Preliminary Transportation Impact Study

American University – Tenley Campus

Washington, DC

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EXECUTIVE SUMMARY

Introduction

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 2011 Campus Plan. The specific element of the Campus Plan presented for Further Processing is the relocation of the Washington College of Law (WCL) from the intersection of 48th and Warren Streets to the American University Tenley Campus, which is located at the intersection of 42nd and Warren Streets. The relocation plan consists of creating a campus for the Washington College of Law following the demolition of some of the existing buildings and the addition of approximately 245,000 square feet of campus space in the approximate footprints of existing buildings. The Tenley Campus will consist of approximately 300,000 to 310,000 square feet of new and renovated facilities.

The following report is considered a preliminary transportation impact study. It presents information compiled during the planning efforts for the proposed 2011 Campus Plan and identifies the additional information and data that the District Department of Transportation (DDOT) has requested be included in the final transportation impact study. Consistent with recently promulgated DDOT policies, the final transportation impact study will be submitted to DDOT, the Office of Planning (OP), and the Zoning Commission at least 45 days prior to the public hearing date for this Further Processing application.

Existing Conditions

- *Transit Service*
  The Tenley Campus is directly served by Metrobus and is within walking distance of the Red Line Tenley-AU Metrorail Station. WMATA bus and rail service connects the campus with destinations throughout the District and Maryland. To encourage transit use by employees, AU operates a SmartBenefits program for employees. The SmartBenefits program provides employees with pre-tax dollars to pay for monthly transit expenses, up to $230 per month. There are no plans in place to change transit services in the near term.

- *AU Shuttle Service*
  AU provides free shuttle service between the Main Campus and the Tenley campus, existing Washington College of Law, and Tenleytown/AU Metro station. AU shuttle service is an essential transportation service provided by the University. AU provides shuttle service to reduce campus vehicle trips and parking demand. Since 1995, ridership has grown significantly and continuously, which speaks to the quality and convenience of the service provided. In 2010, AU shuttles provided approximately 1.67 million passenger trips.

- *Bicycle Facilities*
  The Tenley campus has a bike rack located at the main entrance that is frequently occupied with bicycles. Bicycle routes between the campus and major destinations in the study area, including the Main Campus, commercial uses, and transit stations, are within comfortable cycling distance. Cycling conditions are generally good, but the adjacent streets, including Nebraska and Wisconsin Avenues have narrow lane widths, high traffic volumes, and high traffic speeds, which reduces the attractiveness of bicycling. Cycling is permitted along the sidewalks in the study area and recommended by DDOT along Nebraska Avenue as result of roadway conditions.

  The DC bike-sharing system, Capital Bikeshare, has three stations located in the study area. A station is located adjacent to the Tenleytown/AU Metro station, approximately one block from the Tenleytown campus. Other stations are located along Massachusetts Avenue near Ward Circle, adjacent to the Glover Gate and along Wisconsin Avenue near Newark Street.

- *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 proximity to transit and diverse land uses allows many trips to be made by walking.

- *Roadway Capacity and Operations*
  Regional access for the Tenley Campus is provided primarily by Wisconsin Avenue and Nebraska Avenue. Local access is provided by Yuma Street, Warren Street, Van Ness Street, and 42nd Street. Site access for the Tenley Campus is provided by six driveways, which provide parking, loading, and pick-up/drop-off access. Site driveways are located on Yuma Street, which provides access to parking and service and loading facilities, and Nebraska Avenue, which provides access to a carshare space, a limited number of parking spaces, and pick-up and drop-off areas.

  Vehicle capacity analysis found that all study area intersections operate at acceptable overall levels of service during the morning and afternoon peak hours. However, the northbound approach of Fort Drive at Albemarle Street operates under unacceptable conditions during the afternoon peak period.

- *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. At the Tenley Campus, one vehicle is located in the parking lot. There are five additional vehicles available adjacent to the Tenleytown-AU Metrorail station.

Site Plan Review

This Further Processing application proposes the creation of a new home for the Washington College of Law on the Tenley Campus following the demolition of several existing buildings and the addition of approximately 245,000 square feet of campus space in the approximate footprints of existing buildings. The WCL facilities will consist of approximately 300,000 to 310,000 square feet of new and renovated facilities.

Based on a review of the redevelopment plans and the details listed above, this report concludes that the design conforms to DDOTs general polices of promoting non-automobile modes of travel and sustainability. The site promotes sustainable transportation initiatives in several ways, notably though site location. The site is a re-development parcel, located in a mixed-use neighborhood, and near many high-quality facilities for all modes of travel. The impacts to the transportation network from the people who will work, live, and visit the Tenley Campus will be minimized compared to other sites, which are not located as close to a Metrorail station and other non-automobile facilities like those on the Wisconsin Avenue corridor.

The final transportation impact study will contain additional detail and analysis on the overall transportation impacts of the project, including:

- Details on the final parking supply and access, including the parking garage access location and necessary curb cuts. This preliminary report concludes that the proposed parking garage and loading access points are in appropriate locations and can serve expected traffic demands. The details provided in the final report will address the geometry of these access points, including maneuverability and sight distance.

- The final report will revise the parking supply and demand assumptions based on any further changes to the site plan. 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 in the report and the parking supply proposed, the proposed parking at the Tenley Campus meets both of these goals;
- A final recommended TDM plan for the Tenley Campus, including locations for ZipCar and Capital Bikeshare; and
- Recommendations on changes to curbside activity, including on-street parking regulations, surrounding the campus boundary.

Roadway Analysis

Future Conditions without the Relocation of the Washington College of Law

The future conditions without the proposed 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. Traffic models of future conditions without the Tenley Campus show that, at intersections within the study area, traffic levels rise slightly but do not generate any additional capacity analysis results that exceed the threshold of acceptable conditions (compared to existing conditions).

Future Conditions with the Relocation of the Washington College of Law

Intersection capacity analyses were performed for the future conditions without the Tenley Campus redevelopment at the intersections contained within the study area during the morning and afternoon peak hours. The capacity analysis results show that:

- All of the study intersections (overall LOS grade) operate at acceptable conditions during both the morning and afternoon peak hours.
- The following approaches continue to operate with unacceptable LOS during one or more peak hours:
    - The north- and southbound approaches of Fort Drive at Albemarle Street operate under unacceptable conditions during the morning and afternoon peak period. The conversion to an all-way stop intersection, as recommended in the “Draft Environmental Impact Statement” for the NAC, will allow the intersection to operate at acceptable LOS.
    - The northbound approach of Nebraska Avenue at Tenley Circle operates under unacceptable conditions during the afternoon peak period. Adjusting the signal timings to provide more green time for the movement, as well as correcting the deficient pedestrian timing, will result in acceptable conditions for both vehicles and pedestrians.
- No new unacceptable LOS are observed after adding in traffic generated by the proposed Tenley Campus.

Conclusions and Recommendations

Based on the analyses outlined below, this report concludes that the proposed relocation of the Washington College of Law will not have an adverse impact on the local transportation network and conforms with the District's stated goals of promoting multi-modal transportation and environmental sustainability. The analyses show that no unacceptable levels of vehicular delay occur in future conditions with relocation of the Washington College of Law to the Tenley Campus.

1: INTRODUCTION & SITE REVIEW

This report presents the findings of a Preliminary Transportation Impact Study (TIS) performed for the relocation of American University's Washington College of Law 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 2011 Campus Plan. The specific element of the Campus Plan presented for Further Processing is the relocation of the Washington College of Law from the intersection of 48th and Warren Streets to the American University 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.

The following report is considered a preliminary transportation impact study. It presents information compiled during the planning efforts for the proposed 2011 Campus Plan and identifies the additional information and data that the District Department of Transportation (DDOT) has requested be included in the final transportation impact study. Specifically, Gorove/Slade Associates is undertaking the following additional analyses/data collection:

- Extended peak hour review and analysis of an additional intersection, 42nd Street and Albemarle Street (located near Janney Elementary School). The purpose of including an analysis of this additional intersection, during extended hours, is to observe morning and afternoon drop-off and pick-up operations at Janney and determine the impacts, if any, that WCL use of the Tenley Campus will have on Janney's traffic operations.
- An inventory of on-street parking within a 10-minute walk of the Tenley Campus, and an occupancy count of parking during the afternoon and evening. The purpose of this data will be to examine if changes in the on-street parking regulations surrounding the campus will need to be altered to prevent impacts to on-street parking.
- A detailed drawing of curbside conditions along the Tenley Campus property, showing details before and after construction. The purpose of these drawings will be to identify the changes to transportation infrastructure at the site, including details on items such as the proposed new curb cuts, bicycle parking locations and changes to bus stops.

The purpose of this report is to:

1. Review the transportation elements of the redevelopment plan and demonstrate that the site conforms to DDOT's general polices of promoting non-automobile modes of travel and sustainability. The Design Review section of the report covers this topic.
2. Provide information to DDOT, other agencies, and citizen groups on how the re-development of the Tenley Campus will influence the local transportation network. This report accomplishes this by identifying the potential trips generated by the site on all major modes of travel and where these trips will be distributed on the network. The Impacts Review section of the report contains this analysis.
3. Determine if redevelopment of the Tenley Campus will lead to adverse impacts on the local transportation network. This report accomplishes this by projecting future conditions with and without relocation of WCL to the

Tenley Campus, and performing an analysis of pedestrian and vehicular delays. These delays are compared to the acceptable levels of delay set by DDOT standards to determine if the site will negatively impact the study area. The report describes what improvements to the transportation network are needed to mitigate adverse impacts. The Impacts Review section of the report contains this analysis.

This report contains three sections as follows:

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

- *Design Review*
  This section provides a summary of the internal transportation features of the redevelopment. This section is meant to supplement the details provided in the site plan package contained in the further processing application.

- *Impacts Review*
  This section provides a review of the impacts redevelopment of the Tenley Campus could have to each mode within the transportation network. For each mode, and where necessary, a list of recommendations and mitigation measures are compiled.

1.1 Site Location and Major Transportation Features

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 Capacity and 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. 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 average annual weekday traffic 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 average annual weekday traffic of 20,700 vehicles. Within the limits of the study area, Nebraska Avenue runs from Van Ness Street to Tenley Circle.

- *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 42^{nd} 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 daily traffic of 8,500 vehicles. Within the limits of the study area, Van Ness Street intersects Nebraska Avenue.

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

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

Figure 1: Campus Location

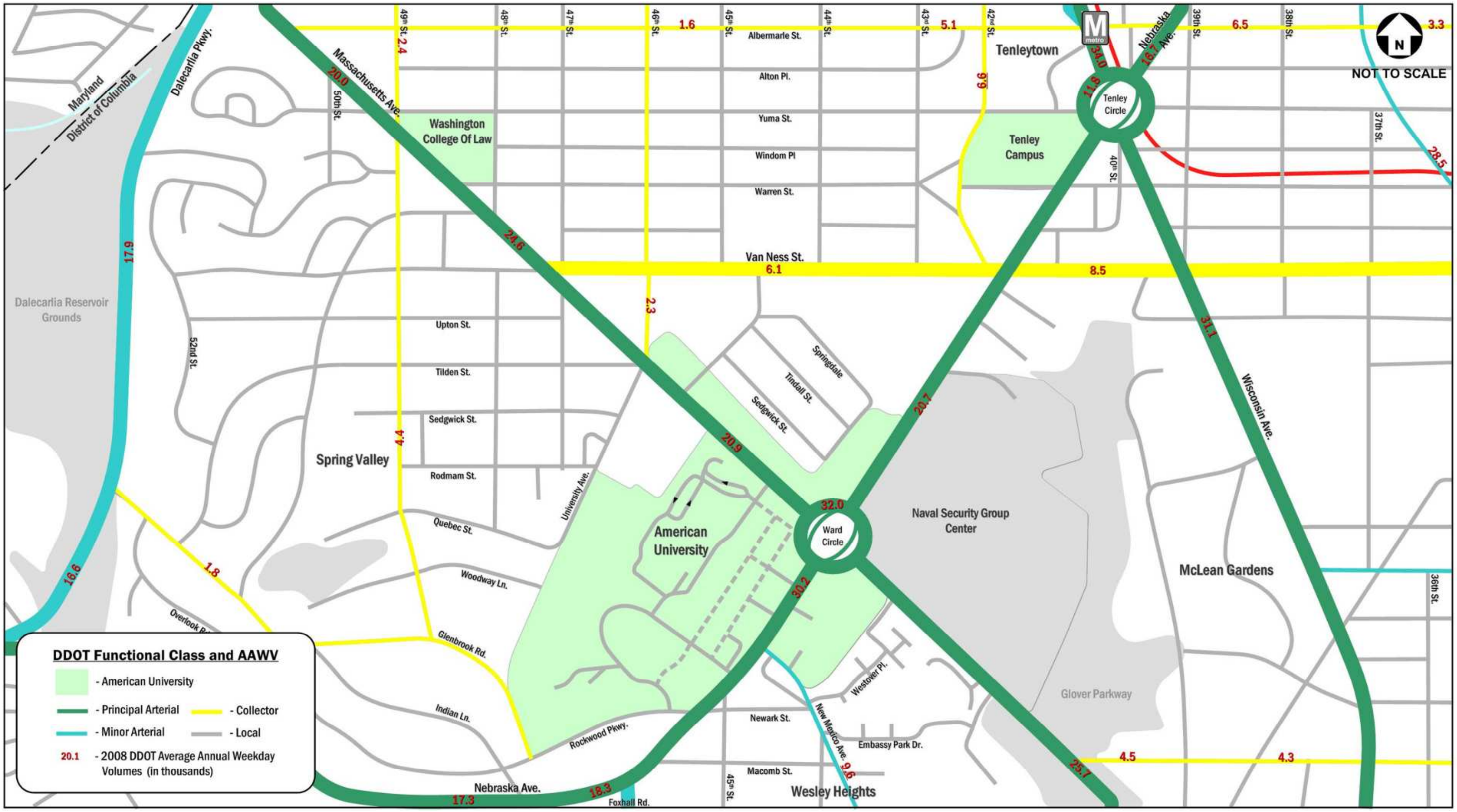

Figure 2: Roadway Classification and Average Daily Volumes

Figure 3: Existing Number of Travel Lanes

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.

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 and 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

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

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 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.

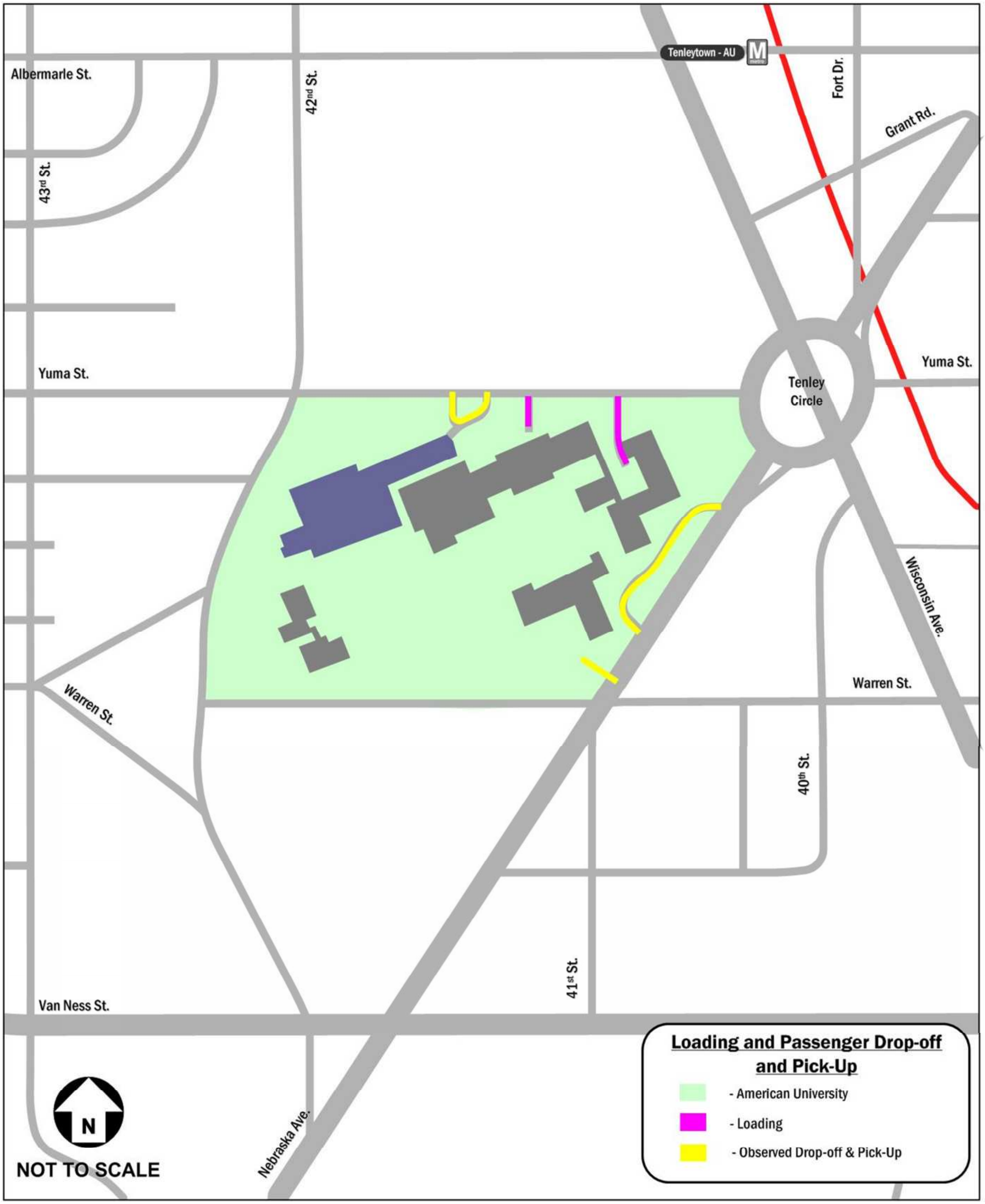

Figure 4: AU Tenley Campus Loading and Passenger Drop-off and Pick-up

	Main Campus – Metro	WCL – Metro
Days of Operation:	Mon-Sun	Mon-Sat
Headways:	5-15 minutes	15-30 minutes

Figure 5: AU Shuttle Routes and Metro Bus Stops

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 5 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 6 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.

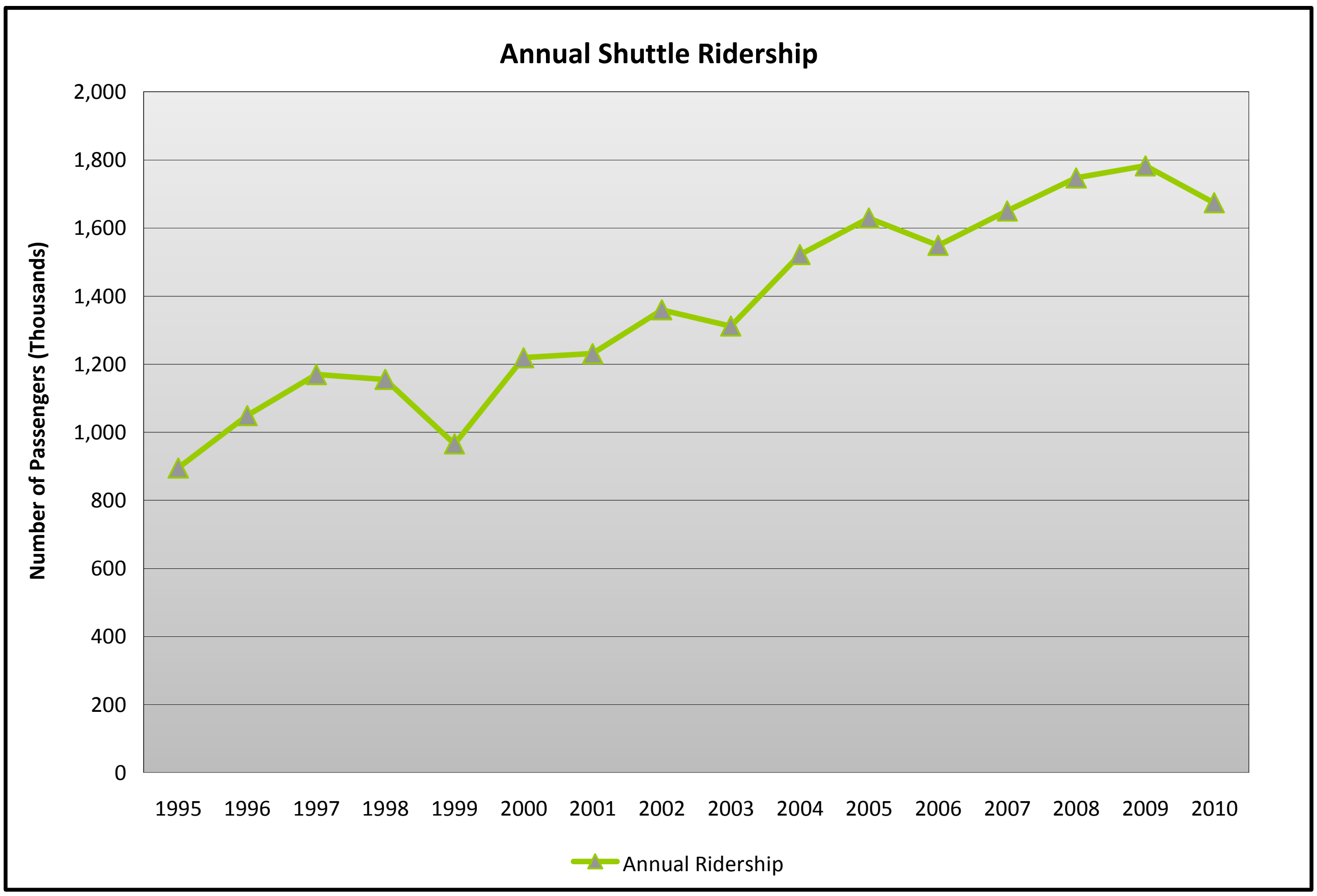

Figure 6: AU Shuttle Ridership Trends Since 1995

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.

Capital Bikeshare was launched in late September 2010 and provide bicycle sharing in the District and Northern Virginia. Capitol 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. Capitol 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 Capitol Bikeshare is currently selecting stations locations. There is not an official timeline for when potential stations will be installed, but Figure 7 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 Capitol Bikeshare to the Tenley Campus and the Main Campus to improve connectivity and mobility.

[2] Capital Bikeshare: www.capitalbikeshare.com

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 8 illustrates future and proposed bicycle conditions from the Bicycle Master Plan.

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.

Figure 7: Existing Bicycle Facilities

Figure 8: Bicycle Master Plan

1.9 Safety

To evaluate safety conditions and identify possible improvements, Gorove/Slade reviewed crash data provided by the District Department of Transportation (DDOT) for intersections within the study area, observed traffic conditions, evaluated transportation infrastructure and reviewed the findings and recommendations contained in the 2011 Rock Creek West II (RCW2) Livability Study conducted by DDOT.

This safety review did not identify any major areas of concern, but several issues and areas and opportunity were identified, including the following:

- Need for traffic calming along 42nd Street to slow travel speeds.
- Elevated accident rates at Albemarle Street and Wisconsin Avenue and at Tenley Circle.
- Need for improved pavement markings, such as crosswalks, stop bars, centerlines and parking zones in several locations throughout the study area.

DDOT's RCW2 study made the following recommendations to address transportation deficiencies in the study area:

- Reverse the one-way directionality of Fort Drive and 40th Street between Albemarle Street and Brandywine Street and address several deficiencies that impact visibility and intersection operations by installing pavement markings, relocating a u-turn lane and relocating bus and shuttle stops.
- Install traffic circles, paint center lines and parking zones and install bicycle sharrows along 42nd Street to calm traffic.
- Install curb extensions at 42nd Street and Albemarle Street and 42nd Street and Van Ness Street to calm traffic and reduce pedestrian crossing distances.

Gorove/Slade obtained and reviewed intersection crash data to determine if any study area intersections can be determined to have 'high crash' rates. DDOT provided the last three years of intersection accident data; from 2007 to 2009 (2010 data has not been compiled yet). This data set included all intersections within the study area. Table 3 lists the study area intersections, total number of accidents and the number of accidents involving pedestrians.

Table 3: Crash Data (2007 - 2009)

Intersection	Total Number of Crashes	Number of Crashes Involving Pedestrians
Albemarle & 42	5	0
Albemarle & Wisconsin	31	1
Albemarle & 40 / Fort	10	1
Yuma & 43	3	1
Yuma & 42	0	0
Tenley Circle	23	0
Warren & 43	0	0
Warren & 42	0	0
Warren & Nebraska	8	1
Warren & 40	3	0
Van Ness & 42	7	0
Van Ness & Nebraska	14	2
41 and Nebraska	0	0
42 and Nebraska	7	0

Based on the crash data, Albemarle & Wisconsin, Tenley Circle and Van Ness & Nebraska had the highest number of crashes in the study area. Additional crash information at intersections with more than 10 accidents are provided below, including time of day, type of accident and number of injuries:

- *Albemarle & Wisconsin*
  Majority occurred during afternoon and evening (75%), 10 rear ends, 6 sideswipes, 5 collisions with parked vehicles, 3 as result of turns and 7 other; and 7 injuries.

- *Tenley Circle*
  Majority occurred during afternoon and evening (74%); 9 sideswipes, 5 rear ends, 5 as result of turns and 4 other; and 14 injuries.

- *Van Ness & Nebraska*
  Majority occurred during morning (58%); 6 right angel accidents, 2 rear ends, 2 sideswipes and 4 other; and 11 injuries.

- *Albemarle & 40 / Fort*
  Majority occurred during afternoon and evening (62%); there was no dominant type of accident; and 2 injuries.

Based on the information available, there is not a dominant type or cause of accidents that would clearly indicate mitigation measures to reduce the number of accidents. Elevated crash rates at Albemarle Street and Wisconsin Avenue and at Tenley Circle may warrant additional analysis to determine the need for additional safety measures. This analysis would also help place the amount of crashes in perspective compared to how much traffic passes through an intersection.

Table 4 provides detailed information on pedestrian crashes in the study area. The data does not indicate a dominant type or cause of pedestrian accidents that would clearly indicate mitigation measures to reduce the number of accidents.

Table 4: Pedestrian Crash Data

Intersection	Date of Crash	Time of Day	Type of Crash	# of injured persons	Type of Collision
Tenley Circle	Tuesday, November 13, 2007	7:56 PM	Injury	1	Left Turn Hit Ped.
Van Ness & Nebraska	Thursday, October 09, 2008	12:01 PM	Injury	1	Straight Hit Ped.
Van Ness & Nebraska	Tuesday, December 16, 2008	7:18 PM	Injury	1	Left Turn hit Ped.
Warren & Nebraska	Tuesday, April 17, 2007	3:20 PM	Pedestrian	1	Straight Hit Ped.
Albemarle & 40	Thursday, October 23, 2008	4:20 PM	Prop. Damage	1	Right Turn Hit Ped.
Albemarle & Wisconsin	Thursday, March 06, 2008	7:50 PM	Injury	1	Straight Hit Ped.

1.10 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 Campuses, 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 5 shows the reported issues, the final recommendations, and the impacts expected from the proposed changes.

Table 5: 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.

Location	Reported Issue	Final Recommendation (12/2010)	Expected Impacts
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.
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 Section 3.2.8 of this report, the proposed driveway for the Tenley Campus is projected to operate under acceptable conditions during the morning and afternoon peak hours. A detailed drawing showing the configuration of the driveway, including the northbound left turn, will be included in the final transportation impact study.

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. Truck maneuvering diagrams to and from the loading docks will be included in the final transportation impact study.

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 exceeds demand and strictly enforces parking restrictions on the residential streets surrounding AU. The Tenley campus 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 6 shows the mode split results. Table 7 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.

Table 6: 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 7: 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%**

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 9 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.

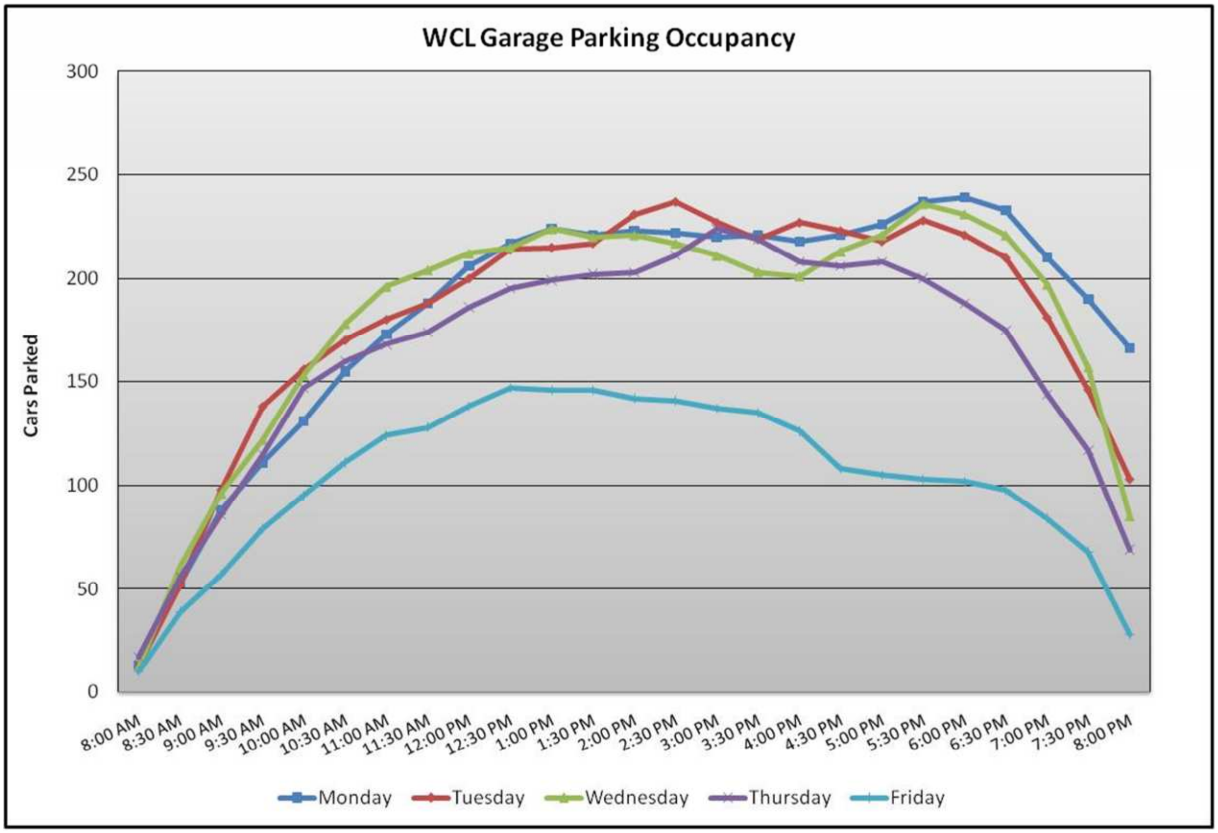

Figure 9: Average Parking Accumulation in WCL Garage

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 10 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.

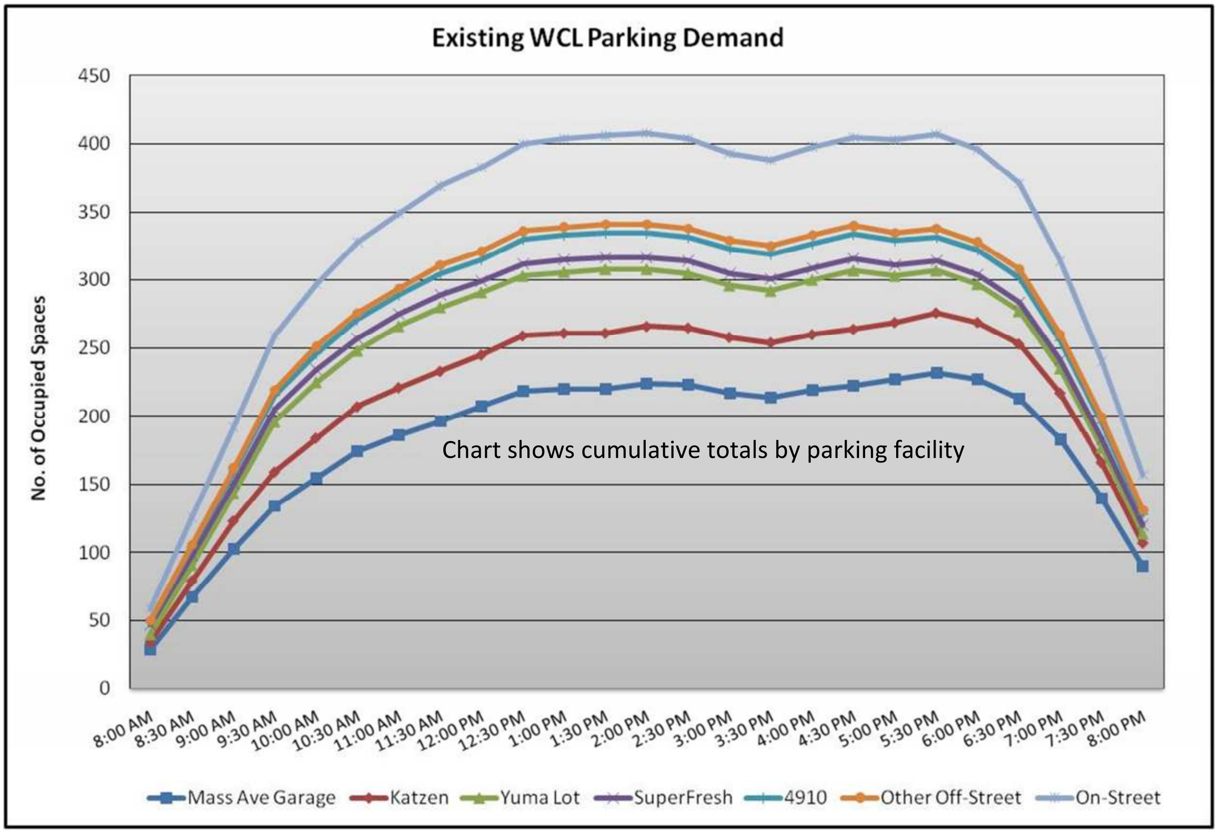

Figure 10: Existing WCL Total Parking Demand

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 8 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 8 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 8: 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. Non-typical demand, such as demand generated by larger than normal events can be accommodated through the demand in excess of 400 spaces, whether it is supplied on the Tenley Campus or the Main 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

This section of the report will be updated in the final transportation impact study. It will include details on the short and long term bicycling parking provided on site, the provision of shower facilities, the recommended location for a new Capital Bikeshare station, and a discussion of pedestrian facilities within the site property including connections to path to and from the site.

The current plans for the Tenley Campus include the construction of 100 to 125 long-term secured and enclosed bicycle parking spaces and 40 short-term bicycle parking spaces. As part of the Campus Plan, AU will provide funds for a Capitol Bikeshare station on the Tenley Campus.

2.4 Transportation Demand Management

This section of the report will be revised in the final study, to include specific TDM recommendations for the Tenley Campus. Presented below are the TDM commitments contained within the 2011 Campus Plan.

2.4.1 Transportation Demand Management Commitments

This section reviews the Transportation Demand Management (TDM) commitments that were included in the 2011 Plan.

- 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 continue the Good Neighbor Policy directed at limiting campus population use of neighborhood on-street parking.
- AU will continue to provide discounts to carpoolers and ride-matching services (Zimride), and will extend preferred parking spaces to registered carpools.
- AU will maintain the Zipcar spaces currently on the Nebraska Avenue parking lot and Tenley campus during construction, and ensure their replacement on campus after construction.
- 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 150 long-term secured and enclosed bicycle parking spaces, and 50 short-term bicycle parking spaces meeting DDOT standards on the East Campus. The use of these spaces will be monitored, and the numbers increased if the average weekday use is over 85%.
- AU will construct 30 long-term secured and enclosed bicycle parking spaces, and 10 short-term bicycle parking spaces meeting DDOT standards at Nebraska Hall. The use of these spaces will be monitored, and the numbers increased if the average weekday use is over 85%.
- AU will construct 100 to 125 long-term secured and enclosed bicycle parking spaces, and 40 short-term bicycle parking spaces meeting DDOT standards on the Tenley Campus. The use of these spaces will be monitored, and the numbers increased if the average weekday use is over 85%.
- AU will provide the funds for two Capitol Bikeshare stations, to be located on the Main or Tenley campus.
- AU will become a corporate member of Capital Bikeshare to provide memberships to employees at discounted rates.
- AU will work with DDOT and provide the funds necessary to expand the sidewalks on the northern side of Nebraska Avenue adjacent to campus to provide an off-street cycling facility, as recommended in the Transportation Report.

3: IMPACTS REVIEW

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

- To provide information to 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.

This section of the report will be updated in the final transportation impact study. The final transportation impact study will include more detail on projected bicycle and transit trips generated by the proposed Tenley Campus, and the roadway capacity analyses will be updated based on the final design plans for the Tenley Campus.

3.1 Site Transportation Demand

The impact of the proposed changes to the Tenley Campus was based on changes to vehicular and pedestrian traffic generated on the campus. Vehicular trips were generated based on changes due to changes in parking. In order to provide a conservative analysis, it was assumed that the upper limit of potential parking (500 spaces)[3] would be built on the Tenley Campus.

First, the existing trips on the Tenley Campus were removed from the surrounding roadway network, and then the new proposed WCL garage trips were added. In order to determine the trips removed from the Tenley Campus, a trip generation rate was estimated based on existing (2010) driveway counts at the University Gates (Glover Gate on Massachusetts Avenue, Tilden Gate on Rockwood Parkway, and Nebraska Avenue Lot on Nebraska and New Mexico Avenues) and on trip generation rates used in the *Transportation Analysis of the SIS Parking Facility* performed by HNTB in March 2005. This trip generation rate was assumed to be 0.30 trips per space during the morning peak hour (0.25 inbound and 0.05 outbound) and 0.50 trips per space during the afternoon peak hour (0.20 inbound and 0.30 outbound).

In order to determine the future trips generated by 500 parking spaces, the trip generation rate for the WCL was estimated based on existing survey data collected by Gorove/Slade on April 13, 2010. The online-survey was distributed to the WCL population to determine the existing mode split of the WCL and the locations utilized for parking by each of the user types. As shown previously, the results showed that over half of the WCL students who responded to the survey utilize modes such as Metrorail and walking, instead of driving alone. Table 9 shows the mode split data obtained for the WCL.

The survey also recorded arrival and departure times for the WCL, which were used to determine the trip generation rates for the future Tenley Campus. This trip generation rate was assumed to be 0.30 trips per space during the morning peak hour (0.25 inbound and 0.05 outbound) and 0.30 trips per space during the afternoon peak hour (0.10 inbound and 0.20 outbound). Table 10 shows the existing trips removed, the future WCL trips added, and the net gain of trips in the study area.

[3] This analysis was conducted prior to the decision to reduce the upper limit of spaces from 500 to 450.

In addition to vehicular trips, the proposed 2011 Plan for the Tenley Campus will generate additional pedestrian trips. Pedestrian trips will be generated by the increase in student and faculty/staff populations. These pedestrian trips would be generated by pedestrians walking from the Tenleytown-AU Metrorail station, from adjacent Metrobus stops, and from adjacent neighborhoods. These pedestrian trips were estimated using the mode split data obtained from the survey, shown previously in Table 9. Table 11 shows the pedestrian trips added to the Tenley Campus.

Table 9: Washington College of Law Mode Split Data

Mode	Students	Adjunct Faculty	Faculty	Staff
Walk	10%	0%	3%	1%
Bike	3%	0%	0%	0%
Drive Alone	35%	70%	75%	55%
Scooter/Motorcycle	2%	5%	2%	0%
Drive Carpool	4%	5%	0%	7%
Carpool Rider/Dropped Off	5%	0%	0%	7%
Metrorail & AU Shuttle	28%	15%	15%	20%
Metrobus	13%	5%	5%	10%
Total	100.0%	100.0%	100.0%	100.0%

Table 10: Net New Vehicular Trips

Source	Size	Net Trips			
		AM Peak Hour		*PM Peak Hour*	
		In	Out	In	Out
Existing Trips Removed (2010)	79 Spaces	20	4	16	24
Future WCL Trips Added (2020)	500 Spaces	125	25	50	100
Total	**421 Spaces**	**105**	**21**	**34**	**76**

The pedestrian trips shown in Table 11 were distributed through the study area based on their assumed arrival location and the location of the WCL entrance along Yuma Street west of Tenley Circle. It was assumed that all Metrorail trips would originate from the north and cross Yuma Street at Tenley Circle, with some pedestrians crossing Wisconsin Avenue as well. Metrobus trips would primarily arrive from the north, approximately 75 percent, and cross Yuma Street at Tenley Circle. The remainder, approximately 25 percent, would arrive from the south and cross Nebraska Avenue at the pedestrian signal at Tenley Circle. Walking trips would primarily arrive from the north, approximately 75 percent, and cross Yuma Street at Tenley Circle, with some pedestrians crossing Wisconsin Avenue as well. The remainder, approximately 25 percent, would arrive from the south and cross Nebraska Avenue at Warren Street, with some pedestrians crossing Nebraska Avenue as well. These splits are shown in Table 11, as well as the resulting pedestrian trips added to each crosswalk.

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 University and adding the site-generated vehicular and pedestrian volumes generated by the WCL to the future without the 2011 Plan traffic volumes. The future traffic volumes with the proposed development on the Tenley Campus are shown on Figure 37, Figure 38, Figure 39, Figure 40, and Figure 41 for the morning peak hour and Figure 42, Figure 43, Figure 44, Figure 45, and Figure 46 for the afternoon peak hour.

Table 11: Pedestrian Trips Added

Source	Percentage	Number	Mode	AM Peak Hour	PM Peak Hour
Students	30%	600	Metrorail	180	180
	15%	300	Metrobus	90	90
	10%	200	Walking	60	60
Faculty/Staff	15%	75	Metrorail	23	23
	5%	25	Metrobus	8	8
	5%	25	Walking	8	8
Total				**369**	**369**
Crossing Yuma St at Tenley Circle (Western Crosswalk)				323	323
Crossing Wisconsin Ave at Tenley Circle (Northern Crosswalk)				75	75
Crossing Nebraska Ave at Tenley Circle (Pedestrian Crosswalk)				23	23
Crossing Warren St at Nebraska Ave (Western Crosswalk)				13	13
Crossing Warren St at Nebraska Ave (Eastern Crosswalk)				10	10
Crossing Nebraska Ave at Warren St (Northern Crosswalk)				10	10

Note: Pedestrian trips added to study area greater than the total pedestrian trips generated as several pedestrian trips will travel through multiple crosswalks.

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, approximately 12 intersections were chosen for analysis. The following intersections were selected for analysis:

1. Wisconsin Avenue and Albemarle Street
2. Albemarle Street and 40th Street
3. Albemarle Street and Fort Drive
4. Nebraska Avenue & Fort Drive/Tenley Circle
5. 42nd Street and Yuma Street
6. 42nd Street and Warrant Street
7. 42nd Street and Albemarle Street (as discussed above, this intersection was added at the request of DDOT)
8. Nebraska Avenue and Warren Street
9. Van Ness Street and 45th Street
10. Nebraska Avenue and Van Ness Street
11. Nebraska Avenue and 42nd Street
12. Wisconsin Avenue and Van Ness Street

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 3:00 to 7:00 PM on Thursday, September 23, 2010 and Tuesday, September 28, 2010. 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. Peak hour traffic volumes are shown on Figure 11 through Figure 15.

3.2.2 Existing Vehicular Capacity Analysis

Intersection capacity analyses were performed for the existing conditions 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 existing LOS capacity analyses were based on: (1) the existing lane use and traffic controls; (2) the peak hour turning movement volumes; 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 12 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 16. The capacity analysis results are also shown on Figure 17, Figure 18, Figure 19, Figure 20, and Figure 21. The capacity analyses results indicate that all study area intersections operate at acceptable levels of service during both the morning and afternoon peak hours.

Table 12: Existing Vehicular Levels of Service

Intersection	Approach	Existing Conditions (2010)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
Wisconsin Ave & Albemarle St	**Overall**	**28.9**	**C**	**21.0**	**C**
	Eastbound	26.1	C	24.1	E
	Westbound	60.9	E	62.3	B
	Westbound	32.3	C	16.4	B
	Southbound	23.2	C	15.8	B
Albemarle St & 40th St	Southbound	17.5	C	47.6	E
Albemarle St & Fort Dr	Eastbound Left	1.1	A	1.1	A
	Westbound Left	3.4	A	0.7	A
	Northbound	44.3	E	54.6	F
Tenley Circle:					
A: Nebraska Ave & Fort Dr/Tenley Circle	**Overall**	**29.8**	**C**	**24.0**	**C**
	Westbound	15.0	B	13.9	B
	Southbound	42.4	D	37.8	D
B: Nebraska Ave & Fort Dr	Eastbound Right	10.2	B	9.3	A

Intersection	Approach	Existing Conditions (2010)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
C: Nebraska Ave & Tenley Circle	Westbound Left	9.7	A	9.4	A
D: Nebraska Ave & Wisconsin Ave	**Overall**	**18.5**	**B**	**5.8**	**A**
	Eastbound	19.9	B	6.2	A
	Westbound	4.0	A	2.9	A
	Southbound	30.4	C	11.5	B
E: Nebraska Ave & Wisconsin Ave	**Overall**	**10.8**	**B**	**33.0**	**C**
	Eastbound	3.1	A	3.8	A
	Westbound	12.2	B	24.0	C
	Northbound	28.2	C	79.0	E
F: Nebraska Ave & Yuma St	Westbound Right	9.4	A	10.0	B
G: Nebraska Ave & Tenley Circle	Northbound Left	2.5	A	1.9	A
H: Nebraska Ave & Yuma St	Eastbound Right	10.5	B	9.9	A
I: Nebraska Ave & Tenley Circle	Southbound Left	4.1	A	4.8	A
J: Nebraska Ave & Tenley Circle	Eastbound Left	12.5	B	14.0	B
K: Nebraska Ave Pedestrian Crossing	**Overall**	**13.5**	**B**	**21.4**	**C**
	Northbound	30.9	C	31.9	C
	Southbound	1.0	A	0.9	A
42nd St & Yuma St	**Overall**	**10.0**	**B**	**10.4**	**B**
	Eastbound	9.9	A	9.1	A
	Westbound	9.0	A	10.5	B
	Northbound	10.3	B	10.5	B
	Southbound	10.2	B	10.4	B
42nd St & Warren St	Westbound	9.8	A	10.7	B
	Southbound Left	1.6	A	0.2	A
Nebraska Ave & Warren St	Eastbound	25.3	D	21.4	C
	Westbound	22.7	C	43.2	E
	Northbound	0.7	A	0.6	A
	Southbound	0.2	A	0.8	A
Van Ness St & 45th St	**Overall**	**8.1**	**A**	**8.4**	**A**
	Eastbound	8.2	A	7.8	A
	Westbound	8.3	A	8.9	A
	Northbound	7.7	A	7.7	A
Nebraska Ave & Van Ness St	**Overall**	**26.3**	**C**	**21.3**	**C**
	Eastbound	55.8	E	28.4	C
	Westbound	42.0	D	26.3	C
	Northbound	5.9	A	21.3	C
	Southbound	23.8	C	8.6	A
Nebraska Ave & 42nd St	Eastbound	10.8	B	17.3	C
	Northbound Left	3.6	A	5.4	A
Wisconsin Ave & Van Ness St	**Overall**	**27.2**	**C**	**18.9**	**B**
	Eastbound	34.0	C	34.0	C
	Westbound	44.0	D	43.1	D
	Northbound	11.1	B	11.6	B
	Southbound	31.2	C	15.1	B

For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of “E” or better on each approach. As stated previously, all study area intersections operate at acceptable levels of service (overall LOS grade) during the morning and afternoon peak hours. However, the northbound approach of Fort Drive at Albemarle Street operates under unacceptable conditions during the afternoon peak period. The results from the capacity analyses generally confirm what was observed in the field.

Comparison of 2010 and 2000 Capacity Analysis Results

The results of the existing capacity analysis show some notable changes from the capacity analysis performed for the 2000 Campus Plan, as shown in Table 13. The following changes in level of service were observed between the 2000 and 2010 capacity analyses:

- *Nebraska Avenue & Tenley Circle*
  Afternoon peak hour overall LOS improved from LOS D in 2000 to LOS C in 2010.

- *Nebraska Avenue & Yuma Street*
  Eastbound right-turn afternoon LOS improved from LOS B in 2000 to LOS A in 2010.

- *42nd Street & Yuma Street*
  Morning peak hour overall LOS improved from LOS B in 2000 to LOS A in 2010. Afternoon peak hour overall LOS degraded from LOS A in 2000 to LOS B in 2010.

- *Nebraska Avenue & Warren Street*
  Eastbound approach LOS degraded from LOS C in 2000 to LOS D in 2010 and improved from LOS D in 2000 to LOS C in 2010 for the morning and afternoon peak hours, respectively.

Changes in LOS between the 2000 and 2010 capacity analyses are due to several factors, including changes in traffic volumes and traffic patterns, as well as changes to signal timings. Changes in LOS between the capacity analyses could also be due to improvements in the software used to estimate the delays and levels of service of the study area intersections. Overall, signal timing changes have had the largest impact. Additionally, the intersection of Nebraska Avenue and Tenley Circle was evaluated as a signalized intersection in the 2000 Campus Plan. In this analysis, the signalized intersection evaluated was the pedestrian crossing on Nebraska Avenue south of Tenley Circle.

Table 13: Level of Service Results from 2000 Campus Plan

Intersection	Approach	Campus Plan (2000)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
A: Nebraska Ave & Tenley Circle	**Overall**	**19.9**	**B**	**37.6**	**D**
	Eastbound	16.5	B	11.7	B
	Northbound	24.8	C	59.6	E
H: Nebraska Ave & Yuma St	Eastbound Right	14.9	B	12.3	B
42nd St & Yuma St	**Overall**	**10.31**	**B**	**9.22**	**A**
	Eastbound	10.91	B	8.90	A
	Westbound	10.07	B	9.02	A
	Northbound	11.47	B	10.11	B
	Southbound	11.53	B	9.67	A
42nd St & Warren St	Westbound	9.6	A	9.9	A
	Southbound Left	7.6	A	7.6	A
Nebraska Ave & Warren St	Eastbound	15.8	C	26.4	D
	Westbound	24.9	C	39.8	E
	Northbound Left	9.3	A	9.0	A
	Southbound Left	8.9	A	9.6	A

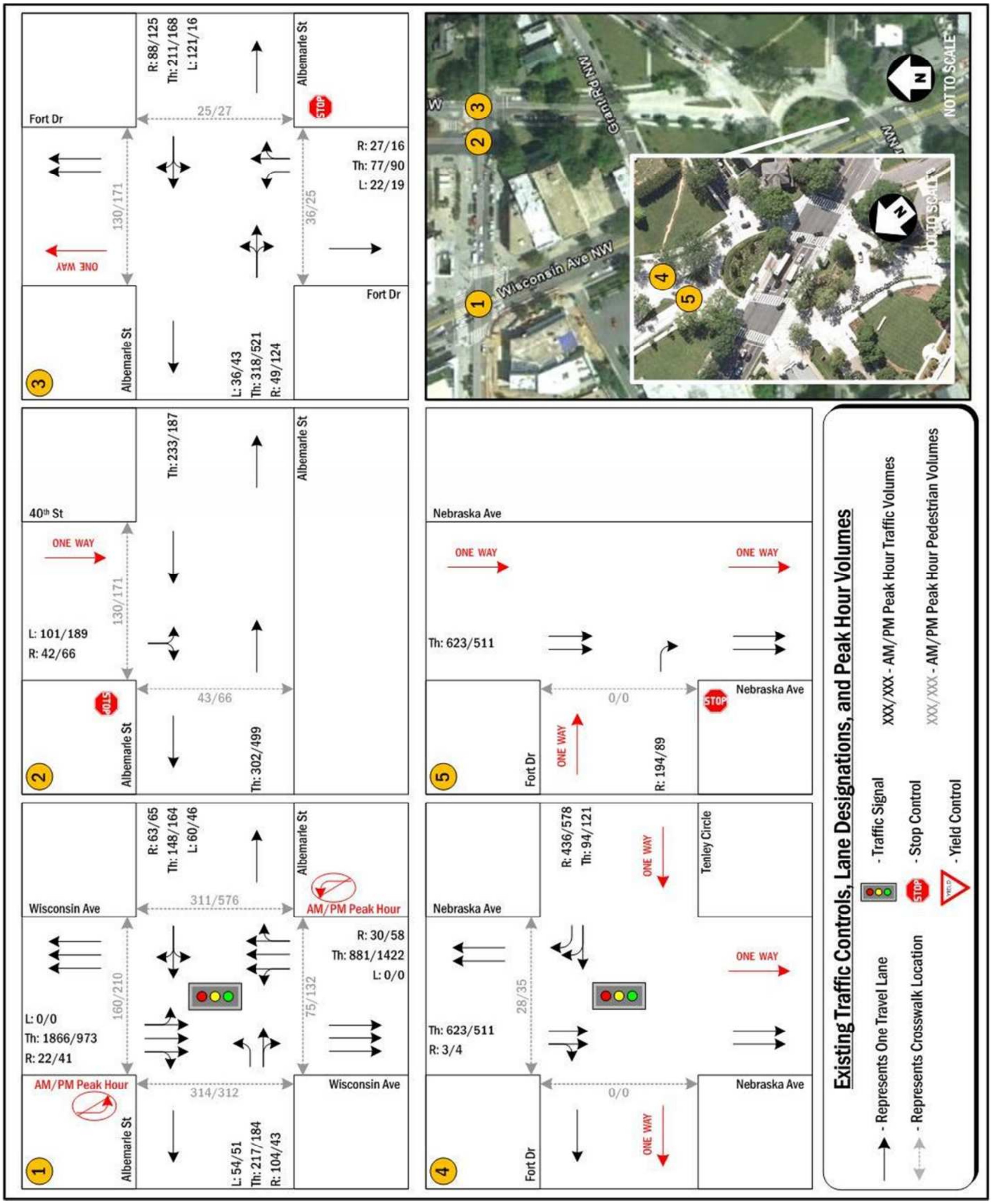

Figure 11: Existing Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (1 of 5)

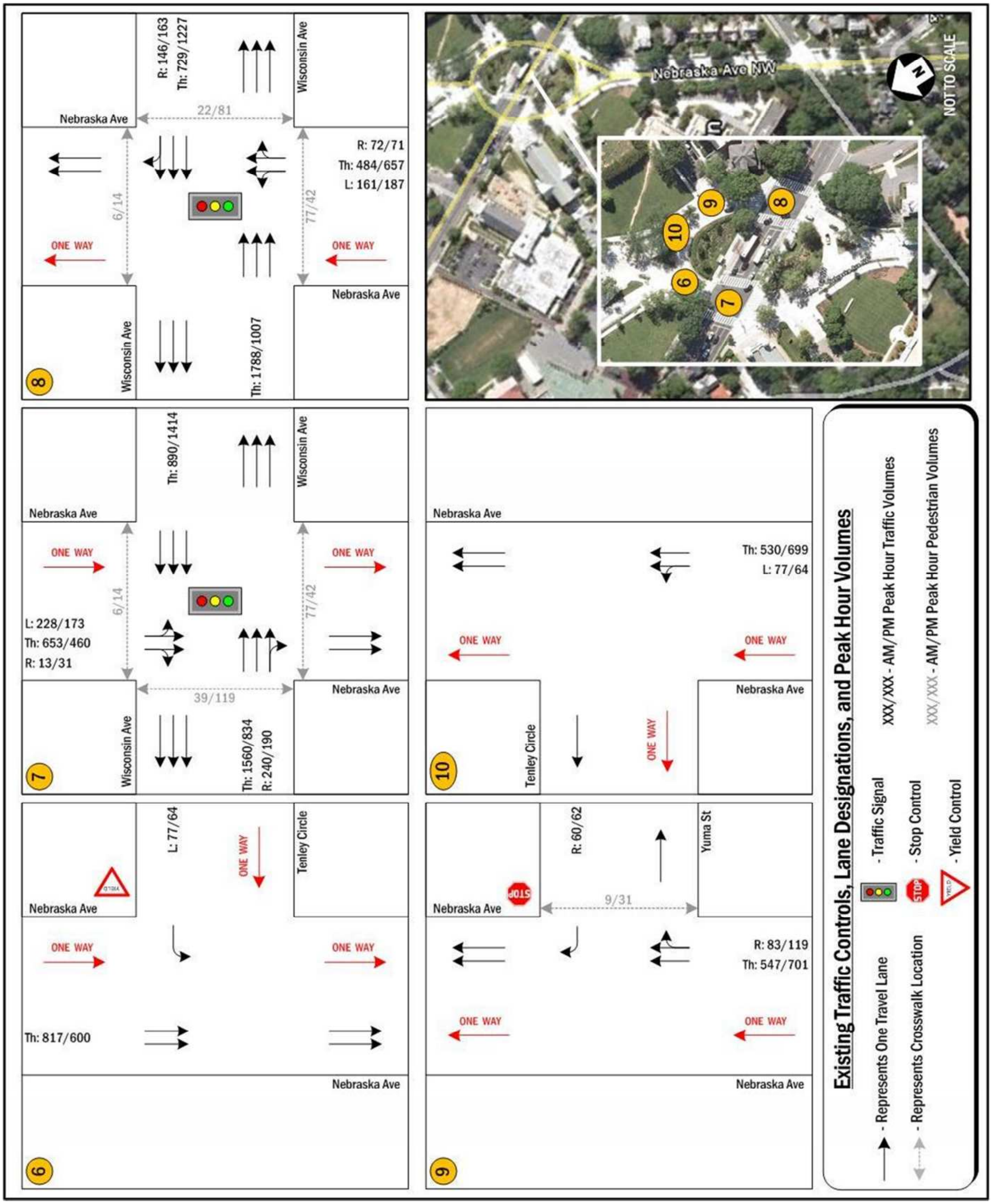

Figure 12: Existing Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (2 of 5)

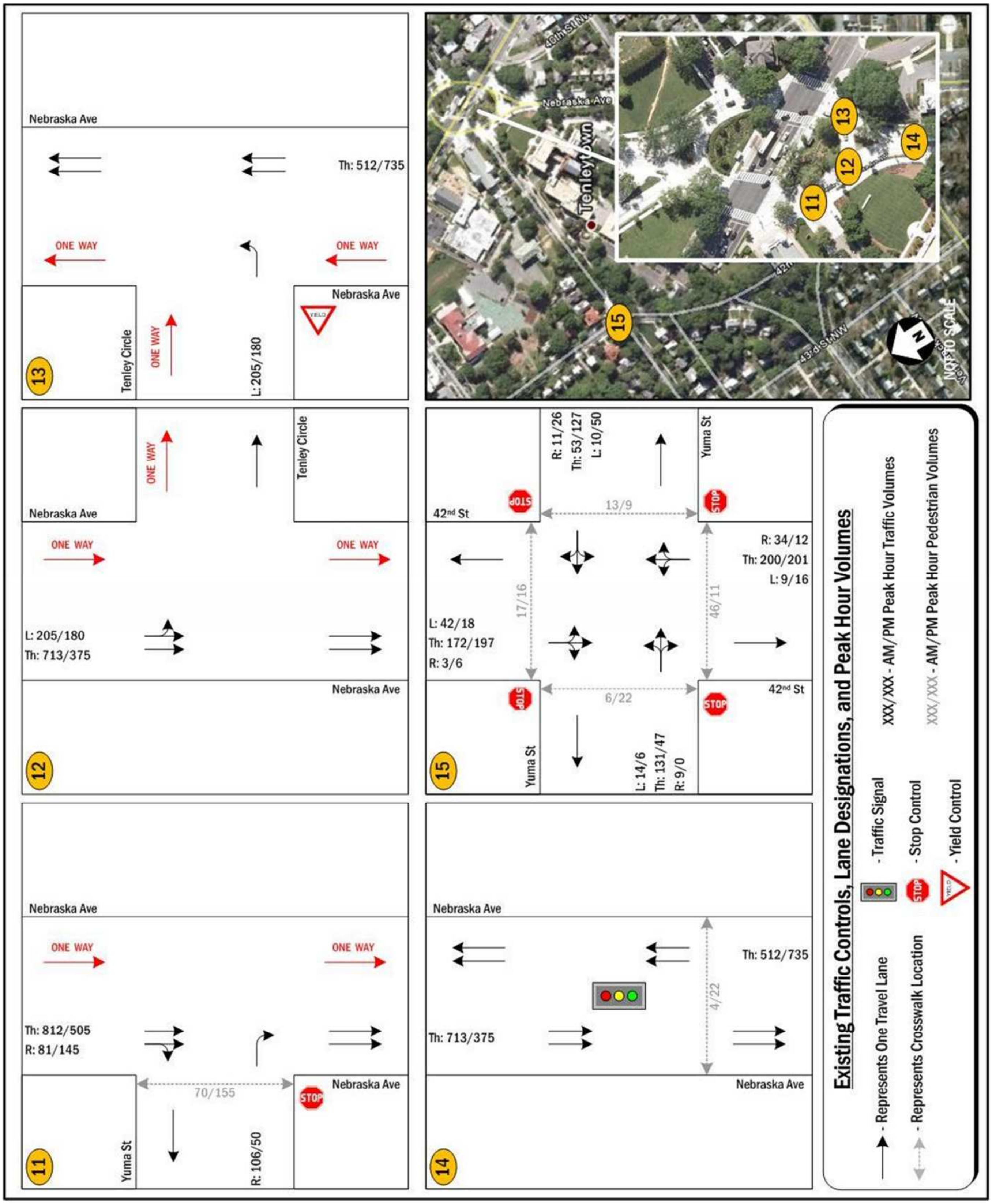

Figure 13: Existing Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (3 of 5)

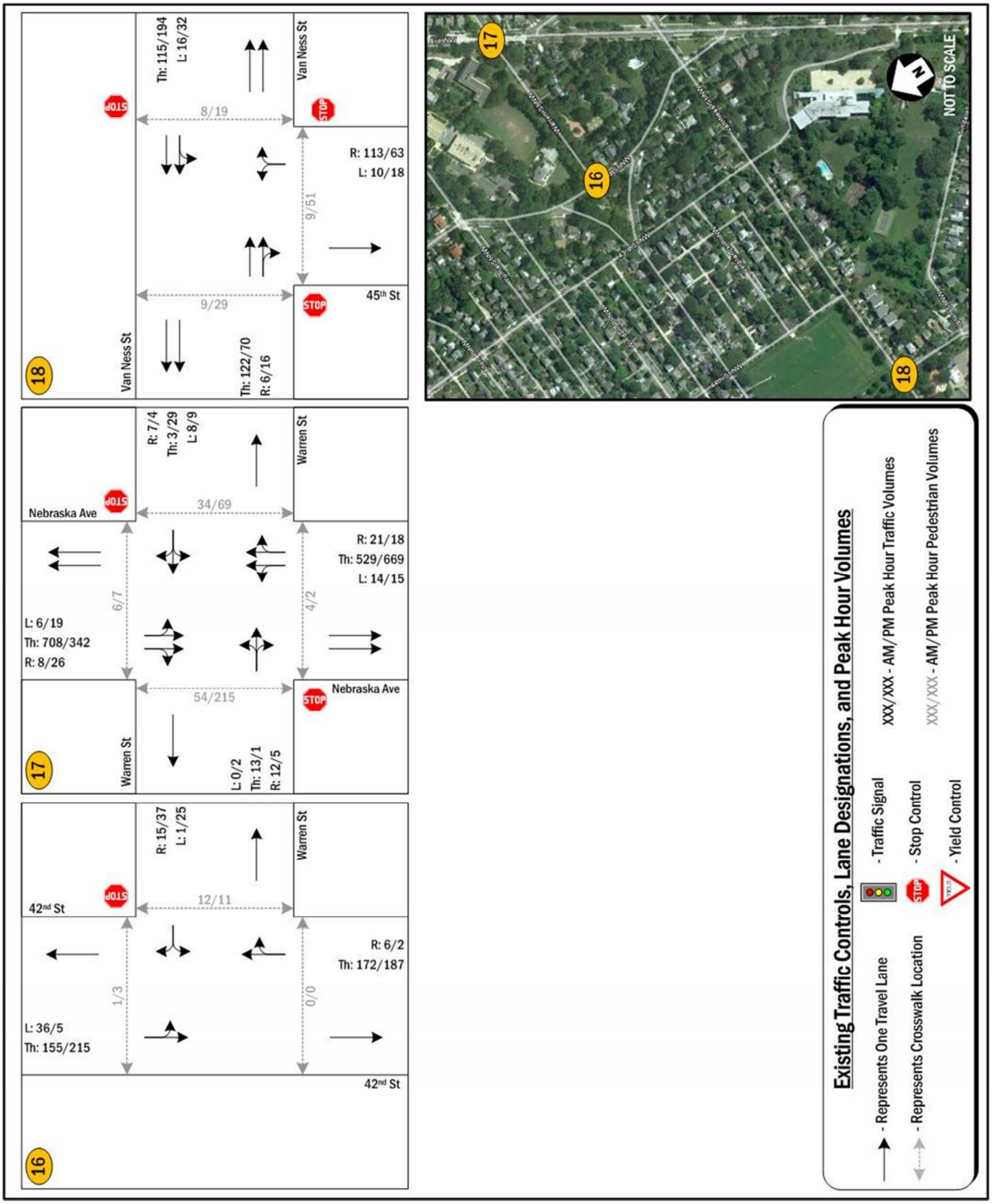

Figure 14: Existing Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (4 of 5)

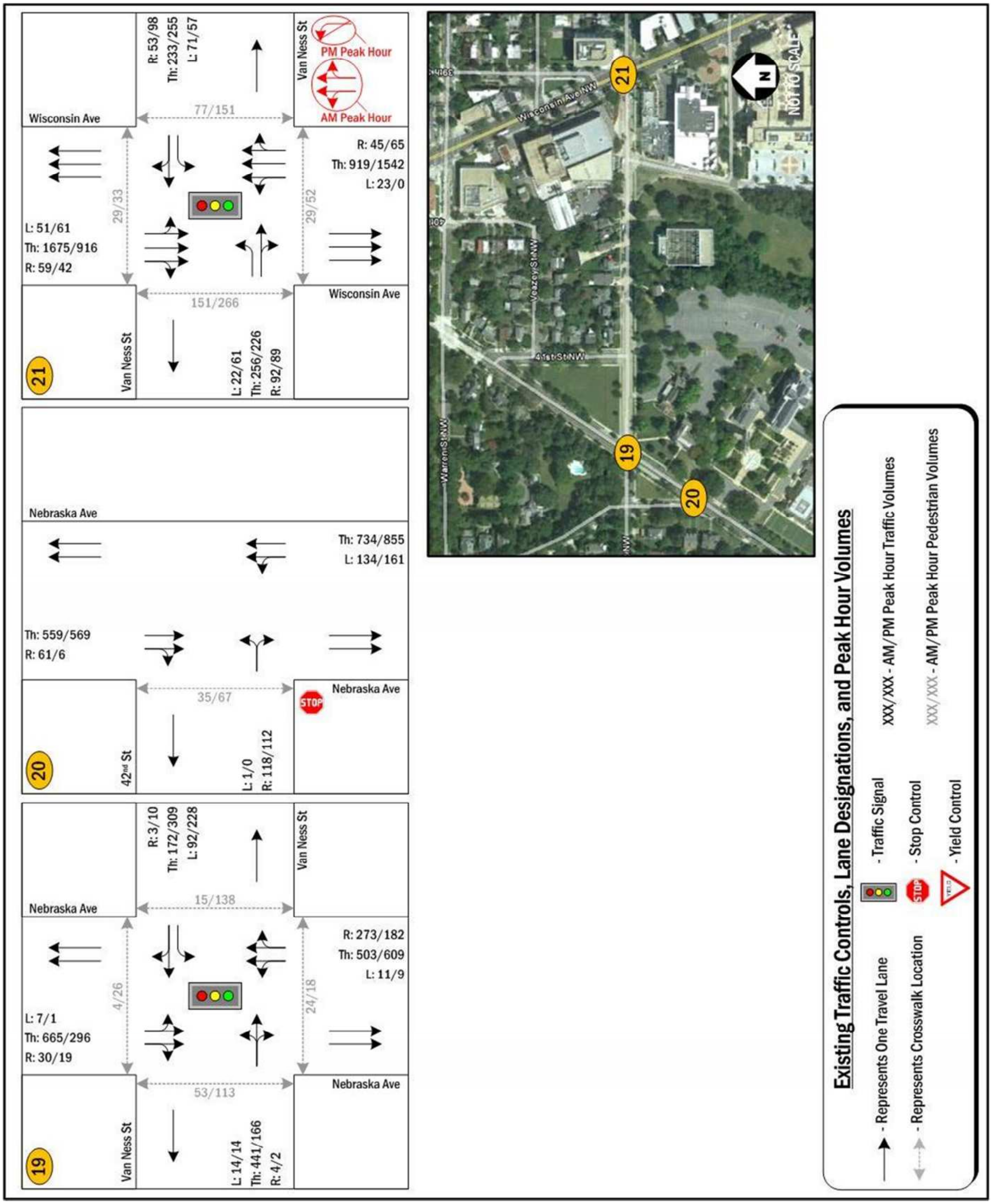

Figure 15: Existing Traffic Controls, Lane Designations, and Peak Hour Traffic Volumes (5 of 5)

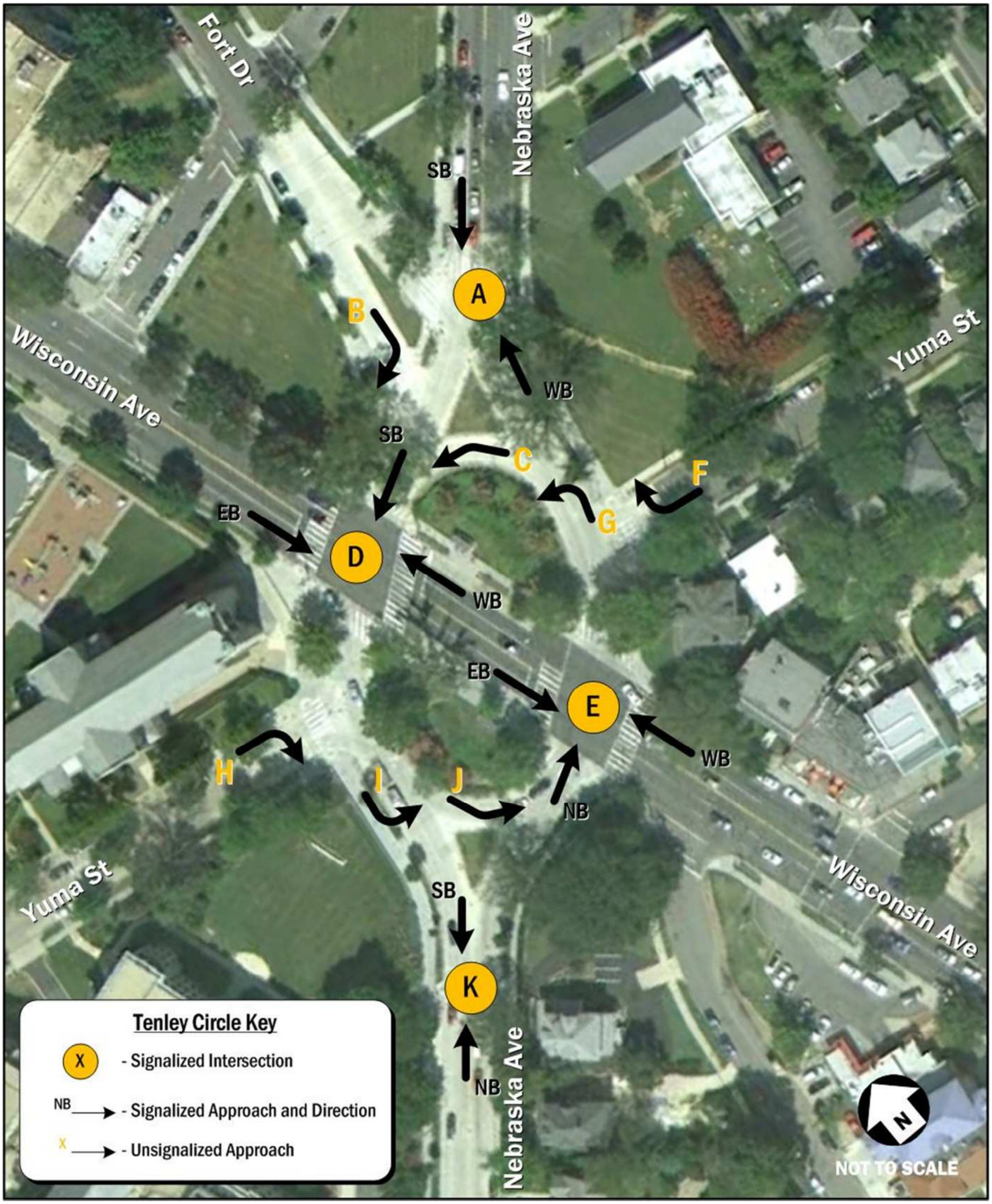

Figure 16: Tenley Circle Diagram of Intersections and Movements

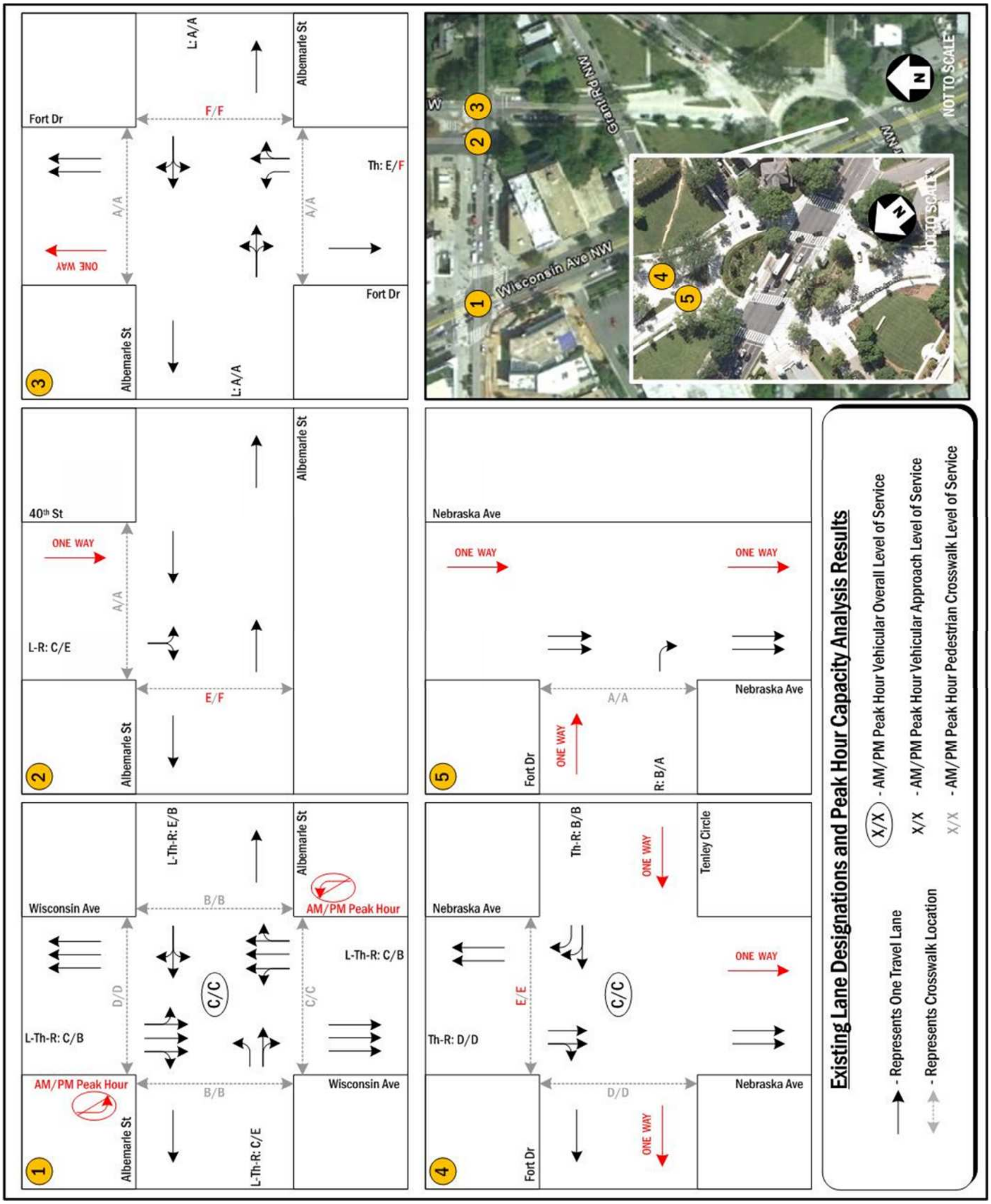

Figure 17: Existing Lane Configurations and Capacity Analysis Results (1 of 5)

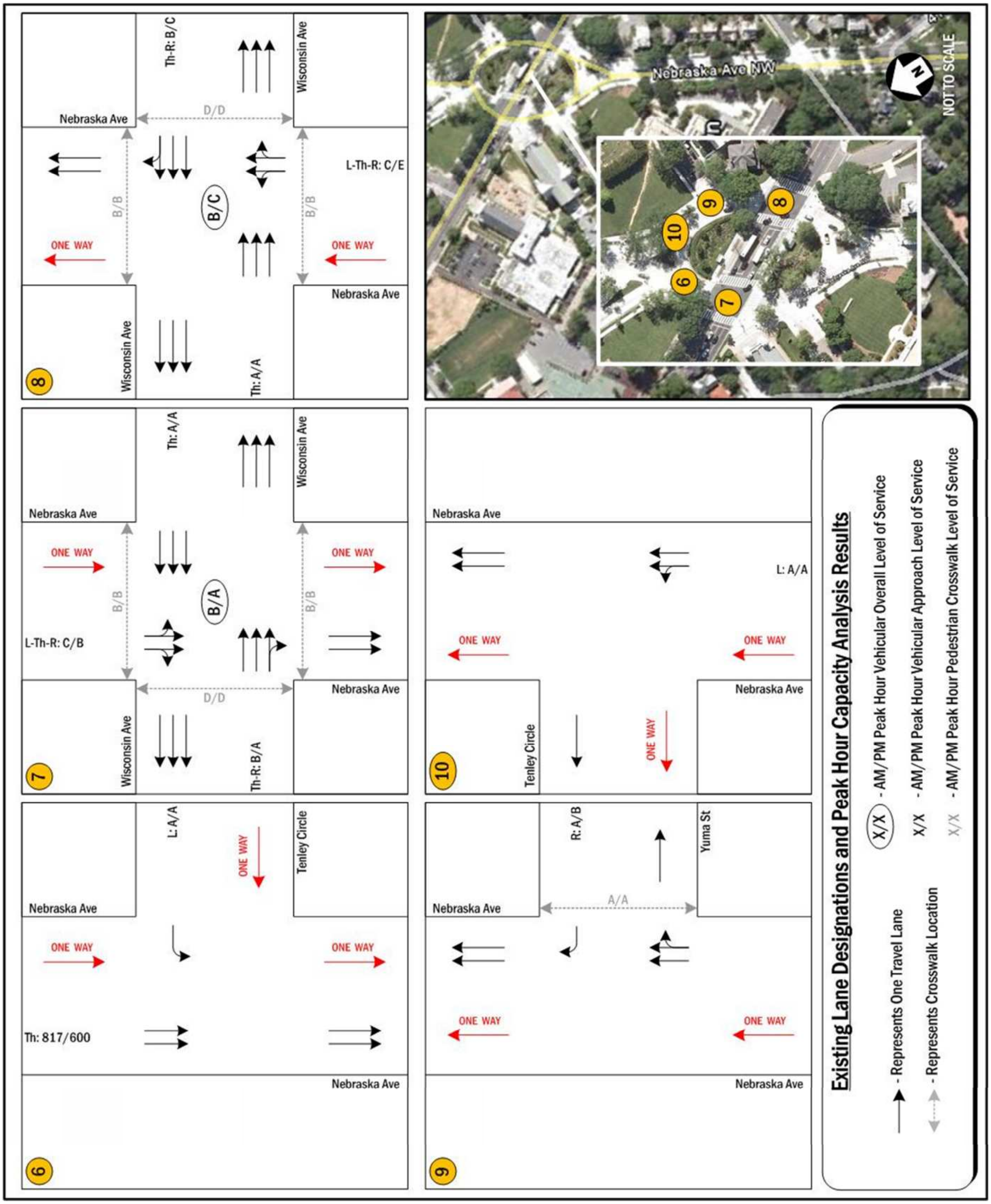

Figure 18: Existing Lane Configurations and Capacity Analysis Results (2 of 5)

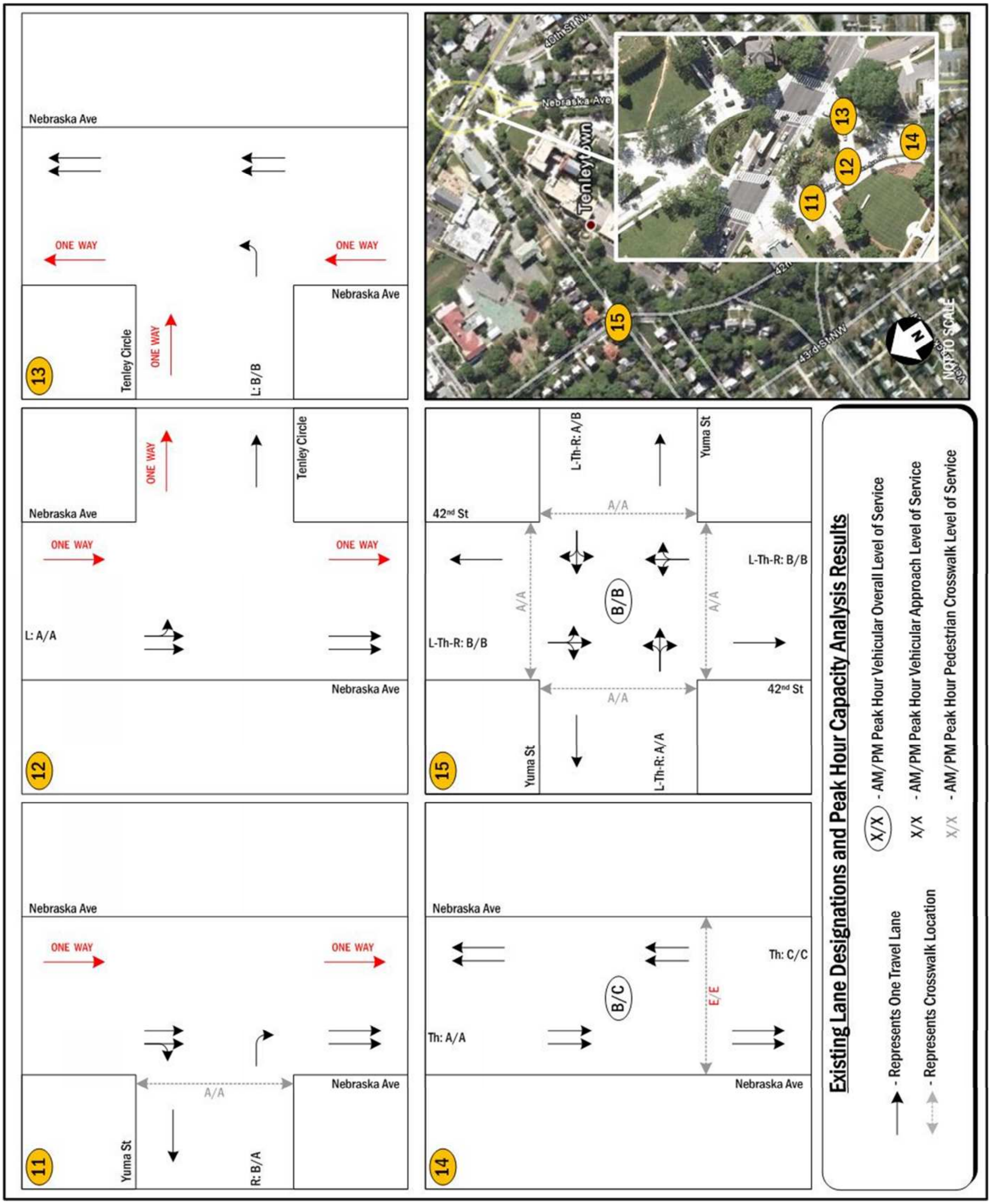

Figure 19: Existing Lane Configurations and Capacity Analysis Results (3 of 5)

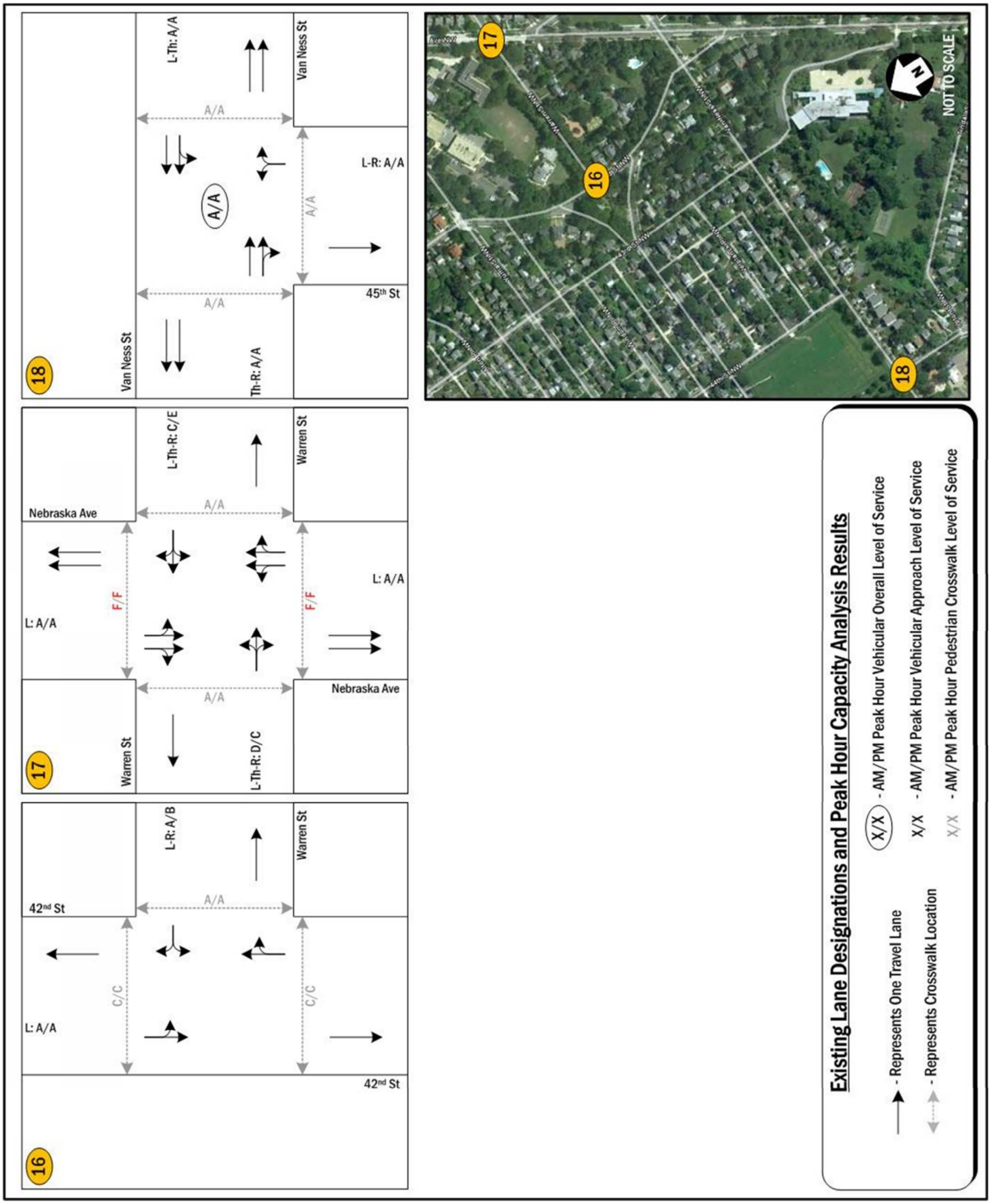

Figure 20: Existing Lane Configurations and Capacity Analysis Results (4 of 5)

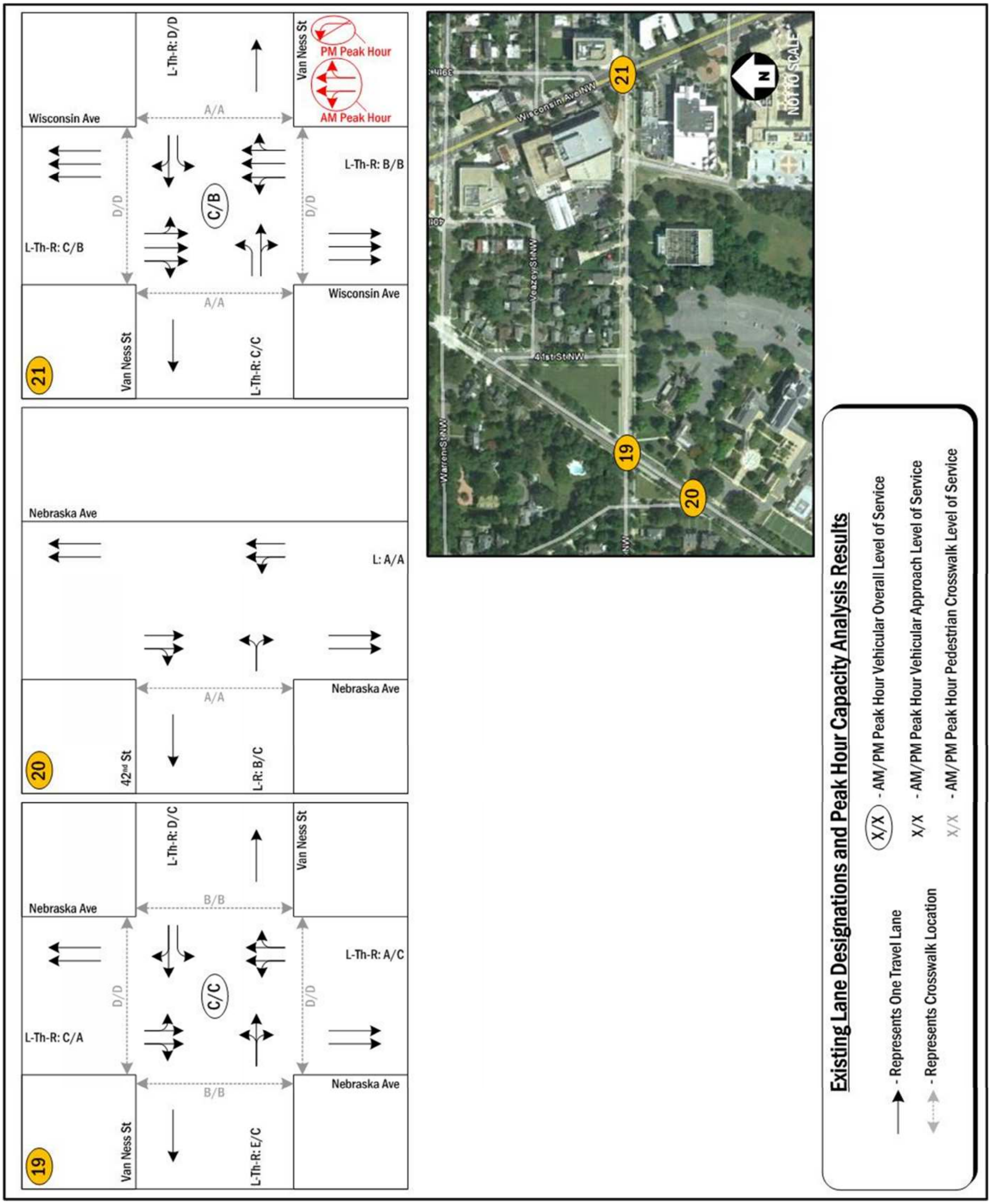

Figure 21: Existing Lane Configurations and Capacity Analysis Results (5 of 5)

3.2.3 Existing Pedestrian Analysis Results

Pedestrian analyses were performed for the existing conditions at the intersections contained within the study area during the morning and afternoon peak hours. The analysis was based on "Chapter 18: Pedestrians" of the Highway Capacity Manual (HCM).

The methodology for signalized intersections was used in order to estimate the average delay experienced by a pedestrian at a signalized crosswalk (the amount of time waiting for a "Walk" sign). This calculation is based on the effective green time programmed for pedestrians and the cycle length and rated by the amount of delay experienced. As stated in the HCM, pedestrian delay is not constrained by capacity, even when pedestrian flow rates reach 5,000 pedestrians per hour (pph). The results of the signalized intersection analyses are expressed in level of service (LOS) and delay (seconds) for each crosswalk. LOS results range from "A" being the best to "F" being the worst. The delay and LOS show the likelihood that a pedestrian will not comply with a traffic-control device (i.e. jaywalking).

The methodology for unsignalized intersections was used in order to estimate the average delay experienced by a pedestrian at an uncontrolled crosswalk. This methodology applies to unsignalized intersections with a pedestrian crossing against a free-flowing traffic stream or an approach not controlled by a stop-sign. The unsignalized intersection methodology does not apply to zebra-striped crossings at unsignalized intersections or at crossings against a traffic stream controlled by a stop-sign because pedestrians have the right-of-way and therefore experience no delay. It should be noted that in the District, pedestrians have the right-of-way at all crosswalks, including those against a free-flowing traffic stream, and therefore, theoretically experience no delay. However, the analysis was performed at pedestrian crossings against free-flowing traffic streams and yield-controlled approaches in order to evaluate the theoretical delay experienced by pedestrians. The calculation for average pedestrian delay at an unsignalized crossing is based on the average pedestrian walking speed, crosswalk length, assumed pedestrian lost time (start-up and end clearance time), and conflicting vehicular flow rate. The results of the unsignalized intersection analyses are expressed in level of service (LOS) and delay (seconds) for each crosswalk. LOS results range from "A" being the best to "F" being the worst. The delay and LOS show the likelihood that a pedestrian will engage in risk-taking behavior (i.e. accepting a short gap between vehicles).

Table 14 and Table 15 show the results of the capacity analyses, including LOS and average delay (in seconds). The capacity analysis results are also shown on Figure 17, Figure 18, Figure 19, Figure 20, and Figure 21.

The analysis results indicate that all signalized crosswalks in the study area operate at acceptable levels of service during both the morning and afternoon peak hours. This indicates a low (LOS A and B) to moderate (LOS C and D) likelihood of non-compliance by pedestrians, which is reflected by pedestrians jaywalking across the intersection. The study intersections with crosswalks operating at LOS D will experience a moderate to high likelihood of non-compliance.

The analysis results also indicate that the majority of the unsignalized crosswalks in the study area operate at acceptable levels of service during the morning and afternoon peak hours. This indicates a moderate (LOS C and D) likelihood of risk-taking behavior for pedestrians, which is reflected in occasional pedestrians dashing between vehicles during short gaps in traffic. As stated previously, pedestrians have the right-of-way in all crosswalks in the District, so vehicles must yield to pedestrians in the crosswalk at the study intersections listed in Table 15. However, the LOS E and F calculated indicate an unfriendly and intimidating environment for pedestrians.

Table 14: Existing Pedestrian Levels of Service for Signalized Intersections

Intersection	Parallel Approach	Existing Conditions (2010)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
Wisconsin Ave & Albemarle St	Eastbound	27.4	C	28.1	C
	Westbound	38.7	D	39.6	D
	Northbound	15.7	B	15.1	B
	Southbound	15.7	B	15.1	B
Tenley Circle:					
A: Nebraska Ave & Fort Dr/Tenley Circle	Eastbound	41.4	E	41.4	E
	Southbound	31.2	D	31.2	D
D: Nebraska Ave & Wisconsin Ave	Eastbound	14.6	B	14.6	B
	Westbound	11.5	B	11.5	B
	Northbound	32.8	D	32.8	D
	Southbound	32.8	D	32.8	D
E: Nebraska Ave & Wisconsin Ave	Eastbound	11.5	B	11.5	B
	Westbound	14.6	B	14.6	B
	Northbound	32.8	D	32.8	D
	Southbound	32.8	D	32.8	D
K: Nebraska Ave Pedestrian Crossing	Eastbound	41.4	E	41.4	E
Nebraska Ave & Van Ness St	Eastbound	32.8	D	31.2	D
	Westbound	32.8	D	31.2	D
	Northbound	11.0	B	12.0	B
	Southbound	11.0	B	12.0	B
Wisconsin Ave & Van Ness St	Eastbound	37.0	D	35.3	D
	Westbound	37.0	D	35.3	D
	Northbound	8.8	A	9.7	A
	Southbound	8.8	A	9.7	A

Table 15: Existing Pedestrian Levels of Service for Unsignalized Intersections

Intersection	Parallel Approach	Existing Conditions (2010)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
Albemarle St & 40th St	Westbound	N/A - Stop controlled crossing, LOS A			
	Southbound	32.9	E	58.7	F
Albemarle St & Fort Dr	Eastbound	N/A - Stop controlled crossing, LOS A			
	Westbound	N/A - Stop controlled crossing, LOS A			
	Northbound	48.9	F	62.3	F
Tenley Circle:					
B: Nebraska Ave & Fort Dr	Southbound	N/A - Stop controlled crossing, LOS A			
F: Nebraska Ave & Yuma St	Northbound	N/A - Stop controlled crossing, LOS A			
H: Nebraska Ave & Yuma St	Southbound	N/A - Stop controlled crossing, LOS A			
42nd St & Yuma St	Eastbound	N/A - Stop controlled crossing, LOS A			
	Westbound	N/A - Stop controlled crossing, LOS A			
	Northbound	N/A - Stop controlled crossing, LOS A			
	Southbound	N/A - Stop controlled crossing, LOS A			
42nd St & Warren St	Eastbound	12.2	C	16.4	C
	Westbound	13.9	C	16.6	C
	Northbound	N/A - Stop controlled crossing, LOS A			
Nebraska Ave & Warren St	Eastbound	2,166.4	F	898.9	F
	Westbound	3,107.4	F	1,048.1	F

Intersection	Parallel Approach	Existing Conditions (2010)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
	Northbound	N/A - Stop controlled crossing, LOS A			
	Southbound	N/A - Stop controlled crossing, LOS A			
Van Ness & 45th St	Eastbound	N/A - Stop controlled crossing, LOS A			
	Northbound	N/A - Stop controlled crossing, LOS A			
	Southbound	N/A - Stop controlled crossing, LOS A			
Nebraska Ave & 42nd St	Southbound	N/A - Stop controlled crossing, LOS A			

3.2.4 Future Conditions without 2011 Campus Plan Traffic Volumes

The American University 2011 Campus Plan for the Tenley Campus projects the future growth and development on the campus for 2011-2020. 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), and the DHS Nebraska Avenue Complex Master Plan, as agreed upon during a scoping meeting with the District Department of Transportation (DDOT) on April 29, 2010.

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.

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, which was also applied for the analysis contained in this report. This growth rate 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, and the inherent growth were added to the existing (2010) traffic volumes in order to establish the future (2020) traffic volumes without the proposed 2011 Plan. The traffic volumes for the future conditions without development are shown on Figure 22, Figure 23, Figure 24, Figure 25, and Figure 26 for the morning peak hour and on Figure 27, Figure 28, Figure 29, Figure 30, and Figure 31 for the afternoon peak hour.

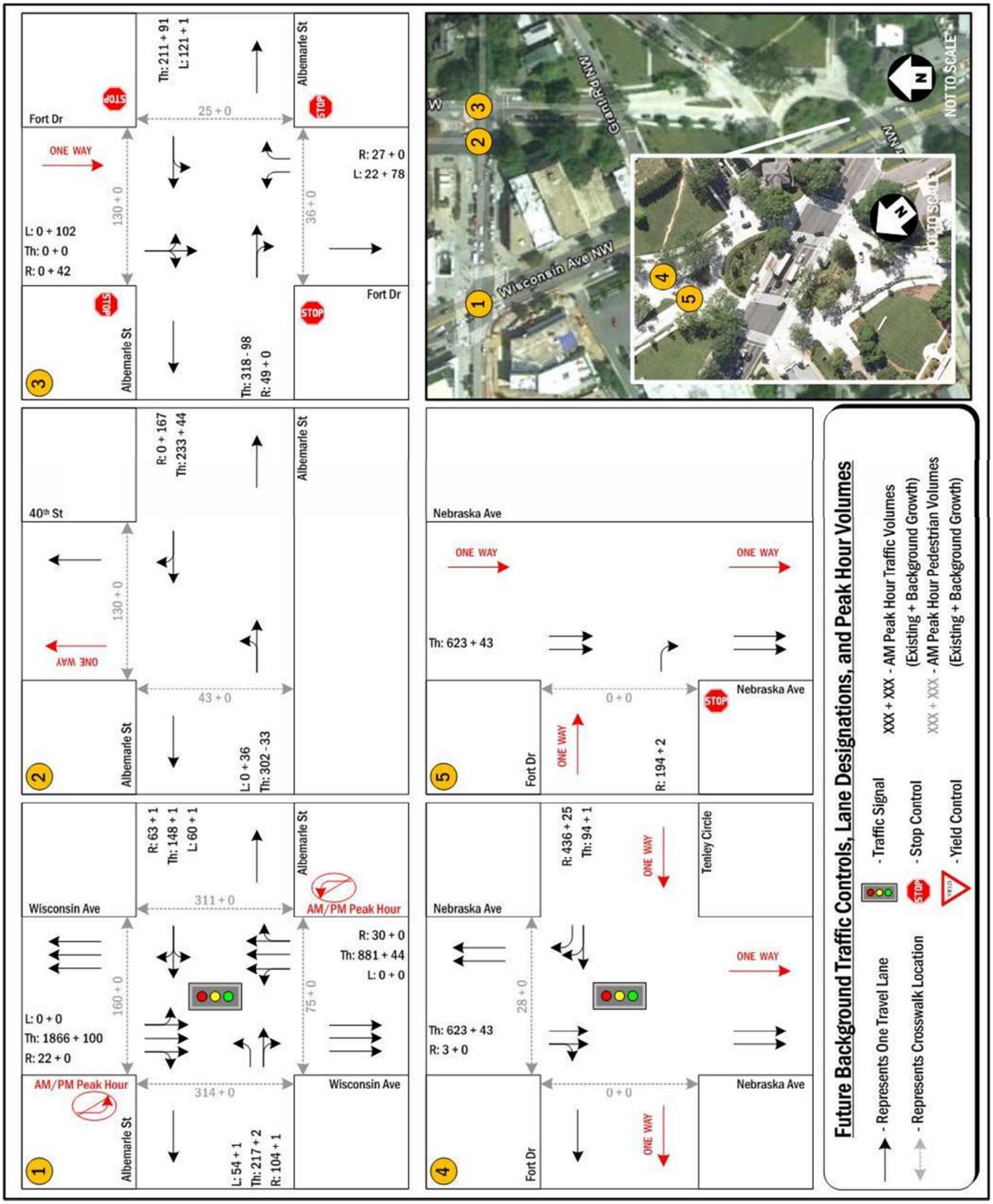

Figure 22: Future Background Traffic Controls, Lane Designations, and AM Traffic Volumes (1 of 5)

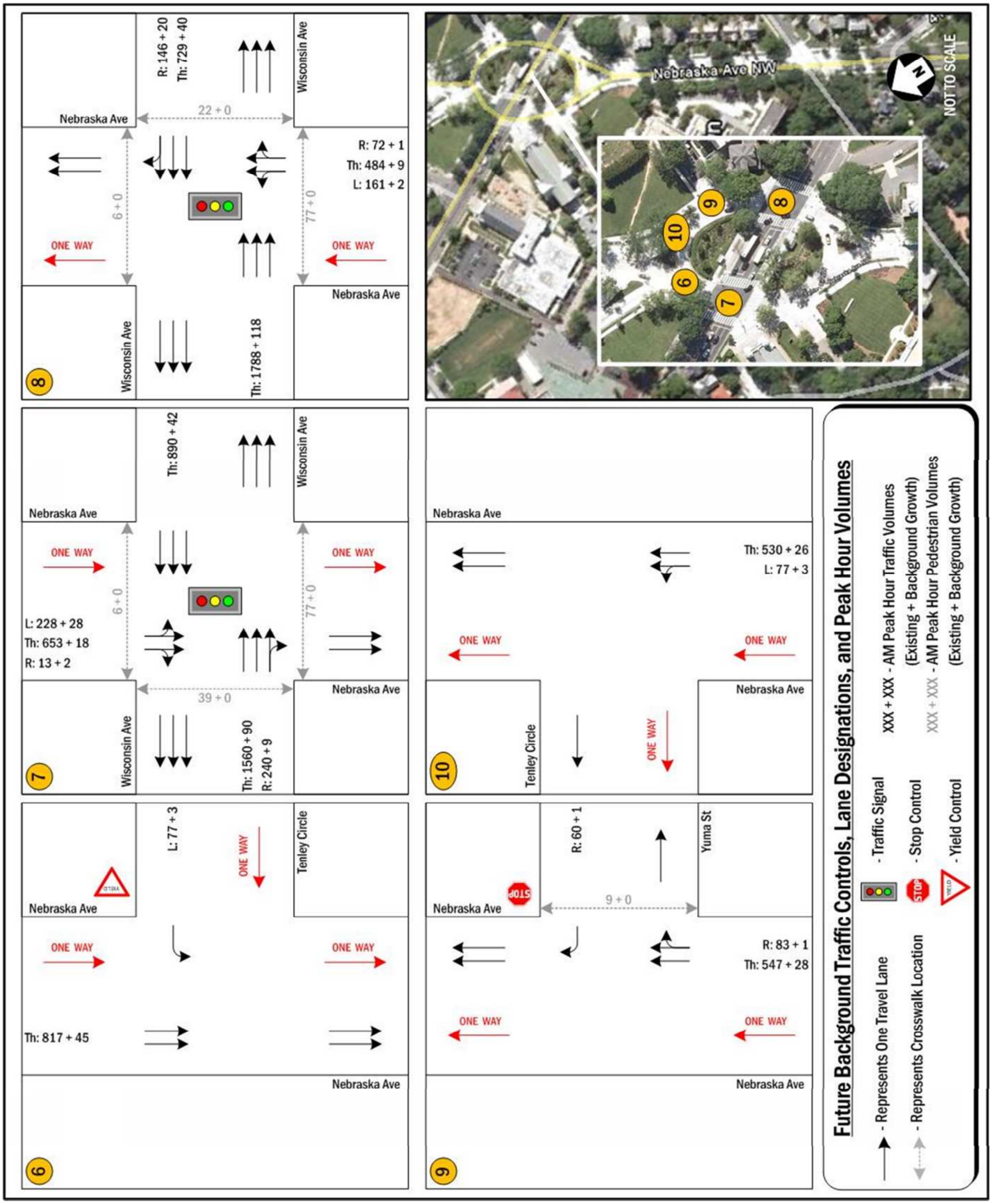

Figure 23: Future Background Traffic Controls, Lane Designations, and AM Traffic Volumes (2 of 5)

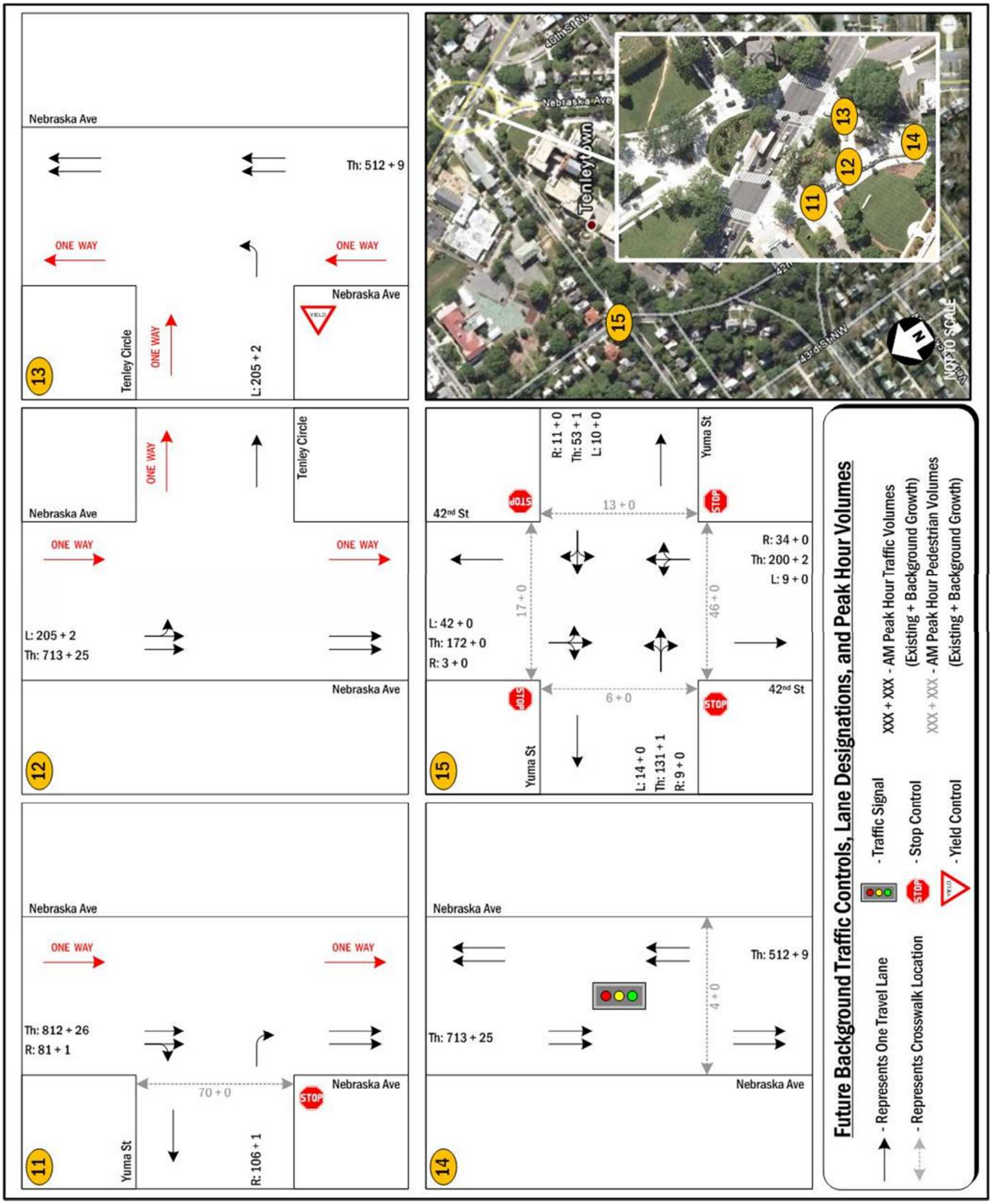

Figure 24: Future Background Traffic Controls, Lane Designations, and AM Traffic Volumes (3 of 5)

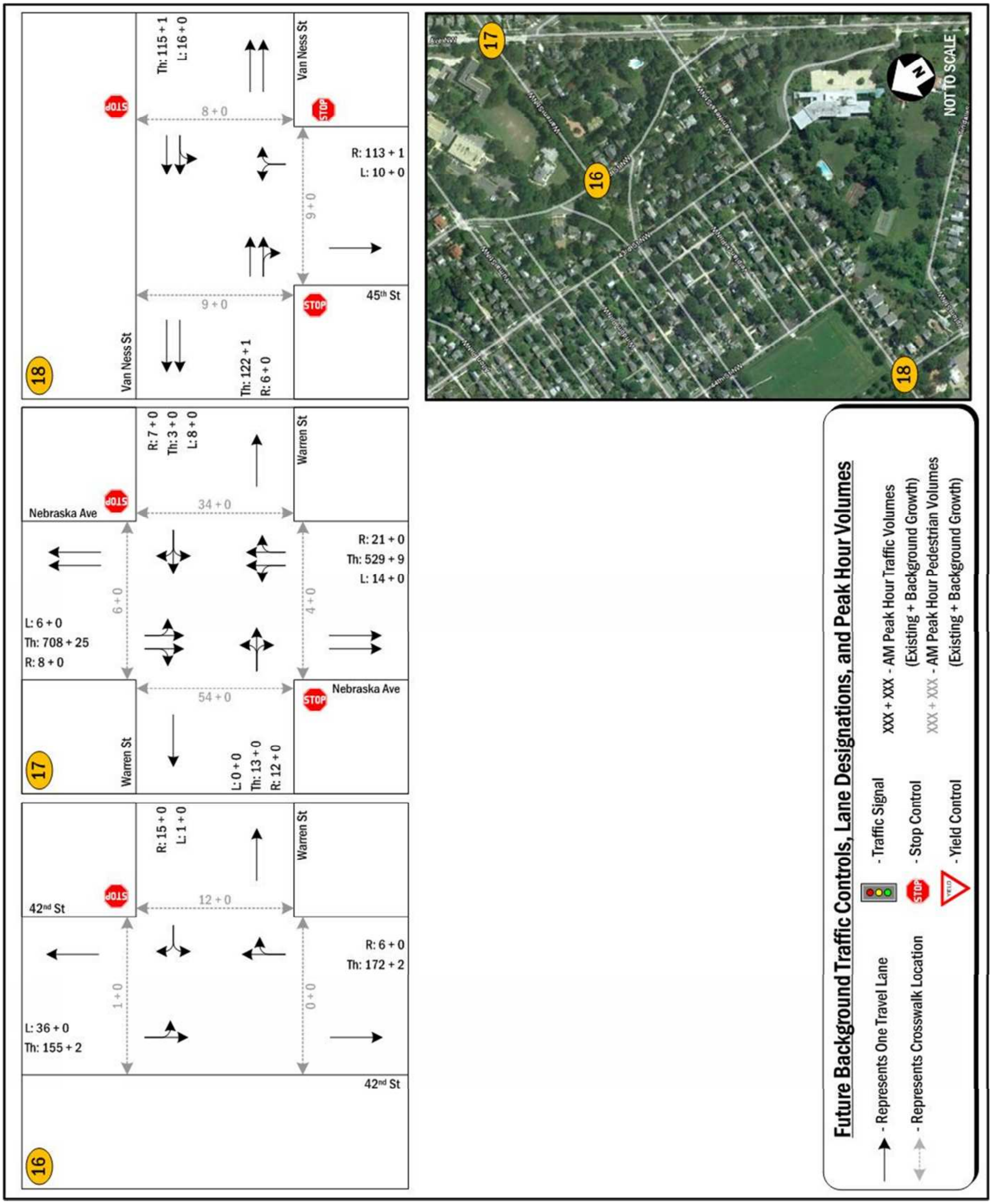

Figure 25: Future Background Traffic Controls, Lane Designations, and AM Traffic Volumes (4 of 5)

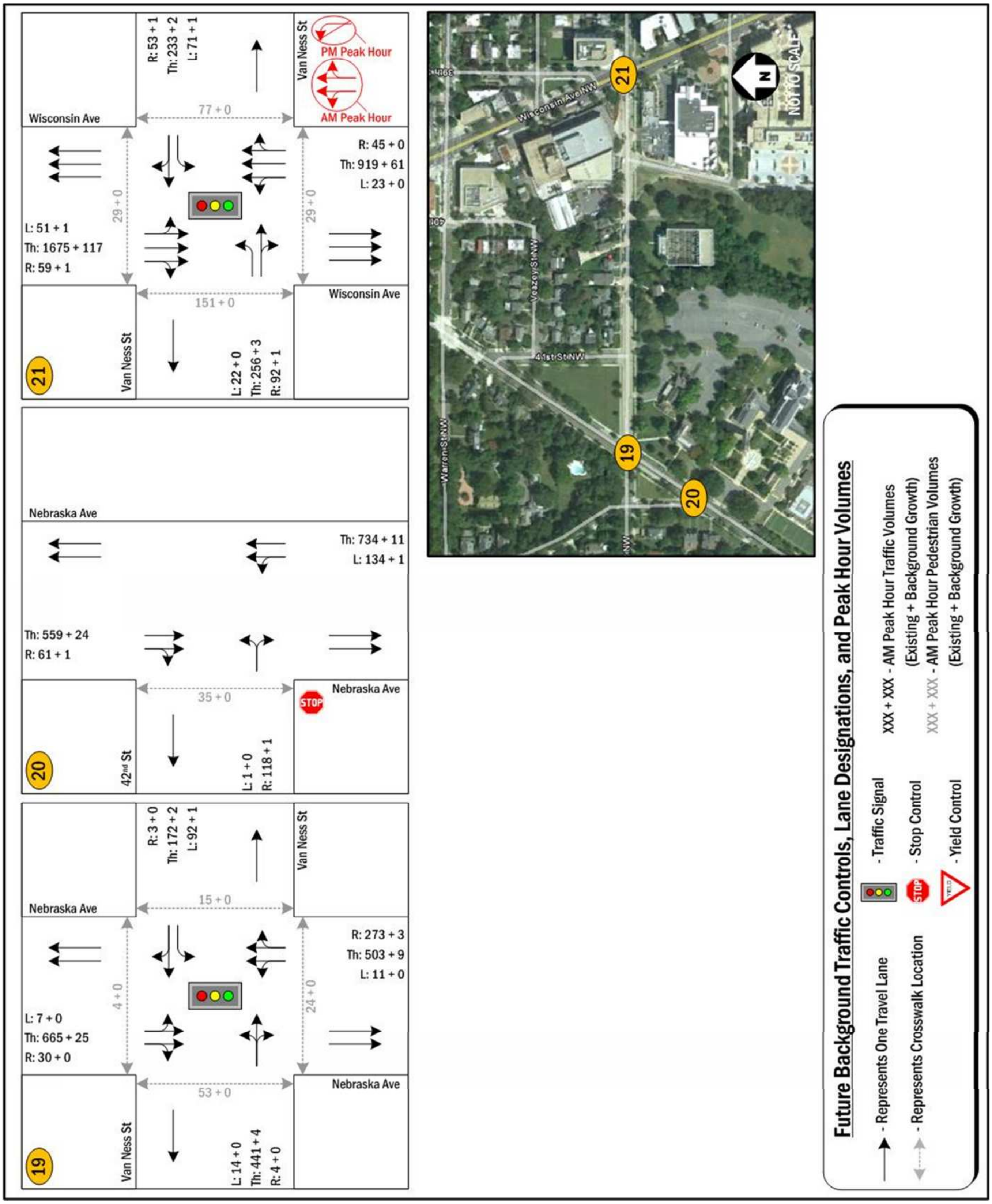

Figure 26: Future Background Traffic Controls, Lane Designations, and AM Traffic Volumes (5 of 5)

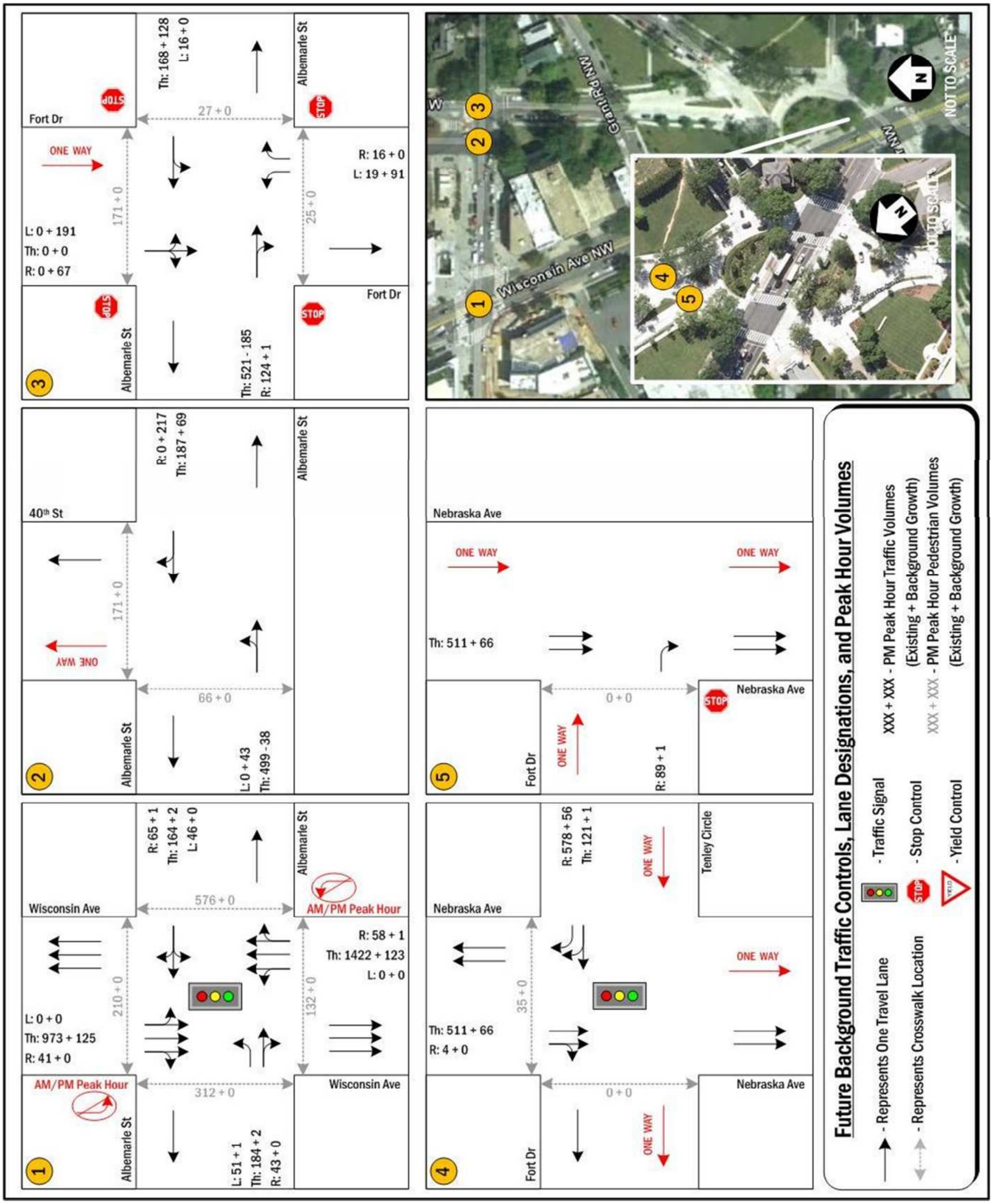

Figure 27: Future Background Traffic Controls, Lane Designations, and PM Traffic Volumes (1 of 5)

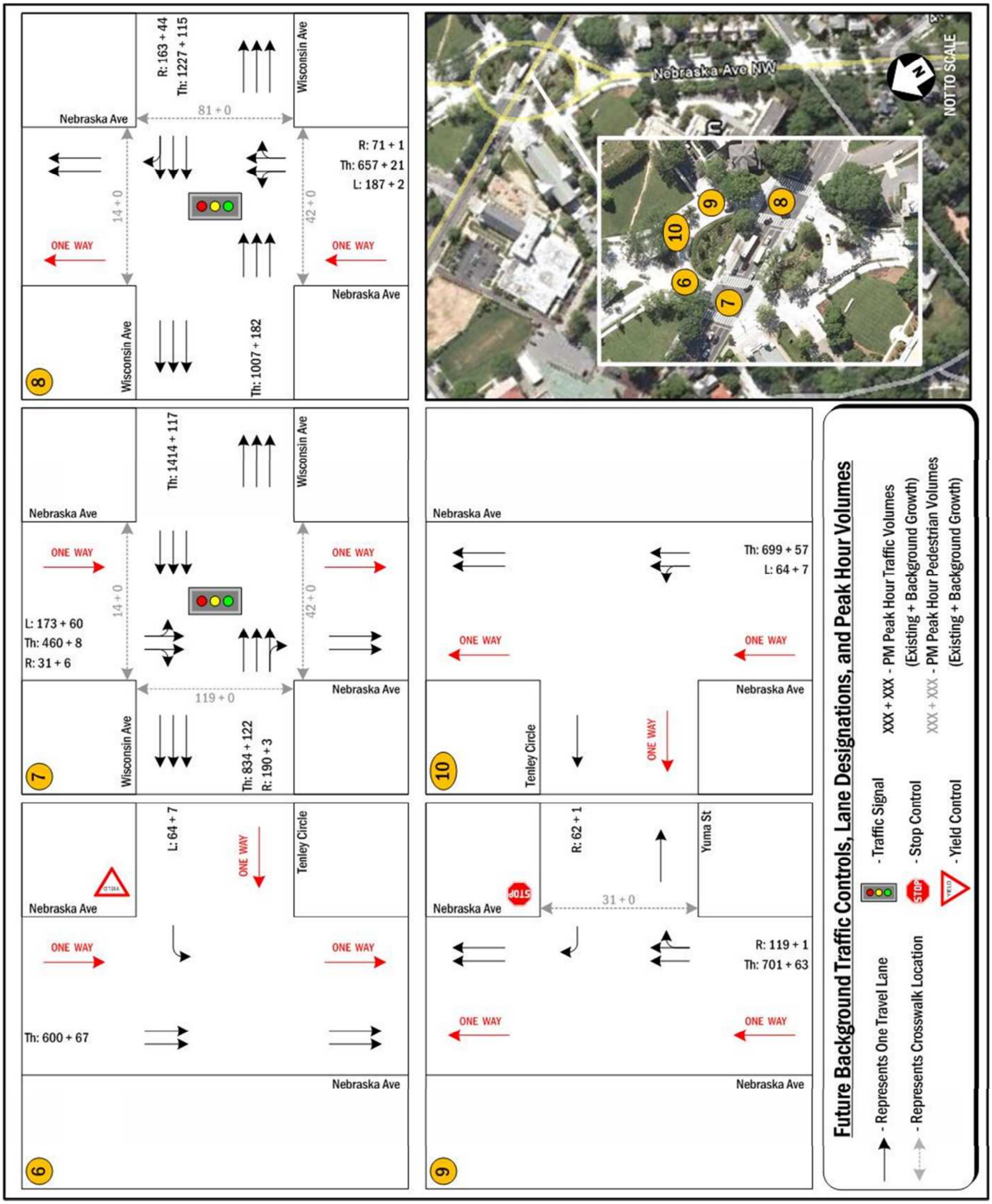

Figure 28: Future Background Traffic Controls, Lane Designations, and PM Traffic Volumes (2 of 5)

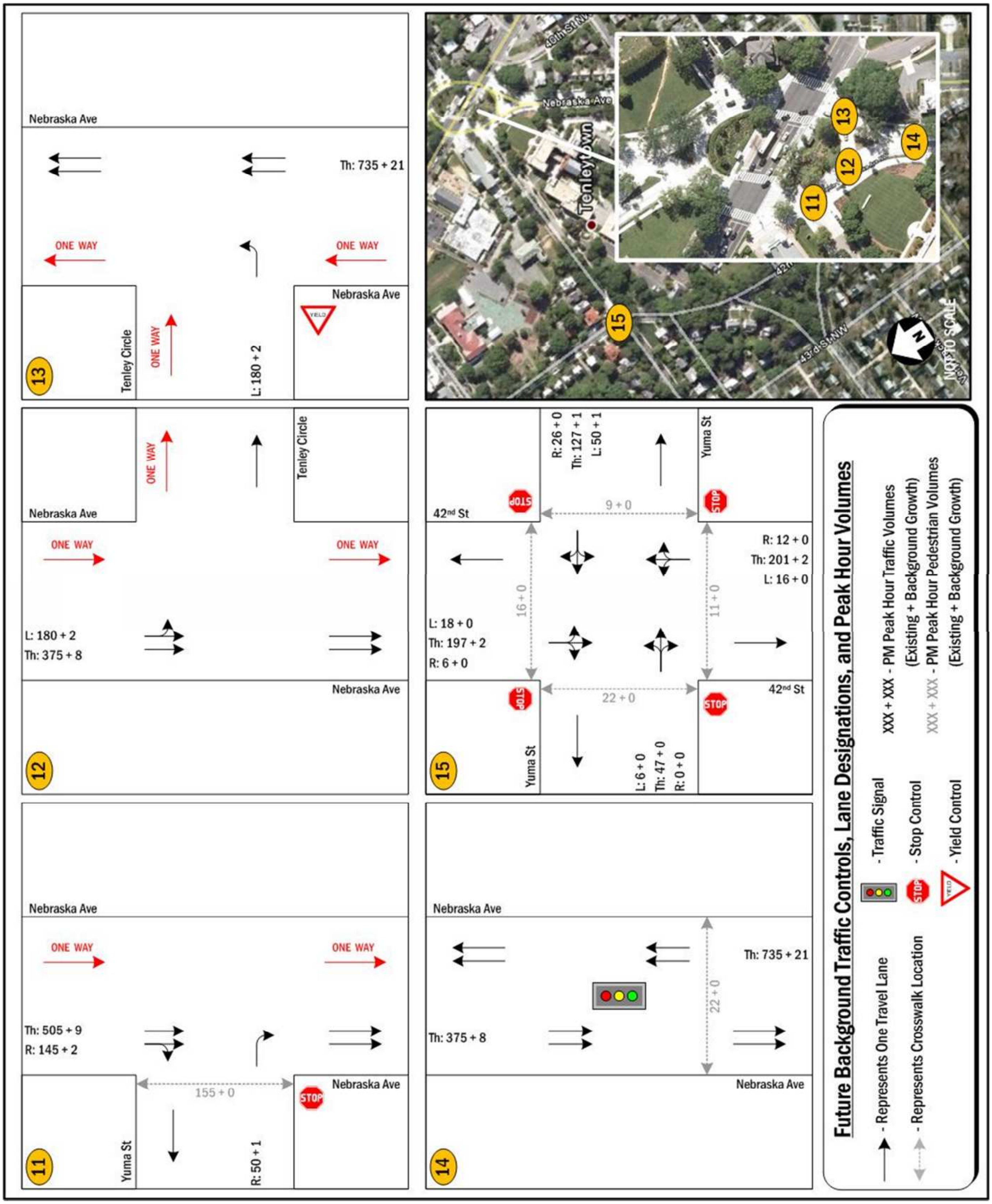

Figure 29: Future Background Traffic Controls, Lane Designations, and PM Traffic Volumes (3 of 5)

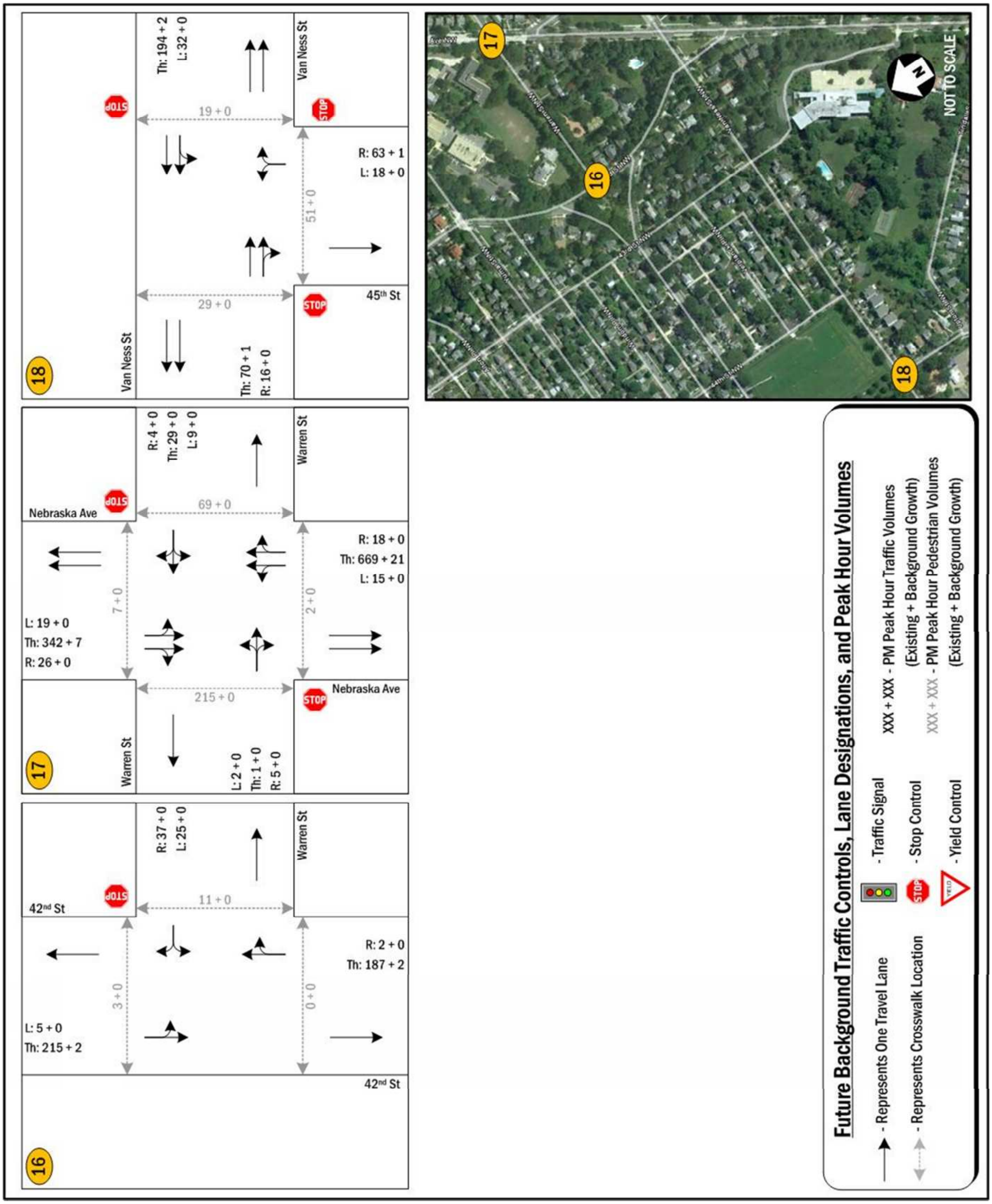

Figure 30: Future Background Traffic Controls, Lane Designations, and PM Traffic Volumes (4 of 5)

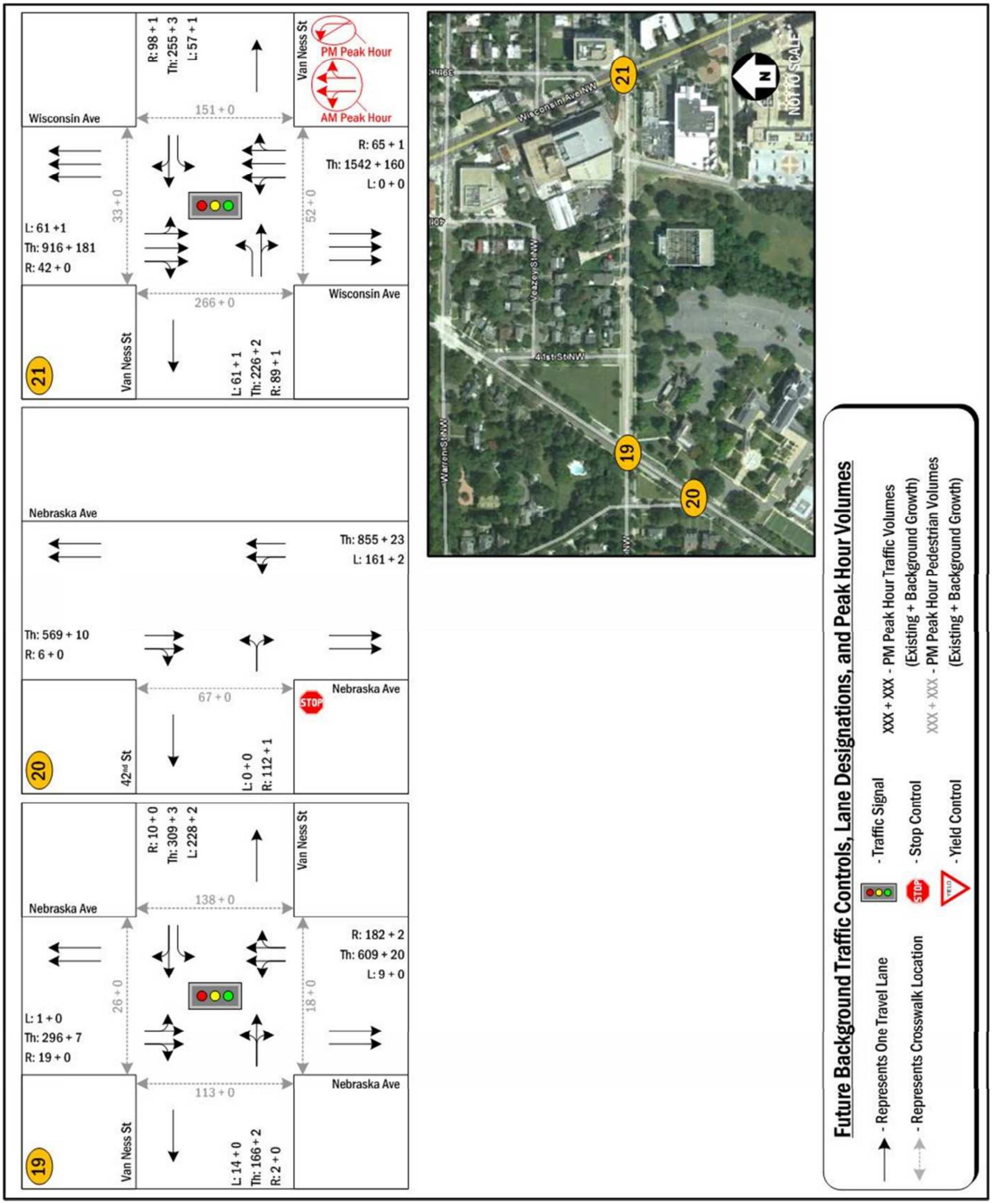

Figure 31: Future Background Traffic Controls, Lane Designations, and PM Traffic Volumes (5 of 5)

3.2.5 Future Conditions without 2011 Campus Plan Vehicular Capacity Analysis

Intersection capacity analyses were performed for the future conditions without the 2011 Plan at the intersections contained within the study area during the morning and afternoon peak hours, following the methodology outlined previously. The capacity analyses for the future conditions without development were based on: (1) the existing lane use and traffic controls; (2) retiming Tenley Circle to improve unacceptable LOS from the existing conditions during the afternoon peak hour; (3) the conversion of 40th Street north of Albemarle Street to one-way northbound and of Fort Drive north of Albemarle Street to one-way southbound as described in the *Rock Creek West II (RCW2) Livability Study*; (4) the peak hour turning movement volumes described previously; and (5) the Highway Capacity Manual (HCM) methodologies (using *Synchro 7* software).

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 2011 Plan for the Tenley Campus. However, the conversion of the intersection of Albemarle Street and Fort Drive to an all-way is also included as a potential future improvement, as recommended by 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. Signal timing changes are also suggested at Tenley Circle in order to improve the northbound approach of Nebraska Avenue and to correct the unacceptable pedestrian delays calculated previously. Detailed LOS descriptions and the analysis worksheets are contained in the Technical Attachments. Additionally, capacity analysis results that do not include the signal timing improvements proposed for Tenley Circle and the improvements at Fort Drive/40th Street are contained in the Technical Attachments.

Table 16 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds). The capacity analysis results are also shown on Figure 32, Figure 33, Figure 34, Figure 35, and Figure 36. The capacity analyses results indicate that all study area intersections operate at acceptable levels of service during both the morning and afternoon peak hours.

Table 16: Future Background Vehicular Levels of Service

Intersection	Approach	Future Background Conditions (2020)			
		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Wisconsin Ave & Albemarle St	**Overall**	**29.8**	**C**	**22.6**	**C**
	Eastbound	26.3	C	24.2	C
	Westbound	62.6	E	63.5	E
	Westbound	32.5	C	19.6	B
	Southbound	24.7	C	16.5	B
Albemarle St & 40th St	Eastbound Left	1.4	A	1.4	A
Albemarle St & Fort Dr	**Overall**	**14.9**	**B**	**21.8**	**C**
	Eastbound	12.6	B	29.3	D
	Westbound	18.7	C	18.3	C
	Northbound	10.5	B	12.6	B
	Southbound	11.6	B	17.4	C
Tenley Circle:					
A: Nebraska Ave & Fort Dr/Tenley Circle	**Overall**	**31.4**	**C**	**22.7**	**C**
	Westbound	14.6	B	14.7	B
	Southbound	45.2	D	33.0	C

Intersection	Approach	Future Background Conditions (2020)			
		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
B: Nebraska Ave & Fort Dr	Eastbound Right	10.3	B	9.3	A
C: Nebraska Ave & Tenley Circle	Westbound Left	9.8	A	9.5	A
D: Nebraska Ave & Wisconsin Ave	**Overall**	**21.3**	**C**	**5.8**	**A**
	Eastbound	20.2	C	6.7	A
	Westbound	3.9	A	3.5	A
	Southbound	40.8	D	9.3	A
E: Nebraska Ave & Wisconsin Ave	**Overall**	**11.3**	**B**	**26.8**	**C**
	Eastbound	3.3	A	5.4	A
	Westbound	12.3	B	26.3	C
	Northbound	30.8	C	54.6	D
F: Nebraska Ave & Yuma St	Westbound Right	9.4	A	10.0	A
G: Nebraska Ave & Tenley Circle	Northbound Left	2.5	A	1.9	A
H: Nebraska Ave & Yuma St	Eastbound Right	10.6	B	9.9	A
I: Nebraska Ave & Tenley Circle	Southbound Left	4.1	A	4.8	A
J: Nebraska Ave & Tenley Circle	Eastbound Left	12.6	B	14.2	B
K: Nebraska Ave Pedestrian Crossing	**Overall**	**13.4**	**B**	**19.2**	**B**
	Northbound	30.9	C	28.3	C
	Southbound	1.1	A	1.3	A
42nd St & Yuma St	**Overall**	**10.1**	**B**	**10.4**	**B**
	Eastbound	9.9	A	9.1	A
	Westbound	9.1	A	10.6	B
	Northbound	10.4	B	10.5	B
	Southbound	10.3	B	10.5	B
42nd St & Warren St	Westbound	9.6	A	10.8	B
	Southbound Left	1.6	A	0.2	A
Nebraska Ave & Warren St	Eastbound	26.3	D	21.4	C
	Westbound	23.4	C	43.5	E
	Northbound	0.7	A	0.6	A
	Southbound	0.2	A	0.8	A
Van Ness St & 45th St	**Overall**	**8.1**	**A**	**8.4**	**A**
	Eastbound	8.2	A	7.8	A
	Westbound	8.3	A	8.9	A
	Northbound	7.7	A	7.7	A
Nebraska Ave & Van Ness St	**Overall**	**26.8**	**C**	**21.3**	**C**
	Eastbound	56.9	E	28.5	C
	Westbound	42.8	D	26.1	C
	Northbound	6.3	A	21.5	C
	Southbound	24.2	C	8.2	A
Nebraska Ave & 42nd St	Eastbound	10.9	B	17.6	C
	Northbound Left	3.7	A	5.5	A
Wisconsin Ave & Van Ness St	**Overall**	**27.7**	**C**	**19.6**	**B**
	Eastbound	33.4	C	34.2	C
	Westbound	45.0	D	44.2	D
	Northbound	11.7	B	12.4	B
	Southbound	32.2	C	17.2	B

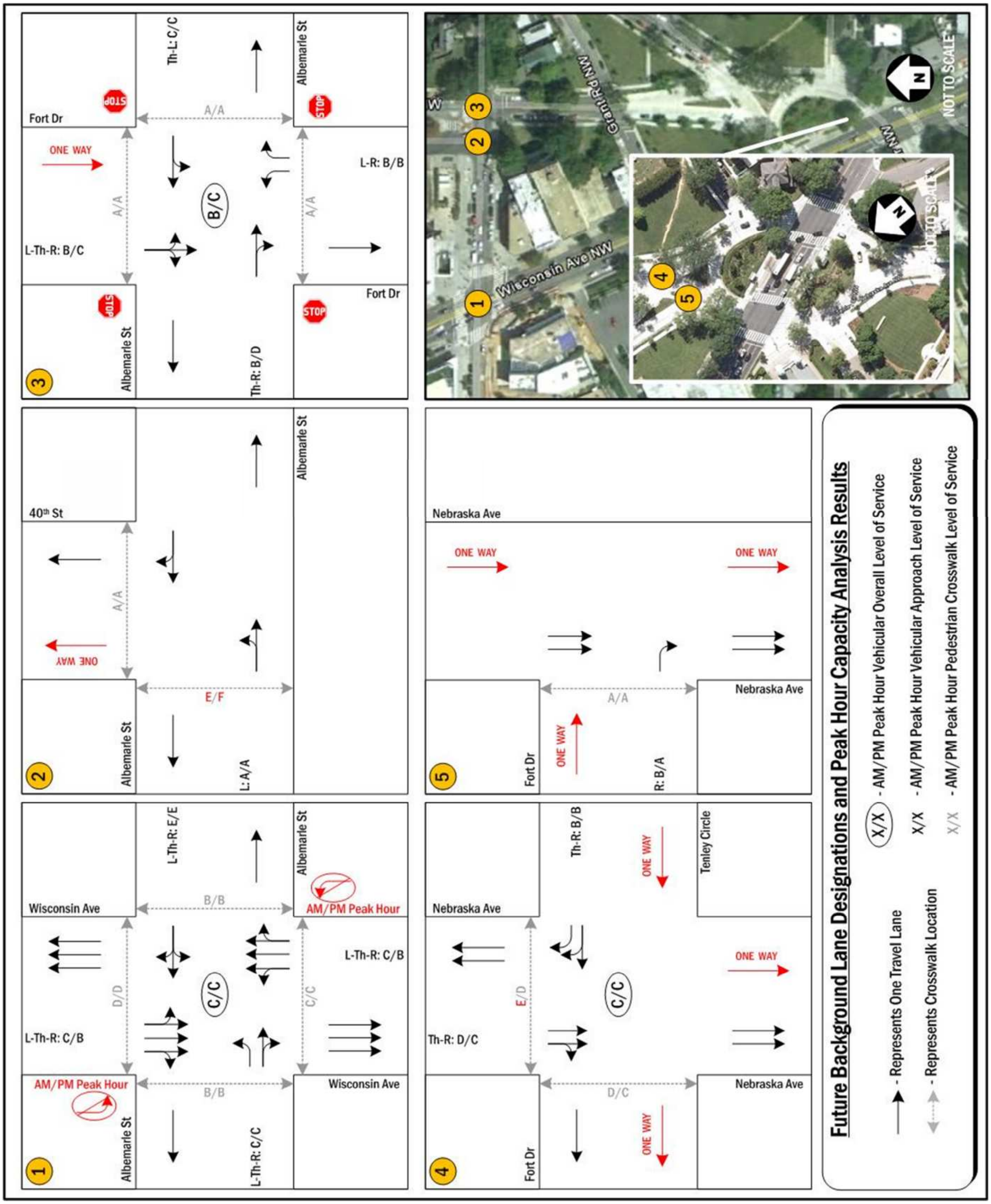

Figure 32: Future Background Lane Configurations and Capacity Analysis Results (1 of 5)

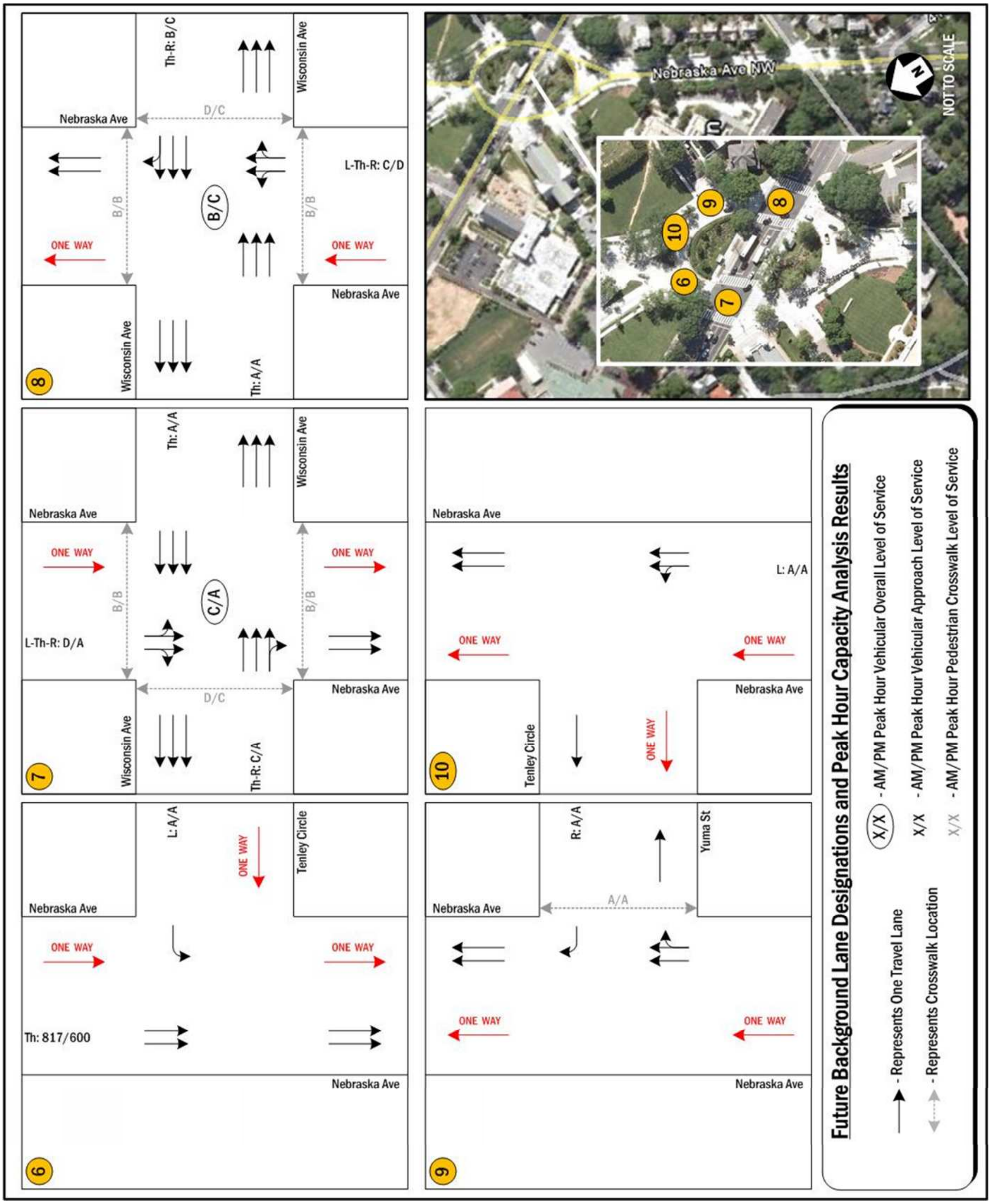

Figure 33: Future Background Lane Configurations and Capacity Analysis Results (2 of 5)

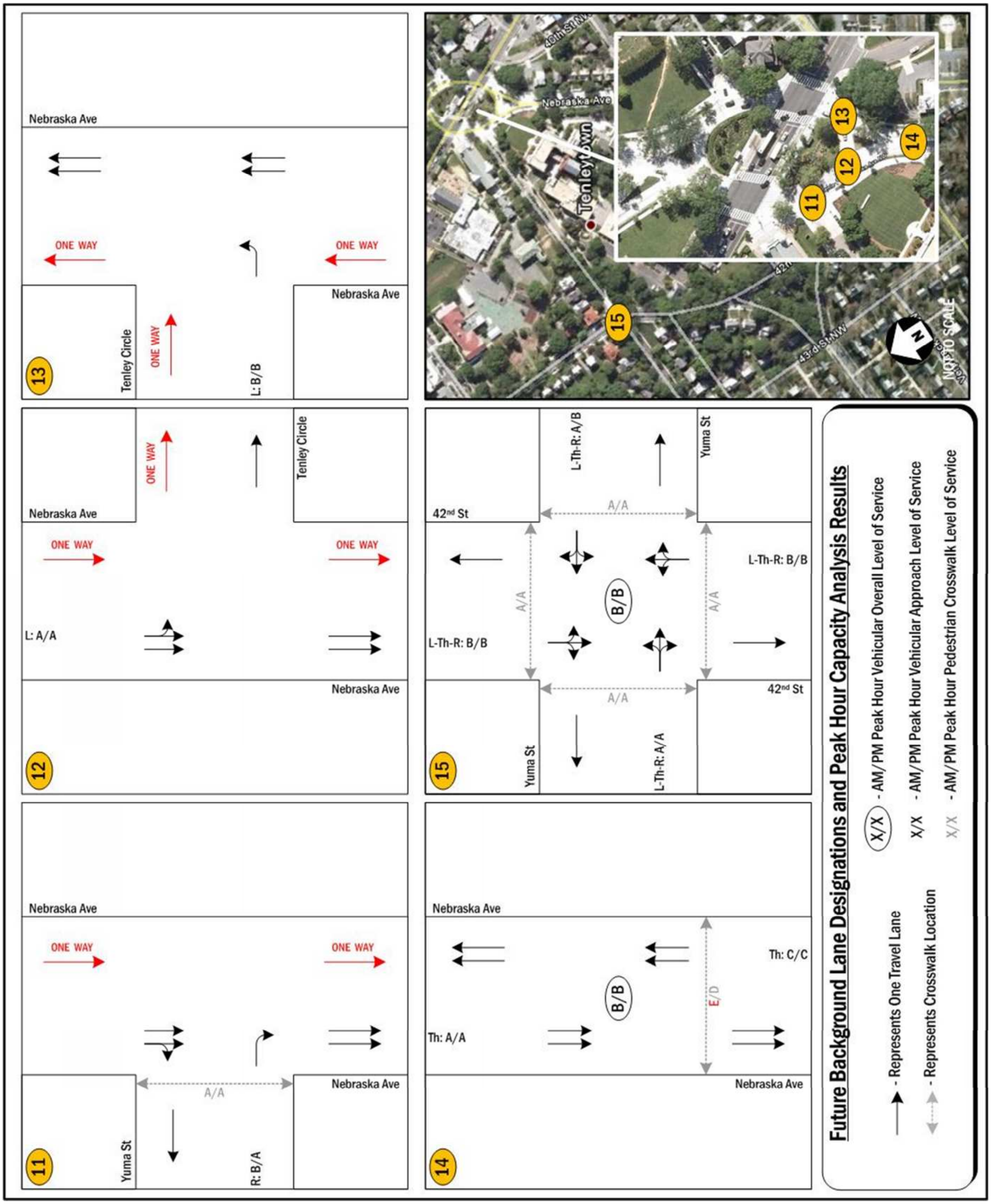

Figure 34: Future Background Lane Configurations and Capacity Analysis Results (3 of 5)

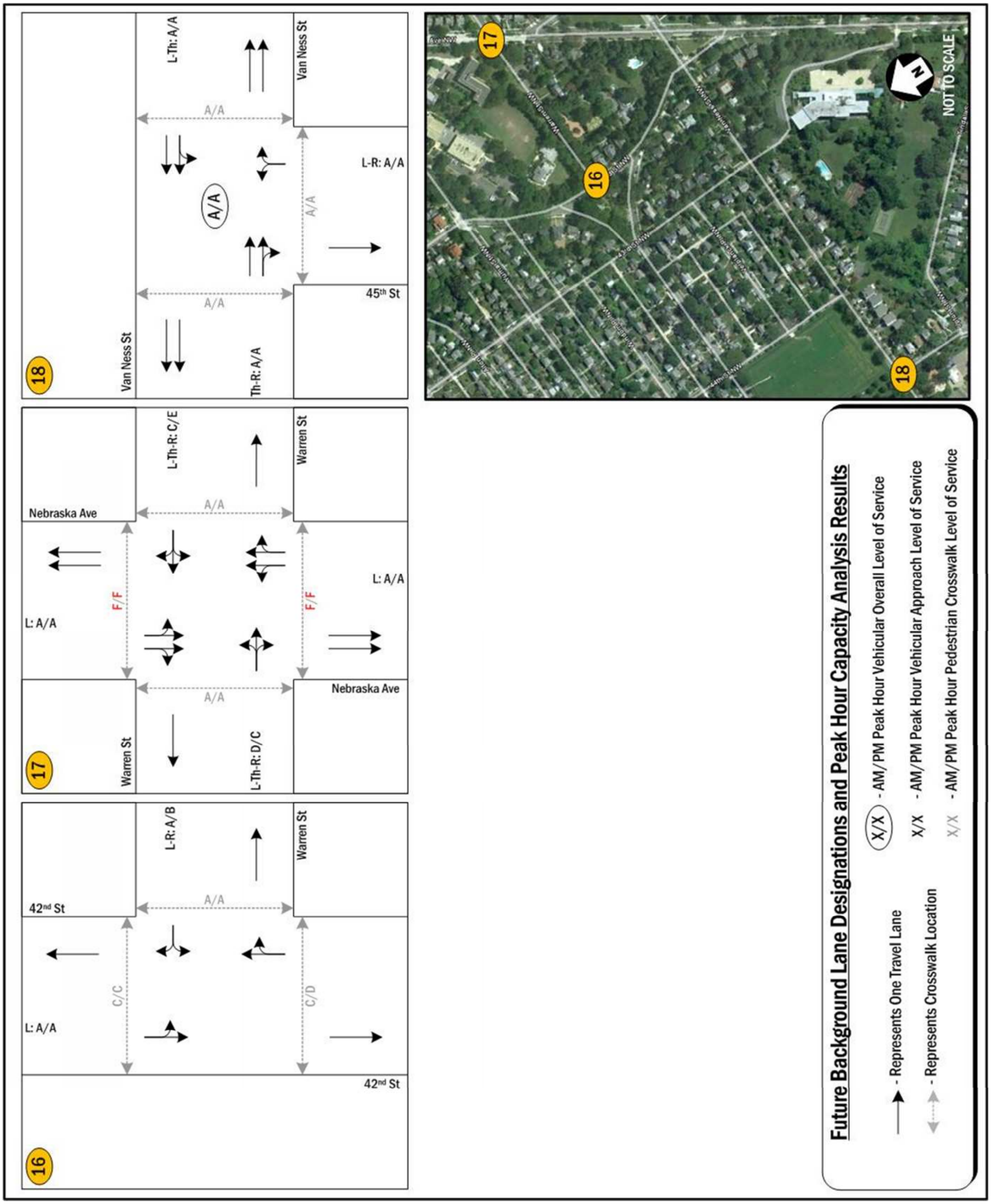

Figure 35: Future Background Lane Configurations and our Capacity Analysis Results (4 of 5)

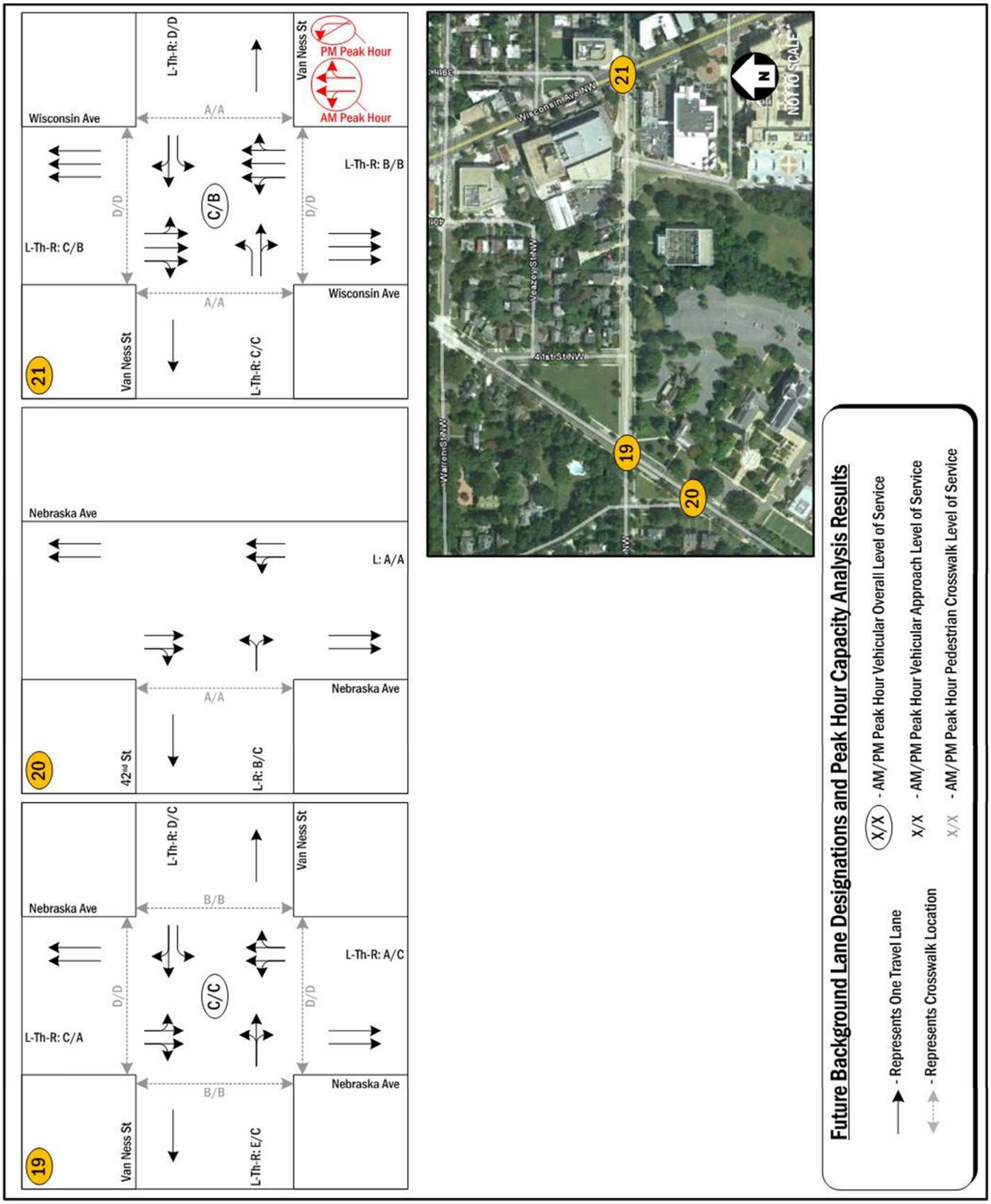

Figure 36: Future Background Lane Configurations and our Capacity Analysis Results (5 of 5)

For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of "E" or better on each approach. As stated previously, all study area intersections operate at acceptable levels of service during the morning and afternoon peak hours. However, a few approaches continue to operate with unacceptable levels of service during one or more peak hours. The LOS results show that:

- All of the study intersections (overall LOS grade) operate at acceptable conditions during both the morning and afternoon peak hours.
- The following approaches continue to operate with unacceptable LOS during one or more peak hours:
- The north- and southbound approaches of Fort Drive at Albemarle Street operate under unacceptable conditions during the morning and afternoon peak period. The conversion to an all-way stop intersection, as recommended in the "Draft Environmental Impact Statement" for the NAC, will allow the intersection to operate at acceptable LOS.
- The northbound approach of Nebraska Avenue at Tenley Circle operates under unacceptable conditions during the afternoon peak period. Adjusting the signal timings to provide more green time for the movement, as well as correcting the deficient pedestrian timing, will result in acceptable conditions for both vehicles and pedestrians.
- No new unacceptable LOS are observed for the future without the 2011 Plan scenario.

3.2.6 Future Conditions without 2011 Campus Plan Pedestrian Analysis Results

Pedestrian analyses were performed for the future without the 2011 Plan conditions at the intersections contained within the study area during the morning and afternoon peak hours. The analysis was based on "Chapter 18: Pedestrians" of the Highway Capacity Manual (HCM), as outlined previously.

Table 17 and Table 18 show the results of the capacity analyses, including LOS and average delay (in seconds). The capacity analysis results are also shown on Figure 32, Figure 33, Figure 34, Figure 35, and Figure 36.

Table 17: Future Background Pedestrian Levels of Service for Signalized Intersections

Intersection	Parallel Approach	Future Background Conditions (2020)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
Wisconsin Ave & Albemarle St	Eastbound	27.4	C	28.1	C
	Westbound	38.7	D	39.6	D
	Northbound	15.7	B	15.1	B
	Southbound	15.7	B	15.1	B
Tenley Circle:					
A: Nebraska Ave & Fort Dr/Tenley Circle	Eastbound	41.4	E	39.6	D
	Southbound	31.2	D	27.4	C
D: Nebraska Ave & Wisconsin Ave	Eastbound	14.6	B	17.4	B
	Westbound	11.5	B	14.0	B
	Northbound	32.8	D	28.9	C
	Southbound	32.8	D	28.9	C
E: Nebraska Ave & Wisconsin Ave	Eastbound	11.5	B	14.0	B
	Westbound	14.6	B	17.4	B
	Northbound	32.8	D	28.9	C
	Southbound	32.8	D	28.9	C
K: Nebraska Ave Pedestrian Crossing	Eastbound	41.4	E	39.6	D
Nebraska Ave & Van Ness St	Eastbound	32.8	D	31.2	D

Intersection	Parallel Approach	Future Background Conditions (2020)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
	Westbound	32.8	D	31.2	D
	Northbound	11.0	B	12.0	B
	Southbound	11.0	B	12.0	B
Wisconsin Ave & Van Ness St	Eastbound	37.0	D	35.3	D
	Westbound	37.0	D	35.3	D
	Northbound	8.8	A	9.7	A
	Southbound	8.8	A	9.7	A

Table 18: Future Background Pedestrian Levels of Service for Unsignalized Intersections

Intersection	Parallel Approach	Future Background Conditions (2020)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
Albemarle St & 40th St	Westbound	N/A - Stop controlled crossing, LOS A			
	Southbound	33.5	E	60.2	F
Albemarle St & Fort Dr	Eastbound	N/A - Stop controlled crossing, LOS A			
	Westbound	N/A - Stop controlled crossing, LOS A			
	Northbound	N/A - Stop controlled crossing, LOS A			
Tenley Circle:					
B: Nebraska Ave & Fort Dr	Southbound	N/A - Stop controlled crossing, LOS A			
F: Nebraska Ave & Yuma St	Northbound	N/A - Stop controlled crossing, LOS A			
H: Nebraska Ave & Yuma St	Southbound	N/A - Stop controlled crossing, LOS A			
42nd St & Yuma St	Eastbound	N/A - Stop controlled crossing, LOS A			
	Westbound	N/A - Stop controlled crossing, LOS A			
	Northbound	N/A - Stop controlled crossing, LOS A			
	Southbound	N/A - Stop controlled crossing, LOS A			
42nd St & Warren St	Eastbound	12.4	C	18.4	D
	Westbound	15.0	C	19.5	C
	Northbound	N/A - Stop controlled crossing, LOS A			
Nebraska Ave & Warren St	Eastbound	2,950.6	F	1,000.3	F
	Westbound	3,107.4	F	1,214.3	F
	Northbound	N/A - Stop controlled crossing, LOS A			
	Southbound	N/A - Stop controlled crossing, LOS A			
Van Ness & 45th St	Eastbound	N/A - Stop controlled crossing, LOS A			
Nebraska Ave & 42nd St	Southbound	N/A - Stop controlled crossing, LOS A			

The analysis results indicate that all signalized crosswalks in the study area operate at acceptable levels of service during both the morning and afternoon peak hours, except two located at Tenley Circle. However, the signal timing improvements at Tenley Circle bring all signalized crosswalks to acceptable LOS. This indicates a low (LOS A and B) to moderate (LOS C and D) likelihood of non-compliance by pedestrians, which is reflected by pedestrians jaywalking across the intersection.

The analysis results also indicate that the majority of the unsignalized crosswalks in the study area operate at acceptable levels of service during the morning and afternoon peak hours. This indicates a moderate (LOS C and D) likelihood of risk-taking behavior for pedestrians, which is reflected in occasional pedestrians dashing between vehicles during short gaps in traffic. As stated previously, pedestrians have the right-of-way in all crosswalks in the District, so vehicles must yield to pedestrians in the crosswalk at the study intersections listed in Table 15. However, the LOS E and F calculated indicate an unfriendly and intimidating environment for pedestrians. No new unacceptable LOS are observed for the future without the 2011 Plan scenario. Additionally, the conversion of the intersection of Albemarle Street & Fort Drive to all-way stop control brings the crosswalks to acceptable LOS since stop-controlled crossing have no pedestrian delay.

3.2.7 Future Conditions with 2011 Campus Plan Traffic Volumes

The impact of the proposed changes to the Tenley Campus was based on changes to vehicular and pedestrian generated traffic on the campus. Section 3.1 of this report describes the methodologies and results of the pedestrian and vehicular trip generation calculations.

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 University and adding the site-generated vehicular and pedestrian volumes generated by the WCL to the future without the 2011 Plan traffic volumes. The future traffic volumes with the proposed development on the Tenley Campus are shown on Figure 37, Figure 38, Figure 39, Figure 40, and Figure 41 for the morning peak hour and Figure 42, Figure 43, Figure 44, Figure 45, and Figure 46 for the afternoon peak hour.

3.2.8 Future Conditions with 2011 Campus Plan Vehicular Capacity Analysis

Intersection capacity analyses were performed for the future conditions with the 2011 Plan for the Tenley Campus at the intersections contained within the study area during the morning and afternoon peak hours, following the methodology outlined previously. The capacity analyses for the future conditions with the 2011 Plan were based on: (1) the future background lane use and traffic controls; (2) the addition of the proposed Tenley Campus driveway location along Nebraska Avenue north of Warren Street; (3) the peak hour turning movement volumes described previously; and (4) the Highway Capacity Manual (HCM) methodologies (using *Synchro 7* software).

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. Signal timing changes are also suggested at Tenley Circle in order to improve the northbound approach of Nebraska Avenue and to correct the unacceptable pedestrian delays calculated previously. The proposed driveway for 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. Detailed LOS descriptions and the analysis worksheets are contained in the Technical Attachments. Additionally, capacity analysis results that do not include the signal timing improvements proposed for Tenley Circle and the improvements at Fort Drive/40th Street are contained in the Technical Attachments.

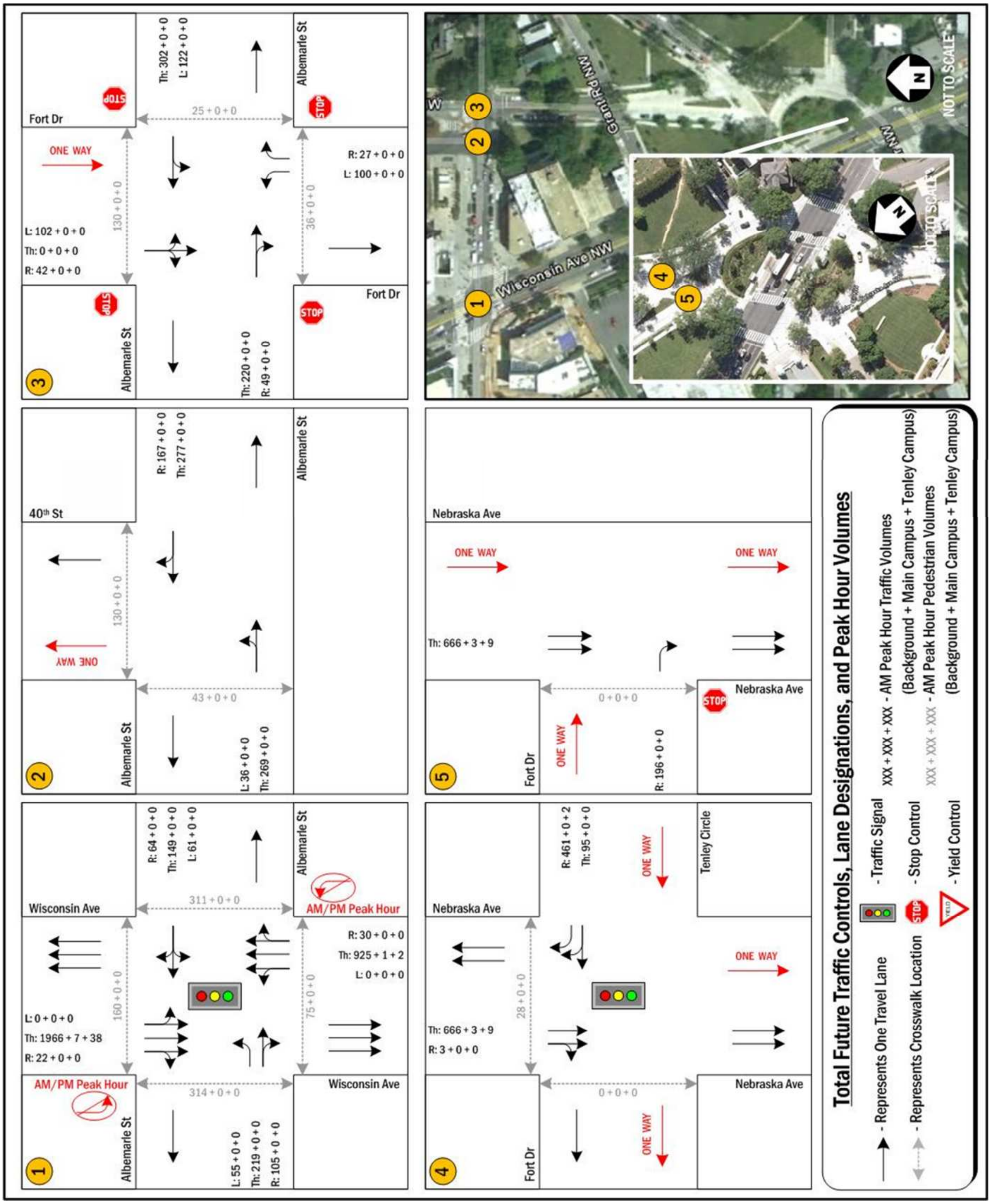

Figure 37: Total Future Traffic Controls, Lane Designations, and AM Traffic Volumes (1 of 5)

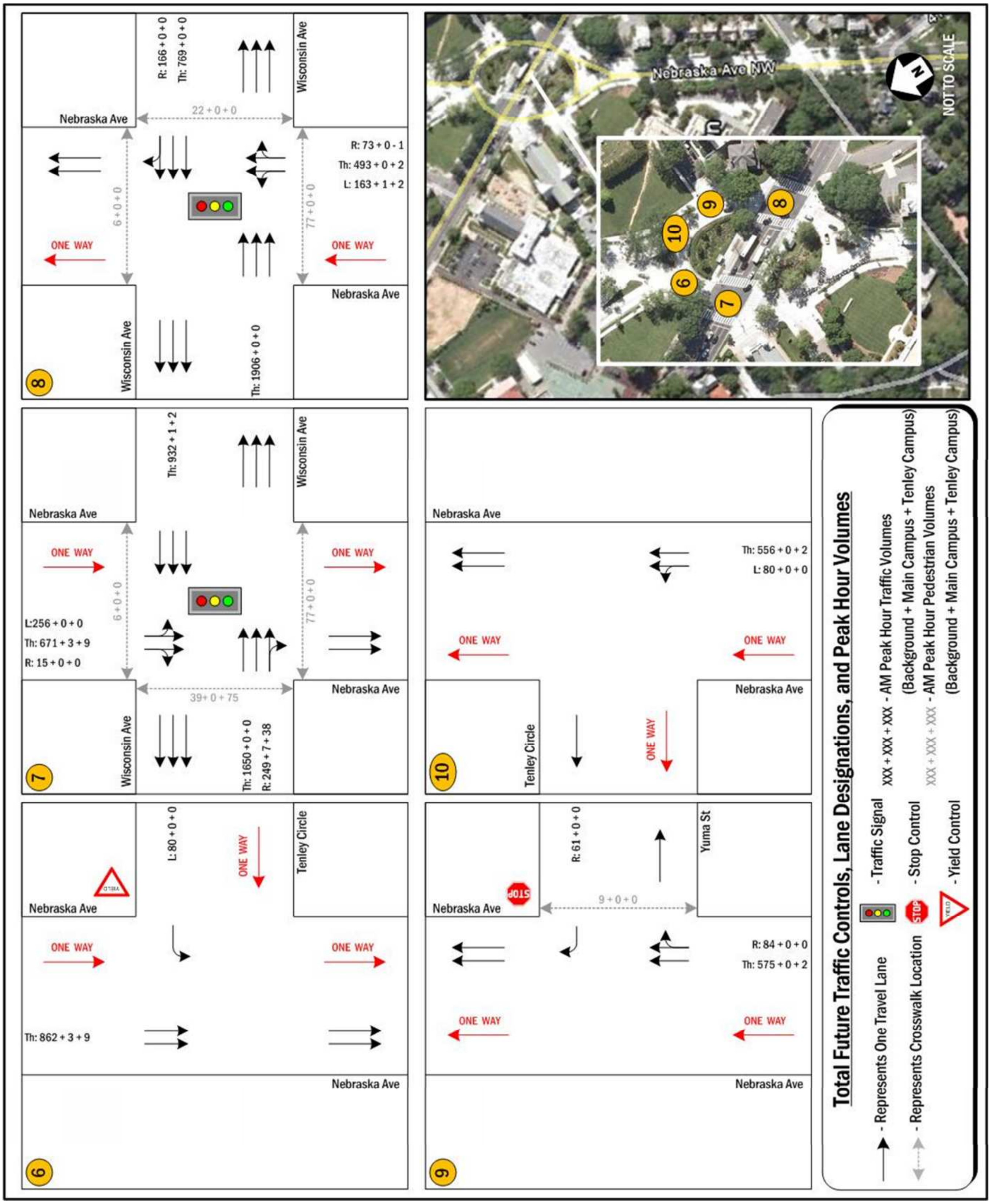

Figure 38: Total Future Traffic Controls, Lane Designations, and AM Traffic Volumes (2 of 5)

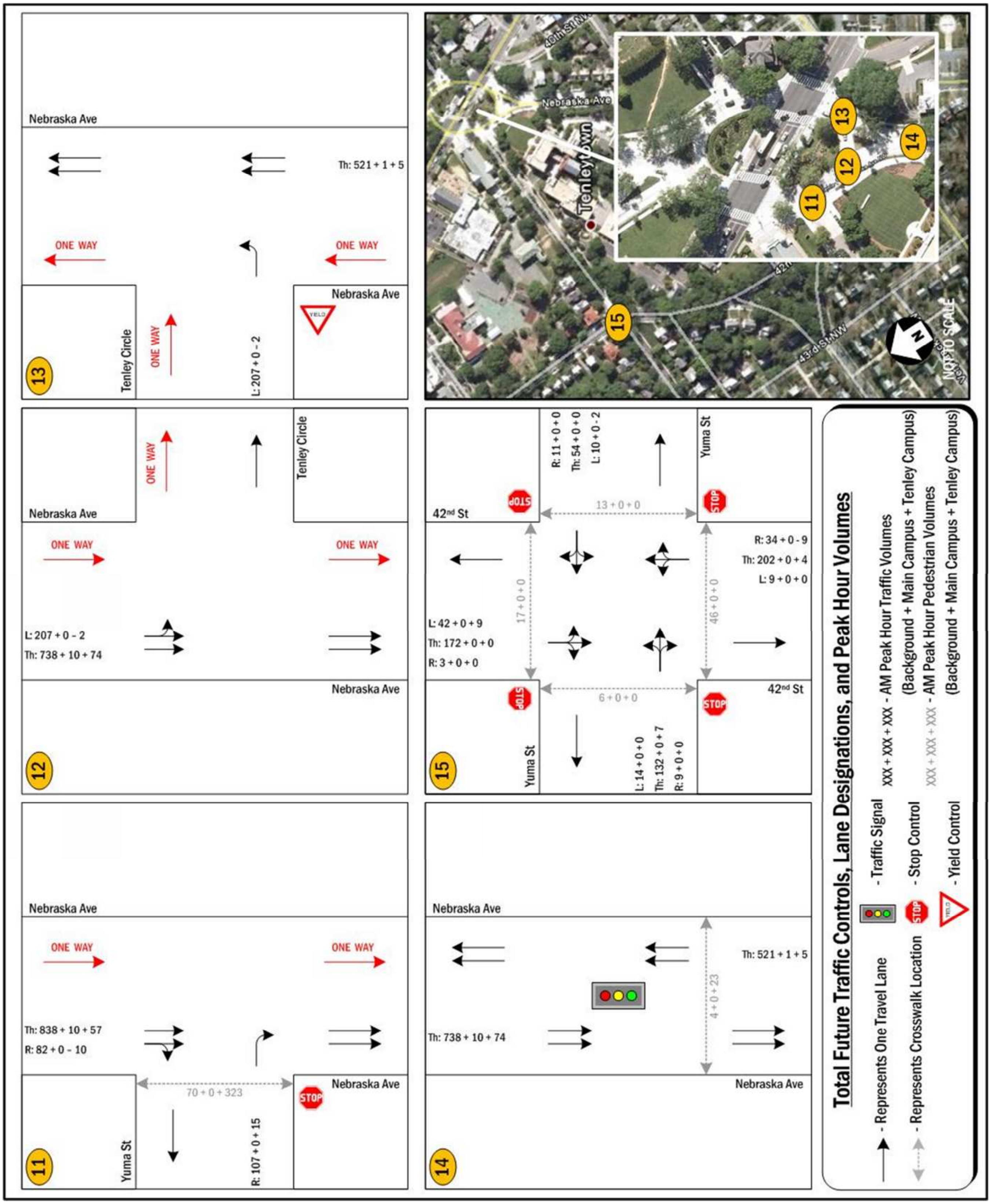

Figure 39: Total Future Traffic Controls, Lane Designations, and AM Traffic Volumes (3 of 5)

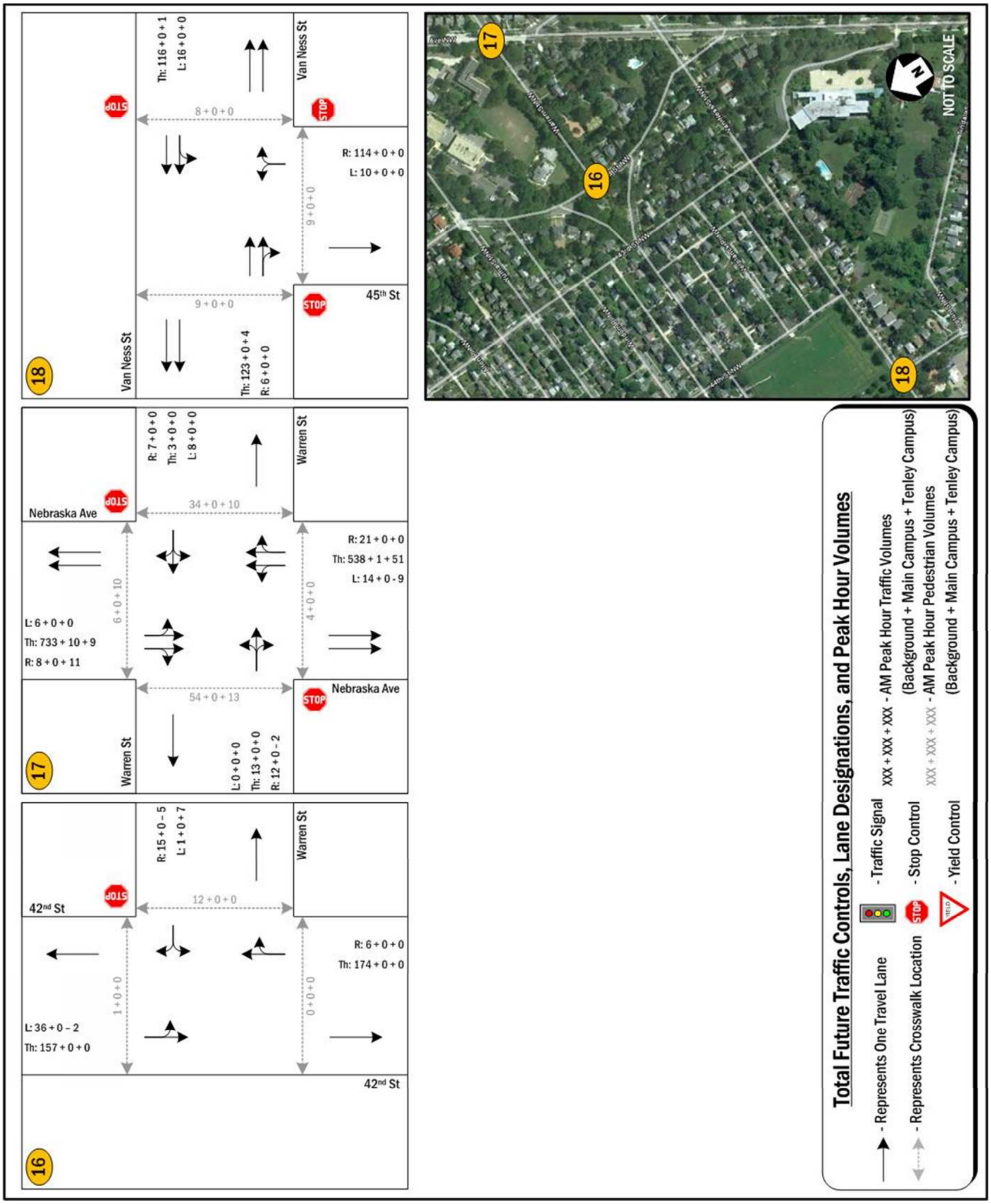

Figure 40: Total Future Traffic Controls, Lane Designations, and AM Traffic Volumes (4 of 5)

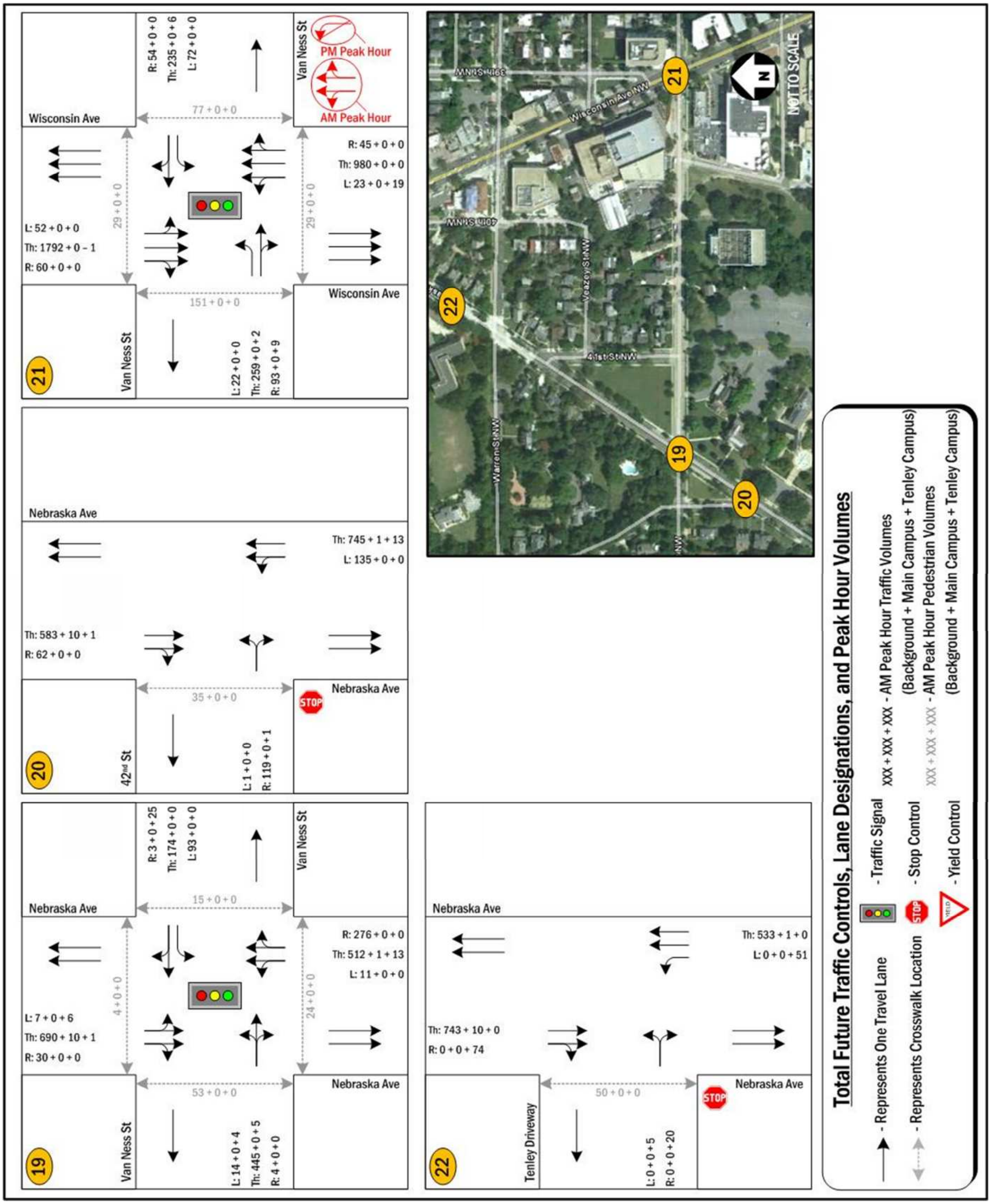

Figure 41: Total Future Traffic Controls, Lane Designations, and AM Traffic Volumes (5 of 5)

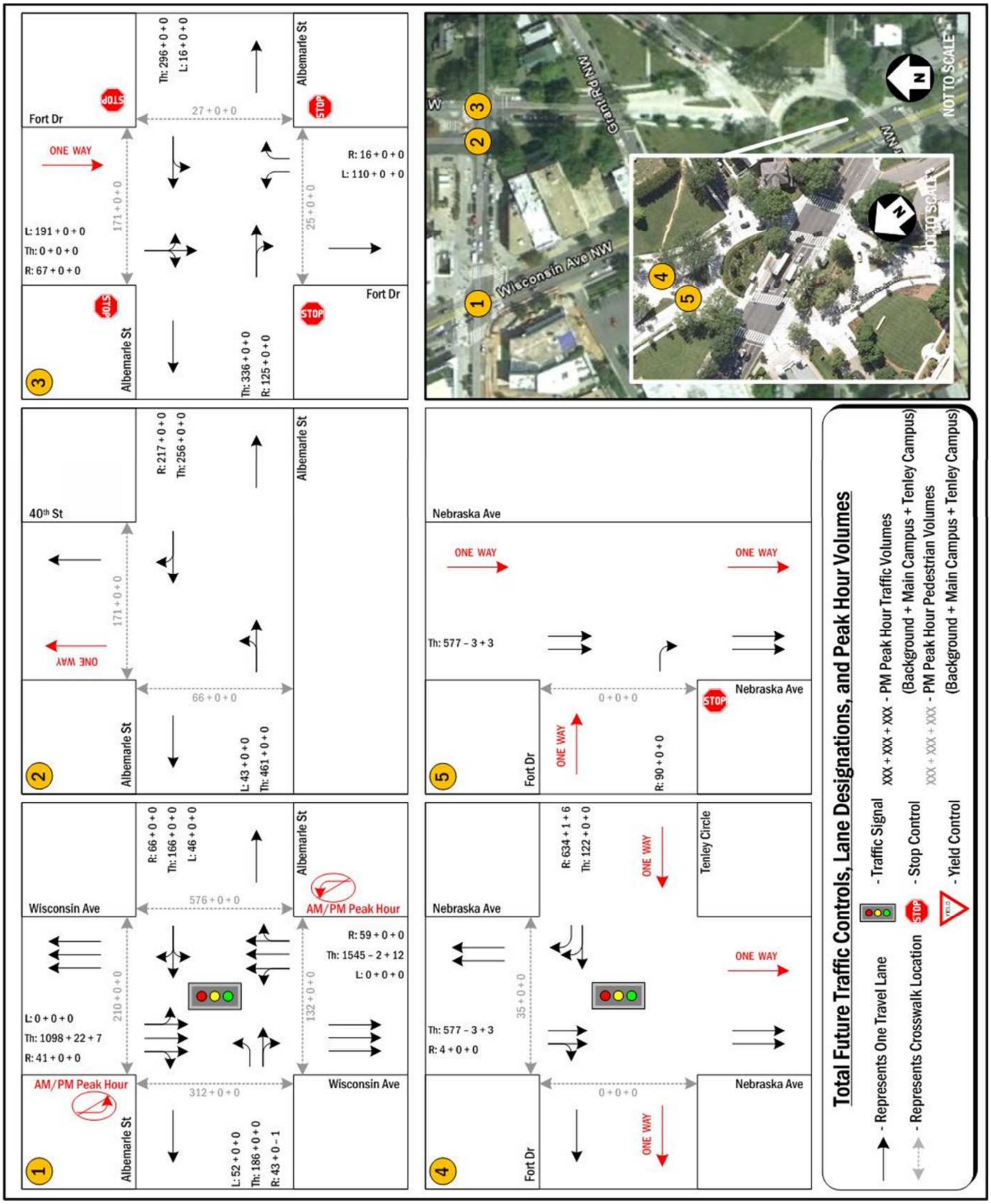

Figure 42: Total Future Traffic Controls, Lane Designations, and PM Traffic Volumes (1 of 5)

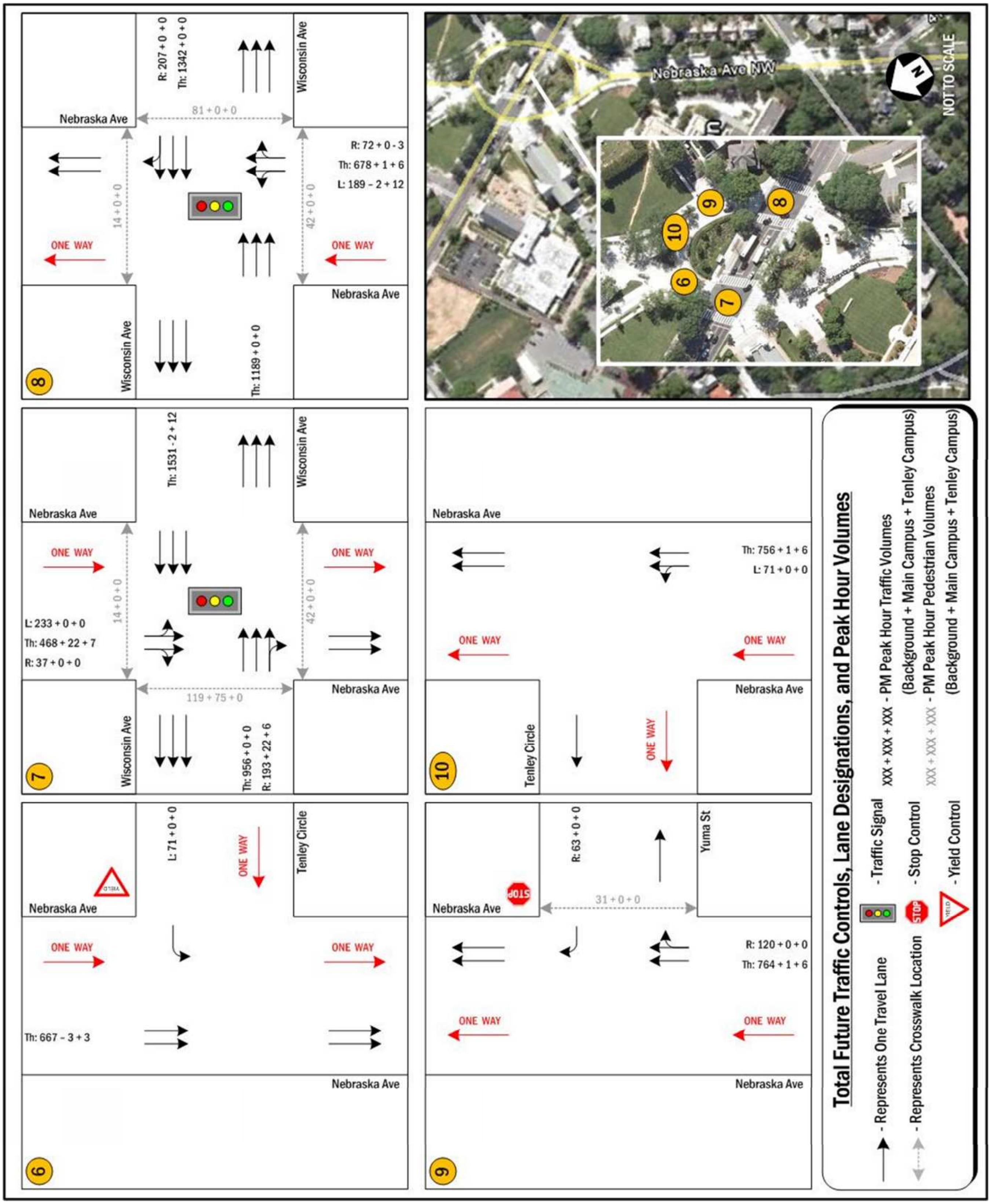

Figure 43: Total Future Traffic Controls, Lane Designations, and PM Traffic Volumes (2 of 5)

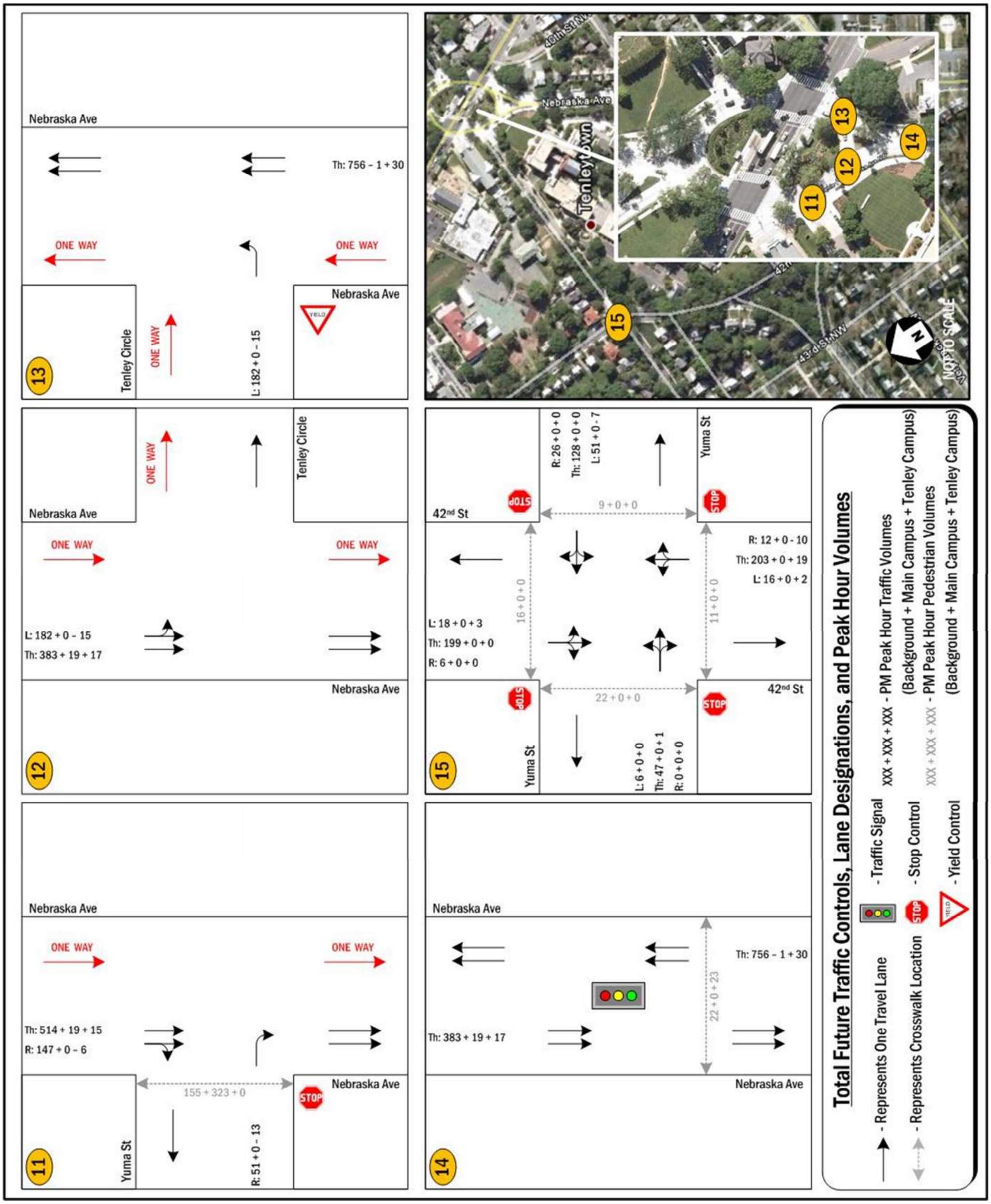

Figure 44: Total Future Traffic Controls, Lane Designations, and PM Traffic Volumes (3 of 5)

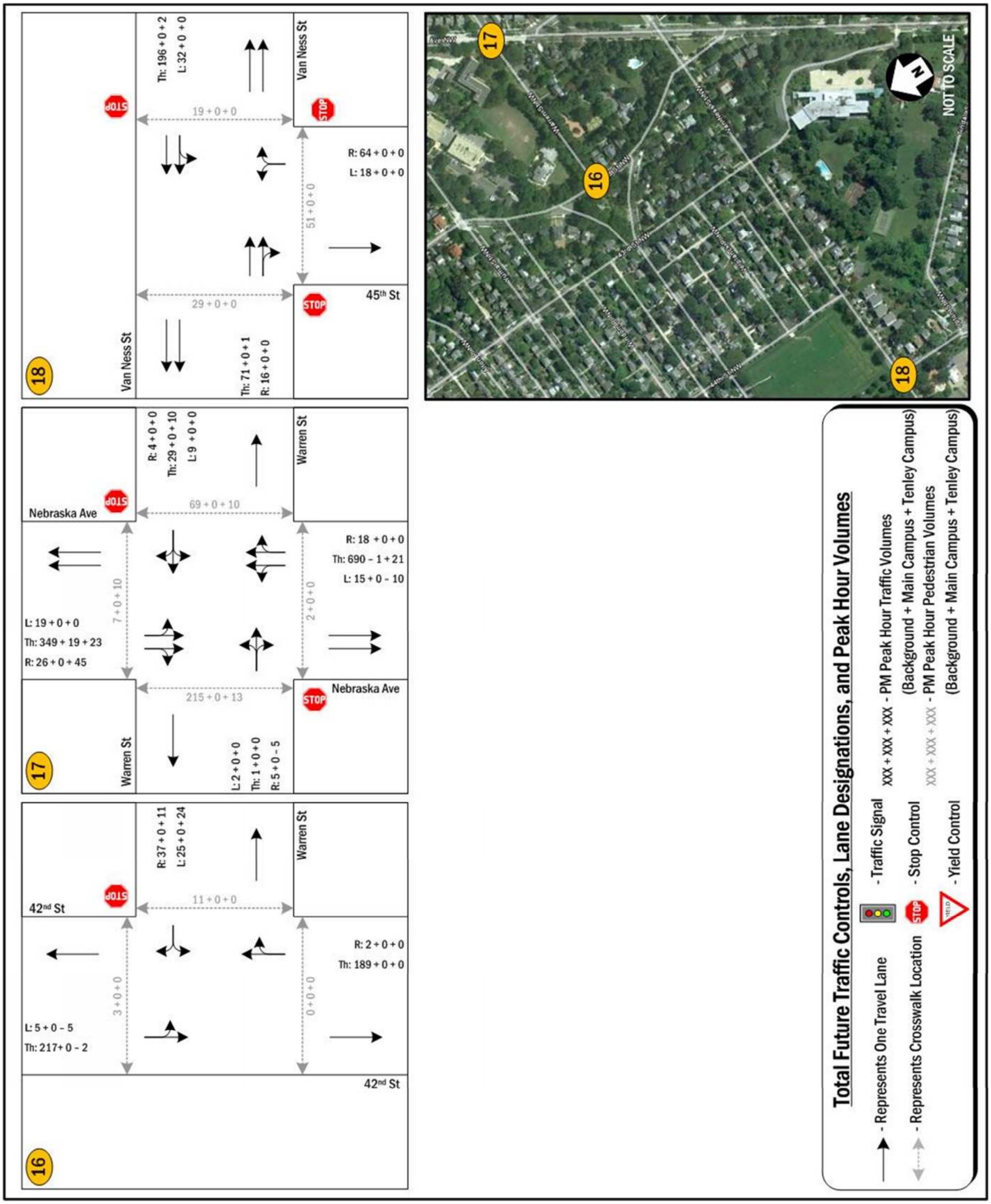

Figure 45: Total Future Traffic Controls, Lane Designations, and PM Traffic Volumes (4 of 5)

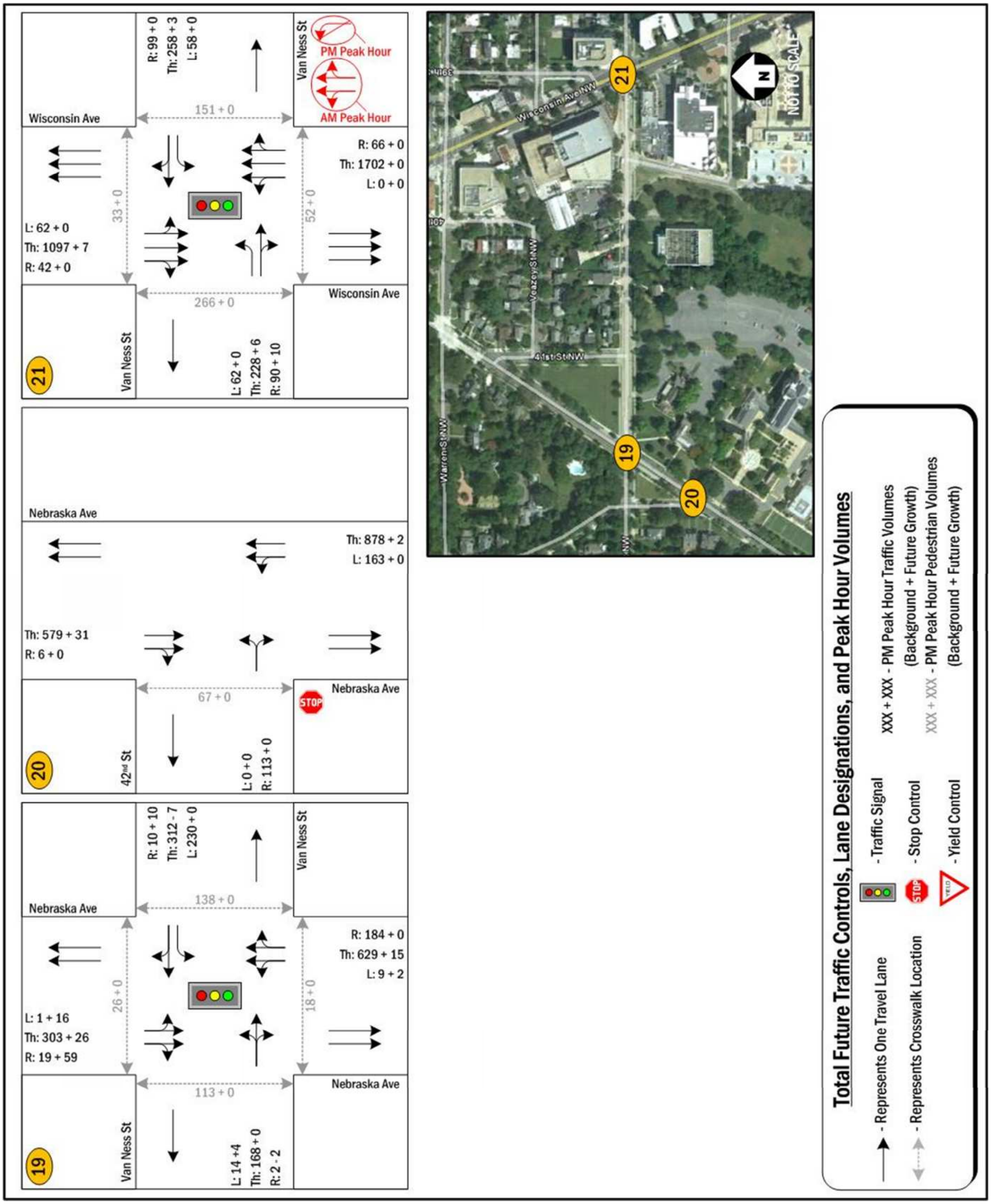

Figure 46: Total Future Traffic Controls, Lane Designations, and PM Traffic Volumes (5 of 5)

Table 19 shows the results of the capacity analyses, including LOS and average delay per vehicle (in seconds). The capacity analysis results are also shown on Figure 47, Figure 48, Figure 49, Figure 50, and Figure 51. The capacity analyses results indicate that all study area intersections operate at acceptable levels of service during both the morning and afternoon peak hours.

Table 19: Total Future Vehicular Levels of Service

Intersection	Approach	Total Future Conditions (2020)			
		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Wisconsin Ave & Albemarle St	**Overall**	**30.2**	**C**	**22.5**	**C**
	Eastbound	26.3	C	24.2	C
	Westbound	62.6	E	63.5	E
	Westbound	32.4	C	19.5	B
	Southbound	25.5	C	16.6	B
Albemarle St & 40th St	Eastbound Left	1.4	A	1.4	A
Albemarle St & Fort Dr	Overall	**14.9**	**B**	**21.8**	**C**
	Eastbound	12.6	B	29.3	D
	Westbound	18.7	C	18.3	C
	Northbound	10.5	B	12.6	B
	Southbound	11.6	B	17.4	C
Tenley Circle:					
A: Nebraska Ave & Fort Dr/Tenley Circle	**Overall**	**32.1**	**C**	**22.7**	**C**
	Westbound	14.7	B	14.8	B
	Southbound	46.3	D	33.0	C
B: Nebraska Ave & Fort Dr	Eastbound Right	10.4	B	9.3	A
C: Nebraska Ave & Tenley Circle	Westbound Left	9.9	A	9.5	A
D: Nebraska Ave & Wisconsin Ave	**Overall**	**22.5**	**C**	**6.0**	**A**
	Eastbound	20.6	C	7.1	A
	Westbound	3.9	A	3.6	A
	Southbound	44.5	D	9.4	A
E: Nebraska Ave & Wisconsin Ave	**Overall**	**9.8**	**A**	**26.9**	**C**
	Eastbound	3.2	A	5.2	A
	Westbound	11.0	B	26.4	C
	Northbound	25.4	C	54.7	D
F: Nebraska Ave & Yuma St	Westbound Right	9.4	A	10.0	B
G: Nebraska Ave & Tenley Circle	Northbound Left	2.5	A	1.9	A
H: Nebraska Ave & Yuma St	Eastbound Right	17.0	C	18.9	C
I: Nebraska Ave & Tenley Circle	Southbound Left	3.9	A	4.5	A
J: Nebraska Ave & Tenley Circle	Eastbound Left	12.6	B	14.2	B
K: Nebraska Ave Pedestrian Crossing	**Overall**	**12.9**	**B**	**19.0**	**B**
	Northbound	30.9	C	28.4	C
	Southbound	1.3	A	1.3	A
42nd St & Yuma St	**Overall**	**10.2**	**B**	**10.5**	**B**
	Eastbound	10.1	B	9.1	A
	Westbound	9.1	A	10.5	B
	Northbound	10.5	B	10.8	B
	Southbound	10.5	B	10.5	B
42nd St & Warren St	Westbound	10.4	B	11.3	B
	Southbound Left	1.6	A	0.0	A

Intersection	Approach	Total Future Conditions (2020)			
		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Nebraska Ave & Warren St	Eastbound	30.9	D	37.3	E
	Westbound	26.0	D	47.5	E
	Northbound	0.2	A	0.2	A
	Southbound	0.2	A	0.8	A
Van Ness St & 45th St	**Overall**	**8.1**	**A**	**8.4**	**A**
	Eastbound	8.2	A	7.8	A
	Westbound	8.3	A	9.0	A
	Northbound	7.7	A	7.7	A
Nebraska Ave & Van Ness St	**Overall**	**28.5**	**C**	**21.6**	**C**
	Eastbound	61.0	E	28.9	C
	Westbound	42.4	D	26.9	C
	Northbound	9.0	A	21.5	C
	Southbound	23.7	C	9.8	A
Nebraska Ave & 42nd St	Eastbound	10.9	B	18.7	C
	Northbound Left	3.7	A	5.7	A
Wisconsin Ave & Van Ness St	**Overall**	**28.7**	**C**	**24.7**	**C**
	Eastbound	37.5	D	62.5	E
	Westbound	46.9	D	53.5	D
	Northbound	13.8	B	12.5	B
	Southbound	31.7	C	16.9	B
Nebraska Ave & Tenley Driveway	Eastbound	14.4	B	20.8	C
	Northbound Left	10.1	B	9.7	A

For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of “E” or better on each approach. As stated previously, all study area intersections operate at acceptable levels of service during the morning and afternoon peak hours. However, a few approaches continue to operate with unacceptable levels of service during one or more peak hours. The LOS results show that:

- All of the study intersections (overall LOS) operate at acceptable conditions during both the morning and afternoon peak hours.
- The following approaches continue to operate with unacceptable LOS during one or more peak hours:
- The north- and southbound approaches of Fort Drive at Albemarle Street continue to operate under unacceptable conditions during the morning and afternoon peak period. The conversion to an all-way stop intersection, as recommended in the “Draft Environmental Impact Statement” for the NAC, will allow the intersection to operate at acceptable LOS.
- The northbound approach of Nebraska Avenue at Tenley Circle continues to operate under unacceptable conditions during the afternoon peak period. Adjusting the signal timings to provide more green time for the movement, as well as correcting the deficient pedestrian timing, will result in acceptable conditions for both vehicles and pedestrians.
- No new unacceptable LOS are observed following the addition of the vehicular and pedestrian traffic generated by the 2011 Plan for the Tenley Campus.

- Additionally, the proposed driveway for the Tenley Campus is projected to operate under acceptable conditions during the morning and afternoon peak hours.

3.2.9 Future Conditions with 2011 Campus Plan Pedestrian Analysis Results

Pedestrian analyses were performed for the future with the 2011 Plan conditions at the intersections contained within the study area during the morning and afternoon peak hours. The analysis was based on "Chapter 18: Pedestrians" of the Highway Capacity Manual (HCM), as outlined previously.

Table 20 and Table 21 show the results of the capacity analyses, including LOS and average delay (in seconds). The capacity analysis results are also shown on Figure 47, Figure 48, Figure 49, Figure 50, and Figure 51.

Table 20: Total Future Pedestrian Levels of Service for Signalized Intersections

Intersection	Parallel Approach	Total Future Conditions (2020)			
		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Wisconsin Ave & Albemarle St	Eastbound	27.4	C	28.1	C
	Westbound	38.7	D	39.6	D
	Northbound	15.7	B	15.1	B
	Southbound	15.7	B	15.1	B
Tenley Circle:					
A: Nebraska Ave & Fort Dr/Tenley Circle	Eastbound	41.4	E	39.6	D
	Southbound	31.2	D	27.4	C
D: Nebraska Ave & Wisconsin Ave	Eastbound	14.6	B	17.4	B
	Westbound	11.5	B	14.0	B
	Northbound	32.8	D	28.9	C
	Southbound	32.8	D	28.9	C
E: Nebraska Ave & Wisconsin Ave	Eastbound	11.5	B	14.0	B
	Westbound	14.6	B	17.4	B
	Northbound	32.8	D	28.9	C
	Southbound	32.8	D	28.9	C
K: Nebraska Ave Pedestrian Crossing	Eastbound	41.4	E	39.6	D
Nebraska Ave & Van Ness St	Eastbound	32.8	D	31.2	D
	Westbound	32.8	D	31.2	D
	Northbound	11.0	B	12.0	B
	Southbound	11.0	B	12.0	B
Wisconsin Ave & Van Ness St	Eastbound	37.0	D	35.3	D
	Westbound	37.0	D	35.3	D
	Northbound	8.8	A	9.7	A
	Southbound	8.8	A	9.7	A

Table 21: Total Future Pedestrian Levels of Service for Unsignalized Intersections

Intersection	Parallel Approach	Total Future Conditions (2020)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
Albemarle St & 40th St	Westbound	N/A - Stop controlled crossing, LOS A			
	Southbound	33.5	E	60.2	F
Albemarle St & Fort Dr	Eastbound	N/A - Stop controlled crossing, LOS A			
	Westbound	N/A - Stop controlled crossing, LOS A			
	Northbound	N/A - Stop controlled crossing, LOS A			
Tenley Circle:					

Intersection	Parallel Approach	Total Future Conditions (2020)			
		AM Peak Hour		*PM Peak Hour*	
		Delay	LOS	Delay	LOS
B: Nebraska Ave & Fort Dr	Southbound	N/A - Stop controlled crossing, LOS A			
F: Nebraska Ave & Yuma St	Northbound	N/A - Stop controlled crossing, LOS A			
H: Nebraska Ave & Yuma St	Southbound	N/A - Stop controlled crossing, LOS A			
42nd St & Yuma St	Eastbound	N/A - Stop controlled crossing, LOS A			
	Westbound	N/A - Stop controlled crossing, LOS A			
	Northbound	N/A - Stop controlled crossing, LOS A			
	Southbound	N/A - Stop controlled crossing, LOS A			
42nd St & Warren St	Eastbound	12.8	C	20.0	D
	Westbound	14.6	C	19.8	C
	Northbound	N/A - Stop controlled crossing, LOS A			
Nebraska Ave & Warren St	Eastbound	3,881.4	F	1,233.9	F
	Westbound	4,573.9	F	2,087.9	F
	Northbound	N/A - Stop controlled crossing, LOS A			
	Southbound	N/A - Stop controlled crossing, LOS A			
Van Ness & 45th St	Eastbound	N/A - Stop controlled crossing, LOS A			
Nebraska Ave & 42nd St	Southbound	N/A - Stop controlled crossing, LOS A			
Nebraska Ave & Tenley Driveway	Southbound	N/A - Stop controlled crossing, LOS A			

The analysis results indicate that all signalized crosswalks in the study area operate at acceptable levels of service during both the morning and afternoon peak hours, except two located at Tenley Circle. However, the signal timing improvements at Tenley Circle bring all signalized crosswalks to acceptable LOS. This indicates a low (LOS A and B) to moderate (LOS C and D) likelihood of non-compliance by pedestrians, which is reflected by pedestrians jaywalking across the intersection.

The analysis results also indicate that the majority of the unsignalized crosswalks in the study area operate at acceptable levels of service during the morning and afternoon peak hours. This indicates a moderate (LOS C and D) likelihood of risk-taking behavior for pedestrians, which is reflected in occasional pedestrians dashing between vehicles during short gaps in traffic. As stated previously, pedestrians have the right-of-way in all crosswalks in the District, so vehicles must yield to pedestrians in the crosswalk at the study intersections listed in Table 15. However, the LOS E and F calculated indicate an unfriendly and intimidating environment for pedestrians. No new unacceptable LOS are observed for the future without the 2011 Plan scenario. Additionally, the conversion of the intersection of Albemarle Street & Fort Drive to all-way stop control brings the crosswalks to acceptable LOS since stop-controlled crossing have no pedestrian delay.

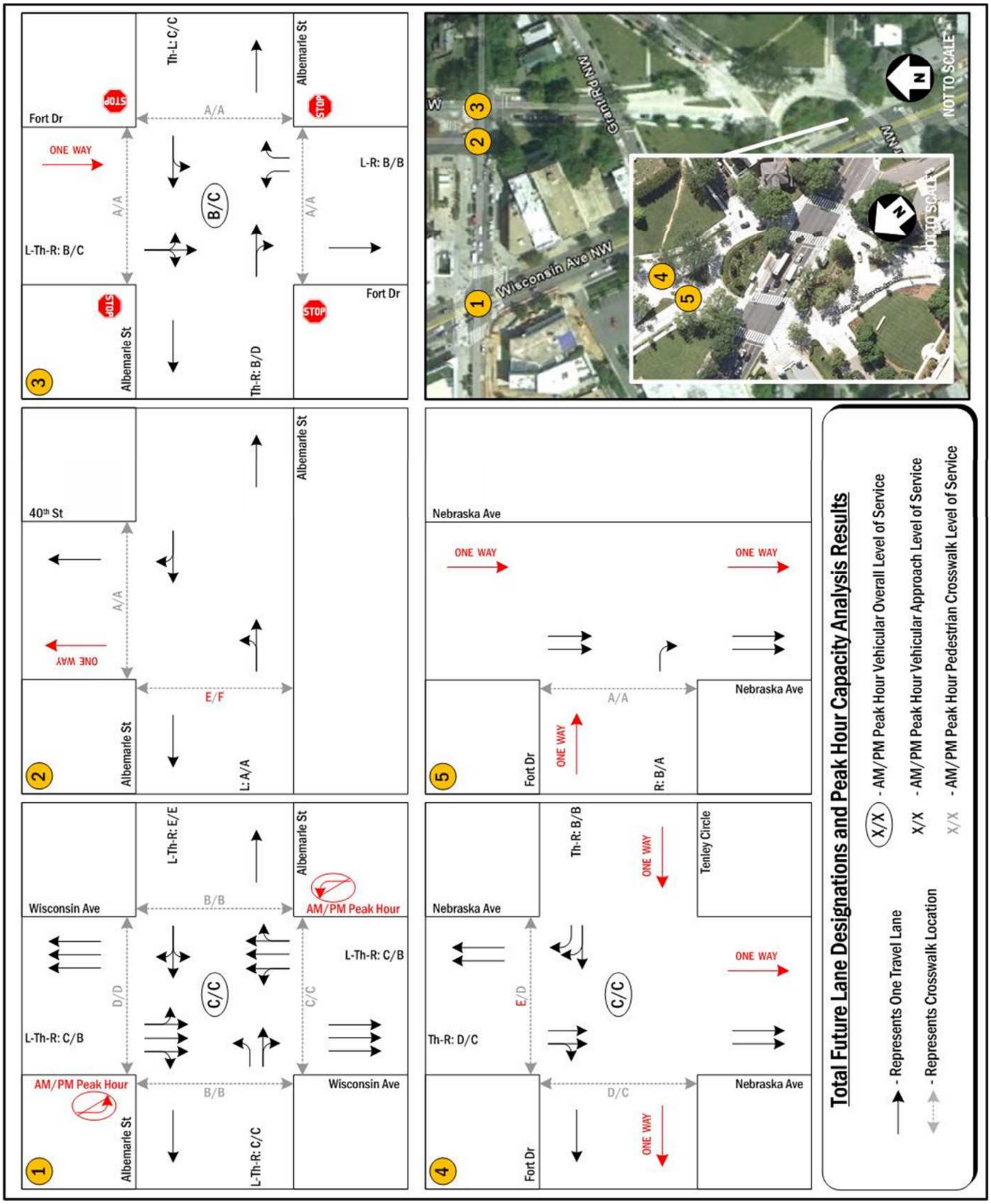

Figure 47: Total Future Lane Configurations and Capacity Analysis Results (1 of 5)

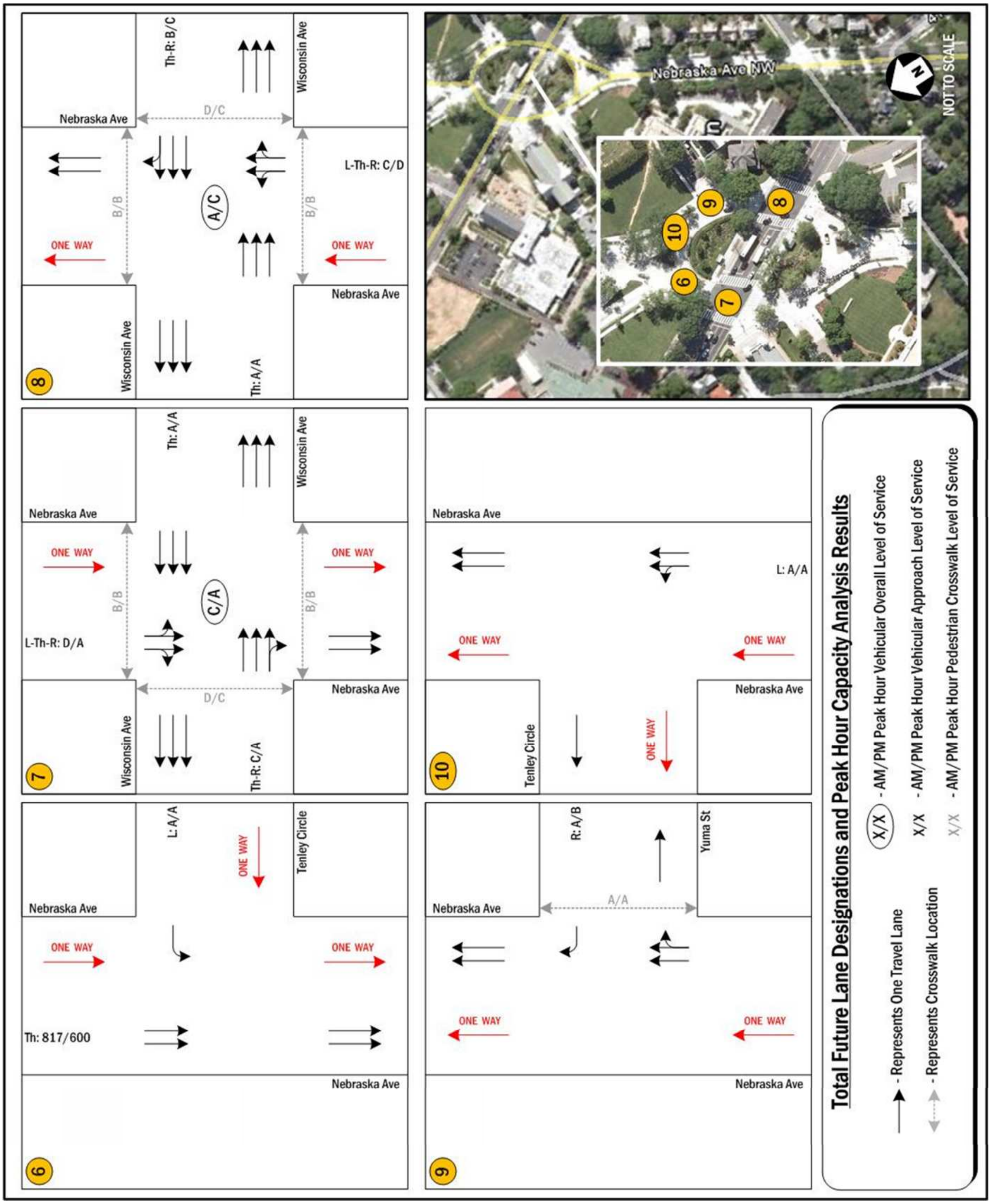

Figure 48: Total Future Lane Configurations and Capacity Analysis Results (2 of 5)

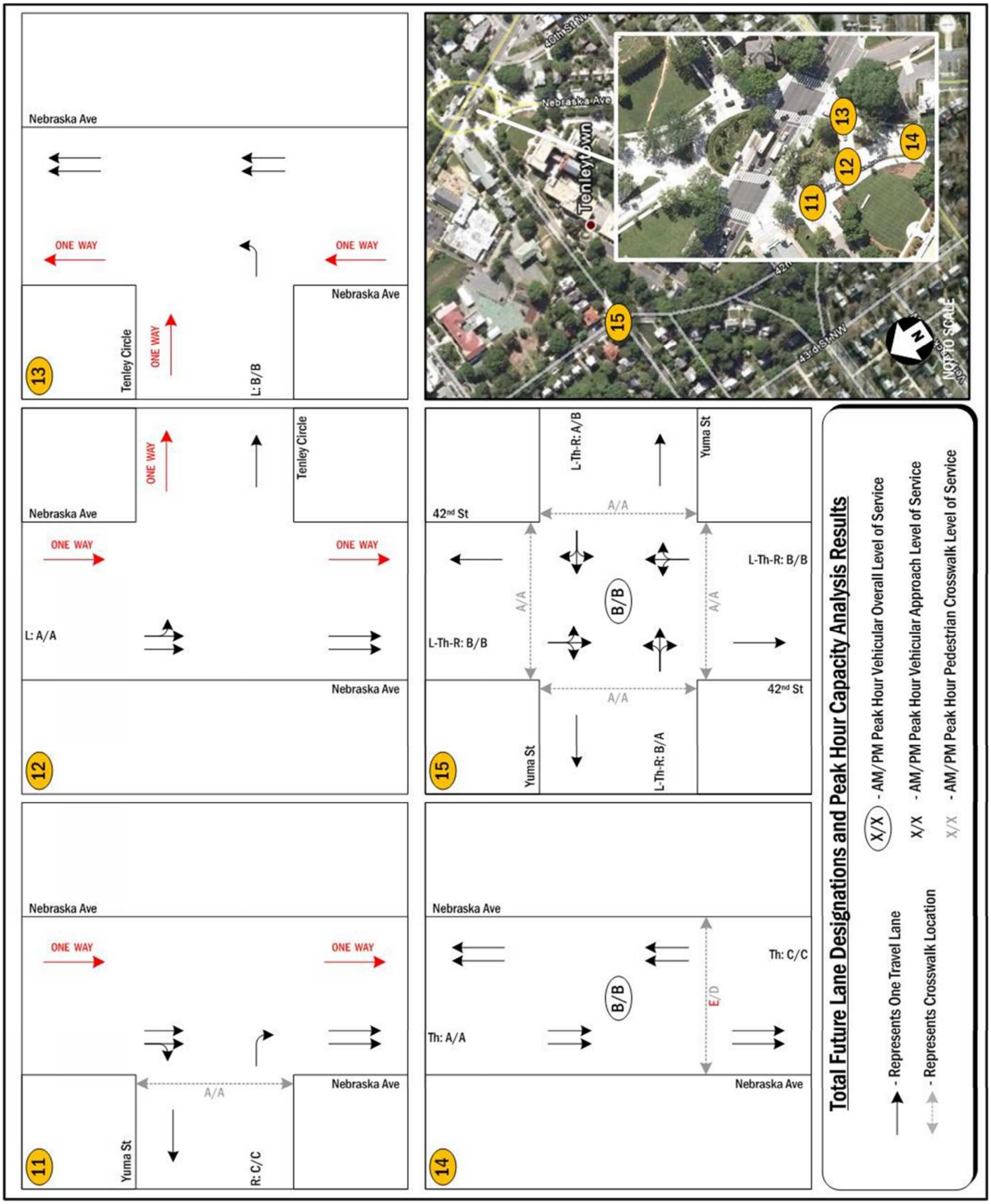

Figure 49: Total Future Lane Configurations and Capacity Analysis Results (3 of 5)

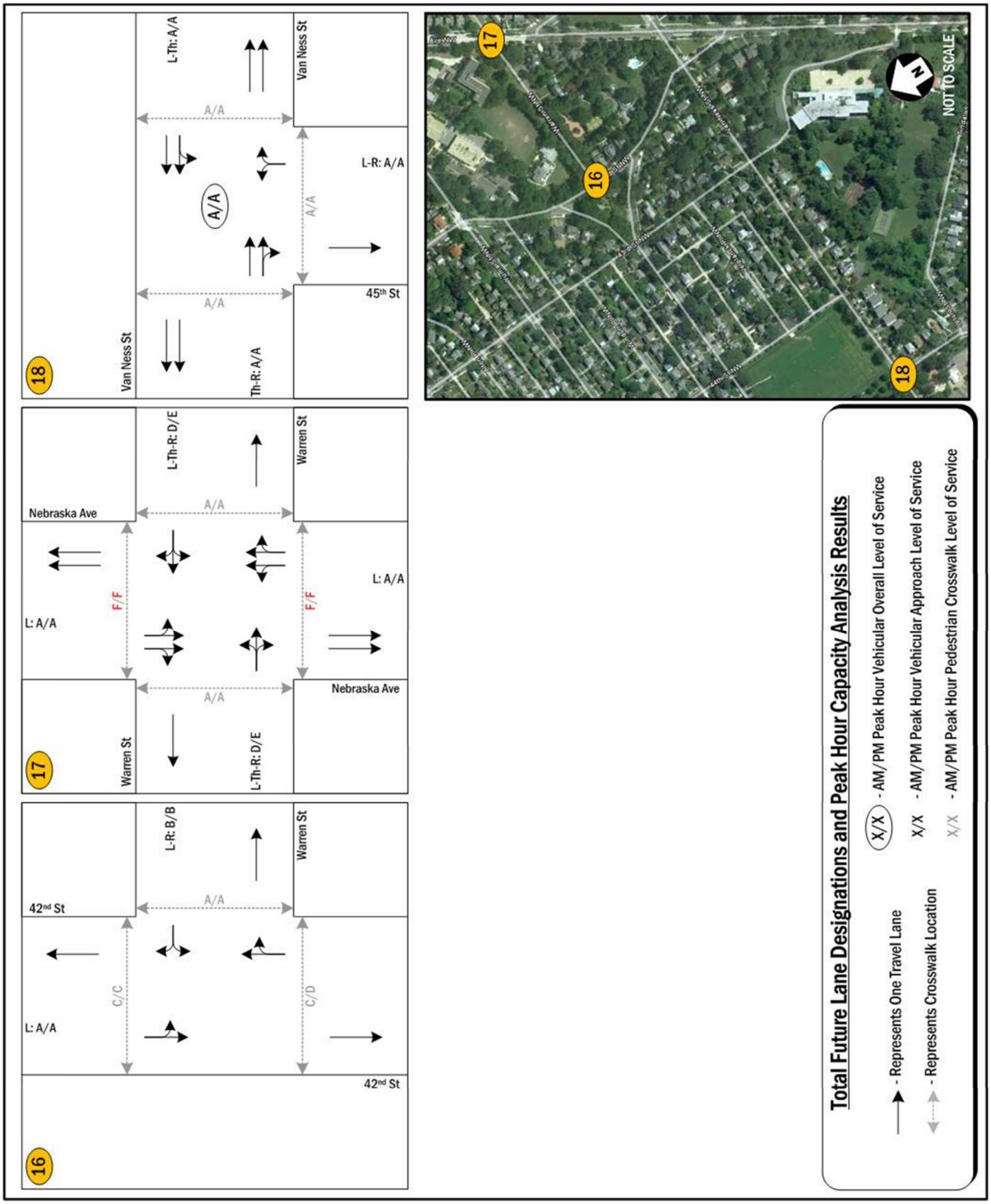

Figure 50: Total Future Lane Configurations and Capacity Analysis Results (4 of 5)

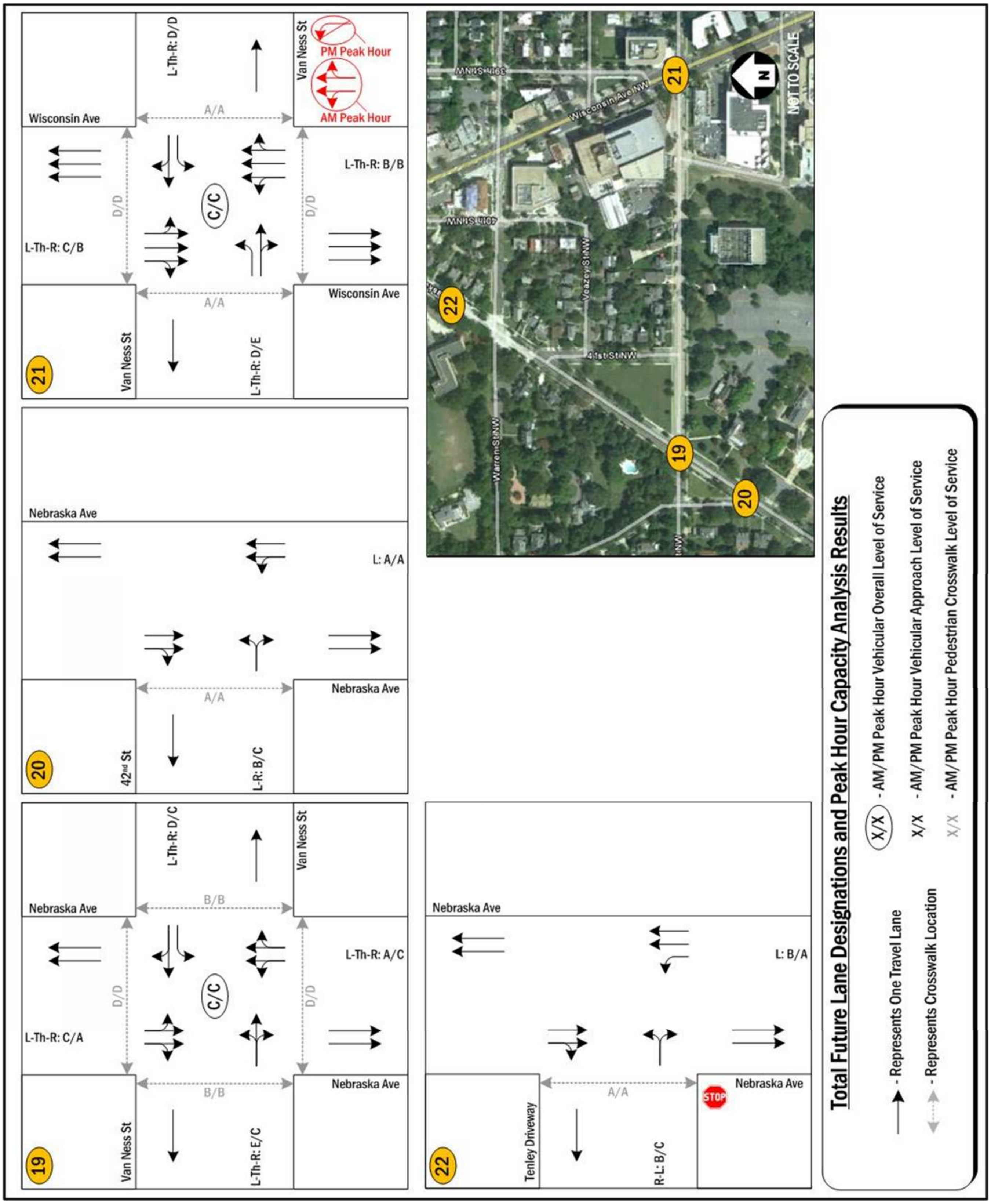

Figure 51: Total Future Lane Configurations and Capacity Analysis Results (5 of 5)