RPP	RPP fully utilized	Convert entire block face to RPP to ease RPP saturation
2 (west)	Unrestricted, 2-Hour Limit	15 spaces of unrestricted hourly parking directly adjacent to Tenley Campus	
3	Unrestricted - No Hourly Limit, AM Peak Prohibition	6 spaces of completely unrestricted parking directly adjacent to Tenley Campus	Parking lane will be removed as part of campus plan
6	RPP & Unrestricted, 2-Hour Limit	3 spaces of unrestricted hourly parking directly adjacent to Tenley Campus	Convert to RPP to match remainder of block face (or install meters).
9	RPP & Unrestricted, 15-Min Limit 7:30 to 9:30 AM, 2:30 to 4:30 PM	12 spaces designated for a school loading zone are unrestricted during most of the day	Install parking meters, enforce fee on unattended vehicles
13	Unrestricted+AM, School Day, PM Peak Restriction	Vehicles are illegally parking during the afternoon; parking utilization reaches 100% during the evening in 22 spaces	Increase enforcement in afternoon, install meters for evening use
17	Unrestricted, 3-Hour and 1-Hour Limit	A total of 8 unrestricted hourly parking spaces in a commercial area see high usage	Install parking meters
38	Unrestricted - No Hourly Limit, PM Peak Prohibition	7 completely unrestricted spaces in a commercial area	Install parking meters
40, 47, 49	Unrestrictred - No Hourly Limit	A total of 23 completely unrestricted spaces in residential area see heavy use	Implement RPP or impose a daytime hourly limit
46	Unrestrictred - No Hourly Limit	7 completely unrestricted spaces in residential area see heavy use	Convert to parking for fire station staff
52-53	RPP & 2-Hour Meters	A total of 10 metered spaces are heavily utilized while RPP on nearby block faces see low occupancy	Increase rates; consider converting some RPP spaces on this block face to meters
65	Unrestrictred - No Hourly Limit, AM Peak Prohibition	23 completely unrestricted spaces in close proximity to the Tenley Campus	Implement RPP or impose a daytime hourly limit
76-77, 81-84, 91-96	Unrestrictred - No Hourly Limit	A total of 187 completely unrestricted spaces in residential area see heavy use relative to the underutilized RPP on adjacent blocks	Implement RPP or impose a daytime hourly limit
112	RPP	12 RPP spaces see heavy use by non-residential traffic in the evening	Reduce grace period to discourage meter avoidance
113	RPP & Unrestricted, School Day Restriction	9 spaces with no parking during school hours see heavy evening usage by non-residents	Implement evening-only RPP
129	2-Hour Meters & Unrestricted, 2-Hour Limit, PM Peak Prohibition for all	All 13 spaces see high utilization when parking is permitted	Convert unrestricted spaces to metered spaces, raise rate to match surrounding area
133	7-Hour Meters (21), Carsharing (2), Metro Kiss-and-Ride (1)	22 spaces are allocated to kiss-and-ride usage (15-min limit) for Metro during commuter peaks and see high utilization	Increase enforcement to ensure turnover of vehicles
149	Unrestrictred - No Hourly Limit, PM Peak Prohibition	12 completely unrestricted spaces in close proximity to the Tenley Campus	Implement hourly restriction; consider adding meters since the spaces front park area instead of houses

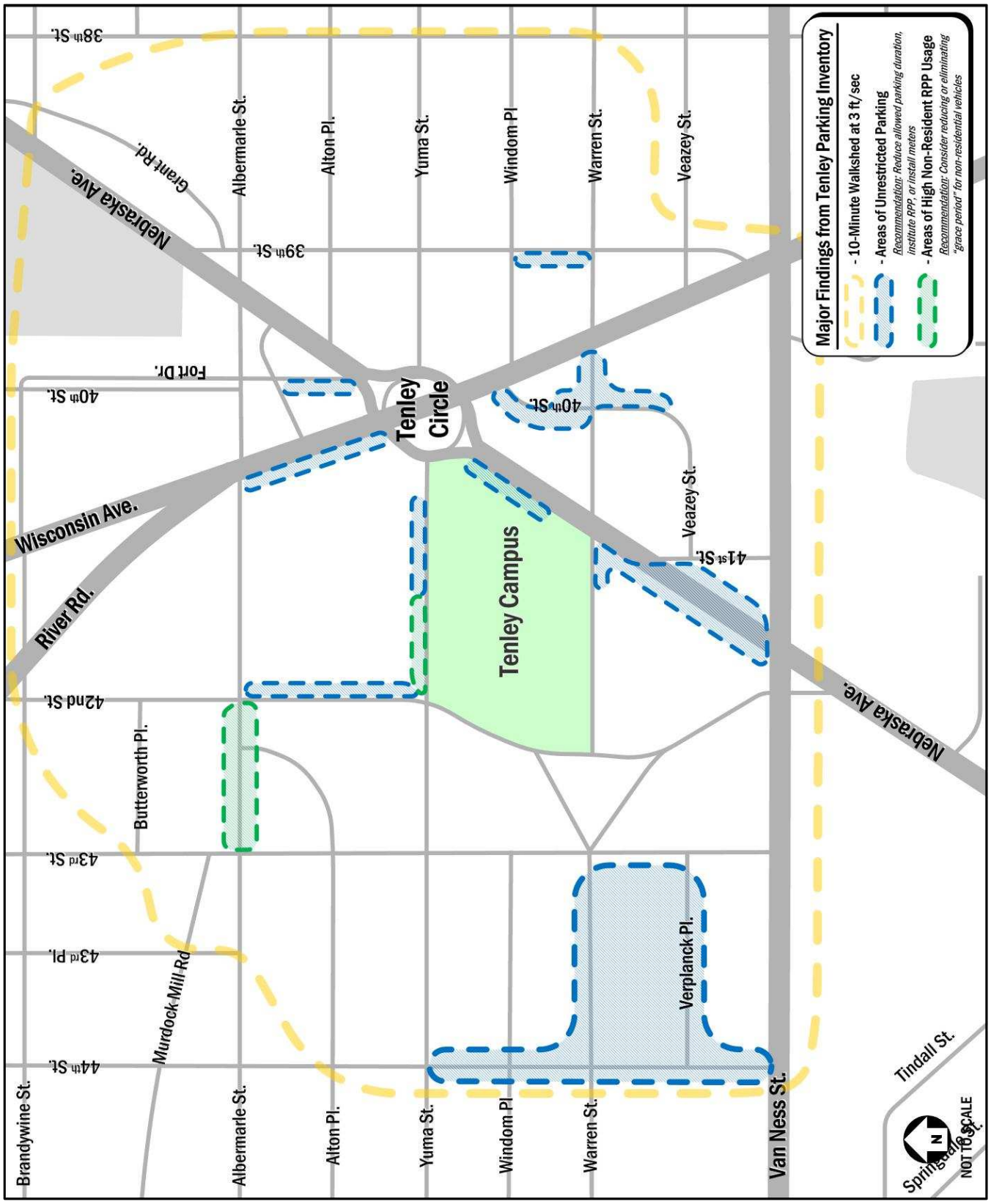

Figure 54: Major Findings from Tenley Parking Inventory