WSB & Associates, Inc.
Infrastructure ■ Engineering ■ Planning ■ Construction
701 Xenia Avenue South
Suite #300
Minneapolis, MN 55416
Tel: 763 541-4800
Fax: 763 541-1700

Memorandum

To:	***Mr. Cary Teague, Community Development Director*** ***City of Edina***
From:	***Charles Rickart, P.E., PTOE, Project Manager*** ***WSB & Associates, Inc.***
Date:	***May 2, 2018***
Re:	***Solomon Real Estate – South Pentagon Park Development*** ***Traffic and Parking Study*** ***City of Edina, MN*** ***WSB Project No. 11953-00***

Background

The purpose of this memorandum is to document the transportation impacts from the proposed redevelopment of the Pentagon Park south area (Solomon Real Estate Group) in relationship to the approved development and mitigation from the Gateway Area, Alternative Urban Areawide Review (AUAR). The site is located on the south side of W. 77th Street between TH 100 and Computer Avenue and is shown on the attached ***Figure 1***.

A Traffic analysis was completed in conjunction with the AUAR in 2007 which included the Pentagon Park area. The AUAR was updated in 2013 and it was concluded that because no Gateway area development had occurred in the area, and that the area traffic levels have not changed significantly from those assumed in the AUAR for the baseline conditions the future year analysis and recommended mitigation in the 2007 AUAR were still valid. AUAR updates are required every five years from the original date of the approved AUAR. Currently the second AUAR update is being prepared. Data and results from the current draft (February 2, 2018) updated AUAR Traffic Study will be used as part of this analysis. This document is attached in the ***Appendix***.

The development of the South Pentagon Park development is planned to be completed in two phases. The first phase of the development is planned to include 346 hotel rooms in two buildings and 11,800 square feet of retail / restaurant uses. The second phase will include 225,000 square feet of office in two buildings and 19,000 square feet of retail uses. Access to the site will be from public streets and driveways off W. 77th Street, Computer Avenue, Viking Drive and Normandale Road. The full development of the South Pentagon Park development is the subject of this Study and is shown on the attached ***Figure 2***.

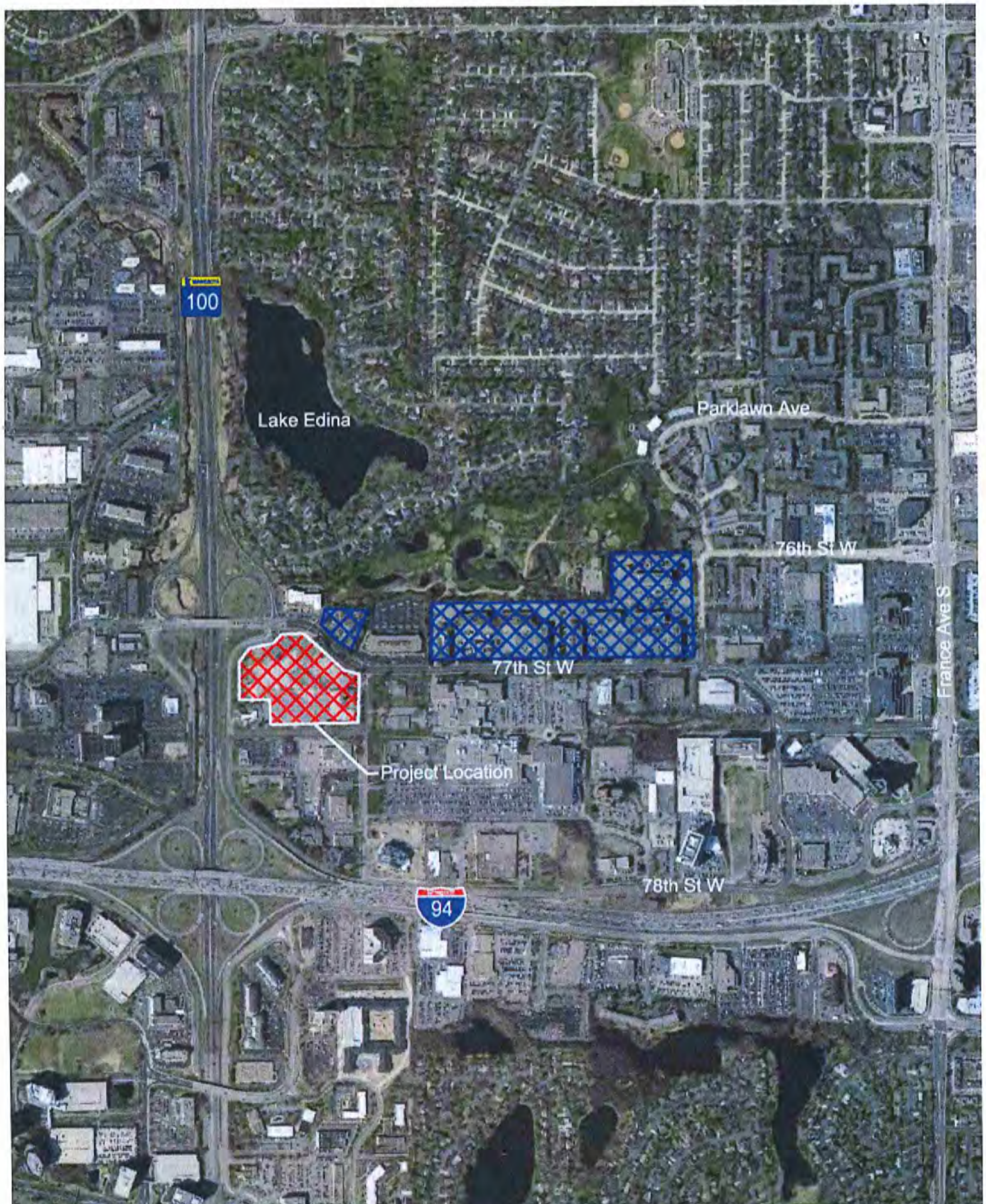


Figure 1 - Location Map
Solomon - Pentagon South
Traffic and Parking Study

Legend
Pentagon North
Pentagon South

SITE PLAN

SOLOMON REAL ESTATE GROUP

PENTAGON PARK SOUTH

EDINA, MN

9 APRIL 2018 | 4 | RSP

Figure 2 - Site Plan
Solomon - Pentagon South
Traffic and Parking Study

WSB

The traffic impacts of the proposed site redevelopment were evaluated for: the existing conditions; projected 2020 the anticipated completion of the South Pentagon Park development only, and; projected 2025 and 2040 from the AUAR. The following locations were included as part of the analysis:

- France Avenue at 76th Street
- France Avenue at Minnesota Drive
- 77th Street at Minnesota Drive
- 77th Street at Parklawn Avenue
- 77th Street at Computer Avenue
- 77th Street at Burgundy Place Driveway
- 77th Street at SB TH 100 Ramp
- 77th Street at NB TH 100 Ramp
- Computer Avenue at Site Access
- Computer Avenue at Viking Drive
- Viking Drive at Normandale Road
- Normandale Road at Site Access

The following sections of this report document the analysis and anticipated impacts of the proposed first phase of the South Pentagon Park redevelopment.

Existing Traffic Conditions

Updated AM and PM peak hour turning movement counts were conducted the weeks of December 4th and December 11th, 2017. These counts were used as the existing baseline conditions for the area. The draft updated AUAR Traffic Study in the ***Appendix*** shows the existing intersections and driveways in the Study Area, with the existing AM and PM peak hour traffic volumes.

Background (Non-Development) Traffic Growth

Traffic growth in the vicinity of a proposed site will occur between existing conditions and any given future year due to other development within the region. This background growth must be accounted for and included in future year traffic forecasts. Reviewing the historical traffic counts in the area, traffic has stayed somewhat constant or dropped in the past few years. In order to account for other development background growth in traffic the Hennepin County State Aid traffic growth projection factor of 1.1 over a 20-year period was used to project traffic to the 2020 analysis year. The Gateway AUAR also identified adjacent development projects in Edina and Bloomington that have yet to be completed. These developments were assumed to be completed and included in the 2025 and 2040 future full build scenarios included in the draft updated AUAR Traffic Study in the ***Appendix***.

Trip Generation

The estimated trip generation from the South Pentagon Park development is shown below in ***Table 1.*** The trip generation rates used to estimate the proposed site traffic is based on extensive surveys of the trip-generation rates for other similar land uses as documented in the Institute of Transportation Engineers *Trip Generation Manual, 10th* Edition. The table show the total daily, AM peak hour and PM peak hour trip generation for the proposed site.

Table 1 - Estimated Trip Generation – South Pentagon Park

Land Use	ITE Code	Size		Time of Day	Trip Rate	Trip Generation				
						Total	In		Out	
							%	Trips	%	Trips
Office	710	225,000	gsf	Daily	9.74	2,192	50	1,096	50	1,096
				AM Peak	1.16	261	86	224	14	37
				PM Peak	1.15	259	16	41	84	218
Retail	820	19,000	gsf	Daily	37.75	718	50	359	50	359
				AM Peak	0.94	18	57	10	43	8
				PM Peak	3.81	72	52	37	48	35
Retail / Restaurant	932	11,800	gsf	Daily	112.18	1,324	50	662	50	662
				AM Peak	9.94	117	55	64	45	53
				PM Peak	9.77	115	62	71	38	44
Hotel	310	346	rms	Daily	8.36	2,892	50	1,446	50	1,446
				AM Peak	0.47	163	59	96	41	67
				PM Peak	0.6	208	51	106	49	102
Total				Daily		7,126		3,563		3,563
				AM Peak		559		394		165
				PM Peak		654		255		399
Internal Trips				Daily		-796		-398		-398
				AM Peak		-89		-48		-41
				PM Peak		-87		-56		-31
Net Increase in Trips				*Daily*		*6,330*		*2,665*		*2,665*
				AM Peak		*470*		*346*		*124*
				PM Peak		*567*		*199*		*368*

Source: Institute of Transportation Engineers Trip Generation Manual, 10th Edition

Based on current planes the remainder of the Pentagon Park development area is anticipated to include on the north side of W. 77th Street; 1,250 market rate apartment units, 225 senior adult housing units and 125 affordable housing units on the Welsh Title site.

In addition, the Gateway Area AUAR assumed additional development adjacent to the Pentagon Park area, including; 519,300 sf office and, 1,296,000 office and warehouse uses.

The estimated trip generation from the remainder of the proposed Pentagon Park development and Gateway AUAR area is shown below in ***Table 2.***

Table 2 - Estimated Trip Generation – Additional Gateway Area

Land Use	ITE Code	Size		Time of Day	Trip Rate	Trip Generation				
						Total	In		Out	
							%	Trips	%	Trips
Market Rate Apartment	221	1,250	units	Daily	5.44	6,800	50	3,400	50	3,400
				AM Peak	0.36	450	26	117	74	333
				PM Peak	0.44	550	61	335	39	215
Senior Adult Housing - Attached	252	225	units	Daily	3.7	832	50	416	50	416
				AM Peak	0.2	45	35	16	65	29
				PM Peak	0.26	59	55	32	45	27
Welsh Title Site – Affordable Housing	221	125	units	Daily	5.44	680	50	340	50	340
				AM Peak	0.36	45	26	12	74	33
				PM Peak	0.44	55	61	34	39	21
Office	710	519,300	gsf	Daily	9.74	5,058	50	2,529	50	2,529
				AM Peak	1.16	602	86	518	14	84
				PM Peak	1.15	597	16	96	84	501
Office and Warehousing	150	1,296,000	gsf	Daily	1.71	1,516	50	758	50	758
				AM Peak	0.17	220	77	169	23	51
				PM Peak	0.19	246	27	66	73	180
Total				Daily	14,886		7,443		7,443	
				AM Peak	1,362		843		519	
				PM Peak	1,507		561		946	
Internal Trips				Daily	-1,208		-604		-604	
				AM Peak	-298		-171		-127	
				PM Peak	-269		-98		-171	
Net Increase in Trips				*Daily*	*13,678*		*6,839*		*6,839*	
				AM Peak	*1,064*		*672*		*392*	
				PM Peak	*1,238*		*463*		*775*	

Proposed North Pentagon Park
Remaining Gateway Area

Source: Institute of Transportation Engineers Trip Generation Manual, 10th Edition

The AUAR identified four potential land use scenarios that were evaluated. Trips for each of the scenarios were generated and are shown in the updated AUAR Traffic Study in the ***Appendix***. All the proposed land use scenarios assume replacing all the existing office space.

Table 3 shows a comparison between the current full build proposal of the area (Pentagon Park proposals both north and south of W. 77th Street with the estimated remainder of the Gateway Area) and the AUAR Scenarios. Based on the full build of the area the current Pentagon Park proposed development would generate fewer trips than those included in the AUAR except the daily traffic for the AUAR Scenario 1 condition.

Table 3 – Traffic Generation Comparison

Scenario	ADT	AM Peak	PM Peak
Current Pentagon Park Proposals w/ Remainder of Gateway Area	20,008	1,534	1,805
AUAR Scenario 1	17,771	2,068	2,078
AUAR Scenario 2	27,825	2,778	2,931
AUAR Scenario 3	34,475	4,057	4,050
AUAR Scenario 4	22,789	2,123	2,270

South Pentagon Park Traffic Operations Analysis

Existing and/or forecasted traffic operations were evaluated for the impacted intersections and driveway adjacent to the proposed development. The analysis was conducted for the following scenarios.

1. Existing 2017 (in draft AUAR Traffic Study update)
2. Projected 2020 – Build South Pentagon Park Development
3. Projected 2025 - Build Full Gateway Area (in draft AUAR Traffic Study update)
4. Projected 2040 - Build Full Gateway Area (in draft AUAR Traffic Study update)

This section describes the methodology used to assess the operations and provides a summary of traffic operations for each analysis year.

Analysis Methodology

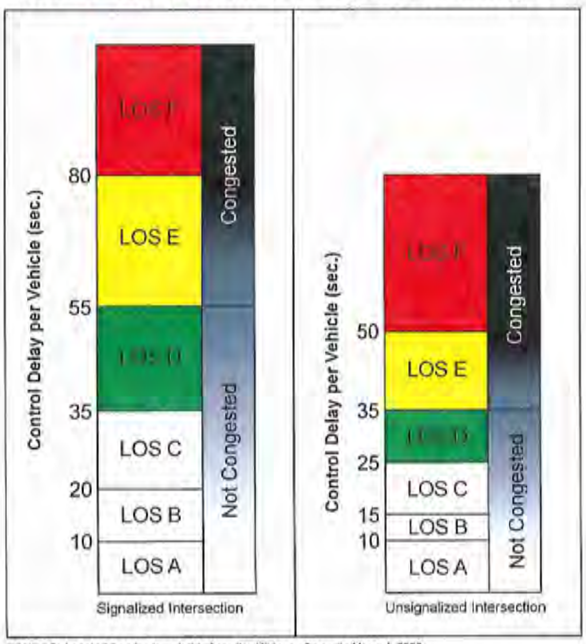
The traffic operations analysis is derived from established methodologies documented in the *Highway Capacity Manual 2000* (HCM). The HCM provides a series of analysis techniques that are used to evaluate traffic operations.

Intersections are given a Level of Service (LOS) grade from "A" to "F" to describe the average amount of control delay per vehicle as defined in the HCM. The LOS is primarily a function of peak traffic hour turning movement volumes, intersection lane configuration, and the traffic controls at the intersection. LOS A is the best traffic operating condition, and drivers experience minimal delay at an intersection operating at that level. LOS E represents the condition where the intersection is at capacity, and some drivers may have to wait through more than one green phase to make it through an intersection controlled by traffic signals.

LOS F represents a condition where there is more traffic than can be handled by the intersection, and many vehicle operators may have to wait through more than one green phase to make it through the intersection. At a stop sign-controlled intersection, LOS F would be characterized by exceptionally long vehicle queues on each approach at an all-way stop, or long queues and/or great difficulty in finding an acceptable gap for drivers on the minor legs at a through-street intersection.

The LOS ranges for both signalized and un-signalized intersections are shown in ***Figure 3***. The threshold LOS values for un-signalized intersections are slightly less than for signalized intersections. This variance was instituted because drivers' expectations at intersections differ with the type of traffic control. A given LOS can be altered by increasing (or decreasing) the number of lanes, changing traffic control arrangements, adjusting the timing at signalized intersections, or other lesser geometric improvements. LOS also changes as traffic volumes increase or decrease.

Figure 3 - Intersection Level of Service Ranges



SOURCE: Level of Service thresholds from the Highway Capacity Manual, 2000.

LOS, as described above, can also be determined for the individual legs (sometimes referred to as "approaches") or lanes (turn lanes in particular) of an intersection. It should be noted that a LOS E or F might be acceptable or justified in those cases where a leg(s) or lane(s) has a very low traffic volume as compared to the volume on the other legs. For example, improving LOS on such low-volume legs by converting a two-way stop condition to an all-way stop, or adjusting timing at a signalized intersection, could result in a significant penalty for the many drivers on the major road while benefiting the few on the minor road. Also, geometric improvements on minor legs, such as additional lanes or longer turn lanes, could have limited positive effects and might be prohibitive in terms of benefit to cost.

Although LOS A represents the best possible level of traffic flow, the cost to construct roadways and intersection to such a high standard often exceeds the benefit to the user. Funding availability might also lead to acceptance of intersection or roadway designs with a lower LOS. LOS D/E is generally accepted as the lowest acceptable level in urban areas such as Edina. LOS C is often considered to be the desirable minimum level for rural areas. LOS E/F may be acceptable in highly congested urban areas for limited durations or distances, or for low-volume legs of some intersections.

The LOS analysis was performed using Synchro/SimTraffic:

- Synchro, a software package that implements Highway Capacity Manual (HCM) methodologies, was used to build each signalized intersection and provide an input database for turning-movement volumes, lane geometrics, and signal design and timing characteristics. In addition, Synchro was used to optimize signal timing parameters for future conditions. Output from Synchro is transferred to SimTraffic, the traffic simulation model.

- SimTraffic is a micro-simulation computer modeling software that simulates each individual vehicle's characteristics and driver behavior in response to traffic volumes, intersection configuration, and signal operations. The model simulates drivers' behaviors and responses to surrounding traffic flow as well as different vehicle types and speeds. It outputs estimated vehicle delay and queue lengths at each intersection being analyzed.

Existing Level of Service Summary

The existing intersection operations were evaluated for the AM and PM peak hour assuming the current lane geometry, traffic control and traffic volumes. The results of this analysis are found in the draft updated Traffic Study included in the ***Appendix.*** Based on the analysis, the only intersection that is operating at an overall deficient level of service (LOS E or F), is France Avenue at Minnesota Drive which is operating at an overall LOS E during the PM peak hour. All other intersections are operating at an overall LOS D or better. However, there are several movements that are operating at LOS F including:

- France Ave at W. 76th St – Northbound Left – AM Peak = LOS F
- W. 77th St at SB TH 100 Ramp – Eastbound Through – PM Peak = LOS F
- W. 77th St at NB TH 100 Ramp – Eastbound Left – PM Peak = LOS F
- France Ave at Minnesota Dr – Westbound Left – PM Peak = LOS F

Forecasted 2020 Traffic Operations

A capacity and LOS analysis was prepared for the study area intersections for 2020 which is assumed to the year after the proposed South Pentagon Park development would be completed. The analysis assumes full build of the South Pentagon Park development with the existing lane configurations and traffic control.

The results of the analysis are shown below in ***Table 4***. It shows that all intersection will continue to operate at overall LOS D or better in 2020 during the AM peak hour. However, during the PM peak hour in 2020 with the increase in traffic from the proposed South Pentagon Park development some intersections and movements will be operating at LOS E/F. Specifically, the intersections of 77th at the TH 100 ramps and France Avenue at Minnesota Street will have overall levels of service at E.

Table 4 – Forecasted 2020 South Pentagon Park Development

Intersection	2020					
	AM Peak Hour			PM Peak Hour		
	LOS	Delay	Movement (LOS)	LOS	Delay	Movement (LOS)
SB TH 100 at W 77th St	C	34.1		E	61.2	EBT (F)
NB TH 100 at W 77th St	C	32.6	EBR (E)	E	64.8	EBL (F)
Commercial Access at W 77th St	C	27.5		D	40.2	NBL (E) EBR (E)
Computer Ave at W 77th St	C	31.3	EBR (E)	D	41.4	NBL (E) EBR (E)
Parklawn Ave at W 77th St	C	24.1		D	39.7	
W 77th St at Minnesota Dr	C	21.2		D	38.1	SBL (E)
France Ave at W 76th St	D	36.4	NBL (F)	D	42.6	
France Ave at Minnesota Dr	C	32.3		E	62.3	WBL (F)
Computer Ave at Site Access	A	8.2		B	11.8	
Computer Ave at Viking Drive	B	12.4		B	14.9	
Viking Drive at Normandale Rd	A	7.6		A	9.1	
Normandale Rd at Site Access	A	6.3		A	8.4	

With the addition of the South Pentagon Park development several movements will be operating at LOS E or F as outline in ***Table 4***. In order to mitigate the unsatisfactory movements, specifically at the main access intersections for the South Pentagon Park development, the following improvements should be considered:

- Addition of a northbound left turn lane, southbound striped left turn lane and eastbound right turn lane at 77th Street and Commercial Access driveway
- Addition of a northbound dual left turn lane and eastbound right turn lane at 77th Street and Computer Avenue
- Signal timing improvements/optimization on W. 77th Street from TH 100 to Parklawn Avenue.

<u>Forecasted 2025 and 2040 Traffic Operations</u>

The 2025 and 2040 intersection operations were evaluated for the AM and PM peak hour assuming the full build of the Gateway AUAR area development is completed including the Pentagon Park development. The summary of the expected traffic operations for the key intersections for each development scenario is included in the draft updated Traffic Study in the ***Appendix.***

The results of the analysis show that all scenarios will have some operational deficiencies in years 2025 and/or 2040. Deficiencies include operations on France Avenue, the TH 100 interchange, and accesses to the Gateway Study Area. The majority of these locations do not have right or left turn lanes or the existing turn lanes do not have adequate capacity to handle the forecast traffic volumes.

During both the AM peak hour PM peak hours in both 2025 and 2040 assuming with the increase in traffic for each land use scenario, several intersections and movements will be operating at LOS E or F. Specifically, the intersections of 77th Street at the TH 100 ramps, 77th Street at Computer Drive, 77th Street at Parklawn Ave, 77th at Minnesota Drive, France Avenue at 76th Street and France Avenue at Minnesota Street.

The AUAR identified mitigation improvements that would improve all intersections and movement to an acceptable LOS E or better depending on the development scenario included:

2025 Mitigation:

1. 2020 Improvement identified for the South Pentagon Park development.
2. Addition of a northbound dual right-turn lane at 77th Street and TH 100 SB Ramp.
3. Addition of a northbound through lane at France Avenue and Minnesota Street.

2040 Mitigation:

1. 2025 Improvements
2. Addition of a northbound through lane at France Avenue and Minnesota Drive.
3. Addition of a southbound through lane at France Avenue and 76th Street.
4. Addition of an eastbound and westbound third lane on 77th Street from TH 100 SB Ramp through Computer Drive.
5. Addition of an eastbound and westbound dual left turn lane at France Avenue and Minnesota Street.
6. Addition of a southbound left turn lane at 77th Street and Minnesota Street.
7. Addition of an eastbound right turn lane at 77th Street and Parklawn Avenue.

AUAR Mitigation Requirements

The AUAR completed in 2007, updated in 2013 and is currently being updated, identified several required mitigation measures to be completed at various levels and stages of development. The AUAR identified development scenarios were used to prepare the Traffic and Transportation Mitigation measures included in the draft updated Traffic Study in the ***Appendix.***

Based on the traffic generation for the current Pentagon Park development plans including the remainder of the Gateway Area, Scenario 1 or 4 provides similar traffic conditions (see ***Table 3***). The following mitigation measures were identified in the draft updated AUAR Traffic Study in the ***Appendix***, for Scenarios 1 and 4 to accommodate both 2025 and 2040 traffic projections.

Scenarios 1 and 4:

Intersection:	France Avenue at West 76th Street
Improvement:	Extend one southbound thru lane on France Avenue to create a total of four thru lanes
Need By:	**2040 No-Build**
Intersection:	Northbound TH 100 at West 77th Street
Improvement:	Add 150-foot northbound right turn lane on Frontage Road Westbound dual right turn lanes on West 77th Street
Need By:	**2040 Full Build**
Intersection:	Edina Industrial Boulevard / West 78th Street
Improvement:	Eastbound dual left turn lanes on West 78th Street
Need By:	**2040 Full Build**
Intersection:	Edina Industrial Boulevard / Metro Boulevard
Improvement:	Add southbound right turn lane on Metro Boulevard, restriping the existing two southbound lanes to accommodate an exclusive left turn lane, and a thru/left lane, providing dual left turn lanes. Add 300-foot eastbound left turn lane on Edina Industrial Boulevard
Need By:	**2025 No-Build**

Parking Demand

The parking demand for the proposed South Pentagon Park development was analyzed based on the anticipated use for the site. Based on the current City Code the proposed development would require a total of 1,718 parking spaces. The current site plan includes 1,422 spaces. ***Table 5*** shows a breakdown of the parking required per City Code for each anticipated development phase.

Based on the results of the parking analysis the spaces provided with the first phase of the development will meet City Code. However, with the addition of the second phase of development or assuming the full development the site does not meet City Code. A 296-space parking variance would be required for the site development with the current plan.

Table 5 – Parking Required per City Code

Use	Size	Rate	Parking Required	Parking Provided
Hotel	346 Rooms / 50 Employees	1/room + 1/employee	396	550
Retail / Restaurant	Rest =7,000 sf /120 seats /10employees Retail = 4,800 sf	Rest = 1/3 seats + 1/employee Retail = 8/first 1000sf + 6/additional 1000sf	81	113
Total Parking Phase 1			**477**	**663**
Office	225,000 sf	1/200sf	1,125	718
Retail	19,000 sf	Retail = 8/first 1000sf + 6/additional 1000sf	116	41
Total Parking Phase 2			**1,241**	**759**
Total South Pentagon Park Parking			**1,718**	**1422**

Source: City of Edina

The parking demand was also analyzed based on industry standards. The parking generation rates used to estimate the parking demand was based on surveys of the parking generation for other similar land uses as documented in the Institute of Transportation Engineers *Parking Generation Manual, 4th* Edition. ***Table 6*** below shows the estimated parking generation rate and the anticipated peak parking demand on a typical weekday. This would represent the worst-case conditions for the parking of the site.

Comparing the provided parking stalls to the industry standard (ITE Rates) the first phase has an adequate number of stalls. Comparing the provided parking stalls to the industry standard the second phase would be short parked by 77 stalls. However, comparing the total number of stalls for the full build the site to the industry standard, an adequate number of stalls would be provided.

Table 6 – Site Parking Demand per ITE

Use	Size	Rate	Parking Required
Hotel	346 Rooms	1.2/room	415
Retail / Restaurant	Rest = 7,000 sf Retail = 4,800 sf	Rest = 13.3 / 1000 sf Retail = 3.16 / 1000 sf	108
Total Parking Phase 1			**523**
Office	225,000 sf	3.45 / 1000 sf	776
Retail	19,000 sf	Retail = 3.16 / 1000 sf	60
Total Parking Phase 2			**836**
Total South Pentagon Park Parking			**1359**

Source: Institute of Transportation Engineers Parking Generation Manual, 4th Edition

Conclusions / Recommendation

Based on the analysis documented in this memorandum, WSB has concluded the following:

- The proposed South Pentagon Park development includes: 346 hotel rooms in two buildings; 11,800 square feet of retail / restaurant uses; 225,000 square feet of office in two buildings, and; 19,000 square feet of retail uses. The site is anticipated to generate an additional 6,330 daily trips, 470 AM peak hour trips and 567 PM peak hour trips.

- The remainder of the Pentagon Park development on the north side and south side of W. 77th Street and the remainder of the Gateway Area AUAR development area site is anticipated to generate 13,678 daily trips, 1,069 AM peak hour trips and 1,238 PM peak hour trips.

- The full build of the area with the current proposed Pentagon Park development will generate fewer trips than any of the land use scenarios included in the AUAR except the daily traffic for the Scenario 1 condition.

- A draft updated Traffic Study has been prepared for the Gateway Area AUAR. This document was used as the baseline for the existing conditions and projected 2025 and 2040 conditions. The document is included in the ***Appendix*** of this memorandum.

- The existing operations analysis shows that the only intersection which is operating at an overall deficient level of service (LOS E or F), is France Avenue at Minnesota Drive which is operating at an overall LOS E during the PM peak hour. All other intersections are operating at an overall LOS D or better.

- The forecasted 2020 traffic operations with the South Pentagon Park development shows that all intersection will continue to operate at overall LOS D or better during the AM peak hour. However, during the PM peak hour some intersections and movements will be operating at LOS E/F. Specifically, the intersections of 77th at the TH 100 ramps and France Avenue at Minnesota Street will have overall levels of service at E.

- With the addition of the South Pentagon Park development by 2020 several movements will be operating at LOS E or F. In order to mitigate the unsatisfactory movements, turn lane and traffic signal timing improvements at the W. 77th Street/Commercial Access driveway and W. 77th Street/Computer Avenue intersection would be needed.

- The Gateway Area AUAR completed in 2007, updated in 2013 and is currently being updated, which included the Pentagon Park development area identified several required mitigation measures to be completed at various levels and stages of development for each land use scenario.

- The full build traffic generation for proposed Gateway area including the current Pentagon Park development most closely represents the AUAR land use Scenario 1 and 4. The AUAR mitigation for these Scenarios was assumed for the 2025 and 2040 forecasted conditions.

- The parking shown on the current site plan does not meet the City's Code for the proposed uses. The current plan provides for 1,422 parking spaces with 1,718 required by City Code. Based on the ITE parking generation estimates the total parking needed for the proposed uses on the site would be 1,359. This represents the worst-case condition and therefore the proposed parking would be adequate for this site, requiring a parking variance.

Based on these conclusions the following is recommended with the development of the North Pentagon Park first phase:

1. Addition of a northbound left turn lane, southbound striped left turn lane and eastbound right turn lane at 77th Street and Commercial Access driveway.

2. Addition of a northbound dual left turn lane and eastbound right turn lane at 77th Street and Computer Avenue

3. Review the traffic signal timing and coordination of the signal systems on W. 77th Street from the TH 100 ramps to Parkland Avenue.

4. Secure a 296-space parking variance for the full site development.

5. As development continues on the remainder of the Pentagon Park site prepare traffic analysis to identify the required mitigation from the Gateway AUAR.

APPENDIX

Draft

Gateway AUAR Update
Traffic Study

For:

City of Edina
4801 W. 50th Street
Edina, MN 55024

February 2, 2018

Prepared By:

WSB & Associates, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416

Draft

CERTIFICATION

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the State of Minnesota.

Charles T. Rickart, P.E., P.T.O.E.

Date: February 2, 2018 Reg. No. 26082

Draft

TABLE OF CONTENTS

Draft

LIST of FIGURES / TABLES

Draft

INTRODUCTION / BACKGROUND

The original Alternative Urban Areawide Review (AUAR) was completed and approved in September 2007 and analyzed the impacts of the four development scenarios for the years 2014 and 2030. The analysis for both years assumed a 1% per year growth in general background traffic, the approved development in the Cities of Bloomington and Edina at that time and the proposed Gateway Development traffic.

AUAR updates are required every five years from the original date of the approved AUAR. The first AUAR update was prepared and approved in June 2013. This included updating the traffic counts at selected intersection and roadway segments on 77th Avenue. The updated traffic counts were then compared to those assumed in the 2007 AUAR to determine if the analysis and recommended mitigation measures were still valid. Based on the facts that: no Gateway Development had occurred in the area; most of the additional development has been in Bloomington and Edina and their traffic generation was included in the new 2013 traffic counts; and, the area traffic levels had not changed significantly from those assumed in the original AUAR for the baseline conditions, it was concluded that the future year analysis and recommended mitigation was still valid and no additional analysis was completed.

The second AUAR update is currently being prepared. In order to update and document the impact the proposed redevelopment of the Gateway AUAR Area adjacent to W. 77th Street between TH 100 and Parklawn Avenue has on the area traffic operations; this Traffic Impact Study is being prepared. The project location is shown on the attached ***Figure 1***.

The following sections of this report document the analysis and anticipated impacts of the proposed Gateway AUAR development area.

Draft

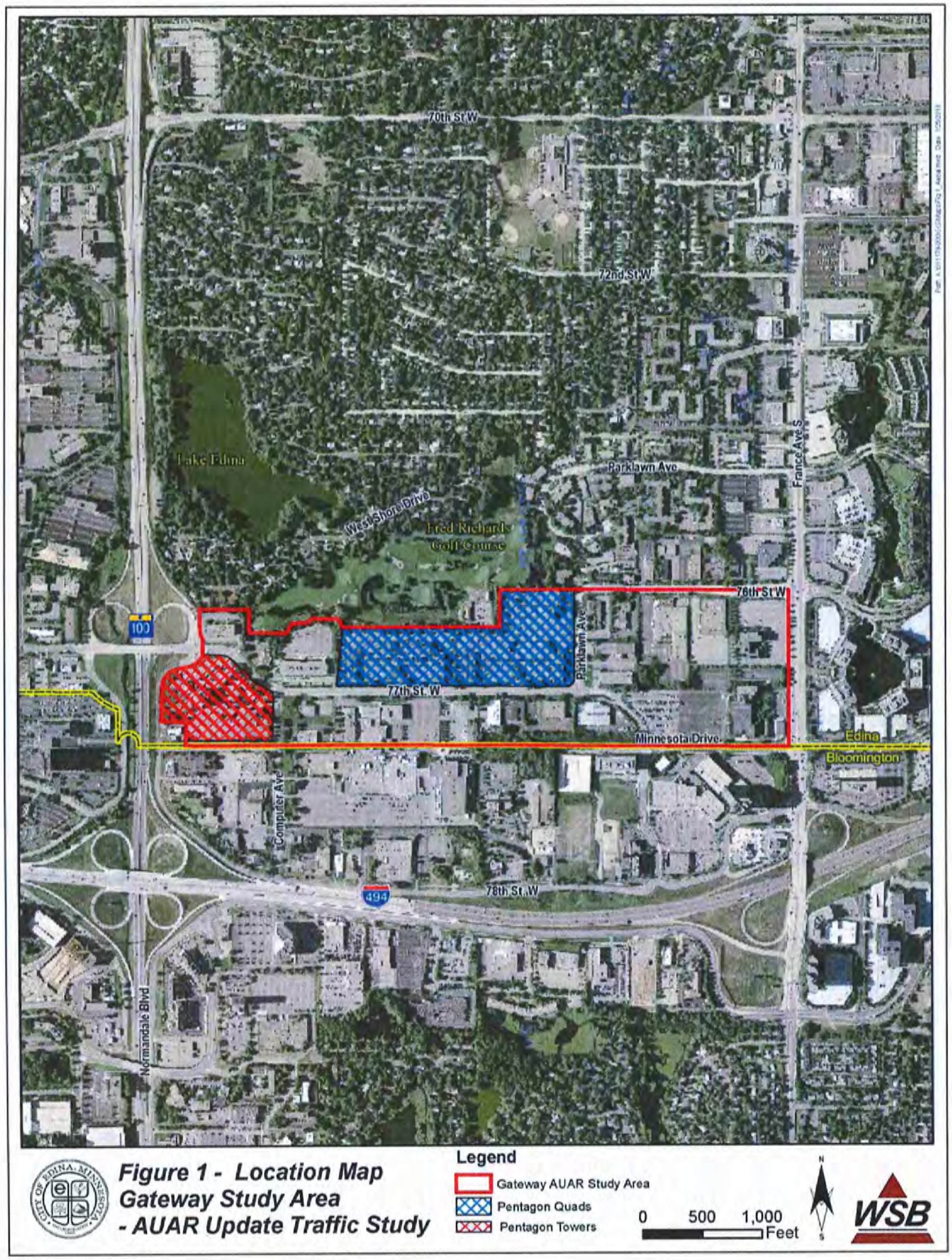


Figure 1 - Location Map Gateway Study Area - AUAR Update Traffic Study

EXISTING TRAFFIC CONDITIONS

In order to evaluate the existing conditions, key roadway segments and intersections were selected that are expected to provide the primary access to the regional roadway system when the Study Area redevelops. This section documents the existing land use, geometry, traffic volumes, and functional class at these locations, and uses these traffic characteristics to estimate their existing traffic operations.

A. Key Roadways

The following five roadways were selected as the key roadway segments for the Study Area:

- Edina Industrial Boulevard/West 77th Street from Metro Avenue to Computer Avenue
- West 77th Street from Computer Avenue to Parklawn Avenue
- Minnesota Drive from West 77th Street to France Avenue
- Parklawn Avenue/West 76th Street from West 77th Street to France Avenue
- France Avenue from West 76th Street to Minnesota Drive

The transportation characteristics for the roadways are displayed in ***Table 1***. The existing roadway segment is documented, along with the existing functional classification. Also displayed are average annual daily traffic (AADT) volumes were obtained from *Year 2016 MnDOT Traffic Flow Maps.*

Table 1: Characteristics of Key Roadways

Segment	Location	Functional Classification	Facility Type	Existing AADT
Edina Industrial Blvd / W. 77th Street	Metro Blvd to Computer Dr	A Minor Arterial – Reliever	Four-Lane with Turn Lanes	12,000
W. 77th Street	Computer Dr to Parklawn Ave	A Minor Arterial – Reliever	Four Lane with Center Turn Lane	11,500
Parklawn Avenue / W. 76th Street	W. 77th St to France Ave	A Minor Arterial – Reliever	Four-Lane	8,700
Minnesota Drive	W. 77th St to France Ave	Other Minor Arterial	Four Lane with Turn Lanes	7,500
France Avenue	W. 76th St to Minnesota Dr	A Minor Arterial - Reliever	Seven Lane with Turn Lane	30,000

Source: 2016 MnDOT Traffic Flow Maps and 2008 Edina Comprehensive Plan

Draft

B. Key Intersection

The following eight intersections, displayed on ***Figure 2*** were selected because they provide primary access to the regional roadway system from the Study Area:

- Southbound TH 100 at West 77th Street
- Northbound TH 100 at West 77th Street
- Commercial Access at West 77th Street
- Computer Avenue at West 77th Street
- Parklawn Avenue at West 77th Street
- West 77th Street at Minnesota Drive/Johnson Avenue
- France Avenue at West 76th Street
- France Avenue at Minnesota Drive

The existing lane configurations at each of the study area intersection are as follows:

W. 77th Street at TH 100 Southbound Ramp/Frontage Road – Traffic Signal Control
SB TH 100 Ramp approaching 77th St – one free right, one through, two left
NB Frontage Road approaching 77th St – one right, one through, one left
EB 77th St approaching TH 100 NB Ramp – one right/through, one through, one left
WB 77th St approaching TH 100 SB Ramp – one free right, two through, one left

W. 77th Street at TH 100 Northbound Ramp/Frontage Road – Traffic Signal Control
SB TH 100 Ramp approaching 77th St – one free right, one through, two left
NB Frontage Road approaching 77th St – one right/through, two left
EB 77th St approaching TH 100 NB Ramp – one right/through, one through, one left
WB 77th St approaching TH 100 SB Ramp – one right, two through, one left

W. 77th Street at Burgundy Place – Traffic Signal Control
SB Driveway approaching 77th St – one right/through, one left
NB Driveway approaching 77th St – one right/through, one left
EB 77th St approaching Driveway – one right/through, one through, one left
WB 77th St approaching Driveway – one right/through, one through, one left

W. 77th Street at Computer Avenue – Traffic Signal Control
SB Driveway approaching 77th St – one right, one through/left
NB Computer Ave approaching 77th St – one right, one through/left
EB 77th St approaching Computer Ave – one right/through, one through, one left
WB 77th St approaching Computer Ave – one right/through, one through, one left

W. 77th Street at Parklawn Avenue – Traffic Signal Control
SB Parklawn Ave approaching 77th St – one right, one right/through, one left
NB Driveway approaching 77th St – one right/through/left
EB 77th St approaching Parklawn Ave – one right/through, one through, one left
WB 77th St approaching Parklawn Ave – one right/through, one through, one left

W. 77th Street at Minnesota Drive – Traffic Signal Control
SB 77th St approaching Minnesota Dr – one right/through, one through/left
NB 77th St approaching Minnesota Dr – one free right, one through, one left
EB Driveway approaching 77th St – one right/through, one through/left
WB Minnesota Dr approaching 77th St – one free right, one through, one left

France Avenue at 76th Street – Traffic Signal Control
SB France Ave approaching 76th St – one free right, three through, one left
NB France Ave approaching 76th St – one free right, four through, one left
EB 76th St approaching France Ave – one free right, two through, two left
WB 76th St approaching France Ave – one free right, two through, two left

France Avenue at Minnesota Drive – Traffic Signal Control
SB France Ave approaching Minnesota Dr – one free right, four through, one left
NB France Ave approaching Minnesota Dr – one free right, three through, one left
EB Minnesota Dr approaching France Ave – one free right, two through, one left
WB Minnesota Dr approaching France Ave – one free right, two through, one left

The majority of traffic exiting and entering the study area will use at least one of these intersections. The a.m. and p.m. peak hour turn movements, lane geometry, and traffic control are displayed on ***Figure 3A*** and ***Figure 3B*** in the ***Appendix.***

All analyzed intersections are controlled by traffic signals. For purposed of analysis, traffic signal timing was obtained from MnDOT, Hennepin County, and the City of Edina.

C. Existing Traffic Volumes

Updated AM and PM peak hour turning movement counts were conducted the weeks of December 4th and December 11th, 2017. These counts were used as the existing baseline conditions for the area. ***Figure 3A*** and ***Figure 3B*** in the ***Appendix*** shows the existing intersections and driveways in the Study Area that were analyzed as part of this traffic study, with the existing AM and PM peak hour traffic volumes.

Draft

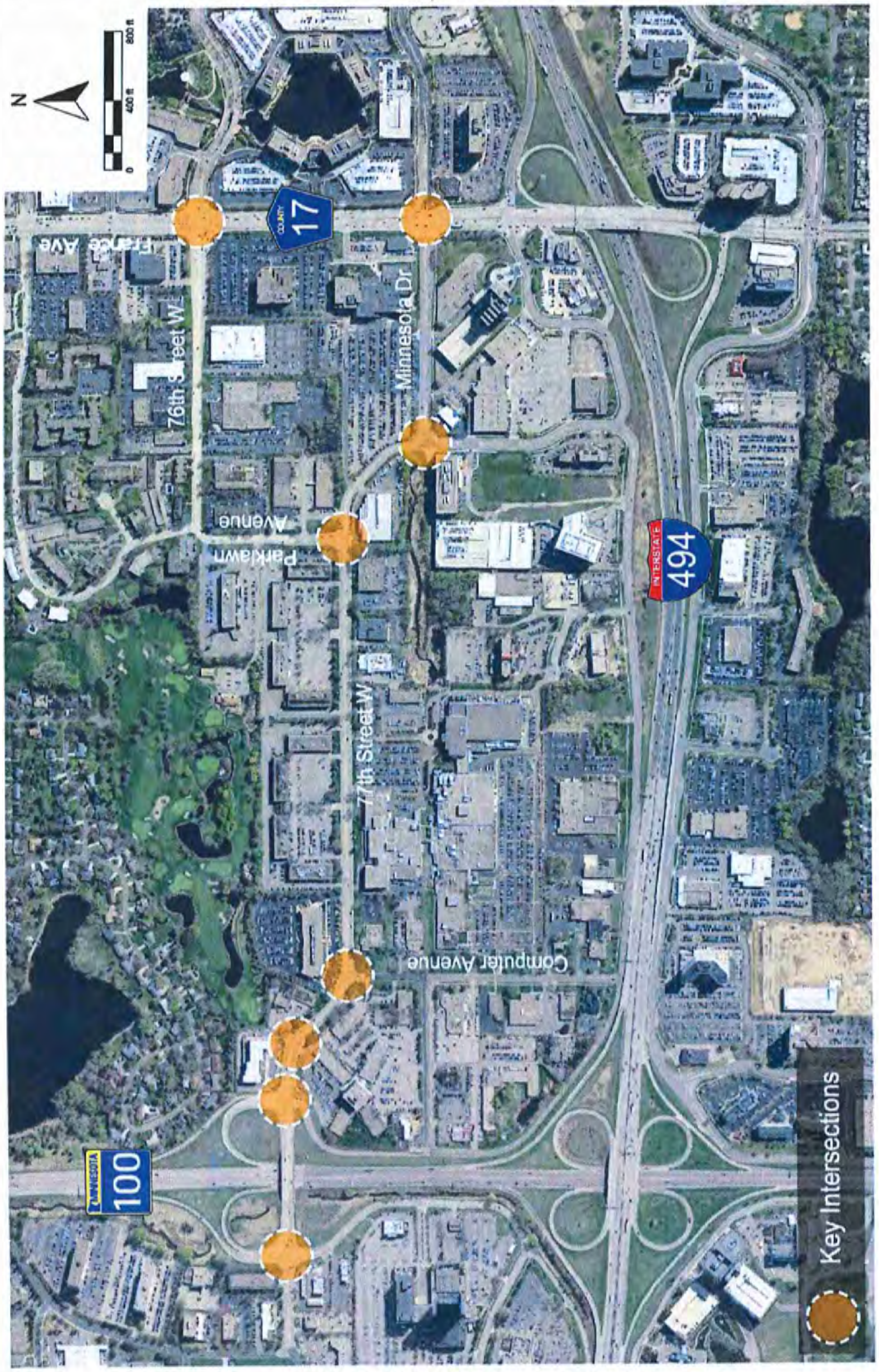


Figure 2 - Key Intersections
Gateway Study Area
- AUAR Update Traffic Study

Draft

D. Existing Land Use

The existing land use consists mostly of office and office/warehouse uses. Currently about 1,736,000 gsf of building space is available within the Study Area, of which approximately 190,000 gsf of office space is unoccupied. Sense the original AUAR was completed the Pentagon Tower building were torn down. Building areas were measured from aerial photographs. The amount of unoccupied space was estimated by the City of Edina.

The existing land use including the estimated trip generation is calculated and shown in ***Table 2***. As shown, the Study Area is currently generating approximately 13,000 vehicle trips per day (vpd). If the office space was fully occupied, the Gateway Study Area has the potential to generate 14,900 vpd.

Table 2: Existing Area Trip Generation

Development	Size		Occupancy	Time of Day	Trip Rate	Trip Generation				
						Total	In		Out	
							%	Trips	%	Trips
Pentagon Quads	355,054	gsf	50.0%	Daily	9.74	1,729	50	865	50	864
				AM Peak	1.16	206	86	177	14	29
				PM Peak	1.15	204	16	33	84	171
Pentagon East	136,611	gsf	91.0%	Daily	9.74	1,211	50	606	50	605
				AM Peak	1.16	144	86	124	14	20
				PM Peak	1.15	143	16	23	84	120
Other Office	992,700	gsf	100.0%	Daily	9.74	9,669	50	4,835	50	4,834
				AM Peak	1.16	1,152	86	991	14	161
				PM Peak	1.15	1,142	16	183	84	959
Other Office / Warehousing	207,000	gsf	100.0%	Daily	*1.74*	*360*	*50*	*180*	*50*	*180*
				AM Peak	*0.17*	*35*	*77*	*27*	*23*	*8*
				PM Peak	*0.19*	*39*	*27*	*11*	*73*	*28*
Other Mini Storage	45,000	gsf	100.0%	Daily	1.51	68	50	34	50	34
				AM Peak	0.1	5	60	3	40	2
				PM Peak	0.17	8	47	4	53	4
Total				Daily	13,037		6,520		6,517	
				AM Peak	1,542		1,322		220	
				PM Peak	1,536		254		1,282	

Source: ITE Trip Generation Manual (10th Edition) and WSB & Associates, Inc.

Draft

TRAFFIC PROJECTIONS

In order to analyze the lane configuration and traffic control needs projected traffic volumes were determined for the area. Traffic forecasts were prepared for the year 2025 which is the year the proposed site is anticipated to be fully developed and; for the 2040 conditions which represents the City's Comprehensive Plan development time frame. The following sections outline the traffic generation, as well as the traffic distribution and projected traffic volumes.

A. Background (Non-Development) Traffic Growth

Traffic growth in the vicinity of a proposed site will occur between existing conditions and any given future year due to other development within the region. This background growth must be accounted for and included in future year traffic forecasts. Reviewing the historical traffic counts in the area, traffic has stayed somewhat constant or dropped in the past few years.

The Gateway AUAR identified adjacent development projects in Edina and Bloomington that have yet to be completed. These developments for the projects in Edina and Bloomington are shown in ***Table 3***. In order to account for these and other development background growth in traffic the Hennepin County State Aid traffic growth projection factor of 1.1 over a 20-year period was used to project traffic to the 2025 and 2040 analysis years.

Draft

Table 3: Summary of Adjacent Redevelopment Proposals

City	Development	Summary of Impacts
Bloomington	Duke-Weeks Realty Limited Partnership (Norman Pointe)	Phase 1 and 2 completed. Phase 3 to add an additional 312,000 sq. ft. of office in the future
	Ryan Companies US, Inc. (Marketpoint)	Phase 1 and 2 completed. Phase 3 to add an additional 250,000 sq. ft. of office in the future.
	8100 Office Tower	255,000 ft^2 of office - Future
	Hotel	100 Rooms – Future
	OATI Office/Data Center	100,000 ft^2 of office - Future
	Hotel	257 Rooms - Future
	Norman Pointe III Office Tower	312,000 ft^2 Office - Future
	Marketpoint III Office Tower	250,000 ft^2 Office – Future
Edina	6500 France Avenue (Aurora on France)	180 units of senior housing & 7 care suites
	Southdale Medical Building	60,000 s.f. medical office addition and new parking ramp
	66 West (3330 66th Street - Affordable Housing project	39 units
	The Millennium (3250 66th Street)	230 units of apartments
	Envi Edina (3200 Southdale Circle)	190 units of apartments
	Homewood Suites Hotel at Southdale	150 rooms
	The Onyx (6725 York)	240 units of apartments
	Southdale One Apartments at Southdale	232 units of apartments
	Byerly's Redevelopment (71 France)	234 units of housing 47,000 s.f. new Byerly's 21,000 s.f. new retail 9,000 s.f. Think Bank
	Continental Gardens (7001 York)	100 senior housing
	Restoration Hardware at Southdale	58,000 s.f. furniture store and restaurant
	Lifetime Fitness	Replacement of 247,000 s.f. JCPenney 120,000 s.f. Lifetime Fitness 65,000 s.f. Retail
	Shake Shack at Southdale	4,000 s.f. restaurant

Draft

B. AUAR Area Scenario Trip Generation

The purpose of this section is to identify the traffic impacts associated with the future redevelopment within the AUAR Study Area. Four potential land use scenarios were evaluated. Trips for each of the scenarios were generated and distributed on the regional system and analyzed for years 2025 and 2040.

In order to estimate the traffic generated by the Study Area, land use assumptions were applied to trip generation rates from the *ITE Trip Generation Manual* (10^{th} Edition) as illustrated in ***Table 4*** to ***Table 7***. All of the proposed scenarios replace existing office space. Trips generated from the existing buildings were shown previously in ***Table 2***. These trips were removed from the network before applying the new land uses. It should be noted only the portion of space that is currently occupied was taken into consideration.

Scenario 1 consists of office and office/warehouse land uses. See ***Figure 4***. This scenario is taken from the Edina Comprehensive Plan. The plan will generate approximately 17,800 vpd. The net increase equates to 4,700 vpd with about 550 trips during each of the a.m. and p.m. peak hours.

Scenario 2 adds residential, retail, and a hotel, increasing the production to about 30,900 vpd. However, the proposed retail will be developed to serve the residential. See ***Figure 5***. To account for trips traveling from the residential to the retail, internal trips were taken into account. Using estimates from the manual, about 3,100 trips were considered internal and removed from the net. The net increase in vehicle trips is 14,800 vpd with 1,300 during each of the a.m. and p.m. peak hours.

Scenario 3 produces the largest number of trips, at about 34,500 trips per day due to the large amount of office space. The net increase is 21,400 vpd with about 2,500 trips during each of the a.m. and p.m. peak hours. See ***Figure 6***.

Scenario 4 includes office, office/warehousing, and residential uses creating 23,000 trips per day. For reasons described above under Scenario 2, about 190 internal trips were removed. The net increase in vehicle trips is 9,700 vpd with 600 and 700 trips during the a.m. and p.m. peak hour, respectively. See ***Figure 7***.

Draft

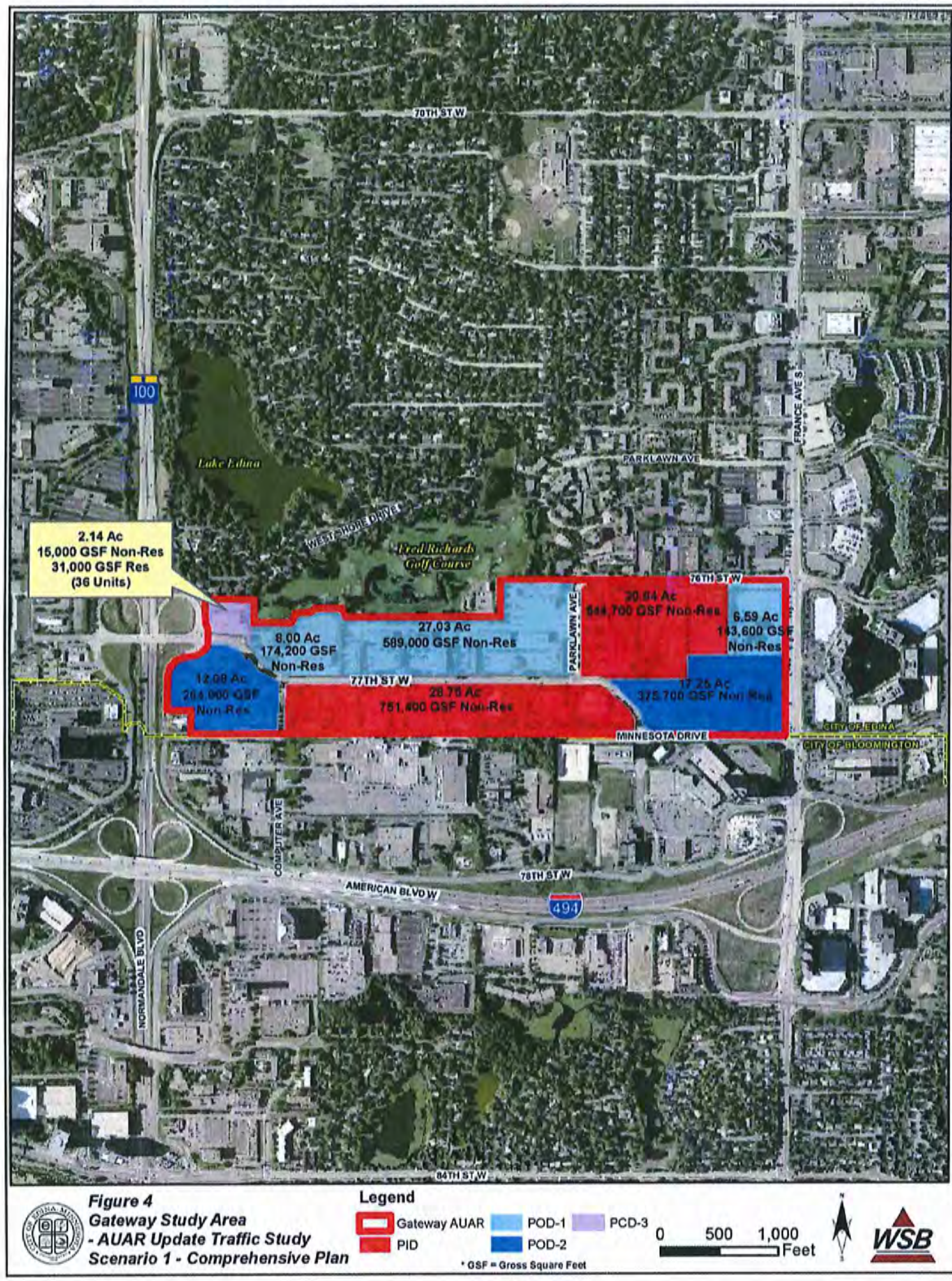


Figure 4
Gateway Study Area - AUAR Update Traffic Study
Scenario 1 - Comprehensive Plan

Draft

Table 4: Estimated Trip Generation – Scenario 1

Land Use	ITE Land Use Code	Size		Time of Day	Trip Rate	Trip Generation					
						Total	In		Out	
							%	Trips	%	Trips
Office	710	1,593,000	gsf	Daily	9.74	15,516	50	7,758	50	7,758
				AM Peak	1.16	1,848	86	1,589	14	259
				PM Peak	1.15	1,832	16	293	84	1,539
Office and Warehousing	150	1,296,000	gsf	Daily	1.74	2,255	50	1,128	50	1,127
				AM Peak	0.17	220	77	169	23	51
				PM Peak	0.19	246	27	66	73	180
Total				Daily	17,771		8,886		8,885	
				AM Peak	2,068		1,758		310	
				PM Peak	2,078		359		1,719	
Net Increase in Trips				*Daily*	*4,734*		*2,366*		*2,368*	
				AM Peak	*526*		*436*		*90*	
				PM Peak	*542*		*105*		*437*	

Source: ITE Trip Generation Manual (10th Edition) and WSB & Associates, Inc.

Draft

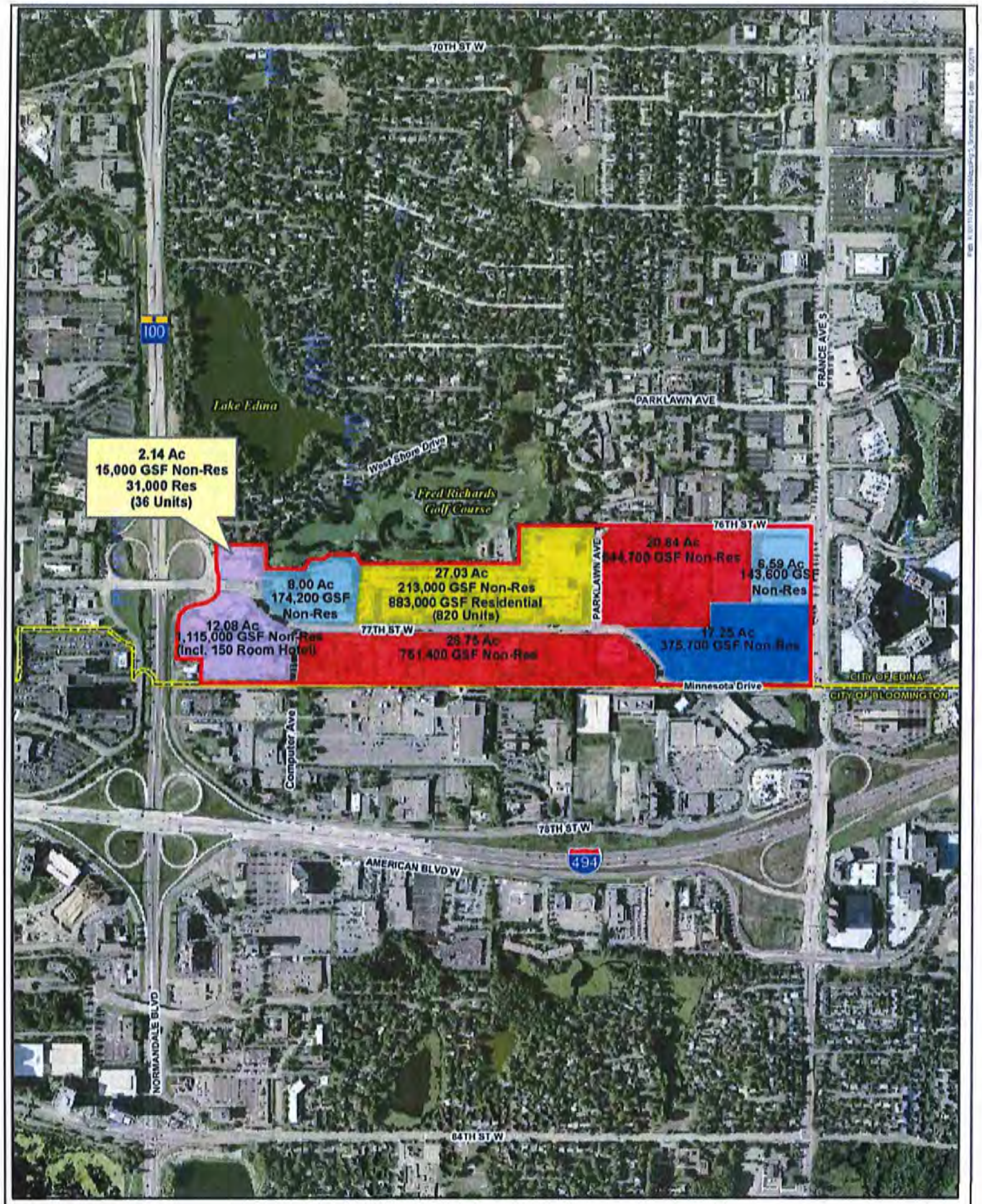


Figure 5
Gateway Study Area - AUAR Update Traffic Study
Scenario 2 - Master Plan

Legend
Gateway AUAR | PID | POD-1 | POD-2 | PCD-3 | PSR-4

* GSF = Gross Square Feet

0 500 1,000 Feet

WSB

Draft

Table 5: Estimated Trip Generation – Scenario 2

Land Use	ITE Land Use Code	Size		Time of Day	Trip Rate	Trip Generation				
						Total	In		Out	
							%	Trips	%	Trips
Office	710	1,908,000	gsf	Daily	9.74	18,584	50	9,292	50	9,292
				AM Peak	1.16	2,213	86	1,903	14	310
				PM Peak	1.15	2,194	16	351	84	1,843
Office and Warehousing	150	1,296,000	gsf	Daily	1.74	2,255	50	1,128	50	1,127
				AM Peak	0.17	220	77	169	23	51
				PM Peak	0.19	246	27	66	73	180
Retail	814	80,000	gsf	Daily	63.47	5,078	50	2,539	50	2,539
				AM Peak	3.18	254	57	145	43	109
				PM Peak	6.84	547	52	284	48	263
Hotel	310	150	rooms	Daily	8.36	1,254	50	627	50	627
				AM Peak	0.47	71	59	42	41	29
				PM Peak	0.6	90	51	46	49	44
Condominium / Townhome	230	205	units	Daily	7.32	1,501	50	751	50	750
				AM Peak	0.46	94	23	22	77	72
				PM Peak	0.56	115	63	72	37	43
Senior Adult Housing - Attached	252	615	units	Daily	3.7	2,276	50	1,138	50	1,138
				AM Peak	0.2	123	35	43	65	80
				PM Peak	0.26	160	55	88	45	72
Total				Daily	30,948		15,475		15,473	
				AM Peak	2,975		2,324		651	
				PM Peak	3,352		907		2,445	
Internal Trips				Daily	-3,123		-1,561		-1,562	
				AM Peak	-197		-112		-85	
				PM Peak	-421		-219		-202	
Net Increase in Trips				*Daily*	*14,788*		*7,394*		*7,394*	
				AM Peak	*1,236*		*890*		*346*	
				PM Peak	*1,395*		*434*		*961*	

Source: ITE Trip Generation Manual (10th Edition) and WSB & Associates, Inc.

Draft

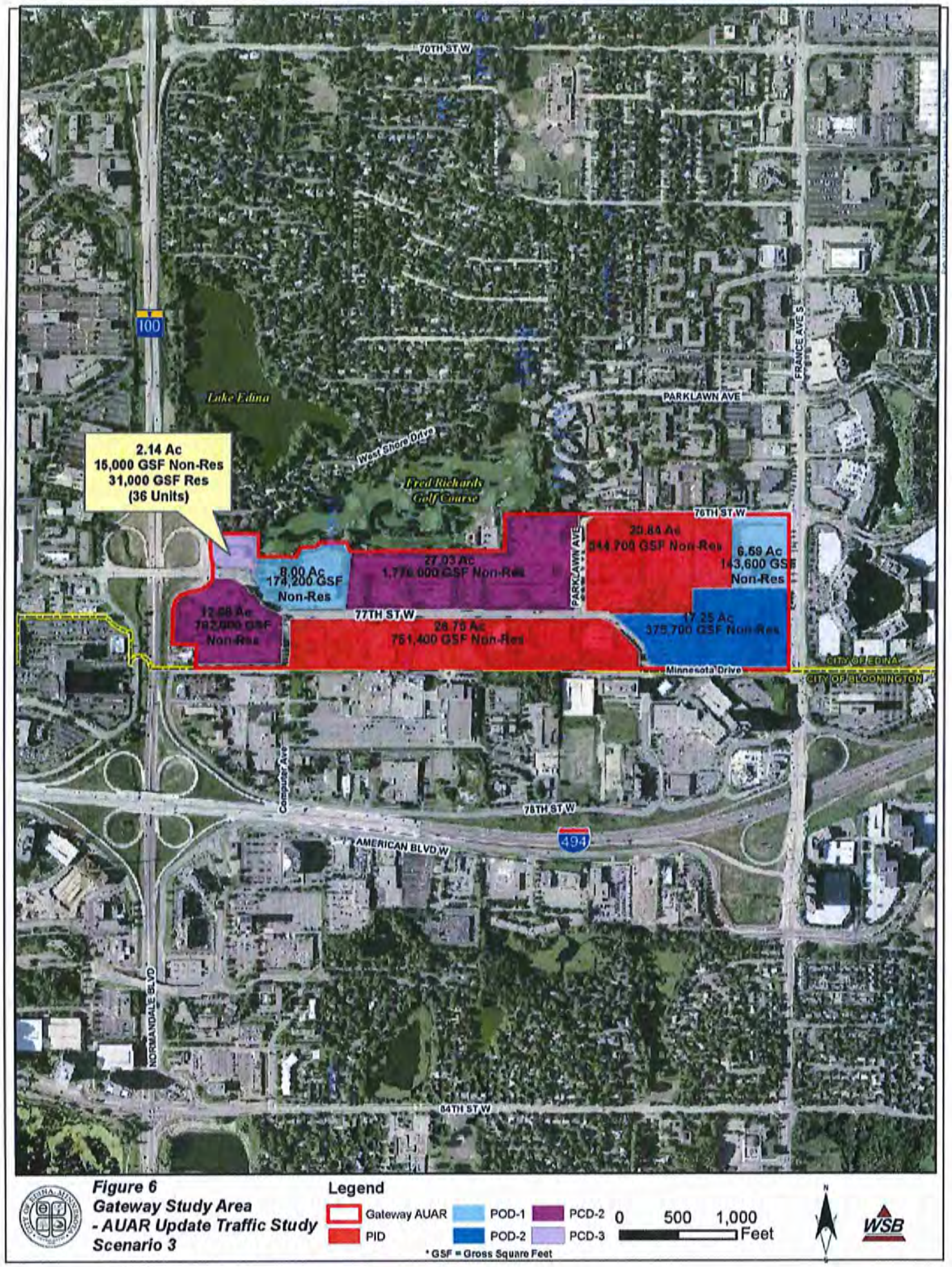


Figure 6
Gateway Study Area - AUAR Update Traffic Study Scenario 3

Draft

Table 6: Estimated Trip Generation – Scenario 3

Land Use	ITE Land Use Code	Size		Time of Day	Trip Rate	Trip Generation				
						Total	In		Out	
							%	Trips	%	Trips
Office	710	3,308,000	gsf	Daily	9.74	32,220	50	16,110	50	16,110
				AM Peak	1.16	3,837	86	3,300	14	537
				PM Peak	1.15	3,804	16	609	84	3,195
Office and Warehousing	150	1,296,000	gsf	Daily	1.74	2,255	50	1,128	50	1,127
				AM Peak	0.17	220	77	169	23	51
				PM Peak	0.19	246	27	66	73	180
Total				Daily	34,475		17,238		17,237	
				AM Peak	4,057		3,469		588	
				PM Peak	4,050		675		3,375	
Net Increase in Trips				*Daily*	*21,438*		*10,718*		*10,720*	
				AM Peak	*2,515*		*2,147*		*368*	
				PM Peak	*2,514*		*421*		*2,093*	

Source: ITE Trip Generation Manual (10th Edition) and WSB & Associates, Inc.

Draft

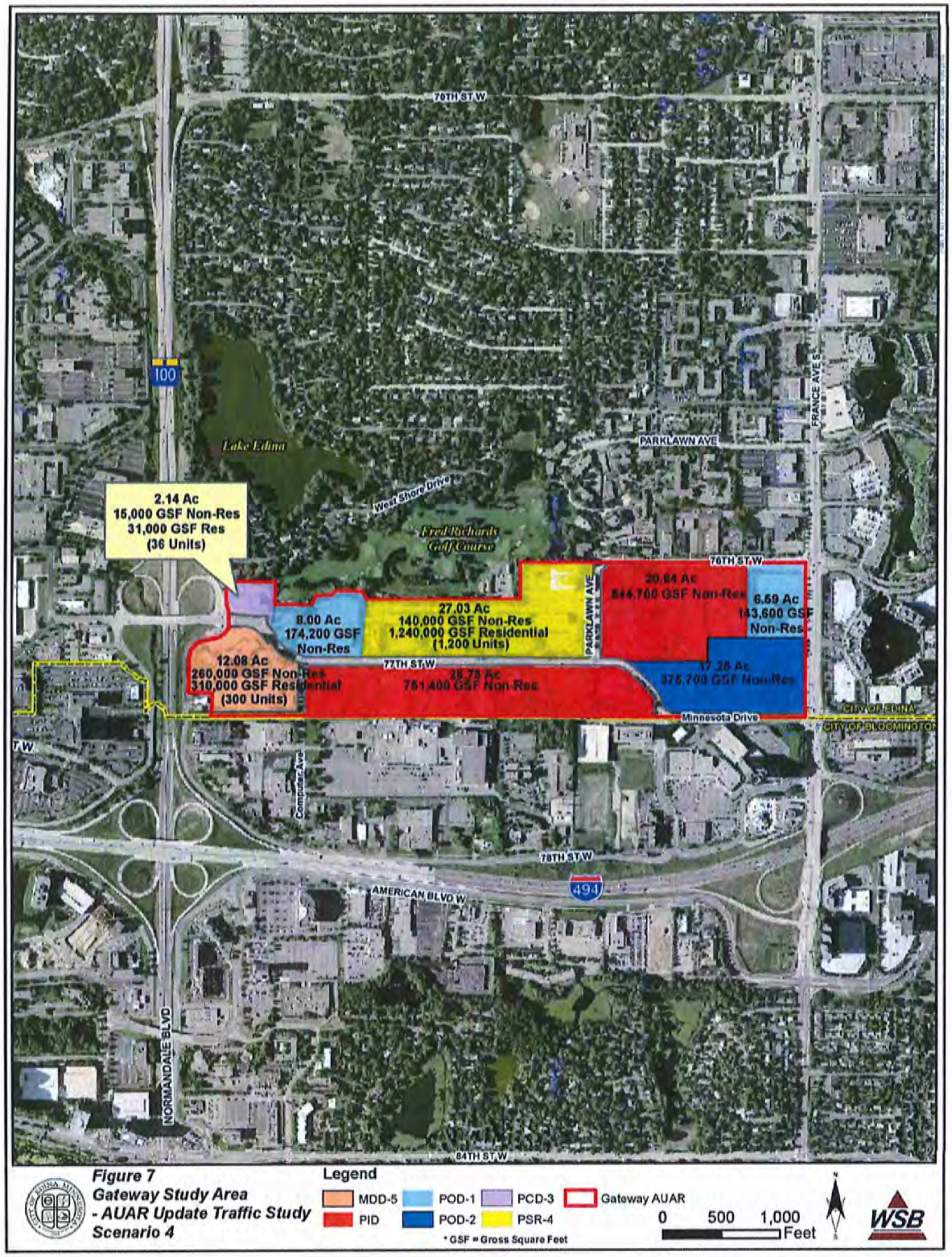


Figure 7
Gateway Study Area - AUAR Update Traffic Study Scenario 4

Draft

Table 7: Estimated Trip Generation – Scenario 4

Land Use	ITE Land Use Code	Size		Time of Day	Trip Rate	Trip Generation				
						Total	In		Out	
							%	Trips	%	Trips
Office	710	1,140,000	gsf	Daily	9.74	11,104	50	5,552	50	5,552
				AM Peak	1.16	1,322	86	1,137	14	185
				PM Peak	1.15	1,311	17	223	83	1,088
Office and Warehousing	150	1,296,000	gsf	Daily	1.74	2,255	50	1,128	50	1,127
				AM Peak	0.17	220	77	169	23	51
				PM Peak	0.19	246	27	66	73	180
Condominium / Townhome	230	1,125	units	Daily	7.32	8,235	50	4,118	50	4,117
				AM Peak	0.46	518	23	119	77	399
				PM Peak	0.56	630	63	397	37	233
Senior Adult Housing - Attached	252	375	units	Daily	3.7	1,388	50	694	50	694
				AM Peak	0.2	75	35	26	65	49
				PM Peak	0.26	98	55	54	45	44
Total				Daily	22,982		11,492		11,490	
				AM Peak	2,135		1,451		684	
				PM Peak	2,285		740		1,545	
Internal Trips				Daily	-193		-97		-96	
				AM Peak	-12		-2		-10	
				PM Peak	-15		-9		-6	
Net Increase in Trips				*Daily*	*9,752*		*4,875*		*4,877*	
				AM Peak	*581*		*127*		*454*	
				PM Peak	*734*		*477*		*257*	

Source: ITE Trip Generation Manual (10th Edition) and WSB & Associates, Inc.

Draft

C. Traffic Distribution

Background and site-generated trips were distributed to the adjacent roadway system based on several factors including the existing Annual Average Daily Traffic (AADT), the travel sheds for the major routes that serve the area and data provided in the Gateway AUAR. In general, the Trip Distribution was assumed as shown in ***Table 8***:

Table 8: Development Traffic Distribution

Direction	AM		PM	
	In	Out	In	Out
North	27%	22%	21%	26%
South	24%	13%	18%	25%
East	21%	35%	22%	20%
West	28%	30%	39%	29%

The generated trips for the proposed Gateway AUAR development area were assumed to arrive or exit using the accesses on 77th Street. The development will access the site via Computer Drive, driveways directly onto 77th Street and Parklawn Avenue. Background non-site and site-generated trips were distributed to the adjacent roadway system based on several factors including:

- Previous traffic and transportation studies in the area.
- Anticipated origins and destinations for specific land use (i.e. location of commercial uses in relationship to residential).
- Existing travel patterns.
- City's current Transportation Plan model.

D. Future Year Traffic Forecasts

Future year traffic forecast turning movements were estimated by applying the approach direction distribution percentages to the site-generated traffic. The traffic forecasts were prepared by adding the projected annual background traffic growth and the projected non-development background traffic growth to the existing 2017 traffic counts to determine the "No-Build" traffic conditions. The anticipated Gateway Area development area traffic was then added to the no-build to determine the "Build" traffic conditions. ***Figures 8-15*** in the ***Appendix*** shows the projected 2025 and 2040 Build AM and PM peak hour traffic volumes.

Draft

TRAFFIC IMPACT ANALYSIS

Existing and/or forecasted traffic operations were evaluated for the impacted intersections and driveway in the Gateway AUAR development area for each land use scenario. The analysis was conducted for the following conditions.

1. Existing 2017 Conditions
2. Projected 2025 Build
3. Projected 2040 Build

This section describes the methodology used to assess the operations and provides a summary of traffic operations for each scenario.

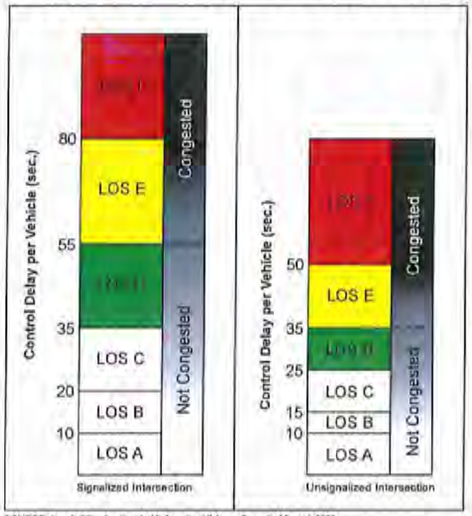
A. Methodology

The traffic operations analysis is derived from established methodologies documented in the Highway Capacity Manual 2000 (HCM). The HCM provides a series of analysis techniques that are used to evaluate traffic operations.

Intersections are given a Level of Service (LOS) grade from "A" to "F" to describe the average amount of control delay per vehicle as defined in the HCM. The LOS is primarily a function of peak traffic hour turning movement volumes, intersection lane configuration, and the traffic controls at the intersection. LOS A is the best traffic operating condition, and drivers experience minimal delay at an intersection operating at that level. LOS E represents the condition where the intersection is at capacity, and some drivers may have to wait through more than one green phase to make it through an intersection controlled by traffic signals. LOS F represents a condition where there is more traffic than can be handled by the intersection, and many vehicle operators may have to wait through more than one green phase to make it through the intersection. At a stop sign-controlled intersection, LOS F would be characterized by exceptionally long vehicle queues on each approach at an all-way stop, or long queues and/or great difficulty in finding an acceptable gap for drivers on the minor legs at a through-street intersection.

The LOS ranges for both signalized and un-signalized intersections are shown in ***Figure 16.*** The threshold LOS values for un-signalized intersections are slightly less than for signalized intersections. This variance was instituted because drivers' expectations at intersections differ with the type of traffic control. A given LOS can be altered by increasing (or decreasing) the number of lanes, changing traffic control arrangements, adjusting the timing at signalized intersections, or other lesser geometric improvements. LOS also changes as traffic volumes increase or decrease.

Figure 16 - Level of Service Ranges



SOURCE: Level of Service thresholds from the Highway Capacity Manual, 2000.

LOS, as described above, can also be determined for the individual legs (sometimes referred to as "approaches") or lanes (turn lanes in particular) of an intersection. It should be noted that a LOS E or F might be acceptable or justified in those cases where a leg(s) or lane(s) has a very low traffic volume as compared to the volume on the other legs. For example, improving LOS on such low-volume legs by converting a two-way stop condition to an all-way stop, or adjusting timing at a signalized intersection, could result in a significant penalty for the many drivers on the major road while benefiting the few on the minor road. Also, geometric improvements on minor legs, such as additional lanes or longer turn lanes, could have limited positive effects and might be prohibitive in terms of benefit to cost.

Although LOS A represents the best possible level of traffic flow, the cost to construct roadways and intersection to such a high standard often exceeds the benefit to the user. Funding availability might also lead to acceptance of intersection or roadway designs with a lower LOS. LOS D is generally accepted as the lowest acceptable level in urban areas. LOS C is often considered to be the desirable minimum level for rural areas. LOS D or E may be acceptable for limited durations or distances, or for very low-volume legs of some intersections.

The LOS analysis was performed using Synchro/SimTraffic:

- Synchro, a software package that implements Highway Capacity Manual (HCM) methodologies, was used to build each signalized intersection and provide an input database for turning-movement volumes, lane geometrics, and signal design and timing characteristics. In addition, Synchro was used to optimize signal timing parameters for future conditions. Output from Synchro is transferred to SimTraffic, the traffic simulation model.

Draft

- SimTraffic is a micro-simulation computer modeling software that simulates each individual vehicle's characteristics and driver behavior in response to traffic volumes, intersection configuration, and signal operations. The model simulates drivers' behaviors and responses to surrounding traffic flow as well as different vehicle types and speeds. It outputs estimated vehicle delay and queue lengths at each intersection being analyzed.

B. Existing Level of Service Summary

The existing intersection operations were evaluated for the AM and PM peak hour based on the current lane geometry, traffic control and traffic volumes. The results of this analysis are illustrated in ***Table 9***. Based on the analysis, the only intersection that is operating at an overall deficient level of service (LOS E or F), is France Avenue at Minnesota Drive which is operating at an overall LOS E during the PM peak hour. All other intersections are operating at an overall LOS D or better. However, there are several movements that are operating at LOS F including:

- France Ave at W. 76th St – Northbound Left – AM Peak = LOS F
- W. 77th St at SB TH 100 Ramp – Eastbound Through – PM Peak = LOS F
- W. 77th St at NB TH 100 Ramp – Eastbound Left – PM Peak = LOS F
- France Ave at Minnesota Dr – Westbound Left – PM Peak = LOS F

Table 9: Existing (2017) Intersection Level of Service

Intersection	Existing 2017					
	AM Peak Hour			PM Peak Hour		
	LOS	Delay	Movement (LOS)	LOS	Delay	Movement (LOS)
SB TH 100 / W 77th St	C	27.1		D	51.3	EBT (F)
NB TH 100 / W 77th St	C	24.5		D	52.6	EBL (F)
Commercial Access / W 77th St	A	8.2		C	24.5	
Computer Ave / W 77th	B	18.4		C	25.6	
Parklawn Ave / W 77th St	C	20.1		C	31.3	
W 77th St / Minnesota Dr	B	16.3		C	28.4	
France Ave / W 76th St	C	32.1	NBL (F)	D	35.6	
France Ave / Minnesota Dr	C	24.3		E	55.2	WBL (F)

Source: WSB & Associates, Inc.
Note: Based upon criteria shown in ***Figure 16***

Draft

C. Forecasted Traffic Operations

A capacity and LOS analysis was also completed for the study area intersections for each land use scenario for the years 2025, which is the anticipated year the proposed Gateway Area development would be completed, and; for the 2040 conditions which represents the City's Comprehensive Plan development time frame.

A summary of the expected traffic operations on the key intersections is displayed in ***Table 10*** to ***13***. Based on the analysis all scenarios will have some operational deficiencies in years 2025 and/or 2040. Deficiencies include operations on France Avenue, the TH 100 interchange, and accesses to the Gateway Study Area. The majority of these locations do not have right or left turn lanes or the existing turn lanes do not have adequate capacity to handle the forecast traffic volumes.

During both the AM peak hour PM peak hours in both 2025 and 2040 assuming with the increase in traffic for each land use scenario, several intersections and movements will be operating at LOS E or F. Specifically, the intersections of 77th Street at the TH 100 ramps, 77th Street at Computer Drive, 77th Street at Parklawn Ave, 77th at Minnesota Drive, France Avenue at 76th Street and France Avenue at Minnesota Street.

Table 10: 2025 AM Peak Hour Intersection Level of Service

Intersection	2025 AM Peak Hour											
	Scenario 1			Scenario 2			Scenario 3			Scenario 4		
	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)
SB TH 100 / W 77th St	D	50.0		F	+100		F	+100		D	36.2	EBT (F) WBL (F)
NB TH 100 / W 77th St	D	54.5	EBT (F) EBR (F)	E	77.4		E	78.9		D	35.4	EBT (F)
Commercial Access / W 77th St	B	11.8		B	14.5		B	12.3		B	11.1	
Computer Ave / W 77th	B	18.4		C	23.7		B	17.2		C	20.7	
Parklawn Ave / W 77th St	C	23.4	WBT (E) SBL (E)	C	30.0	WBT (E) SBL (E)	F	+100		C	22.2	
W 77th St / Minnesota Dr	B	13.9		B	13.9		B	12.2		B	16.1	
France Ave / W 76th St	D	35.6	NBL (F)	D	38.7	NBL (F)	E	56.3	NBL (F)	C	33.1	NBL (F)
France Ave / Minnesota Dr	C	33.3	SBL (E) EBL (E) WBL (E) NBL (F)	D	35.0	SBL (E) EBL (E) WBL (E) NBL (F)	D	40.6	EBL (E) SBL (E) WBL (E) NBL (F)	D	35.0	SBL (E) EBL (E) WBL (E) NBL (F)

Source: WSB & Associates, Inc. Note: Based upon criteria shown in ***Figure 16***

Draft

Table 11: 2025 PM Peak Hour Intersection Level of Service

Intersection	2025 PM Peak Hour											
	Scenario 1			Scenario 2			Scenario 3			Scenario 4		
	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)
SB TH 100 / W 77th St	E	62.3	EB (F)	E	59.8	EBT (F)	F	+100		E	72.0	EBT (F)
NB TH 100 / W 77th St	E	68.7	EBL (F) EBT (F) NBL (F)	F	+100		F	+100		E	66.1	EB (F)
Commercial Access / W 77th St	D	39.5	EBL (F) NBT (F)	C	31.4	EBL (E) NBT (E) WBT (E)	D	47.4	NBL (F) SBL (F) EBL (F)	C	31.5	NBL (F) EBL (F)
Computer Ave / W 77th	F	+100		F	+100		F	+100		E	62.5	WBT (F) NBL (F)
Parklawn Ave / W 77th St	F	+100		F	+100		F	+100		C	27.5	
W 77th St / Minnesota Dr	E	61.4	SBL (F)	E	66.1	SBL (F)	E	71.7	SBL (F)	C	24.0	
France Ave / W 76th St	F	+100		F	+100		F	+100		F	+100	
France Ave / Minnesota Dr	F	+100		F	+100		F	+100		F	+100	

Source: WSB & Associates, Inc. Note: Based upon criteria shown in ***Figure 16***

Table 12: 2040 AM Peak Hour Intersection Level of Service

Intersection	2040 AM Peak Hour											
	Scenario 1			Scenario 2			Scenario 3			Scenario 4		
	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)
SB TH 100 / W 77th St	D	51.2		F	+100		F	+100		C	38.0	EBT (F) WBL (F)
NB TH 100 / W 77th St	E	55.7	EBT (F) EBR (F)	F	82.2		F	84.0		D	41.2	EBT (F)
Commercial Access / W 77th St	B	12.9		B	16.1		B	12.8		B	11.6	
Computer Ave / W 77th	B	19.6		C	24.1		B	18.0		C	22.6	
Parklawn Ave / W 77th St	C	24.4	WBT (E) SBL (E)	C	30.5	WBT (E) SBL (E)	F	+100		C	23.8	SBL (F) WBT (F)
W 77th St / Minnesota Dr	B	15.7		B	14.8		B	12.8		B	17.3	
France Ave / W 76th St	D	36.4	NBL (F)	D	40.7	NBL (F)	E	68.3	NBL (F)	C	35.6	SBL (E) EBL (E) WBL (E) NBL (F)
France Ave / Minnesota Dr	C	38.5	SBL (E) EBL (E) WBL (E) NBL (F)	D	46.8	SBL (E) SBT (E) NBL (F) WBL (F) SBL (F)	D	41.2	SBL (E) SBT (E) NBL (F) WBL (F) SBL (F)	C	37.0	SBL (E) EBL (E) WBL (E) NBL (F)

Source: WSB & Associates, Inc. Note: Based upon criteria shown in ***Figure 16***

Table 13: 2040 PM Peak Hour Intersection Level of Service

Intersection	2040 PM Peak Hour											
	Scenario 1			Scenario 2			Scenario 3			Scenario 4		
	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)	LOS	Delay	Mvmt (LOS)
SB TH 100 / W 77th St	F	83.8		E	62.1	EBT (F) EBR (F)	F	+100		E	75.1	EBT (F) EBR (F)
NB TH 100 / W 77th St	E	77.6	NB (F) EB (F)	F	+100		F	+100		E	68.3	EB (F)
Commercial Access / W 77th St	D	41.2	NB (F) SB (F)	C	32.9	EBL (E) NBL (E) WBT (E)	D	48.2	NBL (F) SBL (F) EBL (F)	C	33.4	NB (F) EBL (F)
Computer Ave / W 77th	F	+100		F	+100		F	+100		E	63.8	WBT (F) WBR (F) NBL (F)
Parklawn Ave / W 77th St	F	+100		F	+100		F	+100		C	28.2	SBT (F)
W 77th St / Minnesota Dr	F	+100		E	66.5	SB (F)	E	73.4	SBT (F) SBL (F)	C	26.1	
France Ave / W 76th St	F	+100		F	+100		F	+100		F	+100	
France Ave / Minnesota Dr	F	+100		F	+100		F	+100		F	+100	

Source: WSB & Associates, Inc. Note: Based upon criteria shown in ***Figure 16***

D. Mitigated Traffic Operations

Mitigation improvements that would improve all intersections and movement to an acceptable LOS E or better includes:

2025 Mitigation:

1. Addition of a northbound dual right-turn lane at 77th Street and TH 100 SB Ramp.
2. Addition of a westbound right-turn lane at 77th Street and TH 100 NB Ramp.
3. Addition of a northbound left turn lane, eastbound right turn lane and signal timing improvements at 77th Street and Commercial Access driveway.
4. Improved signal timing at 77th Street and Computer Avenue.
5. Addition of a northbound dual left turn lane, southbound left turn lane and eastbound right turn lane at 77th Street and Computer Drive.
6. Addition of a northbound through lane at France Avenue and Minnesota Street.

Draft

2040 Mitigation:

1. 2025 Improvements
2. Addition of a northbound through lane at France Avenue and Minnesota Drive.
3. Addition of a southbound through lane at France Avenue and 76th Street.
4. Addition of an eastbound and westbound third lane on 77th Street from TH 100 SB Ramp through Computer Drive.
5. Addition of an eastbound and westbound dual left turn lane at France Avenue and Minnesota Street.
6. Addition of a southbound left turn lane at 77th Street and Minnesota Street.
7. Addition of an eastbound right turn lane at 77th Street and Parklawn Avenue.

Based on the proposed mitigation improvements a capacity and level of service analysis was completed using the projected 2040 traffic volumes for each scenario. The results are shown in ***Tables 14*** and ***15.*** The results show that all intersections would be operating at overall LOS D or better for all scenarios in both the AM and PM peak hours.

Table 14: 2040 AM Peak Hour Mitigation Intersection Level of Service

Intersection	2040 AM Peak Hour							
	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SB TH 100 / W 77th St	D	44.9	D	54.0	D	53.3	D	46.8
NB TH 100 / W 77th St	C	25.9	C	28.2	D	35.3	C	25.4
Commercial Access / W 77th St	A	8.0	B	15.6	B	12.4	A	8.1
Computer Ave / W 77th	A	6.0	B	11.5	A	7.2	A	6.6
Parklawn Ave / W 77th St	C	29.0	C	22.2	B	16.9	C	26.8
W 77th St / Minnesota Dr	B	19.1	B	16.1	B	16.4	C	20.6
France Ave / W 76th St	C	26.7	C	27.2	C	34.8	C	26.2
France Ave / Minnesota Dr	C	23.2	C	25.2	D	37.4	C	22.4

Table 15: 2040 PM Peak Hour Mitigation Intersection Level of Service

Intersection	2040 PM Peak Hour							
	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SB TH 100 / W 77th St	D	47.7	D	45.9	C	33.2	D	53.2
NB TH 100 / W 77th St	C	33.4	D	40.7	C	30.1	C	26.3
Commercial Access / W 77th St	B	10.8	B	19.6	C	27.8	B	14.4
Computer Ave / W 77th	C	22.4	C	24.7	D	46.5	C	26.2
Parklawn Ave / W 77th St	D	37.0	C	32.4	D	47.0	D	40.7
W 77th St / Minnesota Dr	C	30.3	C	23.9	E	57.4	D	38.9
France Ave / W 76th St	D	35.8	C	32.7	D	45.0	C	27.1
France Ave / Minnesota Dr	D	50.5	D	40.8	C	28.8	D	50.8

TRANSIT

Currently there are two forms of transit service within the City of Edina.

Paratransit: Paratransit services are currently provided by Edina Dial-A-Raid Transportation. Door-to-door services provided using a wheelchair lift equipped van on a first-come, first-service basis. Hours of operation are Monday through Friday, 9:00 a.m. to 3:00 p.m., 24-hour advance notice for scheduling is required. Anyone living in Edina is eligible.

Scheduled Transit: The key transit facility in Edina is a Southdale transit center. This is part of the Southdale shopping mall. It includes a covered shelter area with routes and schedule information. The Southdale transit center is one of the busier transit centers in the Twin Cities, with eight transit lines which stop and link at this location. There are also 100 parking spaces at a metro transit Park'n Ride lot at this location.

The existing scheduled services to Edina residents is depicted in ***Table 16***.

Draft

Table 16 – Existing Scheduled Transit Service in Edina

Route	Service Route/Area	Service Description
6	Edina (includes Southdale Transit Center), Uptown, downtown Minneapolis, University of Minnesota	High frequency local service, all day/evening, all week; 5-15 minute headways
46	Edina (includes 50th/France), south Minneapolis, St Paul	Local service all day/evening, all week: 30-60 minute headways
114	Edina (includes Southdale Transit Center), south Minneapolis, Uptown University of Minnesota	Commuter/student service during a.m. and p.m. rush hours, weekdays
146	Edina (Vernon Ave.), southwest Minneapolis, downtown Minneapolis	Commuter express (I-35W) service during a.m. and p.m. rush hours, weekdays
152	Edina (includes Southdale Transit Center), Lake Street, University of Minnesota	Commuter/student express (I-35W) service during a.m. and p.m. rush hours, weekdays
515	Edina (Includes Southdale Transit Center), Richfield, South Minneapolis, Bloomington (includes Mall of America), Veterans Medical Center (alternate route)	Local service, all day/evening, all week; 10-30 minute headways
538	Edina (includes Southdale Transit Center), Bloomington (includes Mall of America)	Local service, all day/evening, all week; 30-60 minute headways
539	Edina (includes Southdale Transit Center), Bloomington (includes Normandale Community College, Mall of America)	Local service, all day/evening, all week; 30-60 minute headways
540	Edina, Richfield (includes Best Buy Headquarters), Bloomington (includes Mall of America)	Local service, all day/evening, all week; 15-30 minute headways during a.m./p.m. rush hours, otherwise 30-60 minute headways
568	Downtown Minneapolis, south Minneapolis, Edina, Minnetonka (Opportunity Partners)	Weekdays only, one a.m. run from Minneapolis to Opportunity Partners; one p.m. run from Opportunity Partners to Minneapolis
578	Edina (includes Southdale Transit Center), downtown Minneapolis	Commuter express service (TH 62 and I-35W) during a.m. and p.m. rush hours
587	Edina, downtown Minneapolis	Commuter express service (TH 100 and I-394) during a.m. and p.m. rush hours, weekdays
631 (Southwest)	Chanhassen, Eden Prairie, Edina (Southdale Transit Center)	Weekday service, morning through evening; approximately 10 runs per day each direction

Note: all routes are Metro Transit with the exception of 631, which is Southwest Metro Transit.

NON-MOTORIZED TRANSPORTATION

Sidewalks and other pedestrian facilities are important components of Edina's transportation infrastructure. Sidewalks and paths provide safe movement for individuals of all ages, decrease dependence on motor vehicles, and encourage active lifestyles. An important key to an effective municipal sidewalk system is in providing networking continuity such that there is broad geographic coverage for a range of users without notable gaps. The Gateway Study Area is a critical link in Edina's non-motorized transportation system.

The City of Edina's 2008 Comprehensive Plan includes a variety of Travel Demand Management (TDM) and non-motorized vehicle transportation (transit, pedestrian/bike facilities) policies and guidelines for development of these facilities or expanded facilities. However, as development continues to grow, specifically in the Gateway Study Area, consideration of site-specific improvements as developments are proposed needs to be included. These would include upgrading the existing bus shelters to become ADA compliant and improvements of sidewalk and/or path connections.

Draft

AUAR MITIGATION REQIREMENTS

Many of the mitigation measures outlined in the 2007 AUAR still remain valid. The updated mitigation measures are outlined below and either remain in effect from the 2007 AUAR or have been updated based on new analysis as noted. Each mitigation includes if the improvement is needed with the no-build or build (with Gateway Area development) conditions and what year (2025 or 2040) the improvement is required.

Based upon the analysis, deficiencies exist for all scenarios near the TH 100/West 77th Street Interchange, on 77th Street and on France Avenue. Intersection signal timing was first modified to provide optimal operations in each scenario. Mitigation strategies were developed for each scenario are listed below.

Scenarios 1 and 4:

The following mitigation strategies are needed for Scenario 1 and 4 to accommodate both 2025 and 2040 traffic projections:

Intersection:	France Avenue at West 76th Street
Improvement:	Extend one southbound thru lane on France Avenue to create a total of four thru lanes
Needed By:	2040 No-Build
Intersection:	Northbound TH 100 at West 77th Street
Improvement:	Add 150 foot northbound right turn lane on Frontage Road Westbound dual right turn lanes on West 77th Street
Need By:	2040 Full Build
Intersection:	Edina Industrial Boulevard / West 78th Street
Improvement:	Eastbound dual left turn lanes on West 78th Street
Need By:	2040 Full Build
Intersection:	Edina Industrial Boulevard / Metro Boulevard
Improvement:	Add southbound right turn lane on Metro Boulevard, restriping the existing two southbound lanes to accommodate an exclusive left turn lane, and a thru/left lane, providing dual left turn lanes. Add 300-foot eastbound left turn lane on Edina Industrial Boulevard
Need By:	2025 No-Build

Scenario 2:

Scenario 2 will require **all the improvements listed above** in addition to the following:

Intersection:	Minnesota Drive at France Avenue
Improvement:	Dual westbound left turn lanes on Minnesota Drive Eastbound dual left turn lanes on Minnesota Drive
Need By:	2040 Full Build

Draft

Intersection:	Northbound TH 100 at West 77th Street
Improvement:	Add 150 foot eastbound right turn lane on West 77th Street
Need By:	2025 Build

Intersection:	Computer Avenue at West 77th Street
Improvement:	Northbound dual left turn lanes on Computer Avenue
Need By:	2040 Full Build

Intersection:	Minnesota Drive / Johnson Avenue at West 77th Street Avenue
Improvement:	Southbound dual left turn lanes on West 77th Street
Need By:	2040 Full Build

Scenario 3:

Scenario 3 will require **all the above improvements listed under Scenarios 1, 2, and 4** in addition to the following:

Intersection:	Minnesota Drive at France Avenue
Improvement:	Eastbound dual right turn lanes on Minnesota Drive
Need By:	2040 Full Build

Intersection:	France Avenue at West 78th Street
Improvement:	Westbound dual right turn lanes on West 78th Street
Need By:	2040 Full Build

Interchange:	TH 100 at West 77th Street
Improvement:	Six-lane section from Metro Boulevard to Computer Avenue Dual left turn turns at both TH 100 Ramps (Hence an eight-lane bridge)
Need By:	2040 Full Build

Transit/Non-Motorized Transportation

As redevelopment occurs in the Gateway Study Area, consideration of site-specific improvements needs to be included as developments are proposed. These would include upgrading the existing transit facilities, including bus shelters, to become ADA compliant and improving the sidewalk and/or path connections in and around each redevelopment.

General

The mitigation measures discussion above are needed to address full build-out of the site and surrounding area. Specific mitigation measures required for proposed development plans will be established through traffic and transportation studies required for each development proposal. These proposals will need to document compliance with the Final AUAR and Mitigation Plan.

APPENDIX

Date: Printed: 1/30/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-03A - Existing 2012 Traffic.dgn

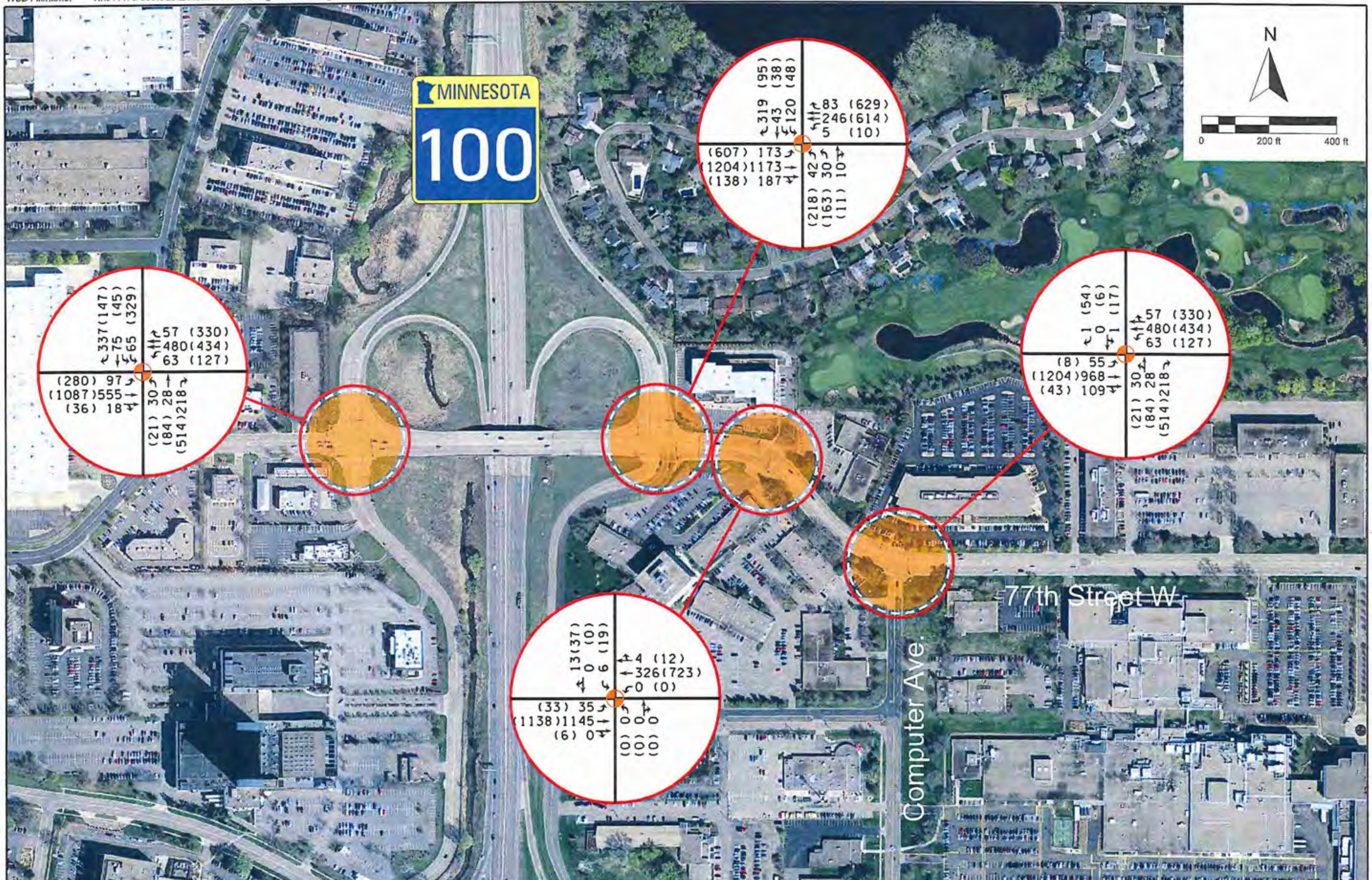


Figure 3A - Existing (2017) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/30/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-03B - Existing 2012 Traffic.dgn

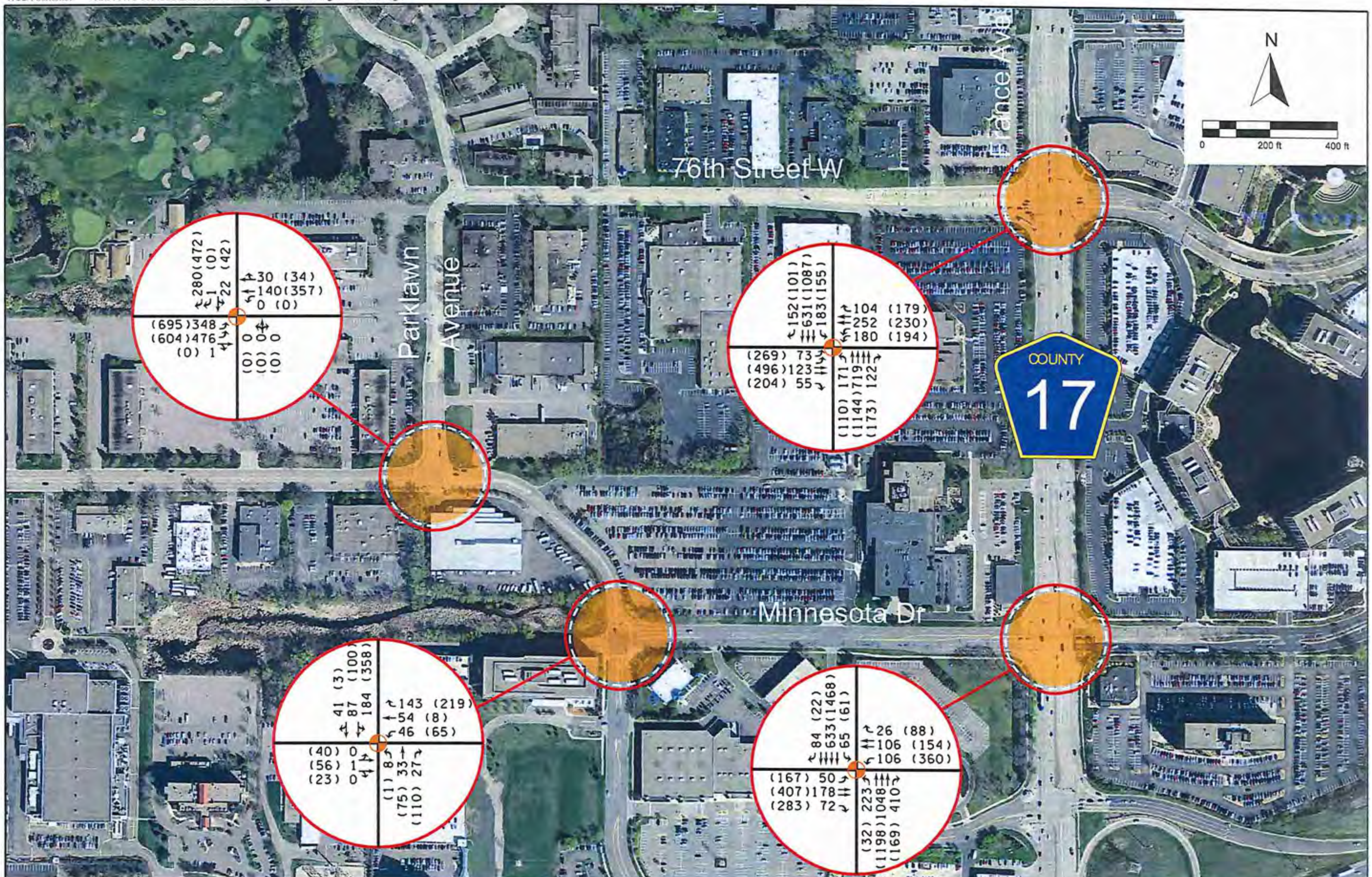


Figure 3B - Existing (2017) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-08A - scenario1 2025 Traffic.dyn

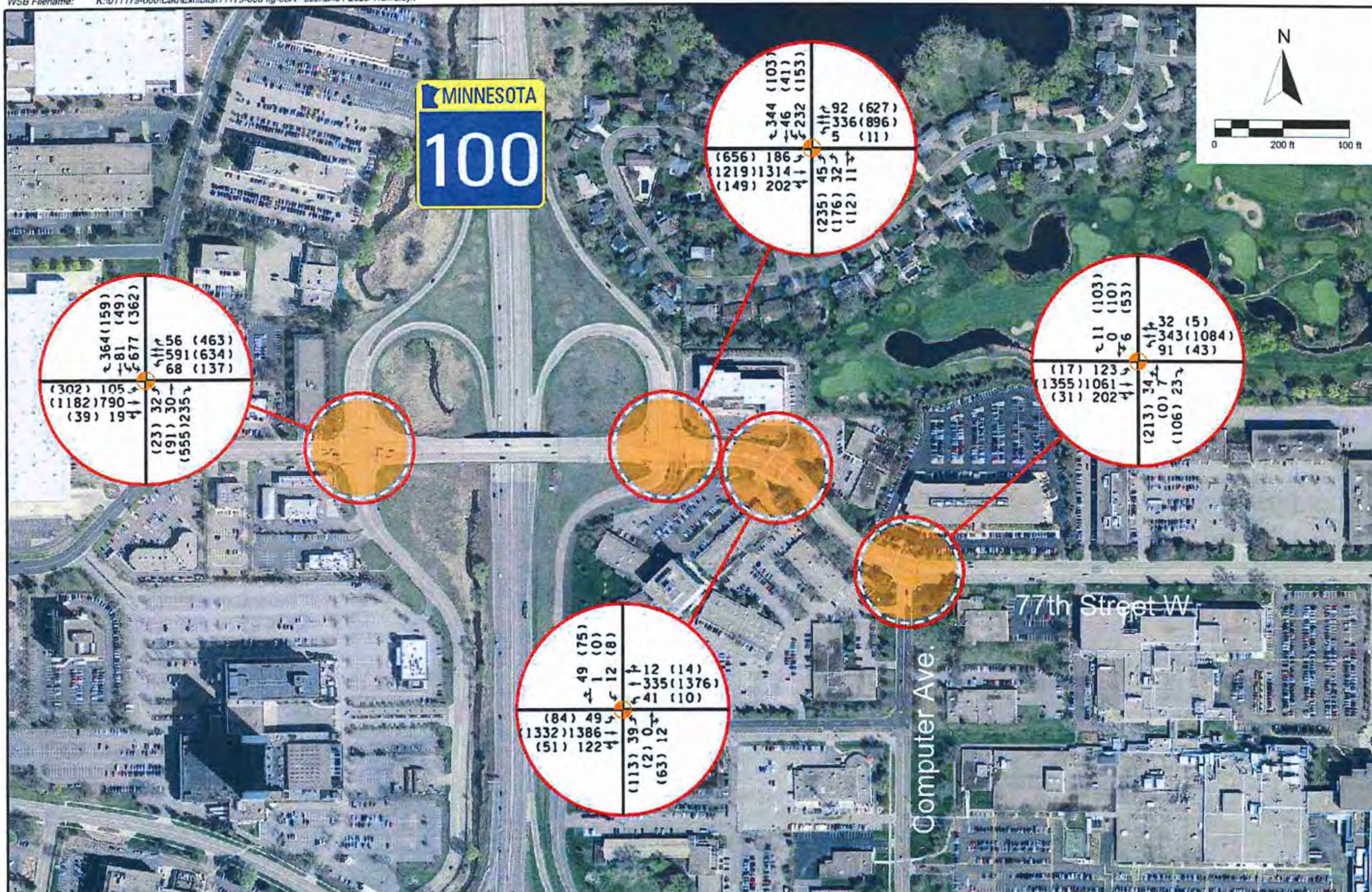


Figure 8A - Scenario 1 (2025) Traffic

Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-08B - scenario1 2025 Traffic.dgn

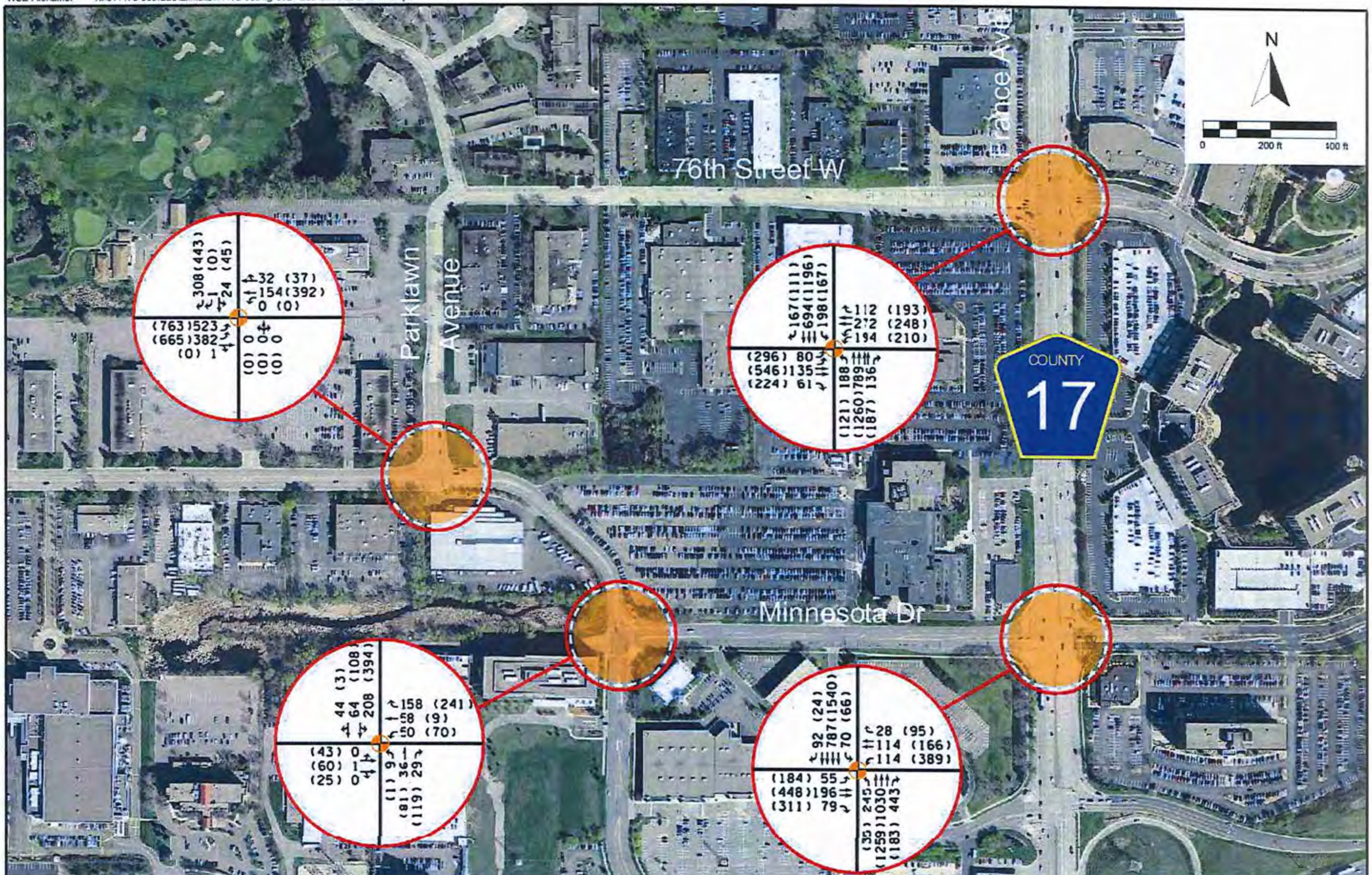


Figure 8B - Scenario 1 (2025) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC

LANE GEOMETRY

TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-09A - scenario2 2025 Traffic.dgn

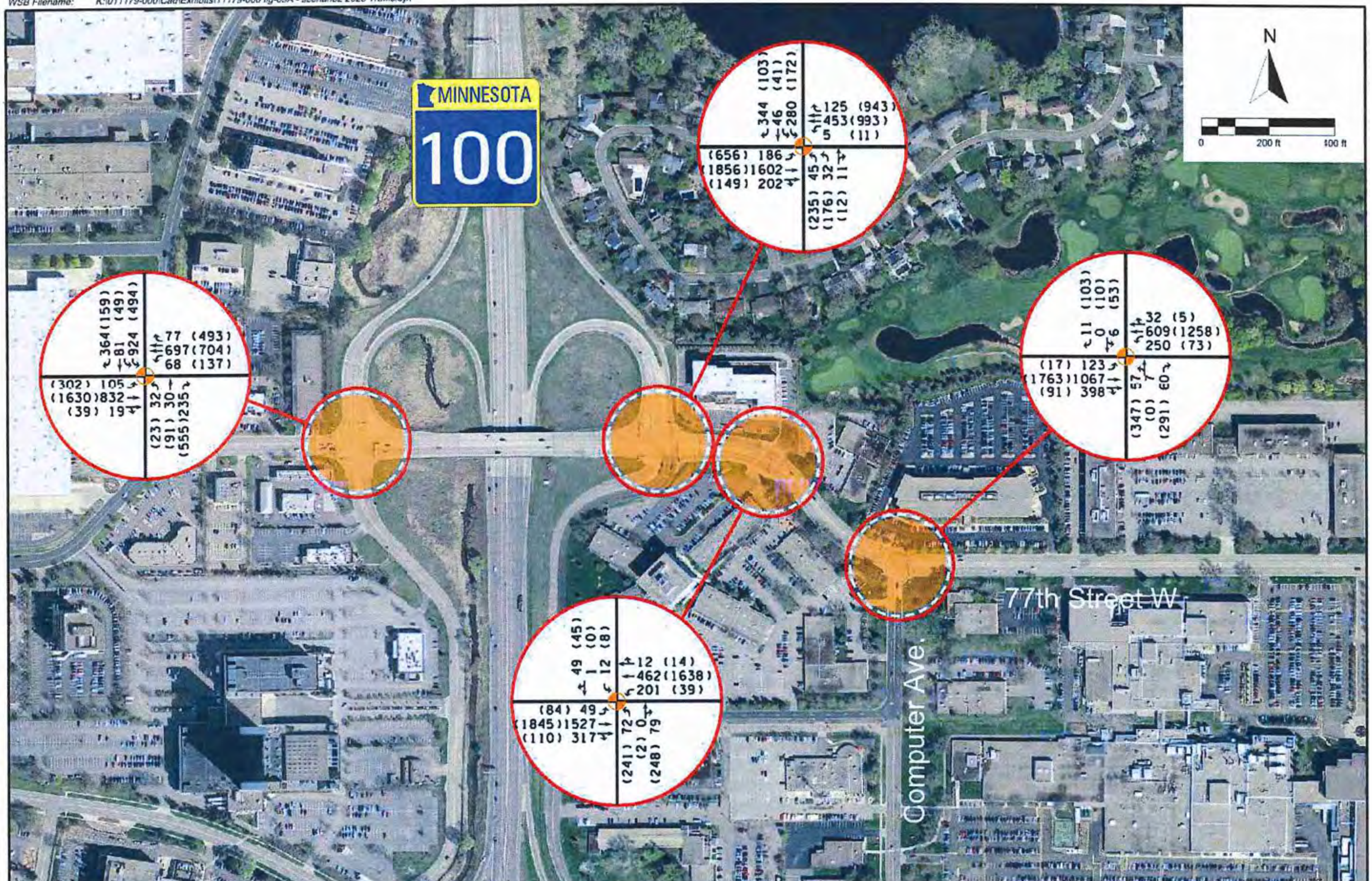


Figure 9A - Scenario 2 (2025) Traffic

Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-09B - scenario2 2025 Traffic.dgn

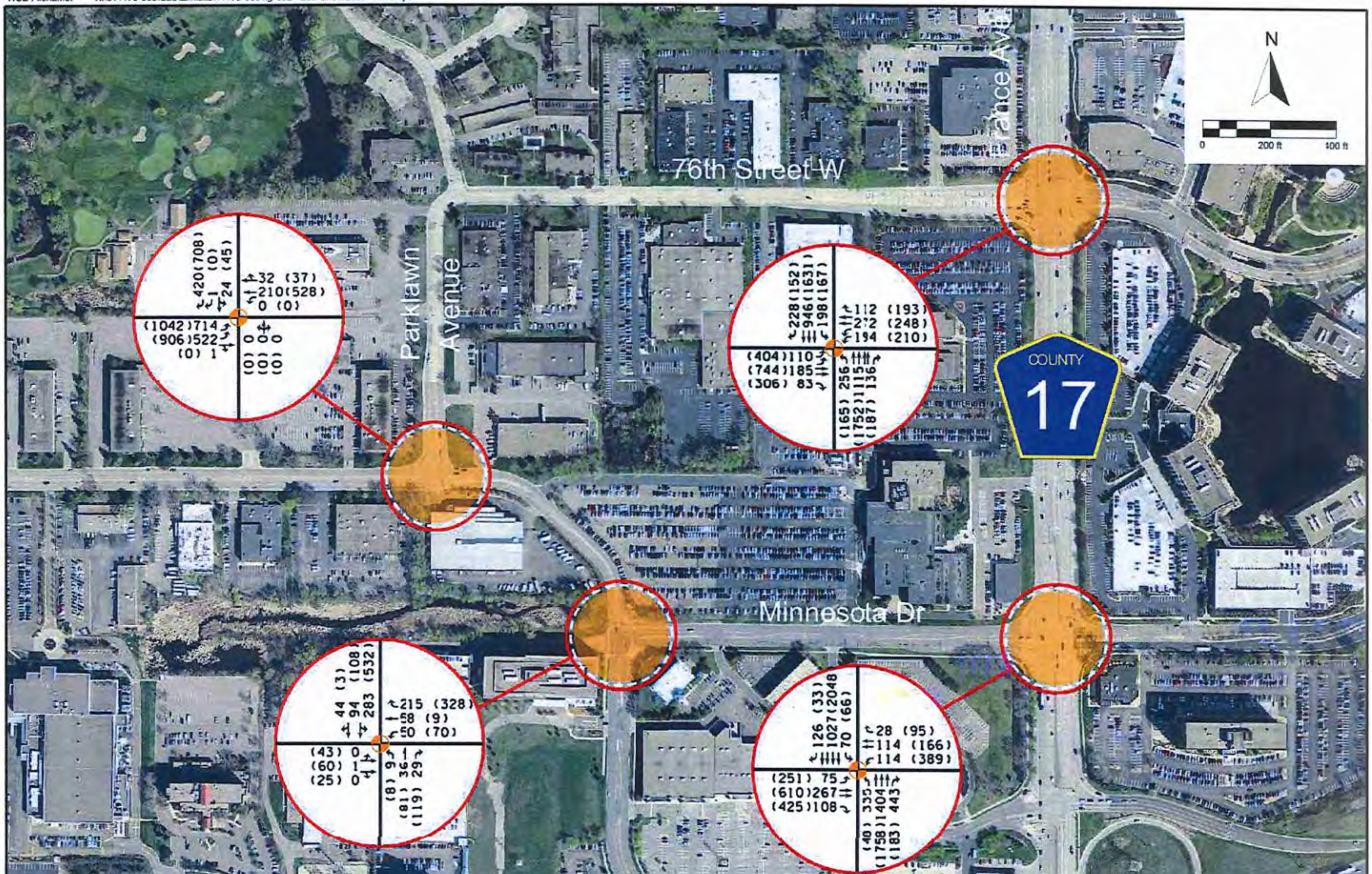


Figure 9B - Scenario 2 (2025) Traffic

Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-10A - scenario3 2025 Traffic.dgn

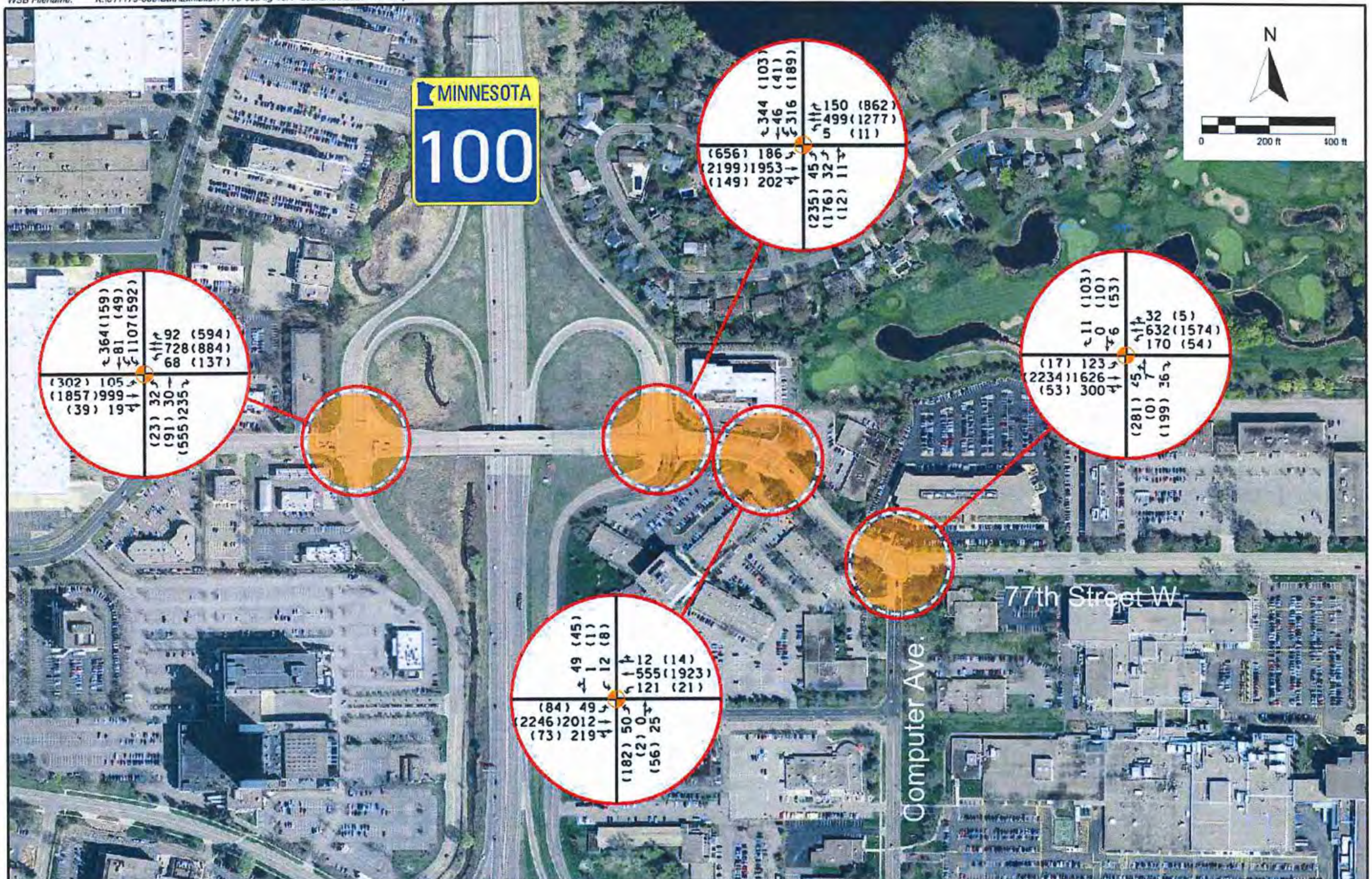


Figure 10A - Scenario 3 (2025) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-10B - scenario3 2025 Traffic.dgn

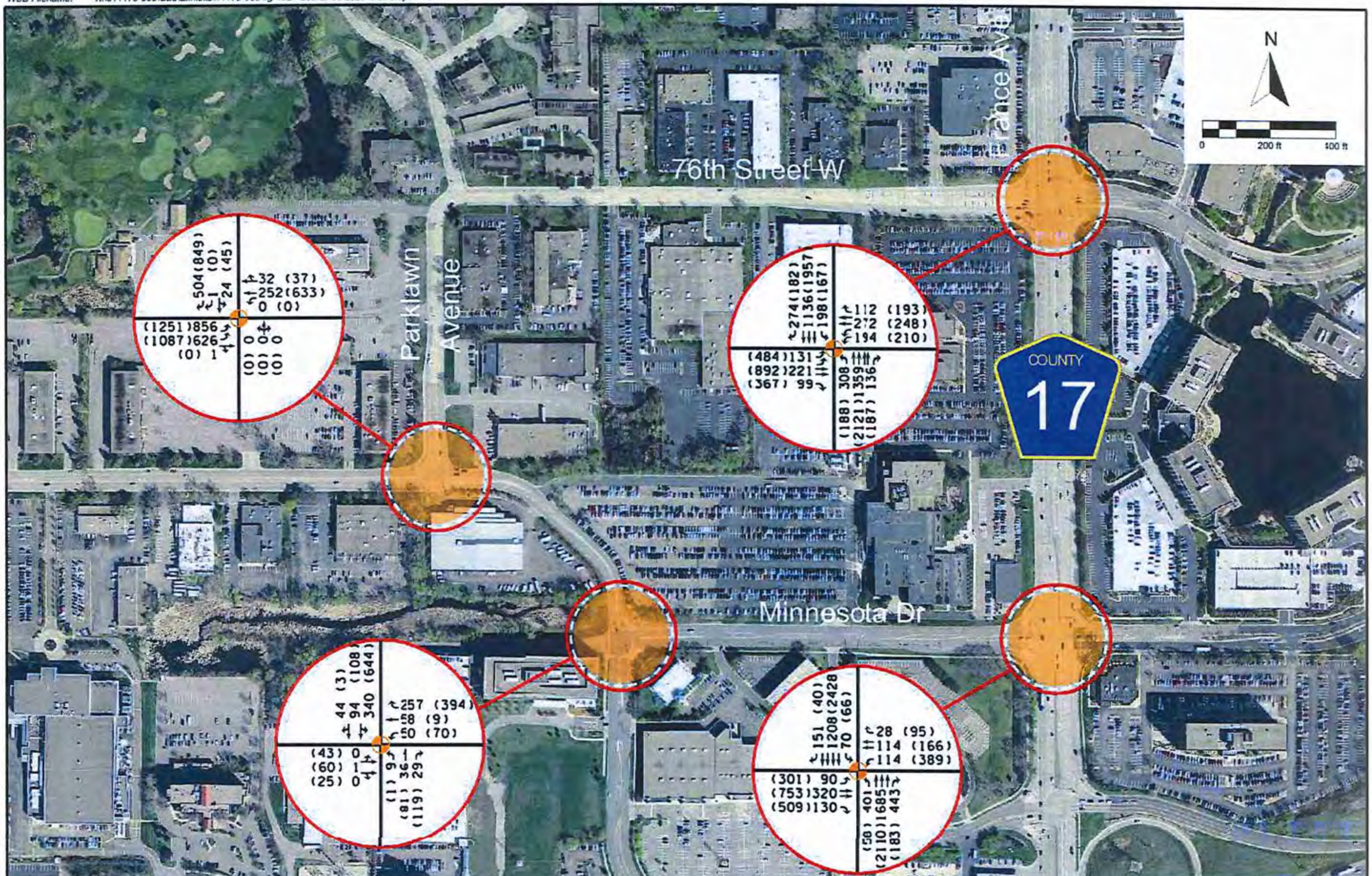


Figure 10B - Scenario 3 (2025) Traffic

Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-11A - scenario4 2025 Traffic.dyn

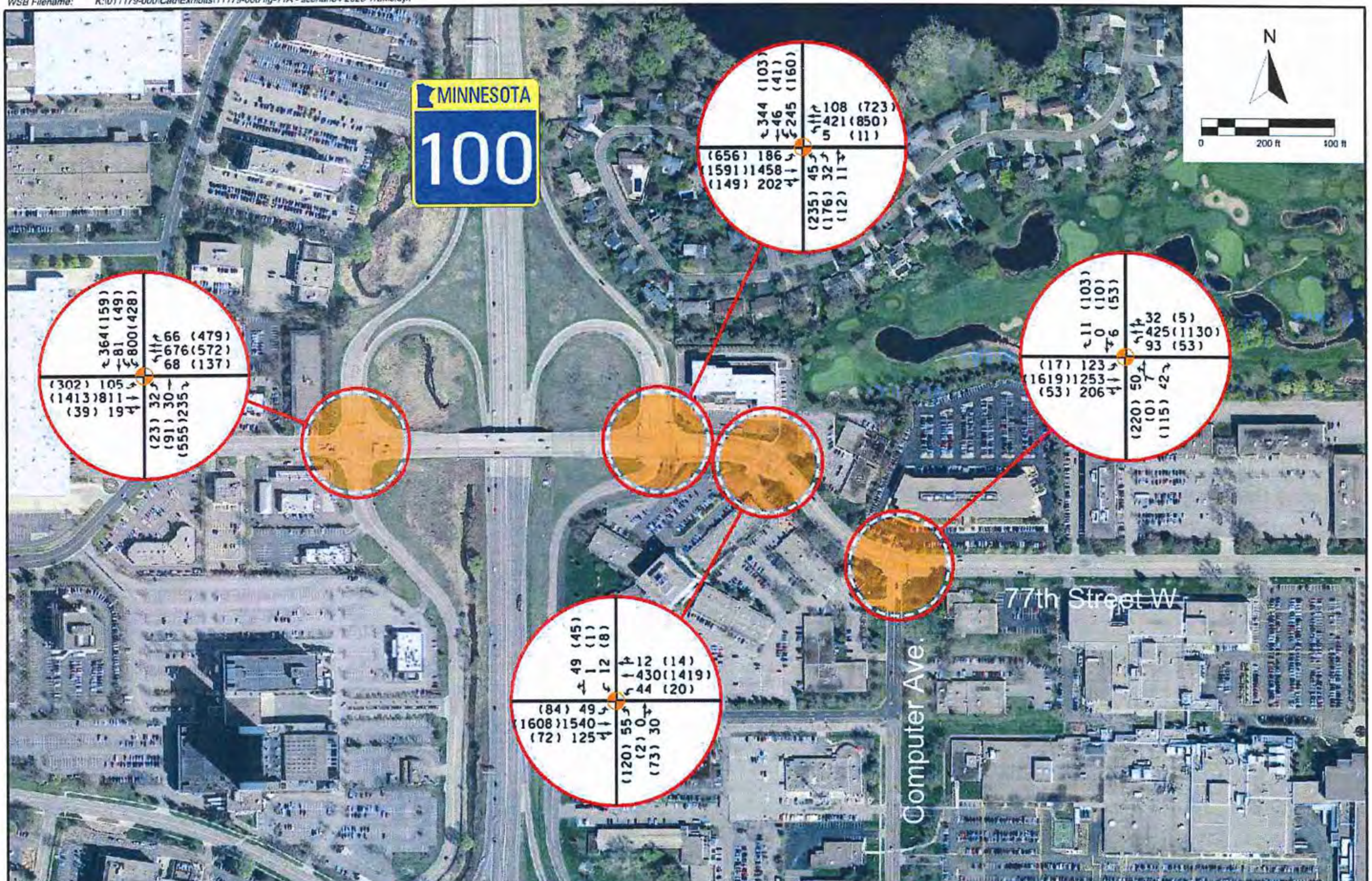


Figure 11A - Scenario 4 (2025) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-11B - scenario4 2025 Traffic.dgn

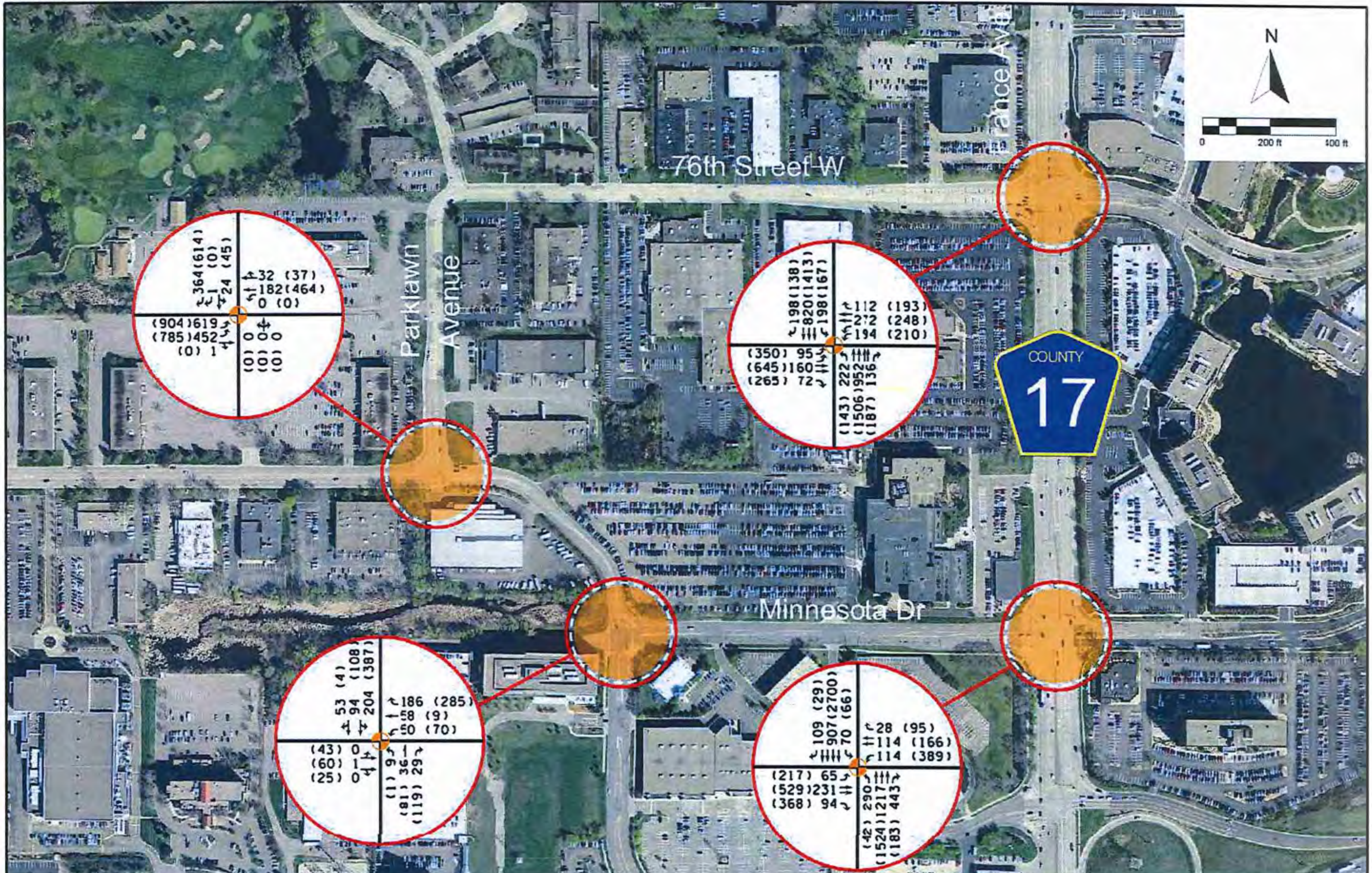


Figure 11B - Scenario 4 (2025) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-12A - scenario1 2040 Traffic.dgn

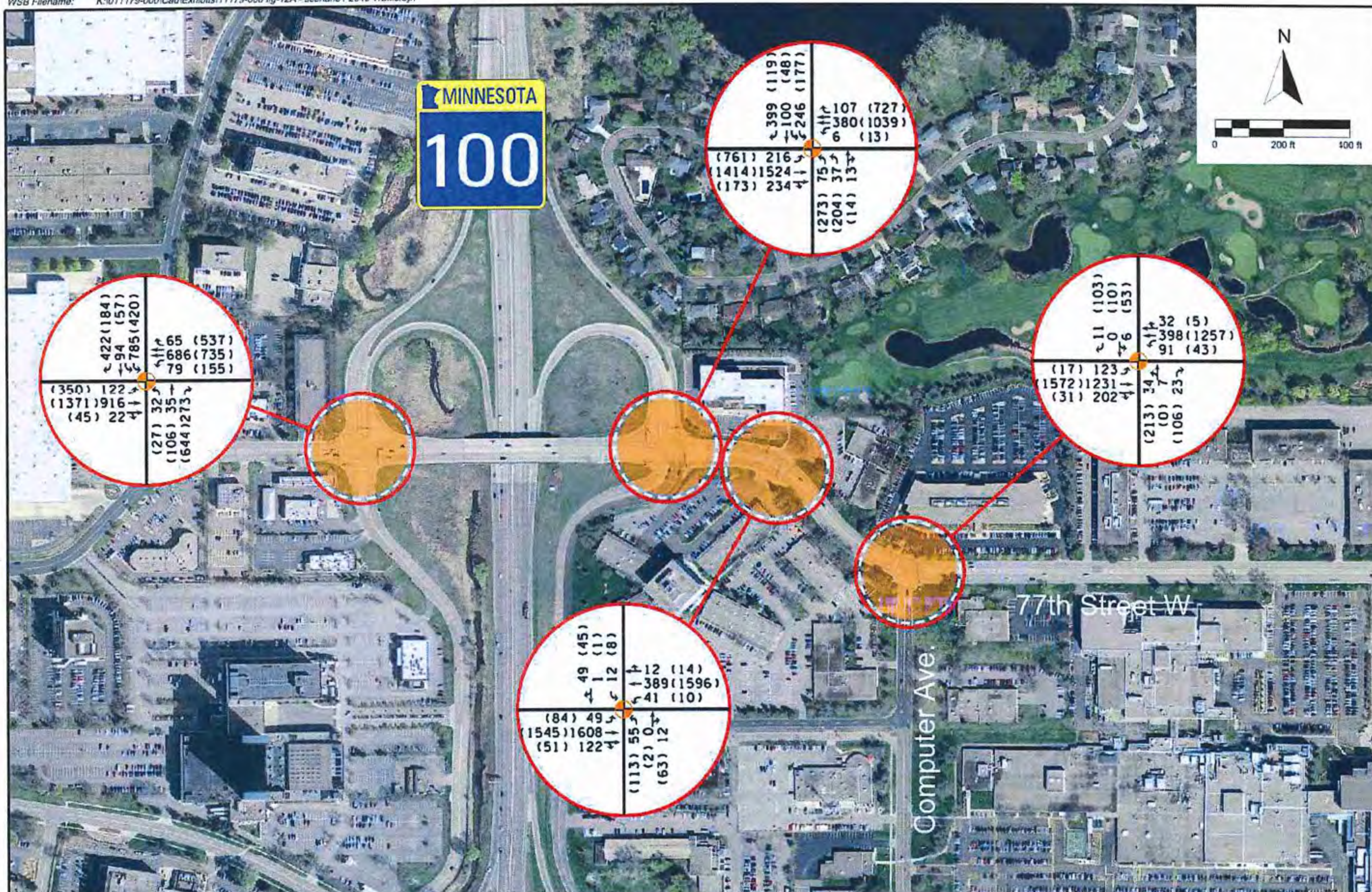


Figure 12A - Scenario 1 (2040) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-12B - scenario1 2040 Traffic.dgn

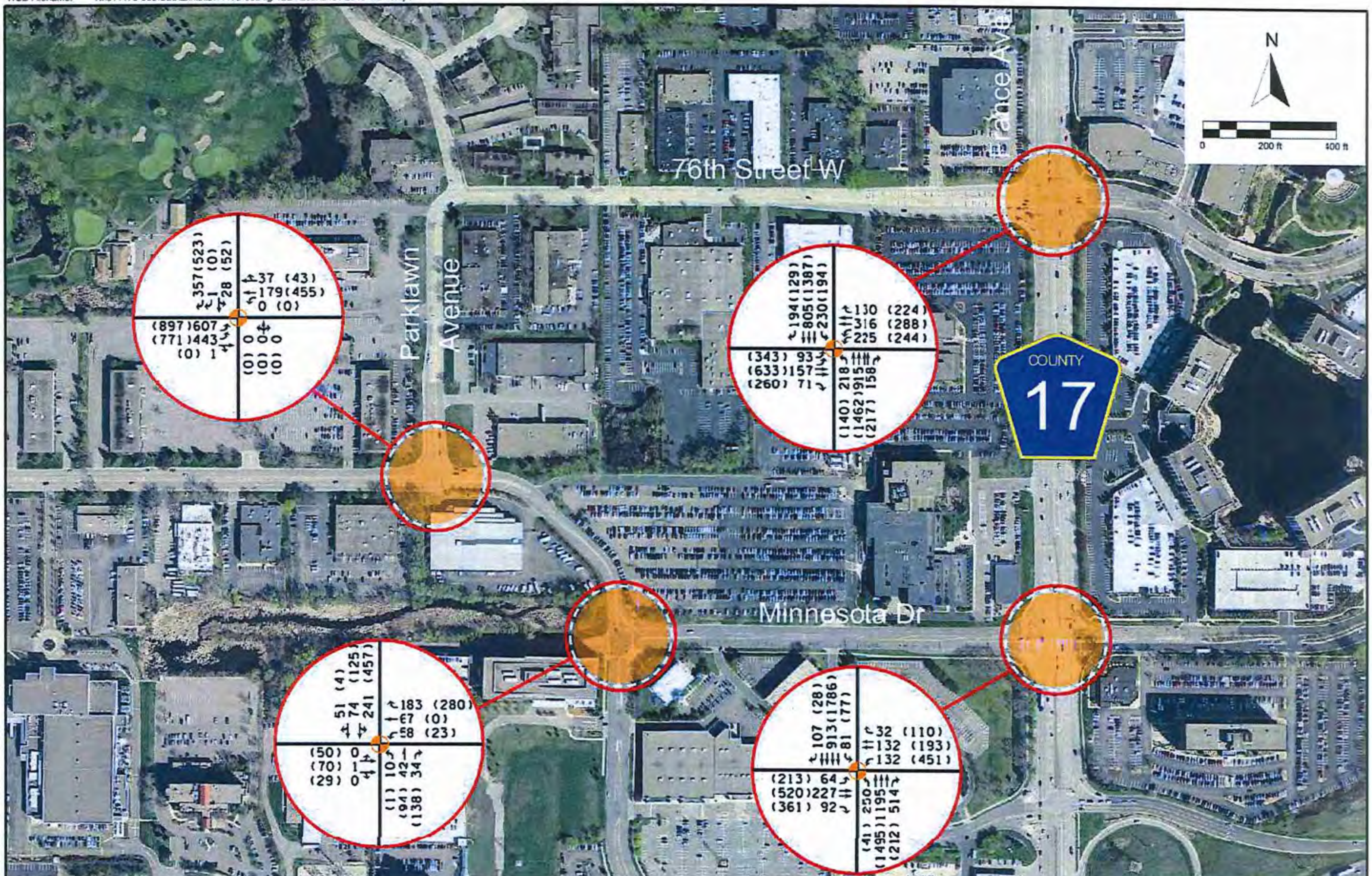


Figure 12B - Scenario 1 (2040) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-13A - scenario2 2040 Traffic.dgn

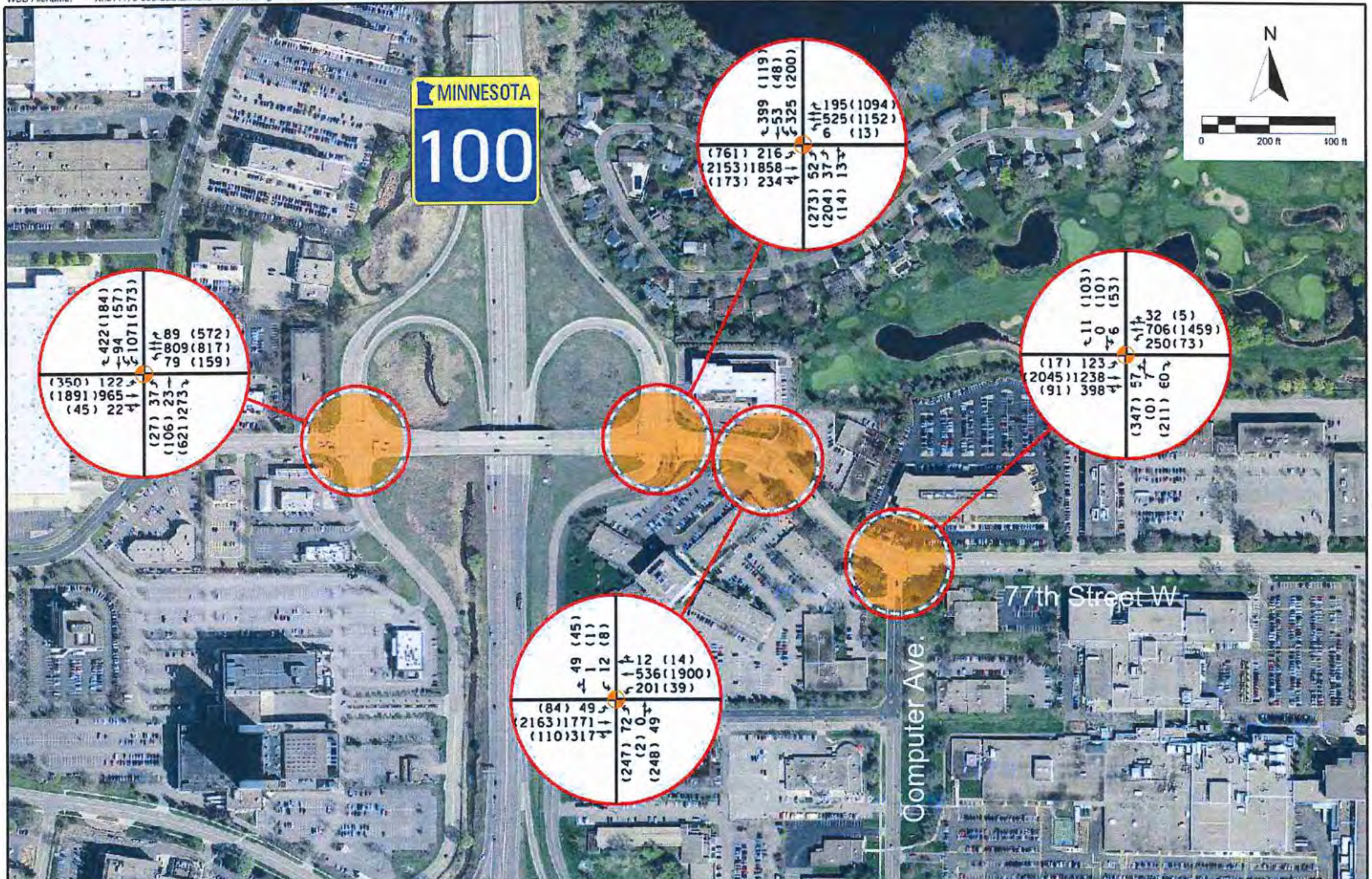


Figure 13A - Scenario 2 (2040) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-13B - scenario2 2040 Traffic.dgn

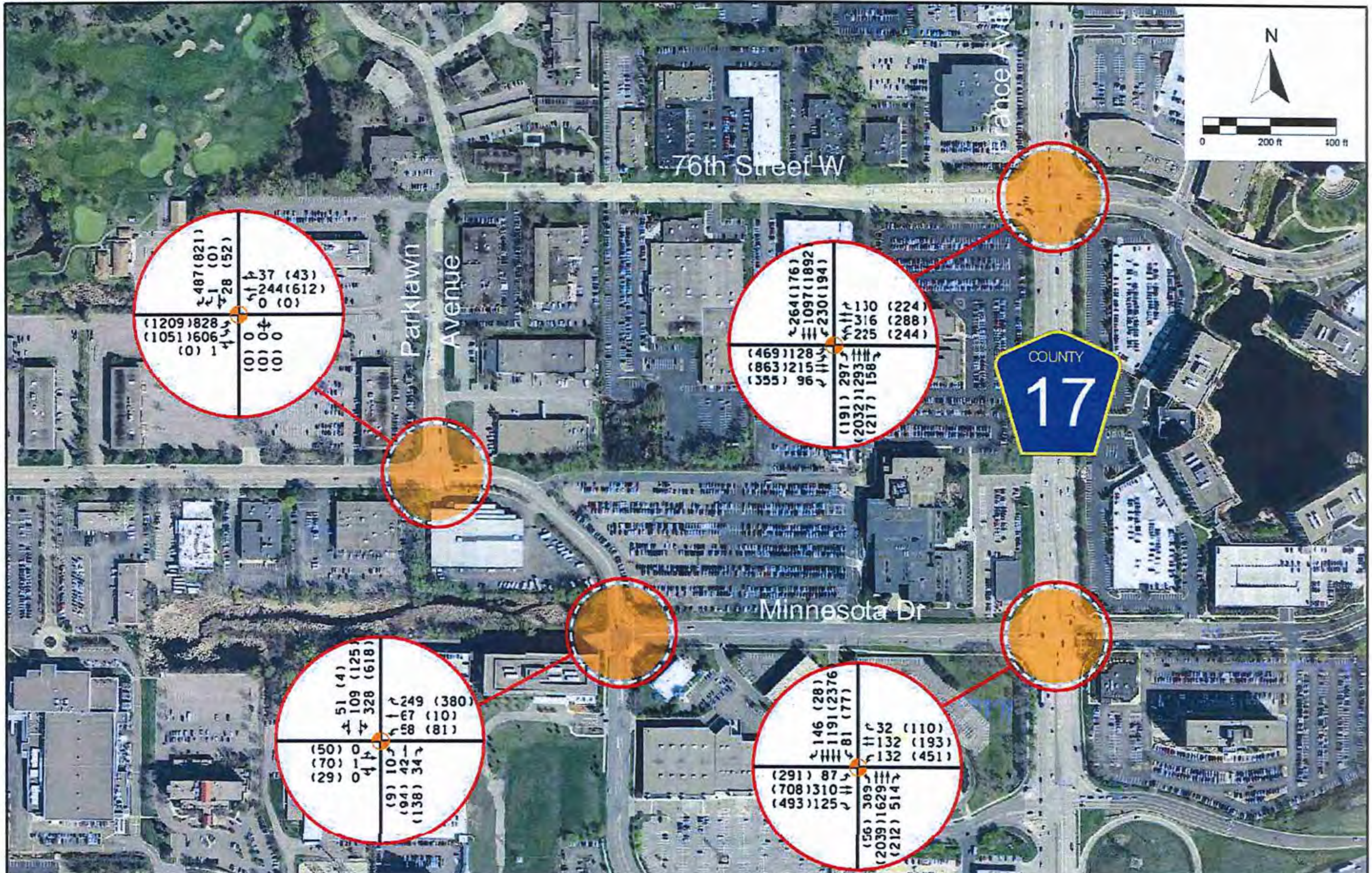


Figure 13B - Scenario 2 (2040) Traffic

Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-14A - scenario3 2040 Traffic.dgn

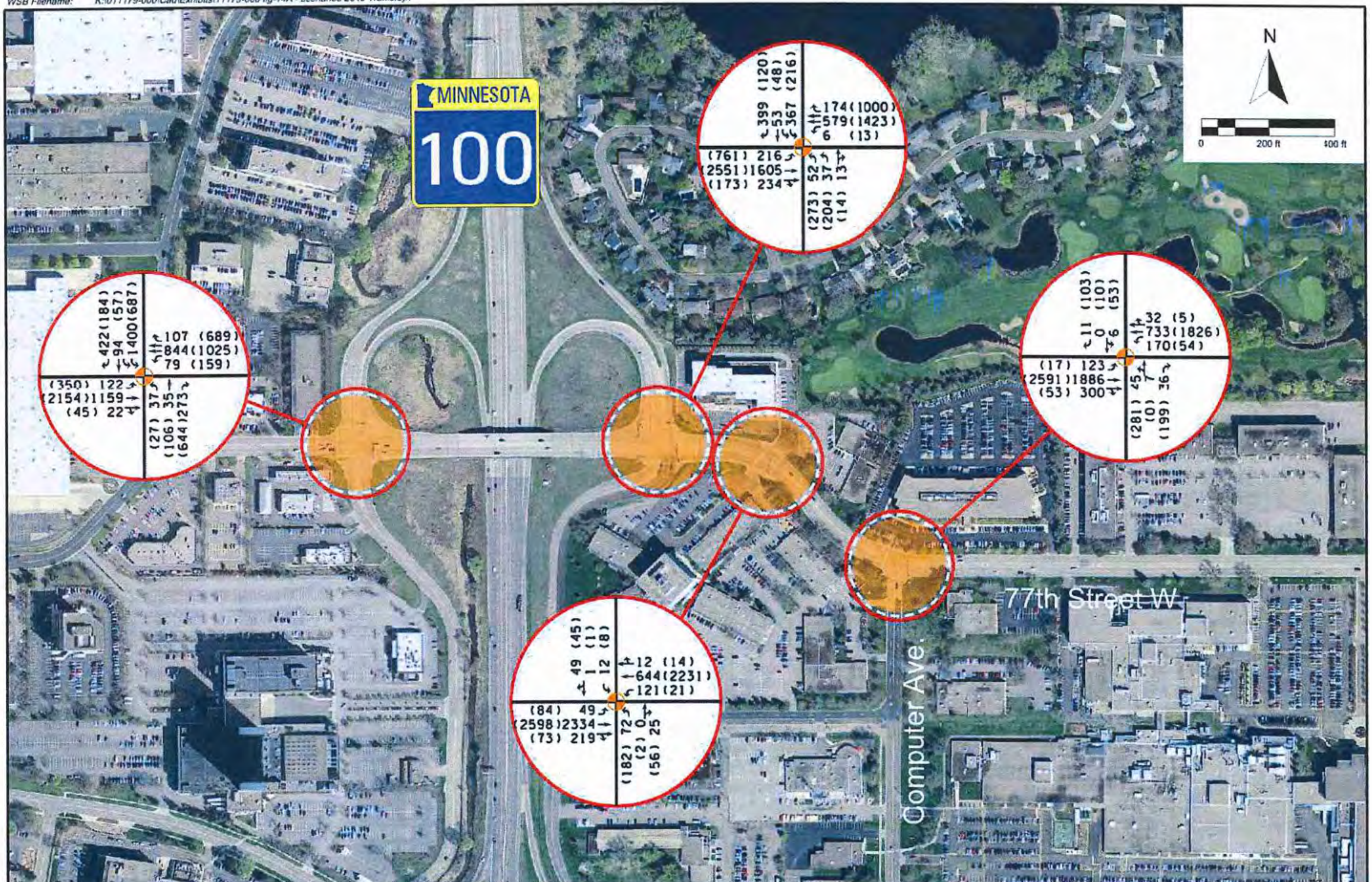


Figure 14A - Scenario 3 (2040) Traffic

Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-14B - scenario3 2040 Traffic.dgn

Figure 14B - Scenario 3 (2040) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-15A - scenario4 2040 Traffic.dgn

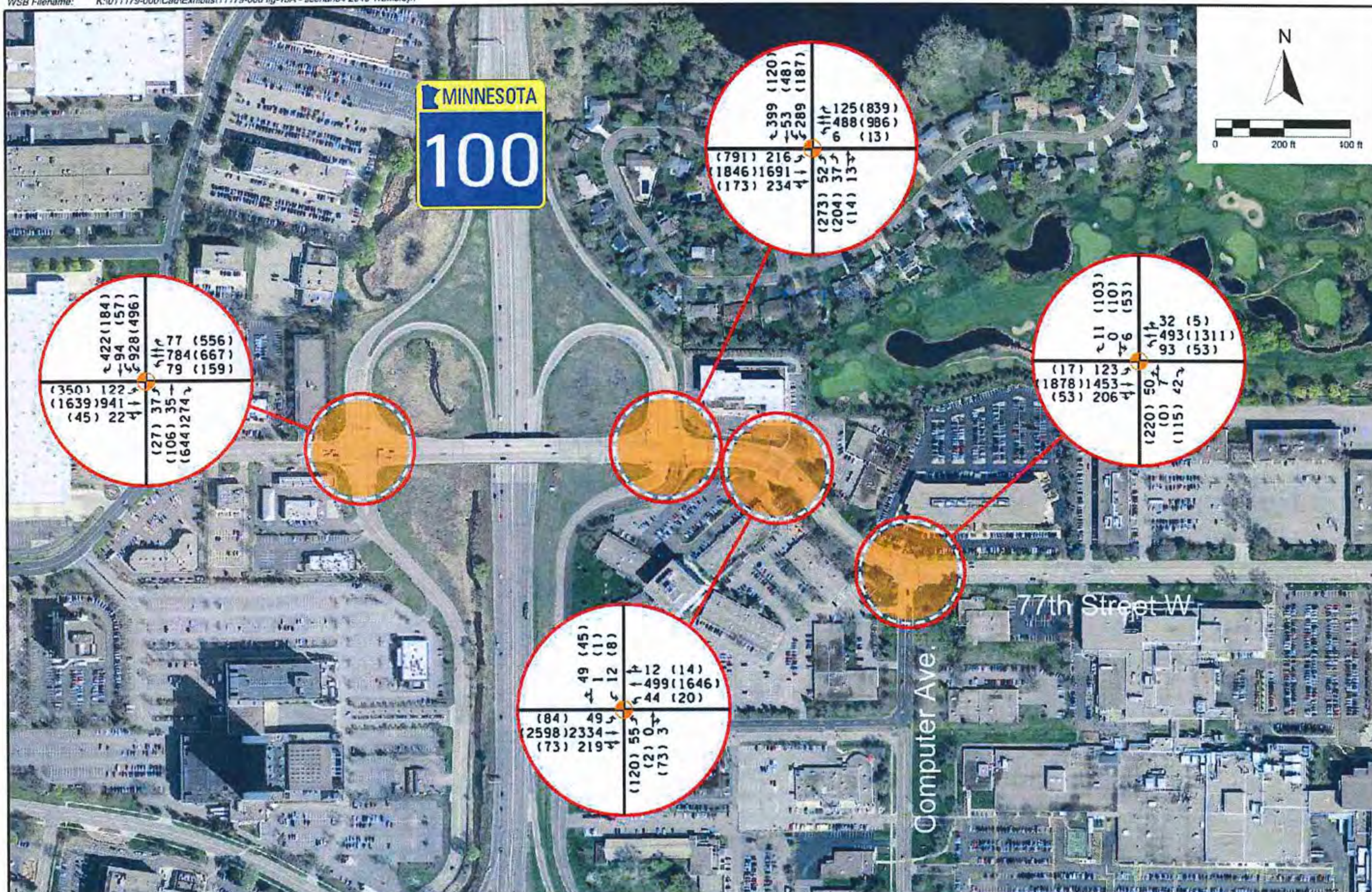


Figure 15A - Scenario 4 (2040) Traffic
Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL

Date: Printed: 1/26/2018
WSB Filename: K:\011179-000\Cad\Exhibits\11179-000 fig-15B - scenario4 2040 Traffic.dgn

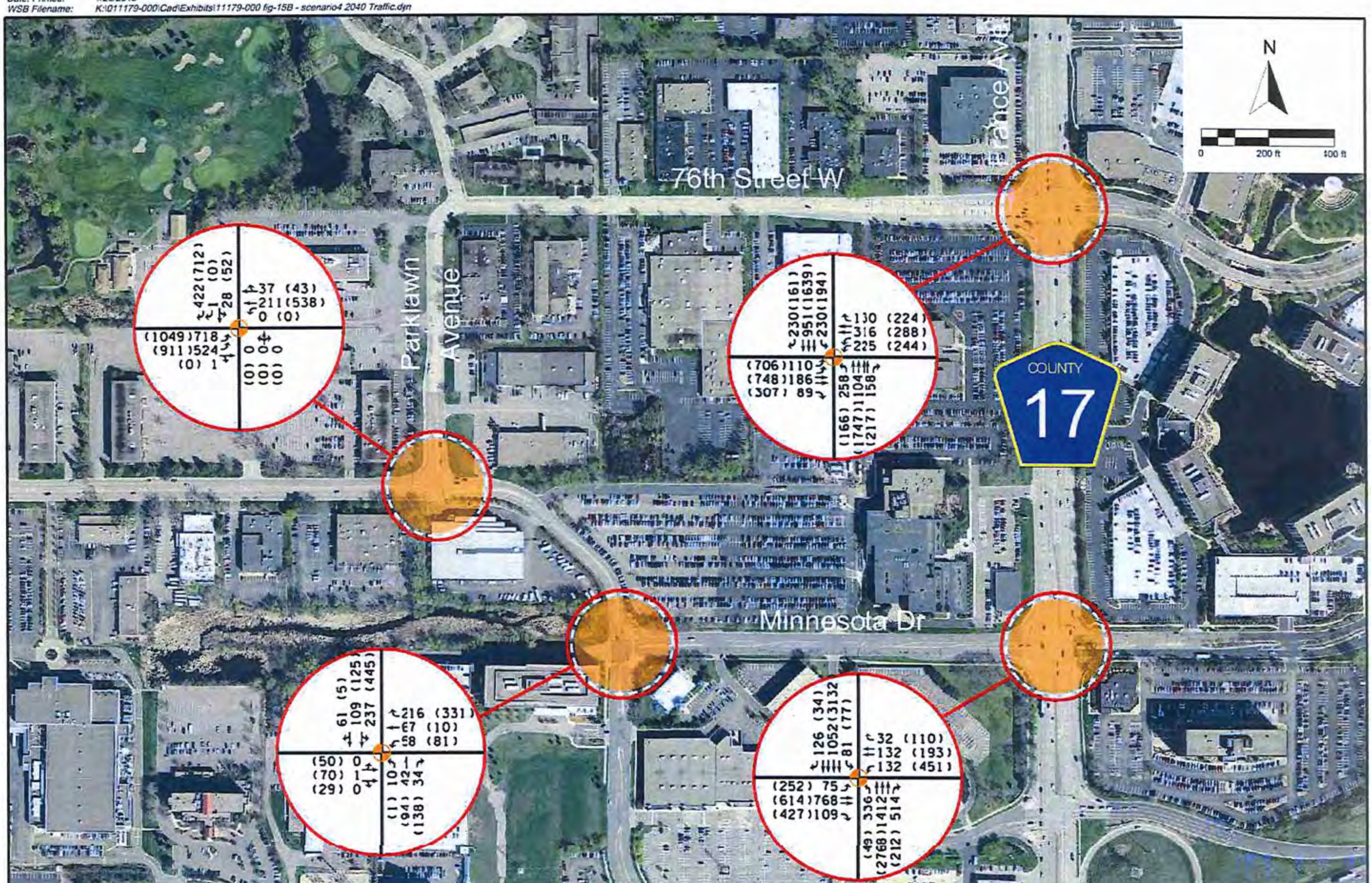


Figure 15B - Scenario 4 (2040) Traffic

Gateway Study Area
- AUAR Update Traffic Study

XX - AM TRAFFIC
(XX) - PM TRAFFIC
LANE GEOMETRY
TRAFFIC SIGNAL