Interstate Access Request

I-35W Transit Access Project

Minneapolis, MN

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SEH No. HENNC 113114

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SEH

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Interstate Access Request

I-35W Transit Access Project

Prepared for the Minnesota Department of Transportation (MnDOT), in cooperation with the Federal Highway Administration (FHWA), Hennepin County, and the City of Minneapolis.

1.0 Report Purpose

The purpose of this Draft Interstate Access Request is to provide the rationale for approval of both new and revised access changes to the Interstate System between 42nd Street and 11th Avenue on I-35W and between 1st Avenue and 11th Avenue on I-94. This report will detail the existing and anticipated future conditions in the study area, and analyze the anticipated impact to the interstate and local road system.

1.1 Introduction

Interstate 35W (I-35W) is one of the most important freeways in Twin Cities Interstate System, providing access to the Central Business District (CBD) of Minneapolis as well as serving interregional through trips. The I-35W Transit Access Project (The Transit Access Project) study area is located immediately south of downtown Minneapolis (Figure 1).

This heavily traveled roadway includes MnPASS lanes, MnDOT's high occupancy toll lanes, between Downtown Minneapolis and City of Burnsville in the southern metropolitan area. Over the last decade, a number of transportation improvement projects have been completed within the study area and its immediate vicinity. Some recent improvements include the new systems interchange of I-35W and TH 62 (2010), the 46th Street Transit Station (2010), and the I-35W Urban Partnership Agreement (UPA) projects that included MnPASS lanes (2010).

By 2018, two major bridges in the project area must be replaced based on the requirements of the Chapter 152 Bridge Replacement Program (2008); the program is a Legislative mandate to repair or replace bridges that are either structurally deficient or fracture critical. The two bridges are the southbound I-35W bridge over northbound TH 65 near 24th Street, and the northbound I-35W/TH 65 flyover bridge to westbound I-94. Replacement of these two structures is impacted by other decisions along the I-35W corridor including a new transit station at Lake Street and any potential access changes in the Lake Street area. A number of technical elements proposed in previous studies were therefore investigated further for this study to ensure they fit cohesively together to meet local and regional multimodal transportation needs. These elements have impacts to the operations of the freeway system, the arterial system or both. The Lake Street arterial and local street operations analysis results are documented in a separate memorandum and the freeway option alternatives are also documented in a separate memorandum. This report documents the interstate access changes requested for approval by FHWA.

This Transit Access Project is being led by Hennepin County and includes an intensive agency and public involvement process to gain input from key stakeholders responsible for or

impacted by the study area transportation system. These stakeholders include MnDOT, FHWA, Metropolitan Council, Metro Transit, the City of Minneapolis, neighborhood representatives and business owners from the project area.

The purpose of this report is to provide the rationale for approval of additional and revised access to the interstate system throughout the project area. This report will detail the existing and anticipated future conditions in the study area, and analyze the anticipated impact to the interstate and local roadway system.

Figure 1 – Study Area

1.2 Current Conditions

Northbound I-35W has four general purpose lanes and a high occupancy toll (HOT) facility between 46th Street and TH 65; the MnPASS facility is a mix of a full HOT lane and a priced dynamic shoulder lane (PDSL). Between TH 65 and the I-94 commons, northbound I-35W has two general purpose lanes around the 35 mph curve into the commons area.

Southbound I-35W has two general purpose lanes through the I-94 commons and around the 35 mph curve, which continue to the TH 65 merge. After southbound TH 65 merges with I-35W, southbound I-35W has four general purpose lanes from TH 65 to 42nd Street. Just south of the 42nd Street overpass, southbound I-35W has four general purpose lanes and a MnPASS lane.

There are existing northbound and southbound I-35W auxiliary lanes between the 31st Street and the 35th Street ramps.

Northbound TH 65 has three general purpose lanes between I-35W and downtown Minneapolis. At the 11th Street/Grant Street exit, the mainline splits with two lane continuing into downtown Minneapolis and two lanes to 11th Street.

Southbound TH 65 has two general purpose lanes between downtown Minneapolis and I-35W. A 2800 foot acceleration lane for the eastbound I-94 entrance ramp is provided; this lane ends at the system merge for TH 65 and I-35W.

The existing transit stops at I-35W and Lake Street include two separate platform areas on the outside of the freeway mainline. The northbound service has been extremely limited due to the buses having to weave from the left most lane at 46th Street to the right most lane at Lake Street and then back to the left most lanes to enter downtown. This maneuver is extremely difficult during peak traffic times. Metro Transit has suspended operation of the northbound stop in the peak period.

Section 4.3 of this report includes a figure of the existing conditions lane schematic.

Average Annual Daily Traffic (AADT) levels vary throughout the project area in both the existing and projected design year forecasts.

Northbound I-35W AADTs between 46th Street and TH 65 vary between 92,500 and 106,900 under existing conditions and the 2038 projected AADT ranges from 116,400 and 137,600. Northbound I-35W AADTs between TH 65 and I-94 vary between 46,000 and 53,300 under existing conditions and the 2038 projected AADT ranges from 54,000 and 65,700.

Southbound I-35W AADTs between TH 65 and 46th Street vary from 95,000 to 111,500 under existing conditions and the 2038 projected AADT vary between 124,300 and 137,400. Southbound I-35W AADTs between I-94 and TH 65 is approximately 52,200 under existing conditions and the 2038 projected AADT is 72,200.

In the study area, I-35W has interchanges with the following configurations:

- 35th / 36th Street: a split diamond interchange with one-way frontage road connections.
- 31st Street: half diamond with ramps to and from the south with one-way frontage road connections
- TH 65: systems interchange with direct connections
- 5th Avenue: northbound I-35W entrance ramp

- I-35W: I-94/I-35W commons area systems interchange

Westbound I-94 AADTs between 11th Avenue and Hennepin/Lyndale Avenue vary from 86,200 to 104,700 under existing conditions and the 2038 projected AADT is between 99,200 and 123,800. Eastbound I-94 AADT's between Hennepin/Lyndale Avenue and 11th Avenue vary from 75,500 to 112,200 under existing conditions and the 2038 projected AADT ranges from 86,000 to 130,100.

In the study area, I-94 has interchanges with the following configurations:

- TH 65: systems interchange with semi-direct connections:
  - Northbound TH 65 to westbound I-94
  - Eastbound I-94 to southbound TH 65/I-35W
- 11th Street : westbound I-94 exit ramp
- 4th Avenue: westbound I-94 entrance ramp
- 5th Avenue: eastbound I-94 entrance ramp
- I-35W: I-94/I-35W commons area systems interchange

Northbound TH 65 AADT's between I-35W and downtown Minneapolis vary from 23,900 to 46,000 under existing conditions and the 2038 projected AADT vary between 34,000 and 62,400. Southbound TH 65 AADT's between downtown Minneapolis and I-35W vary from 19,500 to 45,200 under existing conditions and the 2038 projected AADT ranges from 30,300 to 63,100.

In the study area, TH 65 has interchanges with the following configurations:

- I-94: systems interchange with semi-direct connections to and from the west.
- Downtown Connections: direct connections to downtown street network

Many of the existing entrances and exits do not meet current standards for deceleration lanes, acceleration lanes or ramp spacing.

1.3 Proposed Conditions

The proposed improvements include many different project elements as part of the Transit Access Project in the City of Minneapolis. The major elements requiring interstate access approval include:

- I-35W Southbound Braid Bridge
  - Chapter 152 Bridge requires replacement by 2018
  - Existing conditions has TH 65 merging on the right side of I-35W
  - Proposed conditions has TH 65 merging on the left side of I-35W

- I-35W/TH 65 Northbound Flyover Bridge to Westbound I-94
  - Chapter 152 Bridge requires replacement by 2018
  - Existing conditions has the flyover ramp merging on the right side of I-94
  - Proposed conditions has the flyover ramp merging on the left side of I-94

- I-35W Southbound Exit Ramp to Lake Street
  - New proposed exit ramp

  - Auxiliary lane between the westbound I-94 entrance ramp (I-94 commons area) to the proposed Lake Street exit ramp

- I-35W Northbound Exit Ramp to 28th Street
  - New proposed exit ramp
  - Auxiliary lane between the 31st Street exit ramp and the proposed 28th Street exit ramp; this is an extension of the existing auxiliary lane between 35th Street and 31st Street

Other components of the Transit Access Project included in the analysis that do not directly require interstate access approval include:

- I-35W Northbound MnPASS Lanes
  - The existing Priced Dynamic Shoulder Lane (PDSL) will be reconstructed as a full MnPASS facility from 42nd Street to approximately the 26th Street overpass
- I-35W Southbound MnPASS Lanes
  - A new MnPASS lane will be constructed from approximately the 26th Street overpass to the existing facility near 42nd Street
- I-35W at Lake Street Transit Station
  - Orange Line BRT Station in center median of I-35W
- 2nd Avenue reconstruction
  - Proposed reconstruction between the northbound I-35W 31st Street exit ramp and Lake Street
  - Removal of 2nd Avenue connection between Lake Street and 28th Street
- Lake Street reconstruction
  - Proposed reconstruction between 1st Avenue and 3rd Avenue South

2.0 Regional Traffic Needs

Figure 2 below shows the Metropolitan Council's functional classification of the major roadways within the project area.

I-35W is a major north south freeway in the Twin Cities metropolitan area serving regional traffic.

The traffic conditions along I-35W have improved substantially in the southern study area due to the recent completion of several major projects including the reconstructed I-35W/TH 62 Commons, new Transit Station at 46th Street and MnPASS lanes between 42nd Street and City of Burnsville. The previous bottleneck in the I-35W/TH 62 Commons area has been removed and the MnPASS lanes in the median provide free-flow conditions for transit vehicles, HOVs and SOVs willing-to-pay the MnPASS fee.

However, the operational problems in the central interchange I-35W/I-94/TH 65 area still exist. It is among the most congested areas in the Twin Cities metropolitan area. There are multiple causes contributing to the operational problems in the study area. Most importantly, the I-35W and I-94 freeways were constructed in the 1960s and current peak period traffic demands have well exceeded design capacity at several locations. Secondly, there are several substandard freeway segments with narrow shoulder widths, limited sight distance, deficient horizontal and vertical curves, and closely spaced access ramps. These segments include (but are not limited to) I-94 Lowry Hill Tunnel, I-94/I-35W Commons, and the I-35W Curves. These segments are among the most incident-prone locations in the state. Due to substandard geometry in the area, traffic congestion is also very difficult to alleviate after an incident occurs

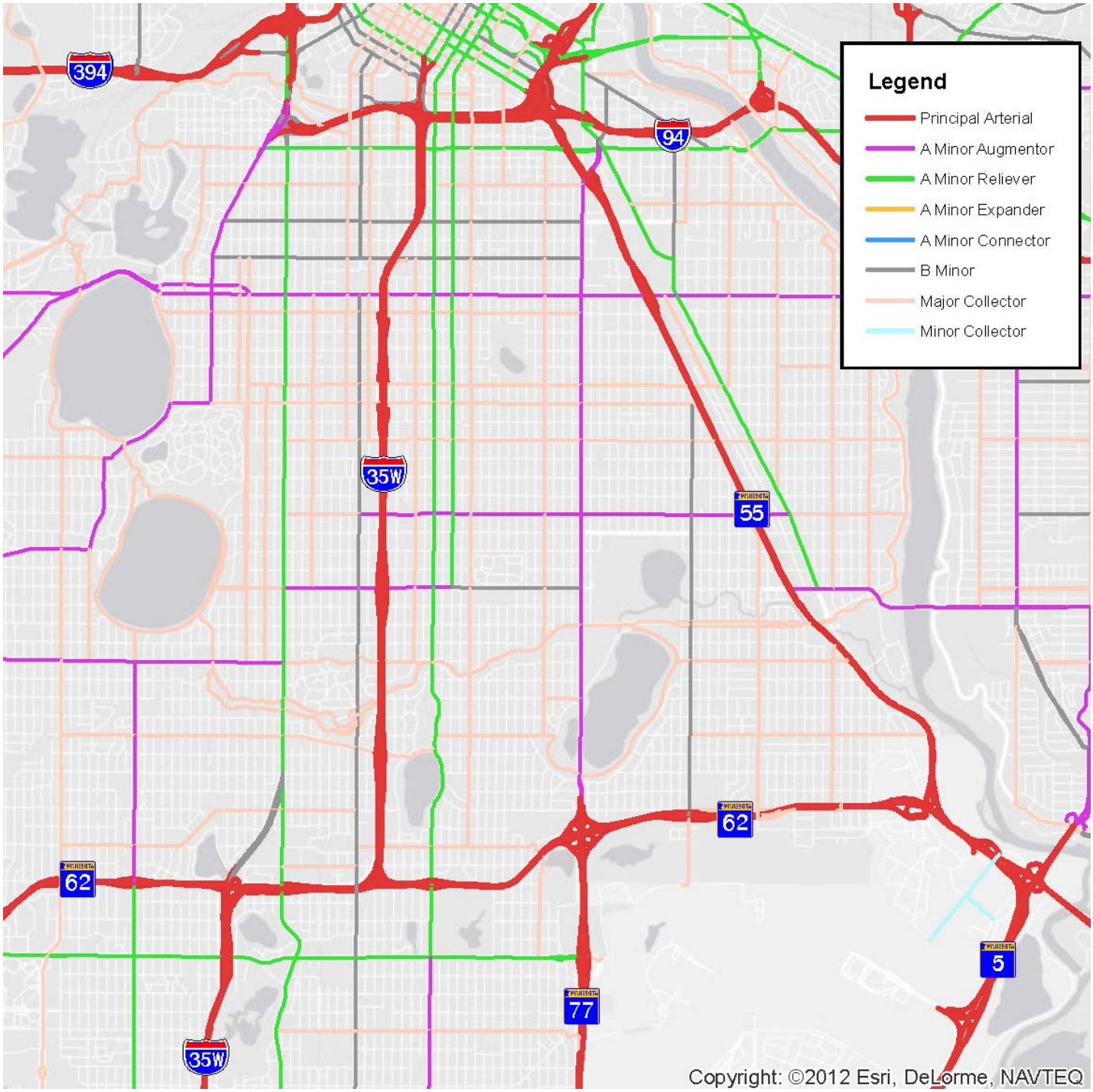
Construction of the transit station and MnPASS lanes on this segment of I-35W would complete a portion of the ultimate vision for both the BRT and MnPASS facilities from the southern metro area into downtown Minneapolis. This corridor experiences substantial congestion during the peak hours resulting from lack of capacity and design deficiencies.

Lake Street is currently an A Minor arterial roadway, 28th Street is a B Minor arterial roadway and 31st Street is major collector roadway. However, 28th Street is a one-way eastbound roadway that works in conjunction with 26th Street which is also a B Minor arterial one-way roadway but in the westbound direction. As a one-way pair, 26th Street and 28th Street carry substantially more traffic than either Lake Street or 31st Street. The pair also span across South Minneapolis from Hennepin Avenue to TH 55, providing a great connectivity for the region.

Existing demands near I-35W on the local system include daily traffic levels of approximately 13,900 vehicles on 31st Street, 20,000 vehicles on Lake Street, 12,100 vehicles on 28th Street and 13,300 vehicles on 26th Street.

2nd Avenue, between 31st Street and 28th Street is a Major Collector roadway that provides a link between northbound I-35W and 28th Street. As part of the widening of I-35W to include the center BRT station, the 2nd Avenue connecting link between Lake Street and 28th Street will be removed due to construction impacts. This change will cause significant rerouting of existing traffic along 31st Street, Lake Street, and the main connecting roads between Lake Street and 28th Street.

Figure 2 – Functional Classification of Roadways



3.0 Reasonable Alternative

Several different project components were reviewed to achieve the goals of the proposed project.

The I-35W corridor between 46th Street and the I-94 commons area will be reconstructed as part of the project to accommodate the freeway access changes, new transit station, and HOV facilities.

Due to the proximity to the systems interchange of TH 65 and I-94, ramp spacing and the existing arterial network, no other local access was considered within the project limits. In addition, the proposed improvements will largely be constructed within the existing right-of way.

Additional information regarding alternatives is discussed in Section 5.0 and 8.0 of this document regarding FHWA Policy Points.

3.1 Dismissed Project Components

Other project components were considered, but ultimately not included as part of this project due to the reasons listed below:

- Northbound I-35W Lake Street Entrance Ramp
  - Due to project costs and impacts to local land uses, this access was removed from further consideration in this project.
  - A future design of this ramp was not precluded in the overall design of the proposed project.

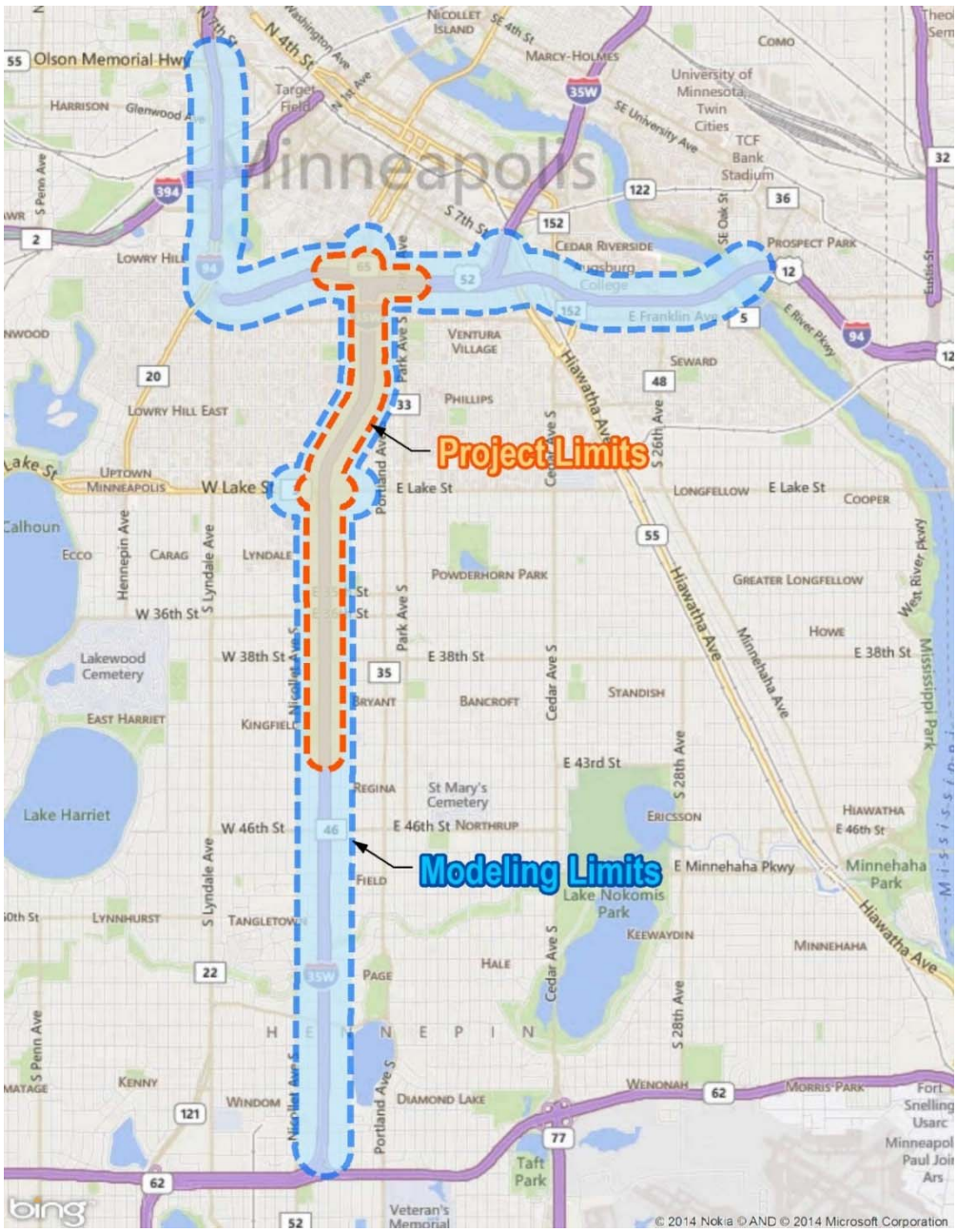
4.0 Operational Analysis

This section presents the operational analysis methodology and the findings obtained through analyzing operations for existing, build and opening years.

4.1 Operations Analysis Methodology

Due to the complexity of operations on freeways, and the observed interaction at systems interchanges such as the I-35W and I-94 interchange, a micro-simulation model of a boundary area beyond the immediate project area was prepared. FHWA's micro-simulation program TSIS 6.3 was used, and the primary simulation program within TSIS 6.3 is CORSIM. The Synchro/SimTraffic micro-simulation program was used for the primary arterial evaluation. The model limits and project limits are illustrated in Figure 3.

Figure 3 – CORSIM Modeling Limits



4.1.1 Freeway Modeling Methodology

The 7-step modeling process documented in FHWA's Traffic Analysis Tool Box Volume IV was followed to develop the CORSIM models. The models are documented with manuals and have been approved by MnDOT Metro Division Traffic Engineering Staff. The 7-step modeling process is summarized into the following 2-phase approach:

- Creation and calibration of an existing condition CORSIM model based on loop detector data and field observations.
- Evaluation of interchange designs in study areas with comparison to No-Build condition for Build year.

All CORSIM models were submitted and approved by MnDOT; the approval letters are attached in Appendix D.

4.1.2 Arterial Modeling Methodology

Due to the close spacing and interaction between intersections, the arterial network was analyzed using the Synchro/SimTraffic software package. The Synchro software allows for improved calibration of the existing conditions as well as evaluating multiple alternatives in a more efficient process. The signal timing optimization within the Synchro program can be used to analyze arterial operation changes due to traffic pattern shifts and geometric changes very efficiently.

The ramp terminals and other impacted intersections were included within the following arterial segments:

- Lake Street intersections from Blaisdell Avenue to 5th Avenue
- 31st Street intersections from Nicollet Avenue to 2nd Avenue
- 28th Street intersections from Nicollet Avenue to 4th Avenue
- Franklin Avenue intersections of 4th Avenue and 5th Avenue

Though many intersections were included along each arterial segment listed above, only the ramp terminal intersections and other directly impacted intersection will be discussed.

4.1.3 Level of Service Criteria

The freeway and arterial Level of Service (LOS) criteria presented in the following tables were used to evaluate the traffic operations in study area.

Table 1
Freeway Measures of Effectiveness

Level of Service (LOS)	Description	Density (pc/mi/ln)
A	Free flow operations where free flow speeds and operating speeds are the same. Vehicles are unimpeded in their ability to maneuver.	≤ 10.00
B	Free flow speeds are generally maintained. Vehicle's ability to maneuver is only slightly restricted.	> 10.0 – 20.0
C	Free flow speeds are generally maintained. Freedom to maneuver is noticeably restricted. Queues may be expected to form behind any significant blockage.	> 20.0 – 28.0
D	Speeds begin to decline with increased traffic. Freedom to maneuver is more noticeably restricted. Queues can be expected to form behind any minor incident.	> 28.0 – 35.0
E	The lower boundary of LOS E is considered at capacity. Operations are very volatile with extremely limited room to maneuver. Any disruption such as lane changing or vehicle entering from a ramp can cause a breakdown and extensive queuing.	> 35.0 – 43.0
F	Total breakdown in vehicular flow. Traffic is under stop and go conditions.	> 43.0

Source: Highway Capacity Manual (Exhibit 12-10)

Table 2
Arterial (Signal Control) Measures of Effectiveness

Level of Service (LOS)	Description	Delay (sec/veh)
A	Traffic moves freely. The free flow condition is accompanied by low volumes. All waiting vehicles clear on one green phase.	≤ 10.00
B	Traffic moves fairly freely. Volumes are somewhat low. Waiting vehicles will still probably clear on one green phase.	> 10.0 – 20.0
C	Traffic moves smoothly. Volumes are beginning to increase. Some minor movements may clear on one green phase.	> 20.0 – 35.0
D	Traffic approaching unstable flow. Acceptable intersection operation for peak periods. Many intersection movements may not clear on one green phase.	> 35.0 – 55.0
E	Unstable traffic flow. Volumes at or near capacity. No vehicles are able to go through the intersection without having to stop.	> 55.0 – 80.0
F	Saturation condition. Volumes are over capacity. All vehicles will stop and probably require more than one green phase.	> 80.0

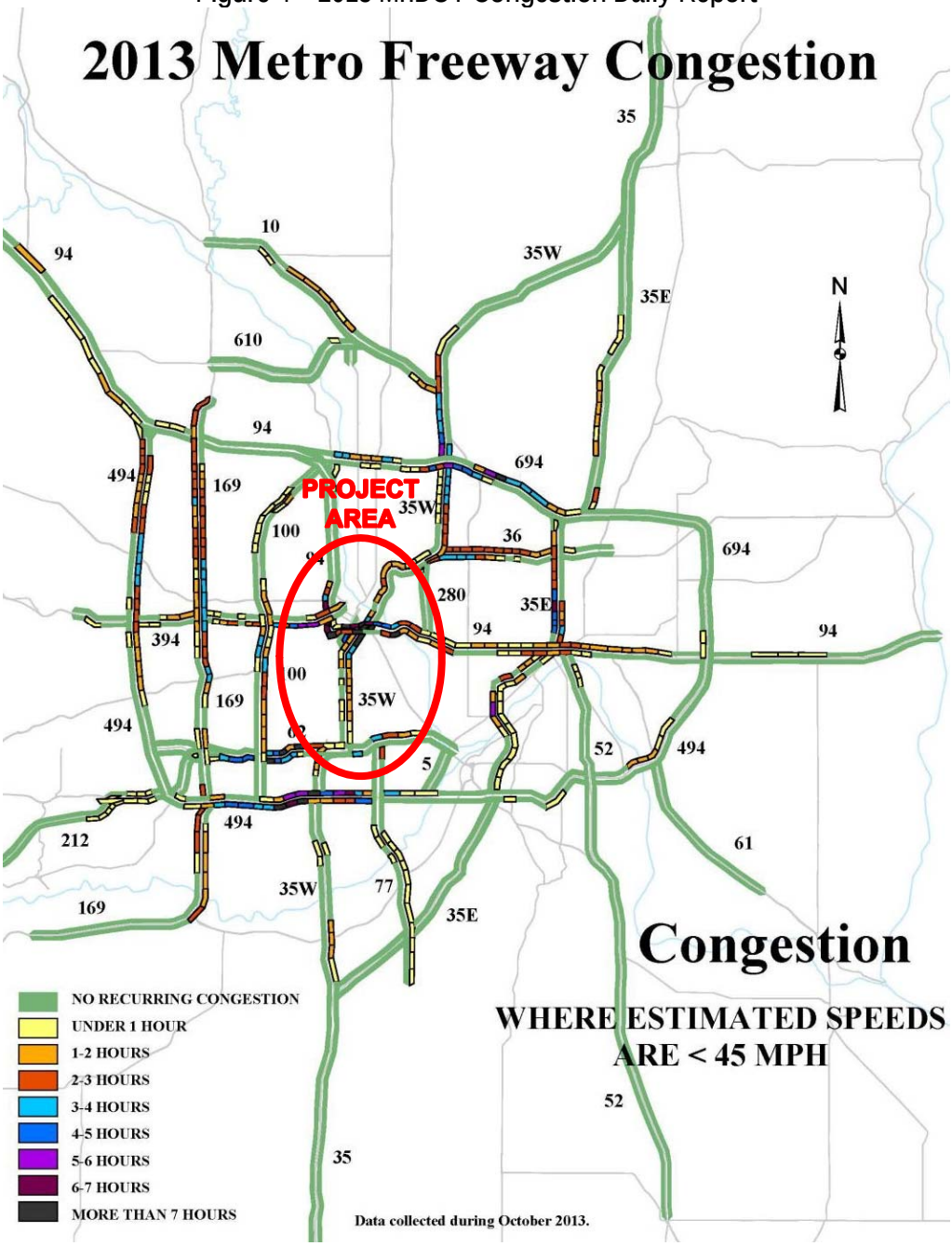
Source: Highway Capacity Manual (Exhibit 18-4)

4.2 Existing Conditions

The data used for the existing operational analysis was obtained from MnDOT and other sources. The data included loop detector volumes and speeds for all freeway segments from spring 2011; multiple days were collected and analyzed in order to create a balanced data set between the existing freeway mainline, freeway ramp, and arterial demands. Turning movement data was collected in November 2010.

The existing project area experiences severe congestion that can occur for over 7 hours of the day. Figure 4 is the daily congestion level reported by MnDOT from the Metropolitan Freeway System 2013 Congestion Report.

Figure 4 – 2013 MnDOT Congestion Daily Report



4.2.1 Origin Destination Study

An Origin-Destination (OD) study was completed for a small portion of westbound I-94 to better understand existing traffic patterns for the model calibration as well as identify future operational impacts of the Flyover Bridge in the study area. The OD study approach and results were documented in a separate memorandum "*I-35W Northbound Ramp to I-94 Westbound Origin-Destination Study" dated on July 22, 2011;* attached in Appendix F.

Figure 5 below shows the OD site locations. The OD study results are summarized in Table 3 and Table 4. The AM peak period and PM peak periods were analyzed between the hours of 7AM to 9AM and 2PM to 6PM, respectively.

The OD results indicate a high percentage of traffic from northbound I-35W desire to continue along westbound I-94 beyond the I-394 exit. The PM peak hour, with the highest level of congestion on I-94, has the highest percentage. Traffic destined beyond the I-394 exit ramp need to be in the left two most lanes along I-94; this creates a major weaving problem with the high exiting volume to Hennepin/Lyndale Avenues and I-394. The relocation of the northbound I-35W entrance ramp to the left side of westbound I-94 would remove a considerable portion of traffic from the weaving section before the Lowry Tunnel. However, it is noted that the traffic destined to Hennepin/Lyndale Avenues would have to make more lane changes than under the current configuration. The ultimate impacts were evaluated using the CORSIM models.

Figure 5 – Origin Destination Study Area

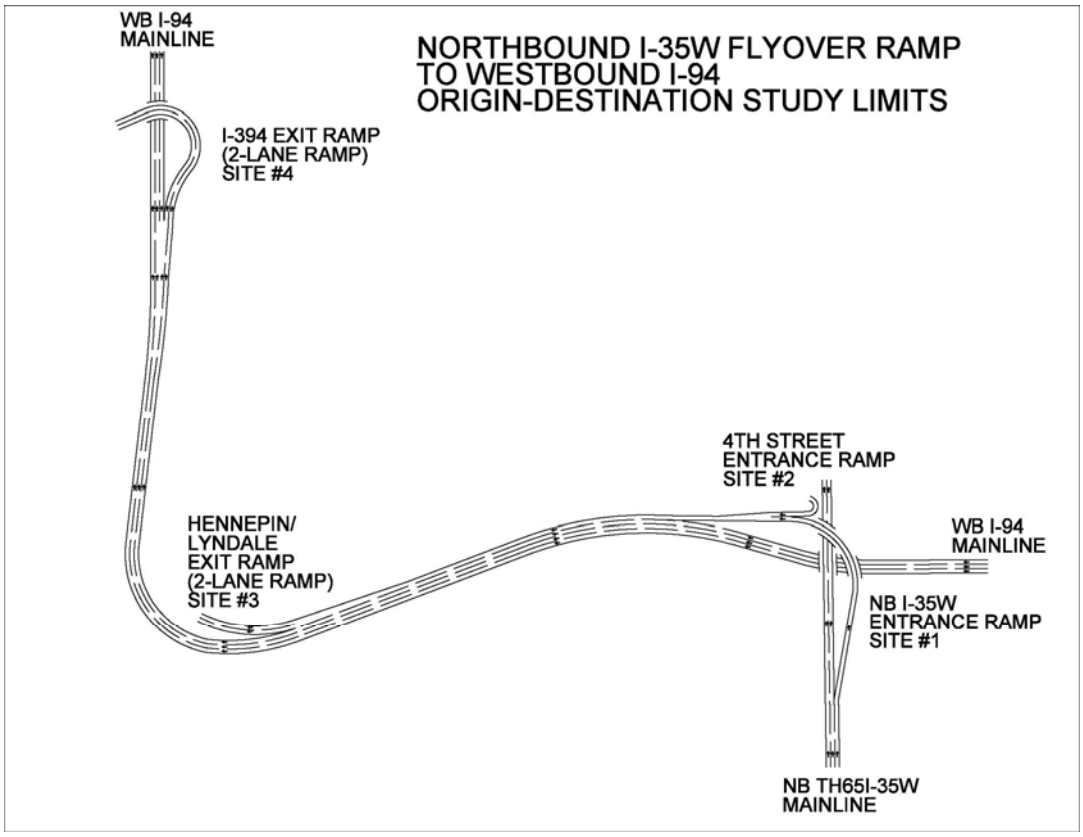


Table 3
AM Peak Period OD Results (7 a.m. to 9 a.m.)

Origin-Destination Table		Destinations			Total
		Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip*	
Origins	WB I-94 Mainline*	1610	4952	3026	9588
		16.8%	51.6%	31.6%	100%
	NB TH 65/I-35W Flyover Entrance	329	826	1945	3100
		10.6%	26.6%	62.7%	100%
	4th Avenue Entrance	11	208	407	626
		1.8%	33.2%	65.0%	100%
	Totals	1950	5986	5378	

*WB I-94 through trips estimated from MnDOT Detector data.

Table 4
PM Peak Period OD Results (2 p.m. to 6 p.m.)

Origin-Destination Table		Destinations			Total
		Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip*	
Origins	WB I-94 Mainline*	3388	8107	6963	18458
		18.4%	43.9%	37.7%	100%
	NB TH 65/I-35W Flyover Entrance	584	667	4399	5650
		10.3%	11.8%	77.9%	100%
	4th Avenue Entrance	89	797	1545	2431
		3.7%	32.8%	63.6%	100%
	Totals	4061	9571	12907	

*WB I-94 through trips estimated from MnDOT Detector data.

4.2.2 Model Calibration

An accurate existing CORSIM model is necessary to reliably simulate future traffic operations under both No-Build and Build conditions. The existing traffic model can be compared against known operating conditions, whether field observed or measured. The parameters for the existing traffic models are adjusted to make the output results match as closely as possible to the known traffic operations. The calibrated parameters are used in the models for future options to produce reliable results.

The existing volume data was a key input into the operational modeling and the field observations assist in “calibrating” the CORSIM operational model to actual conditions. Calibration for this model began with the 2004 existing calibration parameters; however many geometric and operational changes have occurred since that model was created including the completion of I-35W/TH 62 Commons Reconstruction project. Updated geometry and 2011 volumes provided the basis for the updated calibration efforts.

The existing, calibrated CORSIM models were submitted and approved by MnDOT; the approval letter is attached in Appendix D.

The arterial models were calibrated based on existing demands, existing signal timing parameters and field observations.

4.2.3 Existing Operations

The traffic conditions along I-35W have improved substantially in the southern study area due to the recent completion of several major projects including the reconstructed I-35W/TH 62 Commons, new Transit Station at 46th Street and MnPASS lanes between Downtown Minneapolis and City of Burnsville. The previous bottleneck in the I-35W/TH 62 Commons area has been removed and the MnPASS lanes in the median provide free-flow conditions for transit vehicles, HOVs and SOVs willing-to-pay the MnPASS fee. However, the operational problems in the central interchange I-35W/I-94/TH 65 area still exist. It is among the most congested areas in the Twin Cities metropolitan area. There are multiple causes contributing to the operational problems in the study area. Most importantly, the I-35W and I-94 freeways were constructed in the 1960s and current peak period traffic demands have well exceeded design capacity at several locations. Secondly, there are several substandard freeway segments with narrow shoulder widths, limited sight distance, deficient horizontal and vertical curves, and closely spaced access ramps. These segments include (but are not limited to) I-94 Lowry Hill Tunnel, I-94/I-35W Commons, and the I-35W Curves. These segments are

among the most incident-prone locations in the state. Due to substandard geometry in the area, traffic congestion is also very difficult to alleviate after an incident occurs.

Figure 6 and Figure 7 respectively illustrate the congestion areas along the I-35W and I-94 corridors during peak hour periods in a typical weekday. The figures show the operational issues along the freeway corridors in the study area as described below.

The existing AM and PM CORSIM model results for both the freeway and arterial intersections were tabulated in Appendix A.

4.2.3.1 Northbound I-35W

During AM peak period, there are two bottlenecks along the northbound I-35W corridor. One is located in the central interchange I-35W/I-94/TH 65 area and the other is located in 31st street and 35th Street area. During the PM peak, the entrance ramps from both 5th Avenue and eastbound I-94 enter a congested I-35W in the commons area.

Table 5
Existing Conditions MOEs – Northbound I-35W

Northbound I-35W/TH 65	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
	Begin NB I-35W	TH 62 Entrance	63	19	B	63	20	B
	TH 62 Entrance	60th St Entrance	65	16	B	64	18	B
	60th St Entrance	Diamond Lake Exit	65	16	B	64	17	B
	Diamond Lake Exit	Diamond Lake Entrance	65	20	C	65	20	C
	Diamond Lake Entrance	46th St Exit	62	22	C	63	21	C
	46th St Exit	46th St TRANSIT Exit	64	19	B	65	17	B
	46th St TRANSIT Exit	46th St TRANSIT Entrance	56	26	C	66	19	B
	46th St TRANSIT Entrance	46th St Entrance	44	30	D	65	17	B
	46th St Entrance	35/36th St Exit	35	45	***F***	63	21	C
	35/36th St Exit	35/36th St Entrance	30	50	***F***	64	20	C
	35/36th St Entrance	31/Lake St Exit	34	43	***F***	58	21	C
	31/Lake St Exit	Lake St TRANSIT Exit	41	34	D	61	18	B
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	45	35	D	62	20	C
	Lake St TRANSIT Entrance	NB I-35W/TH 65 SPLIT	53	29	D	54	23	C
	NB I-35W/TH 65 Split	5th Ave Entrance	39	45	***F***	43	35	**E**
	5th Ave Entrance	EB I-94 Entrance	36	46	***F***	37	45	***F***
	EB I-94 Entrance	EB I-94 Exit	49	31	D	46	33	D
	EB I-94 Exit	Washington Ave Exit	51	23	C	49	28	D
	Washington Ave Exit	**END NB I-35W**	56	27	C	55	34	D
	Begin NB TH 65	WB I-94 Exit	39	45	***F***	43	35	**E**
	WB I-94 Exit	**END NB TH 65**	36	46	***F***	37	45	***F***

4.2.3.2 Southbound I-35W

Overall operations on southbound I-35W are acceptable except for the I-94 commons area during PM peak period. The main cause is high entering volumes from the Washington Avenue collector-distributor (CD) road and the westbound I-94 entrance ramp approaching the 35-mph curve.

Table 6
Existing Conditions MOEs – Southbound I-35W

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB TH 65**	12th St Entrance	63	4	A	54	19	B
	12th St Entrance	EB I-94 Entrance	56	6	A	46	26	C
	EB I-94 Entrance	SB I-35W Entrance	60	14	B	50	30	D
	Begin SB I-35W	Washington CD Rd Entrance	57	22	C	53	22	C
	Washington CD Rd Entrance	WB I-94 Entrance	52	24	C	44	30	D
	WB I-94 Entrance	SB TH 65 Entrance	47	35	**E**	40	46	***F***
	SB I-35W Entrance	Lake St TRANSIT Exit	63	22	C	55	33	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	64	22	C	51	36	**E**
	Lake St TRANSIT Entrance	31/Lake St Entrance	64	20	C	50	35	**E**
	31/Lake St Entrance	35/36th St Exit	60	21	C	49	35	**E**
	35/36th St Exit	35/36th St Entrance	65	22	C	58	32	D
	35/36th St Entrance	46th St Exit	63	22	C	55	32	D
	46th St Exit	46th St TRANSIT Exit	65	16	B	63	20	C
	46th St TRANSIT Exit	46th St TRANSIT Entrance	66	17	B	65	22	C
	46th St TRANSIT Entrance	46th St Entrance	65	15	B	63	19	B
	46th St Entrance	60th St Exit	62	19	B	56	26	C
	60th St Exit	TH 62 Exit	61	20	B	56	25	C
	TH 62 Exit	**END SB I-35W**	66	13	B	65	15	B

4.2.3.3 Eastbound I-94

During both A.M. and P.M. peak periods, the existing Lowry Tunnel is one of the major bottlenecks for eastbound I-94 metering the traffic entering the study area. After the 35-mph curve through the tunnel, there are high weaving demands between the Hennepin/Lyndale entrance ramp and the southbound I-35W exit ramp.

Table 7
Existing Conditions MOEs – Eastbound I-94

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**	EB I-394 Entrance	51	36	**E**	49	37	**E**
	EB I-394 Entrance	Lyndale/Hennepin Entrance	40	48	***F***	39	50	***F***
	Lyndale/Hennepin Entrance	SB I-35W Exit	45	42	**E**	45	40	**E**
	SB I-35W Exit	NB I-35W Exit	51	38	**E**	51	35	**E**
	NB I-35W Exit	5th Ave Entrance	51	31	D	52	29	D
	5th Ave Entrance	TH 55 Exit	55	23	C	55	23	C
	TH 55 Exit	NB I-35W Entrance	59	24	C	60	22	C
	NB I-35W Entrance	6th St Entrance	61	23	C	61	19	B
	6th St Entrance	**END EB I-94**	61	24	C	60	24	C

4.2.3.4 Westbound I-94

The existing Lowry Tunnel is one of the major bottlenecks for westbound I-94 during both A.M. and P.M. peak periods. There is also a very high weaving demand between the northbound I-35W flyover/4th Avenue combined entrance ramp and the Hennepin/Lyndale

exit ramp. The congestion extends for miles upstream on I-94 and has major impacts to the surrounding freeway and arterial network during the PM peak period.

Table 8
Existing Conditions MOEs – Westbound I-94

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**	5th St Exit	60	23	C	42	45	***F***
	5th St Exit	SB I-35W Exit	51	23	C	14	87	***F***
	SB I-35W Exit	Washington CD Rd Entrance	50	27	C	15	81	***F***
	Washington CD Rd Entrance	11th St Exit	49	27	C	15	74	***F***
	11th St Exit	NB I-35W/4th Ave Entrance	48	31	D	15	91	***F***
	NB I-35W/4th Ave Entrance	Lyndale/Hennepin Exit	45	34	D	42	40	**E**
	Lyndale/Hennepin Exit	WB I-394 Exit	42	40	**E**	42	41	**E**
	WB I-394 Exit	TH 55 Exit	53	14	B	53	18	B
	TH 55 Exit	**END WB I-94**	54	13	B	54	16	B

Figure 6 – I-35W Existing Peak Period Speed Contours

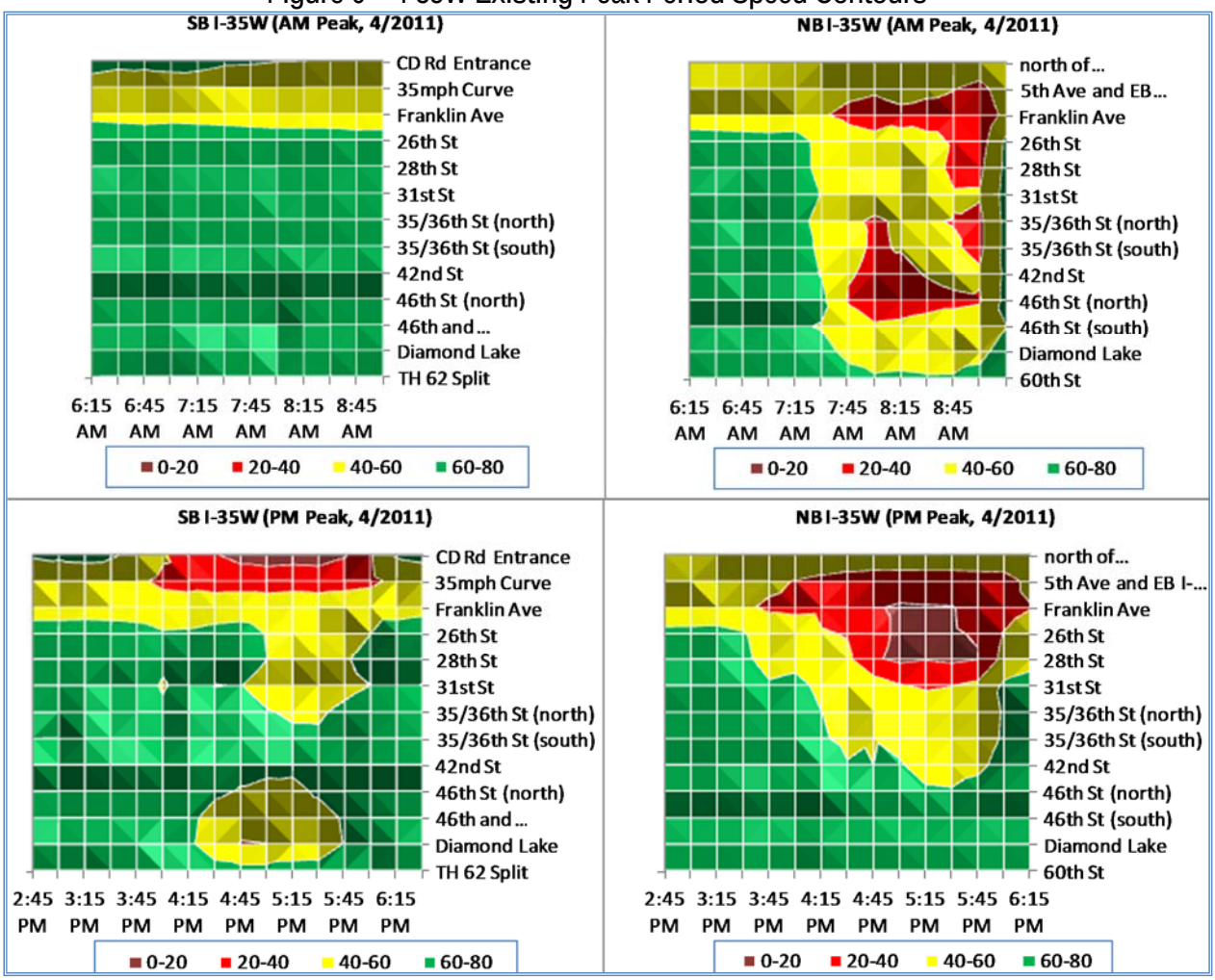
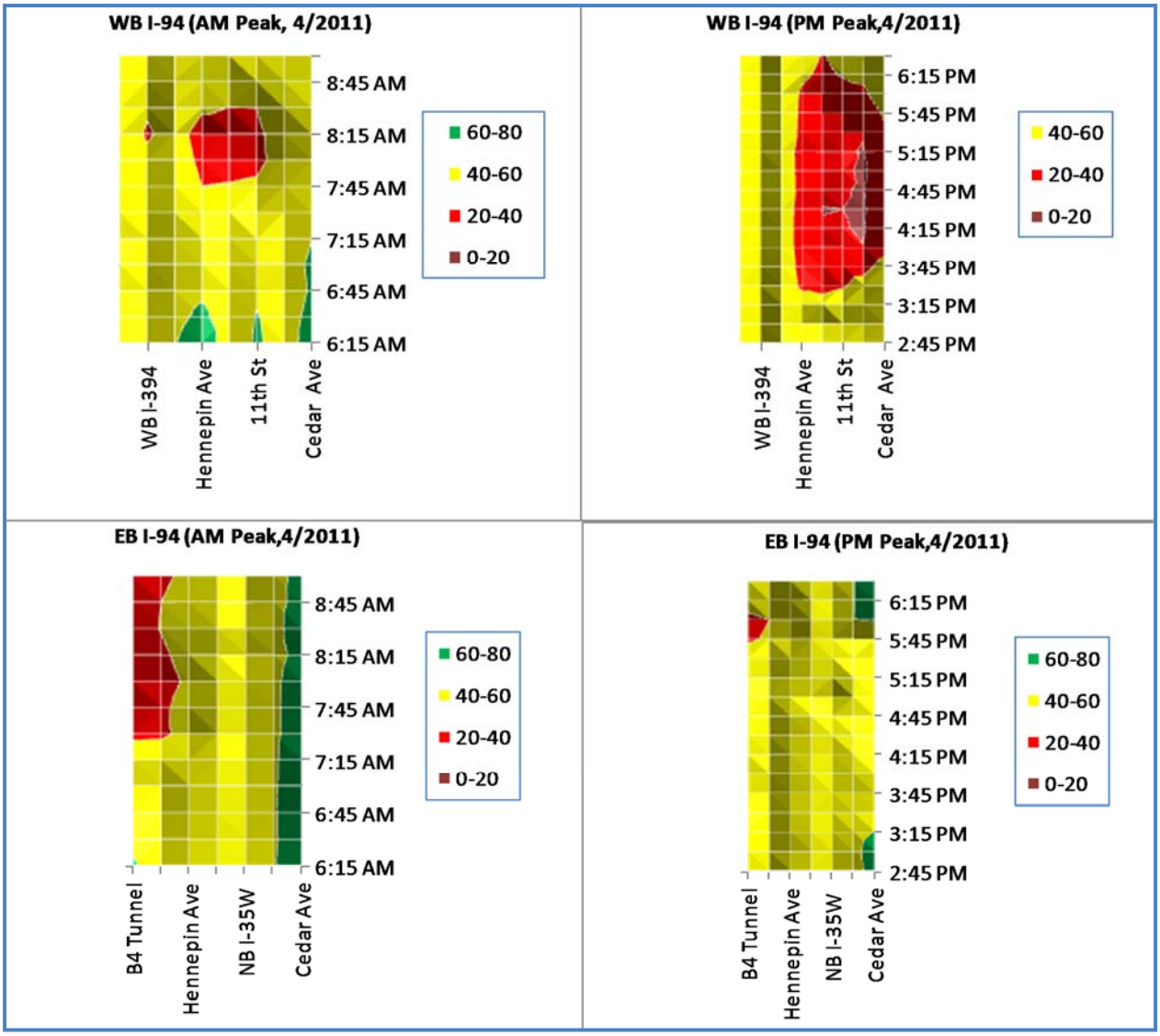


Figure 7 – I-94 Existing Peak Period Speed Contours



4.2.3.5 Arterial Intersections

Lake Street, 31st Street, and Franklin Avenue all have existing congestion problems under existing conditions; 28th Street currently has acceptable operations. While the AM peak hour operations are all acceptable throughout the study area, the PM peak hour does have existing congestion problems.

Along Lake Street, the westbound left turn movement from Lake Street to Stevens operates at a LOS D; however the queue spills into the through lane and then to the upstream intersections. This creates a long queue for the westbound Lake Street approach to 2nd Avenue. Due to the short block lengths and relatively short cycle length of the traffic signals, the average delay per vehicle operates at a LOS D or better; the westbound approach operates at a LOS B or better.

Along 31st Street, the same westbound to southbound movement operates with long delays and queues that spill through the 2nd Avenue intersection and incur long delays as well.

Along Franklin Avenue, the eastbound left turn to northbound 5th Avenue, with access to I-35W and I-94, operates poorly and the queue spills through the 4th Avenue intersection. Because the Franklin Avenue demands require so much of the green time at the 5th Avenue intersection, the northbound 5th Avenue approach greatly suffers due to the limited green time available. However, due to limited freeway access in the surrounding neighborhoods and commercial areas, traffic has very few options to enter the freeway system and thus sit through heavy congestion levels.

Table 9
Existing Arterial Conditions MOEs

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Lake Street @ Stevens Avenue (signal control)	SB	36.4 / D	8.2 / A	37.1 / D	20.7 / C
	EB	4.5 / A		16.3 / B	
	WB	4.4 / A		19.6 / B	
Lake Street @ 2nd Avenue (signal control)	NB	38.4 / D	21.9 / C	16.2 / B	9.9 / A
	EB	12 / B		3.8 / A	
	WB	3.2 / A		9.9 / A	
31st Street @ Stevens Avenue (signal control)	SB	33.1 / C	19.1 / B	39.1 / D	43.7 / D
	EB	9.6 / A		17.4 / B	
	WB	13.4 / B		**61.1 / E**	
31st Street @ 2nd Avenue (signal control)	NB	23.6 / C	20.9 / C	23.4 / C	**77 / E**
	EB	20.9 / C		22.6 / C	
	WB	10.7 / B		**198.9 / F**	
28th Street @ Clinton Avenue (signal control)	NB	8.6 / A	3.8 / A	5.6 / A	3.1 / A
	EB	2.3 / A		2.5 / A	
28th Street @ 4th Avenue (signal control)	NB	15.5 / B	5.2 / A	28.5 / C	17.8 / B
	SB	35.6 / D		25.6 / C	
	EB	2.4 / A		13.8 / B	
Franklin Avenue @ 4th Avenue (signal control)	NB	6.6 / A	4.6 / A	**68.8 / E**	**118.7 / F**
	SB	26.9 / C		**192.8 / F**	
	EB	4 / A		**263.9 / F**	
	WB	3 / A		4.7 / A	
Franklin Avenue @ 5th Avenue (signal control)	NB	34.2 / C	12.3 / B	**243.1 / F**	**71.3 / E**
	EB	11.1 / B		50.5 / D	
	WB	5.3 / A		13.5 / B	

4.3 Proposed Design

The majority of the proposed design changes occur along I-35W, however westbound I-94 also has proposed design changes. Eastbound I-94 does not have any proposed design changes as part of this project.

Figure 8 represents both the existing and proposed Transit Access Project designs for westbound I-94. Figure 9 represents both the existing and proposed Transit Access Project designs for both southbound and northbound I-35W.

- I-35W Southbound Braid Bridge; enter on right side
- I-35W/TH 65 Northbound Flyover Bridge to Westbound I-94; enter on left side of I-94
- I-35W Southbound Exit Ramp to Lake Street with auxiliary lane
- I-35W Northbound Exit Ramp to 28th Street with auxiliary lane
- I-35W Northbound MnPASS Lanes; convert from PDSL
- I-35W Southbound MnPASS Lanes
- I-35W at Lake Street Transit Station

Figure 8 – I-94 Westbound Proposed Changes

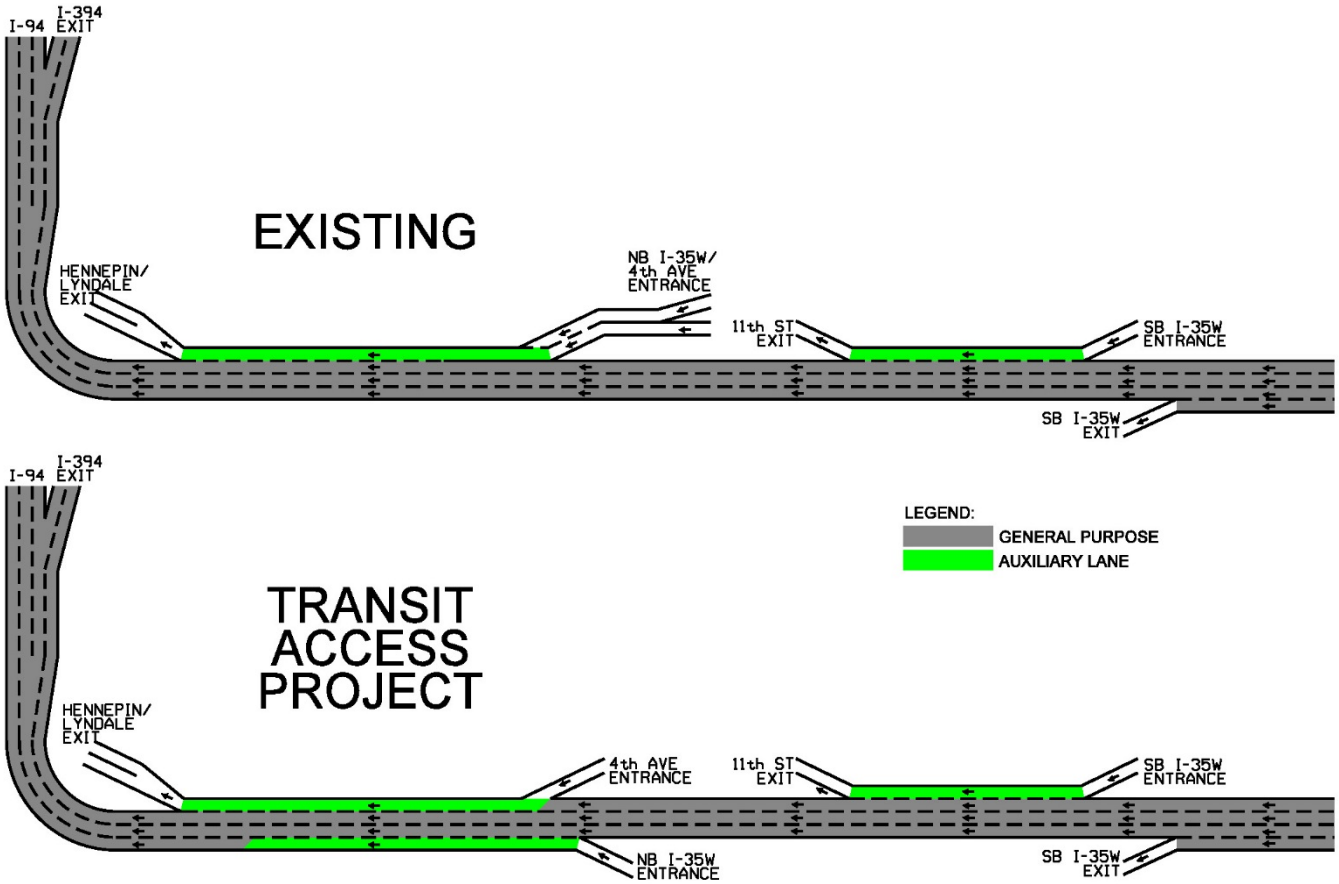
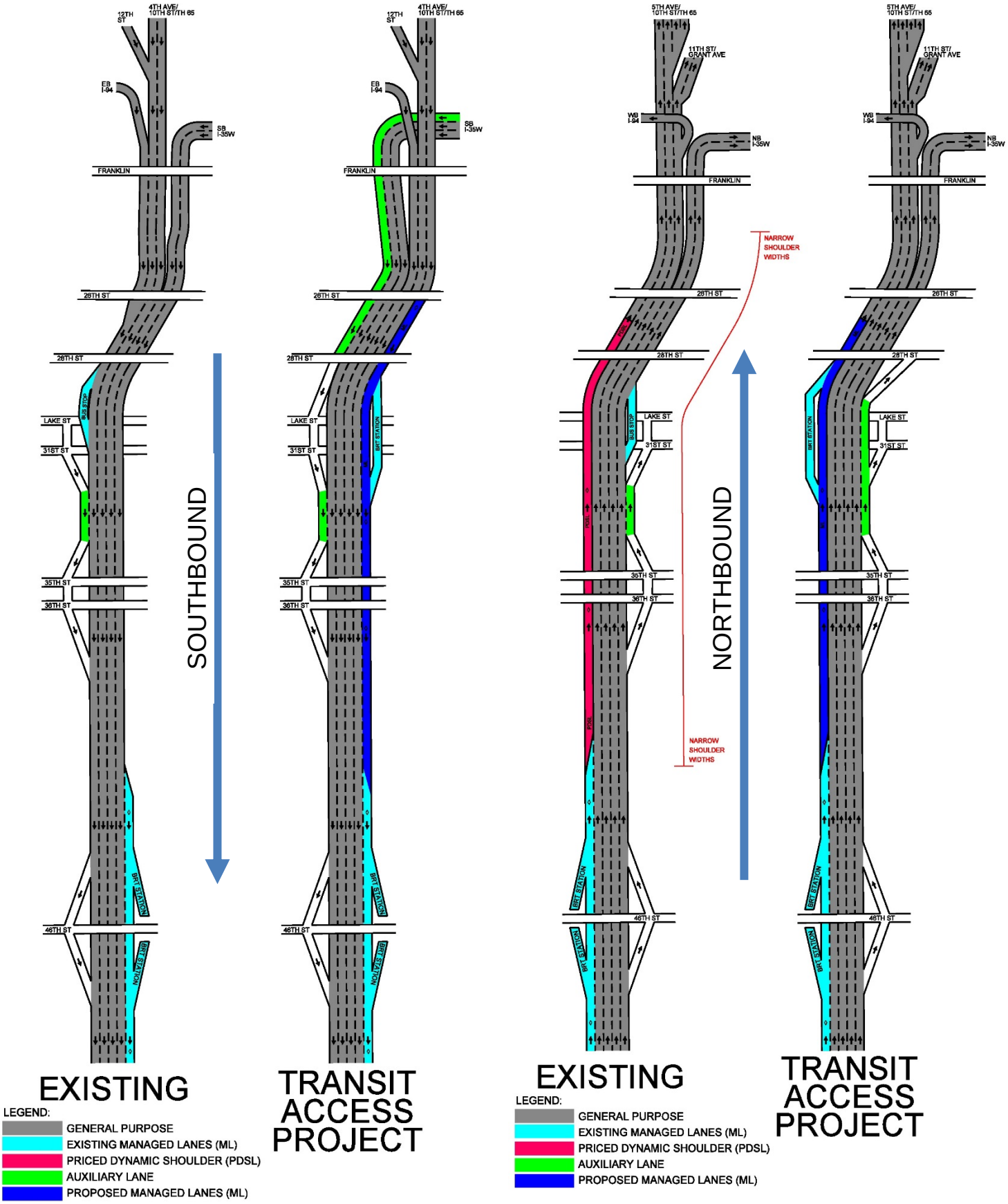


Figure 9 – I-35W Proposed Changes



4.4 Design Year Conditions

The design year for this project is 2038. The operations analysis for the design year consisted of No Build and Build conditions.

Full measure of effectiveness tables for both the Build and No Build can be found in Appendix B.

4.4.1 No Build

Traffic demands under the No Build condition will significantly increase from the existing demands to the design year demands. All available capacity along the freeway and arterial network will be utilized by drivers and congestion will significantly increase.

4.4.1.1 Northbound I-35W

Congestion will increase dramatically by 2038. The I-94/I-35W commons area has several contributing factors including the 35 mph curve and the weaving area between the 5th Avenue entrance, the EB I-94 entrance and the EB I-94 exit ramps. Congestion will extend from the I-94 commons area as far back as Diamond Lake Road in the AM peak and TH 62 in the PM peak; approximately 4.5 to 5 miles. In the PM peak hour, the north to west flyover will spill back from westbound I-94 onto TH 65 and add to the congestion.

Table 10
2038 No Build MOEs – Northbound I-35W

Northbound I-35W/TH 65	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
	Begin NB I-35W	TH 62 Entrance	61	22	C	41	38	**E**
	TH 62 Entrance	60th St Entrance	63	19	B	21	60	***F***
	60th St Entrance	Diamond Lake Exit	60	20	C	19	64	***F***
	Diamond Lake Exit	Diamond Lake Entrance	47	32	D	18	84	***F***
	Diamond Lake Entrance	46th St Exit	36	44	***F***	19	78	***F***
	46th St Exit	46th St TRANSIT Exit	30	44	***F***	16	76	***F***
	46th St TRANSIT Exit	46th St TRANSIT Entrance	27	56	***F***	16	89	***F***
	46th St TRANSIT Entrance	46th St Entrance	24	54	***F***	16	79	***F***
	46th St Entrance	35/36th St Exit	29	57	***F***	19	79	***F***
	35/36th St Exit	35/36th St Entrance	30	55	***F***	20	74	***F***
	35/36th St Entrance	31/Lake St Exit	33	48	***F***	21	65	***F***
	31/Lake St Exit	Lake St TRANSIT Exit	37	43	**E**	21	65	***F***
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	37	47	***F***	21	71	***F***
	Lake St TRANSIT Entrance	NB I-35W/TH 65 SPLIT	37	45	***F***	24	60	***F***
	NB I-35W/TH 65 Split	5th Ave Entrance	17	94	***F***	16	102	***F***
	5th Ave Entrance	EB I-94 Entrance	29	60	***F***	28	64	***F***
	EB I-94 Entrance	EB I-94 Exit	47	34	D	43	39	**E**
	EB I-94 Exit	Washington Ave Exit	52	24	C	49	31	D
	Washington Ave Exit	**END NB I-35W**	56	24	C	55	35	**E**
	Begin NB TH 65	WB I-94 Exit	51	32	D	32	41	**E**
	WB I-94 Exit	**END NB TH 65**	53	23	C	53	17	B

4.4.1.2 Southbound I-35W

Overall operations southbound will only slightly deteriorate by 2038; however congestion will increase in spot locations along southbound I-35W. The main increase in congestion is between the Mississippi River Bridge and the TH 65 merge area. With no change to the

existing corridor, the segment between TH 65 and 46th Street, before the existing MnPASS lane begins, will have increased levels of congestion.

Table 11
2038 No Build MOEs – Southbound I-35W

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB TH 65**	12th St Entrance	62	6	A	57	18	B
	12th St Entrance	EB I-94 Entrance	53	10	A	47	27	C
	EB I-94 Entrance	SB I-35W Entrance	59	19	B	53	29	D
	Begin SB I-35W	Washington CD Rd Entrance	56	24	C	9	117	***F***
	Washington CD Rd Entrance	WB I-94 Entrance	46	29	D	10	120	***F***
	WB I-94 Entrance	SB TH 65 Entrance	40	45	***F***	33	62	***F***
	SB I-35W Entrance	Lake St TRANSIT Exit	62	26	C	57	34	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	62	27	C	48	41	**E**
	Lake St TRANSIT Entrance	31/Lake St Entrance	61	25	C	49	38	**E**
	31/Lake St Entrance	35/36th St Exit	58	25	C	52	35	**E**
	35/36th St Exit	35/36th St Entrance	62	27	C	59	34	D
	35/36th St Entrance	46th St Exit	59	28	D	54	36	**E**
	46th St Exit	46th St TRANSIT Exit	64	19	B	63	22	C
	46th St TRANSIT Exit	46th St TRANSIT Entrance	66	21	C	64	24	C
	46th St TRANSIT Entrance	46th St Entrance	64	18	B	56	24	C
	46th St Entrance	60th St Exit	57	25	C	40	40	**E**
	60th St Exit	TH 62 Exit	57	24	C	52	30	D
	TH 62 Exit	**END SB I-35W**	65	18	B	64	19	B

4.4.1.3 Eastbound I-94

The existing Lowry Tunnel is one of the major bottlenecks for eastbound I-94 that will constrain growth in the corridor. After the 35-mph curve through the tunnel, there are high weaving demands between the Hennepin/Lyndale entrance ramp and the southbound I-35W exit ramp. With no current plans to increase capacity along the corridor, traffic volumes will not increase significantly by 2038 in the peak periods. Therefore, congestion will remain basically unchanged with slow moving traffic from west of I-394 to the NB I-35W exit.

Table 12
2038 No Build MOEs – Eastbound I-94

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**	EB I-394 Entrance	25	80	***F***	26	80	***F***
	EB I-394 Entrance	Lyndale/Hennepin Entrance	30	64	***F***	32	63	***F***
	Lyndale/Hennepin Entrance	SB I-35W Exit	43	45	***F***	44	44	***F***
	SB I-35W Exit	NB I-35W Exit	51	36	**E**	51	39	**E**
	NB I-35W Exit	5th Ave Entrance	51	29	D	51	31	D
	5th Ave Entrance	TH 55 Exit	55	23	C	55	25	C
	TH 55 Exit	NB I-35W Entrance	59	23	C	59	23	C
	NB I-35W Entrance	6th St Entrance	61	22	C	60	21	C
	6th St Entrance	**END EB I-94**	61	24	C	58	27	C

4.4.1.4 Westbound I-94

The existing Lowry Tunnel is one of the major bottlenecks for westbound I-94 that will constrain growth in the corridor. There is also a very high weaving demand between the northbound I-35W flyover/4th Avenue combined entrance ramp and the Hennepin/Lyndale exit ramp. With no plans to increase capacity along the corridor, traffic volumes will not increase significantly by 2038 in the peak periods. The AM peak hour will see an increase in congestion as the demand increases. The PM peak hour will still have major congestion which will result in decreased volume served from the major entrance ramps. The congestion will extend between the Lowry Tunnel and east of the Cedar Avenue interchange (approximately to the modeled limits). Approximately 1,000 vehicles, 15% of the demand, will not be able to travel through the tunnel in the PM peak hour.

Table 13
2038 No Build MOEs – Westbound I-94

	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Westbound I-94	**Begin WB I-94**	5th St Exit	51	32	D	45	43	***F***
	5th St Exit	SB I-35W Exit	27	49	***F***	20	67	***F***
	SB I-35W Exit	Washington CD Rd Entrance	26	55	***F***	17	72	***F***
	Washington CD Rd Entrance	11th St Exit	27	58	***F***	16	71	***F***
	11th St Exit	NB I-35W/4th Ave Entrance	24	71	***F***	15	91	***F***
	NB I-35W/4th Ave Entrance	Lyndale/Hennepin Exit	42	41	**E**	42	39	**E**
	Lyndale/Hennepin Exit	WB I-394 Exit	41	44	***F***	42	40	**E**
	WB I-394 Exit	TH 55 Exit	53	15	B	53	17	B
	TH 55 Exit	**END WB I-94**	54	15	B	54	16	B

4.4.1.5 Arterial Intersections

With increased traffic demands considered in the No-build scenario, and only improving the signal timings, the existing arterial network degrades over the existing conditions.

The AM peak hour operations for all intersections are still acceptable. The PM peak hour operations for Lake Street, 31st Street, and 28th Street all have slightly degraded operations during the PM peak hour.

The Franklin Avenue intersections have severely degraded operations. This magnitude of delay could potentially cause traffic patterns to shift in the area; however there is limited options for access to the freeway system. The growth from existing demands to 2038 demands only represents an approximate 15% increase in total entering demands. Due to the limited freeway access, traffic would likely sit through multiple cycles, as they do under existing conditions, rather than drive longer distances on congested arterials to another freeway access.

The northbound I-35W exit ramp to 31st Street does queue at the signal and extend upstream impacting the freeway operations.

Table 14
2038 No Build Arterial Conditions MOEs

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Lake Street @ Stevens Avenue (signal control)	SB	35.5 / D	8.3 / A	40.4 / D	23.7 / C
	EB	5.2 / A		18.6 / B	
	WB	4.9 / A		23.2 / C	
Lake Street @ 2nd Avenue (signal control)	NB	37.4 / D	19.5 / B	17.4 / B	12.8 / B
	EB	11.2 / B		5.1 / A	
	WB	3.7 / A		14.6 / B	
31st Street @ Stevens Avenue (signal control)	SB	30.3 / C	20.7 / C	27.6 / C	53.8 / D
	EB	13.9 / B		12.6 / B	
	WB	16.6 / B		**97.6 / F**	
31st Street @ 2nd Avenue (signal control)	NB	23.2 / C	19.8 / B	20 / C	**110.8 / F**
	EB	20.2 / C		17.5 / B	
	WB	10.2 / B		**300 / F**	
28th Street @ Clinton Avenue (signal control)	NB	11.8 / B	5 / A	4.6 / A	2.8 / A
	EB	2.8 / A		2.4 / A	
28th Street @ 4th Avenue (signal control)	NB	20.2 / C	5.9 / A	38.2 / D	16.6 / B
	SB	36.7 / D		21.7 / C	
	EB	2.9 / A		8.7 / A	
Franklin Avenue @ 4th Avenue (signal control)	NB	17.2 / B	7.5 / A	**300 / F***	**300 / F***
	SB	29.5 / C		**300 / F***	
	EB	6.5 / A		**300 / F***	
	WB	4 / A		9 / A	
Franklin Avenue @ 5th Avenue (signal control)	NB	47.6 / D	20.4 / C	**288.4 / F**	**97.5 / F**
	EB	20.3 / C		**84.8 / F**	
	WB	7.4 / A		21.6 / C	

*Delay exceeds greater than 300 seconds (5 minutes)

4.4.2 Build

Traffic demand under the Build condition will increase over the No Build demand due to the changes in freeway access, additional auxiliary lanes, and MnPASS capacity.

4.4.2.1 Northbound I-35W

The proposed project does provide benefits for northbound I-35W, however the bottleneck of the 35 mph curve and I-94 commons area will still create congested conditions along the corridor. The I-94/I-35W commons area has several contributing factors including the 35 mph curve and the weaving area between the 5th Avenue entrance, the EB I-94 entrance and the EB I-94 exit ramps.

In the PM peak hour, the north to west flyover will no longer spill back onto TH 65 and add to the congestion along northbound I-35W. Due to the congestion along I-35W, the benefits of the 28th Street exit ramp are not dramatic; however the AM peak hour results in a clear improvement of traffic operations.

Table 15
2038 Build MOEs – Northbound I-35W

	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	61	22	C	50	32	D
	TH 62 Entrance	60th St Entrance	63	19	B	32	44	***F***
	60th St Entrance	Diamond Lake Exit	62	20	B	30	46	***F***
	Diamond Lake Exit	Diamond Lake Entrance	51	29	D	26	63	***F***
	Diamond Lake Entrance	46th St Exit	48	34	D	26	63	***F***
	46th St Exit	46th St BRT Exit	43	33	D	20	65	***F***
	46th St BRT Exit	46th St BRT Entrance	36	46	***F***	19	81	***F***
	46th St BRT Entrance	46th St Entrance	29	48	***F***	17	76	***F***
	46th St Entrance	35/36th St Exit	31	55	***F***	20	79	***F***
	35/36th St Exit	35/36th St Entrance	29	60	***F***	19	80	***F***
	35/36th St Entrance	31/Lake St Exit	28	53	***F***	21	67	***F***
	31/Lake St Exit	Lake St BRT Exit	29	45	***F***	21	58	***F***
	Lake St BRT Exit	28th St Exit	36	42	**E**	23	60	***F***
	28th St Exit	Lake St BRT Entrance	45	37	**E**	24	64	***F***
	Lake St BRT Entrance	NB I-35W/TH 65 SPLIT	41	40	**E**	27	56	***F***
	NB I-35W/TH 65 Split	5th Ave Entrance	18	87	***F***	16	102	***F***
	5th Ave Entrance	EB I-94 Entrance	29	58	***F***	29	63	***F***
	EB I-94 Entrance	EB I-94 Exit	48	32	D	46	36	**E**
	EB I-94 Exit	Washington Ave Exit	52	24	C	50	29	D
	Washington Ave Exit	**END NB I-35W**	56	24	C	55	33	D
	Begin NB TH 65	WB I-94 Exit	52	31	D	50	29	D
	WB I-94 Exit	**END NB TH 65**	53	22	C	53	19	B

4.4.2.2 Southbound I-35W

Overall operations southbound are greatly improved with the proposed project. The auxiliary lane between the westbound I-94 entrance and the new Lake Street exit ramp provides additional capacity through the commons area. The reconfiguration of TH 65 to the left side allow full access to the new MnPASS lane. The new MnPASS lane provides enough capacity to bring the southbound traffic congestion to operate better than existing conditions.

Table 16
2038 Build MOEs – Southbound I-35W

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB TH 65**	12th St Entrance	61	6	A	55	20	C
	12th St Entrance	EB I-94 Entrance	52	13	B	46	31	D
	EB I-94 Entrance	SB I-35W Entrance	60	19	B	58	28	D
	Begin SB I-35W	Washington CD Rd Entrance	53	31	D	51	28	D
	Washington CD Rd Entrance	WB I-94 Entrance	47	35	D	40	42	**E**
	WB I-94 Entrance	SB TH 65 Entrance	48	32	D	44	40	**E**
	SB TH65 Entrance	Lake St Exit	58	23	C	55	31	D
	Lake St Exit	Lake St BRT Exit	62	20	C	60	26	C
	Lake St BRT Exit	Lake St BRT Entrance	63	22	C	60	30	D
	Lake St BRT Entrance	31/Lake St Entrance	58	22	C	52	32	D
	31/Lake St Entrance	35/36th St Exit	58	20	B	52	28	D
	35/36th St Exit	35/36th St Entrance	60	25	C	60	31	D
	35/36th St Entrance	46th St Exit	58	27	C	56	33	D
	46th St Exit	46th St BRT Exit	65	21	C	64	24	C
	46th St BRT Exit	46th St BRT Entrance	61	24	C	64	27	C
	46th St BRT Entrance	46th St Entrance	51	25	C	61	24	C
	46th St Entrance	60th St Exit	45	33	D	51	34	D
	60th St Exit	TH 62 Exit	55	27	C	54	31	D
	TH 62 Exit	**END SB I-35W**	64	20	C	64	19	B

4.4.2.3 Eastbound I-94

With no proposed changes to eastbound I-94, the operations are nearly identical to the No Build scenario.

Table 17
2038 Build MOEs – Eastbound I-94

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**	EB I-394 Entrance	25	80	***F***	26	78	***F***
	EB I-394 Entrance	Lyndale/Hennepin Entrance	31	63	***F***	34	58	***F***
	Lyndale/Hennepin Entrance	SB I-35W Exit	43	45	***F***	46	42	**E**
	SB I-35W Exit	NB I-35W Exit	51	36	**E**	51	37	**E**
	NB I-35W Exit	5th Ave Entrance	52	29	D	51	30	D
	5th Ave Entrance	TH 55 Exit	55	23	C	55	24	C
	TH 55 Exit	NB I-35W Entrance	59	24	C	60	22	C
	NB I-35W Entrance	6th St Entrance	61	22	C	61	20	C
	6th St Entrance	**END EB I-94**	60	24	C	59	26	C

4.4.2.4 Westbound I-94

The proposed project removes significant weaving demands between the I-35W flyover ramp and the Hennepin/Lyndale exit ramp. The new left side entrance ramp will enter into a full lane along westbound I-94. This allows the northbound I-35W flyover ramp volume to enter westbound I-94 and enter the Lowry Tunnel with minimal congestion. The reduced weaving demands between 4th Avenue entrance and the Hennepin/Lyndale exit ramp improve traffic operations to allow more demand access to the Lowry Tunnel.

In the AM peak, there is a noticeable congestion reduction. In the PM peak hour, there is still congestion from the increase demand throughput. Under the No Build scenario, demand through the tunnel was forecast to approximately 6,300 vph; however only 5,300 would be served which is over a 15% reduction. Under the proposed conditions, all 6,300 vehicles will be served through the tunnel.

Table 18
2038 Build MOEs – Westbound I-94

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**	5th St Exit	60	26	C	60	23	C
	5th St Exit	SB I-35W Exit	52	25	C	38	36	**E**
	SB I-35W Exit	Washington CD Rd Entrance	50	27	C	27	55	***F***
	Washington CD Rd Entrance	11th St Exit	46	33	D	30	48	***F***
	11th St Exit	NB I-35W Entrance	49	33	D	31	55	***F***
	NB I-35W Entrance	4th Ave Entrance	48	34	D	31	55	***F***
	4th Ave Entrance	Lyndale/Hennepin Exit	45	35	**E**	36	50	***F***
	Lyndale/Hennepin Exit	WB I-394 Exit	40	46	***F***	38	53	***F***
	WB I-394 Exit	TH 55 Exit	53	15	B	53	19	B
	TH 55 Exit	**END WB I-94**	54	15	B	54	18	B

4.4.2.5 Arterial Intersections

Under the Build conditions, all intersections operate acceptably during both peak hours. All approaches operate at a LOS D or better.

The build scenario includes a new southbound exit ramp to Lake Street that will increase demands entering the Lake Street intersections. The new 28th Street exit ramp will decrease demands along 2nd Avenue at the intersections with Lake Street and 31st Street.

The new southbound exit ramp to Lake Street will need to include four approach lanes; a separate left, shared left-through, shared through-right and right turn lanes. Between Stevens Avenue and 2nd Avenue, Lake Street will be expanded to include side by side left turn lanes; the westbound left turn lane storage will be extended through the 2nd Avenue intersection; this can only be accomplished with the reconstruction of the I-35W bridge over Lake Street.

These improvements, along with the reduction in demands along 2nd Avenue, allow traffic to flow through the area without congestion.

Along 31st Street, a westbound left turn phase was included at the Stevens Avenue intersection. This allows the westbound traffic through both ramp terminal intersections without long queues and delays. Additionally, the reduction in demands from northbound I-

35W and the left turn phase, reduce the queuing impacts along 2nd Avenue. The improvements ensure the arterial queues do not impact to the freeway operations by queueing along the exit ramp.

Along 28th Street, the existing intersection of 2nd Avenue is replaced with the new northbound I-35W exit ramp; this ramp includes dual right turn lanes onto 28th Street. The existing capacity along 28th Street allows for the traffic pattern change to occur without impacting traffic operations.

Along Franklin Avenue, a new bridge allows for adding back to back left turn lanes for the eastbound and westbound approaches. The northbound approach of 5th Avenue to Franklin Avenue will be converted to a one-way northbound roadway from 22nd Street to Franklin Avenue. This reduces conflicts at the intersection and allows for two northbound through lanes without needing additional right of way. These changes allow the 2038 traffic demands to operate acceptably.

Table 19
2038 Build Arterial Conditions MOEs

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Lake Street @ Stevens Avenue (signal control)	SB	23.9 / C	13.5 / B	34 / C	22.1 / C
	EB	4.5 / A		16.4 / B	
	WB	6.8 / A		14.1 / B	
Lake Street @ 2nd Avenue (signal control)	NB	35.7 / D	13.2 / B	19.9 / B	9.2 / A
	EB	5.9 / A		7.1 / A	
	WB	3.2 / A		6.6 / A	
31st Street @ Stevens Avenue (signal control)	SB	29.8 / C	18.6 / B	33 / C	28 / C
	EB	11.6 / B		12.8 / B	
	WB	9.6 / A		31 / C	
31st Street @ 2nd Avenue (signal control)	NB	23.3 / C	15.8 / B	23 / C	17.3 / B
	EB	6.3 / A		9.9 / A	
	WB	8.9 / A		15.8 / B	
28th Street @ I-35W Exit Ramp (signal control)	NB	8.2 / A	5.1 / A	6.2 / A	6 / A
	EB	3.7 / A		5.9 / A	
28th Street @ 4th Avenue (signal control)	NB	17.5 / B	5.7 / A	35.5 / D	16.7 / B
	SB	35 / D		23.4 / C	
	EB	2.9 / A		10.7 / B	
Franklin Avenue @ 4th Avenue (signal control)	NB	11.4 / B	6.3 / A	24.8 / C	10 / B
	SB	30.1 / C		36.5 / D	
	EB	5.2 / A		12.8 / B	
	WB	4 / A		3.2 / A	
Franklin Avenue @ 5th Avenue (signal control)	NB	34.2 / C	14.7 / B	50.5 / D	35.9 / D
	EB	9.5 / A		21 / C	
	WB	12.6 / B		41.2 / D	

4.4.3 2038 Comparison of Design Changes

The proposed design changes result in a dramatic change in demands on the roadway network from the No Build scenario compared to the Build scenario. Data from the forecast model was compared for both vehicle miles traveled (VMT) and vehicle hours traveled (VHT) in the 7-county metro area on a daily level.

As many different forecast scenarios were developed at the beginning of the project, the following tables will compare the three main changes to the freeway network against the No Build scenario. Both the southbound I-35W Lake Street exit and the northbound I-35W 28th Street exit were compared together and separately; these forecast scenarios do not include the southbound I-35W MnPASS improvement which was a project component that was identified later in the study process. The Preferred Build Scenario includes both exit ramps and the MnPASS lanes; all options include the improvements along westbound I-94.

Under the Build conditions, there is a reduction in VMT for both the arterial and freeway roadway networks for all scenarios. This infers that the proposed access changes, and added freeway capacities provide a much more complete roadway network that allows users to reach their destinations on a shorter path. From the data, the southbound I-35W MnPASS lane has the biggest impact of all the proposed changes.

Table 20, below, represents the total daily VMT data taken from the regional forecast model.

Table 20
2038 Vehicle Miles Traveled

Alternative	Freeway Network	Arterial Network	Total Roadway Network
No Build Scenario	**42,332,430**	**56,975,182**	**99,307,612**
SB Exit Only Scenario	42,328,955	56,967,729	99,296,684
Change from No Build	-3,475	-7,453	-10,928
NB Exit Only Scenario	42,330,563	56,932,523	99,263,086
Change from No Build	-1,867	-42,659	-44,526
SB Exit/NB Exit Scenario	42,332,221	56,850,911	99,183,132
Change from No Build	-209	-124,271	-124,480
Preferred Build Scenario	41,991,390	56,000,048	97,991,438
Change from No Build	-341,040	-975,134	-1,316,174

*The SB I-35W MnPASS lanes are only included in the Preferred Build Scenario

Under the Build conditions, there is a reduction in VHT for both the arterial and freeway roadway networks for all scenarios except the northbound Exit Only freeway network. The exit does keep traffic on I-35W for slightly longer under this scenario but has a significant decrease in arterial network time. This infers that the proposed access changes, and added freeway capacities provide both a less congested roadway system and a shorter path to their destination (based on the VMT data). From the data, the southbound I-35W MnPASS lane has the biggest impact of the proposed changes.

Table 21, below, represents the total daily VHT data taken from the regional forecast model.

Table 21
2038 Vehicle Hours Traveled

Alternative	Freeway Network	Arterial Network	Total Roadway Network
No Build Scenario	**1,223,949**	**2,618,542**	**3,842,491**
SB Exit Only Scenario	1,221,165	2,612,010	3,833,175
Change from No Build	-2,784	-6,532	-9,316
NB Exit Only Scenario	1,224,302	2,609,584	3,833,886
Change from No Build	353	-8,958	-8,605
SB Exit/NB Exit Scenario	1,221,687	2,591,109	3,812,796
Change from No Build	-2,262	-27,433	-29,695
Preferred Build Scenario	1,188,886	2,483,099	3,671,985
Change from No Build	-35,063	-135,443	-170,506

*The SB I-35W MnPASS lanes are only included in the Preferred Build Scenario

4.4.3.1 Southbound I-35W Exit to Lake Street and Braid Bridge

The combination of the southbound I-35W and southbound TH 65 changes have a dramatic improvement for traffic both on the freeway and local roadway network.

The change in the braid bridge configuration will keep TH 65 on the left hand side of the mainline, which aligns the transit and HOV vehicles directly into the proposed MnPASS lane. The added auxiliary lane and enhanced curve improve operations through the I-94 commons area.

The changes also position transit vehicles from downtown into the left most lane for the new center transit station at Lake Street; transit vehicles from downtown will be the majority of users at the new transit station. There is very limited transit service along I-35W that does not originate from downtown Minneapolis. The buses being served through the I-35W/I-94 commons area do not require access to the proposed transit station; however the buses can stop at the station if a passenger requests it.

The new southbound exit ramp to Lake Street will result in a major traffic pattern shift on the local street network. Along southbound I-35W, destinations between I-94 and Lake Street have very limited access; through the I-94 commons area there is not an exit ramp from southbound I-35W for over 2.5 miles. Traffic destined from I-35W to the local system must travel down to the 35th Street exit ramp to enter the local street system and then back track north to their final destinations, a high percentage of which are business and residential trips served by 31st Street, Lake Street, 28th Street and 26th Street.

The new exit ramp will remove traffic demands from the 35th Street exit ramp, approximately 25% reduction in the design year forecasts. This reduction will improve operations at the 35th Street interchange, which has failing operations under existing conditions, and remove demand from the short weaving segment between 31st Street and 35th Street which will improve both safety and operations on I-35W.

The new exit ramp also completes accessibility to and from Lake Street along southbound I-35W by serving both “off” and “on” movements for improved access to commercial traffic generators. It should be noted that this does not complete the full interchange at Lake Street as the northbound entrance ramp is currently not proposed as part of this project.

Table 22
2038 Southbound I-35W PM Peak Comparison

Location		No Build Alternative			Build Alternative		
From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Begin SB I-35W	Washington CD Rd Entrance	9	117	***F***	51	28	D
Washington CD Rd Entrance	WB I-94 Entrance	10	120	***F***	40	42	**E**
WB I-94 Entrance	SB TH 65 Entrance	33	62	***F***	44	40	**E**
SB TH65 Entrance	Lake St Exit	57	34	D	55	31	D
Lake St Exit	Lake St BRT Exit				60	26	C
Lake St BRT Exit	Lake St BRT Entrance	48	41	**E**	60	30	D
Lake St BRT Entrance	31/Lake St Entrance	49	38	**E**	52	32	D
31/Lake St Entrance	35/36th St Exit	52	35	**E**	52	28	D
35/36th St Exit	35/36th St Entrance	59	34	D	60	31	D
35/36th St Entrance	46th St Exit	54	36	**E**	56	33	D
46th St Exit	46th St BRT Exit	63	22	C	64	24	C
46th St BRT Exit	46th St BRT Entrance	64	24	C	64	27	C
46th St BRT Entrance	46th St Entrance	56	24	C	61	24	C
46th St Entrance	60th St Exit	40	40	**E**	51	34	D
60th St Exit	TH 62 Exit	52	30	D	54	31	D
TH 62 Exit	**END SB I-35W**	64	19	B	64	19	B

4.4.3.1.1 *Southbound MnPASS*

The beginning location of the proposed southbound MnPASS lane was analyzed at multiple locations along TH 65 and I-35W. The results of the evaluation can be found in Appendix G. The three alternatives included:

- Beginning near 26th Street along I-35W
- Beginning along TH 65 after the EB I-94 Entrance Ramp
- Beginning from Downtown

The evaluation showed that the last two alternatives would remove existing capacity along TH 65 and create unnecessary congestion for the remaining general purpose vehicles. The two alternatives also did not result in an advantageous situation for the MnPASS lane as there is ample capacity along the proposed TH 65 without the MnPASS lane.

For this reason, the MnPASS lane for southbound I-35W will begin at approximately 26th Street. This will give I-35W traffic adequate length to maneuver to the left side of the freeway to access the MnPASS lane.

Metro Transit is currently evaluating the MnPASS lane in more detail along both northbound and southbound TH 65/I-35W as well as possible new connections to and from TH 65 and downtown Minneapolis. The study is currently in the evaluation phase and no findings are available at this time.

4.4.3.2 Northbound I-35W Exit to 28th Street

The proposed access to 28th Street will have a positive impact on traffic operations and safety along I-35W and the local arterial roadway network.

The 28th Street exit ramp provides a more direct access to the residences, businesses, employment centers, and regional destinations of south Minneapolis. It reduces the weaving

volumes between the 35th Street and 31st Street ramps and provides an extended auxiliary lane for the weaving demands. It also reduces the traffic impacts on the historic Healy Block Residential District and 2nd Avenue; which is a livability improvement to the historic district.

The improved access provides a more direct route for emergency vehicles. The neighborhoods north of 28th Street can be accessed more rapidly and the major hospitals, located along 28th Street, will have a more direct route for emergency trips with critical patients.

In both peak periods, the congestion extending from the I-35W/I-94 commons area spills upstream along I-35W, well south of the 28th Street exit area. The congestion in the PM peak period along I-35W extends well beyond the project area and there is no change between the No Build and Build operations. The proposed northbound improvements, especially the flyover ramp, draw more traffic downstream along both I-35W into the commons area and along TH 65 to westbound I-94 in the PM peak.

In the AM peak period, the demands into downtown are greater and the overall congestion along northbound I-35W is less than the PM peak. Therefore, Table 23 compares the AM operations with and without the 28th Street exit. While the overall change in traffic operations is not pronounced, it shows the proposed design does not cause an adverse impact.

Table 23
2038 Northbound I-35W AM Peak Comparison

Location		No Build Alternative			Build Alternative		
From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
35/36th St Exit	35/36th St Entrance	30	55	***F***	29	60	***F***
35/36th St Entrance	31/Lake St Exit	33	48	***F***	28	53	***F***
31/Lake St Exit	Lake St BRT Exit	37	43	**E**	29	45	***F***
Lake St BRT Exit	28th St Exit				36	42	**E**
28th St Exit	Lake St BRT Entrance	37	47	***F***	45	37	**E**
Lake St BRT Entrance	**NB I-35W/**TH 65 Split	37	45	***F***	41	40	**E**
NB I-35W/TH 65 Split	5th Ave Entrance	17	94	***F***	18	87	***F***
5th Ave Entrance	EB I-94 Entrance	29	60	***F***	29	58	***F***
EB I-94 Entrance	EB I-94 Exit	47	34	D	48	32	D
EB I-94 Exit	Washington Ave Exit	52	24	C	52	24	C

The proposed widening of I-35W to accommodate the MnPASS lanes and the center transit station remove the existing 2nd Avenue connection between Lake Street and 28th Street.

The new ramp removes traffic destined for 28th Street from the 31st Street exit and 2nd Avenue by providing a direct connection to 28th Street. This change reduces the weaving volumes between 35th Street entrance and 31st Street exit ramps. The 31st Street exit volume decreases by approximately 4,500 vehicles per day; an approximate 30% reduction of the design year daily traffic and below the current, existing demands. The improvement also provides an auxiliary lane for 35th Street entrance demands. The current weaving distance between 35th/31st is less than 600 feet and does not provide an escape lane. The new 28th Street exit would extend the lane approximately 1,800 feet further for a total of approximately 2,400 feet.

While the overall configuration of the proposed exit ramp would in fact keep traffic on northbound I-35W longer, the auxiliary lane provides the same capacity extended to the new exit ramp.

The 28th Street exit ramp also minimizes traffic impacts to the Healy Block Residential Historic District, traffic impacts to Lake Street and other local streets by allowing traffic destined for 28th Street to exit directly from I-35W. The reduction in demands along 2nd Avenue is a livability concern for the residents of the historic Healy Block district.

From a safety standpoint, the auxiliary lane is estimated to provide a 20% reduction in all crashes on this segment of northbound I-35W based the crash modification clearing house (CMF) estimates. The auxiliary lane to the 28th Street exit essentially provides an acceleration lane for the 35th Street entrance traffic and provide a greater distance to weave. This weaving segment has a significantly high crash rate of 3.6 crashes per million vehicle miles traveled, based on data from section 4.6 of this report.

The new ramp removes traffic from 2nd Avenue, which travels through the intersections of 31st Street and Lake Street, both of which have high crash rates. Using the five-year average crash rate (2009 to 2013), 2nd Avenue at Lake Street has a crash rate of 1.50 and 2nd Avenue at 31st Street has a crash rate of 1.78; Minneapolis average crash rate for similar intersections is 0.89. Arterial improvements are only proposed at Lake Street/2nd Avenue, which will likely reduce the crash rate by 25%. The reduction in traffic along 2nd Avenue would reduce total crashes at these two intersections by approximately 3.5 to 7 crashes per year through 2038; this is based on the change in entering ADT demands.

4.4.3.2.1 *Build Comparison with and without 28th Street*

The proposed forecast scenarios have some major capacity differences between the No Build and Build scenario for the northbound direction. The Build demands include additional capacity downstream from the 31st Street exit ramp that draws more traffic to the interchange and beyond. The proposed auxiliary lane included as part of the 28th Street exit ramp design and the modification to the northbound flyover ramp are capacity improvements that draw more trips into the corridor. For this exercise, the 31st Street and 28th Street exit ramp demands can be combined to evaluate the 31st exit alone.

In the No Build scenario, the PM peak hour demand to the 31st Street exit ramp is approximately 870 vehicles. While in the Build scenario, the PM peak hour demands to both the 31st Street exit ramp and the 28th Street exit ramp are approximately 680 vehicles and 610 vehicles respectively; approximately 1300 vehicle combined.

To assess the implications of the 28th Street exit ramp with similar volumes, an arterial analysis and HCS weaving analysis was conducted on the Build demands with and without the 28th Street exit ramp.

The weaving analysis was conducted for both peak periods using the 2010 HCS software. The change in weaving traffic demands is significant; though it should be noted that with the 28th Street exit the mainline through demands are increased in the comparison.

Table 24
2038 Northbound I-35W HCS Weaving Comparison

35th St Entrance to 31st Street Exit Weaving Segment	AM Peak			PM Peak		
	Weaving Demands	Volume/ Capacity	LOS	Weaving Demands	Volume/ Capacity	LOS
Build with 28th Street Exit	1,890	0.98	E	1,640	0.86	E
Build without 28th Street Exit	2,550	1.12	F	2,250	1.03	F

The results indicate that with the capacity improvements along northbound I-35W in the Build condition, the existing weaving segment would have a significant reduction in weaving performance without the 28th Street exit ramp.

On the arterial roadway network without the 28th Street exit, the additional traffic on 2nd Avenue will cause congestion problems at spot locations. Without the direct connection from 2nd Avenue to 28th Street, removed as part of the freeway widening, the traffic demands destined for areas north of Lake Street must turn onto Lake Street or 31st Street to find an alternate route to the north.

One of the major implications of closing 2nd Avenue between Lake Street and 28th Street is the lack of quality north-south connections between the east-west arterials.

East of I-35W, the next connecting roadway is 4th Avenue at which eastbound traffic cannot turn from Lake Street to the north along 4th Avenue. 5th Avenue also connects, but is a narrow street with on-street parking on both sides, making it not an attractive through route. 4th Avenue would likely be the most heavily used route, but traffic would use 31st Street to access 4th Avenue rather than Lake Street, forcing regional freeway traffic along a Major Collector.

West of I-35W there are limited options to connect between 31st Street and 28th Street, Stevens Avenue (north of Lake Street) will be converted to one-way southbound for the southbound I-35W exit ramp. 1st Avenue will remain available for northbound use, but is two blocks west of 2nd Avenue requiring some “back-tracking” and additional turning movements that would likely limit the number of users.

While the initial analysis resulted in many problematic movements, simple signal timing and phasing changes at spot locations would relieve almost all of the operation problems around the local network. However, the northbound approach of 2nd Avenue to 31st Street would have a significant queuing problem that cannot be relieved with additional capacity due to width constraints along the historic Healy Block.

The additional traffic from the freeway exit ramp to 31st Street increases the green time required for the northbound approach. The pedestrian crossing times control the minimum signal timing splits allowed for the 31st Street approaches. While the overall delay and LOS at the signal is acceptable, LOS C or better, the increased demand along 2nd Avenue extends the maximum northbound queue to approximately 950 feet; which would extends onto the northbound I-35W mainline. Maximum queue lengths under the scenario with the northbound exit to 28th Street will be 405 feet, which will not interfere with freeway operations.

This analysis was conducted using 3-lanes of approach along 2nd Avenue to 31st Street. Additional capacity beyond 3-lanes of approach could only be developed with significant right

of way impacts to the historic Healy Block district along 2nd Avenue and therefore not deemed to be reasonable.

4.4.3.3 Northbound I-35W Flyover – Left Side Entrance

The change for the flyover ramp from northbound I-35W to westbound I-94 does not directly add capacity to I-94. However, it removes a significant weaving demand prior to the Hennepin/Lyndale exit ramp which in turns improves traffic operations significantly.

Based on the 2038 forecasts, there is an approximate weaving demand of almost 3,500 vehicles in the PM peak hour between the entrance and exit ramp. The left side entrance reduces the weaving demands down to approximately 1,000 vehicles in the PM peak hour. The operations analysis did allow for a weaving movement from the left side entrance to the right side exit at Hennepin/Lyndale Avenue; however, if this movement was restricted, traffic operations would see a further positive improvement.

The proposed spacing between the left hand entrance and the Hennepin/Lyndale Avenue exit is approximately 2,800 feet. A vehicle entering on the left hand side from northbound I-35W would be required to make 3 lane-change maneuvers in order to exit at Hennepin/Lyndale Avenue. While there is adequate length for this movement to occur it should be considered for restriction to improve both safety and operations along westbound I-94.

The demand from the northbound I-35W flyover ramp to the Hennepin/Lyndale exit is approximately 10% of the ramp traffic, based on the 2011 Origin-Destination study, and the movement can be accommodated through the downtown street network. In addition, allowing such a weaving movement from the left to right of the highway, in a congested section of highway would likely have a significant negative impact on safety.

Physically restricting the left to right side weaving movement would be difficult. A double white pavement marking and highway signage could be utilized; however experience shows these are not completely effective. Barrier separation would provide the best restriction; however the inclusion of a barrier would change the typical section and would have incredible construction related impacts along the tight corridor. Barrier separation would also shorten the weaving distance for northbound I-35W traffic destined to westbound I-394; putting the majority of the lane changes at the highway curve and inside the tunnel.

It should be noted that there are no current plans to expand the Lowry Tunnel and therefore it will remain a major bottleneck along I-94.

The table below shows a slight improvement in the total length of congestion along westbound I-94. In the No Build scenario, the congestion will spill upstream of the modeling limits which extended over the Mississippi River Bridge. The proposed left side entrance will reduce the length of congested flow to begin around the 5th Street exit ramp; this is a reduction in congested segment length of approximately 1-mile.

However the biggest benefit to this access change is the total traffic throughput. Under the No Build scenario, demand through the tunnel was forecast to approximately 6,300 vph; however only 5,300 would be served which is over a 15% reduction due to congestion. Under the proposed conditions, all 6,300 vehicles will be served through the tunnel.

Table 25
2038 Westbound I-94 PM Peak Comparison

Location		No Build Alternative			Build Alternative		
From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Begin WB I-94	5th St Exit	45	43	***F***	60	23	C
5th St Exit	SB I-35W Exit	20	67	***F***	38	36	**E**
SB I-35W Exit	Washington CD Rd Entrance	17	72	***F***	27	55	***F***
Washington CD Rd Entrance	11th St Exit	16	71	***F***	30	48	***F***
11th St Exit	NB I-35W Entrance	15	91	***F***	31	55	***F***
NB I-35W Entrance	4th Ave Entrance				31	55	***F***
4th Ave Entrance	Lyndale/Hennepin Exit	42	39	**E**	36	50	***F***
Lyndale/Hennepin Exit	WB I-394 Exit	42	40	**E**	38	53	***F***
WB I-394 Exit	TH 55 Exit	53	17	B	53	19	B
TH 55 Exit	**END WB I-94**	54	16	B	54	18	B

4.5 Year of Opening Conditions

The design year for this project is 2018. The operations analysis for the design year consisted of No Build and Build conditions.

Full measure of effectiveness tables for both the Build and No Build can be found in Appendix C.

4.5.1 No Build

Traffic demands will only have a moderate increase from existing conditions to the year of opening. Therefore, congestion will slightly increase over existing conditions.

4.5.1.1 Northbound I-35W

Congestion will increase slightly by 2018 over existing conditions. The I-94/I-35W commons area has several contributing factors including the 35 mph curve and the weaving area between the 5th Avenue entrance, the EB I-94 entrance and the EB I-94 exit ramps.

Table 26
2018 No Build MOEs – Northbound I-35W

Location		AM Peak			PM Peak		
From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Begin NB I-35W	TH 62 Entrance	62	20	C	62	21	C
TH 62 Entrance	60th St Entrance	64	18	B	64	19	B
60th St Entrance	Diamond Lake Exit	65	17	B	63	18	B
Diamond Lake Exit	Diamond Lake Entrance	65	21	C	64	22	C
Diamond Lake Entrance	46th St Exit	55	27	C	61	23	C
46th St Exit	46th St TRANSIT Exit	45	29	D	65	18	B
46th St TRANSIT Exit	46th St TRANSIT Entrance	36	42	**E**	65	21	C
46th St TRANSIT Entrance	46th St Entrance	28	45	***F***	65	18	B
46th St Entrance	35/36th St Exit	30	53	***F***	61	23	C
35/36th St Exit	35/36th St Entrance	31	51	***F***	54	26	C
35/36th St Entrance	31/Lake St Exit	35	43	**E**	44	30	D
31/Lake St Exit	Lake St TRANSIT Exit	42	35	**E**	43	30	D
Lake St TRANSIT Exit	Lake St TRANSIT Entrance	45	35	**E**	42	33	D
Lake St TRANSIT Entrance	NB I-35W/TH 65 SPLIT	53	29	D	40	32	D
NB I-35W/TH 65 Split	5th Ave Entrance	40	44	***F***	34	48	***F***
5th Ave Entrance	EB I-94 Entrance	35	48	***F***	34	52	***F***
EB I-94 Entrance	EB I-94 Exit	49	30	D	46	34	D
EB I-94 Exit	Washington Ave Exit	52	23	C	49	30	D
Washington Ave Exit	**END NB I-35W**	56	26	C	55	35	**E**
Begin NB TH 65	WB I-94 Exit	52	28	D	27	42	**E**
WB I-94 Exit	**END NB TH 65**	53	19	B	53	13	B

Northbound I-35W/TH 65

4.5.1.2 Southbound I-35W

Overall operations for southbound will remain unchanged by 2018 over existing conditions.

Table 27
2018 No Build MOEs – Southbound I-35W

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB TH 65**	12th St Entrance	63	4	A	58	18	B
	12th St Entrance	EB I-94 Entrance	56	6	A	49	25	C
	EB I-94 Entrance	SB I-35W Entrance	60	14	B	53	29	D
	Begin SB I-35W	Washington CD Rd Entrance	57	23	C	57	18	B
	Washington CD Rd Entrance	WB I-94 Entrance	51	25	C	46	25	C
	WB I-94 Entrance	SB TH 65 Entrance	45	37	**E**	40	45	***F***
	SB I-35W Entrance	Lake St TRANSIT Exit	62	23	C	58	33	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	64	23	C	52	38	**E**
	Lake St TRANSIT Entrance	31/Lake St Entrance	63	22	C	52	36	**E**
	31/Lake St Entrance	35/36th St Exit	59	22	C	52	35	D
	35/36th St Exit	35/36th St Entrance	65	23	C	60	33	D
	35/36th St Entrance	46th St Exit	62	24	C	55	34	D
	46th St Exit	46th St TRANSIT Exit	65	17	B	63	22	C
	46th St TRANSIT Exit	46th St TRANSIT Entrance	66	18	B	65	23	C
	46th St TRANSIT Entrance	46th St Entrance	65	16	B	63	21	C
	46th St Entrance	60th St Exit	61	20	C	52	29	D
	60th St Exit	TH 62 Exit	60	21	C	53	28	C
	TH 62 Exit	**END SB I-35W**	66	15	B	65	17	B

4.5.1.3 Eastbound I-94

The existing Lowry Tunnel is a major bottleneck for eastbound I-94 that will constrain growth in the corridor. Therefore, congestion will remain basically unchanged with slow moving traffic from west of I-394 to the NB I-35W exit.

Table 28
2018 No Build MOEs – Eastbound I-94

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**	EB I-394 Entrance	49	39	**E**	50	37	**E**
	EB I-394 Entrance	Lyndale/Hennepin Entrance	36	55	***F***	39	49	***F***
	Lyndale/Hennepin Entrance	SB I-35W Exit	44	44	***F***	47	40	**E**
	SB I-35W Exit	NB I-35W Exit	51	38	**E**	51	37	**E**
	NB I-35W Exit	5th Ave Entrance	51	32	D	51	31	D
	5th Ave Entrance	TH 55 Exit	55	24	C	55	24	C
	TH 55 Exit	NB I-35W Entrance	59	25	C	59	24	C
	NB I-35W Entrance	6th St Entrance	61	23	C	61	20	C
	6th St Entrance	**END EB I-94**	60	25	C	59	26	C

4.5.1.4 Westbound I-94

The existing Lowry Tunnel is one of the major bottlenecks for westbound I-94 during both A.M. and P.M. peak periods. There is also a very high weaving demand between the northbound I-35W flyover/4th Avenue combined entrance ramp and the Hennepin/Lyndale exit ramp. Therefore, congestion will remain basically unchanged with slow moving traffic from Huron Boulevard to I-394.

In the PM peak hour the congestion is not able to serve the entire demands. There is an approximate 10% shortfall of traffic being served through the Lowry Tunnel.

Table 29
2018 No Build MOEs – Westbound I-94

	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Westbound I-94	**Begin WB I-94**	5th St Exit	60	24	C	33	63	***F***
	5th St Exit	SB I-35W Exit	51	23	C	12	94	***F***
	SB I-35W Exit	Washington CD Rd Entrance	50	28	C	14	85	***F***
	Washington CD Rd Entrance	11th St Exit	48	29	D	14	76	***F***
	11th St Exit	NB I-35W/4th Ave Entrance	45	34	D	15	92	***F***
	NB I-35W/4th Ave Entrance	Lyndale/Hennepin Exit	44	35	**E**	42	39	**E**
	Lyndale/Hennepin Exit	WB I-394 Exit	42	41	**E**	42	40	**E**
	WB I-394 Exit	TH 55 Exit	53	14	B	53	17	B
	TH 55 Exit	**END WB I-94**	54	14	B	54	16	B

4.5.1.1 Arterial Intersections

With increased traffic demands and only improving the signal timings, the existing arterial network degrades over the existing conditions.

The AM peak hour operations for all intersections are still acceptable. The PM peak hour operations for Lake Street, 31st Street, and 28th Street all have slightly degraded operations during the PM peak hour.

The Franklin Avenue intersections have severely degraded operations. This type of delay could potentially cause traffic patterns to shift in the area; however there is limited options for access to the freeway system. The growth from existing demands to 2018 demands only represents an approximate 10% increase in total entering demands. Due to the limited freeway access, traffic would likely sit through multiple cycles, as they do under existing conditions, rather than drive long distances on congested arterials to another freeway access.

The northbound I-35W exit ramp to 31st Street does queue at the signal and extend upstream to potentially impact the freeway operations.

Table 30
2018 No Build Arterial Conditions MOEs

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Lake Street @ Stevens Avenue (signal control)	SB	36.1 / D	8.6 / A	40.5 / D	19.4 / B
	EB	5 / A		17.7 / B	
	WB	5.3 / A		15.6 / B	
Lake Street @ 2nd Avenue (signal control)	NB	35.1 / D	18.9 / B	16.3 / B	9.1 / A
	EB	11.6 / B		4.7 / A	
	WB	4 / A		7.6 / A	
31st Street @ Stevens Avenue (signal control)	SB	29.6 / C	20 / C	27.3 / C	54.8 / D
	EB	13.1 / B		13.1 / B	
	WB	15.2 / B		**103.3 / F**	
31st Street @ 2nd Avenue (signal control)	NB	22.4 / C	19.9 / B	19.8 / B	**102.7 / F**
	EB	21.7 / C		17.7 / B	
	WB	10.3 / B		**295.5 / F**	
28th Street @ Clinton Avenue (signal control)	NB	11.2 / B	4.7 / A	4.5 / A	2.7 / A
	EB	2.6 / A		2.3 / A	
28th Street @ 4th Avenue (signal control)	NB	19.8 / B	6.2 / A	34.2 / C	15.2 / B
	SB	36.3 / D		22.7 / C	
	EB	3 / A		8.1 / A	
Franklin Avenue @ 4th Avenue (signal control)	NB	15 / B	6.4 / A	**300 / F***	**300 / F***
	SB	28.2 / C		**300 / F***	
	EB	5.1 / A		**300 / F***	
	WB	4 / A		6.5 / A	
Franklin Avenue @ 5th Avenue (signal control)	NB	36.2 / D	14.7 / B	**102.7 / F**	50.4 / D
	EB	14.2 / B		**71.6 / E**	
	WB	6.7 / A		17.3 / B	

*Delay exceeds greater than 300 seconds (5 minutes)

4.5.2 Build

Traffic demands under the Build condition will increase from the No Build demands with the change in access and additional auxiliary lane and MnPASS capacity.

4.5.2.1 Northbound I-35W

The proposed project does provide benefits for northbound I-35W, however the bottleneck of the 35 mph curve and I-94 commons area will still create congested conditions along the corridor. The I-94/I-35W commons area has several contributing factors including the 35 mph curve and the weaving area between the 5th Avenue entrance, the EB I-94 entrance and the EB I-94 exit ramps.

In the PM peak hour, the north to west flyover will no longer spill back onto TH 65 and add to the congestion along northbound I-35W. However, northbound I-35W will serve more demand through the TH 65 diverge which increase congestion from the I-94 commons upstream to Lake Street.

Table 31
2018 Build MOEs – Northbound I-35W

Northbound I-35W/TH 65	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
	Begin NB I-35W	TH 62 Entrance	62	20	C	61	22	C
	TH 62 Entrance	60th St Entrance	64	17	B	64	19	B
	60th St Entrance	Diamond Lake Exit	65	17	B	62	19	B
	Diamond Lake Exit	Diamond Lake Entrance	65	21	C	63	22	C
	Diamond Lake Entrance	46th St Exit	61	24	C	60	24	C
	46th St Exit	46th St BRT Exit	65	19	B	65	18	B
	46th St BRT Exit	46th St BRT Entrance	64	23	C	65	21	C
	46th St BRT Entrance	46th St Entrance	56	23	C	64	18	B
	46th St Entrance	35/36th St Exit	57	29	D	62	23	C
	35/36th St Exit	35/36th St Entrance	41	42	**E**	63	22	C
	35/36th St Entrance	31/Lake St Exit	33	45	***F***	53	23	C
	31/Lake St Exit	Lake St BRT Exit	33	39	**E**	46	24	C
	Lake St BRT Exit	28th St Exit	39	38	**E**	36	35	**E**
	28th St Exit	Lake St BRT Entrance	48	35	D	28	49	***F***
	Lake St BRT Entrance	NB I-35W/TH 65 SPLIT	47	34	D	29	47	***F***
	NB I-35W/TH 65 Split	5th Ave Entrance	24	70	***F***	16	102	***F***
	5th Ave Entrance	EB I-94 Entrance	32	53	***F***	29	64	***F***
	EB I-94 Entrance	EB I-94 Exit	48	32	D	45	36	**E**
	EB I-94 Exit	Washington Ave Exit	51	24	C	49	30	D
	Washington Ave Exit	**END NB I-35W**	56	27	C	55	35	**E**
	Begin NB TH 65	WB I-94 Exit	49	30	D	52	22	C
	WB I-94 Exit	**END NB TH 65**	53	19	B	54	13	B

4.5.2.2 Southbound I-35W

Overall operations southbound are improved with the proposed project. The auxiliary lane between the westbound I-94 entrance and the new Lake Street exit ramp provides added capacity through the commons. The reconfiguration of TH 65 to the left side allow full access to the new MnPASS lane.

Table 32
2018 Build MOEs – Southbound I-35W

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB TH 65**	12th St Entrance	63	5	A	57	20	B
	12th St Entrance	EB I-94 Entrance	55	9	A	49	28	C
	EB I-94 Entrance	SB I-35W Entrance	60	16	B	59	26	C
	Begin SB I-35W	Washington CD Rd Entrance	54	29	D	54	24	C
	Washington CD Rd Entrance	WB I-94 Entrance	48	32	D	43	35	**E**
	WB I-94 Entrance	SB TH 65 Entrance	50	28	D	48	34	D
	SB TH65 Entrance	Lake St Exit	60	20	C	56	28	D
	Lake St Exit	Lake St BRT Exit	64	17	B	60	25	C
	Lake St BRT Exit	Lake St BRT Entrance	64	19	B	60	28	D
	Lake St BRT Entrance	31/Lake St Entrance	59	20	B	51	31	D
	31/Lake St Entrance	35/36th St Exit	59	17	B	52	27	C
	35/36th St Exit	35/36th St Entrance	64	21	C	61	29	D
	35/36th St Entrance	46th St Exit	61	22	C	56	31	D
	46th St Exit	46th St BRT Exit	65	19	B	64	23	C
	46th St BRT Exit	46th St BRT Entrance	65	21	C	64	25	C
	46th St BRT Entrance	46th St Entrance	63	18	B	62	23	C
	46th St Entrance	60th St Exit	58	23	C	53	30	D
	60th St Exit	TH 62 Exit	58	23	C	54	29	D
	TH 62 Exit	**END SB I-35W**	65	16	B	65	18	B

4.5.2.3 Eastbound I-94

With no proposed changes to eastbound I-94, the operations are nearly identical to the No Build scenario.

Table 33
2018 Build MOEs – Eastbound I-94

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**	EB I-394 Entrance	49	39	**E**	50	38	**E**
	EB I-394 Entrance	Lyndale/Hennepin Entrance	35	55	***F***	38	51	***F***
	Lyndale/Hennepin Entrance	SB I-35W Exit	44	44	***F***	47	40	**E**
	SB I-35W Exit	NB I-35W Exit	51	37	**E**	51	36	**E**
	NB I-35W Exit	5th Ave Entrance	51	31	D	51	29	D
	5th Ave Entrance	TH 55 Exit	55	23	C	55	23	C
	TH 55 Exit	NB I-35W Entrance	59	24	C	59	23	C
	NB I-35W Entrance	6th St Entrance	61	22	C	61	20	C
	6th St Entrance	**END EB I-94**	61	24	C	59	26	C

4.5.2.4 Westbound I-94

The proposed project removes a significant weaving demands between the I-35W flyover ramp and the Hennepin/Lyndale exit ramp. The new left side entrance ramp will enter into a full lane along westbound I-94. This allows the northbound I-35W flyover ramp volume to enter westbound I-94 and enter the Lowry Tunnel with minimal congestion. The reduced weaving demands between 4th Avenue entrance and the Hennepin/Lyndale exit ramp improve traffic operations to allow more demand access to the Lowry Tunnel.

In both peak periods there is a noticeable congestion reduction. In the PM peak hour all of the traffic demands are being served through the Lowry Tunnel.

Table 34
2018 Build MOEs – Westbound I-94

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**	5th St Exit	60	25	C	61	21	C
	5th St Exit	SB I-35W Exit	52	23	C	52	24	C
	SB I-35W Exit	Washington CD Rd Entrance	51	27	C	51	24	C
	Washington CD Rd Entrance	11th St Exit	48	29	D	50	24	C
	11th St Exit	NB I-35W Entrance	50	30	D	51	29	D
	NB I-35W Entrance	4th Ave Entrance	49	31	D	50	30	D
	4th Ave Entrance	Lyndale/Hennepin Exit	47	32	D	47	34	D
	Lyndale/Hennepin Exit	WB I-394 Exit	41	43	***F***	41	44	***F***
	WB I-394 Exit	TH 55 Exit	53	15	B	52	18	B
	TH 55 Exit	**END WB I-94**	54	14	B	54	17	B

4.5.2.5 Arterial Intersections

Under the Build conditions, all intersections operate acceptably during both peak hours. All approaches operate at a LOS D or better. The added intersection capacity and traffic demand shifts allow traffic to easily flow through the area.

Along 31st Street, a westbound left turn phase was included at the Stevens Avenue intersection. This allows the westbound traffic through both ramp terminal intersections without long queues and delays. The reduction in demands from northbound I-35W and the left turn phase improve the queuing along 2nd Avenue as to not have an impact to the freeway.

Along 28th Street, the existing intersection of 2nd Avenue is replaced with the new northbound I-35W exit ramp; this ramp includes dual right turn lanes onto 28th Street. The existing capacity along 28th Street allows for the traffic pattern change to occur without impacting traffic operations.

Along Franklin Avenue, a new bridge allows for adding back to back left turn lanes for the eastbound and westbound approaches. The northbound approach of 5th Avenue to Franklin Avenue will be converted to a one-way northbound roadway from 22nd Street to Franklin Avenue. This eliminates addition conflicts at the intersection and allows for two northbound through lanes without needing additional right of way. These changes allow the 2038 traffic demands to operate acceptably.

Table 35
2018 Build Arterial Conditions MOEs

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Lake Street @ Stevens Avenue (signal control)	SB	23.4 / C	13.5 / B	29 / C	19.2 / B
	EB	4 / A		14.6 / B	
	WB	7 / A		12.6 / B	
Lake Street @ 2nd Avenue (signal control)	NB	28 / C	8.2 / A	19 / B	7.5 / A
	EB	3.5 / A		6.1 / A	
	WB	2.5 / A		5.2 / A	
31st Street @ Stevens Avenue (signal control)	SB	29.6 / C	17.3 / B	31 / C	24.2 / C
	EB	10.3 / B		13.7 / B	
	WB	7 / A		23.3 / C	
31st Street @ 2nd Avenue (signal control)	NB	23.4 / C	13.9 / B	24 / C	16.2 / B
	EB	4.8 / A		9 / A	
	WB	6.1 / A		13.6 / B	
28th Street @ I-35W Exit Ramp (signal control)	NB	7.2 / A	4.8 / A	5.3 / A	5.6 / A
	EB	3.7 / A		5.8 / A	
28th Street @ 4th Avenue (signal control)	NB	17 / B	5.6 / A	31.5 / C	15.2 / B
	SB	35.5 / D		25.9 / C	
	EB	2.6 / A		9.8 / A	
Franklin Avenue @ 4th Avenue (signal control)	NB	14 / B	6.7 / A	21.5 / C	7.3 / A
	SB	29.6 / C		36.6 / D	
	EB	5.2 / A		6.9 / A	
	WB	4.1 / A		3 / A	
Franklin Avenue @ 5th Avenue (signal control)	NB	34.2 / C	14.6 / B	41.1 / D	27.9 / C
	EB	9 / A		18.8 / B	
	WB	12.5 / B		29.7 / C	

4.5.3 2018 Comparison of Design Changes

The proposed design changes have a dramatic roadway network change from the No Build scenario compared to the Build scenario. Data from the forecast model was compared for all vehicle miles traveled (VMT) in the 7-county metro area on a daily level.

As many different forecast scenarios were developed at the beginning of the project, the following tables will compare the three main changes to the freeway network against the No Build scenario. Both the southbound I-35W Lake Street exit and the northbound I-35W 28th Street exit were compared together and separately; these forecast scenarios do not include the southbound I-35W MnPASS improvement which was a project component that was identified later in the study process. The Preferred Build Scenario includes both exit ramps and the MnPASS lanes; all options include the improvements along westbound I-94.

Under the Build conditions, there is a reduction in VMT for the arterial roadway networks for all scenarios; however the freeway roadway networks have an increase until consideration of the MnPASS lanes.

This infers that the proposed access changes, provide a more direct connection that allows users to reach their destinations on a shorter path. The capacity benefits of each scenario along the freeway segments will be fully utilized as evidence in the increased freeway VMT. In the full build, the improvements provide a much more complete roadway network that allows users to reach their destinations on a shorter path.

Table 36, below, represents the total daily VMT data taken from the regional forecast model. From the data, the southbound I-35W MnPASS lane has the biggest impact of the proposed changes.

Table 36
2018 Vehicle Miles Traveled

Alternative	Freeway Network	Arterial Network	Total Roadway Network
No Build Scenario	**37,498,660**	**46,058,219**	**83,556,879**
SB Exit Only Scenario	37,531,029	46,029,813	83,560,842
Change from No Build	32,369	-28,406	3,963
NB Exit Only Scenario	37,517,868	46,025,967	83,543,835
Change from No Build	19,208	-32,252	-13,044
SB Exit/NB Exit Scenario	37,530,266	45,980,294	83,510,560
Change from No Build	31,606	-77,925	-46,319
Preferred Build Scenario	37,423,616	45,709,983	83,133,599
Change from No Build	-75,044	-348,236	-423,280

*The SB I-35W MnPASS lanes are only included in the Preferred Build Scenario

Under the Build conditions, there is a reduction in VHT for the arterial roadway networks for all scenarios; however the freeway roadway networks have an increase until the MnPASS lanes are considered.

This infers that the proposed access changes, provide a more direct connection that allows users to reach their destinations on a shorter path and faster time. The capacity benefits of each scenario along the freeway segments will be fully utilized as evidence in the increased freeway VHT. In the full build, the improvements provide a much more complete roadway network that allows users to reach their destinations on a shorter path.

Table 37, below, represents the total daily VHT data taken from the regional forecast model. From the data, the southbound I-35W MnPASS lane has the biggest impact of the proposed changes.

Table 37
2018 Vehicle Hours Traveled

Alternative	Freeway Network	Arterial Network	Total Roadway Network
No Build Scenario	**1,003,092**	**1,920,327**	**2,923,419**
SB Exit Only Scenario	1,003,605	1,915,847	2,919,452
Change from No Build	513	-4,480	-3,967
NB Exit Only Scenario	1,003,397	1,916,195	2,919,592
Change from No Build	305	-4,132	-3,827
SB Exit/NB Exit Scenario	1,003,279	1,908,076	2,911,355
Change from No Build	187	-12,251	-12,064
Preferred Build Scenario	991,599	1,873,990	2,865,589
Change from No Build	-11,493	-46,337	-57,830

*The SB I-35W MnPASS lanes are only included in the Preferred Build Scenario

4.5.3.1 Southbound I-35W Exit to Lake Street and Braid Bridge

The combination of the southbound I-35W/TH 65 changes have a dramatic improvement for traffic both on the freeway and local roadway network.

The table shows the comparison of the No Build and Build scenarios for the year of opening demands. As with the design year demands, the Build alternative has a significant improvement over the No Build scenario.

Table 38
2018 Southbound I-35W PM Peak Comparison

Location		No Build Alternative			Build Alternative		
From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Begin SB I-35W	Washington CD Rd Entrance	57	18	B	54	24	C
Washington CD Rd Entrance	WB I-94 Entrance	46	25	C	43	35	**E**
WB I-94 Entrance	SB TH 65 Entrance	40	45	***F***	48	34	D
SB TH65 Entrance	Lake St Exit	58	33	D	56	28	D
Lake St Exit	Lake St BRT Exit				60	25	C
Lake St BRT Exit	Lake St BRT Entrance	52	38	**E**	60	28	D
Lake St BRT Entrance	31/Lake St Entrance	52	36	**E**	51	31	D
31/Lake St Entrance	35/36th St Exit	52	35	D	52	27	C
35/36th St Exit	35/36th St Entrance	60	33	D	61	29	D
35/36th St Entrance	46th St Exit	55	34	D	56	31	D
46th St Exit	46th St BRT Exit	63	22	C	64	23	C
46th St BRT Exit	46th St BRT Entrance	65	23	C	64	25	C
46th St BRT Entrance	46th St Entrance	63	21	C	62	23	C
46th St Entrance	60th St Exit	52	29	D	53	30	D
60th St Exit	TH 62 Exit	53	28	C	54	29	D
TH 62 Exit	**END SB I-35W**	65	17	B	65	18	B

4.5.3.2 Northbound I-35W Exit to 28th Street

The proposed direct access to 28th Street will have a positive impact on traffic operations and safety along I-35W and the local arterial roadway network.

In the year of opening, the added capacity of the 28th Street auxiliary lane, improved weaving section between 35th Street and 31st Street, and the northbound flyover change all attract more trips along northbound I-35W and allows more throughput to continue along I-35W.

The AM peak hour comparison results in essentially no change between the No Build and Build alternatives. However this demonstrates no adverse impacts to northbound I-35W.

Approximately 250 more vehicles are being served into the constrained I-94 commons area during the PM peak hour, there is more queuing along northbound I-35W in the Build versus the No Build.

While the additional traffic in the commons extends congestion further upstream, due to the increase throughput, the segments approaching the 31st Street weaving area are improved over the No Build condition.

Table 39
2018 Northbound I-35W aM Peak Comparison

Location		No Build Alternative			Build Alternative		
From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
35/36th St Exit	35/36th St Entrance	31	51	***F***	41	42	**E**
35/36th St Entrance	31/Lake St Exit	35	43	**E**	33	45	***F***
31/Lake St Exit	Lake St BRT Exit	42	35	**E**	33	39	**E**
Lake St BRT Exit	28th St Exit				39	38	**E**
28th St Exit	Lake St BRT Entrance	45	35	**E**	48	35	D
Lake St BRT Entrance	**NB I-35W/**TH 65 Split	53	29	D	47	34	D
NB I-35W/TH 65 Split	5th Ave Entrance	40	44	***F***	24	70	***F***
5th Ave Entrance	EB I-94 Entrance	35	48	***F***	32	53	***F***
EB I-94 Entrance	EB I-94 Exit	49	30	D	48	32	D
EB I-94 Exit	Washington Ave Exit	52	23	C	51	24	C

Table 40
2018 Northbound I-35W PM Peak Comparison

Location		No Build Alternative			Build Alternative		
From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
35/36th St Exit	35/36th St Entrance	54	26	C	63	22	C
35/36th St Entrance	31/Lake St Exit	44	30	D	53	23	C
31/Lake St Exit	Lake St BRT Exit	43	30	D	46	24	C
Lake St BRT Exit	28th St Exit				36	35	E
28th St Exit	Lake St BRT Entrance	42	33	D	28	49	***F***
Lake St BRT Entrance	**NB I-35W/**TH 65 Split	40	32	D	29	47	***F***
NB I-35W/TH 65 Split	5th Ave Entrance	34	48	***F***	16	102	***F***
5th Ave Entrance	EB I-94 Entrance	34	52	***F***	29	64	***F***
EB I-94 Entrance	EB I-94 Exit	46	34	D	45	36	E
EB I-94 Exit	Washington Ave Exit	49	30	D	49	30	D

Though the congestion will increase, due to increase in throughput, the benefits of the exit ramp access and traffic safety are still apparent.

4.5.3.3 Northbound I-35W Flyover – Left Side Entrance

The change for the flyover ramp from northbound I-35W to westbound I-94 does not directly add capacity to I-94. However, it removes a significant weaving demand prior to the Hennepin/Lyndale exit ramp which in turns improves traffic operations significantly.

The following table shows a comparison of the No Build and Build scenarios for the year of opening demands. As with the design year demands, the Build alternative has a significant improvement over the No Build scenario.

Table 41
2018 Westbound I-94 PM Peak Comparison

Location		No Build Alternative			Build Alternative		
From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Begin WB I-94	5th St Exit	33	63	***F***	61	21	C
5th St Exit	SB I-35W Exit	12	94	***F***	52	24	C
SB I-35W Exit	Washington CD Rd Entrance	14	85	***F***	51	24	C
Washington CD Rd Entrance	11th St Exit	14	76	***F***	50	24	C
11th St Exit	NB I-35W Entrance	15	92	***F***	51	29	D
NB I-35W Entrance	4th Ave Entrance				50	30	D
4th Ave Entrance	Lyndale/Hennepin Exit	42	39	**E**	47	34	D
Lyndale/Hennepin Exit	WB I-394 Exit	42	40	**E**	41	44	***F***
WB I-394 Exit	TH 55 Exit	53	17	B	52	18	B
TH 55 Exit	**END WB I-94**	54	16	B	54	17	B

4.6 Safety Analysis

Crash history along the freeway mainline and at different arterial locations around the study area were evaluated.

4.6.1 Freeway Mainline Safety Analysis

Crashes in the project reconstruction area were evaluated between January 1st, 2011 and December 31st, 2013. Within that time period there was a total of 1,426 within the study area are related to the freeway mainline and freeway ramp.

Typical urban freeway segments in the Twin Cities metro area have a crash rate of 1.1 crashes per million vehicle miles traveled (MVMT); data was provided by MnDOT and averaged from data between 2010 and 2012. The severity rate for an urban freeway is 1.4, which is a weighted crash rate based on the severity of the crash. The following tables represent the 3-year crash history along mainline I-35W, I-94, and TH 65.

4.6.1.1 I-35W Mainline

Table 42 shows the total number of crashes along I-35W, a total of 1,051 crash occurred between approximately 43rd Street and the 11th Avenue overpass. Northbound I-35W had a total of 696 crashes and southbound I-35W had a total of 355 crashes. This corresponds to congestion levels along I-35W, based on the 2013 MnDOT Congestion Report, northbound is congested between 1 and 7 hours while southbound is congested for less than 2 hours.

The entire northbound I-35W study area has crash rates that are higher than the statewide average rates for an urban freeway. Southbound I-35W is above the average rates for most of the project area. The short weaving section between 31st Street and 35th Street, in both directions, is approximately three times the average crash rate.

Table 42
I-35W Existing Crash Summary 2011-2013

	From	To	Fatal	A	B	C	Property	Total	Crash Rate	Severity Rate
NB I-35W	43rd Street	36th Street Exit	0	1	6	12	79	98	**1.2**	**1.6**
	36th Street Exit	35th Street Entrance	0	0	4	11	49	64	**1.2**	**1.6**
	35th Street Entrance	31st Street Exit	0	0	3	10	46	59	**3.6**	**4.5**
	31st Street Exit	Greenway Bridge	0	0	3	9	50	62	**1.4**	**1.8**
	Greenway Bridge	TH 65 Diverge	0	0	15	35	191	241	**3.8**	**4.8**
	TH 65 Diverge	5th Ave Entrance	0	0	6	21	96	123	**4.4**	**5.6**
	5th Ave Entrance	EB I-94 Entrance	0	0	1	3	9	13	**1.3**	**1.8**
	EB I-94 Entrance	11th Ave Bridge	0	0	1	7	28	36	**2.3**	**2.9**
SB I-35W	SB I-35W Begin 11th Ave	Portland Bridge	0	0	4	7	23	34	**1.3**	**1.9**
	Portland Bridge	TH 65 Merge	0	1	2	19	88	110	**2.7**	**3.3**
	TH 65 Merge	28th Street Bridge	0	0	3	9	48	60	**1.8**	**2.2**
	28th Street Bridge	31st Street Entrance	0	1	2	8	24	35	**0.6**	**0.9**
	31st Street Entrance	35th Street Exit	0	0	4	11	31	46	**3.2**	**4.5**
	35th Street Exit	36th Street Entrance	0	0	5	11	32	48	**0.8**	**1.2**
	36th Street Entrance	43rd Street	0	0	4	4	14	22	**0.3**	**0.4**
	TOTALS		**0**	**3**	**63**	**177**	**808**	**1,051**		

The proposed design along both northbound and southbound I-35W will address some of the existing design and congestion problems and help reduce crashes along the corridor.

The main improvement for northbound I-35W will be the expansion of the existing PDSL to a full MnPASS lane. The 28th Street exit ramp includes the extension of the existing auxiliary lane between the 35th Street entrance and the 31st Street exit ramp from approximately 580 feet to approximately 2,500 feet; this more safely serves the weaving demands; the crash modification clearing house (CMF) estimates the auxiliary lane to provide over 20% reduction in crashes for the added lane. The northbound I-35W flyover ramp design will remove the spillback congestion from I-94 along TH 65 and reduce the number of congestion related collisions. Northbound I-35W around the 35 mph curve is not addressed as part of this project, so congestion and safety problems will remain.

Southbound I-35W has many improvements that will reduce both congestion and safety problems. The exit ramp to Lake Street will shift traffic demands from the 35th Street exit, which will reduce the weaving volume between 31st Street and 35th Street. The proposed exit ramp includes an auxiliary lane from the I-94 commons to the proposed exit; the proposed design also increases the radius of the existing 35 mph curve to 45 mph. Shifting southbound I-35W to the right side of the freeway will better align southbound TH 65 and reduce the existing weaving traffic demands that occur as HOV vehicles from downtown shift towards the left side of I-35W prior to the existing MnPASS lane. The added capacity of the MnPASS lane will alleviate congestion along southbound I-35W and improve safety.

4.6.1.2 Westbound I-94 Mainline

Table 43 shows the total number of crashes along westbound I-94, a total of 223 crash occurred between approximately the 11th Street exit and approximately 850 feet west of the northbound I-35W entrance ramp.

The majority of the crashes along this portion of westbound I-94 occur between the 11th Street exit ramp and the northbound I-35W/4th Avenue entrance ramp. This segment of I-94 is overwhelmed with congestion, over 7 hours per day based on MnDOT data. There are also geometric deficiencies including sight lines and horizontal curves that add to the crash problems.

Of the 223 crashes, 196 crashes were rear end collisions and 18 were side swipe collisions, which are typical of congested freeways. The crash rate and severity rates along westbound I-94 are significantly higher than the average statewide urban freeway segments.

Table 43
I-94 Existing Crash Summary 2011-2013

	From	To	Fatal	A	B	C	Property	Total	Crash Rate	Severity Rate
WB I-94	WB I-94 Begin	11th Street Exit	1	0	1	4	27	33	**3.4**	**4.5**
	11th Street Exit	NB I-35W Entrance	0	0	11	37	125	173	**7.7**	**10.4**
	NB I-35W Entrance	850 feet West	0	0	2	1	14	17	0.9	1.2
	TOTALS		**1**	**0**	**14**	**42**	**166**	**223**		

The proposed design along westbound I-94 fixes some of the geometrics deficiencies along the mainline and the left side entrance of the northbound I-35W flyover ramp relieves

congestion. These improvements should reduce the congestion along mainline I-94 and improve the safety and crash rates.

4.6.1.3 TH 65 Mainline

Table 44 shows the total number of crashes along TH 65, a total of 152 crash occurred between I-35W and downtown Minneapolis. Southbound TH 65 had 18 crashes and both the crash and severity rates are well below the average statewide urban freeway rates.

Northbound TH 65 had the vast majority of crashes along TH 65, and the majority of which occurred between the I-35W diverge and the westbound I-94 exit ramp. The flyover ramp has congestion that spills back from mainline westbound I-94, along the flyover ramp, and along the right most lane of TH 65 and then upstream along I-35W.

The crash and severity rates for the TH 65 segment upstream of the flyover ramp and the flyover ramp itself, are over 3 times the average urban freeway rates.

Table 44
TH 65 Existing Crash Summary 2011-2013

	From	To	Fatal	A	B	C	Property	Total	Crash Rate	Severity Rate
NB TH 65	NB TH 65 - I-35W Diverge	WB I-94 Exit	0	0	3	18	88	109	**3.6**	**4.4**
	WB I-94 Exit	11th Street Exit	0	0	0	0	8	8	**1.2**	**1.2**
	11th Street Exit	Downtown	0	0	0	0	0	0	**0.0**	**0.0**
	NB Flyover Ramp		0	0	2	4	11	17	**3.1**	**4.5**
SB	SB TH 65 - Downtown	EB I-94 Entrance	0	0	0	0	0	0	**0.0**	**0.0**
	EB I-94 Entrance	I-35W Merge	0	0	1	3	14	18	**0.5**	**0.7**
	TOTALS		**0**	**0**	**6**	**25**	**121**	**152**		

The proposed design along TH 65 is not significantly different that the existing condition. However the northbound flyover ramp entering on the left side of westbound I-94 and with a full auxiliary lane should remove the majority of the congestion that spills upstream along TH 65 today. The reduction in congestion along the flyover ramp and along northbound TH 65 will reduce the crash rate.

4.6.2 Arterial Safety Analysis

Arterial crashes in the project area were evaluated between January 1st, 2009 and December 31st, 2013. Intersections included in the analysis include:

- Lake Street at 1st Avenue
- Lake Street at Stevens Avenue
- Lake Street at 2nd Avenue
- Lake Street at 3rd Avenue
- 31st Street at Stevens Avenue
- 31st Street at 2nd Avenue
- Franklin Avenue at 4th Avenue
- Franklin Avenue at 5th Avenue

A critical crash rate was calculated for each intersection. The critical crash rate is a statistical value that is unique to each intersection based on vehicular exposure and the average crash rate for similar intersections; an intersection with a crash rate higher than the critical rate indicates a sustained crash problem at the intersection.

4.6.2.1 Lake Street and 31st Street

Table 45 shows the total number of crashes at the four Lake Street intersections and the two 31st Street intersections; a total of 351 crashes occurred in the 5-year analysis period. All of the intersections are above the Minneapolis average crash rates for similar intersection and four of the intersection are above the calculated critical rate.

47% of the crashes were left turning or right angle collisions, 20% were rear end collisions, and 14% were side-swipe collisions. All of these intersections experience congestion during the peak periods that result in long queues and long delays. The westbound left turnings from both Lake Street and 31st Street to southbound Stevens Avenue constantly fill the available storage and result in long queues that spill upstream. This creates high lane change maneuvers that result in safety problems.

Table 45
Lake Street and 31st Street Crash Summary 2009-2013

Franklin Avenue	**Crash Severity**						**Average Rates**		**Critical Rates**
From	**Fatal**	**A**	**B**	**C**	**Property**	**Total**	**Crash Rate**	**Severity Rate**	**Critical Crash Rate**
Lake Street at 1st Avenue	0	0	4	26	49	79	1.66	2.38	1.25
Lake Street at Stevens Avenue	0	1	2	14	45	62	1.39	1.86	1.11
Lake Street at 2nd Avenue	0	0	6	19	55	80	1.50	2.08	1.23
Lake Street at 3rd Avenue	0	0	1	8	29	38	0.97	1.23	1.27
31st Street at Stevens Ave	0	0	3	8	19	30	1.06	1.55	1.36
31st Street at 2nd Avenue	0	1	6	17	38	62	1.78	2.69	1.32
TOTAL	**0**	**2**	**22**	**92**	**235**	**351**			

The proposed design along Lake Street will add more storage for the westbound to southbound movement as well as improve the signal timings in order to relieve congestion. The proposed design at 31st Street will add a left turn signal phase to relieve congestion; it should be noted there will be available width under the proposed 31st Street bridge to add turn lanes along 31st Street with a future project. The 28th Street exit ramp will also reduce the volume along 2nd Avenue which will reduce congestion and improve safety.

4.6.2.2 Franklin Avenue

Table 46 shows the total number of crashes at the two Franklin Avenue intersections; a total of 95 crashes occurred in the 5-year period. While both intersections are above the Minneapolis average crash rate for similar intersections, the Franklin Avenue at 5th Avenue intersection is above the calculated critical crash rate.

51% of the crashes were left turning or right angle collisions and 32% were rear end collisions. The intersection experiences severe congestion in the afternoon peak periods that result in long queues for all approaches. Along Franklin Avenue, all left and right turning traffic must turn from the through lanes.

Table 46
Franklin Avenue Crash Summary 2009-2013

Franklin Avenue	Crash Severity						Average Rates		Critical Rates
From	**Fatal**	**A**	**B**	**C**	**Property**	**Total**	**Crash Rate**	**Severity Rate**	**Critical Crash Rate**
Franklin Avenue at 4th Avenue	0	0	1	10	25	36	1.00	1.34	1.29
Franklin Avenue at 5th Avenue	0	1	2	17	39	59	1.53	2.16	1.14
TOTAL	**0**	**1**	**3**	**27**	**64**	**95**			

The proposed design will include a separated eastbound left turn lane and convert 5th Avenue to a northbound one-way. These improvements will reduce the congestion at both intersections and significantly reduce crashes.

5.0 Access Connections and Design

The purpose of this chapter is to discuss the I-35W system plan and proposed access modifications from the 46th Street interchange into the I-94 commons. The interchanges affected by this project include:

- I-35W at 35th Street/36th Street (existing)
- I-35W at 31st Street/Lake Street (existing and proposed)
- I-35W at 28th Street (proposed)
- I-35W at TH 65
- TH 65 at I-94
- I-94 at TH 65/I-35W

The flow of this chapter will be to first discuss the I-35W and I-94 system plans within the project area; then followed by a discussion of the individual interchanges.

5.1 Design Criteria

The primary design principles and criteria that were used to guide the design process include:

- Basic Lane Capacity
- Route continuity
- Lane balance
- Ramp Spacing

These criteria are described in MnDOT's Road Design manual and in American Association of State Highway and Transportation Official's (AASHTO) Policy on Geometric Design of Highways and Streets 2004 edition.

The existing design speed for I-35W in this section is 50 mph, with a posted speed limit of 55 mph.

The proposed design speed of this project will follow the existing design speed of 50 mph based on MnDOT guidance; however geometric improvements were made where feasible. It should also be noted that all mainline I-35W, south of the Franklin Avenue overpass, was designed at 55 mph. The northbound and southbound I-35W curves at the I-94 commons area limit the ability to design at 55 mph; attaining a design speed of 50 or 55 mph around the existing curves would have unbearable social and financial costs.

5.1.1 Basic Lane Capacity

The basic number of lanes is defined as a minimum number of lanes designated and maintained over a significant length of a corridor, regardless of changes in traffic volumes and lane-balance. An assessment of basic lane needs is an indicator of minimum capacity requirements; it is not an indicator of actual capacity. The table below summarizes the basic lane volumes for LOS D and E; the density for a weaving segment was used due to the complexity of the existing freeway and the influence area of the ramps overlapping.

Table 47
Basic Lane Capacity

Free-Flow Speed	Per-Lane Volume Threshold (pcphpl)/ (Vehicle Density (pc/mi/ln))	
	LOS D	LOS E
70 mph	2,080 / (35.0)	2,360 / (43.0)
65 mph	2,030 / (35.0)	2,310 / (43.0)
60 mph	2,010 / (35.0)	2,260 / (43.0)
55 mph	**1,900 / (35.0)**	**2,200 / (43.0)**

Highway Capacity Manual, Exhibit 11-17; assumes weaving density of 43 pc/mi/ln

5.1.2 Route Continuity

A route continuity evaluation is to determine if any forced lane changes are required to continue along a specific highway. A forced lane change occurs when either an established through lane is dropped at a Major Fork Diverge or when an auxiliary lane is added to the left side of the roadway to accommodate the design of a Major Fork Diverge and the through traffic must change lanes in order to continue.

5.1.3 Lane Balance

The concept of lane balance is intended to smooth traffic flow through and beyond an interchange. The AASHTO definition of lane balance is as follows:

1. At entrances, the number of lanes beyond the merging of two traffic streams should not be less than the sum of all traffic lanes on the merging roadways minus one.
2. At exits, the number of approach lanes on the highway must be equal to the number of lanes on the highway beyond the exit, plus the number of lanes on the exit, minus one. Exceptions to this principle occur at cloverleaf loop-ramp exits that follow a loop-ramp entrance and at exits between closely spaced interchanges (i.e. interchanges where the distance between the end of the taper of the entrance terminal and the beginning of the taper of the exit terminal is less than 1,500 ft). In these cases, the auxiliary lane may be dropped in a single-lane exit with the number of lanes on the approach roadway being equal to the number of through lanes beyond the exit plus the lane on the exit.
3. The traveled way of the highway should be reduced by not more than one traffic lane at a time.

5.1.4 Ramp Spacing

The distance between freeway ramps can be one of the most important features to impact freeway operations. MnDOT has established guidelines for desired interchange ramp spacing based on AASHTO criteria and these guidelines are documented in the MnDOT Design Manual and are shown in Figure 10.

Figure 10 – AASHTO Ramp Spacing Criteria

Figure 6-1.04A
Distance Between Successive Ramp Terminals

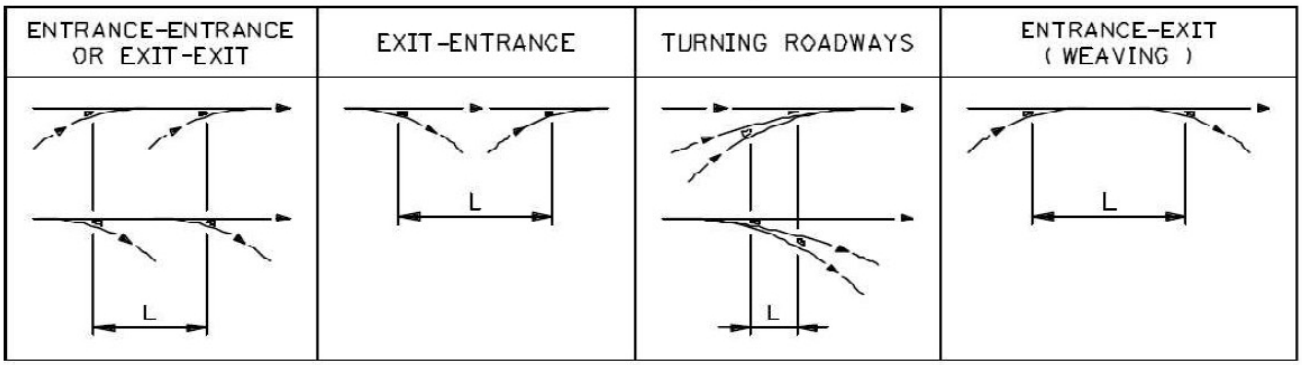


Table 6-1.04A
Distance Between Successive Ramp Terminals (ft)*

	Entrance - Entrance OR Exit - Exit		Exit - Entrance		Turning Roadways		Entrance - Exit (Weaving)			
							System to Service		Service to Service	
	Full Freeway	*C-D Road*	*Full Freeway*	*C-D Road*	*System Interchange*	*Service Interchange*	*Full Freeway*	*C-D Road*	*Full Freeway*	*C-D Road*
Desirable	1500	1200	750	600	1200	1000	3000	2000	2000	1500
Adequate	1200	1000	600	500	1000	800	2500	1800	1800	1200
Absolute Minimum	1000	800	500	400	800	700	2000	1500	1500	1000

*L in Figure 6-1.04A

5.2 I-35W Corridor

The major components of this project are to construct a center BRT station at I-35W and Lake Street, provide MnPASS lanes in both directions of I-35W and resolve access deficiencies for the South Minneapolis neighborhoods and the surrounding area.

The figures on the following page represent a summary of this section for both northbound and southbound I-35W, in the main project area, in both the 2038 No Build and 2038 Build conditions.

5.2.1 Basic Lane Capacity

The following Tables 48 and 49 represent the assessment of the 2038 forecasts traffic demands against the basic lane capacity. For a LOS E assessment, most of I-35W provides the basic capacity for the demands, the northbound I-35W segment between the 5th Avenue entrance and the eastbound I-94 entrance is the only segment at capacity.

There are currently multiple segments that will be over the LOS D capacity in the No Build condition. The addition of auxiliary lanes and a southbound MnPASS lane will provide the basic lane capacity for the Build condition for most segments.

Figure 11 – Southbound I-35W – Access/Design Summary

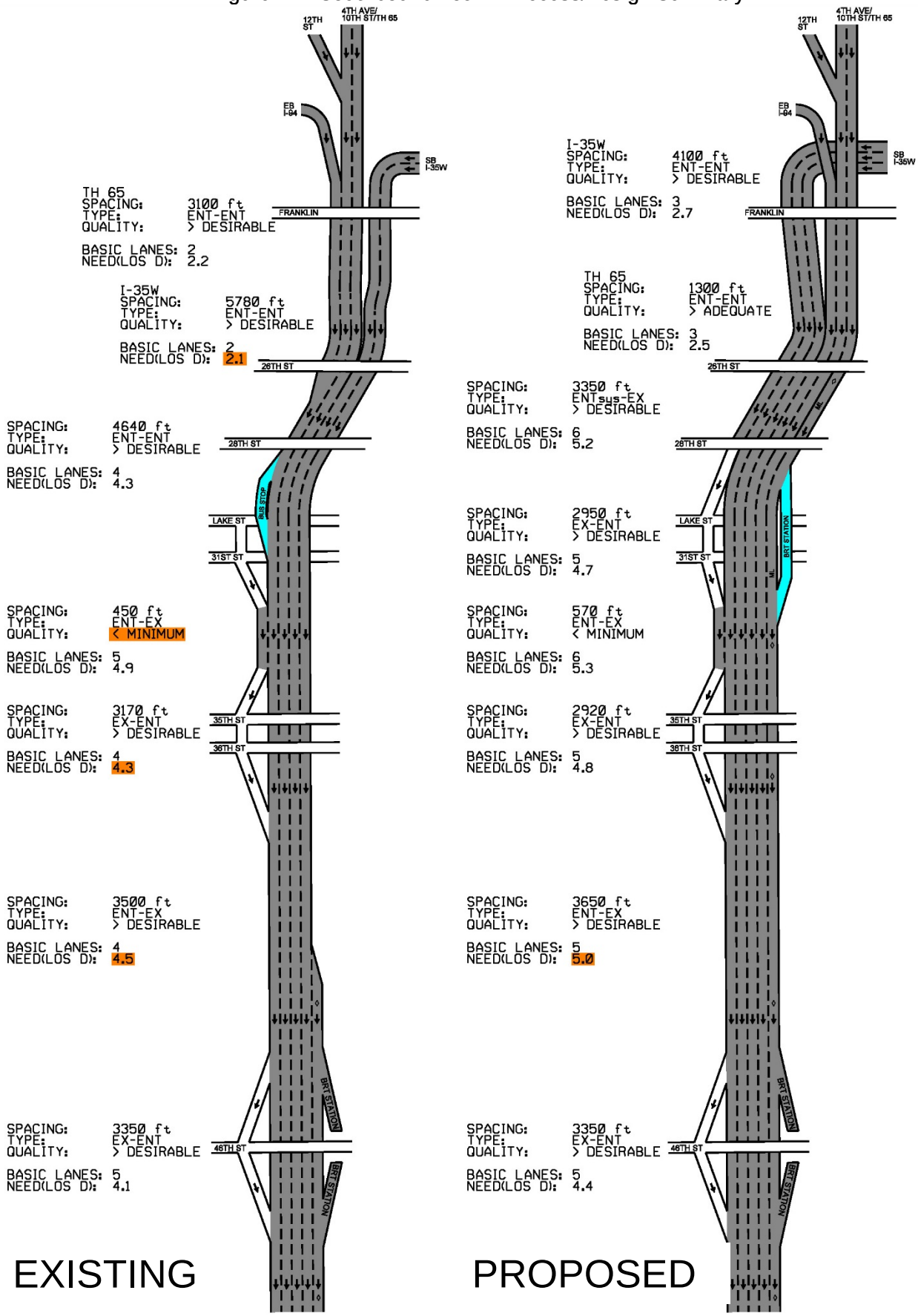


Figure 12 – Northbound I-35W – Access/Design Summary

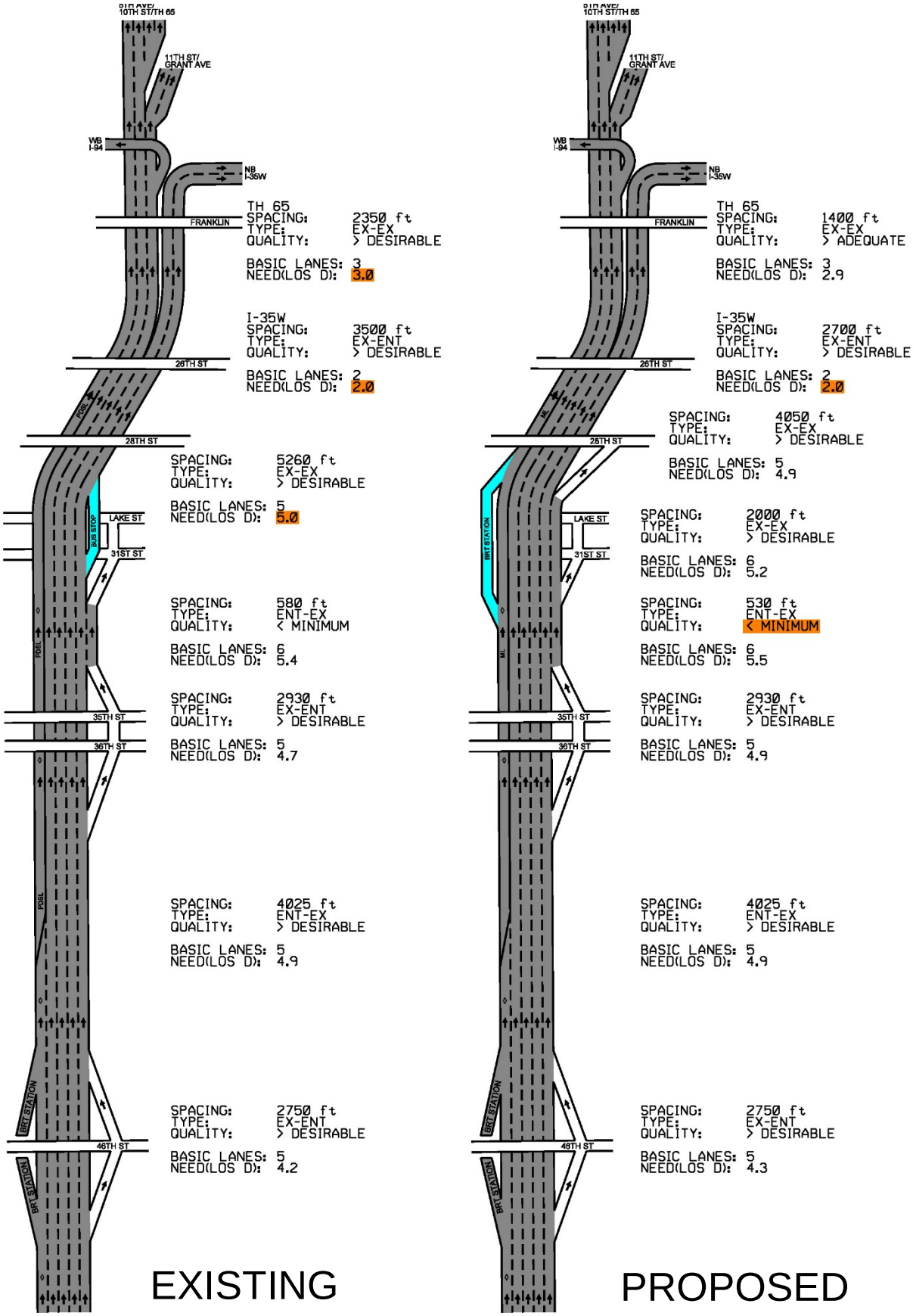


Table 48
Basic Lane Capacity – 2038 No Build Conditions – I-35W

I-35W Freeway Segments			Existing Basic Lanes	2038 No Build Conditions			
				Peak Hour Traffic		Basic Lane Needs	
				AM	PM	LOS D	LOS E
Northbound I-35W	46th Street Entrance	36th Street Exit	5	9250	8630	4.9	4.2
	36th Street Exit	35th Street Entrance	5	8990	8020	4.7	4.1
	35th Street Entrance	31st Street Exit	6	10260	8900	5.4	4.7
	31st Street Exit	TH 65 Diverge	5	9470	8030	**5.0**	4.3
	TH 65 Diverge	5th Avenue Entrance	2	3840	3390	**2.0**	1.7
	5th Avenue Entrance	EB I-94 Entrance	2	4410	4390	**2.3**	**2.0**
	EB I-94 Entrance	EB I-94 Exit	3	5850	5870	**3.1**	2.7
Southbound I-35W	WB I-94 Entrance	TH 65 Merge	2	3640	3990	**2.1**	1.8
	TH 65 Merge	31st Street Entrance	4	6760	8210	**4.3**	3.7
	31st Street Entrance	35th Street Exit	5	7450	9260	4.9	4.2
	35th Street Exit	36th Street Entrance	4	6800	8150	**4.3**	3.7
	36th Street Entrance	42nd Street Overpass	4	7450	8610	**4.5**	3.9
	42nd Street Overpass	46th Street Exit	5	7450	8610	4.5	3.9

Table 49
Basic Lane Capacity – 2038 Build Conditions – I-35W

I-35W Freeway Segments			Proposed Basic Lanes	2038 No Build Conditions			
				Peak Hour Traffic		Basic Lane Needs	
				AM	PM	LOS D	LOS E
Northbound I-35W	46th Street Entrance	36th Street Exit	5	9370	8720	4.9	4.3
	36th Street Exit	35th Street Entrance	5	9250	8240	4.9	4.2
	35th Street Entrance	31st Street Exit	6	10540	9200	5.5	4.8
	31st Street Exit	28th Street Exit	6	9940	8520	5.2	4.5
	28th Street Exit	TH 65 Diverge	5	9280	7910	4.9	4.2
	TH 65 Diverge	5th Avenue Entrance	2	3820	3290	**2.0**	1.7
	5th Avenue Entrance	EB I-94 Entrance	2	4410	4340	**2.3**	**2.0**
	EB I-94 Entrance	EB I-94 Exit	3	5660	5650	**3.0**	2.6
Southbound I-35W	WB I-94 Entrance	TH 65 Merge	3	4560	5050	2.7	2.3
	TH 65 Merge	Lake Street Exit	6	8070	9890	5.2	4.5
	Lake Street Exit	31st Street Entrance	5	7310	8930	4.7	4.1
	31st Street Entrance	35th Street Exit	6	8030	10120	5.3	4.6
	35th Street Exit	36th Street Entrance	5	7560	9190	4.8	4.2
	36th Street Entrance	42nd Street Overpass	5	8210	9490	**5.0**	4.3
	42nd Street Overpass	46th Street Exit	5	8210	9490	**5.0**	4.3

5.2.2 Route Continuity

Both directions of I-35W were assessed for route continuity.

5.2.2.1 Northbound I-35W

Route continuity for northbound I-35W is poor under existing conditions. From the I-35W/TH 62 commons area, northbound I-35W has 3 lanes on the left side of the freeway, two general purpose and one MnPASS lane. TH 62 merges on with two general purpose lanes, one of which drops after the Diamond Lake Road exit ramp, leaving 4 general purpose lanes and one MnPASS lane.

At 42nd Street, the MnPASS lane is converted into a PDSL, which forces a lane change during off peak travel; the PDSL is converted to a general purpose lane at 26th Street. 4.5 miles downstream of the TH 62 merge is the I-35W/TH 65 diverge. At this diverge, the three left most lanes continue along TH 65 into downtown Minneapolis and the two right most lanes continue along I-35W. This is a forced lane shift that breaks the route continuity of I-35W.

Though the route continuity is poor for I-35W, the major destination for the MnPASS lanes in into downtown Minneapolis traveling along I-35W to TH 65. The continuity of the MnPASS lane into downtown along TH 65 decreases congestion and travel times for the high volume of transit and HOV vehicles into downtown.

The proposed design does not modify the current route continuity of I-35W with the exception that the MnPASS lane will be converted from the existing PDSL to a full HOV facility. This will allow off peak traffic to remain in the MnPASS lane rather than be diverted out at the PDSL.

5.2.2.2 Southbound I-35W

Route continuity for southbound I-35W is acceptable under existing conditions. From the I-35W/I-94 commons area, southbound I-35W has two general purpose lanes, then TH 65 merges on the right side of I-35W with two general purpose lanes. The four general purpose lanes continue to approximately 42nd Street where a left side MnPASS lane is added.

At the I-35W/TH 62 diverge, there is a center choice lane at the diverge point. I-35W continues with two general purpose lanes and a MnPASS lane on the left side of the diverge exit; meaning there are two continuous lanes of I-35W through the project area. Three general purpose lanes continue along the TH 62 exit.

The proposed design would alter the route continuity of I-35W, breaking the two continuous lanes of I-35W between I-94 and TH 62. The proposed design would move the southbound I-35W braid bridge over both directions of TH 65, and thus TH 65 would merge onto southbound I-35W on the left side. Though this does break the route continuity of I-35W, it provides multiple benefits for the overall freeway system.

It will align the TH 65 lanes from downtown Minneapolis to the left side of southbound I-35W. The left most lane from TH 65 will be converted to a southbound MnPASS lane around 26th Street, this will align the HOV vehicles from downtown into the MnPASS facility and the high volume of transit into the proposed BRT station.

With I-35W lanes on the right side of the merge point, the proposed auxiliary lane for the Lake Street exit ramp easily incorporated along the corridor.

5.2.3 Lane Balance

Both directions of I-35W achieve proper lane balance at all entrance and exits.

5.2.4 Ramp Spacing

The primary goal for ramp spacing is to achieve “desirable” spacing; the shortest acceptable spacing is “minimum” spacing. Table 50 summarizes the existing and proposed ramp spacing for I-35W. Where spacing is less than the minimum, the text is bold.

Under existing conditions, the weaving areas between 35th Street and 31st Street, in both directions, have significantly less than the minimum distance. In the I-94 commons area, there is also less than minimum spacing for northbound I-35W.

The proposed condition does not directly address any of the existing ramp spacing issues in the I-94 commons area. However, between 35th Street and 31st Streets, it does extend the existing southbound escape lane and provide a full auxiliary lane for the northbound weave area.

Due to potential impacts with addressing the 35th Street and 31st Street weaving distances, this project was unable to address the issue. The impacts include financial constraints, right of way constraints, construction impacts, and public and political controversy based on previous project involvement. However it should be noted that the proposed project does not preclude a future project that could address the short weave issues.

The new proposed access changes for both northbound and southbound I-35W meet the desirable ramp spacing guidelines.

Table 50
I-35W Ramp Spacing

Description			Type	Desirable Spacing (feet)	Adequate Spacing (feet)	Minimum Spacing (feet)	Existing Spacing (feet)	Proposed Spacing (feet)
	From	To						
Northbound I-35W	46th Street Entrance	36th Street Exit	EN-EX	2000	1800	1500	4025	4025
	36th Street Exit	35th Street Entrance	EX-EN	750	600	500	2930	2930
	35th Street Entrance	31st Street Exit	EN-EX	2000	1800	1500	**580**	**530**
	31st Street Exit	TH 65 Diverge	EX-EX	1500	1200	1000	5260	
	31st Street Exit	28th Street Exit	EX-EX	1500	1200	1000		2000
	28th Street Exit	TH 65 Diverge	EX-EX	1500	1200	1000		4050
	TH 65 Diverge	5th Avenue Entrance	EX-EN	750	600	500	3500	2700
	5th Avenue Entrance	EB I-94 Entrance	EN-EN	1500	1200	1000	**920**	**920**
	EB I-94 Entrance	EB I-94 Exit	EN-EX	2000	1800	1500	**1010**	**1010**
Southbound I-35W	WB I-94 Entrance	TH 65 Merge	EN-EN	1500	1200	1000	5780	4100
	TH 65 Merge	31st Street Entrance	EN-EN	1500	1200	1000	4640	
	TH 65 Merge	Lake Street Exit	EN^{sys}-EX	3000	2500	2000		3350
	Lake Street Exit	31st Street Entrance	EX-EN	750	600	500		2950
	31st Street Entrance	35th Street Exit	EN-EX	2000	1800	1500	**450**	**570**
	35th Street Exit	36th Street Entrance	EX-EN	750	600	500	3170	2920
	36th Street Entrance	46th Street Exit	EN-EX	2000	1800	1500	3500	3650

5.3 I-94 Corridor

A major component of this project along I-94 is to reconstruct the northbound I-35W entrance ramp on the left hand side and repair some of the existing geometric deficiencies along

westbound I-94 between the 11th Street exit ramp and the northbound I-35W entrance ramp. There are no proposed changes to eastbound I-94.

The following figures represent a summary of this section for westbound I-94 in both the 2038 No Build and 2038 Build conditions.

Figure 13 – Westbound I-94 No Build – Access/Design Summary

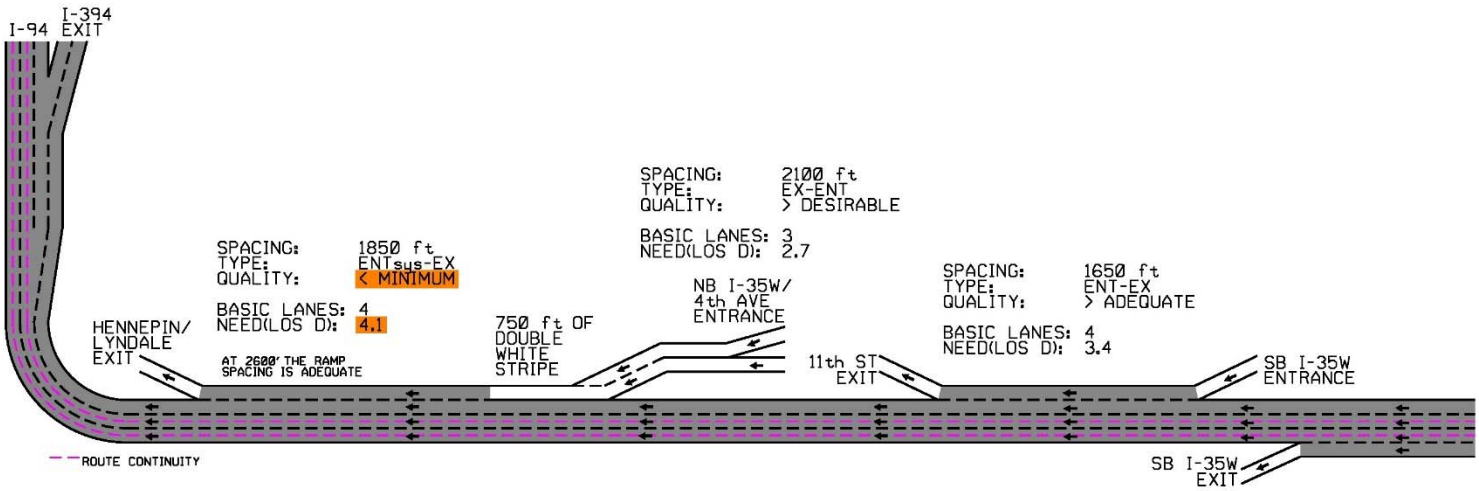
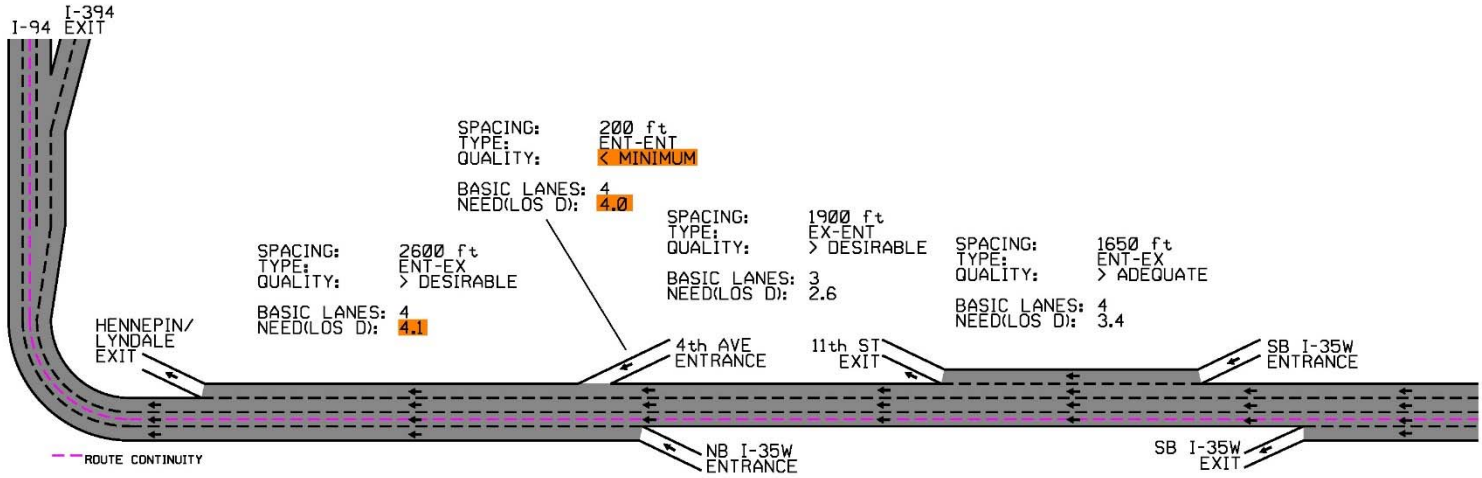


Figure 14 – Westbound I-94 Build – Access/Design Summary



5.3.1 Basic Lane Capacity

The following Tables 51 and 52 represent the assessment of the 2038 forecasts traffic demands against the basic lane capacity in the No Build and the Build scenarios. For a LOS E assessment, most of I-94 provides the basic capacity for the demands, the eastbound I-94 segment between the southbound I-35W exit and the northbound I-35W exit is the only segment at capacity.

There are currently multiple segments that will be over the LOS D capacity in the No Build condition. While the westbound I-94 proposed design does not alter the basic lane capacity, it will remove a large weaving demand and improve both safety and operations.

Table 51
Basic Lane Capacity – 2038 No Build Conditions – I-94

I-35W Freeway Segments			Existing Basic Lanes	2038 No Build Conditions Peak Hour Traffic AM	PM	Basic Lane Needs LOS D	LOS E
Eastbound I-94	Lowry Tunnel	Lyndale Entrance	3	6340	6360	**3.3**	2.9
	Lyndale Entrance	SB I-35W Exit	4	8470	8090	**4.5**	3.9
	SB I-35W Exit	NB I-35W Exit	3	6350	6500	**3.4**	**3.0**
	NB I-35W Exit	5th Avenue Entrance	3	4910	5020	2.6	2.3
	5th Avenue Entrance	TH 55 Exit	3	5450	5680	**3.0**	2.6
Westbound I-94	TH 55/35W CD Entrance	11th Street Exit	4	6460	5740	3.4	2.9
	11th Street Exit	NB I-35W Entrance	3	5100	5050	2.7	2.3
	NB I-35W Entrance	Lyndale Exit	4	7510	7810	**4.1**	3.6
	Lyndale Exit	Lowry Tunnel	3	6250	6290	**3.3**	2.9

Table 52
Basic Lane Capacity – 2038 Build Conditions – I-94

I-35W Freeway Segments			Proposed Basic Lanes	2038 No Build Conditions Peak Hour Traffic AM	PM	Basic Lane Needs LOS D	LOS E
Eastbound I-94	Lowry Tunnel	Lyndale Entrance	3	6340	6320	**3.3**	2.9
	Lyndale Entrance	SB I-35W Exit	4	8410	8060	**4.4**	3.8
	SB I-35W Exit	NB I-35W Exit	3	6180	6180	**3.3**	2.8
	NB I-35W Exit	5th Avenue Entrance	3	4930	4870	2.6	2.2
	5th Avenue Entrance	TH 55 Exit	3	5460	5500	2.9	2.5
Westbound I-94	TH 55/35W CD Entrance	11th Street Exit	4	6230	5540	3.3	2.8
	11th Street Exit	NB I-35W Entrance	3	4890	4900	2.6	2.2
	NB I-35W Entrance	Lyndale Exit	4	7310	7680	**4.0**	3.5
	Lyndale Exit	Lowry Tunnel	3	6210	6260	**3.3**	2.8

5.3.2 Route Continuity

Westbound I-94 currently has acceptable route continuity. While there are three basic lanes along westbound I-94 from the Mississippi River Bridge to the Lowry Tunnel, at the I-394 diverge only two lanes continue along I-94. At this location, the center lane from the Lowry Tunnel is a choice lane with an additional lane add; this allows three lanes to continue along I-94 and two lanes to exit to I-394.

The proposed design will alter the existing route continuity, breaking the two continuous lanes. The new left side entrance of the northbound I-35W will enter westbound I-94 in a full auxiliary lane that enters the Lowry Tunnel. While this design will reduce the continuous westbound I-94 lanes from two down to one, the existing traffic patterns and operational analysis support the modification.

5.3.3 Lane Balance

Westbound I-94 achieves proper lane balance at all entrance and exits.

5.3.4 Ramp Spacing

The primary goal for ramp spacing is “desirable” spacing; the shortest acceptable spacing is “minimum” spacing. Table 53 summarizes the existing and proposed ramp spacing for I-94. Where spacing is less than the minimum, the text is bold.

Under existing conditions, eastbound and westbound I-94 meets all adequate spacing with the exception of the westbound weaving area between the TH 55 entrance and the 11th Street exit.

The proposed condition does not address any of the existing ramp spacing. The new proposed access changes for westbound I-94 does introduce a short entrance-entrance spacing for the 4th Avenue ramp and northbound I-35W flyover ramp. This is addressed by the flyover ramp entering on the left side with a full auxiliary lane into the Lowry Tunnel and 4th Avenue entering on the right side of westbound I-94.

Table 53
I-94 Ramp Spacing

Description			Type	Desirable Spacing (feet)	Adequate Spacing (feet)	Minimum Spacing (feet)	Existing Spacing (feet)	Proposed Spacing (feet)
	From	To						
EB I-94	Lyndale Entrance	SB I-35W Exit	EN-EX	2000	1800	1500	2600	2600
	SB I-35W Exit	NB I-35W Exit	EX-EX	1500	1200	1000	2050	2050
	NB I-35W Exit	5th Avenue Entrance	EX-EN	750	600	500	650	650
	5th Avenue Entrance	TH 55 Exit	EN-EX	2000	1800	1500	1830	1830
WB I-94	TH 55/35W CD Entrance	11th Street Exit	EN-EX	2000	1800	1500	**1650**	**1650**
	11th Street Exit	NB I-35W/4th Entrance	EX-EN	750	600	500	2100	
	11th Street Exit	NB I-35W Entrance	EX-EN	750	600	500		1900
	NB I-35W Entrance	4th Ave Entrance	EN-EN	1500	1200	1000		**200**
	NB I-35W/4th Entrance	Lyndale Exit	EN^{sys}-EX	3000	2500	2000	2580	
	4th Ave Entrance	Lyndale Exit	EN-EX	2000	1800	1500		2600

5.4 Lake Street/31st Street Interchange

The I-35W and Lake Street/31st Street interchange is currently a half diamond interchange with ramps on the south side of 31st Street; there is no direct ramp connection to Lake Street. Both of the 31st Street ramp terminals operate under signalized ramp control.

To minimize construction and right of way impacts, the existing half diamond interchange configuration was evaluated with additional ramps to and from the north side of Lake Street.

5.4.1 Split Diamond Interchange

The new ramps would draw many more trips to the Lake Street area, including a large increase in turning demands at both the ramp terminal intersections. The southbound exit ramp demands can be accommodated with additional capacity at the Lake Street and Stevens Avenue intersection. The Lake Street at 2nd Avenue intersection is unable to handle the increase in intersection demands without the addition of a westbound right turn lane on Lake Street. In addition, the northbound entrance ramp would impact several residential

properties on the east side of 2nd Avenue. These property and right of way impacts were unbearable for the City of Minneapolis and Hennepin County at this point in time.

The new entrance ramp volumes also create significant increases in both southbound and northbound I-35W traffic that needs to be addressed.

5.4.2 Split Diamond Interchange with Mitigations

To relieve the traffic problems caused by the new ramp access on both the local and arterial road network, new and modified access along northbound I-35W and a southbound auxiliary lane was necessary.

5.4.2.1 Southbound Auxiliary Lane

In both peak periods, a significant increase in traffic demands are destined along southbound I-35W to the new Lake Street exit ramp. An auxiliary lane from the I-94 commons area to the new exit ramp was necessary to provide the capacity needed to get traffic to the ramp. The new lane would begin along southbound I-35W at the existing westbound I-94 entrance ramp and extend to the new Lake Street exit ramp.

5.4.2.2 28th Street Exit Ramp

In both peak periods there is a heavy demand from the northbound 31st Street exit ramp through the Lake Street and 2nd Avenue intersection. This through demand is destined to 28th Street and areas north of Lake Street.

To relieve the operational problems along 2nd Avenue caused by the proposed northbound entrance ramp and the existing traffic demands, the northbound exit ramp to 28th Street was necessary as both a mitigation to the ramp terminal intersections and to the freeway weaving section. For more discussion on the freeway and 2nd Avenue benefits of the 28th Street exit ramp see section 4.4.3.2.

As a mitigation for the northbound Lake Street entrance ramp, removing the through demands along 2nd Avenue allows the remaining turning movements at the Lake Street ramp terminal intersection to operate acceptably without major property or right of way impacts.

5.4.2.3 Northbound Entrance Weaving Demands

The proposed northbound entrance ramp would create a major weave between the new entrance ramp and the I-35W and TH 65 systems diverge. As reported in the freeway operations report, this weaving demand was not limited as part of the analysis.

Based on the regional travel demand model, only approximately 26% of the new entrance demand would want to continue along TH 65 into downtown Minneapolis or to westbound I-94.

Under the existing freeway configuration, the ramp spacing would provide approximately 2100 feet of weaving distance; which is greater than the desirable distance. However, the proposed project design allows the diverge point to be shifted north by approximately 1200 feet. Therefore, this would increase the weaving distance to 3,300 feet and give adequate time for traffic to merge across the necessary lanes to continue along TH 65.

However, if restricting the movement was considered, physically restricting the right to left side weaving movement would be difficult. A double white pavement marking and highway signage could be utilized; however experience shows these are not completely effective. Barrier separation would provide the best restriction; however the inclusion of a barrier would change the typical section and would have construction related impacts along the corridor. A

minimum of approximately 16 feet would be added from the barrier separation for the added shoulder and barrier width.

5.4.2.4 Northbound Auxiliary Lane and Eastbound I-94 Modification

With a new northbound entrance ramp from Lake Street, the increase in demands along northbound I-35W would require a full auxiliary lane. This auxiliary lane would need to extend through the I-35W and TH 65 system diverge ramp and around the existing 35-mph curve in the commons area.

To properly terminate the auxiliary lane at an acceptable location, the existing connections of 5th Avenue to eastbound I-94 and northbound I-35W would need to be modified. The existing 5th Avenue ramp to eastbound I-94 would be modified to create a new system connection from northbound I-35W to eastbound I-94.

Currently, 5th Avenue has access to both eastbound I-94 and northbound I-35W. The exit from northbound I-35W to eastbound I-94 occurs after both the 5th Avenue entrance ramp and the eastbound I-94 entrance ramp; these ramp weaving demands create significant delays during both peak periods.

The proposed modification includes providing a new exit ramp to eastbound I-94, prior to the 35 mph curve, which would replace the existing connection from 5th Avenue to northbound I-35W. This removes traffic along northbound I-35W at a much early location and relieves the weaving demands along the freeway.

Though the 5th Avenue connection to eastbound I-94 is removed, the traffic will still have the opportunity to enter northbound I-35W and exit to eastbound I-94.

While this element is not included in the current proposal, the improvement is not precluded as part of this project.

5.4.3 Preferred Alternative

Based on input from the project team and public outreach, the northbound entrance ramp was removed from consideration due to the impacts and high cost associated with the necessary mitigations. However, the current design does not preclude the future addition of the northbound entrance ramp.

The proposed southbound access to Lake Street and the proposed northbound exit ramp to 28th Street are included in the preferred alternative for the interchange design.

The 2nd Avenue and 31st Street connection at the freeway ramp was still under evaluation after the selection of the preferred alternative. The following section describes the alternatives evaluated and the resulting outcomes.

5.4.3.1 2nd Avenue at 31st Street

The current northbound I-35W exit ramp to 31st Street/Lake Street merges into 2nd Avenue prior to the signalized intersection with 31st Street. 2nd Avenue is a northbound one-way residential frontage road.

The historic Healy Block district is located along 2nd Avenue between 32nd Street and 31st Street. Increased freeway width, traffic demands and congestion is a livability concern for the residents of the historic Healy Block District

Due to the potential historic impacts, the configuration of the northbound exit ramp, the connection to 2nd Avenue, and the approach to 31st Street were further refined as part of the project. It should be noted that the freeway modeling analysis was conducted prior to the evaluation of the 2nd Avenue alternatives. The freeway analysis included the following Alternative 1 as the assumed configuration, however the preferred alternative is ultimately different. The change in alternatives results in an improved arterial operation and therefore no modifications to the freeway operations analysis was deemed necessary.

The following describes the different alternatives considered as part of the 2nd Avenue configurations.

- No Build – 3 lanes of approach; Left-Through, Through, Through-Right
  - Short lane drop beyond 31st Street
- Alternative 1 – 3 lanes of approach; Left-Through, Through, Right
  - Ramp and 2nd Avenue traffic mix approaching 31st Street
- Alternative 2 – 2 lanes of approach; Left-Through, Through-Right
  - Ramp and 2nd Avenue traffic mix approaching 31st Street
- Alternative 3 – 2 lanes of approach serving the ramp; Left-Through, Through-Right
  - 2nd Avenue is median separated with a forced right turn at 31st Street
- Alternative 4 and 5 – 3 lanes of approach; Left, Through, Through-Right,
  - Functionally similar to Alternative 1 with variations on 2nd Avenue alignment
  - Ramp and 2nd Avenue traffic mix approaching 31st Street
- Alternative 6 – 1 lane of approach for the ramp; Left-Through-Right
  - 2nd Avenue is median separated with a forced right turn at 31st Street

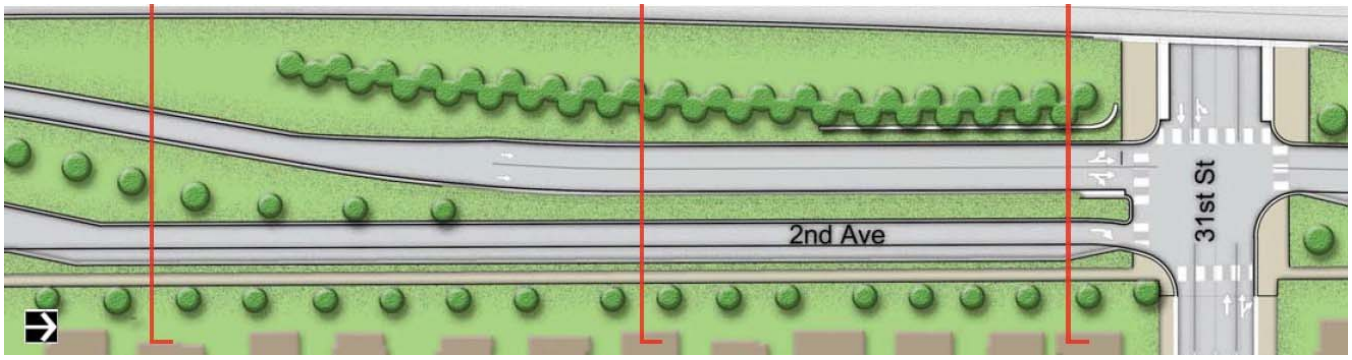
All six alternatives are able to provide acceptable traffic operations at the 31st Street intersection through signal timing changes; however Alternative 6 results in significant queuing from the ramp onto the freeway and has the overall worst intersection operations. For the freeway, queue length was the major differentiating factor between the alternatives. It was determined based on stopping sight distance that a queue longer than 480 feet would result in less than desirable deceleration length and begin to impact freeway operations.

The No Build, Alternative 2, and Alternative 6 all have queues that would impact mainline freeway operations; the maximum queues are 635 feet, 616 feet, and 907 feet respectively. Limited storage capacity on the approach to the signal create the longer queues.

Alternatives 1, and 3 through 5 all had acceptable queue lengths less than 460 feet. Alternative 3 has the shortest maximum queue of only 365 feet and Alternative 1 has a maximum queue of 405 feet.

Based on input from the home owners in the historic district, Alternative 3 provides a separation between the local 2nd Avenue and the freeway exit ramp. The City of Minneapolis has found the grid disconnection of 2nd Avenue and the forced right turn at 31st Street to be an acceptable compromise. Therefore, Alternative 3 is the proposed configuration for the 31st Street Ramp and 2nd Avenue. The figure below represents the preferred alternative.

Figure 15 – 2nd Avenue Preferred Alternative



5.5 28th Street Interchange

There is no current access at 28th Street from I-35W; the proposed access is for a northbound I-35W exit ramp only. No southbound access is proposed or planned, which would develop a new, less than full access interchange. The new exit is proposed as an extension of the 31st Street/Lake Street interchange.

The proposed northbound exit ramp to 28th Street provides both an operational and safety benefit to the roadway network without any adverse impacts to the freeway system. This occurs with the exit ramp as either a standalone access change or in combination with the future northbound Lake Street entrance ramp project; the 28th Street exit is a functional improvement for the 31st Street/Lake Street interchange and a mitigation for the potential future northbound entrance ramp.

5.6 Northbound Flyover Ramp to Westbound I-94

The current design of the northbound flyover ramp to westbound I-94 is a single lane, directional ramp. Prior to entering westbound I-94, the 4th Avenue entrance ramp merges with the flyover ramp traffic and enters westbound I-94 together in a single lane. Currently the flyover ramp traffic is not metered, but the 4th Avenue traffic is metered in both peak periods.

Due to downstream constraints on I-94, including narrow bridges and the Lowry Tunnel, additional downstream capacity is not a viable option as part of this project. The ramp connection was evaluated as landing on either side of westbound I-94.

Based on the OD study, the majority of the PM peak hour traffic from the flyover ramp are destined to continue along westbound I-94 and not exit at either Hennepin/Lyndale Avenue or I-394. Approximately 78% of the flyover demands continue along I-94; while 83% of the Hennepin Lyndale Avenue exiting demands are from mainline westbound I-94.

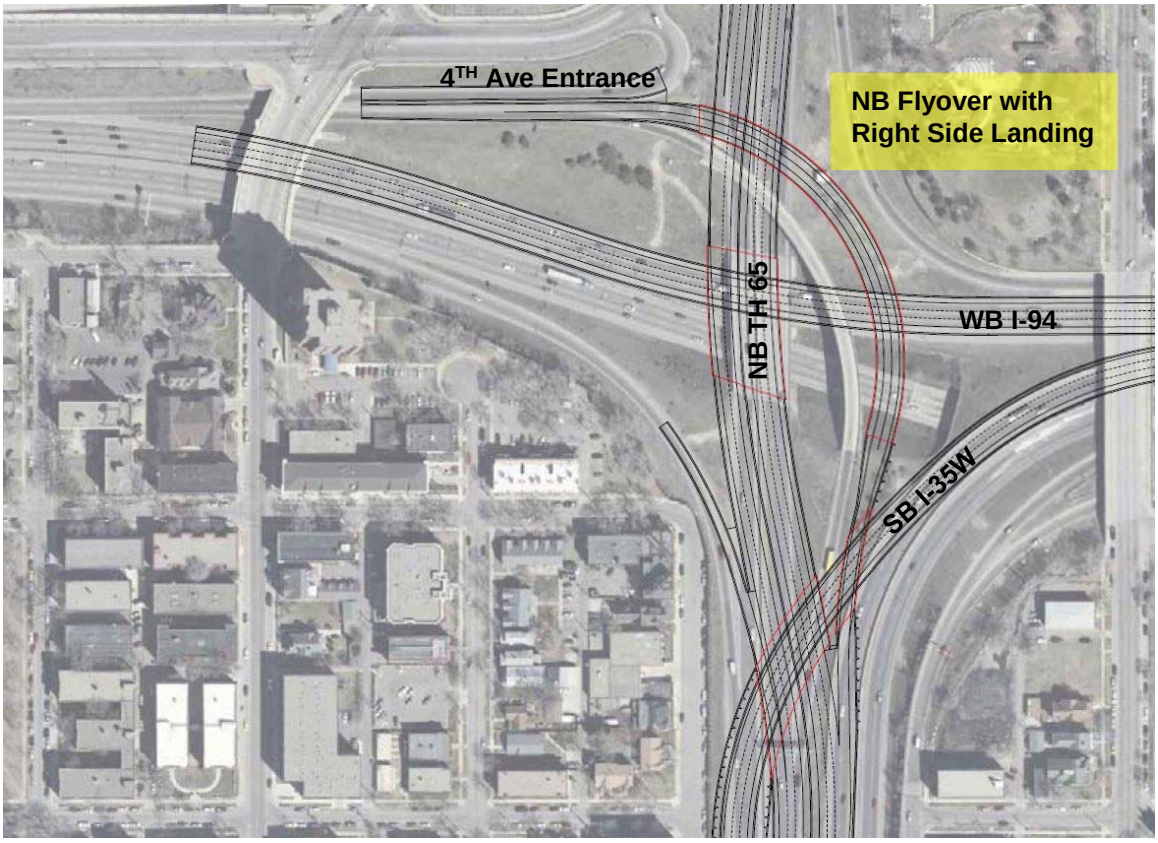
5.6.1 Right Side Landing

The current design of the ramp lands on the right side of westbound I-94. Though the lane is not metered, traffic does back up from I-94 and as far upstream as the TH 65/northbound I-35W diverge. The weaving demands between this entrance ramp and the Hennepin/Lyndale Avenue exit are very significant; approaching almost 4,000 vehicles in the PM peak hour.

With no additional capacity additions downstream of the entrance ramp, a full 2-lane entrance ramp was not evaluated. On the flyover bridge, 2-lanes were considered for storage of vehicles to limit the queuing along northbound TH 65 and I-35W.

With limited improvements available, this alternative was removed from further consideration.

Figure 16 – Northbound Flyover – Right Side



5.6.2 Preferred Alternative - Left Side Landing

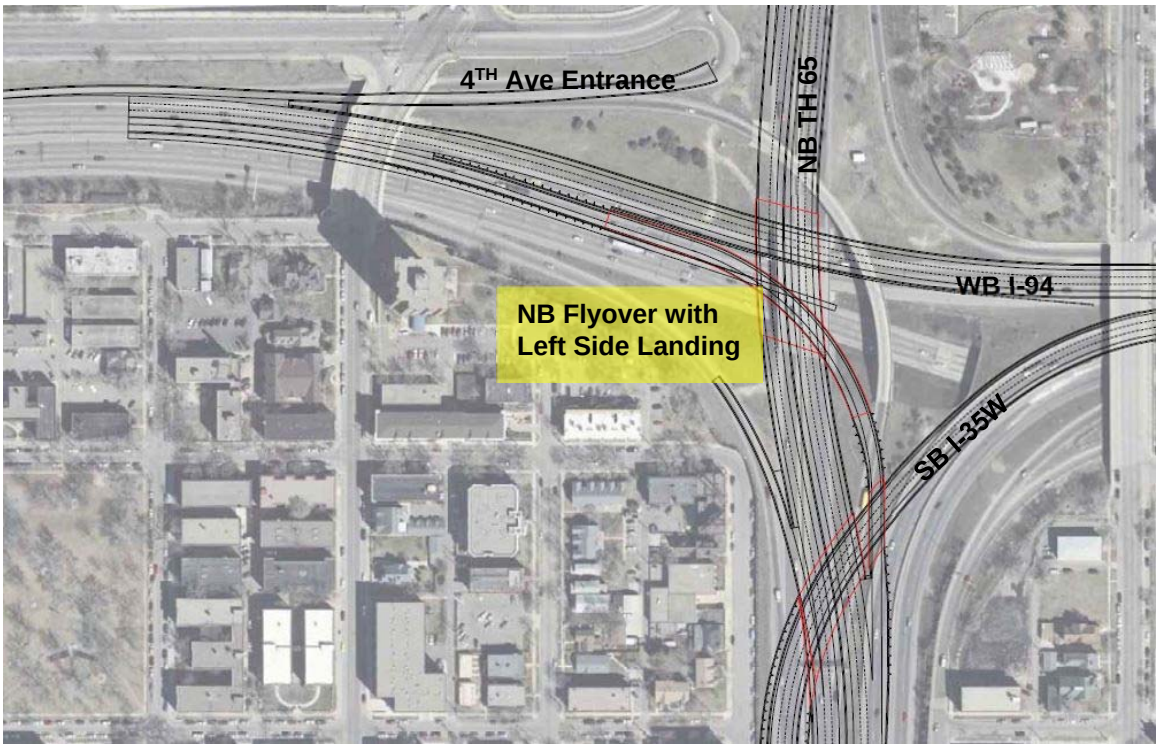
Based on the OD study, the majority of the flyover traffic does not want to be in the right 2-lanes with the traffic exiting at Hennepin/Lyndale or westbound I-394. A left side landing was evaluated based on the OD results and resulted in a significant improvement in traffic operations along I-94.

The forecasted traffic demands on the flyover ramp require that the entrance ramp enter westbound I-94 as a full auxiliary lane. Due to capacity constraints downstream, this does remove a continuous lane along westbound I-94. The proposed design modifies the right most general purpose lane along westbound I-94 into an auxiliary lane for the Hennepin/Lyndale Avenue exit ramp.

This shift in the design puts more of the traffic demands into the appropriate lanes they desire to be in and removes a significant amount of weaving demands from westbound I-94. Therefore, without adding lanes to increase capacity, the removal of weaving demands allows significantly greater throughput. The remaining weaving demands between 4th Avenue and Hennepin/Lyndale Avenue is approximately 2,250 vehicles; a significant reduction.

The preferred alternative does not include the removal of the existing 4th Avenue entrance ramp.

Figure 17 – Preferred Alternative Northbound Flyover – Left Side



5.6.3 4th Avenue to Westbound I-94

As part of the I-35W Freeway Operations Report, the 4th Avenue entrance ramp to westbound I-94 was evaluated as potentially closed. This would remove some demand along I-94 prior to the tunnel. While the operational benefits of this ramp closure were apparent, at the time of the evaluation the City of Minneapolis was severely concerned about the potential impacts that the elimination of the ramp would have on the arterial network.

Therefore an additional study was conducted to evaluate the arterial impacts associated with the potential closure of the 4th Avenue ramp to westbound I-94. While the study is not complete, the draft evaluation results are included in the appendix.

As part of the evaluation, a ramp user origin destination (OD) study was completed to better understand the origins and destination of the 4th Avenue entrance ramp users. This information was used to develop an assumed rerouting plan for the existing ramp traffic to alternative freeway access locations. Downtown Minneapolis includes approximately 48% of the origins for ramp users, while approximately 37% originate south of I-94 and east of I-35W. Vehicle occupancy counts were also conducted at the time of the OD study and resulted in approximately 13% HOV, bus, or motorcycle traffic and 87% single occupant vehicles.

Based on user origins and destinations, traffic was routed along the existing arterial network based on available roadway network following the most realistic paths based on travel distance, existing congestion, and ease of routing.

The rerouted traffic would rely on some of Minneapolis's most congested arterials created significant delays near the existing freeway access to either westbound I-94 or I-394. The most impacted routes included Lyndale Avenue, 3rd Street, and 11th Street. Improvements to these arterial corridors would involve extensive right of way and construction impacts to mitigate the delays caused by the rerouting of the 4th Avenue traffic.

A managed (HOV only) 4th Avenue entrance would still put a large amount of SOV traffic on the local arterial system, which results in the same impacts and necessary mitigations.

At this time, the City of Minneapolis and MnDOT are deliberating on the potential outcomes of the 4th Avenue entrance evaluation. It is clear that opportunities to directly mitigate the rerouting are limited. However, tradeoffs with other downtown egress improvements are being discussed. Outcomes of this discussion or timelines for implementation are unknown. Therefore the 4th Avenue entrance ramp is assumed to remain open and metered as part of this project.

5.7 Southbound I-35W at TH 65

The existing systems merge of southbound I-35W and TH 65 has I-35W bridge over northbound TH 65 and merge on the left side of southbound TH 65. With the need to replace the Braid Bridge and the desire to incorporate both a southbound MnPASS lane and center transit station, this design would create a major weaving problem between southbound TH 65 MnPASS and transit vehicles shifting to the left side of the highway.

Both a left and right side landing for the I-35W Braid Bridge was evaluated.

5.7.1 Left Side Landing

A left side landing would replace the existing bridge in its current location. The addition of a southbound MnPASS lane and center transit station create a major weaving concern as the majority of the MnPASS users and all of the buses will be on southbound TH 65 and have to merge across 3 lanes to access the I-35W MnPASS lane and center transit station at Lake Street.

The required auxiliary lane to the southbound Lake Street exit would occur in the center of the two merging freeways and not provide a continuous route for the exit ramp. Traffic exiting to Lake Street would weave across the southbound TH 65 lanes.

For these reasons, replacing the existing structure on the current alignment was not feasible.

5.7.2 Preferred Alternative – Right Side Landing

Reconstructing the Braid Bridge to land on the right side of TH 65 opens up a significant amount of positive benefits and improvements to the freeway system.

The major benefit is the alignment of southbound TH 65 from downtown on the left side of I-35W; this will allow MnPASS and transit users to stay on the left side to enter both the MnPASS lane and transit station without requiring lane merging. It also allows the auxiliary lane for the proposed southbound Lake Street exit ramp to be a continuous auxiliary lane from the westbound I-94 entrance to the new exit.

The right side landing also allows for a complete relocation of the braiding structure; the current design shifts the location from approximately 24th Street northerly up to 19th Street. This extends the weaving distance between the systems merge and the proposed exit ramp

to over 3300 feet. The change allows the northbound diverge location to also shift north closer to the Franklin Bridge.

This change in configuration allows for a higher speed curve for southbound I-35W exiting the I-94 commons area. The existing curve is a 35 mph design while the proposed design is able to increase the design speed to 40 mph.

5.8 I-35W at 35th/36th Street Interchange

The I-35W and 35th/36th Street interchange is currently a split diamond interchange with signal control at all four ramp terminal intersections. 35th Street is a one-way westbound roadway and 36th Street is a one-way eastbound roadway. Both 35th Street and 36th Street are 30 mph, Major Collector roadways.

The existing short weave section between 35th Street and 31st Street is a major concern to all entities involved. However, due to fiscal constraints and potential impacts, fully addressing the weaving section as part of this project was implausible. Previous engagements in the project area related to improving the weaving section resulted in considerable resistance from local neighborhoods potentially impacted by the change.

As part of this project, the southbound weaving area was extended by approximately 120 feet and the existing auxiliary escape lane was extended from 200 to 400 feet. The northbound weaving section was slightly reduced, from 580 to 530 feet, and a full auxiliary lane is provided to the proposed 28th Street exit ramp; the current existing weaving area does not include an escape lane.

Both short weaving sections have reduced weaving demands with the preferred alternative. The southbound weaving demands are reduced as traffic has the proposed Lake Street exit ramp to exit upstream of this weaving section; forecasts showed a 25% daily reduction in demands at the 35th Street exit ramp. The northbound exit to 28th Street relieves the existing queuing problems from the arterial streets and dissipates the exiting demands to two locations over a much greater distance; relieving the weaving demands at the short weaving section.

The current design of this project does not preclude a future project to address the short weaving issues either by relocation of the existing 35th/36th Street interchange or ramp braiding.

6.0 Transportation Land Use Plans

This project is consistent with the current Transportation Policy Plan (TPP) adopted by the Metropolitan Council (see http://metrocouncil.org/Transportation/Planning-2/Key-Transportation-Planning-Documents.aspx) and the Hennepin County 2030 Comprehensive Plan (see http://www.hennepin.us/~/media/hennepinus/Business/work-with-hennepin-county/Documents/2030-comprehensive-plan-small.pdf).

[TO BE UPDATED AFTER COMMITTEE MEETING] The joint Interchange Review Committee was addressed with a memorandum in April of 2015 for the I-35W 28th Street access. The committee made an acceptable determination of the proposed access; the letter can be found in Appendix D.

The following are Met Council 2040 Transportation Policy Plan Goals, each followed by a short description of how the project is consistent with them:

Goal #1: Transportation System Stewardship
Sustainable investments in the transportation system are protected by strategically preserving, maintaining and operating system assets. An objective is to operate the regional transportation system to efficiently and cost-effectively connect people and freight to destinations.

The improvement elements included in the Transit Access project, when considered separately or in combination, are aligned to efficiently connect people and freight to their destinations. The new exit ramps from I-35W to the arterial system provide a more direct connection of people to their destinations. The improved capacity along I-35W, including the transit station and MnPASS lanes, provide more efficient travel for all users of the roadway network.

Goal #2: Safety and Security
The regional transportation system is safe and secure for all users. An objectives is reducing crashes and improve safety and security for all modes of passenger travel.

The Transit Access project will have a significant reduction in crashes for the local and regional roadway networks. The access and capacity improvements on the freeway system and improvements to the arterial network not only provide safer facilities for all users, the reduction in vehicle miles traveled reduces the number of safety conflicts.

Goal #3: Access to Destinations
People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond. An objective is to increase travel time reliability and predictability for travel on highway and transit systems.

The project aligns with the objective of linking land use and facilities. The Project will better connect South Minneapolis employment and growth centers to the regional roadway system. The new ramp from northbound I-35W to 28th Street and the new ramp from southbound I-35W to Lake Street will provide a direct link between the freeway system and large employment centers along 28th Street, the Lake Street area businesses and Nicollet Avenue business districts. The new transit station and MnPASS lanes will also provide more reliable and predicable travel times for all users.

Goal #5: Healthy Environment
The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments. Objective include to reduce transportation-related air emissions and reduce impacts of transportation construction, operations, and use on the natural, cultural, and developed environments.

The overall project and each component will reduce air emissions for the freeway and arterial systems by providing a more direct route to driver destinations and more capacity on the roadway network. .

6.1 Travelshed Demographics

The land use assumptions in the Twin Cities Travel Demand (TCTD) model were based on 2009 and 2030 socio-economic data provided by the metropolitan council and the City of Minneapolis.

The 2009 and 2030 population, household and employment data for downtown Minneapolis and the metropolitan area are summarized in Table 54. The table shows that downtown Minneapolis has higher annual growth rates in housing and employment between 2009 and 2030 than the metro as a whole. The Lake Street study area has a slight increase in population and households and a reduction in retail and non-retail employment between 2009 and 2030

Table 54
Socio-economic Data

Area	Plan	Population	Households	Retail Employmen	Non-Retail Employmen	Total Employmen
* Downtown Minneapolis	2009	25,032	16,359	13,600	134,948	148,548
	2030	46,770	27,808	19,615	150,754	170,369
	Annual Growth(%)	3%	3%	2%	1%	1%
** Lake Street Study Area	2009	69,145	30,887	7,681	27,689	35,370
	2030	78,992	32,911	5,852	26,508	32,360
	Annual Growth(%)	0.6%	0.3%	-1.3%	-0.2%	-0.4%
Minneapolis Other	2009	304,466	123,400	22,655	109,337	131,992
	2030	314,027	128,204	20,821	125,800	146,621
	Annual Growth(%)	0.1%	0.2%	-0.4%	0.7%	0.5%
Minneapolis Total	2009	398,643	170,646	43,936	271,974	315,910
	2030	439,789	188,923	46,288	303,062	349,350
	Annual Growth(%)	0.5%	0.5%	0.2%	0.5%	0.5%
Metro Total	2009	3,029,044	1,199,308	315,463	1,483,043	1,798,506
	2030	3,734,838	1,529,761	403,208	1,822,900	2,226,108
	Annual Growth(%)	1.0%	1.2%	1.2%	1.0%	1.0%

* Downtown area bounded by freeways I-94 and I-35W, the Mississippi River and Plymouth Ave N
** Lake Street Study area bounded by I-94 (N), 35th Street (S), TH 55 (E) and Hennepin Ave S (W)

6.2 Traffic Projections

Daily and peak hour traffic forecasts for year 2038 for this project were developed largely based on the latest TCTD model and actual counts in May 2011. The use of the TCTD model adheres to 2006 MnDOT Memo "Revised Guidelines for Twin City Travel Demand Forecasts Prepared for the Metropolitan District":

- Latest Twin Cities Travel Demand Model (February, 2011)
- Model and Parameters for Adjustments to Model Inputs (April 10, 2006)
- Model Output Checks for Reasonableness and Post Processing Adjustments (April 10, 2006)
- Documentation of Forecast (April 10, 2006)

The full traffic forecast technical memorandum, "*I-35W Transit Access Project Traffic Forecasts*", can be found in the attached Appendix D.

Figure 18 – Existing Traffic Demands

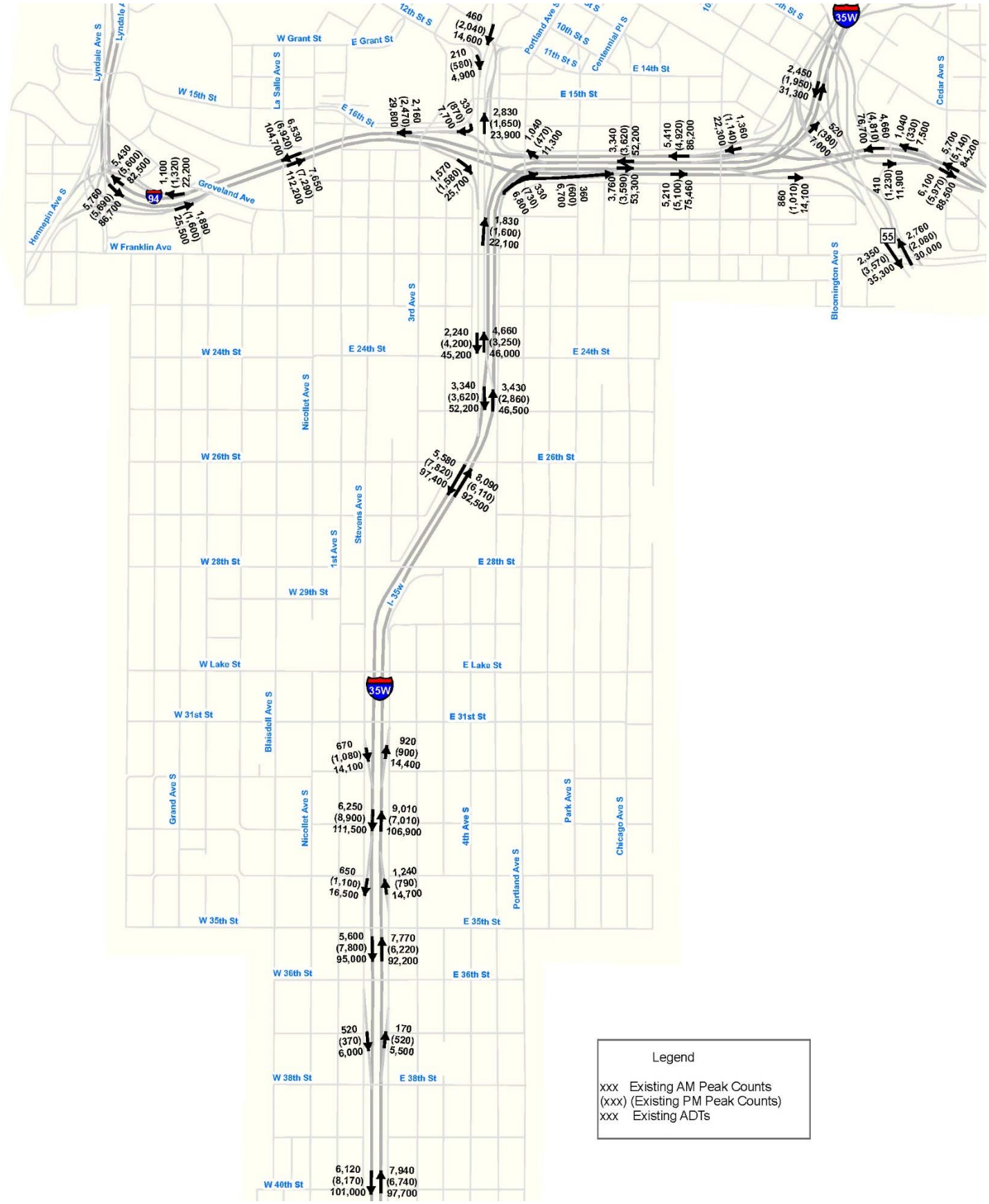


Figure 19 – 2038 No Build Traffic Demands

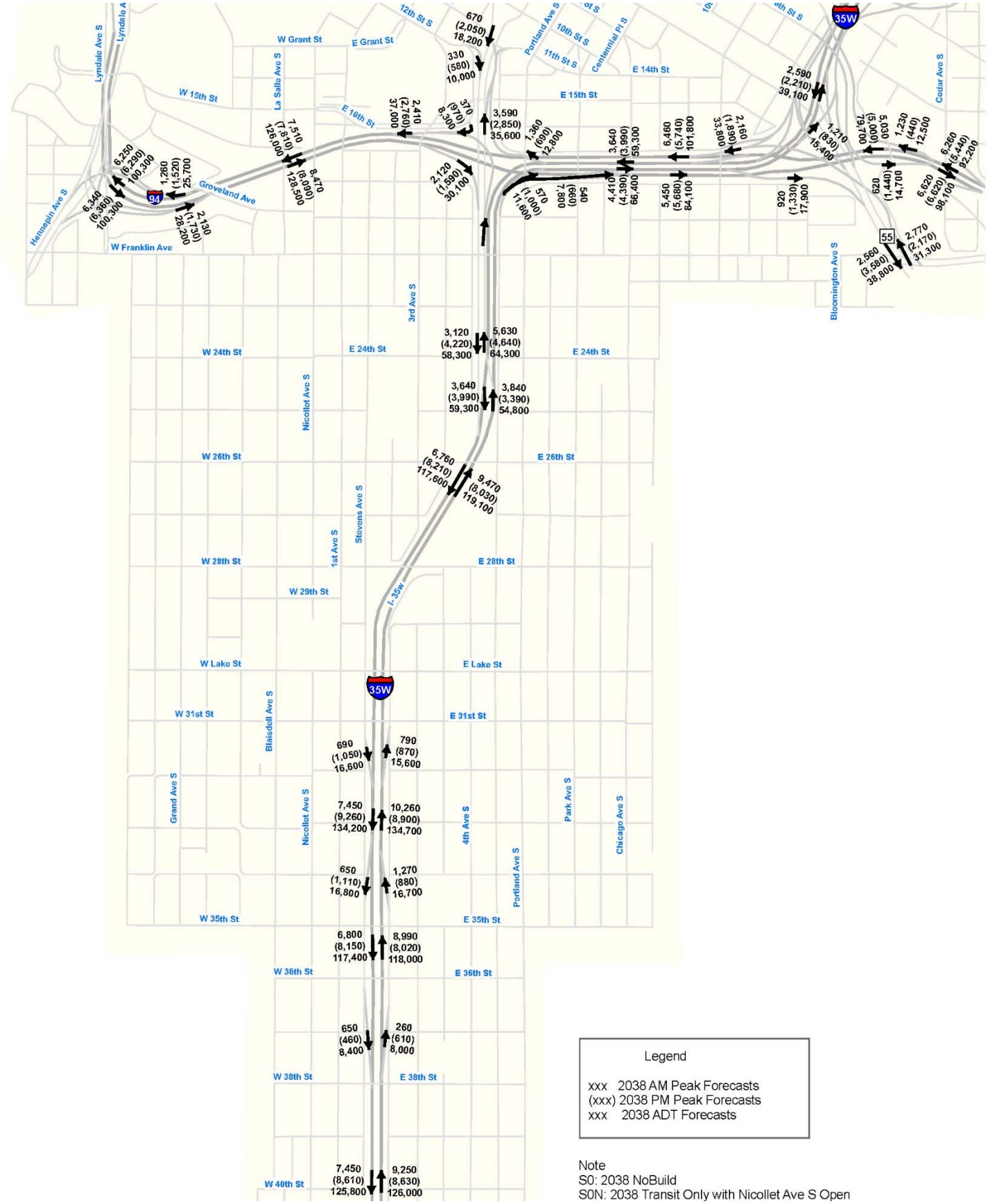
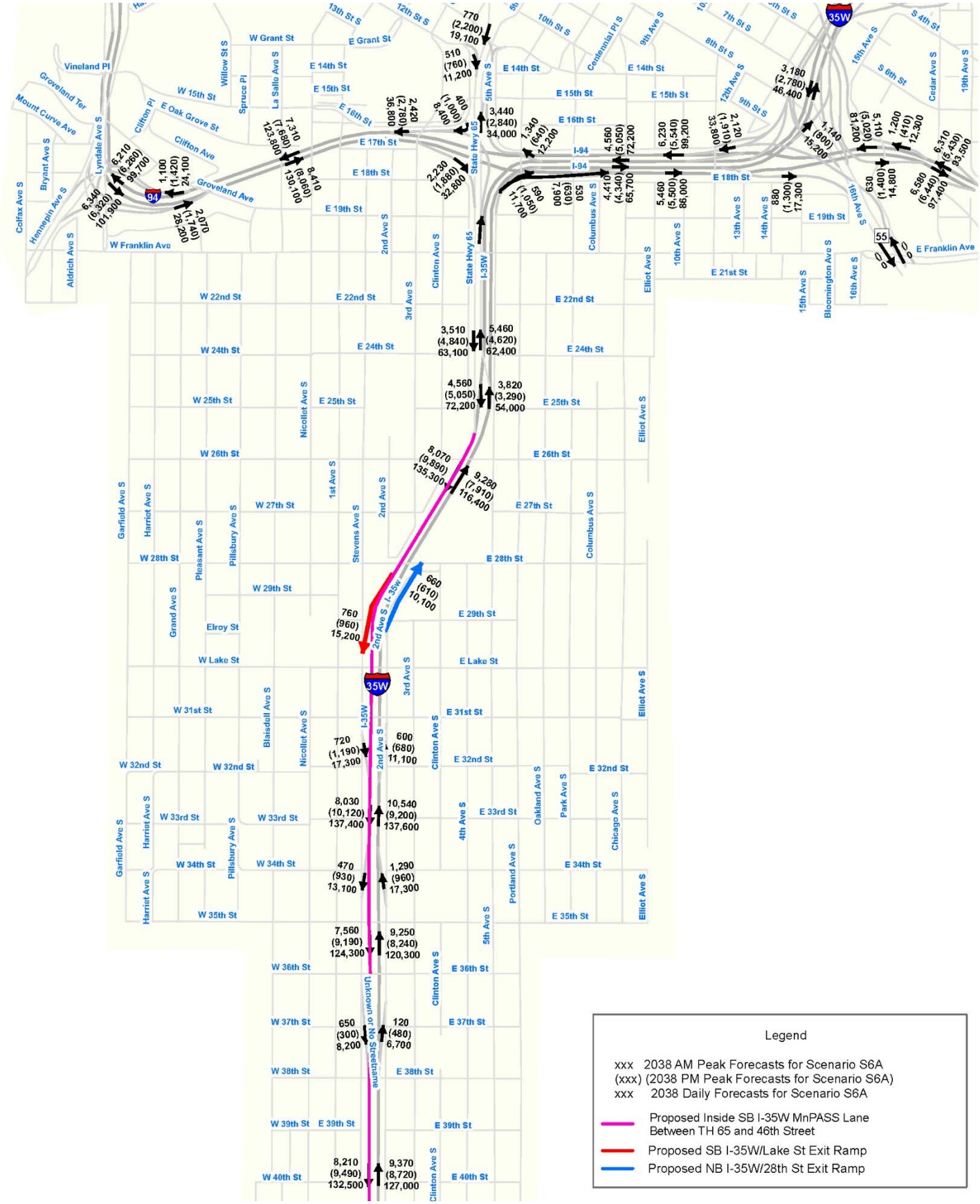


Figure 20 – 2038 Build Traffic Demands



7.0 Request Coordination

A Technical Advisory Committee was formed for the project that includes representatives from the City of Minneapolis, Hennepin County, Metropolitan Council, Metro Transit, MnDOT and FHWA. The committee has met regularly since November 2010 to provide guidance, discuss alternatives, to raise issues and concerns and to help steer the project.

MnDOT has also met with FHWA separately on numerous occasions to review the concept modeling and interchange geometrics.

7.1 Public Involvement

The I-35W Transit Access Project development process included an extensive public involvement program that was initiated at the beginning of the development of design concepts. There were several elements to the involvement program, each of which are detailed below.

7.1.1 Project Advisory Committee

A Project Advisory Committee (PAC) was formed for the project that includes representatives of the TAC group as well as representatives for neighborhoods, businesses, organizations, and City of Minneapolis Council or their appointees. The committee has met regularly since February 2011 to provide information about the stakeholders they represent and to reflect opinions, interests and concerns of the neighbors, businesses and organizations they represent.

7.1.2 Public Meetings

Public Open House meetings were held in August 2011, May 2012, November 2012, and June 2014. The purpose of the meetings was to provide information, receive comments, and answer questions. Participants included property owners, businesses and residents in the area. Verbal and written comments were received from the public including alternative preferences, potential issues and impacts, and other project concerns. These meetings were announced in direct mailings, local papers, city newsletters and the project website.

7.1.3 Neighborhood and Individual Meetings

In addition to the formal meeting process, numerous meetings were held with individual residents businesses, and property owners along the corridor.

7.1.4 Newsletters

Several press releases were published in newsletters to notify the public of open house meetings and to provide project updates.

7.1.5 Project Website

A project website (www.35lake.com) was developed to provide information regarding project updates, design concepts and other aspects of the project. In addition, the website includes project contact information so that interested parties can contact project personnel directly for additional information.

7.1.6 Public Hearing

A public hearing will be held as part of the formal comment period for the EA. The public hearing will provide an opportunity for attendees to ask questions and formally submit public testimony.

8.0 Project Conformance with FHWA Policy Requirements

Section 111 of Title 23 USC provides that before proceeding with the modification of existing access or the addition of access to the Interstate System, it is necessary to gain approval from the U.S. Secretary of Transportation. The authority to administer 23 USC 111 has been delegated to the FHWA pursuant to 49 CFR 1.48(b)(10). The FHWA published a policy statement in the Federal Reserve on October 22, 1990 (55 FR 42670), which was modified on February 11, 1998 (63 FR 7045) and on August 27, 2009 (74 FR 20679). In this statement of policy, eight policy requirements were identified for use by FHWA to approve new or revised access points to the Interstate System. The policy requirements and a discussion of the proposed project conformance to each requirement are discussed in the following sections.

8.1 Policy Number One

The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year demands (23 CFR 625.2(a)).

The proposed project will address safety and limited access concerns and ultimately provide a safety benefit to both the interstate and local roadway systems.

Southbound I-35W

Along southbound I-35W, destinations between I-94 and Lake Street have very limited access; through the I-94 commons area no exit ramp is provided from southbound I-35W for over 2.5 miles. Traffic destined from I-35W to the local system must travel down to the 35th Street exit ramp to enter the local street system and then back track north to their final destination.

Due to the existing high level of development and fully utilized public corridors, additional capacity on the local road system, including the 35th Street interchange, would require extensive right of way acquisition and was therefore not considered reasonable.

Northbound I-35W

Along northbound I-35W, the 31st Street exit ramp is the last exit before downtown Minneapolis and the I-94 commons area; downtown Minneapolis is an additional 2-mile trip along I-35W and TH 65. From northbound I-35W, destinations between Lake Street and I-94, 31st Street is the last exit before traveling beyond the destination and back tracking. Trips that do travel beyond and backtrack add to existing congestion issues in the I-94 Commons.

The 31st Street exit ramp merges with 2nd Avenue in front of the Historic Healy Block of homes located directly along 2nd Avenue. Expansion of the ramp or 2nd Avenue would result in an impact to the historic district. Extensive work related to the proposed design impacts to the historic district have been conducted to minimize impacts.

The majority of the existing traffic currently using the 31st Street exit ramp are destined northerly along 2nd Avenue up to 28th Street; over 50% during the AM peak hour. All of this traffic must travel through the Lake Street and 2nd Avenue intersection, which currently has both safety and operation problems.

With the widening of the freeway to accommodate both the MnPASS lanes and the center transit station, the existing 2nd Avenue connection between Lake Street and 28th Street will be removed.

While the surrounding arterial network can handle the rerouted trips through the arterial network with signal timing changes; the initial exiting demands to 31st Street are too great for the 2nd Avenue/31st Street intersection. While the overall level of service would be acceptable, the queues from the 2nd Avenue and 31st Street intersection would extend onto the northbound I-35W creating major safety and operational problems for the freeway users.

Westbound I-94

Due to the constraints in the Lowry Tunnel, the existing connection from northbound I-35W to westbound I-94 cannot be improved with added capacity. The existing conditions and future no build conditions all have failing operations and poor safety conditions.

The origin-destination study resulted in the majority of traffic from northbound I-35W continuing along I-94 beyond the I-394 exit. The proposed improvement will remove a high weaving demand and improve geometrics along the mainline to improve both safety and operations for westbound I-94.

8.2 Policy Number Two

The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).

As part of the I-35W Transit Access project, mass transit and HOV facilities were considered vital to the feasibility of the project.

The proposed I-35W Lake Street transit station will provide a high capacity connection for transit riders in the immediate area, for transfers from local transit service along Lake Street to/from the I-35W Orange Line BRT. The center median transit station will allow the reinstatement of northbound transit routes to Lake Street which have been suspended by Metro Transit during peak periods due to weaving problems from the existing left side transit lane to the right side transit stop on I-35W.

The existing northbound PDLS lane will be reconstructed to a full MnPASS facility. A full MnPASS facility will be constructed along southbound I-35W from just south of the TH 65 merge area down to the existing MnPASS lane near 43rd Street. The braid ramp reconstruction will align TH 65 on the left side of I-35W which will allow the high transit demands and HOV vehicle demands from downtown Minneapolis to stay in the left lanes and enter the MnPASS lane without unnecessary weaving.

Design considerations for both the southbound I-35W Lake Street exit ramp and the northbound I-35W 28th Street exit ramp were addressed to minimize right of way and construction costs.

Additional ramp access was initially assessed as part of the project; however due to cost, right of way, and other impacts the northbound I-35W entrance ramp from Lake Street was removed from consideration. The current design of this project does not preclude the addition of the northbound I-35W entrance ramp from Lake Street as part of a later project.

The existing short weave section between 35th Street and 31st Street is a major concern to all entities involved. However, due to fiscal constraints and potential impacts, fully addressing the weaving section as part of this project was implausible. Previous engagements in the project area related to improving the weaving section resulted in considerable resistance from local neighborhoods potentially impacted by the change.

As part of this project, the southbound weaving area was extended by approximately 120 feet and the existing auxiliary escape lane was extended from 200 to 400 feet. The northbound weaving section was slightly reduced, from 580 to 530 feet, and a full auxiliary lane is provided to the proposed 28th Street exit ramp; the current weaving area does not include an escape lane.

The current design of this project does not preclude a future project to address the short weaving issues either by relocation of the existing 35th/36th Street interchange or ramp braiding.

8.3 Policy Number Three

An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

An extensive operations analysis was conducted for the proposed I-35W Transit Access project which showed a clear benefit of the proposed project to the interstate system. The analysis included approximately 10 miles of modeled freeways in the project area modeled in FHWA's micro-simulation package CORSIM. See section 4 of this document for further discussion of the operations analysis.

Additional arterial and freeway documentation is also attached in the appendix.

Southbound I-35W

For southbound I-35W, the proposed changes have a significant improvement for both operations and safety. Reconfiguring I-35W to the right side of TH 65 at the systems merge aligns the TH 65 downtown Minneapolis traffic to the left side and approaching the MnPASS lane. This significantly reduces potential weaving demands between the systems interchange and the MnPASS and Transit Station. The added MnPASS lane down to the existing lane which begins at 43rd Street creates a system wide connection from the downtown to the southern metro. The added access to Lake Street reduces demands on the overburdened 35th Street exit, reduces the weaving volumes between 31st Street and 35th

Street, provides a full auxiliary lane around the improved I-94 commons curve, and provides "off" and "on" access ramps for improved accessibility to commercial land uses and employers.

Northbound I-35W

For northbound I-35W, the proposed changes will have an improvement for both operations and safety. The reconstruction of the existing PDSL to a full MnPASS facility and the proposed auxiliary lane for the 28th Street exit will improve safety along the I-35W corridor. The 28th Street exit ramp and auxiliary lane reduce the weaving demands between 35th Street and 31st Street and provide a longer weaving area for the remaining vehicles. The reduced demands at the 31st Street exit remove demand from 2nd Avenue that currently travels through high crash prone intersections.

Based on the regional travel demand modeling, the 2038 VMT and VHT for the project area are improved under the northbound 28th Street Exit Only scenario. The VMT reduction is for both the freeway and arterial network, while the VHT has a minor increase in freeway time but a significant decrease in arterial time. While the intent of the proposed freeway access is not to solely provide direct local access, when the proposed freeway widening occurs and the 2nd Avenue connection to 28th Street is removed, traffic destined north of 28th Street will have severely limited arterial options. This would put more traffic on the 31st Street ramp and queue back onto the freeway system.

Westbound I-94

For westbound I-94, the proposed changes have a significant improvement on vehicle demand throughput and traffic safety. The left side entrance ramp, into a full auxiliary lane, significantly reduces the weaving demands along westbound I-94. This allows for more vehicle throughput to reach the Lowry Tunnel without adding additional congestion. The reduced weaving volumes and the mainline geometric improvements will also provide a safety benefit to a very problematic area.

The OD study resulted in approximately 10% of the flyover ramp traffic destined for the Hennepin/Lyndale Avenue exit. While this movement would not be desired, it is able to be accomplished with an approximate 2,800 feet spacing between the entrance ramp and the exit ramp. A vehicle from the flyover ramp would require 3 lane maneuvers from the left side of I-94 to the right side in order to make the exit. Vehicles that are not comfortable making the maneuvers have the ability to travel along TH 65 into downtown and using local streets to access Hennepin/Lyndale Avenues.

The reduced weaving demands and improved operations from the left side flyover entrance ramp will have a significant improvement on the safety along westbound I-94.

The 4th Avenue entrance ramp study is still under the evaluation phase; however preliminary results indicate a significant impact to many local roadways approach other freeway access. A managed entrance ramp would have minimal use and local impacts would still be great. At this time the City of Minnepolis and MnDOT are assessing the outcomes of that study; however the likelihood is the ramp will remain in place as in the existing condition.

8.4 Policy Number Four

The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or

park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)).

The proposed conditions interstate access changes include an I-35W southbound exit ramp to Lake Street and an I-35W northbound exit ramp to 28th Street.

The existing Lake Street/31st Street interchange is less than a "full interchange"; there are only ramps to and from the south at 31st Street. The proposed I-35W southbound exit ramp to Lake Street will provide an additional movement from southbound I-35W to Lake Street. The northbound entrance ramp was removed from consideration from this project due to construction impacts, including right-of-way and costs; however the design of this project does not preclude the construction of the entrance ramp as a future project.

At this time, neither MnDOT, Hennepin County, nor the City of Minneapolis have planned or programmed to construct the northbound entrance ramp; however all design efforts for the current project either accommodate or do not preclude the construction as part of a later project. As an example, the proposed bridges along northbound I-35W at 26th Street, 24th Street and Franklin Avenue are all designed to accommodate the future auxiliary lane as part of the northbound entrance ramp.

There is no existing interchange at I-35W and 28th Street; the proposed northbound exit ramp to 28th Street would be a less than a "full interchange". As part of previous projects along the I-35W corridor and at the 31st Street/Lake Street interchange, the 28th Street exit was initially a concept that extended as a common exit ramp to 31st, Lake, and 28th Street. However the combined exit ramp design proved to have unbearable impacts that resulted in the separate exit ramp design it is today.

The additional capacity along northbound I-35W and the removal of the 2nd Avenue connection between Lake Street and 28th Street, would add additional traffic to the 31st Street intersection that is unable to process all the traffic in an efficient manner. While the overall operational delay is acceptable, the queues will reach the freeway mainline and create major safety and operational issues.

The proposed ramp access changes along I-35W meet all AASHTO ramp spacing standards. Along I-94, the proposed left hand flyover entrance on I-94 has an entrance to entrance spacing of only 200 feet; however the entrances are on opposite sides of the freeway and the proposed ramp enters into a full auxiliary lane and does not require a merge.

The proposed design of the southbound exit ramp to Lake Street meets all design standards and does not require any design exceptions. The proposed design of the northbound exit ramp to 28th Street meets all design standards with the exception of a substandard outside shoulder; the shoulder width is limited due to the constraints of the center Transit Station width and right of way on both sides of the freeway, and potential impacts to the historic Healy Block district.

8.5 Policy Number Five

The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.

This project is consistent with the current Transportation Policy Plan (TPP) adopted by the Metropolitan Council (see http://metrocouncil.org/Transportation/Planning-2/Key-Transportation-Planning-Documents.aspx).

The joint Interchange Review Committee was addressed with a memorandum in April of 2015 for the I-35W 28th Street access. The committee made an acceptable determination of the proposed access; the letter can be found in Appendix D. (SUBJECT TO CHANGE!!!)

The project is also consistent with the Hennepin County 2030 Comprehensive Plan (see http://www.hennepin.us/~/media/hennepinus/Business/work-with-hennepin-county/Documents/2030-comprehensive-plan-small.pdf).

The replacement of the southbound I-35W braid bridge and the northbound I-35W flyover ramp bridge is consistent with the Trunk Highway Bridge Improvement Program, Chapter 152 (see http://www.dot.state.mn.us/govrel/reports/2013/ch152report.pdf).

The proposed access from southbound I-35W is consistent with policy as it is a step towards completion of a full access interchange at 31st Street/Lake Street; the northbound entrance ramp is not proposed with this project. This project does not preclude the northbound entrance ramp from being constructed with a future project.

The 28th Street exit ramp does not directly conform to policy based on interchange spacing, providing a full interchange access, and functional classification. However, proper ramp spacing is provided under the current project design and with the future northbound Lake Street entrance ramp. The functional classification of 28th Street is a B Minor arterial; the City of Minneapolis classification of 28th Street as a high volume Activity Area Street that serves dense activity centers, employment centers, and growth centers as defined by the City's Comprehensive Plan.

However 28th Street is part of a one-way pair of streets along with 26th Street, also a B Minor arterial. This one-way pair of streets is vital to South Minneapolis area for the east-west connections and combined carry a substantially higher daily traffic demand than either Lake Street or 31st Street. At this time there is no plan to add additional ramp access on 28th Street and it would remain a partial interchange.

Without the 2nd Avenue connection from Lake Street to 28th Street, many of the arterial intersections will see a significant increase in traffic as vehicles use both 31st Street and Lake Street to find a northern route. The majority of the intersections will operate near capacity, so the increase in demands will likely have a safety impact.

8.6 Policy Number Six

In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111).

Figure 3 shows the limits of the models used for this project, which represents a *comprehensive Interstate network study.* There are no additional access changes currently programmed for the area within the model or project limits and the complex interrelationship of proposed improvements was evaluated throughout the modeling process.

The current project design initially incorporated a new northbound I-35W entrance ramp from Lake Street to complete the full interchange. The current project does not include this entrance ramp, however the design of the project does not preclude the future construction of the entrance ramp.

If the northbound entrance ramp is constructed in the future, the 28th Street exit provides additional relief to the local network caused by the increased demands along Lake Street gravitating to the entrance ramp. The freeway study report, and traffic forecast memorandum, along with other information is included in the appendix.

There is a long list of previous projects and studies that have been evaluated over the last 15 years or more. While these documents are not included in the attached appendix material due to size limitations, the number of studies reflect the comprehensive nature of the project. The following is a list of previous projects and studies:

- 1998 I-35W Lake Street Access Alternatives Feasibility Study
- 2000 I-35W South Minneapolis New Access Scoping study
- 2000 26th & 28th Street Operations Study
- 2002 Nicollet Lake Traffic Study
- 2003 I-35W BRT Study
- 2004 I-35W Access Project Preliminary Design Study
- 2007 Downtown Freeway Study
- 2007 UPA Study
- 2008 I-35W Transit Station and Access Study
- 2009 Transit Station Study
- 2013 UPA Evaluation

The proposed project does not address all current ongoing and projected deficiencies along the I-35W and I-94 corridors and currently there are no other programmed improvements in the area. However, this project does not preclude future considerations that have a potential benefit to the regional system.

The 2007 Downtown Freeway Study includes many potential solutions for both I-94 and I-35W. This project will address three strategies from that study including the southbound I-35W/TH 65 Braid Bridge, the 3rd southbound lane around the curve, and the left-side landing of the westbound I-94 flyover ramp.

Potential future projects, from this study and the Downtown Freeway Study could include the following:

- Northbound I-35W entrance from lake Street with 3rd lane around curve
- Modification of the 5th Avenue entrance ramp to northbound I-35W
- Modification of the systems connection to Eastbound I-94
- Modification of the 4th Avenue entrance ramp to westbound I-94
- Relocation or reconfiguration of the 35th/36th Street Interchange

Currently, the 4th Avenue ramp modification is being studied by MnDOT. The draft results are included in the appendix of this document. The analysis evaluated two options including a full ramp closure and a “managed” entrance. Due to the low HOV demand at this entrance,

both options have significant arterial impacts that neither the City of Minneapolis nor MnDOT have the wherewithal to mitigate.

8.7 Policy Number Seven

When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).

The new and revised access changes are proposed as a result of traffic operational and safety concerns due to existing and forecast year growth and congestion.

The request for new or revised access includes four access locations:

- New southbound I-35W exit ramp to Lake Street
- New northbound I-35W exit ramp to 28th Street
- Revise northbound I-35W flyover ramp to enter on the left hand side of I-94
- Revise southbound I-35W Braid Bridge to west side of TH 65; southbound TH 65 will merge on left side of I-35W

Generation of traffic forecasts was completed with the latest Twin Cities Regional Model which reflects socio-economic data and transportation system data provided to the Metropolitan Council. The model has incorporated major transportation improvements within the Twin Cities Metropolitan area that are planned for construction within the next 20 years.

8.8 Policy Number Eight

The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).

The Environmental Assessment (EA) for the project is currently underway and is anticipated to be complete in fall 2015. The EA will discuss the potential social, economic, and environmental impacts of the proposed improvements. The document will be available for public review at that time and a public hearing will be held to receive comments.

Preliminary analysis indicates that the proposed project is not expected to have substantial social, economic, or environmental impacts and that any impacts that will occur will be mitigated using appropriate measures.

8.8.1 Historic Properties

Within the project limits there are a number of registered historic properties. The figure below shows the properties scattered throughout the Area of Potential Effect (APE) for the entire project.

While there are many different historic properties throughout the APE, only two are in direct, close proximity of the proposed, reconstructed roadway. Most of the improvements within the APE will be reconstructed within the existing MnDOT right of way and not impact the local street area.

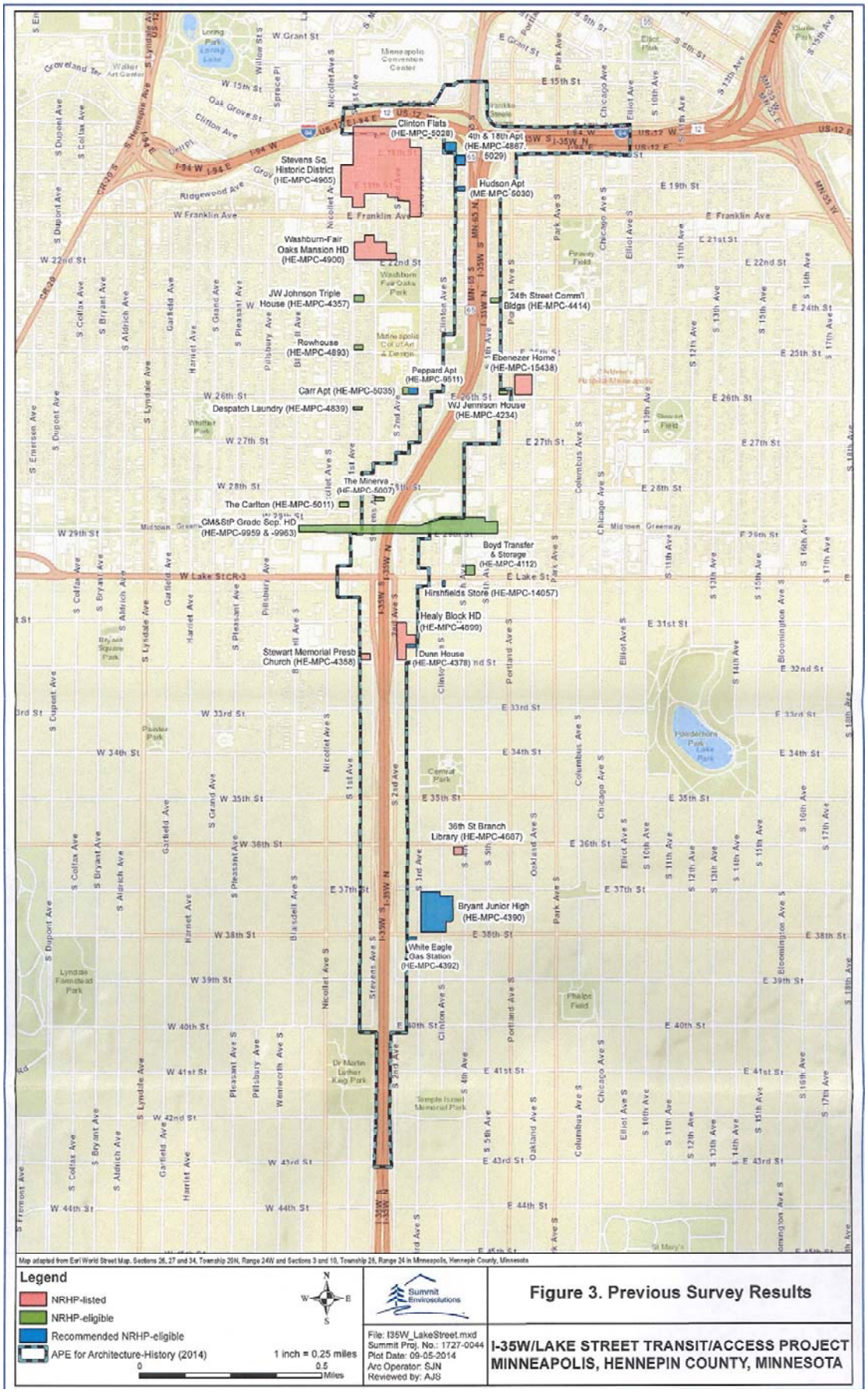
The two main properties within the closest proximity of the project include the Healy Block District and the Redeemer Missionary Baptist Church. These properties are located between 31st Street and 32nd Street on either side of I-35W.

The Baptist Church currently has an existing noise barrier between Stevens Avenue and the freeway. The current layout does not significantly shift the existing noise barrier closer to the historic property and therefore no additional considerations were warranted.

The Healy Block District does not currently have a noise barrier between the freeway and 2nd Avenue; therefore special consideration was deemed appropriate when developing the project layout to not create an adverse impact to the historic district. The widening of the freeway section to accommodate the BRT station and MnPASS lanes had the potential to bring the freeway lanes closer to the district; this was deemed a livability issue by the project team. The considerations include shifting the mainline I-35W alignment west, away from the district, as much as feasible to minimize the impacts. Alternative configurations were also considered for 2nd Avenue, directly abutting of the district, as the existing traffic consistently queues in front of the properties.

Section 4 of this document includes a section on different 2nd Avenue alternatives included in the analysis. The existing 2nd Avenue connection to 31st Street will become a forced right turn serving local movements for the northbound one-way street. The 31st Street exit ramp from northbound I-35W will be physically median separated from 2nd Avenue.

Figure 21 – Historic Properties – APE Boundary



List of Appendices (CD-ROM)

Appendix A - Existing Operational MOE's
Appendix B - 2038 Operational MOE's
Appendix C - 2018 Operational MOE's
Appendix D - MnDOT CORSIM Review Letters
Appendix E - I-35W Transit Access Forecast Memorandum
Appendix F - I-35W Northbound Ramp to I-94 Origin Destination Memorandum
Appendix G - I-35W Existing and Proposed Managed Lane Operations Memorandum
Appendix H - I-35W Freeway Operations Report
Appendix I - I-35W Lake Street Access Scenarios Memorandum
Appendix J - I-35W Arterial Traffic Analysis Memorandum
Appendix K - Westbound I-94 4th Avenue Entrance Study Memorandum
Appendix L - Interchange Review Committee Letter and Response
Appendix M - Approved Layout and Signing Layout

Appendix A

Existing Operational MOE's

Table A1
2011 Existing AM peak
Freeway Measures of Effectiveness
I-35W Lake Street Transit

Iterations: 9

Select Hour Interval: 7:00 AM-8:00 AM

LOS A <10 vplph
LOS B 10<20 vplph
LOS C 20<28 vplph
LOS D 28<35 vplph
LOS E 35<43 vplph
LOS F >43 vplph

FREReport
Exist AM Tools.xlsm
9/15/2014

	Location		Node		Length (ft)	Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
	From	To	From	To		Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,620	4,654	34	63	19	B	63.1	18.9	B	12,006	12,110	104	0.87	0.74
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,290	6,342	52	65	16	B	64.5	16.4	B	16,963	17,114	151	0.89	0.83
	60th St Entrance	Diamond Lake Exit	106	108	910	6,520	6,572	52	65	16	B	65.3	15.6	B	17,486	17,631	145	0.83	0.80
	Diamond Lake Exit		108	110	1,432	6,360	6,433	73	66	20	B				17,062	17,236	174	1.02	1.14
		Diamond Lake Entrance	110	112	1,225	6,360	6,433	73	65	20	B	65	20	C	17,062	17,227	165	0.97	1.15
	Diamond Lake Entrance		112	113	1,449	7,080	7,161	81	59	23	C				18,785	18,967	182	0.97	1.14
			113	114	542	7,080	7,156	76	64	23	C	62	22	C	18,785	18,955	170	0.91	1.07
		46th St Exit	114	116	1,462	7,080	7,152	72	65	21	C				18,785	18,943	158	0.84	1.02
	46th St Exit	46th St BRT Exit	116	118	238	6,870	6,944	74	64	19	B	64.4	18.5	B	18,159	18,315	156	0.86	1.08
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	6,870	6,919	49	56	26	C	55.8	25.6	C	18,159	18,262	103	0.57	0.72
	46th St BRT Entrance	46th St Entrance	120	122	378	6,870	6,909	39	44	30	D	43.6	29.6	D	18,159	18,257	98	0.54	0.57
	46th St Entrance		122	124	1,521	7,940	7,938	-2	38	42	E				20,706	20,755	49	0.24	-0.03
			124	126	818	7,940	7,887	-53	35	47	F	35	45	F	20,706	20,698	-8	-0.04	-0.67
		35/36th St Exit	126	128	1,514	7,940	7,836	-104	32	48	F				20,706	20,647	-59	-0.29	-1.31
	35/36th St Exit		128	130	1,485	7,770	7,602	-168	29	52	F				20,212	20,125	-88	-0.43	-2.16
		35/36th St Entrance	130	132	1,474	7,770	7,536	-234	31	49	F	30	50	F	20,212	20,068	-144	-0.71	-3.01
	35/36th St Entrance	31/Lake St Exit	132	134	604	9,010	8,738	-272	34	43	F	33.6	43.4	F	23,313	23,135	-178	-0.76	-3.02
	31/Lake St Exit	Lake St BRT Exit	134	136	1,029	8,090	7,796	-294	41	34	D	41.4	34.4	D	20,711	20,542	-169	-0.82	-3.64
	Lake St BRT Exit	Lake St BRT Entrance	136	138	721	8,090	7,773	-317	45	35	D	45	34.6	D	20,711	20,505	-206	-1.00	-3.92
	Lake St BRT Entrance		138	140	1,190	8,090	7,757	-333	49	30	D				20,711	20,488	-223	-1.08	-4.12
			140	142	569	8,090	7,743	-347	51	31	D				20,711	20,467	-244	-1.18	-4.29
			142	144	1,061	8,090	7,734	-356	55	28	D	53	29	D	20,711	20,453	-258	-1.24	-4.40
		NB I-35W/TH 65 SPLIT	144	146	859	8,090	7,727	-363	57	27	C				20,711	20,440	-271	-1.31	-4.49
	Begin NB TH 65		146	148	498	4,660	4,450	-210	57	26	C				11,698	11,644	-54	-0.46	-4.50
			148	150	281	4,660	4,447	-213	56	27	C				11,698	11,641	-57	-0.49	-4.57
			150	152	284	4,660	4,445	-215	53	28	D	51	27	C	11,698	11,638	-60	-0.51	-4.62
			152	154	582	4,660	4,442	-218	50	29	D				11,698	11,633	-65	-0.56	-4.68
		WB I-94 Exit	154	156	644	4,660	4,439	-221	45	26	C				11,698	11,624	-75	-0.64	-4.75
	WB I-94 Exit	**END NB TH 65**	156	158	983	2,830	2,786	-44	53	17	B	53.3	17.4	B	7,027	7,221	194	2.76	-1.54
	NB I-35W/TH 65 Split		146	161	665	3,430	3,273	-157	52	32	D				9,013	8,787	-226	-2.51	-4.57
			163	164	927	3,430	3,272	-158	42	40	E	39	45	F	9,013	8,780	-233	-2.58	-4.61
		5th Ave Entrance	164	165	965	3,430	3,269	-161	28	58	F				9,013	8,771	-242	-2.68	-4.70
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,760	3,590	-170	36	46	F	35.5	46.2	F	9,779	9,523	-256	-2.62	-4.52
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,990	4,792	-198	49	31	D	48.5	30.9	D	12,979	12,673	-306	-2.36	-3.97
	EB I-94 Exit		167	168	540	3,650	3,487	-163	51	23	C				9,850	9,639	-211	-2.14	-4.46
		Washington Ave Exit	168	169	448	3,650	3,486	-164	52	22	C	51	23	C	9,850	9,635	-215	-2.18	-4.49
	Washington Ave Exit		169	170	625	3,130	2,982	-148	55	27	C				8,324	8,123	-201	-2.42	-4.72
		END NB I-35W	170	171	523	3,130	2,982	-148	57	26	C	56	27	C	8,324	8,120	-204	-2.46	-4.74
Northbound I-35W/TH 65 Ramps	TH 62	NB I-35W	204	104	266	1,670	1,687	17	53	17	B				4,957	5,010	53	1.06	1.01
	60th St	NB I-35W	206	106	505	230	229	-1	55	4	A				523	523	0	0.04	-0.57
	NB I-35W	Diamond Lake Road	108	208	271	160	142	-18	55	3	A				424	390	-34	-8.11	**-11.31**
	Diamond Lake Road		211	212	606	720	733	13	19	20	C				1,723	1,755	32	1.83	1.86
		NB I-35W	212	112	577	720	732	12	30	19	B				1,723	1,754	31	1.79	1.72
	NB I-35W	46th Street	116	216	370	210	205	-5	55	4	A				626	617	-9	-1.50	-2.43
	NB I-35W	46th St BRT	118	218	166	0	9	9	60	0	A				0	28	28	0.00	0.00
	46th St BRT	NB I-35W	220	120	246	0	9	9	38	0	A				0	28	28	0.00	0.00
	46th Street		221	222	818	1,070	1,074	4	26	21	C				2,547	2,550	3	0.13	0.35
		NB I-35W	222	122	686	1,070	1,069	-1	28	31	D				2,547	2,547	0	0.00	-0.10
	NB I-35W	35/36th Street	128	228	533	170	166	-4	53	3	A				494	459	-35	-7.04	-2.59
	35/36th Street		231	232	595	1,240	1,242	2	14	47	F				3,101	3,109	8	0.25	0.19
		NB I-35W	232	132	470	1,240	1,243	3	27	35	D				3,101	3,105	4	0.14	0.23
	NB I-35W	31/Lake Street	134	234	410	920	920	0	44	21	C				2,602	2,565	-37	-1.43	0.02
	NB I-35W	Lake St BRT	136	236	132	0	3	3	27	0	A				0	9	9	0.00	0.00
	Lake St BRT	NB I-35W	238	138	108	0	3	3	0	0	A				0	9	9	0.00	0.00
	NB TH 65	WB I-94	156	256	388	1,830	1,649	-181	30	56	F				4,671	4,394	-277	-5.93	-9.91
	5th Avenue		261	265	485	330	328	-2	45	4	A				766	765	-1	-0.13	-0.48
		NB I-35W	265	165	220	330	328	-2	35	5	A				766	765	-1	-0.16	-0.64
	EB I-94	NB I-35W	266	166	369	1,230	1,208	-22	52	23	C				3,200	3,163	-37	-1.15	-1.80
	NB I-35W	EB I-94	167	267	483	1,340	1,302	-38	52	25	C				3,129	3,025	-104	-3.33	-2.87
	NB I-35W	Washington Ave	169	262	847	520	503	-17	54	5	A				1,526	1,509	-17	-1.12	-3.31
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,450	2,447	-3	57	22	C	56.7	22	C	6,474	6,473	-1	-0.02	-0.11
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,730	2,730	0	52	24	C	52	23.6	C	7,213	7,220	7	0.10	-0.01
	WB I-94 Entrance		366	367	1,871	3,340	3,322	-18	50	30	D				8,724	8,696	-28	-0.32	-0.54
			367	368	827	3,340	3,319	-21	34	49	F				8,724	8,685	-39	-0.44	-0.62
			368	369	483	3,340	3,317	-23	41	40	E	47	35	E	8,724	8,678	-46	-0.52	-0.69
			369	370	403	3,340	3,316	-24	51	32	D				8,724	8,676	-48	-0.55	-0.72
		SB TH 65 Entrance	374	376	627	3,340	3,311	-29	55	30	D				8,724	8,671	-53	-0.61	-0.86
	Begin SB TH 65	12th St Entrance	300	302	867	460	462	2	63	4	A	63.4	3.7	A	1,228	1,235	7	0.55	0.52
	12th St Entrance	EB I-94 Entrance	302	304	1,088	670	736	66	56	6	A	55.5	6.1	A	1,744	1,944	200	**11.44**	9.85
	EB I-94 Entrance		304	307	1,574	2,240	2,314	74	59	13	B				6,206	6,331	125	2.02	3.32
		SB I-35W Entrance	307	310	1,516	2,240	2,313	73	61	14	B	60	14	B	6,206	6,326	120	1.93	3.25
	SB I-35W Entrance		310	314	698	5,580	5,618	38	60	23	C				14,930	14,987	57	0.38	0.68
			314	318	379	5,580	5,616	36	62	23	C				14,930	14,984	54	0.36	0.64
			318	320	900	5,580	5,613	33	64	22	C	63	22	C	14,930	14,980	50	0.34	0.59
		Lake St BRT Exit	320	322	616	5,580	5,613	33	64	18	B				14,930	14,977	47	0.31	0.59
	Lake St BRT Exit	Lake St BRT Entrance	322	324	719	5,580	5,593	13	64	22	C	64.1	21.8	C	14,930	14,915	-16	-0.10	0.23
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	5,580	5,606	26	64	20	C	64	20.4	C	14,930	14,965	35	0.24	0.46
	31/Lake St Entrance	35/36th St Exit	326	328	518	6,250	6,271	21	60	21	C	59.5	21.1	C	16,649	16,674	25	0.15	0.34
	35/36th St Exit		328	330	1,384	5,600	5,616	16	65	22	C				14,749	14,767	18	0.12	0.28
		35/36th St Entrance	330	332	1,712	5,600	5,611	11	66	21	C	65	22	C	14,749	14,755	6	0.04	0.19
	35/36th St Entrance		332	334	1,460	6,120	6,125	5	61	24	C				16,021	16,017	-4	-0.03	0.08
			334	336	544	6,120	6,123	3	64	24	C	63	22	C	16,021	16,012	-9	-0.06	0.04
		46th St Exit	336	338	1,512	6,120	6,120	0	65	20	B				16,021	16,004	-17	-0.11	0.00
	46th St Exit	46th St BRT Exit	338	340	780	5,770	5,780	10	65	16	B	65.3	16.1	B	15,072	15,069	-3	-0.02	0.17
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	5,770	5,771	1	66	17	B	66.4	17.4	B	15,072	15,047	-25	-0.17	0.02
	46th St BRT Entrance	46th St Entrance	342	344	393	5,770	5,772	2	65	15	B	65.3	15.3	B	15,072	15,050	-22	-0.15	0.03
	46th St Entrance		344	346	1,397	6,300	6,292	-8	62	19	B				16,332	16,302	-30	-0.18	-0.13
		60th St Exit	346	348	1,495	6,300	6,284	-16	62	20	B	62	19	B	16,332	16,293	-39	-0.24	-0.25
	60th St Exit	TH 62 Exit	348	350	2,036	6,050	6,017	-33	61	20	B	60.5	19.9	B	15,715	15,644	-71	-0.45	-0.54
	TH 62 Exit		350	352	1,409	2,680	2,641	-39	66	13	B				6,802	6,798	-4	-0.06	-1.46
			352	354	1,616	2,680	2,636	-44	67	13	B	66	13	B	6,802	6,792	-11	-0.15	-1.64
		END SB I-35W	354	356	719	2,680	2,634	-46	67	13	B				6,802	6,787	-15	-0.22	-1.73
Southbound I-35W/TH 65 Ramps	Washington CD RD	SB I-35W	461	365	302	280	284	4	48	6	A				739	751	12	1.56	1.57
	WB I-94	SB I-35W	466	366	269	610	594	-16	52	11	B				1,511	1,483	-28	-1.83	-2.57
	12th Street	SB TH 65	402	302	283	210	275	65	47	6	A				516	710	194	**37.58**	**30.95**
	EB I-94	SB TH 65	664	304	635	1,570	1,580	10	46	34	D				4,462	4,391	-71	-1.59	0.63
	SB I-35W	SB TH 65	376	310	857	3,340	3,309	-31	56	30	D				8,724	8,668	-56	-0.65	-0.93
	SB I-35W	Lake St BRT	322	422	121	0	18	18	46	0	A				0	58	58	0.00	0.00
	Lake St BRT	SB I-35W	424	324	102	0	18	18	31	1	A				0	58	58	0.00	0.00
	31/Lake Street		425	426	114	670	672	2	22	16	B				1,719	1,716	-3	-0.16	0.25
		SB I-35W	426	326	441	670	671	1	28	18	B				1,719	1,715	-4	-0.21	0.10
	SB I-35W	35/36th Street	328	428	395	650	651	1	41	16	B				1,900	1,897	-3	-0.16	0.18
	35/36th Street		431	432	669	520	521	1	28	10	A				1,272	1,271	-1	-0.05	0.15
		SB I-35W	432	332	585	520	520	0	34	12	B				1,272	1,270	-2	-0.14	0.04
	SB I-35W	46th Street	338	438	703	350	336	-14	54	6	A				949	927	-23	-2.37	-3.94
	SB I-35W	46th St BRT	340	440	116	0	3	3	60	0	A				0	12	12	0.00	0.00
	46th St BRT	SB I-35W	442	342	216	0	4	4	43	0	A				0	12	12	0.00	0.00
	46th St BRT		443	444	1,118	530	526	-4	41	7	A				1,260	1,258	-2	-0.17	-0.68
		SB I-35W	444	344	378	530	526	-4	34	11	B				1,260	1,257	-3	-0.21	-0.75
	SB I-35W	60th Street	348	448	541	250	263	13	54	5	A				617	638	21	3.35	5.16
	SB I-35W		350	450	465	3,370	3,371	1	53	21	C				8,913	8,839	-74	-0.83	0.02
		TH 62	450	451	390	3,370	3,371	1	53	21	C				8,913	8,837	-76	-0.85	0.03
Eastbound I-94	**Begin EB I-94**		554	556	984	3,570	3,572	2	51	36	E				10,318	10,314	-4	-0.04	0.07
			556	557	632	3,570	3,572	2	51	35	E	51	36	E	10,318	10,312	-6	-0.06	0.06
		EB I-394 Entrance	557	558	789	3,570	3,573	3	50	36	E				10,318	10,309	-9	-0.09	0.10
	EB I-394 Entrance		558	559	442	5,760	5,687	-73	40	47	F				16,668	16,460	-208	-1.25	-1.27
			559	560	1,192	5,760	5,690	-70	44	43	F	40	48	F	16,668	16,454	-214	-1.28	-1.21
		Lyndale/Hennepin Entrance	560	561	1,856	5,760	5,694	-66	37	52	F				16,668	16,441	-227	-1.36	-1.15
	Lyndale/Hennepin Entrance		561	562	1,485	7,650	7,556	-94	41	46	F				21,156	20,896	-260	-1.23	-1.22
			562	563	706	7,650	7,544	-106	50	38	E	45	42	E	21,156	20,882	-274	-1.29	-1.38
		SB I-35W Exit	563	564	474	7,650	7,542	-108	50	38	E				21,156	20,876	-280	-1.33	-1.41
	SB I-35W Exit		564	565	792	6,080	5,961	-119	50	40	E				16,694	16,475	-219	-1.31	-1.95
			565	566	865	6,080	5,958	-122	51	39	E	51	38	E	16,694	16,467	-227	-1.36	-2.01
		NB I-35W Exit	566	567	388	6,080	5,957	-123	51	31	D				16,694	16,461	-233	-1.39	-2.03
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,850	4,746	-104	51	31	D	51.3	30.8	D	13,494	13,292	-202	-1.49	-2.14
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,210	5,099	-111	55	23	C	55.1	23.1	C	14,411	14,198	-213	-1.48	-2.13
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,350	4,244	-106	59	24	C	59.2	23.9	C	11,818	11,642	-176	-1.49	-2.43
	NB I-35W Entrance		570	572	1,016	5,690	5,542	-148	61	23	C				14,947	14,660	-287	-1.92	-2.60
		Cedar Ave Entrance	572	573	1,027	5,690	5,538	-152	61	23	C	61	23	C	14,947	14,651	-296	-1.98	-2.67
	Cedar Ave Entrance		573	574	562	6,100	5,945	-155	59	21	C				16,000	15,698	-302	-1.89	-2.55
			574	576	930	6,100	5,941	-159	60	25	C				16,000	15,692	-308	-1.92	-2.61
			576	578	1,378	6,100	5,936	-164	61	24	C				16,000	15,683	-317	-1.98	-2.69
			578	580	1,268	6,100	5,931	-169	61	24	C	61	24	C	16,000	15,673	-327	-2.04	-2.78
			580	582	875	6,100	5,929	-171	61	24	C				16,000	15,665	-335	-2.09	-2.81
		END EB I-94	582	584	1,173	6,100	5,926	-174	61	24	C				16,000	15,656	-344	-2.15	-2.86
	EB I-394	EB I-94	658	558	266	2,190	2,112	-78	32	71	F				6,350	6,155	-195	-3.06	-3.58
	Lyndale/Hennepin Avenue		660	659	1,194	1,890	1,882	-8	31	31	D				4,488	4,481	-7	-0.16	-0.41
		EB I-94	659	561	302	1,890	1,875	-15	22	50	F				4,488	4,475	-13	-0.30	-0.81
	EB I-94	SB I-35W	564	664	604	1,570	1,579	9	47	34	D				4,462	4,392	-70	-1.57	0.57
	EB I-94	NB I-35W	567	266	389	1,230	1,208	-22	52	23	C				3,200	3,164	-36	-1.12	-1.79
	NB I-35W	EB I-94	267	570	442	1,340	1,301	-39	52	25	C				3,129	3,025	-104	-3.34	-2.88
	5th Avenue		661	668	741	360	360	0	45	4	A				917	917	0	0.00	-0.08
		EB I-94	668	568	522	360	359	-1	41	6	A				917	916	-1	-0.14	-0.31
	EB I-94	TH 55	569	662	500	860	850	-10	49	18	B				2,593	2,548	-45	-1.72	-1.15
	Cedar Avenue	EB I-94	673	573	427	410	412	2	54	8	A				1,053	1,053	0	-0.04	0.51
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,700	5,692	-8	62	23	C				15,059	15,047	-12	-0.08	-0.14
			750	752	590	5,700	5,692	-8	62	23	C				15,059	15,036	-23	-0.15	-0.14
			752	754	1,231	5,700	5,690	-10	62	23	C				15,059	15,025	-34	-0.22	-0.17
			754	756	1,378	5,700	5,687	-13	61	23	C	60	23	C	15,059	15,010	-49	-0.32	-0.22
			756	758	775	5,700	5,683	-17	60	24	C				15,059	14,999	-60	-0.40	-0.29
		Cedar Ave Exit	758	759	1,026	5,700	5,681	-19	55	24	C				15,059	14,988	-71	-0.47	-0.34
	Cedar Ave Exit		759	760	755	4,660	4,668	8	53	22	C				12,275	12,255	-20	-0.17	0.18
			760	761	1,114	4,660	4,666	6	51	23	C	51	23	C	12,275	12,247	-28	-0.23	0.12
		SB I-35W Exit	761	762	677	4,660	4,663	3	50	23	C				12,275	12,241	-34	-0.28	0.07
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,050	4,068	18	50	27	C	50	27.1	C	10,764	10,752	-12	-0.11	0.43
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,410	5,430	20	49	27	C	49	26.9	C	14,474	14,445	-29	-0.20	0.36
	11th St Exit		764	765	1,022	4,370	4,384	14	51	29	D				11,654	11,638	-16	-0.14	0.32
		NB I-35W/4th Ave Entrance	765	766	1,082	4,370	4,382	12	45	33	D	48	31	D	11,654	11,630	-24	-0.20	0.28
	NB I-35W/4th Ave Entrance		766	767	717	6,530	6,348	-182	36	42	E				17,172	16,836	-336	-1.96	-2.78
		Lyndale/Hennepin Exit	767	768	1,834	6,530	6,342	-188	49	31	D	45	34	D	17,172	16,814	-358	-2.08	-2.88
	Lyndale/Hennepin Exit		768	769	1,590	5,430	5,275	-155	37	47	F				14,078	13,788	-290	-2.06	-2.85
			769	770	1,188	5,430	5,269	-161	46	38	E	42	40	E	14,078	13,771	-307	-2.18	-2.97
		WB I-394 Exit	770	771	1,432	5,430	5,263	-167	44	33	D				14,078	13,757	-321	-2.28	-3.08
	WB I-394 Exit		771	772	508	2,540	2,422	-118	52	16	B				6,377	6,185	-192	-3.01	-4.65
		TH 55 Exit	772	774	544	2,540	2,419	-121	54	13	B	53	14	B	6,377	6,184	-193	-3.03	-4.75
	TH 55 Exit	**END WB I-94**	774	776	400	2,280	2,152	-128	54	13	B	54.1	13.3	B	5,616	5,434	-182	-3.24	-5.63
	WB I-94	Cedar Avenue	759	859	254	1,040	1,010	-30	53	19	B				2,784	2,723	-61	-2.20	-2.86
	WB I-94	SB I-35W	762	466	250	610	595	-15	53	11	B				1,511	1,484	-27	-1.81	-2.46
	Washington CD Road		860	864	656	1,360	1,360	0	49	14	B				3,710	3,709	-1	-0.02	-0.01
		WB I-94	864	763	506	1,360	1,359	-1	47	14	B				3,710	3,708	-3	-0.07	-0.06
	WB I-94	11th Street	764	861	492	1,040	1,046	6	52	20	C				2,820	2,793	-27	-0.96	0.55
	NB I-35W Flyover		256	6	890	1,830	1,646	-184	30	56	F				4,671	4,386	-285	-6.09	**-10.08**
			6	3	142	1,830	1,643	-187	31	53	F				4,671	4,381	-290	-6.21	**-10.21**
		4th Avenue Entrance	3	2	114	1,830	1,643	-187	32	25	C				4,671	4,380	-291	-6.24	**-10.23**
	4th Avenue Entrance	(dummy exit)	2	1	164	2,160	1,971	-189	34	19	B				5,518	5,223	-295	-5.34	-8.75
		WB I-94	1	766	254	2,160	1,970	-190	34	29	D				5,518	5,221	-297	-5.38	-8.80
	4th Avenue		5	4	466	330	329	-1	18	10	A				847	846	-1	-0.15	-0.21
		NB Flyover	4	2	160	330	329	-1	20	9	A				847	845	-2	-0.26	-0.30
	WB I-94	Lyndale/Hennepin Avenue	768	863	568	1,100	1,060	-40	49	11	B				3,094	3,002	-92	-2.98	-3.63
	WB I-94		771	871	392	2,890	2,836	-54	33	43	F				7,701	7,563	-138	-1.79	-1.85
		WB I-394	871	872	305	2,890	2,835	-55	25	56	F				7,701	7,562	-139	-1.81	-1.90
	WB I-94	TH 55	774	874	249	260	267	7	54	5	A				761	747	-14	-1.79	2.77

Table A2
2011 Existing AM Peak Period
Arterial Measures of Effectiveness

Iterations:
9

Select Time Period:
7:00 AM-8:00 AM

Intersection	Appr	Link	Demand volumes					Total Delay by Movement (sec/veh)				Level of Service by Movement				LOS by Approach		LOS by Intersection		Through		Left Turn		Right Turn	
								Control Delay												Modeled Storage & Maximum Traffic Queueing (feet)					
			Lt	Th	Rt	D	total	L	T	R	D	L	T	R	D	Delay	LOS	Delay	LOS	Link Length	Queue	Storage	Queue	Storage	Queue
Lake Street at Stevens Ave	EB	990-918	5	478	137	0	620	28	24	22	-	C	C	C	-	24	C			1115	180				
	WB	919-918	127	335	37	0	499	6	0	0	-	A	A	A	-	2	A	18.3	B	326	60	125	58		
	SB	992-918	16	261	8	0	285	34	37	31	-	C	D	C	-	37	D			586	246				
Lake Street at 2nd Ave	EB	918-919	113	381	0	0	494	20	22	-	-	C	C	-	-	22	C			326	212	125	94		
	WB	991-919	0	407	18	0	425	-	23	22	-	-	C	C	-	23	C	19.0	B	982	142				
	NB	917-919	92	652	135	0	879	18	18	3	-	B	B	A	-	15	B			618	314				
31st Street at Stevens Ave	EB	988-916	0	197	152	0	349	-	25	22	-	-	C	C	-	24	C			1106	134				
	WB	917-916	153	197	0	0	350	32	24	-	-	C	C	-	-	28	C	20.0	B	328	188				
	SB	918-916	13	479	33	0	525	12	13	2	-	B	B	A	-	12	B			618	218			80	36
31st Street at 2nd Ave	EB	916-917	14	196	0	0	210	4	4	-	-	A	A	-	-	4	A			328	52				
	WB	989-917	0	251	7	0	258	-	43	30	-	-	D	C	-	42	D	22.3	C	972	138				
	NB	987-917	99	858	109	0	1066	24	22	16	-	C	C	B	-	21	C			281	226				
Stevens to I-35W Split	SB	916-986	670	114	0	0	784	0	0	-	-	A	A	-	-	0	A			178	94				
2nd Ave to I-35W Merge	NB	985-987	0	146	0	0	146	-	0	-	-	-	A	-	-	0	A			334	0				

Table A3
2011 Existing PM peak
Freeway Measures of Effectiveness
I-35W Lake Street Transit

Iterations:
10

Select Hour Interval:
4:30 PM-5:30 PM

LOS A <10 vplph
LOS B 10<20 vplph
LOS C 20<28 vplph
LOS D 28<35 vplph
LOS E 35<43 vplph
LOS F >43 vplph

	Location		Node			Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
	From	To	From	To	Length (ft)	Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,790	4,819	29	63	20	B	62.7	19.8	B	13,625	13,709	84	0.62	0.61
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,710	6,757	47	64	18	B	64.2	17.5	B	19,242	19,382	140	0.73	0.69
	60th St Entrance	Diamond Lake Exit	106	108	910	6,890	6,936	46	64	17	B	64.4	16.7	B	19,775	19,909	134	0.68	0.66
	Diamond Lake Exit		108	110	1,432	6,460	6,527	67	65	20	C				18,679	18,824	145	0.77	1.04
		Diamond Lake Entrance	110	112	1,225	6,460	6,528	68	65	20	C	65	20	C	18,679	18,820	141	0.76	1.04
	Diamond Lake Entrance		112	113	1,449	6,810	6,886	76	60	22	C				19,759	19,928	169	0.86	1.11
			113	114	542	6,810	6,882	72	64	22	C	63	21	C	19,759	19,925	166	0.84	1.05
		46th St Exit	114	116	1,462	6,810	6,877	67	65	20	C				19,759	19,922	163	0.83	0.98
	46th St Exit	46th St BRT Exit	116	118	238	6,260	6,300	40	65	17	B	65.4	16.5	B	18,294	18,425	131	0.72	0.65
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	6,260	6,294	34	66	19	B	65.5	19.2	B	18,294	18,411	117	0.64	0.55
	46th St BRT Entrance	46th St Entrance	120	122	378	6,260	6,295	35	65	17	B	64.8	16.8	B	18,294	18,423	129	0.70	0.56
	46th St Entrance		122	124	1,521	6,740	6,778	38	62	21	C				19,826	19,960	134	0.68	0.57
			124	126	818	6,740	6,778	38	64	21	C	63	21	C	19,826	19,959	133	0.67	0.57
		35/36th St Exit	126	128	1,514	6,740	6,779	39	63	21	C				19,826	19,956	130	0.66	0.58
	35/36th St Exit		128	130	1,485	6,220	6,266	46	64	20	B				18,416	18,545	129	0.70	0.74
		35/36th St Entrance	130	132	1,474	6,220	6,270	50	63	20	B	64	20	C	18,416	18,545	129	0.70	0.80
	35/36th St Entrance	31/Lake St Exit	132	134	604	7,010	7,067	57	58	21	C	57.5	20.5	C	20,908	21,045	137	0.65	0.82
	31/Lake St Exit	Lake St BRT Exit	134	136	1,029	6,110	6,160	50	61	18	B	60.9	18.4	B	18,275	18,408	133	0.73	0.81
	Lake St BRT Exit	Lake St BRT Entrance	136	138	721	6,110	6,160	50	62	20	C	61.6	20.1	C	18,275	18,398	123	0.67	0.82
	Lake St BRT Entrance		138	140	1,190	6,110	6,160	50	59	20	B				18,275	18,402	127	0.69	0.81
			140	142	569	6,110	6,155	45	55	23	C				18,275	18,399	124	0.68	0.74
			142	144	1,061	6,110	6,151	41	52	24	C	54	23	C	18,275	18,397	122	0.67	0.68
		NB I-35W/TH 65 SPLIT	144	146	859	6,110	6,147	37	48	26	C				18,275	18,394	119	0.65	0.60
	Begin NB TH 65		146	148	498	3,250	3,265	15	39	29	D				9,317	9,436	119	1.28	0.46
			148	150	281	3,250	3,260	10	37	30	D				9,317	9,433	116	1.25	0.30
			150	152	284	3,250	3,257	7	36	32	D	34	31	D	9,317	9,431	114	1.23	0.21
			152	154	582	3,250	3,251	1	34	33	D				9,317	9,428	111	1.19	0.03
		WB I-94 Exit	154	156	644	3,250	3,244	-6	28	31	D				9,317	9,421	104	1.11	-0.19
	WB I-94 Exit	**END NB TH 65**	156	158	983	1,650	1,690	40	54	10	B	54	10.4	B	5,090	5,326	236	4.64	2.40
	NB I-35W/TH 65 Split		146	161	665	2,860	2,876	16	52	28	C				8,958	8,954	-4	-0.04	0.57
			163	164	927	2,860	2,879	19	49	30	D	43	35	E	8,958	8,956	-2	-0.02	0.67
		5th Ave Entrance	164	165	965	2,860	2,883	23	32	46	F				8,958	8,955	-3	-0.04	0.80
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,590	3,622	32	37	45	F	36.7	45	F	10,984	10,976	-8	-0.07	0.88
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,800	4,815	15	46	33	D	46.2	32.6	D	14,694	14,592	-102	-0.69	0.31
	EB I-94 Exit		167	168	540	4,150	4,141	-9	48	29	D				12,237	12,105	-132	-1.08	-0.21
		Washington Ave Exit	168	169	448	4,150	4,143	-7	50	27	C	49	28	D	12,237	12,104	-133	-1.09	-0.18
	Washington Ave Exit		169	170	625	3,770	3,751	-20	54	35	D				11,147	10,991	-156	-1.40	-0.52
		END NB I-35W	170	171	523	3,770	3,751	-19	56	33	D	55	34	D	11,147	10,988	-159	-1.43	-0.50
Northbound I-35W/TH 65 Ramps	TH 62	NB I-35W	204	104	266	1,920	1,938	18	53	20	B				5,617	5,676	59	1.05	0.95
	60th St	NB I-35W	206	106	505	180	180	-1	54	3	A				533	532	-1	-0.23	-0.28
	NB I-35W	Diamond Lake Road	108	208	271	430	408	-22	54	8	A				1,096	1,082	-14	-1.31	-5.07
	Diamond Lake Road		211	212	606	350	362	12	38	5	A				1,080	1,110	30	2.75	3.37
		NB I-35W	212	112	577	350	362	12	37	8	A				1,080	1,110	30	2.81	3.29
	NB I-35W	46th Street	116	216	370	550	574	24	54	11	B				1,465	1,496	31	2.09	4.36
	NB I-35W	46th St BRT	118	218	166	0	4	4	60	0	A				0	13	13	0.00	0.00
	46th St BRT	NB I-35W	220	120	246	0	4	4	39	0	A				0	13	13	0.00	0.00
	46th Street		221	222	818	480	483	3	26	10	A				1,532	1,539	7	0.42	0.54
		NB I-35W	222	122	686	480	483	3	32	12	B				1,532	1,538	6	0.42	0.65
	NB I-35W	35/36th Street	128	228	533	520	514	-6	54	10	A				1,410	1,409	-1	-0.10	-1.13
	35/36th Street		231	232	595	790	793	3	21	19	B				2,492	2,498	6	0.24	0.33
		NB I-35W	232	132	470	790	794	4	28	22	C				2,492	2,498	6	0.24	0.44
	NB I-35W	31/Lake Street	134	234	410	900	911	11	46	20	C				2,633	2,637	4	0.15	1.20
	NB I-35W	Lake St BRT	136	236	132	0	2	2	0	0	A				0	8	8	0.00	0.00
	Lake St BRT	NB I-35W	238	138	108	0	2	2	0	0	A				0	8	8	0.00	0.00
	NB TH 65	WB I-94	156	256	388	1,600	1,549	-51	17	94	F				4,227	4,089	-138	-3.26	-3.21
	5th Avenue		261	265	485	730	732	2	19	20	C				2,026	2,027	1	0.02	0.22
		NB I-35W	265	165	220	730	732	2	22	17	B				2,026	2,026	0	-0.01	0.25
	EB I-94	NB I-35W	266	166	369	1,210	1,190	-20	52	23	C				3,710	3,619	-91	-2.46	-1.67
	NB I-35W	EB I-94	167	267	483	650	675	25	53	13	B				2,457	2,486	29	1.18	3.88
	NB I-35W	Washington Ave	169	262	847	380	393	13	55	4	A				1,090	1,110	20	1.80	3.34
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	1,950	1,915	-35	53	22	C	52.7	21.5	C	6,148	6,058	-90	-1.47	-1.78
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,590	2,532	-59	44	30	D	43.9	30.1	D	8,167	8,020	-147	-1.80	-2.26
	WB I-94 Entrance		366	367	1,871	3,620	3,498	-122	39	44	F				10,923	10,652	-271	-2.48	-3.38
			367	368	827	3,620	3,490	-130	30	61	F				10,923	10,646	-277	-2.53	-3.60
			368	369	483	3,620	3,487	-133	38	50	F	40	46	F	10,923	10,643	-280	-2.56	-3.68
			369	370	403	3,620	3,485	-135	47	42	E				10,923	10,641	-283	-2.59	-3.73
		SB TH 65 Entrance	374	376	627	3,620	3,475	-145	53	32	D				10,923	10,624	-299	-2.74	-4.01
	Begin SB TH 65	12th St Entrance	300	302	867	2,040	1,921	-119	54	19	B	53.7	19.4	B	5,052	4,803	-249	-4.93	-5.82
	12th St Entrance	EB I-94 Entrance	302	304	1,088	2,620	2,521	-99	46	26	C	46.2	26.2	C	6,562	6,413	-149	-2.28	-3.78
	EB I-94 Entrance		304	307	1,574	4,200	4,056	-144	54	27	C				11,401	11,141	-260	-2.28	-3.43
		SB I-35W Entrance	307	310	1,516	4,200	4,044	-156	46	34	D	50	30	D	11,401	11,116	-285	-2.50	-3.71
	SB I-35W Entrance		310	314	698	7,820	7,507	-313	54	35	D				22,324	21,715	-609	-2.73	-4.01
			314	318	379	7,820	7,503	-317	56	34	D				22,324	21,706	-618	-2.77	-4.05
			318	320	900	7,820	7,499	-321	57	33	D	55	33	D	22,324	21,695	-629	-2.82	-4.11
		Lake St BRT Exit	320	322	616	7,820	7,491	-329	54	29	D				22,324	21,683	-641	-2.87	-4.20
	Lake St BRT Exit	Lake St BRT Entrance	322	324	719	7,820	7,431	-389	51	36	E	51.3	36.4	E	22,324	21,504	-820	-3.67	-4.97
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	7,820	7,474	-346	50	35	E	50.1	35.1	E	22,324	21,651	-673	-3.02	-4.42
	31/Lake St Entrance	35/36th St Exit	326	328	518	8,900	8,600	-300	49	35	E	49.3	35.3	E	25,516	24,879	-637	-2.50	-3.37
	35/36th St Exit		328	330	1,384	7,800	7,516	-284	58	33	D				22,158	21,552	-606	-2.73	-3.64
		35/36th St Entrance	330	332	1,712	7,800	7,494	-306	58	32	D	58	32	D	22,158	21,527	-631	-2.85	-3.93
	35/36th St Entrance		332	334	1,460	8,170	7,839	-331	52	35	E				23,253	22,576	-677	-2.91	-4.05
			334	336	544	8,170	7,823	-348	56	35	E	55	32	D	23,253	22,557	-696	-2.99	-4.25
		46th St Exit	336	338	1,512	8,170	7,807	-363	59	28	D				23,253	22,541	-712	-3.06	-4.44
	46th St Exit	46th St BRT Exit	338	340	780	7,380	7,038	-342	63	20	C	63	20.2	C	21,021	20,410	-611	-2.90	-4.63
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	7,380	7,015	-365	65	22	C	64.7	21.7	C	21,021	20,367	-654	-3.11	-4.94
	46th St BRT Entrance	46th St Entrance	342	344	393	7,380	7,013	-367	63	19	B	63.3	19.2	B	21,021	20,383	-638	-3.04	-4.98
	46th St Entrance		344	346	1,397	7,720	7,349	-371	59	24	C				22,042	21,399	-643	-2.92	-4.80
		60th St Exit	346	348	1,495	7,720	7,353	-368	53	27	C	56	26	C	22,042	21,397	-645	-2.93	-4.76
	60th St Exit	TH 62 Exit	348	350	2,036	7,170	6,803	-367	56	25	C	55.5	24.7	C	20,576	19,888	-688	-3.34	-5.12
	TH 62 Exit		350	352	1,409	3,170	2,985	-185	65	16	B				8,843	8,444	-399	-4.51	-5.83
			352	354	1,616	3,170	2,986	-184	66	15	B	65	15	B	8,843	8,442	-401	-4.53	-5.80
		END SB I-35W	354	356	719	3,170	2,987	-183	66	15	B				8,843	8,441	-402	-4.55	-5.77
Southbound I-35W/TH 65 Ramps	Washington CD RD	SB I-35W	461	365	302	640	622	-18	43	18	B				2,019	1,976	-43	-2.15	-2.77
	WB I-94	SB I-35W	466	366	269	1,030	976	-55	44	28	C				2,756	2,642	-114	-4.12	-5.29
	12th Street	SB TH 65	402	302	283	580	609	29	39	19	B				1,510	1,626	116	7.66	5.02
	EB I-94	SB TH 65	664	304	635	1,580	1,547	-33	43	38	E				4,839	4,753	-87	-1.79	-2.07
	SB I-35W	SB TH 65	376	310	857	3,620	3,471	-149	55	31	D				10,923	10,618	-305	-2.79	-4.12
	SB I-35W	Lake St BRT	322	422	121	0	54	54	41	1	A				0	167	167	0.00	0.00
	Lake St BRT	SB I-35W	424	324	102	0	54	54	27	2	A				0	167	167	0.00	0.00
	31/Lake Street		425	426	114	1,080	1,135	55	5	110	F				3,192	3,246	54	1.69	5.09
		SB I-35W	426	326	441	1,080	1,138	58	26	33	D				3,192	3,248	56	1.74	5.32
	SB I-35W	35/36th Street	328	428	395	1,100	1,070	-30	39	28	C				3,358	3,309	-49	-1.45	-2.72
	35/36th Street		431	432	669	370	371	1	28	7	A				1,095	1,080	-15	-1.35	0.27
		SB I-35W	432	332	585	370	370	0	34	9	A				1,095	1,079	-16	-1.46	0.11
	SB I-35W	46th Street	338	438	703	790	754	-36	54	14	B				2,232	2,114	-118	-5.27	-4.58
	SB I-35W	46th St BRT	340	440	116	0	9	9	37	0	A				0	28	28	0.00	0.00
	46th St BRT	SB I-35W	442	342	216	0	9	9	35	0	A				0	28	28	0.00	0.00
	46th St BRT		443	444	1,118	340	338	-2	42	4	A				1,021	1,020	-1	-0.07	-0.53
		SB I-35W	444	344	378	340	338	-2	34	7	A				1,021	1,020	-1	-0.08	-0.53
	SB I-35W	60th Street	348	448	541	550	559	9	54	10	B				1,466	1,511	45	3.05	1.60
	SB I-35W		350	450	465	4,000	3,823	-177	53	24	C				11,733	11,445	-288	-2.45	-4.43
		TH 62	450	451	390	4,000	3,825	-175	53	24	C				11,733	11,446	-287	-2.44	-4.38
Eastbound I-94	**Begin EB I-94**		554	556	984	3,530	3,525	-5	50	36	E				10,346	10,322	-24	-0.23	-0.14
			556	557	632	3,530	3,524	-6	49	37	E	49	37	E	10,346	10,317	-30	-0.29	-0.16
		EB I-394 Entrance	557	558	789	3,530	3,523	-7	47	38	E				10,346	10,313	-33	-0.32	-0.21
	EB I-394 Entrance		558	559	442	5,690	5,592	-98	38	50	F				16,749	16,528	-221	-1.32	-1.72
			559	560	1,192	5,690	5,593	-97	42	46	F	39	50	F	16,749	16,519	-230	-1.37	-1.71
		Lyndale/Hennepin Entrance	560	561	1,856	5,690	5,593	-97	37	52	F				16,749	16,503	-247	-1.47	-1.71
	Lyndale/Hennepin Entrance		561	562	1,485	7,290	7,145	-145	43	43	E				21,412	21,040	-372	-1.74	-1.99
			562	563	706	7,290	7,143	-147	48	37	E	45	40	E	21,412	21,030	-382	-1.78	-2.01
		SB I-35W Exit	563	564	474	7,290	7,143	-147	49	37	E				21,412	21,024	-388	-1.81	-2.02
	SB I-35W Exit		564	565	792	5,710	5,594	-116	50	37	E				16,573	16,265	-308	-1.86	-2.03
			565	566	865	5,710	5,594	-116	51	37	E	51	35	E	16,573	16,268	-305	-1.84	-2.03
		NB I-35W Exit	566	567	388	5,710	5,593	-117	51	29	D				16,573	16,269	-304	-1.83	-2.05
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,500	4,403	-97	52	29	D	51.5	28.5	D	12,863	12,652	-211	-1.64	-2.16
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,100	4,999	-101	55	23	C	54.9	22.7	C	14,598	14,385	-213	-1.46	-1.98
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,090	3,972	-118	60	22	C	59.5	22.3	C	11,751	11,552	-199	-1.69	-2.88
	NB I-35W Entrance		570	572	1,016	4,740	4,649	-91	61	19	B				14,208	14,039	-169	-1.19	-1.92
		Cedar Ave Entrance	572	573	1,027	4,740	4,647	-93	62	19	B	61	19	B	14,208	14,042	-166	-1.17	-1.96
	Cedar Ave Entrance		573	574	562	5,970	5,877	-93	52	23	C				17,639	17,475	-164	-0.93	-1.56
			574	576	930	5,970	5,875	-95	57	26	C				17,639	17,476	-163	-0.92	-1.59
			576	578	1,378	5,970	5,874	-96	61	24	C				17,639	17,477	-162	-0.92	-1.60
			578	580	1,268	5,970	5,875	-95	61	24	C	60	24	C	17,639	17,476	-163	-0.92	-1.59
			580	582	875	5,970	5,876	-94	61	24	C				17,639	17,475	-164	-0.93	-1.57
		END EB I-94	582	584	1,173	5,970	5,879	-91	61	24	C				17,639	17,478	-161	-0.91	-1.53
	EB I-394	EB I-94	658	558	266	2,160	2,070	-90	30	76	F				6,403	6,220	-183	-2.86	-4.19
	Lyndale/Hennepin Avenue		660	659	1,194	1,600	1,559	-41	31	31	D				4,663	4,561	-103	-2.20	-2.58
		EB I-94	659	561	302	1,600	1,554	-47	23	44	F				4,663	4,554	-109	-2.34	-2.91
	EB I-94	SB I-35W	564	664	604	1,580	1,548	-32	44	39	E				4,839	4,757	-83	-1.70	-2.04
	EB I-94	NB I-35W	567	266	389	1,210	1,189	-21	52	23	C				3,710	3,619	-91	-2.46	-1.74
	NB I-35W	EB I-94	267	570	442	650	676	26	53	13	B				2,457	2,486	29	1.17	4.02
	5th Avenue		661	668	741	600	601	1	21	15	B				1,735	1,732	-3	-0.15	0.12
		EB I-94	668	568	522	600	600	-1	31	14	B				1,735	1,732	-3	-0.18	-0.08
	EB I-94	TH 55	569	662	500	1,010	1,025	15	48	21	C				2,847	2,834	-13	-0.46	1.44
	Cedar Avenue	EB I-94	673	573	427	1,230	1,232	2	54	24	C				3,431	3,430	-1	-0.04	0.15
	Begin WB I-94		748	750	1,488	5,140	5,127	-13	58	23	C				15,918	15,762	-156	-0.98	-0.25
			750	752	590	5,140	5,111	-29	54	29	D				15,918	15,700	-218	-1.37	-0.56

Table A3
2011 Existing PM peak
Freeway Measures of Effectiveness
I-35W Lake Street Transit

10

Select Hour Interval:
4:30 PM-5:30 PM

LOS B 10<20 vplph
LOS C 20<28 vplph
LOS D 28<35 vplph
LOS E 35<43 vplph
LOS F >43 vplph

Westbound I-94

Location		Node		Length	Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
From	To	From	To	(ft)	Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
		752	754	1,231	5,140	5,086	-54	50	36	E				15,918	15,621	-297	-1.86	-1.06
		754	756	1,378	5,140	5,035	-105	39	48	F	42	45	F	15,918	15,500	-418	-2.63	-2.05
		756	758	775	5,140	4,983	-157	28	64	F				15,918	15,401	-517	-3.25	-3.06
	Cedar Ave Exit	758	759	1,026	5,140	4,934	-207	19	76	F				15,918	15,327	-591	-3.71	-4.02
Cedar Ave Exit		759	760	755	4,810	4,572	-238	13	94	F				14,892	14,263	-629	-4.23	-4.95
		760	761	1,114	4,810	4,538	-272	12	93	F	14	87	F	14,892	14,215	-677	-4.55	-5.65
	SB I-35W Exit	761	762	677	4,810	4,518	-292	16	70	F				14,892	14,177	-715	-4.80	-6.08
SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,780	3,533	-247	15	81	F	14.6	80.8	F	12,136	11,518	-618	-5.09	-6.53
Washington CD Rd Entrance	11th St Exit	763	764	1,637	4,920	4,674	-247	15	74	F	15.2	74.4	F	15,794	15,156	-638	-4.04	-5.01
11th St Exit		764	765	1,022	4,450	4,219	-231	15	93	F				14,251	13,645	-606	-4.25	-5.20
	NB I-35W/4th Ave Entrance	765	766	1,082	4,450	4,227	-223	16	90	F	15	91	F	14,251	13,624	-627	-4.40	-5.02
NB I-35W/4th Ave Entrance		766	767	717	6,920	6,641	-280	27	60	F				20,936	20,133	-804	-3.84	-4.04
	Lyndale/Hennepin Exit	767	768	1,834	6,920	6,642	-278	48	33	D	42	40	E	20,936	20,129	-807	-3.85	-4.02
Lyndale/Hennepin Exit		768	769	1,590	5,600	5,421	-179	37	49	F				17,163	16,640	-524	-3.05	-3.20
		769	770	1,188	5,600	5,423	-177	46	40	E	42	41	E	17,163	16,640	-523	-3.04	-3.16
	WB I-394 Exit	770	771	1,432	5,600	5,425	-175	45	34	D				17,163	16,642	-521	-3.04	-3.13
WB I-394 Exit		771	772	508	3,050	2,999	-51	52	19	B				9,623	9,423	-200	-2.08	-1.67
	TH 55 Exit	772	774	544	3,050	2,999	-51	54	16	B	53	18	B	9,623	9,422	-201	-2.09	-1.67
TH 55 Exit	**END WB I-94**	774	776	400	2,660	2,611	-49	54	16	B	53.9	16.2	B	8,438	8,240	-198	-2.35	-1.86
WB I-94	Cedar Avenue	759	859	254	330	315	-15	48	7	A				1,026	1,005	-21	-2.04	-4.61
WB I-94	SB I-35W	762	466	250	1,030	977	-53	46	28	C				2,756	2,644	-112	-4.08	-5.13
Washington CD Road		860	864	656	1,140	1,139	-1	22	27	C				3,658	3,658	0	-0.01	-0.06
	WB I-94	864	763	506	1,140	1,139	-1	27	21	C				3,658	3,658	0	0.01	-0.12
WB I-94	11th Street	764	861	492	470	463	-7	46	10	B				1,543	1,484	-59	-3.80	-1.53
NB I-35W Flyover		256	6	890	1,600	1,545	-55	18	85	F				4,227	4,082	-145	-3.43	-3.43
		6	3	142	1,600	1,543	-57	19	82	F				4,227	4,077	-150	-3.55	-3.56
	4th Avenue Entrance	3	2	114	1,600	1,543	-57	19	41	E				4,227	4,076	-151	-3.58	-3.59
4th Avenue Entrance	(dummy exit)	2	1	164	2,470	2,409	-61	22	37	E				6,685	6,528	-157	-2.34	-2.45
	WB I-94	1	766	254	2,470	2,409	-61	21	58	F				6,685	6,525	-160	-2.39	-2.47
4th Avenue		5	4	466	870	869	-1	14	33	D				2,458	2,455	-3	-0.11	-0.08
	NB Flyover	4	2	160	870	868	-2	20	25	C				2,458	2,454	-4	-0.15	-0.26
WB I-94	Lyndale/Hennepin Avenue	768	863	568	1,320	1,221	-99	49	12	B				3,773	3,490	-283	-7.49	-7.51
WB I-94		771	871	392	2,550	2,428	-122	33	37	E				7,540	7,220	-320	-4.25	-4.79
	WB I-394	871	872	305	2,550	2,428	-122	26	47	F				7,540	7,220	-320	-4.24	-4.78
WB I-94	TH 55	774	874	249	390	389	-2	54	7	A				1,185	1,182	-3	-0.27	-0.38

Table A4
2011 Existing PM Peak Period
Arterial Measures of Effectiveness

Iterations:
10

Select Time Period:
4:30 PM-5:30 PM

Intersection	Appr	Link	Demand volumes					Total Delay by Movement (sec/veh)				Level of Service by Movement				LOS by Approach		LOS by Intersection		Through		Left Turn		Right Turn	
								Control Delay												Modeled Storage & Maximum Traffic Queueing (feet)					
			Lt	Th	Rt	D	total	L	T	R	D	L	T	R	D	Delay	LOS	Delay	LOS	Link Length	Queue	Storage	Queue	Storage	Queue
Lake Street at Stevens Ave	EB	990-918	11	616	124	0	751	26	22	22	-	C	C	C	-	22	C			1115	214				
	WB	919-918	294	994	87	0	1375	12	7	6	-	B	A	A	-	8	A	20.0	B	326	226	125	112		
	SB	992-918	38	415	23	0	476	56	51	43	-	E	D	D	-	51	D			586	468				
Lake Street at 2nd Ave	EB	918-919	30	624	0	0	654	12	1	-	-	B	A	-	-	2	A			326	78	125	52		
	WB	991-919	0	1142	18	0	1160	-	15	14	-	-	B	B	-	15	B	11.3	B	982	234				
	NB	917-919	233	196	161	0	590	22	17	4	-	C	B	A	-	15	B			618	238				
31st Street at Stevens Ave	EB	988-916	0	285	122	0	407	-	21	22	-	-	C	C	-	22	C			1106	164				
	WB	917-916	287	610	0	0	897	27	13	-	-	C	B	-	-	17	B	20.8	C	328	308				
	SB	918-916	40	714	79	0	833	29	25	12	-	C	C	B	-	24	C			618	444			80	72
31st Street at 2nd Ave	EB	916-917	14	311	0	0	325	37	22	-	-	D	C	-	-	22	C			328	138				
	WB	989-917	0	624	8	0	632	-	37	33	-	-	D	C	-	37	D	21.4	C	972	320				
	NB	987-917	273	568	137	0	978	14	10	7	-	B	B	A	-	11	B			281	228				
Stevens to I-35W Split	SB	916-986	1080	43	0	0	1123	0	0	-	-	A	A	-	-	0	A			178	160				
2nd Ave to I-35W Merge	NB	985-987	0	78	0	0	78	-	0	-	-	-	A	-	-	0	A			334	0				

Appendix B

2038 Operational MOE's

Table B1
2038 NoBuild AM peak
Freeway Measures of Effectiveness
I-35W Lake Street Transit

Iterations: 8

MOE Hour
7:00 AM-8:00 AM
4

LOS A <10 vplph
LOS B 10<20 vplph
LOS C 20<28 vplph
LOS D 28<35 vplph
LOS E 35<43 vplph
LOS F >43 vplph

Section	Location		Node		Length (ft)	Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
	From	To	From	To		Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	5,180	5,249	69	61	22	C	60.9	22.1	C	13,462	13,676	214	1.59	1.33
	TH 62 Entrance	60th St Entrance	104	106	1,355	7,221	7,319	98	63	19	B	63.2	19.3	B	19,517	19,264	-253	-1.29	1.36
	60th St Entrance	Diamond Lake Exit	106	108	910	7,722	7,813	91	60	20	C	60.2	20.2	C	20,654	20,329	-325	-1.57	1.18
	Diamond Lake Exit		108	110	1,432	7,262	7,340	78	53	28	C				19,433	19,007	-426	-2.19	1.07
		Diamond Lake Entrance	110	112	1,225	7,262	7,294	32	39	38	E	47	32	D	19,433	18,895	-538	-2.77	0.44
	Diamond Lake Entrance		112	113	1,449	8,292	8,200	-92	37	43	E				21,897	21,129	-768	-3.51	-1.10
			113	114	542	8,292	8,140	-152	38	44	F	36	44	F	21,897	21,048	-849	-3.88	-1.84
		46th St Exit	114	116	1,462	8,292	8,067	-225	34	46	F				21,897	20,968	-929	-4.24	-2.71
	46th St Exit	46th St BRT Exit	116	118	238	8,002	7,765	-237	30	44	F	30.3	44.1	F	21,033	20,218	-815	-3.87	-2.96
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,002	7,652	-351	27	56	F	27.4	56	F	21,033	20,054	-979	-4.65	-4.38
	46th St BRT Entrance	46th St Entrance	120	122	378	8,002	7,571	-431	24	54	F	24.1	54.3	F	21,033	19,996	-1,037	-4.93	-5.39
	46th St Entrance		122	124	1,521	9,252	8,637	-615	27	59	F				24,007	22,620	-1,387	-5.78	-6.64
			124	126	818	9,252	8,563	-689	30	57	F	29	57	F	24,007	22,536	-1,471	-6.13	-7.45
		35/36th St Exit	126	128	1,514	9,252	8,505	-747	30	55	F				24,007	22,467	-1,540	-6.42	-8.07
	35/36th St Exit		128	130	1,485	8,993	8,230	-763	29	56	F				23,254	21,771	-1,483	-6.38	-8.48
		35/36th St Entrance	130	132	1,474	8,993	8,172	-821	31	53	F	30	55	F	23,254	21,700	-1,554	-6.68	-9.13
	35/36th St Entrance	31/Lake St Exit	132	134	604	10,263	9,305	-958	33	48	F	32.5	47.8	F	26,429	24,561	-1,868	-7.07	-9.33
	31/Lake St Exit	Lake St BRT Exit	134	136	1,029	9,473	8,548	-925	37	43	E	36.9	42.6	E	24,195	22,506	-1,690	-6.98	-9.76
	Lake St BRT Exit	Lake St BRT Entrance	136	138	721	9,473	8,512	-961	37	47	F	37	46.7	F	24,195	22,460	-1,735	-7.17	**-10.14**
	Lake St BRT Entrance		138	140	1,190	9,473	8,484	-989	38	43	F				24,195	22,453	-1,743	-7.20	**-10.44**
			140	142	569	9,473	8,453	-1,020	38	46	F				24,195	22,432	-1,763	-7.29	**-10.77**
			142	144	1,061	9,473	8,426	-1,047	38	45	F	37	45	F	24,195	22,416	-1,779	-7.35	**-11.05**
		NB I-35W/TH 65 SPLIT	144	146	859	9,473	8,396	-1,077	36	47	F				24,195	22,396	-1,799	-7.43	**-11.37**
	Begin NB TH 65		146	148	498	5,633	5,153	-480	56	31	D				14,105	13,444	-661	-4.69	-8.53
			148	150	281	5,633	5,153	-480	55	32	D				14,105	13,439	-666	-4.72	-8.52
			150	152	284	5,633	5,154	-479	52	33	D	51	32	D	14,105	13,436	-669	-4.74	-8.51
			152	154	582	5,633	5,155	-478	50	34	D				14,105	13,432	-673	-4.77	-8.48
		WB I-94 Exit	154	156	644	5,633	5,156	-478	45	30	D				14,105	13,423	-682	-4.83	-8.48
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,593	3,548	-46	53	23	C	52.5	22.5	C	8,896	9,070	174	1.96	-1.27
	NB I-35W/TH 65 Split		146	161	665	3,840	3,223	-617	19	88	F				10,090	8,938	-1,152	**-11.42**	**-16.06**
			163	164	927	3,840	3,202	-638	17	98	F	17	94	F	10,090	8,921	-1,169	**-11.58**	**-16.60**
		5th Ave Entrance	164	165	965	3,840	3,196	-644	17	94	F				10,090	8,908	-1,182	**-11.71**	**-16.77**
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,410	3,760	-650	29	60	F	28.8	59.5	F	11,412	10,214	-1,198	**-10.50**	**-14.75**
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,850	5,069	-781	47	34	D	46.7	34	D	15,159	13,705	-1,454	-9.59	**-13.35**
	EB I-94 Exit		167	168	540	4,380	3,786	-594	51	25	C				11,728	10,602	-1,126	-9.60	**-13.56**
		Washington Ave Exit	168	169	448	4,380	3,784	-596	52	24	C	52	24	C	11,728	10,598	-1,130	-9.64	**-13.61**
	Washington Ave Exit		169	170	625	3,171	2,727	-444	56	25	C				8,178	7,344	-834	**-10.20**	**-14.01**
		END NB I-35W	170	171	523	3,171	2,726	-445	57	24	C	56	24	C	8,178	7,341	-837	**-10.23**	**-14.05**
Northbound I-35W/TH 65 Ramps	TH 62	NB I-35W	204	104	266	2,041	2,074	33	53	21	C				6,055	5,636	-419	-6.91	1.62
	60th St	NB I-35W	206	106	505	501	500	-1	54	10	A				1,137	1,136	-1	-0.11	-0.28
	NB I-35W	Diamond Lake Road	108	208	271	460	454	-6	52	9	A				1,221	1,232	11	0.92	-1.37
	Diamond Lake Road		211	212	606	1,030	1,013	-17	5	95	F				2,464	2,380	-84	-3.41	-1.67
		NB I-35W	212	112	577	1,030	986	-44	19	43	E				2,464	2,354	-110	-4.47	-4.26
	NB I-35W	46th Street	116	216	370	290	239	-51	51	5	A				864	679	-185	**-21.39**	**-17.69**
	NB I-35W	46th St BRT	118	218	166	0	19	19	60	0	A				0	56	56	0.00	0.00
	46th St BRT	NB I-35W	220	120	246	0	19	19	40	1	A				0	56	56	0.00	0.00
	46th Street		221	222	818	1,250	1,161	-89	5	122	F				2,974	2,731	-243	-8.16	-7.14
		NB I-35W	222	122	686	1,250	1,133	-117	26	36	E				2,974	2,702	-272	-9.16	-9.35
	NB I-35W	35/36th Street	128	228	533	259	211	-48	53	4	A				753	616	-138	**-18.26**	**-18.57**
	35/36th Street		231	232	595	1,270	1,190	-80	5	123	F				3,175	2,930	-245	-7.70	-6.32
		NB I-35W	232	132	470	1,270	1,173	-97	28	32	D				3,175	2,911	-264	-8.32	-7.61
	NB I-35W	31/Lake Street	134	234	410	790	728	-62	48	15	B				2,234	2,025	-210	-9.38	-7.82
	NB I-35W	Lake St BRT	136	236	132	0	6	6	70	0	A				0	18	18	0.00	0.00
	Lake St BRT	NB I-35W	238	138	108	0	6	6	34	0	A				0	18	18	0.00	0.00
	NB TH 65	WB I-94	156	256	388	2,040	1,606	-434	29	56	F				5,209	4,344	-865	**-16.61**	**-21.28**
	5th Avenue		261	265	485	570	567	-3	42	7	A				1,322	1,321	-1	-0.07	-0.49
		NB I-35W	265	165	220	570	567	-3	30	10	B				1,322	1,321	-1	-0.08	-0.51
	EB I-94	NB I-35W	266	166	369	1,440	1,311	-129	51	26	C				3,747	3,506	-241	-6.43	-8.96
	NB I-35W	EB I-94	167	267	483	1,470	1,281	-189	52	25	C				3,431	3,095	-336	-9.80	**-12.85**
	NB I-35W	Washington Ave	169	262	847	1,209	1,055	-154	54	10	A				3,550	3,249	-301	-8.49	**-12.70**
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,590	2,590	0	56	24	C	56	23.5	C	6,844	6,841	-3	-0.05	-0.01
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,909	2,915	6	46	29	D	46.4	28.5	D	7,688	7,701	13	0.17	0.20
	WB I-94 Entrance		366	367	1,871	3,638	3,612	-26	36	46	F				9,495	9,445	-50	-0.53	-0.72
			367	368	827	3,638	3,597	-41	32	57	F				9,495	9,436	-59	-0.62	-1.12
			368	369	483	3,638	3,593	-45	41	44	F	40	45	F	9,495	9,432	-63	-0.66	-1.24
			369	370	403	3,638	3,591	-47	50	36	E				9,495	9,429	-66	-0.69	-1.29
		SB TH 65 Entrance	374	376	627	3,638	3,586	-52	54	33	D				9,495	9,423	-72	-0.76	-1.42
	Begin SB TH 65	12th St Entrance	300	302	867	670	672	2	62	6	A	62	5.5	A	1,788	1,794	6	0.34	0.33
	12th St Entrance	EB I-94 Entrance	302	304	1,088	999	1,131	132	53	10	A	52.6	9.8	A	2,597	2,990	393	**15.14**	**13.22**
	EB I-94 Entrance		304	307	1,574	3,119	3,089	-30	59	18	B				8,622	8,593	-29	-0.33	-0.96
		SB I-35W Entrance	307	310	1,516	3,119	3,087	-32	59	20	B	59	19	B	8,622	8,587	-35	-0.41	-1.04
	SB I-35W Entrance		310	314	698	6,757	6,668	-89	59	28	D				18,117	17,996	-121	-0.67	-1.32
			314	318	379	6,757	6,666	-91	61	27	C				18,117	17,991	-127	-0.70	-1.35
			318	320	900	6,757	6,664	-93	63	27	C	62	26	C	18,117	17,985	-132	-0.73	-1.38
		Lake St BRT Exit	320	322	616	6,757	6,662	-95	62	22	C				18,117	17,979	-138	-0.76	-1.41
	Lake St BRT Exit	Lake St BRT Entrance	322	324	719	6,757	6,621	-136	62	27	C	62.1	26.6	C	18,117	17,862	-255	-1.41	-2.01
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	6,757	6,655	-103	61	25	C	60.9	25.4	C	18,117	17,967	-150	-0.83	-1.52
	31/Lake St Entrance	35/36th St Exit	326	328	518	7,447	7,338	-109	58	25	C	57.7	25.4	C	19,888	19,711	-177	-0.89	-1.47
	35/36th St Exit		328	330	1,384	6,797	6,688	-109	63	27	C				17,988	17,809	-179	-0.99	-1.61
		35/36th St Entrance	330	332	1,712	6,797	6,681	-116	61	28	C	62	27	C	17,988	17,798	-190	-1.06	-1.71
	35/36th St Entrance		332	334	1,460	7,448	7,319	-129	54	32	D				19,579	19,375	-204	-1.04	-1.73
			334	336	544	7,448	7,314	-134	61	30	D	59	28	D	19,579	19,364	-215	-1.10	-1.80
		46th St Exit	336	338	1,512	7,448	7,308	-140	63	25	C				19,579	19,356	-223	-1.14	-1.88
	46th St Exit	46th St BRT Exit	338	340	780	6,928	6,786	-142	64	19	B	64.1	19.2	B	18,169	17,977	-192	-1.05	-2.05
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,928	6,771	-157	66	21	C	65.6	20.6	C	18,169	17,943	-226	-1.24	-2.26
	46th St BRT Entrance	46th St Entrance	342	344	393	6,928	6,772	-156	64	18	B	64.2	18.3	B	18,169	17,956	-213	-1.17	-2.25
	46th St Entrance		344	346	1,397	7,447	7,285	-162	59	23	C				19,404	19,183	-221	-1.14	-2.17
		60th St Exit	346	348	1,495	7,447	7,277	-170	54	26	C	57	25	C	19,404	19,173	-231	-1.19	-2.28
	60th St Exit	TH 62 Exit	348	350	2,036	6,977	6,802	-175	57	24	C	56.7	24	C	18,244	17,993	-251	-1.38	-2.50
	TH 62 Exit		350	352	1,409	3,597	3,504	-93	64	18	B				9,305	9,201	-104	-1.11	-2.59
			352	354	1,616	3,597	3,497	-100	65	18	B	65	18	B	9,305	9,194	-111	-1.20	-2.77
		END SB I-35W	354	356	719	3,597	3,492	-105	66	18	B				9,305	9,188	-117	-1.26	-2.92
Southbound I-35W/TH 65 Ramps	Washington CD RD	SB I-35W	461	365	302	319	327	8	47	7	A				844	865	21	2.49	2.57
	WB I-94	SB I-35W	466	366	269	729	710	-19	48	15	B				1,807	1,751	-56	-3.10	-2.63
	12th Street	SB TH 65	402	302	283	329	461	132	45	11	B				809	1,198	389	**48.03**	**40.06**
	EB I-94	SB TH 65	664	304	635	2,120	1,960	-160	46	43	F				6,025	5,608	-417	-6.92	-7.53
	SB I-35W	SB TH 65	376	310	857	3,638	3,584	-54	56	32	D				9,495	9,418	-77	-0.81	-1.48
	SB I-35W	Lake St BRT	322	422	121	0	37	37	41	1	A				0	114	114	0.00	0.00
	Lake St BRT	SB I-35W	424	324	102	0	37	37	28	1	A				0	114	114	0.00	0.00
	31/Lake Street		425	426	114	690	686	-4	22	16	B				1,771	1,756	-15	-0.85	-0.59
		SB I-35W	426	326	441	690	685	-5	27	19	B				1,771	1,755	-16	-0.91	-0.70
	SB I-35W	35/36th Street	328	428	395	650	648	-3	41	16	B				1,900	1,892	-8	-0.41	-0.38
	35/36th Street		431	432	669	651	650	-1	28	12	B				1,591	1,590	-1	-0.08	-0.20
		SB I-35W	432	332	585	651	649	-2	34	15	B				1,591	1,590	-1	-0.07	-0.32
	SB I-35W	46th Street	338	438	703	520	516	-4	54	10	A				1,410	1,369	-41	-2.88	-0.81
	SB I-35W	46th St BRT	340	440	116	0	7	7	56	0	A				0	23	23	0.00	0.00
	46th St BRT	SB I-35W	442	342	216	0	8	8	39	0	A				0	23	23	0.00	0.00
	46th St BRT		443	444	1,118	519	517	-2	42	6	A				1,235	1,235	-1	-0.04	-0.42
		SB I-35W	444	344	378	519	516	-3	35	11	B				1,235	1,233	-2	-0.15	-0.66
	SB I-35W	60th Street	348	448	541	470	464	-6	54	9	A				1,160	1,166	6	0.51	-1.36
	SB I-35W		350	450	465	3,380	3,292	-88	53	21	C				8,939	8,780	-159	-1.78	-2.60
		TH 62	450	451	390	3,380	3,292	-88	53	21	C				8,939	8,780	-159	-1.78	-2.61
Eastbound I-94	**Begin EB I-94**		554	556	984	4,151	3,989	-162	24	85	F				11,996	11,709	-287	-2.39	-3.91
			556	557	632	4,151	3,987	-164	24	82	F	25	80	F	11,996	11,693	-303	-2.52	-3.95
		EB I-394 Entrance	557	558	789	4,151	3,986	-166	27	74	F				11,996	11,681	-316	-2.63	-3.99
	EB I-394 Entrance		558	559	442	6,341	5,746	-595	26	74	F				18,346	16,936	-1,410	-7.68	-9.38
			559	560	1,192	6,341	5,744	-597	31	62	F	30	64	F	18,346	16,921	-1,425	-7.77	-9.41
		Lyndale/Hennepin Entrance	560	561	1,856	6,341	5,736	-605	31	63	F				18,346	16,899	-1,447	-7.89	-9.54
	Lyndale/Hennepin Entrance		561	562	1,485	8,471	7,752	-719	39	50	F				23,405	21,913	-1,492	-6.38	-8.49
			562	563	706	8,471	7,740	-731	49	40	E	43	45	F	23,405	21,896	-1,509	-6.45	-8.62
		SB I-35W Exit	563	564	474	8,471	7,738	-733	50	39	E				23,405	21,888	-1,517	-6.48	-8.66
	SB I-35W Exit		564	565	792	6,351	5,776	-575	50	38	E				17,380	16,271	-1,110	-6.38	-9.05
			565	566	865	6,351	5,773	-578	51	38	E	51	36	E	17,380	16,263	-1,117	-6.43	-9.11
		NB I-35W Exit	566	567	388	6,351	5,771	-580	51	30	D				17,380	16,255	-1,125	-6.47	-9.14
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,911	4,459	-452	51	29	D	51.4	28.9	D	13,633	12,744	-889	-6.52	-9.20
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,452	4,991	-461	55	23	C	55	22.7	C	15,011	14,113	-898	-5.98	-8.46
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,532	4,081	-451	59	23	C	59.4	22.9	C	12,236	11,450	-786	-6.43	-9.96
	NB I-35W Entrance		570	572	1,016	6,002	5,360	-642	61	22	C				15,667	14,537	-1,130	-7.21	**-10.69**
		Cedar Ave Entrance	572	573	1,027	6,002	5,359	-643	61	22	C	61	22	C	15,667	14,530	-1,137	-7.26	**-10.71**
	Cedar Ave Entrance		573	574	562	6,621	5,974	-647	58	21	C				17,257	16,110	-1,147	-6.65	-9.77
			574	576	930	6,621	5,968	-653	60	25	C				17,257	16,099	-1,158	-6.71	-9.86
			576	578	1,378	6,621	5,960	-661	61	24	C				17,257	16,085	-1,172	-6.79	-9.98
			578	580	1,268	6,621	5,954	-667	61	24	C	61	24	C	17,257	16,072	-1,185	-6.87	**-10.07**
			580	582	875	6,621	5,950	-671	61	24	C				17,257	16,062	-1,195	-6.92	**-10.14**
		END EB I-94	582	584	1,173	6,621	5,944	-677	61	24	C				17,257	16,053	-1,204	-6.98	**-10.22**
	EB I-394	EB I-94	658	558	266	2,190	1,763	-427	18	106	F				6,350	5,270	-1,080	**-17.01**	**-19.51**
	Lyndale/Hennepin Avenue		660	659	1,194	2,130	2,063	-67	16	67	F				5,059	5,049	-10	-0.20	-3.14
		EB I-94	659	561	302	2,130	2,035	-95	19	65	F				5,059	5,040	-19	-0.37	-4.47
	EB I-94	SB I-35W	564	664	604	2,120	1,959	-161	46	42	E				6,025	5,610	-415	-6.89	-7.58
	EB I-94	NB I-35W	567	266	389	1,440	1,311	-129	52	25	C				3,747	3,507	-240	-6.42	-8.97
	NB I-35W	EB I-94	267	570	442	1,470	1,282	-189	52	25	C				3,431	3,094	-337	-9.82	**-12.82**
	5th Avenue		661	668	741	541	537	-4	45	6	A				1,378	1,377	-1	-0.10	-0.81
		EB I-94	668	568	522	541	536	-5	40	10	A				1,378	1,376	-2	-0.13	-0.89
	EB I-94	TH 55	569	662	500	920	905	-15	48	19	B				2,775	2,656	-119	-4.30	-1.66
	Cedar Avenue	EB I-94	673	573	427	619	618	-1	54	12	B				1,590	1,589	-1	-0.09	-0.19
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,260	6,256	-4	61	26	C				16,539	16,511	-28	-0.17	-0.07
			750	752	590	6,260	6,252	-8	60	26	C				16,539	16,475	-64	-0.39	-0.13
			752	754	1,231	6,260	6,249	-11	56	28	D				16,539	16,425	-114	-0.69	-0.18
			754	756	1,378	6,260	6,240	-20	48	34	D	51	32	D	16,539	16,341	-198	-1.20	-0.32
			756	758	775	6,260	6,228	-33	43	38	E				16,539	16,263	-276	-1.67	-0.52
		Cedar Ave Exit	758	759	1,026	6,260	6,212	-48	37	41	E				16,539	16,192	-347	-2.10	-0.77
	Cedar Ave Exit		759	760	755	5,030	4,983	-47	29	49	F				13,246	12,912	-334	-2.52	-0.93
			760	761	1,114	5,030	4,962	-68	26	51	F	27	49	F	13,246	12,857	-389	-2.94	-1.36
		SB I-35W Exit	761	762	677	5,030	4,939	-91	28	46	F				13,246	12,816	-430	-3.24	-1.81
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,301	4,217	-84	26	55	F	25.7	55.2	F	11,439	11,048	-391	-3.42	-1.95
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	6,462	6,355	-107	27	58	F	26.7	57.9	F	17,333	16,899	-434	-2.51	-1.65
	11th St Exit		764	765	1,022	5,103	5,002	-101	24	68	F				13,646	13,322	-324	-2.38	-1.97
		NB I-35W/4th Ave Entrance	765	766	1,082	5,103	4,974	-129	23	73	F	24	71	F	13,646	13,286	-360	-2.64	-2.53
	NB I-35W/4th Ave Entrance		766	767	717	7,513	6,921	-592	29	56	F				19,804	18,528	-1,276	-6.44	-7.88
		Lyndale/Hennepin Exit	767	768	1,834	7,513	6,914	-599	46	35	D	42	41	E	19,804	18,505	-1,300	-6.56	-7.97
	Lyndale/Hennepin Exit		768	769	1,590	6,253	5,721	-532	36	52	F				16,261	15,176	-1,085	-6.67	-8.51
			769	770	1,188	6,253	5,719	-534	45	42	E	41	44	F	16,261	15,161	-1,100	-6.77	-8.54
		WB I-394 Exit	770	771	1,432	6,253	5,716	-538	44	37	E				16,261	15,146	-1,115	-6.86	-8.60
	WB I-394 Exit		771	772	508	2,933	2,652	-281	52	17	B				7,415	6,789	-626	-8.45	-9.59
		TH 55 Exit	772	774	544	2,933	2,651	-282	54	14	B	53	15	B	7,415	6,787	-628	-8.47	-9.60
	TH 55 Exit	**END WB I-94**	774	776	400	2,634	2,378	-256	54	15	B	54	14.7	B	6,538	6,015	-523	-8.00	-9.73
	WB I-94	Cedar Avenue	759	859	254	1,230	1,212	-18	50	24	C				3,293	3,212	-81	-2.46	-1.46
	WB I-94	SB I-35W	762	466	250	729	710	-19	51	14	B				1,807	1,751	-56	-3.08	-2.59
	Washington CD Road		860	864	656	2,161	2,161	0	48	23	C				5,894	5,889	-5	-0.09	0.01
		WB I-94	864	763	506	2,161	2,162	1	30	36	E				5,894	5,884	-10	-0.17	0.05
	WB I-94	11th Street	764	861	492	1,359	1,320	-39	49	27	C				3,687	3,536	-151	-4.11	-2.84
	NB I-35W Flyover		256	6	890	2,040	1,604	-436	29	56	F				5,209	4,337	-872	**-16.75**	**-21.36**
			6	3	142	2,040	1,603	-437	29	56	F				5,209	4,331	-878	**-16.85**	**-21.42**
		4th Avenue Entrance	3	2	114	2,040	1,603	-437	29	27	C				5,209	4,330	-879	**-16.88**	**-21.44**
	4th Avenue Entrance	(dummy exit)	2	1	164	2,410	1,969	-441	30	22	C				6,158	5,275	-883	**-14.34**	**-18.29**
		WB I-94	1	766	254	2,410	1,968	-443	29	34	D				6,158	5,273	-886	**-14.38**	**-18.36**
	4th Avenue		5	4	466	370	370	0	9	22	C				949	949	-1	-0.05	0.05
		NB Flyover	4	2	160	370	368	-2	20	11	B				949	947	-2	-0.19	-0.59
	WB I-94	Lyndale/Hennepin Avenue	768	863	568	1,260	1,190	-70	49	12	B				3,543	3,305	-238	-6.71	-5.56
	WB I-94		771	871	392	3,320	3,061	-259	33	47	F				8,846	8,347	-499	-5.64	-7.80
		WB I-394	871	872	305	3,320	3,061	-259	25	61	F				8,846	8,344	-502	-5.67	-7.79
	WB I-94	TH 55	774	874	249	299	274	-25	54	5	A				877	769	-108	**-12.29**	-8.49

Table B2
2038 NoBuild AM Peak Period
Arterial Measures of Effectiveness

Iterations: 8

Hour 4

MOE Hour
7:00 AM-8:00 AM

	Intersection	Appr	Link	Demand volumes					Total Delay by Movement (sec/veh)				Level of Service by Movement				LOS by Approach		LOS by Intersection		Through		Left Turn		Right Turn	
				Lt	Th	Rt	D	total	L	T	R	D	L	T	R	D	Delay	LOS	Delay	LOS	Link Length	Queue	Storage	Queue	Storage	Queue
signal	Lake Street at Stevens Ave	NB	990-918	10	630	151	0	791	23	23	23	-	C	C	C	-	23	C			1115	200				
signal		EB	919-918	120	451	59	0	630	12	3	1	-	B	A	A	-	5	A	20.0	B	326	84	125	62		
signal		WB	992-918	20	290	11	0	321	43	42	36	-	D	D	D	-	42	D			586	312				
signal	Lake Street at 2nd Ave	NB	918-919	121	529	0	0	650	10	6	-	-	A	A	-	-	7	A			326	96	125	68		
signal		SB	991-919	0	510	40	0	550	-	17	18	-	-	B	B	-	17	B	17.8	B	982	136				
signal		EB	917-919	120	539	131	0	790	32	31	9	-	C	C	A	-	28	C			618	290				
signal	31st Street at Stevens Ave	WB	988-916	0	220	151	0	371	-	23	21	-	-	C	C	-	22	C			1106	140				
signal		SB	917-916	131	251	0	0	382	34	29	-	-	C	C	-	-	30	C	21.0	C	328	162				
signal		EB	918-916	21	490	50	0	561	18	15	3	-	B	B	A	-	14	B			618	218			80	42
signal	31st Street at 2nd Ave	WB	916-917	29	212	0	0	241	30	23	-	-	C	C	-	-	24	C			328	124				
signal		NB	989-917	0	311	10	0	321	-	28	18	-	-	C	B	-	28	C	16.4	B	972	118				
signal		EB	987-917	71	751	80	0	902	11	10	7	-	B	B	A	-	10	A			281	164				
signal	Stevens to I-35W Split	WB	916-986	690	82	0	0	772	0	0	-	-	A	A	-	-	0	A			178	84				
signal	2nd Ave to I-35W Merge	SB	985-987	0	112	0	0	112	-	0	-	-	-	A	-	-	0	A			334	0				

Table B3
2038 NoBuild PM peak
Freeway Measures of Effectiveness
I-35W Lake Street Transit

Iterations: 8

MOE Hour
4:30 PM-5:30 PM
6

LOS A <10 vplph
LOS B 10<20 vplph
LOS C 20<28 vplph
LOS D 28<35 vplph
LOS E 35<43 vplph
LOS F >43 vplph

	Location		Node		Length (ft)	Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
	From	To	From	To		Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	5,921	5,918	-3	41	38	E	40.9	38.3	E	16,841	16,990	149	0.88	-0.05
	TH 62 Entrance	60th St Entrance	104	106	1,355	8,101	7,259	-842	21	60	F	20.5	59.7	F	23,219	22,018	-1,201	-5.17	**-10.40**
	60th St Entrance	Diamond Lake Exit	106	108	910	8,521	7,614	-907	19	64	F	18.7	64.2	F	24,463	23,189	-1,274	-5.21	**-10.65**
	Diamond Lake Exit		108	110	1,432	8,321	7,329	-992	18	84	F				23,953	22,538	-1,415	-5.91	**-11.92**
		Diamond Lake Entrance	110	112	1,225	8,321	7,289	-1,032	18	83	F	18	84	F	23,953	22,457	-1,496	-6.25	**-12.40**
	Diamond Lake Entrance		112	113	1,449	8,761	7,719	-1,042	19	76	F				25,312	23,801	-1,511	-5.97	**-11.90**
			113	114	542	8,761	7,704	-1,057	20	79	F	19	78	F	25,312	23,749	-1,563	-6.17	**-12.06**
		46th St Exit	114	116	1,462	8,761	7,703	-1,058	19	79	F				25,312	23,693	-1,619	-6.40	**-12.08**
	46th St Exit	46th St BRT Exit	116	118	238	8,031	7,114	-917	16	76	F	16.1	75.8	F	23,367	21,955	-1,412	-6.04	**-11.42**
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,031	7,105	-926	16	89	F	16	88.9	F	23,367	21,858	-1,509	-6.46	**-11.53**
	46th St BRT Entrance	46th St Entrance	120	122	378	8,031	7,110	-921	16	79	F	15.5	79.2	F	23,367	21,808	-1,559	-6.67	**-11.47**
	46th St Entrance		122	124	1,521	8,632	7,718	-914	17	83	F				25,284	23,683	-1,601	-6.33	**-10.59**
			124	126	818	8,632	7,715	-917	19	80	F	19	79	F	25,284	23,619	-1,665	-6.58	**-10.62**
		35/36th St Exit	126	128	1,514	8,632	7,709	-923	20	75	F				25,284	23,558	-1,726	-6.82	**-10.69**
	35/36th St Exit		128	130	1,485	8,022	7,214	-808	19	74	F				23,630	22,043	-1,587	-6.72	**-10.07**
		35/36th St Entrance	130	132	1,474	8,022	7,233	-789	20	73	F	20	74	F	23,630	21,979	-1,651	-6.99	-9.83
	35/36th St Entrance	31/Lake St Exit	132	134	604	8,902	8,135	-767	21	65	F	20.8	65.2	F	26,406	24,730	-1,676	-6.35	-8.62
	31/Lake St Exit	Lake St BRT Exit	134	136	1,029	8,032	7,352	-680	21	65	F	20.5	65.4	F	23,862	22,304	-1,558	-6.53	-8.47
	Lake St BRT Exit	Lake St BRT Entrance	136	138	721	8,032	7,374	-658	21	71	F	21	70.6	F	23,862	22,269	-1,593	-6.68	-8.19
	Lake St BRT Entrance		138	140	1,190	8,032	7,407	-625	22	62	F				23,862	22,263	-1,599	-6.70	-7.78
			140	142	569	8,032	7,433	-599	24	62	F				23,862	22,252	-1,610	-6.75	-7.45
			142	144	1,061	8,032	7,451	-581	25	59	F	24	60	F	23,862	22,241	-1,621	-6.79	-7.23
		NB I-35W/TH 65 SPLIT	144	146	859	8,032	7,467	-565	25	59	F				23,862	22,229	-1,633	-6.85	-7.04
	Begin NB TH 65		146	148	498	4,641	4,253	-388	37	39	E				13,243	12,616	-627	-4.74	-8.36
			148	150	281	4,641	4,248	-393	36	40	E				13,243	12,612	-631	-4.77	-8.46
			150	152	284	4,641	4,246	-395	34	42	E	32	41	E	13,243	12,609	-634	-4.78	-8.52
			152	154	582	4,641	4,241	-400	32	44	F				13,243	12,605	-638	-4.82	-8.62
		WB I-94 Exit	154	156	644	4,641	4,233	-408	27	42	E				13,243	12,596	-647	-4.88	-8.80
	WB I-94 Exit	**END NB TH 65**	156	158	983	2,851	2,767	-84	53	17	B	53	17.4	B	8,515	8,624	109	1.28	-2.94
	NB I-35W/TH 65 Split		146	161	665	3,391	3,222	-169	16	104	F				10,619	9,605	-1,014	-9.55	-4.99
			163	164	927	3,391	3,232	-159	16	104	F	16	102	F	10,619	9,607	-1,012	-9.53	-4.69
		5th Ave Entrance	164	165	965	3,391	3,233	-158	17	98	F				10,619	9,607	-1,012	-9.53	-4.66
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,390	3,979	-411	28	64	F	28.3	64.1	F	13,393	11,687	-1,706	**-12.74**	-9.35
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,870	5,368	-502	43	39	E	43	39.1	E	17,931	15,977	-1,954	**-10.90**	-8.56
	EB I-94 Exit		167	168	540	5,041	4,590	-451	47	32	D				14,794	13,224	-1,570	**-10.61**	-8.95
		Washington Ave Exit	168	169	448	5,041	4,590	-452	50	30	D	49	31	D	14,794	13,224	-1,570	**-10.61**	-8.96
	Washington Ave Exit		169	170	625	4,210	3,800	-410	54	35	E				12,412	11,047	-1,365	**-11.00**	-9.73
		END NB I-35W	170	171	523	4,210	3,800	-410	56	34	D	55	35	E	12,412	11,047	-1,365	**-11.00**	-9.74
Northbound I-35W/TH 65 Ramps	TH 62	NB I-35W	204	104	266	2,180	1,397	-783	9	88	F				6,378	5,084	-1,294	**-20.29**	**-35.94**
	60th St	NB I-35W	206	106	505	420	419	-1	52	8	A				1,244	1,243	-1	-0.09	-0.19
	NB I-35W	Diamond Lake Road	108	208	271	200	241	41	39	6	A				510	577	67	**13.16**	**20.25**
	Diamond Lake Road		211	212	606	440	458	18	38	6	A				1,359	1,417	58	4.29	4.11
		NB I-35W	212	112	577	440	459	19	34	11	B				1,359	1,417	58	4.28	4.20
	NB I-35W	46th Street	116	216	370	730	590	-140	49	12	B				1,945	1,690	-255	**-13.13**	**-19.14**
	NB I-35W	46th St BRT	118	218	166	0	8	8	58	0	A				0	25	25	0.00	0.00
	46th St BRT	NB I-35W	220	120	246	0	8	8	35	0	A				0	25	25	0.00	0.00
	46th Street		221	222	818	601	607	6	15	21	C				1,917	1,929	12	0.62	1.06
		NB I-35W	222	122	686	601	608	7	31	16	B				1,917	1,928	11	0.56	1.20
	NB I-35W	35/36th Street	128	228	533	610	502	-108	52	10	A				1,654	1,441	-213	**-12.90**	**-17.64**
	35/36th Street		231	232	595	880	887	7	13	36	E				2,776	2,787	11	0.38	0.75
		NB I-35W	232	132	470	880	886	6	28	24	C				2,776	2,788	12	0.42	0.67
	NB I-35W	31/Lake Street	134	234	410	870	802	-68	42	19	B				2,544	2,403	-141	-5.53	-7.83
	NB I-35W	Lake St BRT	136	236	132	0	3	3	26	0	A				0	13	13	0.00	0.00
	Lake St BRT	NB I-35W	238	138	108	0	3	3	49	0	A				0	12	12	0.00	0.00
	NB TH 65	WB I-94	156	256	388	1,790	1,458	-332	14	101	F				4,728	3,963	-765	**-16.17**	**-18.56**
	5th Avenue		261	265	485	999	745	-254	2	187	F				2,774	2,085	-690	**-24.86**	**-25.40**
		NB I-35W	265	165	220	999	745	-254	21	19	B				2,774	2,079	-695	**-25.04**	**-25.41**
	EB I-94	NB I-35W	266	166	369	1,480	1,387	-93	51	28	C				4,538	4,291	-247	-5.44	-6.26
	NB I-35W	EB I-94	167	267	483	829	779	-50	52	15	B				3,137	2,751	-386	**-12.31**	-6.04
	NB I-35W	Washington Ave	169	262	847	831	788	-43	54	7	A				2,382	2,176	-206	-8.63	-5.16
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,209	2,158	-51	9	117	F	9.3	117.4	F	6,967	6,692	-275	-3.95	-2.32
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,839	2,690	-149	10	120	F	10.1	120.2	F	8,954	8,490	-464	-5.19	-5.26
	WB I-94 Entrance		366	367	1,871	3,989	3,804	-185	22	79	F				12,032	11,427	-605	-5.03	-4.65
			367	368	827	3,989	3,803	-186	30	64	F				12,032	11,416	-616	-5.12	-4.66
			368	369	483	3,989	3,803	-186	41	47	F	33	62	F	12,032	11,415	-617	-5.13	-4.66
			369	370	403	3,989	3,804	-185	50	38	E				12,032	11,415	-617	-5.13	-4.65
		SB TH 65 Entrance	374	376	627	3,989	3,803	-186	54	35	E				12,032	11,415	-617	-5.13	-4.67
	Begin SB TH 65	12th St Entrance	300	302	867	2,050	2,050	0	57	18	B	57	18.3	B	5,077	5,079	2	0.04	-0.01
	12th St Entrance	EB I-94 Entrance	302	304	1,088	2,630	2,749	119	47	27	C	47.2	26.7	C	6,587	6,945	358	5.44	4.51
	EB I-94 Entrance		304	307	1,574	4,221	4,251	30	57	25	C				11,459	11,616	157	1.37	0.71
		SB I-35W Entrance	307	310	1,516	4,221	4,249	28	49	32	D	53	29	D	11,459	11,614	155	1.35	0.67
	SB I-35W Entrance		310	314	698	8,210	8,052	-158	56	36	E				23,491	23,027	-464	-1.98	-1.92
			314	318	379	8,210	8,052	-158	58	35	D				23,491	23,026	-465	-1.98	-1.92
			318	320	900	8,210	8,051	-159	58	35	D	57	34	D	23,491	23,025	-466	-1.98	-1.94
		Lake St BRT Exit	320	322	616	8,210	8,052	-159	54	31	D				23,491	23,023	-468	-1.99	-1.93
	Lake St BRT Exit	Lake St BRT Entrance	322	324	719	8,210	7,941	-269	48	41	E	48.4	41	E	23,491	22,676	-815	-3.47	-3.28
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	8,210	8,058	-152	49	38	E	49.4	37.9	E	23,491	23,017	-474	-2.02	-1.85
	31/Lake St Entrance	35/36th St Exit	326	328	518	9,260	9,118	-142	52	35	E	51.5	35.4	E	26,594	26,116	-478	-1.80	-1.53
	35/36th St Exit		328	330	1,384	8,150	8,037	-113	60	33	D				23,205	22,786	-419	-1.81	-1.39
		35/36th St Entrance	330	332	1,712	8,150	8,037	-113	59	34	D	59	34	D	23,205	22,785	-420	-1.81	-1.39
	35/36th St Entrance		332	334	1,460	8,610	8,498	-112	50	40	E				24,566	24,145	-421	-1.71	-1.30
			334	336	544	8,610	8,498	-112	55	39	E	54	36	E	24,566	24,145	-421	-1.71	-1.30
		46th St Exit	336	338	1,512	8,610	8,497	-113	59	31	D				24,566	24,143	-423	-1.72	-1.31
	46th St Exit	46th St BRT Exit	338	340	780	7,771	7,668	-103	63	22	C	62.9	22.1	C	22,194	21,808	-386	-1.74	-1.32
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	7,771	7,646	-125	64	24	C	63.8	24	C	22,194	21,752	-442	-1.99	-1.61
	46th St BRT Entrance	46th St Entrance	342	344	393	7,771	7,666	-105	56	24	C	56.2	23.9	C	22,194	21,816	-378	-1.70	-1.35
	46th St Entrance		344	346	1,397	8,451	8,347	-104	41	39	E				24,236	23,857	-379	-1.57	-1.24
		60th St Exit	346	348	1,495	8,451	8,347	-104	39	41	E	40	40	E	24,236	23,856	-380	-1.57	-1.23
	60th St Exit	TH 62 Exit	348	350	2,036	7,810	7,712	-98	52	30	D	51.9	29.7	D	22,528	22,159	-369	-1.64	-1.25
	TH 62 Exit		350	352	1,409	3,649	3,614	-35	63	19	B				10,324	10,226	-98	-0.95	-0.96
			352	354	1,616	3,649	3,613	-36	65	19	B	64	19	B	10,324	10,223	-101	-0.98	-0.98
		END SB I-35W	354	356	719	3,649	3,614	-35	66	18	B				10,324	10,220	-104	-1.01	-0.96
Southbound I-35W/TH 65 Ramps	Washington CD RD	SB I-35W	461	365	302	630	532	-98	4	144	F				1,987	1,843	-144	-7.25	**-15.54**
	WB I-94	SB I-35W	466	366	269	1,150	1,114	-36	14	81	F				3,078	2,964	-114	-3.70	-3.14
	12th Street	SB TH 65	402	302	283	580	701	121	40	19	B				1,510	1,867	357	**23.63**	**20.91**
	EB I-94	SB TH 65	664	304	635	1,591	1,504	-87	46	33	D				4,872	4,671	-201	-4.13	-5.44
	SB I-35W	SB TH 65	376	310	857	3,989	3,803	-186	55	34	D				12,032	11,415	-617	-5.13	-4.66
	SB I-35W	Lake St BRT	322	422	121	0	114	114	30	4	A				0	344	344	0.00	0.00
	Lake St BRT	SB I-35W	424	324	102	0	115	115	28	4	A				0	346	346	0.00	0.00
	31/Lake Street		425	426	114	1,050	1,060	10	27	20	C				3,103	3,101	-3	-0.08	0.94
		SB I-35W	426	326	441	1,050	1,060	10	32	25	C				3,103	3,101	-2	-0.08	0.94
	SB I-35W	35/36th Street	328	428	395	1,110	1,082	-28	39	28	D				3,389	3,331	-58	-1.71	-2.56
	35/36th Street		431	432	669	460	460	0	28	9	A				1,361	1,361	0	-0.03	-0.04
		SB I-35W	432	332	585	460	461	1	34	11	B				1,361	1,361	0	-0.01	0.17
	SB I-35W	46th Street	338	438	703	839	828	-11	54	15	B				2,372	2,333	-39	-1.65	-1.29
	SB I-35W	46th St BRT	340	440	116	0	20	20	66	0	A				0	60	60	0.00	0.00
	46th St BRT	SB I-35W	442	342	216	0	21	21	38	1	A				0	59	59	0.00	0.00
	46th St BRT		443	444	1,118	680	679	-1	41	8	A				2,042	2,040	-2	-0.09	-0.12
		SB I-35W	444	344	378	680	680	0	33	15	B				2,042	2,041	-1	-0.04	-0.03
	SB I-35W	60th Street	348	448	541	641	635	-6	54	12	B				1,708	1,695	-13	-0.78	-0.90
	SB I-35W		350	450	465	4,161	4,098	-63	53	26	C				12,204	11,930	-274	-2.24	-1.52
		TH 62	450	451	390	4,161	4,100	-61	53	26	C				12,204	11,931	-273	-2.24	-1.48
Eastbound I-94	**Begin EB I-94**		554	556	984	4,070	4,055	-15	25	84	F				11,929	11,920	-9	-0.08	-0.36
			556	557	632	4,070	4,055	-15	25	82	F	26	80	F	11,929	11,920	-9	-0.07	-0.38
		EB I-394 Entrance	557	558	789	4,070	4,054	-16	28	73	F				11,929	11,922	-7	-0.06	-0.40
	EB I-394 Entrance		558	559	442	6,360	5,917	-443	27	72	F				18,717	17,652	-1,065	-5.69	-6.96
			559	560	1,192	6,360	5,915	-445	33	60	F	32	63	F	18,717	17,651	-1,066	-5.69	-7.00
		Lyndale/Hennepin Entrance	560	561	1,856	6,360	5,909	-451	32	62	F				18,717	17,650	-1,067	-5.70	-7.09
	Lyndale/Hennepin Entrance		561	562	1,485	8,091	7,629	-462	40	48	F				23,761	22,692	-1,069	-4.50	-5.71
			562	563	706	8,091	7,626	-465	49	39	E	44	44	F	23,761	22,691	-1,070	-4.50	-5.75
		SB I-35W Exit	563	564	474	8,091	7,627	-464	50	38	E				23,761	22,691	-1,070	-4.50	-5.74
	SB I-35W Exit		564	565	792	6,500	6,123	-377	50	41	E				18,889	18,019	-870	-4.60	-5.80
			565	566	865	6,500	6,122	-378	51	40	E	51	39	E	18,889	18,019	-871	-4.61	-5.82
		NB I-35W Exit	566	567	388	6,500	6,121	-379	51	32	D				18,889	18,018	-871	-4.61	-5.84
	NB I-35W Exit	5th Ave Entrance	567	568	688	5,020	4,732	-288	51	31	D	51.1	30.9	D	14,351	13,726	-625	-4.36	-5.75
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,680	5,388	-292	55	25	C	54.5	24.7	C	16,259	15,634	-626	-3.85	-5.14
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,350	4,139	-211	59	23	C	59.4	23.2	C	12,511	12,019	-492	-3.93	-4.86
	NB I-35W Entrance		570	572	1,016	5,179	4,916	-263	61	20	C				15,648	14,769	-879	-5.62	-5.08
		Cedar Ave Entrance	572	573	1,027	5,179	4,913	-266	58	21	C	60	21	C	15,648	14,768	-880	-5.62	-5.13
	Cedar Ave Entrance		573	574	562	6,618	6,351	-267	42	31	D				19,663	18,784	-879	-4.47	-4.04
			574	576	930	6,618	6,350	-268	54	29	D				19,663	18,785	-878	-4.46	-4.05
			576	578	1,378	6,618	6,350	-268	61	26	C				19,663	18,785	-878	-4.47	-4.05
			578	580	1,268	6,618	6,350	-268	61	26	C	58	27	C	19,663	18,784	-879	-4.47	-4.05
			580	582	875	6,618	6,348	-270	61	26	C				19,663	18,785	-878	-4.46	-4.07
		END EB I-94	582	584	1,173	6,618	6,349	-269	61	26	C				19,663	18,785	-878	-4.47	-4.06
	EB I-394	EB I-94	658	558	266	2,290	1,864	-426	20	100	F				6,788	5,729	-1,059	**-15.61**	**-18.59**
	Lyndale/Hennepin Avenue		660	659	1,194	1,731	1,729	-2	33	26	C				5,044	5,043	-1	-0.02	-0.13
		EB I-94	659	561	302	1,731	1,728	-3	24	43	E				5,044	5,043	-1	-0.01	-0.16
	EB I-94	SB I-35W	564	664	604	1,591	1,503	-88	47	32	D				4,872	4,671	-201	-4.13	-5.51
	EB I-94	NB I-35W	567	266	389	1,480	1,387	-93	52	27	C				4,538	4,292	-246	-5.43	-6.26
	NB I-35W	EB I-94	267	570	442	829	780	-49	53	15	B				3,137	2,752	-386	**-12.29**	-5.92
	5th Avenue		661	668	741	660	658	-2	14	23	C				1,908	1,907	-2	-0.08	-0.33
		EB I-94	668	568	522	660	659	-1	30	16	B				1,908	1,907	-1	-0.03	-0.21
	EB I-94	TH 55	569	662	500	1,330	1,246	-84	48	26	C				3,748	3,614	-134	-3.58	-6.29
	Cedar Avenue	EB I-94	673	573	427	1,439	1,440	1	50	30	D				4,015	4,014	-1	-0.02	0.04
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,441	5,431	-10	57	28	C				16,848	16,625	-224	-1.33	-0.18
			750	752	590	5,441	5,419	-22	55	32	D				16,848	16,528	-320	-1.90	-0.40
			752	754	1,231	5,441	5,404	-37	49	39	E				16,848	16,434	-414	-2.46	-0.68
			754	756	1,378	5,441	5,371	-70	44	49	F	45	43	F	16,848	16,309	-539	-3.20	-1.28
			756	758	775	5,441	5,337	-104	37	56	F				16,848	16,215	-633	-3.76	-1.92
		Cedar Ave Exit	758	759	1,026	5,441	5,293	-148	28	60	F				16,848	16,145	-703	-4.17	-2.72
	Cedar Ave Exit		759	760	755	5,001	4,802	-199	22	68	F				15,480	14,763	-717	-4.63	-3.99
			760	761	1,114	5,001	4,760	-242	19	69	F	20	67	F	15,480	14,709	-771	-4.98	-4.83
		SB I-35W Exit	761	762	677	5,001	4,729	-272	20	61	F				15,480	14,674	-806	-5.21	-5.44
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,851	3,606	-245	17	72	F	17.4	71.8	F	12,402	11,700	-702	-5.66	-6.37
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,741	4,576	-1,165	16	71	F	15.8	71.1	F	18,466	15,173	-3,293	**-17.83**	**-20.30**
	11th St Exit		764	765	1,022	5,051	4,036	-1,015	15	92	F				16,200	13,318	-2,883	**-17.79**	**-20.09**
		NB I-35W/4th Ave Entrance	765	766	1,082	5,051	4,040	-1,011	15	91	F	15	91	F	16,200	13,294	-2,906	**-17.94**	**-20.02**
	NB I-35W/4th Ave Entrance		766	767	717	7,811	6,455	-1,356	26	59	F				23,669	19,960	-3,709	**-15.67**	**-17.36**
		Lyndale/Hennepin Exit	767	768	1,834	7,811	6,458	-1,353	48	31	D	42	39	E	23,669	19,960	-3,709	**-15.67**	**-17.32**
	Lyndale/Hennepin Exit		768	769	1,590	6,291	5,288	-1,003	37	47	F				19,323	16,502	-2,821	**-14.60**	**-15.95**
			769	770	1,188	6,291	5,290	-1,001	46	38	E	42	40	E	19,323	16,508	-2,815	**-14.57**	**-15.91**
		WB I-394 Exit	770	771	1,432	6,291	5,292	-999	45	33	D				19,323	16,511	-2,812	**-14.55**	**-15.87**
	WB I-394 Exit		771	772	508	3,351	2,914	-437	52	19	B				10,631	9,281	-1,350	**-12.70**	**-13.05**
		TH 55 Exit	772	774	544	3,351	2,915	-436	54	15	B	53	17	B	10,631	9,282	-1,349	**-12.69**	**-13.00**
	TH 55 Exit	**END WB I-94**	774	776	400	2,920	2,560	-360	54	16	B	53.9	15.8	B	9,323	8,134	-1,189	**-12.76**	**-12.34**
	WB I-94	Cedar Avenue	759	859	254	440	444	4	50	9	A				1,368	1,320	-48	-3.50	0.84
	WB I-94	SB I-35W	762	466	250	1,150	1,114	-36	21	56	F				3,078	2,964	-114	-3.70	-3.14
	Washington CD Road		860	864	656	1,890	977	-913	3	192	F				6,064	3,498	-2,566	**-42.31**	**-48.31**
		WB I-94	864	763	506	1,890	977	-913	29	17	B				6,064	3,499	-2,566	**-42.31**	**-48.31**
	WB I-94	11th Street	764	861	492	690	538	-152	47	11	B				2,266	1,823	-443	**-19.55**	**-22.07**
	NB I-35W Flyover		256	6	890	1,790	1,452	-338	16	90	F				4,728	3,955	-773	**-16.35**	**-18.86**
			6	3	142	1,790	1,448	-342	17	86	F				4,728	3,949	-779	**-16.48**	**-19.09**
		4th Avenue Entrance	3	2	114	1,790	1,448	-342	17	43	F				4,728	3,948	-780	**-16.50**	**-19.13**
	4th Avenue Entrance	(dummy exit)	2	1	164	2,760	2,416	-344	20	40	E				7,469	6,684	-785	**-10.50**	**-12.47**
		WB I-94	1	766	254	2,760	2,414	-346	20	62	F				7,469	6,682	-787	**-10.53**	**-12.53**
	4th Avenue		5	4	466	970	969	-2	11	46	F				2,741	2,739	-2	-0.09	-0.15
		NB Flyover	4	2	160	970	969	-1	20	28	D				2,741	2,738	-3	-0.11	-0.09
	WB I-94	Lyndale/Hennepin Avenue	768	863	568	1,520	1,174	-346	49	12	B				4,346	3,466	-880	**-20.25**	**-22.78**
	WB I-94		771	871	392	2,940	2,381	-559	33	36	E				8,692	7,232	-1,460	**-16.80**	**-19.00**
		WB I-394	871	872	305	2,940	2,382	-558	26	46	F				8,692	7,231	-1,461	**-16.80**	**-18.97**
	WB I-94	TH 55	774	874	249	431	357	-74	54	7	A				1,308	1,149	-159	**-12.17**	**-17.10**

Table B4
2038 NoBuild PM Peak Period
Arterial Measures of Effectiveness

Iterations: 8

Hour 6 — **MOE Hour** **4:30 PM-5:30 PM**

	Intersection	Appr	Link	Demand volumes					Total Delay by Movement (sec/veh)				Level of Service by Movement				LOS by Approach		LOS by Intersection		Modeled Storage & Maximum Traffic Queueing (feet): Through		Left Turn		Right Turn	
				Lt	Th	Rt	D	total	L	T	R	D	L	T	R	D	Delay	LOS	Delay	LOS	Link Length	Queue	Storage	Queue	Storage	Queue
signal		NB	990-918	20	680	140	0	840	27	22	23	-	C	C	C	-	23	C			1115	248				
signal	Lake Street at Stevens Ave	EB	919-918	300	1139	111	0	1550	14	7	6	-	B	A	A	-	8	A	19.5	B	326	244	125	110		
signal		WB	992-918	41	399	30	0	470	52	51	44	-	D	D	D	-	51	D			586	498				
signal		NB	918-919	39	682	0	0	721	21	2	-	-	C	A	-	-	3	A			326	116	125	64		
signal	Lake Street at 2nd Ave	SB	991-919	0	1290	30	0	1320	-	16	17	-	-	B	B	-	16	B	17.7	B	982	270				
signal		EB	917-919	260	230	190	0	680	50	46	10	-	D	D	A	-	38	D			618	308				
signal		WB	988-916	0	360	159	0	519	-	16	20	-	-	B	B	-	17	B			1106	158				
signal	31st Street at Stevens Ave	SB	917-916	311	639	0	0	950	26	15	-	-	C	B	-	-	18	B	25.7	C	328	280				
signal		EB	918-916	40	720	79	0	839	48	41	16	-	D	D	B	-	39	D			618	436			80	72
signal		WB	916-917	29	371	0	0	400	30	16	-	-	C	B	-	-	18	B			328	158				
signal	31st Street at 2nd Ave	NB	989-917	0	711	20	0	731	-	26	24	-	-	C	C	-	26	C	18.7	B	972	242				
signal		EB	987-917	239	631	110	0	980	16	13	10	-	B	B	A	-	14	B			281	216				
signal	Stevens to I-35W Split	WB	916-986	1050	140	0	0	1190	0	0	-	-	A	A	-	-	0	A			178	120				
signal	2nd Ave to I-35W Merge	SB	985-987	0	110	0	0	110	-	0	-	-	-	A	-	-	0	A			334	0				

Table B5
Build S6A&Flyover_Full Aux 2038 AM Peak Period
Freeway Measures of Effectiveness
I-35W Lake Street Transit

Iterations:
8

MOE Hour
7:00 AM-8:00 AM
4

LOS A <10 vplph
LOS B 10<20 vplph
LOS C 20<28 vplph
LOS D 28<35 vplph
LOS E 35<43 vplph
LOS F >43 vplph

	Location		Node		Length (ft)	Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
	From	To	From	To		Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	5,190	5,261	71	61	22	C	61	22	C	13,487	13,699	212	1.57	1.37
	TH 62 Entrance	60th St Entrance	104	106	1,355	7,141	7,245	104	63	19	B	63	19	B	19,275	19,548	273	1.42	1.45
	60th St Entrance	Diamond Lake Exit	106	108	910	7,733	7,837	104	62	20	B	62	20	B	20,617	20,845	228	1.11	1.35
	Diamond Lake Exit		108	110	1,432	7,263	7,368	105	59	25	C				19,369	19,519	150	0.77	1.44
		Diamond Lake Entrance	110	112	1,225	7,263	7,357	94	43	34	D	51	29	D	19,369	19,438	69	0.35	1.29
	Diamond Lake Entrance		112	113	1,449	8,404	8,396	-8	44	36	E				22,098	21,877	-221	-1.00	-0.10
			113	114	542	8,404	8,376	-28	53	32	D	48	34	D	22,098	21,813	-285	-1.29	-0.33
		46th St Exit	114	116	1,462	8,404	8,343	-61	49	34	D				22,098	21,745	-353	-1.60	-0.73
	46th St Exit	46th St BRT Exit	116	118	238	8,144	8,061	-83	43	33	D	43	33	D	21,322	21,022	-300	-1.41	-1.02
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,144	7,965	-179	36	46	F	36	46	F	21,322	20,877	-445	-2.09	-2.20
	46th St BRT Entrance	46th St Entrance	120	122	378	8,144	7,899	-245	29	48	F	29	48	F	21,322	20,838	-484	-2.27	-3.01
	46th St Entrance		122	124	1,521	9,375	8,898	-477	30	55	F				24,249	23,444	-805	-3.32	-5.09
			124	126	818	9,375	8,826	-549	32	55	F	31	55	F	24,249	23,368	-881	-3.63	-5.86
		35/36th St Exit	126	128	1,514	9,375	8,759	-616	31	54	F				24,249	23,298	-951	-3.92	-6.57
	35/36th St Exit		128	130	1,485	9,256	8,576	-680	29	59	F				23,903	22,916	-987	-4.13	-7.34
		35/36th St Entrance	130	132	1,474	9,256	8,501	-755	28	61	F	29	60	F	23,903	22,829	-1,074	-4.49	-8.15
	35/36th St Entrance	31/Lake St Exit	132	134	604	10,546	9,643	-903	28	53	F	28	53	F	27,130	25,737	-1,393	-5.13	-8.56
	31/Lake St Exit	Lake St BRT Exit	134	135	478	9,945	9,070	-875	29	45	F	29	45	F	25,431	24,177	-1,254	-4.93	-8.80
	Lake St BRT Exit		135	136	553	9,945	8,905	-1,041	32	47	F				25,431	23,722	-1,709	-6.72	**-10.46**
		28th St Exit	136	138	843	9,945	8,887	-1,059	39	39	E	36	42	E	25,431	23,699	-1,732	-6.81	**-10.64**
	28th St Exit	Lake St BRT Entrance	138	140	1,112	9,284	8,304	-980	45	37	E	45	37	E	23,742	22,161	-1,581	-6.66	**-10.55**
	Lake St BRT Entrance		140	142	496	9,284	8,426	-858	43	34	D				23,742	22,575	-1,167	-4.91	-9.24
			142	144	1,043	9,284	8,406	-879	43	40	E	41	40	E	23,742	22,559	-1,183	-4.98	-9.46
		NB I-35W/TH 65 SPLIT	144	146	1,405	9,284	8,375	-909	40	42	E				23,742	22,527	-1,215	-5.12	-9.79
	Begin NB TH 65		146	148	294	5,464	5,145	-319	56	30	D				13,705	13,474	-231	-1.68	-5.84
			148	150	242	5,464	5,144	-320	55	31	D				13,705	13,472	-233	-1.70	-5.85
			150	152	180	5,464	5,143	-321	53	32	D	52	31	D	13,705	13,471	-234	-1.71	-5.87
			152	154	395	5,464	5,143	-321	51	34	D				13,705	13,469	-236	-1.72	-5.87
		WB I-94 Exit	154	156	434	5,464	5,144	-320	47	30	D				13,705	13,464	-241	-1.76	-5.86
	WB I-94 Exit	**END NB TH 65**	156	158	1,164	3,443	3,518	75	53	22	C	53	22	C	8,547	8,991	444	5.19	2.17
	NB I-35W/TH 65 Split		146	161	286	3,820	3,210	-610	23	73	F				10,037	9,028	-1,009	**-10.05**	**-15.97**
			162	163	212	3,820	3,178	-642	18	92	F				10,037	8,993	-1,044	**-10.40**	**-16.81**
			163	164	311	3,820	3,174	-646	18	88	F	18	87	F	10,037	8,985	-1,052	**-10.49**	**-16.92**
		5th Ave Entrance	164	165	965	3,820	3,168	-652	18	90	F				10,037	8,968	-1,069	**-10.65**	**-17.08**
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,410	3,751	-659	29	58	F	29	58	F	11,405	10,312	-1,093	-9.59	**-14.95**
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,661	4,896	-765	48	32	D	48	32	D	14,659	13,328	-1,331	-9.08	**-13.52**
	EB I-94 Exit		167	168	540	4,291	3,761	-530	51	25	C				11,461	10,519	-943	-8.22	**-12.36**
		Washington Ave Exit	168	169	448	4,291	3,760	-532	52	24	C	52	24	C	11,461	10,515	-947	-8.26	**-12.39**
	Washington Ave Exit		169	170	625	3,152	2,753	-399	56	25	C				8,116	7,419	-697	-8.58	**-12.66**
		END NB I-35W	170	171	523	3,152	2,753	-399	57	24	C	56	24	C	8,116	7,417	-699	-8.61	**-12.66**
Northbound I-35W/TH 65 Ramps	TH 62	NB I-35W	204	104	266	1,951	1,985	34	53	20	C				5,788	5,876	88	1.51	1.74
	60th St	NB I-35W	206	106	505	592	591	-1	54	11	B				1,342	1,341	-1	-0.08	-0.15
	NB I-35W	Diamond Lake Road	108	208	271	470	468	-2	54	9	A				1,248	1,266	18	1.47	-0.43
	Diamond Lake Road		211	212	606	1,141	1,080	-61	4	130	F				2,729	2,559	-170	-6.22	-5.35
		NB I-35W	212	112	577	1,141	1,062	-79	28	31	D				2,729	2,534	-195	-7.14	-6.89
	NB I-35W	46th Street	116	216	370	260	248	-12	52	5	A				776	665	-112	**-14.37**	-4.58
	NB I-35W	46th St BRT	118	218	166	0	19	19	60	0	A				0	56	56	0.00	0.00
	46th St BRT	NB I-35W	220	120	246	0	19	19	39	1	A				0	56	56	0.00	0.00
	46th Street		221	222	818	1,231	1,089	-142	5	120	F				2,927	2,704	-223	-7.61	**-11.55**
		NB I-35W	222	122	686	1,231	1,062	-169	25	36	E				2,927	2,674	-253	-8.64	**-13.70**
	NB I-35W	35/36th Street	128	228	533	119	95	-24	53	2	A				346	292	-54	**-15.49**	**-19.92**
	35/36th Street		231	232	595	1,290	1,205	-85	6	104	F				3,227	2,988	-239	-7.40	-6.60
		NB I-35W	232	132	470	1,290	1,189	-101	27	33	D				3,227	2,969	-258	-7.99	-7.81
	NB I-35W	31/Lake Street	134	234	410	601	545	-56	49	11	B				1,699	1,531	-168	-9.88	-9.38
	NB I-35W	Lake St BRT	135	235	115	0	144	144	56	3	A				0	434	434	0.00	0.00
	NB I-35W		138	238	455	661	560	-102	54	10	B				1,689	1,511	-178	**-10.54**	**-15.36**
		28th St Exit	238	239	369	661	560	-101	54	10	B				1,689	1,511	-178	**-10.56**	**-15.30**
	Lake St BRT	NB I-35W	240	140	219	0	144	144	38	4	A				0	434	434	0.00	0.00
	NB TH 65	WB I-94	156	256	544	2,021	1,625	-396	31	52	F				5,158	4,467	-691	**-13.40**	**-19.58**
	5th Avenue		261	265	485	590	590	0	42	7	A				1,368	1,366	-2	-0.16	-0.05
		NB I-35W	265	165	220	590	589	-1	29	11	B				1,368	1,365	-3	-0.22	-0.15
	EB I-94	NB I-35W	266	166	369	1,251	1,148	-103	52	22	C				3,254	3,031	-223	-6.85	-8.27
	NB I-35W (from 5th Ave)	EB I-94	167	267	483	1,370	1,134	-236	52	22	C				3,198	2,802	-396	**-12.40**	**-17.21**
	NB I-35W	Washington Ave	169	262	847	1,139	1,006	-133	54	9	A				3,345	3,091	-254	-7.60	**-11.69**
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	3,181	3,177	-4	53	31	D	53	30.5	D	8,404	8,400	-4	-0.05	-0.14
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	3,559	3,563	4	47	35	D	46.5	34.5	D	9,406	9,417	11	0.11	0.11
	WB I-94 Entrance		366	367	1,871	4,559	4,540	-19	53	29	D				11,882	11,859	-23	-0.19	-0.42
			367	368	750	4,559	4,534	-25	37	41	E				11,882	11,847	-35	-0.29	-0.54
			368	369	334	4,559	4,533	-26	40	38	E	48	32	D	11,882	11,841	-41	-0.34	-0.57
			369	370	179	4,559	4,532	-27	48	32	D				11,882	11,839	-43	-0.37	-0.59
		SB TH 65 Entrance	374	376	464	4,559	4,529	-31	55	27	C				11,882	11,828	-54	-0.46	-0.67
	Begin SB TH 65	12th St Entrance	300	302	867	770	771	1	61	6	A	61.4	6.4	A	2,053	2,061	8	0.38	0.18
	12th St Entrance	EB I-94 Entrance	302	304	1,296	1,278	1,405	127	52	13	B	52.3	12.5	B	3,302	3,696	394	**11.94**	9.95
	EB I-94 Entrance		304	307	1,366	3,508	3,459	-49	59	20	B				9,640	9,601	-39	-0.41	-1.39
			307	308	271	3,508	3,458	-50	62	19	B	60	19	B	9,640	9,596	-44	-0.46	-1.44
		SB I-35W Entrance	308	310	278	3,508	3,457	-51	62	19	B				9,640	9,594	-46	-0.47	-1.45
	SB I-35W Entrance		310	314	1,660	8,067	7,980	-87	59	23	C				21,522	21,409	-113	-0.53	-1.08
		Lake St Exit	314	318	765	8,067	7,975	-92	58	23	C	58	23	C	21,522	21,394	-128	-0.60	-1.14
	Lake St Exit	Lake St BRT Exit	318	320	586	7,307	7,209	-98	62	20	C	62	20	C	19,495	19,364	-131	-0.67	-1.35
	Lake St BRT Exit		320	322	545	7,307	7,067	-240	63	23	C				19,495	18,938	-557	-2.86	-3.29
			322	324	721	7,307	7,062	-245	63	22	C	63	22	C	19,495	18,933	-562	-2.88	-3.35
		31/Lake St Entrance	324	326	1,326	7,307	7,060	-247	64	22	C				19,495	18,924	-571	-2.93	-3.39
	31/Lake St Entrance	Lake St BRT Entrance	326	327	134	8,028	7,746	-282	58	22	C	58.1	22.2	C	21,343	20,689	-654	-3.06	-3.52
	Lake St BRT Entrance	35/36th St Exit	327	328	384	8,028	7,884	-144	58	20	B	57.9	19.7	B	21,343	21,108	-235	-1.10	-1.80
	35/36th St Exit		328	330	1,384	7,559	7,424	-135	62	24	C				19,969	19,796	-173	-0.86	-1.78
		35/36th St Entrance	330	332	1,712	7,559	7,415	-145	58	26	C	60	25	C	19,969	19,780	-189	-0.95	-1.91
	35/36th St Entrance		332	334	1,460	8,210	8,055	-155	52	29	D				21,560	21,348	-212	-0.98	-1.89
			334	336	544	8,210	8,049	-161	60	27	C	58	27	C	21,560	21,336	-224	-1.04	-1.96
		46th St Exit	336	338	1,512	8,210	8,043	-167	62	25	C				21,560	21,327	-233	-1.08	-2.03
	46th St Exit	46th St BRT Exit	338	340	780	7,570	7,424	-146	65	21	C	64.6	20.9	C	19,824	19,623	-201	-1.01	-1.93
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	7,570	7,410	-160	61	24	C	61	24.3	C	19,824	19,586	-238	-1.20	-2.11
	46th St BRT Entrance	46th St Entrance	342	344	393	7,570	7,409	-161	51	25	C	51	25.4	C	19,824	19,598	-226	-1.14	-2.13
	46th St Entrance		344	346	1,397	8,029	7,852	-177	44	34	D				20,916	20,679	-237	-1.14	-2.21
		60th St Exit	346	348	1,495	8,029	7,823	-206	46	33	D	45	33	D	20,916	20,663	-253	-1.21	-2.57
	60th St Exit	TH 62 Exit	348	350	2,036	7,469	7,261	-208	55	27	C	54.5	26.7	C	19,535	19,309	-226	-1.16	-2.78
	TH 62 Exit		350	352	1,409	3,809	3,732	-77	62	20	C				9,856	9,946	90	0.91	-2.03
			352	354	1,616	3,809	3,723	-86	64	19	B	64	20	C	9,856	9,935	79	0.80	-2.26
		END SB I-35W	354	356	719	3,809	3,718	-91	65	19	B				9,856	9,928	72	0.73	-2.39
Southbound I-35W/TH 65 Ramps	Washington CD RD	SB I-35W	461	365	302	378	386	8	46	9	A				1,002	1,025	23	2.28	2.04
	WB I-94	SB I-35W	466	366	269	1,000	982	-18	52	19	B				2,476	2,455	-21	-0.84	-1.79
	12th Street	SB TH 65	402	302	283	508	636	128	45	15	B				1,249	1,639	390	**31.21**	**25.14**
	EB I-94	SB TH 65	664	304	815	2,230	2,056	-174	46	45	F				6,338	5,911	-427	-6.74	-7.79
	SB I-35W	SB TH 65	376	310	291	4,559	4,527	-32	56	27	C				11,882	11,826	-56	-0.47	-0.70
	SB I-35W	Lake St	318	418	271	760	764	4	44	18	B				2,027	2,021	-6	-0.30	0.47
	SB I-35W	Lake St BRT	320	420	118	0	139	139	57	3	A				0	422	422	0.00	0.00
	31/Lake Street		425	426	114	721	687	-34	29	12	B				1,848	1,773	-75	-4.05	-4.69
		SB I-35W	426	326	441	721	687	-35	34	15	B				1,848	1,773	-75	-4.08	-4.79
	Lake St BRT	SB I-35W	427	327	271	0	139	139	40	4	A				0	422	422	0.00	0.00
	SB I-35W	35/36th Street	328	428	395	469	454	-15	42	11	B				1,374	1,304	-70	-5.11	-3.22
	35/36th Street		431	432	669	651	652	1	28	12	B				1,591	1,590	-1	-0.09	0.12
		SB I-35W	432	332	585	651	651	0	34	15	B				1,591	1,589	-3	-0.16	0.00
	SB I-35W	46th Street	338	438	703	640	616	-24	54	11	B				1,736	1,693	-43	-2.47	-3.81
	SB I-35W	46th St BRT	340	440	116	0	8	8	60	0	A				0	23	23	0.00	0.00
	46th St BRT	SB I-35W	442	342	216	0	7	7	40	0	A				0	23	23	0.00	0.00
	46th St BRT		443	444	1,118	459	459	0	42	6	A				1,092	1,092	0	0.01	-0.02
		SB I-35W	444	344	378	459	458	-1	34	10	A				1,092	1,091	-1	-0.08	-0.17
	SB I-35W	60th Street	348	448	541	560	537	-23	54	10	B				1,381	1,339	-43	-3.08	-4.09
	SB I-35W		350	450	465	3,660	3,516	-144	53	22	C				9,679	9,351	-328	-3.39	-3.93
		TH 62	450	451	390	3,660	3,515	-145	53	22	C				9,679	9,351	-328	-3.39	-3.95
Eastbound I-94	**Begin EB I-94**		554	556	984	4,131	3,994	-137	24	85	F				11,937	11,760	-177	-1.48	-3.32
			556	557	632	4,131	3,993	-138	24	82	F	25	80	F	11,937	11,745	-192	-1.61	-3.35
		EB I-394 Entrance	557	558	789	4,131	3,992	-139	27	73	F				11,937	11,732	-205	-1.72	-3.37
	EB I-394 Entrance		558	559	442	6,341	5,761	-580	26	74	F				18,346	17,005	-1,341	-7.31	-9.15
			559	560	1,192	6,341	5,758	-583	32	61	F	31	63	F	18,346	16,991	-1,355	-7.39	-9.19
		Lyndale/Hennepin Entrance	560	561	1,856	6,341	5,750	-591	31	61	F				18,346	16,973	-1,373	-7.49	-9.32
	Lyndale/Hennepin Entrance		561	562	1,485	8,411	7,746	-665	39	50	F				23,263	21,851	-1,412	-6.07	-7.91
			562	563	706	8,411	7,737	-674	49	40	E	43	45	F	23,263	21,834	-1,429	-6.14	-8.02
		SB I-35W Exit	563	564	474	8,411	7,734	-677	50	39	E				23,263	21,827	-1,436	-6.17	-8.05
	SB I-35W Exit		564	565	792	6,181	5,673	-508	50	38	E				16,925	15,907	-1,018	-6.02	-8.22
			565	566	865	6,181	5,669	-512	51	37	E	51	36	E	16,925	15,899	-1,026	-6.06	-8.29
		NB I-35W Exit	566	567	388	6,181	5,667	-514	51	29	D				16,925	15,893	-1,032	-6.10	-8.32
	NB I-35W Exit	NB I-35W Entrance	567	568	688	4,930	4,516	-414	52	29	D	51.5	29.2	D	13,671	12,856	-815	-5.96	-8.39
	NB I-35W Entrance	TH 55 Exit	568	569	1,557	5,462	5,042	-421	55	23	C	55.2	22.8	C	15,024	14,199	-825	-5.49	-7.70
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,582	4,236	-346	59	24	C	59.2	23.8	C	12,369	11,712	-657	-5.31	-7.55
	NB I-35W Entrance		570	572	1,016	5,952	5,369	-583	61	22	C				15,567	14,508	-1,059	-6.80	-9.79
		Cedar Ave Entrance	572	573	1,027	5,952	5,367	-585	61	22	C	61	22	C	15,567	14,499	-1,068	-6.86	-9.84
	Cedar Ave Entrance		573	574	562	6,581	5,990	-591	57	21	C				17,184	16,105	-1,079	-6.28	-8.97
			574	576	930	6,581	5,986	-595	59	25	C				17,184	16,097	-1,087	-6.33	-9.05
			576	578	1,378	6,581	5,980	-601	61	25	C				17,184	16,087	-1,097	-6.38	-9.13
			578	580	1,268	6,581	5,974	-607	61	25	C	60	24	C	17,184	16,075	-1,109	-6.45	-9.23
			580	582	875	6,581	5,970	-611	61	25	C				17,184	16,064	-1,120	-6.52	-9.28
		END EB I-94	582	584	1,173	6,581	5,970	-611	61	25	C				17,184	16,054	-1,130	-6.57	-9.28
	EB I-394	EB I-94	658	558	266	2,210	1,770	-440	18	105	F				6,409	5,286	-1,123	**-17.53**	**-19.91**
	Lyndale/Hennepin Avenue		660	659	1,194	2,070	2,041	-29	19	56	F				4,917	4,910	-7	-0.14	-1.39
		EB I-94	659	561	302	2,070	2,013	-57	18	68	F				4,917	4,902	-15	-0.30	-2.74
	EB I-94	SB I-35W	564	664	604	2,230	2,056	-174	46	44	F				6,338	5,913	-425	-6.71	-7.78
	EB I-94	NB I-35W	567	266	389	1,251	1,148	-103	53	22	C				3,254	3,032	-222	-6.82	-8.24
	from 5th Ave	EB I-94	668	568	522	532	530	-2	50	11	B				1,353	1,352	-1	-0.10	-0.41
	NB I-35W	EB I-94	267	570	442	1,370	1,135	-235	53	22	C				3,198	2,802	-396	**-12.38**	**-17.15**
	EB I-94	TH 55	569	662	500	880	802	-78	48	17	B				2,655	2,480	-175	-6.59	-8.85
	Cedar Avenue	EB I-94	673	573	427	629	627	-2	54	12	B				1,617	1,615	-2	-0.10	-0.33
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,311	6,312	1	62	26	C				16,673	16,666	-7	-0.04	0.02
			750	752	590	6,311	6,312	1	62	26	C				16,673	16,654	-19	-0.11	0.01
			752	754	1,231	6,311	6,309	-2	61	26	C				16,673	16,644	-29	-0.18	-0.04
			754	756	1,378	6,311	6,303	-8	60	26	C	60	26	C	16,673	16,629	-45	-0.27	-0.13
			756	758	775	6,311	6,298	-13	59	27	C				16,673	16,617	-56	-0.34	-0.21
		Cedar Ave Exit	758	759	1,026	6,311	6,293	-18	55	27	C				16,673	16,606	-67	-0.40	-0.28
	Cedar Ave Exit		759	760	755	5,111	5,093	-18	53	24	C				13,460	13,397	-63	-0.47	-0.35
			760	761	1,114	5,111	5,089	-22	52	25	C	52	25	C	13,460	13,388	-72	-0.54	-0.43
		SB I-35W Exit	761	762	677	5,111	5,085	-26	51	25	C				13,460	13,379	-81	-0.60	-0.50
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,111	4,099	-12	50	27	C	49.8	27.4	C	10,984	10,917	-67	-0.61	-0.28
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	6,232	6,220	-12	46	33	D	45.7	33	D	16,770	16,683	-87	-0.52	-0.19
	11th St Exit		764	15	780	4,893	4,883	-10	49	33	D				13,137	13,051	-86	-0.65	-0.20
		NB I-35W Flyover	15	765	828	4,893	4,884	-9	50	33	D	49	33	D	13,137	13,045	-92	-0.70	-0.19
	NB I-35W Flyover	4th Ave Entrance	765	766	490	6,914	6,506	-408	46	35	E	48	34	D	18,295	17,494	-801	-4.38	-5.90
	4th Ave Entrance		766	767	714	7,314	6,902	-412	45	35	D				19,321	18,506	-815	-4.22	-5.64
		Lyndale/Hennepin Exit	767	768	1,834	7,314	6,898	-416	45	36	E	45	35	E	19,321	18,484	-837	-4.33	-5.69
	Lyndale/Hennepin Exit		768	769	1,590	6,214	5,810	-404	36	54	F				16,227	15,453	-774	-4.77	-6.50
			769	770	1,188	6,214	5,808	-406	44	44	F	40	46	F	16,227	15,437	-790	-4.87	-6.54
		WB I-394 Exit	770	771	1,432	6,214	5,808	-406	42	39	E				16,227	15,420	-808	-4.98	-6.53
	WB I-394 Exit		771	772	508	2,894	2,643	-251	52	17	B				7,381	6,906	-475	-6.43	-8.66
		TH 55 Exit	772	774	544	2,894	2,643	-251	54	14	B	53	15	B	7,381	6,904	-477	-6.46	-8.66
	TH 55 Exit	**END WB I-94**	774	776	400	2,605	2,380	-225	54	15	B	54	14.7	B	6,533	6,136	-397	-6.08	-8.64
	WB I-94	Cedar Avenue	759	859	254	1,200	1,194	-6	53	23	C				3,213	3,197	-16	-0.51	-0.48
	WB I-94	SB I-35W	762	466	250	1,000	983	-17	52	19	B				2,476	2,456	-20	-0.80	-1.69
	Washington CD Road		860	864	656	2,121	2,120	-1	49	22	C				5,786	5,783	-3	-0.06	-0.06
		WB I-94	864	763	506	2,121	2,120	-1	45	24	C				5,786	5,780	-6	-0.11	-0.04
	WB I-94	11th Street	764	861	492	1,339	1,338	-1	52	26	C				3,633	3,617	-16	-0.43	-0.05
	NB I-35W Flyover		256	6	470	2,021	1,624	-397	29	56	F				5,158	4,461	-697	**-13.52**	**-19.63**
			6	3	251	2,021	1,624	-397	33	50	F				5,158	4,457	-701	**-13.58**	**-19.66**
		WB I-94	3	765	200	2,021	1,624	-397	38	43	F				5,158	4,456	-703	**-13.62**	**-19.66**
	4th Avenue Entrance		5	4	466	400	400	0	9	22	C				1,026	1,024	-2	-0.21	0.00
			4	2	160	400	397	-3	19	12	B				1,026	1,022	-4	-0.35	-0.65
			2	1	164	400	397	-3	34	12	B				1,026	1,022	-4	-0.37	-0.70
		WB I-94	1	766	254	400	397	-3	43	9	A				1,026	1,022	-5	-0.44	-0.70
	WB I-94	Lyndale/Hennepin Avenue	768	863	568	1,100	1,083	-17	49	11	B				3,094	3,004	-90	-2.91	-1.55
	WB I-94		771	871	392	3,320	3,164	-156	33	49	F				8,846	8,502	-345	-3.89	-4.70
		WB I-394	871	872	305	3,320	3,162	-158	25	63	F				8,846	8,499	-347	-3.93	-4.76
	WB I-94	TH 55	774	874	249	289	264	-25	54	5	A				848	767	-81	-9.56	-8.79

Table B6
Build S6A&Flyover_Full Aux 2038 AM Peak Period
Arterial Measures of Effectiveness

Iterations: 8 | Hour 4 | **MOE Hour** **7:00 AM-8:00 AM**

	Intersection	Appr	Link	Demand volumes					Total Delay by Movement (sec/veh)				Level of Service by Movement				LOS by Approach		LOS by Intersection		Through		Left Turn		Right Turn	
									Control Delay												Modeled Storage & Maximum Traffic Queueing (feet)					
				Lt	Th	Rt	D	total	L	T	R	D	L	T	R	D	Delay	LOS	Delay	LOS	Link Length	Queue	Storage	Queue	Storage	Queue
signal		EB	990-918	0	480	151	0	631	-	12	9	-	-	B	A	-	11	B			1115	150				
signal	Lake Street at Stevens Ave	WB	919-918	120	465	0	0	585	11	5	-	-	B	A	-	-	6	A	13.0	B	326	102	225	96		
signal		SB	992-918	271	359	360	0	990	27	26	5	-	C	C	A	-	18	B			586	210	250	158		
signal		EB	918-919	19	732	0	0	751	4	9	-	-	A	A	-	-	8	A			326	182				
signal	Lake Street at 2nd Ave	WB	991-919	0	430	10	0	440	-	22	20	-	-	C	B	-	22	C	13.8	B	982	122				
signal		NB	917-919	155	11	219	0	385	23	19	8	-	C	B	A	-	14	B			618	138				
signal		EB	988-916	0	220	180	0	400	-	27	16	-	-	C	B	-	22	C			1106	172				
signal	31st Street at Stevens Ave	WB	917-916	120	301	0	0	421	13	8	-	-	B	A	-	-	9	A	12.7	B	328	116				
signal		SB	918-916	70	440	120	0	630	11	10	1	-	B	B	A	-	9	A			618	182			80	42
signal		EB	916-917	29	261	0	0	290	23	14	-	-	C	B	-	-	15	B			328	88				
signal	31st Street at 2nd Ave	WB	989-917	0	281	10	0	291	-	18	15	-	-	B	B	-	18	B	12.1	B	972	120				
signal		NB	987-917	140	346	140	0	626	9	8	5	-	A	A	A	-	7	A			281	130				
signal	Stevens to I-35W Split	SB	916-986	721	19	0	0	740	0	0	-	-	A	A	-	-	0	A			178	32				
signal	2nd Ave to I-35W Merge	NB	985-987	0	25	0	0	25	-	0	-	-	-	A	-	-	0	A			334	0				

Table B7
Build S6A&Flyover_Full Aux 2038 PM Peak Period
Freeway Measures of Effectiveness
I-35W Lake Street Transit

Iterations: 10

MOE Hour
4:30 PM-5:30 PM
6

LOS A <10 vplph
LOS B 10<20 vplph
LOS C 20<28 vplph
LOS D 28<35 vplph
LOS E 35<43 vplph
LOS F >43 vplph

	Location		Node			Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
	From	To	From	To	Length (ft)	Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	5,932	5,973	41	50	32	D	50	32	D	16,869	17,035	166	0.98	0.68
	TH 62 Entrance	60th St Entrance	104	106	1,355	8,202	7,895	-307	32	44	F	32	44	F	23,471	23,486	15	0.06	-3.75
	60th St Entrance	Diamond Lake Exit	106	108	910	8,661	8,297	-364	30	46	F	30	46	F	24,842	24,815	-27	-0.11	-4.20
	Diamond Lake Exit		108	110	1,432	8,261	7,853	-408	27	61	F				23,852	23,746	-106	-0.45	-4.94
		Diamond Lake Entrance	110	112	1,225	8,261	7,804	-457	25	65	F	26	63	F	23,852	23,701	-151	-0.63	-5.54
	Diamond Lake Entrance		112	113	1,449	8,791	8,318	-473	26	61	F				25,478	25,337	-141	-0.55	-5.39
			113	114	542	8,791	8,293	-498	27	64	F	26	63	F	25,478	25,308	-170	-0.67	-5.66
		46th St Exit	114	116	1,462	8,791	8,269	-522	25	65	F				25,478	25,276	-202	-0.79	-5.94
	46th St Exit	46th St BRT Exit	116	118	238	8,041	7,567	-474	20	65	F	20	65	F	23,495	23,351	-144	-0.61	-5.89
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,041	7,525	-516	19	81	F	19	81	F	23,495	23,273	-222	-0.95	-6.42
	46th St BRT Entrance	46th St Entrance	120	122	378	8,041	7,500	-541	17	76	F	17	76	F	23,495	23,240	-255	-1.08	-6.72
	46th St Entrance		122	124	1,521	8,722	8,188	-534	19	81	F				25,640	25,339	-301	-1.17	-6.12
			124	126	818	8,722	8,191	-531	21	80	F	20	79	F	25,640	25,294	-346	-1.35	-6.08
		35/36th St Exit	126	128	1,514	8,722	8,197	-525	21	77	F				25,640	25,253	-387	-1.51	-6.01
	35/36th St Exit		128	130	1,485	8,243	7,795	-448	19	80	F				24,375	24,001	-374	-1.53	-5.43
		35/36th St Entrance	130	132	1,474	8,243	7,805	-438	19	81	F	19	80	F	24,375	23,930	-445	-1.83	-5.31
	35/36th St Entrance	31/Lake St Exit	132	134	604	9,204	8,861	-343	21	67	F	21	67	F	27,386	26,903	-483	-1.76	-3.72
	31/Lake St Exit	Lake St BRT Exit	134	135	478	8,524	8,265	-259	21	58	F	21	58	F	25,402	25,008	-395	-1.55	-3.03
	Lake St BRT Exit		135	136	553	8,524	8,162	-362	22	63	F				25,402	24,644	-758	-2.99	-4.25
		28th St Exit	136	138	843	8,524	8,179	-345	24	58	F	23	60	F	25,402	24,625	-777	-3.06	-4.05
	28th St Exit	Lake St BRT Entrance	138	140	1,112	7,914	7,634	-280	24	64	F	24	64	F	23,595	22,862	-733	-3.11	-3.54
	Lake St BRT Entrance		140	142	496	7,914	7,766	-148	25	53	F				23,595	23,196	-399	-1.69	-1.87
			142	144	1,043	7,914	7,778	-136	27	58	F	27	56	F	23,595	23,179	-416	-1.76	-1.71
		NB I-35W/TH 65 SPLIT	144	146	1,405	7,914	7,790	-124	28	55	F				23,595	23,155	-440	-1.87	-1.56
	Begin NB TH 65		146	148	294	4,623	4,597	-26	55	28	D				13,268	13,437	169	1.27	-0.57
			148	150	242	4,623	4,597	-26	54	29	D				13,268	13,438	170	1.28	-0.57
			150	152	180	4,623	4,597	-26	52	29	D	50	29	D	13,268	13,437	169	1.28	-0.56
			152	154	395	4,623	4,597	-26	50	31	D				13,268	13,436	168	1.26	-0.56
		WB I-94 Exit	154	156	434	4,623	4,596	-27	45	28	C				13,268	13,433	165	1.24	-0.58
	WB I-94 Exit	**END NB TH 65**	156	158	1,164	2,843	2,997	154	53	19	B	53	19	B	8,568	9,171	603	7.04	5.41
	NB I-35W/TH 65 Split		146	161	286	3,291	3,199	-92	16	102	F				10,327	9,702	-625	-6.06	-2.78
			162	163	212	3,291	3,206	-85	14	112	F				10,327	9,667	-661	-6.40	-2.59
			163	164	311	3,291	3,206	-85	16	103	F	16	102	F	10,327	9,660	-667	-6.46	-2.59
		5th Ave Entrance	164	165	965	3,291	3,206	-85	16	99	F				10,327	9,648	-679	-6.58	-2.59
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,339	3,953	-386	29	63	F	29	63	F	13,237	11,718	-1,519	**-11.48**	-8.90
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,649	5,191	-458	46	36	E	46	36	E	17,248	15,551	-1,697	-9.84	-8.10
	EB I-94 Exit		167	168	540	4,811	4,377	-434	49	30	D				14,100	12,673	-1,427	**-10.12**	-9.01
		Washington Ave Exit	168	169	448	4,811	4,377	-434	51	29	D	50	29	D	14,100	12,671	-1,429	**-10.13**	-9.02
	Washington Ave Exit		169	170	625	4,010	3,625	-385	54	33	D				11,809	10,583	-1,226	**-10.38**	-9.59
		END NB I-35W	170	171	523	4,010	3,626	-384	57	32	D	55	33	D	11,809	10,581	-1,228	**-10.40**	-9.59
Northbound I-35W/TH 65 Ramps	TH 62	NB I-35W	204	104	266	2,270	1,968	-302	19	63	F				6,602	6,482	-120	-1.81	**-13.30**
	60th St	NB I-35W	206	106	505	459	458	-1	53	9	A				1,371	1,369	-2	-0.12	-0.31
	NB I-35W	Diamond Lake Road	108	208	271	400	396	-4	44	9	A				990	1,032	42	4.28	-1.05
	Diamond Lake Road		211	212	606	530	550	20	38	7	A				1,626	1,679	53	3.25	3.81
		NB I-35W	212	112	577	530	550	20	34	13	B				1,626	1,679	53	3.28	3.85
	NB I-35W	46th Street	116	216	370	750	680	-70	50	14	B				1,983	1,895	-88	-4.43	-9.39
	NB I-35W	46th St BRT	118	218	166	0	8	8	60	0	A				0	25	25	0.00	0.00
	46th St BRT	NB I-35W	220	120	246	0	8	8	33	0	A				0	25	25	0.00	0.00
	46th Street		221	222	818	681	685	4	15	23	C				2,145	2,145	0	-0.02	0.57
		NB I-35W	222	122	686	681	685	4	31	18	B				2,145	2,142	-3	-0.15	0.60
	NB I-35W	35/36th Street	128	228	533	479	413	-66	52	8	A				1,265	1,188	-77	-6.08	**-13.80**
	35/36th Street		231	232	595	961	1,028	67	4	128	F				3,011	3,022	11	0.38	6.93
		NB I-35W	232	132	470	961	1,044	83	27	29	D				3,011	3,022	11	0.37	8.66
	NB I-35W	31/Lake Street	134	234	410	680	605	-75	45	13	B				1,984	1,873	-111	-5.60	**-10.97**
	NB I-35W	Lake St BRT	135	235	115	0	113	113	55	2	A				0	345	345	0.00	0.00
	NB I-35W		138	238	455	610	570	-40	51	11	B				1,807	1,748	-59	-3.24	-6.59
		28th St Exit	238	239	369	610	570	-40	53	11	B				1,807	1,748	-59	-3.24	-6.59
	Lake St BRT	NB I-35W	240	140	219	0	113	113	39	3	A				0	345	345	0.00	0.00
	NB TH 65	WB I-94	156	256	544	1,780	1,598	-182	27	59	F				4,700	4,258	-442	-9.41	**-10.23**
	5th Avenue		261	265	485	1,048	747	-301	2	186	F				2,910	2,087	-823	**-28.27**	**-28.76**
		NB I-35W	265	165	220	1,048	746	-302	21	19	B				2,910	2,083	-827	**-28.43**	**-28.78**
	EB I-94	NB I-35W	266	166	369	1,310	1,239	-71	52	24	C				4,011	3,837	-174	-4.33	-5.45
	NB I-35W (from 5th Ave)	EB I-94	167	267	483	838	813	-25	53	15	B				3,148	2,876	-272	-8.63	-3.01
	NB I-35W	Washington Ave	169	262	847	801	751	-50	54	7	A				2,291	2,086	-205	-8.94	-6.19
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,778	2,782	4	51	28	D	50.6	28.1	D	8,748	8,745	-3	-0.03	0.15
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	3,658	3,668	10	40	42	E	39.8	41.5	E	11,488	11,504	16	0.14	0.28
	WB I-94 Entrance		366	367	1,871	5,049	5,120	71	46	37	E				15,249	15,324	75	0.49	1.41
			367	368	750	5,049	5,129	80	34	50	F				15,249	15,325	76	0.50	1.58
			368	369	334	5,049	5,131	82	39	44	F	44	40	E	15,249	15,324	75	0.49	1.62
			369	370	179	5,049	5,131	82	47	36	E				15,249	15,324	75	0.49	1.63
		SB TH 65 Entrance	374	376	464	5,049	5,133	84	55	31	D				15,249	15,324	75	0.49	1.67
	Begin SB TH 65	12th St Entrance	300	302	867	2,200	2,204	4	55	20	C	55.2	20.4	C	5,473	5,477	4	0.07	0.16
	12th St Entrance	EB I-94 Entrance	302	304	1,296	2,960	3,077	117	46	31	D	46.3	30.8	D	7,473	7,834	361	4.83	3.94
	EB I-94 Entrance		304	307	1,366	4,841	4,887	46	58	28	D				13,182	13,323	141	1.07	0.94
			307	308	271	4,841	4,886	45	60	27	C	58	28	D	13,182	13,320	138	1.05	0.94
		SB I-35W Entrance	308	310	278	4,841	4,888	47	59	28	C				13,182	13,320	138	1.05	0.96
	SB I-35W Entrance		310	314	1,660	9,890	10,021	131	54	31	D				28,431	28,641	210	0.74	1.33
		Lake St Exit	314	318	765	9,890	10,019	129	56	30	D	55	31	D	28,431	28,637	206	0.72	1.31
	Lake St Exit	Lake St BRT Exit	318	320	586	8,929	9,029	100	60	26	C	60	26	C	25,677	25,817	140	0.54	1.12
	Lake St BRT Exit		320	322	545	8,929	8,903	-26	60	30	D				25,677	25,428	-249	-0.97	-0.30
			322	324	721	8,929	8,903	-26	61	29	D	60	30	D	25,677	25,426	-251	-0.98	-0.30
		31/Lake St Entrance	324	326	1,326	8,929	8,903	-26	60	30	D				25,677	25,425	-252	-0.98	-0.29
	31/Lake St Entrance	Lake St BRT Entrance	326	327	134	10,119	10,000	-119	52	32	D	52.3	31.9	D	29,173	28,693	-480	-1.64	-1.17
	Lake St BRT Entrance	35/36th St Exit	327	328	384	10,119	10,131	12	52	28	D	52.3	28	D	29,173	29,081	-92	-0.32	0.12
	35/36th St Exit		328	330	1,384	9,189	9,213	24	60	31	D				26,364	26,353	-11	-0.04	0.26
		35/36th St Entrance	330	332	1,712	9,189	9,220	31	60	31	D	60	31	D	26,364	26,352	-12	-0.05	0.33
	35/36th St Entrance		332	334	1,460	9,490	9,522	32	53	34	D				27,292	27,277	-15	-0.05	0.34
			334	336	544	9,490	9,519	29	55	35	D	56	33	D	27,292	27,277	-15	-0.06	0.31
		46th St Exit	336	338	1,512	9,490	9,518	28	59	31	D				27,292	27,276	-16	-0.06	0.29
	46th St Exit	46th St BRT Exit	338	340	780	8,441	8,501	60	64	24	C	63.7	24.2	C	24,329	24,424	95	0.39	0.71
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	8,441	8,483	42	64	27	C	63.6	26.7	C	24,329	24,363	34	0.14	0.50
	46th St BRT Entrance	46th St Entrance	342	344	393	8,441	8,506	65	61	24	C	60.5	24.4	C	24,329	24,422	93	0.38	0.77
	46th St Entrance		344	346	1,397	9,001	9,069	68	54	32	D				26,019	26,114	95	0.37	0.76
		60th St Exit	346	348	1,495	9,001	9,075	74	49	36	E	51	34	D	26,019	26,121	102	0.39	0.82
	60th St Exit	TH 62 Exit	348	350	2,036	8,340	8,417	77	54	31	D	53.9	31.3	D	24,241	24,321	80	0.33	0.92
	TH 62 Exit		350	352	1,409	3,689	3,759	70	63	20	B				10,636	10,851	215	2.02	1.90
			352	354	1,616	3,689	3,759	70	65	19	B	64	19	B	10,636	10,849	213	2.00	1.89
		END SB I-35W	354	356	719	3,689	3,759	70	66	19	B				10,636	10,847	211	1.99	1.91
Southbound I-35W/TH 65 Ramps	Washington CD RD	SB I-35W	461	365	302	880	885	5	43	22	C				2,740	2,759	19	0.68	0.57
	WB I-94	SB I-35W	466	366	269	1,391	1,445	54	49	30	D				3,761	3,818	57	1.52	3.85
	12th Street	SB TH 65	402	302	283	760	879	119	40	23	C				2,000	2,356	356	**17.82**	**15.66**
	EB I-94	SB TH 65	664	304	815	1,881	1,815	-66	46	40	E				5,709	5,493	-216	-3.78	-3.49
	SB I-35W	SB TH 65	376	310	291	5,049	5,134	85	56	31	D				15,249	15,325	76	0.50	1.68
	SB I-35W	Lake St	318	418	271	961	988	27	43	23	C				2,754	2,819	65	2.36	2.79
	SB I-35W	Lake St BRT	320	420	118	0	126	126	55	2	A				0	388	388	0.00	0.00
	31/Lake Street		425	426	114	1,190	1,097	-93	27	20	C				3,496	3,269	-227	-6.49	-7.83
		SB I-35W	426	326	441	1,190	1,097	-93	32	26	C				3,496	3,269	-227	-6.50	-7.81
	Lake St BRT	SB I-35W	427	327	271	0	128	128	40	3	A				0	388	388	0.00	0.00
	SB I-35W	35/36th Street	328	428	395	930	925	-5	39	24	C				2,809	2,730	-79	-2.82	-0.56
	35/36th Street		431	432	669	301	304	3	27	6	A				928	928	0	-0.02	1.03
		SB I-35W	432	332	585	301	304	3	34	7	A				928	928	0	0.03	0.86
	SB I-35W	46th Street	338	438	703	1,049	1,015	-34	53	19	B				2,963	2,850	-113	-3.81	-3.24
	SB I-35W	46th St BRT	340	440	116	0	19	19	59	0	A				0	61	61	0.00	0.00
	46th St BRT	SB I-35W	442	342	216	0	21	21	39	1	A				0	60	60	0.00	0.00
	46th St BRT		443	444	1,118	560	563	3	41	7	A				1,690	1,689	-2	-0.09	0.50
		SB I-35W	444	344	378	560	563	3	34	12	B				1,690	1,689	-1	-0.04	0.46
	SB I-35W	60th Street	348	448	541	661	667	6	54	12	B				1,778	1,801	23	1.30	0.85
	SB I-35W		350	450	465	4,651	4,661	10	52	30	D				13,605	13,467	-138	-1.02	0.22
		TH 62	450	451	390	4,651	4,661	10	53	30	D				13,605	13,466	-139	-1.02	0.22
Eastbound I-94	**Begin EB I-94**		554	556	984	4,100	4,080	-20	25	82	F				12,006	12,002	-4	-0.04	-0.49
			556	557	632	4,100	4,080	-20	25	81	F	26	78	F	12,006	12,001	-5	-0.04	-0.50
		EB I-394 Entrance	557	558	789	4,100	4,080	-21	29	71	F				12,006	12,001	-5	-0.04	-0.50
	EB I-394 Entrance		558	559	442	6,320	5,944	-376	28	71	F				18,609	17,752	-857	-4.61	-5.95
			559	560	1,192	6,320	5,944	-376	35	56	F	34	58	F	18,609	17,750	-859	-4.61	-5.94
		Lyndale/Hennepin Entrance	560	561	1,856	6,320	5,944	-376	35	57	F				18,609	17,747	-862	-4.63	-5.95
	Lyndale/Hennepin Entrance		561	562	1,485	8,061	7,678	-383	42	45	F				23,669	22,801	-868	-3.67	-4.75
			562	563	706	8,061	7,676	-385	50	39	E	46	42	E	23,669	22,802	-867	-3.66	-4.78
		SB I-35W Exit	563	564	474	8,061	7,675	-386	50	38	E				23,669	22,803	-866	-3.66	-4.79
	SB I-35W Exit		564	565	792	6,180	5,861	-319	50	39	E				17,960	17,310	-650	-3.62	-5.17
			565	566	865	6,180	5,861	-319	51	39	E	51	37	E	17,960	17,312	-648	-3.61	-5.17
		NB I-35W Exit	566	567	388	6,180	5,860	-320	51	30	D				17,960	17,313	-647	-3.60	-5.18
	NB I-35W Exit	NB I-35W Entrance	567	568	688	4,870	4,619	-251	51	30	D	51.2	30.1	D	13,949	13,476	-473	-3.39	-5.16
	NB I-35W Entrance	TH 55 Exit	568	569	1,557	5,500	5,244	-256	55	24	C	54.6	24	C	15,773	15,299	-474	-3.01	-4.65
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,200	3,971	-229	60	22	C	59.5	22.3	C	12,116	11,741	-375	-3.10	-5.45
	NB I-35W Entrance		570	572	1,016	5,038	4,783	-255	61	20	B				15,264	14,618	-646	-4.23	-5.07
		Cedar Ave Entrance	572	573	1,027	5,038	4,781	-257	61	20	B	61	20	C	15,264	14,620	-644	-4.22	-5.10
	Cedar Ave Entrance		573	574	562	6,437	6,179	-258	47	27	C				19,182	18,541	-641	-3.34	-4.00
			574	576	930	6,437	6,180	-257	55	28	D				19,182	18,543	-639	-3.33	-4.00
			576	578	1,378	6,437	6,180	-257	61	25	C				19,182	18,543	-639	-3.33	-4.00
			578	580	1,268	6,437	6,179	-258	61	25	C	59	26	C	19,182	18,543	-639	-3.33	-4.00
			580	582	875	6,437	6,179	-258	61	25	C				19,182	18,543	-639	-3.33	-4.00
		END EB I-94	582	584	1,173	6,437	6,181	-256	61	25	C				19,182	18,542	-640	-3.34	-3.98
	EB I-394	EB I-94	658	558	266	2,220	1,864	-356	20	99	F				6,603	5,751	-852	**-12.91**	**-16.03**
	Lyndale/Hennepin Avenue		660	659	1,194	1,741	1,740	-1	34	26	C				5,060	5,058	-2	-0.04	-0.08
		EB I-94	659	561	302	1,741	1,738	-3	25	43	E				5,060	5,057	-3	-0.06	-0.20
	EB I-94	SB I-35W	564	664	604	1,881	1,815	-66	47	39	E				5,709	5,494	-215	-3.76	-3.53
	EB I-94	NB I-35W	567	266	389	1,310	1,238	-72	52	24	C				4,011	3,837	-174	-4.34	-5.47
	from 5th Ave	EB I-94	668	568	522	630	628	-2	49	13	B				1,824	1,823	-1	-0.08	-0.27
	NB I-35W	EB I-94	267	570	442	838	813	-25	53	15	B				3,148	2,876	-272	-8.65	-2.95
	EB I-94	TH 55	569	662	500	1,300	1,272	-29	48	27	C				3,657	3,559	-98	-2.67	-2.19
	Cedar Avenue	EB I-94	673	573	427	1,399	1,399	0	52	28	C				3,918	3,918	0	-0.01	0.00
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,432	5,431	-1	62	22	C				16,834	16,844	10	0.06	-0.02
			750	752	590	5,432	5,433	1	62	22	C				16,834	16,847	13	0.07	0.01
			752	754	1,231	5,432	5,435	3	62	22	C				16,834	16,848	14	0.08	0.05
			754	756	1,378	5,432	5,440	8	61	23	C	60	23	C	16,834	16,850	16	0.09	0.15
			756	758	775	5,432	5,447	15	58	24	C				16,834	16,852	18	0.11	0.27
		Cedar Ave Exit	758	759	1,026	5,432	5,468	36	51	26	C				16,834	16,853	19	0.11	0.65
	Cedar Ave Exit		759	760	755	5,021	5,088	67	43	31	D				15,553	15,590	37	0.24	1.34
			760	761	1,114	5,021	5,122	101	38	36	E	38	36	E	15,553	15,593	40	0.26	2.02
		SB I-35W Exit	761	762	677	5,021	5,160	139	33	43	E				15,553	15,596	43	0.28	2.76
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,630	3,744	114	27	55	F	26.8	54.8	F	11,792	11,783	-9	-0.07	3.14
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,540	5,577	37	30	48	F	29.9	47.9	F	17,905	17,173	-732	-4.09	0.66
	11th St Exit		764	15	780	4,899	4,948	49	31	54	F				15,790	15,137	-653	-4.14	1.01
		NB I-35W Flyover	15	765	828	4,899	4,962	63	31	55	F	31	55	F	15,790	15,141	-649	-4.11	1.29
	NB I-35W Flyover	4th Ave Entrance	765	766	490	6,679	6,567	-112	31	54	F	31	55	F	20,490	19,391	-1,099	-5.36	-1.68
	4th Ave Entrance		766	767	714	7,680	7,577	-103	32	55	F				23,327	22,222	-1,105	-4.74	-1.34
		Lyndale/Hennepin Exit	767	768	1,834	7,680	7,592	-88	37	48	F	36	50	F	23,327	22,219	-1,108	-4.75	-1.15
	Lyndale/Hennepin Exit		768	769	1,590	6,259	6,237	-22	34	61	F				19,285	18,399	-886	-4.59	-0.35
			769	770	1,188	6,259	6,242	-17	40	53	F	38	53	F	19,285	18,397	-888	-4.60	-0.28
		WB I-394 Exit	770	771	1,432	6,259	6,245	-14	40	44	F				19,285	18,394	-891	-4.62	-0.23
	WB I-394 Exit		771	772	508	3,319	3,266	-53	52	21	C				10,593	10,053	-540	-5.10	-1.60
		TH 55 Exit	772	774	544	3,319	3,266	-53	54	17	B	53	19	B	10,593	10,052	-541	-5.11	-1.60
	TH 55 Exit	**END WB I-94**	774	776	400	2,898	2,863	-35	54	18	B	53.8	17.7	B	9,316	8,829	-487	-5.23	-1.20
	WB I-94	Cedar Avenue	759	859	254	411	409	-2	54	8	A				1,281	1,264	-17	-1.30	-0.49
	WB I-94	SB I-35W	762	466	250	1,391	1,443	52	49	30	D				3,761	3,818	57	1.50	3.77
	Washington CD Road		860	864	656	1,910	1,794	-117	6	150	F				6,113	5,381	-732	**-11.98**	-6.10
		WB I-94	864	763	506	1,910	1,793	-117	31	29	D				6,113	5,380	-733	**-11.99**	-6.10
	WB I-94	11th Street	764	861	492	641	662	21	53	13	B				2,115	2,045	-70	-3.30	3.24
	NB I-35W Flyover		256	6	470	1,780	1,596	-184	28	58	F				4,700	4,254	-446	-9.50	**-10.32**
			6	3	251	1,780	1,595	-185	32	49	F				4,700	4,251	-449	-9.56	**-10.39**
		WB I-94	3	765	200	1,780	1,594	-186	38	43	E				4,700	4,250	-451	-9.59	**-10.46**
	4th Avenue Entrance		5	4	466	1,001	1,001	0	12	44	F				2,837	2,834	-3	-0.09	-0.04
			4	2	160	1,001	1,001	0	20	29	D				2,837	2,834	-3	-0.10	0.04
			2	1	164	1,001	1,001	0	33	30	D				2,837	2,834	-3	-0.11	0.00
		WB I-94	1	766	254	1,001	1,001	0	40	25	C				2,837	2,833	-4	-0.13	0.02
	WB I-94	Lyndale/Hennepin Avenue	768	863	568	1,421	1,365	-56	49	14	B				4,042	3,816	-226	-5.60	-3.93
	WB I-94		771	871	392	2,940	2,980	40	33	45	F				8,692	8,339	-353	-4.06	1.36
		WB I-394	871	872	305	2,940	2,980	40	26	59	F				8,692	8,338	-354	-4.07	1.36
	WB I-94	TH 55	774	874	249	421	403	-18	54	8	A				1,277	1,222	-55	-4.29	-4.18

Table B8
Build S6A&Flyover_Full Aux 2038 PM Peak Period
Arterial Measures of Effectiveness

Iterations: 10

Hour 6 — **MOE Hour** **4:30 PM-5:30 PM**

	Intersection	Appr	Link	Demand volumes					Total Delay by Movement (sec/veh)				Level of Service by Movement				LOS by Approach		LOS by Intersection		Through		Left Turn		Right Turn	
				Lt	Th	Rt	D	total	L	T	R	D	L	T	R	D	Delay	LOS	Delay	LOS	Link Length	Queue	Storage	Queue	Storage	Queue
signal		EB	990-918	0	580	140	0	720	-	17	16	-	-	B	B	-	17	B			1115	182				
signal	Lake Street at Stevens Ave	WB	919-918	300	920	0	0	1220	19	9	-	-	B	A	-	-	12	B	17.5	B	326	158	225	204		
signal		SB	992-918	339	571	440	0	1350	30	29	9	-	C	C	A	-	23	C			586	286	250	208		
signal		EB	918-919	9	910	0	0	919	16	8	-	-	B	A	-	-	8	A			326	234				
signal	Lake Street at 2nd Ave	WB	991-919	0	1080	10	0	1090	-	24	24	-	-	C	C	-	24	C	16.2	B	982	240				
signal		NB	917-919	140	10	170	0	320	26	22	6	-	C	C	A	-	15	B			618	176				
signal		EB	988-916	0	341	170	0	511	-	13	13	-	-	B	B	-	13	B			1106	166				
signal	31st Street at Stevens Ave	WB	917-916	319	651	0	0	970	21	15	-	-	C	B	-	-	17	B	22.9	C	328	262				
signal		SB	918-916	101	740	170	0	1011	42	36	14	-	D	D	B	-	33	C			618	442			80	80
signal		EB	916-917	20	422	0	0	442	25	15	-	-	C	B	-	-	16	B			328	158				
signal	31st Street at 2nd Ave	WB	989-917	0	671	11	0	682	-	11	6	-	-	B	A	-	11	B	14.5	B	972	194				
signal		NB	987-917	299	289	141	0	729	21	17	11	-	C	B	B	-	18	B			281	220				
signal	Stevens to I-35W Split	SB	916-986	1190	39	0	0	1229	0	0	-	-	A	A	-	-	0	A			178	114				
signal	2nd Ave to I-35W Merge	NB	985-987	0	49	0	0	49	-	0	-	-	-	A	-	-	0	A			334	0				

Appendix C

2018 Operational MOE's

Table C1
2018 NoBuild AM peak
Freeway Measures of Effectiveness
I-35W Lake Street Transit

Iterations:
9

MOE Hour
7:00 AM-8:00 AM
4

LOS	
LOS A	<10 vplph
LOS B	10<20 vplph
LOS C	20<28 vplph
LOS D	28<35 vplph
LOS E	35<43 vplph
LOS F	>43 vplph

	Location		Node			Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
	From	To	From	To	Length (ft)	Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,850	4,893	43	62	20	C	62.2	20.2	C	12,604	12,724	120	0.96	0.88
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,670	6,732	62	64	18	B	64	17.5	B	18,007	18,149	142	0.79	0.93
	60th St Entrance	Diamond Lake Exit	106	108	910	6,970	7,032	62	65	17	B	64.6	16.9	B	18,689	18,810	121	0.64	0.89
	Diamond Lake Exit		108	110	1,432	6,670	6,741	71	66	21	C				17,892	17,947	55	0.31	1.06
		Diamond Lake Entrance	110	112	1,225	6,670	6,738	68	63	21	C	65	21	C	17,892	17,887	-5	-0.03	1.01
	Diamond Lake Entrance		112	113	1,449	7,481	7,552	71	55	26	C				19,831	19,782	-49	-0.25	0.95
			113	114	542	7,481	7,546	65	59	26	C	55	27	C	19,831	19,722	-109	-0.55	0.86
		46th St Exit	114	116	1,462	7,481	7,530	49	53	28	C				19,831	19,657	-174	-0.88	0.65
	46th St Exit	46th St BRT Exit	116	118	238	7,281	7,320	39	45	29	D	45.1	28.5	D	19,233	19,067	-166	-0.86	0.53
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	7,281	7,245	-36	36	42	E	35.6	41.6	E	19,233	18,940	-294	-1.53	-0.50
	46th St BRT Entrance	46th St Entrance	120	122	378	7,281	7,183	-98	28	45	F	27.6	45.3	F	19,233	18,871	-362	-1.88	-1.35
	46th St Entrance		122	124	1,521	8,392	8,206	-186	29	53	F				21,876	21,446	-430	-1.97	-2.21
			124	126	818	8,392	8,133	-259	31	54	F	30	53	F	21,876	21,367	-509	-2.33	-3.08
		35/36th St Exit	126	128	1,514	8,392	8,068	-324	30	52	F				21,876	21,299	-577	-2.64	-3.86
	35/36th St Exit		128	130	1,485	8,192	7,820	-372	30	53	F				21,295	20,693	-602	-2.83	-4.55
		35/36th St Entrance	130	132	1,474	8,192	7,760	-432	32	49	F	31	51	F	21,295	20,620	-675	-3.17	-5.27
	35/36th St Entrance	31/Lake St Exit	132	134	604	9,402	8,840	-562	35	43	E	34.6	42.6	E	24,322	23,568	-754	-3.10	-5.98
	31/Lake St Exit	Lake St BRT Exit	134	136	1,029	8,512	7,973	-539	42	35	E	41.5	35	E	21,805	21,119	-686	-3.15	-6.33
	Lake St BRT Exit	Lake St BRT Entrance	136	138	721	8,512	7,950	-562	45	35	E	45.2	35.2	E	21,805	21,080	-725	-3.32	-6.60
	Lake St BRT Entrance		138	140	1,190	8,512	7,937	-575	49	30	D				21,805	21,065	-740	-3.39	-6.75
			140	142	569	8,512	7,926	-586	51	31	D				21,805	21,044	-761	-3.49	-6.88
			142	144	1,061	8,512	7,920	-592	55	29	D	53	29	D	21,805	21,027	-778	-3.57	-6.96
		NB I-35W/TH 65 SPLIT	144	146	859	8,512	7,911	-601	57	28	C				21,805	21,010	-795	-3.65	-7.06
	Begin NB TH 65		146	148	498	4,952	4,644	-308	57	27	C				12,451	12,212	-239	-1.92	-6.22
			148	150	281	4,952	4,642	-310	56	28	C				12,451	12,207	-244	-1.96	-6.26
			150	152	284	4,952	4,641	-311	53	29	D	52	28	D	12,451	12,203	-248	-1.99	-6.28
			152	154	582	4,952	4,639	-313	51	30	D				12,451	12,197	-254	-2.04	-6.31
		WB I-94 Exit	154	156	644	4,952	4,636	-316	46	27	C				12,451	12,188	-263	-2.11	-6.38
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,072	3,032	-40	53	19	B	53	19.1	B	7,652	7,839	187	2.45	-1.30
	NB I-35W/TH 65 Split		146	161	665	3,560	3,263	-297	51	32	D				9,354	8,785	-569	-6.08	-8.35
			163	164	927	3,560	3,262	-299	43	38	E	40	44	F	9,354	8,777	-577	-6.17	-8.38
		5th Ave Entrance	164	165	965	3,560	3,262	-298	28	58	F				9,354	8,765	-589	-6.30	-8.38
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,959	3,658	-301	35	48	F	34.8	48.1	F	10,281	9,675	-606	-5.90	-7.60
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,078	4,744	-334	49	30	D	48.8	30.4	D	13,194	12,495	-699	-5.30	-6.59
	EB I-94 Exit		167	168	540	3,828	3,591	-237	51	23	C				10,275	9,736	-539	-5.25	-6.20
		Washington Ave Exit	168	169	448	3,828	3,589	-239	52	23	C	52	23	C	10,275	9,731	-544	-5.29	-6.25
	Washington Ave Exit		169	170	625	3,118	2,905	-213	55	26	C				8,192	7,708	-484	-5.90	-6.84
		END NB I-35W	170	171	523	3,118	2,903	-215	57	25	C	56	26	C	8,192	7,705	-487	-5.95	-6.90
Northbound I-35W/TH 65 Ramps	TH 62	NB I-35W	204	104	266	1,820	1,840	20	53	19	B				5,403	5,438	35	0.64	1.08
	60th St	NB I-35W	206	106	505	300	301	1	55	6	A				682	682	0	-0.01	0.20
	NB I-35W	Diamond Lake Road	108	208	271	300	291	-9	54	5	A				797	824	27	3.40	-3.03
	Diamond Lake Road		211	212	606	811	824	13	14	31	D				1,939	1,976	37	1.90	1.58
		NB I-35W	212	112	577	811	822	11	30	22	C				1,939	1,971	32	1.65	1.39
	NB I-35W	46th Street	116	216	370	200	191	-10	52	4	A				598	532	-66	**-11.05**	-4.75
	NB I-35W	46th St BRT	118	218	166	0	11	11	60	0	A				0	32	32	0.00	0.00
	46th St BRT	NB I-35W	220	120	246	0	11	11	38	0	A				0	33	33	0.00	0.00
	46th Street		221	222	818	1,111	1,101	-10	8	70	F				2,643	2,649	6	0.24	-0.92
		NB I-35W	222	122	686	1,111	1,088	-23	27	33	D				2,643	2,646	3	0.10	-2.11
	NB I-35W	35/36th Street	128	228	533	200	171	-29	53	3	A				581	522	-59	**-10.09**	**-14.55**
	35/36th Street		231	232	595	1,210	1,126	-84	6	105	F				3,027	3,008	-20	-0.64	-6.93
		NB I-35W	232	132	470	1,210	1,111	-99	28	31	D				3,027	2,995	-33	-1.07	-8.15
	NB I-35W	31/Lake Street	134	234	410	890	844	-46	49	17	B				2,517	2,420	-97	-3.85	-5.12
	NB I-35W	Lake St BRT	136	236	132	0	3	3	47	0	A				0	10	10	0.00	0.00
	Lake St BRT	NB I-35W	238	138	108	0	3	3	0	0	A				0	10	10	0.00	0.00
	NB TH 65	WB I-94	156	256	388	1,880	1,599	-281	30	53	F				4,799	4,341	-458	-9.55	**-14.93**
	5th Avenue		261	265	485	399	400	1	44	5	A				927	928	1	0.12	0.15
		NB I-35W	265	165	220	399	399	0	34	6	A				927	928	1	0.06	0.03
	EB I-94	NB I-35W	266	166	369	1,119	1,089	-30	52	21	C				2,913	2,836	-77	-2.65	-2.69
	NB I-35W	EB I-94	167	267	483	1,250	1,151	-99	52	22	C				2,919	2,750	-169	-5.79	-7.90
	NB I-35W	Washington Ave	169	262	847	710	682	-28	54	6	A				2,083	2,020	-63	-3.03	-4.00
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,489	2,488	-1	57	23	C	56.5	22.5	C	6,579	6,574	-5	-0.08	-0.02
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,789	2,792	3	51	25	C	51.2	24.5	C	7,370	7,374	4	0.06	0.12
	WB I-94 Entrance		366	367	1,871	3,430	3,429	-1	48	32	D				8,956	8,948	-8	-0.09	-0.02
			367	368	827	3,430	3,425	-6	33	51	F				8,956	8,936	-20	-0.22	-0.16
			368	369	483	3,430	3,422	-8	41	42	E	45	37	E	8,956	8,931	-25	-0.28	-0.24
			369	370	403	3,430	3,420	-10	51	34	D				8,956	8,928	-28	-0.31	-0.30
		SB TH 65 Entrance	374	376	627	3,430	3,415	-15	55	31	D				8,956	8,923	-33	-0.37	-0.44
	Begin SB TH 65	12th St Entrance	300	302	867	500	501	1	63	4	A	63.2	4	A	1,335	1,338	3	0.25	0.24
	12th St Entrance	EB I-94 Entrance	302	304	1,088	700	776	76	56	6	A	55.6	6.4	A	1,826	2,058	232	**12.68**	**10.87**
	EB I-94 Entrance		304	307	1,574	2,410	2,460	50	59	14	B				6,686	6,844	158	2.36	2.07
		SB I-35W Entrance	307	310	1,516	2,410	2,460	50	61	15	B	60	14	B	6,686	6,837	151	2.26	2.08
	SB I-35W Entrance		310	314	698	5,840	5,871	31	60	25	C				15,642	15,750	108	0.69	0.54
			314	318	379	5,840	5,870	30	62	24	C				15,642	15,745	103	0.66	0.51
			318	320	900	5,840	5,868	28	64	23	C	62	23	C	15,642	15,742	100	0.64	0.47
		Lake St BRT Exit	320	322	616	5,840	5,866	26	64	19	B				15,642	15,738	96	0.61	0.44
	Lake St BRT Exit	Lake St BRT Entrance	322	324	719	5,840	5,843	3	64	23	C	63.5	23	C	15,642	15,666	24	0.16	0.06
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	5,840	5,864	24	63	22	C	63.2	21.6	C	15,642	15,726	84	0.54	0.40
	31/Lake St Entrance	35/36th St Exit	326	328	518	6,549	6,564	15	59	22	C	58.8	22.3	C	17,462	17,543	81	0.46	0.24
	35/36th St Exit		328	330	1,384	5,860	5,885	25	64	23	C				15,446	15,553	107	0.69	0.42
		35/36th St Entrance	330	332	1,712	5,860	5,880	20	65	23	C	65	23	C	15,446	15,544	98	0.64	0.35
	35/36th St Entrance		332	334	1,460	6,460	6,475	15	59	26	C				16,914	16,999	85	0.50	0.24
			334	336	544	6,460	6,472	12	64	26	C	62	24	C	16,914	16,990	76	0.45	0.19
		46th St Exit	336	338	1,512	6,460	6,471	11	65	21	C				16,914	16,983	69	0.41	0.17
	46th St Exit	46th St BRT Exit	338	340	780	6,060	6,083	23	65	17	B	65	17	B	15,829	15,901	72	0.45	0.37
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,060	6,073	13	66	18	B	66.2	18.4	B	15,829	15,877	48	0.31	0.22
	46th St BRT Entrance	46th St Entrance	342	344	393	6,060	6,074	14	65	16	B	65.1	16.2	B	15,829	15,883	54	0.34	0.23
	46th St Entrance		344	346	1,397	6,559	6,565	6	62	20	C				17,015	17,058	43	0.25	0.09
		60th St Exit	346	348	1,495	6,559	6,559	0	61	21	C	61	20	C	17,015	17,045	30	0.18	0.00
	60th St Exit	TH 62 Exit	348	350	2,036	6,259	6,236	-23	60	21	C	59.9	20.8	C	16,273	16,257	-16	-0.10	-0.36
	TH 62 Exit		350	352	1,409	2,980	2,969	-11	65	15	B				7,599	7,626	27	0.36	-0.36
			352	354	1,616	2,980	2,966	-15	66	15	B	66	15	B	7,599	7,621	22	0.29	-0.49
		END SB I-35W	354	356	719	2,980	2,963	-17	66	15	B				7,599	7,616	17	0.23	-0.57
Southbound I-35W/TH 65 Ramps	Washington CD RD	SB I-35W	461	365	302	300	305	5	47	7	A				791	805	14	1.82	1.67
	WB I-94	SB I-35W	466	366	269	641	640	-1	52	12	B				1,586	1,583	-3	-0.20	-0.14
	12th Street	SB TH 65	402	302	283	200	276	76	47	6	A				491	721	230	**46.84**	**38.15**
	EB I-94	SB TH 65	664	304	635	1,710	1,684	-26	46	37	E				4,860	4,791	-69	-1.41	-1.51
	SB I-35W	SB TH 65	376	310	857	3,430	3,413	-17	56	31	D				8,956	8,921	-35	-0.39	-0.48
	SB I-35W	Lake St BRT	322	422	121	0	22	22	49	0	A				0	67	67	0.00	0.00
	Lake St BRT	SB I-35W	424	324	102	0	22	22	29	1	A				0	67	67	0.00	0.00
	31/Lake Street		425	426	114	709	704	-5	22	16	B				1,820	1,826	6	0.35	-0.66
		SB I-35W	426	326	441	709	704	-5	27	19	B				1,820	1,825	5	0.29	-0.76
	SB I-35W	35/36th Street	328	428	395	689	675	-14	41	17	B				2,016	1,981	-35	-1.73	-1.97
	35/36th Street		431	432	669	600	601	1	28	11	B				1,468	1,466	-2	-0.13	0.15
		SB I-35W	432	332	585	600	601	1	34	14	B				1,468	1,465	-3	-0.18	0.12
	SB I-35W	46th Street	338	438	703	400	384	-16	54	7	A				1,085	1,075	-10	-0.90	-3.97
	SB I-35W	46th St BRT	340	440	116	0	5	5	60	0	A				0	14	14	0.00	0.00
	46th St BRT	SB I-35W	442	342	216	0	4	4	32	0	A				0	14	14	0.00	0.00
	46th St BRT		443	444	1,118	499	499	0	42	6	A				1,186	1,184	-2	-0.19	-0.08
		SB I-35W	444	344	378	499	497	-2	34	10	B				1,186	1,183	-3	-0.24	-0.38
	SB I-35W	60th Street	348	448	541	300	320	20	54	6	A				742	777	35	4.72	6.60
	SB I-35W		350	450	465	3,279	3,262	-17	53	20	C				8,674	8,625	-49	-0.57	-0.51
		TH 62	450	451	390	3,279	3,262	-17	54	20	C				8,674	8,623	-51	-0.58	-0.53
Eastbound I-94	**Begin EB I-94**		554	556	984	3,770	3,771	1	51	38	E				10,894	10,890	-4	-0.04	0.03
			556	557	632	3,770	3,775	5	50	38	E	49	39	E	10,894	10,887	-7	-0.07	0.14
		EB I-394 Entrance	557	558	789	3,770	3,778	8	47	40	E				10,894	10,884	-10	-0.09	0.22
	EB I-394 Entrance		558	559	442	5,950	5,805	-145	36	54	F				17,216	16,837	-379	-2.20	-2.43
			559	560	1,192	5,950	5,806	-145	38	51	F	36	55	F	17,216	16,830	-386	-2.24	-2.43
		Lyndale/Hennepin Entrance	560	561	1,856	5,950	5,797	-153	34	57	F				17,216	16,819	-397	-2.31	-2.57
	Lyndale/Hennepin Entrance		561	562	1,485	7,931	7,734	-197	40	48	F				21,918	21,487	-431	-1.97	-2.48
			562	563	706	7,931	7,723	-208	49	39	E	44	44	F	21,918	21,474	-444	-2.03	-2.62
		SB I-35W Exit	563	564	474	7,931	7,719	-212	50	39	E				21,918	21,466	-452	-2.06	-2.67
	SB I-35W Exit		564	565	792	6,221	6,033	-188	50	40	E				17,058	16,666	-392	-2.30	-3.02
			565	566	865	6,221	6,029	-192	51	40	E	51	38	E	17,058	16,658	-400	-2.35	-3.08
		NB I-35W Exit	566	567	388	6,221	6,027	-194	51	31	D				17,058	16,653	-405	-2.37	-3.11
	NB I-35W Exit	5th Ave Entrance	567	568	688	5,102	4,936	-166	51	32	D	51.1	32.2	D	14,145	13,813	-332	-2.35	-3.25
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,502	5,328	-174	55	24	C	54.9	24.3	C	15,165	14,821	-344	-2.27	-3.16
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,592	4,459	-133	59	25	C	59	25.2	C	12,421	12,165	-256	-2.06	-2.89
	NB I-35W Entrance		570	572	1,016	5,842	5,609	-233	61	23	C				15,340	14,910	-430	-2.80	-3.99
		Cedar Ave Entrance	572	573	1,027	5,842	5,607	-235	61	23	C	61	23	C	15,340	14,900	-440	-2.87	-4.02
	Cedar Ave Entrance		573	574	562	6,342	6,104	-238	58	22	C				16,625	16,176	-450	-2.70	-3.76
			574	576	930	6,342	6,099	-243	60	26	C				16,625	16,171	-454	-2.73	-3.83
			576	578	1,378	6,342	6,093	-249	61	25	C				16,625	16,163	-462	-2.78	-3.93
			578	580	1,268	6,342	6,085	-257	61	25	C	60	25	C	16,625	16,153	-472	-2.84	-4.05
			580	582	875	6,342	6,079	-263	61	25	C				16,625	16,144	-481	-2.89	-4.15
		END EB I-94	582	584	1,173	6,342	6,073	-269	61	25	C				16,625	16,134	-491	-2.95	-4.24
	EB I-394	EB I-94	658	558	266	2,180	2,024	-156	26	82	F				6,322	5,958	-364	-5.76	-7.16
	Lyndale/Hennepin Avenue		660	659	1,194	1,981	1,970	-11	23	45	F				4,702	4,695	-7	-0.14	-0.58
		EB I-94	659	561	302	1,981	1,956	-25	20	58	F				4,702	4,687	-15	-0.33	-1.25
	EB I-94	SB I-35W	564	664	604	1,710	1,684	-27	47	36	E				4,860	4,793	-68	-1.39	-1.55
	EB I-94	NB I-35W	567	266	389	1,119	1,089	-30	53	21	C				2,913	2,837	-76	-2.62	-2.67
	NB I-35W	EB I-94	267	570	442	1,250	1,152	-98	52	22	C				2,919	2,749	-170	-5.81	-7.86
	5th Avenue		661	668	741	400	398	-3	45	5	A				1,020	1,020	0	-0.02	-0.63
		EB I-94	668	568	522	400	397	-3	40	7	A				1,020	1,019	-1	-0.14	-0.85
	EB I-94	TH 55	569	662	500	910	866	-44	48	18	B				2,744	2,645	-99	-3.60	-4.88
	Cedar Avenue	EB I-94	673	573	427	500	500	0	54	10	A				1,285	1,285	0	-0.03	-0.04
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,870	5,868	-2	62	24	C				15,508	15,498	-10	-0.07	-0.04
			750	752	590	5,870	5,864	-6	62	24	C				15,508	15,486	-22	-0.14	-0.10
			752	754	1,231	5,870	5,863	-8	62	24	C				15,508	15,476	-32	-0.21	-0.13
			754	756	1,378	5,870	5,861	-9	61	24	C	60	24	C	15,508	15,461	-47	-0.30	-0.15
			756	758	775	5,870	5,858	-12	59	25	C				15,508	15,449	-59	-0.38	-0.20
		Cedar Ave Exit	758	759	1,026	5,870	5,854	-16	55	25	C				15,508	15,438	-70	-0.45	-0.28
	Cedar Ave Exit		759	760	755	4,769	4,762	-7	53	23	C				12,563	12,501	-62	-0.49	-0.14
			760	761	1,114	4,769	4,760	-10	51	23	C	51	23	C	12,563	12,496	-67	-0.54	-0.20
		SB I-35W Exit	761	762	677	4,769	4,756	-13	50	24	C				12,563	12,488	-75	-0.59	-0.27
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,128	4,112	-16	50	28	C	49.6	27.7	C	10,977	10,899	-78	-0.71	-0.39
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,718	5,704	-15	48	29	D	48	28.8	D	15,315	15,221	-94	-0.61	-0.25
	11th St Exit		764	765	1,022	4,617	4,575	-42	50	30	D				12,331	12,222	-109	-0.88	-0.91
		NB I-35W/4th Ave Entrance	765	766	1,082	4,617	4,571	-46	41	37	E	45	34	D	12,331	12,204	-127	-1.03	-1.00
	NB I-35W/4th Ave Entrance		766	767	717	6,797	6,452	-345	35	44	F				17,900	17,271	-629	-3.51	-5.07
		Lyndale/Hennepin Exit	767	768	1,834	6,797	6,445	-352	48	32	D	44	35	E	17,900	17,249	-651	-3.64	-5.18
	Lyndale/Hennepin Exit		768	769	1,590	5,697	5,367	-330	37	48	F				14,806	14,232	-574	-3.88	-5.79
			769	770	1,188	5,697	5,364	-333	46	39	E	42	41	E	14,806	14,214	-592	-4.00	-5.85
		WB I-394 Exit	770	771	1,432	5,697	5,360	-337	44	34	D				14,806	14,199	-607	-4.10	-5.91
	WB I-394 Exit		771	772	508	2,687	2,467	-220	52	16	B				6,786	6,420	-366	-5.40	-8.20
		TH 55 Exit	772	774	544	2,687	2,466	-221	54	13	B	53	14	B	6,786	6,417	-369	-5.44	-8.22
	TH 55 Exit	**END WB I-94**	774	776	400	2,406	2,200	-206	54	14	B	54	13.6	B	5,965	5,635	-330	-5.53	-8.57
	WB I-94	Cedar Avenue	759	859	254	1,101	1,087	-14	53	21	C				2,945	2,929	-16	-0.56	-1.29
	WB I-94	SB I-35W	762	466	250	641	641	0	53	12	B				1,586	1,583	-3	-0.18	-0.02
	Washington CD Road		860	864	656	1,590	1,591	1	49	17	B				4,338	4,335	-3	-0.07	0.07
		WB I-94	864	763	506	1,590	1,591	1	46	17	B				4,338	4,333	-5	-0.11	0.07
	WB I-94	11th Street	764	861	492	1,101	1,131	30	52	22	C				2,984	2,982	-2	-0.07	2.69
	NB I-35W Flyover		256	6	890	1,880	1,596	-284	30	54	F				4,799	4,333	-466	-9.71	**-15.11**
			6	3	142	1,880	1,594	-287	31	52	F				4,799	4,327	-472	-9.83	**-15.24**
		4th Avenue Entrance	3	2	114	1,880	1,593	-287	32	25	C				4,799	4,326	-473	-9.85	**-15.26**
	4th Avenue Entrance	(dummy exit)	2	1	164	2,180	1,890	-290	34	19	B				5,569	5,092	-477	-8.57	**-13.28**
		WB I-94	1	766	254	2,180	1,889	-291	33	28	D				5,569	5,089	-480	-8.62	**-13.36**
	4th Avenue		5	4	466	300	300	0	10	15	B				770	768	-2	-0.21	-0.10
		NB Flyover	4	2	160	300	299	-1	19	9	A				770	767	-3	-0.39	-0.40
	WB I-94	Lyndale/Hennepin Avenue	768	863	568	1,100	1,071	-29	49	11	B				3,094	2,992	-102	-3.31	-2.62
	WB I-94		771	871	392	3,010	2,891	-119	33	44	F				8,020	7,769	-251	-3.13	-3.96
		WB I-394	871	872	305	3,010	2,890	-120	25	57	F				8,020	7,766	-254	-3.17	-3.98
	WB I-94	TH 55	774	874	249	281	265	-16	54	5	A				821	780	-41	-5.04	-5.55

Table C2
2018 NoBuild AM Peak Period
Arterial Measures of Effectiveness

Iterations: 9

Hour 4 — **MOE Hour 7:00 AM-8:00 AM**

	Intersection	Appr	Link	Demand volumes					Total Delay by Movement (sec/veh)				Level of Service by Movement				LOS by Approach		LOS by Intersection		Modeled Storage & Maximum Traffic Queueing (feet): Through		Left Turn		Right Turn	
				Lt	Th	Rt	D	total	L	T	R	D	L	T	R	D	Delay	LOS	Delay	LOS	Link Length	Queue	Storage	Queue	Storage	Queue
signal	Lake Street at Stevens Ave	EB	990-918	10	589	141	0	740	22	24	21	-	C	C	C	-	23	C			1115	200				
signal		WB	919-918	120	422	59	0	601	11	3	1	-	B	A	A	-	5	A	20.0	C	326	102	125	60		
signal		SB	992-918	20	300	11	0	331	41	41	39	-	D	D	D	-	41	D			586	302				
signal	Lake Street at 2nd Ave	EB	918-919	121	488	0	0	609	10	6	-	-	A	A	-	-	7	A			326	100	125	64		
signal		WB	991-919	0	481	40	0	521	-	18	17	-	-	B	B	-	18	B	18.0	B	982	144				
signal		NB	917-919	120	509	131	0	760	31	31	9	-	C	C	A	-	27	C			618	264				
signal	31st Street at Stevens Ave	EB	988-916	0	201	160	0	361	-	23	20	-	-	C	C	-	22	C			1106	126				
signal		WB	917-916	149	231	0	0	380	31	27	-	-	C	C	-	-	29	C	20.7	C	328	182				
signal		SB	918-916	21	490	50	0	561	18	16	3	-	B	B	A	-	15	B			618	226			80	38
signal	31st Street at 2nd Ave	EB	916-917	29	193	0	0	222	27	23	-	-	C	C	-	-	23	C			328	114				
signal		WB	989-917	0	281	10	0	291	-	29	21	-	-	C	C	-	28	C	15.5	B	972	124				
signal		NB	987-917	99	721	120	0	940	11	10	6	-	B	A	A	-	9	A			281	148				
signal	Stevens to I-35W Split	SB	916-986	709	90	0	0	799	0	0	-	-	A	A	-	-	0	A			178	94				
signal	2nd Ave to I-35W Merge	NB	985-987	0	50	0	0	50	-	0	-	-	-	A	-	-	0	A			334	0				

Table C3
2018 NoBuild PM peak
Freeway Measures of Effectiveness
I-35W Lake Street Transit

Iterations: 10

MOE Hour
4:30 PM-5:30 PM
6

LOS A <10 vplph
LOS B 10<20 vplph
LOS C 20<28 vplph
LOS D 28<35 vplph
LOS E 35<43 vplph
LOS F >43 vplph

	Location		Node			Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
	From	To	From	To	Length (ft)	Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	5,101	5,129	28	62	21	C	61.7	21.3	C	14,509	14,603	94	0.65	0.55
	TH 62 Entrance	60th St Entrance	104	106	1,355	7,102	7,155	53	64	19	B	63.9	18.7	B	20,361	20,517	156	0.76	0.74
	60th St Entrance	Diamond Lake Exit	106	108	910	7,402	7,459	57	63	18	B	63.2	18.3	B	21,249	21,401	152	0.72	0.77
	Diamond Lake Exit		108	110	1,432	7,001	7,069	68	65	22	C				20,229	20,385	156	0.77	0.97
		Diamond Lake Entrance	110	112	1,225	7,001	7,065	64	63	22	C	64	22	C	20,229	20,381	152	0.75	0.91
	Diamond Lake Entrance		112	113	1,449	7,400	7,470	70	58	24	C				21,463	21,646	183	0.85	0.94
			113	114	542	7,400	7,466	66	63	24	C	61	23	C	21,463	21,644	181	0.84	0.89
		46th St Exit	114	116	1,462	7,400	7,465	65	64	22	C				21,463	21,639	176	0.82	0.87
	46th St Exit	46th St BRT Exit	116	118	238	6,800	6,879	79	65	18	B	65.2	18.1	B	19,865	20,087	222	1.12	1.16
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	6,800	6,874	74	65	21	C	65.2	21.1	C	19,865	20,055	190	0.96	1.09
	46th St BRT Entrance	46th St Entrance	120	122	378	6,800	6,881	81	65	18	B	64.5	18.4	B	19,865	20,053	188	0.95	1.18
	46th St Entrance		122	124	1,521	7,300	7,383	83	62	23	C				21,460	21,636	176	0.82	1.14
			124	126	818	7,300	7,379	79	62	24	C	61	23	C	21,460	21,601	141	0.66	1.09
		35/36th St Exit	126	128	1,514	7,300	7,369	69	60	24	C				21,460	21,555	95	0.44	0.95
	35/36th St Exit		128	130	1,485	6,800	6,852	52	57	25	C				20,104	20,153	49	0.24	0.77
		35/36th St Entrance	130	132	1,474	6,800	6,822	22	50	28	D	54	26	C	20,104	20,104	0	0.00	0.32
	35/36th St Entrance	31/Lake St Exit	132	134	604	7,600	7,598	-2	44	30	D	43.9	29.8	D	22,628	22,603	-25	-0.11	-0.02
	31/Lake St Exit	Lake St BRT Exit	134	136	1,029	6,700	6,688	-12	43	30	D	42.6	29.7	D	19,995	20,007	12	0.06	-0.18
	Lake St BRT Exit	Lake St BRT Entrance	136	138	721	6,700	6,664	-36	42	33	D	41.7	33	D	19,995	19,981	-14	-0.07	-0.54
	Lake St BRT Entrance		138	140	1,190	6,700	6,644	-56	41	31	D				19,995	19,970	-25	-0.13	-0.83
			140	142	569	6,700	6,626	-74	41	33	D				19,995	19,952	-43	-0.22	-1.11
			142	144	1,061	6,700	6,615	-85	41	32	D	40	32	D	19,995	19,939	-56	-0.28	-1.27
		NB I-35W/TH 65 SPLIT	144	146	859	6,700	6,603	-97	39	34	D				19,995	19,926	-69	-0.35	-1.44
	Begin NB TH 65		146	148	498	3,700	3,643	-58	31	40	E				10,600	10,712	112	1.05	-1.55
			148	150	281	3,700	3,637	-63	30	41	E				10,600	10,708	108	1.02	-1.70
			150	152	284	3,700	3,635	-65	29	43	E	27	42	E	10,600	10,704	104	0.98	-1.76
			152	154	582	3,700	3,631	-69	27	44	F				10,600	10,700	100	0.94	-1.88
		WB I-94 Exit	154	156	644	3,700	3,625	-75	24	41	E				10,600	10,691	91	0.86	-2.02
	WB I-94 Exit	**END NB TH 65**	156	158	983	1,999	2,113	114	53	13	B	53.2	13.2	B	6,108	6,548	440	7.21	5.68
	NB I-35W/TH 65 Split		146	161	665	3,000	2,953	-47	48	31	D				9,395	9,208	-187	-1.99	-1.56
			163	164	927	3,000	2,965	-35	34	46	F	34	48	F	9,395	9,209	-186	-1.98	-1.15
		5th Ave Entrance	164	165	965	3,000	2,981	-19	25	61	F				9,395	9,211	-184	-1.96	-0.64
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,799	3,796	-3	34	52	F	33.5	51.7	F	11,615	11,429	-186	-1.60	-0.09
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,940	4,905	-35	46	34	D	45.8	33.5	D	15,111	14,884	-227	-1.50	-0.71
	EB I-94 Exit		167	168	540	4,380	4,327	-53	48	30	D				12,993	12,754	-239	-1.84	-1.21
		Washington Ave Exit	168	169	448	4,380	4,327	-53	50	29	D	49	30	D	12,993	12,754	-240	-1.84	-1.21
	Washington Ave Exit		169	170	625	3,880	3,827	-53	54	35	E				11,559	11,335	-224	-1.94	-1.37
		END NB I-35W	170	171	523	3,880	3,828	-52	56	34	D	55	35	E	11,559	11,335	-224	-1.94	-1.35
Northbound I-35W/TH 65 Ramps	TH 62	NB I-35W	204	104	266	2,001	2,024	23	53	20	C				5,852	5,915	63	1.07	1.15
	60th St	NB I-35W	206	106	505	300	302	2	55	6	A				888	888	0	-0.02	0.60
	NB I-35W	Diamond Lake Road	108	208	271	401	389	-12	54	7	A				1,020	1,011	-9	-0.90	-2.89
	Diamond Lake Road		211	212	606	399	410	11	38	6	A				1,234	1,267	33	2.71	2.78
		NB I-35W	212	112	577	399	411	12	38	9	A				1,234	1,267	33	2.69	2.96
	NB I-35W	46th Street	116	216	370	600	584	-17	54	11	B				1,598	1,546	-52	-3.25	-2.75
	NB I-35W	46th St BRT	118	218	166	0	6	6	60	0	A				0	15	15	0.00	0.00
	46th St BRT	NB I-35W	220	120	246	0	6	6	45	0	A				0	15	15	0.00	0.00
	46th Street		221	222	818	500	505	5	17	15	B				1,595	1,601	6	0.38	1.04
		NB I-35W	222	122	686	500	504	4	33	13	B				1,595	1,602	7	0.41	0.84
	NB I-35W	35/36th Street	128	228	533	500	499	-1	54	9	A				1,356	1,344	-12	-0.88	-0.22
	35/36th Street		231	232	595	800	805	5	14	30	D				2,524	2,527	3	0.11	0.63
		NB I-35W	232	132	470	800	806	6	28	22	C				2,524	2,528	4	0.14	0.70
	NB I-35W	31/Lake Street	134	234	410	900	889	-11	48	19	B				2,633	2,576	-57	-2.17	-1.20
	NB I-35W	Lake St BRT	136	236	132	0	3	3	39	0	A				0	8	8	0.00	0.00
	Lake St BRT	NB I-35W	238	138	108	0	3	3	12	0	A				0	8	8	0.00	0.00
	NB TH 65	WB I-94	156	256	388	1,701	1,511	-190	14	106	F				4,492	4,136	-356	-7.93	**-11.17**
	5th Avenue		261	265	485	799	802	3	12	34	D				2,220	2,219	-1	-0.04	0.36
		NB I-35W	265	165	220	799	801	2	21	20	B				2,220	2,219	-1	-0.06	0.20
	EB I-94	NB I-35W	266	166	369	1,141	1,102	-39	52	21	C				3,496	3,458	-38	-1.09	-3.44
	NB I-35W	EB I-94	167	267	483	560	579	19	53	11	B				2,118	2,131	13	0.59	3.39
	NB I-35W	Washington Ave	169	262	847	500	500	0	54	5	A				1,434	1,417	-17	-1.17	0.00
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,000	1,999	-1	57	18	B	56.9	17.9	B	6,305	6,309	4	0.06	-0.06
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,600	2,604	4	46	25	C	46.2	25.4	C	8,198	8,215	17	0.20	0.14
	WB I-94 Entrance		366	367	1,871	3,700	3,650	-50	37	45	F				11,141	11,015	-126	-1.13	-1.35
			367	368	827	3,700	3,656	-44	31	59	F				11,141	11,018	-123	-1.10	-1.18
			368	369	483	3,700	3,658	-42	41	45	F	40	45	F	11,141	11,020	-121	-1.09	-1.12
			369	370	403	3,700	3,659	-41	51	36	E				11,141	11,021	-120	-1.08	-1.12
		SB TH 65 Entrance	374	376	627	3,700	3,660	-40	54	34	D				11,141	11,023	-118	-1.06	-1.09
	Begin SB TH 65	12th St Entrance	300	302	867	2,000	1,999	-1	58	18	B	58	17.6	B	4,953	4,954	1	0.01	-0.03
	12th St Entrance	EB I-94 Entrance	302	304	1,088	2,600	2,668	68	49	25	C	49.3	24.8	C	6,515	6,722	207	3.18	2.62
	EB I-94 Entrance		304	307	1,574	4,200	4,276	76	58	25	C				11,415	11,570	155	1.36	1.81
		SB I-35W Entrance	307	310	1,516	4,200	4,276	76	49	33	D	53	29	D	11,415	11,567	152	1.33	1.80
	SB I-35W Entrance		310	314	698	7,900	7,936	36	57	35	E				22,556	22,589	33	0.15	0.46
			314	318	379	7,900	7,937	37	59	34	D				22,556	22,590	34	0.15	0.46
			318	320	900	7,900	7,937	37	59	34	D	58	33	D	22,556	22,590	34	0.15	0.47
		Lake St BRT Exit	320	322	616	7,900	7,936	36	56	30	D				22,556	22,588	32	0.14	0.46
	Lake St BRT Exit	Lake St BRT Entrance	322	324	719	7,900	7,866	-34	52	38	E	51.9	37.9	E	22,556	22,385	-171	-0.76	-0.44
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	7,900	7,932	32	52	36	E	51.8	35.6	E	22,556	22,586	30	0.13	0.40
	31/Lake St Entrance	35/36th St Exit	326	328	518	9,000	9,059	59	52	35	D	52	34.8	D	25,807	25,850	43	0.17	0.66
	35/36th St Exit		328	330	1,384	7,900	7,927	27	61	33	D				22,449	22,457	8	0.04	0.34
		35/36th St Entrance	330	332	1,712	7,900	7,928	28	59	33	D	60	33	D	22,449	22,460	11	0.05	0.35
	35/36th St Entrance		332	334	1,460	8,301	8,331	30	51	38	E				23,633	23,647	14	0.06	0.36
			334	336	544	8,301	8,331	30	55	38	E	55	34	D	23,633	23,649	16	0.07	0.37
		46th St Exit	336	338	1,512	8,301	8,333	32	59	30	D				23,633	23,649	16	0.07	0.39
	46th St Exit	46th St BRT Exit	338	340	780	7,501	7,524	23	63	22	C	63.4	21.5	C	21,373	21,404	31	0.14	0.31
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	7,501	7,514	13	65	23	C	64.8	23.2	C	21,373	21,372	-1	-0.01	0.18
	46th St BRT Entrance	46th St Entrance	342	344	393	7,501	7,527	26	63	21	C	63.1	20.7	C	21,373	21,408	35	0.16	0.34
	46th St Entrance		344	346	1,397	7,900	7,925	25	57	26	C				22,574	22,613	39	0.17	0.31
		60th St Exit	346	348	1,495	7,900	7,928	28	48	32	D	52	29	D	22,574	22,615	41	0.18	0.36
	60th St Exit	TH 62 Exit	348	350	2,036	7,301	7,332	31	53	28	C	53.3	27.5	C	20,976	21,027	51	0.24	0.43
	TH 62 Exit		350	352	1,409	3,301	3,295	-6	64	17	B				9,243	9,261	18	0.20	-0.19
			352	354	1,616	3,301	3,297	-4	66	17	B	65	17	B	9,243	9,261	18	0.20	-0.11
		END SB I-35W	354	356	719	3,301	3,298	-3	66	17	B				9,243	9,261	18	0.19	-0.09
Southbound I-35W/TH 65 Ramps	Washington CD RD	SB I-35W	461	365	302	600	606	6	46	14	B				1,893	1,905	12	0.63	0.93
	WB I-94	SB I-35W	466	366	269	1,100	1,043	-57	42	25	C				2,943	2,798	-145	-4.94	-5.20
	12th Street	SB TH 65	402	302	283	600	673	73	41	17	B				1,562	1,770	208	**13.30**	**12.13**
	EB I-94	SB TH 65	664	304	635	1,600	1,611	11	46	35	E				4,900	4,849	-51	-1.03	0.67
	SB I-35W	SB TH 65	376	310	857	3,700	3,660	-40	56	33	D				11,141	11,023	-118	-1.06	-1.09
	SB I-35W	Lake St BRT	322	422	121	0	69	69	33	2	A				0	202	202	0.00	0.00
	Lake St BRT	SB I-35W	424	324	102	0	68	68	28	2	A				0	202	202	0.00	0.00
	31/Lake Street		425	426	114	1,100	1,129	29	5	105	F				3,251	3,261	10	0.30	2.62
		SB I-35W	426	326	441	1,100	1,131	31	26	32	D				3,251	3,263	12	0.36	2.78
	SB I-35W	35/36th Street	328	428	395	1,100	1,132	32	39	29	D				3,358	3,392	34	1.00	2.90
	35/36th Street		431	432	669	401	402	1	28	8	A				1,184	1,183	-1	-0.05	0.30
		SB I-35W	432	332	585	401	402	1	34	9	A				1,184	1,184	0	0.00	0.20
	SB I-35W	46th Street	338	438	703	800	813	13	54	15	B				2,260	2,246	-14	-0.61	1.60
	SB I-35W	46th St BRT	340	440	116	0	11	11	50	0	A				0	35	35	0.00	0.00
	46th St BRT	SB I-35W	442	342	216	0	11	11	42	0	A				0	35	35	0.00	0.00
	46th St BRT		443	444	1,118	399	398	-1	41	5	A				1,201	1,201	0	0.02	-0.30
		SB I-35W	444	344	378	399	398	-1	34	8	A				1,201	1,201	0	0.02	-0.20
	SB I-35W	60th Street	348	448	541	599	600	1	54	11	B				1,598	1,588	-10	-0.65	0.20
	SB I-35W		350	450	465	4,000	4,039	39	53	26	C				11,733	11,768	35	0.30	0.97
		TH 62	450	451	390	4,000	4,039	39	53	25	C				11,733	11,769	36	0.31	0.98
Eastbound I-94	**Begin EB I-94**		554	556	984	3,710	3,709	-1	51	37	E				10,874	10,874	0	0.00	-0.04
			556	557	632	3,710	3,710	0	51	37	E	50	37	E	10,874	10,875	1	0.01	0.00
		EB I-394 Entrance	557	558	789	3,710	3,711	1	49	38	E				10,874	10,875	1	0.01	0.03
	EB I-394 Entrance		558	559	442	5,920	5,813	-107	38	51	F				17,425	17,231	-194	-1.12	-1.81
			559	560	1,192	5,920	5,817	-103	42	46	F	39	49	F	17,425	17,231	-194	-1.11	-1.74
		Lyndale/Hennepin Entrance	560	561	1,856	5,920	5,821	-99	38	51	F				17,425	17,231	-194	-1.11	-1.67
	Lyndale/Hennepin Entrance		561	562	1,485	7,530	7,427	-103	44	42	E				22,117	21,923	-194	-0.88	-1.36
			562	563	706	7,530	7,424	-106	50	37	E	47	40	E	22,117	21,924	-193	-0.87	-1.40
		SB I-35W Exit	563	564	474	7,530	7,422	-108	50	37	E				22,117	21,925	-192	-0.87	-1.43
	SB I-35W Exit		564	565	792	5,930	5,811	-119	50	39	E				17,217	17,076	-141	-0.82	-2.00
			565	566	865	5,930	5,811	-120	51	38	E	51	37	E	17,217	17,077	-141	-0.82	-2.02
		NB I-35W Exit	566	567	388	5,930	5,810	-120	51	30	D				17,217	17,077	-140	-0.81	-2.02
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,789	4,708	-82	51	31	D	51.2	30.6	D	13,721	13,621	-100	-0.73	-1.70
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,389	5,305	-84	55	24	C	54.7	24.2	C	15,456	15,356	-100	-0.64	-1.56
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,288	4,245	-43	59	24	C	59.3	23.9	C	12,354	12,330	-24	-0.20	-1.00
	NB I-35W Entrance		570	572	1,016	4,848	4,827	-21	61	20	B				14,472	14,462	-10	-0.07	-0.43
		Cedar Ave Entrance	572	573	1,027	4,848	4,830	-18	60	20	C	61	20	C	14,472	14,464	-8	-0.06	-0.38
	Cedar Ave Entrance		573	574	562	6,158	6,144	-14	46	27	C				18,127	18,119	-8	-0.04	-0.23
			574	576	930	6,158	6,144	-14	55	28	C				18,127	18,121	-6	-0.03	-0.22
			576	578	1,378	6,158	6,144	-14	61	25	C				18,127	18,122	-5	-0.03	-0.22
			578	580	1,268	6,158	6,144	-14	61	25	C	59	26	C	18,127	18,125	-2	-0.01	-0.23
			580	582	875	6,158	6,143	-15	61	25	C				18,127	18,128	1	0.01	-0.25
		END EB I-94	582	584	1,173	6,158	6,143	-15	61	25	C				18,127	18,129	2	0.01	-0.24
	EB I-394	EB I-94	658	558	266	2,210	2,101	-109	29	78	F				6,551	6,354	-197	-3.01	-4.95
	Lyndale/Hennepin Avenue		660	659	1,194	1,610	1,610	0	31	27	C				4,692	4,690	-2	-0.04	-0.01
		EB I-94	659	561	302	1,610	1,609	-1	24	40	E				4,692	4,690	-2	-0.04	-0.09
	EB I-94	SB I-35W	564	664	604	1,600	1,609	9	47	34	D				4,900	4,849	-51	-1.03	0.59
	EB I-94	NB I-35W	567	266	389	1,141	1,102	-39	53	21	C				3,496	3,458	-38	-1.09	-3.45
	NB I-35W	EB I-94	267	570	442	560	580	20	53	11	B				2,118	2,131	13	0.62	3.57
	5th Avenue		661	668	741	600	601	1	16	20	B				1,735	1,733	-2	-0.10	0.23
		EB I-94	668	568	522	600	600	0	31	14	B				1,735	1,734	-1	-0.06	0.07
	EB I-94	TH 55	569	662	500	1,101	1,057	-44	48	22	C				3,102	3,028	-74	-2.40	-4.00
	Cedar Avenue	EB I-94	673	573	427	1,310	1,312	2	53	26	C				3,655	3,654	-1	-0.03	0.17
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,200	5,172	-28	55	26	C				16,105	15,705	-400	-2.48	-0.54
			750	752	590	5,200	5,133	-67	47	34	D				16,105	15,603	-502	-3.12	-1.28
			752	754	1,231	5,200	5,078	-122	36	52	F				16,105	15,513	-592	-3.67	-2.34
			754	756	1,378	5,200	4,996	-204	25	80	F	33	63	F	16,105	15,386	-719	-4.46	-3.92
			756	758	775	5,200	4,934	-266	18	96	F				16,105	15,285	-820	-5.09	-5.11
		Cedar Ave Exit	758	759	1,026	5,200	4,894	-306	13	99	F				16,105	15,208	-897	-5.57	-5.89
	Cedar Ave Exit		759	760	755	4,800	4,484	-316	11	110	F				14,861	13,982	-879	-5.91	-6.59
			760	761	1,114	4,800	4,471	-329	12	97	F	12	94	F	14,861	13,925	-936	-6.30	-6.86
		SB I-35W Exit	761	762	677	4,800	4,465	-335	16	71	F				14,861	13,879	-982	-6.61	-6.98
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,700	3,421	-279	14	85	F	13.5	84.8	F	11,918	11,065	-853	-7.16	-7.55
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,100	4,485	-615	14	76	F	14.3	75.8	F	16,411	14,859	-1,552	-9.46	**-12.05**
	11th St Exit		764	765	1,022	4,601	4,031	-571	14	93	F				14,769	13,323	-1,446	-9.79	**-12.40**
		NB I-35W/4th Ave Entrance	765	766	1,082	4,601	4,038	-563	15	90	F	15	92	F	14,769	13,300	-1,469	-9.95	**-12.24**
	NB I-35W/4th Ave Entrance		766	767	717	7,203	6,450	-753	26	59	F				21,806	19,936	-1,870	-8.58	**-10.46**
		Lyndale/Hennepin Exit	767	768	1,834	7,203	6,452	-751	48	32	D	42	39	E	21,806	19,932	-1,874	-8.59	**-10.43**
	Lyndale/Hennepin Exit		768	769	1,590	5,803	5,281	-522	37	47	F				17,804	16,502	-1,302	-7.31	-9.00
			769	770	1,188	5,803	5,286	-518	46	38	E	42	40	E	17,804	16,508	-1,296	-7.28	-8.92
		WB I-394 Exit	770	771	1,432	5,803	5,288	-515	45	33	D				17,804	16,510	-1,294	-7.27	-8.87
	WB I-394 Exit		771	772	508	3,103	2,883	-220	52	19	B				9,821	9,282	-539	-5.49	-7.08
		TH 55 Exit	772	774	544	3,103	2,883	-220	54	15	B	53	17	B	9,821	9,283	-538	-5.48	-7.09
	TH 55 Exit	**END WB I-94**	774	776	400	2,703	2,521	-182	54	16	B	53.9	15.6	B	8,606	8,132	-475	-5.51	-6.74
	WB I-94	Cedar Avenue	759	859	254	400	381	-19	46	8	A				1,244	1,162	-82	-6.61	-4.80
	WB I-94	SB I-35W	762	466	250	1,100	1,043	-57	47	23	C				2,943	2,797	-146	-4.95	-5.22
	Washington CD Road		860	864	656	1,400	1,060	-341	3	188	F				4,493	3,823	-670	**-14.92**	**-24.32**
		WB I-94	864	763	506	1,400	1,061	-339	27	20	B				4,493	3,817	-676	**-15.05**	**-24.21**
	WB I-94	11th Street	764	861	492	499	462	-37	46	10	B				1,642	1,509	-133	-8.12	-7.37
	NB I-35W Flyover		256	6	890	1,701	1,509	-192	16	93	F				4,492	4,129	-363	-8.09	**-11.30**
			6	3	142	1,701	1,508	-193	17	88	F				4,492	4,122	-370	-8.23	**-11.36**
		4th Avenue Entrance	3	2	114	1,701	1,508	-193	17	44	F				4,492	4,121	-371	-8.27	**-11.37**
	4th Avenue Entrance	(dummy exit)	2	1	164	2,602	2,406	-196	20	40	E				7,037	6,657	-380	-5.40	-7.52
		WB I-94	1	766	254	2,602	2,406	-196	20	61	F				7,037	6,654	-383	-5.44	-7.53
	4th Avenue		5	4	466	901	901	0	12	39	E				2,545	2,540	-5	-0.19	-0.02
		NB Flyover	4	2	160	901	899	-2	20	26	C				2,545	2,538	-7	-0.26	-0.18
	WB I-94	Lyndale/Hennepin Avenue	768	863	568	1,400	1,174	-226	49	12	B				4,002	3,433	-569	**-14.23**	**-16.11**
	WB I-94		771	871	392	2,700	2,407	-293	33	36	E				7,983	7,229	-754	-9.44	**-10.84**
		WB I-394	871	872	305	2,700	2,408	-292	26	47	F				7,983	7,229	-754	-9.45	**-10.80**
	WB I-94	TH 55	774	874	249	400	362	-38	54	7	A				1,215	1,151	-64	-5.24	-9.45

Table C4
2018 NoBuild PM Peak Period
Arterial Measures of Effectiveness

Iterations: 10

Hour 6 — **MOE Hour** **4:30 PM-5:30 PM**

	Intersection	Appr	Link	Demand volumes					Total Delay by Movement (sec/veh)				Level of Service by Movement				LOS by Approach		LOS by Intersection		Through		Left Turn		Right Turn	
				Lt	Th	Rt	D	total	L	T	R	D	L	T	R	D	Delay	LOS	Delay	LOS	Link Length	Queue	Storage	Queue	Storage	Queue
signal	Lake Street at Stevens Ave	EB	990-918	20	641	130	0	791	26	23	23	-	C	C	C	-	23	C			1115	224				
signal		WB	919-918	280	1070	111	0	1461	13	6	5	-	B	A	A	-	7	A	19.4	B	326	244	125	112		
signal		SB	992-918	41	399	30	0	470	50	51	44	-	D	D	D	-	51	D			586	466				
signal	Lake Street at 2nd Ave	EB	918-919	39	643	0	0	682	19	2	-	-	B	A	-	-	3	A			326	118	125	66		
signal		WB	991-919	0	1210	30	0	1240	-	16	17	-	-	B	B	-	16	B	17.8	B	982	256				
signal		NB	917-919	251	220	180	0	651	49	45	9	-	D	D	A	-	37	D			618	280				
signal	31st Street at Stevens Ave	EB	988-916	0	341	159	0	500	-	17	19	-	-	B	B	-	18	B			1106	168				
signal		WB	917-916	311	599	0	0	910	23	13	-	-	C	B	-	-	16	B	26.6	C	328	272				
signal		SB	918-916	40	690	79	0	809	52	46	17	-	D	D	B	-	43	D			618	412			80	66
signal	31st Street at 2nd Ave	EB	916-917	29	352	0	0	381	28	17	-	-	C	B	-	-	18	B			328	158				
signal		WB	989-917	0	660	20	0	680	-	26	21	-	-	C	C	-	26	C	18.4	B	972	218				
signal		NB	987-917	250	602	120	0	972	17	13	9	-	B	B	A	-	13	B			281	216				
signal	Stevens to I-35W Split	SB	916-986	1100	60	0	0	1160	0	0	-	-	A	A	-	-	0	A			178	140				
signal	2nd Ave to I-35W Merge	NB	985-987	0	72	0	0	72	-	0	-	-	-	A	-	-	0	A			334	0				

Iterations:
10

Table C5
Build S6A&Flyover_Full Aux 2018 AM Peak Period
Freeway Measures of Effectiveness
I-35W Lake Street Transit

MOE Hour
7:00 AM-8:00 AM
4

LOS A <10 vplph
LOS B 10<20 vplph
LOS C 20<28 vplph
LOS D 28<35 vplph
LOS E 35<43 vplph
LOS F >43 vplph

	Location		Node			Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
	From	To	From	To	Length (ft)	Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,890	4,930	40	62	20	C	62	20	C	12,895	13,022	127	0.99	0.82
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,621	6,678	57	64	17	B	64	17	B	18,110	18,292	182	1.01	0.86
	60th St Entrance	Diamond Lake Exit	106	108	910	6,932	6,988	56	65	17	B	65	17	B	18,826	19,000	174	0.92	0.81
	Diamond Lake Exit		108	110	1,432	6,641	6,704	63	66	20	C				18,044	18,205	161	0.89	0.94
		Diamond Lake Entrance	110	112	1,225	6,641	6,705	64	64	21	C	65	21	C	18,044	18,198	154	0.85	0.97
	Diamond Lake Entrance		112	113	1,449	7,462	7,537	75	56	25	C				20,032	20,217	185	0.92	1.01
			113	114	542	7,462	7,538	76	63	24	C	61	24	C	20,032	20,210	178	0.89	1.02
		46th St Exit	114	116	1,462	7,462	7,537	75	65	22	C				20,032	20,201	169	0.84	1.01
	46th St Exit	46th St BRT Exit	116	118	238	7,263	7,340	77	65	19	B	65	19	B	19,428	19,604	176	0.90	1.06
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	7,263	7,329	66	64	23	C	64	23	C	19,428	19,564	136	0.70	0.90
	46th St BRT Entrance	46th St Entrance	120	122	378	7,263	7,339	76	56	23	C	56	23	C	19,428	19,589	161	0.83	1.05
	46th St Entrance		122	124	1,521	8,382	8,453	71	53	30	D				22,128	22,273	145	0.66	0.84
			124	126	818	8,382	8,450	68	61	28	C	57	29	D	22,128	22,258	130	0.59	0.81
		35/36th St Exit	126	128	1,514	8,382	8,447	65	60	27	C				22,128	22,227	99	0.45	0.78
	35/36th St Exit		128	130	1,485	8,282	8,336	54	46	37	E				21,833	21,887	54	0.25	0.65
		35/36th St Entrance	130	132	1,474	8,282	8,293	11	35	47	F	41	42	E	21,833	21,816	-17	-0.08	0.13
	35/36th St Entrance	31/Lake St Exit	132	134	604	9,421	9,387	-34	33	45	F	33	45	F	24,723	24,653	-70	-0.28	-0.36
	31/Lake St Exit	Lake St BRT Exit	134	135	478	8,921	8,870	-51	33	39	E	33	39	E	23,287	23,241	-46	-0.20	-0.57
	Lake St BRT Exit		135	136	553	8,921	8,772	-149	35	41	E				23,287	22,976	-311	-1.34	-1.67
		28th St Exit	136	138	843	8,921	8,749	-172	41	35	E	39	38	E	23,287	22,948	-339	-1.45	-1.93
	28th St Exit	Lake St BRT Entrance	138	140	1,112	8,332	8,136	-196	48	35	D	48	35	D	21,748	21,421	-327	-1.50	-2.35
	Lake St BRT Entrance		140	142	496	8,332	8,191	-141	47	30	D				21,748	21,643	-105	-0.48	-1.69
			142	144	1,043	8,332	8,170	-162	48	35	D	47	34	D	21,748	21,626	-122	-0.56	-1.95
		NB I-35W/TH 65 SPLIT	144	146	1,405	8,332	8,135	-197	46	35	E				21,748	21,600	-148	-0.68	-2.36
	Begin NB TH 65		146	148	294	4,702	4,685	-17	55	29	D				12,072	12,262	190	1.58	-0.36
			148	150	242	4,702	4,683	-19	53	30	D				12,072	12,260	188	1.55	-0.41
			150	152	180	4,702	4,681	-21	51	31	D	49	30	D	12,072	12,257	185	1.54	-0.44
			152	154	395	4,702	4,679	-23	48	33	D				12,072	12,255	183	1.51	-0.50
		WB I-94 Exit	154	156	434	4,702	4,674	-28	44	29	D				12,072	12,250	178	1.47	-0.59
	WB I-94 Exit	**END NB TH 65**	156	158	1,164	2,841	2,971	130	53	19	B	53	19	B	7,254	7,725	471	6.49	4.59
	NB I-35W/TH 65 Split		146	161	286	3,630	3,425	-205	31	55	F				9,676	9,321	-356	-3.67	-5.64
			162	163	212	3,630	3,392	-238	24	72	F				9,676	9,310	-366	-3.78	-6.56
			163	164	311	3,630	3,386	-244	25	69	F	24	70	F	9,676	9,307	-369	-3.81	-6.71
		5th Ave Entrance	164	165	965	3,630	3,375	-255	23	75	F				9,676	9,298	-378	-3.90	-7.02
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,031	3,763	-268	32	53	F	32	53	F	10,617	10,225	-392	-3.70	-6.64
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,172	4,874	-298	48	32	D	48	32	D	13,627	13,154	-473	-3.47	-5.77
	EB I-94 Exit		167	168	540	3,933	3,730	-203	51	25	C				10,698	10,378	-320	-2.99	-5.16
		Washington Ave Exit	168	169	448	3,933	3,729	-204	52	24	C	51	24	C	10,698	10,373	-325	-3.04	-5.19
	Washington Ave Exit		169	170	625	3,223	3,051	-172	55	28	C				8,580	8,300	-280	-3.26	-5.34
		END NB I-35W	170	171	523	3,223	3,049	-174	57	27	C	56	27	C	8,580	8,297	-283	-3.30	-5.39
Northbound I-35W/TH 65 Ramps	TH 62	NB I-35W	204	104	266	1,731	1,750	19	53	18	B				5,215	5,275	60	1.15	1.10
	60th St	NB I-35W	206	106	505	311	311	0	55	6	A				716	715	-1	-0.10	0.06
	NB I-35W	Diamond Lake Road	108	208	271	291	285	-6	54	5	A				782	788	6	0.73	-2.06
	Diamond Lake Road		211	212	606	821	831	10	15	28	D				1,988	2,027	39	1.98	1.27
		NB I-35W	212	112	577	821	830	9	30	22	C				1,988	2,027	39	1.95	1.13
	NB I-35W	46th Street	116	216	370	199	197	-2	54	4	A				604	590	-14	-2.35	-1.01
	NB I-35W	46th St BRT	118	218	166	0	11	11	68	0	A				0	33	33	0.00	0.00
	46th St BRT	NB I-35W	220	120	246	0	11	11	38	0	A				0	33	33	0.00	0.00
	46th Street		221	222	818	1,119	1,119	0	22	26	C				2,700	2,703	3	0.10	-0.01
		NB I-35W	222	122	686	1,119	1,118	-2	31	30	D				2,700	2,697	-3	-0.10	-0.13
	NB I-35W	35/36th Street	128	228	533	100	96	-4	54	2	A				295	282	-13	-4.34	-3.60
	35/36th Street		231	232	595	1,139	1,140	1	16	37	E				2,890	2,897	7	0.26	0.12
		NB I-35W	232	132	470	1,139	1,139	0	27	32	D				2,890	2,894	4	0.14	-0.03
	NB I-35W	31/Lake Street	134	234	410	500	493	-7	49	10	B				1,436	1,380	-56	-3.91	-1.48
	NB I-35W	Lake St BRT	135	235	115	0	79	79	57	1	A				0	237	237	0.00	0.00
	NB I-35W		138	238	455	589	583	-6	53	11	B				1,539	1,502	-37	-2.40	-1.00
		28th St Exit	238	239	369	589	583	-6	54	11	B				1,539	1,501	-38	-2.44	-1.05
	Lake St BRT	NB I-35W	240	140	219	0	80	80	39	2	A				0	239	239	0.00	0.00
	NB TH 65	WB I-94	156	256	544	1,861	1,699	-162	28	60	F				4,818	4,519	-299	-6.21	-8.72
	5th Avenue		261	265	485	401	402	1	44	5	A				941	940	-1	-0.14	0.25
		NB I-35W	265	165	220	401	402	1	33	6	A				941	939	-2	-0.17	0.12
	EB I-94	NB I-35W	266	166	369	1,141	1,116	-25	52	22	C				3,010	2,943	-67	-2.22	-2.16
	NB I-35W (from 5th Ave)	EB I-94	167	267	483	1,239	1,142	-97	52	22	C				2,929	2,768	-161	-5.50	-7.80
	NB I-35W	Washington Ave	169	262	847	710	677	-33	54	6	A				2,118	2,068	-51	-2.38	-4.69
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	3,080	3,084	4	54	29	D	53.8	29.2	D	8,259	8,256	-3	-0.04	0.12
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	3,379	3,385	6	48	32	D	48.3	31.5	D	9,061	9,065	4	0.04	0.17
	WB I-94 Entrance		366	367	1,871	4,169	4,140	-29	55	25	C				11,044	11,020	-24	-0.22	-0.70
			367	368	750	4,169	4,134	-35	38	36	E				11,044	11,011	-33	-0.30	-0.84
			368	369	334	4,169	4,132	-37	40	35	D	50	28	D	11,044	11,006	-38	-0.34	-0.89
			369	370	179	4,169	4,131	-38	48	29	D				11,044	11,003	-41	-0.37	-0.91
		SB TH 65 Entrance	374	376	464	4,169	4,130	-39	56	25	C				11,044	10,995	-49	-0.44	-0.94
	Begin SB TH 65	12th St Entrance	300	302	867	600	602	2	63	5	A	62.5	4.9	A	1,627	1,631	4	0.27	0.28
	12th St Entrance	EB I-94 Entrance	302	304	1,296	999	1,077	78	55	9	A	54.9	9.1	A	2,621	2,850	229	8.72	7.85
	EB I-94 Entrance		304	307	1,366	2,890	2,943	53	59	17	B				8,077	8,180	103	1.28	1.82
			307	308	271	2,890	2,941	51	63	16	B	60	16	B	8,077	8,179	102	1.26	1.78
		SB I-35W Entrance	308	310	278	2,890	2,941	51	63	16	B				8,077	8,178	101	1.25	1.76
	SB I-35W Entrance		310	314	1,660	7,059	7,064	5	60	20	B				19,121	19,159	38	0.20	0.08
		Lake St Exit	314	318	765	7,059	7,057	-2	60	20	B	60	20	C	19,121	19,145	24	0.13	-0.03
	Lake St Exit	Lake St BRT Exit	318	320	586	6,350	6,350	0	64	17	B	64	17	B	17,199	17,203	4	0.02	0.00
	Lake St BRT Exit		320	322	545	6,350	6,265	-86	64	20	B				17,199	16,949	-250	-1.45	-1.35
			322	324	721	6,350	6,262	-88	64	20	B	64	19	B	17,199	16,943	-256	-1.49	-1.39
		31/Lake St Entrance	324	326	1,326	6,350	6,258	-92	65	19	B				17,199	16,935	-264	-1.54	-1.45
	31/Lake St Entrance	Lake St BRT Entrance	326	327	134	7,040	6,929	-111	59	20	B	59.1	19.5	B	18,997	18,680	-317	-1.67	-1.58
	Lake St BRT Entrance	35/36th St Exit	327	328	384	7,040	7,011	-29	59	17	B	59.3	17.1	B	18,997	18,926	-71	-0.38	-0.41
	35/36th St Exit		328	330	1,384	6,639	6,635	-5	64	21	C				17,806	17,795	-11	-0.06	-0.07
		35/36th St Entrance	330	332	1,712	6,639	6,630	-9	64	21	C	64	21	C	17,806	17,783	-23	-0.13	-0.13
	35/36th St Entrance		332	334	1,460	7,139	7,122	-17	58	23	C				19,045	19,010	-35	-0.18	-0.24
			334	336	544	7,139	7,116	-23	63	23	C	61	22	C	19,045	19,001	-44	-0.23	-0.32
		46th St Exit	336	338	1,512	7,139	7,112	-27	64	21	C				19,045	18,992	-53	-0.28	-0.38
	46th St Exit	46th St BRT Exit	338	340	780	6,639	6,653	14	65	19	B	65.3	18.5	B	17,668	17,690	22	0.13	0.22
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,639	6,644	5	65	21	C	64.8	20.5	C	17,668	17,668	0	0.00	0.07
	46th St BRT Entrance	46th St Entrance	342	344	393	6,639	6,645	6	63	18	B	63.3	18.2	B	17,668	17,677	9	0.05	0.09
	46th St Entrance		344	346	1,397	7,138	7,142	4	60	23	C				18,873	18,871	-2	-0.01	0.05
		60th St Exit	346	348	1,495	7,138	7,133	-6	57	24	C	58	23	C	18,873	18,854	-19	-0.10	-0.08
	60th St Exit	TH 62 Exit	348	350	2,036	6,737	6,727	-10	58	23	C	57.9	23.3	C	17,870	17,869	-1	0.00	-0.15
	TH 62 Exit		350	352	1,409	3,116	3,155	39	64	17	B				8,152	8,393	241	2.95	1.25
			352	354	1,616	3,116	3,151	35	66	16	B	65	16	B	8,152	8,385	233	2.86	1.11
		END SB I-35W	354	356	719	3,116	3,147	31	66	16	B				8,152	8,380	228	2.80	0.99
Southbound I-35W/TH 65 Ramps	Washington CD RD	SB I-35W	461	365	302	299	305	6	47	7	A				802	814	12	1.50	1.91
	WB I-94	SB I-35W	466	366	269	790	761	-29	52	15	B				1,983	1,963	-20	-1.03	-3.62
	12th Street	SB TH 65	402	302	283	399	477	78	46	11	B				994	1,221	227	**22.82**	**19.45**
	EB I-94	SB TH 65	664	304	815	1,891	1,866	-25	46	41	E				5,456	5,335	-121	-2.23	-1.31
	SB I-35W	SB TH 65	376	310	291	4,169	4,130	-39	56	24	C				11,044	10,992	-52	-0.47	-0.95
	SB I-35W	Lake St	318	418	271	709	704	-5	44	16	B				1,922	1,934	12	0.64	-0.69
	SB I-35W	Lake St BRT	320	420	118	0	84	84	57	2	A				0	248	248	0.00	0.00
	31/Lake Street		425	426	114	690	674	-16	29	12	B				1,798	1,753	-45	-2.48	-2.32
		SB I-35W	426	326	441	690	674	-16	34	15	B				1,798	1,753	-45	-2.51	-2.36
	Lake St BRT	SB I-35W	427	327	271	0	83	83	40	2	A				0	249	249	0.00	0.00
	SB I-35W	35/36th Street	328	428	395	401	376	-25	42	9	A				1,191	1,123	-68	-5.74	-6.33
	35/36th Street		431	432	669	500	500	0	28	9	A				1,239	1,240	1	0.07	-0.04
		SB I-35W	432	332	585	500	500	0	34	12	B				1,239	1,239	0	-0.02	-0.06
	SB I-35W	46th Street	338	438	703	500	455	-45	54	8	A				1,377	1,292	-85	-6.20	-9.06
	SB I-35W	46th St BRT	340	440	116	0	4	4	60	0	A				0	15	15	0.00	0.00
	46th St BRT	SB I-35W	442	342	216	0	4	4	44	0	A				0	15	15	0.00	0.00
	46th St BRT		443	444	1,118	499	499	0	41	6	A				1,205	1,203	-2	-0.13	0.08
		SB I-35W	444	344	378	499	499	0	34	11	B				1,205	1,202	-3	-0.23	0.00
	SB I-35W	60th Street	348	448	541	401	393	-8	54	7	A				1,003	965	-38	-3.75	-1.95
	SB I-35W		350	450	465	3,621	3,564	-57	53	22	C				9,718	9,462	-257	-2.64	-1.57
		TH 62	450	451	390	3,621	3,564	-57	53	22	C				9,718	9,460	-258	-2.65	-1.58
Eastbound I-94	**Begin EB I-94**		554	556	984	3,771	3,773	2	51	38	E				11,071	11,065	-6	-0.06	0.06
			556	557	632	3,771	3,775	4	50	38	E	49	39	E	11,071	11,063	-8	-0.08	0.11
		EB I-394 Entrance	557	558	789	3,771	3,778	7	47	40	E				11,071	11,063	-9	-0.08	0.19
	EB I-394 Entrance		558	559	442	5,951	5,782	-169	35	55	F				17,493	16,970	-523	-2.99	-2.84
			559	560	1,192	5,951	5,787	-164	38	51	F	35	55	F	17,493	16,962	-531	-3.03	-2.76
		Lyndale/Hennepin Entrance	560	561	1,856	5,951	5,785	-166	33	58	F				17,493	16,945	-548	-3.13	-2.79
	Lyndale/Hennepin Entrance		561	562	1,485	7,931	7,727	-204	40	48	F				22,259	21,671	-588	-2.64	-2.57
			562	563	706	7,931	7,715	-216	50	39	E	44	44	F	22,259	21,656	-603	-2.71	-2.72
		SB I-35W Exit	563	564	474	7,931	7,712	-219	50	39	E				22,259	21,649	-610	-2.74	-2.77
	SB I-35W Exit		564	565	792	6,040	5,843	-197	50	39	E				16,803	16,306	-497	-2.96	-3.25
			565	566	865	6,040	5,840	-200	51	38	E	51	37	E	16,803	16,299	-504	-3.00	-3.31
		NB I-35W Exit	566	567	388	6,040	5,837	-203	51	30	D				16,803	16,294	-509	-3.03	-3.36
	NB I-35W Exit	NB I-35W Entrance	567	568	688	4,899	4,717	-182	51	31	D	51.4	30.6	D	13,793	13,345	-448	-3.25	-3.72
	NB I-35W Entrance	TH 55 Exit	568	569	1,557	5,300	5,109	-192	55	23	C	55.2	23.2	C	14,829	14,371	-458	-3.09	-3.61
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,490	4,324	-166	59	24	C	59.1	24.4	C	12,346	11,950	-396	-3.21	-3.70
	NB I-35W Entrance		570	572	1,016	5,729	5,463	-266	61	23	C				15,275	14,712	-563	-3.68	-4.64
		Cedar Ave Entrance	572	573	1,027	5,729	5,458	-271	61	22	C	61	22	C	15,275	14,703	-572	-3.74	-4.74
	Cedar Ave Entrance		573	574	562	6,228	5,950	-278	58	21	C				16,575	15,994	-581	-3.50	-4.47
			574	576	930	6,228	5,948	-280	60	25	C				16,575	15,989	-586	-3.54	-4.49
			576	578	1,378	6,228	5,943	-285	61	24	C				16,575	15,979	-596	-3.60	-4.57
			578	580	1,268	6,228	5,936	-292	61	24	C	61	24	C	16,575	15,968	-607	-3.66	-4.68
			580	582	875	6,228	5,932	-296	61	24	C				16,575	15,958	-617	-3.72	-4.75
		END EB I-94	582	584	1,173	6,228	5,928	-300	61	24	C				16,575	15,946	-629	-3.80	-4.81
	EB I-394	EB I-94	658	558	266	2,180	2,000	-180	25	85	F				6,422	5,910	-512	-7.97	-8.27
	Lyndale/Hennepin Avenue		660	659	1,194	1,980	1,971	-9	27	38	E				4,766	4,759	-7	-0.14	-0.44
		EB I-94	659	561	302	1,980	1,960	-20	20	61	F				4,766	4,752	-15	-0.30	-1.02
	EB I-94	SB I-35W	564	664	604	1,891	1,866	-25	47	40	E				5,456	5,335	-121	-2.21	-1.34
	EB I-94	NB I-35W	567	266	389	1,141	1,117	-24	53	21	C				3,010	2,944	-66	-2.20	-2.12
	from 5th Ave	EB I-94	668	568	522	401	398	-3	50	8	A				1,036	1,035	-1	-0.06	-0.75
	NB I-35W	EB I-94	267	570	442	1,239	1,142	-97	52	22	C				2,929	2,768	-161	-5.50	-7.80
	EB I-94	TH 55	569	662	500	810	780	-30	49	16	B				2,483	2,413	-70	-2.80	-3.74
	Cedar Avenue	EB I-94	673	573	427	499	496	-3	54	10	A				1,300	1,298	-2	-0.18	-0.60
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,951	5,946	-5	62	24	C				15,954	15,943	-11	-0.07	-0.09
			750	752	590	5,951	5,942	-9	62	24	C				15,954	15,932	-22	-0.14	-0.16
			752	754	1,231	5,951	5,939	-12	61	24	C				15,954	15,924	-30	-0.19	-0.20
			754	756	1,378	5,951	5,936	-15	61	25	C	60	25	C	15,954	15,910	-44	-0.28	-0.25
			756	758	775	5,951	5,934	-17	59	25	C				15,954	15,896	-58	-0.36	-0.28
		Cedar Ave Exit	758	759	1,026	5,951	5,932	-19	55	25	C				15,954	15,883	-71	-0.44	-0.32
	Cedar Ave Exit		759	760	755	4,841	4,802	-39	53	23	C				12,939	12,853	-86	-0.67	-0.80
			760	761	1,114	4,841	4,801	-40	52	23	C	52	23	C	12,939	12,842	-97	-0.75	-0.83
		SB I-35W Exit	761	762	677	4,841	4,799	-42	51	23	C				12,939	12,831	-108	-0.83	-0.88
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,051	4,035	-16	51	27	C	50.6	26.6	C	10,956	10,863	-94	-0.85	-0.40
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,642	5,628	-14	48	29	D	47.8	28.5	D	15,362	15,255	-107	-0.69	-0.24
	11th St Exit		764	15	780	4,534	4,518	-16	50	30	D				12,308	12,234	-74	-0.60	-0.36
		NB I-35W Flyover	15	765	828	4,534	4,518	-16	50	30	D	50	30	D	12,308	12,228	-80	-0.65	-0.36
	NB I-35W Flyover	4th Ave Entrance	765	766	490	6,395	6,210	-185	47	33	D	49	31	D	17,126	16,727	-399	-2.33	-2.90
	4th Ave Entrance		766	767	714	6,695	6,507	-188	47	32	D				17,906	17,494	-412	-2.30	-2.81
		Lyndale/Hennepin Exit	767	768	1,834	6,695	6,503	-192	48	32	D	47	32	D	17,906	17,476	-430	-2.40	-2.87
	Lyndale/Hennepin Exit		768	769	1,590	5,685	5,511	-174	36	51	F				15,021	14,669	-352	-2.35	-3.06
			769	770	1,188	5,685	5,507	-178	45	41	E	41	43	F	15,021	14,650	-371	-2.47	-3.13
		WB I-394 Exit	770	771	1,432	5,685	5,502	-183	43	35	E				15,021	14,633	-388	-2.58	-3.22
	WB I-394 Exit		771	772	508	2,665	2,537	-128	52	16	B				6,857	6,624	-233	-3.40	-4.80
		TH 55 Exit	772	774	544	2,665	2,536	-129	54	13	B	53	15	B	6,857	6,620	-237	-3.45	-4.86
	TH 55 Exit	**END WB I-94**	774	776	400	2,396	2,271	-125	54	14	B	54	14	B	6,054	5,869	-185	-3.06	-5.20
	WB I-94	Cedar Avenue	759	859	254	1,110	1,127	17	53	21	C				3,015	3,019	4	0.15	1.55
	WB I-94	SB I-35W	762	466	250	790	762	-28	52	15	B				1,983	1,963	-20	-1.01	-3.57
	Washington CD Road		860	864	656	1,591	1,593	2	49	17	B				4,406	4,402	-4	-0.09	0.10
		WB I-94	864	763	506	1,591	1,593	2	47	17	B				4,406	4,401	-5	-0.11	0.12
	WB I-94	11th Street	764	861	492	1,108	1,112	4	52	21	C				3,054	3,013	-41	-1.35	0.32
	NB I-35W Flyover		256	6	470	1,861	1,695	-166	28	60	F				4,818	4,512	-306	-6.35	-8.92
			6	3	251	1,861	1,693	-168	32	52	F				4,818	4,508	-310	-6.43	-9.02
		WB I-94	3	765	200	1,861	1,693	-168	38	45	F				4,818	4,506	-312	-6.47	-9.04
	4th Avenue Entrance		5	4	466	300	300	0	14	11	B				780	778	-2	-0.31	0.13
			4	2	160	300	300	0	20	9	A				780	777	-3	-0.38	0.10
			2	1	164	300	300	0	34	9	A				780	777	-3	-0.41	0.07
		WB I-94	1	766	254	300	300	0	43	7	A				780	777	-3	-0.44	-0.07
	WB I-94	Lyndale/Hennepin Avenue	768	863	568	1,010	988	-22	49	10	B				2,885	2,782	-103	-3.56	-2.17
	WB I-94		771	871	392	3,020	2,961	-59	33	45	F				8,164	7,996	-169	-2.06	-1.96
		WB I-394	871	872	305	3,020	2,959	-61	25	58	F				8,164	7,993	-171	-2.10	-2.01
	WB I-94	TH 55	774	874	249	269	265	-4	54	5	A				803	749	-54	-6.76	-1.56

Table C6
Build S6A&Flyover_Full Aux 2018 AM Peak Period
Arterial Measures of Effectiveness

Iterations: 10 | Hour 4 | **MOE Hour** **7:00 AM-8:00 AM**

	Intersection	Appr	Link	Demand volumes					Total Delay by Movement (sec/veh)				Level of Service by Movement				LOS by Approach		LOS by Intersection		Through		Left Turn		Right Turn	
				Lt	Th	Rt	D	total	L	T	R	D	L	T	R	D	Delay	LOS	Delay	LOS	Link Length	Queue	Storage	Queue	Storage	Queue
signal	Lake Street at Stevens Ave	EB	990-918	0	460	141	0	601	-	11	9	-	-	B	A	-	11	B			1115	146				
signal		WB	919-918	120	435	0	0	555	10	5	-	-	A	A	-	-	6	A	12.9	B	326	94	225	98		
signal		SB	992-918	260	339	341	0	940	27	25	5	-	C	C	A	-	18	B			586	196	250	146		
signal	Lake Street at 2nd Ave	EB	918-919	19	701	0	0	720	5	9	-	-	A	A	-	-	9	A			326	180				
signal		WB	991-919	0	400	10	0	410	-	22	18	-	-	C	B	-	22	C	13.8	B	982	122				
signal		NB	917-919	155	11	210	0	376	24	24	7	-	C	C	A	-	15	B			618	144				
signal	31st Street at Stevens Ave	EB	988-916	0	210	171	0	381	-	26	16	-	-	C	B	-	22	C			1106	166				
signal		WB	917-916	120	290	0	0	410	13	9	-	-	B	A	-	-	10	B	12.5	B	328	112				
signal		SB	918-916	70	410	120	0	600	12	9	2	-	B	A	A	-	8	A			618	170			80	46
signal	31st Street at 2nd Ave	EB	916-917	29	251	0	0	280	23	16	-	-	C	B	-	-	16	B			328	92				
signal		WB	989-917	0	270	10	0	280	-	19	10	-	-	B	B	-	19	B	12.6	B	972	114				
signal		NB	987-917	140	337	130	0	607	10	8	5	-	A	A	A	-	8	A			281	140				
signal	Stevens to I-35W Split	SB	916-986	690	11	0	0	701	0	0	-	-	A	A	-	-	0	A			178	44				
signal	2nd Ave to I-35W Merge	NB	985-987	0	107	0	0	107	-	0	-	-	-	A	-	-	0	A			334	0				

Control Delay

Modeled Storage & Maximum Traffic Queueing (feet)

Table C7
Build S6A&Flyover_Full Aux 2018 PM Peak Period
Freeway Measures of Effectiveness
I-35W Lake Street Transit

Iterations:
10

MOE Hour
4:30 PM-5:30 PM
6

LOS A <10 vplph
LOS B 10<20 vplph
LOS C 20<28 vplph
LOS D 28<35 vplph
LOS E 35<43 vplph
LOS F >43 vplph

	Location		Node			Hourly Volumes			Link Statistics			Aggregate Statistics			Total Thruput				
	From	To	From	To	Length (ft)	Actual	Simu-lated	Differ-ence	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm	LOS	Actual	Simu-lated	Differ-ence	% Vol diff	Peak % Vol diff
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	5,200	5,229	29	61	22	C	61	22	C	14,792	14,885	93	0.63	0.57
	TH 62 Entrance	60th St Entrance	104	106	1,355	7,200	7,250	50	64	19	B	64	19	B	20,643	20,799	156	0.75	0.69
	60th St Entrance	Diamond Lake Exit	106	108	910	7,500	7,548	48	62	19	B	62	19	B	21,532	21,686	154	0.72	0.65
	Diamond Lake Exit		108	110	1,432	6,900	6,935	35	64	22	C				20,002	20,134	132	0.66	0.50
		Diamond Lake Entrance	110	112	1,225	6,900	6,933	33	61	23	C	63	22	C	20,002	20,130	128	0.64	0.48
	Diamond Lake Entrance		112	113	1,449	7,401	7,444	43	55	26	C				21,547	21,703	156	0.73	0.58
			113	114	542	7,401	7,443	42	62	24	C	60	24	C	21,547	21,699	152	0.71	0.56
		46th St Exit	114	116	1,462	7,401	7,442	41	64	22	C				21,547	21,694	147	0.68	0.55
	46th St Exit	46th St BRT Exit	116	118	238	6,801	6,828	27	65	18	B	65	18	B	19,949	20,111	162	0.81	0.39
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	6,801	6,823	22	65	21	C	65	21	C	19,949	20,094	145	0.72	0.32
	46th St BRT Entrance	46th St Entrance	120	122	378	6,801	6,829	28	64	18	B	64	18	B	19,949	20,107	158	0.79	0.41
	46th St Entrance		122	124	1,521	7,402	7,432	30	61	23	C				21,866	22,030	164	0.75	0.41
			124	126	818	7,402	7,432	30	63	24	C	62	23	C	21,866	22,032	166	0.76	0.40
		35/36th St Exit	126	128	1,514	7,402	7,434	32	64	23	C				21,866	22,031	165	0.75	0.43
	35/36th St Exit		128	130	1,485	7,003	7,035	32	64	22	C				20,783	20,952	169	0.82	0.46
		35/36th St Entrance	130	132	1,474	7,003	7,036	33	62	23	C	63	22	C	20,783	20,952	169	0.81	0.48
	35/36th St Entrance	31/Lake St Exit	132	134	604	7,802	7,844	42	53	23	C	53	23	C	23,305	23,487	182	0.78	0.53
	31/Lake St Exit	Lake St BRT Exit	134	135	478	7,202	7,263	61	46	24	C	46	24	C	21,551	21,768	217	1.00	0.84
	Lake St BRT Exit		135	136	553	7,202	7,199	-3	40	32	D				21,551	21,565	14	0.07	-0.04
		28th St Exit	136	138	843	7,202	7,214	12	34	38	E	36	35	E	21,551	21,566	15	0.07	0.17
	28th St Exit	Lake St BRT Entrance	138	140	1,112	6,702	6,726	24	28	49	F	28	49	F	20,061	20,055	-6	-0.03	0.36
	Lake St BRT Entrance		140	142	496	6,702	6,822	120	28	44	F				20,061	20,258	197	0.98	1.79
			142	144	1,043	6,702	6,841	139	29	48	F	29	47	F	20,061	20,261	200	0.99	2.07
		NB I-35W/TH 65 SPLIT	144	146	1,405	6,702	6,862	160	29	48	F				20,061	20,261	200	1.00	2.39
	Begin NB TH 65		146	148	294	3,601	3,690	89	58	21	C				10,350	10,659	309	2.99	2.46
			148	150	242	3,601	3,690	89	56	22	C				10,350	10,660	310	2.99	2.47
			150	152	180	3,601	3,691	90	54	23	C	52	22	C	10,350	10,661	311	3.00	2.49
			152	154	395	3,601	3,692	91	51	24	C				10,350	10,662	312	3.01	2.52
		WB I-94 Exit	154	156	434	3,601	3,691	90	47	22	C				10,350	10,662	312	3.02	2.51
	WB I-94 Exit	**END NB TH 65**	156	158	1,164	2,001	2,130	129	54	13	B	54	13	B	6,123	6,564	441	7.20	6.44
	NB I-35W/TH 65 Split		146	161	286	3,101	3,185	84	16	100	F				9,711	9,600	-111	-1.15	2.71
			162	163	212	3,101	3,197	96	14	113	F				9,711	9,585	-126	-1.30	3.10
			163	164	311	3,101	3,198	97	16	103	F	16	102	F	9,711	9,582	-129	-1.33	3.12
		5th Ave Entrance	164	165	965	3,101	3,199	98	16	100	F				9,711	9,577	-134	-1.38	3.17
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,900	4,000	100	29	64	F	29	64	F	11,930	11,789	-141	-1.19	2.56
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,070	5,190	120	45	36	E	45	36	E	15,517	15,391	-126	-0.81	2.36
	EB I-94 Exit		167	168	540	4,321	4,409	88	47	31	D				12,683	12,617	-66	-0.52	2.04
		Washington Ave Exit	168	169	448	4,321	4,407	86	50	29	D	49	30	D	12,683	12,617	-66	-0.52	2.00
	Washington Ave Exit		169	170	625	3,821	3,878	57	54	36	E				11,249	11,166	-83	-0.74	1.49
		END NB I-35W	170	171	523	3,821	3,878	57	56	35	D	55	35	E	11,249	11,166	-83	-0.74	1.49
Northbound I-35W/TH 65 Ramps	TH 62	NB I-35W	204	104	266	2,000	2,020	20	53	20	C				5,851	5,912	61	1.04	1.00
	60th St	NB I-35W	206	106	505	300	300	0	55	6	A				889	889	0	-0.01	0.07
	NB I-35W	Diamond Lake Road	108	208	271	600	611	11	54	11	B				1,530	1,550	20	1.29	1.82
	Diamond Lake Road		211	212	606	501	513	12	38	7	A				1,545	1,578	33	2.11	2.32
		NB I-35W	212	112	577	501	512	11	37	11	B				1,545	1,578	33	2.13	2.28
	NB I-35W	46th Street	116	216	370	600	614	14	54	11	B				1,598	1,578	-20	-1.23	2.30
	NB I-35W	46th St BRT	118	218	166	0	6	6	60	0	A				0	15	15	0.00	0.00
	46th St BRT	NB I-35W	220	120	246	0	6	6	45	0	A				0	15	15	0.00	0.00
	46th Street		221	222	818	601	605	4	16	20	B				1,917	1,923	6	0.30	0.73
		NB I-35W	222	122	686	601	605	4	33	15	B				1,917	1,922	5	0.26	0.73
	NB I-35W	35/36th Street	128	228	533	399	400	1	54	7	A				1,083	1,077	-6	-0.55	0.30
	35/36th Street		231	232	595	799	803	4	12	34	D				2,522	2,530	8	0.30	0.44
		NB I-35W	232	132	470	799	804	5	29	21	C				2,522	2,531	9	0.36	0.68
	NB I-35W	31/Lake Street	134	234	410	600	585	-15	48	12	B				1,754	1,721	-33	-1.86	-2.43
	NB I-35W	Lake St BRT	135	235	115	0	71	71	56	1	A				0	204	204	0.00	0.00
	NB I-35W		138	238	455	500	518	18	52	10	A				1,490	1,510	20	1.36	3.62
		28th St Exit	238	239	369	500	518	18	54	10	A				1,490	1,510	20	1.34	3.64
	Lake St BRT	NB I-35W	240	140	219	0	69	69	39	2	A				0	204	204	0.00	0.00
	NB TH 65	WB I-94	156	256	544	1,600	1,562	-38	30	52	F				4,227	4,099	-128	-3.03	-2.40
	5th Avenue		261	265	485	799	800	1	11	38	E				2,219	2,218	-1	-0.05	0.18
		NB I-35W	265	165	220	799	800	1	21	20	C				2,219	2,218	-1	-0.04	0.15
	EB I-94	NB I-35W	266	166	369	1,170	1,190	20	52	23	C				3,587	3,607	20	0.55	1.73
	NB I-35W (from 5th Ave)	EB I-94	167	267	483	749	780	31	53	15	B				2,834	2,774	-60	-2.13	4.14
	NB I-35W	Washington Ave	169	262	847	500	528	28	54	5	A				1,434	1,450	16	1.08	5.52
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,488	2,490	2	54	24	C	54.1	23.5	C	7,848	7,847	-1	-0.01	0.08
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	3,388	3,397	9	43	35	E	43.3	35.3	E	10,688	10,700	12	0.11	0.27
	WB I-94 Entrance		366	367	1,871	4,729	4,747	18	53	30	D				14,276	14,335	59	0.41	0.38
			367	368	750	4,729	4,745	16	36	44	F				14,276	14,334	58	0.40	0.33
			368	369	334	4,729	4,745	16	40	40	E	48	34	D	14,276	14,335	59	0.41	0.34
			369	370	179	4,729	4,745	16	48	33	D				14,276	14,336	60	0.42	0.33
		SB TH 65 Entrance	374	376	464	4,729	4,743	14	55	29	D				14,276	14,337	61	0.42	0.29
	Begin SB TH 65	12th St Entrance	300	302	867	2,170	2,168	-2	57	20	B	56.5	19.6	B	5,375	5,379	4	0.07	-0.11
	12th St Entrance	EB I-94 Entrance	302	304	1,296	2,860	2,928	68	49	28	C	48.8	27.8	C	7,172	7,381	209	2.91	2.39
	EB I-94 Entrance		304	307	1,366	4,641	4,685	44	59	27	C				12,626	12,781	155	1.23	0.95
			307	308	271	4,641	4,685	44	61	26	C	59	26	C	12,626	12,780	154	1.22	0.94
		SB I-35W Entrance	308	310	278	4,641	4,684	43	60	26	C				12,626	12,780	154	1.22	0.94
	SB I-35W Entrance		310	314	1,660	9,370	9,424	54	55	28	D				26,902	27,119	217	0.81	0.58
		Lake St Exit	314	318	765	9,370	9,421	51	56	28	C	56	28	D	26,902	27,120	218	0.81	0.54
	Lake St Exit	Lake St BRT Exit	318	320	586	8,560	8,572	12	60	25	C	60	25	C	24,547	24,682	135	0.55	0.14
	Lake St BRT Exit		320	322	545	8,560	8,491	-69	61	28	D				24,547	24,456	-91	-0.37	-0.81
			322	324	721	8,560	8,492	-68	61	28	C	60	28	D	24,547	24,458	-89	-0.36	-0.80
		31/Lake St Entrance	324	326	1,326	8,560	8,494	-66	60	29	D				24,547	24,462	-85	-0.35	-0.77
	31/Lake St Entrance	Lake St BRT Entrance	326	327	134	9,740	9,639	-101	51	31	D	51.3	31.4	D	28,034	27,767	-267	-0.95	-1.03
	Lake St BRT Entrance	35/36th St Exit	327	328	384	9,740	9,716	-25	52	27	C	52	27	C	28,034	27,993	-41	-0.15	-0.25
	35/36th St Exit		328	330	1,384	8,830	8,807	-23	60	29	D				25,256	25,257	1	0.01	-0.26
		35/36th St Entrance	330	332	1,712	8,830	8,806	-24	61	29	D	61	29	D	25,256	25,256	0	0.00	-0.28
	35/36th St Entrance		332	334	1,460	9,131	9,106	-25	53	32	D				26,145	26,143	-2	-0.01	-0.28
			334	336	544	9,131	9,103	-28	55	33	D	56	31	D	26,145	26,142	-3	-0.01	-0.31
		46th St Exit	336	338	1,512	9,131	9,103	-28	59	30	D				26,145	26,141	-4	-0.02	-0.31
	46th St Exit	46th St BRT Exit	338	340	780	8,122	8,115	-8	64	23	C	64	23	C	23,293	23,354	61	0.26	-0.09
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	8,122	8,101	-21	64	25	C	63.9	25.4	C	23,293	23,321	28	0.12	-0.26
	46th St BRT Entrance	46th St Entrance	342	344	393	8,122	8,111	-11	62	23	C	62	22.7	C	23,293	23,359	66	0.28	-0.14
	46th St Entrance		344	346	1,397	8,423	8,414	-9	57	28	D				24,195	24,265	70	0.29	-0.10
		60th St Exit	346	348	1,495	8,423	8,416	-7	50	33	D	53	30	D	24,195	24,270	75	0.31	-0.08
	60th St Exit	TH 62 Exit	348	350	2,036	7,912	7,931	19	54	29	D	54.2	29.3	D	22,833	22,941	108	0.47	0.24
	TH 62 Exit		350	352	1,409	3,450	3,492	42	63	18	B				9,748	9,945	197	2.02	1.23
			352	354	1,616	3,450	3,492	42	65	18	B	65	18	B	9,748	9,941	193	1.98	1.21
		END SB I-35W	354	356	719	3,450	3,491	41	66	18	B				9,748	9,938	190	1.95	1.18
Southbound I-35W/TH 65 Ramps	Washington CD RD	SB I-35W	461	365	302	900	905	5	44	22	C				2,840	2,852	12	0.43	0.58
	WB I-94	SB I-35W	466	366	269	1,341	1,352	11	51	27	C				3,588	3,635	47	1.32	0.81
	12th Street	SB TH 65	402	302	283	690	761	71	40	20	C				1,797	2,005	208	**11.55**	**10.23**
	EB I-94	SB TH 65	664	304	815	1,781	1,758	-23	46	39	E				5,454	5,403	-51	-0.93	-1.27
	SB I-35W	SB TH 65	376	310	291	4,729	4,743	14	56	28	D				14,276	14,337	61	0.43	0.29
	SB I-35W	Lake St	318	418	271	810	847	37	44	20	B				2,355	2,440	85	3.61	4.52
	SB I-35W	Lake St BRT	320	420	118	0	80	80	56	1	A				0	227	227	0.00	0.00
	31/Lake Street		425	426	114	1,180	1,145	-35	27	21	C				3,487	3,304	-183	-5.26	-2.98
		SB I-35W	426	326	441	1,180	1,145	-35	32	27	C				3,487	3,303	-184	-5.27	-2.98
	Lake St BRT	SB I-35W	427	327	271	0	78	78	41	2	A				0	228	228	0.00	0.00
	SB I-35W	35/36th Street	328	428	395	910	907	-3	39	23	C				2,778	2,736	-42	-1.51	-0.35
	35/36th Street		431	432	669	301	301	0	27	6	A				889	889	0	0.00	0.13
		SB I-35W	432	332	585	301	302	1	34	7	A				889	889	0	0.01	0.47
	SB I-35W	46th Street	338	438	703	1,009	989	-20	54	19	B				2,852	2,785	-67	-2.34	-1.98
	SB I-35W	46th St BRT	340	440	116	0	12	12	46	0	A				0	35	35	0.00	0.00
	46th St BRT	SB I-35W	442	342	216	0	12	12	41	0	A				0	35	35	0.00	0.00
	46th St BRT		443	444	1,118	301	302	1	41	4	A				902	902	-1	-0.06	0.33
		SB I-35W	444	344	378	301	302	1	34	6	A				902	902	0	-0.04	0.47
	SB I-35W	60th Street	348	448	541	511	493	-18	54	9	A				1,362	1,334	-28	-2.09	-3.60
	SB I-35W		350	450	465	4,462	4,445	-17	53	28	D				13,085	12,997	-88	-0.67	-0.37
		TH 62	450	451	390	4,462	4,447	-16	53	28	D				13,085	13,000	-85	-0.65	-0.35
Eastbound I-94	**Begin EB I-94**		554	556	984	3,791	3,794	3	51	38	E				11,109	11,105	-4	-0.03	0.09
			556	557	632	3,791	3,795	4	51	37	E	50	38	E	11,109	11,105	-4	-0.04	0.11
		EB I-394 Entrance	557	558	789	3,791	3,797	6	48	40	E				11,109	11,105	-4	-0.04	0.16
	EB I-394 Entrance		558	559	442	5,881	5,859	-22	37	53	F				17,304	17,286	-18	-0.11	-0.37
			559	560	1,192	5,881	5,863	-18	40	48	F	38	51	F	17,304	17,286	-18	-0.11	-0.31
		Lyndale/Hennepin Entrance	560	561	1,856	5,881	5,866	-15	37	53	F				17,304	17,287	-18	-0.10	-0.26
	Lyndale/Hennepin Entrance		561	562	1,485	7,473	7,459	-14	44	42	E				21,941	21,924	-17	-0.08	-0.18
			562	563	706	7,473	7,460	-13	50	37	E	47	40	E	21,941	21,925	-16	-0.07	-0.17
		SB I-35W Exit	563	564	474	7,473	7,460	-13	50	37	E				21,941	21,927	-14	-0.06	-0.17
	SB I-35W Exit		564	565	792	5,692	5,701	9	51	38	E				16,487	16,526	39	0.24	0.16
			565	566	865	5,692	5,698	6	51	37	E	51	36	E	16,487	16,525	38	0.23	0.11
		NB I-35W Exit	566	567	388	5,692	5,696	4	51	29	D				16,487	16,525	38	0.23	0.06
	NB I-35W Exit	NB I-35W Entrance	567	568	688	4,522	4,505	-17	51	29	D	51.4	29.2	D	12,900	12,920	20	0.15	-0.38
	NB I-35W Entrance	TH 55 Exit	568	569	1,557	5,122	5,102	-20	55	23	C	55	23.2	C	14,635	14,654	19	0.13	-0.39
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,122	4,122	0	59	23	C	59.3	23.2	C	11,815	11,841	26	0.22	0.00
	NB I-35W Entrance		570	572	1,016	4,871	4,903	32	61	20	C				14,649	14,618	-31	-0.21	0.65
		Cedar Ave Entrance	572	573	1,027	4,871	4,900	29	61	20	C	61	20	C	14,649	14,619	-30	-0.20	0.60
	Cedar Ave Entrance		573	574	562	6,159	6,184	25	50	26	C				18,246	18,216	-30	-0.17	0.40
			574	576	930	6,159	6,183	24	56	28	C				18,246	18,219	-27	-0.15	0.39
			576	578	1,378	6,159	6,184	25	61	25	C				18,246	18,221	-25	-0.14	0.41
			578	580	1,268	6,159	6,185	26	61	25	C	59	26	C	18,246	18,224	-22	-0.12	0.42
			580	582	875	6,159	6,185	26	61	25	C				18,246	18,226	-20	-0.11	0.42
		END EB I-94	582	584	1,173	6,159	6,184	25	61	25	C				18,246	18,225	-21	-0.12	0.40
	EB I-394	EB I-94	658	558	266	2,090	2,060	-30	28	79	F				6,195	6,181	-14	-0.23	-1.42
	Lyndale/Hennepin Avenue		660	659	1,194	1,592	1,594	2	34	24	C				4,637	4,637	0	-0.01	0.11
		EB I-94	659	561	302	1,592	1,593	1	25	38	E				4,637	4,637	0	-0.01	0.05
	EB I-94	SB I-35W	564	664	604	1,781	1,758	-23	47	38	E				5,454	5,403	-51	-0.94	-1.29
	EB I-94	NB I-35W	567	266	389	1,170	1,190	20	52	23	C				3,587	3,607	20	0.55	1.71
	from 5th Ave	EB I-94	668	568	522	600	599	-1	50	13	B				1,735	1,733	-2	-0.14	-0.10
	NB I-35W	EB I-94	267	570	442	749	781	32	53	15	B				2,834	2,774	-60	-2.11	4.22
	EB I-94	TH 55	569	662	500	1,000	979	-21	48	20	C				2,820	2,813	-7	-0.23	-2.14
	Cedar Avenue	EB I-94	673	573	427	1,288	1,286	-2	54	25	C				3,597	3,595	-2	-0.05	-0.12
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,281	5,281	0	63	21	C				16,352	16,355	3	0.02	0.00
			750	752	590	5,281	5,283	2	62	21	C				16,352	16,356	4	0.02	0.03
			752	754	1,231	5,281	5,284	3	62	21	C				16,352	16,357	5	0.03	0.06
			754	756	1,378	5,281	5,285	4	62	21	C	61	21	C	16,352	16,360	8	0.05	0.07
			756	758	775	5,281	5,284	3	61	22	C				16,352	16,361	9	0.05	0.05
		Cedar Ave Exit	758	759	1,026	5,281	5,284	3	57	22	C				16,352	16,365	13	0.08	0.06
	Cedar Ave Exit		759	760	755	4,981	4,979	-2	53	24	C				15,419	15,447	28	0.18	-0.03
			760	761	1,114	4,981	4,981	0	52	24	C	52	24	C	15,419	15,451	32	0.20	0.00
		SB I-35W Exit	761	762	677	4,981	4,982	1	51	24	C				15,419	15,454	35	0.23	0.02
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,640	3,629	-12	51	24	C	51.2	23.6	C	11,831	11,823	-8	-0.07	-0.32
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,029	4,850	-179	50	24	C	49.6	23.7	C	16,289	15,159	-1,130	-6.94	-3.56
	11th St Exit		764	15	780	4,529	4,359	-170	50	29	D				14,647	13,632	-1,015	-6.93	-3.76
		NB I-35W Flyover	15	765	828	4,529	4,359	-170	51	29	D	51	29	D	14,647	13,634	-1,014	-6.92	-3.76
	NB I-35W Flyover	4th Ave Entrance	765	766	490	6,129	5,923	-206	48	31	D	50	30	D	18,874	17,724	-1,150	-6.09	-3.35
	4th Ave Entrance		766	767	714	7,130	6,926	-204	44	36	E				21,702	20,544	-1,158	-5.33	-2.86
		Lyndale/Hennepin Exit	767	768	1,834	7,130	6,925	-205	48	34	D	47	34	D	21,702	20,540	-1,162	-5.35	-2.88
	Lyndale/Hennepin Exit		768	769	1,590	5,819	5,689	-130	36	52	F				17,956	17,054	-902	-5.03	-2.23
			769	770	1,188	5,819	5,693	-126	45	42	E	41	44	F	17,956	17,055	-901	-5.02	-2.16
		WB I-394 Exit	770	771	1,432	5,819	5,694	-125	44	36	E				17,956	17,055	-901	-5.02	-2.16
	WB I-394 Exit		771	772	508	3,209	3,161	-48	51	21	C				10,239	9,808	-431	-4.21	-1.48
		TH 55 Exit	772	774	544	3,209	3,163	-46	54	17	B	52	18	B	10,239	9,808	-431	-4.21	-1.44
	TH 55 Exit	**END WB I-94**	774	776	400	2,808	2,771	-37	54	17	B	53.8	17.2	B	9,022	8,642	-380	-4.21	-1.32
	WB I-94	Cedar Avenue	759	859	254	300	306	6	54	6	A				933	922	-11	-1.18	1.83
	WB I-94	SB I-35W	762	466	250	1,341	1,353	12	51	27	C				3,588	3,635	47	1.32	0.91
	Washington CD Road		860	864	656	1,389	1,219	-170	4	177	F				4,458	3,330	-1,128	**-25.31**	**-12.25**
		WB I-94	864	763	506	1,389	1,218	-171	32	19	B				4,458	3,329	-1,129	**-25.32**	**-12.29**
	WB I-94	11th Street	764	861	492	500	493	-7	54	9	A				1,642	1,532	-110	-6.70	-1.46
	NB I-35W Flyover		256	6	470	1,600	1,562	-38	29	55	F				4,227	4,095	-132	-3.13	-2.36
			6	3	251	1,600	1,563	-37	32	48	F				4,227	4,093	-134	-3.18	-2.34
		WB I-94	3	765	200	1,600	1,563	-37	38	42	E				4,227	4,092	-135	-3.20	-2.34
	4th Avenue Entrance		5	4	466	1,001	1,001	0	11	46	F				2,828	2,826	-2	-0.08	-0.01
			4	2	160	1,001	1,001	0	20	29	D				2,828	2,824	-4	-0.14	0.02
			2	1	164	1,001	1,001	0	34	30	D				2,828	2,824	-4	-0.15	-0.02
		WB I-94	1	766	254	1,001	1,001	0	41	24	C				2,828	2,824	-5	-0.16	0.00
	WB I-94	Lyndale/Hennepin Avenue	768	863	568	1,311	1,238	-73	49	13	B				3,746	3,485	-262	-6.98	-5.58
	WB I-94		771	871	392	2,610	2,532	-78	33	38	E				7,717	7,248	-469	-6.08	-2.98
		WB I-394	871	872	305	2,610	2,531	-79	26	49	F				7,717	7,248	-469	-6.08	-3.01
	WB I-94	TH 55	774	874	249	401	393	-8	54	7	A				1,217	1,165	-52	-4.27	-2.04

Table C8
Build S6A&Flyover_Full Aux 2018 PM Peak Period
Arterial Measures of Effectiveness

Iterations: 10 | Hour 6 | **MOE Hour** **4:30 PM-5:30 PM**

	Intersection	Appr	Link	Demand volumes					Total Delay by Movement (sec/veh)				Level of Service by Movement				LOS by Approach		LOS by Intersection		Through		Left Turn		Right Turn	
									Control Delay												Modeled Storage & Maximum Traffic Queueing (feet)					
				Lt	Th	Rt	D	total	L	T	R	D	L	T	R	D	Delay	LOS	Delay	LOS	Link Length	Queue	Storage	Queue	Storage	Queue
signal		EB	990-918	0	540	140	0	680	-	17	15	-	-	B	B	-	17	B			1115	184				
signal	Lake Street at Stevens Ave	WB	919-918	280	870	0	0	1150	18	8	-	-	B	A	-	-	11	B	18.5	B	326	166	225	200		
signal		SB	992-918	320	606	409	0	1335	31	34	9	-	C	C	A	-	26	C			586	386	250	200		
signal		EB	918-919	9	851	0	0	860	15	8	-	-	B	A	-	-	8	A			326	218				
signal	Lake Street at 2nd Ave	WB	991-919	0	1010	10	0	1020	-	23	22	-	-	C	C	-	23	C	16.0	B	982	232				
signal		NB	917-919	140	10	161	0	311	25	21	6	-	C	C	A	-	15	B			618	178				
signal		EB	988-916	0	321	159	0	480	-	14	13	-	-	B	B	-	13	B			1106	162				
signal	31st Street at Stevens Ave	WB	917-916	299	612	0	0	911	20	15	-	-	B	B	-	-	17	B	26.3	C	328	252				
signal		SB	918-916	101	765	160	0	1026	50	43	20	-	D	D	B	-	40	D			618	454			80	80
signal		EB	916-917	20	402	0	0	422	22	15	-	-	C	B	-	-	15	B			328	162				
signal	31st Street at 2nd Ave	WB	989-917	0	631	11	0	642	-	11	9	-	-	B	A	-	11	B	14.7	B	972	188				
signal		NB	987-917	280	280	141	0	701	21	17	10	-	C	B	B	-	18	B			281	228				
signal	Stevens to I-35W Split	SB	916-986	1180	43	0	0	1223	0	0	-	-	A	A	-	-	0	A			178	118				
signal	2nd Ave to I-35W Merge	NB	985-987	0	101	0	0	101	-	0	-	-	-	A	-	-	0	A			334	0				

Appendix D

MnDOT CORSIM Review Letters

Minnesota Department of Transportation

Metropolitan Division Traffic Engineering
Waters Edge Building, 2nd Floor South
1500 West County Road B-2
Roseville, Minnesota 55113-3105

Phone #: (651) 234-7844
Fax #: (651) 234-7809

November 21st, 2011

Graham Johnson, P.E.
Short Elliot Hendrickson Inc.
10901 Red Circle Drive
Suite 200
Minnetonka, MN 55343-9301

Subject: I-35W Transit Access Project – 2011 Existing Conditions Modeling Submittal

This letter summarizes the findings of the 2011 existing conditions modeling submittal for the I-35W transit access project in Minneapolis, Minnesota. The following discussion pertains to the submittals of November 1st and 16th, 2011.

The 2011 existing condition models are approved.

If you have questions, please feel free to contact me at (651) 234-7844.

Sincerely,

Kevin Sommers
Mn/DOT –Metro Division Traffic

cc:
Jim McCarthy, Federal Highway Administration
John Griffith, Metro West Area Manager
Ryan Coddington, Metro Traffic Program Support – West Area Manager
Tony Fischer, Metro Traffic Freeway Operations

Minnesota Department of Transportation

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March 29th, 2012

Graham Johnson, P.E.
Short Elliot Hendrickson Inc.
10901 Red Circle Drive
Suite 200
Minnetonka, MN 55343-9301

Subject: I-35W Transit Access Project – 2038 No Build Modeling Submittal

This letter summarizes the findings of the 2038 no build modeling submittal for the I-35W transit access project in Minneapolis, Minnesota. The following discussion pertains to the submittal of March 20th, 2012.

The 2038 no build models are approved.

If you have questions, please feel free to contact me at (651) 234-7844.

Sincerely,

Kevin Sommers
Mn/DOT –Metro Division Traffic

cc:
Jim McCarthy, Federal Highway Administration
John Griffith, Metro West Area Manager
Ryan Coddington, Metro Traffic Program Support – West Area Manager
Tony Fischer, Metro Traffic Freeway Operations

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April 20th, 2012

Graham Johnson, P.E.
Short Elliot Hendrickson Inc.
10901 Red Circle Drive
Suite 200
Minnetonka, MN 55343-9301

Subject: I-35W Transit Access Project – 2038 Transit Station Only Modeling Submittal

This letter summarizes the findings of the 2038 transit station only modeling submittal for the I-35W transit access project in Minneapolis, Minnesota. The following discussion pertains to the submittals of April 11th and April 17th, 2012.

The 2038 transit station only models are approved.

If you have questions, please feel free to contact me at (651) 234-7844.

Sincerely,

Kevin Sommers
Mn/DOT –Metro Division Traffic

cc:
Jim McCarthy, Federal Highway Administration
John Griffith, Metro West Area Manager
Ryan Coddington, Metro Traffic Program Support – West Area Manager
Tony Fischer, Metro Traffic Freeway Operations

Minnesota Department of Transportation

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May 16th, 2012

Graham Johnson, P.E.
Short Elliot Hendrickson Inc.
10901 Red Circle Drive
Suite 200
Minnetonka, MN 55343-9301

Subject: I-35W Transit Access Project – 2038 No Build Modeling Resubmittal
2038 Transit Station Only Modeling Resubmittal

This letter summarizes the findings of the 2038 no build and 2038 transit station only modeling resubmittals for the I-35W transit access project in Minneapolis, Minnesota. The following discussion pertains to the submittals of May 8th, 2012.

The 2038 no build models are approved.
The 2038 transit station only models are approved.

If you have questions, please feel free to contact me at (651) 234-7844.

Sincerely,

Kevin Sommers
Mn/DOT –Metro Division Traffic

cc:
Jim McCarthy, Federal Highway Administration
John Griffith, Metro West Area Manager
Ryan Coddington, Metro Traffic Program Support – West Area Manager
Tony Fischer, Metro Traffic Freeway Operations

Minnesota Department of Transportation

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September 25th, 2014

Graham Johnson, P.E.
Short Elliot Hendrickson Inc.
10901 Red Circle Drive
Suite 200
Minnetonka, MN 55343-9301

Subject: I-35W Transit Access Project – 2018 and 2038 S6A Modeling Submittal

This letter summarizes the findings of the 2018 and 2038 S6A modeling submittal for the I-35W transit access project in Minneapolis, Minnesota. The following discussion pertains to the submittal of September 17th, 2014.

The 2018 S6A models are approved.
The 2038 S6A models are approved.

If you have questions, please feel free to contact me at (651) 234-7844.

Sincerely,

Kevin Sommers
Mn/DOT –Metro Division Traffic

cc:
Nnaemeka Ezekwemba, Federal Highway Administration
Ron Rauchle, MnDOT Project Manager
Chad Erickson, Metro Traffic Program Support – West Area Manager
Tony Fischer, Metro Traffic Freeway Operations

Minnesota Department of Transportation

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May 23rd, 2012

Graham Johnson, P.E.
Short Elliot Hendrickson Inc.
10901 Red Circle Drive
Suite 300
Minnetonka, MN 55343-9301

Subject: I-35W Transit Access Project – 2038 Full Build Modeling Submittal
2038 Transit NB Flyover SB Braid Modeling Submittal

This letter summarizes the findings of the 2038 Full Build and 2038 Transit NB Flyover SB Braid modeling submittals for the I-35W transit access project in Minneapolis, Minnesota. The following discussion pertains to the submittals of May 8th and 17th, 2012.

The 2038 Full Build models are approved.
The 2038 Transit NB Flyover SB Braid models are approved.

If you have questions, please feel free to contact me at (651) 234-7844.

Sincerely,

Kevin Sommers
Mn/DOT –Metro Division Traffic

cc:
Jim McCarthy, Federal Highway Administration
John Griffith, Metro West Area Manager
Ryan Coddington, Metro Traffic Program Support – West Area Manager
Tony Fischer, Metro Traffic Freeway Operations

Minnesota Department of Transportation

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June 15th, 2012

Graham Johnson, P.E.
Short Elliot Hendrickson Inc.
10901 Red Circle Drive
Suite 300
Minnetonka, MN 55343-9301

Subject: I-35W Transit Access Project – 2038 Full Build with Left NB Flyover Model Submittal
2038 Full Build without 4th Ave. Model Submittal

This letter summarizes the findings of the 2038 Full Build with Left NB Flyover and 2038 Full Build without 4th Ave. modeling submittals for the I-35W transit access project in Minneapolis, Minnesota. The following discussion pertains to the submittals of June 1st and 6th, 2012.

The 2038 Full Build with Left NB Flyover models are approved.
The 2038 Full Build without 4th Ave. models are approved.

If you have questions, please feel free to contact me at (651) 234-7844.

Sincerely,

Kevin Sommers
Mn/DOT –Metro Division Traffic

cc:
Jim McCarthy, Federal Highway Administration
John Griffith, Metro West Area Manager
Ryan Coddington, Metro Traffic Program Support – West Area Manager
Tony Fischer, Metro Traffic Freeway Operations

Minnesota Department of Transportation

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June 26th, 2012

Graham Johnson, P.E.
Short Elliot Hendrickson Inc.
10901 Red Circle Drive
Suite 300
Minnetonka, MN 55343-9301

Subject: I-35W Transit Access Project – 2038 Lake St. Ramps Only Model
2038 Full Build with NB Flyover w/o 4th Ave. Model

This letter summarizes the findings of the 2038 Lake St. Ramps Only and 2038 Full Build with NB Flyover without 4th Ave. modeling submittals for the I-35W transit access project in Minneapolis, Minnesota. The following discussion pertains to the submittals of June 13th and 22nd, 2012.

The 2038 Lake St. Ramps Only models are approved.
The 2038 Full Build with NB Flyover without 4th Ave. models are approved.

If you have questions, please feel free to contact me at (651) 234-7844.

Sincerely,

Kevin Sommers
Mn/DOT –Metro Division Traffic

cc:
Jim McCarthy, Federal Highway Administration
John Griffith, Metro West Area Manager
Ryan Coddington, Metro Traffic Program Support – West Area Manager
Tony Fischer, Metro Traffic Freeway Operations

Minnesota Department of Transportation

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July 26th, 2012

Graham Johnson, P.E.
Short Elliot Hendrickson Inc.
10901 Red Circle Drive
Suite 300
Minnetonka, MN 55343-9301

Subject: I-35W Transit Access Project – 2018 No Build Model
2018 Transit Station Only Model
2018 Transit Flyover Braid Model
2018 Lake St. Ramps Only Model

This letter summarizes the findings of the above mentioned 2018 modeling submittals for the I-35W transit access project in Minneapolis, Minnesota. The following discussion pertains to the submittals of July 6th, 2012.

The 2018 No Build models are approved.
The 2018 Transit Station Only models are approved.
The 2018 Transit Flyover Braid models are approved.
The 2018 Lake St. Ramps Only models are approved.

If you have questions, please feel free to contact me at (651) 234-7844.

Sincerely,

Kevin Sommers
Mn/DOT –Metro Division Traffic

cc:
Scott Pedersen, Metro West Area Manager
Ryan Coddington, Metro Traffic Program Support – West Area Manager
Tony Fischer, Metro Traffic Freeway Operations

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August 7th, 2012

Graham Johnson, P.E.
Short Elliot Hendrickson Inc.
10901 Red Circle Drive
Suite 300
Minnetonka, MN 55343-9301

Subject: I-35W Transit Access Project – 2018 Lake St. Ramps Only Model
2018 Full Build Model
2018 Full Build without 4th Ave. Model
2018 Full Build with NB Flyover Model
2018 Full Build with NB Flyover w/o 4th Ave. Model

This letter summarizes the findings of the above mentioned 2018 modeling submittals for the I-35W transit access project in Minneapolis, Minnesota. The following discussion pertains to the submittals of July 6th and August 1st, 2012.

The 2018 Lake St. Ramps Only models are approved.
The 2018 Full Build models are approved.
The 2018 Full Build without 4th Ave. models are approved.
The 2018 Full Build with NB Flyover models are approved.
The 2018 Full Build with NB Flyover w/o 4th Ave. models are approved.

If you have questions, please feel free to contact me at (651) 234-7844.

Sincerely,

Kevin Sommers
Mn/DOT –Metro Division Traffic

cc:
Scott Pedersen, Metro West Area Manager
Ryan Coddington, Metro Traffic Program Support – West Area Manager
Tony Fischer, Metro Traffic Freeway Operations

Appendix E

I-35W Transit Access Forecast Memorandum

TECHNICAL MEMORANDUM

TO: I-35W Transit Access Project Technical Advisory Committee (TAC)

FROM: Haifeng Xiao, PE, Senior Transportation Engineer
Mike Kotila, PE, Project Engineer

DATE: June 26, 2014

RE: I-35W Transit Access Project Traffic Forecasts
Freeway System and Arterial/Local Street Network
SEH No. 113114

This memorandum is an update to the I-35W Transit Access Project traffic forecast memorandum dated January 13, 2012 (the "2012 Traffic Forecast"). The 2012 Traffic Forecast documented the methodology, assumptions and results for nine traffic forecast scenarios developed to that point in time. A Preferred Alternative, Scenario S6, was identified for further study. Scenario S6 includes a new southbound I-35W exit ramp to Lake Street and a new northbound I-35W exit ramp to 28th Street. Subsequently, it was determined a southbound MnPASS lane from Downtown Minneapolis to 46th Street should also be included in the project. Therefore, traffic forecasts for the 2038 preferred alternative have now been updated to include the southbound MnPASS lane addition. This memorandum expands the 2012 Traffic Forecast memorandum to include forecasts for the new scenario (named as S6A) to serve as complete documentation for all scenarios studied.

1. Overview

The I-35W Transit Access Project (T/A Project) includes numerous planned improvement components along the I-35W corridor in the vicinity of Lake Street and on the adjacent local/arterial street system. In addition, land use and street connection changes (i.e. Nicollet Avenue S.) are anticipated in accordance with the City of Minneapolis Comprehensive Plan. The traffic impact of each change on the local and arterial streets in the study area and on the freeway needs to be evaluated in order to determine recommended improvements for the T/A Project.

This memorandum summarizes the traffic forecast methodology and forecast results for the regional freeway system as well as for the arterial/local street network. The freeway system traffic forecasts have been developed based largely on previous I-35W Lake Street Transit Station Feasibility Study (Feasibility Study) that was completed in February 2009 and the most recent Twin Cities Travel Demand Model (TCTD Model). A sub-area model was created to develop forecasts for the arterial/local street network.

Daily and peak hour traffic forecasts were developed for "No Build" conditions and eight potential "Build" scenarios for year 2038 that were developed prior to 2012 and one newly developed "Build" scenario for the preferred alternative in 2013. The basic characteristics of existing and 2038 traffic forecast scenarios are described as following:

2011 Existing Conditions

- Existing conditions as of 2011 (includes High Occupancy Transit and/or Priced Dynamic Shoulder Lane (HOT/PDSL) operation on northbound I-35W and a southbound HOT lane beginning at 42nd Street as well as completion of I-35W/TH 62 commons)
- No new system improvements or new access ramps in the study area

S0: 2038 No Build
- Same as existing conditions

S0N: 2038 Transit Station with Nicollet Open
- S0 Conditions, plus
- I-35W Transit Station at Lake Street
- Nicollet Avenue connection between Lake Street and 29th Street
- K-mart site redevelopment assumptions

S1: Southbound Exit Only
- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new exit ramp from southbound I-35W to East Lake Street with an auxiliary lane beginning in the I-94 commons

S2: Northbound Entrance Only
- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new entrance ramp from East Lake Street to northbound I-35W and an auxiliary lane with a new connection to eastbound I-94 and a geometrically modified entrance from 5th Avenue South (no freeway access changes)

S3: Southbound Exit and Northbound Entrance
- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new exit ramp from southbound I-35W to East Lake Street with an auxiliary lane beginning in the I-94 commons
- Adding a new entrance ramp from East Lake Street to northbound I-35W and an auxiliary lane with a new connection to eastbound I-94 and a geometrically modified entrance from 5th Avenue South (no freeway access changes)

S4: Northbound Entrance and 28th Street Exit
- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new entrance ramp from East Lake Street to northbound I-35W and an auxiliary lane with a new connection to eastbound I-94 and a geometrically modified entrance from 5th Ave S(no freeway access changes)
- Adding a new northbound I-35W exit ramp to East 28th Street

S5: Full Build (Southbound Exit, Northbound Entrance and 28th Street Exit)
- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new exit ramp from southbound I-35W to East Lake Street with an auxiliary lane beginning in the I-94 commons
- Adding a new entrance ramp from East Lake Street to northbound I-35W and an auxiliary lane with a new connection to eastbound I-94 and a geometrically modified entrance from 5th Avenue South (no freeway access changes)
- Adding a new northbound I-35W exit ramp to East 28th Street

S5.1: Full Build with Closure of 4th Avenue Entrance Ramp to Westbound I-94 (see note)
- S5 Full Build conditions, plus
- Closing the 4th Avenue South entrance ramp to westbound I-94

Note: This scenario is being tested to determine traffic forecast influence on the viability of the Northbound I-35W to westbound I-94 "flyover" bridge replacement scenarios. This scenario is currently not part of this 35W T/A project

S6: Southbound Exit and 28th Street Exit

- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new exit ramp from southbound I-35W to East Lake Street with an auxiliary lane beginning in the I-94 commons
- Adding a new northbound I-35W exit ramp to East 28th Street

All the above scenarios were studied and analyzed prior to 2013. Scenario S6 was selected as the preferred alternative for the study in 2013 based on all the analysis and inputs from stakeholders. In late 2013, it was anticipated that the southbound MnPASS between Downtown Minneapolis and 46th Street (aligned with existing MnPASS lane to the south) would likely be programed for construction with the Transit Access Project. Therefore, the traffic forecasts and freeway modeling analysis were supplemented for the preferred alternative with the SB MnPASS improvement, which is numbered as S6A.

S6A: Southbound Exit and 28th Street Exit with Southbound I-35W MnPASS

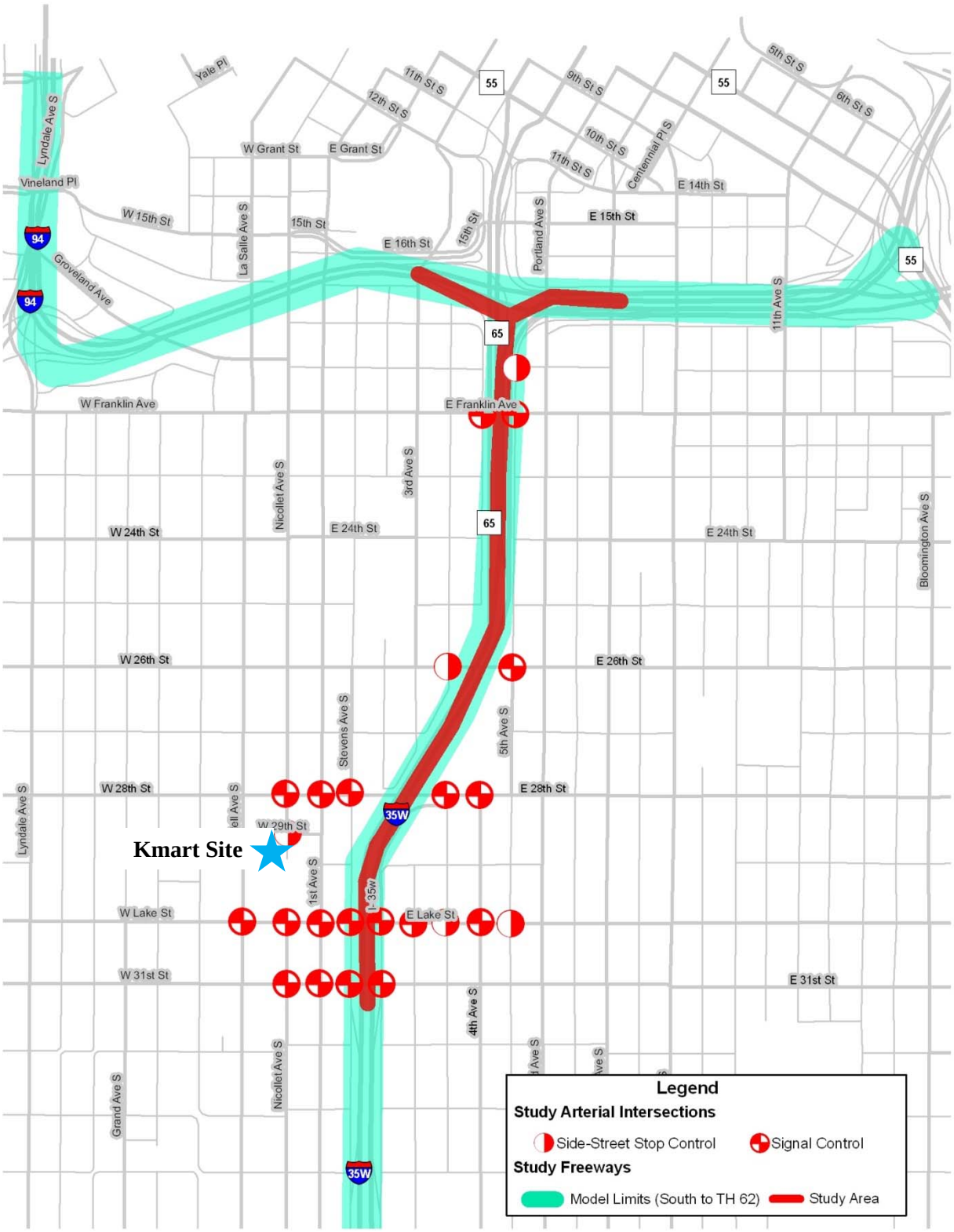
- S6 Conditions, plus
- Adding an inside southbound I-35W MNPASS lane between I-35W/TH 65 merging area and 46th Street.

The freeway peak hour traffic forecasts were used for traffic operations analysis using CORSIM models for freeway access scenarios in combination with S0N Conditions (includes transit station and Nicollet Avenue connection), plus replacement of the I-35W southbound braid bridge over TH 65 northbound and the I-35W northbound to I-94 westbound flyover bridge. The forecast and CORSIM model limits are extended well beyond the project area to fully address the traffic impacts of potential "build" scenarios on the system.

The peak hour forecasts for arterial streets and intersections were used for traffic operations analysis of the various improvement scenarios using Synchro/SimTraffic software.

Figure 1 illustrates the study area, forecast model limits, and intersections of interest.

Figure 1 Study Area and Forecast Model Limits



2. Forecast Methodology

Daily and peak hour traffic forecasts for year 2038 for the T/A Project were developed largely based on the review of the previously developed 2030 forecasts used in the Feasibility Study and were refined based on the latest TCTD model and actual counts in May 2011. The use of the TCTD model adheres to 2006 MnDOT Memo "Revised Guidelines for Twin City Travel Demand Forecasts Prepared for the Metropolitan District":

- Latest Twin Cities Travel Demand Model (February, 2011)
- Model and Parameters for Adjustments to Model Inputs (April 10, 2006)
- Model Output Checks for Reasonableness and Post Processing Adjustments (April 10, 2006)
- Documentation of Forecast (April 10, 2006)

The 2038 daily and peak hour traffic forecasts were developed using the following steps:

1. The base TCTD model was reviewed and network coding errors were identified and corrected.
2. The TCTD was refined to create a subarea model (Subarea Model). The Subarea Model includes more Traffic Analysis Zones (TAZs) and more detailed arterial street network within the study area.
3. The daily outputs from the base TCTD model and the Subarea model were validated based on a screen line analysis in the model limits area.
4. The Subarea Model 2030 network was modified to reflect proposed different scenarios for I-35W Lake Street Transit Access Study. Relevant network modifications identified in base year model were made to the 2030 network
5. 2030 land use and socio-economic data for the City of Minneapolis in the TCTD model were reviewed. The socio-economic data remained unchanged except for Traffic Analysis Zone (TAZ) 373 which was modified to acknowledge potential land use changes on the Kmart site.
6. The 2038 daily and peak hour model outputs for each segment in the study area were calculated based on the 2030 model outputs assuming the same average annual growth rates from existing to 2038.
7. The calculated 2038 model outputs were adjusted based on the actual counts and base model outputs. The adjusted model outputs were further refined based on the review of the freeway forecasts previously developed for the Feasibility Study and capacity constrained conditions.
8. The final 2038 freeway traffic forecasts were compared against the forecasts from the previous Feasibility Study and checked for reasonableness at the system level.
9. For the arterial and local street intersections, final link daily traffic forecasts were converted into peak hour turning movement level forecasts based on the current turning movement counts and daily traffic forecasts.

3. Socio-Economic Data

The TCTD Model utilizes the traditional four-step modeling process which includes trip generation, trip distribution, mode choice, and trip assignment. The socio-economic data, including population and employment, is one of the most important inputs for the model. The 2009 and 2030 socio-economic data for the City of Minneapolis and the metropolitan area in the TCTD model were reviewed. The 2009 and 2030 population, household and employment data for downtown Minneapolis and the metropolitan area are summarized in **Table 1**. The table shows that downtown Minneapolis has higher annual growth rates in housing and employment between 2009 and 2030 than the metro as a whole. The Lake Street study area has a slight increase in population and households and a reduction in retail and non-retail employment between 2009 and 2030.

Table 1
Socio-Economic Data Summary for City of Minneapolis and Metropolitan Area
(Latest TCTD Model, February 2011 Version)

Area	Plan	Population	Households	Retail Employmen	Non-Retail Employmen	Total Employmen
* Downtown Minneapolis	2009	25,032	16,359	13,600	134,948	148,548
	2030	46,770	27,808	19,615	150,754	170,369
	Annual Growth(%)	3%	3%	2%	1%	1%
** Lake Street Study Area	2009	69,145	30,887	7,681	27,689	35,370
	2030	78,992	32,911	5,852	26,508	32,360
	Annual Growth(%)	0.6%	0.3%	-1.3%	-0.2%	-0.4%
Minneapolis Other	2009	304,466	123,400	22,655	109,337	131,992
	2030	314,027	128,204	20,821	125,800	146,621
	Annual Growth(%)	0.1%	0.2%	-0.4%	0.7%	0.5%
Minneapolis Total	2009	398,643	170,646	43,936	271,974	315,910
	2030	439,789	188,923	46,288	303,062	349,350
	Annual Growth(%)	0.5%	0.5%	0.2%	0.5%	0.5%
Metro Total	2009	3,029,044	1,199,308	315,463	1,483,043	1,798,506
	2030	3,734,838	1,529,761	403,208	1,822,900	2,226,108
	Annual Growth(%)	1.0%	1.2%	1.2%	1.0%	1.0%

* Downtown area bounded by freeways I-94 and I-35W, the Mississippi River and Plymouth Ave N
** Lake Street Study area bounded by I-94 (N), 35th Street (S), TH 55 (E) and Hennepin Ave S (W)

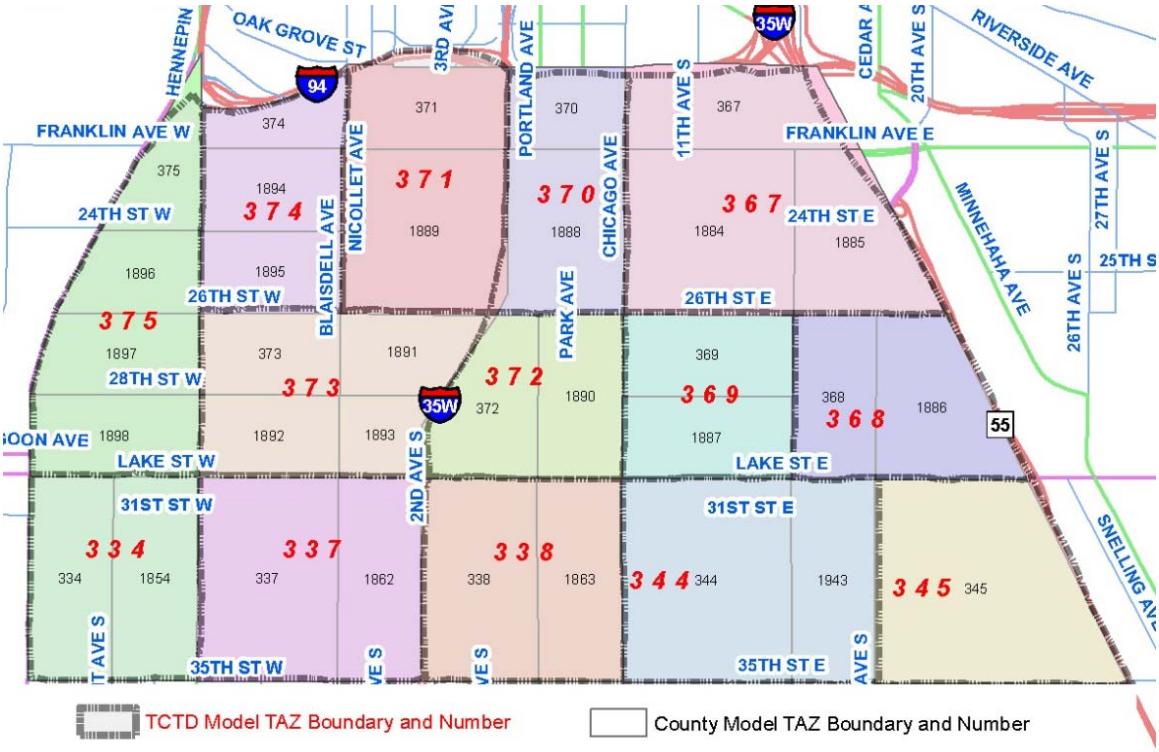
The 2030 socio-economic data remained unchanged for the No Build scenario S0 as they were identical to the City's and Metro Council's latest plans. For all other scenarios, Kmart redevelopment was assumed for the TAZ 373. Land use assumptions and their impacts are summarized in a subsequent section of this memorandum.

4. Subarea Model Calibration and Validation

The traffic forecasts for this study are based largely on the use of the most recent Twins Cities Travel Demand Model (TCTD Model) released by the Metropolitan Council in 2011. The components of the TCTD utilize the four step modeling process which includes trip generation, trip distribution, mode choice, and trip assignment. The TCTD model wasn't directly used for forecasts for arterial streets due to lack of detailed network coding within the study area. It was determined the TCTD model should be refined to include more arterial street roadways and subdivided Traffic Analysis Zones (TAZs) in order to develop traffic forecasts for the study. The refinement of the TCTD model within the study area was based on the TAZ structure and land development data from the Hennepin County Model (County Model). After the full TCTD model runs, the trip tables for the TAZs in the study area were split and then reassigned onto the refined network. No changes were made to the TCTD model outside of the study area. This subarea model development methodology will ensure that the overall trips for each TAZ in the TCTD model remain unchanged while using the County Model distribution within the study area.

Figure 2 illustrates the original TAZs in the TCTD model and their subdivided TAZs in the Subarea Model.

Figure 2 Subarea Model subdivided TAZs in Study Area



Appendix A-1 summarizes the subarea model TAZ splits for corresponding trip tables for the TAZs in the TCTD model. Those splits were calculated based on the existing and future land use development data and trip generation rates in the County Model.

Appendix A-2 summarizes the results on the primary roadways across the east-west and south-north screen lines in the study area. The tables show the total amount of traffic crossing the screen lines in the model was generally in agreement with the actual counts. The differences are less than 10% at screen line level. Differences on individual roadways in the larger network area are expected at this stage of the forecasting process. Some model outputs typically require adjustments as final forecasts are developed. The calibration results show that the model is a good tool to use to develop daily forecasts for this study.

5. Scenario Traffic Impacts Analysis

I. Kmart Site Redevelopment and Nicollet Ave S Connection (Scenario S0 versus Scenario S0N)

A specific development plan has not been proposed for Kmart Site (located north of Lake Street between Blaisdell and 1st Avenues). Existing and 2030 socio economic (SE) data in the TCTD model indicate significant changes in land use are anticipated for TAZ 373 which includes the Kmart site (See **Table 2**). TAZ population is projected to increase while employment decreases, resulting in a net 13 percent decrease of daily trips (about 4,100) for the TAZ.

Actual redevelopment plans will differ from the modeled assumptions. After discussion with the city, a more conservative Kmart site redevelopment plan was assumed to assess the travel demand on the roadways in the study area. It was assumed that 2030 retail and non-retail employment will not decrease

and the 2030 population will increase by 10%. The redevelopment "test" scenario generally corresponds to a possible Kmart site land use change that maintains existing retail land uses and adds residential land uses. It is assumed that the connection of Nicollet Avenue South will occur in conjunction with redevelopment of the Kmart site. The daily traffic results shown in **Table 3** indicate that daily traffic volumes on Blaisdell Avenue South and 1st Avenue South near the site decrease by 8% to 32% and the daily traffic volumes on Nicollet Avenue South increase by 8% north of 28th Street and by 14% south of Lake Street. There are no significant changes in demand on the extended arterial network or on the freeways. Therefore, the traffic impacts of Kmart redevelopment and Nicollet Avenue South connection will be limited to the streets around the site unless the actual development is much more intensive than the scenario described. It should be noted that the forecast scenarios carried forward include the land use assumptions of this "test" scenario except for Scenario S0: 2030 No Build.

Table 2
Socio-Economic Data for TAZ 373 in the TCTD Model

Plan	Population	Households	Retail Employment	Non-Retail Employment	Total Employment	Daily Vehicle Trips
2009	5,633	2,563	817	2,193	3,010	32,599
2030*	7,779	2,947	744	1,391	2,135	28,508
Change from 2009 (%)	38%	15%	-9%	-37%	-29%	-13%
Kmart Site "test" Scenario	6,196	3,442	817	2,193	3,010	32,108
Change from 2009 (%)	10%	34%	0%	0%	0%	-2%

Table 3
Daily Traffic Changes due to Kmart Redevelopment and Nicollet Ave Open

Roadway		Location	S0: NoBuild_2038	S0N: Nicollet Open Transit Only_2038	% Changes
East-West Arterial Corridor	28th St	West of Blaisdell Ave S	10,800	10,900	1%
		West of I-35W	14,900	15,000	1%
		East of I-35W	15,100	15,000	-1%
	Lake St	West of Blaisdell Ave S	22,900	23,200	1%
		West of I-35W	22,900	23,600	3%
		East of I-35W	20,900	20,800	0%
		East of Portland Ave S	20,900	20,900	0%
	31st St	West of Blaisdell Ave S	9,300	9,300	0%
		West of I-35W	16,700	16,600	-1%
		East of I-35W	12,400	12,400	0%
North-South Arterial Corridor	Hennepin Ave S	North of W 26th St	30,800	30,700	0%
		North of W Lake St	29,100	28,900	-1%
		South of W 31st St	10,500	10,500	0%
	Blaisdell Ave S	North of W Lake St	12,900	11,200	-13%
		North of W 31st St	10,200	10,000	-2%
		South of W 31st St	6,500	6,300	-3%
	Nicollet Ave S	North of W 28th St	13,000	14,000	***8%***
		North of W Lake St		12,000	
		North of W 31st St	11,400	13,000	***14%***
		South of W 31st St	12,400	12,900	4%
	1st Ave S	North of E 26th St	6,200	6,200	0%
		North of E Lake St	11,000	7,500	-32%
		North of E 31st St	6,400	6,300	-2%
		South of E 31st St	4,000	3,700	-8%
	5th Ave S	North of E 28th St	13,500	13,700	1%
	Portland Ave S	North of E 26th St	13,600	13,800	1%
		North of E Lake St	13,500	13,500	0%
		South of E 31st St	12,300	12,300	0%
I-94	East of Hennein& Lyndale Ave S	EB	128,500	128,400	0%
		WB	126,000	126,000	0%
35W	North of Lake St	NB	119,100	118,600	0%
		SB	117,600	117,100	0%

Note: Highlighted if the change is greater than 5% on arterial streets or 2% on freeways (increase in grey, decrease in green)

II. Closure of 4th Ave S Entrance Ramp to Westbound I-94 (Scenario S5 versus Scenario S5.1)

The 4th Avenue South entrance ramp merges with the northbound to westbound "flyover" ramp from northbound I-35W/TH 65. Replacement scenarios for the flyover bridge are being studied both with and without the 4th Avenue South entrance ramp closure. Additional study of traffic displaced on the downtown streets may be warranted if closure is further considered as part of the scenarios analysis.

Freeway forecasts have been developed for the Full Build Scenario (Southbound Exit and Northbound Entrance to/from Lake Street and the 28th Street Exit) and the Full Build Scenario combined with the closure of 4th Avenue entrance ramp to westbound I-94 from Downtown Minneapolis. **Table 4** illustrates daily traffic volume changes on the roadways due to the ramp closure. Westbound I-94 at the Lowry Hill Tunnel experiences a decrease (4%) in traffic demands if the 4th Avenue South ramp is closed. The impacts on the freeway will be evaluated based on traffic operations for scenarios with and without the closure of 4th Avenue ramp. However, Table 4 indicates the daily traffic changes on the arterial streets in the Lake Street interchange area are small (less than 5%) and can be neglected. Therefore, the 4th Avenue ramp closure scenario does not require a specific forecast scenario for the arterial and local streets in the Lake Street area.

Note: This scenario is not part of this 35W T/A project as previously stated in scenario descriptions

Table 4
Daily Traffic Changes due to Closure of 4th Ave S Entrance Ramp to WB I-94

Roadway		Location	S5: Full Build_2038	S5.1: Full Build & 4th Ave S Ramp Closure_2038	% Changes
East-West Arterial Corridor	Franklin Ave	West of I-35W	20,500	20,000	-2%
		East of I-35W	18,000	17,300	-4%
	26th St	West of I-35W	14,100	13,500	-4%
		East of I-35W	14,700	14,800	1%
	28th St	West of Blaisdell Ave S	11,300	11,100	-1%
		West of I-35W	14,000	13,700	-2%
		East of I-35W	17,500	17,400	-1%
	Lake St	West of Blaisdell Ave S	28,700	29,000	1%
		West of I-35W	32,000	32,100	0%
		East of I-35W	24,400	24,500	0%
	31st St	West of Blaisdell Ave S	12,300	12,200	-1%
		West of I-35W	19,300	19,400	1%
		East of I-35W	14,200	14,400	1%
North-South Arterial Corridor	Hennepin Ave S	North of W 26th St	29,500	29,300	-1%
		South of W 31st St	10,900	10,900	0%
	Blaisdell Ave S	North of W Lake St	11,200	11,300	1%
		South of W 31st St	7,000	7,000	0%
	Nicollet Ave S	North of W Lake St	11,300	11,400	1%
		South of W 31st St	12,000	11,800	-1%
	1st Ave S	North of E Lake St	7,800	7,800	0%
		South of E 31st St	3,100	3,100	1%
	5th Ave S	North of E 28th St	10,600	10,800	2%
	Portland Ave S	North of E 26th St	10,700	10,900	2%
		South of E 31st St	12,300	12,500	1%
I-94	East of Hennein& Lyndale Ramps	EB	128,200	128,400	0%
		WB	123,700	119,200	*-4%*
35W	North of Lake St	NB	129,400	129,900	0%
		SB	133,400	133,600	0%

Note: Highlighted if the change is greater than 5% on arterial streets or 2% on freeways (increase in grey, decrease in green)

III. Full Build Scenarios (S0N versus S5)

The Full Build Scenario assumes the addition of entrance/exit ramps to/from I-35W north and an exit ramp to East 28th Street from northbound I-35W as well as a full auxiliary lane for the I-35W mainline in both directions between East Lake Street and I-94. Under Scenario S0N: Nicollet Open Only Conditions, drivers in the Lake Street area either access I-35W further south at East 35th Street or use parallel arterial streets to access the freeway system further north. **Table 5** summarizes the daily traffic changes on the roadways in the study area and **Figure 3** illustrates the daily traffic changes graphically. The table and figure show that with the addition of the access ramps the daily traffic increased significantly on I-35W between Lake Street and I-94 as well as Lake Street west of I-35W. The figure also shows that most parallel arterial and local streets in the study area will experience a traffic decrease due to the traffic pattern shifts to I-35W. However, some north-south parallel streets intersected with Lake Street will experience a traffic increase due to traffic concentrating in the area around the new access ramps. With the new I-35W accesses at Lake Street and 28th Street, local and regional traffic is rerouted and the travel patterns in the study area change significantly due to different streets having differing levels of available capacity.

Table 5
Daily Traffic Changes due to Full Build Conditions in Lake Street Area

Roadway		Location	S0N: Nicollet Open Transit Only_2038	S5: Full Build_2038	% Changes
East-West Arterial Corridor	28th St	West of Blaisdell Ave S	10,900	11,300	4%
		West of I-35W	15,000	14,000	*-7%*
		East of I-35W	15,000	17,500	*17%*
	Lake St	West of Blaisdell Ave S	23,200	28,700	*24%*
		West of I-35W	23,600	32,000	*36%*
		East of I-35W	20,800	24,400	*17%*
		East of Portland Ave S	20,900	22,600	*8%*
	31st St	West of Blaisdell Ave S	9,300	12,300	*32%*
		West of I-35W	16,600	19,300	*16%*
		East of I-35W	12,400	14,200	*15%*
North-South Arterial Corridor	Hennepin Ave S	North of W 26th St	30,700	29,500	-4%
		North of W Lake St	28,900	27,600	-4%
		South of W 31st St	10,500	10,900	4%
	Blaisdell Ave S	North of W Lake St	11,200	11,200	0%
		North of W 31st St	10,000	10,700	*7%*
		South of W 31st St	6,300	7,000	*11%*
	Nicollet Ave S	North of W 28th St	14,000	11,200	*-20%*
		North of W Lake St	12,000	11,300	*-6%*
		North of W 31st St	13,000	10,700	*-18%*
		South of W 31st St	12,900	12,000	*-7%*
	1st Ave S	North of E 26th St	6,200	4,700	*-24%*
		North of E Lake St	7,500	7,800	4%
		North of E 31st St	6,300	4,300	*-32%*
		South of E 31st St	3,700	3,100	*-16%*
	5th Ave S	North of E 28th St	13,700	10,600	*-23%*
	Portland Ave S	North of E 26th St	13,800	10,700	*-22%*
		North of E Lake St	13,500	13,400	-1%
		South of E 31st St	12,300	12,300	0%
I-94	East of Hennein& Lyndale Ave S	EB	128,500	128,200	0%
		WB	126,000	123,700	-2%
35W	North of Lake St	NB	119,100	129,400	*9%*
		SB	117,600	133,400	*13%*

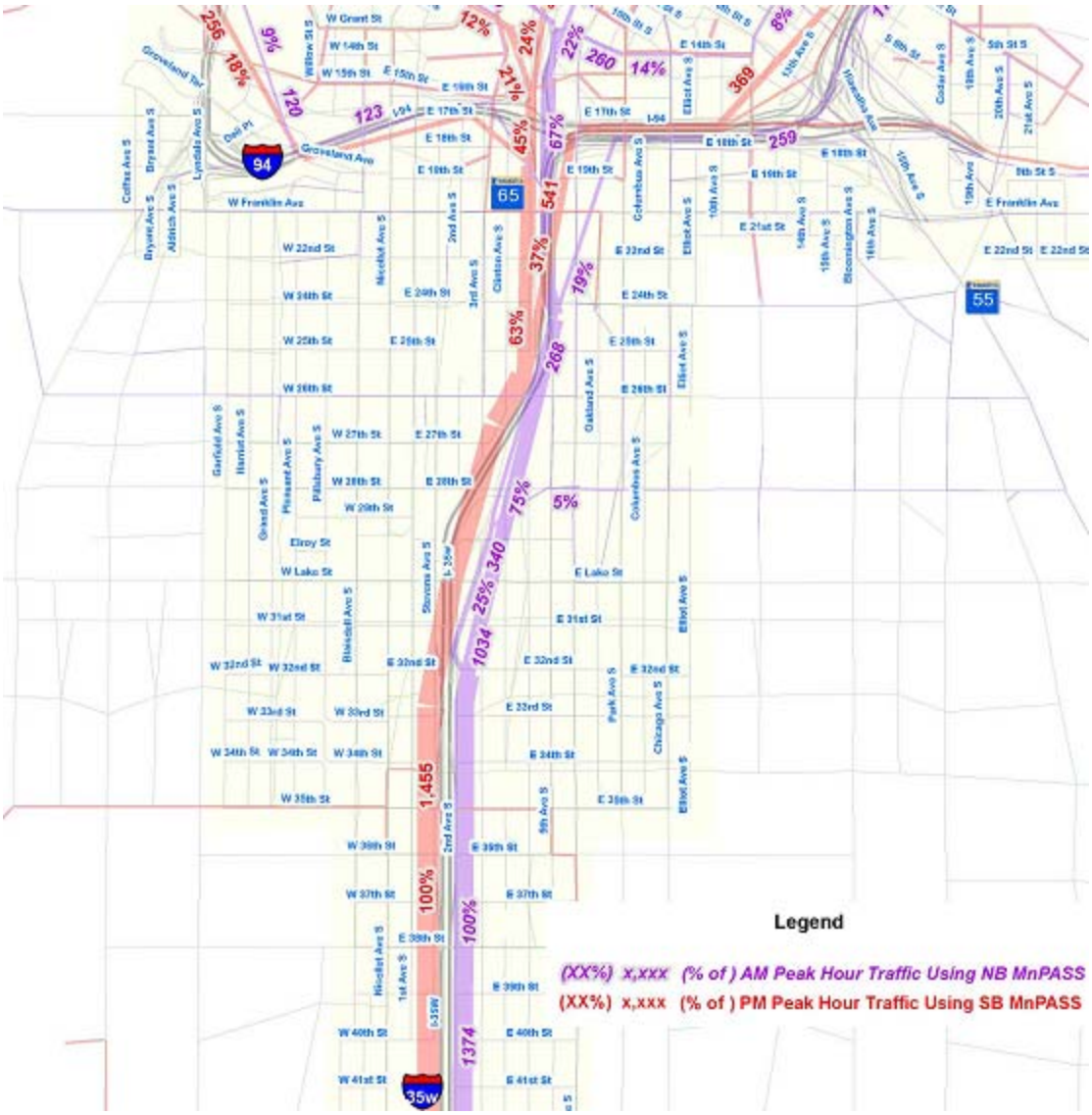
Note: Values in last column are highlighted if the change is greater than 5% on arterial streets or 2% on freeways (increases in grey, decreases in green)

Figure 3 Daily Traffic Changes due to Full Build Conditions in Lake Street Area

IV. Northbound and Southbound MnPASS Lanes Usage in S6A

The preferred S6A scenario assumes a new northbound exit ramp to 28th Street, a new southbound exit ramp to Lake Street and a new inside MnPASS lane on southbound I-35W between TH 65 merging area and 46th Street to align with the existing MnPASS lane to the south. The new southbound MnPASS lane, which runs parallel with the existing northbound MnPASS lane, adds additional capacity to the segment and provides a congestion free choice for HOVs and willing-to-pay SOVs. **Figure 4** below illustrates a selected link analysis on I-35W at the Lake Street Bridge during 2030 peak hours for both directions of the MnPASS lanes. Southbound MnPASS lane usage near Lake Street originates approximately 18% from EB I-94/Lowry Hill Tunnel, 45% from SB TH 65/Downtown and 37% from combined SB I-35W/WB I-94 during p.m. peak hour. The southbound MnPASS users travel through the study area without exiting the new ramp to Lake Street. It is noted that the regional model shows the majority of the MnPASS users in the study area are HOVs and approximately 12% of MnPASS users are paid SOVs.

Figure 4 2030 Peak Hour MnPASS Lanes Selected Link Analysis at Lake Street Bridge



6. Traffic Forecast Results

Based on previously stated findings, it is noted that the opening of Nicollet Avenue South and redevelopment of the Kmart site do not have noticeable impacts on the freeways. Similarly, the closure of the 4th Avenue South entrance ramp to westbound I-94 does not have significant impacts on the arterial streets in the Lake Street interchange area. It is also noted that the southbound MnPASS lane, which was included late in this analysis, does not have significant impacts on the arterials in the Lake Street interchange area. Therefore, the traffic forecasting scenarios were narrowed down and the following scenarios were identified for traffic forecast development.

Freeway Forecast Scenarios and Results

Appendix B illustrates existing peak hour and daily freeway traffic counts from May 2011for the ramps and major freeways within the study area.

Appendix B-0 illustrates peak hour and daily freeway traffic forecasts for 2038 No Build Scenario S0 and 2038 Transit Only with Nicollet Open Scenario S0N (The freeway forecasts for the two scenarios are the same as it is indicated in Table 3 the connection of Nicollet Ave S does not have noticeable traffic impacts on the freeways).

Appendix B-1 illustrates peak hour and daily freeway traffic forecasts for 2038 Southbound Exit Only Scenario S1.
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Appendix B-2 illustrates peak hour and daily freeway traffic forecasts for 2038 Northbound Entrance Only Scenario S2.
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Appendix B-3 illustrates peak hour and daily freeway traffic forecasts for 2038 Southbound Exit and Northbound Entrance Scenario S3.

Appendix B-4 illustrates peak hour and daily freeway traffic forecasts for 2038 Northbound Entrance and 28th Exit Scenario S4.

Appendix B-5 illustrates peak hour and daily freeway traffic forecasts for 2038 Full Build Scenario S5.

Appendix B-5.1 illustrates peak hour and daily freeway traffic forecasts for 2038 Full Build and WB I-94 4th Ave S Ramp Closure Scenario S5.1.

Appendix B-6 illustrates peak hour and daily freeway traffic forecasts for 2038 Southbound Exit and 28th Exit Scenario S6.

Appendix B-6A illustrates peak hour and daily freeway traffic forecasts for 2038 Southbound Exit and 28th Exit with SB I-35W MnPASS Lane Scenario S6A.

Some geometric actions to be studied through operations modeling will not affect the traffic forecasts. These include replacing the NB I-35W to WB I-94 Flyover Bridge and SB I-35W Braid Bridge over NB TH 65. Individual traffic forecasts will not be developed for these geometric actions.

Arterial Forecast Scenarios and Results

Appendix C illustrates existing peak hour turning movements for study intersections and daily traffic counts for major arterials within study area.

Appendix C-0 illustrates peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 No Build Scenario S0.
Appendix C-0N illustrates peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Transit Station Only with Nicollet Open Scenario S0N.

Appendix C-1 illustrates peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Southbound Exit Only Scenario S1.

Appendix C-2 illustrates peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Northbound Entrance Only Scenario S2.

Appendix C-3 illustrates peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Southbound Exit and Northbound Entrance Scenario S3.

Appendix C-4 illustrates peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Northbound Entrance and 28th Exit Scenario S4.

Appendix C-5 illustrates peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Full Build Scenario S5.

Appendix C-6 illustrates peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Southbound Exit and 28th Exit Scenario S6.

Appendix C-6A illustrates peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Southbound Exit and 28th Exit with SB I-35W MnPASS Lane Scenario S6A.

7. 2038 Traffic Forecasts Reasonableness Checks

Reasonableness checks were performed for mainline segments of the freeways I-35W, I-94 and TH 65 consistent with MnDOT freeway forecasting guidelines. The checks include comparing the base year and future year models for four criteria: Peak Hour Percent of Daily, Directional Split of Peak Hour Traffic, Daily Growth Factors and Capacity of Road Segment within and beyond Project Limits.

Appendix D-0 illustrates the A.M. and P.M. reasonableness checks for 2038 No Build Scenario S0 and 2038 Transit Only with Nicollet Open Scenario S0N.

Appendix D-1 illustrates the A.M. and P.M. reasonableness checks for 2038 Southbound Exit Only Scenario S1.

Appendix D-2 illustrates the A.M. and P.M. reasonableness checks for 2038 Northbound Entrance Only Scenario S2.

Appendix D-3 illustrates the A.M. and P.M. reasonableness checks for 2038 Southbound Exit and Northbound Entrance Scenario S3.

Appendix D-4 illustrates the A.M. and P.M. reasonableness checks for 2038 Northbound Entrance and 28th Exit Scenario S4.

Appendix D-5 illustrates the A.M. and P.M. reasonableness checks for 2038 Full Build Scenario S5.

Appendix D-5.1 illustrates the A.M. and P.M. reasonableness checks for 2038 Full Build and WB I-94 4th Ave S Entrance Ramp Closure Scenario S5.1.

Appendix D-6 illustrates the A.M. and P.M. reasonableness checks for 2038 Southbound Exit and 28th Exit Scenario S6.

Appendix D-6A illustrates the A.M. and P.M. reasonableness checks for 2038 Southbound Exit and 28th Exit with SB I-35W MnPASS Lane Scenario S6.

The tables for reasonableness checks reveal that:

- Peak Hour Percent of Daily Demand: Generally speaking, the peak hour percentages of daily demands for existing and all 2038 scenarios fall within 6% and 9% for all freeway segments. The 2038 peak hour percentages for most segments are equal or less than those of existing except for I-35W between Lake Street and I-94 under Build scenarios due to the capacity improvements. They are however consistent with expectations.
- Directional Split: Generally speaking, the directional splits for all four 2038 scenarios have patterns similar to the existing traffic counts. Especially, the splits for freeways in the project area which are more evenly distributed than those of existing during p.m. peak. They are consistent with general expectations.
- Daily Growth Factors: The forecasted daily traffic volumes for I-35W between Lake Street and TH 65 are 236,700/263,800/262,800 and 263,500 respectively for 2038 No Build (S0), Lake Street Ramps Only (S3), Lake Street Ramps & 28th Street Exit Ramp (S5: Full Build) and Lake Street Ramps & 28th Street Exit Ramp & 4th Ave S Entrance Ramp Closure (S5.1) Scenarios. For the Lowry Hill Tunnel, the forecasted daily traffic volumes are 200,600/200,800/201,000 and 196,900 for those four scenarios. These forecasts are consistent with general expectations. The capacity improvement for the I-35W between Lake Street and I-94 will draw more traffic to this capacity constrained segment than No Build. The closure of 4th Ave S entrance ramp to westbound I-94 will potentially reduce traffic demand at the Lowry Hill Tunnel. However, any reduced demand may be backfilled from other users. The forecasts for other build scenarios are consistent with general expectations as well.
- Capacity of Road Segment Within and Beyond Project Limits: The peak hour forecasted traffic volumes on freeway segments within and beyond the limits of the project do not exceed their capacities.

8. Traffic Forecasts Comparison

Freeway Forecasts Comparison

Daily and peak hour traffic forecasts developed for this study were compared to those from the Feasibility Study that was completed in February 2009. Forecasts from other older studies were not included for comparison due to significant assumption differences in the geometry, socio-economic and forecast years.

Table 6 compares the major study assumptions for the Feasibility Study and the T/A Project.

Table 7 compares the daily forecasts in the study area for the Feasibility Study and the T/A Project.

Table 8 compares the A.M. peak hour forecasts in the study area for the Feasibility Study and the T/A Project.

Table 9 compares the P.M. peak hour forecasts in the study area for the Feasibility Study and the T/A Project.

From the tables, it can be seen that the forecasts from two studies are generally consistent with their assumptions. The forecasts for I-35W between Lake Street and I-94 under Build scenarios in this study are noticeably higher than the Feasibility Study due to the auxiliary lanes associated with the new Lake Street ramps assumed in this I-35W T/A study while not in the Feasibility Study (In the Feasibility Study, the auxiliary lanes were not assumed in the process of the forecast development but they were recommended in the mitigation plan based on the operations analysis).

Table 6
Comparison of Study Assumptions for Freeway Forecasts

	Feasibility Study	T/A Project
Base Year	2006*	2011
Forecast Year	2030	2038
I-35W	No Auxiliary Lanes between Lake Street and I-94 for Build Scenarios**	Full Auxiliary Lanes for both directions between Lake Street and I-94 for build Scenarios
Regional Model	2008 TSP not incorporated	2008 TSP incorporated

**The base 2030 No Build for the feasibility study assumed completion of I-35W UPA and TH 62/35W Commons Reconstruction Projects, same as this study.*
***In the Feasibility Study, the auxiliary lanes were not assumed in the process of the forecast development. They were recommended in the mitigation plan based on the operations analysis.*

Table 7
Freeway Daily Traffic Forecasts Comparison in Study Area

Scenario	Study	Forecast Year	I-35W (Lake St to TH65)	I-35W (46th St to 36th St)	I-94 (Lowry Hill Tunnel)	TH 65 (35W to I-94 Flyover)
Existing		2011	189,900	198,700	169,200	91,200
S0: Nobuild	Feasibility Study	2030	230,000	245,100	188,100	119,200
	T/A Project	2038	236,700	251,800	200,600	122,600
	Diff (%)		2.9%	2.7%	6.6%	2.9%
S3: Lake St Ramps Only	Feasibility Study	2030	247,300	243,100	189,300	125,200
	T/A Project	2038	263,900	255,900	200,900	127,800
	Diff (%)		6.7%	5.3%	6.1%	2.1%
S5: Lake St & 28th St Ramps	Feasibility Study	2030	247,300	243,100	189,300	125,200
	T/A Project	2038	262,800	258,200	201,000	126,800
	Diff (%)		6.3%	6.2%	6.2%	1.3%
S5.1: Lake St & 28th St Ramps& 4th Ave Closure	Feasibility Study	2030	248,600	243,100	186,700	126,600
	T/A Project	2038	263,500	259,500	196,900	127,700
	Diff (%)		6.0%	6.7%	5.5%	0.9%

Note: Scenarios S1, S2, S4, S6 were not included in the 2009 Feasibility Study.

Table 8
A.M. Peak Freeway Traffic Forecasts Comparison in Study Area

Alternative	Study	Forecast Year	I-35W Lake St to TH65		I-35W 46th St to 36th St		I-94 Lowry Hill Tunnel		TH 65 35W to I-94 Flyover	
			NB	SB	NB	SB	EB	WB	NB	SB
Existing		2011	8,090	5,580	7,940	6,120	5,760	5,430	4,660	2,240
S0: Nobuild	Feasibility Study	2030	9,425	6,525	9,175	7,250	6,150	6,200	5,600	3,000
	T/A Project	2038	9,470	6,760	9,250	7,450	6,340	6,250	5,630	3,120
	Diff (%)		0.5%	3.6%	0.8%	2.8%	3.1%	0.8%	0.5%	4.0%
S3: Lake St Ramps Only	Feasibility Study	2030	10,125	7,025	9,125	7,225	6,200	6,275	5,900	3,175
	T/A Project	2038	10,650	7,790	9,290	7,860	6,400	6,200	5,700	3,340
	Diff (%)		5.2%	10.9%	1.8%	8.8%	3.2%	-1.2%	-3.4%	5.2%
S5: Lake St & 28th St Ramps	Feasibility Study	2030	10,125	7,025	9,125	7,225	6,200	6,275	5,900	3,175
	T/A Project	2038	10,300	7,880	9,340	7,890	6,420	6,220	5,620	3,340
	Diff (%)		1.7%	12.2%	2.4%	9.2%	3.5%	-0.9%	-4.7%	5.2%
S51: Lake St & 28th St Ramps& 4th Ave Closure	Feasibility Study	2030	10,200	7,025	9,125	7,225	6,200	6,175	6,000	3,175
	T/A Project	2038	10,360	7,880	9,410	7,920	6,390	5,940	5,650	3,360
	Diff (%)		1.6%	12.2%	3.1%	9.6%	3.1%	-3.8%	-5.8%	5.8%

Note: Scenarios S1, S2, S4, S6 and S6A were not included in the 2009 Feasibility Study thus not included for comparison.

Table 9
P.M. Peak Freeway Traffic Forecasts Comparison in Study Area

Alternative	Study	Forecast Year	I-35W Lake St to TH65		I-35W 46th St to 36th St		I-94 Lowry Hill Tunnel		TH 65 35W to I-94 Flyover	
			NB	SB	NB	SB	EB	WB	NB	SB
Existing		2011	6,110	7,820	6,740	8,170	5,690	5,600	3,250	4,200
S0: Nobuild	Feasibility Study	2030	7,900	7,525	8,475	7,875	5,775	6,200	4,400	4,175
	T/A Project	2038	8,030	8,210	8,630	8,610	6,360	6,290	4,640	4,220
	Diff (%)		1.6%	8.3%	1.8%	8.5%	9.2%	1.4%	5.2%	1.1%
S3: Lake St Ramps Only	Feasibility Study	2030	8,325	8,075	8,400	7,825	5,800	6,200	4,475	4,400
	T/A Project	2038	9,040	9,080	8,890	8,500	6,270	6,320	4,590	4,230
	Diff (%)		7.9%	11.1%	5.5%	7.9%	7.5%	1.9%	2.5%	-4.0%
S5: Lake St & 28th St Ramps	Feasibility Study	2030	8,325	8,075	8,400	7,825	5,800	6,200	4,475	4,400
	T/A Project	2038	8,840	9,310	8,910	8,770	6,330	6,360	4,410	4,380
	Diff (%)		5.8%	13.3%	5.7%	10.8%	8.4%	2.5%	-1.5%	-0.5%
S51: Lake St & 28th St Ramps& 4th Ave Closure	Feasibility Study	2030	8,500	8,075	8,400	7,825	5,800	5,900	4,675	4,400
	T/A Project	2038	9,030	9,250	8,980	8,570	6,320	6,110	4,700	4,330
	Diff (%)		5.9%	12.7%	6.5%	8.7%	8.2%	3.4%	0.5%	-1.6%

Note: Scenarios S1, S2, S4, S6 and S6A were not included in the 2009 Feasibility Study thus not included for comparison.

Arterial Forecasts Comparison

Appendix E summarizes the daily forecasts for major arterial streets for all the scenarios from this T/A Study.

The arterial forecasts were compare ed to those from the Nicollet-Lake Traffic Study (Traffic Study) completed in 2003 in conjunction with the former I-35W/Lake Street Access Project study (T/A Project). It is noted that the Traffic Study did not include freeway forecasts while the Feasibility Study did not include arterial forecasts.

Table 10 compares the major study assumptions for the Traffic Study and the T/A Project. **Table 11** compares the daily forecasts for E Lake St on both sides of I-35W.

The tables show that there are some differences between the previous forecasts and the results from this T/A study and the differences are primarily due to different study time periods, modeling techniques, geometric and land use assumptions as well as different base year counts. It is noted that the final preferred scenario includes the assumption for the improvement of the SB I-35W MnPASS Lane between TH 65 merging area and 46th Street to align with the current SB I-35W MnPASS lane, which was not included in

Table 10
Comparison of Study Assumptions for Arterial Forecasts in Lake Street Area

Assumption	Nicollet-Lake Traffic Study	T/A Project
Base Year	2000	2011
Forecast Year	2020	2038
Regional Model*	Hennepin County Model	Twin Cities Travel Demand Model
Major Access Modifications	I-35W/35th St&36th St Ramps relocated to 38th Street for Lake St Ramp Build Scenarios	I-35W auxiliary lanes between I-94 for Lake St Ramp Build Scenarios

**Additional HOV lanes were assumed for I-35W corridor in the regional models prior to 2008 while MnPASS and Priced Dynamic Shoulder Lanes were assumed afterwards.*

.

Table 11
Comparison of Daily Forecasts for E Lake St

Scenario	E Lake St West of I-35W		E Lake St East of I-35W	
	Nicollet-Lake Traffic Study	T/A Project	Nicollet-Lake Traffic Study	T/A Project
Base Year	23,000	20,500	21,400	18,700
S0: No Build	26,800	22,900	28,300	20,900
S0N: Nicollet Open	28,700	23,600	28,300	20,800
S5: Full Build*	31,800	32,000	32,400	24,400

** Full Build assumptions for the Nicollet-Lake Traffic Study included relocation of the 35th/36th Street interchange to 38th Street (a factor influencing demand on Lake Street east of I-35W)*

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Appendix A-2: 2009 Base Subarea Model East-West Cross Roads Screen Line Check

Freeway Forecasts

Appendix B: Existing peak hour and daily freeway traffic counts from May 2011for the ramps and major freeways within the study area.

Appendix B-0: Peak hour and daily freeway traffic forecasts for 2038 No Build Scenario S0.

Appendix B-1: Peak hour and daily freeway traffic forecasts for 2038 SB Exit Only Scenario S1.

Appendix B-2: Peak hour and daily freeway traffic forecasts for 2038 NB Entrance Only Scenario S2.

Appendix B-3: Peak hour and daily freeway traffic forecasts for 2038 SB Exit and NB Entrance **Scenario S3**.

Appendix B-4: Peak hour and daily freeway traffic forecasts for 2038 Northbound Entrance and 28th Exit Scenario S4.

Appendix B-5: Peak hour and daily freeway traffic forecasts for 2038 Full Build Scenario S5.

Appendix B-5.1: Peak hour and daily freeway traffic forecasts for 2038 Full Build and WB I-94 4th Ave S Entrance Ramp Closure Scenario S5.1.

Appendix B-6: Peak hour and daily freeway traffic forecasts for 2038 Southbound Exit and 28th Exit Scenario S6.

Appendix B-6A: Peak hour and daily freeway traffic forecasts for 2038 Southbound Exit and 28th Exit with SB I-35W MnPASS Lane Scenario S6A.

Arterial Forecasts

Appendix C: Existing peak hour turning movements and daily traffic.

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Appendix C-0N: Peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Transit Station Only with Nicollet Open Scenario S0N.

Appendix C-1: Peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Southbound Exit Only Scenario S1.

Appendix C-2: Peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Northbound Entrance Only Scenario S2.

Appendix C-3: Peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Southbound Exit and Northbound Entrance Scenario S3.

Appendix C-4: Peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Northbound Entrance and 28th Exit Scenario S4.

Appendix C-5: Peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Full Build Scenario S5.

Appendix C-6: Peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Southbound Exit and 28th Exit Scenario S6.

Appendix C-6A: Peak hour turning movements and daily forecasts for study intersections and major arterials for 2038 Southbound Exit and 28th Exit with SB I-35W MnPASS Lane Scenario S6A.

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Appendix D-0: A.M. and P.M. reasonableness checks for 2038 No Build Scenario S0.

Appendix D-1: A.M. and P.M. reasonableness checks for 2038 Southbound Exit Only Scenario S1.

Appendix D-2: A.M. and P.M. reasonableness checks for 2038 Northbound Entrance Only Scenario S2.

Appendix D-3: A.M. and P.M. reasonableness checks for 2038 Southbound Exit and Northbound Entrance Scenario S3.

Appendix D-4: A.M. and P.M. reasonableness checks for 2038 Northbound Entrance and 28th Exit Scenario S4.

Appendix D-5: A.M. and P.M. reasonableness checks for 2038 Full Build Scenario S5.

Appendix D-5.1: A.M. and P.M. reasonableness checks for 2038 Full Build and WB I-94 4th Ave S Entrance Ramp Closure Scenario S5.1.

Appendix D-6: A.M. and P.M. reasonableness checks for 2038 Southbound Exit and 28th Exit Scenario S6.

Appendix D-6A: A.M. and P.M. reasonableness checks for 2038 Southbound Exit and 28th Exit with SB I-35W MnPASS Lane Scenario S6A.

Arterial Forecast Comparison

Appendix E: Arterial daily forecasts comparison table

Distribution List

I-35W Transit Access Project Technical Advisory Committee
James Grube, Hennepin County
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Ron Rauchle, MnDOT Metro
Scott Pedersen, MnDOT Metro
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Appendix A-1
Subarea Model Trip Generation and Production Splits

TCTD Model TAZ	Subarea Model TAZ	2009						2030					
		Productions			Attractions			Productions			Attractions		
		HBW	HBO	NHB	HBW	HBO	NHB	HBW	HBO	NHB	HBW	HBO	NHB
334	334	53%	53%	51%	49%	51%	51%	53%	53%	51%	49%	51%	51%
	1854	47%	47%	49%	51%	49%	49%	47%	47%	49%	51%	49%	49%
337	337	76%	76%	32%	15%	36%	32%	75%	75%	31%	15%	36%	31%
	1862	24%	24%	68%	85%	64%	68%	25%	25%	69%	85%	64%	69%
338	338	52%	52%	70%	76%	71%	70%	52%	52%	71%	76%	71%	71%
	1863	48%	48%	30%	24%	29%	30%	48%	48%	29%	24%	29%	29%
344	344	64%	64%	66%	55%	69%	66%	64%	64%	66%	55%	69%	66%
	1943	36%	36%	34%	45%	31%	34%	36%	36%	34%	45%	31%	34%
345	345	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
367	367	22%	22%	20%	17%	26%	20%	21%	21%	20%	17%	26%	20%
	1884	52%	52%	69%	77%	60%	69%	52%	52%	69%	77%	61%	69%
	1885	26%	26%	12%	6%	13%	12%	27%	27%	12%	6%	14%	12%
368	368	84%	84%	35%	26%	42%	35%	77%	77%	32%	23%	38%	32%
	1886	17%	17%	65%	74%	58%	65%	23%	23%	68%	77%	62%	68%
369	369	60%	60%	62%	67%	65%	62%	52%	50%	61%	67%	63%	61%
	1887	40%	40%	38%	33%	35%	38%	48%	50%	39%	33%	37%	39%
370	370	31%	31%	31%	27%	36%	31%	35%	35%	31%	27%	35%	31%
	1888	69%	69%	69%	73%	64%	69%	65%	65%	69%	73%	65%	69%
371	371	54%	54%	25%	19%	21%	25%	51%	51%	27%	21%	22%	27%
	1889	46%	46%	75%	81%	79%	75%	49%	49%	73%	79%	78%	73%
372	372	18%	18%	79%	87%	73%	79%	18%	18%	77%	85%	76%	77%
	1890	82%	82%	21%	13%	27%	21%	82%	82%	23%	15%	24%	23%
373	373	45%	45%	10%	4%	12%	10%	42%	42%	10%	4%	12%	10%
	1891	29%	29%	32%	27%	35%	32%	28%	28%	32%	28%	35%	32%
	1892	23%	23%	27%	33%	23%	27%	27%	27%	27%	31%	24%	27%
	1893	3%	3%	31%	36%	29%	31%	3%	3%	31%	37%	29%	31%
374	374	22%	22%	21%	36%	18%	21%	21%	21%	21%	36%	18%	21%
	1894	42%	42%	60%	54%	64%	60%	43%	42%	60%	53%	64%	60%
	1895	36%	36%	19%	11%	19%	19%	36%	36%	19%	11%	19%	19%
375	375	28%	28%	14%	12%	15%	14%	25%	25%	15%	13%	15%	15%
	1896	24%	24%	9%	6%	9%	9%	22%	22%	10%	7%	9%	10%
	1897	33%	33%	12%	9%	9%	12%	29%	29%	12%	10%	10%	12%
	1898	15%	15%	65%	73%	67%	65%	23%	23%	63%	70%	65%	63%

**HBW(Home Based Work Trips); HBO(Home Based Other including shoping and etc); NHB (Non Home Based)*

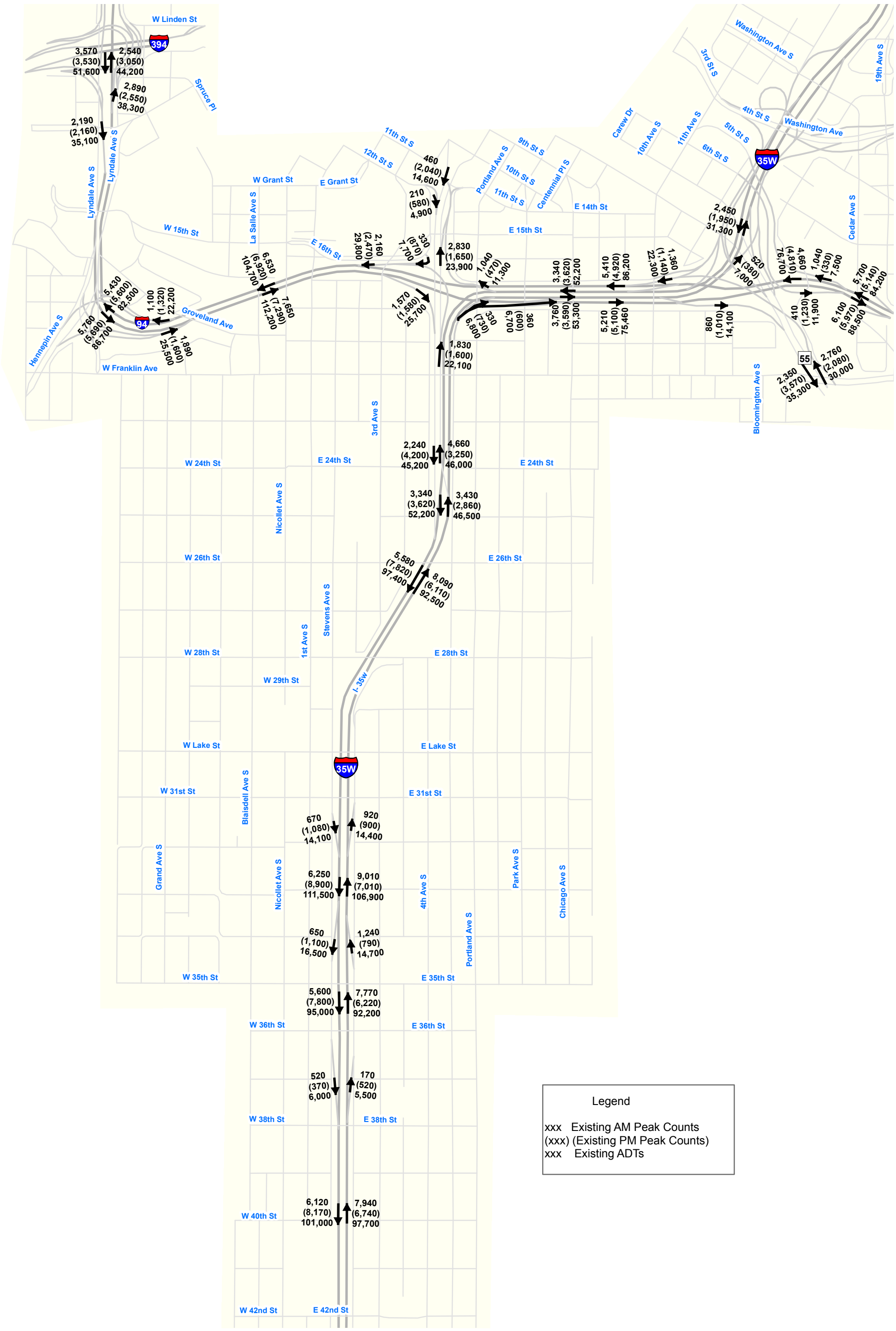
Appendix A-2

2009 Base Subarea Model East-West Cross Roads Screen Line Check

Screenline Location		Major East-West Cross Roads															Screen Line Total
		I-94	Franklin Avenue	26th Street	28th Street	Lake Street	31st Street	35th Street	36th Street	38th Street	42nd Street	46th Street	50th Street	DLk Road	60th Street	TH 62	
West of Lyndale Avenue	Count	197,000	14,800	9,700	9,700	11,300	12,200	5,800	10,800	6,100	6,600	4,500	12,500	11,500	8,000	102,400	422,900
	Regional Model Output	193,788	9,962	16,721	13,072	19,571	6,907	15,725		10,267	6,665	2,171	18,268	7,837	10,327	130,629	461,910
	Difference (%)	-2%	-33%	72%	35%	73%	-43%	-5%		68%	1%	-52%	46%	-32%	29%	28%	9%
	Sub-area Model	194,930	13,280	7,731	6,615	19,348	8,647	14,461		8,699	6,582	2,294	18,239	7,867	10,229	130,419	449,341
	Difference (%)	-1%	-10%	-20%	-32%	71%	-29%	-13%		43%	0%	-49%	46%	-32%	28%	27%	6%
West of I-35W	Count		19,500	13,200	13,300	20,500	14,900	17,100	10,000	11,500	11,300	18,100	7,000	24,100	11,200		191,700
	Regional Model Output		24,387	11,984	9,379	16,568	20,006	21,092	14,202	7,658	6,899	24,567	6,865	16,652	12,015		192,274
	Difference (%)		25%	-9%	-29%	-19%	34%	23%	42%	-33%	-39%	36%	-2%	-31%	7%		0%
	Sub-area Model		24,026	12,574	9,999	15,483	19,974	14,001	15,655	8,779	6,941	24,910	7,004	16,972	12,068		188,386
	Difference (%)		23%	-5%	-25%	-24%	34%	-18%	57%	-24%	-39%	38%	0%	-30%	8%		-2%
East of I-35W	Count		17,400	13,200	13,300	18,700	11,100	9,900	9,900	11,500	11,300	18,100	7,000	18,600	8,600		168,600
	Regional Model Output		16,609	11,984	9,379	20,917	17,258	13,601	18,425	5,282	6,264	23,308	6,069	10,805	3,713		163,614
	Difference (%)		-5%	-9%	-29%	12%	55%	37%	86%	-54%	-45%	29%	-13%	-42%	-57%		-3%
	Sub-area Model		16,092	12,329	9,999	16,429	14,497	9,147	11,941	9,467	6,464	23,491	6,202	10,879	3,566		150,503
	Difference (%)		-8%	-7%	-25%	-12%	31%	-8%	21%	-18%	-43%	30%	-11%	-42%	-59%		-11%
East of Bloomington Avenue	Count	153,000	12,600	12,700	7,100	21,500	6,500	5,000		7,900	7,300	3,900				104,400	341,900
	Regional Model Output	163,427	15,883	7,173	12,496	15,309	7,716	10,194		9,647	8,474	5,712				113,445	369,476
	Difference (%)	7%	26%	-44%	76%	-29%	19%	104%		22%	16%	46%				9%	8%
	Sub-area Model	163,110	14,780	8,792	10,120	14,490	5,483	8,552		8,802	8,592	5,625				113,173	361,519
	Difference (%)	7%	17%	-31%	43%	-33%	-16%	71%		11%	18%	44%				8%	6%

2009 Base Subarea Model North-South Cross Roads Screen Line Check

Screenline Location		Major North-South Cross Roads													Screen Line Total
		Hennepin Avenue	Lyndale Avenue	Blaisdell Ave	Nicollet Avenue	1st Ave	TH 65	35W	Portland Avenue	Park Avenue	Chicago Avenue	Blmgtn. Avenue	TH 55	Cedar Avenue	
South of Franklin Avenue	Count	28,500	27,900	7,400	8,600	5,500	91,200	98,700	12,200	13,900	7,400	5,700	65,300	21,300	393,600
	Regional Model Output	22,454	22,931		26,459		96,339	104,616	13,781	20,480	9,468	10,100	53,363	21,183	401,174
	Difference (%)	-21%	-18%		208%		6%	6%	13%	47%	28%	77%	-18%	-1%	2%
	Sub-area Model	20,251	24,111	7,203	10,630	4,370	99,925	105,304	20,103	7,285	13,535	8,084	53,326	23,333	397,460
	Difference (%)	-29%	-14%	-3%	24%	-21%	10%	7%	65%	-48%	83%	42%	-18%	10%	1%
North of Lake Street	Count	26,000	21,200	11,500		9,800		189,900		9,900	5,500	14,300	38,000	14,300	340,400
	Regional Model Output	26,176	16,301					200,955		16,860	3,937	3,680	49,843	11,453	329,205
	Difference (%)	1%	-23%					6%		70%	-28%	-74%	31%	-20%	-3%
	Sub-area Model	23,027	21,461	9,317		7,637		205,229		12,760	9,781	8,159	51,585	13,909	362,865
	Difference (%)	-11%	1%	-19%		-22%		8%		29%	78%	-43%	36%	-3%	7%
North of 35th Street	Count	12,350	12,433	5,800	11,528	3,500		218,400		11,000	7,800	9,200	38,000	14,100	344,111
	Regional Model Output	12,658	12,950		11,469			201,716		20,898	3,916	2,913	48,787	13,276	328,583
	Difference (%)	2%	4%		-1%			-8%		90%	-50%	-68%	28%	-6%	-5%
	Sub-area Model	9,534	11,405	4,964	11,012	1,980		205,946		8,363	8,790	4,225	47,761	14,869	328,849
	Difference (%)	-23%	-8%	-14%	-4%	-43%		-6%		-24%	13%	-54%	26%	5%	-4%
South of 46th Street	Count		17,500		8,800			191,400	11,700		7,200	3,900		16,600	257,100
	Regional Model Output		16,192		9,853			194,602	11,686		4,947	3,182		11,759	252,221
	Difference (%)		-7%		12%			2%	0%		-31%	-18%		-29%	-2%
	Sub-area Model		16,517		9,956			191,965	11,494		4,858	3,216		12,070	250,076
	Difference (%)		-6%		13%			0%	-2%		-33%	-18%		-27%	-3%



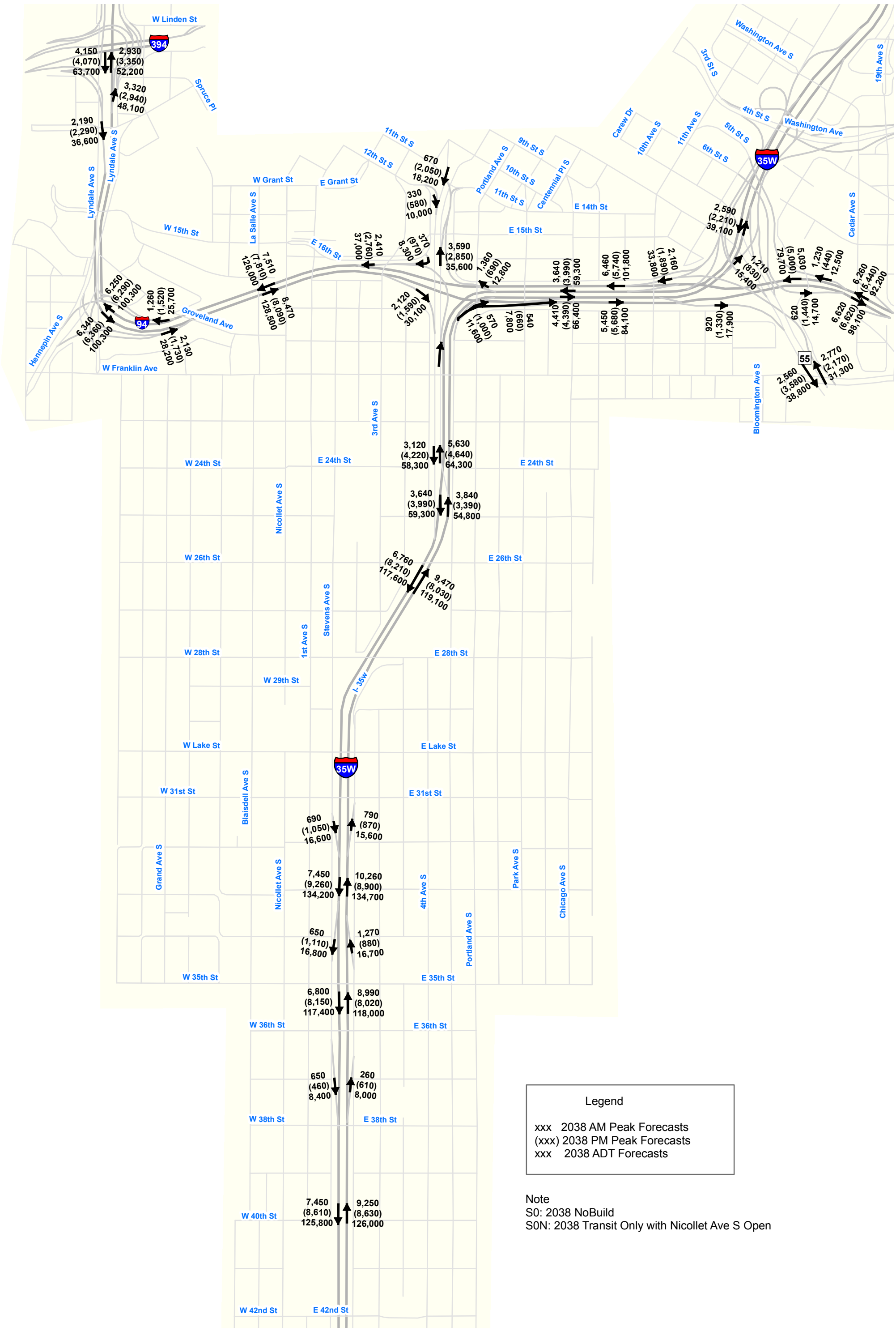
SEH

N

I-35W/Lake Street Transit Study

Appendix B

Existing Conditions
Freeway Peak and Daily Traffic Volumes
(Between I-94 and 41st Street)



Legend

xxx 2038 AM Peak Forecasts
(xxx) 2038 PM Peak Forecasts
xxx 2038 ADT Forecasts

Note
S0: 2038 NoBuild
S0N: 2038 Transit Only with Nicollet Ave S Open

SEH

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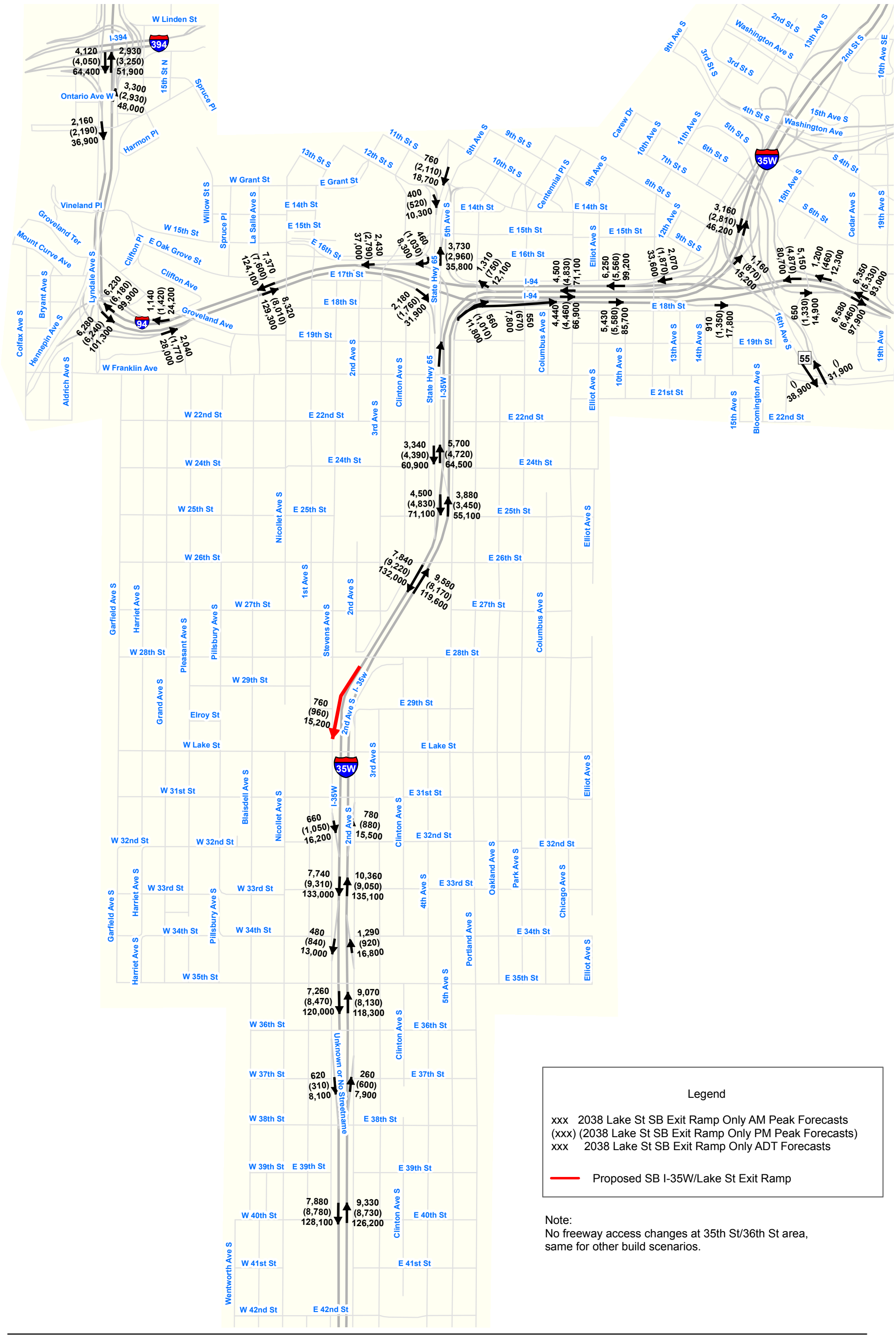
I-35W/Lake Street Transit Study

Appendix B-0

For Scenario S0 or S0N
2038 Freeway Peak and Daily Traffic Volumes
(Between I-94 and 41st Street)



Legend

xxx 2038 Lake St SB Exit Ramp Only AM Peak Forecasts
(xxx) (2038 Lake St SB Exit Ramp Only PM Peak Forecasts)
xxx 2038 Lake St SB Exit Ramp Only ADT Forecasts

Proposed SB I-35W/Lake St Exit Ramp

Note:
No freeway access changes at 35th St/36th St area, same for other build scenarios.

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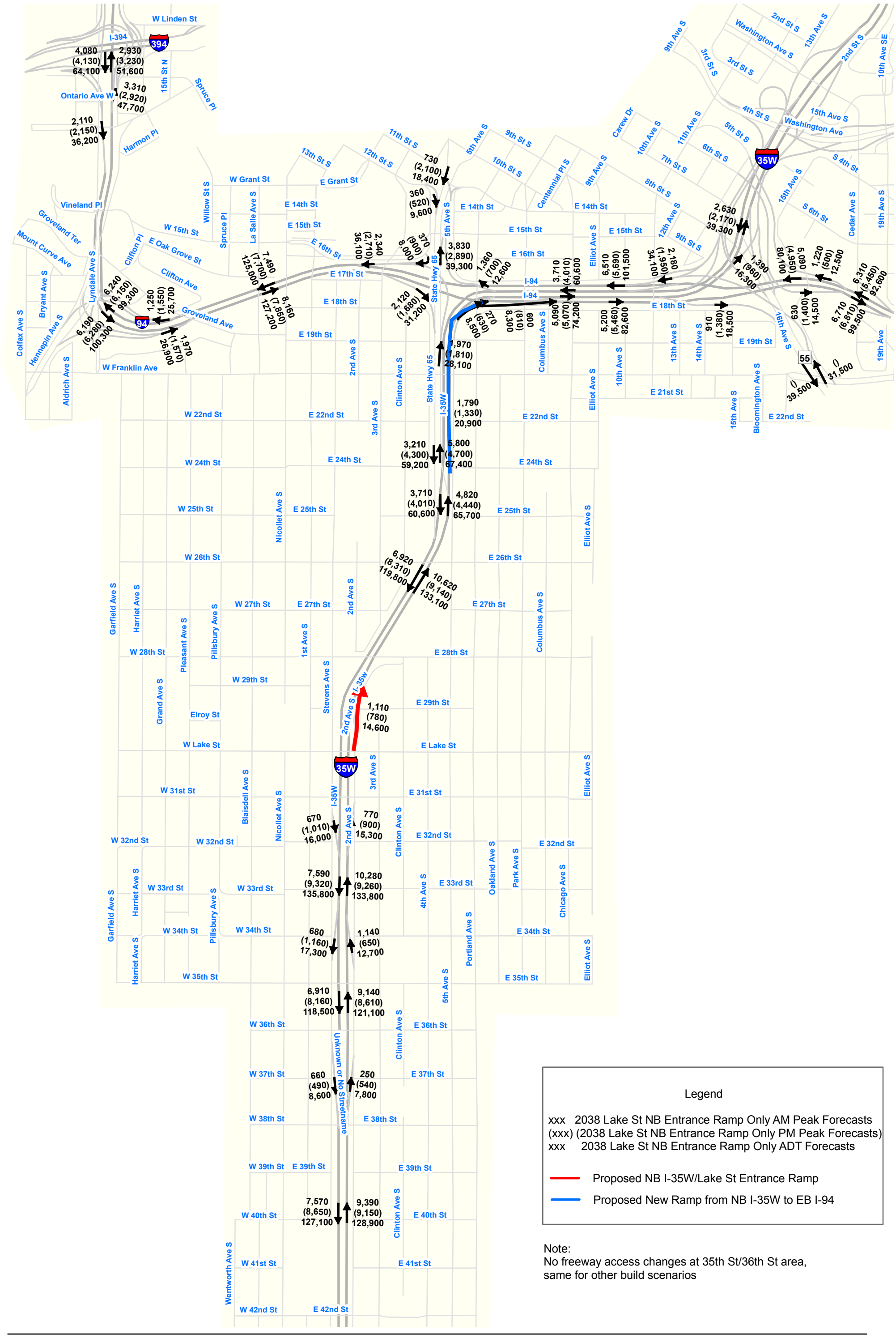
I-35W/Lake Street Transit Study

Appendix B-1

For Scenario S1
2038 SB I-35W/Lake St Exit Ramp Only
Freeway Peak and Daily Traffic Volumes
(Between I-94 and 41st Street)



Legend

xxx 2038 Lake St NB Entrance Ramp Only AM Peak Forecasts
(xxx) (2038 Lake St NB Entrance Ramp Only PM Peak Forecasts)
xxx 2038 Lake St NB Entrance Ramp Only ADT Forecasts

Proposed NB I-35W/Lake St Entrance Ramp

Proposed New Ramp from NB I-35W to EB I-94

Note:
No freeway access changes at 35th St/36th St area, same for other build scenarios

SEH

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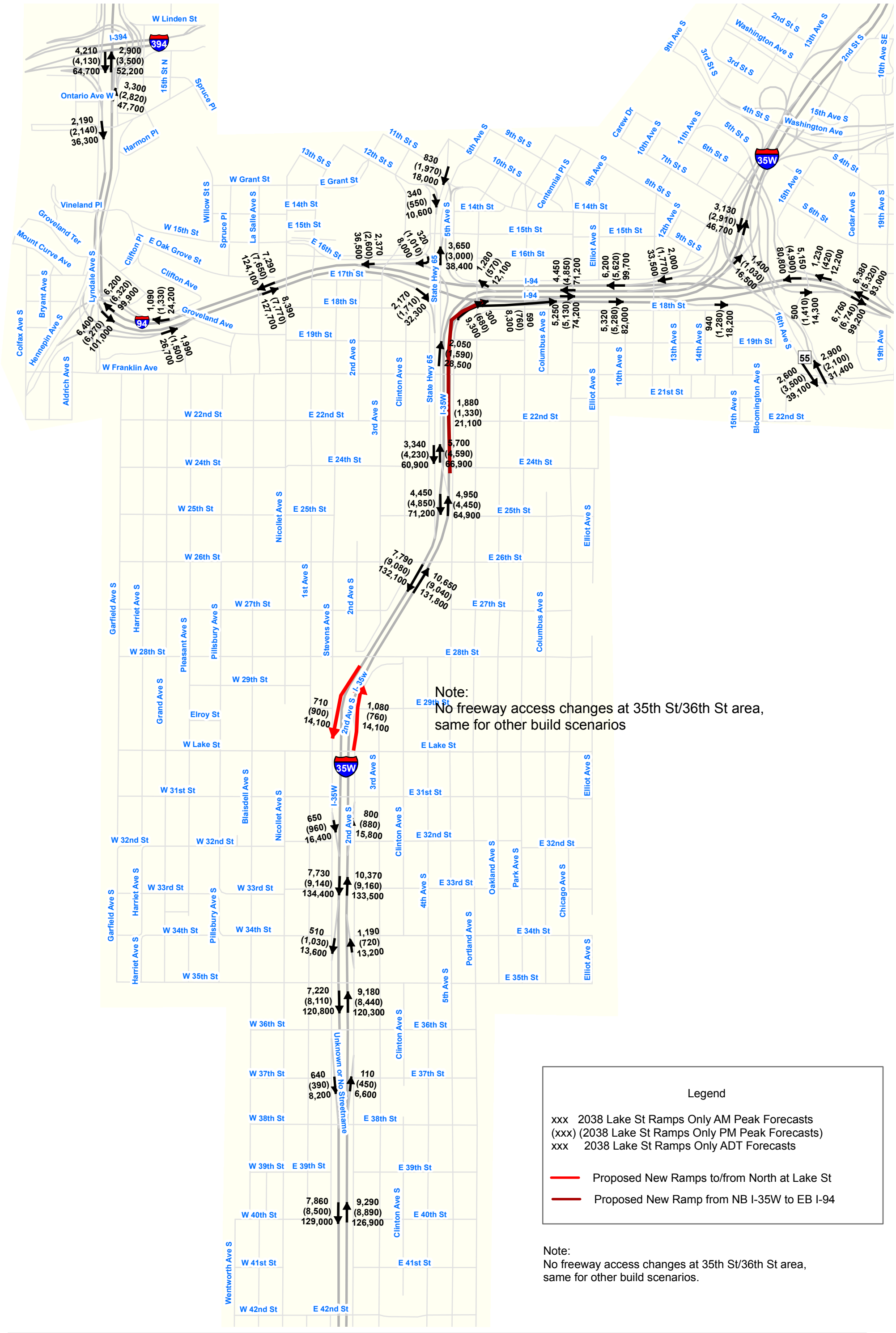
I-35W/Lake Street Transit Study

Appendix B-2
For Scenario S2
2038 NBI-35W/Lake St Entrance Ramp Only
Freeway Peak and Daily Traffic Volumes
(Between I-94 and 41st Street)



Note:
No freeway access changes at 35th St/36th St area, same for other build scenarios

Legend

xxx 2038 Lake St Ramps Only AM Peak Forecasts
(xxx) (2038 Lake St Ramps Only PM Peak Forecasts)
xxx 2038 Lake St Ramps Only ADT Forecasts

Proposed New Ramps to/from North at Lake St

Proposed New Ramp from NB I-35W to EB I-94

Note:
No freeway access changes at 35th St/36th St area, same for other build scenarios.

SEH

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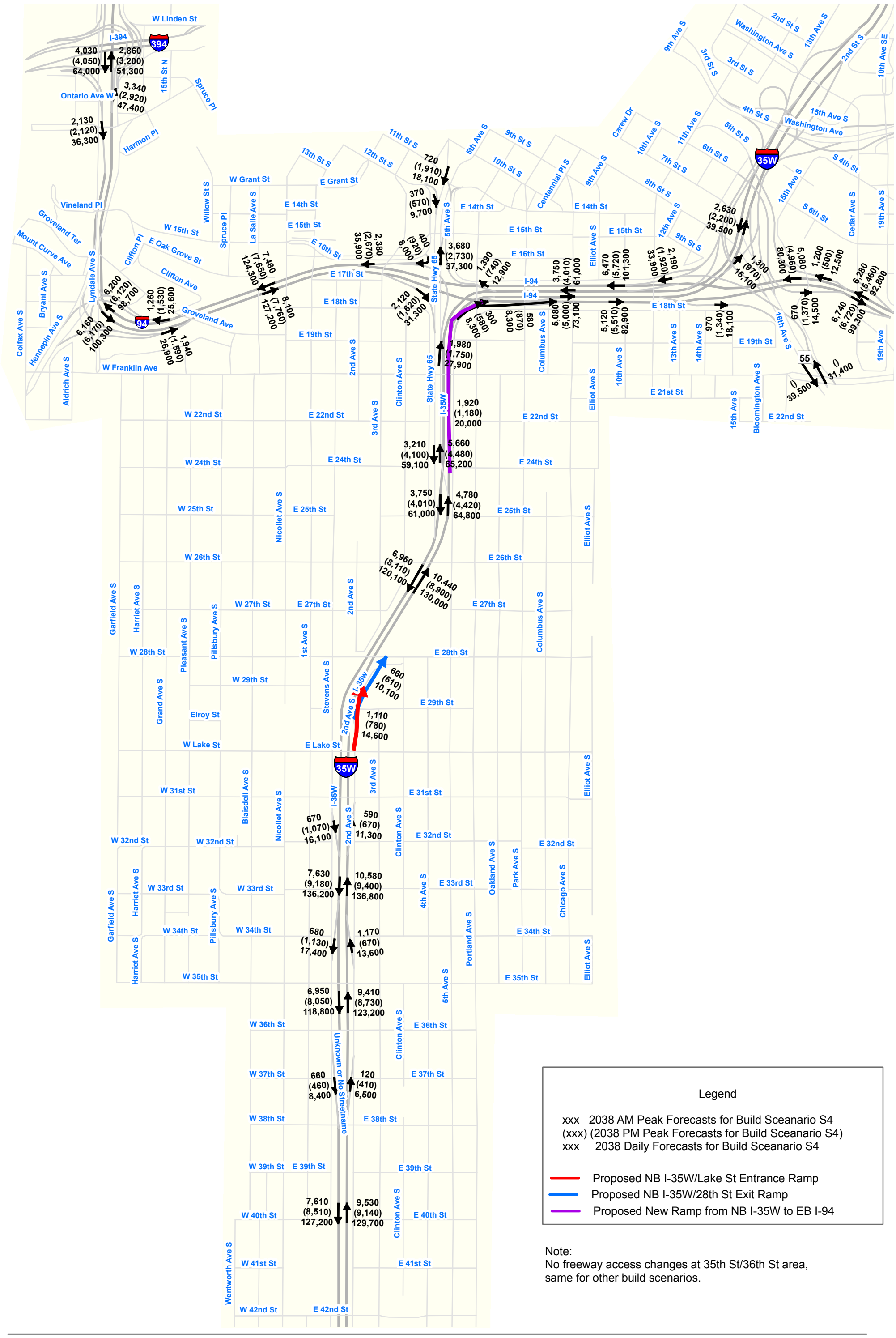
I-35W/Lake Street Transit Study

Appendix B-3

For Scenario S3
2038 Lake St Ramps Build Only
Freeway Peak and Daily Traffic Volumes
(Between I-94 and 41st Street)



SEH

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I-35W/Lake Street Transit Study

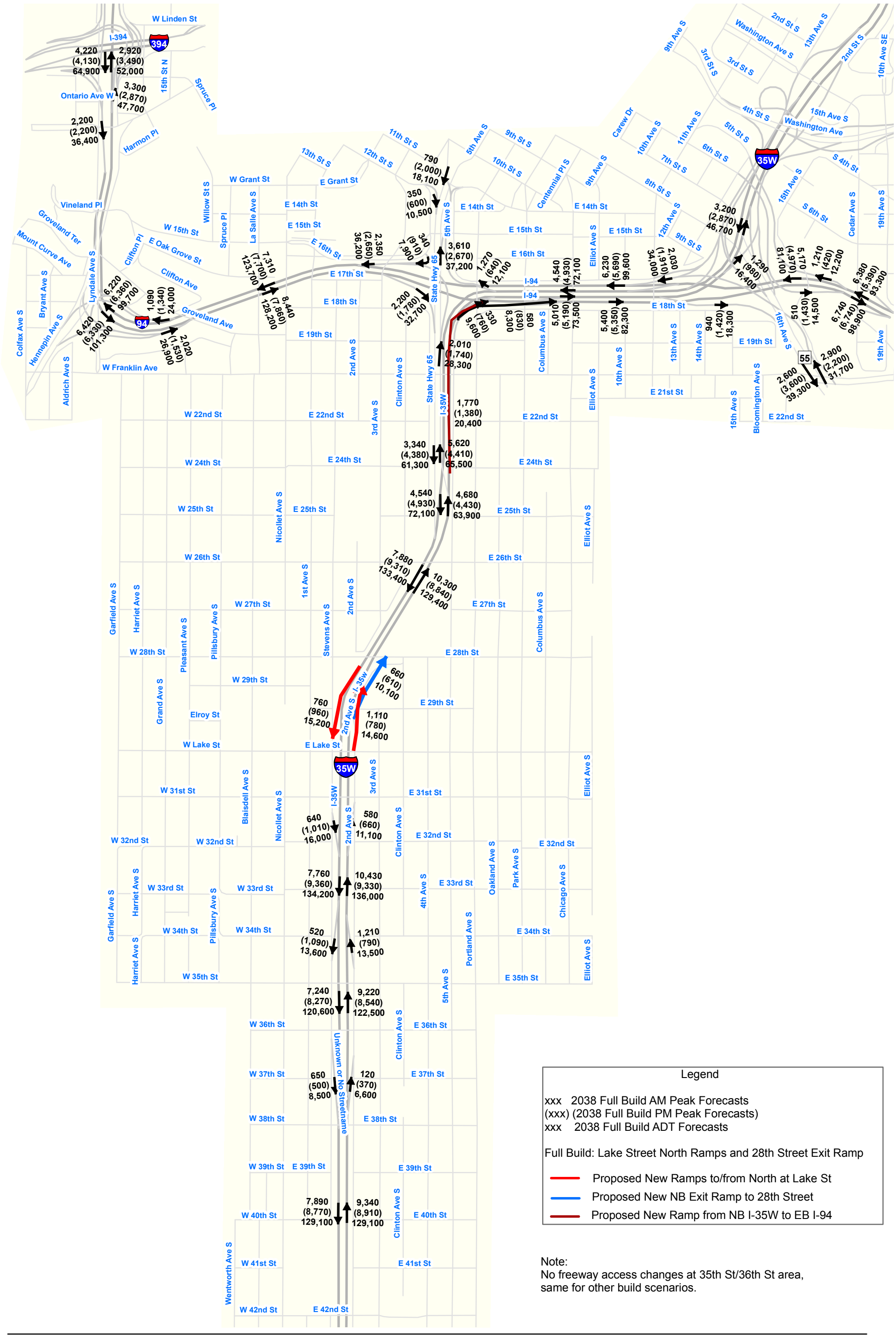
Appendix B-4

For Scenario S4

2038 NBI-35W/Lake St Entrance&28th St Exit Ramps

Freeway Peak and Daily Traffic Volumes

(Between I-94 and 41st Street)



Legend

xxx 2038 Full Build AM Peak Forecasts
(xxx) (2038 Full Build PM Peak Forecasts)
xxx 2038 Full Build ADT Forecasts

Full Build: Lake Street North Ramps and 28th Street Exit Ramp

- Proposed New Ramps to/from North at Lake St
- Proposed New NB Exit Ramp to 28th Street
- Proposed New Ramp from NB I-35W to EB I-94

Note:
No freeway access changes at 35th St/36th St area, same for other build scenarios.

SEH

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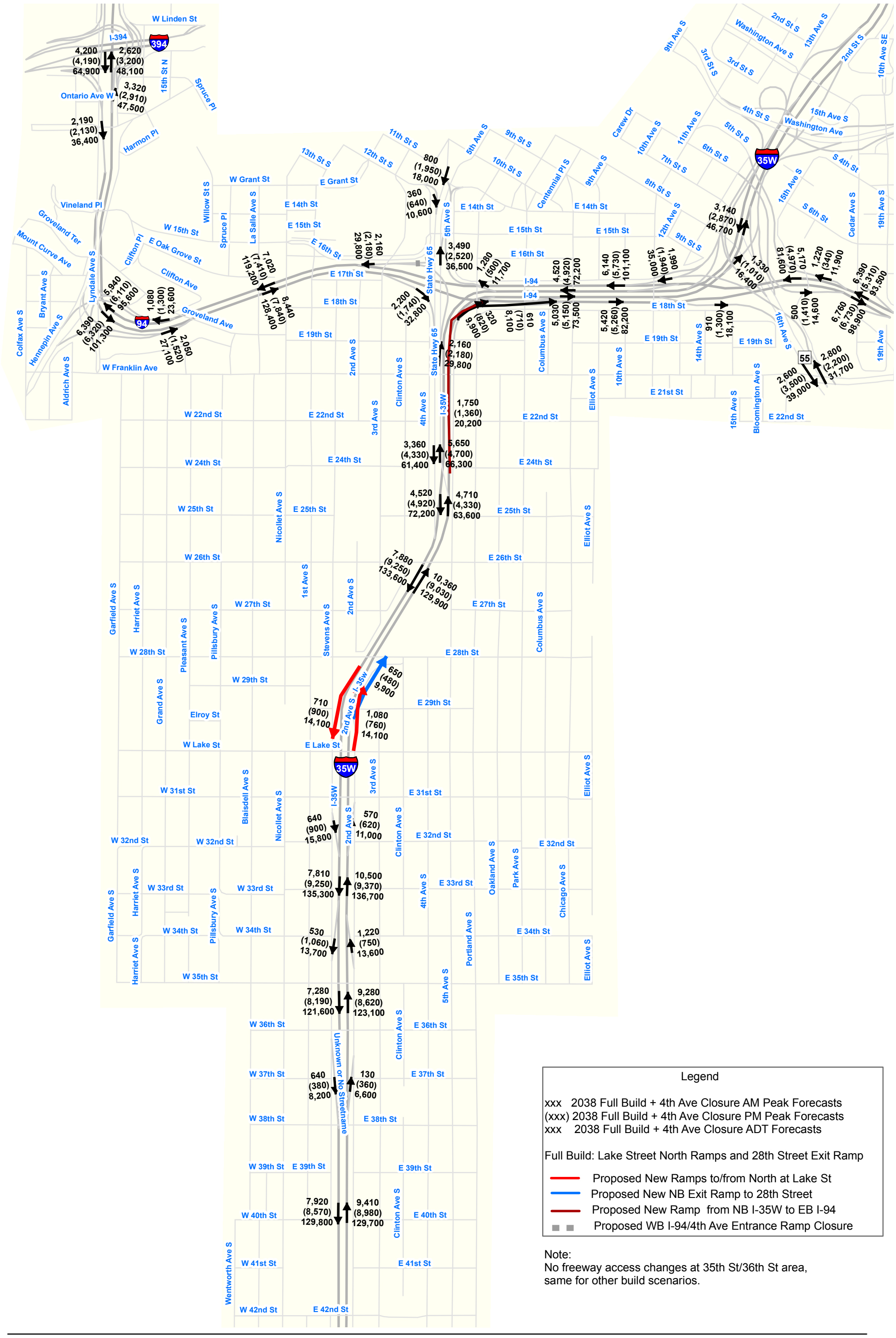
I-35W/Lake Street Transit Study

Appendix B-5
For Scenario S5
2038 Full Build
Freeway Peak and Daily Traffic Volumes
(Between I-94 and 41st Street)



Legend

xxx 2038 Full Build + 4th Ave Closure AM Peak Forecasts
(xxx) 2038 Full Build + 4th Ave Closure PM Peak Forecasts
xxx 2038 Full Build + 4th Ave Closure ADT Forecasts

Full Build: Lake Street North Ramps and 28th Street Exit Ramp

- Proposed New Ramps to/from North at Lake St
- Proposed New NB Exit Ramp to 28th Street
- Proposed New Ramp from NB I-35W to EB I-94
- Proposed WB I-94/4th Ave Entrance Ramp Closure

Note:
No freeway access changes at 35th St/36th St area, same for other build scenarios.

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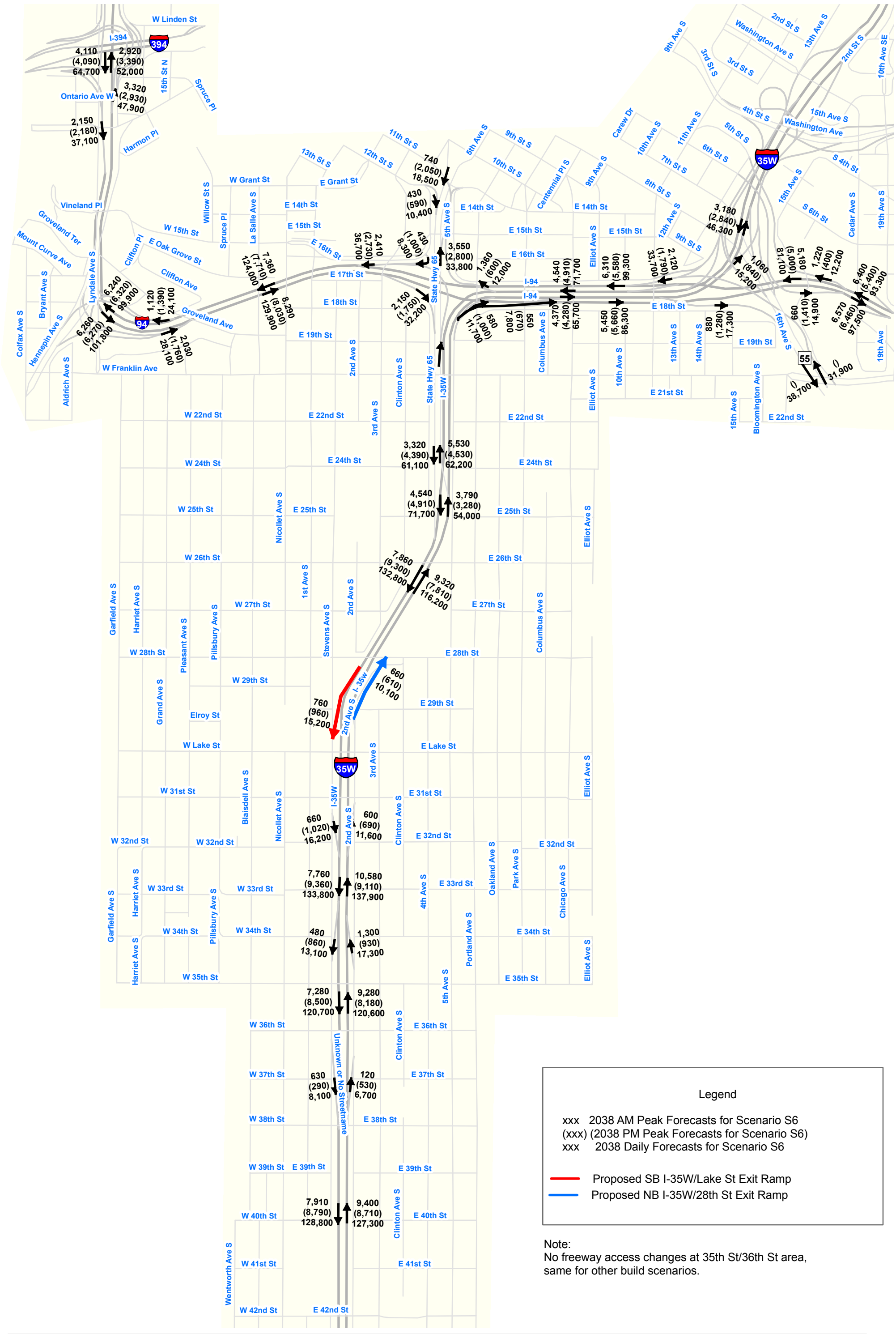
I-35W/Lake Street Transit Study

Appendix B-5.1
For Scenario S5.1
2038 Full Build + 4th Ave Ramp Closure
Freeway Peak and Daily Traffic Volumes
(Between I-94 and 41st Street)



Note:
No freeway access changes at 35th St/36th St area, same for other build scenarios.

SEH

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I-35W/Lake Street Transit Study

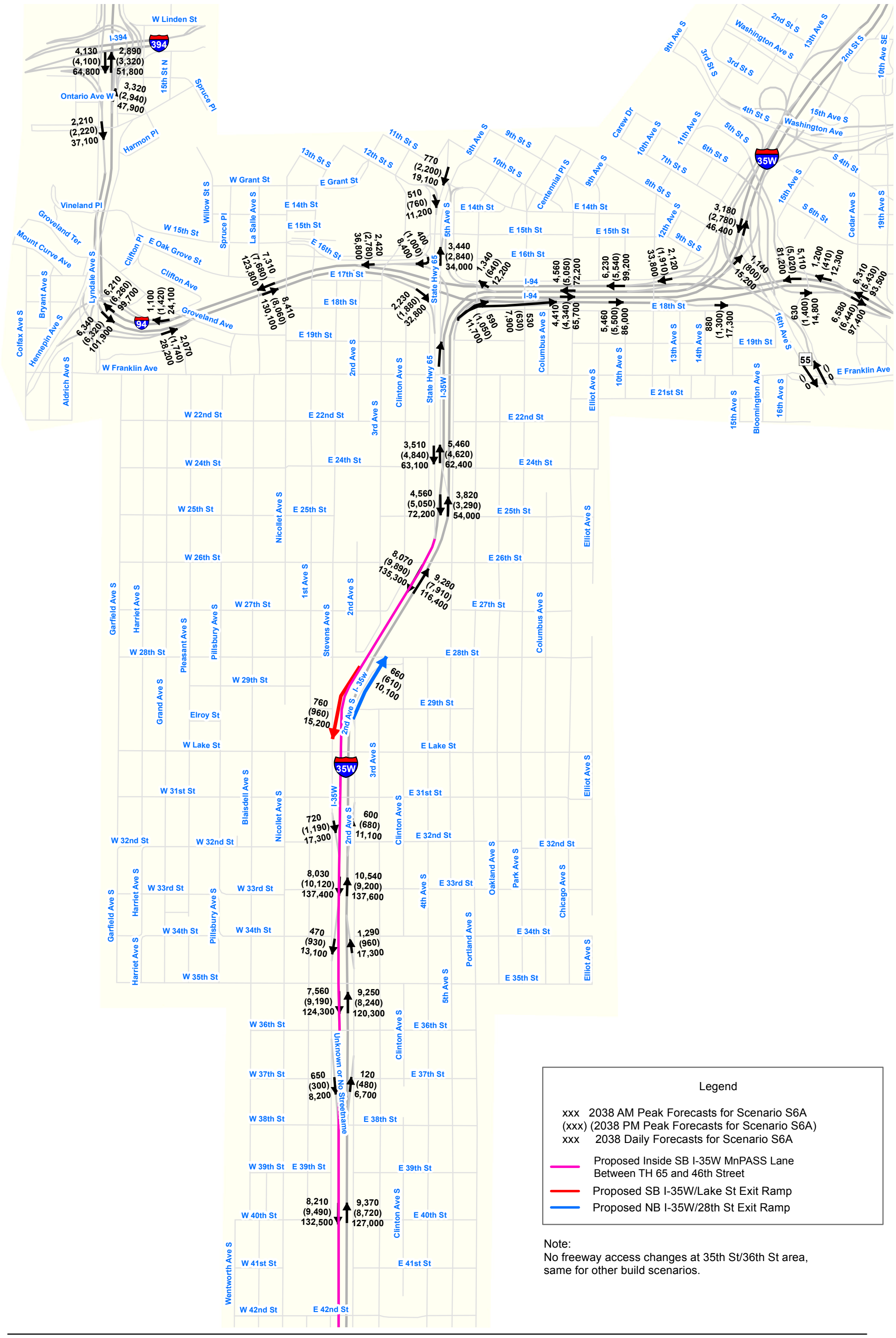
Appendix B-6

For Scenario S6

2038 SB I-35W/Lake St&NB I-35W/28th St Exit Ramps

Freeway Peak and Daily Traffic Volumes

(Between I-94 and 41st Street)



Legend

xxx 2038 AM Peak Forecasts for Scenario S6A
(xxx) (2038 PM Peak Forecasts for Scenario S6A)
xxx 2038 Daily Forecasts for Scenario S6A

Proposed Inside SB I-35W MnPASS Lane Between TH 65 and 46th Street

Proposed SB I-35W/Lake St Exit Ramp

Proposed NB I-35W/28th St Exit Ramp

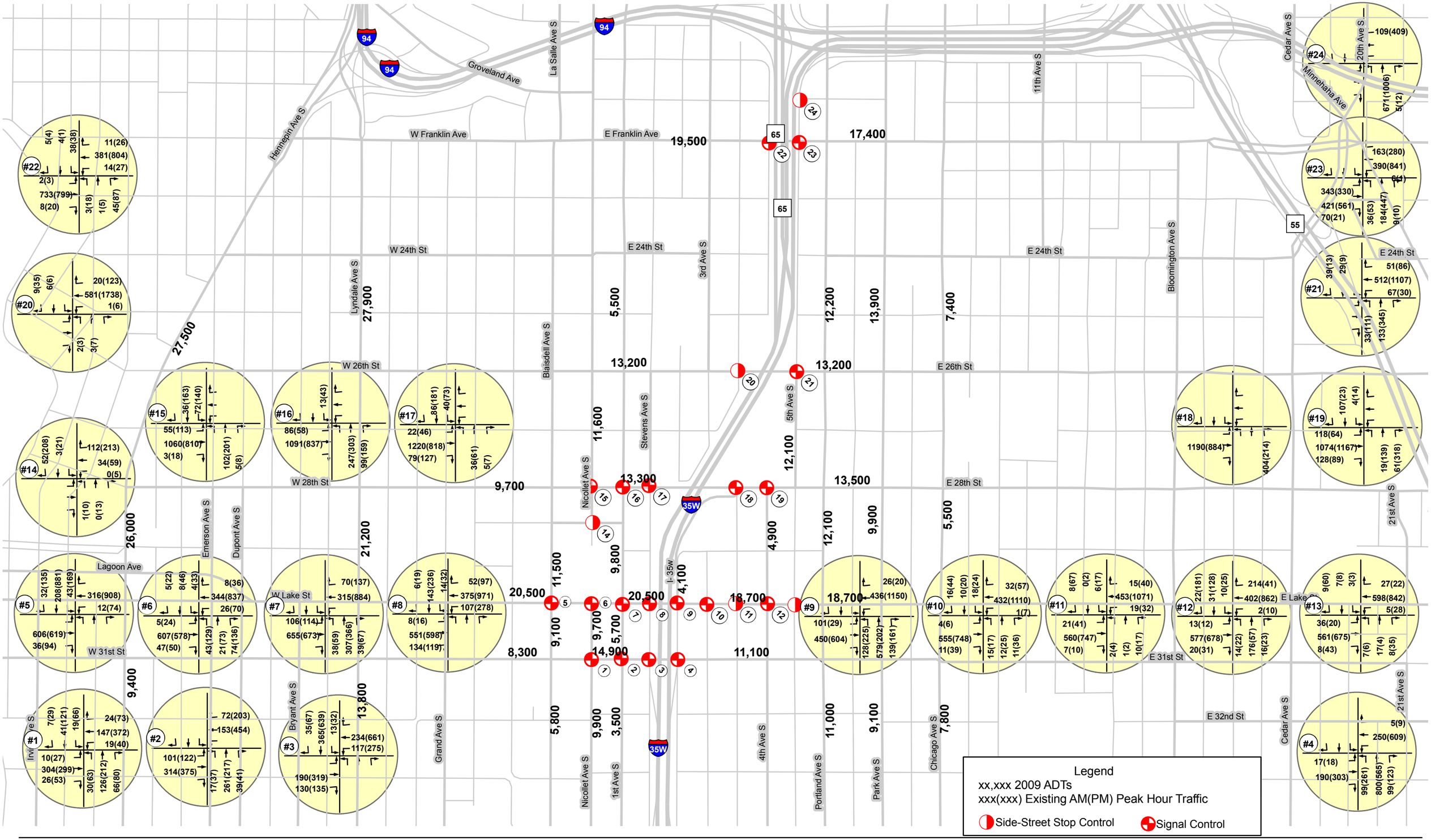
Note:
No freeway access changes at 35th St/36th St area, same for other build scenarios.

SEH

N

I-35W/Lake Street Transit Study

Appendix B-6A
For Scenario S6A Southbound MnPASS
2038 SB I-35W/Lake St&NB I-35W/28th St Exit Ramps
Freeway Peak and Daily Traffic Volumes
(Between I-94 and 41st Street)

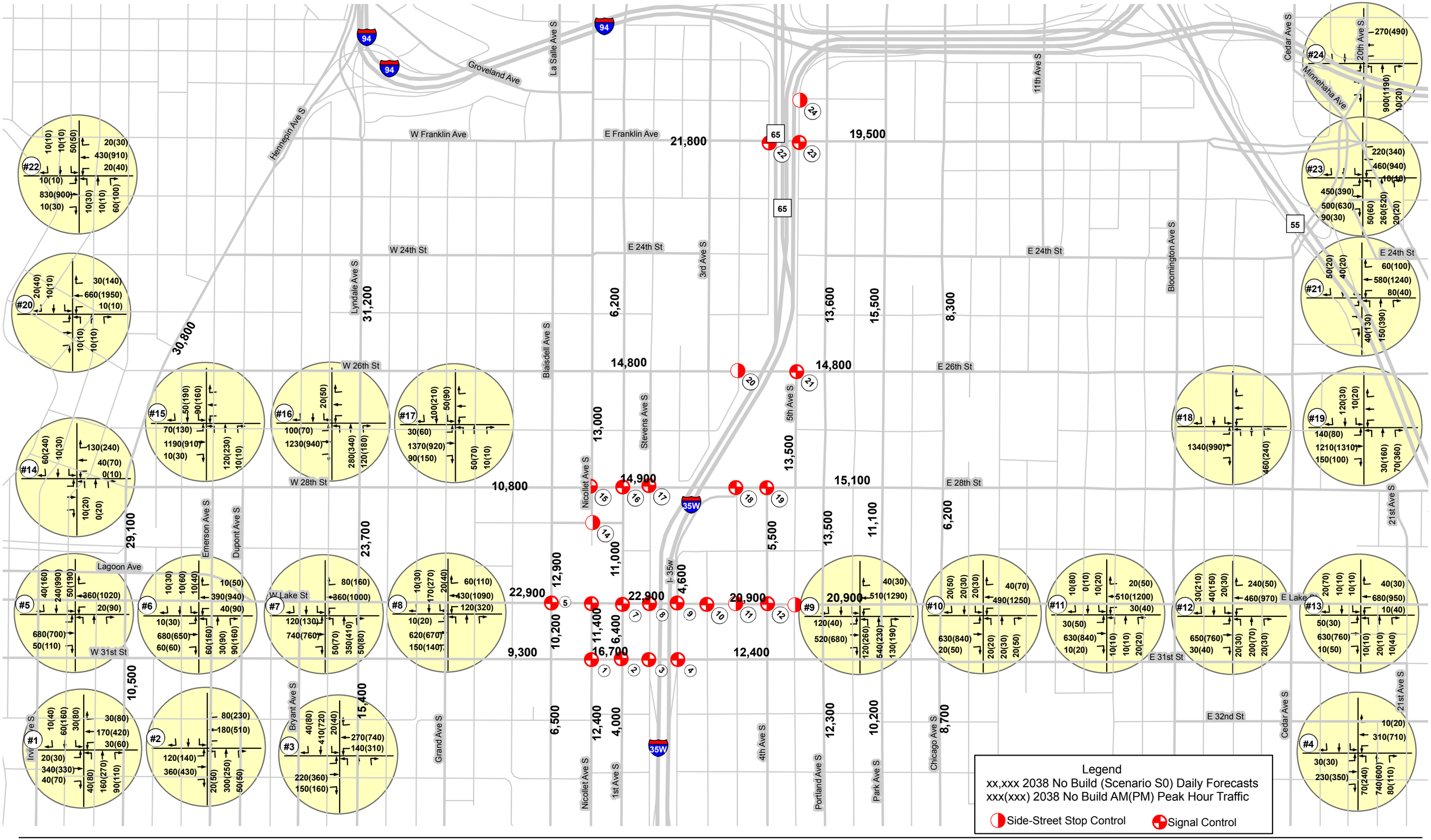


SEH

N

I-35W/Lake Street Transit Study

Appendix C
Arterial Existing Traffic Volumes



SEH

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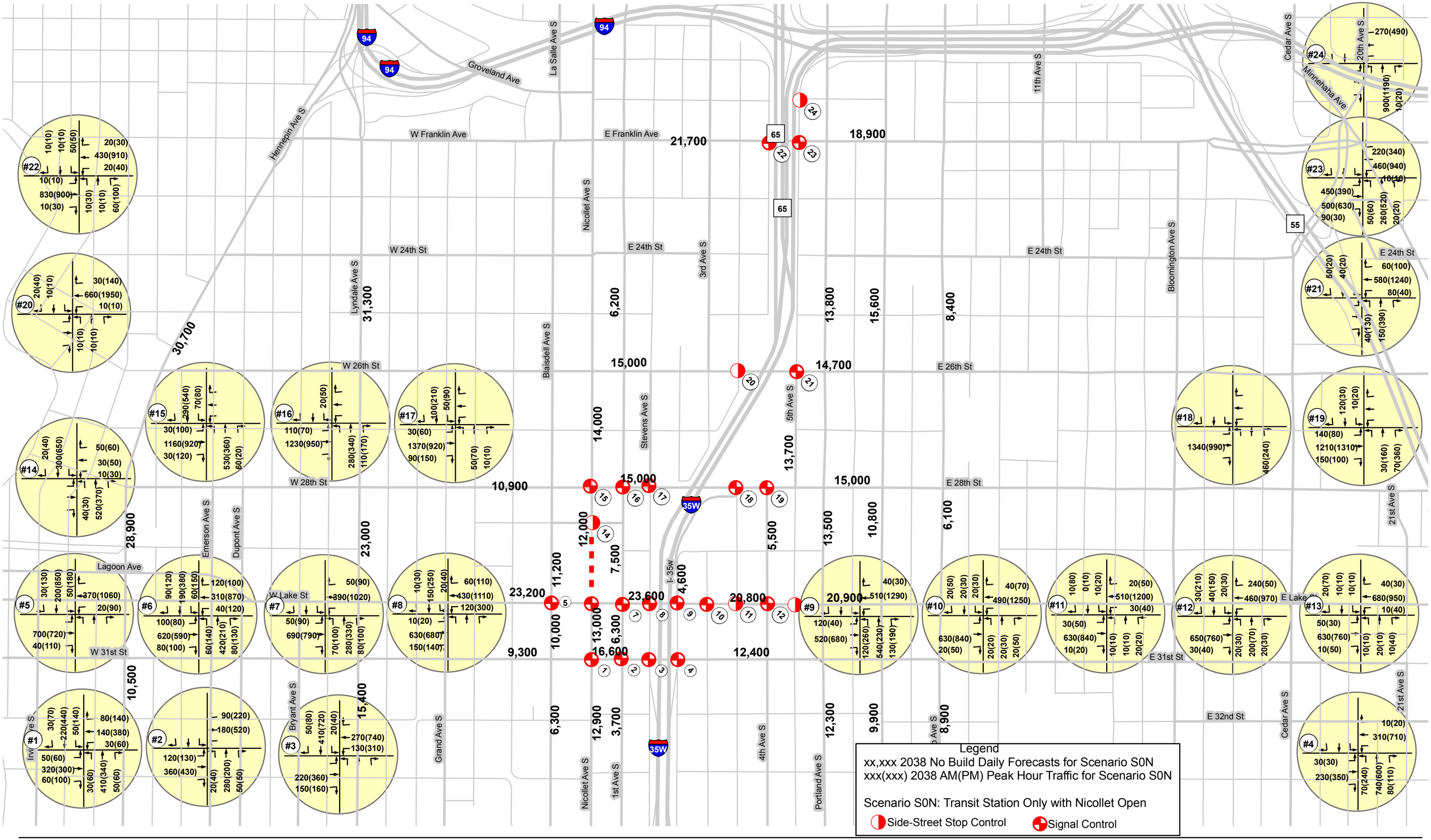
I-35W/Lake Street Transit Study

Appendix C-0

For Scenario S0
2038 No Build
Arterial Traffic Volumes



SEH

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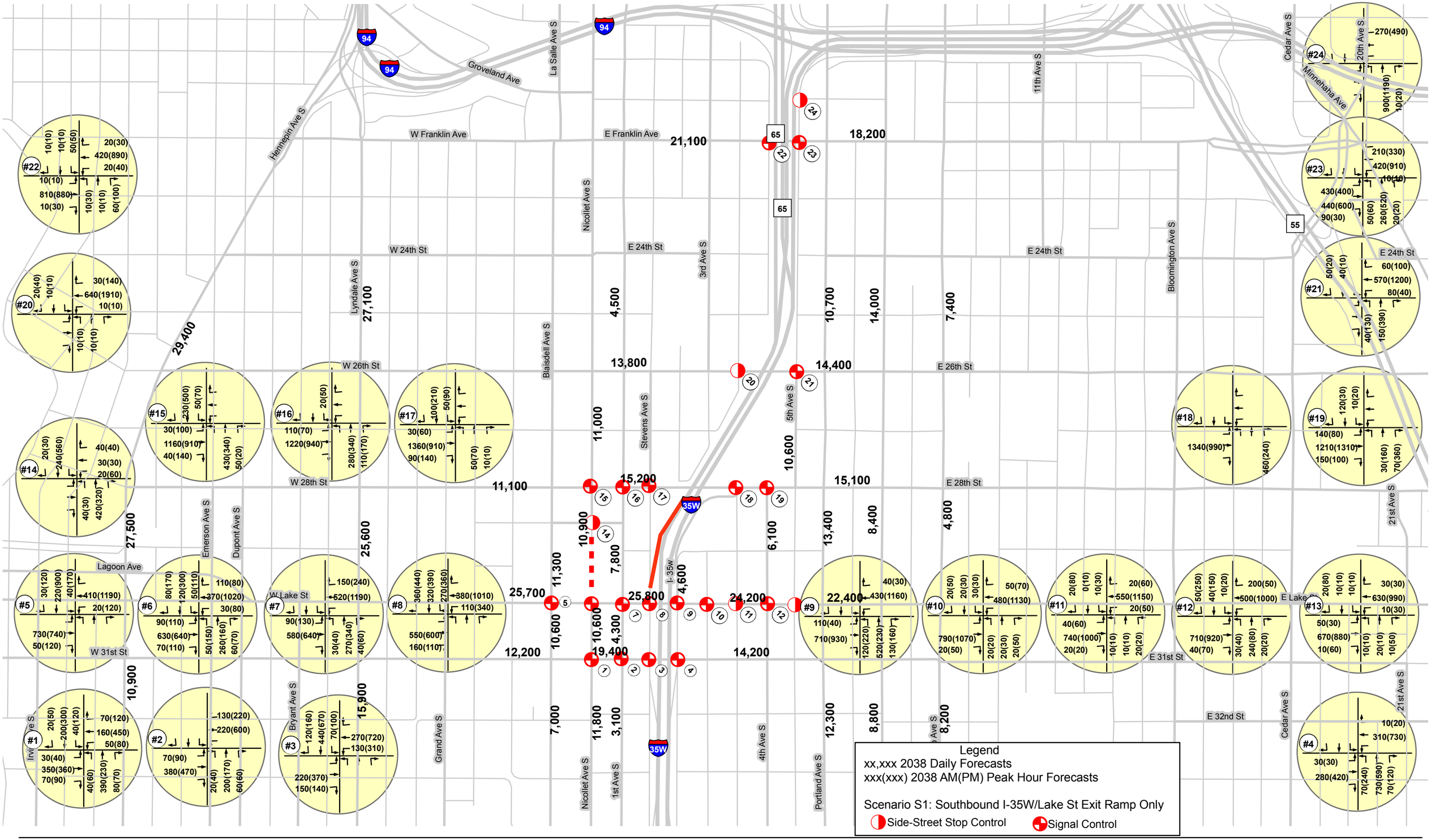
I-35W/Lake Street Transit Study

Appendix C-0N
For Scenario S0N
2038 Transit Station Only With Nicollet Open
Arterial Traffic Volumes

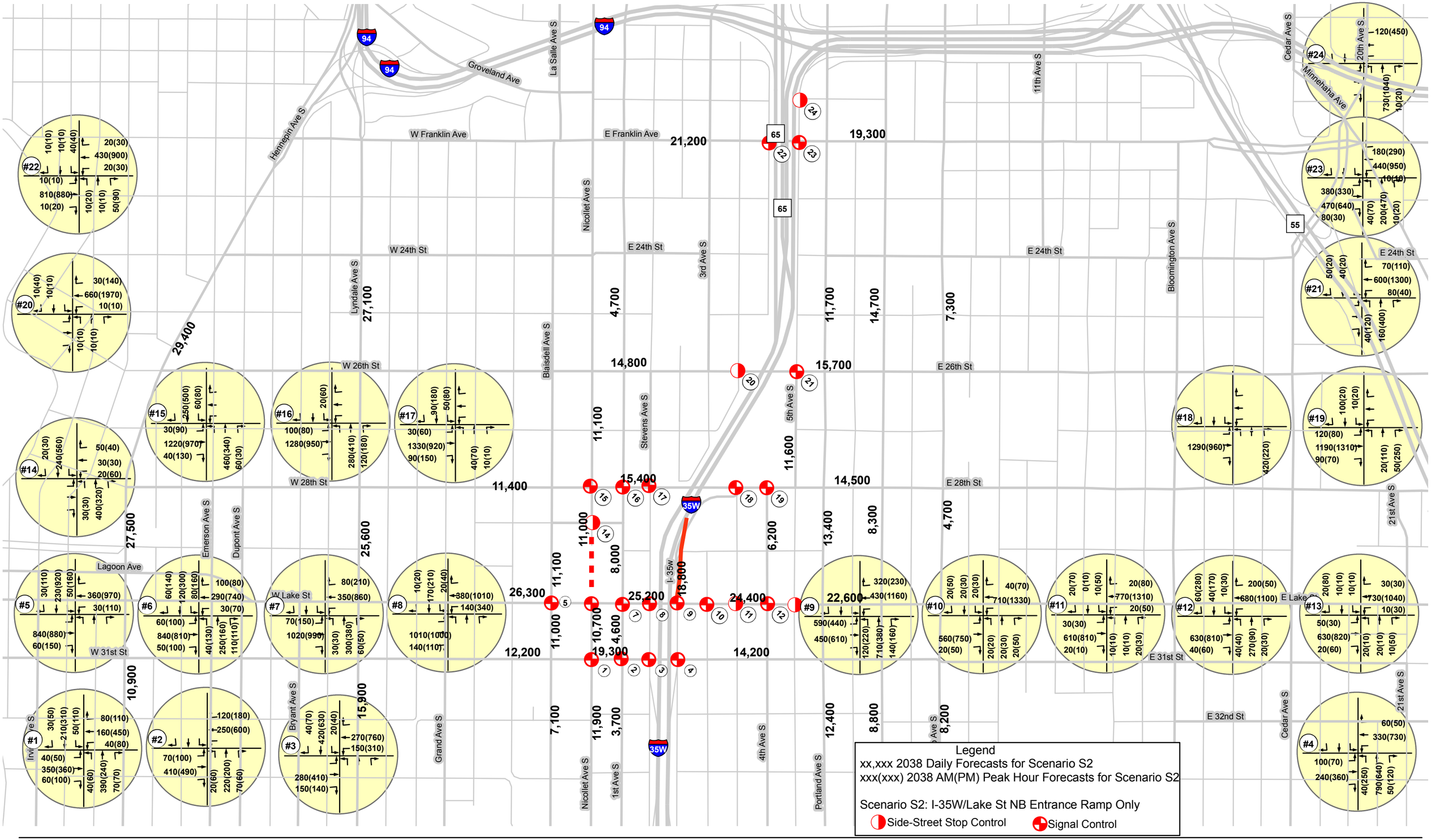


SEH

N

I-35W/Lake Street Transit Study

Appendix C-1
For Scenario S1
2038 I-35W/Lake St SB Exit Ramp Only
Arterial Traffic Volumes

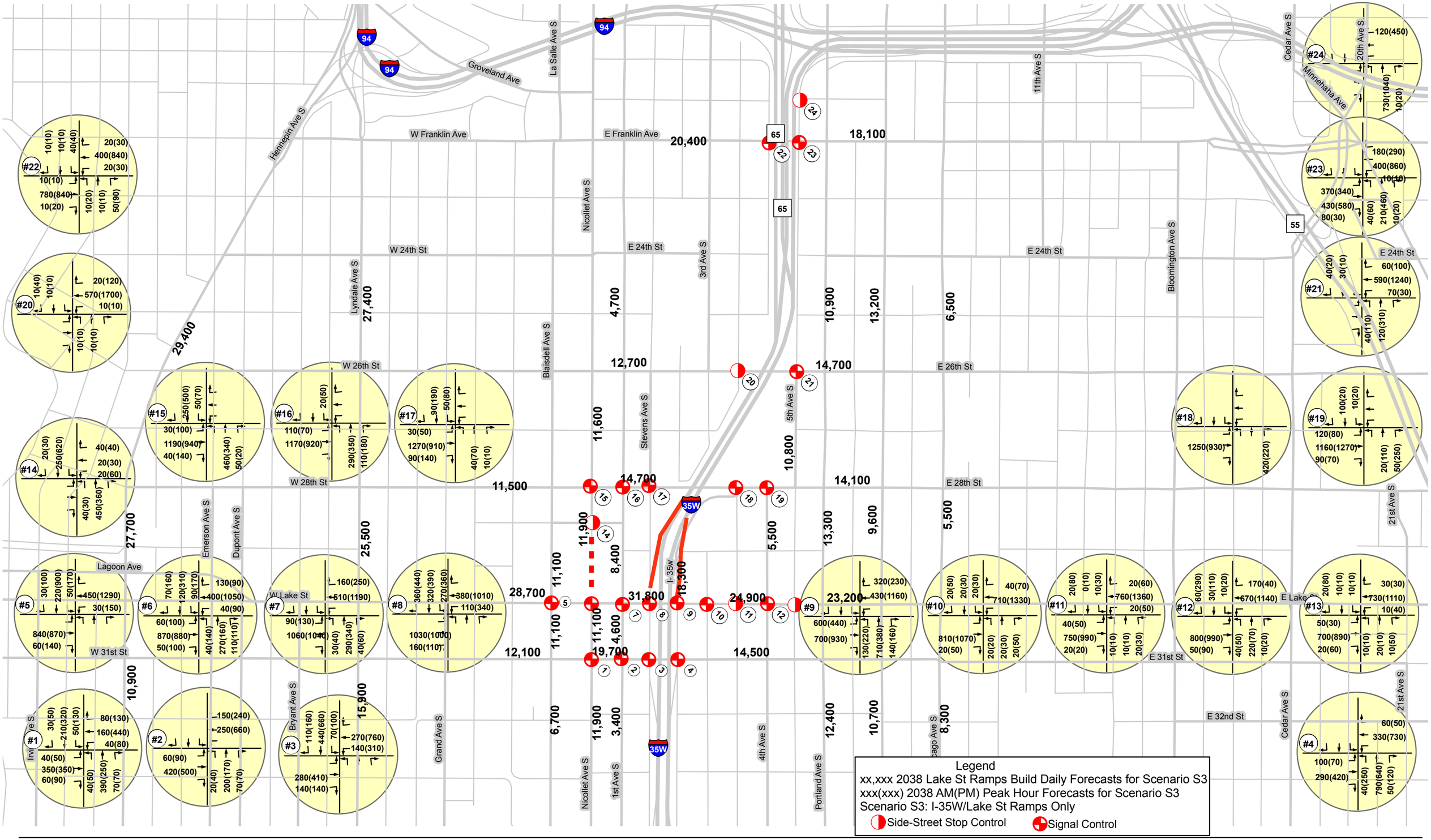


SEH

N

I-35W/Lake Street Transit Study

Appendix C-2
For Scenario S2
2038 I-35W/Lake St NB Entrance Ramp Only
Arterial Traffic Volumes



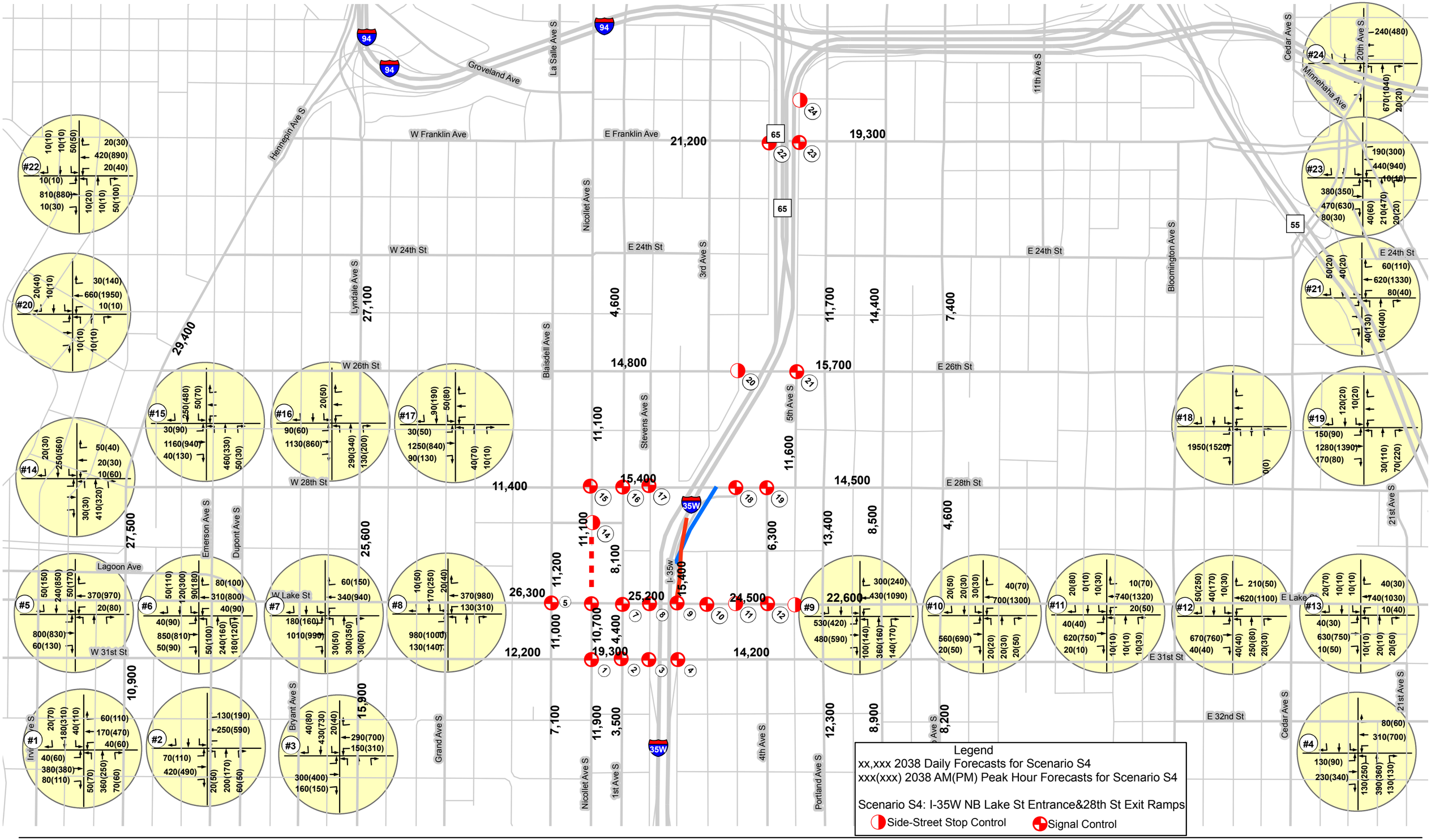
SEH

N

I-35W/Lake Street Transit Study

Appendix C-3

For Scenario S3
2038 Lake Street Ramps Build
Arterial Traffic Volumes

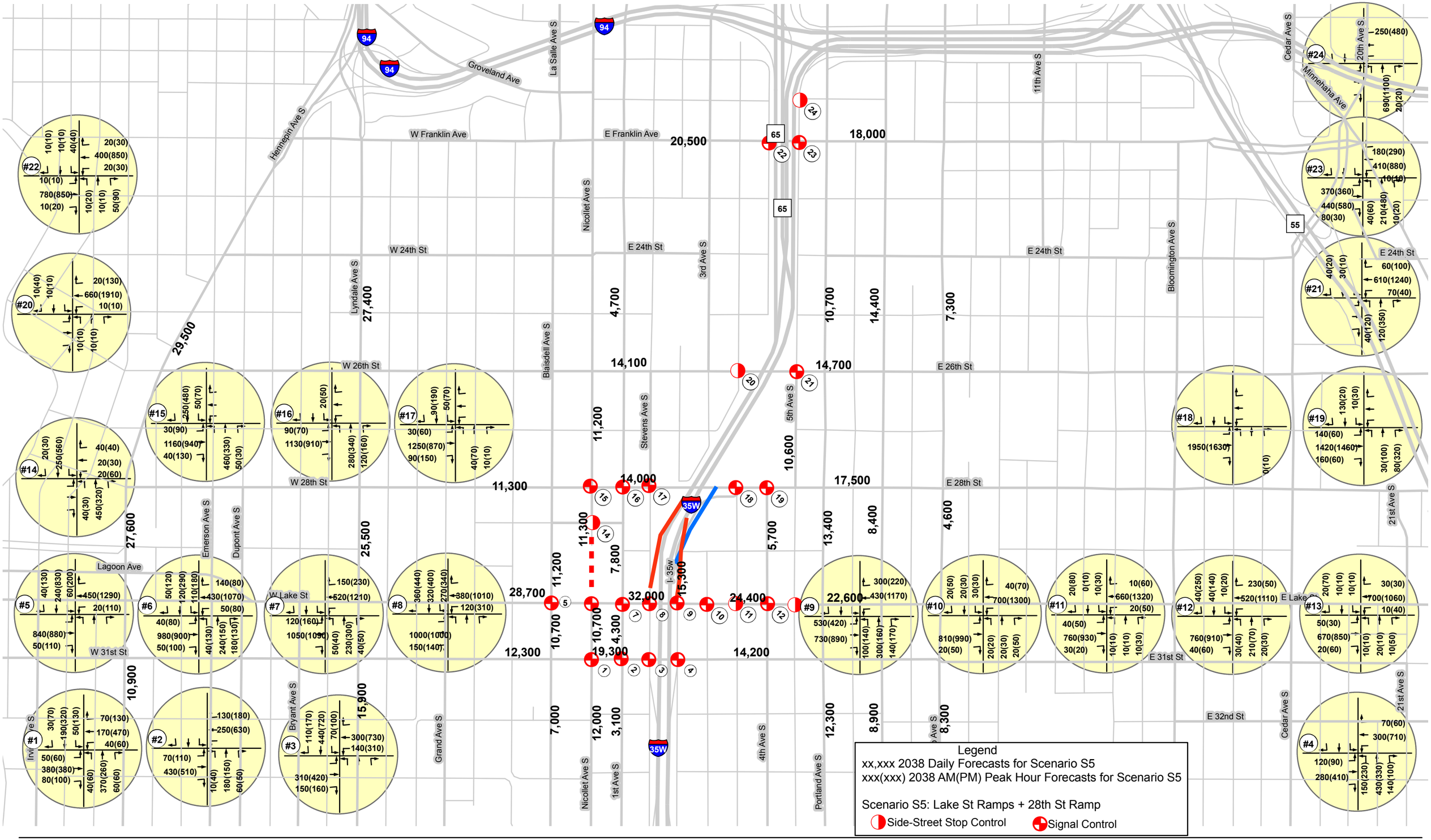


SEH

N

I-35W/Lake Street Transit Study

Appendix C-4
For Scenario S4
2038 I-35W NB Lake St Entrance Ramp and 28th St Exit Ramp
Arterial Traffic Volumes

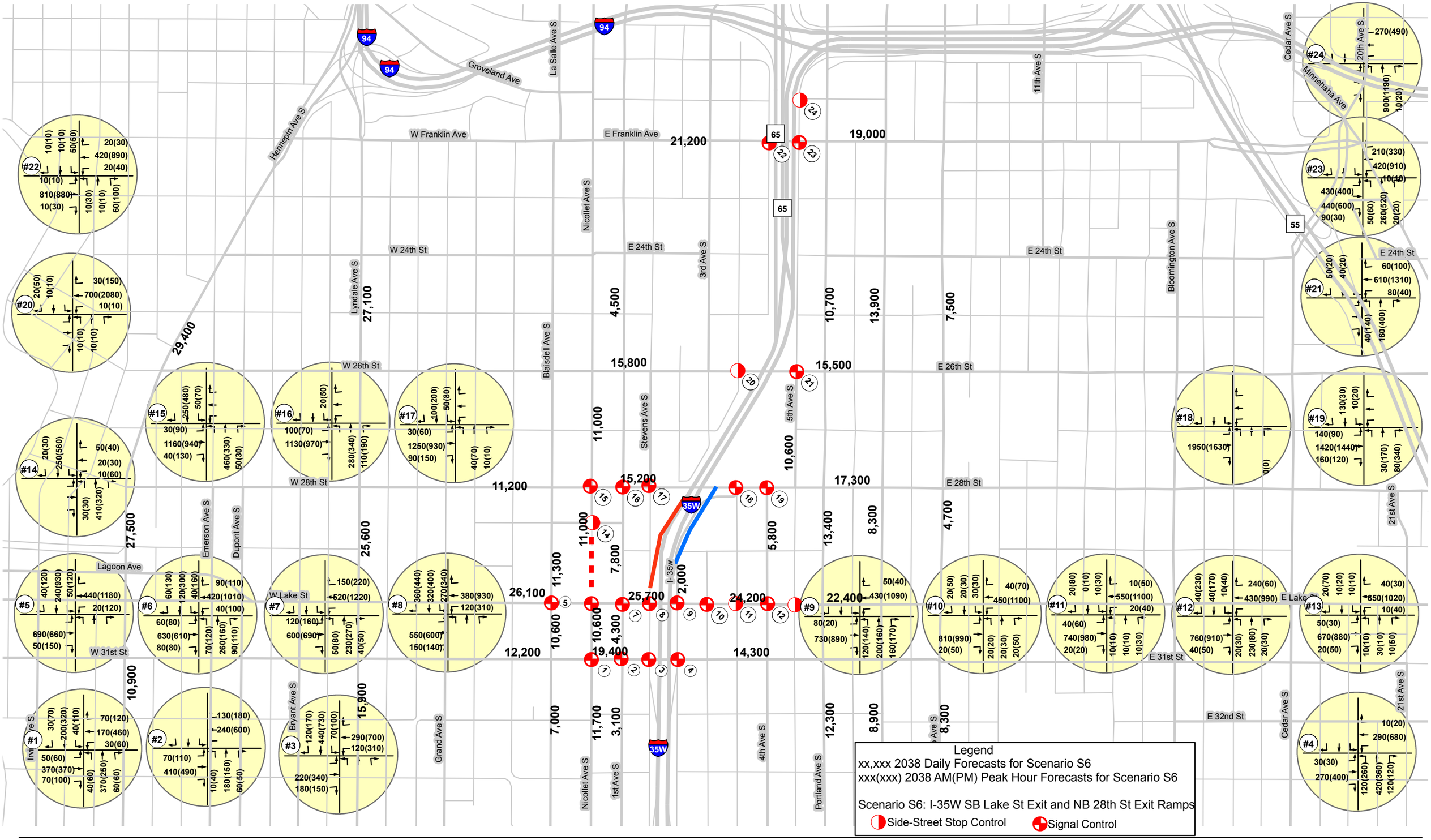


N

SEH

I-35W/Lake Street Transit Study

Appendix C-5
For Scenario S5
2038 Full Build
Arterial Traffic Volumes



SEH

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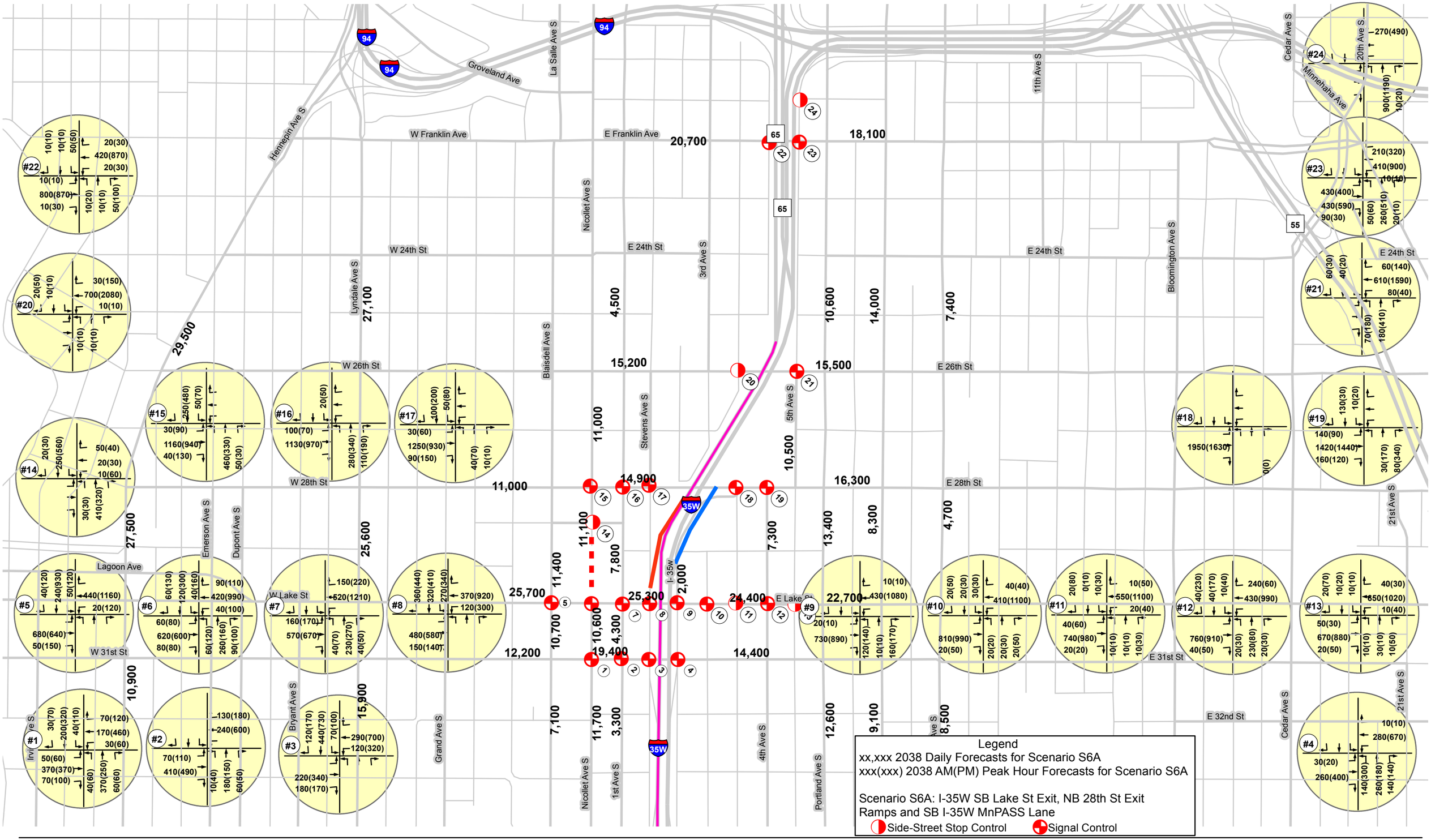
I-35W/Lake Street Transit Study

Appendix C-6
For Scenario S6
2038 I-35W SB Lake St Exit and NB 28th St Exit Ramps
Arterial Traffic Volumes



SEH

N

I-35W/Lake Street Transit Study

Appendix C-6A
For Scenario S6A with SB MnPASS Lane
2038 I-35W SB Lake St Exit and NB 28th St Exit Ramps
Arterial Traffic Volumes

Appendix D-0
Traffic Forecast Reasonableness Check
For Scenario S00 or S01: Year 2038 No Access with or without Nicollet Open

AM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 No Access with or without Nicollet Open											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd	6*	3*	12,400	5,800	129,200	9,200	7.1%	6,520	71%	2,680	29%	6*	3*	12,400	5,800	173,400	11,320	6.5%	7,720	68%	3,600	32%	1.34	1.23
	Diamond LRd to46th St	5*	5*	10,200	10,200	191,400	13,380	7.0%	7,080	53%	6,300	47%	5*	5*	10,200	10,200	243,500	15,740	6.5%	8,290	53%	7,450	47%	1.27	1.18
	46th St to 35th/36th St	5**	4	10,200	8,800	198,700	14,060	7.1%	7,940	56%	6,120	44%	5**	4	10,200	8,800	251,800	16,700	6.6%	9,250	55%	7,450	45%	1.27	1.19
	35th/36th St to 31st/Lake St	6**	5	12,400	11,000	218,400	15,260	7.0%	9,010	59%	6,250	41%	6**	5	12,400	11,000	268,900	17,710	6.6%	10,260	58%	7,450	42%	1.23	1.16
	31th/Lake St to TH 65	5**	4	10,200	8,800	189,900	13,670	7.2%	8,090	59%	5,580	41%	5**	4	10,200	8,800	236,700	16,230	6.9%	9,470	58%	6,760	42%	1.25	1.19
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,770	6.9%	3,430	51%	3,340	49%	2	2	4,400	4,400	114,100	7,480	6.6%	3,840	51%	3,640	49%	1.16	1.10
	I-94 Common Section	3	2	6,600	4,400	105,500	7,100	6.7%	3,760	53%	3,340	47%	3	2	6,600	4,400	125,700	8,050	6.4%	4,410	55%	3,640	45%	1.19	1.13
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,190	6.6%	5,760	51%	5,430	49%	3	3	6,600	6,600	200,600	12,590	6.3%	6,340	50%	6,250	50%	1.19	1.13
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,180	6.5%	7,650	54%	6,530	46%	4	4	8,800	8,800	254,500	15,980	6.3%	8,470	53%	7,510	47%	1.17	1.13
	I-35W Commons	4	4	8,800	8,800	161,660	10,620	6.6%	5,210	49%	5,410	51%	4	4	8,800	8,800	185,900	11,910	6.4%	5,450	46%	6,460	54%	1.15	1.12
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,800	6.8%	6,100	52%	5,700	48%	4	4	8,800	8,800	190,300	12,880	6.8%	6,620	51%	6,260	49%	1.10	1.09
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	6,900	7.6%	4,660	68%	2,240	32%	3	2	6,600	4,400	122,600	8,750	7.1%	5,630	64%	3,120	36%	1.34	1.27

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

PM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 No Access with or without Nicollet Open											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd	6*	3*	12,400	5,800	129,200	10,060	7.8%	6,890	68%	3,170	32%	6*	3*	12,400	5,800	173,400	12,170	7.0%	8,520	70%	3,650	30%	1.34	1.21
	Diamond LRd to46th St	5*	5*	10,200	10,200	191,400	14,530	7.6%	6,810	47%	7,720	53%	5*	5*	10,200	10,200	243,500	17,210	7.1%	8,760	51%	8,450	49%	1.27	1.18
	46th St to 35th/36th St	5**	4	10,200	8,800	198,700	14,910	7.5%	6,740	45%	8,170	55%	5**	4	10,200	8,800	251,800	17,240	6.8%	8,630	50%	8,610	50%	1.27	1.16
	35th/36th St to 31st/Lake St	6**	5	12,400	11,000	218,400	15,910	7.3%	7,010	44%	8,900	56%	6**	5	12,400	11,000	268,900	18,160	6.8%	8,900	49%	9,260	51%	1.23	1.14
	31th/Lake St to TH 65	5**	4	10,200	8,800	189,900	13,930	7.3%	6,110	44%	7,820	56%	5**	4	10,200	8,800	236,700	16,240	6.9%	8,030	49%	8,210	51%	1.25	1.17
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,480	6.6%	2,860	44%	3,620	56%	2	2	4,400	4,400	114,100	7,380	6.5%	3,390	46%	3,990	54%	1.16	1.14
	I-94 Common Section	3	2	6,600	4,400	105,500	7,210	6.8%	3,590	50%	3,620	50%	3	2	6,600	4,400	125,700	8,380	6.7%	4,390	52%	3,990	48%	1.19	1.16
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,290	6.7%	5,690	50%	5,600	50%	3	3	6,600	6,600	200,600	12,650	6.3%	6,360	50%	6,290	50%	1.19	1.12
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,210	6.6%	7,290	51%	6,920	49%	4	4	8,800	8,800	254,500	15,900	6.2%	8,090	51%	7,810	49%	1.17	1.12
	I-35W Commons	4	4	8,800	8,800	161,660	10,020	6.2%	5,100	51%	4,920	49%	4	4	8,800	8,800	185,900	11,420	6.1%	5,680	50%	5,740	50%	1.15	1.14
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,110	6.4%	5,970	54%	5,140	46%	4	4	8,800	8,800	190,300	12,060	6.3%	6,620	55%	5,440	45%	1.10	1.09
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	7,450	8.2%	3,250	44%	4,200	56%	3	2	6,600	4,400	122,600	8,860	7.2%	4,640	52%	4,220	48%	1.34	1.19

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

Appendix D-1
Traffic Forecast Reasonableness Check
For Scenario S1: Year 2038 Southbound I-35W/Lake St Exit Ramp Only

AM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 I-35W/Lake St SB Exit Ramp Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	9,200	7.1%	6,520	71%	2,680	29%	6*	3*	12,400	5,800	174,000	11,390	6.5%	7,660	67%	3,730	33%	1.35	1.24
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	13,380	7.0%	7,080	53%	6,300	47%	5*	5*	10,200	10,200	246,000	16,200	6.6%	8,340	51%	7,860	49%	1.29	1.21
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,060	7.1%	7,940	56%	6,120	44%	5**	4	10,200	8,800	254,300	17,210	6.8%	9,330	54%	7,880	46%	1.28	1.22
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,260	7.0%	9,010	59%	6,250	41%	6**	5	12,400	11,000	268,100	18,100	6.8%	10,360	57%	7,740	43%	1.23	1.19
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,670	7.2%	8,090	59%	5,580	41%	5**	5	10,200	11,000	251,600	17,420	6.9%	9,580	55%	7,840	45%	1.32	1.27
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,770	6.9%	3,430	51%	3,340	49%	2	3	4,400	6,600	126,200	8,380	6.6%	3,880	46%	4,500	54%	1.28	1.24
	I-94 Common Section	3	2	6,600	4,400	105,500	7,100	6.7%	3,760	53%	3,340	47%	3	3	6,600	6,600	138,000	8,940	6.5%	4,440	50%	4,500	50%	1.31	1.26
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,190	6.6%	5,760	51%	5,430	49%	3	3	6,600	6,600	201,200	12,510	6.2%	6,280	50%	6,230	50%	1.19	1.12
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,180	6.5%	7,650	54%	6,530	46%	4	4	8,800	8,800	253,400	15,690	6.2%	8,320	53%	7,370	47%	1.17	1.11
	I-35W Commons	4	4	8,800	8,800	161,660	10,620	6.6%	5,210	49%	5,410	51%	4	4	8,800	8,800	184,900	11,680	6.3%	5,430	46%	6,250	54%	1.14	1.10
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,800	6.8%	6,100	52%	5,700	48%	4	4	8,800	8,800	190,900	12,930	6.8%	6,580	51%	6,350	49%	1.11	1.10
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	6,900	7.6%	4,660	68%	2,240	32%	3	2	6,600	4,400	125,400	9,040	7.2%	5,700	63%	3,340	37%	1.38	1.31

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

PM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 I-35W/Lake St SB Exit Ramp Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	10,060	7.8%	6,890	68%	3,170	32%	6*	3*	12,400	5,800	174,000	12,450	7.2%	8,630	69%	3,820	31%	1.35	1.24
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	14,530	7.6%	6,810	47%	7,720	53%	5*	5*	10,200	10,200	246,000	17,650	7.2%	8,870	50%	8,780	50%	1.29	1.21
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,910	7.5%	6,740	45%	8,170	55%	5**	4	10,200	8,800	254,300	17,510	6.9%	8,730	50%	8,780	50%	1.28	1.17
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,910	7.3%	7,010	44%	8,900	56%	6**	5	12,400	11,000	268,100	18,360	6.8%	9,050	49%	9,310	51%	1.23	1.15
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,930	7.3%	6,110	44%	7,820	56%	5**	5	10,200	11,000	251,600	17,390	6.9%	8,170	47%	9,220	53%	1.32	1.25
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,480	6.6%	2,860	44%	3,620	56%	2	3	4,400	6,600	126,200	8,280	6.6%	3,450	42%	4,830	58%	1.28	1.28
	I-94 Common Section	3	2	6,600	4,400	105,500	7,210	6.8%	3,590	50%	3,620	50%	3	3	6,600	6,600	138,000	9,290	6.7%	4,460	48%	4,830	52%	1.31	1.29
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,290	6.7%	5,690	50%	5,600	50%	3	3	6,600	6,600	201,200	12,420	6.2%	6,240	50%	6,180	50%	1.19	1.10
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,210	6.6%	7,290	51%	6,920	49%	4	4	8,800	8,800	253,400	15,610	6.2%	8,010	51%	7,600	49%	1.17	1.10
	I-35W Commons	4	4	8,800	8,800	161,660	10,020	6.2%	5,100	51%	4,920	49%	4	4	8,800	8,800	184,900	11,140	6.0%	5,580	50%	5,560	50%	1.14	1.11
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,110	6.4%	5,970	54%	5,140	46%	4	4	8,800	8,800	190,900	11,790	6.2%	6,460	55%	5,330	45%	1.11	1.06
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	7,450	8.2%	3,250	44%	4,200	56%	3	2	6,600	4,400	125,400	9,110	7.3%	4,720	52%	4,390	48%	1.38	1.22

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

Appendix D-2
Traffic Forecast Reasonableness Check
For Scenario S2: Year 2038 Northbound I-35W/Lake St Entrance Ramp Only

AM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 I-35W/Lake St NB Entrance Ramp Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	9,200	7.1%	6,520	71%	2,680	29%	6*	3*	12,400	5,800	176,000	11,390	6.5%	7,760	68%	3,630	32%	1.36	1.24
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	13,380	7.0%	7,080	53%	6,300	47%	5*	5*	10,200	10,200	247,200	15,950	6.5%	8,400	53%	7,550	47%	1.29	1.19
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,060	7.1%	7,940	56%	6,120	44%	5**	4	10,200	8,800	256,000	16,960	6.6%	9,390	55%	7,570	45%	1.29	1.21
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,260	7.0%	9,010	59%	6,250	41%	6**	5	12,400	11,000	269,600	17,870	6.6%	10,280	58%	7,590	42%	1.23	1.17
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,670	7.2%	8,090	59%	5,580	41%	6**	4	12,400	8,800	252,900	17,540	6.9%	10,620	61%	6,920	39%	1.33	1.28
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,770	6.9%	3,430	51%	3,340	49%	3	2	6,600	4,400	126,300	8,530	6.8%	4,820	57%	3,710	43%	1.28	1.26
	I-94 Common Section	3	2	6,600	4,400	105,500	7,100	6.7%	3,760	53%	3,340	47%	3	2	6,600	4,400	134,800	8,800	6.5%	5,090	58%	3,710	42%	1.28	1.24
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,190	6.6%	5,760	51%	5,430	49%	3	3	6,600	6,600	199,600	12,430	6.2%	6,190	50%	6,240	50%	1.18	1.11
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,180	6.5%	7,650	54%	6,530	46%	4	4	8,800	8,800	252,200	15,650	6.2%	8,160	52%	7,490	48%	1.16	1.10
	I-35W Commons	4	4	8,800	8,800	161,660	10,620	6.6%	5,210	49%	5,410	51%	4	4	8,800	8,800	184,100	11,710	6.4%	5,200	44%	6,510	56%	1.14	1.10
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,800	6.8%	6,100	52%	5,700	48%	4	4	8,800	8,800	192,100	13,020	6.8%	6,710	52%	6,310	48%	1.11	1.10
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	6,900	7.6%	4,660	68%	2,240	32%	3	2	6,600	4,400	126,600	9,010	7.1%	5,800	64%	3,210	36%	1.39	1.31

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

PM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 I-35W/Lake St NB Entrance Ramp Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	10,060	7.8%	6,890	68%	3,170	32%	6*	3*	12,400	5,800	176,000	12,730	7.2%	8,980	71%	3,750	29%	1.36	1.27
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	14,530	7.6%	6,810	47%	7,720	53%	5*	5*	10,200	10,200	247,200	17,820	7.2%	9,300	52%	8,520	48%	1.29	1.23
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,910	7.5%	6,740	45%	8,170	55%	5**	4	10,200	8,800	256,000	17,800	7.0%	9,150	51%	8,650	49%	1.29	1.19
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,910	7.3%	7,010	44%	8,900	56%	6**	5	12,400	11,000	269,600	18,580	6.9%	9,260	50%	9,320	50%	1.23	1.17
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,930	7.3%	6,110	44%	7,820	56%	6**	4	12,400	8,800	252,900	17,450	6.9%	9,140	52%	8,310	48%	1.33	1.25
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,480	6.6%	2,860	44%	3,620	56%	3	2	6,600	4,400	126,300	8,450	6.7%	4,440	53%	4,010	47%	1.28	1.30
	I-94 Common Section	3	2	6,600	4,400	105,500	7,210	6.8%	3,590	50%	3,620	50%	3	2	6,600	4,400	134,800	9,080	6.7%	5,070	56%	4,010	44%	1.28	1.26
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,290	6.7%	5,690	50%	5,600	50%	3	3	6,600	6,600	199,600	12,430	6.2%	6,280	51%	6,150	49%	1.18	1.10
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,210	6.6%	7,290	51%	6,920	49%	4	4	8,800	8,800	252,200	15,550	6.2%	7,850	50%	7,700	50%	1.16	1.09
	I-35W Commons	4	4	8,800	8,800	161,660	10,020	6.2%	5,100	51%	4,920	49%	4	4	8,800	8,800	184,100	11,150	6.1%	5,460	49%	5,690	51%	1.14	1.11
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,110	6.4%	5,970	54%	5,140	46%	4	4	8,800	8,800	192,100	12,260	6.4%	6,810	56%	5,450	44%	1.11	1.10
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	7,450	8.2%	3,250	44%	4,200	56%	3	2	6,600	4,400	126,600	9,000	7.1%	4,700	52%	4,300	48%	1.39	1.21

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

Appendix D-3
Traffic Forecast Reasonableness Check
For Scenario S3: Year 2038 I-35W/Lake St Ramps Only

AM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 Lake St Ramps Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	9,200	7.1%	6,520	71%	2,680	29%	6*	3*	12,400	5,800	175,800	11,590	6.6%	7,760	67%	3,830	33%	1.36	1.26
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	13,380	7.0%	7,080	53%	6,300	47%	5*	5*	10,200	10,200	247,400	16,160	6.5%	8,320	51%	7,840	49%	1.29	1.21
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,060	7.1%	7,940	56%	6,120	44%	5**	4	10,200	8,800	255,900	17,150	6.7%	9,290	54%	7,860	46%	1.29	1.22
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,260	7.0%	9,010	59%	6,250	41%	6**	5	12,400	11,000	267,900	18,100	6.8%	10,370	57%	7,730	43%	1.23	1.19
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,670	7.2%	8,090	59%	5,580	41%	6**	5	12,400	11,000	263,900	18,440	7.0%	10,650	58%	7,790	42%	1.39	1.35
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,770	6.9%	3,430	51%	3,340	49%	3	3	6,600	6,600	136,100	9,400	6.9%	4,950	53%	4,450	47%	1.38	1.39
	I-94 Common Section	3	2	6,600	4,400	105,500	7,100	6.7%	3,760	53%	3,340	47%	3	3	6,600	6,600	145,400	9,700	6.7%	5,250	54%	4,450	46%	1.38	1.37
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,190	6.6%	5,760	51%	5,430	49%	3	3	6,600	6,600	200,900	12,600	6.3%	6,400	51%	6,200	49%	1.19	1.13
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,180	6.5%	7,650	54%	6,530	46%	4	4	8,800	8,800	251,800	15,680	6.2%	8,390	54%	7,290	46%	1.16	1.11
	I-35W Commons	4	4	8,800	8,800	161,660	10,620	6.6%	5,210	49%	5,410	51%	4	4	8,800	8,800	181,700	11,520	6.3%	5,320	46%	6,200	54%	1.12	1.08
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,800	6.8%	6,100	52%	5,700	48%	4	4	8,800	8,800	192,200	13,140	6.8%	6,760	51%	6,380	49%	1.11	1.11
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	6,900	7.6%	4,660	68%	2,240	32%	3	2	6,600	4,400	127,800	9,040	7.1%	5,700	63%	3,340	37%	1.40	1.31

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

PM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 Lake St Ramps Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	10,060	7.8%	6,890	68%	3,170	32%	6*	3*	12,400	5,800	175,800	12,490	7.1%	8,730	70%	3,760	30%	1.36	1.24
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	14,530	7.6%	6,810	47%	7,720	53%	5*	5*	10,200	10,200	247,400	17,480	7.1%	9,030	52%	8,450	48%	1.29	1.20
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,910	7.5%	6,740	45%	8,170	55%	5**	4	10,200	8,800	255,900	17,390	6.8%	8,890	51%	8,500	49%	1.29	1.17
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,910	7.3%	7,010	44%	8,900	56%	6**	5	12,400	11,000	267,900	18,300	6.8%	9,160	50%	9,140	50%	1.23	1.15
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,930	7.3%	6,110	44%	7,820	56%	6**	5	12,400	11,000	263,900	18,120	6.9%	9,040	50%	9,080	50%	1.39	1.30
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,480	6.6%	2,860	44%	3,620	56%	3	3	6,600	6,600	136,100	9,300	6.8%	4,450	48%	4,850	52%	1.38	1.44
	I-94 Common Section	3	2	6,600	4,400	105,500	7,210	6.8%	3,590	50%	3,620	50%	3	3	6,600	6,600	145,400	9,980	6.9%	5,130	51%	4,850	49%	1.38	1.38
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,290	6.7%	5,690	50%	5,600	50%	3	3	6,600	6,600	200,900	12,590	6.3%	6,270	50%	6,320	50%	1.19	1.12
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,210	6.6%	7,290	51%	6,920	49%	4	4	8,800	8,800	251,800	15,420	6.1%	7,770	50%	7,650	50%	1.16	1.09
	I-35W Commons	4	4	8,800	8,800	161,660	10,020	6.2%	5,100	51%	4,920	49%	4	4	8,800	8,800	181,700	10,900	6.0%	5,280	48%	5,620	52%	1.12	1.09
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,110	6.4%	5,970	54%	5,140	46%	4	4	8,800	8,800	192,200	12,060	6.3%	6,740	56%	5,320	44%	1.11	1.09
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	7,450	8.2%	3,250	44%	4,200	56%	3	2	6,600	4,400	127,800	8,820	6.9%	4,590	52%	4,230	48%	1.40	1.18

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

Appendix D-4
Traffic Forecast Reasonableness Check
For Scenario S4: Year 2038 I-35W/Lake St NB Entrance & 28th St Exit Ramps

AM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 I-35W/Lake St NB Entrance & 28th St Exit Ramps Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	9,200	7.1%	6,520	71%	2,680	29%	6*	3*	12,400	5,800	176,400	11,620	6.6%	7,930	68%	3,690	32%	1.37	1.26
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	13,380	7.0%	7,080	53%	6,300	47%	5*	5*	10,200	10,200	247,700	16,090	6.5%	8,510	53%	7,580	47%	1.29	1.20
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,060	7.1%	7,940	56%	6,120	44%	5**	4	10,200	8,800	256,900	17,140	6.7%	9,530	56%	7,610	44%	1.29	1.22
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,260	7.0%	9,010	59%	6,250	41%	6**	5	12,400	11,000	273,000	18,210	6.7%	10,580	58%	7,630	42%	1.25	1.19
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,670	7.2%	8,090	59%	5,580	41%	6**	4	12,400	8,800	250,100	17,400	7.0%	10,440	60%	6,960	40%	1.32	1.27
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,770	6.9%	3,430	51%	3,340	49%	3	2	6,600	4,400	125,800	8,530	6.8%	4,780	56%	3,750	44%	1.27	1.26
	I-94 Common Section	3	2	6,600	4,400	105,500	7,100	6.7%	3,760	53%	3,340	47%	3	2	6,600	4,400	134,100	8,830	6.6%	5,080	58%	3,750	42%	1.27	1.24
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,190	6.6%	5,760	51%	5,430	49%	3	3	6,600	6,600	199,000	12,360	6.2%	6,160	50%	6,200	50%	1.18	1.10
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,180	6.5%	7,650	54%	6,530	46%	4	4	8,800	8,800	251,500	15,560	6.2%	8,100	52%	7,460	48%	1.16	1.10
	I-35W Commons	4	4	8,800	8,800	161,660	10,620	6.6%	5,210	49%	5,410	51%	4	4	8,800	8,800	184,200	11,590	6.3%	5,120	44%	6,470	56%	1.14	1.09
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,800	6.8%	6,100	52%	5,700	48%	4	4	8,800	8,800	192,100	13,020	6.8%	6,740	52%	6,280	48%	1.11	1.10
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	6,900	7.6%	4,660	68%	2,240	32%	3	2	6,600	4,400	124,300	8,870	7.1%	5,660	64%	3,210	36%	1.36	1.29

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

PM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 I-35W/Lake St NB Entrance & 28th St Exit Ramps Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	10,060	7.8%	6,890	68%	3,170	32%	6*	3*	12,400	5,800	176,400	12,760	7.2%	9,040	71%	3,720	29%	1.37	1.27
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	14,530	7.6%	6,810	47%	7,720	53%	5*	5*	10,200	10,200	247,700	17,710	7.1%	9,280	52%	8,430	48%	1.29	1.22
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,910	7.5%	6,740	45%	8,170	55%	5**	4	10,200	8,800	256,900	17,650	6.9%	9,140	52%	8,510	48%	1.29	1.18
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,910	7.3%	7,010	44%	8,900	56%	6**	5	12,400	11,000	273,000	18,580	6.8%	9,400	51%	9,180	49%	1.25	1.17
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,930	7.3%	6,110	44%	7,820	56%	6**	4	12,400	8,800	250,100	17,010	6.8%	8,900	52%	8,110	48%	1.32	1.22
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,480	6.6%	2,860	44%	3,620	56%	3	2	6,600	4,400	125,800	8,430	6.7%	4,420	52%	4,010	48%	1.27	1.30
	I-94 Common Section	3	2	6,600	4,400	105,500	7,210	6.8%	3,590	50%	3,620	50%	3	2	6,600	4,400	134,100	9,010	6.7%	5,000	55%	4,010	45%	1.27	1.25
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,290	6.7%	5,690	50%	5,600	50%	3	3	6,600	6,600	199,000	12,290	6.2%	6,170	50%	6,120	50%	1.18	1.09
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,210	6.6%	7,290	51%	6,920	49%	4	4	8,800	8,800	251,500	15,410	6.1%	7,760	50%	7,650	50%	1.16	1.08
	I-35W Commons	4	4	8,800	8,800	161,660	10,020	6.2%	5,100	51%	4,920	49%	4	4	8,800	8,800	184,200	11,230	6.1%	5,510	49%	5,720	51%	1.14	1.12
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,110	6.4%	5,970	54%	5,140	46%	4	4	8,800	8,800	192,100	12,180	6.3%	6,720	55%	5,460	45%	1.11	1.10
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	7,450	8.2%	3,250	44%	4,200	56%	3	2	6,600	4,400	124,300	8,580	6.9%	4,480	52%	4,100	48%	1.36	1.15

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

Appendix D-5
Traffic Forecast Reasonableness Check
For Scenario S5: Year 2038 Full Build

AM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 Full Build (Lake St and 28th St Ramps) Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	9,200	7.1%	6,520	71%	2,680	29%	6*	3*	12,400	5,800	177,300	11,710	6.6%	7,820	67%	3,890	33%	1.37	1.27
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	13,380	7.0%	7,080	53%	6,300	47%	5*	5*	10,200	10,200	249,200	16,180	6.5%	8,310	51%	7,870	49%	1.30	1.21
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,060	7.1%	7,940	56%	6,120	44%	5**	4	10,200	8,800	258,200	17,230	6.7%	9,340	54%	7,890	46%	1.30	1.23
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,260	7.0%	9,010	59%	6,250	41%	6**	5	12,400	11,000	270,200	18,190	6.7%	10,430	57%	7,760	43%	1.24	1.19
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,670	7.2%	8,090	59%	5,580	41%	6**	5	12,400	11,000	262,800	18,180	6.9%	10,300	57%	7,880	43%	1.38	1.33
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,770	6.9%	3,430	51%	3,340	49%	3	3	6,600	6,600	136,000	9,220	6.8%	4,680	51%	4,540	49%	1.38	1.36
	I-94 Common Section	3	2	6,600	4,400	105,500	7,100	6.7%	3,760	53%	3,340	47%	3	3	6,600	6,600	145,600	9,550	6.6%	5,010	52%	4,540	48%	1.38	1.35
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,190	6.6%	5,760	51%	5,430	49%	3	3	6,600	6,600	201,000	12,640	6.3%	6,420	51%	6,220	49%	1.19	1.13
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,180	6.5%	7,650	54%	6,530	46%	4	4	8,800	8,800	251,900	15,750	6.3%	8,440	54%	7,310	46%	1.16	1.11
	I-35W Commons	4	4	8,800	8,800	161,660	10,620	6.6%	5,210	49%	5,410	51%	4	4	8,800	8,800	181,900	11,630	6.4%	5,400	46%	6,230	54%	1.13	1.10
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,800	6.8%	6,100	52%	5,700	48%	4	4	8,800	8,800	192,200	13,120	6.8%	6,740	51%	6,380	49%	1.11	1.11
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	6,900	7.6%	4,660	68%	2,240	32%	3	2	6,600	4,400	126,800	8,960	7.1%	5,620	63%	3,340	37%	1.39	1.30

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

PM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 Full Build (Lake St and 28th St Ramps) Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	10,060	7.8%	6,890	68%	3,170	32%	6*	3*	12,400	5,800	177,300	12,540	7.1%	8,870	71%	3,670	29%	1.37	1.25
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	14,530	7.6%	6,810	47%	7,720	53%	5*	5*	10,200	10,200	249,200	17,800	7.1%	9,130	51%	8,670	49%	1.30	1.23
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,910	7.5%	6,740	45%	8,170	55%	5**	4	10,200	8,800	258,200	17,680	6.8%	8,910	50%	8,770	50%	1.30	1.19
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,910	7.3%	7,010	44%	8,900	56%	6**	5	12,400	11,000	270,200	18,690	6.9%	9,330	50%	9,360	50%	1.24	1.17
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,930	7.3%	6,110	44%	7,820	56%	6**	5	12,400	11,000	262,800	18,150	6.9%	8,840	49%	9,310	51%	1.38	1.30
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,480	6.6%	2,860	44%	3,620	56%	3	3	6,600	6,600	136,000	9,360	6.9%	4,430	47%	4,930	53%	1.38	1.44
	I-94 Common Section	3	2	6,600	4,400	105,500	7,210	6.8%	3,590	50%	3,620	50%	3	3	6,600	6,600	145,600	10,120	7.0%	5,190	51%	4,930	49%	1.38	1.40
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,290	6.7%	5,690	50%	5,600	50%	3	3	6,600	6,600	201,000	12,690	6.3%	6,330	50%	6,360	50%	1.19	1.12
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,210	6.6%	7,290	51%	6,920	49%	4	4	8,800	8,800	251,900	15,560	6.2%	7,860	51%	7,700	49%	1.16	1.10
	I-35W Commons	4	4	8,800	8,800	161,660	10,020	6.2%	5,100	51%	4,920	49%	4	4	8,800	8,800	181,900	11,040	6.1%	5,350	48%	5,690	52%	1.13	1.10
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,110	6.4%	5,970	54%	5,140	46%	4	4	8,800	8,800	192,200	12,130	6.3%	6,740	56%	5,390	44%	1.11	1.09
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	7,450	8.2%	3,250	44%	4,200	56%	3	2	6,600	4,400	126,800	8,790	6.9%	4,410	50%	4,380	50%	1.39	1.18

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

Appendix D-5.1
Traffic Forecast Reasonableness Check
For Scenario S51: Year 2038 Full Build & WB I-94/4th Ave Entrance Ramp Closure

AM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 4th Full Build (Lake St and 28th St Ramps) and 4th Ave Ramp Closure Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	9,200	7.1%	6,520	71%	2,680	29%	6*	3*	12,400	5,800	178,100	11,740	6.6%	7,870	67%	3,870	33%	1.38	1.28
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	13,380	7.0%	7,080	53%	6,300	47%	5*	5*	10,200	10,200	250,200	16,270	6.5%	8,380	52%	7,890	48%	1.31	1.22
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,060	7.1%	7,940	56%	6,120	44%	5**	4	10,200	8,800	259,500	17,330	6.7%	9,410	54%	7,920	46%	1.31	1.23
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,260	7.0%	9,010	59%	6,250	41%	6**	5	12,400	11,000	272,000	18,310	6.7%	10,500	57%	7,810	43%	1.25	1.20
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,670	7.2%	8,090	59%	5,580	41%	6**	5	12,400	11,000	263,500	18,240	6.9%	10,360	57%	7,880	43%	1.39	1.33
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,770	6.9%	3,430	51%	3,340	49%	3	3	6,600	6,600	135,800	9,230	6.8%	4,710	51%	4,520	49%	1.38	1.36
	I-94 Common Section	3	2	6,600	4,400	105,500	7,100	6.7%	3,760	53%	3,340	47%	3	3	6,600	6,600	145,700	9,550	6.6%	5,030	53%	4,520	47%	1.38	1.35
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,190	6.6%	5,760	51%	5,430	49%	3	3	6,600	6,600	196,900	12,330	6.3%	6,390	52%	5,940	48%	1.16	1.10
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,180	6.5%	7,650	54%	6,530	46%	4	4	8,800	8,800	247,600	15,460	6.2%	8,440	55%	7,020	45%	1.14	1.09
	I-35W Commons	4	4	8,800	8,800	161,660	10,620	6.6%	5,210	49%	5,410	51%	4	4	8,800	8,800	183,300	11,560	6.3%	5,420	47%	6,140	53%	1.13	1.09
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,800	6.8%	6,100	52%	5,700	48%	4	4	8,800	8,800	192,400	13,150	6.8%	6,760	51%	6,390	49%	1.11	1.11
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	6,900	7.6%	4,660	68%	2,240	32%	3	2	6,600	4,400	127,700	9,010	7.1%	5,650	63%	3,360	37%	1.40	1.31

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

PM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 4th Full Build (Lake St and 28th St Ramps) and 4th Ave Ramp Closure Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	10,060	7.8%	6,890	68%	3,170	32%	6*	3*	12,400	5,800	178,100	12,600	7.1%	8,760	70%	3,840	30%	1.38	1.25
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	14,530	7.6%	6,810	47%	7,720	53%	5*	5*	10,200	10,200	250,200	17,510	7.0%	9,020	52%	8,490	48%	1.31	1.21
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,910	7.5%	6,740	45%	8,170	55%	5**	4	10,200	8,800	259,500	17,550	6.8%	8,980	51%	8,570	49%	1.31	1.18
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,910	7.3%	7,010	44%	8,900	56%	6**	5	12,400	11,000	272,000	18,620	6.8%	9,370	50%	9,250	50%	1.25	1.17
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,930	7.3%	6,110	44%	7,820	56%	6**	5	12,400	11,000	263,500	18,280	6.9%	9,030	49%	9,250	51%	1.39	1.31
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,480	6.6%	2,860	44%	3,620	56%	3	3	6,600	6,600	135,800	9,250	6.8%	4,330	47%	4,920	53%	1.38	1.43
	I-94 Common Section	3	2	6,600	4,400	105,500	7,210	6.8%	3,590	50%	3,620	50%	3	3	6,600	6,600	145,700	10,070	6.9%	5,150	51%	4,920	49%	1.38	1.40
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,290	6.7%	5,690	50%	5,600	50%	3	3	6,600	6,600	196,900	12,430	6.3%	6,320	51%	6,110	49%	1.16	1.10
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,210	6.6%	7,290	51%	6,920	49%	4	4	8,800	8,800	247,600	15,250	6.2%	7,840	51%	7,410	49%	1.14	1.07
	I-35W Commons	4	4	8,800	8,800	161,660	10,020	6.2%	5,100	51%	4,920	49%	4	4	8,800	8,800	183,300	10,990	6.0%	5,260	48%	5,730	52%	1.13	1.10
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,110	6.4%	5,970	54%	5,140	46%	4	4	8,800	8,800	192,400	12,040	6.3%	6,730	56%	5,310	44%	1.11	1.08
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	7,450	8.2%	3,250	44%	4,200	56%	3	2	6,600	4,400	127,700	9,030	7.1%	4,700	52%	4,330	48%	1.40	1.21

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

Appendix D-6
Traffic Forecast Reasonableness Check
For Scenario S6: Year 2038 Southbound I_35W/Lake St Exit Ramp & Northbound I-35W/28th St Exit Ramp

AM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 Southbound I_35W/Lake St Exit Ramp & Northbound I-35W/28th St Exit Ramp Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	9,200	7.1%	6,520	71%	2,680	29%	6*	3*	12,400	5,800	175,600	11,460	6.5%	7,730	67%	3,730	33%	1.36	1.25
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	13,380	7.0%	7,080	53%	6,300	47%	5*	5*	10,200	10,200	246,900	16,280	6.6%	8,390	52%	7,890	48%	1.29	1.22
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,060	7.1%	7,940	56%	6,120	44%	5**	4	10,200	8,800	256,100	17,310	6.8%	9,400	54%	7,910	46%	1.29	1.23
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,260	7.0%	9,010	59%	6,250	41%	6**	5	12,400	11,000	271,700	18,340	6.8%	10,580	58%	7,760	42%	1.24	1.20
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,670	7.2%	8,090	59%	5,580	41%	5**	5	10,200	11,000	249,000	17,180	6.9%	9,320	54%	7,860	46%	1.31	1.26
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,770	6.9%	3,430	51%	3,340	49%	2	3	4,400	6,600	125,700	8,330	6.6%	3,790	45%	4,540	55%	1.27	1.23
	I-94 Common Section	3	2	6,600	4,400	105,500	7,100	6.7%	3,760	53%	3,340	47%	3	3	6,600	6,600	137,400	8,910	6.5%	4,370	49%	4,540	51%	1.30	1.25
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,190	6.6%	5,760	51%	5,430	49%	3	3	6,600	6,600	201,700	12,500	6.2%	6,260	50%	6,240	50%	1.19	1.12
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,180	6.5%	7,650	54%	6,530	46%	4	4	8,800	8,800	253,900	15,650	6.2%	8,290	53%	7,360	47%	1.17	1.10
	I-35W Commons	4	4	8,800	8,800	161,660	10,620	6.6%	5,210	49%	5,410	51%	4	4	8,800	8,800	185,600	11,760	6.3%	5,450	46%	6,310	54%	1.15	1.11
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,800	6.8%	6,100	52%	5,700	48%	4	4	8,800	8,800	190,800	12,970	6.8%	6,570	51%	6,400	49%	1.10	1.10
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	6,900	7.6%	4,660	68%	2,240	32%	3	2	6,600	4,400	123,300	8,850	7.2%	5,530	62%	3,320	38%	1.35	1.28

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

PM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 Southbound I_35W/Lake St Exit Ramp & Northbound I-35W/28th St Exit Ramp Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	10,060	7.8%	6,890	68%	3,170	32%	6*	3*	12,400	5,800	175,600	12,340	7.0%	8,660	70%	3,680	30%	1.36	1.23
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	14,530	7.6%	6,810	47%	7,720	53%	5*	5*	10,200	10,200	246,900	17,410	7.1%	8,780	50%	8,630	50%	1.29	1.20
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,910	7.5%	6,740	45%	8,170	55%	5**	4	10,200	8,800	256,100	17,500	6.8%	8,710	50%	8,790	50%	1.29	1.17
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,910	7.3%	7,010	44%	8,900	56%	6**	5	12,400	11,000	271,700	18,470	6.8%	9,110	49%	9,360	51%	1.24	1.16
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,930	7.3%	6,110	44%	7,820	56%	5**	5	10,200	11,000	249,000	17,110	6.9%	7,810	46%	9,300	54%	1.31	1.23
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,480	6.6%	2,860	44%	3,620	56%	2	3	4,400	6,600	125,700	8,190	6.5%	3,280	40%	4,910	60%	1.27	1.26
	I-94 Common Section	3	2	6,600	4,400	105,500	7,210	6.8%	3,590	50%	3,620	50%	3	3	6,600	6,600	137,400	9,190	6.7%	4,280	47%	4,910	53%	1.30	1.27
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,290	6.7%	5,690	50%	5,600	50%	3	3	6,600	6,600	201,700	12,590	6.2%	6,270	50%	6,320	50%	1.19	1.12
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,210	6.6%	7,290	51%	6,920	49%	4	4	8,800	8,800	253,900	15,740	6.2%	8,030	51%	7,710	49%	1.17	1.11
	I-35W Commons	4	4	8,800	8,800	161,660	10,020	6.2%	5,100	51%	4,920	49%	4	4	8,800	8,800	185,600	11,240	6.1%	5,660	50%	5,580	50%	1.15	1.12
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,110	6.4%	5,970	54%	5,140	46%	4	4	8,800	8,800	190,800	11,860	6.2%	6,460	54%	5,400	46%	1.10	1.07
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	7,450	8.2%	3,250	44%	4,200	56%	3	2	6,600	4,400	123,300	8,920	7.2%	4,530	51%	4,390	49%	1.35	1.20

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

Appendix D-6A
Traffic Forecast Reasonableness Check
For Scenario S6A: Year 2038 Southbound I_35W/Lake St Exit Ramp & Northbound I-35W/28th St Exit Ramp & SB MnPASS Lane

AM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 SB I-35W/Lake St Exit Ramp & NB I-35W/28th St Exit Ramp & SB I-35W MnPASS Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	9,200	7.1%	6,520	71%	2,680	29%	6*	3*	12,400	5,800	176,100	11,540	6.6%	7,730	67%	3,810	33%	1.36	1.25
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	13,380	7.0%	7,080	53%	6,300	47%	5*	5*	10,200	10,200	248,800	16,430	6.6%	8,400	51%	8,030	49%	1.30	1.23
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,060	7.1%	7,940	56%	6,120	44%	5**	5*	10,200	10,200	259,500	17,580	6.8%	9,370	53%	8,210	47%	1.31	1.25
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,260	7.0%	9,010	59%	6,250	41%	6**	6*	12,400	12,400	275,000	18,570	6.8%	10,540	57%	8,030	43%	1.26	1.22
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,670	7.2%	8,090	59%	5,580	41%	5**	6*	10,200	12,400	251,700	17,350	6.9%	9,280	53%	8,070	47%	1.33	1.27
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,770	6.9%	3,430	51%	3,340	49%	2	3	4,400	6,600	126,200	8,380	6.6%	3,820	46%	4,560	54%	1.28	1.24
	I-94 Common Section	3	2	6,600	4,400	105,500	7,100	6.7%	3,760	53%	3,340	47%	3	3	6,600	6,600	137,900	8,970	6.5%	4,410	49%	4,560	51%	1.31	1.26
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,190	6.6%	5,760	51%	5,430	49%	3	3	6,600	6,600	201,600	12,550	6.2%	6,340	51%	6,210	49%	1.19	1.12
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,180	6.5%	7,650	54%	6,530	46%	4	4	8,800	8,800	253,900	15,720	6.2%	8,410	53%	7,310	47%	1.17	1.11
	I-35W Commons	4	4	8,800	8,800	161,660	10,620	6.6%	5,210	49%	5,410	51%	4	4	8,800	8,800	185,200	11,690	6.3%	5,460	47%	6,230	53%	1.15	1.10
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,800	6.8%	6,100	52%	5,700	48%	4	4	8,800	8,800	190,900	12,890	6.8%	6,580	51%	6,310	49%	1.11	1.09
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	6,900	7.6%	4,660	68%	2,240	32%	3	3	6,600	6,600	125,500	8,970	7.1%	5,460	61%	3,510	39%	1.38	1.30

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

PM Peak Hour Percentage and Directional Distribution Comparison

Freeway	Segment	Existing(2011)											Year 2038 SB I-35W/Lake St Exit Ramp & NB I-35W/28th St Exit Ramp & SB I-35W MnPASS Build Scenario											Growth Factor	
		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB		Num of Lanes		Hourly Capacity***		Two-way			NB/EB		SB/WB			
		NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	NB/EB	SB/WB	NB/EB	SB/WB	Daily	Peak	% of Daily	Peak	Dir %	Peak	Dir %	Daily	Peak
I-35W	60th St to Diamond LRd***	6*	3*	12,400	5,800	129,200	10,060	7.8%	6,890	68%	3,170	32%	6*	3*	12,400	5,800	176,100	12,350	7.0%	8,660	70%	3,690	30%	1.36	1.23
	Diamond LRd to46th St***	5*	5*	10,200	10,200	191,400	14,530	7.6%	6,810	47%	7,720	53%	5*	5*	10,200	10,200	248,800	17,790	7.2%	8,790	49%	9,000	51%	1.30	1.22
	46th St to 35th/36th St****	5**	4	10,200	8,800	198,700	14,910	7.5%	6,740	45%	8,170	55%	5**	5*	10,200	10,200	259,500	18,210	7.0%	8,720	48%	9,490	52%	1.31	1.22
	35th/36th St to 31st/Lake St****	6**	5	12,400	11,000	218,400	15,910	7.3%	7,010	44%	8,900	56%	6**	6*	12,400	12,400	275,000	19,320	7.0%	9,200	48%	10,120	52%	1.26	1.21
	31th/Lake St to TH 65***	5**	4	10,200	8,800	189,900	13,930	7.3%	6,110	44%	7,820	56%	5**	6*	10,200	12,400	251,700	17,800	7.1%	7,910	44%	9,890	56%	1.33	1.28
	TH 65 to I-94	2	2	4,400	4,400	98,700	6,480	6.6%	2,860	44%	3,620	56%	2	3	4,400	6,600	126,200	8,340	6.6%	3,290	39%	5,050	61%	1.28	1.29
	I-94 Common Section	3	2	6,600	4,400	105,500	7,210	6.8%	3,590	50%	3,620	50%	3	3	6,600	6,600	137,900	9,390	6.8%	4,340	46%	5,050	54%	1.31	1.30
I-94	LH Tunnel	3	3	6,600	6,600	169,200	11,290	6.7%	5,690	50%	5,600	50%	3	3	6,600	6,600	201,600	12,580	6.2%	6,320	50%	6,260	50%	1.19	1.11
	Lydale Ave to I-35W	4	4	8,800	8,800	216,900	14,210	6.6%	7,290	51%	6,920	49%	4	4	8,800	8,800	253,900	15,740	6.2%	8,060	51%	7,680	49%	1.17	1.11
	I-35W Commons	4	4	8,800	8,800	161,660	10,020	6.2%	5,100	51%	4,920	49%	4	4	8,800	8,800	185,200	11,040	6.0%	5,500	50%	5,540	50%	1.15	1.10
	5th/6th St to Cedar Ave	4	4	8,800	8,800	172,700	11,110	6.4%	5,970	54%	5,140	46%	4	4	8,800	8,800	190,900	11,870	6.2%	6,440	54%	5,430	46%	1.11	1.07
TH 65	I-35W to I-94	3	2	6,600	4,400	91,200	7,450	8.2%	3,250	44%	4,200	56%	3	3	6,600	6,600	125,500	9,460	7.5%	4,620	49%	4,840	51%	1.38	1.27

* Including inside MnPASS Lane; ** Including northbound inside PDSL; *** 2,200 veh/ln/h for General Purpose Lane and 1,400 veh/ln/h for MnPASS/PDSL;

Appendix E

Arterial Daily Forecasts Summary for all Scenarios *

Roadway		Location	Existing	S0: 2038 Nobuild	S0N: 2038 Transit Station Nicollet Ave Open	S1: 2038 Southbound Ramp Only	S2: 2038 Northbound Ramp Only	S3: 2038 Lake St Ramps	S4: 2038 NB Ramp and 28th St Ramp	S5: 2038 Full Build	S6: 2038 SB Ramp and 28th St Ramp	S6A: S6 and SB I-35W MnPASS Lane
East-West Arterial Corridor	28th St	West of Blaisdell Ave S	9,700	10,800	10,900	11,100	11,400	11,500	11,400	11,300	11,200	11,000
		West of I-35W	13,300	14,900	15,000	15,200	15,400	14,700	15,400	14,000	15,200	14,900
		East of I-35W	13,500	15,100	15,000	15,100	14,500	14,100	14,500	17,500	17,300	16,300
	Lake St	West of Blaisdell Ave S	20,500	22,900	23,200	25,700	26,300	28,700	26,300	28,700	26,100	25,700
		West of I-35W	20,500	22,900	23,600	25,800	25,200	31,800	25,200	32,000	25,700	25,300
		East of I-35W	18,700	20,900	20,800	24,200	24,400	24,900	24,500	24,400	24,200	24,400
		East of Portland Ave S	18,700	20,900	20,900	22,400	22,600	23,200	22,600	22,600	22,400	22,700
	31st St	West of Blaisdell Ave S	8,300	9,300	9,300	12,200	12,200	12,100	12,200	12,300	12,200	12,200
		West of I-35W	14,900	16,700	16,600	19,400	19,300	19,700	19,300	19,300	19,400	19,400
		East of I-35W	11,100	12,400	12,400	14,200	14,200	14,500	14,200	14,200	14,300	14,400
North-South Arterial Corridor	Hennepin Ave S	North of W 26th St	27,500	30,800	30,700	29,400	29,400	29,400	29,400	29,500	29,400	29,500
		North of W Lake St	26,000	29,100	28,900	27,500	27,500	27,700	27,500	27,600	27,500	27,500
		South of W 31st St	9,400	10,500	10,500	10,900	10,900	10,900	10,900	10,900	10,900	10,900
	Blaisdell Ave S	North of W Lake St	11,500	12,900	11,200	11,300	11,100	11,100	11,200	11,200	11,300	11,400
		North of W 31st St	9,100	10,200	10,000	10,600	11,000	11,100	11,000	10,700	10,600	10,700
		South of W 31st St	5,800	6,500	6,300	7,000	7,100	6,700	7,100	7,000	7,000	7,100
	Nicollet Ave S	North of W 28th St	11,600	13,000	14,000	11,000	11,100	11,600	11,100	11,200	11,000	11,000
		North of W Lake St	0	0	12,000	10,900	11,000	11,900	11,100	11,300	11,000	11,100
		North of W 31st St	9,700	11,400	13,000	10,600	10,700	11,100	10,700	10,700	10,600	10,600
		South of W 31st St	9,900	12,400	12,900	11,800	11,900	11,900	11,900	12,000	11,700	11,700
	1st Ave S	North of E 26th St	5,500	6,200	6,200	4,500	4,700	4,700	4,600	4,700	4,500	4,500
		North of E Lake St	9,800	11,000	7,500	7,800	8,000	8,400	8,100	7,800	7,800	7,800
		North of E 31st St	5,700	6,400	6,300	4,300	4,600	4,600	4,400	4,300	4,300	4,300
		South of E 31st St	3,500	4,000	3,700	3,100	3,700	3,400	3,500	3,100	3,100	3,300
	5th Ave S	North of E 28th St	12,100	13,500	13,700	10,600	11,600	10,800	11,600	10,600	10,600	10,500
	Portland Ave S	North of E 26th St	12,200	13,600	13,800	10,700	11,700	10,900	11,700	10,700	10,700	10,600
		North of E Lake St	12,100	13,500	13,500	13,400	13,400	13,300	13,400	13,400	13,400	13,400
		South of E 31st St	11,000	12,300	12,300	12,300	12,400	12,400	12,300	12,300	12,300	12,600

* Note: The scenario S6A is the only scenario that includes the assumption for SB I-35W MnPASS lane

Appendix F

I-35W Northbound Ramp to I-94 Origin Destination Memorandum

DRAFT TECHNICAL MEMORANDUM

TO: Jim Grube, Hennepin County

FROM: Graham Johnson, PE
Mike Kotila, PE

DATE: July 19, 2011

RE: I-35W Northbound Ramp to I-94 Origin-Destination Study
SEH No. AHENNC 113114

For the I-35W Lake Street Access Study, the northbound I-35W flyover ramp to westbound I-94 will need to have the existing bridge replaced by 2018. Mn/DOT's 2009 Feasibility Study of the area showed potential improvement in traffic operations along westbound I-94 with relocation of the entrance ramp from the right side of I-94 to the left side. Before forgoing such major ramp relocation, a better understanding of the destination of the vehicle demand currently using the ramp is needed to assure relocating the ramp entrance won't increase congestion or safety problems by additional weaving along I-94.

To determine where the traffic from the northbound flyover ramp is destined, an origin-destination (OD) study was completed to identify where entering vehicles will exit downstream along westbound I-94. Since the main concerns for this entrance ramp are the two exits to Lyndale/Hennepin Avenues and westbound I-394, any vehicle destined beyond these exits will be considered through trips.

Video cameras were used to capture license plate data for the study. Traffic Engineering Services, Inc. (TES) collected the data between 1 PM and 7 PM on Monday, May 16th and between 7 AM and 1 PM on Tuesday, May 17th, 2011. Though 12 hours of video was collected, only specific portions of the video were analyzed.

The AM time frame analyzed was between 7 AM and 9 AM, a total of 2-hours during the morning rush hours. The PM time frame analyzed was between 2 PM and 6 PM, a total of 4-hours during the evening rush hours.

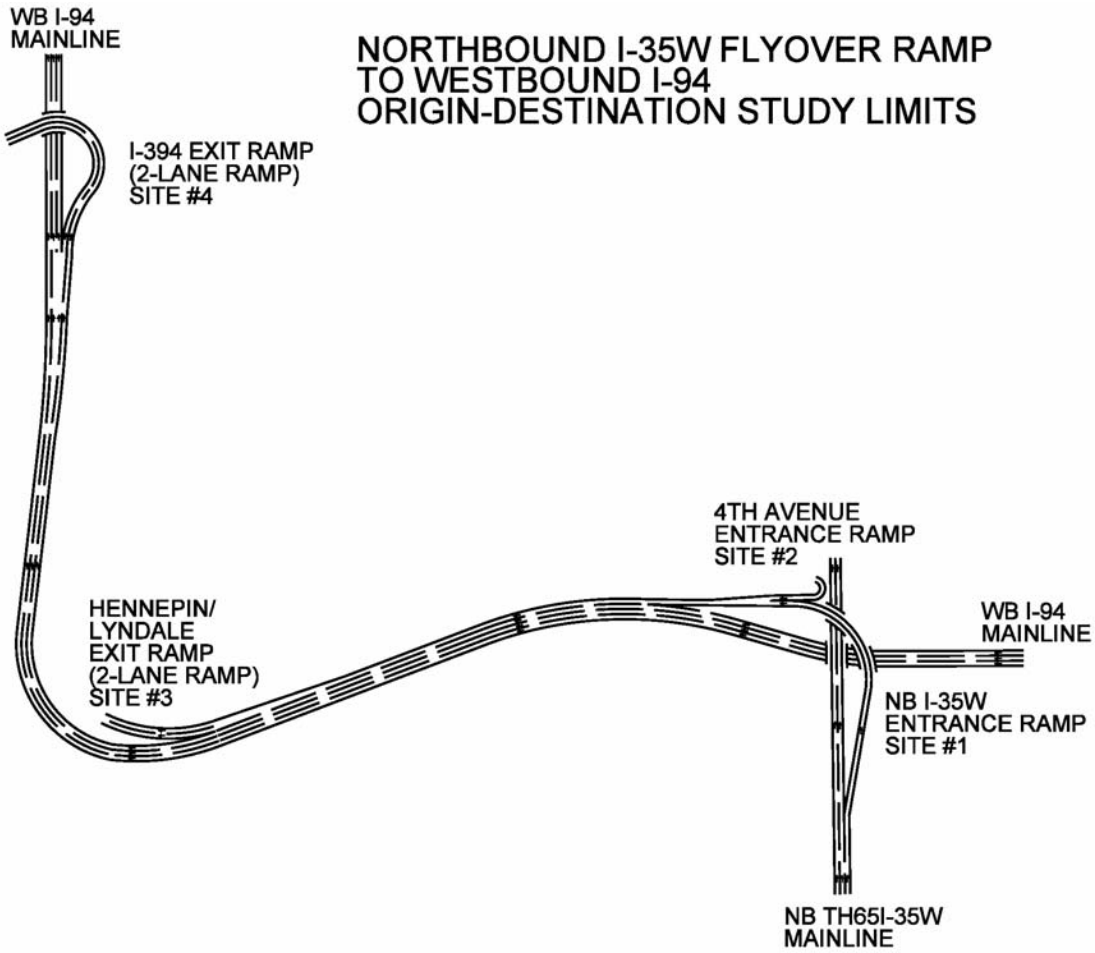
Data Collection

Four ramp locations were selected to determine the origin-destination patterns that occur for the northbound I-35W flyover ramp. Two entrance ramp and two exit ramp sites were used to determine the OD pattern that will influence decisions related to the flyover ramp replacement.

The entrance ramps to westbound I-94 include the northbound I-35W flyover ramp and the 4th Avenue entrance ramp; both of these entrance ramps merge together before entering I-94 as a single lane. The exit ramp locations from westbound I-94 include the Hennepin/Lyndale Avenue exit and the westbound I-394 exit ramp; both of these exit ramps are 2-lane exits from I-94.

Figure 1 shows a lane schematic of the area including all four data collection sites.

Figure 1 Westbound I-94 OD Locations



License plates from the four entering and exiting ramp locations were collected and compared. Due to many different factors, including feasibility and cost, the mainline traffic was not collected as part of the OD study; freeway detector data was collected during the same time period to be included in the OD tables. Any vehicle that was not matched from either of the two entrances to the two exits is considered a trip to or from westbound I-94.

Due to the nature of any license plate survey, there are many sources of error that can occur. The problems can include reading and/or recording of license plates incorrectly, and a recorder's incorrect database entry. With any of these errors, a ramp to ramp trip could be interpreted as up to 2 separate trips including one ramp to mainline trip and/or one mainline to ramp trip. Therefore, an adjustment to the number of matches can be made using the "method of moment" statistical technique.[1] This provides for an adjustment based on the actual number of observed matches, along with the percentage of vehicles captured at each entrance and exit site. The adjusted number of matched license plates is then compared to the total traffic volumes entering and exiting the O-D sites collected from the video analysis.

[1] ITE Journal Article No. 37, License Plate Matching Surveys, written by Mark C. Schaefer, P.E., July 1988.

AM Peak Period

The AM peak period data was analyzed from **7:00 AM** to **9:00 AM**. There were a total of **11,662** vehicles that passed the video cameras set up at the four ramp locations during the 2-hour time period. **91.3%** (**10,643** license plates) of the vehicles license plates were recorded into the OD database. **8.7%** of the license plates that were not collected due to other vehicles blocking the view, dirty or unreadable license plates, or license plates outside of the camera view (buses, trucks, etc.).

The two entrance ramp locations, northbound I-35W and 4th Avenue, had a license plate capture rate of approximately 96%. The Hennepin/Lyndale exit ramp had a capture rate of approximately 95%. The westbound I-394 exit ramp had the worst capture rate of approximately 87%; this was due to high volume and low speed conditions with high vehicle density sometimes blocking the line of sight. The previously mentioned adjustment methodology was applied to correct for the unread license plates.

Table 1 shows the resultant OD information for the AM peak period. More detailed tables, including hourly and 15-minute data can be found in the tables attached to this memorandum. The attached Figure 2 is a graphical representation of the table below.

Table 1 AM Peak Period OD Summary

Origin-Destination Table		Destinations			Total
		Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip*	
Origins	WB I-94 Mainline*	1610	4952	3026	9588
		16.8%	51.6%	31.6%	100%
	NB I-35W Flyover Entrance	329	826	1945	3100
		10.6%	26.6%	62.7%	100%
	4th Avenue Entrance	11	208	407	626
		1.8%	33.2%	65.0%	100%
	Totals	1950	5986	5378	

*WB I-94 through trips estimated from Mn/DOT Detector data.

The results of the 2-hr AM peak period indicate that over **37%**, 1,155 vehicles, of the northbound I-35W traffic entering westbound I-94 will exit the mainline at one of the first two exit ramps. Approximately **11%**, 329 vehicles, of the northbound I-35W traffic will continue on the auxiliary lane along I-94 only to exit at the Hennepin/Lyndale exit ramp, about ½ mile downstream. Approximately **27%**, 826 vehicles, of the northbound I-35W traffic will merge into the three mainline traffic lanes, continue through the I-94 tunnel and exit at westbound I-394, about 1.3 miles downstream. The remaining **63%**, 1,945 vehicles, will merge into the three mainline traffic lanes and continue along westbound I-94.

Attached Tables 3.1 to 3.3 depict the overall summary of the AM peak hour OD information (total number of plates/vehicles, number of matches, etc.). Table 4 shows the hourly breakdown summary of the OD table. Table 5 shows the 15-minute breakdown of the OD table.

PM Peak Period

The PM peak period data was analyzed from **2:00 PM** to **6:00 PM**. There were a total of **21,917** vehicles that passed the video cameras set up at the four ramp locations during the 4-hour time period. **93%** (**20,390** license plates) of the vehicles license plates were recorded into the OD database. **7%** of the

license plates that were not collected due to other vehicles blocking the view, dirty or unreadable license plates, or license plates outside of the camera view (buses, trucks, etc.).

The northbound I-35W entrance ramp had a license plate capture rate of approximately 95%. The 4th Avenue entrance ramp had the worst capture rate of approximately 88%; this is due to vehicles stacking on the ramp from the ramp meter or downstream congestion, thus sometimes blocking the line of sight. The Hennepin/Lyndale exit ramp had a capture rate of approximately 95%. The westbound I-394 exit ramp had a capture rate of approximately 92%. The previously mentioned adjustment methodology was applied to correct for the unread license plates.

Table 2 shows the resultant OD information for the PM peak period. More detailed tables, including hourly and 15-minute data can be found attached to this memorandum. The attached Figure 3 is a graphical representation of the table below.

Table 2 PM Peak Period OD Summary

Origin-Destination Table		Destinations			Total
		Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip*	
Origins	WB I-94 Mainline*	3388	8107	6963	18458
		18.4%	43.9%	37.7%	100%
	NB I-35W Flyover Entrance	584	667	4399	5650
		10.3%	11.8%	77.9%	100%
	4th Avenue Entrance	89	797	1545	2431
		3.7%	32.8%	63.6%	100%
	Totals	4061	9571	12907	

*WB I-94 through trips estimated from Mn/DOT Detector data.

The results indicate that over **22%**, 1,251 vehicles, of the northbound I-35W traffic entering westbound I-94 will exit the mainline at one of the first two exit ramps. Approximately **10%**, 584 vehicles, of the northbound I-35W traffic will continue on the auxiliary lane along I-94 only to exit at the Hennepin/Lyndale exit ramp, about ½ mile downstream. Approximately **12%**, 667 vehicles, of the northbound I-35W traffic will merge into the three mainline traffic lanes, continue through the I-94 tunnel and exit at westbound I-394, about 1.3 miles downstream. The remaining **78%**, 4,399 vehicles, will merge into the three mainline traffic lanes and continue along westbound I-94.

Attached Tables 6.1 to 6.3 depict the overall summary of the AM peak hour OD information (total number of plates/vehicles, number of matches, etc.). Table 7 shows the hourly breakdown summary of the OD table. Table 8 shows the 15-minute breakdown of the OD table.

Conclusion / Recommendation

The AM peak period has a relatively high percentage, over 37%, of traffic from northbound I-35W that will exit at either Hennepin/Lyndale Avenue or westbound I-394. Between 7AM and 9AM, there were 1,155 vehicles from northbound I-35W that would stay on the right most lanes of westbound I-94, compared to 1,945 vehicles destined for mainline I-94.

The PM peak period has a relatively low percentage, just over 22%, of traffic from northbound I-35W that will exit at either Hennepin/Lyndale Avenue or westbound I-394. Between 2PM and 6PM, there were 1,241 vehicles from northbound I-35W that would stay on the right most lanes of westbound I-94, compared to 4,399 vehicles destined for mainline I-94.

The 2009 Feasibility study showed a decrease in congestion along westbound I-94 with the flyover ramp entering on the left side of the mainline. However the report did not specify the OD percentages used for the analysis, only that it was a large percentage that continued along westbound I-94. This OD analysis shows that the majority of the traffic that exits at either Hennepin/Lyndale Avenue or westbound I-394 is from the mainline traffic lanes; between 82% and 85% of the exiting volumes are from the mainline traffic demands.

Based on the origin-destination results of this study, it is recommended that a CORSIM operational analysis be conducted of two flyover bridge replacement alternatives to demonstrate the operational changes and the effect of adding a new weaving movement along westbound I-94.

gtj
Attachments:
Figure 2 – AM OD Summary
Figure 3 – PM OD Summary
Tables 3.1-3.3 – AM OD Overall Summary Results
Tables 4 – AM Hourly OD Results
Tables 5 – AM 15-Minute OD Results
Tables 6.1-6.3 – PM OD Overall Summary Results
Tables 7 – PM Hourly OD Results
Tables 8 – PM 15-Minute OD Results

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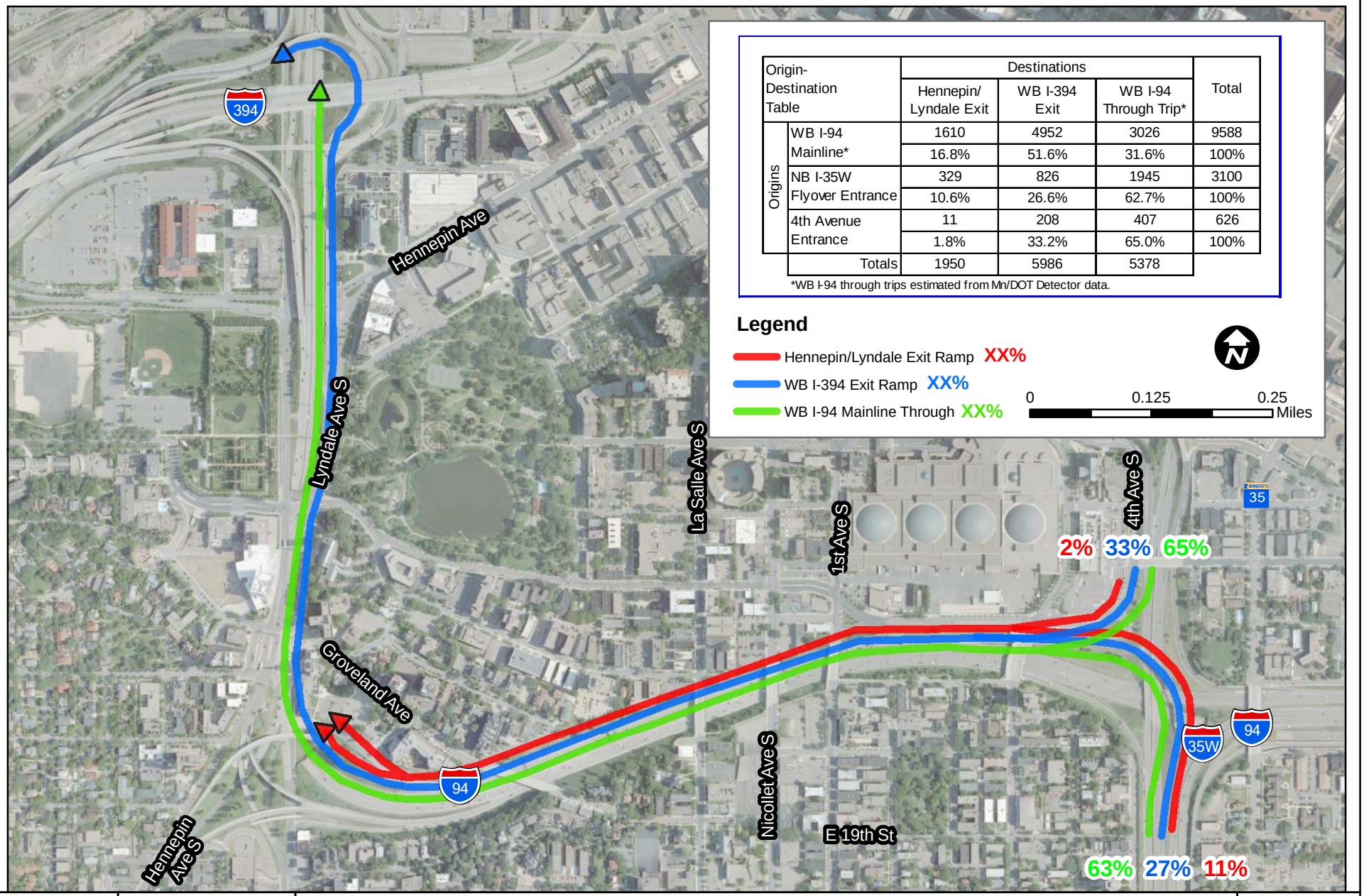


Origin-Destination Table		Destinations			Total
		Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip*	
Origins	WB I-94 Mainline*	1610	4952	3026	9588
		16.8%	51.6%	31.6%	100%
	NB I-35W Flyover Entrance	329	826	1945	3100
		10.6%	26.6%	62.7%	100%
	4th Avenue Entrance	11	208	407	626
		1.8%	33.2%	65.0%	100%
	Totals	1950	5986	5378	

*WB I-94 through trips estimated from Mn/DOT Detector data.

Map Document: (P:\FJH\Hennc\Common\I-35W Transit Access Project\GIS\OD AM.mxd)
7/20/2011 -- 2:03:45 PM

SEH

Project: HENNC 113114
Print Date: 06/20/2011

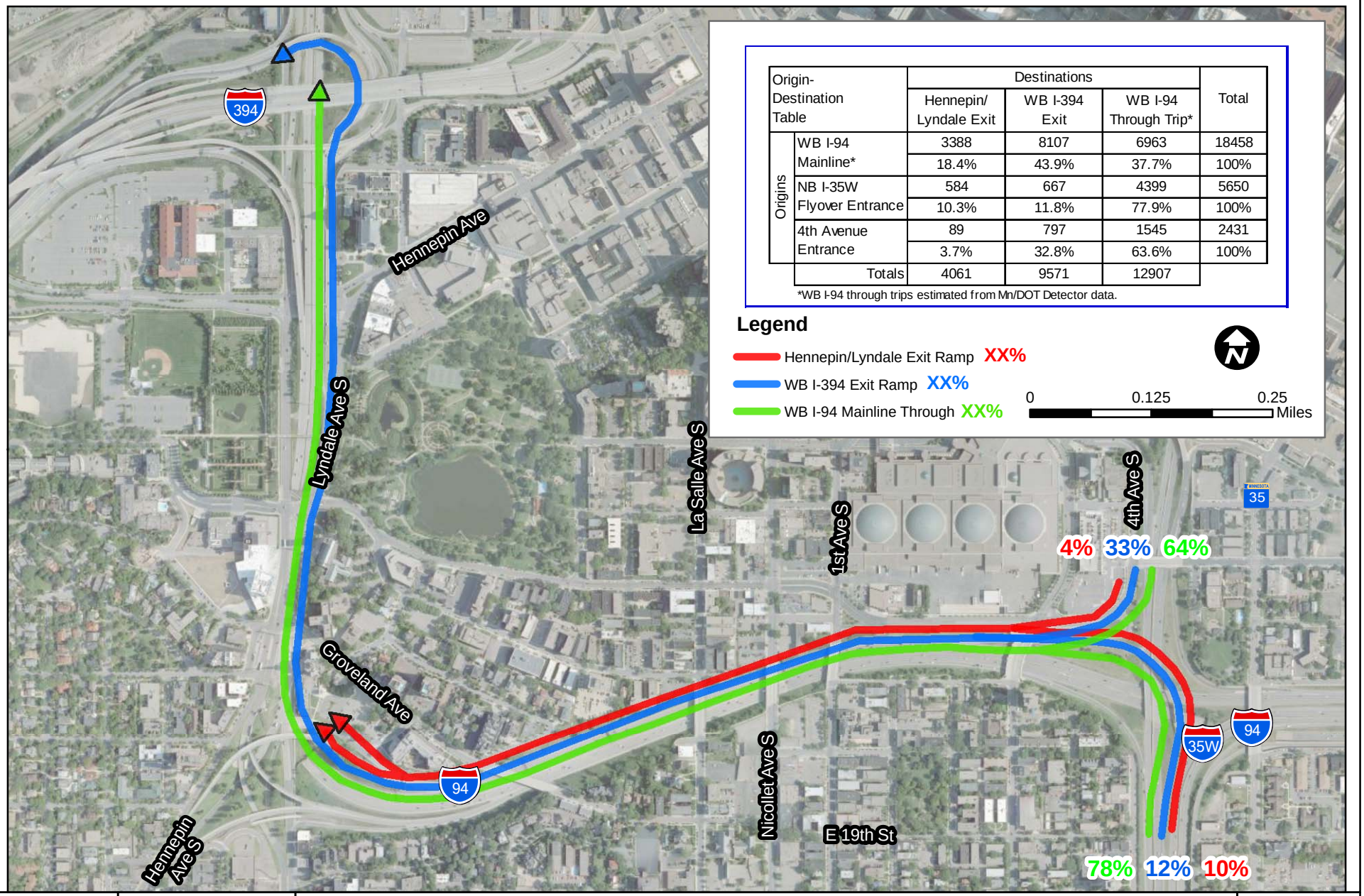
Map by: MSS
Projection: Henn Co Coords
Source: MnDOT, Henn Co

ORIGIN-DESTINATION STUDY (7-9 AM)

NB I-35W to WB I-94/I-394
Minneapolis, Minnesota

Figure 2

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.



Origin-Destination Table		Destinations			Total
		Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip*	
Origins	WB I-94 Mainline*	3388	8107	6963	18458
		18.4%	43.9%	37.7%	100%
	NB I-35W Flyover Entrance	584	667	4399	5650
		10.3%	11.8%	77.9%	100%
	4th Avenue Entrance	89	797	1545	2431
		3.7%	32.8%	63.6%	100%
	Totals	4061	9571	12907	

*WB I-94 through trips estimated from Mn/DOT Detector data.

Map Document: (P:\FJH\Hennc\Common\I-35W Transit Access Project\GIS\OD PM.mxd)
7/20/2011 -- 1:48:33 PM

SEH

Project: HENNC 113114
Print Date: 06/20/2011

Map by: MSS
Projection: Henn Co Coords
Source: MnDOT, Henn Co

ORIGIN - DESTINATION STUDY (2-6 PM)

NB I-35W to WB I-94/I-394
Minneapolis, Minnesota

Figure 3

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

Table 3.1
Origin-Destination Summary
NB I-35W Flyover
7AM to 9AM

		Site 1		Site 2		Site 3		Site 4	
		I-35W Flyover Entrance		4th Avenue Entrance		Hennepin/ Lyndale Exit		WB I-394 Exit	
Cars	Read	2844		579		1784		5086	
	Unread	87	3.0%	10	1.7%	65	3.5%	692	12.0%
Single Unit Trucks	Read	58		19		43		73	
	Unread	35	37.6%	14	42.4%	26	37.7%	48	39.7%
Semi-Truck	Read	68		4		23		62	
	Unread	8	10.5%	0	0.0%	9	28.1%	25	28.7%
All Vehicles	Read	2970		602		1850		5221	
	Unread	130	4.2%	24	3.8%	100	5.1%	765	12.8%
	Total	3100		626		1950		5986	
	Detector Data	0		607		2312		6054	

Notes: NB I-35W Flyover Ramp detector was not working.
Hennepin/Lyndale Exit detector is high due to weaving at detector location.

Table 3.2
Accuracy Information

	Plates	%
Captured License Plates	10643	91.3%
Motorcyle Plates (unread)	54	0.5%
Unreadable Plates	217	1.9%
Blocked Plates	748	6.4%
Total Plates	11662	100.0%

Table 3.3
Matched License Plates*

(Unadjusted)	Plates	%
Single Plate (included unread)	9209	79.0%
2 Matching Plates	2428	20.8%
3 Matching Plates	21	0.2%
4 Matching Plates	4	0.0%
5 or More Matching Plates	0	0.0%
Total Plates	11662	100.0%

Table 4
Hourly Summary
Origin-Destination Study
(Adjusted Data)

Origins	Time		Destinations			Total
	From	To	Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip*	
WB I-94 Mainline*	7:00	8:00	659	2576	1658	4893
	8:00	9:00	951	2376	1368	4695
NB I-35W Flyover Entrance	7:00	8:00	160	461	1003	1624
	8:00	9:00	169	365	942	1476
4th Avenue Entrance	7:00	8:00	5	102	212	319
	8:00	9:00	6	106	195	307

Origins	Time		Destinations			Total
	From	To	Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip	
WB I-94 Mainline*	7:00	8:00	13.5%	52.6%	33.9%	100%
	8:00	9:00	20.3%	50.6%	29.1%	100%
NB I-35W Flyover Entrance	7:00	8:00	9.9%	28.4%	61.8%	100%
	8:00	9:00	11.4%	24.7%	63.8%	100%
4th Avenue Entrance	7:00	8:00	1.6%	32.0%	66.5%	100%
	8:00	9:00	2.0%	34.5%	63.5%	100%

NOTES:

*WB I-94 through trips estimated from Mn/DOT Detector data.

O-D pairs were adjusted based on percentage of missed plates, per vehicle type, at each site.

Table 5
NB I-35W Flyover/4th Street Entrance Ramp
Origin-Destination Study
15-Minute Data
(Adjusted Data)

Site	Time	Hennepin/Lyndale Exit			WB I-394 Exit			WB I-94 Through Trip			Total
		Cars	Trucks	Total	Cars	Trucks	Total	Cars	Trucks	Total	
WB I-94 Mainline*	7:00	144	10	154	581	24	605	335	0	335	1094
	7:15	170	11	181	651	27	678	490	0	490	1349
	7:30	145	7	152	609	22	631	479	0	479	1262
	7:45	157	15	172	640	22	662	354	0	354	1188
	8:00	190	11	201	548	24	572	432	0	432	1205
	8:15	224	12	236	571	23	594	348	0	348	1178
	8:30	227	14	241	552	23	575	325	0	325	1141
	8:45	263	10	273	600	35	635	263	0	263	1171
NB I-35W Flyover	7:00	53	0	53	98	0	98	256	19	275	426
	7:15	34	1	35	119	1	120	267	15	282	437
	7:30	25	1	26	126	1	127	212	10	222	375
	7:45	45	1	46	116	0	116	213	11	224	386
	8:00	35	2	37	101	0	101	198	23	221	359
	8:15	45	3	48	105	2	107	185	23	208	363
	8:30	45	2	47	89	1	90	216	21	237	374
	8:45	37	0	37	67	0	67	244	32	276	380
4th Avenue	7:00	2	0	2	16	2	18	32	10	42	62
	7:15	0	1	1	27	0	27	41	4	45	73
	7:30	0	0	0	41	0	41	53	4	57	98
	7:45	2	0	2	16	0	16	64	4	68	86
	8:00	2	0	2	26	0	26	51	5	56	84
	8:15	1	0	1	20	1	21	44	2	46	68
	8:30	3	0	3	30	0	30	53	2	55	88
	8:45	0	0	0	29	0	29	36	2	38	67
WB I-94 Mainline*	7am-9am	1520	90	1610	4752	200	4952	3026	0	3026	
NB I-35W Flyover	7am-9am	319	10	329	821	5	826	1791	154	1945	
4th Avenue	7am-9am	10	1	11	205	3	208	374	33	407	

Site	Time	Hennepin/Lyndale Exit			WB I-394 Exit			WB I-94 Through Trip			Total
		Cars	Trucks	Total	Cars	Trucks	Total	Cars	Trucks	Total	
WB I-94 Mainline*	7:00	13%	1%	14%	53%	2%	55%	31%	0%	31%	100%
	7:15	13%	1%	13%	48%	2%	50%	36%	0%	36%	100%
	7:30	11%	1%	12%	48%	2%	50%	38%	0%	38%	100%
	7:45	13%	1%	14%	54%	2%	56%	30%	0%	30%	100%
	8:00	16%	1%	17%	45%	2%	47%	36%	0%	36%	100%
	8:15	19%	1%	20%	48%	2%	50%	30%	0%	30%	100%
	8:30	20%	1%	21%	48%	2%	50%	28%	0%	28%	100%
	8:45	22%	1%	23%	51%	3%	54%	22%	0%	22%	100%
NB I-35W Flyover	7:00	12%	0%	12%	23%	0%	23%	60%	4%	65%	100%
	7:15	8%	0%	8%	27%	0%	27%	61%	3%	65%	100%
	7:30	7%	0%	7%	34%	0%	34%	57%	3%	59%	100%
	7:45	12%	0%	12%	30%	0%	30%	55%	3%	58%	100%
	8:00	10%	1%	10%	28%	0%	28%	55%	6%	62%	100%
	8:15	12%	1%	13%	29%	1%	29%	51%	6%	57%	100%
	8:30	12%	1%	13%	24%	0%	24%	58%	6%	63%	100%
	8:45	10%	0%	10%	18%	0%	18%	64%	8%	73%	100%
4th Avenue	7:00	3%	0%	3%	26%	3%	29%	52%	16%	68%	100%
	7:15	0%	1%	1%	37%	0%	37%	56%	5%	62%	100%
	7:30	0%	0%	0%	42%	0%	42%	54%	4%	58%	100%
	7:45	2%	0%	2%	19%	0%	19%	74%	5%	79%	100%
	8:00	2%	0%	2%	31%	0%	31%	61%	6%	67%	100%
	8:15	1%	0%	1%	29%	1%	31%	65%	3%	68%	100%
	8:30	3%	0%	3%	34%	0%	34%	60%	2%	63%	100%
	8:45	0%	0%	0%	43%	0%	43%	54%	3%	57%	100%

NOTES:

*WB I-94 through trips estimated from Mn/DOT Detector data, no vehicle class data available.

O-D pairs were adjusted based on percentage of missed plates, per vehicle type, at each site.

Table 6.1
Origin-Destination Summary
NB I-35W Flyover
2PM to 6PM

		Site 1		Site 2		Site 3		Site 4	
		I-35W Flyover Entrance		4th Avenue Entrance		Hennepin/ Lyndale Exit		WB I-394 Exit	
Cars	Read	5159		2132		3857		8808	
	Unread	168	3.2%	277	11.5%	178	4.4%	655	6.9%
Single Unit Trucks	Read	143		12		36		100	
	Unread	81	36.2%	8	40.0%	21	36.8%	64	39.0%
Semi-Truck	Read	70		2		9		62	
	Unread	29	29.3%	0	0.0%	11	55.0%	35	36.1%
All Vehicles	Read	5372		2146		3902		8970	
	Unread	278	4.9%	285	11.7%	210	5.1%	754	7.8%
	Total	5650		2431		4112		9724	
	Detector Data	0		2775		4806		10480	

Notes: NB I-35W Flyover Ramp detector was not working.

I-394/Hennepin/Lyndale Exit detectors are high due to weaving at detector locations.

Table 6.2
Accuracy Information

	Plates	%
Captured License Plates	20390	93.0%
Motorcyle Plates (unread)	95	0.4%
Unreadable Plates	486	2.2%
Blocked Plates	946	4.3%
Total Plates	21917	100.0%

Table 6.3
Matched License Plates*

(Unadjusted)	Plates	%
Single Plate (included unread)	18002	82.1%
2 Matching Plates	3807	17.4%
3 Matching Plates	72	0.3%
4 Matching Plates	16	0.1%
5 or More Matching Plates	20	0.1%
Total Plates	21917	100.0%

*Matched plates includes vehicles with multiple trips through study area.

Table 7
Hourly Summary
Origin-Destination Study
(Adjusted Data)

Origins	Time		Destinations			Total
	From	To	Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip*	
WB I-94 Mainline*	14:00	15:00	851	1917	1764	4532
	15:00	16:00	785	2133	1681	4599
	16:00	17:00	749	2106	1666	4521
	17:00	18:00	1003	1951	1852	4806
NB I-35W Flyover Entrance	14:00	15:00	157	216	1121	1494
	15:00	16:00	133	174	1115	1422
	16:00	17:00	125	153	1091	1369
	17:00	18:00	169	124	1072	1365
4th Avenue Entrance	14:00	15:00	14	145	280	439
	15:00	16:00	24	188	412	624
	16:00	17:00	28	219	440	687
	17:00	18:00	23	245	413	681

Origins	Time		Destinations			Total
	From	To	Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip	
WB I-94 Mainline*	14:00	15:00	18.8%	42.3%	38.9%	100%
	15:00	16:00	17.1%	46.4%	36.6%	100%
	16:00	17:00	16.6%	46.6%	36.9%	100%
	17:00	18:00	20.9%	40.6%	38.5%	100%
NB I-35W Flyover Entrance	14:00	15:00	10.5%	14.5%	75.0%	100%
	15:00	16:00	9.4%	12.2%	78.4%	100%
	16:00	17:00	9.1%	11.2%	79.7%	100%
	17:00	18:00	12.4%	9.1%	78.5%	100%
4th Avenue Entrance	14:00	15:00	3.2%	33.0%	63.8%	100%
	15:00	16:00	3.8%	30.1%	66.0%	100%
	16:00	17:00	4.1%	31.9%	64.0%	100%
	17:00	18:00	3.4%	36.0%	60.6%	100%

NOTES:

*WB I-94 through trips estimated from Mn/DOT Detector data.

O-D pairs were adjusted based on percentage of missed plates, per vehicle type, at each site.

Table 8
NB I-35W Flyover/4th Street Entrance Ramp
Origin-Destination Study
15-Minute Data
(Adjusted Data)

Site	Time	Hennepin/Lyndale Exit			WB I-394 Exit			WB I-94 Through Trip			Total
		Cars	Trucks	Total	Cars	Trucks	Total	Cars	Trucks	Total	
WB I-94 Mainline*	14:00	169	5	174	307	22	329	606	0	606	1109
	14:15	198	7	205	518	21	539	421	0	421	1165
	14:30	226	8	234	471	32	503	445	0	445	1182
	14:45	234	4	238	530	16	546	292	0	292	1076
	15:00	200	5	205	535	22	557	399	0	399	1161
	15:15	191	3	194	547	13	560	474	0	474	1228
	15:30	178	5	183	498	14	512	393	0	393	1088
	15:45	200	3	203	496	8	504	415	0	415	1122
	16:00	162	2	164	511	11	522	463	0	463	1149
	16:15	188	4	192	575	14	589	282	0	282	1063
	16:30	229	4	233	504	19	523	421	0	421	1177
	16:45	159	1	160	456	16	472	500	0	500	1132
	17:00	201	3	204	520	12	532	366	0	366	1102
	17:15	239	4	243	494	7	501	408	0	408	1152
	17:30	263	1	264	524	10	534	439	0	439	1237
	17:45	291	1	292	376	8	384	639	0	639	1315
NB I-35W Flyover	14:00	30	1	31	51	3	54	237	33	270	355
	14:15	39	1	40	54	2	56	241	35	276	372
	14:30	40	0	40	48	2	50	267	31	298	388
	14:45	45	1	46	55	1	56	251	26	277	379
	15:00	41	0	41	42	0	42	298	18	316	399
	15:15	30	2	32	43	1	44	263	26	289	365
	15:30	34	2	36	46	1	47	244	14	258	341
	15:45	24	0	24	41	0	41	244	8	252	317
	16:00	29	1	30	43	0	43	249	14	263	336
	16:15	42	1	43	37	0	37	261	18	279	359
	16:30	28	2	30	37	0	37	244	20	264	331
	16:45	22	0	22	36	0	36	271	14	285	343
	17:00	39	2	41	36	0	36	249	9	258	335
	17:15	40	1	41	39	0	39	277	6	283	363
	17:30	39	0	39	26	0	26	250	20	270	335
	17:45	46	2	48	23	0	23	256	5	261	332
4th Avenue	14:00	3	0	3	23	1	24	59	2	61	88
	14:15	3	0	3	44	1	45	65	2	67	115
	14:30	3	0	3	37	0	37	84	0	84	124
	14:45	5	0	5	39	0	39	68	0	68	112
	15:00	8	0	8	36	0	36	92	1	93	137
	15:15	7	0	7	48	0	48	96	0	96	151
	15:30	5	0	5	42	0	42	97	2	99	146
	15:45	3	1	4	62	0	62	124	0	124	190
	16:00	10	0	10	49	0	49	155	1	156	215
	16:15	8	0	8	47	0	47	94	0	94	149
	16:30	3	0	3	58	0	58	103	2	105	166
	16:45	7	0	7	65	0	65	85	0	85	157
	17:00	7	0	7	50	1	51	104	1	105	163
	17:15	6	0	6	79	0	79	92	0	92	177
	17:30	3	0	3	65	0	65	97	5	102	170
	17:45	7	0	7	49	1	50	113	1	114	171
WB I-94 Mainline*	2pm-6pm	3328	60	3388	7862	245	8107	6963	0	6963	
NB I-35W Flyover	2pm-6pm	568	16	584	657	10	667	4102	297	4399	
4th Avenue	2pm-6pm	88	1	89	793	4	797	1528	17	1545	

NOTES:

*WB I-94 through trips estimated from Mn/DOT Detector data, no vehicle class data available.

O-D pairs were adjusted based on percentage of missed plates, per vehicle type, at each site.

Table 8
NB I-35W Flyover/4th Street Entrance Ramp
Origin-Destination Study
15-Minute Data
(Adjusted Data)

Site	Time	Hennepin/Lyndale Exit			WB I-394 Exit			WB I-94 Through Trip			Total
		Cars	Trucks	Total	Cars	Trucks	Total	Cars	Trucks	Total	
WB I-94 Mainline*	14:00	15%	0%	16%	28%	2%	30%	55%	0%	55%	100%
	14:15	17%	1%	18%	44%	2%	46%	36%	0%	36%	100%
	14:30	19%	1%	20%	40%	3%	43%	38%	0%	38%	100%
	14:45	22%	0%	22%	49%	1%	51%	27%	0%	27%	100%
	15:00	17%	0%	18%	46%	2%	48%	34%	0%	34%	100%
	15:15	16%	0%	16%	45%	1%	46%	39%	0%	39%	100%
	15:30	16%	0%	17%	46%	1%	47%	36%	0%	36%	100%
	15:45	18%	0%	18%	44%	1%	45%	37%	0%	37%	100%
	16:00	14%	0%	14%	44%	1%	45%	40%	0%	40%	100%
	16:15	18%	0%	18%	54%	1%	55%	27%	0%	27%	100%
	16:30	19%	0%	20%	43%	2%	44%	36%	0%	36%	100%
	16:45	14%	0%	14%	40%	1%	42%	44%	0%	44%	100%
	17:00	18%	0%	19%	47%	1%	48%	33%	0%	33%	100%
	17:15	21%	0%	21%	43%	1%	43%	35%	0%	35%	100%
	17:30	21%	0%	21%	42%	1%	43%	35%	0%	35%	100%
	17:45	22%	0%	22%	29%	1%	29%	49%	0%	49%	100%
NB I-35W Flyover	14:00	8%	0%	9%	14%	1%	15%	67%	9%	76%	100%
	14:15	10%	0%	11%	15%	1%	15%	65%	9%	74%	100%
	14:30	10%	0%	10%	12%	1%	13%	69%	8%	77%	100%
	14:45	12%	0%	12%	15%	0%	15%	66%	7%	73%	100%
	15:00	10%	0%	10%	11%	0%	11%	75%	5%	79%	100%
	15:15	8%	1%	9%	12%	0%	12%	72%	7%	79%	100%
	15:30	10%	1%	11%	13%	0%	14%	72%	4%	76%	100%
	15:45	8%	0%	8%	13%	0%	13%	77%	3%	79%	100%
	16:00	9%	0%	9%	13%	0%	13%	74%	4%	78%	100%
	16:15	12%	0%	12%	10%	0%	10%	73%	5%	78%	100%
	16:30	8%	1%	9%	11%	0%	11%	74%	6%	80%	100%
	16:45	6%	0%	6%	10%	0%	10%	79%	4%	83%	100%
	17:00	12%	1%	12%	11%	0%	11%	74%	3%	77%	100%
	17:15	11%	0%	11%	11%	0%	11%	76%	2%	78%	100%
	17:30	12%	0%	12%	8%	0%	8%	75%	6%	81%	100%
	17:45	14%	1%	14%	7%	0%	7%	77%	2%	79%	100%
4th Avenue	14:00	3%	0%	3%	26%	1%	27%	67%	2%	69%	100%
	14:15	3%	0%	3%	38%	1%	39%	57%	2%	58%	100%
	14:30	2%	0%	2%	30%	0%	30%	68%	0%	68%	100%
	14:45	4%	0%	4%	35%	0%	35%	61%	0%	61%	100%
	15:00	6%	0%	6%	26%	0%	26%	67%	1%	68%	100%
	15:15	5%	0%	5%	32%	0%	32%	64%	0%	64%	100%
	15:30	3%	0%	3%	29%	0%	29%	66%	1%	68%	100%
	15:45	2%	1%	2%	33%	0%	33%	65%	0%	65%	100%
	16:00	5%	0%	5%	23%	0%	23%	72%	0%	73%	100%
	16:15	5%	0%	5%	32%	0%	32%	63%	0%	63%	100%
	16:30	2%	0%	2%	35%	0%	35%	62%	1%	63%	100%
	16:45	4%	0%	4%	41%	0%	41%	54%	0%	54%	100%
	17:00	4%	0%	4%	31%	1%	31%	64%	1%	64%	100%
	17:15	3%	0%	3%	45%	0%	45%	52%	0%	52%	100%
	17:30	2%	0%	2%	38%	0%	38%	57%	3%	60%	100%
	17:45	4%	0%	4%	29%	1%	29%	66%	1%	67%	100%

NOTES:

*WB I-94 through trips estimated from Mn/DOT Detector data.

O-D pairs were adjusted based on percentage of missed plates, per vehicle type, at each site.

Appendix G

I-35W Existing and Proposed Managed Lane Operations Memorandum

MEMORANDUM

TO: Jim Grube, Hennepin County

FROM: Mike Kotila, PE
Graham Johnson, PE

DATE: December 12, 2013

RE: I-35W Transit Access Project
Existing and Proposed Managed Lane Operations
SEH No. AHENNC 113114

This memorandum summarizes the operation and design configuration of the existing and potential proposed managed lanes along I-35W between TH 62 and Downtown Minneapolis. It also assesses the operational implication of alternative beginning and end points for the managed lane designation on I-35W and TH 65 entering and leaving downtown Minneapolis. Findings provided in this memorandum are intended to inform decisions by MnDOT and Metro Transit related to the beginning and end points for managed lane operation.

Managed Lane Definitions
"Managed lane" is a general term for HOV, HOT, PDSL or MnPASS lanes that are actively managed for specific operational strategies (i.e. congestion pricing) and to provide adaptability to changing conditions. Physical and operational characteristics that differentiate the various types of managed lanes follow:

HOV Lane: High Occupancy Vehicle Lane. A restricted traffic lane reserved for vehicles with a driver and one or more passengers. This is a permanent facility that can be restricted for 24-hours per day or restricted only during peak hours allowing general purpose traffic during off-peak hours.

HOT Lane: High Occupancy Toll Lane. A price managed lane reserved for HOV vehicles and single occupancy vehicles (SOV) that pay a toll to utilize the restricted lane. This is a permanent facility that can be restricted 24-hours per day or restricted only during peak hours allowing general purpose traffic during off-peak hours.

PDSL: Priced Dynamic Shoulder Lane. A price managed lane utilizing the inside shoulder of the freeway to operate as a HOT lane during periods of congestion. This type of facility typically operates only during peak hours during which the left shoulder is not available for emergency stopping; During off-peak hours the shoulder is closed to moving traffic but is available for emergency stops.

MnPASS: An electronic toll system operated by MnDOT to control their system of priced managed lanes.

EXISTING CONDITIONS

Northbound I-35W
MnDOT operates a continuous MnPASS lane on northbound I-35W from CR 42 in Burnsville to 26th Street just south of downtown Minneapolis. North of TH 62, the MnPASS lane is an unrestricted access (entering or exiting the lane can occur at any point) HOT lane up to approximately 38th Street. Between 38th Street and 26th Street the MnPASS lane is a restricted access PDSL; at 26th Street, the PDSL feeds

traffic into a general purpose lane which begins at that point and continues on TH 65. The MnPASS lane is tolled between 6 AM and 10 AM during the morning peak hours and from 3 PM to 7 PM during the afternoon peak hours. The PDSL (left side shoulder lane) is open to traffic only during the tolled hours. The HOT lane segment (not a shoulder lane) is open to all traffic during the non-tolled hours.

The cross-section of the I-35W HOT lane section along northbound I-35W typically has an 11 foot inside shoulder, a12 foot HOT lane and a 4 foot buffer between the HOT lane and the general purpose lanes. The PDSL is typically striped as an 11-12 foot drivable shoulder lane with a minimum of 2 feet of reaction distance to the center median barrier and a 2 foot buffer from the general purpose lane.

Vehicles in the MnPASS lane but not destined to westbound I-94 or downtown should exit the lane prior to the restricted access (double solid white line) which begins at 38th Street. Beyond that point, the restricted nature of the PDSL does not allow vehicles to exit the MnPASS lane until after 26th Street at which point weaving to the right to continue along I-35W is not prudent during periods of congestion.

MnPASS lane operational data was pulled from the MnDOT Regional Transportation Center (RTMC) loop detector database. Table 1 includes average values or Tuesdays, Wednesdays, and Thursdays during the month of September 2013; the week of Labor Day was not included. The data was sorted to remove any errant values or errors when a detector might have failed.

The data shows that at the 28th Street overpass, the MnPASS lane serves approximately 1,300 vehicles per hour traveling at an average speed of 45.5 mph. At 26th Street, the MnPASS lane becomes a general purpose lane allowing an additional 170 vehicles enter the lane, with the average speed increasing to 46.3 mph. Near Franklin Avenue, more vehicles enter the left most lane, increasing to 1,700 vehicles per hour with an average speed of almost 51 mph.

This shows that even though the left most lane is operating under capacity, either as a MnPASS or general purpose lane, the influence of the remaining general purpose lanes reduces the speed in this lane. Under the build condition, the improvement to the westbound I-94 flyover should relieve the middle lane along this section of I-35W and improve speeds along the left most lanes.

Table 1 Existing Northbound MnPASS Lane (am peak hour)

	MnPASS/GP Lane		All Freeway Lanes	
Description	Volume (vph)	Speed (mph)	Volume (vph)	Speed (mph)
At 28th Street	1300	45.5	7730	33.2
At 26th Street	1470	46.3	7740	35.7
At Franklin Ave	1690	50.8	4400	40.4
After 11th Street	1000	49.5	1960	50.5

Southbound I-35W

Four general purpose lanes operate on southbound I-35W from downtown to 43rd Street; there is no existing managed lane. The inside (left) shoulder is typically 8-10 feet in width. A MnPASS lane begins as an inside lane addition just south of the 42nd Street overpass. From 43rd Street to 60th Street, the MnPASS lane operates with unrestricted access; the southbound MnPASS lane through the TH 62 commons operates with restricted access. The MnPASS lane is tolled between 6 AM and 10 PM during the morning peak hours and from 3 PM to 7 PM during the afternoon peak hours. During the off-peak hours, the MnPASS lane is open to all traffic.

The cross-section of the I-35W HOT lane section along southbound I-35W typically has an 11 foot inside shoulder, a 12 foot HOT lane and a 4 foot buffer between the HOT lane and the general purpose lanes.

Existing operational data along southbound TH 65/I-35W is provided in Table 2. The existing conditions has a bottleneck at the TH 65 and I-35W merge area. Southbound TH 65 operates with a lane drop under the existing configuration that will be eliminated in the build condition; the build condition also includes merging TH 65 on the left side of I-35W allowing buses and MnPASS users access to the center of the freeway without weaving across the southbound lanes. Therefore, existing operational problems related to weaving will be addressed under the future condition.

Table 2 Existing Southbound Freeway Lanes (pm peak hour)

Description	MnPASS Lane		All Freeway Lanes	
	Volume (vph)	Speed (mph)	Volume (vph)	Speed (mph)
Before 12th Street	N/A	N/A	1980	9.8
At Franklin Ave	N/A	N/A	4025	24.5
At 26th Street	N/A	N/A	7560	38.6
At 28th Street	N/A	N/A	7590	45.3

MANAGED LANES - ALTERNATIVE BEGINNING AND ENDING POINTS

Three configurations were evaluated for beginning and ending the designated managed lane in and out of downtown Minneapolis. The existing condition, beginning and ending near the 26th Street overpass is the first configuration. Another configuration would extend the managed lanes all the way to downtown Minneapolis. A third alternative has the beginning and end points somewhere in between 26th and downtown. The second and third configurations would convert an existing general purpose lane to a managed lane; this conversion removes existing vehicle capacity from the general purpose lanes.

In each southbound case, a general purpose lane would transition directly into a managed lane requiring all non-paying SOV's to shift out of the inside lane. In each northbound case, non-paying SOV's would be allowed to enter the inside lane after the managed lane designation is dropped. Of interest, are the lane utilization and capacity implications of each condition, and the influence they would have on the traffic flow in the general purpose lanes, the managed lanes and the ability for buses to cross over the general purpose lanes as they enter southbound TH 65 from 12th Street or exit northbound TH 65 to 11th Street.

To evaluate the operations for the various configurations, a CORSIM freeway model was developed for each. The previously utilized build models were extended further north towards downtown Minneapolis and the signalized intersections of 10th Street at 4th Avenue and 5th Avenue were included in the CORSIM model. The northbound configurations were evaluated in the AM peak hour and the southbound configurations were evaluated in the PM peak hour. Traffic forecasts were updated with the latest version of the MnPASS scripts within the Twin Cities Regional Travel Demand Model to ensure the forecasts demands for the MnPASS lanes are current.

Northbound I-35W/TH 65 MnPASS Configurations

Northbound I-35W from 43rd Street to 26th Street will be reconstructed to accommodate 24 hour managed lane operation replacing the existing northbound PDSL. Typically the managed lane will have a 6 foot inside shoulder, a 12 foot managed lane and a 2-4 foot buffer from the general purpose lanes. The MnPASS lanes would continue to be tolled between 6 AM and 10 PM during the morning peak hours and from 3 PM to 7 PM during the afternoon peak hours; however increased congestion could provoke a

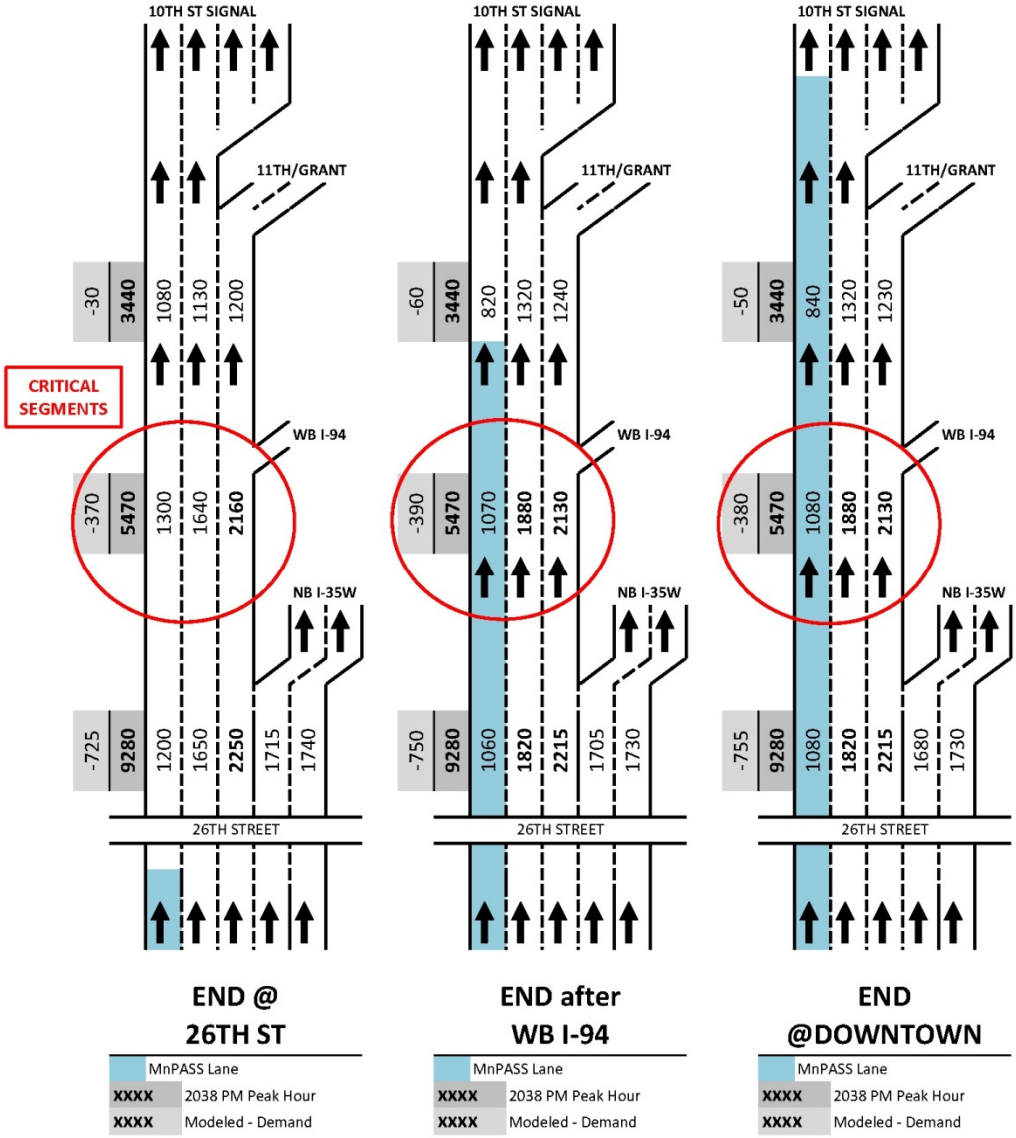
change to the time frames. The existing managed lane ends around the 26th Street overpass, this lane continues on as a general purpose lane (no vehicles are forced out of the lane) into downtown. Currently, all Metro Transit buses to downtown exit TH 65 at the 11th Street exit ramp. Currently there are no plans to alter the existing bus routes with a change in MnPASS lanes; however there is potential in the future to have some buses continue on TH 65 into downtown via 5th Avenue.

Three configurations were analyzed for the ending point of the northbound MnPASS lane as represented in Figure 1. The first is the the existing condition, ending near the 26th Street overpass. The second configuration would extend the MnPASS lane beyond the westbound I-94 exit ramp. The third configuration would extend the MnPASS lane all the way into downtown Minneapolis. The volumes shown are the modeled volumes from the freeway model.

The base scenario showed heavy congestion south of the I-35W/TH 65 diverge (with a modeled volume shortfall of more than 1100 vehicles per hour). Therefore, the total traffic demands entering downtown were not fully realized. To show the full impact of the MnPASS lane configuration, an additional AM scenario was run which relieved congestion on northbound I-35W around the I35W curve. The comparison below is based on the relieved congestion scenario.

It should be noted that the section width of northbound TH 65 shown on the current draft I-35W Transit/Access Project Layout would not preclude conversion of the inside lane and shoulder from a general purpose lane to a managed lane or vice-versa.

Figure 1 Northbound MnPASS Configurations



Traffic volume lane distribution on the segment of northbound TH 65 approaching the exit to westbound I-94 is a critical consideration to assess the potential end points for managed lane operation.

With a full lane volume of traffic exiting at the westbound I-94 flyover ramp, the outside lane becomes effectively a full length auxiliary lane for the I-94 exit. That combined with the heavy congestion from the I-35W commons area, most of the traffic destined for downtown exits are in the two left most lanes.

The first configuration, ending the MnPASS lane near the 26th Street overpass, allows for some of the general purpose traffic destined for downtown to spread out over the two effective lanes along TH 65. This transition occurs after the major congestion point and does not force any traffic out of the lane so all MnPASS users can continue in this lane. At all segments in this model, both the MnPASS lane and general purpose lane had operating speeds greater than 52 mph.

In both the second and third configurations, the MnPASS lane creates a pinch point along TH 65 between the I-35W diverge and the westbound I-94 exit ramp. The left lane is MnPASS only which operates under capacity, the right lane is effectively a full auxiliary lane at capacity, which leaves only the middle lane to handle all the general purpose traffic to downtown; this puts the middle lane at or near capacity on this segment. After the westbound I-94 exit, the total demand is less than the capacity with or without the MnPASS lane and in both configurations the MnPASS lanes had operating speeds of 51 mph or more.

The pinch point created by extending the MnPASS lane beyond the I-35W/TH 65 diverge area creates more congestion and slower speeds in the general purpose lane. The speeds in the center lane of TH 65 drop between 5 and 7 mph compared to the existing MnPASS lane configuration, with no additional improvement in the MnPASS lane operations itself.

The full comparison of the modeled by-lane measures of effectiveness can be found on the attached figures. Figure 3a represents the current build condition for 2038 and Figure 3b represents the relieved congestion scenario on northbound I-35W to allow more flow to TH 65.

The second and third scenarios, with a congested general purpose lane, will make it difficult for buses in the managed lane to shift two lanes to the right to exit at 11th Street. A potential mitigation for this could be to convert the existing center lane to a decision lane which splits to downtown or to the 1tth Street exit which would require buses to make only one lane change. Currently, two lanes continue on TH 65 and the right lane exits into a 2-lane ramp. This potential mitigated configuration was not modeled as part of this evaluation. Table 2 below represents the freeway modeling results for spot locations for the three scenarios for the northbound conditions.

Table 3 Modeling Results - Northbound MnPASS

	#1 MnPASS/GP Lane		#2 MnPASS Lane		#3MnPASS Lane	
Description	Volume	Volume	Volume	Speed	Volume	Speed
At 28th Street	1050	51	1070	53	1040	53
At 26th Street	1070	54	1090	54	1070	54
At Franklin Ave	1300	59	1090	57	1080	57
After 11th Street	1010	51	910	51	810	49

Southbound I-35W/TH 65 MnPASS Configurations

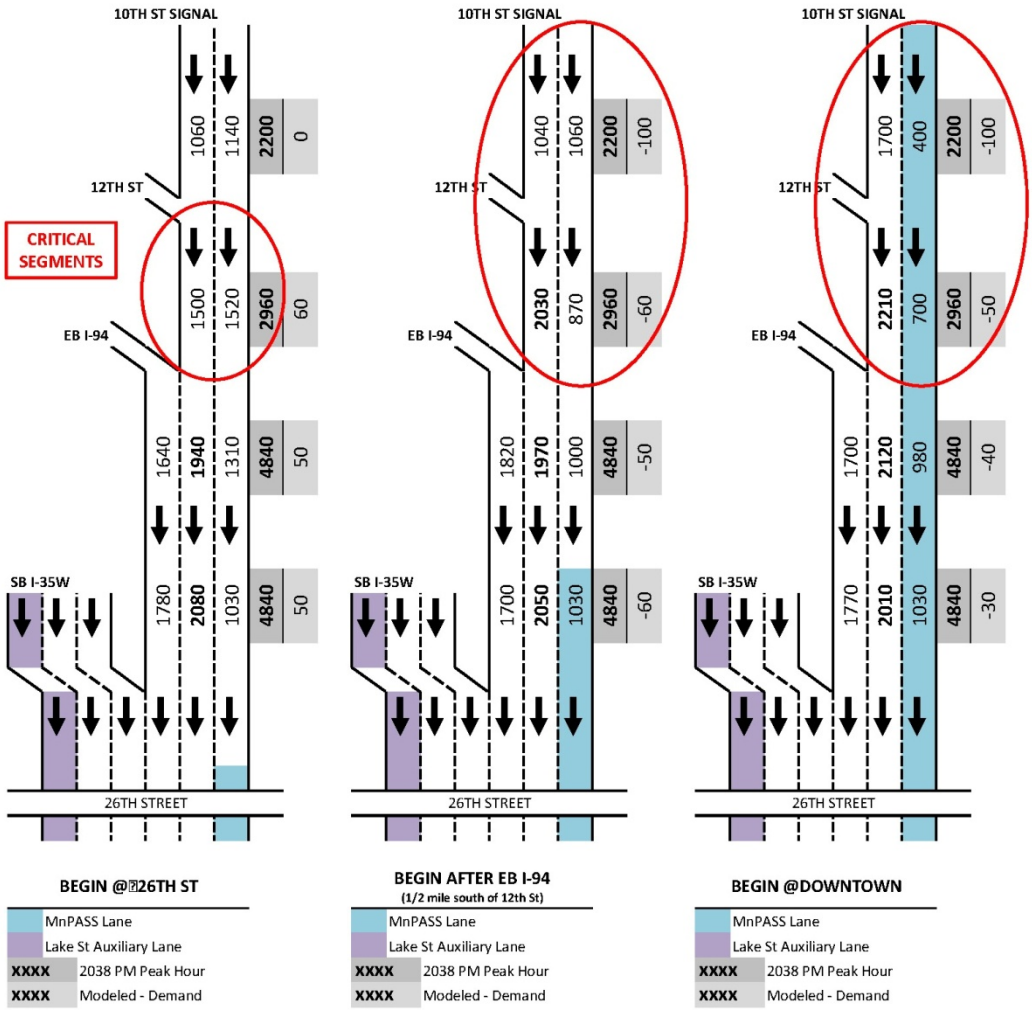
There are three configurations for the southbound MnPASS lanes represented in Figure 2. The first configuration would start the MnPASS lane near the 26th Street overpass; this provides the most capacity for the 2-lane section along TH 65 and allows for more sorting of traffic before the restricted lane begins. The second configuration would start the MnPASS lane ½ mile after the 12th Street entrance ramp; ½ mile is the minimum warning sign distance to convert a general purpose lane to a restricted lane. The third configuration would start the MnPASS lane beginning from downtown; this would give priority to the MnPASS users directly after the 10th Street/4th Avenue signalized intersection.

Currently, all Metro Transit buses from downtown enter TH 65 from the 12th Street entrance ramp; there are currently no plans to alter the existing bus routes associated with the proposed changes in MnPASS operation.

The 2-lane section of TH 65 is the critical segment in assessing the effectiveness of various beginning points for the MnPASS lane. The total demands from downtown are below the 2-lane capacity through the 2038 forecast year; however if the left lane operates under capacity it can put strain on the adjacent

right lane. The figure below shows the three different configurations analyzed; the volumes inside the lane lines are the modeled volumes from the freeway model.

Figure 2 Southbound MnPASS Configurations



In the first configuration, the restricted lane begins near the 26th Street overpass, the 2-lane section of TH 65 is able to divide the traffic between both lanes so traffic moves smoothly; it should be noted that speeds in the right lane drop down to 40mph as traffic enters from the 12th Street ramp. After the eastbound I-94 entrance ramp, traffic begins to exit the left general purpose lane as it approaches the restricted lane designation. The left most lane operates at 53 mph or greater from downtown to the beginning of the MnPASS lane and beyond.

In both the second and third configurations, the 2-lane section of TH 65 between the 12th Street and eastbound I-94 entrance ramps creates a pinch point with the right lane operating at or near capacity. The right lane speeds drop to 32-35 mph after the 12th Street entrance which creates a tough merge area for the buses. In the second configuration, the shifting of general traffic from downtown out of the left lane occurs near the 12th Street entrance and creates additional congestion in a problematic area. In the third configuration, the shifting of general traffic occurs closer to the 10th Street signal and the resultant congestion occasionally backs into the intersection as traffic shifts between lanes. Both of these configurations have speeds of 20 mph or less as traffic leaves downtown.

A full comparison of modeled by-lane measures of effectiveness can be found on the attached Figure 4.

The cross section of the proposed MnPASS lane down to 43rd Street would typically have a 6 foot inside shoulder, a 12 foot managed lane, and a 2-4 foot buffer. The inside shoulder width is reduced to 5 feet across the Lake Street bridge due to overall section width constraints. The new managed lane would operate as a MnPASS controlled lane during congested periods (i.e. HOV or tolled SOV), while during off-peak hours it would be open to all traffic.

It should be noted that the section width of southbound TH 65 shown on the current draft I-35W Transit/Access Project Layout would not preclude conversion of the inside lane and shoulder from a general purpose lane to a managed lane or vice-versa.

Table 3 below represents the freeway modeling results for spot locations for the three scenarios for the southbound conditions.

Table 4 Modeling Results - Southbound MnPASS

Description	#1 MnPASS/GP Lane		#2 MnPASS Lane		#3MnPASS Lane	
	Volume	Volume	Volume	Speed	Volume	Speed
Before 12th Street	1140	53	1060	21	400	37
12th to EB I-94	1520	56	870	45	700	44
EB I-94 to SB I-35W	1040	58	990	59	1020	58
After Merge	1540	58	1550	60	1550	60

Total User Trips

The capacity of the travel lanes on the freeway are based on total vehicle demands for each lane. However, MnPASS lanes carry more person trips than what is shown in the total traffic demand as the MnPASS lane includes all transit buses, HOV vehicles, and paying SOV vehicles. The forecast model showed that the MnPASS lane will have approximately 90% HOV and 10% SOV paying users for both northbound and southbound lanes.

Metro Transit has not yet completed a full transit ridership forecast (planned for 2014) but did provide estimates for peak hour and daily ridership for all transit service (including Minnesota Valley Transit Authority and Southwest Transit). In the future year it is estimated that 3,000 transit users will go into and out of downtown Minneapolis on a total of approximately 120 buses in the peak hour; with a daily total of 24,000 users.

Northbound TH 65, between the I-35W and westbound I-94 exit ramps, serves AM peak period traffic demands of 5,470 vehicles per hour. The previously discussed analysis showed that designating a MnPASS lane in this segment would overburden the center general purpose lane resulting in congested flow. The MnPASS lane has a total vehicle demand of 1,030 which equates to approximately 4,850 person trips; the remaining 4,440 vehicles are spread over the two general purpose lanes which would operate at capacity.

Southbound TH 65, between the 12th Street and eastbound I-94 entrance ramps, serves PM peak period traffic demands of 2,960 vehicles per hour. The previously discussed analysis showed that designating a MnPASS lane in this segment would overburden the single remaining general purpose lane resulting in congested flow. The MnPASS lane has a total vehicle demand of 650 which equates to approximately 4,130 person trips including transit; the remaining 2,300 vehicles will be confined to the single general purpose lane which would operate over capacity.

CONCLUSIONS

Based on the above analysis the key findings for the beginning and end points of the proposed MnPASS lanes are as follows:

Northbound TH 65/I-35W:

- MnPASS ending near 26th Street
  - Best traffic operations for all users
  - Left most lane (MnPASS/General Purpose) has speeds above 52 mph
    - 4,850 AM peak hour MnPASS users do not experience degradation of operations when the MnPASS lane changes to a GP lane.
- MnPASS ending after WB I-94 Exit
  - Creates capacity constraint in the general purpose lanes
  - Left most lane (MnPASS/General Purpose) has speeds above 51 mph
    - 4,850 AM peak hour MnPASS users do not experience improved operation as a result of extending the managed lane
  - Center general purpose lane has speed reductions of up to 8 mph
- MnPASS ending at Downtown
  - Creates capacity constraint in general purpose lanes
  - Left most lane (MnPASS) has speeds above 51 mph
    - 4,850 AM peak hour MnPASS users do not experience improved operations as a result of extending the managed lane
  - Center general purpose lane has speed reductions of up to 9 mph

Southbound TH 65/I-35W:

- MnPASS beginning near 26th Street
  - Provides more than adequate warning sign distance for lane conversion (GP to HOV)
  - Best traffic operations for all users
  - Left most lane (MnPASS/General Purpose) has speeds above 53 mph
    - 4,130 PM peak hour MnPASS users are served in an unimpeded lane
- MnPASS beginning after EB I-94 Entrance
  - Provides the minimum warning sign distance for lane conversion (GP to HOV)
  - Creates a capacity constraint in the general purpose lanes prior to the beginning point of the MnPASS lane
  - Prior to the EB I-94 entrance, average hourly lane speeds range from 13 mph to 45 mph
    - 4,130 PM peak hour MnPASS users experience degraded operations
- MnPASS beginning at Downtown
  - Warning sign placement potentially difficult at 10th Street/4th Avenue intersection
  - Creates a capacity constraint in the general purpose lane; congestion can spill into 10th Street/4th Avenue intersection
  - Prior to the EB I-94 entrance, average hourly lane speeds range from 17 mph to 44 mph
    - 4,130 MnPASS PM peak hour users experience degraded operations

Attachments:
Northbound Operations Comparison
Southbound Operations Comparison
MnPASS Traffic Select Link Figure

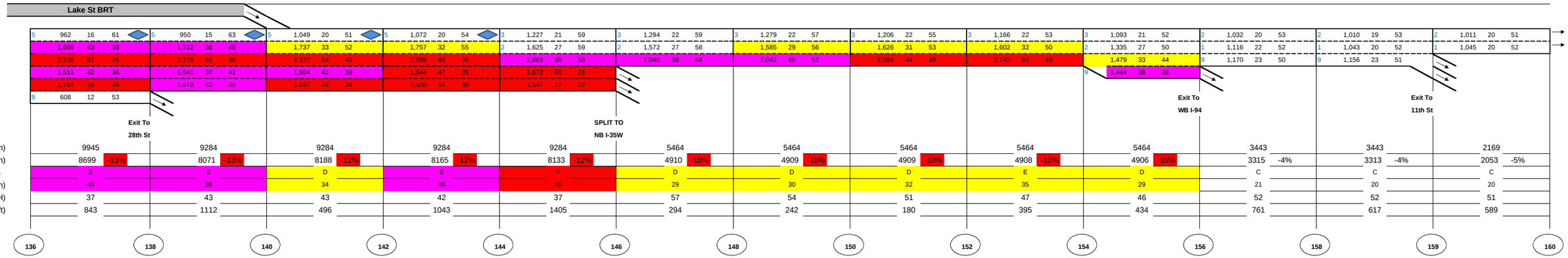
Density	43	V/Ln/M/Hr	LOS F
	35 43	V/Ln/M/Hr	LOS E
	28 35	V/Ln/M/Hr	LOS D

Vol.	Density	Speed	HOV lane/ SOV(blank)
x.xxx	xx	xx	<>
x.xxx	xx	xx	
x.xxx	xx	xx	

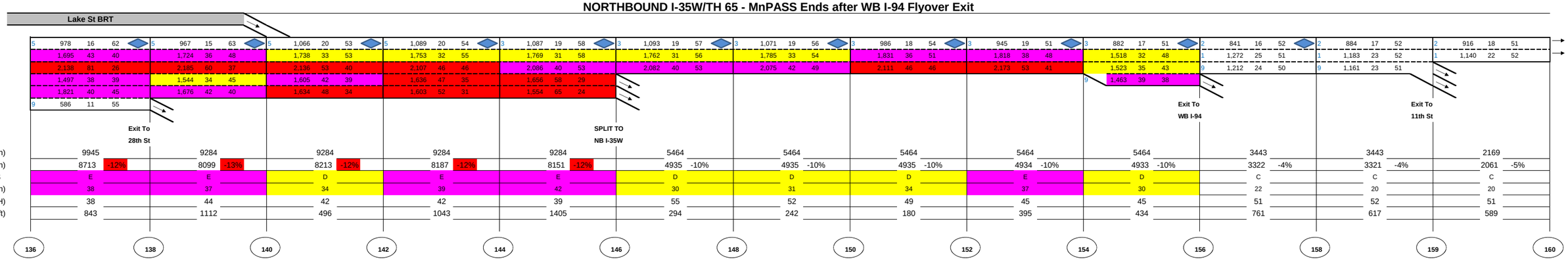
10%

MOE Hour
7:00 AM-8:00 AM

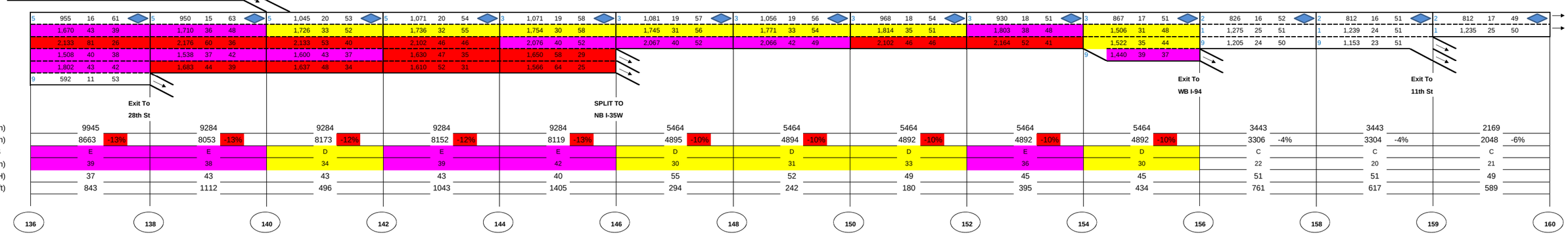
NORTHBOUND I-35W/TH 65 - MnPASS Ends around 26th Street



NORTHBOUND I-35W/TH 65 - MnPASS Ends after WB I-94 Flyover Exit



NORTHBOUND I-35W/TH 65 - MnPASS Ends at Downtown



I-35W Lake Street Transit Access

Northbound I-35W/TH 65 between Lake Street Transit Station and Downtown

2038 Build S6A

Figure 3a

AM Peak Hour

I-35W Lane Schematic

MnPASS Lane Options

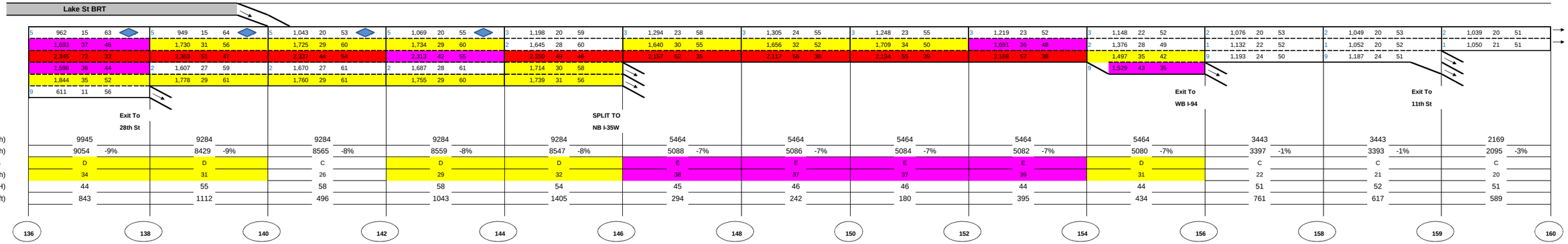
Density			
43		V/Ln/M/Hr	LOS F
35	43	V/Ln/M/Hr	LOS E
28	35	V/Ln/M/Hr	LOS D

Vol.	Density	Speed	HOV lane/ SOV(blank)
x.xxx	xx	xx	<>
x.xxx	xx	xx	
x.xxx	xx	xx	

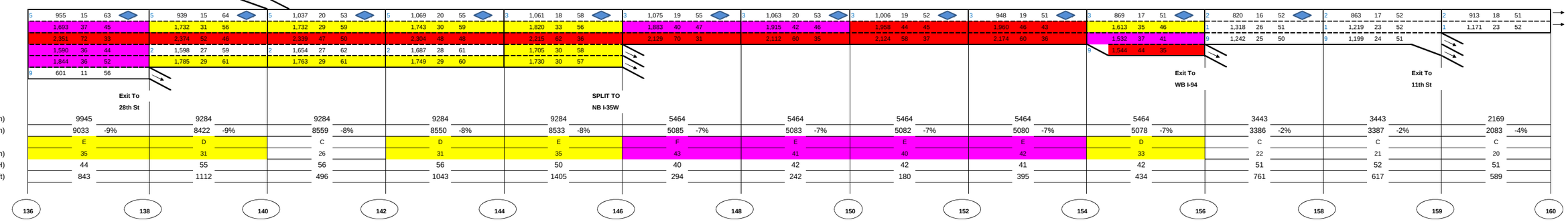
10%

MOE Hour
7:00 AM-8:00 AM

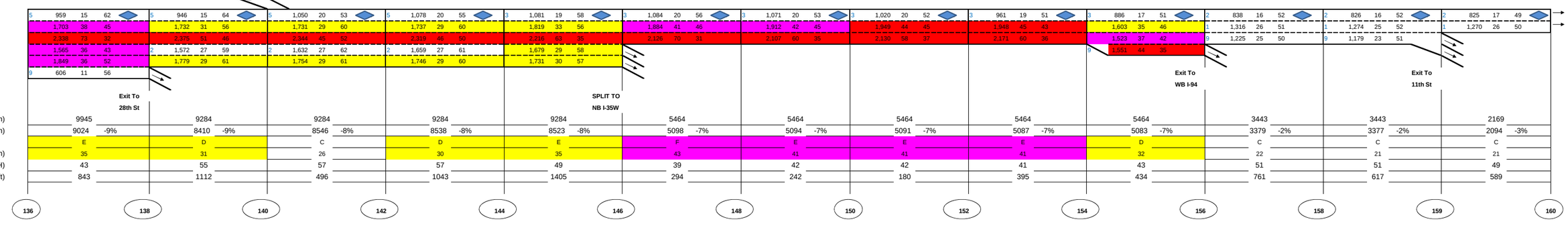
NORTHBOUND I-35W/TH 65 - MnPASS Ends around 26th Street



NORTHBOUND I-35W/TH 65 - MnPASS Ends after WB I-94 Flyover Exit



NORTHBOUND I-35W/TH 65 - MnPASS Ends at Downtown



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I-35W Lake Street Transit Access

Northbound I-35W/TH 65 between Lake Street Transit Station and Downtown

2038 Build S6A

Figure 3b

AM Peak Hour

I-35W Lane Schematic

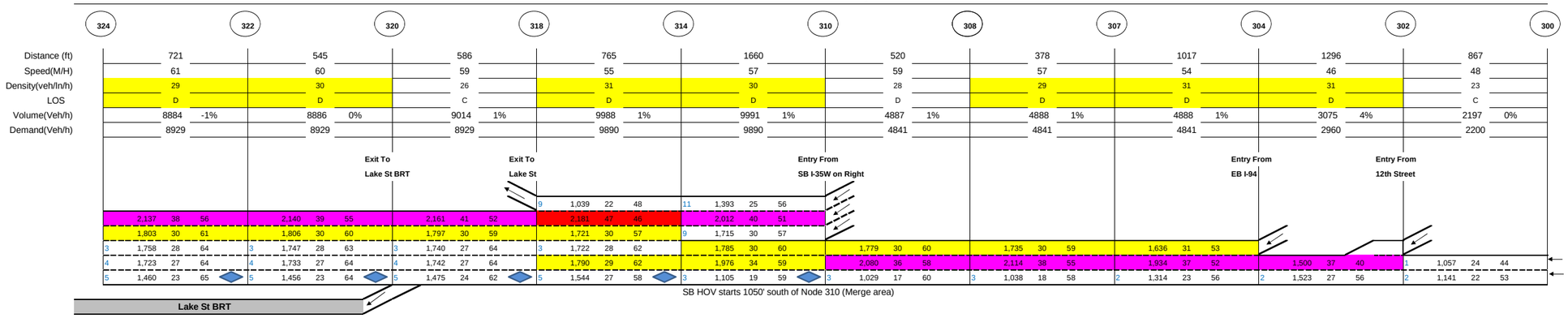
MnPASS Lane Options

Density			
43		V/Ln/M/Hr	LOS F
35	43	V/Ln/M/Hr	LOS E
28	35	V/Ln/M/Hr	LOS D

Vol.	Density	Speed	HOV lane/ SOV(blank)
x.xxx	xx	xx	<>
x.xxx	xx	xx	
x.xxx	xx	xx	
10%			

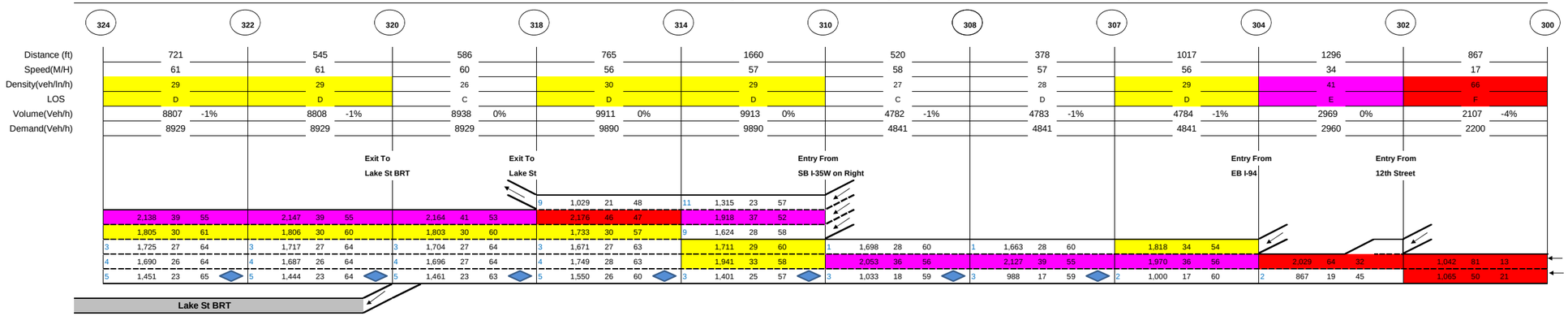
MOE Hour
4:30 PM-5:30 PM

SOUTHBOUND I-35W/TH 65 - MnPASS Begins around 26th Street



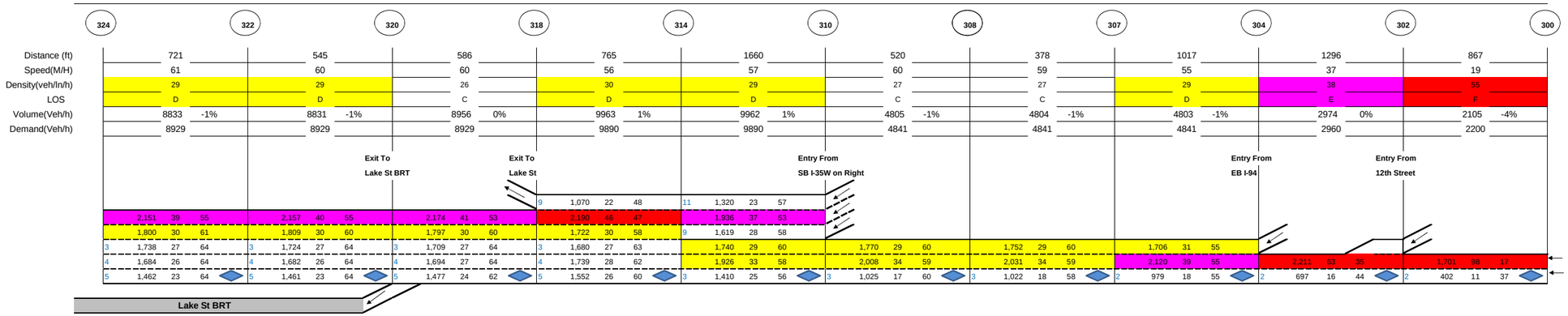
10th Street @ 4th Avenue	Delay	LOS	Max Queue
EB APPROACH	30.5	C	316
SB APPROACH	14.2	B	348
INTERSECTION	21.7	C	

SOUTHBOUND I-35W/TH 65 - MnPASS Begins after EB I-94 Entrance (1/2 mile south of the 12th Street Entrance)



10th Street @ 4th Avenue	Delay	LOS	Max Queue
EB APPROACH	33.6	C	348
SB APPROACH	18.0	B	380
INTERSECTION	25.2	C	

SOUTHBOUND I-35W/TH 65 - MnPASS Begins in Downtown



10th Street @ 4th Avenue	Delay	LOS	Max Queue
EB APPROACH	32.3	C	350
SB APPROACH	17.3	B	370
INTERSECTION	24.2	C	

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I-35W Lake Street Transit Access

Southbound I-35W/TH 65 between Downtown and Lake Street Transit Station

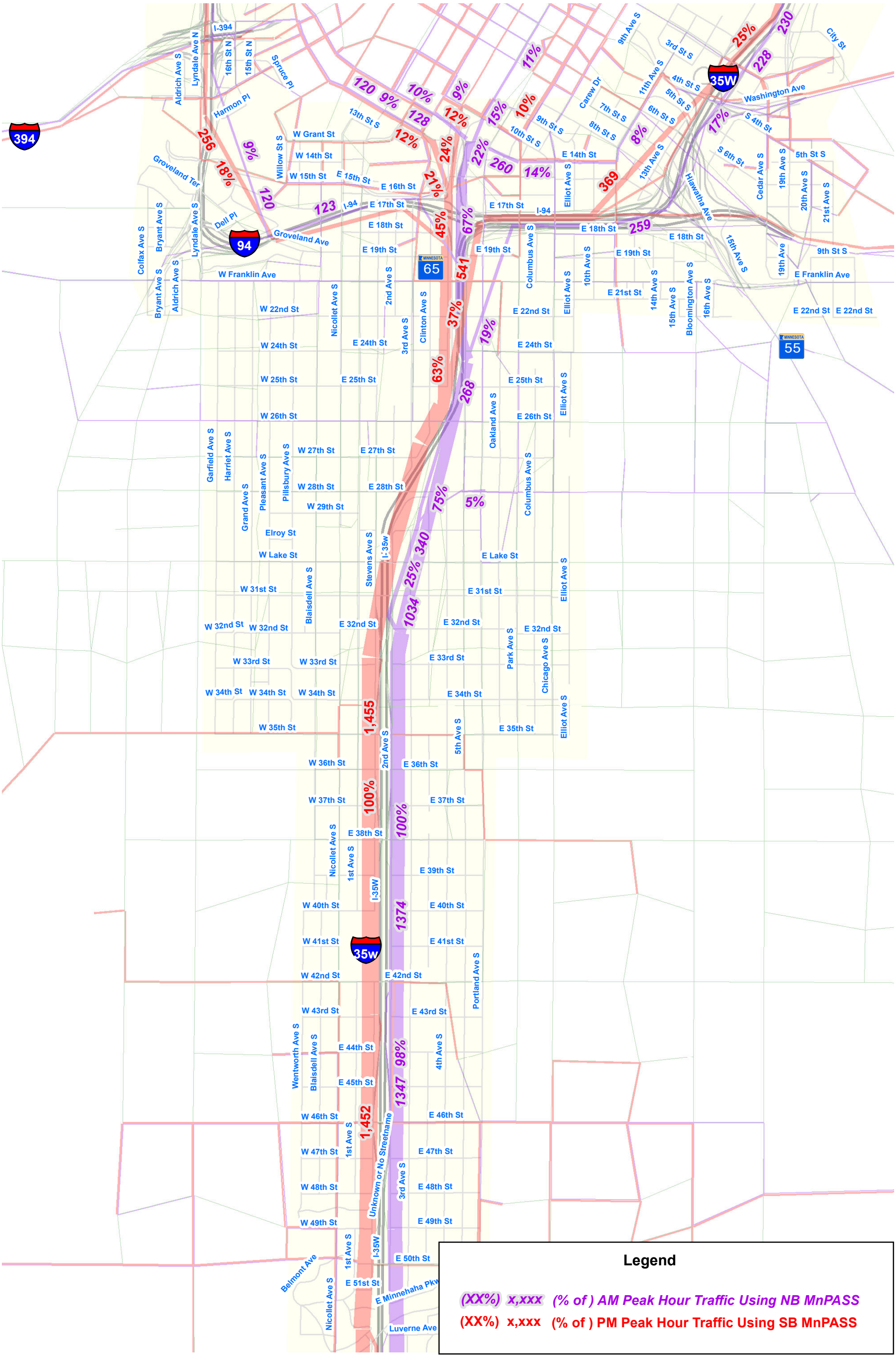
2038 Build S6A

Figure 4

PM Peak Hour

I-35W Lane Schematic

MnPASS Lane Options



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N

I-35W/Lake Street Transit Study

Figure 1
MnPASS Lanes Selected Analysis
at Lake St Bridge
New I-35W SB Lake St & NB 28th St Exits
(Regional Model 2030 Peak Hours)

Appendix H

I-35W Freeway Operations Report

I-35W Freeway Operations Report

I-35W Transit Access Project

Minneapolis, MN

SEH No. AHENNC 113114

Draft - July 25, 2012
Revised/Final – November 9, 2012

Executive Summary

Project Overview

The I-35W Transit Access Project is being led by Hennepin County in partnership with the City of Minneapolis, Metro Transit and the Minnesota Department of Transportation (MnDOT). Project components considered in this project include: constructing a new transit station on I-35W at Lake Street; extending MnPASS lanes through the project area, providing new service interchange ramps to and from the north at Lake Street and adding a new northbound exit to East 28th Street. The project also includes replacement of the southbound I-35W bridge over TH 65 (known as the "Braid Bridge") and replacing the bridge from northbound TH 65 to westbound I-94 (known as the "Flyover Bridge"). The project also includes non-freeway elements including reconstruction of Lake Street near I-35W and a pedestrian and bike connection from Lake Street to the Midtown Greenway (non-freeway elements are not evaluated in this report).

This Freeway Operations Report documents the results of freeway operations modeling of alternatives for the project. Alternatives are comprised of varying combinations of project elements (Transit Station, bridge replacement and/or access ramps) to inform the agency partners in the selection of a preferred alternative.

Existing Conditions

An accurate existing conditions CORSIM model was created to reliably simulate future traffic operations under both No-Build and Build conditions. The existing traffic model was compared against known operating conditions, both field observed and measured. The parameters for the existing traffic models were adjusted to make the output results match as closely as possible to the known traffic operations. The calibrated parameters were used in the models for future options to produce reliable results.

An Origin-Destination (OD) study was also completed for a small portion of westbound I-94 to better understand existing traffic patterns for the model calibration as well as identify future operational impacts of the Flyover Bridge in the study area. The results indicated that a high percentage of traffic from the flyover ramp is destined beyond the I-394 exit (63% in the AM peak and 78% in the PM Peak).

Traffic Forecasts

Peak hour traffic forecasts for design year 2038 and year of opening 2018 were developed. The forecasts are necessary for evaluation of the geometry changes to the freeway. Due to the fact that other interacting factors including geometry changes to local streets and land use assumptions may affect traffic forecasts, the traffic forecasts were prepared for both freeways and local streets at the same time. It is also noted that some geometry changes affected only the quality and not the quantity of the traffic flow and therefore did not require individual forecast scenarios. The detailed forecast methodology and results are documented in the memorandum "*I-35W Transit Access Project Traffic Forecasts*" dated on January 13, 2012.

The forecast scenarios were input into the corresponding no build and build models to evaluate the operational impact of each build option.

No Build Conditions

The existing geometrics were carried forward into the 2018 and 2038 No Build analysis. The only changes from the existing conditions were the traffic demands, bus routes and signal timings (both ramp meters and intersection traffic signals). Recent changes to the freeway network were

included in the modeling effort including the permanent lane changes along I-94 between TH 280 and 5th Street and the westbound I-94 restriping changes at the I-394 exit.

In 2018, traffic operations for the entire freeway network will only slightly degrade. Northbound I-35W will see some spot locations worsen, including the I-94 Commons area and the 35th Street to 31st Street weaving area. Southbound I-35W will have some spot locations in the I-94 commons area worsen. Eastbound and westbound I-94 have two major bottle necks, high weaving traffic and the Lowry Tunnel, that limit the peak period growth along the corridor; therefore the operational change will be minimal by 2018 along I-94.

In 2038, traffic operations for portions of the freeway network will severely degrade. Northbound I-35W will experience the biggest impact; the I-94 Commons area will create a major bottleneck that creates northbound congestion as far back as TH 62. Southbound I-35W will also experience a big impact; the I-94 commons area will have very poor operations. Eastbound and westbound I-94 have two major bottle necks, high weaving traffic demands and the Lowry Tunnel, that limit the peak period growth along the corridor. While the operational performance change will be minimal along I-94 by 2038, the unserved demands at the entrance ramp locations will be severe.

Build Option Results

The No Build models were a starting point for all the Build models created as part of this project. In total, nine (9) freeway models were developed to compare results and determine the impacts of each of the seven (7) separate build options being considered in the project. Below is a list of each separate build option and the general operational impacts of each, based on the model comparisons:

1. **Lake Street Transit Station**
   In both the 2018 and 2038 forecast years, there is a no net change in traffic operations along I-35W for both northbound and southbound directions. Bus traffic accounts for a small percentage of the total traffic demand along I-35W; however, bus service through the new station will be improved.

   Constructing the Lake Street Station will have no negative impact to I-35W operations.

2. **Southbound I-35W Braid Bridge**
   In both the 2018 and 2038 forecast years, there is a minor operational improvement for southbound I-35W. Relocating downtown TH 65 traffic to the left side of the freeway aligns buses for the new Lake Street Transit Station, removing weaving buses from the mainline. It also aligns southbound I-35W traffic to the right side that will be more likely to use the 35th/36th Street exit ramp than traffic from downtown which is realigned to the inside lanes of the freeway by the Braid Bridge.

   Constructing the Southbound I-35W Braid Bridge will have a minor operational benefit to the mainline. It will provide an operational and safety benefit for transit users. The reconfigured bridge will provide better operations for a potential exit ramp to Lake Street as well as a continuous HOV/MnPASS lane from downtown to the existing MnPASS lane at 46th Street.

3. **Southbound I-35W Exit Ramp to Lake Street**
   In both the 2018 and 2038 forecast years, the southbound I-35W exit ramp will provide better overall operations for I-35W. The new auxiliary lane around the 35-mph curve will

help serve the increased demands (in 2038 approximately 800 and 1000 vehicles in the AM and PM peak hours respectively) while improving traffic flow. TH 65 will incur slightly degraded operations with the increased demands served along I-35W.

Constructing the Southbound I-35W Exit Ramp to Lake Street, along with the needed auxiliary lane, will provide better overall operations while serving much higher demands along I-35W.

4. **Northbound I-35W Entrance Ramp from Lake Street**
   In both the 2018 and 2038 forecast years, the northbound I-35W entrance ramp and auxiliary lane will serve greater demand through the I-35W corridor. In the 2038 PM peak hour there is a significant operational benefit that reduces congestion. The AM peak hour for both forecast years has a considerable increase in demand served; however operational results are virtually unchanged.

   Constructing the Northbound I-35W Entrance Ramp from Lake Street and the Eastbound I-94/5th Avenue ramp changes with auxiliary lane will provide better overall operations along I-35W while serving higher demands along I-35W.

5. **Northbound I-35W Exit Ramp to 28th Street**
   In the 2018 analysis, the new exit ramp from northbound I-35W to 28th Street has virtually the same freeway operations as without the ramp. In the 2038 analysis, the congestion from the I-94 Commons area spills through the interchange area upstream all the way to TH 62; with such severe congestion the operational benefits provided by the 28th Street exit ramp is indiscernible. The benefits of the ramp can be seen on the local street network from the removal of traffic along 2nd Avenue that would otherwise travel through both the 31st Street and Lake Street intersections.

   The 28th Street exit ramp would provide an escape lane for the short weaving section along northbound I-35W between the 35th Street entrance and the 31st Street exit; this escape lane and the reduction in weaving volume will improve the weaving segment.

   Constructing the Northbound I-35W Exit Ramp to 28th Street would have no negative operational impact to the operations along I-35W. It would be a major benefit on the local network through reduction in demands that use 2nd Avenue to reach 28th Street.

6. **Northbound I-35W Flyover to Westbound I-94**
   In both the 2018 and 2038 forecast years, relocating the northbound I-35W flyover ramp to westbound I-94 from the right side of I-94 to the left side would provide a dramatic improvement in operations. The existing and no build congestion along westbound I-94 extends from the Mississippi River Bridge to I-394; moving the entrance to the left side of the freeway helps alleviate a major weaving problem and the congestion is reduced extending only to the 11th Street exit ramp. Reducing the weaving volumes through this segment greatly increases the capacity of the segment.

   Relocating the Northbound I-35W Flyover to Westbound I-94 to the left side of I-94 would have a major positive benefit to the traffic operations along I-94. The increase in capacity along westbound I-94 would potentially draw more traffic through this segment and the

Lowry Tunnel; therefore, more study of this ramp should be completed before a decision is made.

7. **Westbound I-94 Entrance Ramp from 4th Avenue (Removal)**
   This alternative was studied due to its proximity to the existing northbound I-35W flyover entrance to westbound I-94.

   In both the 2018 and 2038 forecast years, removing the 4th Avenue entrance ramp to westbound I-94 would provide a dramatic improvement in freeway operations. The existing and no build congestion along westbound I-94 extends from the Mississippi River Bridge to I-394; removing the entrance ramp helps alleviate congestion by reducing demands through the weaving section and tunnel; some of the displaced traffic demand would reroute to alternative upstream freeway entrances, ultimately using the northbound flyover from I-35W and westbound I-94 (via the southbound I-35W C-D road) so the net reduction through the tunnel is only 250 vehicles per hour. The length of congested flow on westbound I-94 is reduced, extending only to the 11th Street exit ramp.

   If the ramp removal is done in conjunction with a left side flyover entrance, the benefits are less evident; this is because the left side flyover entrance has a similar positive impact and the benefits of each overlap. The removal of the flyover weaving volumes greatly increases the capacity of the weaving segment, while the removal of the 4th Avenue demand increases the volumes along westbound I-94 and the northbound flyover ramp somewhat diminishing the benefits of ramp removal.

   Removing the 4th Avenue Entrance Ramp to Westbound I-94 would have a major positive benefit to the traffic operations along I-94; however it may not be necessary if the flyover bridge was relocated to the left side of I-94. Removing the 4th Avenue ramp without moving the flyover to the left hand side, while improving operations, would leave the heavy weaving demands between the Hennepin/Lyndale Avenue exit ramp and the demands from northbound I-35W destined beyond I-394. Impacts to the local street network have not been evaluated.

Conclusions/Recommendations

Constructing the new ***Lake Street Transit Station*** in the median of I-35W will not impact freeway operations and will provide better service and safer travel for buses along the corridor. In conjunction with the new transit station, the ***southbound I-35W Braid Bridge*** should be relocated to span over both directions of TH 65; this change has a minor positive improvement for mainline I-35W traffic and will improve transit and MnPASS operations and safety well into the future.

Both of the above improvements should be made during the first phase of construction.

A new ***southbound I-35W exit to Lake Street***, and the associated auxiliary lane, will improve freeway operations along I-35W as well as provide a direct connection to a heavily traveled minor arterial in the area; the operational impacts to Lake Street are minimal. A new ***northbound I-35W entrance from Lake Street***, and the associated auxiliary lane and new eastbound I-94 connection, will improve freeway operations along I-35W; the new ramp draws heavy traffic demands to the ramp terminal intersection on Lake Street at 2nd Avenue and adds congestion on the local network.

Executive Summary (Continued)

A new ***northbound I-35W exit to 28th Street*** will have a minor positive impact to freeway operations; however it will relieve a high demand of traffic from 2nd Avenue and help relieve congestion on the arterial network.

All three I-35W ramps have positive operational benefits, either for the freeway or local streets, and could be constructed together or separately during the first phase of construction.

Based on Origin-Destination information obtained from this study, the majority of the northbound I-35W flyover traffic to westbound I-94 will continue along I-94 beyond I-394. With existing conditions, this traffic must try to merge over 2 or more lanes to continue along I-94 all while weaving through the heavy exiting volumes at the Hennepin/Lyndale Avenue exit and the westbound I-394 exit. Relocating the ***northbound TH 65/I-35W flyover ramp*** to the left side of westbound I-94 removes a major portion of the weaving traffic and improves traffic operations significantly. Improvements are achieved on westbound I-94 as well as on northbound TH 65 and northbound I-35W.

Removing the ***4th Avenue Entrance Ramp*** would improve freeway operations significantly; however it does not remove the high weaving volumes and the corridor will still have localized operational and safety problems. Northbound TH 65 and northbound I-35W would still have vehicles stacking as they approach the flyover ramp in this scenario. Combining the relocated left side flyover ramp with the removal of the 4th Avenue entrance ramp would provide the greatest operational and safety benefits; however the improvements are only slightly better than completing only one of the changes.

Westbound I-94 operations will see an improvement with either of the entrance ramp changes. However, only the relocated flyover ramp changes the weaving patterns, improving flow for all traffic through the area. Therefore, based on this current analysis, the northbound I-35W flyover ramp would be recommended to be relocated on the left side of westbound I-94 during the first phase of construction; however more study may be needed to finalize this decision.

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I-35W Freeway Operations Report

I-35W Transit Access Project

Prepared for Hennepin County

1.0 Project Overview

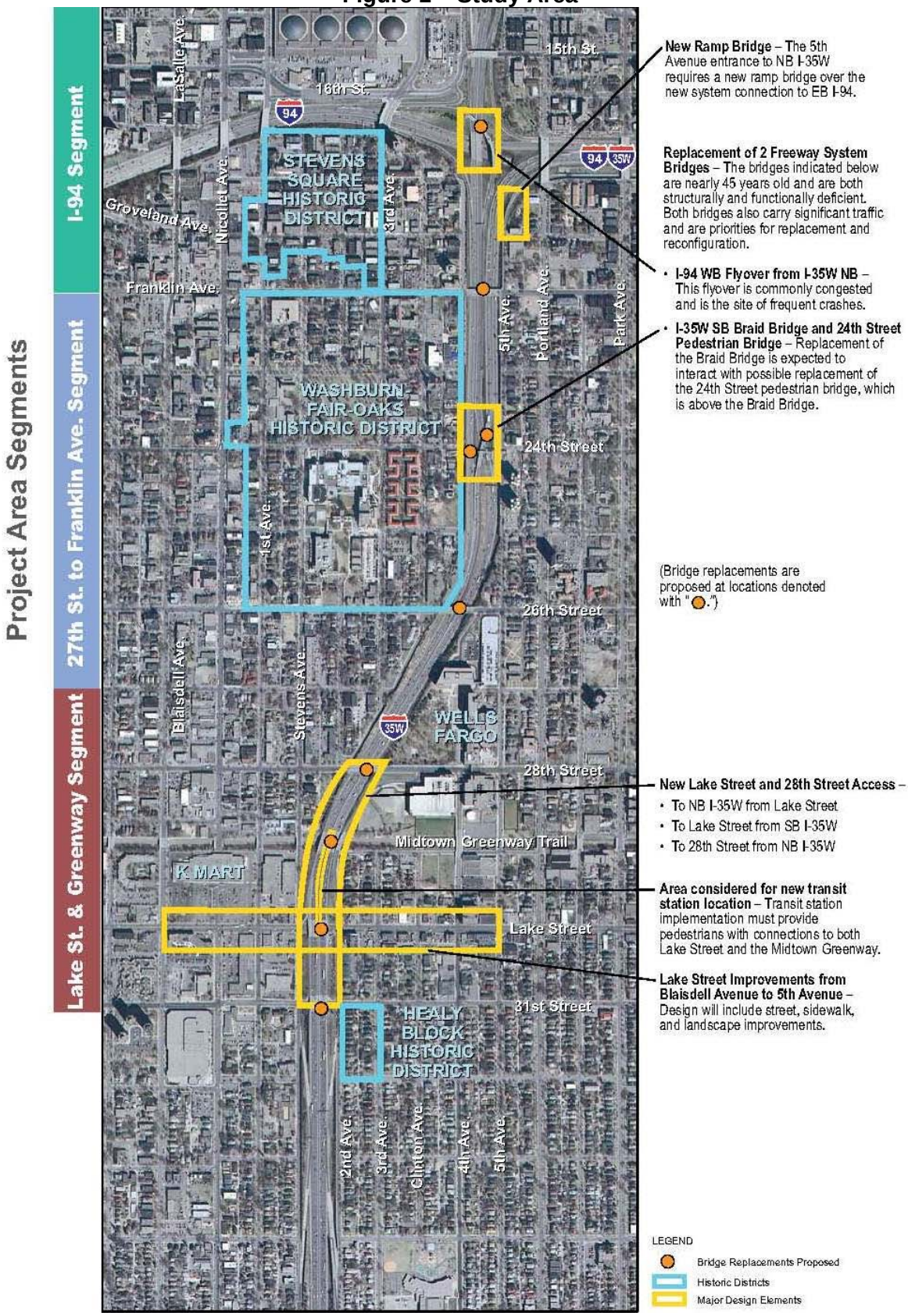
Interstate 35W (I-35W) is one of the most important freeways in Twin Cities Interstate System, providing access to the Central Business District (CBD) of Minneapolis as well as serving interregional through trips. The I-35W Transit Access Project (The Transit Access Project) study area is located immediately south of downtown Minneapolis (Figure 1). This heavily traveled roadway includes MnPASS lanes between Downtown Minneapolis and City of Burnsville in the southern metropolitan area. Over the last decade, a number of transportation improvement projects have been accomplished within the study area and its immediate vicinity. Some of the recent improvements include the new systems interchange with TH 62 (2010), the 46th Street Transit Station (2010), and the I-35W Urban Partnership Agreement (UPA) projects that included MnPASS lanes (2010).

There are several relevant past studies that address the transportation needs in the study area. Two of them play critical roles in providing relevant data and ideas for the scope and approach of this study. One study is the I-35W/Lake Street Access Project that was completed in 2004. In the study, a number of concepts including a transit station in the median were developed and evaluated for access improvements in and around the Lake Street area. Another study is the I-35W Lake Street Transit Station Feasibility Study that was completed in 2009. In the study, mitigations to the freeways in the study area were recommended to accommodate the traffic increase due to the new access at Lake Street.

By 2018, two major bridges in the project area must be replaced based on the requirements of the Chapter 152 Bridge Replacement Program (2008). The two bridges are the southbound I-35W bridge over northbound TH 65 near 24th Street, and the northbound I-35W/TH 65 flyover bridge to westbound I-94. Replacement of these two structures is impacted by other decisions along the I-35W corridor including a new transit station at Lake Street and any potential access changes in the Lake Street area. A number of technical elements proposed in previous studies were therefore investigated further for this study to ensure they fit cohesively together to meet local and regional multimodal transportation needs. These elements have impacts to the operations of the freeway system, the arterial system or both. The Lake Street arterial and local street operations analysis results are documented in a separate memorandum. This report documents the freeway operations study approach and results.

This Transit Access Project is being led by Hennepin County and includes an intensive agency and public involvement process to gain input from key stakeholders responsible or impacted by the study area transportation system. These stakeholders include MnDOT, FHWA, Metro Transit, the City of Minneapolis, neighborhood representatives and business owners from the project area.

Figure 1 – Study Area



1.1 Freeway Study Approach

The freeway operations analysis was conducted for A.M. and P.M. peak periods by using CORSIM, a powerful micro simulation tool. The CORSIM model limits were developed based on MnDOT freeway modeling policy and are shown in Figure 2. The modeling limits include all freeway entrance and exit ramps along each corridor in the study area. I-35W modeling limits extend from TH 62 on the south end to the Mississippi River Bridge on the north end, approximately 6.5 miles. I-94 was included between TH 55 and the Mississippi River Bridge, approximately 4 miles. Select ramp terminal intersections were included based on their potential to impact or be impacted by I-35W operations.

The CORSIM traffic simulation analysis followed a step-by-step approach below.

- Creation and calibration of an existing condition CORSIM model
- Conversion of future 2038 peak hour forecasts to 15-minute interval data for 3-hour A.M. and P.M. peak periods required in the MnDOT CORSIM modeling guidelines. (The 2038 forecast methodology and results are document in the memorandum *"I-35W Transit Access Project Traffic Forecasts – Freeway System and Arterial/Local Street Network"* dated on January 13, 2012*)*
- Future design year 2038 no-build CORSIM model analysis
- Future design year 2038 build conditions CORSIM model analysis for one or more combined design elements.
- Future opening year 2018 for all CORSIM models developed for design year.
- Creation of final report with conclusions and any further recommendations

The CORSIM output includes a number of quantitative measures of effectiveness (MOEs) that describe operating conditions on the freeway and arterial network. The key MOEs for this project are detailed below.

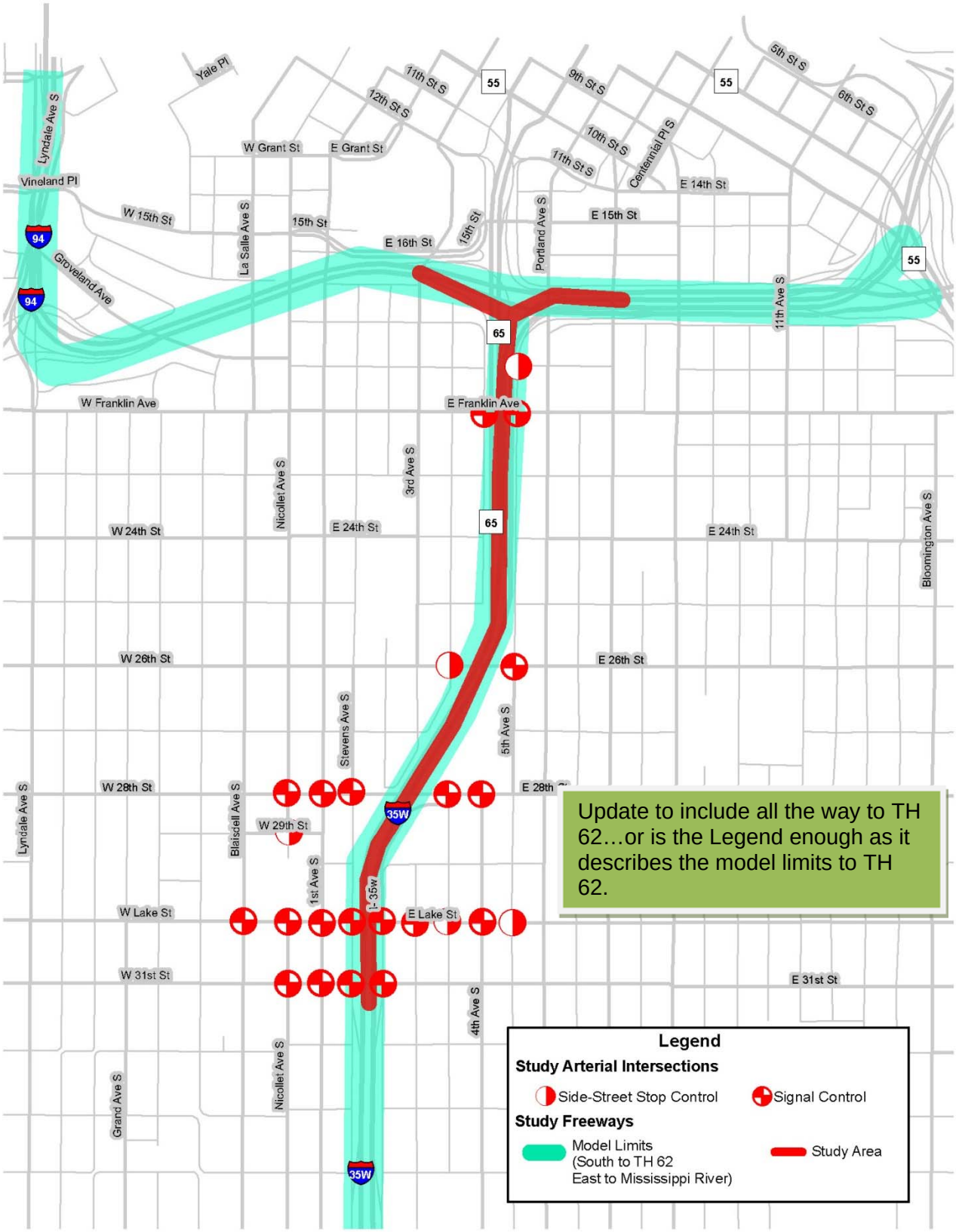
<u>Density</u> – The measure is expressed in passenger cars per mile per lane (pc/mi/ln), and correlates to a letter grade Level of Service (LOS) A through F based on the criteria in Highway Capacity Manual (HCM). As densities increase, freeway operations deteriorate, freedom to maneuver is more restricted and operations become volatile and sensitive to any disruption, such as a lane change or entering ramp traffic. The lower boundary of LOS E, 43 pc/mi/ln, is considered at capacity. The criteria for LOS and density ranges are summarized in Table 1.

<u>Throughput</u> – The number of vehicles that are actually able to pass through a given location in the model. Throughput is compared to the traffic volume demand at that location. Related to density in that throughput decreases as densities increase.

<u>Speed</u>- The average vehicular speed, on a given segment, during the analysis period. This is an indication of congested conditions and safety on the mainline. The following Freeway Level of Service Criteria were used to evaluate the freeway operations for different design elements.

Table 1 Freeway Level of Service

Level of Service (LOS)	Description	Density (pc/mi/ln)
A	Free flow operations where free flow speeds and operating speeds are the same. Vehicles are unimpeded in their ability to maneuver.	≤ 10.00
B	Free flow speeds are generally maintained. Vehicle's ability to maneuver is only slightly restricted.	> 10.0 – 20.0
C	Free flow speeds are generally maintained. Freedom to maneuver is noticeably restricted. Queues may be expected to form behind any significant blockage.	> 20.0 – 28.0
D	Speeds begin to decline with increased traffic. Freedom to maneuver is more noticeably restricted. Queues can be expected to form behind any minor incident.	> 28.0 – 35.0
E	The lower boundary of LOS E is considered at capacity. Operations are very volatile with extremely limited room to maneuver. Any disruption such as lane changing or vehicle entering from a ramp can cause a breakdown and extensive queuing.	> 35.0 – 43.0
F	Total breakdown in vehicular flow. Traffic is under stop-and-go conditions.	> 43.0



Update to include all the way to TH 62…or is the Legend enough as it describes the model limits to TH 62.

Figure 2 – Study Modeling Limits

2.0 Existing Conditions

2.1 Existing Traffic Data and Model Calibration

An accurate existing CORSIM model is necessary to reliably simulate future traffic operations under both No-Build and Build conditions. The existing traffic model can be compared against known operating conditions, whether field observed or measured. The parameters for the existing traffic models are adjusted to make the output results match as closely as possible to the known traffic operations. The calibrated parameters are used in the models for future options to produce reliable results.

The existing volume data was a key input into the operational modeling and the field observations assist in "calibrating" the CORSIM operational model to actual conditions. Calibration for this model started with the 2004 existing calibration parameters; however many geometric and operational changes have occurred including the completion of I-35W/TH 62 Commons Reconstruction project since that model was created. Updated geometry and 2011 volumes were the starting point for the new calibration efforts. Arterial turning movement volumes were collected in November 2010. 15-minute freeway data for both peak periods, 6 to 9 AM and 3 to 6 PM, were obtained from the freeway detector data from the spring of 2011. Multiple days were collected and analyzed in order to create a balanced data set between the existing turning movement volumes, ramp volumes, and mainline volumes. From this data, a balanced volume database was created.

Existing timings at the arterial intersections were input into Synchro and exported to CORSIM models. The existing timings were provided by MnDOT and the City of Minneapolis. Actual ramp meter timing data was also obtained from MnDOT and incorporated into the base AM and PM CORSIM models to better replicate existing conditions.

2.2 Origin-Destination Study

An Origin-Destination (OD) study was completed for a small portion of westbound I-94 to better understand existing traffic patterns for the model calibration as well as identify future operational impacts of the Flyover Bridge in the study area. The OD study approach and results were documented in a separate memorandum "*I-35W Northbound Ramp to I-94 Westbound Origin-Destination Study" dated on July 22, 2011*. Figure 3 below shows the OD site locations. The OD study results are summarized in Table 2 and Table 3. The AM peak period and PM peak periods were analyzed between the hours of 7AM to 9AM and 2PM to 6PM, respectively.

The OD results indicate a high percentage of traffic from northbound I-35W desire to continue along westbound I-94 beyond the I-394 exit. The PM peak hour, with the highest level of congestion on I-94, has the highest percentage. Traffic destined beyond the I-394 exit ramp need to be in the left two most lanes along I-94; this creates a major weaving problem with the high exiting volume to Hennepin/Lyndale Avenues and I-394. The relocation of the northbound I-35W entrance ramp to the left side of westbound I-94 would remove a considerable portion of traffic from the weaving section before the Lowry Tunnel. However, it is noted that the traffic destined to Hennepin/Lyndale Avenues would have to make more lane changes than current configuration. The ultimate impacts were evaluated using the CORSIM models.

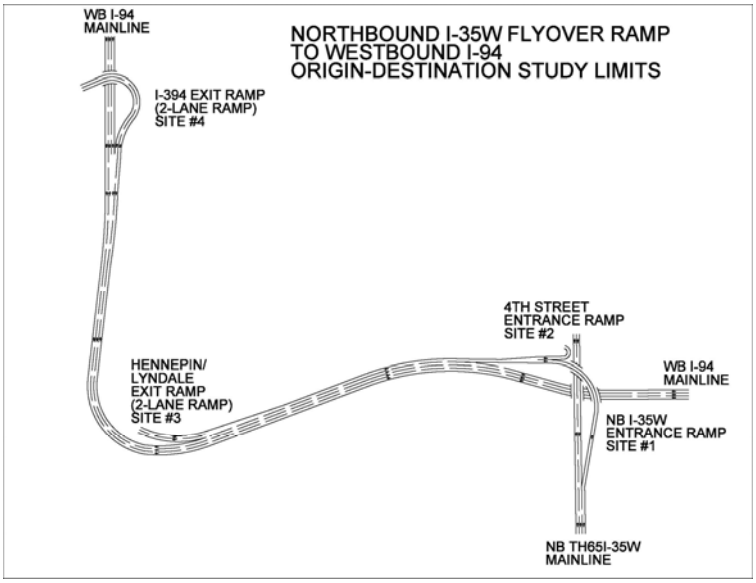


Figure 3 – Origin-Destination Study Area

Table 2 - AM Peak Period OD Results (7 AM to 9 AM)

Origin-Destination Table		Destinations			Total
		Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip*	
Origins	WB I-94 Mainline*	1610	4952	3026	9588
		16.8%	51.6%	31.6%	100%
	NB I-35W Flyover Entrance	329	826	1945	3100
		10.6%	26.6%	62.7%	100%
	4th Avenue Entrance	11	208	407	626
		1.8%	33.2%	65.0%	100%
	Totals	1950	5986	5378	

*WB I-94 through trips estimated from Mn/DOT Detector data.

Table 3 - PM Peak Period OD Results (2 PM to 6 PM)

Origin-Destination Table		Destinations			Total
		Hennepin/ Lyndale Exit	WB I-394 Exit	WB I-94 Through Trip*	
Origins	WB I-94 Mainline*	3388	8107	6963	18458
		18.4%	43.9%	37.7%	100%
	NB I-35W Flyover Entrance	584	667	4399	5650
		10.3%	11.8%	77.9%	100%
	4th Avenue Entrance	89	797	1545	2431
		3.7%	32.8%	63.6%	100%

Totals	4061	9571	12907

*WB I-94 through trips estimated from Mn/DOT Detector data.

2.3 Existing Operational Issues

The traffic conditions along I-35W have improved substantially in the southern study area due to the recent completion of several major projects including the reconstructed I-35W/TH 62 Commons, new Transit Station at 46th Street and MnPASS lanes between Downtown Minneapolis and City of Burnsville. The previous bottleneck in the I-35W/TH 62 Commons area has been removed and the MnPASS lanes in the median provide free-flow conditions for transit vehicles, HOVs and SOVs willing-to-pay the MnPASS fee. However, the operational problems in the central interchange I-35W/I-94/TH 65 area still exist. It is among the most congested areas in the Twin Cities metropolitan area. There are multiple causes contributing to the operational problems in the study area. Most importantly, the I-35W and I-94 freeways were constructed in the 1960s and current peak period traffic demands have well exceeded design capacity at several locations. Secondly, there are several substandard freeway segments with narrow shoulder widths, limited sight distance, deficient horizontal and vertical curves, and closely spaced access ramps. These segments include (but are not limited to) I-94 Lowry Hill Tunnel, I-94/I-35W Commons, and the I-35W Curves. These segments are among the most incident-prone locations in the state. Due to substandard geometry in the area, traffic congestion is also very difficult to alleviate after an incident occurs.

Figure 4 and Figure 5 respectively illustrate the congestion areas along the I-35W and I-94 corridors during peak hour periods in a typical weekday. The figures show the operational issues along the freeway corridors in the study area as described below:

Northbound I-35W – During AM peak period, there are two bottlenecks along the northbound I-35W corridor. One is located in the central interchange I-35W/I-94/TH 65 area and the other is located in 31st street and 35th Street area. During the PM peak, the entrance ramps from both eastbound and westbound I-94 enter a congested I-35W and queues extend back onto I-94.

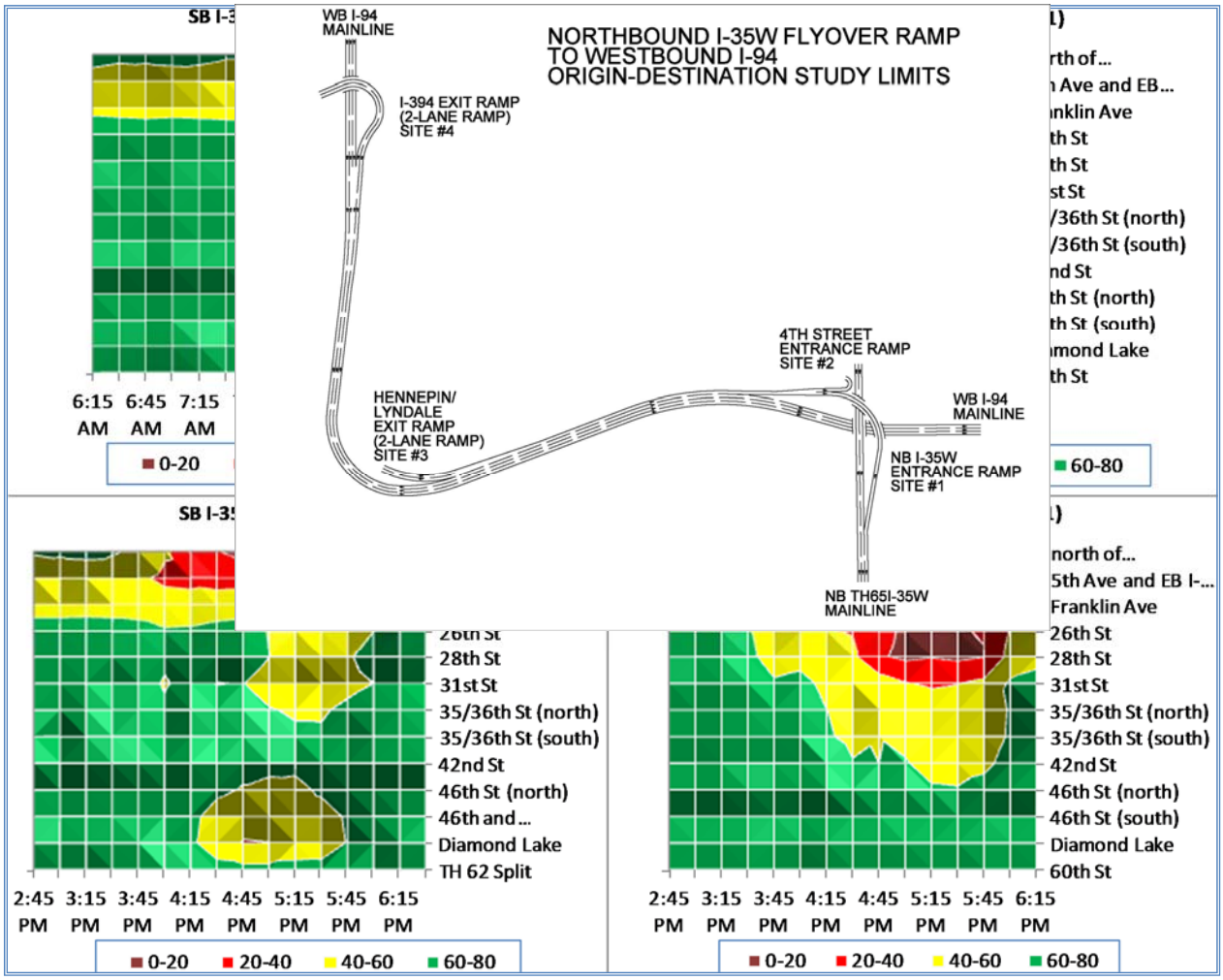
Southbound I-35W – Overall operations on southbound I-35W are acceptable except for the I-94 commons area during PM peak period. The main cause is high entering volumes from the Washington Avenue collector-distributor (CD) road and the westbound I-94 entrance ramp approaching the 35-mph curve.

Eastbound I-94 – During both A.M. and P.M. peak periods, the existing Lowry Tunnel is one of the major bottlenecks for eastbound I-94 that meters the traffic entering the study area. After the 35-mph curve through the tunnel, there are high weaving demands between the Hennepin/Lyndale entrance ramp and the southbound I-35W exit ramp.

Westbound I-94 – The existing Lowry Tunnel is one of the major bottlenecks for westbound I-94 during both A.M. and P.M. peak periods. There is also a

very high weaving demand between the northbound I-35W flyover/4th Avenue combined entrance ramp and the Hennepin/Lyndale exit ramp. The congestion extends for miles upstream and has major impacts to the surrounding freeway and arterial network during the PM peak period.

Figure 4 – I-35W Existing Peak Period Speed Contours



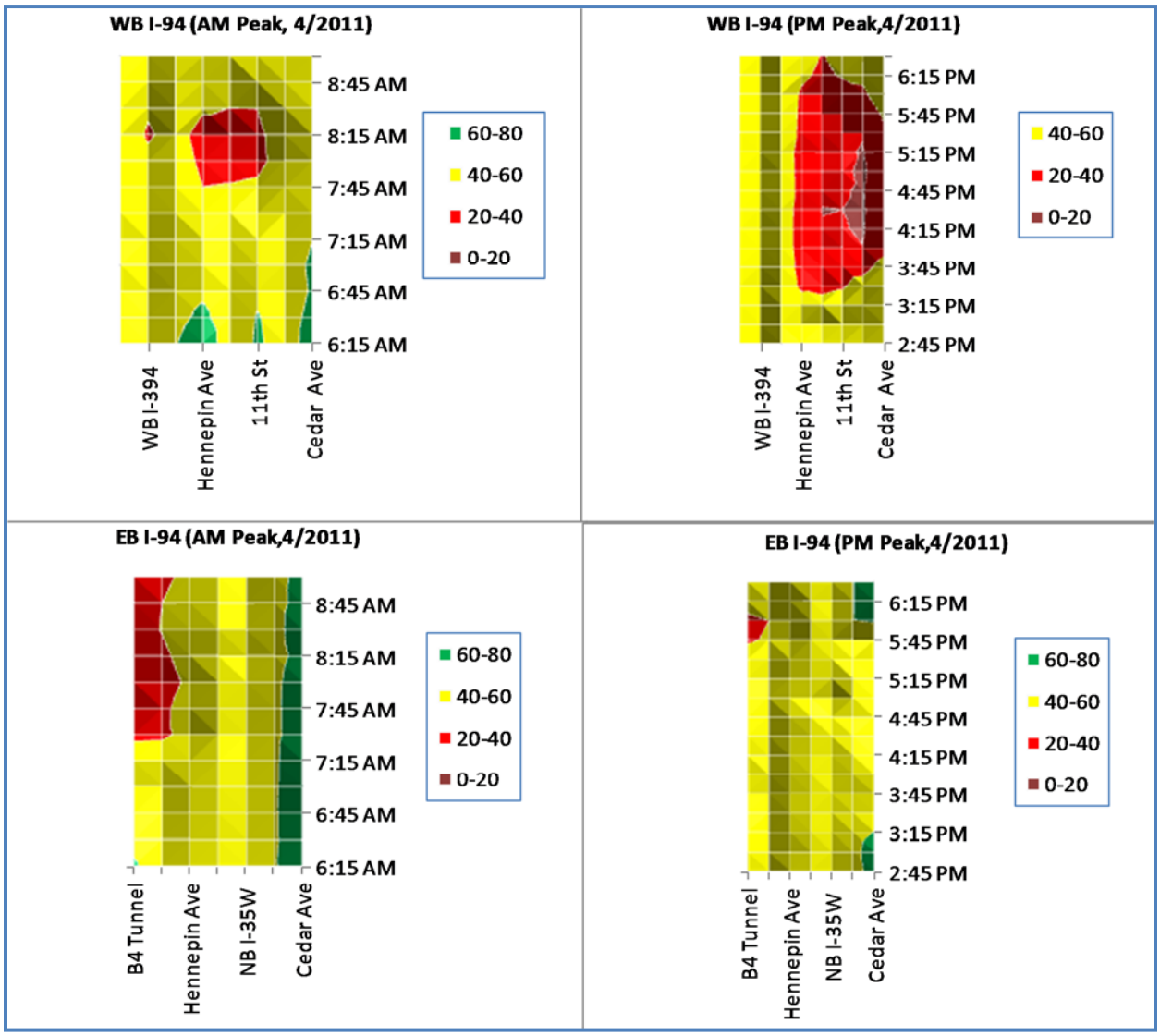


Figure 5 – I-94 Existing Peak Period Speed Contours

3.0 Design Year Operational Analysis (2038)

3.1 Freeway Improvement Concepts

Based on findings and recommendations of previous studies in the study area, a number of concepts were developed for further evaluation in this Transit Access Project study; a total of seven (7) different build components were identified. The improvements and changes to the freeways are listed as follows:

1. **Relocation of the Transit Station to the freeway median over Lake Street**: Currently, the transit stops at Lake Street are located on the right hand side of the freeway. Since most of the northbound bus routes along I-35W are destined to Downtown via TH 65 on the left hand side, they have been directed to bypass the existing transit station at Lake Street during congested periods as the movement becomes a safety concern crossing so many lanes. The proposed Lake Street transit station in the median allows northbound bus routes to use the HOV/Bus lane through the center transit station and directly into downtown. There has been significant investment on the I-35W corridor to encourage the use of transit and carpools while offering MnPASS to single occupant vehicles. The Transit Access Project further enhances this commitment by providing the transit station at Lake Street in the median.
2. **Realignment of the existing southbound I-35W bridge (Braid Bridge) over TH 65**: Currently, the southbound I-35W bridge spans only over northbound TH 65 and joins southbound TH 65 on the left hand side. The proposed southbound I-35W Braid Bridge crosses over both directions of TH 65 to let both directions of TH 65 merge or diverge from the inside of I-35W. The realigned Braid Bridge enhances the compatibility of the MnPASS lanes and the relocated Lake Street transit station in the median by aligning southbound TH 65 to the left side of the freeway.
3. **New southbound I-35W exit ramp to Lake Street**: The new exit ramp will not only provide direct access to Lake Street, but potentially remove some of the exiting traffic from the 35th Street exit ramp. This shift in traffic would remove traffic from the short mainline weaving section along southbound I-35W between 31st Street and 35th Street. The previous feasibility study shows a full auxiliary lane is needed between the westbound I-94 entrance ramp, through the 35-mph curve, to the new exit ramp in order to mitigate the increase in traffic demands.
4. **New northbound I-35W entrance ramp from Lake Street**: The new entrance ramp will provide direct access from Lake Street to northbound I-35W. This new connection will potentially have a major impact on both the freeway and arterial networks as access to the freeway is limited in the immediate area. The previous feasibility study shows a full auxiliary lane is needed to handle the entering traffic when the new northbound entrance ramp is built. To accommodate the new ramp and auxiliary lane, the eastbound I-94 and 5th Avenue connections will be modified. A new exit to eastbound I-94 will be established prior to the 35-mph curve and enter I-94 on the alignment of the existing 5th Avenue ramp. Traffic from 5th Avenue that is destined to eastbound I-94 will have to merge onto I-35W and exit from I-35W to I-94 at the east end of the downtown commons. In this analysis traffic from the new Lake street entrance ramp was allowed to weave across I-35W to exit at TH 65 into downtown and to westbound I-94.

5. **New northbound I-35W exit ramp to 28th Street**: The existing traffic counts at the Lake Street and 2nd Avenue intersection show that there is a substantial amount of northbound traffic from I-35W destined for 28th Street. The traffic must travel from the 31st Street exit ramp along 2nd Avenue through the 31st Street and Lake Street intersections. The new exit ramp from northbound I-35W will reroute a high percentage of traffic from 2nd Avenue and will help to improve the operations at the Lake Street and 2nd Avenue intersection.
6. **Relocation of existing northbound I-35W/TH 65 flyover bridge (Flyover Bridge) to westbound I-94**: This study element investigates whether the relocation of the flyover bridge from the right hand side to the left hand side would improve the freeway operations in the study area. An Origin-Destination (OD) survey was conducted for westbound I-94 in the study area to better understand traffic patterns and to identify a solution for the realignment of the Flyover Bridge.
7. **Closure of existing 4th Avenue entrance ramp to westbound I-94**: Currently the 4th Avenue Entrance merges with the Flyover Bridge traffic prior to merging onto westbound I-94. The impacts of the closure of the ramp on the freeway operations were studied together with the relocation of the Flyover Bridge to determine the influence that each movement has on overall freeway performance.

The Transit Access Project evaluates each of the proposed network changes. The purpose of this freeway study is to analyze the operational impacts of those different network changes and provide preferred alternatives for next study phase.

3.2 2038 Year Traffic Forecast Scenarios

Peak hour traffic forecasts for design year 2038 are necessary for evaluation of the geometry changes to the freeway. Due to the fact that other interacting factors including geometry changes to local streets and land use assumptions may affect traffic forecasts, the traffic forecasts were prepared for both freeways and local streets at the same time. It is also noted that some geometry changes affected only the quality and not the quantity of the traffic flow and therefore did not require individual forecast scenarios. The detailed forecast methodology and results are documented in the memorandum "*I-35W Transit Access Project Traffic Forecasts*" dated on January 13, 2012.

Below is a summary of the forecast scenarios based on different assumptions on freeways, local streets and land uses from the memorandum.

a. S0: 2038 No Build: Same as existing conditions as of 2011 including completion of the I-35W/TH 62 Commons Reconstruction Project and the UPA Project.
b. S0N: 2038 Transit Station with Nicollet Open
    - S0 Conditions, plus
    - I-35W Transit Station at Lake Street
    - Nicollet Avenue connection between Lake Street and 29th Street
    - K-mart site redevelopment assumptions
c. S1: Southbound Exit Only

- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new exit ramp from southbound I-35W to East Lake Street with an auxiliary lane beginning in the I-94 commons

d. S2: Northbound Entrance Only

- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new entrance ramp from East Lake Street to northbound I-35W and an auxiliary lane with a new connection to eastbound I-94 and a geometrically modified entrance from 5th Avenue South (no freeway access changes)

e. S3: Southbound Exit and Northbound Entrance

- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new exit ramp from southbound I-35W to East Lake Street with an auxiliary lane beginning in the I-94 commons
- Adding a new entrance ramp from East Lake Street to northbound I-35W and an auxiliary lane with a new connection to eastbound I-94 and a geometrically modified entrance from 5th Avenue South (no freeway access changes)

f. S4: Northbound Entrance and 28th Street Exit

- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new entrance ramp from East Lake Street to northbound I-35W and an auxiliary lane with a new connection to eastbound I-94 and a geometrically modified entrance from 5th Ave S(no freeway access changes)
- Adding a new northbound I-35W exit ramp to East 28th Street

g. S5: Full Build (Southbound Exit, Northbound Entrance and 28th Street Exit)

- S0N Conditions (includes transit station and Nicollet Avenue connection), plus
- Adding a new exit ramp from southbound I-35W to East Lake Street with an auxiliary lane beginning in the I-94 commons
- Adding a new entrance ramp from East Lake Street to northbound I-35W and an auxiliary lane with a new connection to eastbound I-94 and a geometrically modified entrance from 5th Avenue South (no freeway access changes)
- Adding a new northbound I-35W exit ramp to East 28th Street

h. S5.1: Full Build with Closure of 4th Avenue Entrance Ramp to Westbound I-94 (see note)

- S5 Full Build conditions, plus
- Closing the 4th Avenue South entrance ramp to westbound I-94

Note: Scenario S5.1 is being tested to determine traffic forecast influence on the viability of the Northbound I-35W to westbound I-94 “flyover” bridge replacement scenarios. Closure of the 4th Avenue ramp is currently not part of this I-35W T/A project.

3.3 2038 CORSIM Model Scenarios

It was mentioned previously that some geometry changes affected only the quality but not the quantity of the traffic flow and therefore did not require individual forecast scenarios. To evaluate the seven (7) geometry changes to the freeways described in section 3.1, a total of nine (9) CORSIM model scenarios were created based on their impacts on the freeway operations.

All future CORSIM models were built based on the calibrated existing models to reflect the proposed geometry for the different concepts and scenario variations. The calibrated parameters in the existing models were carried forward for future models.

Below describes all the CORSIM model scenarios that have been completed.

1. Existing Model – Existing geometry (existing transit station) with actual counts from 2011 for model calibration
2. Future 2038 No Build Model – Existing geometry (existing transit station) with 2038 forecast demands from forecasting scenario S0
3. Future 2038 Transit Station Only Model – New Transit Station with 2038 forecast demands from forecasting scenario S0N
4. Future 2038 Transit Station, SB Braid Bridge, NB Flyover Model – New Transit Station, Southbound I-35W Braid Bridge and Northbound I-94 Flyover Left Entrance (with 4th Ave) with 2038 forecast demands from forecasting scenario S0N
5. Future 2038 Lake Street Ramps Model – New Transit Station, Southbound I-35W Braid Bridge and ramps to and from Lake Street, with 2038 forecast demands from forecasting scenario S3
6. Future 2038 Full Build Model – New Transit Station, Southbound I-35W Braid Bridge, Ramps to and from Lake Street, 28th Street Exit and Northbound I-94 Flyover Right Entrance (*with* 4th Ave), with 2038 forecast demands from forecasting scenario S5
7. Future 2038 Full Build Ver2 Model – New Transit Station, Southbound I-35W Braid Bridge, Ramps to and from Lake Street, 28th Street Exit and Northbound I-94 Flyover Right Entrance (*without* 4th Ave), with 2038 forecast demands from forecasting scenario S5.1
8. Future 2038 Full Build, NB Flyover Model – New Transit Station, Southbound I-35W Braid Bridge, Ramps to and from Lake Street, 28th Street Exit and Northbound I-94 Flyover Left Entrance (*with* 4th Ave), with 2038 forecast demands from forecasting scenario S5
9. Future 2038 Full Build, NB Flyover Ver2 Model – New Transit Station, Southbound I-35W Braid Bridge, Ramps to and from Lake Street, 28th Street Exit and Northbound I-94 Flyover Left Entrance (*without* 4th Ave), with 2038 forecast demands from forecasting scenario S5.1.

Table 4 represents a comparison matrix showing which of the nine CORSIM models will be compared to each other in order to determine the impacts of each freeway alternative separately.

Table 4
CORSIM Model Scenario Evaluation Matrix

Freeway Build Components	CORSIM Model Reference Number								
	Existing Conditions	No Build	Transit Station Scenarios		Transit Station / Lake Street Access Changes				
	#1	#2	#3	#4	#5	#6	#7	#8	#9
1 Transit Station		X	X	X					
2 Southbound Braid Bridge			X	X					
3 Southbound I-35W Exit				X	X				
4 Northbound I-35W Entrance				X	X				
5 Northbound 28th Street Exit					X	X			
6 Northbound I-94 Flyover			X	X		X		X	
7 4TH Avenue to Westbound I-94						X	X	X	X

An "X" indicates the models that will be compared to assess the different "Freeway Build Components". Different shading indicates different comparisons that were made for that "Freeway Build Component".

3.4 2038 CORSIM Model Results

Multiple CORSIM model runs were conducted to produce freeway MOEs for all those scenarios.

Table A-1 in the appendix summarizes the full CORSIM model results for the freeway segments in the study area from all the model scenarios during A.M. peak hour.

Table A-2 in the appendix summarizes the full CORSIM model results for the freeway segments in the study area from all the model scenarios during P.M. peak hour.

For comparison purposes, the results for existing and 2038 no build are included in the tables.

3.4.1 2038 No Build Operations

(See Tables 5, 6, 7 and 8)

Northbound I-35W – Congestion will increase dramatically by 2038. The I-94/I-35W commons area has several contributing factors including the 35 mph curve and the weaving area between the 5th Avenue entrance, the EB I-94 entrance and the EB I-94 exit ramps. Congestion will spill back as far as Diamond Lake Road in the AM peak and TH 62 in the PM peak. In the PM peak hour, the north to west flyover will spill back onto TH 65 and add to the congestion.

Table 5
2038 No Build MOEs – Northbound I-35W

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	61	22	C	41	38	E
	TH 62 Entrance	60th St Entrance	63	19	B	21	60	F
	60th St Entrance	Diamond Lake Exit	60	20	C	19	64	F
	Diamond Lake Exit	Diamond Lake Entrance	47	32	D	18	84	F
	Diamond Lake Entrance	46th St Exit	36	44	F	19	78	F
	46th St Exit	46th St TRANSIT Exit	30	44	F	16	76	F
	46th St TRANSIT Exit	46th St TRANSIT Entrance	27	56	F	16	89	F
	46th St TRANSIT Entrance	46th St Entrance	24	54	F	16	79	F
	46th St Entrance	35/36th St Exit	29	57	F	19	79	F
	35/36th St Exit	35/36th St Entrance	30	55	F	20	74	F
	35/36th St Entrance	31/Lake St Exit	33	48	F	21	65	F
	31/Lake St Exit	Lake St TRANSIT Exit	37	43	E	21	65	F
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	37	47	F	21	71	F
	Lake St TRANSIT Entrance	NB I-35W/TH 65 SPLIT	37	45	F	24	60	F
	NB I-35W/TH 65 Split	5th Ave Entrance	17	94	F	16	102	F
	5th Ave Entrance	EB I-94 Entrance	29	60	F	28	64	F
	EB I-94 Entrance	EB I-94 Exit	47	34	D	43	39	E
	EB I-94 Exit	Washington Ave Exit	52	24	C	49	31	D
	Washington Ave Exit	**END NB I-35W**	56	24	C	55	35	E
	Begin NB TH 65	WB I-94 Exit	51	32	D	32	41	E
	WB I-94 Exit	**END NB TH 65**	53	23	C	53	17	B

Southbound I-35W – Overall operations southbound will only slightly deteriorate by 2038; however congestion will increase in spot locations along southbound I-35W. The main increase in congestion is between the Mississippi River Bridge and the TH 65 merge area.

Table 6
2038 No Build MOEs – Southbound I-35W

	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Southbound I-35W/TH 65	**Begin SB TH 65**	12th St Entrance	62	6	A	57	18	B
	12th St Entrance	EB I-94 Entrance	53	10	A	47	27	C
	EB I-94 Entrance	SB I-35W Entrance	59	19	B	53	29	D
	Begin SB I-35W	Washington CD Rd Entrance	56	24	C	9	117	***F***
	Washington CD Rd Entrance	WB I-94 Entrance	46	29	D	10	120	***F***
	WB I-94 Entrance	SB TH 65 Entrance	40	45	***F***	33	62	***F***
	SB I-35W Entrance	Lake St TRANSIT Exit	62	26	C	57	34	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	62	27	C	48	41	**E**
	Lake St TRANSIT Entrance	31/Lake St Entrance	61	25	C	49	38	**E**
	31/Lake St Entrance	35/36th St Exit	58	25	C	52	35	**E**
	35/36th St Exit	35/36th St Entrance	62	27	C	59	34	D
	35/36th St Entrance	46th St Exit	59	28	D	54	36	**E**
	46th St Exit	46th St TRANSIT Exit	64	19	B	63	22	C
	46th St TRANSIT Exit	46th St TRANSIT Entrance	66	21	C	64	24	C
	46th St TRANSIT Entrance	46th St Entrance	64	18	B	56	24	C
	46th St Entrance	60th St Exit	57	25	C	40	40	**E**
	60th St Exit	TH 62 Exit	57	24	C	52	30	D
	TH 62 Exit	**END SB I-35W**	65	18	B	64	19	B

Eastbound I-94 – The existing Lowry Tunnel is one of the major bottlenecks for eastbound I-94 that will constrain growth in the corridor. After the 35-mph curve through the tunnel, there are high weaving demands between the Hennepin/Lyndale entrance ramp and the southbound I-35W exit ramp. With no current plans to increase capacity along the corridor, traffic volumes will not increase significantly by 2038 in the peak periods. Therefore, congestion will remain basically unchanged with slow moving traffic from west of I-394 to the NB I-35W exit.

Table 7
2038 No Build MOEs – Eastbound I-94

	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Eastbound I-94	**Begin EB I-94**	EB I-394 Entrance	25	80	***F***	26	80	***F***
	EB I-394 Entrance	Lyndale/Hennepin Entrance	30	64	***F***	32	63	***F***
	Lyndale/Hennepin Entrance	SB I-35W Exit	43	45	***F***	44	44	***F***
	SB I-35W Exit	NB I-35W Exit	51	36	**E**	51	39	**E**
	NB I-35W Exit	5th Ave Entrance	51	29	D	51	31	D
	5th Ave Entrance	TH 55 Exit	55	23	C	55	25	C
	TH 55 Exit	NB I-35W Entrance	59	23	C	59	23	C
	NB I-35W Entrance	6th St Entrance	61	22	C	60	21	C
	6th St Entrance	**END EB I-94**	61	24	C	58	27	C

Westbound I-94 – The existing Lowry Tunnel is one of the major bottlenecks for westbound I-94 that will constrain growth in the corridor. There is also a very high weaving demand between the northbound I-35W flyover/4th Avenue combined entrance ramp and the Hennepin/Lyndale exit ramp. With no plans to increase capacity along the corridor, traffic volumes will not increase significantly by 2038 in the peak periods. The AM peak hour will see an increase in congestion as the demand increases. The PM peak hour will still have major congestion which will result in decreased volume served from the major entrance ramps. The congestion will extend between the Lowry Tunnel and east of the Cedar Avenue interchange (approximately to the modeled limits). Approximately 1,000 vehicles, 15% of the demand, will not be able to travel through the tunnel in the PM peak hour.

Table 8
2038 No Build MOEs – Westbound I-94

	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Westbound I-94	**Begin WB I-94**	5th St Exit	51	32	D	45	43	***F***
	5th St Exit	SB I-35W Exit	27	49	***F***	20	67	***F***
	SB I-35W Exit	Washington CD Rd Entrance	26	55	***F***	17	72	***F***
	Washington CD Rd Entrance	11th St Exit	27	58	***F***	16	71	***F***
	11th St Exit	NB I-35W/4th Ave Entrance	24	71	***F***	15	91	***F***
	NB I-35W/4th Ave Entrance	Lyndale/Hennepin Exit	42	41	**E**	42	39	**E**
	Lyndale/Hennepin Exit	WB I-394 Exit	41	44	***F***	42	40	**E**
	WB I-394 Exit	TH 55 Exit	53	15	B	53	17	B
	TH 55 Exit	**END WB I-94**	54	15	B	54	16	B

3.4.2 2038 Build Option Comparisons

The 2038 No Build operation sets the stage for comparison of the Build Options analyzed as part of this Transit/Access Project. Each build option was analyzed by comparing the appropriate models based on the Evaluation Matrix.

The following information describes the resulting findings based on the comparison and provides a concise comparison table. The full AM and PM peak hour comparison tables can be found in Appendix B.

1. Transit Station Comparison (Table 9)

- Comparing the No Build model #2 to Transit Station Only model #3
- Virtually no operational changes to mainline I-35W (NB or SB) since buses account for a very small percentage of the overall traffic volumes along I-35W.
- Constructing the Lake Street Station will have no negative impact to I-35W.

Table 9
2038 Transit Station Comparison

	Location		PM Peak			PM Peak		
			Model #2			Model #3		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W	46th St TRANSIT Entrance	46th St Entrance	15	79	*F*	15	79	*F*
	46th St Entrance	35/36th St Exit	19	79	*F*	19	79	*F*
	35/36th St Exit	35/36th St Entrance	19	74	*F*	19	74	*F*
	35/36th St Entrance	31/Lake St Exit	20	66	*F*	20	66	*F*
	31/Lake St Exit	Lake St TRANSIT Exit	20	61	*F*	20	61	*F*
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	21	69	*F*	21	69	*F*
	Lake St TRANSIT Entrance	NB I-35W/TH 65 SPLIT	25	58	*F*	25	58	*F*
Southbound I-35W	EB I-94 Entrance	SB TH 65 Entrance	53	28	D	53	28	D
	SB TH 65 Entrance	Lake St TRANSIT Exit	58	33	D	58	33	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	56	36	**E**	56	36	**E**
	Lake St TRANSIT Entrance	31/Lake St Entrance	49	37	**E**	49	37	**E**
	31/Lake St Entrance	35/36th St Exit	49	32	D	49	32	D
	35/36th St Exit	35/36th St Entrance	55	37	**E**	55	37	**E**
	35/36th St Entrance	46th St Exit	53	37	**E**	53	37	**E**
	46th St Exit	46th St TRANSIT Exit	63	22	C	63	22	C

2. Southbound Braid Bridge Comparison (Table 10)

- Comparing the Transit Station Only model #3 to Transit Station with SB Braid model #4
- Minor operational improvement along southbound I-35W near the 31st Street Entrance/Transit Entrance due to more efficient lane usage.
- I-35W mainline trips are more likely to use 35th Street exit than those originating from downtown (TH 65), which more likely have destinations beyond 35th Street. The result is less friction in weaving area.
- Constructing the Southbound I-35W Braid Bridge will have a minor improvement to I-35W with no negative impact.

Table 10
2038 Southbound I-35W Braid Bridge Comparison

	Location		PM Peak			PM Peak		
			Model #3			Model #4		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	9	117	***F***	9	118	***F***
	Washington CD Rd Entrance	WB I-94 Entrance	10	120	***F***	10	121	***F***
	WB I-94 Entrance	SB TH 65 Entrance	33	62	***F***	31	65	***F***
	SB TH 65 Entrance	Lake St TRANSIT Exit	58	33	D	59	33	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	56	36	**E**	59	34	D
	Lake St TRANSIT Entrance	31/Lake St Entrance	49	37	**E**	50	36	**E**
	31/Lake St Entrance	35/36th St Exit	49	32	D	48	32	D
	Begin SB TH 65	12th St Entrance	57	18	B	57	18	B
	12th St Entrance	EB I-94 Entrance	47	27	C	48	27	C
	EB I-94 Entrance	SB I-35W Merge	53	28	D	55	27	C

3. Southbound Lake Street Exit Ramp Comparison (Table 11)

- Comparing the Transit Station Braid Bridge model #4 to Lake Street Ramps model #5
- Serves higher demand along I-35W from the Mississippi River Bridge to new Lake Street Exit with addition of auxiliary lane (approximately 800 vehicles in the AM and 1000 vehicles in the PM peak hours)
- Improved southbound operations through I-94 Commons and 35 mph curve with new auxiliary lane
- Degraded operations on southbound TH 65 from downtown due to increase in demand being served along I-35W.
- AM peak hour improvement along westbound I-94 near the exit ramp to southbound I-35W (lane now enters as full auxiliary).
- Constructing the Southbound I-35W Lake Street Exit ramp will provide better overall operations along I-35W while serving more demand prior to the new exit to Lake Street.

Table 11
2038 Southbound I-35W Lake Street Exit Ramp Comparison

	Location		PM Peak			PM Peak		
			Model #4			Model #5		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	9	118	***F***	47	32	D
	Washington CD Rd Entrance	WB I-94 Entrance	10	121	***F***	38	46	***F***
	WB I-94 Entrance	SB TH 65 Entrance	31	65	***F***	46	36	**E**
	SB TH 65 Entrance	Lake St Exit	59	33	D	43	42	**E**
	Lake St Exit	Lake St TRANSIT Exit				53	32	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	59	34	D	57	35	**E**
	Lake St TRANSIT Entrance	31/Lake St Entrance	50	36	**E**	51	35	**E**
	31/Lake St Entrance	35/36th St Exit	48	32	D	49	31	D
	Begin SB TH 65	12th St Entrance	57	18	B	57	18	B
	12th St Entrance	EB I-94 Entrance	48	27	C	48	25	C
	EB I-94 Entrance	SB I-35W Merge	55	27	C	41	38	**E**

4. Northbound Lake Street Entrance Ramp Comparison (Table 12)

- Comparing the Transit Station Only model #3 to Lake Street Ramps model #5
- Traffic weaving to continue along TH 65 or westbound I-94 was not limited in this analysis. Based on forecast information, approximately 290 vehicles in the AM peak and 200 vehicles in the PM peak would weave across traffic to exit to TH 65; this is approximately 26% of the entrance ramp traffic.
- Serves higher demand along I-35W
  - Transit Only model is unable to serve approximately 500 to 1000 vehicle in the PM peak hour along northbound I-35W
  - Build model has slightly higher demand, yet serves the majority of traffic (higher throughput).
- Reduced congestion spillback along I-35W; northbound improved from TH 62 to 35th/36th Street due to addition of the auxiliary lane and ramp changes in the I-94 Commons (new eastbound I-94 connection)
- Reduced congestion along I-35W in I-94 Commons area (AM peak hour) from ramp configuration changes
- Constructing the Northbound I-35W Lake Street Entrance ramp along with new auxiliary lane to the reconstructed ramp to EB I-94 will provide better overall operations along I-35W while serving more demand.

Table 12
2038 Northbound I-35W Lake Street Entrance Ramp Comparison

	Location		PM Peak			PM Peak		
			Model #3			Model #5		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W	46th St Exit	46th St TRANSIT Exit	17	73	F	61	23	C
	46th St TRANSIT Exit	46th St TRANSIT Entrance	16	88	F	60	28	D
	46th St TRANSIT Entrance	46th St Entrance	15	79	F	57	26	C
	46th St Entrance	35/36th St Exit	19	79	F	50	35	E
	35/36th St Exit	35/36th St Entrance	19	74	F	34	51	F
	35/36th St Entrance	31/Lake St Exit	20	66	F	29	53	F
	31/Lake St Exit	Lake St TRANSIT Exit	20	61	F	28	50	F
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	21	69	F	27	60	F
	Lake St TRANSIT Entrance	Lake St Entrance				30	47	F
	Lake St Entrance	NB I-35W/TH 65 SPLIT	25	58	F	28	55	F
	NB I-35W/TH 65 Split	EB I-94 Exit	16	102	F	16	88	F
	EB I-94 Exit	5th Ave Entrance				13	111	F
	5th Ave Entrance	EB I-94 Entrance	28	64	F	26	71	F
	EB I-94 Entrance	EB I-94 Exit	43	39	E	39	44	F
	EB I-94 Exit	Washington Ave Exit	48	32	D	47	35	E
	Washington Ave Exit	END NB I-35W	55	35	E	55	36	E

5. Northbound 28th Street Exit Ramp Comparison (Table 13)

- Comparing the Lake Street Ramps model #5 to Full Build model #6
- Serves higher demands near the 35th/36th Street and 31st Street interchanges
- Virtually no operational change, just slight shift in location of congestion
- Constructing the Northbound I-35W 28th Street Exit ramp will have limited impact along I-35W (congestion through ramp area possibly limiting operational benefits).

Table 13
2038 Northbound I-35W 28th Street Exit Ramp Comparison

	Location		PM Peak			PM Peak		
			Model #5			Model #6		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W	46th St Exit	46th St TRANSIT Exit	61	23	C	58	26	C
	46th St TRANSIT Exit	46th St TRANSIT Entrance	60	28	D	57	31	D
	46th St TRANSIT Entrance	46th St Entrance	57	26	C	53	29	D
	46th St Entrance	35/36th St Exit	50	35	E	43	41	E
	35/36th St Exit	35/36th St Entrance	34	51	F	30	57	F
	35/36th St Entrance	31/Lake St Exit	29	53	F	28	51	F
	31/Lake St Exit	28th Street Exit	28	50	F	28	45	F
	28th Street Exit	Lake St TRANSIT Exit				30	46	F
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	27	60	F	34	46	F
	Lake St TRANSIT Entrance	Lake St Entrance	30	47	F	34	40	E
	Lake St Entrance	NB I-35W/TH 65 SPLIT	28	55	F	36	41	E
	NB I-35W/TH 65 Split	EB I-94 Exit	16	88	F	31	53	F

6. Northbound I-35W Flyover to Westbound I-94 Flyover Comparison (Table 14)

- Comparing the Transit Station Only model #3 to Transit Station, Braid Bridge, Flyover model #4; also comparing the Full Build model #6 to Full Build with Flyover model #8
    - Existing Flyover on right side of I-94, proposed on left side. All comparisons include the 4th Avenue entrance ramp.
    - All models have a "fixed demand" forecasts; meaning when capacity is increased along a segment, more traffic is served but the demand does not change.
- Improves westbound I-94 dramatically. Congestion is reduced from approximately Huron Boulevard to the 11th Street exit
- Improves northbound TH 65/I-35W. The stacking queue along TH 65 from the right side to the flyover is eliminated and traffic into downtown can flow much better.
- Constructing the Northbound I-35W Flyover on the left side of westbound I-94 has a major positive impact on traffic operations.
- Section 3.5 will further discuss the implications of this change to the freeway system.

Table 14
2038 Northbound I-35W Flyover to Westbound I-94 Comparison

	Location		PM Peak			PM Peak		
			Model #6			Model #8		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**	5th St Exit	37	58	***F***	60	22	C
	5th St Exit	SB I-35W Exit	15	91	***F***	44	29	D
	SB I-35W Exit	Washington CD Rd Entrance	13	92	***F***	38	35	**E**
	Washington CD Rd Entrance	11th St Exit	14	81	***F***	39	33	D
	11th St Exit	NB I-35W	14	97	***F***	39	40	**E**
	NB I-35W	4th Ave Entrance				38	41	**E**
	4th Ave Entrance	Lyndale/Hennepin Exit	41	40	**E**	40	42	**E**
	Lyndale/Hennepin Exit	WB I-394 Exit	42	42	**E**	39	48	***F***
	WB I-394 Exit	TH 55 Exit	52	18	B	52	19	B
	TH 55 Exit	**END WB I-94**	54	17	B	54	17	B

7. 4th Avenue Connection to Westbound I-94 Comparison (Table 15)

- Comparing the Full Build model #5 to Full Build without 4th Avenue model #7; also comparing the Full Build with Flyover model #8 to Full Build with Flyover without 4th Avenue model #9
    - Existing Flyover on right side of I-94; proposed on left side.
    - All models have a "fixed demand" forecasts; meaning when capacity is increased along a segment, more traffic is served but the demand does not change.
- Improves westbound I-94 dramatically. Congestion is reduced from approximately Huron Boulevard to the 11th Street exit
- Removing the existing 4th Avenue Entrance ramp has a major positive impact on westbound I-94 traffic operations.
- Removing the existing 4th Avenue Entrance ramp will have major traffic pattern shifts on the local street network for all vehicles currently using the entrance ramp. These impacts are unknown at this time; however the impacts could create more congestion in the downtown area on routes to alternative freeway access points.
    - The 4th Avenue PM peak hour forecast demand is approximately 900 vehicles. When the ramp is closed, traffic patterns will shift throughout the network and the total reduction in peak hour volume through the Lowry Tunnel is only 250 vehicles. The westbound I-94 and northbound flyover demands increase with the closure of 4th Avenue.
- Section 3.5 will further discuss the implications of this change to the freeway system.

Table 15
2038 Westbound I-94 4th Avenue Entrance Comparison

	Location		PM Peak			PM Peak		
			Model #8			Model #9		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**	5th St Exit	60	22	C	59	23	C
	5th St Exit	SB I-35W Exit	44	29	D	45	29	D
	SB I-35W Exit	Washington CD Rd Entrance	38	35	**E**	43	31	D
	Washington CD Rd Entrance	11th St Exit	39	33	D	44	29	D
	11th St Exit	NB I-35W Entrance	39	40	**E**	47	34	D
	NB I-35W Entrance	4th Ave Entrance	38	41	**E**			
	4th Ave Entrance	Lyndale/Hennepin Exit	40	42	**E**	47	35	**E**
	Lyndale/Hennepin Exit	WB I-394 Exit	39	48	***F***	40	45	***F***
	WB I-394 Exit	TH 55 Exit	52	19	B	53	17	B
	TH 55 Exit	**END WB I-94**	54	17	B	54	16	B

3.5 Westbound I-94 Freeway Operational Changes

Due to the major reconstruction and system changes being considered for the westbound I-94 freeway system, additional analysis was conducted. A Highway Capacity Manual (HCM) weaving analysis was completed as well as a volume sensitivity analysis of the CORSIM model #8.

Due to the complexity of the area and the potential implications along westbound I-94, it is recommended that further analysis and study be completed for both the 4th Avenue entrance ramp closure and the northbound I-35W flyover ramp relocation before a final decision is made.

Additional analysis for each scenario should include, but is not limited to:

- A better understanding of the existing traffic demands using both ramps
  - Traffic demand fluctuations; daily and monthly.
  - Origin information for vehicles using the 4th Avenue entrance ramp
  - Origin-Destination information for weekend traffic on flyover ramp
- Sensitivity analysis of different forecast scenarios
- Local arterial network impacts of closure
- Safety implications

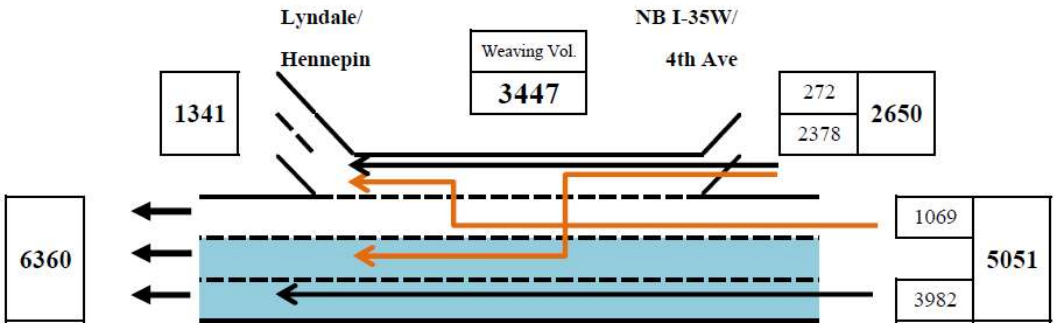
3.5.1 HCS Analysis

An HCM weaving analysis was performed for the different configurations along westbound I-94. The Highway Capacity Software (HCS), which utilizes the calculations in the HCM methodology, was used to analyze the proposed changes.

This analysis was conducted with the 2038 PM peak hour as this is the worst case scenario. The origin-destination information from the existing study was also incorporated into this analysis.

3.5.1.1 2038 PM Peak Hour – Existing Condition

With the northbound I-35W flyover on the right hand side and 4th Avenue entrance open, this existing condition scenario has the worst weaving situation. The figure below represents the volume and weaving pattern for this scenario.



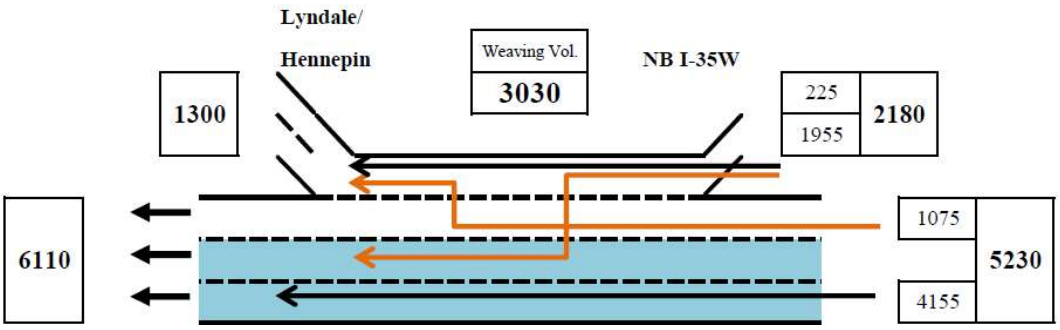
This configuration has a total weaving volume of approximately 3,450 vehicles in the PM peak hour. The following table shows the results from the HCS Analysis.

Flow Rate	8643 pc/hr
Capacity	5308 veh/hr
Volume/Capacity Ratio	1.61
LOS	F

This scenario has the lowest capacity of all the different options due to the highest weaving volumes. The Volume to Capacity (V/C) for the weaving segment is well above the capacity threshold of 1.0.

3.5.1.2 2038 PM Peak Hour – Flyover on Right, 4th Avenue Closed

With the northbound I-35W flyover on the right hand side and 4th Avenue entrance closed, this scenario still has a high weaving demand. The figure below represents the volume and weaving pattern for this scenario.



This configuration would result in a total weaving volume of approximately 3,000 vehicles in the peak hour. The following table shows the results from the HCS Analysis.

Flow Rate	8316 pc/hr
Capacity	5812 veh/hr
Volume/Capacity Ratio	1.42
LOS	F

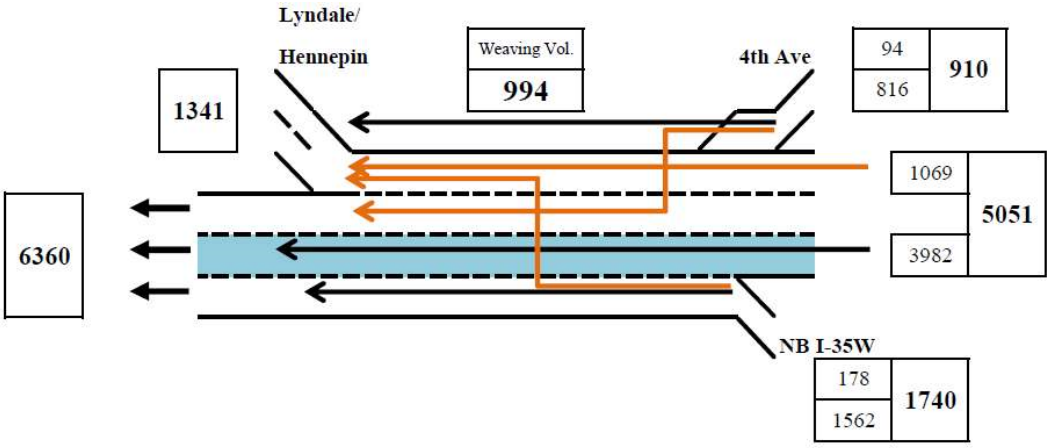
The removal of the 4th Avenue entrance ramp increases the upstream demands along westbound I-94 and the northbound I-35W flyover ramp; the resultant volume change in the tunnel is only a reduction in 250 vehicles in the PM peak hour. The V/C ratio for the weaving segment is well above the capacity threshold of 1.0.

3.5.1.3 2038 PM Peak Hour – Flyover on Left, 4th Avenue Open

With the northbound I-35W flyover on the left hand side and 4th Avenue entrance open, this scenario has reduced weaving demands without closing access.

This scenario cannot be completely analyzed based on HCM methodology due to the two entrance ramps; therefore an assumption was made to analyze this option. The assumption is that the 4th Avenue entrance volume would be incorporated into the westbound I-94 mainline traffic; therefore the analysis evaluates the weave created by the left side flyover entrance and the right side Hennepin/Lyndale exit.

The figure below represents the volume and weaving pattern for this scenario.



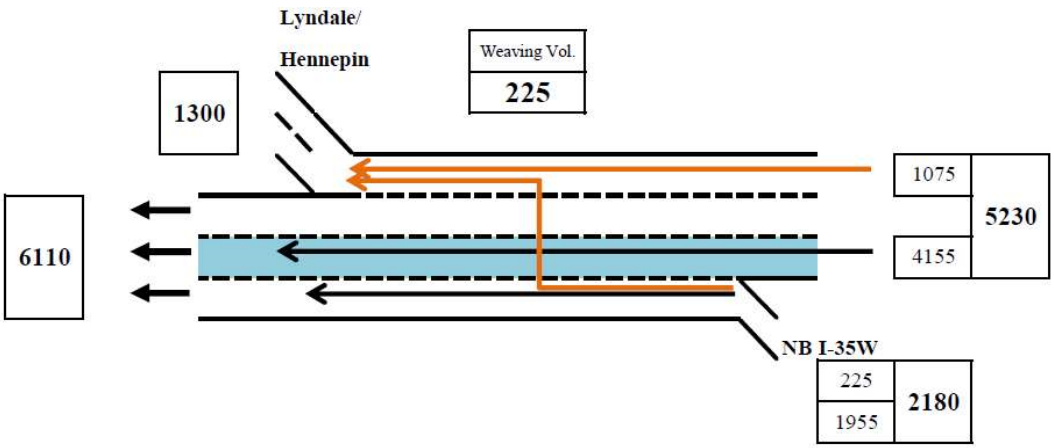
This configuration would result in a total weaving volume of approximately 1,000 vehicles in the peak hour. The following table shows the results from the HCS Analysis.

Flow Rate	8643 pc/hr
Capacity	7929 veh/hr
Volume/Capacity Ratio	1.08
LOS	F

Shifting the flyover entrance to the left side significantly reduces the weaving volumes along westbound I-94. The capacity of the weaving segment is increased to a level almost equal to the demands; it will still operate at a LOS F. However compared to the two previous scenarios this would work much better.

3.5.1.4 2038 PM Peak Hour – Flyover on Left, 4th Avenue Closed

With the northbound I-35W flyover on the left hand side and 4th Avenue entrance closed, this scenario has the lowest weaving volumes. The figure below represents the volume and weaving pattern for this scenario.



This configuration would result in a total weaving volume of approximately 225 vehicles in the peak hour. The following table shows the results from the HCS Analysis.

Flow Rate	8316 pc/hr
Capacity	7909 veh/hr
Volume/Capacity Ratio	1.04
LOS	F

Shifting the flyover entrance to the left side significantly reduces the weaving volumes along westbound I-94 and the removal of 4th Avenue removes both weaving and through traffic. The capacity of the weaving segment is increased to a level almost equal to the demands; however it will still operate at a LOS F.

3.5.2 Sensitivity Analysis

The CORSIM analysis results reported in Section 3.4 compares alternatives assuming a fixed forecast demand. The demand assumption is useful for alternative evaluation but does not recognize the effects that varying traffic demand may have on freeway performance. Therefore, an additional volume sensitivity analysis has been completed. This sensitivity analysis uses model #8 to examine the full build scenario for Lake Street with the northbound I-35W flyover relocated on the left hand side and with 4th Avenue open.

The "fixed demand" approach assumes that as capacity is added, the forecast demand volume would stay the same. In reality, adding capacity may attract demand. In the case of the northbound flyover landing on the left or right side, segment capacity would be increased by reducing the weaving patterns with the left hand entrance, thereby increasing its potential to serve more trips (attracting demand).

Currently, the Flyover and the 4th Avenue entrance ramps merge together prior to entering westbound I-94. This joining of ramps serves to constrain the flow rate or geometrically meter the demand, which limits the total flow that is able to enter the mainline. Relieving this geometric constraint by separating the ramps could increase the total demand entering westbound I-94. This sensitivity analysis measures the potential impact that the increased entering demand may have along the mainline I-94.

This sensitivity analysis evaluates the new left hand entrance operating at full capacity during the PM peak period. With the ramp entering in its own travel lane along westbound I-94, this condition is a potentially realistic outcome. The results will show the potential range of outcomes from shifting the flyover to the left hand side.

This analysis was conducted with the 2038 PM peak hour scenario where the northbound flyover ramp had a continuous volume of 2,000 vehicles per hour; essentially representing maximum capacity for the ramp (based on 30 mph design speed on the flyover ramp). The increase in volume was then pushed through the tunnel. The table below shows the volume change in the PM peak hour and the total 3-hour PM peak period modeled for Flyover and the resulting demand in the tunnel.

Table 16
2038 Traffic Demand Comparison

	No Build	Model #8	Sensitivity Model	Increased Demands
Flyover Volume				
PM Peak Hour (1-hr)	1,790	1,740	2,000	+260
PM Peak Period (3-hr)	4,730	4,600	6,000	+1,400
Lowry Tunnel				
PM Peak Hour (1-hr)	6,290	6,360	6,620	+260
PM Peak Period (3-hr)	19,300	19,500	20,900	+1,400

While the increase in demand might not seem great, this increase enters the tunnel, which is already at operating at capacity. Since the flyover ramp enters into a full auxiliary lane that enters the tunnel, this ramp is unimpeded by what is occurring on westbound I-94. If too much traffic enters from the flyover ramp on the left side, simultaneously with the 4th Avenue ramp on the right side, the total entering volume may possibly choke down the mainline lanes of westbound I-94.

From the OD study, we know that 10% of the flyover ramp volume wants to exit at Hennepin/Lyndale Avenue and 12% want to exit at westbound I-394; the remaining 78% would stay on westbound I-94. Once in the flyover ramps full auxiliary lane, approximately 440 vehicles will begin to merge right to exit at Hennepin/Lyndale or westbound I-394. This could potentially choke the westbound I-94 through lanes which are operating at capacity as well.

The results of the sensitivity analysis are represented in Table 17. This table compares the 2038 scenarios of Model #2 (No Build), Model #8 and Model #8 with increased demands. The sensitivity model shows that there is potential for the flyover ramp demands to increase to a point where it would choke westbound I-94 if these volumes were ever realized.

Comparing the traffic throughput through the Lowry Tunnel shows that even though the congestion along westbound I-94 is greatest in the sensitivity model, the tunnel is still able to push almost 95% of the demand through. The No Build, with the flyover on the right hand side, is only able to push 84% of the demand through the tunnel in the peak hour; this is the lowest throughput demand between the three scenarios.

This analysis shows the range of operations that could occur along westbound I-94 with a right or left side flyover. A more detailed analysis, specific to this freeway section, should be completed to determine a final recommendation for the flyover bridge configuration.

Table 17
2038 Northbound I-35W Flyover to Westbound I-94 Sensitivity Comparison

	Location		PM Peak			PM Peak			PM Peak		
			Model #2			Model #8			Sensitivity Model		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**	5th St Exit	45	43	***F***	60	22	C	13	119	***F***
	5th St Exit	SB I-35W Exit	20	67	***F***	44	29	D	14	100	***F***
	SB I-35W Exit	Washington CD Rd Ent	17	72	***F***	38	35	**E**	14	101	***F***
	Washington CD Rd Ent	11th St Exit	16	71	***F***	39	33	D	20	67	***F***
	11th St Exit	NB I-35W Entrance	15	91	***F***	39	40	**E**	23	69	***F***
	NB I-35W Entrance	4th Ave Entrance				38	41	**E**	24	68	***F***
	4th Ave Entrance	Lyndale/Hennepin Exit	42	39	**E**	40	42	**E**	33	54	***F***
	Lyndale/Hennepin Exit	WB I-394 Exit	42	40	**E**	39	48	***F***	38	53	***F***
	WB I-394 Exit	TH 55 Exit	53	17	B	52	19	B	52	21	C
	TH 55 Exit	**END WB I-94**	54	16	B	54	17	B	54	20	B

Lowry Tunnel Traffic			%	Demand	Throughput	%	Demand	Throughput	%
	6290	5290	84%	6360	5950	94%	6620	6320	95%

3.5.3 Northbound I-35W Flyover Ramp Landing

Results from the previously described weaving analysis and the CORSIM work corroborate that the any change considered from the existing configuration will provide a net benefit because the existing condition has the poorest operations.

Landing the northbound I-35W flyover on the left hand side would remove the highest weaving volume from the segment. This change has the greatest improvement to the capacity of the weaving segment.

In each of the scenarios analyzed, traffic from the left side flyover ramp was allowed to exit at the Hennepin/Lyndale exit ramp, a weaving maneuver across 3-lanes. The existing weaving length is about 2,700 feet. The maximum weaving length available with the left hand entrance is approximately 3,000 feet. Even though the weaving demand is would be greatly reduced compared to the existing condition, safety concerns remain – especially when I-94 is operating without congestion and traffic would make this weaving maneuver at high speeds.

One solution would be to prohibit the maneuver as the demand is fairly low, approximately 10% of the ramp traffic. Elimination of this movement could be accomplished in two ways:

1) Construct a physical barrier along westbound I-94 to a point where traffic could not physically make this maneuver. This would require shoulder design width exceptions under the 3rd Avenue bridge and possibly under the 1st Avenue, Nicollet Avenue and Lassalle Avenue bridges. Feasibility of this alternative should be further explored.
2) Double white stripe pavement marking and additional signage legally prohibiting the movement. This approach will reduce the demand but would not fully eliminate it.

Additional traffic operations and design work should be conducted to further assess the feasibility of moving the northbound I-35W flyover ramp to the left hand side of westbound I-94.

3.5.4 4th Avenue Entrance Ramp

The 4th Avenue entrance ramp is a major access point to westbound I-94 from the surrounding neighborhoods, including downtown Minneapolis. Destinations for traffic using this ramp is split between westbound I-394, approximately 35%, and continuing along westbound I-94, approximately 65%. A small portion of this traffic, between 2-4%, exit at the Hennepin/Lyndale exit.

In the AM peak hour the entrance volume is much lower than the PM peak; approximately 330 vehicles in the AM peak hour, while the existing PM peak hour demands are approximately 870 vehicles. The high PM peak hour demands contribute to the operational problems experienced along westbound I-94.

This analysis has not fully explored the impact that the closing of this ramp would have on the local street system, although some general observations were developed.

Based on the Twin Cities Travel Demand Model, 75% of the ramps demand originates south of I-94, while the other 25% originates from downtown. Existing intersection traffic counts on streets leading to the entrance ramp suggest that the actual split might be closer to 50% from each. Regardless, closing this ramp could have major impacts to the local network as convenient alternative access pints to westbound I-94 and I-394 are limited in the area.

The regional model suggests that the closure of the 4th Avenue ramp would displace trips to other entry points, some of which are upstream from the 4th Avenue ramp. Some of the trips entering from upstream locations would still be served by the Flyover and all would still use the Lowry Tunnel. This results in a reduction of approximately 250 vehicles from the existing weaving segment and through the tunnel.

For local connections to westbound I-94, traffic has limited options. Traffic would either travel further south to access northbound I-35W or travel east to access I-94, as the regional model suggest. Another option would be for traffic to try to enter I-94 or I-394 near the Hennepin/Lyndale interchange area; this area is already heavily congested and additional traffic could degrade the local arterial network operations severely.

Additional traffic studies and operations evaluation should be conducted to assess the impacts and feasibility of this closure.

4.0 Year of Opening Operational Analysis (2018)

The year 2018 build CORSIM analysis was conducted to determine what impacts proposed freeway changes in this study would have on the regional freeway system for the year of opening. The year 2018 was selected for analysis since this is the year the Braid Bridge and the Flyover Bridge are scheduled to be replaced. Each of the 2038 CORSIM scenarios were analyzed for year 2018.

4.1 2018 CORSIM Model Scenarios

Below describes all the 2018 CORSIM model scenarios that have been completed:

1. Existing Model – Existing geometry (existing transit station) with actual counts from 2011 for model calibration
2. Future 2018 No Build Model – Existing geometry (existing transit station) with 2018 forecast demands from forecasting scenario S0
3. Future 2018 Transit Station Only Model – New Transit Station with 2018 forecast demands from forecasting scenario S0N
4. Future 2018 Transit Station, SB Braid Bridge, NB Flyover Model – New Transit Station, Southbound I-35W Braid Bridge and Northbound I-94 Flyover Left Entrance (with 4th Ave) with 2018 forecast demands from forecasting scenario S0N
5. Future 2018 Lake Street Ramps Model – New Transit Station, Southbound I-35W Braid Bridge and ramps to and from Lake Street, with 2018 forecast demands from forecasting scenario S3
6. Future 2018 Full Build Model – New Transit Station, Southbound I-35W Braid Bridge, Ramps to and from Lake Street, 28th Street Exit and Northbound I-94 Flyover Right Entrance (*with* 4th Ave), with 2018 forecast demands from forecasting scenario S5
7. Future 2018 Full Build Ver2 Model – New Transit Station, Southbound I-35W Braid Bridge, Ramps to and from Lake Street, 28th Street Exit and Northbound I-94 Flyover Right Entrance (*without* 4th Ave), with 2018 forecast demands from forecasting scenario S5.1
8. Future 2018 Full Build, NB Flyover Model – New Transit Station, Southbound I-35W Braid Bridge, Ramps to and from Lake Street, 28th Street Exit and Northbound I-94 Flyover Left Entrance (*with* 4th Ave), with 2018 forecast demands from forecasting scenario S5
9. Future 2018 Full Build, NB Flyover Ver2 Model – New Transit Station, Southbound I-35W Braid Bridge, Ramps to and from Lake Street, 28th Street Exit and Northbound I-94 Flyover Left Entrance (*without* 4th Ave), with 2018 forecast demands from forecasting scenario S5.1.

4.2 2018 CORSIM Model Results

Multiple CORSIM model runs were conducted to produce freeway MOEs for all those scenarios.

Table C-1 in the appendix summarizes the full CORSIM 2018 MOE results for the freeway segments in the study area from all the model scenarios during AM peak hour.

Table C-2 in the appendix summarizes the full CORSIM 2018 MOE results for the freeway segments in the study area from all the model scenarios during PM peak hour.

For comparison purposes, the results for existing and 2018 no build are included in the tables.

4.2.1 2018 No Build Operations

(See Tables 18, 19, 20, and 21)

Northbound I-35W – Congestion will increase slightly by 2018 over existing conditions. The I-94/I-35W commons area has several contributing factors including the 35 mph curve and the weaving area between the 5th Avenue entrance, the EB I-94 entrance and the EB I-94 exit ramps.

Table 18
2018 No Build MOEs – Northbound I-35W

	Location		AM Peak			PM Peak		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	62	20	C	62	21	C
	TH 62 Entrance	60th St Entrance	64	18	B	64	19	B
	60th St Entrance	Diamond Lake Exit	65	17	B	63	18	B
	Diamond Lake Exit	Diamond Lake Entrance	65	21	C	64	22	C
	Diamond Lake Entrance	46th St Exit	55	27	C	61	23	C
	46th St Exit	46th St TRANSIT Exit	45	29	D	65	18	B
	46th St TRANSIT Exit	46th St TRANSIT Entrance	36	42	**E**	65	21	C
	46th St TRANSIT Entrance	46th St Entrance	28	45	***F***	65	18	B
	46th St Entrance	35/36th St Exit	30	53	***F***	61	23	C
	35/36th St Exit	35/36th St Entrance	31	51	***F***	54	26	C
	35/36th St Entrance	31/Lake St Exit	35	43	**E**	44	30	D
	31/Lake St Exit	Lake St TRANSIT Exit	42	35	**E**	43	30	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	45	35	**E**	42	33	D
	Lake St TRANSIT Entrance	NB I-35W/TH 65 SPLIT	53	29	D	40	32	D
	NB I-35W/TH 65 Split	5th Ave Entrance	40	44	***F***	34	48	***F***
	5th Ave Entrance	EB I-94 Entrance	35	48	***F***	34	52	***F***
	EB I-94 Entrance	EB I-94 Exit	49	30	D	46	34	D
	EB I-94 Exit	Washington Ave Exit	52	23	C	49	30	D
	Washington Ave Exit	**END NB I-35W**	56	26	C	55	35	**E**
	Begin NB TH 65	WB I-94 Exit	52	28	D	27	42	**E**
	WB I-94 Exit	**END NB TH 65**	53	19	B	53	13	B

Southbound I-35W – Overall operations for southbound will remain virtually unchanged by 2018 over existing conditions.

Table 19
2018 No Build MOEs – Southbound I-35W

	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Southbound I-35W/TH 65	**Begin SB TH 65**	12th St Entrance	63	4	A	58	18	B
	12th St Entrance	EB I-94 Entrance	56	6	A	49	25	C
	EB I-94 Entrance	SB I-35W Entrance	60	14	B	53	29	D
	Begin SB I-35W	Washington CD Rd Entrance	57	23	C	57	18	B
	Washington CD Rd Entrance	WB I-94 Entrance	51	25	C	46	25	C
	WB I-94 Entrance	SB TH 65 Entrance	45	37	**E**	40	45	***F***
	SB I-35W Entrance	Lake St TRANSIT Exit	62	23	C	58	33	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	64	23	C	52	38	**E**
	Lake St TRANSIT Entrance	31/Lake St Entrance	63	22	C	52	36	**E**
	31/Lake St Entrance	35/36th St Exit	59	22	C	52	35	D
	35/36th St Exit	35/36th St Entrance	65	23	C	60	33	D
	35/36th St Entrance	46th St Exit	62	24	C	55	34	D
	46th St Exit	46th St TRANSIT Exit	65	17	B	63	22	C
	46th St TRANSIT Exit	46th St TRANSIT Entrance	66	18	B	65	23	C
	46th St TRANSIT Entrance	46th St Entrance	65	16	B	63	21	C
	46th St Entrance	60th St Exit	61	20	C	52	29	D
	60th St Exit	TH 62 Exit	60	21	C	53	28	C
	TH 62 Exit	**END SB I-35W**	66	15	B	65	17	B

Eastbound I-94 – The existing Lowry Tunnel is a major bottleneck for eastbound I-94 that will constrain growth in the corridor. Therefore, congestion will remain basically unchanged with slow moving traffic from west of I-394 to the NB I-35W exit.

Table 20
2018 No Build MOEs – Eastbound I-94

	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Eastbound I-94	**Begin EB I-94**	EB I-394 Entrance	49	39	**E**	50	37	**E**
	EB I-394 Entrance	Lyndale/Hennepin Entrance	36	55	***F***	39	49	***F***
	Lyndale/Hennepin Entrance	SB I-35W Exit	44	44	***F***	47	40	**E**
	SB I-35W Exit	NB I-35W Exit	51	38	**E**	51	37	**E**
	NB I-35W Exit	5th Ave Entrance	51	32	D	51	31	D
	5th Ave Entrance	TH 55 Exit	55	24	C	55	24	C
	TH 55 Exit	NB I-35W Entrance	59	25	C	59	24	C
	NB I-35W Entrance	6th St Entrance	61	23	C	61	20	C
	6th St Entrance	**END EB I-94**	60	25	C	59	26	C

Westbound I-94 – The existing Lowry Tunnel is one of the major bottlenecks for westbound I-94 during both A.M. and P.M. peak periods. There is also a very high weaving demand between the northbound I-35W flyover/4th Avenue combined entrance ramp and the Hennepin/Lyndale exit ramp. Therefore, congestion will remain basically unchanged with slow moving traffic from Huron Boulevard to I-394.

Table 21
2018 No Build MOEs – Westbound I-94

	Location		AM Peak			PM Peak		
	From	**To**	**Speed (mph)**	**Density (vplpm)**	**LOS**	**Speed (mph)**	**Density (vplpm)**	**LOS**
Westbound I-94	**Begin WB I-94**	5th St Exit	60	24	C	33	63	***F***
	5th St Exit	SB I-35W Exit	51	23	C	12	94	***F***
	SB I-35W Exit	Washington CD Rd Entrance	50	28	C	14	85	***F***
	Washington CD Rd Entrance	11th St Exit	48	29	D	14	76	***F***
	11th St Exit	NB I-35W/4th Ave Entrance	45	34	D	15	92	***F***
	NB I-35W/4th Ave Entrance	Lyndale/Hennepin Exit	44	35	**E**	42	39	**E**
	Lyndale/Hennepin Exit	WB I-394 Exit	42	41	**E**	42	40	**E**
	WB I-394 Exit	TH 55 Exit	53	14	B	53	17	B
	TH 55 Exit	**END WB I-94**	54	14	B	54	16	B

4.2.2 2018 Build Option Comparisons

The tables show that the 2018 model results reinforce the main findings from the 2038 model runs. The following information describes the resulting findings based on the comparison and provides a concise comparison table. The full AM and PM peak hour comparison tables can be found in Appendix D.

The 2018 findings are summarized below:

1. Transit Station Comparison (Table 22)

- Comparing the No Build model #2 to Transit Station Only model #3
- Virtually no operational changes to mainline I-35W (NB or SB) since buses account for a very small percentage of the overall traffic volumes along I-35W.
- Constructing the Lake Street Transit Station will have no negative impact to I-35W.

Table 22
2018 Transit Station Comparison

	Location		PM Peak			PM Peak		
			Model #2			Model #3		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W	46th St TRANSIT Entrance	46th St Entrance	65	18	B	65	18	B
	46th St Entrance	35/36th St Exit	61	23	C	61	23	C
	35/36th St Exit	35/36th St Entrance	51	28	D	51	28	D
	35/36th St Entrance	31/Lake St Exit	43	31	D	43	31	D
	31/Lake St Exit	Lake St TRANSIT Exit	42	28	D	42	28	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	41	34	D	41	34	D
	Lake St TRANSIT Entrance	NB I-35W/TH 65 SPLIT	41	33	D	41	33	D
Southbound I-35W	EB I-94 Entrance	SB TH 65 Entrance	53	29	D	53	29	D
	SB TH 65 Entrance	Lake St TRANSIT Exit	58	32	D	58	32	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	57	35	**E**	57	35	**E**
	Lake St TRANSIT Entrance	31/Lake St Entrance	50	36	**E**	50	36	**E**
	31/Lake St Entrance	35/36th St Exit	50	30	D	50	30	D
	35/36th St Exit	35/36th St Entrance	58	34	D	58	34	D
	35/36th St Entrance	46th St Exit	55	35	**E**	55	35	**E**
	46th St Exit	46th St TRANSIT Exit	64	21	C	64	21	C

2. Southbound Braid Bridge Comparison (Table 23)

- Comparing the Transit Station Only model #3 to Transit Station with SB Braid model #4
- Minor operational improvement along southbound I-35W near the 31st Street Entrance/Transit Entrance due to more efficient lane usage.
- I-35W mainline trips are more likely to use 35th Street exit than those originating from downtown (TH 65), which more likely have destinations beyond 35th Street. The result is less friction in weaving area.
- Constructing the Southbound I-35W Braid Bridge will have a minor improvement to I-35W with no negative impact.

Table 23
2018 Southbound I-35W Braid Bridge Comparison

	Location		PM Peak			PM Peak		
			Model #3			Model #4		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	57	18	B	57	18	B
	Washington CD Rd Entrance	WB I-94 Entrance	47	25	C	48	25	C
	WB I-94 Entrance	SB TH 65 Entrance	41	43	***F***	40	46	***F***
	SB TH 65 Entrance	Lake St TRANSIT Exit	58	32	D	59	32	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	57	35	**E**	59	33	D
	Lake St TRANSIT Entrance	31/Lake St Entrance	50	36	**E**	51	35	**E**
	31/Lake St Entrance	35/36th St Exit	50	30	D	50	31	D
	Begin SB TH 65	12th St Entrance	58	18	B	58	18	B
	12th St Entrance	EB I-94 Entrance	49	25	C	49	25	C
	EB I-94 Entrance	SB I-35W Merge	53	29	D	55	27	C

3. Southbound Lake Street Exit Ramp Comparison (Table 24)

- Comparing the Transit Station Braid Bridge model #4 to Lake Street Ramps model #5
- Serves higher demand along I-35W from the Mississippi River Bridge to new Lake Street Exit with addition of auxiliary lane (approximately 600 vehicles in the AM and 800 vehicles in the PM peak hours)
- Improved southbound operations through I-94 Commons and 35 mph curve with new auxiliary lane
- Degraded operations on southbound TH 65 from downtown due to increase in demand being served along I-35W.
- Constructing the Southbound I-35W Lake Street Exit ramp will provide better overall operations along I-35W while serving more demand prior to the new exit to Lake Street.

Table 24
2018 Southbound I-35W Lake Street Exit Ramp Comparison

	Location		PM Peak Model #4			PM Peak Model #5		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	57	18	B	53	25	C
	Washington CD Rd Entrance	WB I-94 Entrance	48	25	C	42	38	**E**
	WB I-94 Entrance	SB TH 65 Entrance	40	46	***F***	48	32	D
	SB TH 65 Entrance	Lake St Exit	59	32	D	49	36	**E**
	Lake St Exit	Lake St TRANSIT Exit				55	30	D
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	59	33	D	59	34	D
	Lake St TRANSIT Entrance	31/Lake St Entrance	51	35	**E**	53	34	D
	31/Lake St Entrance	35/36th St Exit	50	31	D	52	29	D
	Begin SB TH 65	12th St Entrance	58	18	B	58	17	B
	12th St Entrance	EB I-94 Entrance	49	25	C	49	25	C
	EB I-94 Entrance	SB I-35W Merge	55	27	C	35	45	***F***

4. Northbound Lake Street Entrance Ramp Comparison (Table 25)

- Comparing the Transit Station Only model #3 to Lake Street Ramps model #5
- Serves higher demand along I-35W
- Weaving from entrance ramp to TH 65 was allowed (approximately 26%).
- Reduced congestion spillback along I-35W; AM peak has no change in operations south of Lake Street while PM peak has slight improvement
- Reduced congestion along I-35W in I-94 Commons area (AM peak hour) from ramp configuration changes
- Constructing the Northbound I-35W Lake Street Entrance ramp along with new auxiliary lane to the reconstructed ramp to EB I-94 will provide better overall operations along I-35W while serving more demand.

Table 25
2018 Northbound I-35W Lake Street Entrance Ramp Comparison

	Location		PM Peak			PM Peak		
			Model #3			Model #5		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W	46th St Exit	46th St TRANSIT Exit	65	18	B	65	19	B
	46th St TRANSIT Exit	46th St TRANSIT Entrance	65	21	C	65	22	C
	46th St TRANSIT Entrance	46th St Entrance	65	18	B	64	19	B
	46th St Entrance	35/36th St Exit	61	23	C	63	23	C
	35/36th St Exit	35/36th St Entrance	51	28	D	63	23	C
	35/36th St Entrance	31/Lake St Exit	43	31	D	60	22	C
	31/Lake St Exit	Lake St TRANSIT Exit	42	28	D	62	19	B
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	41	34	D	63	22	C
	Lake St TRANSIT Entrance	Lake St Entrance				60	20	C
	Lake St Entrance	NB I-35W/TH 65 SPLIT	41	33	D	58	22	C
	NB I-35W/TH 65 Split	EB I-94 Exit	33	48	***F***	45	29	D
	EB I-94 Exit	5th Ave Entrance				33	46	***F***
	5th Ave Entrance	EB I-94 Entrance	33	52	***F***	32	57	***F***
	EB I-94 Entrance	EB I-94 Exit	46	34	D	43	39	**E**
	EB I-94 Exit	Washington Ave Exit	49	30	D	48	32	D
	Washington Ave Exit	END NB I-35W	55	35	**E**	55	36	**E**

5. Northbound 28th Street Exit Ramp Comparison (Table 26)

- Comparing the Lake Street Ramps model #5 to Full Build model #6
- Serves slightly higher demands near the 35th/36th Street and 31st Street interchanges (higher throughput)
- Virtually no operational change, just slight shift in location of congestion in AM peak
- Constructing the Northbound I-35W 28th Street Exit ramp will provide more capacity along I-35W without a negative impact

Table 26
2018 Northbound I-35W 28th Street Exit Ramp Comparison

	Location		PM Peak			PM Peak		
			Model #5			Model #6		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W	46th St Exit	46th St TRANSIT Exit	65	19	B	65	19	B
	46th St TRANSIT Exit	46th St TRANSIT Entrance	65	22	C	65	22	C
	46th St TRANSIT Entrance	46th St Entrance	64	19	B	65	19	B
	46th St Entrance	35/36th St Exit	63	23	C	63	23	C
	35/36th St Exit	35/36th St Entrance	63	23	C	63	23	C
	35/36th St Entrance	31/Lake St Exit	60	22	C	60	21	C
	31/Lake St Exit	28th Street Exit	62	19	B	59	18	B
	28th Street Exit	Lake St TRANSIT Exit				57	21	C
	Lake St TRANSIT Exit	Lake St TRANSIT Entrance	63	22	C	55	25	C
	Lake St TRANSIT Entrance	Lake St Entrance	60	20	C	50	24	C
	Lake St Entrance	NB I-35W/TH 65 SPLIT	58	22	C	47	27	C
	NB I-35W/TH 65 Split	EB I-94 Exit	45	29	D	46	28	D

6. Northbound I-35W Flyover to Westbound I-94 Flyover Comparison (Table 27)

- Comparing the Transit Station Only model #3 to Transit Station, Braid Bridge, Flyover model #4; also comparing the Full Build model #6 to Full Build with Flyover model #8
    a) Existing Flyover on right side of I-94, proposed on left side. All comparisons include the 4th Avenue entrance ramp.
- Improves westbound I-94 dramatically. Congestion is reduced from approximately Huron Boulevard to the 11th Street exit
- Improves northbound TH 65/I-35W. The stacking queue along TH 65 from the right side to the flyover is eliminated and traffic into downtown can flow much better.
- Constructing the Northbound I-35W Flyover on the left side of westbound I-94 has a major positive impact on traffic operations.

Table 27
2018 Northbound I-35W Flyover to Westbound I-94 Comparison

	Location		PM Peak			PM Peak		
			Model #6			Model #8		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**	5th St Exit	48	36	**E**	61	21	C
	5th St Exit	SB I-35W Exit	23	72	***F***	52	24	C
	SB I-35W Exit	Washington CD Rd Entrance	20	75	***F***	51	24	C
	Washington CD Rd Entrance	11th St Exit	18	70	***F***	49	24	C
	11th St Exit	NB I-35W	15	92	***F***	50	29	D
	NB I-35W	4th Ave Entrance				48	30	D
	4th Ave Entrance	Lyndale/Hennepin Exit	41	40	**E**	46	35	**E**
	Lyndale/Hennepin Exit	WB I-394 Exit	42	42	**E**	41	44	***F***
	WB I-394 Exit	TH 55 Exit	52	18	B	52	19	B
	TH 55 Exit	**END WB I-94**	54	17	B	54	18	B

7. 4th Avenue Connection to Westbound I-94 Comparison (Table 28)

- Comparing the Full Build model #6 to Full Build without 4th Avenue model #7; also comparing the Full Build with Flyover model #8 to Full Build with Flyover without 4th Avenue model #9
- Existing Flyover on right side of I-94; proposed on left side.
- Improves westbound I-94 dramatically. Congestion is reduced from approximately Huron Boulevard to the 11th Street exit
- Removing the existing 4th Avenue Entrance ramp has a major positive impact on westbound I-94 traffic operations.
- Removing the existing 4th Avenue Entrance ramp will have major traffic pattern shifts on the local street network for all vehicles currently using the entrance ramp. These impacts are unknown at this time; however the impacts could create more congestion in the downtown area on routes to alternative freeway access points.

Table 28
2018 Westbound I-94 4th Avenue Ramp Comparison

	Location		PM Peak			PM Peak		
			Model #8			Model #9		
	From	To	Speed (mph)	Density (vplpm)	LOS	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**	5th St Exit	61	21	C	61	21	C
	5th St Exit	SB I-35W Exit	52	24	C	52	23	C
	SB I-35W Exit	Washington CD Rd Entrance	51	24	C	51	25	C
	Washington CD Rd Entrance	11th St Exit	49	24	C	49	24	C
	11th St Exit	NB I-35W Entrance	50	29	D	50	30	D
	NB I-35W Entrance	4th Ave Entrance	48	30	D			
	4th Ave Entrance	Lyndale/Hennepin Exit	46	35	**E**	50	31	D
	Lyndale/Hennepin Exit	WB I-394 Exit	41	44	***F***	42	40	**E**
	WB I-394 Exit	TH 55 Exit	52	19	B	53	16	B
	TH 55 Exit	**END WB I-94**	54	18	B	54	15	B

5.0 Conclusions and Next Steps

5.1 Study findings

Constructing the new ***Lake Street Transit Station*** in the median of I-35W will not negatively impact freeway operations and will provide better service and safer travel for buses along the corridor. In conjunction with the new transit station, the ***southbound I-35W Braid Bridge*** should be relocated to span over both directions of TH 65; this change has a minor positive improvement for mainline I-35W traffic and will improve transit and MnPASS operations and safety well into the future.

Both of the above improvements should be made during the first phase of construction.

A new ***southbound I-35W exit to Lake Street***, and the associated auxiliary lane, will improve freeway operations along I-35W as well as provide a direct connection to a heavily traveled minor arterial in the area; the operational impacts to Lake Street are minimal. A new ***northbound I-35W entrance from Lake Street***, and the associated auxiliary lane and new eastbound I-94 connection, will improve freeway operations along I-35W; the new ramp draws heavy traffic demands to the ramp terminal intersection on Lake Street at 2nd Avenue and adds congestion on the local network. A new ***northbound I-35W exit to 28th Street*** will have no negative impact to freeway operations; however it will relieve a high demand of traffic from 2nd Avenue and help relieve congestion on the arterial network.

All three I-35W ramps have positive operational benefits, either for the freeway or local streets, and could be constructed together or could be considered separately for the first phase of construction.

Based on Origin-Destination information obtained from this study, the majority of the northbound I-35W flyover traffic to westbound I-94 will continue along I-94 beyond I-394. With existing conditions, this traffic must merge over 2 or more lanes to continue along I-94 while weaving through the heavy exiting volumes at the Hennepin/Lyndale Avenue exit and the westbound I-394 exit. Based upon modeling results reported herein, relocating the ***northbound I-35W flyover ramp*** to the left side of westbound I-94 removes a major portion of the weaving traffic and improves traffic operations significantly. Improvements are achieved on westbound I-94 as well as on northbound TH 65 and northbound I-35W.

Removing the ***4th Avenue Entrance Ramp*** would improve operations significantly; however it does not remove the high weaving volumes from the northbound I-35W flyover ramp and the corridor will still have localized operational and safety problems. Northbound TH 65 and northbound I-35W would still have vehicles stacking as they approach the flyover ramp in this scenario. Combining the relocated left side flyover ramp with the removal of the 4th Avenue entrance ramp would provide the greatest operational and safety benefits; however the improvements are only slightly better than completing only one of the changes.

Westbound I-94 operations will experience an improvement with either of the entrance ramp changes. However, only the relocated flyover ramp changes the

weaving patterns, improving flow for all traffic through the area. Therefore, relocating the flyover to the left side of westbound I-94 should be considered. Further study of how traffic demands could vary with this freeway change should be conducted.

5.2 Next Steps

- Identify additional alternatives for evaluation based upon direction of the Technical Advisory Committee (TAC) and Project Management Team (PMT). This could include partial access at the Lake Street interchange. (i.e. no northbound entrance ramp)
- Identification of individual projects that could be built independently.
- The northbound TH 65/I-35W to westbound I-94 Flyover project should be further studied.
- The 4th Avenue entrance ramp to westbound I-94 should be further studied – including the impacts of closure on the local arterials.
- Selected projects will need to be further evaluated in Interstate Access Request (IAR) or Interstate Access Modification (IAM).
    - The Transit Access Project (center transit station, southbound exit ramp to Lake Street, and northbound exit to 28th Street) should be considered together in a common IAR with the Southbound I-35W Braid Bridge
    - The northbound TH 65/I-35W Flyover bridge project should be considered in an IAM independently from the Transit Access project.

Appendix A

2038 Full MOE Comparison Tables

Table A-1

I-35W Transit/Access Project

2038 Freeway MOE Comparison

AM Peak Hour

Direction	Location		Node		Model # 1 – Existing Conditions						Model # 2 – 2038 No Build Conditions						Model # 3 – 2038 Transit Station Only Conditions					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,620	4,654	63	19	B	744	5,180	5,249	61	22	C	744	5,180	5,252	61	22	C
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,290	6,342	65	16	B	1,355	7,221	7,319	63	19	B	1,355	7,221	7,323	63	19	B
	60th St Entrance	Diamond Lake Exit	106	108	910	6,520	6,572	65	16	B	910	7,722	7,813	60	20	C	910	7,722	7,818	61	20	B
	Diamond Lake Exit		108	110	1,432	6,360	6,433	66	20	B	1,432	7,262	7,340	53	28	C	1,432	7,262	7,333	55	27	C
		Diamond Lake Entrance	110	112	1,225	6,360	6,433	65	20	B	1,225	7,262	7,294	39	38	E	1,225	7,262	7,289	41	36	E
	Diamond Lake Entrance		112	113	1,449	7,080	7,161	59	23	C	1,449	8,292	8,200	37	43	E	1,449	8,292	8,204	38	41	E
			113	114	542	7,080	7,156	64	23	C	542	8,292	8,140	38	44	F	542	8,292	8,141	41	41	E
		46th St Exit	114	116	1,462	7,080	7,152	65	21	C	1,462	8,292	8,067	34	46	F	1,462	8,292	8,065	36	44	F
	46th St Exit	46th St BRT Exit	116	118	238	6,870	6,944	64	19	B	238	8,002	7,765	30	44	F	238	8,002	7,762	32	43	E
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	6,870	6,919	56	26	C	2,201	8,002	7,652	27	56	F	2,201	8,002	7,639	28	55	F
	46th St BRT Entrance	46th St Entrance	120	122	378	6,870	6,909	44	30	D	378	8,002	7,571	24	54	F	378	8,002	7,546	25	53	F
	46th St Entrance		122	124	1,521	7,940	7,938	38	42	E	1,521	9,252	8,637	27	59	F	1,521	9,252	8,625	28	59	F
			124	126	818	7,940	7,887	35	47	F	818	9,252	8,563	30	57	F	818	9,252	8,554	30	57	F
		35/36th St Exit	126	128	1,514	7,940	7,836	32	48	F	1,514	9,252	8,505	30	55	F	1,514	9,252	8,494	30	55	F
	35/36th St Exit		128	130	1,485	7,770	7,602	29	52	F	1,485	8,993	8,230	29	56	F	1,485	8,993	8,211	29	56	F
		35/36th St Entrance	130	132	1,474	7,770	7,536	31	49	F	1,474	8,993	8,172	31	53	F	1,474	8,993	8,148	31	53	F
	35/36th St Entrance	31/Lake St Exit	132	134	604	9,010	8,738	34	43	F	604	10,263	9,305	33	48	F	604	10,263	9,276	32	49	F
	31/Lake St Exit	Lake St BRT Exit	134	136	1,029	8,090	7,796	41	34	D	1,029	9,473	8,548	37	43	E						
	31/Lake St Exit		134	135													478	9,473	8,538	36	41	E
		Lake St BRT Exit	135	136													553	9,473	8,374	36	47	F
	Lake St BRT Exit	Lake St BRT Entrance	136	138	721	8,090	7,773	45	35	D	721	9,473	8,512	37	47	F	718	9,473	8,353	36	47	F
	Lake St BRT Entrance		138	140	1,190	8,090	7,757	49	30	D	1,190	9,473	8,484	38	43	F	1,240	9,473	8,322	36	47	F
			140	142	569	8,090	7,743	51	31	D	569	9,473	8,453	38	46	F	494	9,473	8,438	35	42	E
			142	144	1,061	8,090	7,734	55	28	D	1,061	9,473	8,426	38	45	F	1,061	9,473	8,414	36	47	F
		NB I-35W/TH 65 SPLIT	144	146	859	8,090	7,727	57	27	C	859	9,473	8,396	36	47	F	859	9,473	8,386	36	48	F
	Begin NB TH 65		146	148	498	4,660	4,450	57	26	C	498	5,633	5,153	56	31	D	498	5,633	5,142	55	31	D
			148	150	281	4,660	4,447	56	27	C	281	5,633	5,153	55	32	D	281	5,633	5,141	55	31	D
			150	152	284	4,660	4,445	53	28	D	284	5,633	5,154	52	33	D	284	5,633	5,140	52	33	D
			152	154	582	4,660	4,442	50	29	D	582	5,633	5,155	50	34	D	582	5,633	5,139	50	34	D
		WB I-94 Exit	154	156	644	4,660	4,439	45	26	C	644	5,633	5,156	45	30	D	644	5,633	5,136	46	30	D
	WB I-94 Exit	**END NB TH 65**	156	158	983	2,830	2,786	53	17	B	983	3,593	3,548	53	23	C	983	3,593	3,529	53	22	C
	NB I-35W/TH 65 Split		146	161	665	3,430	3,273	52	32	D	665	3,840	3,223	19	88	F	665	3,840	3,224	20	85	F
		New - EB I-94 Exit	162	163																		
	New - EB I-94 Exit		163	164	927	3,430	3,272	42	40	E	927	3,840	3,202	17	98	F	927	3,840	3,188	17	97	F
		5th Ave Entrance	164	165	965	3,430	3,269	28	58	F	965	3,840	3,196	17	94	F	965	3,840	3,180	17	95	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,760	3,590	36	46	F	1,048	4,410	3,760	29	60	F	1,048	4,410	3,746	29	60	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,990	4,792	49	31	D	1,024	5,850	5,069	47	34	D	1,024	5,850	5,064	47	34	D
	EB I-94 Exit		167	168	540	3,650	3,487	51	23	C	540	4,380	3,786	51	25	C	540	4,380	3,782	51	25	C
		Washington Ave Exit	168	169	448	3,650	3,486	52	22	C	448	4,380	3,784	52	24	C	448	4,380	3,779	52	24	C
	Washington Ave Exit		169	170	625	3,130	2,982	55	27	C	625	3,171	2,727	56	25	C	625	3,171	2,713	56	24	C
		END NB I-35W	170	171	523	3,130	2,982	57	26	C	523	3,171	2,726	57	24	C	523	3,171	2,713	57	24	C
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,450	2,447	57	22	C	1,074	2,590	2,590	56	24	C	1,074	2,590	2,588	55	24	C
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,730	2,730	52	24	C	892	2,909	2,915	46	29	D	892	2,909	2,916	44	32	D
	WB I-94 Entrance		366	367	1,871	3,340	3,322	50	30	D	1,871	3,638	3,612	36	46	F	1,871	3,638	3,623	34	49	F
			367	368	827	3,340	3,319	34	49	F	827	3,638	3,597	32	57	F	827	3,638	3,608	31	58	F
			368	369	483	3,340	3,317	41	40	E	483	3,638	3,593	41	44	F	483	3,638	3,603	41	44	F
			369	370	403	3,340	3,316	51	32	D	403	3,638	3,591	50	36	E	403	3,638	3,601	50	36	E
		SB TH 65 Entrance	374	376	627	3,340	3,311	55	30	D	627	3,638	3,586	54	33	D	627	3,638	3,597	54	33	D
	Begin SB TH 65	12th St Entrance	300	302	867	460	462	63	4	A	867	670	672	62	6	A	867	670	672	62	6	A
	12th St Entrance	EB I-94 Entrance	302	304	1,088	670	736	56	6	A	1,088	999	1,131	53	10	A	1,088	999	1,128	53	10	A
	EB I-94 Entrance		304	307	1,574	2,240	2,314	59	13	B	1,574	3,119	3,089	59	18	B	1,574	3,119	3,080	59	18	B
		SB I-35W Entrance	307	310	1,516	2,240	2,313	61	14	B	1,516	3,119	3,087	59	20	B	1,516	3,119	3,079	60	19	B
			307	308																		
		SB I-35W Entrance	308	310																		
	SB I-35W Entrance		310	314	698	5,580	5,618	60	23	C	698	6,757	6,668	59	28	D	698	6,757	6,671	59	28	D
			314	318	379	5,580	5,616	62	23	C	379	6,757	6,666	61	27	C	379	6,757	6,668	61	28	C
			318	320	900	5,580	5,613	64	22	C	900	6,757	6,664	63	27	C	972	6,757	6,665	62	24	C
		Lake St BRT Exit	320	322	616	5,580	5,613	64	18	B	616	6,757	6,662	62	22	C	545	6,757	6,522	63	26	C
	Lake St BRT Exit	Lake St BRT Entrance	322	324	719	5,580	5,593	64	22	C	719	6,757	6,621	62	27	C	721	6,757	6,521	63	26	C
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	5,580	5,606	64	20	C	1,325	6,757	6,655	61	25	C	1,326	6,757	6,519	63	26	C
	31/Lake St Entrance	Lake St BRT Entrance	326	327													134	7,447	7,207	57	25	C
	Lake St BRT Entrance	35/36th St Exit	327	328													384	7,447	7,344	55	23	C
	31/Lake St Entrance	35/36th St Exit	326	328	518	6,250	6,271	60	21	C	518	7,447	7,338	58	25	C						
	35/36th St Exit		328	330	1,384	5,600	5,616	65	22	C	1,384	6,797	6,688	63	27	C	1,384	6,797	6,710	60	28	C
		35/36th St Entrance	330	332	1,712	5,600	5,611	66	21	C	1,712	6,797	6,681	61	28	C	1,712	6,797	6,708	59	29	D
	35/36th St Entrance		332	334	1,460	6,120	6,125	61	24	C	1,460	7,448	7,319	54	32	D	1,460	7,448	7,350	53	33	D
			334	336	544	6,120	6,123	64	24	C	544	7,448	7,314	61	30	D	544	7,448	7,340	61	30	D
		46th St Exit	336	338	1,512	6,120	6,120	65	20	B	1,512	7,448	7,308	63	25	C	1,512	7,448	7,333	63	25	C
	46th St Exit	46th St BRT Exit	338	340	780	5,770	5,780	65	16	B	780	6,928	6,786	64	19	B	780	6,928	6,797	64	19	B
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	5,770	5,771	66	17	B	2,275	6,928	6,771	66	21	C	2,275	6,928	6,785	66	21	C
	46th St BRT Entrance	46th St Entrance	342	344	393	5,770	5,772	65	15	B	393	6,928	6,772	64	18	B	393	6,928	6,790	64	18	B
	46th St Entrance		344	346	1,397	6,300	6,292	62	19	B	1,397	7,447	7,285	59	23	C	1,397	7,447	7,300	59	23	C
		60th St Exit	346	348	1,495	6,300	6,284	62	20	B	1,495	7,447	7,277	54	26	C	1,495	7,447	7,289	55	26	C
	60th St Exit	TH 62 Exit	348	350	2,036	6,050	6,017	61	20	B	2,036	6,977	6,802	57	24	C	2,036	6,977	6,807	57	24	C
	TH 62 Exit		350	352	1,409	2,680	2,641	66	13	B	1,409	3,597	3,504	64	18	B	1,409	3,597	3,514	64	18	B
			352	354	1,616	2,680	2,636	67	13	B	1,616	3,597	3,497	65	18	B	1,616	3,597	3,506	65	18	B
		END SB I-35W	354	356	719	2,680	2,634	67	13	B	719	3,597	3,492	66	18	B	719	3,597	3,499	66	18	B

Direction	Location		Node		Model # 4 – 2038 Transit Station, SB Braid, NB Flyover						Model # 5 – 2038 Build Lake St Ramps Only						Model # 6 – 2038 Full Build					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	5,180	5,254	61	22	C	744	5,229	5,294	61	22	C	744	5,289	5,360	61	23	C
	TH 62 Entrance	60th St Entrance	104	106	1,355	7,221	7,326	63	19	B	1,355	7,239	7,338	63	20	B	1,355	7,210	7,309	62	20	B
	60th St Entrance	Diamond Lake Exit	106	108	910	7,722	7,818	59	21	C	910	7,760	7,851	59	21	C	910	7,821	7,900	57	22	C
	Diamond Lake Exit		108	110	1,432	7,262	7,329	49	30	D	1,432	7,309	7,351	50	30	D	1,432	7,431	7,451	50	30	D
		Diamond Lake Entrance	110	112	1,225	7,262	7,278	37	40	E	1,225	7,309	7,302	38	39	E	1,225	7,431	7,385	38	39	E
	Diamond Lake Entrance		112	113	1,449	8,292	8,179	36	43	F	1,449	8,319	8,188	36	44	F	1,449	8,311	8,162	35	45	F
			113	114	542	8,292	8,118	36	45	F	542	8,319	8,131	38	45	F	542	8,311	8,099	36	46	F
		46th St Exit	114	116	1,462	8,292	8,047	33	48	F	1,462	8,319	8,067	34	46	F	1,462	8,311	8,027	33	47	F
	46th St Exit	46th St BRT Exit	116	118	238	8,002	7,748	29	46	F	238	8,050	7,792	31	44	F	238	8,071	7,786	30	44	F
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,002	7,634	27	57	F	2,201	8,050	7,689	28	56	F	2,201	8,071	7,678	28	56	F
	46th St BRT Entrance	46th St Entrance	120	122	378	8,002	7,552	24	55	F	378	8,050	7,619	24	55	F	378	8,071	7,603	24	54	F
	46th St Entrance		122	124	1,521	9,252	8,619	27	60	F	1,521	9,290	8,650	27	59	F	1,521	9,340	8,705	28	59	F
			124	126	818	9,252	8,541	30	58	F	818	9,290	8,583	30	58	F	818	9,340	8,638	31	57	F
		35/36th St Exit	126	128	1,514	9,252	8,481	29	56	F	1,514	9,290	8,527	30	55	F	1,514	9,340	8,576	30	55	F
	35/36th St Exit		128	130	1,485	8,993	8,202	29	56	F	1,485	9,180	8,371	30	57	F	1,485	9,221	8,404	29	58	F
		35/36th St Entrance	130	132	1,474	8,993	8,144	31	53	F	1,474	9,180	8,306	31	53	F	1,474	9,221	8,329	28	59	F
	35/36th St Entrance	31/Lake St Exit	132	134	604	10,263	9,282	33	48	F	604	10,371	9,300	33	47	F	604	10,431	9,362	29	50	F
	31/Lake St Exit	Lake St BRT Exit	134	136																		
	31/Lake St Exit		134	135	478	9,473	8,552	37	39	E	478	9,571	8,558	37	39	E	478	9,851	8,822	30	42	E
		Lake St BRT Exit	135	136	553	9,473	8,396	38	45	F	553	9,571	8,404	37	45	F	553	9,851	8,663	33	45	F
	Lake St BRT Exit	Lake St BRT Entrance	136	138	718	9,473	8,378	38	45	F	843	9,571	8,388	39	43	F	843	9,851	8,647	38	38	E
	Lake St BRT Entrance		138	140	1,240	9,473	8,345	38	45	F	1,112	9,571	8,366	41	41	E	1,112	9,191	8,053	43	37	E
			140	142	494	9,473	8,457	37	40	E	496	9,571	8,495	41	36	E	496	9,191	8,182	43	33	D
			142	144	1,061	9,473	8,433	38	45	F	1,061	10,650	9,535	45	36	E	1,061	10,301	9,265	45	34	D
		NB I-35W/TH 65 SPLIT	144	146	859	9,473	8,405	38	46	F	859	10,650	9,532	53	30	D	859	10,301	9,261	53	29	D
	Begin NB TH 65		146	148	498	5,633	5,157	56	31	D	498	5,699	5,281	54	32	D	498	5,621	5,243	54	32	D
			148	150	281	5,633	5,156	55	31	D	281	5,699	5,280	55	32	D	281	5,621	5,241	55	32	D
			150	152	284	5,633	5,155	52	33	D	284	5,699	5,281	53	33	D	284	5,621	5,240	52	33	D
			152	154	582	5,633	5,155	50	34	D	582	5,699	5,283	51	35	D	582	5,621	5,239	50	35	D
		WB I-94 Exit	154	156	644	5,633	5,153	46	30	D	644	5,699	5,283	47	30	D	644	5,621	5,237	46	30	D
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,593	3,520	53	22	C	983	3,649	3,697	53	24	C	983	3,611	3,643	53	23	C
	NB I-35W/TH 65 Split		146	161	665	3,840	3,226	22	79	F	174	4,951	4,250	53	27	C	174	4,680	4,017	53	25	C
		New - EB I-94 Exit	162	163							678	4,951	4,255	37	38	E	678	4,680	4,018	40	34	D
	New - EB I-94 Exit		163	164	927	3,840	3,187	18	91	F	552	3,070	2,642	46	29	D	552	2,910	2,497	49	26	C
		5th Ave Entrance	164	165	965	3,840	3,172	17	92	F	965	3,070	2,633	29	45	F	965	2,910	2,493	32	39	E
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,410	3,737	29	59	F	1,048	3,963	3,508	35	46	F	1,048	3,821	3,391	36	43	E
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,850	5,056	47	34	D	1,024	5,452	4,853	47	32	D	1,024	5,241	4,663	48	30	D
	EB I-94 Exit		167	168	540	4,380	3,801	51	25	C	540	4,860	4,262	50	28	D	540	4,660	4,088	51	27	C
		Washington Ave Exit	168	169	448	4,380	3,800	52	24	C	448	4,860	4,262	52	27	C	448	4,660	4,087	52	26	C
	Washington Ave Exit		169	170	625	3,171	2,752	56	25	C	625	3,461	3,040	55	28	C	625	3,371	2,951	55	27	C
		END NB I-35W	170	171	523	3,171	2,753	57	24	C	523	3,461	3,040	57	27	C	523	3,371	2,951	57	26	C
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,590	2,587	56	24	C	1,074	3,130	3,129	53	30	D	1,074	3,200	3,199	53	31	D
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,909	2,911	46	29	D	892	3,500	3,504	47	34	D	892	3,570	3,574	46	35	D
	WB I-94 Entrance		366	367	1,871	3,638	3,610	35	47	F	1,871	4,449	4,417	54	28	C	1,871	4,539	4,540	53	29	D
			367	368	827	3,638	3,601	31	57	F	827	4,449	4,414	37	40	E	827	4,539	4,533	36	42	E
			368	369	483	3,638	3,598	41	44	F	483	4,449	4,412	42	35	E	483	4,539	4,528	42	36	E
			369	370	205	3,638	3,597	49	37	E	205	4,449	4,412	51	29	D	205	4,539	4,526	51	30	D
		SB TH 65 Entrance	374	376	436	3,638	3,595	55	33	D	434	4,449	4,410	56	26	C	434	4,539	4,522	56	27	C
	Begin SB TH 65	12th St Entrance	300	302	867	670	672	62	6	A	867	830	831	62	7	A	867	791	792	62	7	A
	12th St Entrance	EB I-94 Entrance	302	304	1,088	999	1,130	53	10	A	1,088	1,169	1,298	53	11	B	1,088	1,140	1,267	53	11	B
	EB I-94 Entrance		304	307	1,574	3,119	3,066	59	17	B	1,574	3,339	3,291	59	19	B	1,574	3,340	3,290	59	19	B
		SB I-35W Entrance	307	310																		
			307	308	718	3,119	3,065	60	17	B	718	3,339	3,292	60	19	B	718	3,340	3,288	60	18	B
		SB I-35W Entrance	308	310	825	3,119	3,064	60	19	B	825	3,339	3,291	55	22	C	825	3,340	3,287	54	23	C
	SB I-35W Entrance		310	314	698	6,757	6,655	59	28	D	698	7,788	7,698	55	28	C	698	7,879	7,799	54	29	D
			314	318	379	6,757	6,653	61	27	C	765	7,788	7,693	55	28	C	765	7,879	7,795	54	29	D
			318	320	972	6,757	6,651	63	24	C	586	7,079	6,962	60	24	C	586	7,120	7,044	59	25	C
		Lake St BRT Exit	320	322	545	6,757	6,508	63	26	C	545	7,079	6,819	61	28	D	545	7,120	6,903	60	29	D
	Lake St BRT Exit	Lake St BRT Entrance	322	324	721	6,757	6,505	63	26	C	721	7,079	6,814	62	28	C	721	7,120	6,901	62	28	D
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,326	6,757	6,500	63	26	C	1,326	7,079	6,811	63	27	C	1,326	7,120	6,896	62	28	C
	31/Lake St Entrance	Lake St BRT Entrance	326	327	134	7,447	7,180	57	25	C	134	7,730	7,457	56	27	C	134	7,760	7,526	56	27	C
	Lake St BRT Entrance	35/36th St Exit	327	328	384	7,447	7,318	55	23	C	384	7,730	7,597	54	24	C	384	7,760	7,663	53	24	C
	31/Lake St Entrance	35/36th St Exit	326	328																		
	35/36th St Exit		328	330	1,384	6,797	6,682	60	28	C	1,384	7,221	7,100	58	31	D	1,384	7,240	7,166	57	32	D
		35/36th St Entrance	330	332	1,712	6,797	6,675	59	29	D	1,712	7,221	7,089	53	34	D	1,712	7,240	7,161	51	35	E
	35/36th St Entrance		332	334	1,460	7,448	7,318	52	33	D	1,460	7,863	7,719	50	36	E	1,460	7,891	7,801	49	37	E
			334	336	544	7,448	7,313	60	30	D	544	7,863	7,713	59	33	D	544	7,891	7,793	58	33	D
		46th St Exit	336	338	1,512	7,448	7,306	63	25	C	1,512	7,863	7,712	62	26	C	1,512	7,891	7,786	62	27	C
	46th St Exit	46th St BRT Exit	338	340	780	6,928	6,793	64	19	B	780	7,363	7,217	64	21	C	780	7,381	7,264	64	21	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,928	6,781	66	21	C	2,275	7,363	7,203	63	23	C	2,275	7,381	7,249	63	23	C
	46th St BRT Entrance	46th St Entrance	342	344	393	6,928	6,786	64	18	B	393	7,363	7,203	56	23	C	393	7,381	7,249	54	23	C
	46th St Entrance		344	346	1,397	7,447	7,299	60	23	C	1,397	7,842	7,668	48	31	D	1,397	7,869	7,730	46	32	D
		60th St Exit	346	348	1,495	7,447	7,293	55	26	C	1,495	7,842	7,644	45	32	D	1,495	7,869	7,707	45	33	D
	60th St Exit	TH 62 Exit	348	350	2,036	6,977	6,815	56	24	C	2,036	7,572	7,351	54	27	C	2,036	7,399	7,205	54	27	C
	TH 62 Exit		350	352	1,409	3,597	3,476	64	18	B	1,409	3,832	3,694	63	20	B	1,409	3,889	3,775	63	20	C
			352	354	1,616	3,597	3,470	66	18	B	1,616	3,832	3,687	65	19	B	1,616	3,889	3,769	65	19	B
		END SB I-35W	354	356	719	3,597	3,466	66	18	B	719	3,832	3,681	66	19	B	719	3,889	3,763	65	19	B

Direction	Location		Node		Model # 7 – 2038 Full Build Without 4th Ave Ramp						Model # 8 – 2038 Full Build NB Flyover						Model # 9 – 2038 Full Build NB Flyover w/o 4th Ave					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	5,311	5,383	61	23	C	744	5,289	5,355	61	23	C	744	5,311	5,376	61	23	C
	TH 62 Entrance	60th St Entrance	104	106	1,355	7,262	7,355	61	20	C	1,355	7,210	7,306	63	19	B	1,355	7,262	7,349	62	20	C
	60th St Entrance	Diamond Lake Exit	106	108	910	7,873	7,933	53	23	C	910	7,821	7,898	56	22	C	910	7,873	7,930	53	23	C
	Diamond Lake Exit		108	110	1,432	7,514	7,496	44	34	D	1,432	7,431	7,436	48	31	D	1,432	7,514	7,506	45	34	D
		Diamond Lake Entrance	110	112	1,225	7,514	7,408	34	44	F	1,225	7,431	7,361	37	40	E	1,225	7,514	7,418	35	43	F
	Diamond Lake Entrance		112	113	1,449	8,383	8,142	31	49	F	1,449	8,311	8,145	34	46	F	1,449	8,383	8,170	32	49	F
			113	114	542	8,383	8,069	32	50	F	542	8,311	8,082	34	47	F	542	8,383	8,103	33	50	F
		46th St Exit	114	116	1,462	8,383	7,994	30	51	F	1,462	8,311	8,016	32	48	F	1,462	8,383	8,031	30	51	F
	46th St Exit	46th St BRT Exit	116	118	238	8,143	7,759	28	47	F	238	8,071	7,782	30	45	F	238	8,143	7,797	28	48	F
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,143	7,648	26	59	F	2,201	8,071	7,682	27	57	F	2,201	8,143	7,682	26	59	F
	46th St BRT Entrance	46th St Entrance	120	122	378	8,143	7,568	23	57	F	378	8,071	7,614	24	55	F	378	8,143	7,597	23	57	F
	46th St Entrance		122	124	1,521	9,412	8,668	27	61	F	1,521	9,340	8,713	28	60	F	1,521	9,412	8,701	27	61	F
			124	126	818	9,412	8,594	29	59	F	818	9,340	8,633	30	58	F	818	9,412	8,630	30	59	F
		35/36th St Exit	126	128	1,514	9,412	8,529	29	57	F	1,514	9,340	8,566	30	56	F	1,514	9,412	8,563	29	57	F
	35/36th St Exit		128	130	1,485	9,282	8,343	28	60	F	1,485	9,221	8,397	28	59	F	1,485	9,282	8,376	28	60	F
		35/36th St Entrance	130	132	1,474	9,282	8,267	27	61	F	1,474	9,221	8,324	28	60	F	1,474	9,282	8,310	27	62	F
	35/36th St Entrance	31/Lake St Exit	132	134	604	10,502	9,310	28	52	F	604	10,431	9,339	29	50	F	604	10,502	9,361	27	53	F
	31/Lake St Exit	Lake St BRT Exit	134	136																		
	31/Lake St Exit		134	135	478	9,933	8,788	29	44	F	478	9,851	8,806	30	42	E	478	9,933	8,836	29	45	F
		Lake St BRT Exit	135	136	553	9,933	8,632	31	46	F	553	9,851	8,644	32	45	F	553	9,933	8,678	31	47	F
	Lake St BRT Exit	Lake St BRT Entrance	136	138	843	9,933	8,619	37	39	E	843	9,851	8,623	38	38	E	843	9,933	8,660	37	39	E
	Lake St BRT Entrance		138	140	1,112	9,283	8,037	43	38	E	1,112	9,191	8,037	43	37	E	1,112	9,283	8,082	43	38	E
			140	142	496	9,283	8,169	43	33	D	496	9,191	8,169	43	33	D	496	9,283	8,215	43	33	D
			142	144	1,061	10,363	9,224	45	34	D	1,061	10,301	9,259	45	35	D	1,061	10,363	9,276	45	34	D
		NB I-35W/TH 65 SPLIT	144	146	859	10,363	9,218	53	29	D	859	10,301	9,255	53	29	D	859	10,363	9,268	53	29	D
	Begin NB TH 65		146	148	498	5,653	5,222	54	32	D	498	5,621	5,237	54	32	D	498	5,653	5,235	54	32	D
			148	150	281	5,653	5,221	55	32	D	281	5,621	5,234	55	32	D	281	5,653	5,233	55	32	D
			150	152	284	5,653	5,220	53	33	D	284	5,621	5,233	53	33	D	284	5,653	5,232	53	33	D
			152	154	582	5,653	5,218	51	34	D	582	5,621	5,233	51	34	D	582	5,653	5,231	51	34	D
		WB I-94 Exit	154	156	644	5,653	5,214	46	30	D	644	5,621	5,231	47	30	D	644	5,653	5,230	46	30	D
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,493	3,530	53	22	C	983	3,611	3,644	53	23	C	983	3,493	3,549	53	23	C
	NB I-35W/TH 65 Split		146	161	174	4,710	3,994	53	25	C	174	4,680	4,018	53	25	C	174	4,710	4,030	53	26	C
		New - EB I-94 Exit	162	163	678	4,710	3,999	40	33	D	678	4,680	4,022	40	34	D	678	4,710	4,032	41	33	D
	New - EB I-94 Exit		163	164	552	2,960	2,497	48	26	C	552	2,910	2,489	49	25	C	552	2,960	2,537	46	28	D
		5th Ave Entrance	164	165	965	2,960	2,493	30	42	E	965	2,910	2,486	33	38	E	965	2,960	2,533	29	44	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,892	3,414	35	44	F	1,048	3,821	3,388	37	42	E	1,048	3,892	3,448	35	45	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,322	4,697	48	31	D	1,024	5,241	4,673	48	30	D	1,024	5,322	4,738	48	31	D
	EB I-94 Exit		167	168	540	4,711	4,098	51	27	C	540	4,660	4,095	51	27	C	540	4,711	4,133	51	27	C
		Washington Ave Exit	168	169	448	4,711	4,098	52	26	C	448	4,660	4,093	52	26	C	448	4,711	4,133	52	27	C
	Washington Ave Exit		169	170	625	3,381	2,939	55	27	C	625	3,371	2,962	55	27	C	625	3,381	2,952	55	27	C
		END NB I-35W	170	171	523	3,381	2,941	57	26	C	523	3,371	2,963	57	26	C	523	3,381	2,953	57	26	C
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	3,139	3,136	54	30	D	1,074	3,200	3,199	53	31	D	1,074	3,139	3,141	54	30	D
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	3,497	3,502	47	33	D	892	3,570	3,574	46	35	D	892	3,497	3,505	47	33	D
	WB I-94 Entrance		366	367	1,871	4,515	4,503	54	28	C	1,871	4,539	4,533	53	29	D	1,871	4,515	4,514	54	28	D
			367	368	827	4,515	4,499	37	41	E	827	4,539	4,528	36	42	E	827	4,515	4,509	36	41	E
			368	369	483	4,515	4,497	42	36	E	483	4,539	4,525	42	36	E	483	4,515	4,504	42	36	E
			369	370	205	4,515	4,496	51	29	D	205	4,539	4,525	51	30	D	205	4,515	4,501	51	30	D
		SB TH 65 Entrance	374	376	434	4,515	4,492	56	27	C	434	4,539	4,521	56	27	C	434	4,515	4,496	56	27	C
	Begin SB TH 65	12th St Entrance	300	302	867	800	801	62	7	A	867	791	793	62	7	A	867	800	801	62	7	A
	12th St Entrance	EB I-94 Entrance	302	304	1,088	1,160	1,288	53	11	B	1,088	1,140	1,270	53	11	B	1,088	1,160	1,289	53	11	B
	EB I-94 Entrance		304	307	1,574	3,360	3,318	59	19	B	1,574	3,340	3,302	59	19	B	1,574	3,360	3,307	59	19	B
		SB I-35W Entrance	307	310																		
			307	308	718	3,360	3,316	60	19	B	718	3,340	3,299	59	19	B	718	3,360	3,304	59	19	B
		SB I-35W Entrance	308	310	825	3,360	3,315	55	23	C	825	3,340	3,297	54	23	C	825	3,360	3,302	54	23	C
	SB I-35W Entrance		310	314	698	7,875	7,801	53	29	D	698	7,879	7,809	53	29	D	698	7,875	7,788	54	29	D
			314	318	765	7,875	7,795	54	29	D	765	7,879	7,805	53	29	D	765	7,875	7,784	53	29	D
			318	320	586	7,166	7,094	59	25	C	586	7,120	7,047	59	25	C	586	7,166	7,091	59	25	C
		Lake St BRT Exit	320	322	545	7,166	6,951	60	29	D	545	7,120	6,903	60	29	D	545	7,166	6,953	60	29	D
	Lake St BRT Exit	Lake St BRT Entrance	322	324	721	7,166	6,948	61	28	D	721	7,120	6,901	61	28	D	721	7,166	6,954	61	28	D
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,326	7,166	6,943	62	28	D	1,326	7,120	6,896	62	28	C	1,326	7,166	6,951	62	28	C
	31/Lake St Entrance	Lake St BRT Entrance	326	327	134	7,806	7,568	55	27	C	134	7,760	7,519	56	27	C	134	7,806	7,574	56	27	C
	Lake St BRT Entrance	35/36th St Exit	327	328	384	7,806	7,706	53	25	C	384	7,760	7,657	54	24	C	384	7,806	7,714	54	24	C
	31/Lake St Entrance	35/36th St Exit	326	328																		
	35/36th St Exit		328	330	1,384	7,276	7,187	57	32	D	1,384	7,240	7,155	57	31	D	1,384	7,276	7,190	58	31	D
		35/36th St Entrance	330	332	1,712	7,276	7,180	51	35	E	1,712	7,240	7,150	51	35	D	1,712	7,276	7,179	52	35	D
	35/36th St Entrance		332	334	1,460	7,918	7,808	49	37	E	1,460	7,891	7,792	49	37	E	1,460	7,918	7,805	49	37	E
			334	336	544	7,918	7,799	58	34	D	544	7,891	7,781	58	33	D	544	7,918	7,798	58	34	D
		46th St Exit	336	338	1,512	7,918	7,795	62	27	C	1,512	7,891	7,773	62	27	C	1,512	7,918	7,795	62	27	C
	46th St Exit	46th St BRT Exit	338	340	780	7,398	7,281	64	21	C	780	7,381	7,253	64	21	C	780	7,398	7,268	64	21	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	7,398	7,266	64	23	C	2,275	7,381	7,235	64	23	C	2,275	7,398	7,252	65	22	C
	46th St BRT Entrance	46th St Entrance	342	344	393	7,398	7,267	57	22	C	393	7,381	7,232	56	23	C	393	7,398	7,253	61	21	C
	46th St Entrance		344	346	1,397	7,886	7,744	48	31	D	1,397	7,869	7,709	46	32	D	1,397	7,886	7,733	50	29	D
		60th St Exit	346	348	1,495	7,886	7,725	45	33	D	1,495	7,869	7,685	45	33	D	1,495	7,886	7,718	46	32	D
	60th St Exit	TH 62 Exit	348	350	2,036	7,426	7,236	54	27	C	2,036	7,399	7,172	54	27	C	2,036	7,426	7,224	54	27	C
	TH 62 Exit		350	352	1,409	3,866	3,727	63	20	B	1,409	3,889	3,760	63	20	B	1,409	3,866	3,721	63	20	B
			352	354	1,616	3,866	3,718	65	19	B	1,616	3,889	3,753	65	19	B	1,616	3,866	3,714	65	19	B
		END SB I-35W	354	356	719	3,866	3,710	65	19	B	719	3,889	3,749	66	19	B	719	3,866	3,709	66	19	B

Table A-1

I-35W Transit/Access Project

2038 Freeway MOE Comparison

AM Peak Hour

	Location From	Location To	Node From	Node To	Model # 1: Existing Conditions						Model # 2: 2038 No Build Conditions						Model # 3: 2038 Transit Station Only Conditions					
					Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**		554	556	984	3,570	3,572	51	36	E	984	4,151	3,989	24	85	F	984	4,151	4,000	24	85	F
			556	557	632	3,570	3,572	51	35	E	632	4,151	3,987	24	82	F	632	4,151	3,998	24	82	F
		EB I-394 Entrance	557	558	789	3,570	3,573	50	36	E	789	4,151	3,986	27	74	F	789	4,151	3,997	27	73	F
	EB I-394 Entrance		558	559	442	5,760	5,687	40	47	F	442	6,341	5,746	26	74	F	442	6,341	5,764	26	74	F
			559	560	1,192	5,760	5,690	44	43	F	1,192	6,341	5,744	31	62	F	1,192	6,341	5,761	32	61	F
		Lyndale/Hennepin Entrance	560	561	1,856	5,760	5,694	37	52	F	1,856	6,341	5,736	31	63	F	1,856	6,341	5,751	31	63	F
	Lyndale/Hennepin Entrance		561	562	1,485	7,650	7,556	41	46	F	1,485	8,471	7,752	39	50	F	1,485	8,471	7,769	38	51	F
			562	563	706	7,650	7,544	50	38	E	706	8,471	7,740	49	40	E	706	8,471	7,756	49	40	E
		SB I-35W Exit	563	564	474	7,650	7,542	50	38	E	474	8,471	7,738	50	39	E	474	8,471	7,753	50	39	E
	SB I-35W Exit		564	565	792	6,080	5,961	50	40	E	792	6,351	5,776	50	38	E	792	6,351	5,799	50	38	E
			565	566	865	6,080	5,958	51	39	E	865	6,351	5,773	51	38	E	865	6,351	5,795	51	38	E
		NB I-35W Exit	566	567	388	6,080	5,957	51	31	D	388	6,351	5,771	51	30	D	388	6,351	5,792	51	30	D
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,850	4,746	51	31	D	688	4,911	4,459	51	29	D	688	4,911	4,470	51	29	D
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,210	5,099	55	23	C	1,557	5,452	4,991	55	23	C	1,557	5,452	5,004	55	23	C
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,350	4,244	59	24	C	469	4,532	4,081	59	23	C	469	4,532	4,120	59	23	C
	NB I-35W Entrance		570	572	1,016	5,690	5,542	61	23	C	1,016	6,002	5,360	61	22	C	1,016	6,002	5,399	61	22	C
		Cedar Ave Entrance	572	573	1,027	5,690	5,538	61	23	C	1,027	6,002	5,359	61	22	C	1,027	6,002	5,395	61	22	C
	Cedar Ave Entrance		573	574	562	6,100	5,945	59	21	C	562	6,621	5,974	58	21	C	562	6,621	6,009	58	21	C
			574	576	930	6,100	5,941	60	25	C	930	6,621	5,968	60	25	C	930	6,621	6,005	60	25	C
			576	578	1,378	6,100	5,936	61	24	C	1,378	6,621	5,960	61	24	C	1,378	6,621	5,997	61	25	C
			578	580	1,268	6,100	5,931	61	24	C	1,268	6,621	5,954	61	24	C	1,268	6,621	5,989	61	25	C
			580	582	875	6,100	5,929	61	24	C	875	6,621	5,950	61	24	C	875	6,621	5,984	61	25	C
		END EB I-94	582	584	1,173	6,100	5,926	61	24	C	1,173	6,621	5,944	61	24	C	1,173	6,621	5,980	61	25	C
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,700	5,692	62	23	C	1,488	6,260	6,256	61	26	C	1,488	6,260	6,258	61	26	C
			750	752	590	5,700	5,692	62	23	C	590	6,260	6,252	60	26	C	590	6,260	6,255	61	26	C
			752	754	1,231	5,700	5,690	62	23	C	1,231	6,260	6,249	56	28	D	1,231	6,260	6,254	60	26	C
			754	756	1,378	5,700	5,687	61	23	C	1,378	6,260	6,240	48	34	D	1,378	6,260	6,252	56	28	D
			756	758	775	5,700	5,683	60	24	C	775	6,260	6,228	43	38	E	775	6,260	6,247	51	32	D
		Cedar Ave Exit	758	759	1,026	5,700	5,681	55	24	C	1,026	6,260	6,212	37	41	E	1,026	6,260	6,240	44	34	D
	Cedar Ave Exit		759	760	755	4,660	4,668	53	22	C	755	5,030	4,983	29	49	F	755	5,030	5,011	32	43	F
			760	761	1,114	4,660	4,666	51	23	C	1,114	5,030	4,962	26	51	F	1,114	5,030	4,982	27	50	F
		SB I-35W Exit	761	762	677	4,660	4,663	50	23	C	677	5,030	4,939	28	46	F	677	5,030	4,953	29	44	F
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,050	4,068	50	27	C	492	4,301	4,217	26	55	F	492	4,301	4,216	27	54	F
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,410	5,430	49	27	C	1,637	6,462	6,355	27	58	F	1,637	6,462	6,346	28	57	F
	11th St Exit		764	15																		
		NB I-35W Flyover	15	765																		
	11th St Exit		764	765	1,022	4,370	4,384	51	29	D	1,022	5,103	5,002	24	68	F	1,022	5,103	4,986	25	67	F
		NB I-35W/4th Ave Entrance	765	766	1,082	4,370	4,382	45	33	D	1,082	5,103	4,974	23	73	F	1,082	5,103	4,953	23	72	F
	NB I-35W/4th Ave Entrance		766	767	717	6,530	6,348	36	42	E	717	7,513	6,921	29	56	F	717	7,513	6,899	30	56	F
		Lyndale/Hennepin Exit	767	768	1,834	6,530	6,342	49	31	D	1,834	7,513	6,914	46	35	D	1,834	7,513	6,892	46	35	D
	Lyndale/Hennepin Exit		768	769	1,590	5,430	5,275	37	47	F	1,590	6,253	5,721	36	52	F	1,590	6,253	5,721	36	52	F
			769	770	1,188	5,430	5,269	46	38	E	1,188	6,253	5,719	45	42	E	1,188	6,253	5,719	45	43	E
		WB I-394 Exit	770	771	1,432	5,430	5,263	44	33	D	1,432	6,253	5,716	44	37	E	1,432	6,253	5,718	43	37	E
	WB I-394 Exit		771	772	508	2,540	2,422	52	16	B	508	2,933	2,652	52	17	B	508	2,933	2,635	52	17	B
		TH 55 Exit	772	774	544	2,540	2,419	54	13	B	544	2,933	2,651	54	14	B	544	2,933	2,634	54	14	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,280	2,152	54	13	B	400	2,634	2,378	54	15	B	400	2,634	2,361	54	15	B
	NB I-35W Flyover		256	6	890	1,830	1,646	30	56	F	890	2,040	1,604	29	56	F	890	2,040	1,603	29	56	F
			6	3	142	1,830	1,643	31	53	F	142	2,040	1,603	29	56	F	142	2,040	1,602	29	56	F
		4th Avenue Entrance	3	2	114	1,830	1,643	32	25	C	114	2,040	1,603	29	27	C	114	2,040	1,602	29	28	C
		WB I-94	3	765																		
	4th Avenue		5	4	466	330	329	18	10	A	466	370	370	9	22	C	466	370	371	9	22	C
		NB Flyover Entrance	4	2	160	330	329	20	9	A	160	370	368	20	11	B	160	370	370	20	11	B
	NB Flyover Entrance		2	1	164	2,160	1,971	34	19	B	164	2,410	1,969	30	22	C	164	2,410	1,971	30	22	C
		WB I-94	1	766	254	2,160	1,970	34	29	D	254	2,410	1,968	29	34	D	254	2,410	1,969	29	34	D

	Location From	Location To	Node From	Node To	Model # 4: 2038 Transit Station, SB Braid, NB Flyover						Model # 5: 2038 Build Lake St Ramps Only						Model # 6: 2038 Full Build					
					Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**		554	556	984	4,151	3,989	24	85	F	984	4,211	3,986	24	85	F	984	4,221	3,994	24	85	F
			556	557	632	4,151	3,988	24	82	F	632	4,211	3,986	24	82	F	632	4,221	3,993	24	83	F
		EB I-394 Entrance	557	558	789	4,151	3,987	27	73	F	789	4,211	3,987	27	73	F	789	4,221	3,992	27	74	F
	EB I-394 Entrance		558	559	442	6,341	5,761	26	74	F	442	6,401	5,773	26	73	F	442	6,421	5,758	26	74	F
			559	560	1,192	6,341	5,756	32	61	F	1,192	6,401	5,770	32	60	F	1,192	6,421	5,754	32	61	F
		Lyndale/Hennepin Entrance	560	561	1,856	6,341	5,744	31	62	F	1,856	6,401	5,757	31	62	F	1,856	6,421	5,744	31	62	F
	Lyndale/Hennepin Entrance		561	562	1,485	8,471	7,762	39	50	F	1,485	8,392	7,700	39	49	F	1,485	8,441	7,711	39	50	F
			562	563	706	8,471	7,750	49	40	E	706	8,392	7,688	49	39	E	706	8,441	7,698	49	39	E
		SB I-35W Exit	563	564	474	8,471	7,747	50	39	E	474	8,392	7,685	50	39	E	474	8,441	7,696	50	38	E
	SB I-35W Exit		564	565	792	6,351	5,808	50	38	E	792	6,222	5,689	50	38	E	792	6,241	5,670	51	37	E
			565	566	865	6,351	5,807	51	38	E	865	6,222	5,685	51	37	E	865	6,241	5,667	51	37	E
		NB I-35W Exit	566	567	388	6,351	5,806	51	30	D	388	6,222	5,683	51	29	D	388	6,241	5,664	51	29	D
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,911	4,482	51	29	D	688	4,733	4,328	51	28	D	688	4,821	4,385	51	28	D
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,452	5,014	55	23	C	1,557	6,614	5,944	52	29	D	1,557	6,591	5,908	52	28	D
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,532	4,110	59	23	C	469	5,674	4,848	58	28	D	469	5,651	4,840	58	28	C
	NB I-35W Entrance		570	572	1,016	6,002	5,363	61	22	C	1,016	6,266	5,434	61	22	C	1,016	6,232	5,408	61	22	C
		Cedar Ave Entrance	572	573	1,027	6,002	5,360	61	22	C	1,027	6,266	5,431	61	22	C	1,027	6,232	5,401	61	22	C
	Cedar Ave Entrance		573	574	562	6,621	5,974	58	21	C	562	6,765	5,925	57	21	C	562	6,741	5,903	56	21	C
			574	576	930	6,621	5,969	60	25	C	930	6,765	5,922	59	25	C	930	6,741	5,899	59	25	C
			576	578	1,378	6,621	5,962	61	24	C	1,378	6,765	5,914	61	24	C	1,378	6,741	5,893	61	24	C
			578	580	1,268	6,621	5,953	61	24	C	1,268	6,765	5,907	61	24	C	1,268	6,741	5,887	61	24	C
			580	582	875	6,621	5,945	61	24	C	875	6,765	5,904	61	24	C	875	6,741	5,879	61	24	C
		END EB I-94	582	584	1,173	6,621	5,939	61	24	C	1,173	6,765	5,899	61	24	C	1,173	6,741	5,874	61	24	C
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,260	6,260	62	26	C	1,488	6,379	6,379	61	26	C	1,488	6,379	6,376	61	26	C
			750	752	590	6,260	6,257	62	25	C	590	6,379	6,377	62	26	C	590	6,379	6,374	62	26	C
			752	754	1,231	6,260	6,254	61	26	C	1,231	6,379	6,370	61	26	C	1,231	6,379	6,371	61	26	C
			754	756	1,378	6,260	6,248	60	26	C	1,378	6,379	6,364	60	27	C	1,378	6,379	6,365	60	26	C
			756	758	775	6,260	6,244	58	27	C	775	6,379	6,361	58	27	C	775	6,379	6,360	58	27	C
		Cedar Ave Exit	758	759	1,026	6,260	6,242	54	27	C	1,026	6,379	6,359	54	28	C	1,026	6,379	6,357	54	27	C
	Cedar Ave Exit		759	760	755	5,030	5,013	53	24	C	755	5,149	5,135	52	25	C	755	5,169	5,162	52	25	C
			760	761	1,114	5,030	5,012	52	24	C	1,114	5,149	5,133	49	26	C	1,114	5,169	5,160	47	28	C
		SB I-35W Exit	761	762	677	5,030	5,011	51	25	C	677	5,149	5,133	47	27	C	677	5,169	5,158	43	31	D
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,301	4,303	49	29	D	492	4,200	4,213	44	33	D	492	4,200	4,184	37	38	E
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	6,462	6,466	46	34	D	1,637	6,200	6,208	38	40	E	1,637	6,232	6,204	33	47	F
	11th St Exit		764	15	730	5,103	5,103	49	35	D												
		NB I-35W Flyover	15	765	828	5,103	5,102	49	35	D												
	11th St Exit		764	765							1,022	4,921	4,896	33	52	F	1,022	4,963	4,892	27	62	F
		NB I-35W/4th Ave Entrance	765	766	490	7,143	6,730	46	37	E	1,082	4,921	4,873	26	63	F	1,082	4,963	4,867	24	69	F
	NB I-35W/4th Ave Entrance		766	767	717	7,513	7,095	44	37	E	717	7,291	6,752	30	53	F	717	7,313	6,771	29	55	F
		Lyndale/Hennepin Exit	767	768	1,834	7,513	7,090	45	37	E	1,834	7,291	6,743	47	34	D	1,834	7,313	6,764	46	34	D
	Lyndale/Hennepin Exit		768	769	1,590	6,253	5,861	36	55	F	1,590	6,200	5,696	37	52	F	1,590	6,222	5,740	36	53	F
			769	770	1,188	6,253	5,858	43	45	F	1,188	6,200	5,694	45	42	E	1,188	6,222	5,739	45	43	E
		WB I-394 Exit	770	771	1,432	6,253	5,853	42	39	E	1,432	6,200	5,692	44	37	E	1,432	6,222	5,738	43	37	E
	WB I-394 Exit		771	772	508	2,933	2,659	52	17	B	508	2,900	2,587	52	17	B	508	2,922	2,622	52	17	B
		TH 55 Exit	772	774	544	2,933	2,658	54	14	B	544	2,900	2,586	54	14	B	544	2,922	2,621	54	14	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,634	2,384	54	15	B	400	2,601	2,312	54	14	B	400	2,623	2,352	54	15	B
	NB I-35W Flyover		256	6	470	2,040	1,630	29	57	F	890	2,050	1,583	30	53	F	890	2,010	1,588	29	55	F
			6	3	251	2,040	1,630	32	50	F	142	2,050	1,581	30	52	F	142	2,010	1,586	29	54	F
		4th Avenue Entrance	3	2							114	2,050	1,581	31	25	C	114	2,010	1,586	30	27	C
		WB I-94	3	765	200	2,040	1,629	38	43	F												
	4th Avenue		5	4	466	370	370	9	21	C	466	320	318	8	20	B	466	340	339	9	20	C
		NB Flyover Entrance	4	2	160	370	368	19	11	B	160	320	318	20	9	A	160	340	339	20	10	A
	NB Flyover Entrance		2	1	164	370	368	34	11	B	164	2,370	1,898	32	20	B	164	2,350	1,924	31	21	C
		WB I-94	1	766	254	370	368	43	9	A	254	2,370	1,897	31	30	D	254	2,350	1,923	30	33	D

	Location From	Location To	Node From	Node To	Model # 7: 2038 Full Build Without 4th Ave Ramp						Model # 8: 2038 Full Build NB Flyover						Model # 9: 2038 Full Build NB Flyover w/o 4th Ave					
					Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**		554	556	984	4,201	3,973	24	86	F	984	4,221	4,005	24	84	F	984	4,201	3,991	24	84	F
			556	557	632	4,201	3,973	24	83	F	632	4,221	4,004	24	82	F	632	4,201	3,988	24	82	F
		EB I-394 Entrance	557	558	789	4,201	3,972	27	74	F	789	4,221	4,004	27	73	F	789	4,201	3,987	27	73	F
	EB I-394 Entrance		558	559	442	6,391	5,726	26	74	F	442	6,421	5,766	26	74	F	442	6,391	5,743	26	74	F
			559	560	1,192	6,391	5,722	31	61	F	1,192	6,421	5,763	32	60	F	1,192	6,391	5,740	31	61	F
		Lyndale/Hennepin Entrance	560	561	1,856	6,391	5,711	31	62	F	1,856	6,421	5,755	31	61	F	1,856	6,391	5,728	31	62	F
	Lyndale/Hennepin Entrance		561	562	1,485	8,441	7,690	38	50	F	1,485	8,441	7,719	39	50	F	1,485	8,441	7,703	39	50	F
			562	563	706	8,441	7,678	49	39	E	706	8,441	7,707	49	39	E	706	8,441	7,692	49	39	E
		SB I-35W Exit	563	564	474	8,441	7,675	50	39	E	474	8,441	7,706	50	39	E	474	8,441	7,689	50	39	E
	SB I-35W Exit		564	565	792	6,241	5,642	51	37	E	792	6,241	5,672	51	37	E	792	6,241	5,666	51	37	E
			565	566	865	6,241	5,640	51	37	E	865	6,241	5,669	51	37	E	865	6,241	5,664	51	37	E
		NB I-35W Exit	566	567	388	6,241	5,638	52	29	D	388	6,241	5,667	51	29	D	388	6,241	5,663	51	29	D
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,811	4,347	51	28	D	688	4,821	4,374	51	28	D	688	4,811	4,363	51	28	D
	5th Ave Entrance	TH 55 Exit	568	569	1,557	6,561	5,852	53	28	C	1,557	6,591	5,914	52	28	D	1,557	6,561	5,857	52	28	C
	TH 55 Exit	NB I-35W Entrance	569	570	469	5,651	4,870	58	28	D	469	5,651	4,829	58	28	C	469	5,651	4,880	58	28	D
	NB I-35W Entrance		570	572	1,016	6,262	5,462	61	23	C	1,016	6,232	5,401	61	22	C	1,016	6,262	5,478	61	23	C
		Cedar Ave Entrance	572	573	1,027	6,262	5,457	61	22	C	1,027	6,232	5,396	61	22	C	1,027	6,262	5,474	61	23	C
	Cedar Ave Entrance		573	574	562	6,761	5,952	57	22	C	562	6,741	5,900	57	21	C	562	6,761	5,969	56	22	C
			574	576	930	6,761	5,947	59	25	C	930	6,741	5,895	59	25	C	930	6,761	5,964	59	25	C
			576	578	1,378	6,761	5,941	61	24	C	1,378	6,741	5,886	61	24	C	1,378	6,761	5,961	61	24	C
			578	580	1,268	6,761	5,934	61	24	C	1,268	6,741	5,880	61	24	C	1,268	6,761	5,957	61	24	C
			580	582	875	6,761	5,928	61	24	C	875	6,741	5,876	61	24	C	875	6,761	5,953	61	24	C
		END EB I-94	582	584	1,173	6,761	5,921	61	24	C	1,173	6,741	5,871	61	24	C	1,173	6,761	5,949	61	24	C
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,390	6,383	61	26	C	1,488	6,379	6,371	61	26	C	1,488	6,390	6,384	61	26	C
			750	752	590	6,390	6,381	62	26	C	590	6,379	6,367	62	26	C	590	6,390	6,381	62	26	C
			752	754	1,231	6,390	6,379	61	26	C	1,231	6,379	6,364	61	26	C	1,231	6,390	6,378	61	26	C
			754	756	1,378	6,390	6,373	60	27	C	1,378	6,379	6,358	60	27	C	1,378	6,390	6,371	60	26	C
			756	758	775	6,390	6,369	58	27	C	775	6,379	6,353	58	27	C	775	6,390	6,366	59	27	C
		Cedar Ave Exit	758	759	1,026	6,390	6,367	54	27	C	1,026	6,379	6,352	55	27	C	1,026	6,390	6,365	55	27	C
	Cedar Ave Exit		759	760	755	5,170	5,165	53	25	C	755	5,169	5,151	53	25	C	755	5,170	5,175	53	25	C
			760	761	1,114	5,170	5,161	51	25	C	1,114	5,169	5,150	52	25	C	1,114	5,170	5,174	52	25	C
		SB I-35W Exit	761	762	677	5,170	5,159	49	26	C	677	5,169	5,150	51	25	C	677	5,170	5,173	51	25	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,152	4,152	47	30	D	492	4,200	4,185	50	28	C	492	4,152	4,159	50	28	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	6,143	6,148	45	33	D	1,637	6,232	6,217	46	33	D	1,637	6,143	6,152	46	32	D
	11th St Exit		764	15							780	4,963	4,941	49	34	D	780	4,864	4,877	49	33	D
		NB I-35W Flyover	15	765							828	4,963	4,940	49	34	D	828	4,864	4,876	50	33	D
	11th St Exit		764	765	1,022	4,864	4,862	48	34	D												
		NB I-35W/4th Ave Entrance	765	766	1,082	4,864	4,860	42	39	E	490	6,973	6,521	45	36	E	490	7,024	6,550	47	35	D
	NB I-35W/4th Ave Entrance		766	767	717	7,024	6,539	37	45	F	714	7,313	6,859	44	37	E	714	7,024	6,550	48	34	D
		Lyndale/Hennepin Exit	767	768	1,834	7,024	6,539	47	32	D	1,834	7,313	6,855	46	35	E	1,834	7,024	6,548	48	32	D
	Lyndale/Hennepin Exit		768	769	1,590	5,945	5,506	37	50	F	1,590	6,222	5,789	36	54	F	1,590	5,945	5,511	36	51	F
			769	770	1,188	5,945	5,502	45	41	E	1,188	6,222	5,787	44	44	F	1,188	5,945	5,510	45	41	E
		WB I-394 Exit	770	771	1,432	5,945	5,500	43	35	E	1,432	6,222	5,785	42	39	E	1,432	5,945	5,506	43	36	E
	WB I-394 Exit		771	772	508	2,625	2,330	52	15	B	508	2,922	2,606	52	17	B	508	2,625	2,317	52	15	B
		TH 55 Exit	772	774	544	2,625	2,330	54	12	B	544	2,922	2,606	54	14	B	544	2,625	2,316	54	12	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,356	2,097	54	13	B	400	2,623	2,340	54	14	B	400	2,356	2,082	54	13	B
	NB I-35W Flyover		256	6	890	2,160	1,680	30	56	F	470	2,010	1,583	29	54	F	470	2,160	1,677	29	58	F
			6	3	142	2,160	1,680	32	53	F	251	2,010	1,582	33	49	F	251	2,160	1,676	32	52	F
		4th Avenue Entrance	3	2	114	2,160	1,680	34	25	C												
		WB I-94	3	765							200	2,010	1,582	38	42	E	200	2,160	1,676	38	45	F
	4th Avenue		5	4							466	340	338	9	20	C						
		NB Flyover Entrance	4	2							160	340	338	20	10	A						
	NB Flyover Entrance		2	1	164	2,160	1,679	37	23	C	164	340	338	34	10	A						
		WB I-94	1	766	254	2,160	1,679	39	43	F	254	340	339	40	8	A						

Table A-2

I-35W Transit/Access Project

2038 Freeway MOE Comparison

PM Peak Hour

Direction	Location From	Location To	Node From	Node To	Model # 1 Existing Conditions						Model # 2 2038 No Build Conditions						Model # 3 2038 Transit Station Only Conditions					
					Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,790	4,819	63	20	B	744	5,921	5,918	41	38	E	744	5,921	5,877	39	40	E
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,710	6,757	64	18	B	1,355	8,101	7,259	21	60	F	1,355	8,101	7,335	24	54	F
	60th St Entrance	Diamond Lake Exit	106	108	910	6,890	6,936	64	17	B	910	8,521	7,614	19	64	F	910	8,521	7,677	22	58	F
	Diamond Lake Exit		108	110	1,432	6,460	6,527	65	20	C	1,432	8,321	7,329	18	84	F	1,432	8,321	7,369	20	76	F
		Diamond Lake Entrance	110	112	1,225	6,460	6,528	65	20	C	1,225	8,321	7,289	18	83	F	1,225	8,321	7,313	20	77	F
	Diamond Lake Entrance		112	113	1,449	6,810	6,886	60	22	C	1,449	8,761	7,719	19	76	F	1,449	8,761	7,732	21	73	F
			113	114	542	6,810	6,882	64	22	C	542	8,761	7,704	20	79	F	542	8,761	7,711	21	76	F
		46th St Exit	114	116	1,462	6,810	6,877	65	20	C	1,462	8,761	7,703	19	79	F	1,462	8,761	7,696	20	76	F
	46th St Exit	46th St BRT Exit	116	118	238	6,260	6,300	65	17	B	238	8,031	7,114	16	76	F	238	8,031	7,099	17	73	F
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	6,260	6,294	66	19	B	2,201	8,031	7,105	16	89	F	2,201	8,031	7,072	16	88	F
	46th St BRT Entrance	46th St Entrance	120	122	378	6,260	6,295	65	17	B	378	8,031	7,110	16	79	F	378	8,031	7,061	15	79	F
	46th St Entrance		122	124	1,521	6,740	6,778	62	21	C	1,521	8,632	7,718	17	83	F	1,521	8,632	7,663	17	83	F
			124	126	818	6,740	6,778	64	21	C	818	8,632	7,715	19	80	F	818	8,632	7,658	19	80	F
		35/36th St Exit	126	128	1,514	6,740	6,779	63	21	C	1,514	8,632	7,709	20	75	F	1,514	8,632	7,661	20	75	F
	35/36th St Exit		128	130	1,485	6,220	6,266	64	20	B	1,485	8,022	7,214	19	74	F	1,485	8,022	7,168	19	75	F
		35/36th St Entrance	130	132	1,474	6,220	6,270	63	20	B	1,474	8,022	7,233	20	73	F	1,474	8,022	7,187	20	74	F
	35/36th St Entrance	31/Lake St Exit	132	134	604	7,010	7,067	58	21	C	604	8,902	8,135	21	65	F	604	8,902	8,092	20	66	F
	31/Lake St Exit	Lake St BRT Exit	134	136	1,029	6,110	6,160	61	18	B	1,029	8,032	7,352	21	65	F						
	31/Lake St Exit		134	135													478	8,032	7,322	20	61	F
		Lake St BRT Exit	135	136													553	8,032	7,224	20	73	F
	Lake St BRT Exit	Lake St BRT Entrance	136	138	721	6,110	6,160	62	20	C	721	8,032	7,374	21	71	F	718	8,032	7,241	21	71	F
	Lake St BRT Entrance		138	140	1,190	6,110	6,160	59	20	B	1,190	8,032	7,407	22	62	F	1,240	8,032	7,264	22	66	F
			140	142	569	6,110	6,155	55	23	C	569	8,032	7,433	24	62	F	494	8,032	7,394	24	54	F
			142	144	1,061	6,110	6,151	52	24	C	1,061	8,032	7,451	25	59	F	1,061	8,032	7,398	25	60	F
		NB I-35W/TH 65 SPLIT	144	146	859	6,110	6,147	48	26	C	859	8,032	7,467	25	59	F	859	8,032	7,398	25	59	F
	Begin NB TH 65		146	148	498	3,250	3,265	39	29	D	498	4,641	4,253	37	39	E	498	4,641	4,203	39	36	E
			148	150	281	3,250	3,260	37	30	D	281	4,641	4,248	36	40	E	281	4,641	4,199	38	37	E
			150	152	284	3,250	3,257	36	32	D	284	4,641	4,246	34	42	E	284	4,641	4,196	36	39	E
			152	154	582	3,250	3,251	34	33	D	582	4,641	4,241	32	44	F	582	4,641	4,191	34	41	E
		WB I-94 Exit	154	156	644	3,250	3,244	28	31	D	644	4,641	4,233	27	42	E	644	4,641	4,183	28	40	E
	WB I-94 Exit	**END NB TH 65**	156	158	983	1,650	1,690	54	10	B	983	2,851	2,767	53	17	B	983	2,851	2,737	53	17	B
	NB I-35W/TH 65 Split		146	161	665	2,860	2,876	52	28	C	665	3,391	3,222	16	104	F	665	3,391	3,192	15	106	F
		New - EB I-94 Exit	162	163																		
	New - EB I-94 Exit		163	164	927	2,860	2,879	49	30	D	927	3,391	3,232	16	104	F	927	3,391	3,198	15	104	F
		5th Ave Entrance	164	165	965	2,860	2,883	32	46	F	965	3,391	3,233	17	98	F	965	3,391	3,198	16	99	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,590	3,622	37	45	F	1,048	4,390	3,979	28	64	F	1,048	4,390	3,945	28	64	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,800	4,815	46	33	D	1,024	5,870	5,368	43	39	E	1,024	5,870	5,334	43	39	E
	EB I-94 Exit		167	168	540	4,150	4,141	48	29	D	540	5,041	4,590	47	32	D	540	5,041	4,583	47	33	D
		Washington Ave Exit	168	169	448	4,150	4,143	50	27	C	448	5,041	4,590	50	30	D	448	5,041	4,582	50	30	D
	Washington Ave Exit		169	170	625	3,770	3,751	54	35	D	625	4,210	3,800	54	35	E	625	4,210	3,812	54	35	E
		END NB I-35W	170	171	523	3,770	3,751	56	33	D	523	4,210	3,800	56	34	D	523	4,210	3,810	56	34	D
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	1,950	1,915	53	22	C	1,074	2,209	2,158	9	117	F	1,074	2,209	2,162	9	117	F
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,590	2,532	44	30	D	892	2,839	2,690	10	120	F	892	2,839	2,690	10	120	F
	WB I-94 Entrance		366	367	1,871	3,620	3,498	39	44	F	1,871	3,989	3,804	22	79	F	1,871	3,989	3,810	22	79	F
			367	368	827	3,620	3,490	30	61	F	827	3,989	3,803	30	64	F	827	3,989	3,811	30	64	F
			368	369	483	3,620	3,487	38	50	F	483	3,989	3,803	41	47	F	483	3,989	3,811	41	47	F
			369	370	403	3,620	3,485	47	42	E	403	3,989	3,804	50	38	E	403	3,989	3,810	50	38	E
		SB TH 65 Entrance	374	376	627	3,620	3,475	53	32	D	627	3,989	3,803	54	35	E	627	3,989	3,811	54	35	E
	Begin SB TH 65	12th St Entrance	300	302	867	2,040	1,921	54	19	B	867	2,050	2,050	57	18	B	867	2,050	2,051	57	18	B
	12th St Entrance	EB I-94 Entrance	302	304	1,088	2,620	2,521	46	26	C	1,088	2,630	2,749	47	27	C	1,088	2,630	2,750	47	27	C
	EB I-94 Entrance		304	307	1,574	4,200	4,056	54	27	C	1,574	4,221	4,251	57	25	C	1,574	4,221	4,257	57	25	C
		SB I-35W Entrance	307	310	1,516	4,200	4,044	46	34	D	1,516	4,221	4,249	49	32	D	1,516	4,221	4,254	50	32	D
			307	308																		
		SB I-35W Entrance	308	310																		
	SB I-35W Entrance		310	314	698	7,820	7,507	54	35	D	698	8,210	8,052	56	36	E	698	8,210	8,061	56	36	E
			314	318	379	7,820	7,503	56	34	D	379	8,210	8,052	58	35	D	379	8,210	8,059	58	35	D
			318	320	900	7,820	7,499	57	33	D	900	8,210	8,051	58	35	D	972	8,210	8,059	59	31	D
		Lake St BRT Exit	320	322	616	7,820	7,491	54	29	D	616	8,210	8,052	54	31	D	545	8,210	7,931	57	35	D
	Lake St BRT Exit	Lake St BRT Entrance	322	324	719	7,820	7,431	51	36	E	719	8,210	7,941	48	41	E	721	8,210	7,931	56	35	E
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	7,820	7,474	50	35	E	1,325	8,210	8,058	49	38	E	1,326	8,210	7,930	55	36	E
	31/Lake St Entrance	Lake St BRT Entrance	326	327													134	9,260	8,995	49	37	E
	Lake St BRT Entrance	35/36th St Exit	327	328													384	9,260	9,122	49	32	D
	31/Lake St Entrance	35/36th St Exit	326	328	518	8,900	8,600	49	35	E	518	9,260	9,118	52	35	E						
	35/36th St Exit		328	330	1,384	7,800	7,516	58	33	D	1,384	8,150	8,037	60	33	D	1,384	8,150	8,039	57	35	E
		35/36th St Entrance	330	332	1,712	7,800	7,494	58	32	D	1,712	8,150	8,037	59	34	D	1,712	8,150	8,037	53	38	E
	35/36th St Entrance		332	334	1,460	8,170	7,839	52	35	E	1,460	8,610	8,498	50	40	E	1,460	8,610	8,492	47	42	E
			334	336	544	8,170	7,823	56	35	E	544	8,610	8,498	55	39	E	544	8,610	8,490	53	40	E
		46th St Exit	336	338	1,512	8,170	7,807	59	28	D	1,512	8,610	8,497	59	31	D	1,512	8,610	8,490	58	31	D
	46th St Exit	46th St BRT Exit	338	340	780	7,380	7,038	63	20	C	780	7,771	7,668	63	22	C	780	7,771	7,642	63	22	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	7,380	7,015	65	22	C	2,275	7,771	7,646	64	24	C	2,275	7,771	7,619	64	24	C
	46th St BRT Entrance	46th St Entrance	342	344	393	7,380	7,013	63	19	B	393	7,771	7,666	56	24	C	393	7,771	7,638	57	24	C
	46th St Entrance		344	346	1,397	7,720	7,349	59	24	C	1,397	8,451	8,347	41	39	E	1,397	8,451	8,320	44	37	E
		60th St Exit	346	348	1,495	7,720	7,353	53	27	C	1,495	8,451	8,347	39	41	E	1,495	8,451	8,320	40	41	E
	60th St Exit	TH 62 Exit	348	350	2,036	7,170	6,803	56	25	C	2,036	7,810	7,712	52	30	D	2,036	7,810	7,686	52	30	D
	TH 62 Exit		350	352	1,409	3,170	2,985	65	16	B	1,409	3,649	3,614	63	19	B	1,409	3,649	3,604	63	19	B
			352	354	1,616	3,170	2,986	66	15	B	1,616	3,649	3,613	65	19	B	1,616	3,649	3,605	65	18	B
		END SB I-35W	354	356	719	3,170	2,987	66	15	B	719	3,649	3,614	66	18	B	719	3,649	3,606	66	18	B

Direction	Location From	Location To	Node From	Node To	Model # 4 2038 Transit Station, SB Braid, NB Flyover						Model # 5 2038 Build Lake St Ramps Only						Model # 6 2038 Full Build					
					Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	5,921	5,932	44	36	E	744	6,140	6,183	57	28	D	744	6,220	6,267	56	29	D
	TH 62 Entrance	60th St Entrance	104	106	1,355	8,101	7,384	22	56	F	1,355	8,340	8,423	62	23	C	1,355	8,420	8,485	60	24	C
	60th St Entrance	Diamond Lake Exit	106	108	910	8,521	7,732	21	59	F	910	8,730	8,808	56	24	C	910	8,871	8,921	55	26	C
	Diamond Lake Exit		108	110	1,432	8,321	7,429	19	79	F	1,432	8,270	8,317	48	35	D	1,432	8,680	8,695	52	34	D
		Diamond Lake Entrance	110	112	1,225	8,321	7,389	19	78	F	1,225	8,270	8,303	39	43	E	1,225	8,680	8,684	45	39	E
	Diamond Lake Entrance		112	113	1,449	8,761	7,829	21	73	F	1,449	9,030	9,073	44	39	E	1,449	9,129	9,143	46	38	E
			113	114	542	8,761	7,820	21	76	F	542	9,030	9,068	56	32	D	542	9,129	9,137	54	34	D
		46th St Exit	114	116	1,462	8,761	7,819	20	75	F	1,462	9,030	9,060	60	29	D	1,462	9,129	9,129	57	31	D
	46th St Exit	46th St BRT Exit	116	118	238	8,031	7,219	17	73	F	238	8,300	8,350	61	23	C	238	8,399	8,454	58	26	C
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,031	7,210	17	86	F	2,201	8,300	8,320	60	28	D	2,201	8,399	8,418	57	31	D
	46th St BRT Entrance	46th St Entrance	120	122	378	8,031	7,219	16	78	F	378	8,300	8,304	57	26	C	378	8,399	8,393	53	29	D
	46th St Entrance		122	124	1,521	8,632	7,841	18	82	F	1,521	8,892	8,884	53	33	D	1,521	8,911	8,868	47	37	E
			124	126	818	8,632	7,855	20	79	F	818	8,892	8,857	52	35	E	818	8,911	8,815	44	42	E
		35/36th St Exit	126	128	1,514	8,632	7,864	21	74	F	1,514	8,892	8,816	47	37	E	1,514	8,911	8,766	39	45	F
	35/36th St Exit		128	130	1,485	8,022	7,352	20	73	F	1,485	8,441	8,336	37	46	F	1,485	8,542	8,372	32	54	F
		35/36th St Entrance	130	132	1,474	8,022	7,380	21	71	F	1,474	8,441	8,294	31	56	F	1,474	8,542	8,309	29	60	F
	35/36th St Entrance	31/Lake St Exit	132	134	604	8,902	8,294	22	63	F	604	9,161	8,996	29	53	F	604	9,332	9,066	28	51	F
	31/Lake St Exit	Lake St BRT Exit	134	136																		
	31/Lake St Exit		134	135	478	8,032	7,511	22	57	F	478	8,281	8,159	28	50	F	478	8,672	8,452	28	45	F
		Lake St BRT Exit	135	136	553	8,032	7,414	22	70	F	553	8,281	8,039	26	62	F	553	8,672	8,324	28	50	F
	Lake St BRT Exit	Lake St BRT Entrance	136	138	718	8,032	7,437	22	68	F	843	8,281	8,032	26	62	F	843	8,672	8,313	32	44	F
	Lake St BRT Entrance		138	140	1,240	8,032	7,464	23	64	F	1,112	8,281	8,027	28	58	F	1,112	8,062	7,747	34	46	F
			140	142	494	8,032	7,595	25	52	F	496	8,281	8,141	30	47	F	496	8,062	7,853	34	40	E
			142	144	1,061	8,032	7,602	27	57	F	1,061	9,041	8,883	30	50	F	1,061	8,842	8,611	36	40	E
		NB I-35W/TH 65 SPLIT	144	146	859	8,032	7,606	28	55	F	859	9,041	8,863	25	61	F	859	8,842	8,605	37	41	E
	Begin NB TH 65		146	148	498	4,641	4,375	54	27	C	498	4,590	4,703	42	38	E	498	4,411	4,382	33	44	F
			148	150	281	4,641	4,374	54	27	C	281	4,590	4,700	40	40	E	281	4,411	4,376	32	46	F
			150	152	284	4,641	4,373	52	28	C	284	4,590	4,698	38	42	E	284	4,411	4,373	31	47	F
			152	154	582	4,641	4,372	50	29	D	582	4,590	4,694	36	44	F	582	4,411	4,369	30	49	F
		WB I-94 Exit	154	156	644	4,641	4,371	44	27	C	644	4,590	4,689	30	42	E	644	4,411	4,364	27	43	F
	WB I-94 Exit	**END NB TH 65**	156	158	983	2,851	2,819	53	18	B	983	3,000	3,226	53	20	C	983	2,671	2,844	53	18	B
	NB I-35W/TH 65 Split		146	161	665	3,391	3,231	15	106	F	174	4,451	4,149	17	97	F	174	4,431	4,219	40	44	F
		New - EB I-94 Exit	162	163							678	4,451	4,143	16	86	F	678	4,431	4,228	29	56	F
	New - EB I-94 Exit		163	164	927	3,391	3,232	16	104	F	552	3,123	2,845	14	106	F	552	3,053	2,882	25	68	F
		5th Ave Entrance	164	165	965	3,391	3,232	16	98	F	965	3,123	2,833	13	114	F	965	3,053	2,869	16	94	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,390	3,977	28	64	F	1,048	4,561	4,015	26	71	F	1,048	4,641	4,004	27	69	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,870	5,364	43	40	E	1,024	6,101	5,524	39	44	F	1,024	6,201	5,499	39	45	F
	EB I-94 Exit		167	168	540	5,041	4,608	47	33	D	540	5,341	4,897	45	36	E	540	5,372	4,904	45	37	E
		Washington Ave Exit	168	169	448	5,041	4,609	50	31	D	448	5,341	4,898	49	33	D	448	5,372	4,904	49	33	D
	Washington Ave Exit		169	170	625	4,210	3,849	54	36	E	625	4,310	3,961	54	37	E	625	4,391	4,010	54	37	E
		END NB I-35W	170	171	523	4,210	3,849	56	34	D	523	4,310	3,961	56	35	E	523	4,391	4,009	56	36	E
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,209	2,149	9	118	F	1,074	2,909	2,924	47	32	D	1,074	2,869	2,877	46	33	D
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,839	2,667	10	121	F	892	3,799	3,827	38	46	F	892	3,739	3,762	38	45	F
	WB I-94 Entrance		366	367	1,871	3,989	3,805	22	79	F	1,871	4,849	4,814	49	33	D	1,871	4,929	4,924	46	36	E
			367	368	827	3,989	3,804	30	64	F	827	4,849	4,821	35	46	F	827	4,929	4,931	34	48	F
			368	369	483	3,989	3,804	41	47	F	483	4,849	4,823	42	39	E	483	4,929	4,934	41	40	E
			369	370	205	3,989	3,803	49	39	E	205	4,849	4,823	51	32	D	205	4,929	4,935	49	34	D
		SB TH 65 Entrance	374	376	436	3,989	3,803	55	35	D	434	4,849	4,825	55	29	D	434	4,929	4,941	46	40	E
	Begin SB TH 65	12th St Entrance	300	302	867	2,050	2,048	57	18	B	867	1,970	1,970	57	18	B	867	2,000	1,998	57	18	B
	12th St Entrance	EB I-94 Entrance	302	304	1,088	2,630	2,748	48	27	C	1,088	2,520	2,639	48	25	C	1,088	2,600	2,715	44	29	D
	EB I-94 Entrance		304	307	1,574	4,221	4,257	58	25	C	1,574	4,231	4,264	49	29	D	1,574	4,381	4,363	31	48	F
		SB I-35W Entrance	307	310																		
			307	308	718	4,221	4,256	54	26	C	718	4,231	4,256	33	43	F	718	4,381	4,337	23	62	F
		SB I-35W Entrance	308	310	825	4,221	4,253	50	31	D	825	4,231	4,250	32	50	F	825	4,381	4,332	27	60	F
	SB I-35W Entrance		310	314	698	8,210	8,053	57	36	E	698	9,080	9,079	40	46	F	698	9,310	9,302	35	54	F
			314	318	379	8,210	8,052	59	34	D	765	9,080	9,087	46	39	E	765	9,310	9,311	45	42	E
			318	320	972	8,210	8,052	61	30	D	586	8,179	8,186	53	32	D	586	8,350	8,327	52	34	D
		Lake St BRT Exit	320	322	545	8,210	7,926	60	33	D	545	8,179	8,059	55	36	E	545	8,350	8,203	54	38	E
	Lake St BRT Exit	Lake St BRT Entrance	322	324	721	8,210	7,925	60	33	D	721	8,179	8,060	57	35	E	721	8,350	8,207	56	37	E
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,326	8,210	7,922	58	34	D	1,326	8,179	8,062	58	35	D	1,326	8,350	8,209	56	37	E
	31/Lake St Entrance	Lake St BRT Entrance	326	327	134	9,260	8,977	50	36	E	134	9,139	9,028	51	35	E	134	9,360	9,228	48	39	E
	Lake St BRT Entrance	35/36th St Exit	327	328	384	9,260	9,105	48	32	D	384	9,139	9,156	49	31	D	384	9,360	9,353	46	34	D
	31/Lake St Entrance	35/36th St Exit	326	328																		
	35/36th St Exit		328	330	1,384	8,150	8,032	56	36	E	1,384	8,109	8,112	57	36	E	1,384	8,270	8,288	52	40	E
		35/36th St Entrance	330	332	1,712	8,150	8,035	52	39	E	1,712	8,109	8,114	57	35	E	1,712	8,270	8,291	44	48	F
	35/36th St Entrance		332	334	1,460	8,610	8,495	47	42	E	1,460	8,499	8,507	50	40	E	1,460	8,769	8,795	43	48	F
			334	336	544	8,610	8,494	54	40	E	544	8,499	8,510	55	39	E	544	8,769	8,798	50	45	F
		46th St Exit	336	338	1,512	8,610	8,494	59	31	D	1,512	8,499	8,511	59	31	D	1,512	8,769	8,795	50	39	E
	46th St Exit	46th St BRT Exit	338	340	780	7,771	7,667	63	22	C	780	7,780	7,790	63	23	C	780	8,001	8,030	42	40	E
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	7,771	7,648	62	25	C	2,275	7,780	7,775	52	31	D	2,275	8,001	7,983	29	60	F
	46th St BRT Entrance	46th St Entrance	342	344	393	7,771	7,668	52	27	C	393	7,780	7,804	34	41	E	393	8,001	7,974	22	63	F
	46th St Entrance		344	346	1,397	8,451	8,347	40	40	E	1,397	8,449	8,486	31	53	F	1,397	8,670	8,633	26	64	F
		60th St Exit	346	348	1,495	8,451	8,352	38	42	E	1,495	8,449	8,499	36	45	F	1,495	8,670	8,625	35	48	F
	60th St Exit	TH 62 Exit	348	350	2,036	7,810	7,723	52	30	D	2,036	7,818	7,877	51	31	D	2,036	7,889	7,872	51	31	D
	TH 62 Exit		350	352	1,409	3,649	3,621	63	19	B	1,409	3,757	3,798	62	20	C	1,409	3,667	3,642	63	19	B
			352	354	1,616	3,649	3,620	65	19	B	1,616	3,757	3,799	65	20	B	1,616	3,667	3,643	65	19	B
		END SB I-35W	354	356	719	3,649	3,618	66	18	B	719	3,757	3,797	65	19	B	719	3,667	3,645	66	19	B

Direction	Location From	Location To	Node From	Node To	Model # 7 2038 Full Build Without 4th Ave Ramp						Model # 8 2038 Full Build NB Flyover						Model # 9 2038 Full Build NB Flyover w/o 4th Ave					
					Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	6,161	6,213	57	28	D	744	6,220	6,270	56	29	D	744	6,161	6,202	55	29	D
	TH 62 Entrance	60th St Entrance	104	106	1,355	8,421	8,477	59	24	C	1,355	8,420	8,502	61	23	C	1,355	8,421	8,436	57	25	C
	60th St Entrance	Diamond Lake Exit	106	108	910	8,760	8,780	54	26	C	910	8,871	8,942	56	25	C	910	8,760	8,746	52	27	C
	Diamond Lake Exit		108	110	1,432	8,189	8,149	45	37	E	1,432	8,680	8,717	54	33	D	1,432	8,189	8,116	44	38	E
		Diamond Lake Entrance	110	112	1,225	8,189	8,101	35	46	F	1,225	8,680	8,699	45	39	E	1,225	8,189	8,070	35	47	F
	Diamond Lake Entrance		112	113	1,449	9,020	8,902	40	43	E	1,449	9,129	9,149	47	37	E	1,449	9,020	8,874	39	44	F
			113	114	542	9,020	8,865	47	38	E	542	9,129	9,133	55	34	D	542	9,020	8,840	46	39	E
		46th St Exit	114	116	1,462	9,020	8,823	46	37	E	1,462	9,129	9,111	57	31	D	1,462	9,020	8,800	46	38	E
	46th St Exit	46th St BRT Exit	116	118	238	8,390	8,193	42	34	D	238	8,399	8,400	56	26	C	238	8,390	8,184	43	34	D
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,390	8,126	37	44	F	2,201	8,399	8,346	53	33	D	2,201	8,390	8,116	40	43	F
	46th St BRT Entrance	46th St Entrance	120	122	378	8,390	8,069	32	44	F	378	8,399	8,301	48	31	D	378	8,390	8,057	35	43	E
	46th St Entrance		122	124	1,521	8,982	8,614	31	52	F	1,521	8,911	8,768	44	39	E	1,521	8,982	8,602	32	52	F
			124	126	818	8,982	8,557	31	56	F	818	8,911	8,711	41	43	F	818	8,982	8,547	31	57	F
		35/36th St Exit	126	128	1,514	8,982	8,504	28	59	F	1,514	8,911	8,654	36	47	F	1,514	8,982	8,507	29	58	F
	35/36th St Exit		128	130	1,485	8,621	8,106	24	68	F	1,485	8,542	8,239	30	58	F	1,485	8,621	8,126	26	65	F
		35/36th St Entrance	130	132	1,474	8,621	8,054	23	72	F	1,474	8,542	8,177	27	63	F	1,474	8,621	8,077	24	68	F
	35/36th St Entrance	31/Lake St Exit	132	134	604	9,370	8,785	24	57	F	604	9,332	8,928	27	54	F	604	9,370	8,801	25	55	F
	31/Lake St Exit	Lake St BRT Exit	134	136																		
	31/Lake St Exit		134	135	478	8,751	8,209	24	49	F	478	8,672	8,294	26	48	F	478	8,751	8,213	25	47	F
		Lake St BRT Exit	135	136	553	8,751	8,089	27	51	F	553	8,672	8,164	26	54	F	553	8,751	8,097	27	50	F
	Lake St BRT Exit	Lake St BRT Entrance	136	138	843	8,751	8,086	32	42	E	843	8,672	8,144	26	53	F	843	8,751	8,099	33	41	E
	Lake St BRT Entrance		138	140	1,112	8,271	7,646	39	39	E	1,112	8,062	7,548	26	58	F	1,112	8,271	7,656	39	39	E
			140	142	496	8,271	7,766	41	33	D	496	8,062	7,643	28	47	F	496	8,271	7,776	41	33	D
			142	144	1,061	9,031	8,532	44	32	D	1,061	8,842	8,396	27	52	F	1,061	9,031	8,535	43	34	D
		NB I-35W/TH 65 SPLIT	144	146	859	9,031	8,538	48	30	D	859	8,842	8,369	22	65	F	859	9,031	8,546	41	36	E
	Begin NB TH 65		146	148	498	4,700	4,506	42	36	E	498	4,411	4,346	55	26	C	498	4,700	4,507	44	34	D
			148	150	281	4,700	4,504	40	37	E	281	4,411	4,347	55	26	C	281	4,700	4,506	42	35	E
			150	152	284	4,700	4,503	39	39	E	284	4,411	4,348	53	27	C	284	4,700	4,505	41	37	E
			152	154	582	4,700	4,503	37	40	E	582	4,411	4,348	51	29	D	582	4,700	4,504	39	39	E
		WB I-94 Exit	154	156	644	4,700	4,502	33	36	E	644	4,411	4,350	45	26	C	644	4,700	4,504	34	35	E
	WB I-94 Exit	**END NB TH 65**	156	158	983	2,520	2,610	53	16	B	983	2,671	2,797	53	18	B	983	2,520	2,608	53	16	B
	NB I-35W/TH 65 Split		146	161	174	4,331	4,035	51	26	C	174	4,431	4,009	12	114	F	174	4,331	4,047	32	49	F
		New - EB I-94 Exit	162	163	678	4,331	4,053	39	35	E	678	4,431	3,986	15	91	F	678	4,331	4,059	19	76	F
	New - EB I-94 Exit		163	164	552	2,972	2,742	37	38	E	552	3,053	2,671	12	114	F	552	2,972	2,707	14	98	F
		5th Ave Entrance	164	165	965	2,972	2,740	22	66	F	965	3,053	2,662	11	122	F	965	2,972	2,701	12	116	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,501	3,880	29	61	F	1,048	4,641	4,044	26	72	F	1,048	4,501	4,057	26	71	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	6,050	5,391	39	44	F	1,024	6,201	5,535	40	43	F	1,024	6,050	5,525	40	44	F
	EB I-94 Exit		167	168	540	5,340	4,869	45	36	E	540	5,372	4,813	46	35	E	540	5,340	4,889	45	36	E
		Washington Ave Exit	168	169	448	5,340	4,868	49	33	D	448	5,372	4,814	50	32	D	448	5,340	4,890	49	33	D
	Washington Ave Exit		169	170	625	4,329	3,967	54	37	E	625	4,391	3,918	54	36	E	625	4,329	3,983	54	37	E
		END NB I-35W	170	171	523	4,329	3,967	56	35	E	523	4,391	3,918	56	35	D	523	4,329	3,983	56	35	E
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,869	2,879	46	32	D	1,074	2,869	2,874	49	30	D	1,074	2,869	2,871	50	29	D
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	3,739	3,764	37	45	F	892	3,739	3,753	38	44	F	892	3,739	3,745	39	44	F
	WB I-94 Entrance		366	367	1,871	4,919	4,970	47	35	E	1,871	4,929	4,983	47	36	E	1,871	4,919	4,984	46	36	E
			367	368	827	4,919	4,978	34	48	F	827	4,929	4,988	34	49	F	827	4,919	5,000	34	49	F
			368	369	483	4,919	4,980	41	40	E	483	4,929	4,989	41	41	E	483	4,919	5,004	39	43	E
			369	370	205	4,919	4,980	50	33	D	205	4,929	4,990	48	35	E	205	4,919	5,004	45	38	E
		SB TH 65 Entrance	374	376	434	4,919	4,982	51	33	D	434	4,929	5,015	39	45	F	434	4,919	5,023	33	53	F
	Begin SB TH 65	12th St Entrance	300	302	867	1,950	1,952	58	17	B	867	2,000	1,997	57	18	B	867	1,950	1,951	57	18	B
	12th St Entrance	EB I-94 Entrance	302	304	1,088	2,590	2,709	47	27	C	1,088	2,600	2,711	43	29	D	1,088	2,590	2,706	44	29	D
	EB I-94 Entrance		304	307	1,574	4,331	4,383	33	45	F	1,574	4,381	4,371	31	52	F	1,574	4,331	4,377	30	49	F
		SB I-35W Entrance	307	310																		
			307	308	718	4,331	4,360	23	64	F	718	4,381	4,352	22	67	F	718	4,331	4,348	23	64	F
		SB I-35W Entrance	308	310	825	4,331	4,352	26	61	F	825	4,381	4,344	26	63	F	825	4,331	4,336	27	61	F
	SB I-35W Entrance		310	314	698	9,250	9,348	33	57	F	698	9,310	9,418	32	59	F	698	9,250	9,409	32	60	F
			314	318	765	9,250	9,353	44	43	E	765	9,310	9,422	44	43	F	765	9,250	9,414	44	43	F
			318	320	586	8,350	8,444	52	34	D	586	8,350	8,416	52	34	D	586	8,350	8,479	51	35	D
		Lake St BRT Exit	320	322	545	8,350	8,320	54	39	E	545	8,350	8,291	54	38	E	545	8,350	8,355	54	39	E
	Lake St BRT Exit	Lake St BRT Entrance	322	324	721	8,350	8,322	56	37	E	721	8,350	8,293	56	37	E	721	8,350	8,353	56	38	E
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,326	8,350	8,322	58	36	E	1,326	8,350	8,298	57	36	E	1,326	8,350	8,352	57	37	E
	31/Lake St Entrance	Lake St BRT Entrance	326	327	134	9,250	9,239	50	37	E	134	9,360	9,313	49	38	E	134	9,250	9,267	50	37	E
	Lake St BRT Entrance	35/36th St Exit	327	328	384	9,250	9,366	48	33	D	384	9,360	9,438	47	34	D	384	9,250	9,391	48	33	D
	31/Lake St Entrance	35/36th St Exit	326	328																		
	35/36th St Exit		328	330	1,384	8,190	8,321	55	38	E	1,384	8,270	8,366	53	39	E	1,384	8,190	8,316	56	37	E
		35/36th St Entrance	330	332	1,712	8,190	8,322	55	38	E	1,712	8,270	8,366	45	47	F	1,712	8,190	8,316	56	37	E
	35/36th St Entrance		332	334	1,460	8,569	8,702	48	42	E	1,460	8,769	8,867	44	47	F	1,460	8,569	8,692	49	42	E
			334	336	544	8,569	8,701	53	41	E	544	8,769	8,869	52	43	E	544	8,569	8,692	53	41	E
		46th St Exit	336	338	1,512	8,569	8,700	58	32	D	1,512	8,769	8,867	54	35	D	1,512	8,569	8,694	57	32	D
	46th St Exit	46th St BRT Exit	338	340	780	7,789	7,948	56	26	C	780	8,001	8,114	44	35	D	780	7,789	7,922	56	26	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	7,789	7,916	32	50	F	2,275	8,001	8,057	26	63	F	2,275	7,789	7,891	33	51	F
	46th St BRT Entrance	46th St Entrance	342	344	393	7,789	7,919	23	60	F	393	8,001	8,036	21	66	F	393	7,789	7,896	23	61	F
	46th St Entrance		344	346	1,397	8,489	8,611	26	63	F	1,397	8,670	8,691	25	65	F	1,397	8,489	8,588	26	63	F
		60th St Exit	346	348	1,495	8,489	8,606	35	47	F	1,495	8,670	8,681	35	47	F	1,495	8,489	8,585	35	47	F
	60th St Exit	TH 62 Exit	348	350	2,036	7,868	7,982	51	31	D	2,036	7,889	7,917	51	31	D	2,036	7,868	7,956	51	31	D
	TH 62 Exit		350	352	1,409	3,837	3,869	62	21	C	1,409	3,667	3,668	63	20	B	1,409	3,837	3,856	62	21	C
			352	354	1,616	3,837	3,867	65	20	B	1,616	3,667	3,667	65	19	B	1,616	3,837	3,854	65	20	B
		END SB I-35W	354	356	719	3,837	3,866	65	20	B	719	3,667	3,668	66	19	B	719	3,837	3,852	65	20	B

Table A-2

I-35W Transit/Access Project

2038 Freeway MOE Comparison

PM Peak Hour

	Location		Node		Model # 1: Existing Conditions						Model # 2: 2038 No Build Conditions						Model # 3: 2038 Transit Station Only Conditions					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**		554	556	984	3,530	3,525	50	36	E	984	4,070	4,055	25	84	F	984	4,070	4,055	25	83	F
			556	557	632	3,530	3,524	49	37	E	632	4,070	4,055	25	82	F	632	4,070	4,055	25	81	F
		EB I-394 Entrance	557	558	789	3,530	3,523	47	38	E	789	4,070	4,054	28	73	F	789	4,070	4,054	28	73	F
	EB I-394 Entrance		558	559	442	5,690	5,592	38	50	F	442	6,360	5,917	27	72	F	442	6,360	5,910	27	72	F
			559	560	1,192	5,690	5,593	42	46	F	1,192	6,360	5,915	33	60	F	1,192	6,360	5,908	33	59	F
		Lyndale/Hennepin Entrance	560	561	1,856	5,690	5,593	37	52	F	1,856	6,360	5,909	32	62	F	1,856	6,360	5,903	32	62	F
	Lyndale/Hennepin Entrance		561	562	1,485	7,290	7,145	43	43	E	1,485	8,091	7,629	40	48	F	1,485	8,091	7,622	40	48	F
			562	563	706	7,290	7,143	48	37	E	706	8,091	7,626	49	39	E	706	8,091	7,618	49	39	E
		SB I-35W Exit	563	564	474	7,290	7,143	49	37	E	474	8,091	7,627	50	38	E	474	8,091	7,618	50	38	E
	SB I-35W Exit		564	565	792	5,710	5,594	50	37	E	792	6,500	6,123	50	41	E	792	6,500	6,111	50	41	E
			565	566	865	5,710	5,594	51	37	E	865	6,500	6,122	51	40	E	865	6,500	6,109	51	40	E
		NB I-35W Exit	566	567	388	5,710	5,593	51	29	D	388	6,500	6,121	51	32	D	388	6,500	6,108	51	32	D
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,500	4,403	52	29	D	688	5,020	4,732	51	31	D	688	5,020	4,720	51	31	D
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,100	4,999	55	23	C	1,557	5,680	5,388	55	25	C	1,557	5,680	5,377	55	25	C
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,090	3,972	60	22	C	469	4,350	4,139	59	23	C	469	4,350	4,124	60	23	C
	NB I-35W Entrance		570	572	1,016	4,740	4,649	61	19	B	1,016	5,179	4,916	61	20	C	1,016	5,179	4,876	61	20	B
		Cedar Ave Entrance	572	573	1,027	4,740	4,647	62	19	B	1,027	5,179	4,913	58	21	C	1,027	5,179	4,876	59	21	C
	Cedar Ave Entrance		573	574	562	5,970	5,877	52	23	C	562	6,618	6,351	42	31	D	562	6,618	6,313	42	31	D
			574	576	930	5,970	5,875	57	26	C	930	6,618	6,350	54	29	D	930	6,618	6,309	54	29	D
			576	578	1,378	5,970	5,874	61	24	C	1,378	6,618	6,350	61	26	C	1,378	6,618	6,308	61	26	C
			578	580	1,268	5,970	5,875	61	24	C	1,268	6,618	6,350	61	26	C	1,268	6,618	6,306	61	26	C
			580	582	875	5,970	5,876	61	24	C	875	6,618	6,348	61	26	C	875	6,618	6,306	61	26	C
		END EB I-94	582	584	1,173	5,970	5,879	61	24	C	1,173	6,618	6,349	61	26	C	1,173	6,618	6,307	61	26	C
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,140	5,127	58	23	C	1,488	5,441	5,431	57	28	C	1,488	5,441	5,416	53	29	D
			750	752	590	5,140	5,111	54	29	D	590	5,441	5,419	55	32	D	590	5,441	5,382	47	37	E
			752	754	1,231	5,140	5,086	50	36	E	1,231	5,441	5,404	49	39	E	1,231	5,441	5,341	40	49	F
			754	756	1,378	5,140	5,035	39	48	F	1,378	5,441	5,371	44	49	F	1,378	5,441	5,281	32	68	F
			756	758	775	5,140	4,983	28	64	F	775	5,441	5,337	37	56	F	775	5,441	5,236	26	81	F
		Cedar Ave Exit	758	759	1,026	5,140	4,934	19	76	F	1,026	5,441	5,293	28	60	F	1,026	5,441	5,205	22	82	F
	Cedar Ave Exit		759	760	755	4,810	4,572	13	94	F	755	5,001	4,802	22	68	F	755	5,001	4,759	18	86	F
			760	761	1,114	4,810	4,538	12	93	F	1,114	5,001	4,760	19	69	F	1,114	5,001	4,746	18	80	F
		SB I-35W Exit	761	762	677	4,810	4,518	16	70	F	677	5,001	4,729	20	61	F	677	5,001	4,736	20	66	F
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,780	3,533	15	81	F	492	3,851	3,606	17	72	F	492	3,851	3,612	18	73	F
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	4,920	4,674	15	74	F	1,637	5,741	4,576	16	71	F	1,637	5,741	4,589	17	69	F
	11th St Exit		764	15																		
		NB I-35W Flyover	15	765																		
	11th St Exit		764	765	1,022	4,450	4,219	15	93	F	1,022	5,051	4,036	15	92	F	1,022	5,051	4,045	15	90	F
		NB I-35W/4th Ave Entrance	765	766	1,082	4,450	4,227	16	90	F	1,082	5,051	4,040	15	91	F	1,082	5,051	4,049	15	90	F
	NB I-35W/4th Ave Entrance		766	767	717	6,920	6,641	27	60	F	717	7,811	6,455	26	59	F	717	7,811	6,451	26	59	F
		Lyndale/Hennepin Exit	767	768	1,834	6,920	6,642	48	33	D	1,834	7,811	6,458	48	31	D	1,834	7,811	6,454	48	32	D
	Lyndale/Hennepin Exit		768	769	1,590	5,600	5,421	37	49	F	1,590	6,291	5,288	37	47	F	1,590	6,291	5,311	37	48	F
			769	770	1,188	5,600	5,423	46	40	E	1,188	6,291	5,290	46	38	E	1,188	6,291	5,316	46	39	E
		WB I-394 Exit	770	771	1,432	5,600	5,425	45	34	D	1,432	6,291	5,292	45	33	D	1,432	6,291	5,319	45	33	D
	WB I-394 Exit		771	772	508	3,050	2,999	52	19	B	508	3,351	2,914	52	19	B	508	3,351	2,910	52	19	B
		TH 55 Exit	772	774	544	3,050	2,999	54	16	B	544	3,351	2,915	54	15	B	544	3,351	2,911	54	15	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,660	2,611	54	16	B	400	2,920	2,560	54	16	B	400	2,920	2,549	54	16	B
	NB I-35W Flyover		256	6	890	1,600	1,545	18	85	F	890	1,790	1,452	16	90	F	890	1,790	1,435	17	86	F
			6	3	142	1,600	1,543	19	82	F	142	1,790	1,448	17	86	F	142	1,790	1,432	17	83	F
		4th Avenue Entrance	3	2	114	1,600	1,543	19	41	E	114	1,790	1,448	17	43	F	114	1,790	1,431	17	42	E
		WB I-94	3	765																		
	4th Avenue		5	4	466	870	869	14	33	D	466	970	969	11	46	F	466	970	970	11	45	F
		NB Flyover Entrance	4	2	160	870	868	20	25	C	160	970	969	20	28	D	160	970	970	20	28	C
	NB Flyover Entrance		2	1	164	2,470	2,409	22	37	E	164	2,760	2,416	20	40	E	164	2,760	2,401	21	39	E
		WB I-94	1	766	254	2,470	2,409	21	58	F	254	2,760	2,414	20	62	F	254	2,760	2,400	20	60	F

	Location		Node		Model # 4: 2038 Transit Station, SB Braid, NB Flyover						Model # 5: 2038 Build Lake St Ramps Only						Model # 6: 2038 Full Build					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**		554	556	984	4,070	4,049	25	83	F	984	4,131	4,070	25	83	F	984	4,131	4,067	25	83	F
			556	557	632	4,070	4,048	25	81	F	632	4,131	4,071	25	81	F	632	4,131	4,066	25	81	F
		EB I-394 Entrance	557	558	789	4,070	4,048	28	72	F	789	4,131	4,071	28	72	F	789	4,131	4,065	28	72	F
	EB I-394 Entrance		558	559	442	6,360	5,904	27	72	F	442	6,271	5,944	28	71	F	442	6,331	5,929	28	72	F
			559	560	1,192	6,360	5,904	33	59	F	1,192	6,271	5,944	34	58	F	1,192	6,331	5,928	34	58	F
		Lyndale/Hennepin Entrance	560	561	1,856	6,360	5,901	32	62	F	1,856	6,271	5,942	33	60	F	1,856	6,331	5,927	33	60	F
	Lyndale/Hennepin Entrance		561	562	1,485	8,091	7,621	40	48	F	1,485	7,772	7,438	42	45	F	1,485	7,862	7,453	41	45	F
			562	563	706	8,091	7,620	49	39	E	706	7,772	7,436	50	37	E	706	7,862	7,447	50	38	E
		SB I-35W Exit	563	564	474	8,091	7,619	50	38	E	474	7,772	7,436	50	37	E	474	7,862	7,445	50	38	E
	SB I-35W Exit		564	565	792	6,500	6,111	50	41	E	792	6,061	5,803	50	38	E	792	6,081	5,765	50	38	E
			565	566	865	6,500	6,111	51	40	E	865	6,061	5,802	51	38	E	865	6,081	5,764	51	38	E
		NB I-35W Exit	566	567	388	6,500	6,110	51	32	D	388	6,061	5,801	51	30	D	388	6,081	5,763	51	30	D
	NB I-35W Exit	5th Ave Entrance	567	568	688	5,020	4,722	51	31	D	688	4,521	4,290	51	28	C	688	4,521	4,266	51	28	C
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,680	5,381	54	25	C	1,557	5,849	5,589	53	26	C	1,557	5,899	5,617	53	27	C
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,350	4,118	59	23	C	469	4,569	4,247	59	24	C	469	4,478	4,109	59	23	C
	NB I-35W Entrance		570	572	1,016	5,179	4,872	61	20	B	1,016	5,329	4,876	60	20	C	1,016	5,307	4,703	61	19	B
		Cedar Ave Entrance	572	573	1,027	5,179	4,872	58	21	C	1,027	5,329	4,878	51	24	C	1,027	5,307	4,702	54	22	C
	Cedar Ave Entrance		573	574	562	6,618	6,311	42	31	D	562	6,738	6,292	36	36	E	562	6,736	6,132	38	33	D
			574	576	930	6,618	6,311	54	29	D	930	6,738	6,297	53	30	D	930	6,736	6,134	53	29	D
			576	578	1,378	6,618	6,312	61	26	C	1,378	6,738	6,299	61	26	C	1,378	6,736	6,135	61	25	C
			578	580	1,268	6,618	6,311	61	26	C	1,268	6,738	6,300	61	26	C	1,268	6,736	6,137	61	25	C
			580	582	875	6,618	6,311	61	26	C	875	6,738	6,302	61	26	C	875	6,736	6,138	61	25	C
		END EB I-94	582	584	1,173	6,618	6,311	61	26	C	1,173	6,738	6,304	61	26	C	1,173	6,736	6,138	61	25	C
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,441	5,444	62	22	C	1,488	5,321	5,266	51	31	D	1,488	5,392	5,368	54	31	D
			750	752	590	5,441	5,442	62	22	C	590	5,321	5,236	44	40	E	590	5,392	5,341	50	40	E
			752	754	1,231	5,441	5,443	62	22	C	1,231	5,321	5,189	34	54	F	1,231	5,392	5,314	43	48	F
			754	756	1,378	5,441	5,447	62	22	C	1,378	5,321	5,107	26	72	F	1,378	5,392	5,262	31	66	F
			756	758	775	5,441	5,450	61	22	C	775	5,321	5,035	21	86	F	775	5,392	5,217	23	81	F
		Cedar Ave Exit	758	759	1,026	5,441	5,450	57	22	C	1,026	5,321	4,989	18	89	F	1,026	5,392	5,193	19	91	F
	Cedar Ave Exit		759	760	755	5,001	4,990	53	24	C	755	4,901	4,552	15	99	F	755	4,972	4,773	16	102	F
			760	761	1,114	5,001	4,990	52	24	C	1,114	4,901	4,522	13	91	F	1,114	4,972	4,764	14	93	F
		SB I-35W Exit	761	762	677	5,001	4,988	48	26	C	677	4,901	4,510	16	71	F	677	4,972	4,756	16	74	F
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,851	3,840	51	25	C	492	3,851	3,531	13	90	F	492	3,782	3,603	13	92	F
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,741	4,818	50	23	C	1,637	5,622	4,505	14	80	F	1,637	5,692	4,603	14	81	F
	11th St Exit		764	15	730	5,051	4,258	51	28	D												
		NB I-35W Flyover	15	765	828	5,051	4,257	51	28	C												
	11th St Exit		764	765							1,022	5,052	4,042	14	99	F	1,022	5,051	4,105	14	98	F
		NB I-35W/4th Ave Entrance	765	766	490	6,841	5,803	48	30	D	1,082	5,052	4,045	14	96	F	1,082	5,051	4,109	14	95	F
	NB I-35W/4th Ave Entrance		766	767	717	7,811	6,771	44	35	E	717	7,652	6,511	25	61	F	717	7,701	6,541	26	61	F
		Lyndale/Hennepin Exit	767	768	1,834	7,811	6,767	48	33	D	1,834	7,652	6,516	47	32	D	1,834	7,701	6,543	47	33	D
	Lyndale/Hennepin Exit		768	769	1,590	6,291	5,488	37	50	F	1,590	6,322	5,505	37	50	F	1,590	6,360	5,484	37	50	F
			769	770	1,188	6,291	5,488	45	41	E	1,188	6,322	5,512	45	41	E	1,188	6,360	5,489	46	40	E
		WB I-394 Exit	770	771	1,432	6,291	5,489	44	35	D	1,432	6,322	5,517	45	34	D	1,432	6,360	5,492	45	34	D
	WB I-394 Exit		771	772	508	3,351	2,983	52	19	B	508	3,502	3,184	51	21	C	508	3,490	3,123	51	20	C
		TH 55 Exit	772	774	544	3,351	2,982	54	16	B	544	3,502	3,184	53	17	B	544	3,490	3,124	54	16	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,920	2,613	54	16	B	400	3,051	2,753	54	17	B	400	3,039	2,712	54	17	B
	NB I-35W Flyover		256	6	470	1,790	1,548	28	56	F	890	1,590	1,455	16	89	F	890	1,740	1,519	16	94	F
			6	3	251	1,790	1,547	32	48	F	142	1,590	1,454	17	87	F	142	1,740	1,520	17	88	F
		4th Avenue Entrance	3	2							114	1,590	1,453	16	44	F	114	1,740	1,520	17	44	F
		WB I-94	3	765	200	1,790	1,547	38	41	E												
	4th Avenue		5	4	466	970	970	11	45	F	466	1,010	1,010	11	46	F	466	910	909	11	44	F
		NB Flyover Entrance	4	2	160	970	970	20	28	C	160	1,010	1,011	20	29	D	160	910	909	20	26	C
	NB Flyover Entrance		2	1	164	970	970	34	29	D	164	2,600	2,464	20	42	E	164	2,650	2,429	21	39	E
		WB I-94	1	766	254	970	970	42	23	C	254	2,600	2,463	19	65	F	254	2,650	2,430	20	60	F

	Location		Node		Model # 7: 2038 Full Build Without 4th Ave Ramp						Model # 8: 2038 Full Build NB Flyover						Model # 9: 2038 Full Build NB Flyover w/o 4th Ave					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**		554	556	984	4,189	4,077	25	83	F	984	4,131	4,053	25	83	F	984	4,189	4,079	25	83	F
			556	557	632	4,189	4,076	25	81	F	632	4,131	4,052	25	81	F	632	4,189	4,079	25	81	F
		EB I-394 Entrance	557	558	789	4,189	4,075	28	72	F	789	4,131	4,051	28	72	F	789	4,189	4,079	28	72	F
	EB I-394 Entrance		558	559	442	6,320	5,943	28	71	F	442	6,331	5,899	27	72	F	442	6,320	5,945	28	71	F
			559	560	1,192	6,320	5,942	35	57	F	1,192	6,331	5,898	34	59	F	1,192	6,320	5,945	35	58	F
		Lyndale/Hennepin Entrance	560	561	1,856	6,320	5,939	33	60	F	1,856	6,331	5,897	33	60	F	1,856	6,320	5,942	33	60	F
	Lyndale/Hennepin Entrance		561	562	1,485	7,841	7,457	41	45	F	1,485	7,862	7,421	40	46	F	1,485	7,841	7,457	41	45	F
			562	563	706	7,841	7,456	50	38	E	706	7,862	7,417	48	39	E	706	7,841	7,454	49	38	E
		SB I-35W Exit	563	564	474	7,841	7,455	50	37	E	474	7,862	7,414	49	38	E	474	7,841	7,451	49	38	E
	SB I-35W Exit		564	565	792	6,100	5,760	50	38	E	792	6,081	5,732	50	38	E	792	6,100	5,741	50	38	E
			565	566	865	6,100	5,759	51	38	E	865	6,081	5,733	51	38	E	865	6,100	5,739	51	38	E
		NB I-35W Exit	566	567	388	6,100	5,757	51	30	D	388	6,081	5,733	51	30	D	388	6,100	5,738	51	30	D
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,551	4,245	51	28	C	688	4,521	4,242	51	28	C	688	4,551	4,272	51	28	C
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,910	5,573	53	26	C	1,557	5,899	5,559	52	27	C	1,557	5,910	5,633	53	27	C
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,610	4,168	59	24	C	469	4,478	4,063	59	23	C	469	4,610	4,234	59	24	C
	NB I-35W Entrance		570	572	1,016	5,320	4,692	61	19	B	1,016	5,307	4,788	61	20	B	1,016	5,320	4,874	61	20	C
		Cedar Ave Entrance	572	573	1,027	5,320	4,696	55	22	C	1,027	5,307	4,790	56	22	C	1,027	5,320	4,877	54	23	C
	Cedar Ave Entrance		573	574	562	6,729	6,111	39	32	D	562	6,736	6,220	40	32	D	562	6,729	6,291	38	34	D
			574	576	930	6,729	6,113	53	29	D	930	6,736	6,222	53	29	D	930	6,729	6,295	53	30	D
			576	578	1,378	6,729	6,115	61	25	C	1,378	6,736	6,225	61	26	C	1,378	6,729	6,297	61	26	C
			578	580	1,268	6,729	6,117	61	25	C	1,268	6,736	6,225	61	25	C	1,268	6,729	6,298	61	26	C
			580	582	875	6,729	6,119	61	25	C	875	6,736	6,227	61	26	C	875	6,729	6,299	61	26	C
		END EB I-94	582	584	1,173	6,729	6,119	61	25	C	1,173	6,736	6,228	61	26	C	1,173	6,729	6,301	61	26	C
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,312	5,317	63	22	C	1,488	5,392	5,397	63	22	C	1,488	5,312	5,311	63	22	C
			750	752	590	5,312	5,319	62	21	C	590	5,392	5,396	62	22	C	590	5,312	5,312	62	21	C
			752	754	1,231	5,312	5,322	62	22	C	1,231	5,392	5,394	62	22	C	1,231	5,312	5,319	61	22	C
			754	756	1,378	5,312	5,325	62	22	C	1,378	5,392	5,394	61	22	C	1,378	5,312	5,340	58	23	C
			756	758	775	5,312	5,328	61	22	C	775	5,392	5,402	58	23	C	775	5,312	5,366	56	25	C
		Cedar Ave Exit	758	759	1,026	5,312	5,326	57	22	C	1,026	5,392	5,422	53	25	C	1,026	5,312	5,397	51	25	C
	Cedar Ave Exit		759	760	755	4,973	5,006	53	24	C	755	4,972	5,015	47	27	C	755	4,973	5,092	46	28	D
			760	761	1,114	4,973	5,003	51	24	C	1,114	4,972	5,046	44	29	D	1,114	4,973	5,123	44	30	D
		SB I-35W Exit	761	762	677	4,973	5,001	51	25	C	677	4,972	5,080	42	31	D	677	4,973	5,150	44	29	D
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,793	3,804	51	25	C	492	3,782	3,876	38	35	E	492	3,793	3,943	43	31	D
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,733	5,146	49	26	C	1,637	5,692	5,141	39	33	D	1,637	5,733	5,306	44	29	D
	11th St Exit		764	15							780	5,051	4,615	40	40	E	780	5,233	4,876	47	35	D
		NB I-35W Flyover	15	765							828	5,051	4,631	39	40	E	828	5,233	4,881	48	34	D
	11th St Exit		764	765	1,022	5,233	4,698	46	34	D												
		NB I-35W/4th Ave Entrance	765	766	1,082	5,233	4,693	38	42	E	490	6,791	6,202	37	42	E	490	7,413	6,781	46	37	E
	NB I-35W/4th Ave Entrance		766	767	717	7,413	6,585	34	48	F	714	7,701	7,120	37	46	F	714	7,413	6,787	48	36	E
		Lyndale/Hennepin Exit	767	768	1,834	7,413	6,586	48	32	D	1,834	7,701	7,137	41	41	E	1,834	7,413	6,796	47	34	D
	Lyndale/Hennepin Exit		768	769	1,590	6,113	5,464	37	49	F	1,590	6,360	5,936	35	56	F	1,590	6,113	5,629	36	52	F
			769	770	1,188	6,113	5,466	46	40	E	1,188	6,360	5,942	41	48	F	1,188	6,113	5,638	43	44	F
		WB I-394 Exit	770	771	1,432	6,113	5,470	45	34	D	1,432	6,360	5,948	42	40	E	1,432	6,113	5,647	43	37	E
	WB I-394 Exit		771	772	508	3,203	2,905	52	19	B	508	3,490	3,254	51	21	C	508	3,203	2,969	52	19	B
		TH 55 Exit	772	774	544	3,203	2,906	54	15	B	544	3,490	3,255	54	17	B	544	3,203	2,970	54	16	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,792	2,528	54	16	B	400	3,039	2,812	54	17	B	400	2,792	2,582	54	16	B
	NB I-35W Flyover		256	6	890	2,180	1,894	28	68	F	470	1,740	1,556	28	55	F	470	2,180	1,894	26	73	F
			6	3	142	2,180	1,894	31	61	F	251	1,740	1,557	32	48	F	251	2,180	1,894	32	59	F
		4th Avenue Entrance	3	2	114	2,180	1,893	33	29	D												
		WB I-94	3	765							200	1,740	1,558	38	42	E	200	2,180	1,894	38	51	F
	4th Avenue		5	4							466	910	909	11	44	F						
		NB Flyover Entrance	4	2							160	910	908	20	26	C						
	NB Flyover Entrance		2	1	164	2,180	1,894	35	27	C	164	910	909	33	28	C						
		WB I-94	1	766	254	2,180	1,894	36	52	F	254	910	909	36	26	C						

Appendix B

2038 Evaluation Comparison Tables

Table B-1
I-35W Transit/Access Project
Freeway MOE Comparison

TRANSIT STATION COMPARISON

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 2						Model # 3						Model # 2						Model # 3					
					2038 No Build Conditions						2038 Transit Station Only Conditions						2038 No Build Conditions						2038 Transit Station Only Conditions					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	5,180	5,249	61	22	C	744	5,180	5,252	61	22	C	744	5,921	5,918	41	38	E	744	5,921	5,877	39	40	E
	TH 62 Entrance	60th St Entrance	104	106	1,355	7,221	7,319	63	19	B	1,355	7,221	7,323	63	19	B	1,355	8,101	7,259	21	60	F	1,355	8,101	7,335	24	54	F
	60th St Entrance	Diamond Lake Exit	106	108	910	7,722	7,813	60	20	C	910	7,722	7,818	61	20	B	910	8,521	7,614	19	64	F	910	8,521	7,677	22	58	F
	Diamond Lake Exit		108	110	1,432	7,262	7,340	53	28	C	1,432	7,262	7,333	55	27	C	1,432	8,321	7,329	18	84	F	1,432	8,321	7,369	20	76	F
		Diamond Lake Entrance	110	112	1,225	7,262	7,294	39	38	E	1,225	7,262	7,289	41	36	E	1,225	8,321	7,289	18	83	F	1,225	8,321	7,313	20	77	F
	Diamond Lake Entrance		112	113	1,449	8,292	8,200	37	43	E	1,449	8,292	8,204	38	41	E	1,449	8,761	7,719	19	76	F	1,449	8,761	7,732	21	73	F
			113	114	542	8,292	8,140	38	44	F	542	8,292	8,141	41	41	E	542	8,761	7,704	20	79	F	542	8,761	7,711	21	76	F
		46th St Exit	114	116	1,462	8,292	8,067	34	46	F	1,462	8,292	8,065	36	44	F	1,462	8,761	7,703	19	79	F	1,462	8,761	7,696	20	76	F
	46th St Exit	46th St BRT Exit	116	118	238	8,002	7,765	30	44	F	238	8,002	7,762	32	43	E	238	8,031	7,114	16	76	F	238	8,031	7,099	17	73	F
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,002	7,652	27	56	F	2,201	8,002	7,639	28	55	F	2,201	8,031	7,105	16	89	F	2,201	8,031	7,072	16	88	F
	46th St BRT Entrance	46th St Entrance	120	122	378	8,002	7,571	24	54	F	378	8,002	7,546	25	53	F	378	8,031	7,110	16	79	F	378	8,031	7,061	15	79	F
	46th St Entrance		122	124	1,521	9,252	8,637	27	59	F	1,521	9,252	8,625	28	59	F	1,521	8,632	7,718	17	83	F	1,521	8,632	7,663	17	83	F
			124	126	818	9,252	8,563	30	57	F	818	9,252	8,554	30	57	F	818	8,632	7,715	19	80	F	818	8,632	7,658	19	80	F
		35/36th St Exit	126	128	1,514	9,252	8,505	30	55	F	1,514	9,252	8,494	30	55	F	1,514	8,632	7,709	20	75	F	1,514	8,632	7,661	20	75	F
	35/36th St Exit		128	130	1,485	8,993	8,230	29	56	F	1,485	8,993	8,211	29	56	F	1,485	8,022	7,214	19	74	F	1,485	8,022	7,168	19	75	F
		35/36th St Entrance	130	132	1,474	8,993	8,172	31	53	F	1,474	8,993	8,148	31	53	F	1,474	8,022	7,233	20	73	F	1,474	8,022	7,187	20	74	F
	35/36th St Entrance	31/Lake St Exit	132	134	604	10,263	9,305	33	48	F	604	10,263	9,276	32	49	F	604	8,902	8,135	21	65	F	604	8,902	8,092	20	66	F
	31/Lake St Exit	Existing - Lake St BRT Exit	134	136	1,029	9,473	8,548	37	43	E							1,029	8,032	7,352	21	65	F						
	31/Lake St Exit	New - Lake St BRT Exit	134	135							478	9,473	8,538	36	41	E							478	8,032	7,322	20	61	F
	New - Lake St BRT Exit		135	136							553	9,473	8,374	36	47	F							553	8,032	7,224	20	73	F
	Existing - Lake St BRT Exit	Existing - Lake St BRT Ent	136	138	721	9,473	8,512	37	47	F	718	9,473	8,353	36	47	F	721	8,032	7,374	21	71	F	718	8,032	7,241	21	71	F
	Existing - Lake St BRT Ent	New - Lake St BRT Ent	138	140	1,190	9,473	8,484	38	43	F	1,240	9,473	8,322	36	47	F	1,190	8,032	7,407	22	62	F	1,240	8,032	7,264	22	66	F
	New - Lake St BRT Ent		140	142	569	9,473	8,453	38	46	F	494	9,473	8,438	35	42	E	569	8,032	7,433	24	62	F	494	8,032	7,394	24	54	F
			142	144	1,061	9,473	8,426	38	45	F	1,061	9,473	8,414	36	47	F	1,061	8,032	7,451	25	59	F	1,061	8,032	7,398	25	60	F
		NB I-35W/TH 65 SPLIT	144	146	859	9,473	8,396	36	47	F	859	9,473	8,386	36	48	F	859	8,032	7,467	25	59	F	859	8,032	7,398	25	59	F
	Begin NB TH 65		146	148	498	5,633	5,153	56	31	D	498	5,633	5,142	55	31	D	498	4,641	4,253	37	39	E	498	4,641	4,203	39	36	E
			148	150	281	5,633	5,153	55	32	D	281	5,633	5,141	55	31	D	281	4,641	4,248	36	40	E	281	4,641	4,199	38	37	E
			150	152	284	5,633	5,154	52	33	D	284	5,633	5,140	52	33	D	284	4,641	4,246	34	42	E	284	4,641	4,196	36	39	E
			152	154	582	5,633	5,155	50	34	D	582	5,633	5,139	50	34	D	582	4,641	4,241	32	44	F	582	4,641	4,191	34	41	E
		WB I-94 Exit	154	156	644	5,633	5,156	45	30	D	644	5,633	5,136	46	30	D	644	4,641	4,233	27	42	E	644	4,641	4,183	28	40	E
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,593	3,548	53	23	C	983	3,593	3,529	53	22	C	983	2,851	2,767	53	17	B	983	2,851	2,737	53	17	B
	NB I-35W/TH 65 Split		146	161	665	3,840	3,223	19	88	F	665	3,840	3,224	20	85	F	665	3,391	3,222	16	104	F	665	3,391	3,192	15	106	F
			163	164	927	3,840	3,202	17	98	F	927	3,840	3,188	17	97	F	927	3,391	3,232	16	104	F	927	3,391	3,198	15	104	F
		5th Ave Entrance	164	165	965	3,840	3,196	17	94	F	965	3,840	3,180	17	95	F	965	3,391	3,233	17	98	F	965	3,391	3,198	16	99	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,410	3,760	29	60	F	1,048	4,410	3,746	29	60	F	1,048	4,390	3,979	28	64	F	1,048	4,390	3,945	28	64	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,850	5,069	47	34	D	1,024	5,850	5,064	47	34	D	1,024	5,870	5,368	43	39	E	1,024	5,870	5,334	43	39	E
	EB I-94 Exit		167	168	540	4,380	3,786	51	25	C	540	4,380	3,782	51	25	C	540	5,041	4,590	47	32	D	540	5,041	4,583	47	33	D
		Washington Ave Exit	168	169	448	4,380	3,784	52	24	C	448	4,380	3,779	52	24	C	448	5,041	4,590	50	30	D	448	5,041	4,582	50	30	D
	Washington Ave Exit		169	170	625	3,171	2,727	56	25	C	625	3,171	2,713	56	24	C	625	4,210	3,800	54	35	E	625	4,210	3,812	54	35	E
		END NB I-35W	170	171	523	3,171	2,726	57	24	C	523	3,171	2,713	57	24	C	523	4,210	3,800	56	34	D	523	4,210	3,810	56	34	D
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,590	2,590	56	24	C	1,074	2,590	2,588	55	24	C	1,074	2,209	2,158	9	117	F	1,074	2,209	2,162	9	117	F
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,909	2,915	46	29	D	892	2,909	2,916	44	32	D	892	2,839	2,690	10	120	F	892	2,839	2,690	10	120	F
	WB I-94 Entrance		366	367	1,871	3,638	3,612	36	46	F	1,871	3,638	3,623	34	49	F	1,871	3,989	3,804	22	79	F	1,871	3,989	3,810	22	79	F
			367	368	827	3,638	3,597	32	57	F	827	3,638	3,608	31	58	F	827	3,989	3,803	30	64	F	827	3,989	3,811	30	64	F
			368	369	483	3,638	3,593	41	44	F	483	3,638	3,603	41	44	F	483	3,989	3,803	41	47	F	483	3,989	3,811	41	47	F
			369	370	403	3,638	3,591	50	36	E	403	3,638	3,601	50	36	E	403	3,989	3,804	50	38	E	403	3,989	3,810	50	38	E
		SB TH 65 Entrance	374	376	627	3,638	3,586	54	33	D	627	3,638	3,597	54	33	D	627	3,989	3,803	54	35	E	627	3,989	3,811	54	35	E
	Begin SB TH 65	12th St Entrance	300	302	867	670	672	62	6	A	867	670	672	62	6	A	867	2,050	2,050	57	18	B	867	2,050	2,051	57	18	B
	12th St Entrance	EB I-94 Entrance	302	304	1,088	999	1,131	53	10	A	1,088	999	1,128	53	10	A	1,088	2,630	2,749	47	27	C	1,088	2,630	2,750	47	27	C
	EB I-94 Entrance		304	307	1,574	3,119	3,089	59	18	B	1,574	3,119	3,080	59	18	B	1,574	4,221	4,251	57	25	C	1,574	4,221	4,257	57	25	C
		SB I-35W Entrance	307	310	1,516	3,119	3,087	59	20	B	1,516	3,119	3,079	60	19	B	1,516	4,221	4,249	49	32	D	1,516	4,221	4,254	50	32	D
	SB I-35W Entrance		310	314	698	6,757	6,668	59	28	D	698	6,757	6,671	59	28	D	698	8,210	8,052	56	36	E	698	8,210	8,061	56	36	E
			314	318	379	6,757	6,666	61	27	C	379	6,757	6,668	61	28	C	379	8,210	8,052	58	35	D	379	8,210	8,059	58	35	D
		New - Lake St BRT Exit	318	320	900	6,757	6,664	63	27	C	972	6,757	6,665	62	24	C	900	8,210	8,051	58	35	D	972	8,210	8,059	59	31	D
	New - Lake St BRT Exit	Existing - Lake St BRT Exit	320	322	616	6,757	6,662	62	22	C	545	6,757	6,522	63	26	C	616	8,210	8,052	54	31	D	545	8,210	7,931	57	35	D
	Existing - Lake St BRT Exit	Existing - Lake St BRT Entrance	322	324	719	6,757	6,621	62	27	C	721	6,757	6,521	63	26	C	719	8,210	7,941	48	41	E	721	8,210	7,931	56	35	E
	Existing - Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	6,757	6,655	61	25	C	1,326	6,757	6,519	63	26	C	1,325	8,210	8,058	49	38	E	1,326	8,210	7,930	55	36	E
	31/Lake St Entrance	New - Lake St BRT Entrance	326	327							134	7,447	7,207	57	25	C							134	9,260	8,995	49	37	E
	New - Lake St BRT Entrance	35/36th St Exit	327	328							384	7,447	7,344	55	23	C							384	9,260	9,122	49	32	D
	31/Lake St Entrance	35/36th St Exit	326	328	518	7,447	7,338	58	25	C							518	9,260	9,118	52	35	E						
	35/36th St Exit		328	330	1,384	6,797	6,688	63	27	C	1,384	6,797	6,710	60	28	C	1,384	8,150	8,037	60	33	D	1,384	8,150	8,039	57	35	E
		35/36th St Entrance	330	332	1,712	6,797	6,681	61	28	C	1,712	6,797	6,708	59	29	D	1,712	8,150	8,037	59	34	D	1,712	8,150	8,037	53	38	E
	35/36th St Entrance		332	334	1,460	7,448	7,319	54	32	D	1,460	7,448	7,350	53	33	D	1,460	8,610	8,498	50	40	E	1,460	8,610	8,492	47	42	E
			334	336	544	7,448	7,314	61	30	D	544	7,448	7,340	61	30	D	544	8,610	8,498	55	39	E	544	8,610	8,490	53	40	E
		46th St Exit	336	338	1,512	7,448	7,308	63	25	C	1,512	7,448	7,333	63	25	C	1,512	8,610	8,497	59	31	D	1,512	8,610	8,490	58	31	D
	46th St Exit	46th St BRT Exit	338	340	780	6,928	6,786	64	19	B	780	6,928	6,797	64	19	B	780	7,771	7,668	63	22	C	780	7,771	7,642	63	22	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,928	6,771	66	21	C	2,275	6,928	6,785	66	21	C	2,275	7,771	7,646	64	24	C	2,275	7,771	7,619	64	24	C
	46th St BRT Entrance	46th St Entrance	342	344	393	6,928	6,772	64	18	B	393	6,928	6,790	64	18	B	393	7,771	7,666	56	24	C	393	7,771	7,638	57	24	C
	46th St Entrance		344	346	1,397	7,447	7,285	59	23	C	1,397	7,447	7,300	59	23	C	1,397	8,451	8,347	41	39	E	1,397	8,451	8,320	44	37	E
		60th St Exit	346	348	1,495	7,447	7,277	54	26	C	1,495	7,447	7,289	55	26	C	1,495	8,451	8,347	39	41	E	1,495	8,451	8,320	40	41	E
	60th St Exit	TH 62 Exit	348	350	2,036	6,977	6,802	57	24	C	2,036	6,977	6,807	57	24	C	2,036	7,810	7,712	52	30	D	2,036	7,810	7,686	52	30	D
	TH 62 Exit		350	352	1,409	3,597	3,504	64	18	B	1,409	3,597	3,514	64	18	B	1,409	3,649	3,614	63	19	B	1,409	3,649	3,604	63	19	B
			352	354	1,616	3,597	3,497	65	18	B	1,616	3,597	3,506	65	18	B	1,616	3,649	3,613	65	19	B	1,616	3,649	3,605	65	18	B
		END SB I-35W	354	356	719	3,597	3,492	66	18	B	719	3,597	3,499	66	18	B	719	3,649	3,614	66	18	B	719	3,649	3,606	66	18	B

Table B-2
I-35W Transit/Access Project
Freeway MOE Comparison

SOUTHBOUND BRAID BRIDGE

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 3						Model # 4						Model # 3						Model # 4					
					2038 Transit Station Only Conditions						2038 Transit Station, SB Braid, NB Flyover						2038 Transit Station Only Conditions						2038 Transit Station, SB Braid, NB Flyover					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,590	2,588	55	24	C	1,074	2,590	2,587	56	24	C	1,074	2,209	2,162	9	117	F	1,074	2,209	2,149	9	118	F
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,909	2,916	44	32	D	892	2,909	2,911	46	29	D	892	2,839	2,690	10	120	F	892	2,839	2,667	10	121	F
	WB I-94 Entrance		366	367	1,871	3,638	3,623	34	49	F	1,871	3,638	3,610	35	47	F	1,871	3,989	3,810	22	79	F	1,871	3,989	3,805	22	79	F
			367	368	827	3,638	3,608	31	58	F	827	3,638	3,601	31	57	F	827	3,989	3,811	30	64	F	827	3,989	3,804	30	64	F
			368	369	483	3,638	3,603	41	44	F	483	3,638	3,598	41	44	F	483	3,989	3,811	41	47	F	483	3,989	3,804	41	47	F
			369	370	403	3,638	3,601	50	36	E	205	3,638	3,597	49	37	E	403	3,989	3,810	50	38	E	205	3,989	3,803	49	39	E
		SB TH 65 Entrance	374	376	627	3,638	3,597	54	33	D	436	3,638	3,595	55	33	D	627	3,989	3,811	54	35	E	436	3,989	3,803	55	35	D
	Begin SB TH 65	12th St Entrance	300	302	867	670	672	62	6	A	867	670	672	62	6	A	867	2,050	2,051	57	18	B	867	2,050	2,048	57	18	B
	12th St Entrance	EB I-94 Entrance	302	304	1,088	999	1,128	53	10	A	1,088	999	1,130	53	10	A	1,088	2,630	2,750	47	27	C	1,088	2,630	2,748	48	27	C
	EB I-94 Entrance		304	307	1,574	3,119	3,080	59	18	B	1,574	3,119	3,066	59	17	B	1,574	4,221	4,257	57	25	C	1,574	4,221	4,257	58	25	C
		SB I-35W Entrance	307	310	1,516	3,119	3,079	60	19	B							1,516	4,221	4,254	50	32	D						
			307	308							718	3,119	3,065	60	17	B							718	4,221	4,256	54	26	C
		SB I-35W Entrance	308	310							825	3,119	3,064	60	19	B							825	4,221	4,253	50	31	D
	SB I-35W Entrance		310	314	698	6,757	6,671	59	28	D	698	6,757	6,655	59	28	D	698	8,210	8,061	56	36	E	698	8,210	8,053	57	36	E
			314	318	379	6,757	6,668	61	28	C	379	6,757	6,653	61	27	C	379	8,210	8,059	58	35	D	379	8,210	8,052	59	34	D
		New - Lake St BRT Exit	318	320	972	6,757	6,665	62	24	C	972	6,757	6,651	63	24	C	972	8,210	8,059	59	31	D	972	8,210	8,052	61	30	D
	New - Lake St BRT Exit		320	322	545	6,757	6,522	63	26	C	545	6,757	6,508	63	26	C	545	8,210	7,931	57	35	D	545	8,210	7,926	60	33	D
			322	324	721	6,757	6,521	63	26	C	721	6,757	6,505	63	26	C	721	8,210	7,931	56	35	E	721	8,210	7,925	60	33	D
		31/Lake St Entrance	324	326	1,326	6,757	6,519	63	26	C	1,326	6,757	6,500	63	26	C	1,326	8,210	7,930	55	36	E	1,326	8,210	7,922	58	34	D
	31/Lake St Entrance	New - Lake St BRT Ent	326	327	134	7,447	7,207	57	25	C	134	7,447	7,180	57	25	C	134	9,260	8,995	49	37	E	134	9,260	8,977	50	36	E
	New - Lake St BRT Ent	35/36th St Exit	327	328	384	7,447	7,344	55	23	C	384	7,447	7,318	55	23	C	384	9,260	9,122	49	32	D	384	9,260	9,105	48	32	D
	35/36th St Exit		328	330	1,384	6,797	6,710	60	28	C	1,384	6,797	6,682	60	28	C	1,384	8,150	8,039	57	35	E	1,384	8,150	8,032	56	36	E
		35/36th St Entrance	330	332	1,712	6,797	6,708	59	29	D	1,712	6,797	6,675	59	29	D	1,712	8,150	8,037	53	38	E	1,712	8,150	8,035	52	39	E
	35/36th St Entrance		332	334	1,460	7,448	7,350	53	33	D	1,460	7,448	7,318	52	33	D	1,460	8,610	8,492	47	42	E	1,460	8,610	8,495	47	42	E
			334	336	544	7,448	7,340	61	30	D	544	7,448	7,313	60	30	D	544	8,610	8,490	53	40	E	544	8,610	8,494	54	40	E
		46th St Exit	336	338	1,512	7,448	7,333	63	25	C	1,512	7,448	7,306	63	25	C	1,512	8,610	8,490	58	31	D	1,512	8,610	8,494	59	31	D
	46th St Exit	46th St BRT Exit	338	340	780	6,928	6,797	64	19	B	780	6,928	6,793	64	19	B	780	7,771	7,642	63	22	C	780	7,771	7,667	63	22	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,928	6,785	66	21	C	2,275	6,928	6,781	66	21	C	2,275	7,771	7,619	64	24	C	2,275	7,771	7,648	62	25	C
	46th St BRT Entrance	46th St Entrance	342	344	393	6,928	6,790	64	18	B	393	6,928	6,786	64	18	B	393	7,771	7,638	57	24	C	393	7,771	7,668	52	27	C
	46th St Entrance		344	346	1,397	7,447	7,300	59	23	C	1,397	7,447	7,299	60	23	C	1,397	8,451	8,320	44	37	E	1,397	8,451	8,347	40	40	E
		60th St Exit	346	348	1,495	7,447	7,289	55	26	C	1,495	7,447	7,293	55	26	C	1,495	8,451	8,320	40	41	E	1,495	8,451	8,352	38	42	E
	60th St Exit	TH 62 Exit	348	350	2,036	6,977	6,807	57	24	C	2,036	6,977	6,815	56	24	C	2,036	7,810	7,686	52	30	D	2,036	7,810	7,723	52	30	D
	TH 62 Exit		350	352	1,409	3,597	3,514	64	18	B	1,409	3,597	3,476	64	18	B	1,409	3,649	3,604	63	19	B	1,409	3,649	3,621	63	19	B
			352	354	1,616	3,597	3,506	65	18	B	1,616	3,597	3,470	66	18	B	1,616	3,649	3,605	65	18	B	1,616	3,649	3,620	65	19	B
		END SB I-35W	354	356	719	3,597	3,499	66	18	B	719	3,597	3,466	66	18	B	719	3,649	3,606	66	18	B	719	3,649	3,618	66	18	B

Table B-3
I-35W Transit/Access Project
Freeway MOE Comparison

SOUTHBOUND EXIT RAMP

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 4						Model # 5						Model # 4						Model # 5					
					2038 Transit Station, SB Braid, NB Flyover						2038 Build Lake St Ramps Only						2038 Transit Station, SB Braid, NB Flyover						2038 Build Lake St Ramps Only					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,590	2,587	56	24	C	1,074	3,130	3,129	53	30	D	1,074	2,209	2,149	9	118	F	1,074	2,909	2,924	47	32	D
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,909	2,911	46	29	D	892	3,500	3,504	47	34	D	892	2,839	2,667	10	121	F	892	3,799	3,827	38	46	F
	WB I-94 Entrance		366	367	1,871	3,638	3,610	35	47	F	1,871	4,449	4,417	54	28	C	1,871	3,989	3,805	22	79	F	1,871	4,849	4,814	49	33	D
			367	368	827	3,638	3,601	31	57	F	827	4,449	4,414	37	40	E	827	3,989	3,804	30	64	F	827	4,849	4,821	35	46	F
			368	369	483	3,638	3,598	41	44	F	483	4,449	4,412	42	35	E	483	3,989	3,804	41	47	F	483	4,849	4,823	42	39	E
			369	370	205	3,638	3,597	49	37	E	205	4,449	4,412	51	29	D	205	3,989	3,803	49	39	E	205	4,849	4,823	51	32	D
		SB TH 65 Entrance	374	376	436	3,638	3,595	55	33	D	434	4,449	4,410	56	26	C	436	3,989	3,803	55	35	D	434	4,849	4,825	55	29	D
	Begin SB TH 65	12th St Entrance	300	302	867	670	672	62	6	A	867	830	831	62	7	A	867	2,050	2,048	57	18	B	867	1,970	1,970	57	18	B
	12th St Entrance	EB I-94 Entrance	302	304	1,088	999	1,130	53	10	A	1,088	1,169	1,298	53	11	B	1,088	2,630	2,748	48	27	C	1,088	2,520	2,639	48	25	C
	EB I-94 Entrance		304	307	1,574	3,119	3,066	59	17	B	1,574	3,339	3,291	59	19	B	1,574	4,221	4,257	58	25	C	1,574	4,231	4,264	49	29	D
			307	308	718	3,119	3,065	60	17	B	718	3,339	3,292	60	19	B	718	4,221	4,256	54	26	C	718	4,231	4,256	33	43	F
		SB I-35W Entrance	308	310	825	3,119	3,064	60	19	B	825	3,339	3,291	55	22	C	825	4,221	4,253	50	31	D	825	4,231	4,250	32	50	F
	SB I-35W Entrance		310	314	698	6,757	6,655	59	28	D	698	7,788	7,698	55	28	C	698	8,210	8,053	57	36	E	698	9,080	9,079	40	46	F
		Lake Street Exit Ramp	314	318	379	6,757	6,653	61	27	C	765	7,788	7,693	55	28	C	379	8,210	8,052	59	34	D	765	9,080	9,087	46	39	E
	Lake Street Exit Ramp	New - Lake St BRT Exit	318	320	972	6,757	6,651	63	24	C	586	7,079	6,962	60	24	C	972	8,210	8,052	61	30	D	586	8,179	8,186	53	32	D
	New - Lake St BRT Exit		320	322	545	6,757	6,508	63	26	C	545	7,079	6,819	61	28	D	545	8,210	7,926	60	33	D	545	8,179	8,059	55	36	E
			322	324	721	6,757	6,505	63	26	C	721	7,079	6,814	62	28	C	721	8,210	7,925	60	33	D	721	8,179	8,060	57	35	E
		31/Lake St Entrance	324	326	1,326	6,757	6,500	63	26	C	1,326	7,079	6,811	63	27	C	1,326	8,210	7,922	58	34	D	1,326	8,179	8,062	58	35	D
	31/Lake St Entrance	New - Lake St BRT Ent	326	327	134	7,447	7,180	57	25	C	134	7,730	7,457	56	27	C	134	9,260	8,977	50	36	E	134	9,139	9,028	51	35	E
	New - Lake St BRT Ent	35/36th St Exit	327	328	384	7,447	7,318	55	23	C	384	7,730	7,597	54	24	C	384	9,260	9,105	48	32	D	384	9,139	9,156	49	31	D
	35/36th St Exit		328	330	1,384	6,797	6,682	60	28	C	1,384	7,221	7,100	58	31	D	1,384	8,150	8,032	56	36	E	1,384	8,109	8,112	57	36	E
		35/36th St Entrance	330	332	1,712	6,797	6,675	59	29	D	1,712	7,221	7,089	53	34	D	1,712	8,150	8,035	52	39	E	1,712	8,109	8,114	57	35	E
	35/36th St Entrance		332	334	1,460	7,448	7,318	52	33	D	1,460	7,863	7,719	50	36	E	1,460	8,610	8,495	47	42	E	1,460	8,499	8,507	50	40	E
			334	336	544	7,448	7,313	60	30	D	544	7,863	7,713	59	33	D	544	8,610	8,494	54	40	E	544	8,499	8,510	55	39	E
		46th St Exit	336	338	1,512	7,448	7,306	63	25	C	1,512	7,863	7,712	62	26	C	1,512	8,610	8,494	59	31	D	1,512	8,499	8,511	59	31	D
	46th St Exit	46th St BRT Exit	338	340	780	6,928	6,793	64	19	B	780	7,363	7,217	64	21	C	780	7,771	7,667	63	22	C	780	7,780	7,790	63	23	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,928	6,781	66	21	C	2,275	7,363	7,203	63	23	C	2,275	7,771	7,648	62	25	C	2,275	7,780	7,775	52	31	D
	46th St BRT Entrance	46th St Entrance	342	344	393	6,928	6,786	64	18	B	393	7,363	7,203	56	23	C	393	7,771	7,668	52	27	C	393	7,780	7,804	34	41	E
	46th St Entrance		344	346	1,397	7,447	7,299	60	23	C	1,397	7,842	7,668	48	31	D	1,397	8,451	8,347	40	40	E	1,397	8,449	8,486	31	53	F
		60th St Exit	346	348	1,495	7,447	7,293	55	26	C	1,495	7,842	7,644	45	32	D	1,495	8,451	8,352	38	42	E	1,495	8,449	8,499	36	45	F
	60th St Exit	TH 62 Exit	348	350	2,036	6,977	6,815	56	24	C	2,036	7,572	7,351	54	27	C	2,036	7,810	7,723	52	30	D	2,036	7,818	7,877	51	31	D
	TH 62 Exit		350	352	1,409	3,597	3,476	64	18	B	1,409	3,832	3,694	63	20	B	1,409	3,649	3,621	63	19	B	1,409	3,757	3,798	62	20	C
			352	354	1,616	3,597	3,470	66	18	B	1,616	3,832	3,687	65	19	B	1,616	3,649	3,620	65	19	B	1,616	3,757	3,799	65	20	B
		END SB I-35W	354	356	719	3,597	3,466	66	18	B	719	3,832	3,681	66	19	B	719	3,649	3,618	66	18	B	719	3,757	3,797	65	19	B

Table B-4
I-35W Transit/Access Project
Freeway MOE Comparison

NORTHBOUND ENTRANCE RAMP

Northbound I-35W/TH 65

Location		Node		AM PEAK HOUR										PM PEAK HOUR									
				Model # 3						Model # 5										Model # 5			
				2038 Transit Station Only Conditions						2038 Build Lake St Ramps Only				2038 Transit Station Only Conditions						2038 Build Lake St Ramps Only			
From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Begin NB I-35W	TH 62 Entrance	102	104	744	5,180	5,252	61	22	C	744	5,229	5,294	61	22	C	744	5,921	5,877	39	40	E	744	6,140	6,183	57	28	D
TH 62 Entrance	60th St Entrance	104	106	1,355	7,221	7,323	63	19	B	1,355	7,239	7,338	63	20	B	1,355	8,101	7,335	24	54	F	1,355	8,340	8,423	62	23	C
60th St Entrance	Diamond Lake Exit	106	108	910	7,722	7,818	61	20	B	910	7,760	7,851	59	21	C	910	8,521	7,677	22	58	F	910	8,730	8,808	56	24	C
Diamond Lake Exit		108	110	1,432	7,262	7,333	55	27	C	1,432	7,309	7,351	50	30	D	1,432	8,321	7,369	20	76	F	1,432	8,270	8,317	48	35	D
	Diamond Lake Entrance	110	112	1,225	7,262	7,289	41	36	E	1,225	7,309	7,302	38	39	E	1,225	8,321	7,313	20	77	F	1,225	8,270	8,303	39	43	E
Diamond Lake Entrance		112	113	1,449	8,292	8,204	38	41	E	1,449	8,319	8,188	36	44	F	1,449	8,761	7,732	21	73	F	1,449	9,030	9,073	44	39	E
		113	114	542	8,292	8,141	41	41	E	542	8,319	8,131	38	45	F	542	8,761	7,711	21	76	F	542	9,030	9,068	56	32	D
	46th St Exit	114	116	1,462	8,292	8,065	36	44	F	1,462	8,319	8,067	34	46	F	1,462	8,761	7,696	20	76	F	1,462	9,030	9,060	60	29	D
46th St Exit	46th St BRT Exit	116	118	238	8,002	7,762	32	43	E	238	8,050	7,792	31	44	F	238	8,031	7,099	17	73	F	238	8,300	8,350	61	23	C
46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,002	7,639	28	55	F	2,201	8,050	7,689	28	56	F	2,201	8,031	7,072	16	88	F	2,201	8,300	8,320	60	28	D
46th St BRT Entrance	46th St Entrance	120	122	378	8,002	7,546	25	53	F	378	8,050	7,619	24	55	F	378	8,031	7,061	15	79	F	378	8,300	8,304	57	26	C
46th St Entrance		122	124	1,521	9,252	8,625	28	59	F	1,521	9,290	8,650	27	59	F	1,521	8,632	7,663	17	83	F	1,521	8,892	8,884	53	33	D
		124	126	818	9,252	8,554	30	57	F	818	9,290	8,583	30	58	F	818	8,632	7,658	19	80	F	818	8,892	8,857	52	35	E
	35/36th St Exit	126	128	1,514	9,252	8,494	30	55	F	1,514	9,290	8,527	30	55	F	1,514	8,632	7,661	20	75	F	1,514	8,892	8,816	47	37	E
35/36th St Exit		128	130	1,485	8,993	8,211	29	56	F	1,485	9,180	8,371	30	57	F	1,485	8,022	7,168	19	75	F	1,485	8,441	8,336	37	46	F
	35/36th St Entrance	130	132	1,474	8,993	8,148	31	53	F	1,474	9,180	8,306	31	53	F	1,474	8,022	7,187	20	74	F	1,474	8,441	8,294	31	56	F
35/36th St Entrance	31/Lake St Exit	132	134	604	10,263	9,276	32	49	F	604	10,371	9,300	33	47	F	604	8,902	8,092	20	66	F	604	9,161	8,996	29	53	F
31/Lake St Exit	New - Lake St BRT Exit	134	135	478	9,473	8,538	36	41	E	478	9,571	8,558	37	39	E	478	8,032	7,322	20	61	F	478	8,281	8,159	28	50	F
New - Lake St BRT Exit		135	136	553	9,473	8,374	36	47	F	553	9,571	8,404	37	45	F	553	8,032	7,224	20	73	F	553	8,281	8,039	26	62	F
		136	138	718	9,473	8,353	36	47	F	843	9,571	8,388	39	43	F	718	8,032	7,241	21	71	F	843	8,281	8,032	26	62	F
	New - Lake St BRT Entrance	138	140	1,240	9,473	8,322	36	47	F	1,112	9,571	8,366	41	41	E	1,240	8,032	7,264	22	66	F	1,112	8,281	8,027	28	58	F
New - Lake St BRT Entrance	Lake Street Entrance Ramp	140	142	494	9,473	8,438	35	42	E	496	9,571	8,495	41	36	E	494	8,032	7,394	24	54	F	496	8,281	8,141	30	47	F
Lake Street Entrance Ramp		142	144	1,061	9,473	8,414	36	47	F	1,061	10,650	9,535	45	36	E	1,061	8,032	7,398	25	60	F	1,061	9,041	8,883	30	50	F
	NB I-35W/TH 65 SPLIT	144	146	859	9,473	8,386	36	48	F	859	10,650	9,532	53	30	D	859	8,032	7,398	25	59	F	859	9,041	8,863	25	61	F
Begin NB TH 65		146	148	498	5,633	5,142	55	31	D	498	5,699	5,281	54	32	D	498	4,641	4,203	39	36	E	498	4,590	4,703	42	38	E
		148	150	281	5,633	5,141	55	31	D	281	5,699	5,280	55	32	D	281	4,641	4,199	38	37	E	281	4,590	4,700	40	40	E
		150	152	284	5,633	5,140	52	33	D	284	5,699	5,281	53	33	D	284	4,641	4,196	36	39	E	284	4,590	4,698	38	42	E
		152	154	582	5,633	5,139	50	34	D	582	5,699	5,283	51	35	D	582	4,641	4,191	34	41	E	582	4,590	4,694	36	44	F
	WB I-94 Exit	154	156	644	5,633	5,136	46	30	D	644	5,699	5,283	47	30	D	644	4,641	4,183	28	40	E	644	4,590	4,689	30	42	E
WB I-94 Exit	**END NB TH 65**	156	158	983	3,593	3,529	53	22	C	983	3,649	3,697	53	24	C	983	2,851	2,737	53	17	B	983	3,000	3,226	53	20	C
NB I-35W/TH 65 Split		146	161	665	3,840	3,224	20	85	F	174	4,951	4,250	53	27	C	665	3,391	3,192	15	106	F	174	4,451	4,149	17	97	F
	New - EB I-94 Exit	162	163							678	4,951	4,255	37	38	E							678	4,451	4,143	16	86	F
New - EB I-94 Exit		163	164	927	3,840	3,188	17	97	F	552	3,070	2,642	46	29	D	927	3,391	3,198	15	104	F	552	3,123	2,845	14	106	F
	5th Ave Entrance	164	165	965	3,840	3,180	17	95	F	965	3,070	2,633	29	45	F	965	3,391	3,198	16	99	F	965	3,123	2,833	13	114	F
5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,410	3,746	29	60	F	1,048	3,963	3,508	35	46	F	1,048	4,390	3,945	28	64	F	1,048	4,561	4,015	26	71	F
EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,850	5,064	47	34	D	1,024	5,452	4,853	47	32	D	1,024	5,870	5,334	43	39	E	1,024	6,101	5,524	39	44	F
EB I-94 Exit		167	168	540	4,380	3,782	51	25	C	540	4,860	4,262	50	28	D	540	5,041	4,583	47	33	D	540	5,341	4,897	45	36	E
	Washington Ave Exit	168	169	448	4,380	3,779	52	24	C	448	4,860	4,262	52	27	C	448	5,041	4,582	50	30	D	448	5,341	4,898	49	33	D
Washington Ave Exit		169	170	625	3,171	2,713	56	24	C	625	3,461	3,040	55	28	C	625	4,210	3,812	54	35	E	625	4,310	3,961	54	37	E
	END NB I-35W	170	171	523	3,171	2,713	57	24	C	523	3,461	3,040	57	27	C	523	4,210	3,810	56	34	D	523	4,310	3,961	56	35	E

Table B-5
I-35W Transit/Access Project
Freeway MOE Comparison

NORTHBOUND EXIT RAMP

Northbound I-35W/TH 65

Location		Node		AM PEAK HOUR												PM PEAK HOUR											
				Model # 5						Model # 6						Model # 5						Model # 6					
				2038 Build Lake St Ramps Only						2038 Full Build						2038 Build Lake St Ramps Only						2038 Full Build					
From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Begin NB I-35W	TH 62 Entrance	102	104	744	5,229	5,294	61	22	C	744	5,289	5,360	61	23	C	744	6,140	6,183	57	28	D	744	6,220	6,267	56	29	D
TH 62 Entrance	60th St Entrance	104	106	1,355	7,239	7,338	63	20	B	1,355	7,210	7,309	62	20	B	1,355	8,340	8,423	62	23	C	1,355	8,420	8,485	60	24	C
60th St Entrance	Diamond Lake Exit	106	108	910	7,760	7,851	59	21	C	910	7,821	7,900	57	22	C	910	8,730	8,808	56	24	C	910	8,871	8,921	55	26	C
Diamond Lake Exit		108	110	1,432	7,309	7,351	50	30	D	1,432	7,431	7,451	50	30	D	1,432	8,270	8,317	48	35	D	1,432	8,680	8,695	52	34	D
	Diamond Lake Entrance	110	112	1,225	7,309	7,302	38	39	E	1,225	7,431	7,385	38	39	E	1,225	8,270	8,303	39	43	E	1,225	8,680	8,684	45	39	E
Diamond Lake Entrance		112	113	1,449	8,319	8,188	36	44	F	1,449	8,311	8,162	35	45	F	1,449	9,030	9,073	44	39	E	1,449	9,129	9,143	46	38	E
		113	114	542	8,319	8,131	38	45	F	542	8,311	8,099	36	46	F	542	9,030	9,068	56	32	D	542	9,129	9,137	54	34	D
	46th St Exit	114	116	1,462	8,319	8,067	34	46	F	1,462	8,311	8,027	33	47	F	1,462	9,030	9,060	60	29	D	1,462	9,129	9,129	57	31	D
46th St Exit	46th St BRT Exit	116	118	238	8,050	7,792	31	44	F	238	8,071	7,786	30	44	F	238	8,300	8,350	61	23	C	238	8,399	8,454	58	26	C
46th St BRT Exit	46th St BRT Entrance	118	120	2,201	8,050	7,689	28	56	F	2,201	8,071	7,678	28	56	F	2,201	8,300	8,320	60	28	D	2,201	8,399	8,418	57	31	D
46th St BRT Entrance	46th St Entrance	120	122	378	8,050	7,619	24	55	F	378	8,071	7,603	24	54	F	378	8,300	8,304	57	26	C	378	8,399	8,393	53	29	D
46th St Entrance		122	124	1,521	9,290	8,650	27	59	F	1,521	9,340	8,705	28	59	F	1,521	8,892	8,884	53	33	D	1,521	8,911	8,868	47	37	E
		124	126	818	9,290	8,583	30	58	F	818	9,340	8,638	31	57	F	818	8,892	8,857	52	35	E	818	8,911	8,815	44	42	E
	35/36th St Exit	126	128	1,514	9,290	8,527	30	55	F	1,514	9,340	8,576	30	55	F	1,514	8,892	8,816	47	37	E	1,514	8,911	8,766	39	45	F
35/36th St Exit		128	130	1,485	9,180	8,371	30	57	F	1,485	9,221	8,404	29	58	F	1,485	8,441	8,336	37	46	F	1,485	8,542	8,372	32	54	F
	35/36th St Entrance	130	132	1,474	9,180	8,306	31	53	F	1,474	9,221	8,329	28	59	F	1,474	8,441	8,294	31	56	F	1,474	8,542	8,309	29	60	F
35/36th St Entrance	31/Lake St Exit	132	134	604	10,371	9,300	33	47	F	604	10,431	9,362	29	50	F	604	9,161	8,996	29	53	F	604	9,332	9,066	28	51	F
31/Lake St Exit	New - Lake St BRT Exit	134	135	478	9,571	8,558	37	39	E	478	9,851	8,822	30	42	E	478	8,281	8,159	28	50	F	478	8,672	8,452	28	45	F
New - Lake St BRT Exit		135	136	553	9,571	8,404	37	45	F	553	9,851	8,663	33	45	F	553	8,281	8,039	26	62	F	553	8,672	8,324	28	50	F
	28th Street Exit Ramp	136	138	843	9,571	8,388	39	43	F	843	9,851	8,647	38	38	E	843	8,281	8,032	26	62	F	843	8,672	8,313	32	44	F
28th Street Exit Ramp	New - Lake St BRT Entrance	138	140	1,112	9,571	8,366	41	41	E	1,112	9,191	8,053	43	37	E	1,112	8,281	8,027	28	58	F	1,112	8,062	7,747	34	46	F
New - Lake St BRT Entrance	Lake Street Entrance Ramp	140	142	496	9,571	8,495	41	36	E	496	9,191	8,182	43	33	D	496	8,281	8,141	30	47	F	496	8,062	7,853	34	40	E
Lake Street Entrance Ramp		142	144	1,061	10,650	9,535	45	36	E	1,061	10,301	9,265	45	34	D	1,061	9,041	8,883	30	50	F	1,061	8,842	8,611	36	40	E
	NB I-35W/TH 65 SPLIT	144	146	859	10,650	9,532	53	30	D	859	10,301	9,261	53	29	D	859	9,041	8,863	25	61	F	859	8,842	8,605	37	41	E
Begin NB TH 65		146	148	498	5,699	5,281	54	32	D	498	5,621	5,243	54	32	D	498	4,590	4,703	42	38	E	498	4,411	4,382	33	44	F
		148	150	281	5,699	5,280	55	32	D	281	5,621	5,241	55	32	D	281	4,590	4,700	40	40	E	281	4,411	4,376	32	46	F
		150	152	284	5,699	5,281	53	33	D	284	5,621	5,240	52	33	D	284	4,590	4,698	38	42	E	284	4,411	4,373	31	47	F
		152	154	582	5,699	5,283	51	35	D	582	5,621	5,239	50	35	D	582	4,590	4,694	36	44	F	582	4,411	4,369	30	49	F
	WB I-94 Exit	154	156	644	5,699	5,283	47	30	D	644	5,621	5,237	46	30	D	644	4,590	4,689	30	42	E	644	4,411	4,364	27	43	F
WB I-94 Exit	**END NB TH 65**	156	158	983	3,649	3,697	53	24	C	983	3,611	3,643	53	23	C	983	3,000	3,226	53	20	C	983	2,671	2,844	53	18	B
NB I-35W/TH 65 Split		146	161	174	4,951	4,250	53	27	C	174	4,680	4,017	53	25	C	174	4,451	4,149	17	97	F	174	4,431	4,219	40	44	F
	New - EB I-94 Exit	162	163	678	4,951	4,255	37	38	E	678	4,680	4,018	40	34	D	678	4,451	4,143	16	86	F	678	4,431	4,228	29	56	F
New - EB I-94 Exit		163	164	552	3,070	2,642	46	29	D	552	2,910	2,497	49	26	C	552	3,123	2,845	14	106	F	552	3,053	2,882	25	68	F
	5th Ave Entrance	164	165	965	3,070	2,633	29	45	F	965	2,910	2,493	32	39	E	965	3,123	2,833	13	114	F	965	3,053	2,869	16	94	F
5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,963	3,508	35	46	F	1,048	3,821	3,391	36	43	E	1,048	4,561	4,015	26	71	F	1,048	4,641	4,004	27	69	F
EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,452	4,853	47	32	D	1,024	5,241	4,663	48	30	D	1,024	6,101	5,524	39	44	F	1,024	6,201	5,499	39	45	F
EB I-94 Exit		167	168	540	4,860	4,262	50	28	D	540	4,660	4,088	51	27	C	540	5,341	4,897	45	36	E	540	5,372	4,904	45	37	E
	Washington Ave Exit	168	169	448	4,860	4,262	52	27	C	448	4,660	4,087	52	26	C	448	5,341	4,898	49	33	D	448	5,372	4,904	49	33	D
Washington Ave Exit		169	170	625	3,461	3,040	55	28	C	625	3,371	2,951	55	27	C	625	4,310	3,961	54	37	E	625	4,391	4,010	54	37	E
	END NB I-35W	170	171	523	3,461	3,040	57	27	C	523	3,371	2,951	57	26	C	523	4,310	3,961	56	35	E	523	4,391	4,009	56	36	E

Table B-6A
I-35W Transit/Access Project
Freeway MOE Comparison

NB FLYOVER COMPARISON (with 4th Ave)

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 3						Model # 4						Model # 3						Model # 4					
					2038 Transit Station Only Conditions						2038 Transit Station, SB Braid, NB Flyover						2038 Transit Station Only Conditions						2038 Transit Station, SB Braid, NB Flyover					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,260	6,258	61	26	C	1,488	6,260	6,260	62	26	C	1,488	5,441	5,416	53	29	D	1,488	5,441	5,444	62	22	C
			750	752	590	6,260	6,255	61	26	C	590	6,260	6,257	62	25	C	590	5,441	5,382	47	37	E	590	5,441	5,442	62	22	C
			752	754	1,231	6,260	6,254	60	26	C	1,231	6,260	6,254	61	26	C	1,231	5,441	5,341	40	49	F	1,231	5,441	5,443	62	22	C
			754	756	1,378	6,260	6,252	56	28	D	1,378	6,260	6,248	60	26	C	1,378	5,441	5,281	32	68	F	1,378	5,441	5,447	62	22	C
			756	758	775	6,260	6,247	51	32	D	775	6,260	6,244	58	27	C	775	5,441	5,236	26	81	F	775	5,441	5,450	61	22	C
		Cedar Ave Exit	758	759	1,026	6,260	6,240	44	34	D	1,026	6,260	6,242	54	27	C	1,026	5,441	5,205	22	82	F	1,026	5,441	5,450	57	22	C
	Cedar Ave Exit		759	760	755	5,030	5,011	32	43	F	755	5,030	5,013	53	24	C	755	5,001	4,759	18	86	F	755	5,001	4,990	53	24	C
			760	761	1,114	5,030	4,982	27	50	F	1,114	5,030	5,012	52	24	C	1,114	5,001	4,746	18	80	F	1,114	5,001	4,990	52	24	C
		SB I-35W Exit	761	762	677	5,030	4,953	29	44	F	677	5,030	5,011	51	25	C	677	5,001	4,736	20	66	F	677	5,001	4,988	48	26	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,301	4,216	27	54	F	492	4,301	4,303	49	29	D	492	3,851	3,612	18	73	F	492	3,851	3,840	51	25	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	6,462	6,346	28	57	F	1,637	6,462	6,466	46	34	D	1,637	5,741	4,589	17	69	F	1,637	5,741	4,818	50	23	C
	11th St Exit		764	15							730	5,103	5,103	49	35	D							730	5,051	4,258	51	28	D
		NB I-35W Flyover	15	765							828	5,103	5,102	49	35	D							828	5,051	4,257	51	28	C
	11th St Exit		764	765	1,022	5,103	4,986	25	67	F							1,022	5,051	4,045	15	90	F						
		NB I-35W/4th Ave Entrance	765	766	1,082	5,103	4,953	23	72	F	490	7,143	6,730	46	37	E	1,082	5,051	4,049	15	90	F	490	6,841	5,803	48	30	D
	NB I-35W/4th Ave Entrance		766	767	717	7,513	6,899	30	56	F	717	7,513	7,095	44	37	E	717	7,811	6,451	26	59	F	717	7,811	6,771	44	35	E
		Lyndale/Hennepin Exit	767	768	1,834	7,513	6,892	46	35	D	1,834	7,513	7,090	45	37	E	1,834	7,811	6,454	48	32	D	1,834	7,811	6,767	48	33	D
	Lyndale/Hennepin Exit		768	769	1,590	6,253	5,721	36	52	F	1,590	6,253	5,861	36	55	F	1,590	6,291	5,311	37	48	F	1,590	6,291	5,488	37	50	F
			769	770	1,188	6,253	5,719	45	43	E	1,188	6,253	5,858	43	45	F	1,188	6,291	5,316	46	39	E	1,188	6,291	5,488	45	41	E
		WB I-394 Exit	770	771	1,432	6,253	5,718	43	37	E	1,432	6,253	5,853	42	39	E	1,432	6,291	5,319	45	33	D	1,432	6,291	5,489	44	35	D
	WB I-394 Exit		771	772	508	2,933	2,635	52	17	B	508	2,933	2,659	52	17	B	508	3,351	2,910	52	19	B	508	3,351	2,983	52	19	B
		TH 55 Exit	772	774	544	2,933	2,634	54	14	B	544	2,933	2,658	54	14	B	544	3,351	2,911	54	15	B	544	3,351	2,982	54	16	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,634	2,361	54	15	B	400	2,634	2,384	54	15	B	400	2,920	2,549	54	16	B	400	2,920	2,613	54	16	B
	NB I-35W Flyover		256	6	890	2,040	1,603	29	56	F	470	2,040	1,630	29	57	F	890	1,790	1,435	17	86	F	470	1,790	1,548	28	56	F
			6	3	142	2,040	1,602	29	56	F	251	2,040	1,630	32	50	F	142	1,790	1,432	17	83	F	251	1,790	1,547	32	48	F
		4th Avenue Entrance	3	2	114	2,040	1,602	29	28	C							114	1,790	1,431	17	42	E						
		WB I-94	3	765							200	2,040	1,629	38	43	F							200	1,790	1,547	38	41	E
	4th Avenue		5	4	466	370	371	9	22	C	466	370	370	9	21	C	466	970	970	11	45	F	466	970	970	11	45	F
		NB Flyover Entrance	4	2	160	370	370	20	11	B	160	370	368	19	11	B	160	970	970	20	28	C	160	970	970	20	28	C
	NB Flyover Entrance		2	1	164	2,410	1,971	30	22	C	164	370	368	34	11	B	164	2,760	2,401	21	39	E	164	970	970	34	29	D
		WB I-94	1	766	254	2,410	1,969	29	34	D	254	370	368	43	9	A	254	2,760	2,400	20	60	F	254	970	970	42	23	C
Northbound I-35W/TH 65 (truncated)	31/Lake St Exit	New - Lake St BRT Exit	134	135	478	9,473	8,538	36	41	E	478	9,473	8,552	37	39	E	478	8,032	7,322	20	61	F	478	8,032	7,511	22	57	F
	New - Lake St BRT Exit		135	136	553	9,473	8,374	36	47	F	553	9,473	8,396	38	45	F	553	8,032	7,224	20	73	F	553	8,032	7,414	22	70	F
			136	138	718	9,473	8,353	36	47	F	718	9,473	8,378	38	45	F	718	8,032	7,241	21	71	F	718	8,032	7,437	22	68	F
		New - Lake St BRT Ent	138	140	1,240	9,473	8,322	36	47	F	1,240	9,473	8,345	38	45	F	1,240	8,032	7,264	22	66	F	1,240	8,032	7,464	23	64	F
	New - Lake St BRT Ent		140	142	494	9,473	8,438	35	42	E	494	9,473	8,457	37	40	E	494	8,032	7,394	24	54	F	494	8,032	7,595	25	52	F
			142	144	1,061	9,473	8,414	36	47	F	1,061	9,473	8,433	38	45	F	1,061	8,032	7,398	25	60	F	1,061	8,032	7,602	27	57	F
		NB I-35W/TH 65 SPLIT	144	146	859	9,473	8,386	36	48	F	859	9,473	8,405	38	46	F	859	8,032	7,398	25	59	F	859	8,032	7,606	28	55	F
	Begin NB TH 65		146	148	498	5,633	5,142	55	31	D	498	5,633	5,157	56	31	D	498	4,641	4,203	39	36	E	498	4,641	4,375	54	27	C
			148	150	281	5,633	5,141	55	31	D	281	5,633	5,156	55	31	D	281	4,641	4,199	38	37	E	281	4,641	4,374	54	27	C
			150	152	284	5,633	5,140	52	33	D	284	5,633	5,155	52	33	D	284	4,641	4,196	36	39	E	284	4,641	4,373	52	28	C
			152	154	582	5,633	5,139	50	34	D	582	5,633	5,155	50	34	D	582	4,641	4,191	34	41	E	582	4,641	4,372	50	29	D
		WB I-94 Exit	154	156	644	5,633	5,136	46	30	D	644	5,633	5,153	46	30	D	644	4,641	4,183	28	40	E	644	4,641	4,371	44	27	C
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,593	3,529	53	22	C	983	3,593	3,520	53	22	C	983	2,851	2,737	53	17	B	983	2,851	2,819	53	18	B
	NB I-35W/TH 65 Split		146	161	665	3,840	3,224	20	85	F	665	3,840	3,226	22	79	F	665	3,391	3,192	15	106	F	665	3,391	3,231	15	106	F
			163	164	927	3,840	3,188	17	97	F	927	3,840	3,187	18	91	F	927	3,391	3,198	15	104	F	927	3,391	3,232	16	104	F
		5th Ave Entrance	164	165	965	3,840	3,180	17	95	F	965	3,840	3,172	17	92	F	965	3,391	3,198	16	99	F	965	3,391	3,232	16	98	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	4,410	3,746	29	60	F	1,048	4,410	3,737	29	59	F	1,048	4,390	3,945	28	64	F	1,048	4,390	3,977	28	64	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,850	5,064	47	34	D	1,024	5,850	5,056	47	34	D	1,024	5,870	5,334	43	39	E	1,024	5,870	5,364	43	40	E
	EB I-94 Exit		167	168	540	4,380	3,782	51	25	C	540	4,380	3,801	51	25	C	540	5,041	4,583	47	33	D	540	5,041	4,608	47	33	D
		Washington Ave Exit	168	169	448	4,380	3,779	52	24	C	448	4,380	3,800	52	24	C	448	5,041	4,582	50	30	D	448	5,041	4,609	50	31	D
	Washington Ave Exit		169	170	625	3,171	2,713	56	24	C	625	3,171	2,752	56	25	C	625	4,210	3,812	54	35	E	625	4,210	3,849	54	36	E
		END NB I-35W	170	171	523	3,171	2,713	57	24	C	523	3,171	2,753	57	24	C	523	4,210	3,810	56	34	D	523	4,210	3,849	56	34	D

Table B-6B
I-35W Transit/Access Project
Freeway MOE Comparison

NB FLYOVER COMPARISON (with 4th Ave)

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 6						Model # 8						Model # 6						Model # 8					
					2038 Full Build						2038 Full Build NB Flyover						2038 Full Build						2038 Full Build NB Flyover					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,379	6,376	61	26	C	1,488	6,379	6,371	61	26	C	1,488	5,392	5,368	54	31	D	1,488	5,392	5,397	63	22	C
			750	752	590	6,379	6,374	62	26	C	590	6,379	6,367	62	26	C	590	5,392	5,341	50	40	E	590	5,392	5,396	62	22	C
			752	754	1,231	6,379	6,371	61	26	C	1,231	6,379	6,364	61	26	C	1,231	5,392	5,314	43	48	F	1,231	5,392	5,394	62	22	C
			754	756	1,378	6,379	6,365	60	26	C	1,378	6,379	6,358	60	27	C	1,378	5,392	5,262	31	66	F	1,378	5,392	5,394	61	22	C
			756	758	775	6,379	6,360	58	27	C	775	6,379	6,353	58	27	C	775	5,392	5,217	23	81	F	775	5,392	5,402	58	23	C
		Cedar Ave Exit	758	759	1,026	6,379	6,357	54	27	C	1,026	6,379	6,352	55	27	C	1,026	5,392	5,193	19	91	F	1,026	5,392	5,422	53	25	C
	Cedar Ave Exit		759	760	755	5,169	5,162	52	25	C	755	5,169	5,151	53	25	C	755	4,972	4,773	16	102	F	755	4,972	5,015	47	27	C
			760	761	1,114	5,169	5,160	47	28	C	1,114	5,169	5,150	52	25	C	1,114	4,972	4,764	14	93	F	1,114	4,972	5,046	44	29	D
		SB I-35W Exit	761	762	677	5,169	5,158	43	31	D	677	5,169	5,150	51	25	C	677	4,972	4,756	16	74	F	677	4,972	5,080	42	31	D
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,200	4,184	37	38	E	492	4,200	4,185	50	28	C	492	3,782	3,603	13	92	F	492	3,782	3,876	38	35	E
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	6,232	6,204	33	47	F	1,637	6,232	6,217	46	33	D	1,637	5,692	4,603	14	81	F	1,637	5,692	5,141	39	33	D
	11th St Exit		764	15							780	4,963	4,941	49	34	D							780	5,051	4,615	40	40	E
		NB I-35W Flyover	15	765							828	4,963	4,940	49	34	D							828	5,051	4,631	39	40	E
	11th St Exit		764	765	1,022	4,963	4,892	27	62	F							1,022	5,051	4,105	14	98	F						
		NB I-35W/4th Ave Entrance	765	766	1,082	4,963	4,867	24	69	F	490	6,973	6,521	45	36	E	1,082	5,051	4,109	14	95	F	490	6,791	6,202	37	42	E
	NB I-35W/4th Ave Entrance		766	767	717	7,313	6,771	29	55	F	714	7,313	6,859	44	37	E	717	7,701	6,541	26	61	F	714	7,701	7,120	37	46	F
		Lyndale/Hennepin Exit	767	768	1,834	7,313	6,764	46	34	D	1,834	7,313	6,855	46	35	E	1,834	7,701	6,543	47	33	D	1,834	7,701	7,137	41	41	E
	Lyndale/Hennepin Exit		768	769	1,590	6,222	5,740	36	53	F	1,590	6,222	5,789	36	54	F	1,590	6,360	5,484	37	50	F	1,590	6,360	5,936	35	56	F
			769	770	1,188	6,222	5,739	45	43	E	1,188	6,222	5,787	44	44	F	1,188	6,360	5,489	46	40	E	1,188	6,360	5,942	41	48	F
		WB I-394 Exit	770	771	1,432	6,222	5,738	43	37	E	1,432	6,222	5,785	42	39	E	1,432	6,360	5,492	45	34	D	1,432	6,360	5,948	42	40	E
	WB I-394 Exit		771	772	508	2,922	2,622	52	17	B	508	2,922	2,606	52	17	B	508	3,490	3,123	51	20	C	508	3,490	3,254	51	21	C
		TH 55 Exit	772	774	544	2,922	2,621	54	14	B	544	2,922	2,606	54	14	B	544	3,490	3,124	54	16	B	544	3,490	3,255	54	17	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,623	2,352	54	15	B	400	2,623	2,340	54	14	B	400	3,039	2,712	54	17	B	400	3,039	2,812	54	17	B
	NB I-35W Flyover		256	6	890	2,010	1,588	29	55	F	470	2,010	1,583	29	54	F	890	1,740	1,519	16	94	F	470	1,740	1,556	28	55	F
			6	3	142	2,010	1,586	29	54	F	251	2,010	1,582	33	49	F	142	1,740	1,520	17	88	F	251	1,740	1,557	32	48	F
		4th Avenue Entrance	3	2	114	2,010	1,586	30	27	C							114	1,740	1,520	17	44	F						
		WB I-94	3	765							200	2,010	1,582	38	42	E							200	1,740	1,558	38	42	E
	4th Avenue		5	4	466	340	339	9	20	C	466	340	338	9	20	C	466	910	909	11	44	F	466	910	909	11	44	F
		NB Flyover Entrance	4	2	160	340	339	20	10	A	160	340	338	20	10	A	160	910	909	20	26	C	160	910	908	20	26	C
	NB Flyover Entrance		2	1	164	2,350	1,924	31	21	C	164	340	338	34	10	A	164	2,650	2,429	21	39	E	164	910	909	33	28	C
		WB I-94	1	766	254	2,350	1,923	30	33	D	254	340	339	40	8	A	254	2,650	2,430	20	60	F	254	910	909	36	26	C
	31/Lake St Exit	New - Lake St BRT Exit	134	135	478	9,851	8,822	30	42	E	478	9,851	8,806	30	42	E	478	8,672	8,452	28	45	F	478	8,672	8,294	26	48	F
	New - Lake St BRT Exit		135	136	553	9,851	8,663	33	45	F	553	9,851	8,644	32	45	F	553	8,672	8,324	28	50	F	553	8,672	8,164	26	54	F
			136	138	843	9,851	8,647	38	38	E	843	9,851	8,623	38	38	E	843	8,672	8,313	32	44	F	843	8,672	8,144	26	53	F
		New - Lake St BRT Ent	138	140	1,112	9,191	8,053	43	37	E	1,112	9,191	8,037	43	37	E	1,112	8,062	7,747	34	46	F	1,112	8,062	7,548	26	58	F
	New - Lake St BRT Ent		140	142	496	9,191	8,182	43	33	D	496	9,191	8,169	43	33	D	496	8,062	7,853	34	40	E	496	8,062	7,643	28	47	F
			142	144	1,061	10,301	9,265	45	34	D	1,061	10,301	9,259	45	35	D	1,061	8,842	8,611	36	40	E	1,061	8,842	8,396	27	52	F
		NB I-35W/TH 65 SPLIT	144	146	859	10,301	9,261	53	29	D	859	10,301	9,255	53	29	D	859	8,842	8,605	37	41	E	859	8,842	8,369	22	65	F
	Begin NB TH 65		146	148	498	5,621	5,243	54	32	D	498	5,621	5,237	54	32	D	498	4,411	4,382	33	44	F	498	4,411	4,346	55	26	C
			148	150	281	5,621	5,241	55	32	D	281	5,621	5,234	55	32	D	281	4,411	4,376	32	46	F	281	4,411	4,347	55	26	C
			150	152	284	5,621	5,240	52	33	D	284	5,621	5,233	53	33	D	284	4,411	4,373	31	47	F	284	4,411	4,348	53	27	C
			152	154	582	5,621	5,239	50	35	D	582	5,621	5,233	51	34	D	582	4,411	4,369	30	49	F	582	4,411	4,348	51	29	D
		WB I-94 Exit	154	156	644	5,621	5,237	46	30	D	644	5,621	5,231	47	30	D	644	4,411	4,364	27	43	F	644	4,411	4,350	45	26	C
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,611	3,643	53	23	C	983	3,611	3,644	53	23	C	983	2,671	2,844	53	18	B	983	2,671	2,797	53	18	B
	NB I-35W/TH 65 Split		146	161	174	4,680	4,017	53	25	C	174	4,680	4,018	53	25	C	174	4,431	4,219	40	44	F	174	4,431	4,009	12	114	F
			163	164	552	2,910	2,497	49	26	C	552	2,910	2,489	49	25	C	552	3,053	2,882	25	68	F	552	3,053	2,671	12	114	F
		5th Ave Entrance	164	165	965	2,910	2,493	32	39	E	965	2,910	2,486	33	38	E	965	3,053	2,869	16	94	F	965	3,053	2,662	11	122	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,821	3,391	36	43	E	1,048	3,821	3,388	37	42	E	1,048	4,641	4,004	27	69	F	1,048	4,641	4,044	26	72	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,241	4,663	48	30	D	1,024	5,241	4,673	48	30	D	1,024	6,201	5,499	39	45	F	1,024	6,201	5,535	40	43	F
	EB I-94 Exit		167	168	540	4,660	4,088	51	27	C	540	4,660	4,095	51	27	C	540	5,372	4,904	45	37	E	540	5,372	4,813	46	35	E
		Washington Ave Exit	168	169	448	4,660	4,087	52	26	C	448	4,660	4,093	52	26	C	448	5,372	4,904	49	33	D	448	5,372	4,814	50	32	D
	Washington Ave Exit		169	170	625	3,371	2,951	55	27	C	625	3,371	2,962	55	27	C	625	4,391	4,010	54	37	E	625	4,391	3,918	54	36	E
		END NB I-35W	170	171	523	3,371	2,951	57	26	C	523	3,371	2,963	57	26	C	523	4,391	4,009	56	36	E	523	4,391	3,918	56	35	D

Table B-7A
I-35W Transit/Access Project
Freeway MOE Comparison

4th AVENUE COMPARISON (NB Flyover on Right)

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 6						Model # 7						Model # 6						Model # 7					
					2038 Full Build						2038 Full Build Without 4th Ave Ramp						2038 Full Build						2038 Full Build Without 4th Ave Ramp					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,379	6,376	61	26	C	1,488	6,390	6,383	61	26	C	1,488	5,392	5,368	54	31	D	1,488	5,312	5,317	63	22	C
			750	752	590	6,379	6,374	62	26	C	590	6,390	6,381	62	26	C	590	5,392	5,341	50	40	E	590	5,312	5,319	62	21	C
			752	754	1,231	6,379	6,371	61	26	C	1,231	6,390	6,379	61	26	C	1,231	5,392	5,314	43	48	F	1,231	5,312	5,322	62	22	C
			754	756	1,378	6,379	6,365	60	26	C	1,378	6,390	6,373	60	27	C	1,378	5,392	5,262	31	66	F	1,378	5,312	5,325	62	22	C
			756	758	775	6,379	6,360	58	27	C	775	6,390	6,369	58	27	C	775	5,392	5,217	23	81	F	775	5,312	5,328	61	22	C
		Cedar Ave Exit	758	759	1,026	6,379	6,357	54	27	C	1,026	6,390	6,367	54	27	C	1,026	5,392	5,193	19	91	F	1,026	5,312	5,326	57	22	C
	Cedar Ave Exit		759	760	755	5,169	5,162	52	25	C	755	5,170	5,165	53	25	C	755	4,972	4,773	16	102	F	755	4,973	5,006	53	24	C
			760	761	1,114	5,169	5,160	47	28	C	1,114	5,170	5,161	51	25	C	1,114	4,972	4,764	14	93	F	1,114	4,973	5,003	51	24	C
		SB I-35W Exit	761	762	677	5,169	5,158	43	31	D	677	5,170	5,159	49	26	C	677	4,972	4,756	16	74	F	677	4,973	5,001	51	25	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,200	4,184	37	38	E	492	4,152	4,152	47	30	D	492	3,782	3,603	13	92	F	492	3,793	3,804	51	25	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	6,232	6,204	33	47	F	1,637	6,143	6,148	45	33	D	1,637	5,692	4,603	14	81	F	1,637	5,733	5,146	49	26	C
	11th St Exit		764	15																								
		NB I-35W Flyover	15	765																								
	11th St Exit		764	765	1,022	4,963	4,892	27	62	F	1,022	4,864	4,862	48	34	D	1,022	5,051	4,105	14	98	F	1,022	5,233	4,698	46	34	D
		NB I-35W/4th Ave Entrance	765	766	1,082	4,963	4,867	24	69	F	1,082	4,864	4,860	42	39	E	1,082	5,051	4,109	14	95	F	1,082	5,233	4,693	38	42	E
	NB I-35W/4th Ave Entrance		766	767	717	7,313	6,771	29	55	F	717	7,024	6,539	37	45	F	717	7,701	6,541	26	61	F	717	7,413	6,585	34	48	F
		Lyndale/Hennepin Exit	767	768	1,834	7,313	6,764	46	34	D	1,834	7,024	6,539	47	32	D	1,834	7,701	6,543	47	33	D	1,834	7,413	6,586	48	32	D
	Lyndale/Hennepin Exit		768	769	1,590	6,222	5,740	36	53	F	1,590	5,945	5,506	37	50	F	1,590	6,360	5,484	37	50	F	1,590	6,113	5,464	37	49	F
			769	770	1,188	6,222	5,739	45	43	E	1,188	5,945	5,502	45	41	E	1,188	6,360	5,489	46	40	E	1,188	6,113	5,466	46	40	E
		WB I-394 Exit	770	771	1,432	6,222	5,738	43	37	E	1,432	5,945	5,500	43	35	E	1,432	6,360	5,492	45	34	D	1,432	6,113	5,470	45	34	D
	WB I-394 Exit		771	772	508	2,922	2,622	52	17	B	508	2,625	2,330	52	15	B	508	3,490	3,123	51	20	C	508	3,203	2,905	52	19	B
		TH 55 Exit	772	774	544	2,922	2,621	54	14	B	544	2,625	2,330	54	12	B	544	3,490	3,124	54	16	B	544	3,203	2,906	54	15	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,623	2,352	54	15	B	400	2,356	2,097	54	13	B	400	3,039	2,712	54	17	B	400	2,792	2,528	54	16	B
	NB I-35W Flyover		256	6	890	2,010	1,588	29	55	F	890	2,160	1,680	30	56	F	890	1,740	1,519	16	94	F	890	2,180	1,894	28	68	F
			6	3	142	2,010	1,586	29	54	F	142	2,160	1,680	32	53	F	142	1,740	1,520	17	88	F	142	2,180	1,894	31	61	F
		4th Avenue Entrance	3	2	114	2,010	1,586	30	27	C	114	2,160	1,680	34	25	C	114	1,740	1,520	17	44	F	114	2,180	1,893	33	29	D
Northbound I-35W/TH 65 (truncated)	31/Lake St Exit	New - Lake St BRT Exit	134	135	478	9,851	8,822	30	42	E	478	9,933	8,788	29	44	F	478	8,672	8,452	28	45	F	478	8,751	8,209	24	49	F
	New - Lake St BRT Exit		135	136	553	9,851	8,663	33	45	F	553	9,933	8,632	31	46	F	553	8,672	8,324	28	50	F	553	8,751	8,089	27	51	F
			136	138	843	9,851	8,647	38	38	E	843	9,933	8,619	37	39	E	843	8,672	8,313	32	44	F	843	8,751	8,086	32	42	E
		New - Lake St BRT Ent	138	140	1,112	9,191	8,053	43	37	E	1,112	9,283	8,037	43	38	E	1,112	8,062	7,747	34	46	F	1,112	8,271	7,646	39	39	E
	New - Lake St BRT Ent		140	142	496	9,191	8,182	43	33	D	496	9,283	8,169	43	33	D	496	8,062	7,853	34	40	E	496	8,271	7,766	41	33	D
			142	144	1,061	10,301	9,265	45	34	D	1,061	10,363	9,224	45	34	D	1,061	8,842	8,611	36	40	E	1,061	9,031	8,532	44	32	D
		NB I-35W/TH 65 SPLIT	144	146	859	10,301	9,261	53	29	D	859	10,363	9,218	53	29	D	859	8,842	8,605	37	41	E	859	9,031	8,538	48	30	D
	Begin NB TH 65		146	148	498	5,621	5,243	54	32	D	498	5,653	5,222	54	32	D	498	4,411	4,382	33	44	F	498	4,700	4,506	42	36	E
			148	150	281	5,621	5,241	55	32	D	281	5,653	5,221	55	32	D	281	4,411	4,376	32	46	F	281	4,700	4,504	40	37	E
			150	152	284	5,621	5,240	52	33	D	284	5,653	5,220	53	33	D	284	4,411	4,373	31	47	F	284	4,700	4,503	39	39	E
			152	154	582	5,621	5,239	50	35	D	582	5,653	5,218	51	34	D	582	4,411	4,369	30	49	F	582	4,700	4,503	37	40	E
		WB I-94 Exit	154	156	644	5,621	5,237	46	30	D	644	5,653	5,214	46	30	D	644	4,411	4,364	27	43	F	644	4,700	4,502	33	36	E
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,611	3,643	53	23	C	983	3,493	3,530	53	22	C	983	2,671	2,844	53	18	B	983	2,520	2,610	53	16	B
	NB I-35W/TH 65 Split		146	161	174	4,680	4,017	53	25	C	174	4,710	3,994	53	25	C	174	4,431	4,219	40	44	F	174	4,331	4,035	51	26	C
			163	164	552	2,910	2,497	49	26	C	552	2,960	2,497	48	26	C	552	3,053	2,882	25	68	F	552	2,972	2,742	37	38	E
		5th Ave Entrance	164	165	965	2,910	2,493	32	39	E	965	2,960	2,493	30	42	E	965	3,053	2,869	16	94	F	965	2,972	2,740	22	66	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,821	3,391	36	43	E	1,048	3,892	3,414	35	44	F	1,048	4,641	4,004	27	69	F	1,048	4,501	3,880	29	61	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,241	4,663	48	30	D	1,024	5,322	4,697	48	31	D	1,024	6,201	5,499	39	45	F	1,024	6,050	5,391	39	44	F
	EB I-94 Exit		167	168	540	4,660	4,088	51	27	C	540	4,711	4,098	51	27	C	540	5,372	4,904	45	37	E	540	5,340	4,869	45	36	E
		Washington Ave Exit	168	169	448	4,660	4,087	52	26	C	448	4,711	4,098	52	26	C	448	5,372	4,904	49	33	D	448	5,340	4,868	49	33	D
	Washington Ave Exit		169	170	625	3,371	2,951	55	27	C	625	3,381	2,939	55	27	C	625	4,391	4,010	54	37	E	625	4,329	3,967	54	37	E
		END NB I-35W	170	171	523	3,371	2,951	57	26	C	523	3,381	2,941	57	26	C	523	4,391	4,009	56	36	E	523	4,329	3,967	56	35	E

Table B-7B
I-35W Transit/Access Project
Freeway MOE Comparison

4th AVENUE COMPARISON (NB Flyover on Left)

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 8						Model # 9						Model # 8						Model # 9					
					2038 Full Build NB Flyover						2038 Full Build NB Flyover w/o 4th Ave						2038 Full Build NB Flyover						2038 Full Build NB Flyover w/o 4th Ave					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,379	6,371	61	26	C	1,488	6,390	6,384	61	26	C	1,488	5,392	5,397	63	22	C	1,488	5,312	5,311	63	22	C
			750	752	590	6,379	6,367	62	26	C	590	6,390	6,381	62	26	C	590	5,392	5,396	62	22	C	590	5,312	5,312	62	21	C
			752	754	1,231	6,379	6,364	61	26	C	1,231	6,390	6,378	61	26	C	1,231	5,392	5,394	62	22	C	1,231	5,312	5,319	61	22	C
			754	756	1,378	6,379	6,358	60	27	C	1,378	6,390	6,371	60	26	C	1,378	5,392	5,394	61	22	C	1,378	5,312	5,340	58	23	C
			756	758	775	6,379	6,353	58	27	C	775	6,390	6,366	59	27	C	775	5,392	5,402	58	23	C	775	5,312	5,366	56	25	C
		Cedar Ave Exit	758	759	1,026	6,379	6,352	55	27	C	1,026	6,390	6,365	55	27	C	1,026	5,392	5,422	53	25	C	1,026	5,312	5,397	51	25	C
	Cedar Ave Exit		759	760	755	5,169	5,151	53	25	C	755	5,170	5,175	53	25	C	755	4,972	5,015	47	27	C	755	4,973	5,092	46	28	D
			760	761	1,114	5,169	5,150	52	25	C	1,114	5,170	5,174	52	25	C	1,114	4,972	5,046	44	29	D	1,114	4,973	5,123	44	30	D
		SB I-35W Exit	761	762	677	5,169	5,150	51	25	C	677	5,170	5,173	51	25	C	677	4,972	5,080	42	31	D	677	4,973	5,150	44	29	D
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,200	4,185	50	28	C	492	4,152	4,159	50	28	C	492	3,782	3,876	38	35	E	492	3,793	3,943	43	31	D
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	6,232	6,217	46	33	D	1,637	6,143	6,152	46	32	D	1,637	5,692	5,141	39	33	D	1,637	5,733	5,306	44	29	D
	11th St Exit		764	15	780	4,963	4,941	49	34	D	780	4,864	4,877	49	33	D	780	5,051	4,615	40	40	E	780	5,233	4,876	47	35	D
		NB I-35W Flyover	15	765	828	4,963	4,940	49	34	D	828	4,864	4,876	50	33	D	828	5,051	4,631	39	40	E	828	5,233	4,881	48	34	D
		NB I-35W/4th Ave Entrance	765	766	490	6,973	6,521	45	36	E	490	7,024	6,550	47	35	D	490	6,791	6,202	37	42	E	490	7,413	6,781	46	37	E
	NB I-35W/4th Ave Entrance		766	767	714	7,313	6,859	44	37	E	714	7,024	6,550	48	34	D	714	7,701	7,120	37	46	F	714	7,413	6,787	48	36	E
		Lyndale/Hennepin Exit	767	768	1,834	7,313	6,855	46	35	E	1,834	7,024	6,548	48	32	D	1,834	7,701	7,137	41	41	E	1,834	7,413	6,796	47	34	D
	Lyndale/Hennepin Exit		768	769	1,590	6,222	5,789	36	54	F	1,590	5,945	5,511	36	51	F	1,590	6,360	5,936	35	56	F	1,590	6,113	5,629	36	52	F
			769	770	1,188	6,222	5,787	44	44	F	1,188	5,945	5,510	45	41	E	1,188	6,360	5,942	41	48	F	1,188	6,113	5,638	43	44	F
		WB I-394 Exit	770	771	1,432	6,222	5,785	42	39	E	1,432	5,945	5,506	43	36	E	1,432	6,360	5,948	42	40	E	1,432	6,113	5,647	43	37	E
	WB I-394 Exit		771	772	508	2,922	2,606	52	17	B	508	2,625	2,317	52	15	B	508	3,490	3,254	51	21	C	508	3,203	2,969	52	19	B
		TH 55 Exit	772	774	544	2,922	2,606	54	14	B	544	2,625	2,316	54	12	B	544	3,490	3,255	54	17	B	544	3,203	2,970	54	16	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,623	2,340	54	14	B	400	2,356	2,082	54	13	B	400	3,039	2,812	54	17	B	400	2,792	2,582	54	16	B
	NB I-35W Flyover		256	6	470	2,010	1,583	29	54	F	470	2,160	1,677	29	58	F	470	1,740	1,556	28	55	F	470	2,180	1,894	26	73	F
			6	3	251	2,010	1,582	33	49	F	251	2,160	1,676	32	52	F	251	1,740	1,557	32	48	F	251	2,180	1,894	32	59	F
		WB I-94	3	765	200	2,010	1,582	38	42	E	200	2,160	1,676	38	45	F	200	1,740	1,558	38	42	E	200	2,180	1,894	38	51	F
Northbound I-35W/TH 65 (truncated)	31/Lake St Exit	New - Lake St BRT Exit	134	135	478	9,851	8,806	30	42	E	478	9,933	8,836	29	45	F	478	8,672	8,294	26	48	F	478	8,751	8,213	25	47	F
	New - Lake St BRT Exit		135	136	553	9,851	8,644	32	45	F	553	9,933	8,678	31	47	F	553	8,672	8,164	26	54	F	553	8,751	8,097	27	50	F
			136	138	843	9,851	8,623	38	38	E	843	9,933	8,660	37	39	E	843	8,672	8,144	26	53	F	843	8,751	8,099	33	41	E
		New - Lake St BRT Ent	138	140	1,112	9,191	8,037	43	37	E	1,112	9,283	8,082	43	38	E	1,112	8,062	7,548	26	58	F	1,112	8,271	7,656	39	39	E
	New - Lake St BRT Ent		140	142	496	9,191	8,169	43	33	D	496	9,283	8,215	43	33	D	496	8,062	7,643	28	47	F	496	8,271	7,776	41	33	D
			142	144	1,061	10,301	9,259	45	35	D	1,061	10,363	9,276	45	34	D	1,061	8,842	8,396	27	52	F	1,061	9,031	8,535	43	34	D
		NB I-35W/TH 65 SPLIT	144	146	859	10,301	9,255	53	29	D	859	10,363	9,268	53	29	D	859	8,842	8,369	22	65	F	859	9,031	8,546	41	36	E
	Begin NB TH 65		146	148	498	5,621	5,237	54	32	D	498	5,653	5,235	54	32	D	498	4,411	4,346	55	26	C	498	4,700	4,507	44	34	D
			148	150	281	5,621	5,234	55	32	D	281	5,653	5,233	55	32	D	281	4,411	4,347	55	26	C	281	4,700	4,506	42	35	E
			150	152	284	5,621	5,233	53	33	D	284	5,653	5,232	53	33	D	284	4,411	4,348	53	27	C	284	4,700	4,505	41	37	E
			152	154	582	5,621	5,233	51	34	D	582	5,653	5,231	51	34	D	582	4,411	4,348	51	29	D	582	4,700	4,504	39	39	E
		WB I-94 Exit	154	156	644	5,621	5,231	47	30	D	644	5,653	5,230	46	30	D	644	4,411	4,350	45	26	C	644	4,700	4,504	34	35	E
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,611	3,644	53	23	C	983	3,493	3,549	53	23	C	983	2,671	2,797	53	18	B	983	2,520	2,608	53	16	B
	NB I-35W/TH 65 Split		146	161	174	4,680	4,018	53	25	C	174	4,710	4,030	53	26	C	174	4,431	4,009	12	114	F	174	4,331	4,047	32	49	F
			163	164	552	2,910	2,489	49	25	C	552	2,960	2,537	46	28	D	552	3,053	2,671	12	114	F	552	2,972	2,707	14	98	F
		5th Ave Entrance	164	165	965	2,910	2,486	33	38	E	965	2,960	2,533	29	44	F	965	3,053	2,662	11	122	F	965	2,972	2,701	12	116	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,821	3,388	37	42	E	1,048	3,892	3,448	35	45	F	1,048	4,641	4,044	26	72	F	1,048	4,501	4,057	26	71	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,241	4,673	48	30	D	1,024	5,322	4,738	48	31	D	1,024	6,201	5,535	40	43	F	1,024	6,050	5,525	40	44	F
	EB I-94 Exit		167	168	540	4,660	4,095	51	27	C	540	4,711	4,133	51	27	C	540	5,372	4,813	46	35	E	540	5,340	4,889	45	36	E
		Washington Ave Exit	168	169	448	4,660	4,093	52	26	C	448	4,711	4,133	52	27	C	448	5,372	4,814	50	32	D	448	5,340	4,890	49	33	D
	Washington Ave Exit		169	170	625	3,371	2,962	55	27	C	625	3,381	2,952	55	27	C	625	4,391	3,918	54	36	E	625	4,329	3,983	54	37	E
		END NB I-35W	170	171	523	3,371	2,963	57	26	C	523	3,381	2,953	57	26	C	523	4,391	3,918	56	35	D	523	4,329	3,983	56	35	E

Appendix C

2018 Full MOE Comparison Tables

Table C-1

I-35W Transit/Access Project

2018 Freeway MOE Comparison

AM Peak Hour

	Location		Node		Model # 1: Existing Conditions						Model # 2: 2018 No Build Conditions						Model # 3: 2018 Transit Station Only Conditions					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,620	4,654	63	19	B	744	4,850	4,893	62	20	C	744	4,850	4,896	62	20	C
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,290	6,342	65	16	B	1,355	6,670	6,732	64	18	B	1,355	6,670	6,732	64	18	B
	60th St Entrance	Diamond Lake Exit	106	108	910	6,520	6,572	65	16	B	910	6,970	7,032	65	17	B	910	6,970	7,033	65	17	B
	Diamond Lake Exit		108	110	1,432	6,360	6,433	66	20	B	1,432	6,670	6,741	66	21	C	1,432	6,670	6,741	65	21	C
		Diamond Lake Entrance	110	112	1,225	6,360	6,433	65	20	B	1,225	6,670	6,738	63	21	C	1,225	6,670	6,735	62	22	C
	Diamond Lake Entrance		112	113	1,449	7,080	7,161	59	23	C	1,449	7,481	7,552	55	26	C	1,449	7,481	7,544	53	27	C
			113	114	542	7,080	7,156	64	23	C	542	7,481	7,546	59	26	C	542	7,481	7,529	55	28	C
		46th St Exit	114	116	1,462	7,080	7,152	65	21	C	1,462	7,481	7,530	53	28	C	1,462	7,481	7,493	49	30	D
	46th St Exit	46th St BRT Exit	116	118	238	6,870	6,944	64	19	B	238	7,281	7,320	45	29	D	238	7,281	7,273	42	31	D
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	6,870	6,919	56	26	C	2,201	7,281	7,245	36	42	E	2,201	7,281	7,176	34	44	F
	46th St BRT Entrance	46th St Entrance	120	122	378	6,870	6,909	44	30	D	378	7,281	7,183	28	45	F	378	7,281	7,094	28	46	F
	46th St Entrance		122	124	1,521	7,940	7,938	38	42	E	1,521	8,392	8,206	29	53	F	1,521	8,392	8,114	29	54	F
			124	126	818	7,940	7,887	35	47	F	818	8,392	8,133	31	54	F	818	8,392	8,050	30	54	F
		35/36th St Exit	126	128	1,514	7,940	7,836	32	48	F	1,514	8,392	8,068	30	52	F	1,514	8,392	7,994	30	52	F
	35/36th St Exit		128	130	1,485	7,770	7,602	29	52	F	1,485	8,192	7,820	30	53	F	1,485	8,192	7,747	30	52	F
		35/36th St Entrance	130	132	1,474	7,770	7,536	31	49	F	1,474	8,192	7,760	32	49	F	1,474	8,192	7,686	32	48	F
	35/36th St Entrance	31/Lake St Exit	132	134	604	9,010	8,738	34	43	F	604	9,402	8,840	35	43	E	604	9,402	8,780	34	43	E
	31/Lake St Exit	Lake St BRT Exit	134	136	1,029	8,090	7,796	41	34	D	1,029	8,512	7,973	42	35	E						
	31/Lake St Exit		134	135													478	8,512	7,922	40	34	D
		Lake St BRT Exit	135	136													553	8,512	7,830	42	37	E
	Lake St BRT Exit	Lake St BRT Entrance	136	138	721	8,090	7,773	45	35	D	721	8,512	7,950	45	35	E	718	8,512	7,816	44	35	E
	Lake St BRT Entrance		138	140	1,190	8,090	7,757	49	30	D	1,190	8,512	7,937	49	30	D	1,240	8,512	7,800	49	32	D
			140	142	569	8,090	7,743	51	31	D	569	8,512	7,926	51	31	D	494	8,512	7,867	50	27	C
			142	144	1,061	8,090	7,734	55	28	D	1,061	8,512	7,920	55	29	D	1,061	8,512	7,862	54	29	D
		NB I-35W/TH 65 SPLIT	144	146	859	8,090	7,727	57	27	C	859	8,512	7,911	57	28	C	859	8,512	7,859	56	28	D
	Begin NB TH 65		146	148	498	4,660	4,450	57	26	C	498	4,952	4,644	57	27	C	498	4,952	4,612	56	27	C
			148	150	281	4,660	4,447	56	27	C	281	4,952	4,642	56	28	C	281	4,952	4,611	55	28	C
			150	152	284	4,660	4,445	53	28	D	284	4,952	4,641	53	29	D	284	4,952	4,609	53	29	D
			152	154	582	4,660	4,442	50	29	D	582	4,952	4,639	51	30	D	582	4,952	4,606	50	30	D
		WB I-94 Exit	154	156	644	4,660	4,439	45	26	C	644	4,952	4,636	46	27	C	644	4,952	4,602	46	27	C
	WB I-94 Exit	**END NB TH 65**	156	158	983	2,830	2,786	53	17	B	983	3,072	3,032	53	19	B	983	3,072	3,015	53	19	B
	NB I-35W/TH 65 Split		146	161	665	3,430	3,273	52	32	D	665	3,560	3,263	51	32	D	665	3,560	3,244	51	32	D
		New - EB I-94 Exit	162	163																		
	New - EB I-94 Exit		163	164	927	3,430	3,272	42	40	E	927	3,560	3,262	43	38	E	927	3,560	3,243	43	39	E
		5th Ave Entrance	164	165	965	3,430	3,269	28	58	F	965	3,560	3,262	28	58	F	965	3,560	3,237	29	57	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,760	3,590	36	46	F	1,048	3,959	3,658	35	48	F	1,048	3,959	3,628	35	47	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,990	4,792	49	31	D	1,024	5,078	4,744	49	30	D	1,024	5,078	4,714	49	30	D
	EB I-94 Exit		167	168	540	3,650	3,487	51	23	C	540	3,828	3,591	51	23	C	540	3,828	3,557	51	23	C
		Washington Ave Exit	168	169	448	3,650	3,486	52	22	C	448	3,828	3,589	52	23	C	448	3,828	3,556	52	23	C
	Washington Ave Exit		169	170	625	3,130	2,982	55	27	C	625	3,118	2,905	55	26	C	625	3,118	2,889	55	26	C
		END NB I-35W	170	171	523	3,130	2,982	57	26	C	523	3,118	2,903	57	25	C	523	3,118	2,888	57	25	C
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,450	2,447	57	22	C	1,074	2,489	2,488	57	23	C	1,074	2,489	2,487	57	22	C
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,730	2,730	52	24	C	892	2,789	2,792	51	25	C	892	2,789	2,790	51	25	C
	WB I-94 Entrance		366	367	1,871	3,340	3,322	50	30	D	1,871	3,430	3,429	48	32	D	1,871	3,430	3,417	48	32	D
			367	368	827	3,340	3,319	34	49	F	827	3,430	3,425	33	51	F	827	3,430	3,414	34	51	F
			368	369	483	3,340	3,317	41	40	E	483	3,430	3,422	41	42	E	483	3,430	3,411	41	42	E
			369	370	403	3,340	3,316	51	32	D	403	3,430	3,420	51	34	D	403	3,430	3,411	51	34	D
		SB TH 65 Entrance	374	376	627	3,340	3,311	55	30	D	627	3,430	3,415	55	31	D	627	3,430	3,407	55	31	D
	Begin SB TH 65	12th St Entrance	300	302	867	460	462	63	4	A	867	500	501	63	4	A	867	500	502	63	4	A
	12th St Entrance	EB I-94 Entrance	302	304	1,088	670	736	56	6	A	1,088	700	776	56	6	A	1,088	700	777	56	6	A
	EB I-94 Entrance		304	307	1,574	2,240	2,314	59	13	B	1,574	2,410	2,460	59	14	B	1,574	2,410	2,430	59	14	B
		SB I-35W Entrance	307	310	1,516	2,240	2,313	61	14	B	1,516	2,410	2,460	61	15	B	1,516	2,410	2,428	61	15	B
			307	308																		
		SB I-35W Entrance	308	310																		
	SB I-35W Entrance		310	314	698	5,580	5,618	60	23	C	698	5,840	5,871	60	25	C	698	5,840	5,829	60	25	C
			314	318	379	5,580	5,616	62	23	C	379	5,840	5,870	62	24	C	379	5,840	5,829	62	24	C
			318	320	900	5,580	5,613	64	22	C	900	5,840	5,868	64	23	C	972	5,840	5,829	64	21	C
		Lake St BRT Exit	320	322	616	5,580	5,613	64	18	B	616	5,840	5,866	64	19	B	545	5,840	5,747	64	23	C
	Lake St BRT Exit	Lake St BRT Entrance	322	324	719	5,580	5,593	64	22	C	719	5,840	5,843	64	23	C	721	5,840	5,744	64	22	C
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	5,580	5,606	64	20	C	1,325	5,840	5,864	63	22	C	1,326	5,840	5,739	65	22	C
	31/Lake St Entrance	Lake St BRT Entrance	326	327													134	6,549	6,440	59	22	C
	Lake St BRT Entrance	35/36th St Exit	327	328													384	6,549	6,522	58	19	B
	31/Lake St Entrance	35/36th St Exit	326	328	518	6,250	6,271	60	21	C	518	6,549	6,564	59	22	C						
	35/36th St Exit		328	330	1,384	5,600	5,616	65	22	C	1,384	5,860	5,885	64	23	C	1,384	5,860	5,824	63	23	C
		35/36th St Entrance	330	332	1,712	5,600	5,611	66	21	C	1,712	5,860	5,880	65	23	C	1,712	5,860	5,820	65	23	C
	35/36th St Entrance		332	334	1,460	6,120	6,125	61	24	C	1,460	6,460	6,475	59	26	C	1,460	6,460	6,412	59	25	C
			334	336	544	6,120	6,123	64	24	C	544	6,460	6,472	64	26	C	544	6,460	6,409	64	25	C
		46th St Exit	336	338	1,512	6,120	6,120	65	20	B	1,512	6,460	6,471	65	21	C	1,512	6,460	6,407	65	21	C
	46th St Exit	46th St BRT Exit	338	340	780	5,770	5,780	65	16	B	780	6,060	6,083	65	17	B	780	6,060	6,008	65	17	B
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	5,770	5,771	66	17	B	2,275	6,060	6,073	66	18	B	2,275	6,060	6,002	66	18	B
	46th St BRT Entrance	46th St Entrance	342	344	393	5,770	5,772	65	15	B	393	6,060	6,074	65	16	B	393	6,060	6,006	65	16	B
	46th St Entrance		344	346	1,397	6,300	6,292	62	19	B	1,397	6,559	6,565	62	20	C	1,397	6,559	6,499	62	20	B
		60th St Exit	346	348	1,495	6,300	6,284	62	20	B	1,495	6,559	6,559	61	21	C	1,495	6,559	6,493	61	21	C
	60th St Exit	TH 62 Exit	348	350	2,036	6,050	6,017	61	20	B	2,036	6,259	6,236	60	21	C	2,036	6,259	6,176	60	21	C
	TH 62 Exit		350	352	1,409	2,680	2,641	66	13	B	1,409	2,980	2,969	65	15	B	1,409	2,980	2,947	65	15	B
			352	354	1,616	2,680	2,636	67	13	B	1,616	2,980	2,966	66	15	B	1,616	2,980	2,943	66	15	B
		END SB I-35W	354	356	719	2,680	2,634	67	13	B	719	2,980	2,963	66	15	B	719	2,980	2,939	66	15	B

	Location		Node		Model # 4: 2018 Transit Station, SB Braid, NB Flyover						Model # 5: 2018 Build Lake St Ramps Only						Model # 6: 2018 Full Build					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,850	4,894	62	20	C	744	4,840	4,883	62	20	C	744	4,881	4,919	62	20	C
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,670	6,735	64	18	B	1,355	6,660	6,726	64	18	B	1,355	6,572	6,626	64	17	B
	60th St Entrance	Diamond Lake Exit	106	108	910	6,970	7,036	65	17	B	910	6,960	7,026	65	17	B	910	6,972	7,025	65	17	B
	Diamond Lake Exit		108	110	1,432	6,670	6,741	66	21	C	1,432	6,660	6,734	66	21	C	1,432	6,672	6,731	65	21	C
		Diamond Lake Entrance	110	112	1,225	6,670	6,739	63	22	C	1,225	6,660	6,732	63	21	C	1,225	6,672	6,729	62	22	C
	Diamond Lake Entrance		112	113	1,449	7,481	7,553	54	27	C	1,449	7,471	7,545	55	26	C	1,449	7,473	7,526	52	28	C
			113	114	542	7,481	7,543	58	26	C	542	7,471	7,534	60	25	C	542	7,473	7,508	53	29	D
		46th St Exit	114	116	1,462	7,481	7,518	53	28	D	1,462	7,471	7,510	56	26	C	1,462	7,473	7,471	47	32	D
	46th St Exit	46th St BRT Exit	116	118	238	7,281	7,311	46	28	D	238	7,271	7,302	51	26	C	238	7,273	7,255	41	32	D
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	7,281	7,231	36	42	E	2,201	7,271	7,221	40	38	E	2,201	7,273	7,167	34	45	F
	46th St BRT Entrance	46th St Entrance	120	122	378	7,281	7,164	29	45	F	378	7,271	7,151	31	41	E	378	7,273	7,090	27	46	F
	46th St Entrance		122	124	1,521	8,392	8,191	29	53	F	1,521	8,382	8,052	31	50	F	1,521	8,464	8,095	29	53	F
			124	126	818	8,392	8,123	31	54	F	818	8,382	7,977	31	52	F	818	8,464	8,021	30	54	F
		35/36th St Exit	126	128	1,514	8,392	8,061	30	53	F	1,514	8,382	7,912	29	52	F	1,514	8,464	7,955	29	54	F
	35/36th St Exit		128	130	1,485	8,192	7,809	30	53	F	1,485	8,282	7,750	29	53	F	1,485	8,364	7,787	27	58	F
		35/36th St Entrance	130	132	1,474	8,192	7,745	32	48	F	1,474	8,282	7,687	31	50	F	1,474	8,364	7,706	27	58	F
	35/36th St Entrance	31/Lake St Exit	132	134	604	9,402	8,840	34	43	E	604	9,392	8,620	33	44	F	604	9,454	8,640	27	50	F
	31/Lake St Exit	Lake St BRT Exit	134	136																		
	31/Lake St Exit		134	135	478	8,512	7,972	40	34	D	478	8,502	7,758	36	36	E	478	8,954	8,138	28	42	E
		Lake St BRT Exit	135	136	553	8,512	7,882	42	37	E	553	8,502	7,669	37	42	E	553	8,954	8,040	31	44	F
	Lake St BRT Exit	Lake St BRT Entrance	136	138	718	8,512	7,868	45	35	E	843	8,502	7,655	39	39	E	843	8,954	8,023	37	36	E
	Lake St BRT Entrance		138	140	1,240	8,512	7,850	49	32	D	1,112	8,502	7,634	41	37	E	1,112	8,354	7,481	43	35	D
			140	142	494	8,512	7,914	50	27	C	496	8,502	7,696	42	31	D	496	8,354	7,547	44	30	D
			142	144	1,061	8,512	7,907	54	29	D	1,061	9,513	8,667	46	32	D	1,061	9,354	8,520	46	31	D
		NB I-35W/TH 65 SPLIT	144	146	859	8,512	7,902	57	28	D	859	9,513	8,654	53	27	C	859	9,354	8,513	53	27	C
	Begin NB TH 65		146	148	498	4,952	4,620	57	27	C	498	5,053	4,650	55	28	D	498	5,034	4,672	55	28	D
			148	150	281	4,952	4,619	56	28	C	281	5,053	4,648	56	28	C	281	5,034	4,670	56	28	C
			150	152	284	4,952	4,617	53	29	D	284	5,053	4,648	53	29	D	284	5,034	4,670	53	29	D
			152	154	582	4,952	4,616	51	30	D	582	5,053	4,648	52	30	D	582	5,034	4,669	51	30	D
		WB I-94 Exit	154	156	644	4,952	4,611	46	27	C	644	5,053	4,648	47	26	C	644	5,034	4,669	47	26	C
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,072	2,999	53	19	B	983	3,173	3,123	53	20	B	983	3,124	3,089	53	19	B
	NB I-35W/TH 65 Split		146	161	665	3,560	3,281	52	32	D	174	4,460	3,998	53	25	C	174	4,320	3,838	53	24	C
		New - EB I-94 Exit	162	163							678	4,460	4,004	40	34	D	678	4,320	3,840	42	30	D
	New - EB I-94 Exit		163	164	927	3,560	3,281	42	40	E	552	2,720	2,429	50	24	C	552	2,620	2,334	51	23	C
		5th Ave Entrance	164	165	965	3,560	3,281	27	60	F	965	2,720	2,428	36	34	D	965	2,620	2,331	36	32	D
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,959	3,676	35	49	F	1,048	3,421	3,121	41	35	D	1,048	3,321	3,023	41	34	D
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,078	4,761	49	31	D	1,024	4,741	4,397	48	29	D	1,024	4,600	4,268	49	27	C
	EB I-94 Exit		167	168	540	3,828	3,583	51	23	C	540	4,241	3,895	50	26	C	540	4,100	3,768	50	25	C
		Washington Ave Exit	168	169	448	3,828	3,584	52	23	C	448	4,241	3,896	52	25	C	448	4,100	3,768	52	24	C
	Washington Ave Exit		169	170	625	3,118	2,910	55	26	C	625	3,431	3,145	55	29	D	625	3,299	3,039	55	28	C
		END NB I-35W	170	171	523	3,118	2,910	57	25	C	523	3,431	3,145	57	28	C	523	3,299	3,038	57	27	C
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,489	2,488	57	22	C	1,074	2,988	2,988	55	28	C	1,074	2,999	3,000	55	28	D
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,789	2,792	51	24	C	892	3,288	3,292	49	30	D	892	3,299	3,301	49	30	D
	WB I-94 Entrance		366	367	1,871	3,430	3,433	47	33	D	1,871	4,099	4,076	55	25	C	1,871	4,231	4,232	55	26	C
			367	368	827	3,430	3,426	33	51	F	827	4,099	4,073	38	36	E	827	4,231	4,227	37	38	E
			368	369	483	3,430	3,423	41	42	E	483	4,099	4,073	42	32	D	483	4,231	4,224	42	34	D
			369	370	205	3,430	3,422	49	35	D	205	4,099	4,070	52	26	C	205	4,231	4,221	51	27	C
		SB TH 65 Entrance	374	376	436	3,430	3,418	55	31	D	434	4,099	4,066	56	24	C	434	4,231	4,214	56	25	C
	Begin SB TH 65	12th St Entrance	300	302	867	500	502	63	4	A	867	600	602	63	5	A	867	600	602	63	5	A
	12th St Entrance	EB I-94 Entrance	302	304	1,088	700	776	55	6	A	1,088	800	876	56	7	A	1,088	901	978	55	8	A
	EB I-94 Entrance		304	307	1,574	2,410	2,447	59	14	B	1,574	2,600	2,628	59	15	B	1,574	2,711	2,749	59	16	B
		SB I-35W Entrance	307	310																		
			307	308	718	2,410	2,446	62	13	B	718	2,600	2,627	61	14	B	718	2,711	2,748	61	15	B
		SB I-35W Entrance	308	310	825	2,410	2,445	61	15	B	825	2,600	2,626	59	16	B	825	2,711	2,747	59	17	B
	SB I-35W Entrance		310	314	698	5,840	5,856	60	25	C	698	6,699	6,688	57	23	C	698	6,942	6,956	56	25	C
			314	318	379	5,840	5,854	62	24	C	765	6,699	6,684	58	23	C	765	6,942	6,954	57	25	C
			318	320	972	5,840	5,854	64	21	C	586	6,098	6,064	62	21	C	586	6,252	6,258	61	22	C
		Lake St BRT Exit	320	322	545	5,840	5,770	63	23	C	545	6,098	5,979	63	24	C	545	6,252	6,173	62	25	C
	Lake St BRT Exit	Lake St BRT Entrance	322	324	721	5,840	5,770	63	23	C	721	6,098	5,977	63	24	C	721	6,252	6,171	63	25	C
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,326	5,840	5,767	64	23	C	1,326	6,098	5,974	64	23	C	1,326	6,252	6,167	64	24	C
	31/Lake St Entrance	Lake St BRT Entrance	326	327	134	6,549	6,470	58	23	C	134	6,697	6,570	59	23	C	134	6,851	6,754	58	23	C
	Lake St BRT Entrance	35/36th St Exit	327	328	384	6,549	6,552	57	20	B	384	6,697	6,652	58	19	B	384	6,851	6,835	58	20	C
	31/Lake St Entrance	35/36th St Exit	326	328																		
	35/36th St Exit		328	330	1,384	5,860	5,861	63	23	C	1,384	6,198	6,176	62	25	C	1,384	6,352	6,328	62	25	C
		35/36th St Entrance	330	332	1,712	5,860	5,854	64	23	C	1,712	6,198	6,170	63	24	C	1,712	6,352	6,323	63	25	C
	35/36th St Entrance		332	334	1,460	6,460	6,445	57	26	C	1,460	6,698	6,659	58	27	C	1,460	6,852	6,815	57	28	D
			334	336	544	6,460	6,439	63	26	C	544	6,698	6,655	63	27	C	544	6,852	6,808	62	27	C
		46th St Exit	336	338	1,512	6,460	6,436	64	21	C	1,512	6,698	6,650	64	22	C	1,512	6,852	6,804	64	23	C
	46th St Exit	46th St BRT Exit	338	340	780	6,060	6,034	65	17	B	780	6,298	6,245	65	18	B	780	6,452	6,407	65	18	B
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,060	6,026	66	18	B	2,275	6,298	6,238	66	19	B	2,275	6,452	6,397	66	19	B
	46th St BRT Entrance	46th St Entrance	342	344	393	6,060	6,028	65	16	B	393	6,298	6,241	65	17	B	393	6,452	6,400	65	17	B
	46th St Entrance		344	346	1,397	6,559	6,522	62	20	B	1,397	6,797	6,737	62	21	C	1,397	6,951	6,896	61	21	C
		60th St Exit	346	348	1,495	6,559	6,515	61	21	C	1,495	6,797	6,728	60	22	C	1,495	6,951	6,892	59	23	C
	60th St Exit	TH 62 Exit	348	350	2,036	6,259	6,205	60	21	C	2,036	6,597	6,502	59	22	C	2,036	6,551	6,477	59	22	C
	TH 62 Exit		350	352	1,409	2,980	2,937	65	15	B	1,409	3,098	3,014	65	15	B	1,409	3,081	3,012	65	16	B
			352	354	1,616	2,980	2,934	66	15	B	1,616	3,098	3,009	66	15	B	1,616	3,081	3,007	66	15	B
		END SB I-35W	354	356	719	2,980	2,931	67	15	B	719	3,098	3,005	66	15	B	719	3,081	3,003	66	15	B

	Location		Node		Model # 7: 2018 Full Build Without 4th Ave Ramp						Model # 8: 2018 Full Build NB Flyover						Model # 9: 2018 Full Build NB Flyover w/o 4th Ave					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,920	4,961	62	21	C	744	4,881	4,922	62	20	C	744	4,920	4,956	62	21	C
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,629	6,692	64	17	B	1,355	6,572	6,634	64	17	B	1,355	6,629	6,688	64	17	B
	60th St Entrance	Diamond Lake Exit	106	108	910	7,029	7,093	64	17	B	910	6,972	7,034	64	17	B	910	7,029	7,090	64	17	B
	Diamond Lake Exit		108	110	1,432	6,830	6,896	65	21	C	1,432	6,672	6,727	66	21	C	1,432	6,830	6,894	65	21	C
		Diamond Lake Entrance	110	112	1,225	6,830	6,896	62	22	C	1,225	6,672	6,725	64	21	C	1,225	6,830	6,891	63	22	C
	Diamond Lake Entrance		112	113	1,449	7,631	7,703	54	27	C	1,449	7,473	7,532	56	25	C	1,449	7,631	7,701	55	26	C
			113	114	542	7,631	7,695	61	26	C	542	7,473	7,530	63	24	C	542	7,631	7,700	61	25	C
		46th St Exit	114	116	1,462	7,631	7,682	59	25	C	1,462	7,473	7,531	64	22	C	1,462	7,631	7,697	60	25	C
	46th St Exit	46th St BRT Exit	116	118	238	7,431	7,481	55	24	C	238	7,273	7,330	65	19	B	238	7,431	7,506	55	24	C
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	7,431	7,431	45	35	D	2,201	7,273	7,316	63	23	C	2,201	7,431	7,455	45	34	D
	46th St BRT Entrance	46th St Entrance	120	122	378	7,431	7,394	35	38	E	378	7,273	7,322	55	24	C	378	7,431	7,415	36	38	E
	46th St Entrance		122	124	1,521	8,642	8,448	34	48	F	1,521	8,464	8,372	49	33	D	1,521	8,642	8,462	35	47	F
			124	126	818	8,642	8,392	34	50	F	818	8,464	8,351	49	36	E	818	8,642	8,404	35	49	F
		35/36th St Exit	126	128	1,514	8,642	8,332	32	50	F	1,514	8,464	8,318	43	39	E	1,514	8,642	8,343	33	49	F
	35/36th St Exit		128	130	1,485	8,542	8,164	30	54	F	1,485	8,364	8,178	35	47	F	1,485	8,542	8,174	31	54	F
		35/36th St Entrance	130	132	1,474	8,542	8,088	29	55	F	1,474	8,364	8,114	31	52	F	1,474	8,542	8,099	29	55	F
	35/36th St Entrance	31/Lake St Exit	132	134	604	9,652	8,983	30	46	F	604	9,454	9,059	31	46	F	604	9,652	9,009	30	47	F
	31/Lake St Exit	Lake St BRT Exit	134	136																		
	31/Lake St Exit		134	135	478	8,952	8,311	31	39	E	478	8,954	8,541	32	39	E	478	8,952	8,334	30	40	E
		Lake St BRT Exit	135	136	553	8,952	8,214	33	41	E	553	8,954	8,443	34	42	E	553	8,952	8,239	33	42	E
	Lake St BRT Exit	Lake St BRT Entrance	136	138	843	8,952	8,195	38	36	E	843	8,954	8,423	40	36	E	843	8,952	8,223	38	36	E
	Lake St BRT Entrance		138	140	1,112	8,351	7,638	44	35	D	1,112	8,354	7,836	46	34	D	1,112	8,351	7,680	44	35	D
			140	142	496	8,351	7,710	44	30	D	496	8,354	7,903	46	30	D	496	8,351	7,750	45	30	D
			142	144	1,061	9,361	8,685	46	32	D	1,061	9,354	8,878	47	32	D	1,061	9,361	8,736	46	31	D
		NB I-35W/TH 65 SPLIT	144	146	859	9,361	8,674	53	27	C	859	9,354	8,869	54	28	C	859	9,361	8,728	53	27	C
	Begin NB TH 65		146	148	498	4,981	4,767	55	29	D	498	5,034	4,885	55	30	D	498	4,981	4,796	55	29	D
			148	150	281	4,981	4,765	55	29	D	281	5,034	4,883	55	30	D	281	4,981	4,795	55	29	D
			150	152	284	4,981	4,763	53	30	D	284	5,034	4,881	53	31	D	284	4,981	4,794	53	30	D
			152	154	582	4,981	4,761	51	31	D	582	5,034	4,879	51	32	D	582	4,981	4,792	51	31	D
		WB I-94 Exit	154	156	644	4,981	4,756	45	28	C	644	5,034	4,873	46	28	D	644	4,981	4,788	45	28	D
	WB I-94 Exit	**END NB TH 65**	156	158	983	2,891	3,024	53	19	B	983	3,124	3,221	53	20	C	983	2,891	3,044	53	19	B
	NB I-35W/TH 65 Split		146	161	174	4,380	3,901	53	25	C	174	4,320	3,982	53	25	C	174	4,380	3,931	53	25	C
		New - EB I-94 Exit	162	163	678	4,380	3,901	40	33	D	678	4,320	3,981	41	32	D	678	4,380	3,931	40	33	D
	New - EB I-94 Exit		163	164	552	2,640	2,346	51	23	C	552	2,620	2,417	51	24	C	552	2,640	2,360	50	24	C
		5th Ave Entrance	164	165	965	2,640	2,345	37	32	D	965	2,620	2,414	36	34	D	965	2,640	2,359	36	33	D
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,341	3,039	42	33	D	1,048	3,321	3,105	41	35	D	1,048	3,341	3,054	41	34	D
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,640	4,291	49	27	C	1,024	4,600	4,351	49	28	D	1,024	4,640	4,327	49	28	C
	EB I-94 Exit		167	168	540	4,140	3,789	50	25	C	540	4,100	3,848	50	26	C	540	4,140	3,819	50	25	C
		Washington Ave Exit	168	169	448	4,140	3,786	52	24	C	448	4,100	3,849	52	25	C	448	4,140	3,817	52	25	C
	Washington Ave Exit		169	170	625	3,330	3,033	55	28	C	625	3,299	3,111	55	28	D	625	3,330	3,051	55	28	C
		END NB I-35W	170	171	523	3,330	3,032	57	27	C	523	3,299	3,110	57	27	C	523	3,330	3,050	57	27	C
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,988	2,985	55	28	C	1,074	2,999	3,000	55	28	C	1,074	2,988	2,983	55	28	C
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	3,288	3,288	50	30	D	892	3,299	3,304	50	30	D	892	3,288	3,285	49	30	D
	WB I-94 Entrance		366	367	1,871	4,169	4,147	55	25	C	1,871	4,231	4,222	55	26	C	1,871	4,169	4,150	55	25	C
			367	368	827	4,169	4,142	38	37	E	827	4,231	4,214	38	37	E	827	4,169	4,147	38	37	E
			368	369	483	4,169	4,139	42	33	D	483	4,231	4,211	42	34	D	483	4,169	4,146	42	33	D
			369	370	205	4,169	4,137	52	27	C	205	4,231	4,211	52	27	C	205	4,169	4,145	52	27	C
		SB TH 65 Entrance	374	376	434	4,169	4,133	56	25	C	434	4,231	4,208	56	25	C	434	4,169	4,142	56	25	C
	Begin SB TH 65	12th St Entrance	300	302	867	600	603	63	5	A	867	600	602	63	5	A	867	600	602	63	5	A
	12th St Entrance	EB I-94 Entrance	302	304	1,088	901	980	55	8	A	1,088	901	979	55	8	A	1,088	901	978	55	8	A
	EB I-94 Entrance		304	307	1,574	2,691	2,749	59	16	B	1,574	2,711	2,752	59	16	B	1,574	2,691	2,736	59	15	B
		SB I-35W Entrance	307	310																		
			307	308	718	2,691	2,747	61	15	B	718	2,711	2,750	61	15	B	718	2,691	2,732	61	15	B
		SB I-35W Entrance	308	310	825	2,691	2,746	58	18	B	825	2,711	2,749	58	18	B	825	2,691	2,731	58	18	B
	SB I-35W Entrance		310	314	698	6,860	6,874	57	24	C	698	6,942	6,953	57	25	C	698	6,860	6,868	56	24	C
			314	318	765	6,860	6,871	57	24	C	765	6,942	6,950	57	25	C	765	6,860	6,865	57	24	C
			318	320	586	6,260	6,270	61	22	C	586	6,252	6,259	61	21	C	586	6,260	6,265	61	22	C
		Lake St BRT Exit	320	322	545	6,260	6,183	62	25	C	545	6,252	6,172	62	25	C	545	6,260	6,179	62	25	C
	Lake St BRT Exit	Lake St BRT Entrance	322	324	721	6,260	6,181	63	25	C	721	6,252	6,170	63	24	C	721	6,260	6,177	63	25	C
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,326	6,260	6,177	64	24	C	1,326	6,252	6,168	64	24	C	1,326	6,260	6,172	64	24	C
	31/Lake St Entrance	Lake St BRT Entrance	326	327	134	6,859	6,762	58	23	C	134	6,851	6,756	59	23	C	134	6,859	6,751	59	23	C
	Lake St BRT Entrance	35/36th St Exit	327	328	384	6,859	6,845	58	20	C	384	6,851	6,839	58	20	C	384	6,859	6,833	58	20	C
	31/Lake St Entrance	35/36th St Exit	326	328																		
	35/36th St Exit		328	330	1,384	6,360	6,347	62	26	C	1,384	6,352	6,343	62	26	C	1,384	6,360	6,333	62	26	C
		35/36th St Entrance	330	332	1,712	6,360	6,343	63	25	C	1,712	6,352	6,340	63	25	C	1,712	6,360	6,325	63	25	C
	35/36th St Entrance		332	334	1,460	6,860	6,836	58	28	C	1,460	6,852	6,833	57	28	C	1,460	6,860	6,818	57	28	C
			334	336	544	6,860	6,832	62	27	C	544	6,852	6,830	62	27	C	544	6,860	6,816	62	27	C
		46th St Exit	336	338	1,512	6,860	6,829	64	23	C	1,512	6,852	6,827	64	23	C	1,512	6,860	6,813	64	23	C
	46th St Exit	46th St BRT Exit	338	340	780	6,460	6,425	65	18	B	780	6,452	6,421	65	18	B	780	6,460	6,428	65	18	B
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,460	6,416	66	20	B	2,275	6,452	6,410	66	19	B	2,275	6,460	6,425	66	20	B
	46th St BRT Entrance	46th St Entrance	342	344	393	6,460	6,416	65	17	B	393	6,452	6,409	65	17	B	393	6,460	6,431	64	17	B
	46th St Entrance		344	346	1,397	6,959	6,908	62	21	C	1,397	6,951	6,906	61	21	C	1,397	6,959	6,929	61	22	C
		60th St Exit	346	348	1,495	6,959	6,898	58	23	C	1,495	6,951	6,899	59	23	C	1,495	6,959	6,928	57	23	C
	60th St Exit	TH 62 Exit	348	350	2,036	6,659	6,575	58	23	C	2,036	6,551	6,464	59	22	C	2,036	6,659	6,611	58	23	C
	TH 62 Exit		350	352	1,409	3,120	3,066	65	16	B	1,409	3,081	3,039	65	16	B	1,409	3,120	3,092	65	16	B
			352	354	1,616	3,120	3,061	66	16	B	1,616	3,081	3,033	66	15	B	1,616	3,120	3,087	66	16	B
		END SB I-35W	354	356	719	3,120	3,056	66	15	B	719	3,081	3,028	66	15	B	719	3,120	3,083	66	16	B

Table C-1

I-35W Transit/Access Project

2018 Freeway MOE Comparison

AM Peak Hour

	Location From	Location To	Node From	Node To	Model # 1 Existing Conditions Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 2 2018 No Build Conditions Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 3 2018 Transit Station Only Conditions Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**		554	556	984	3,570	3,572	51	36	E	984	3,770	3,771	51	38	E	984	3,770	3,770	51	38	E
			556	557	632	3,570	3,572	51	35	E	632	3,770	3,775	50	38	E	632	3,770	3,771	51	37	E
		EB I-394 Entrance	557	558	789	3,570	3,573	50	36	E	789	3,770	3,778	47	40	E	789	3,770	3,772	48	39	E
	EB I-394 Entrance		558	559	442	5,760	5,687	40	47	F	442	5,950	5,805	36	54	F	442	5,950	5,787	36	54	F
			559	560	1,192	5,760	5,690	44	43	F	1,192	5,950	5,806	38	51	F	1,192	5,950	5,789	37	52	F
		Lyndale/Hennepin Entrance	560	561	1,856	5,760	5,694	37	52	F	1,856	5,950	5,797	34	57	F	1,856	5,950	5,784	33	59	F
	Lyndale/Hennepin Entrance		561	562	1,485	7,650	7,556	41	46	F	1,485	7,931	7,734	40	48	F	1,485	7,931	7,719	40	49	F
			562	563	706	7,650	7,544	50	38	E	706	7,931	7,723	49	39	E	706	7,931	7,706	49	39	E
		SB I-35W Exit	563	564	474	7,650	7,542	50	38	E	474	7,931	7,719	50	39	E	474	7,931	7,704	50	39	E
	SB I-35W Exit		564	565	792	6,080	5,961	50	40	E	792	6,221	6,033	50	40	E	792	6,221	6,046	50	40	E
			565	566	865	6,080	5,958	51	39	E	865	6,221	6,029	51	40	E	865	6,221	6,044	51	40	E
		NB I-35W Exit	566	567	388	6,080	5,957	51	31	D	388	6,221	6,027	51	31	D	388	6,221	6,043	51	31	D
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,850	4,746	51	31	D	688	5,102	4,936	51	32	D	688	5,102	4,950	51	32	D
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,210	5,099	55	23	C	1,557	5,502	5,328	55	24	C	1,557	5,502	5,343	55	24	C
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,350	4,244	59	24	C	469	4,592	4,459	59	25	C	469	4,592	4,443	59	25	C
	NB I-35W Entrance		570	572	1,016	5,690	5,542	61	23	C	1,016	5,842	5,609	61	23	C	1,016	5,842	5,596	61	23	C
		Cedar Ave Entrance	572	573	1,027	5,690	5,538	61	23	C	1,027	5,842	5,607	61	23	C	1,027	5,842	5,591	61	23	C
	Cedar Ave Entrance		573	574	562	6,100	5,945	59	21	C	562	6,342	6,104	58	22	C	562	6,342	6,087	58	21	C
			574	576	930	6,100	5,941	60	25	C	930	6,342	6,099	60	26	C	930	6,342	6,083	60	25	C
			576	578	1,378	6,100	5,936	61	24	C	1,378	6,342	6,093	61	25	C	1,378	6,342	6,075	61	25	C
			578	580	1,268	6,100	5,931	61	24	C	1,268	6,342	6,085	61	25	C	1,268	6,342	6,069	61	25	C
			580	582	875	6,100	5,929	61	24	C	875	6,342	6,079	61	25	C	875	6,342	6,066	61	25	C
		END EB I-94	582	584	1,173	6,100	5,926	61	24	C	1,173	6,342	6,073	61	25	C	1,173	6,342	6,063	61	25	C
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,700	5,692	62	23	C	1,488	5,870	5,868	62	24	C	1,488	5,870	5,874	62	24	C
			750	752	590	5,700	5,692	62	23	C	590	5,870	5,864	62	24	C	590	5,870	5,870	62	24	C
			752	754	1,231	5,700	5,690	62	23	C	1,231	5,870	5,863	62	24	C	1,231	5,870	5,864	61	24	C
			754	756	1,378	5,700	5,687	61	23	C	1,378	5,870	5,861	61	24	C	1,378	5,870	5,858	61	24	C
			756	758	775	5,700	5,683	60	24	C	775	5,870	5,858	59	25	C	775	5,870	5,856	59	25	C
		Cedar Ave Exit	758	759	1,026	5,700	5,681	55	24	C	1,026	5,870	5,854	55	25	C	1,026	5,870	5,855	55	25	C
	Cedar Ave Exit		759	760	755	4,660	4,668	53	22	C	755	4,769	4,762	53	23	C	755	4,769	4,742	53	23	C
			760	761	1,114	4,660	4,666	51	23	C	1,114	4,769	4,760	51	23	C	1,114	4,769	4,739	51	23	C
		SB I-35W Exit	761	762	677	4,660	4,663	50	23	C	677	4,769	4,756	50	24	C	677	4,769	4,737	50	24	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,050	4,068	50	27	C	492	4,128	4,112	50	28	C	492	4,128	4,108	49	28	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,410	5,430	49	27	C	1,637	5,718	5,704	48	29	D	1,637	5,718	5,697	48	29	D
	11th St Exit		764	15																		
		NB I-35W Flyover	15	765																		
	11th St Exit		764	765	1,022	4,370	4,384	51	29	D	1,022	4,617	4,575	50	30	D	1,022	4,617	4,583	50	31	D
		NB I-35W/4th Ave Entrance	765	766	1,082	4,370	4,382	45	33	D	1,082	4,617	4,571	41	37	E	1,082	4,617	4,578	43	36	E
	NB I-35W/4th Ave Entrance		766	767	717	6,530	6,348	36	42	E	717	6,797	6,452	35	44	F	717	6,797	6,437	36	43	E
		Lyndale/Hennepin Exit	767	768	1,834	6,530	6,342	49	31	D	1,834	6,797	6,445	48	32	D	1,834	6,797	6,428	48	31	D
	Lyndale/Hennepin Exit		768	769	1,590	5,430	5,275	37	47	F	1,590	5,697	5,367	37	48	F	1,590	5,697	5,342	37	48	F
			769	770	1,188	5,430	5,269	46	38	E	1,188	5,697	5,364	46	39	E	1,188	5,697	5,339	46	39	E
		WB I-394 Exit	770	771	1,432	5,430	5,263	44	33	D	1,432	5,697	5,360	44	34	D	1,432	5,697	5,337	44	34	D
	WB I-394 Exit		771	772	508	2,540	2,422	52	16	B	508	2,687	2,467	52	16	B	508	2,687	2,452	52	16	B
		TH 55 Exit	772	774	544	2,540	2,419	54	13	B	544	2,687	2,466	54	13	B	544	2,687	2,451	54	13	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,280	2,152	54	13	B	400	2,406	2,200	54	14	B	400	2,406	2,181	54	14	B
	NB I-35W Flyover		256	6	890	1,830	1,646	30	56	F	890	1,880	1,596	30	54	F	890	1,880	1,579	30	53	F
			6	3	142	1,830	1,643	31	53	F	142	1,880	1,594	31	52	F	142	1,880	1,576	31	51	F
		4th Avenue Entrance	3	2	114	1,830	1,643	32	25	C	114	1,880	1,593	32	25	C	114	1,880	1,576	33	24	C
		WB I-94	3	765																		
	4th Avenue		5	4	466	330	329	18	10	A	466	300	300	10	15	B	466	300	299	10	15	B
		NB Flyover Entrance	4	2	160	330	329	20	9	A	160	300	299	19	9	A	160	300	298	19	9	A
	NB Flyover Entrance		2	1	164	2,160	1,971	34	19	B	164	2,180	1,890	34	19	B	164	2,180	1,872	34	18	B
		WB I-94	1	766	254	2,160	1,970	34	29	D	254	2,180	1,889	33	28	D	254	2,180	1,870	34	27	C

	Location From	Location To	Node From	Node To	Model # 4 2018 Transit Station, SB Braid, NB Flyover Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 5 2018 Build Lake St Ramps Only Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 6 2018 Full Build Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**		554	556	984	3,770	3,774	51	38	E	984	3,770	3,776	51	38	E	984	3,800	3,808	51	38	E
			556	557	632	3,770	3,776	51	37	E	632	3,770	3,778	51	37	E	632	3,800	3,809	50	38	E
		EB I-394 Entrance	557	558	789	3,770	3,777	48	39	E	789	3,770	3,779	48	40	E	789	3,800	3,810	47	41	E
	EB I-394 Entrance		558	559	442	5,950	5,814	37	53	F	442	5,950	5,800	36	54	F	442	6,000	5,824	36	54	F
			559	560	1,192	5,950	5,814	39	50	F	1,192	5,950	5,801	38	51	F	1,192	6,000	5,828	39	50	F
		Lyndale/Hennepin Entrance	560	561	1,856	5,950	5,804	34	58	F	1,856	5,950	5,795	33	58	F	1,856	6,000	5,830	35	56	F
	Lyndale/Hennepin Entrance		561	562	1,485	7,931	7,741	40	49	F	1,485	7,840	7,652	40	48	F	1,485	7,801	7,610	41	46	F
			562	563	706	7,931	7,729	50	39	E	706	7,840	7,639	50	39	E	706	7,801	7,602	50	38	E
		SB I-35W Exit	563	564	474	7,931	7,726	50	39	E	474	7,840	7,637	50	38	E	474	7,801	7,600	50	38	E
	SB I-35W Exit		564	565	792	6,221	6,050	50	40	E	792	6,040	5,880	50	39	E	792	5,991	5,823	50	39	E
			565	566	865	6,221	6,045	51	40	E	865	6,040	5,876	51	39	E	865	5,991	5,820	51	38	E
		NB I-35W Exit	566	567	388	6,221	6,042	51	31	D	388	6,040	5,873	51	30	D	388	5,991	5,819	51	30	D
	NB I-35W Exit	5th Ave Entrance	567	568	688	5,102	4,952	51	32	D	688	4,720	4,590	51	30	D	688	4,712	4,567	51	30	D
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,502	5,345	55	24	C	1,557	6,460	6,166	52	30	D	1,557	6,412	6,070	52	29	D
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,592	4,458	59	25	C	469	5,550	5,072	58	29	D	469	5,512	4,993	58	29	D
	NB I-35W Entrance		570	572	1,016	5,842	5,632	61	23	C	1,016	6,050	5,570	61	23	C	1,016	6,012	5,487	61	23	C
		Cedar Ave Entrance	572	573	1,027	5,842	5,628	61	23	C	1,027	6,050	5,565	61	23	C	1,027	6,012	5,479	61	22	C
	Cedar Ave Entrance		573	574	562	6,342	6,125	58	22	C	562	6,450	5,960	58	21	C	562	6,412	5,872	57	21	C
			574	576	930	6,342	6,120	60	26	C	930	6,450	5,955	60	25	C	930	6,412	5,867	59	25	C
			576	578	1,378	6,342	6,115	61	25	C	1,378	6,450	5,949	61	24	C	1,378	6,412	5,860	61	24	C
			578	580	1,268	6,342	6,111	61	25	C	1,268	6,450	5,944	61	24	C	1,268	6,412	5,853	61	24	C
			580	582	875	6,342	6,105	61	25	C	875	6,450	5,938	61	24	C	875	6,412	5,847	61	24	C
		END EB I-94	582	584	1,173	6,342	6,101	61	25	C	1,173	6,450	5,934	61	24	C	1,173	6,412	5,841	61	24	C
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,870	5,866	62	24	C	1,488	5,969	5,969	62	24	C	1,488	6,000	5,999	62	25	C
			750	752	590	5,870	5,862	62	24	C	590	5,969	5,966	62	24	C	590	6,000	5,991	62	24	C
			752	754	1,231	5,870	5,860	62	24	C	1,231	5,969	5,964	61	24	C	1,231	6,000	5,984	61	24	C
			754	756	1,378	5,870	5,857	61	24	C	1,378	5,969	5,957	61	25	C	1,378	6,000	5,974	61	25	C
			756	758	775	5,870	5,855	59	25	C	775	5,969	5,950	59	25	C	775	6,000	5,970	59	25	C
		Cedar Ave Exit	758	759	1,026	5,870	5,852	56	25	C	1,026	5,969	5,948	55	25	C	1,026	6,000	5,972	55	25	C
	Cedar Ave Exit		759	760	755	4,769	4,768	53	23	C	755	4,868	4,854	53	23	C	755	4,899	4,878	53	23	C
			760	761	1,114	4,769	4,766	52	23	C	1,114	4,868	4,852	51	24	C	1,114	4,899	4,883	51	24	C
		SB I-35W Exit	761	762	677	4,769	4,763	51	23	C	677	4,868	4,849	50	24	C	677	4,899	4,887	50	24	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,128	4,115	51	27	C	492	4,057	4,057	50	27	C	492	3,967	3,954	50	26	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,718	5,705	48	29	D	1,637	5,547	5,548	49	28	C	1,637	5,466	5,449	49	27	C
	11th St Exit		764	15	730	4,617	4,611	50	31	D												
		NB I-35W Flyover	15	765	828	4,617	4,611	50	31	D												
	11th St Exit		764	765							1,022	4,446	4,450	50	30	D	1,022	4,365	4,340	50	29	D
		NB I-35W/4th Ave Entrance	765	766	490	6,497	6,211	48	33	D	1,082	4,446	4,447	45	34	D	1,082	4,365	4,337	46	32	D
	NB I-35W/4th Ave Entrance		766	767	717	6,797	6,505	47	31	D	717	6,626	6,259	36	41	E	717	6,575	6,207	37	40	E
		Lyndale/Hennepin Exit	767	768	1,834	6,797	6,497	49	31	D	1,834	6,626	6,250	48	30	D	1,834	6,575	6,203	48	30	D
	Lyndale/Hennepin Exit		768	769	1,590	5,697	5,418	37	49	F	1,590	5,626	5,270	37	47	F	1,590	5,575	5,213	37	47	F
			769	770	1,188	5,697	5,415	45	40	E	1,188	5,626	5,264	46	39	E	1,188	5,575	5,211	46	38	E
		WB I-394 Exit	770	771	1,432	5,697	5,411	44	35	D	1,432	5,626	5,258	44	33	D	1,432	5,575	5,209	44	33	D
	WB I-394 Exit		771	772	508	2,687	2,501	52	16	B	508	2,616	2,349	52	15	B	508	2,576	2,355	52	15	B
		TH 55 Exit	772	774	544	2,687	2,500	54	13	B	544	2,616	2,349	54	12	B	544	2,576	2,355	54	12	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,406	2,227	54	14	B	400	2,345	2,106	54	13	B	400	2,305	2,110	54	13	B
	NB I-35W Flyover		256	6	470	1,880	1,604	29	55	F	890	1,880	1,521	31	50	F	890	1,910	1,575	31	52	F
			6	3	251	1,880	1,603	33	49	F	142	1,880	1,520	32	48	F	142	1,910	1,575	32	50	F
		4th Avenue Entrance	3	2							114	1,880	1,520	33	23	C	114	1,910	1,574	33	24	C
		WB I-94	3	765	200	1,880	1,603	38	43	E												
	4th Avenue		5	4	466	300	299	10	15	B	466	300	301	9	18	B	466	300	302	8	19	B
		NB Flyover Entrance	4	2	160	300	298	19	9	A	160	300	300	20	9	A	160	300	300	20	9	A
	NB Flyover Entrance		2	1	164	300	298	34	9	A	164	2,180	1,819	35	17	B	164	2,210	1,873	35	18	B
		WB I-94	1	766	254	300	297	43	7	A	254	2,180	1,818	36	26	C	254	2,210	1,873	35	27	C

	Location From	Location To	Node From	Node To	Model # 7 2018 Full Build Without 4th Ave Ramp Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 8 2018 Full Build NB Flyover Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 9 2018 Full Build NB Flyover w/o 4th Ave Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**		554	556	984	3,770	3,775	51	38	E	984	3,800	3,805	51	38	E	984	3,770	3,771	51	38	E
			556	557	632	3,770	3,776	51	37	E	632	3,800	3,806	50	38	E	632	3,770	3,772	51	37	E
		EB I-394 Entrance	557	558	789	3,770	3,778	48	39	E	789	3,800	3,808	47	41	E	789	3,770	3,775	48	40	E
	EB I-394 Entrance		558	559	442	5,950	5,804	36	53	F	442	6,000	5,838	36	54	F	442	5,950	5,784	36	54	F
			559	560	1,192	5,950	5,806	39	50	F	1,192	6,000	5,841	39	50	F	1,192	5,950	5,789	38	51	F
		Lyndale/Hennepin Entrance	560	561	1,856	5,950	5,804	34	57	F	1,856	6,000	5,840	35	56	F	1,856	5,950	5,788	33	58	F
	Lyndale/Hennepin Entrance		561	562	1,485	7,840	7,669	40	48	F	1,485	7,801	7,616	41	46	F	1,485	7,840	7,646	40	48	F
			562	563	706	7,840	7,658	50	39	E	706	7,801	7,606	50	38	E	706	7,840	7,634	49	39	E
		SB I-35W Exit	563	564	474	7,840	7,656	50	38	E	474	7,801	7,605	50	38	E	474	7,840	7,633	50	38	E
	SB I-35W Exit		564	565	792	6,050	5,882	50	39	E	792	5,991	5,825	50	39	E	792	6,050	5,869	50	39	E
			565	566	865	6,050	5,877	51	39	E	865	5,991	5,822	51	38	E	865	6,050	5,866	51	39	E
		NB I-35W Exit	566	567	388	6,050	5,874	51	30	D	388	5,991	5,819	51	30	D	388	6,050	5,864	51	30	D
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,751	4,611	51	30	D	688	4,712	4,564	51	30	D	688	4,751	4,580	51	30	D
	5th Ave Entrance	TH 55 Exit	568	569	1,557	6,491	6,169	51	30	D	1,557	6,412	6,127	51	30	D	1,557	6,491	6,153	51	30	D
	TH 55 Exit	NB I-35W Entrance	569	570	469	5,581	5,094	58	30	D	469	5,512	5,071	57	29	D	469	5,581	5,092	58	30	D
	NB I-35W Entrance		570	572	1,016	6,081	5,588	61	23	C	1,016	6,012	5,566	61	23	C	1,016	6,081	5,589	61	23	C
		Cedar Ave Entrance	572	573	1,027	6,081	5,583	61	23	C	1,027	6,012	5,562	61	23	C	1,027	6,081	5,584	61	23	C
	Cedar Ave Entrance		573	574	562	6,481	5,977	58	21	C	562	6,412	5,958	57	21	C	562	6,481	5,978	57	21	C
			574	576	930	6,481	5,976	60	25	C	930	6,412	5,952	59	25	C	930	6,481	5,975	59	25	C
			576	578	1,378	6,481	5,972	61	24	C	1,378	6,412	5,945	61	24	C	1,378	6,481	5,971	61	24	C
			578	580	1,268	6,481	5,968	61	24	C	1,268	6,412	5,939	61	24	C	1,268	6,481	5,966	61	24	C
			580	582	875	6,481	5,964	61	24	C	875	6,412	5,935	61	24	C	875	6,481	5,962	61	24	C
		END EB I-94	582	584	1,173	6,481	5,957	61	24	C	1,173	6,412	5,929	61	24	C	1,173	6,481	5,955	61	24	C
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,969	5,970	62	25	C	1,488	6,000	5,995	62	25	C	1,488	5,969	5,966	62	24	C
			750	752	590	5,969	5,964	62	24	C	590	6,000	5,990	62	24	C	590	5,969	5,962	62	24	C
			752	754	1,231	5,969	5,961	61	24	C	1,231	6,000	5,988	61	24	C	1,231	5,969	5,960	61	24	C
			754	756	1,378	5,969	5,957	61	25	C	1,378	6,000	5,986	61	25	C	1,378	5,969	5,957	61	25	C
			756	758	775	5,969	5,951	59	25	C	775	6,000	5,982	59	25	C	775	5,969	5,953	59	25	C
		Cedar Ave Exit	758	759	1,026	5,969	5,946	55	25	C	1,026	6,000	5,979	56	25	C	1,026	5,969	5,948	56	25	C
	Cedar Ave Exit		759	760	755	4,868	4,862	53	23	C	755	4,899	4,878	53	23	C	755	4,868	4,858	53	23	C
			760	761	1,114	4,868	4,860	51	24	C	1,114	4,899	4,875	52	24	C	1,114	4,868	4,855	52	23	C
		SB I-35W Exit	761	762	677	4,868	4,860	50	24	C	677	4,899	4,872	52	24	C	677	4,868	4,852	52	24	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,987	3,996	50	27	C	492	3,967	3,951	51	26	C	492	3,987	3,982	51	26	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,477	5,485	49	27	C	1,637	5,466	5,449	49	27	C	1,637	5,477	5,478	49	27	C
	11th St Exit		764	15							780	4,365	4,346	50	29	D	780	4,376	4,370	50	29	D
		NB I-35W Flyover	15	765							828	4,365	4,346	51	29	D	828	4,376	4,368	50	29	D
	11th St Exit		764	765	1,022	4,376	4,358	51	29	D												
		NB I-35W/4th Ave Entrance	765	766	1,082	4,376	4,357	49	29	D	490	6,275	5,987	47	32	D	490	6,466	6,103	48	32	D
	NB I-35W/4th Ave Entrance		766	767	717	6,466	6,078	42	36	E	714	6,575	6,283	47	32	D	714	6,466	6,103	49	31	D
		Lyndale/Hennepin Exit	767	768	1,834	6,466	6,077	49	29	D	1,834	6,575	6,275	49	30	D	1,834	6,466	6,103	50	29	D
	Lyndale/Hennepin Exit		768	769	1,590	5,466	5,111	37	46	F	1,590	5,575	5,293	37	48	F	1,590	5,466	5,128	37	46	F
			769	770	1,188	5,466	5,112	46	37	E	1,188	5,575	5,290	45	39	E	1,188	5,466	5,128	45	38	E
		WB I-394 Exit	770	771	1,432	5,466	5,112	44	32	D	1,432	5,575	5,289	44	34	D	1,432	5,466	5,125	44	33	D
	WB I-394 Exit		771	772	508	2,456	2,199	52	14	B	508	2,576	2,414	52	16	B	508	2,456	2,215	52	14	B
		TH 55 Exit	772	774	544	2,456	2,197	54	12	B	544	2,576	2,413	54	13	B	544	2,456	2,215	54	12	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,206	1,955	54	12	B	400	2,305	2,158	54	13	B	400	2,206	1,972	54	12	B
	NB I-35W Flyover		256	6	890	2,090	1,726	30	58	F	470	1,910	1,645	29	57	F	470	2,090	1,738	28	62	F
			6	3	142	2,090	1,725	32	54	F	251	1,910	1,644	32	51	F	251	2,090	1,736	32	54	F
		4th Avenue Entrance	3	2	114	2,090	1,725	34	25	C												
		WB I-94	3	765							200	1,910	1,643	37	44	F	200	2,090	1,736	37	46	F
	4th Avenue		5	4							466	300	301	9	18	B						
		NB Flyover Entrance	4	2							160	300	300	20	9	A						
	NB Flyover Entrance		2	1	164	2,090	1,724	37	23	C	164	300	299	34	9	A						
		WB I-94	1	766	254	2,090	1,724	40	43	E	254	300	299	41	7	A						

Table C-2

I-35W Transit/Access Project

2018 Freeway MOE Comparison

PM Peak Hour

	Location		Node		Model # 1 Existing Conditions						Model # 2 2018 No Build Conditions						Model # 3 2018 Transit Station Only Conditions					
	From	**To**	**From**	**To**	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,790	4,819	63	20	B	744	5,101	5,129	62	21	C	744	5,101	5,127	62	21	C
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,710	6,757	64	18	B	1,355	7,102	7,155	64	19	B	1,355	7,102	7,152	64	19	B
	60th St Entrance	Diamond Lake Exit	106	108	910	6,890	6,936	64	17	B	910	7,402	7,459	63	18	B	910	7,402	7,456	63	18	B
	Diamond Lake Exit		108	110	1,432	6,460	6,527	65	20	C	1,432	7,001	7,069	65	22	C	1,432	7,001	7,064	65	22	C
		Diamond Lake Entrance	110	112	1,225	6,460	6,528	65	20	C	1,225	7,001	7,065	63	22	C	1,225	7,001	7,064	63	22	C
	Diamond Lake Entrance		112	113	1,449	6,810	6,886	60	22	C	1,449	7,400	7,470	58	24	C	1,449	7,400	7,468	58	25	C
			113	114	542	6,810	6,882	64	22	C	542	7,400	7,466	63	24	C	542	7,400	7,464	63	24	C
		46th St Exit	114	116	1,462	6,810	6,877	65	20	C	1,462	7,400	7,465	64	22	C	1,462	7,400	7,462	64	22	C
	46th St Exit	46th St BRT Exit	116	118	238	6,260	6,300	65	17	B	238	6,800	6,879	65	18	B	238	6,800	6,866	65	18	B
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	6,260	6,294	66	19	B	2,201	6,800	6,874	65	21	C	2,201	6,800	6,862	65	21	C
	46th St BRT Entrance	46th St Entrance	120	122	378	6,260	6,295	65	17	B	378	6,800	6,881	65	18	B	378	6,800	6,870	65	18	B
	46th St Entrance		122	124	1,521	6,740	6,778	62	21	C	1,521	7,300	7,383	62	23	C	1,521	7,300	7,369	62	22	C
			124	126	818	6,740	6,778	64	21	C	818	7,300	7,379	62	24	C	818	7,300	7,365	63	24	C
		35/36th St Exit	126	128	1,514	6,740	6,779	63	21	C	1,514	7,300	7,369	60	24	C	1,514	7,300	7,353	60	24	C
	35/36th St Exit		128	130	1,485	6,220	6,266	64	20	B	1,485	6,800	6,852	57	25	C	1,485	6,800	6,842	54	26	C
		35/36th St Entrance	130	132	1,474	6,220	6,270	63	20	B	1,474	6,800	6,822	50	28	D	1,474	6,800	6,806	48	30	D
	35/36th St Entrance	31/Lake St Exit	132	134	604	7,010	7,067	58	21	C	604	7,600	7,598	44	30	D	604	7,600	7,585	43	31	D
	31/Lake St Exit	Lake St BRT Exit	134	136	1,029	6,110	6,160	61	18	B	1,029	6,700	6,688	43	30	D						
	31/Lake St Exit		134	135													478	6,700	6,686	42	28	D
		Lake St BRT Exit	135	136													553	6,700	6,604	41	34	D
	Lake St BRT Exit	Lake St BRT Entrance	136	138	721	6,110	6,160	62	20	C	721	6,700	6,664	42	33	D	718	6,700	6,592	41	34	D
	Lake St BRT Entrance		138	140	1,190	6,110	6,160	59	20	B	1,190	6,700	6,644	41	31	D	1,240	6,700	6,575	41	34	D
			140	142	569	6,110	6,155	55	23	C	569	6,700	6,626	41	33	D	494	6,700	6,629	40	29	D
			142	144	1,061	6,110	6,151	52	24	C	1,061	6,700	6,615	41	32	D	1,061	6,700	6,616	41	33	D
		NB I-35W/TH 65 SPLIT	144	146	859	6,110	6,147	48	26	C	859	6,700	6,603	39	34	D	859	6,700	6,605	40	34	D
	Begin NB TH 65		146	148	498	3,250	3,265	39	29	D	498	3,700	3,643	31	40	E	498	3,700	3,675	31	40	E
			148	150	281	3,250	3,260	37	30	D	281	3,700	3,637	30	41	E	281	3,700	3,670	30	41	E
			150	152	284	3,250	3,257	36	32	D	284	3,700	3,635	29	43	E	284	3,700	3,666	29	43	E
			152	154	582	3,250	3,251	34	33	D	582	3,700	3,631	27	44	F	582	3,700	3,662	28	44	F
		WB I-94 Exit	154	156	644	3,250	3,244	28	31	D	644	3,700	3,625	24	41	E	644	3,700	3,655	23	44	F
	WB I-94 Exit	**END NB TH 65**	156	158	983	1,650	1,690	54	10	B	983	1,999	2,113	53	13	B	983	1,999	2,140	53	13	B
	NB I-35W/TH 65 Split		146	161	665	2,860	2,876	52	28	C	665	3,000	2,953	48	31	D	665	3,000	2,927	45	33	D
		New - EB I-94 Exit	162	163																		
	New - EB I-94 Exit		163	164	927	2,860	2,879	49	30	D	927	3,000	2,965	34	46	F	927	3,000	2,949	34	46	F
		5th Ave Entrance	164	165	965	2,860	2,883	32	46	F	965	3,000	2,981	25	61	F	965	3,000	2,968	25	60	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,590	3,622	37	45	F	1,048	3,799	3,796	34	52	F	1,048	3,799	3,783	33	52	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,800	4,815	46	33	D	1,024	4,940	4,905	46	34	D	1,024	4,940	4,898	46	34	D
	EB I-94 Exit		167	168	540	4,150	4,141	48	29	D	540	4,380	4,327	48	30	D	540	4,380	4,318	48	30	D
		Washington Ave Exit	168	169	448	4,150	4,143	50	27	C	448	4,380	4,327	50	29	D	448	4,380	4,318	50	29	D
	Washington Ave Exit		169	170	625	3,770	3,751	54	35	D	625	3,880	3,827	54	35	E	625	3,880	3,809	54	35	E
		END NB I-35W	170	171	523	3,770	3,751	56	33	D	523	3,880	3,828	56	34	D	523	3,880	3,810	56	34	D
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	1,950	1,915	53	22	C	1,074	2,000	1,999	57	18	B	1,074	2,000	1,996	57	18	B
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,590	2,532	44	30	D	892	2,600	2,604	46	25	C	892	2,600	2,602	47	25	C
	WB I-94 Entrance		366	367	1,871	3,620	3,498	39	44	F	1,871	3,700	3,650	37	45	F	1,871	3,700	3,624	39	42	E
			367	368	827	3,620	3,490	30	61	F	827	3,700	3,656	31	59	F	827	3,700	3,629	32	57	F
			368	369	483	3,620	3,487	38	50	F	483	3,700	3,658	41	45	F	483	3,700	3,630	41	45	F
			369	370	403	3,620	3,485	47	42	E	403	3,700	3,659	51	36	E	403	3,700	3,632	51	36	E
		SB TH 65 Entrance	374	376	627	3,620	3,475	53	32	D	627	3,700	3,660	54	34	D	627	3,700	3,633	55	33	D
	Begin SB TH 65	12th St Entrance	300	302	867	2,040	1,921	54	19	B	867	2,000	1,999	58	18	B	867	2,000	2,003	58	18	B
	12th St Entrance	EB I-94 Entrance	302	304	1,088	2,620	2,521	46	26	C	1,088	2,600	2,668	49	25	C	1,088	2,600	2,674	49	25	C
	EB I-94 Entrance		304	307	1,574	4,200	4,056	54	27	C	1,574	4,200	4,276	58	25	C	1,574	4,200	4,278	57	25	C
		SB I-35W Entrance	307	310	1,516	4,200	4,044	46	34	D	1,516	4,200	4,276	49	33	D	1,516	4,200	4,275	49	33	D
			307	308																		
		SB I-35W Entrance	308	310																		
	SB I-35W Entrance		310	314	698	7,820	7,507	54	35	D	698	7,900	7,936	57	35	E	698	7,900	7,910	57	35	E
			314	318	379	7,820	7,503	56	34	D	379	7,900	7,937	59	34	D	379	7,900	7,912	59	34	D
			318	320	900	7,820	7,499	57	33	D	900	7,900	7,937	59	34	D	972	7,900	7,911	59	30	D
		Lake St BRT Exit	320	322	616	7,820	7,491	54	29	D	616	7,900	7,936	56	30	D	545	7,900	7,832	58	34	D
	Lake St BRT Exit	Lake St BRT Entrance	322	324	719	7,820	7,431	51	36	E	719	7,900	7,866	52	38	E	721	7,900	7,834	56	35	D
	Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	7,820	7,474	50	35	E	1,325	7,900	7,932	52	36	E	1,326	7,900	7,834	56	35	D
	31/Lake St Entrance	Lake St BRT Entrance	326	327													134	9,000	8,953	50	36	E
	Lake St BRT Entrance	35/36th St Exit	327	328													384	9,000	9,028	50	30	D
	31/Lake St Entrance	35/36th St Exit	326	328	518	8,900	8,600	49	35	E	518	9,000	9,059	52	35	D						
	35/36th St Exit		328	330	1,384	7,800	7,516	58	33	D	1,384	7,900	7,927	61	33	D	1,384	7,900	7,917	58	34	D
		35/36th St Entrance	330	332	1,712	7,800	7,494	58	32	D	1,712	7,900	7,928	59	33	D	1,712	7,900	7,915	57	35	D
	35/36th St Entrance		332	334	1,460	8,170	7,839	52	35	E	1,460	8,301	8,331	51	38	E	1,460	8,301	8,316	50	39	E
			334	336	544	8,170	7,823	56	35	E	544	8,301	8,331	55	38	E	544	8,301	8,317	55	38	E
		46th St Exit	336	338	1,512	8,170	7,807	59	28	D	1,512	8,301	8,333	59	30	D	1,512	8,301	8,315	59	30	D
	46th St Exit	46th St BRT Exit	338	340	780	7,380	7,038	63	20	C	780	7,501	7,524	63	22	C	780	7,501	7,487	64	21	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	7,380	7,015	65	22	C	2,275	7,501	7,514	65	23	C	2,275	7,501	7,481	65	23	C
	46th St BRT Entrance	46th St Entrance	342	344	393	7,380	7,013	63	19	B	393	7,501	7,527	63	21	C	393	7,501	7,496	63	21	C
	46th St Entrance		344	346	1,397	7,720	7,349	59	24	C	1,397	7,900	7,925	57	26	C	1,397	7,900	7,897	57	26	C
		60th St Exit	346	348	1,495	7,720	7,353	53	27	C	1,495	7,900	7,928	48	32	D	1,495	7,900	7,903	49	31	D
	60th St Exit	TH 62 Exit	348	350	2,036	7,170	6,803	56	25	C	2,036	7,301	7,332	53	28	C	2,036	7,301	7,298	54	27	C
	TH 62 Exit		350	352	1,409	3,170	2,985	65	16	B	1,409	3,301	3,295	64	17	B	1,409	3,301	3,269	64	17	B
			352	354	1,616	3,170	2,986	66	15	B	1,616	3,301	3,297	66	17	B	1,616	3,301	3,267	66	17	B
		END SB I-35W	354	356	719	3,170	2,987	66	15	B	719	3,301	3,298	66	17	B	719	3,301	3,267	66	17	B

Node		Model # 4 2018 Transit Station, SB Braid, NB Flyover						Model # 5 2018 Build Lake St Ramps Only						Model # 6 2018 Full Build					
From	**To**	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
102	104	744	5,101	5,128	62	21	C	744	5,380	5,416	61	23	C	744	5,261	5,302	61	22	C
104	106	1,355	7,102	7,152	64	19	B	1,355	7,410	7,468	64	20	B	1,355	7,253	7,313	64	19	B
106	108	910	7,402	7,452	63	18	B	910	7,710	7,767	63	19	B	910	7,553	7,614	63	19	B
108	110	1,432	7,001	7,064	65	22	C	1,432	7,218	7,270	64	23	C	1,432	7,251	7,299	64	23	C
110	112	1,225	7,001	7,062	63	22	C	1,225	7,218	7,269	63	23	C	1,225	7,251	7,299	63	23	C
112	113	1,449	7,400	7,469	58	24	C	1,449	7,626	7,688	57	25	C	1,449	7,650	7,707	57	26	C
113	114	542	7,400	7,467	63	24	C	542	7,626	7,685	62	25	C	542	7,650	7,702	62	25	C
114	116	1,462	7,400	7,466	64	22	C	1,462	7,626	7,683	64	23	C	1,462	7,650	7,701	64	23	C
116	118	238	6,800	6,888	65	18	B	238	7,036	7,101	65	19	B	238	7,050	7,113	65	19	B
118	120	2,201	6,800	6,884	65	21	C	2,201	7,036	7,094	65	22	C	2,201	7,050	7,106	65	22	C
120	122	378	6,800	6,894	65	19	B	378	7,036	7,100	64	19	B	378	7,050	7,109	65	19	B
122	124	1,521	7,300	7,398	62	22	C	1,521	7,546	7,614	62	23	C	1,521	7,550	7,611	62	23	C
124	126	818	7,300	7,398	63	23	C	818	7,546	7,613	63	24	C	818	7,550	7,612	64	24	C
126	128	1,514	7,300	7,398	63	23	C	1,514	7,546	7,615	63	23	C	1,514	7,550	7,610	64	23	C
128	130	1,485	6,800	6,894	64	22	C	1,485	7,156	7,235	63	23	C	1,485	7,151	7,215	64	23	C
130	132	1,474	6,800	6,890	64	22	C	1,474	7,156	7,232	63	23	C	1,474	7,151	7,211	63	23	C
132	134	604	7,600	7,693	59	22	C	604	7,766	7,842	60	22	C	604	7,851	7,913	60	21	C
134	136																		
134	135	478	6,700	6,817	60	19	B	478	6,876	6,959	62	19	B	478	7,251	7,326	59	18	B
135	136	553	6,700	6,748	62	22	C	553	6,876	6,887	63	22	C	553	7,251	7,251	59	21	C
136	138	718	6,700	6,749	63	22	C	843	6,876	6,886	64	22	C	843	7,251	7,244	57	22	C
138	140	1,240	6,700	6,750	63	22	C	1,112	6,876	6,888	63	22	C	1,112	6,751	6,743	55	25	C
140	142	494	6,700	6,818	60	20	B	496	6,876	6,957	60	20	C	496	6,751	6,804	50	24	C
142	144	1,061	6,700	6,818	59	23	C	1,061	7,586	7,668	58	22	C	1,061	7,451	7,493	47	27	C
144	146	859	6,700	6,818	58	24	C	859	7,586	7,671	58	22	C	859	7,451	7,481	46	27	C
146	148	498	3,700	3,820	57	22	C	498	3,646	3,736	57	22	C	498	3,521	3,610	36	34	D
148	150	281	3,700	3,820	55	23	C	281	3,646	3,737	56	22	C	281	3,521	3,606	34	36	E
150	152	284	3,700	3,820	53	24	C	284	3,646	3,736	53	24	C	284	3,521	3,602	33	37	E
152	154	582	3,700	3,819	51	25	C	582	3,646	3,736	50	25	C	582	3,521	3,595	31	39	E
154	156	644	3,700	3,818	44	23	C	644	3,646	3,736	44	23	C	644	3,521	3,584	27	36	E
156	158	983	1,999	2,173	53	14	B	983	2,165	2,334	53	15	B	983	1,909	2,066	53	13	B
146	161	665	3,000	2,998	50	30	D	174	3,940	3,936	53	25	C	174	3,930	3,861	53	25	C
162	163							678	3,940	3,937	44	30	D	678	3,930	3,861	45	29	D
163	164	927	3,000	3,005	38	42	E	552	2,759	2,726	42	34	D	552	2,710	2,658	50	26	C
164	165	965	3,000	3,017	26	60	F	965	2,759	2,712	25	57	F	965	2,710	2,656	33	40	E
165	166	1,048	3,799	3,829	34	52	F	1,048	4,058	3,916	32	57	F	1,048	4,018	3,803	35	50	F
166	167	1,024	4,940	4,965	45	34	D	1,024	5,420	5,301	43	39	E	1,024	5,380	5,184	44	37	E
167	168	540	4,380	4,388	47	31	D	540	4,720	4,637	46	34	D	540	4,671	4,561	46	33	D
168	169	448	4,380	4,387	50	29	D	448	4,720	4,636	50	31	D	448	4,671	4,563	50	31	D
169	170	625	3,880	3,891	54	36	E	625	4,020	3,947	54	37	E	625	4,070	3,975	54	37	E
170	171	523	3,880	3,891	56	35	D	523	4,020	3,946	56	35	E	523	4,070	3,975	56	35	E
364	365	1,074	2,000	2,006	57	18	B	1,074	2,600	2,602	53	25	C	1,074	2,490	2,495	54	24	C
365	366	892	2,600	2,610	48	25	C	892	3,502	3,511	42	37	E	892	3,392	3,400	43	36	E
366	367	1,871	3,700	3,723	39	44	F	1,871	4,562	4,551	54	28	D	1,871	4,562	4,521	54	28	D
367	368	827	3,700	3,717	31	60	F	827	4,562	4,551	37	42	E	827	4,562	4,519	37	41	E
368	369	483	3,700	3,715	41	46	F	483	4,562	4,552	42	36	E	483	4,562	4,521	42	36	E
369	370	205	3,700	3,715	49	38	E	205	4,562	4,552	51	30	D	205	4,562	4,522	51	29	D
374	376	436	3,700	3,715	55	34	D	434	4,562	4,550	56	27	C	434	4,562	4,525	56	27	C
300	302	867	2,000	2,005	58	18	B	867	1,980	1,979	58	17	B	867	1,880	1,878	59	16	B
302	304	1,088	2,600	2,673	49	25	C	1,088	2,570	2,639	49	25	C	1,088	2,470	2,537	50	23	C
304	307	1,574	4,200	4,257	58	24	C	1,574	4,250	4,312	42	35	D	1,574	4,161	4,245	48	30	D
307	310																		
307	308	718	4,200	4,256	54	26	C	718	4,250	4,298	26	55	F	718	4,161	4,246	30	48	F
308	310	825	4,200	4,254	50	32	D	825	4,250	4,289	29	56	F	825	4,161	4,248	30	53	F
310	314	698	7,900	7,967	57	35	E	698	8,812	8,832	48	37	E	698	8,723	8,776	49	36	E
314	318	379	7,900	7,966	59	34	D	765	8,812	8,827	50	35	E	765	8,723	8,775	50	35	D
318	320	972	7,900	7,965	61	29	D	586	8,002	8,028	55	31	D	586	7,912	7,962	56	30	D
320	322	545	7,900	7,883	60	33	D	545	8,002	7,949	57	35	D	545	7,912	7,880	58	34	D
322	324	721	7,900	7,881	60	33	D	721	8,002	7,948	58	34	D	721	7,912	7,879	59	34	D
324	326	1,326	7,900	7,879	58	34	D	1,326	8,002	7,947	60	33	D	1,326	7,912	7,878	59	34	D
326	327	134	9,000	9,012	51	35	E	134	8,992	8,953	53	34	D	134	9,002	8,993	50	36	E
327	328	384	9,000	9,086	50	31	D	384	8,992	9,028	52	30	D	384	9,002	9,066	49	31	D
326	328																		
328	330	1,384	7,900	7,973	58	34	D	1,384	7,982	8,031	58	35	D	1,384	7,992	8,056	57	35	E
330	332	1,712	7,900	7,971	57	35	D	1,712	7,982	8,029	57	35	E	1,712	7,992	8,053	56	36	E
332	334	1,460	8,301	8,372	50	40	E	1,460	8,383	8,428	50	40	E	1,460	8,393	8,461	49	41	E
334	336	544	8,301	8,371	54	39	E	544	8,383	8,427	54	39	E	544	8,393	8,464	54	39	E
336	338	1,512	8,301	8,373	59	30	D	1,512	8,383	8,426	59	30	D	1,512	8,393	8,467	59	31	D
338	340	780	7,501	7,556	63	22	C	780	7,573	7,611	63	22	C	780	7,583	7,658	63	22	C
340	342	2,275	7,501	7,545	65	23	C	2,275	7,573	7,600	65	24	C	2,275	7,583	7,650	65	24	C
342	344	393	7,501	7,557	63	21	C	393	7,573	7,612	62	21	C	393	7,583	7,664	62	21	C
344	346	1,397	7,900	7,957	57	27	C	1,397	7,972	8,011	53	29	D	1,397	8,083	8,167	53	29	D
346	348	1,495	7,900	7,958	47	32	D	1,495	7,972	8,013	43	36	E	1,495	8,083	8,174	44	36	E
348	350	2,036	7,301	7,359	53	28	C	2,036	7,473	7,521	52	29	D	2,036	7,374	7,490	53	28	D
350	352	1,409	3,301	3,309	64	17	B	1,409	3,434	3,456	63	18	B	1,409	3,335	3,382	64	18	B
352	354	1,616	3,301	3,309	66	17	B	1,616	3,434	3,458	65	18	B	1,616	3,335	3,382	66	17	B
354	356	719	3,301	3,311	66	17	B	719	3,434	3,458	66	18	B	719	3,335	3,383	66	17	B

Node		Model # 7 2018 Full Build Without 4th Ave Ramp						Model # 8 2018 Full Build NB Flyover						Model # 9 2018 Full Build NB Flyover w/o 4th Ave					
From	**To**	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
102	104	744	5,431	5,463	61	23	C	744	5,261	5,302	61	22	C	744	5,431	5,466	61	23	C
104	106	1,355	7,481	7,534	63	20	B	1,355	7,253	7,315	64	19	B	1,355	7,481	7,533	63	20	B
106	108	910	7,682	7,732	63	19	B	910	7,553	7,616	63	19	B	910	7,682	7,733	63	19	B
108	110	1,432	6,900	6,955	65	21	C	1,432	7,251	7,304	64	23	C	1,432	6,900	6,952	65	21	C
110	112	1,225	6,900	6,953	61	23	C	1,225	7,251	7,301	63	23	C	1,225	6,900	6,952	62	23	C
112	113	1,449	7,618	7,683	53	27	C	1,449	7,650	7,706	57	25	C	1,449	7,618	7,678	54	27	C
113	114	542	7,618	7,682	62	25	C	542	7,650	7,699	62	25	C	542	7,618	7,674	62	25	C
114	116	1,462	7,618	7,681	64	23	C	1,462	7,650	7,698	64	23	C	1,462	7,618	7,673	64	23	C
116	118	238	7,127	7,188	65	19	B	238	7,050	7,114	65	19	B	238	7,127	7,196	65	19	B
118	120	2,201	7,127	7,170	64	23	C	2,201	7,050	7,104	65	22	C	2,201	7,127	7,188	65	22	C
120	122	378	7,127	7,160	60	21	C	378	7,050	7,108	65	19	B	378	7,127	7,190	62	20	B
122	124	1,521	7,637	7,645	55	27	C	1,521	7,550	7,609	62	23	C	1,521	7,637	7,686	57	26	C
124	126	818	7,637	7,602	52	30	D	818	7,550	7,607	63	24	C	818	7,637	7,655	54	29	D
126	128	1,514	7,637	7,549	45	33	D	1,514	7,550	7,607	64	23	C	1,514	7,637	7,607	48	33	D
128	130	1,485	7,348	7,192	35	42	E	1,485	7,151	7,220	64	23	C	1,485	7,348	7,267	39	40	E
130	132	1,474	7,348	7,126	31	47	F	1,474	7,151	7,218	63	23	C	1,474	7,348	7,200	32	46	F
132	134	604	7,958	7,697	30	40	E	604	7,851	7,919	61	20	C	604	7,958	7,768	30	40	E
134	136																		
134	135	478	7,279	7,024	29	35	E	478	7,251	7,326	62	17	B	478	7,279	7,105	29	35	E
135	136	553	7,279	6,941	30	39	E	553	7,251	7,257	62	20	B	553	7,279	7,024	30	39	E
136	138	843	7,279	6,929	34	34	D	843	7,251	7,260	60	20	C	843	7,279	7,013	35	34	D
138	140	1,112	6,889	6,560	40	33	D	1,112	6,751	6,776	62	22	C	1,112	6,889	6,637	40	33	D
140	142	496	6,889	6,618	41	28	C	496	6,751	6,843	60	20	B	496	6,889	6,696	42	28	C
142	144	1,061	7,609	7,307	44	28	D	1,061	7,451	7,544	58	22	C	1,061	7,609	7,393	43	28	D
144	146	859	7,609	7,302	46	27	C	859	7,451	7,545	58	22	C	859	7,609	7,388	45	27	C
146	148	498	3,809	3,695	37	34	D	498	3,521	3,676	57	22	C	498	3,809	3,718	36	34	D
148	150	281	3,809	3,692	36	35	D	281	3,521	3,676	56	22	C	281	3,809	3,716	36	35	D
150	152	284	3,809	3,690	35	35	E	284	3,521	3,675	53	23	C	284	3,809	3,715	35	36	E
152	154	582	3,809	3,687	34	36	E	582	3,521	3,675	51	24	C	582	3,809	3,713	34	37	E
154	156	644	3,809	3,684	30	33	D	644	3,521	3,675	45	22	C	644	3,809	3,711	29	35	D
156	158	983	1,658	1,776	54	11	B	983	1,909	2,084	53	13	B	983	1,658	1,807	54	11	B
146	161	174	3,800	3,604	53	23	C	174	3,930	3,870	53	25	C	174	3,800	3,666	53	23	C
162	163	678	3,800	3,610	46	26	C	678	3,930	3,875	44	30	D	678	3,800	3,673	46	27	C
163	164	552	2,651	2,493	51	25	C	552	2,710	2,644	50	26	C	552	2,651	2,549	48	27	C
164	165	965	2,651	2,495	36	35	E	965	2,710	2,642	33	40	E	965	2,651	2,545	25	52	F
165	166	1,048	4,050	3,452	39	41	E	1,048	4,018	3,785	35	49	F	1,048	4,050	3,928	31	58	F
166	167	1,024	5,401	4,831	45	33	D	1,024	5,380	5,161	44	37	E	1,024	5,401	5,311	44	38	E
167	168	540	4,701	4,364	48	31	D	540	4,671	4,534	46	33	D	540	4,701	4,608	47	33	D
168	169	448	4,701	4,365	51	29	D	448	4,671	4,534	50	30	D	448	4,701	4,609	50	31	D
169	170	625	4,001	3,695	54	34	D	625	4,070	3,950	54	37	E	625	4,001	3,913	54	36	E
170	171	523	4,001	3,697	57	33	D	523	4,070	3,950	56	35	E	523	4,001	3,913	56	35	D
364	365	1,074	2,570	2,573	54	25	C	1,074	2,490	2,494	54	24	C	1,074	2,570	2,571	53	25	C
365	366	892	3,460	3,469	43	36	E	892	3,392	3,402	43	36	E	892	3,460	3,470	42	37	E
366	367	1,871	4,550	4,568	54	28	D	1,871	4,562	4,589	54	28	D	1,871	4,550	4,543	54	28	D
367	368	827	4,550	4,568	36	42	E	827	4,562	4,587	36	42	E	827	4,550	4,545	37	42	E
368	369	483	4,550	4,568	42	37	E	483	4,562	4,585	42	37	E	483	4,550	4,545	42	36	E
369	370	205	4,550	4,568	51	30	D	205	4,562	4,585	51	30	D	205	4,550	4,546	51	30	D
374	376	434	4,550	4,567	56	27	C	434	4,562	4,584	56	28	C	434	4,550	4,546	56	27	C
300	302	867	1,980	1,982	58	18	B	867	1,880	1,875	59	16	B	867	1,980	1,984	58	18	B
302	304	1,088	2,570	2,642	48	25	C	1,088	2,470	2,535	50	23	C	1,088	2,570	2,642	49	25	C
304	307	1,574	4,250	4,346	36	41	E	1,574	4,161	4,234	49	29	D	1,574	4,250	4,318	41	36	E
307	310																		
307	308	718	4,250	4,332	24	62	F	718	4,161	4,232	30	47	F	718	4,250	4,310	26	56	F
308	310	825	4,250	4,326	27	59	F	825	4,161	4,229	30	52	F	825	4,250	4,309	28	57	F
310	314	698	8,800	8,895	47	38	E	698	8,723	8,806	48	37	E	698	8,800	8,853	49	36	E
314	318	765	8,800	8,895	49	36	E	765	8,723	8,803	50	35	E	765	8,800	8,851	51	35	E
318	320	586	7,989	8,073	55	31	D	586	7,912	7,970	55	30	D	586	7,989	8,036	56	30	D
320	322	545	7,989	7,992	57	35	E	545	7,912	7,888	57	35	D	545	7,989	7,953	57	35	D
322	324	721	7,989	7,991	58	34	D	721	7,912	7,889	59	34	D	721	7,989	7,951	59	34	D
324	326	1,326	7,989	7,991	60	34	D	1,326	7,912	7,890	59	33	D	1,326	7,989	7,950	59	34	D
326	327	134	8,979	9,003	53	34	D	134	9,002	9,014	52	35	E	134	8,979	8,955	52	35	D
327	328	384	8,979	9,077	51	30	D	384	9,002	9,089	51	30	D	384	8,979	9,028	51	30	D
326	328																		
328	330	1,384	7,969	8,084	58	35	D	1,384	7,992	8,081	58	35	E	1,384	7,969	8,037	58	35	D
330	332	1,712	7,969	8,084	56	36	E	1,712	7,992	8,081	54	38	E	1,712	7,969	8,038	57	35	E
332	334	1,460	8,370	8,485	49	41	E	1,460	8,393	8,487	49	41	E	1,460	8,370	8,441	50	40	E
334	336	544	8,370	8,488	54	39	E	544	8,393	8,488	54	39	E	544	8,370	8,444	54	39	E
336	338	1,512	8,370	8,490	59	31	D	1,512	8,393	8,487	59	31	D	1,512	8,370	8,447	59	30	D
338	340	780	7,560	7,671	63	22	C	780	7,583	7,671	63	22	C	780	7,560	7,639	63	22	C
340	342	2,275	7,560	7,658	65	24	C	2,275	7,583	7,659	65	24	C	2,275	7,560	7,629	65	24	C
342	344	393	7,560	7,668	62	22	C	393	7,583	7,670	61	22	C	393	7,560	7,641	61	22	C
344	346	1,397	7,959	8,066	51	30	D	1,397	8,083	8,171	53	30	D	1,397	7,959	8,043	50	31	D
346	348	1,495	7,959	8,064	42	37	E	1,495	8,083	8,172	44	36	E	1,495	7,959	8,048	43	37	E
348	350	2,036	7,460	7,569	52	29	D	2,036	7,374	7,473	53	29	D	2,036	7,460	7,558	52	29	D
350	352	1,409	3,529	3,562	63	19	B	1,409	3,335	3,373	64	18	B	1,409	3,529	3,588	63	19	B
352	354	1,616	3,529	3,563	65	18	B	1,616	3,335	3,372	66	17	B	1,616	3,529	3,590	65	18	B
354	356	719	3,529	3,563	66	18	B	719	3,335	3,371	66	17	B	719	3,529	3,591	66	18	B

Table C-2
I-35W Transit/Access Project
2018 Freeway MOE Comparison
PM Peak Hour

	Location From	Location To	Node From	Node To	Model # 1 Existing Conditions Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 2 2018 No Build Conditions Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 3 2018 Transit Station Only Conditions Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 4 2018 Transit Station, SB Braid, NB Flyover Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 5 2018 Build Lake St Ramps Only Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 6 2018 Full Build Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 7 2018 Full Build Without 4th Ave Ramp Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 8 2018 Full Build NB Flyover Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Model # 9 2018 Full Build NB Flyover w/o 4th Ave Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Eastbound I-94	**Begin EB I-94**		554	556	984	3,530	3,525	50	36	E	984	3,710	3,709	51	37	E	984	3,710	3,714	51	37	E	984	3,710	3,712	51	37	E	984	3,791	3,793	51	38	E	984	3,730	3,736	51	37	E	984	3,800	3,806	51	38	E	984	3,730	3,736	51	37	E	984	3,800	3,801	51	38	E
			556	557	632	3,530	3,524	49	37	E	632	3,710	3,710	51	37	E	632	3,710	3,713	51	37	E	632	3,710	3,714	51	37	E	632	3,791	3,794	51	37	E	632	3,730	3,737	51	37	E	632	3,800	3,806	51	38	E	632	3,730	3,737	51	37	E	632	3,800	3,802	51	38	E
		EB I-394 Entrance	557	558	789	3,530	3,523	47	38	E	789	3,710	3,711	49	38	E	789	3,710	3,714	49	38	E	789	3,710	3,715	49	38	E	789	3,791	3,795	48	40	E	789	3,730	3,738	49	39	E	789	3,800	3,807	48	40	E	789	3,730	3,739	49	39	E	789	3,800	3,803	48	40	E
	EB I-394 Entrance		558	559	442	5,690	5,592	38	50	F	442	5,920	5,813	38	51	F	442	5,920	5,820	38	51	F	442	5,920	5,822	39	50	F	442	5,880	5,860	37	52	F	442	5,850	5,822	38	51	F	442	5,800	5,824	39	50	F	442	5,850	5,819	38	51	F	442	5,800	5,817	39	50	F
			559	560	1,192	5,690	5,593	42	46	F	1,192	5,920	5,817	42	46	F	1,192	5,920	5,825	42	46	F	1,192	5,920	5,826	42	46	F	1,192	5,880	5,863	41	48	F	1,192	5,850	5,825	42	47	F	1,192	5,800	5,830	41	47	F	1,192	5,850	5,821	42	47	F	1,192	5,800	5,823	42	47	F
		Lyndale/Hennepin Entrance	560	561	1,856	5,690	5,593	37	52	F	1,856	5,920	5,821	38	51	F	1,856	5,920	5,830	38	52	F	1,856	5,920	5,830	38	52	F	1,856	5,880	5,867	37	53	F	1,856	5,850	5,827	38	52	F	1,856	5,800	5,837	37	52	F	1,856	5,850	5,824	37	52	F	1,856	5,800	5,829	37	52	F
	Lyndale/Hennepin Entrance		561	562	1,485	7,290	7,145	43	43	E	1,485	7,530	7,427	44	42	E	1,485	7,530	7,439	44	42	E	1,485	7,530	7,438	44	42	E	1,485	7,270	7,257	44	41	E	1,485	7,260	7,234	44	41	E	1,485	7,200	7,237	44	41	E	1,485	7,260	7,230	44	41	E	1,485	7,200	7,229	44	41	E
			562	563	706	7,290	7,143	48	37	E	706	7,530	7,424	50	37	E	706	7,530	7,437	50	37	E	706	7,530	7,437	50	37	E	706	7,270	7,257	50	36	E	706	7,260	7,235	50	36	E	706	7,200	7,239	50	36	E	706	7,260	7,231	50	36	E	706	7,200	7,231	50	36	E
		SB I-35W Exit	563	564	474	7,290	7,143	49	37	E	474	7,530	7,422	50	37	E	474	7,530	7,436	50	37	E	474	7,530	7,437	50	37	E	474	7,270	7,256	50	36	E	474	7,260	7,235	50	36	E	474	7,200	7,241	50	36	E	474	7,260	7,232	50	36	E	474	7,200	7,233	50	36	E
	SB I-35W Exit		564	565	792	5,710	5,594	50	37	E	792	5,930	5,811	50	39	E	792	5,930	5,831	50	39	E	792	5,930	5,849	50	39	E	792	5,590	5,577	51	37	E	792	5,569	5,527	51	36	E	792	5,520	5,525	51	36	E	792	5,569	5,535	51	37	E	792	5,520	5,551	51	37	E
			565	566	865	5,710	5,594	51	37	E	865	5,930	5,811	51	38	E	865	5,930	5,828	51	38	E	865	5,930	5,848	51	39	E	865	5,590	5,577	51	37	E	865	5,569	5,527	51	36	E	865	5,520	5,523	51	36	E	865	5,569	5,533	51	36	E	865	5,520	5,550	51	36	E
		NB I-35W Exit	566	567	388	5,710	5,593	51	29	D	388	5,930	5,810	51	30	D	388	5,930	5,827	51	30	D	388	5,930	5,847	51	30	D	388	5,590	5,576	52	29	D	388	5,569	5,528	52	28	D	388	5,520	5,521	52	28	D	388	5,569	5,531	52	28	D	388	5,520	5,550	52	29	D
	NB I-35W Exit	5th Ave Entrance	567	568	688	4,500	4,403	52	29	D	688	4,789	4,708	51	31	D	688	4,789	4,716	51	31	D	688	4,789	4,719	51	31	D	688	4,228	4,186	52	27	C	688	4,207	4,142	52	27	C	688	4,169	4,140	52	27	C	688	4,207	4,151	52	27	C	688	4,169	4,164	51	27	C
	5th Ave Entrance	TH 55 Exit	568	569	1,557	5,100	4,999	55	23	C	1,557	5,389	5,305	55	24	C	1,557	5,389	5,312	55	24	C	1,557	5,389	5,318	55	24	C	1,557	5,409	5,402	54	25	C	1,557	5,427	5,358	54	25	C	1,557	5,318	5,267	54	25	C	1,557	5,427	5,395	54	25	C	1,557	5,318	5,299	54	25	C
	TH 55 Exit	NB I-35W Entrance	569	570	469	4,090	3,972	60	22	C	469	4,288	4,245	59	24	C	469	4,288	4,237	59	24	C	469	4,288	4,244	59	24	C	469	4,308	4,194	59	24	C	469	4,235	4,065	59	23	C	469	4,217	4,053	59	23	C	469	4,235	4,063	59	23	C	469	4,217	4,078	59	23	C
	NB I-35W Entrance		570	572	1,016	4,740	4,649	61	19	B	1,016	4,848	4,827	61	20	B	1,016	4,848	4,824	61	20	B	1,016	4,848	4,822	61	20	B	1,016	5,008	4,858	61	20	B	1,016	4,944	4,691	61	19	B	1,016	4,917	4,520	62	18	B	1,016	4,944	4,689	61	19	B	1,016	4,917	4,782	61	20	B
		Cedar Ave Entrance	572	573	1,027	4,740	4,647	62	19	B	1,027	4,848	4,830	60	20	C	1,027	4,848	4,824	60	20	C	1,027	4,848	4,822	60	20	C	1,027	5,008	4,857	60	20	C	1,027	4,944	4,694	59	20	B	1,027	4,917	4,521	60	19	B	1,027	4,944	4,691	60	20	B	1,027	4,917	4,782	60	20	B
	Cedar Ave Entrance		573	574	562	5,970	5,877	52	23	C	562	6,158	6,144	46	27	C	562	6,158	6,136	46	27	C	562	6,158	6,134	47	27	C	562	6,308	6,158	45	28	D	562	6,254	6,006	45	27	C	562	6,217	5,822	46	26	C	562	6,254	6,004	46	27	C	562	6,217	6,084	46	27	C
			574	576	930	5,970	5,875	57	26	C	930	6,158	6,144	55	28	C	930	6,158	6,136	55	28	C	930	6,158	6,134	55	28	C	930	6,308	6,161	55	28	D	930	6,254	6,007	55	27	C	930	6,217	5,823	55	26	C	930	6,254	6,006	55	27	C	930	6,217	6,089	55	28	C
			576	578	1,378	5,970	5,874	61	24	C	1,378	6,158	6,144	61	25	C	1,378	6,158	6,137	61	25	C	1,378	6,158	6,134	61	25	C	1,378	6,308	6,164	61	25	C	1,378	6,254	6,006	61	25	C	1,378	6,217	5,822	61	24	C	1,378	6,254	6,007	61	25	C	1,378	6,217	6,091	61	25	C
			578	580	1,268	5,970	5,875	61	24	C	1,268	6,158	6,144	61	25	C	1,268	6,158	6,136	61	25	C	1,268	6,158	6,134	61	25	C	1,268	6,308	6,167	61	25	C	1,268	6,254	6,006	61	25	C	1,268	6,217	5,821	61	24	C	1,268	6,254	6,008	61	25	C	1,268	6,217	6,092	61	25	C
			580	582	875	5,970	5,876	61	24	C	875	6,158	6,143	61	25	C	875	6,158	6,135	61	25	C	875	6,158	6,134	61	25	C	875	6,308	6,169	61	25	C	875	6,254	6,007	61	25	C	875	6,217	5,821	61	24	C	875	6,254	6,011	61	25	C	875	6,217	6,094	61	25	C
		END EB I-94	582	584	1,173	5,970	5,879	61	24	C	1,173	6,158	6,143	61	25	C	1,173	6,158	6,135	61	25	C	1,173	6,158	6,134	61	25	C	1,173	6,308	6,172	61	25	C	1,173	6,254	6,010	61	25	C	1,173	6,217	5,820	61	24	C	1,173	6,254	6,011	61	25	C	1,173	6,217	6,097	61	25	C
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,140	5,127	58	23	C	1,488	5,200	5,172	55	26	C	1,488	5,200	5,142	45	35	D	1,488	5,200	5,207	63	21	C	1,488	5,200	5,204	63	21	C	1,488	5,180	5,182	62	21	C	1,488	5,140	5,146	63	21	C	1,488	5,180	5,186	63	21	C	1,488	5,140	5,142	63	21	C
			750	752	590	5,140	5,111	54	29	D	590	5,200	5,133	47	34	D	590	5,200	5,087	40	48	F	590	5,200	5,202	62	21	C	590	5,200	5,201	62	21	C	590	5,180	5,176	59	23	C	590	5,140	5,146	62	21	C	590	5,180	5,187	62	21	C	590	5,140	5,143	62	21	C
			752	754	1,231	5,140	5,086	50	36	E	1,231	5,200	5,078	36	52	F	1,231	5,200	5,027	33	67	F	1,231	5,200	5,199	62	21	C	1,231	5,200	5,199	62	21	C	1,231	5,180	5,157	54	27	C	1,231	5,140	5,144	62	21	C	1,231	5,180	5,187	62	21	C	1,231	5,140	5,143	62	21	C
			754	756	1,378	5,140	5,035	39	48	F	1,378	5,200	4,996	25	80	F	1,378	5,200	4,947	24	86	F	1,378	5,200	5,196	62	21	C	1,378	5,200	5,202	62	21	C	1,378	5,180	5,108	44	41	E	1,378	5,140	5,144	62	21	C	1,378	5,180	5,186	62	21	C	1,378	5,140	5,145	62	21	C
			756	758	775	5,140	4,983	28	64	F	775	5,200	4,934	18	96	F	775	5,200	4,894	20	91	F	775	5,200	5,195	61	21	C	775	5,200	5,202	61	21	C	775	5,180	5,051	37	52	F	775	5,140	5,143	61	21	C	775	5,180	5,185	61	21	C	775	5,140	5,148	61	21	C
		Cedar Ave Exit	758	759	1,026	5,140	4,934	19	76	F	1,026	5,200	4,894	13	99	F	1,026	5,200	4,860	16	94	F	1,026	5,200	5,194	57	21	C	1,026	5,200	5,197	52	24	C	1,026	5,180	5,008	31	58	F	1,026	5,140	5,144	57	21	C	1,026	5,180	5,185	57	21	C	1,026	5,140	5,147	57	21	C
	Cedar Ave Exit		759	760	755	4,810	4,572	13	94	F	755	4,800	4,484	11	110	F	755	4,800	4,454	12	104	F	755	4,800	4,781	53	23	C	755	4,900	4,880	42	34	D	755	4,880	4,672	24	75	F	755	4,840	4,826	53	23	C	755	4,880	4,878	53	23	C	755	4,840	4,829	53	23	C
			760	761	1,114	4,810	4,538	12	93	F	1,114	4,800	4,471	12	97	F	1,114	4,800	4,427	12	94	F	1,114	4,800	4,782	52	23	C	1,114	4,900	4,864	37	41	E	1,114	4,880	4,648	22	76	F	1,114	4,840	4,825	51	24	C	1,114	4,880	4,877	52	24	C	1,114	4,840	4,827	52	23	C
		SB I-35W Exit	761	762	677	4,810	4,518	16	70	F	677	4,800	4,465	16	71	F	677	4,800	4,411	16	70	F	677	4,800	4,784	52	23	C	677	4,900	4,846	33	43	F	677	4,880	4,633	23	61	F	677	4,840	4,824	51	24	C	677	4,880	4,878	51	24	C	677	4,840	4,824	51	24	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,780	3,533	15	81	F	492	3,700	3,421	14	85	F	492	3,700	3,390	13	85	F	492	3,700	3,669	51	24	C	492	3,840	3,797	28	56	F	492	3,710	3,498	20	75	F	492	3,750	3,724	51	24	C	492	3,710	3,692	51	24	C	492	3,750	3,753	51	25	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	4,920	4,674	15	74	F	1,637	5,100	4,485	14	76	F	1,637	5,100	4,449	14	77	F	1,637	5,100	4,731	50	23	C	1,637	5,140	4,809	25	57	F	1,637	5,100	4,593	18	70	F	1,637	5,130	4,901	50	24	C	1,637	5,100	4,790	49	24	C	1,637	5,130	4,906	49	24	C
	11th St Exit		764	15																			730	4,601	4,285	51	28	D																			780	4,601	4,320	50	29	D	780	4,720	4,501	50	30	D
		NB I-35W Flyover	15	765																			828	4,601	4,284	51	28	D																			828	4,601	4,321	50	29	D	828	4,720	4,502	50	30	D
	11th St Exit		764	765	1,022	4,450	4,219	15	93	F	1,022	4,601	4,031	14	93	F	1,022	4,601	4,012	14	94	F							1,022	4,641	4,327	20	79	F	1,022	4,601	4,137	16	91	F	1,022	4,720	4,503	51	30	D																
		NB I-35W/4th Ave Entrance	765	766	1,082	4,450	4,227	16	90	F	1,082	4,601	4,038	15	90	F	1,082	4,601	4,017	15	91	F	490	6,302	5,926	48	31	D	1,082	4,641	4,322	17	85	F	1,082	4,601	4,135	15	92	F	1,082	4,720	4,504	47	32	D	490	6,213	5,909	45	33	D	490	6,871	6,406	48	33	D
	NB I-35W/4th Ave Entrance		766	767	717	6,920	6,641	27	60	F	717	7,203	6,450	26	59	F	717	7,203	6,430	26	59	F	717	7,203	6,829	44	35	E	717	7,023	6,624	27	59	F	717	7,114	6,539	26	60	F	717	6,871	6,410	38	42	E	714	7,114	6,810	42	39	E	714	6,871	6,405	49	33	D
		Lyndale/Hennepin Exit	767	768	1,834	6,920	6,642	48	33	D	1,834	7,203	6,452	48	32	D	1,834	7,203	6,431	48	32	D	1,834	7,203	6,829	48	33	D	1,834	7,023	6,623	48	33	D	1,834	7,114	6,541	47	33	D	1,834	6,871	6,410	49	31	D	1,834	7,114	6,819	47	34	D	1,834	6,871	6,407	50	30	D
	Lyndale/Hennepin Exit		768	769	1,590	5,600	5,421	37	49	F	1,590	5,803	5,281	37	47	F	1,590	5,803	5,263	37	47	F	1,590	5,803	5,534	37	50	F	1,590	5,823	5,542	37	50	F	1,590	5,905	5,493	37	50	F	1,590	5,650	5,269	37	47	F	1,590	5,905	5,697	36	53	F	1,590	5,650	5,275	37	48	F
			769	770	1,188	5,600	5,423	46	40	E	1,188	5,803	5,286	46	38	E	1,188	5,803	5,268	46	38	E	1,188	5,803	5,535	45	41	E	1,188	5,823	5,547	46	41	E	1,188	5,905	5,499	45	40	E	1,188	5,650	5,274	46	38	E	1,188	5,905	5,706	45	43	E	1,188	5,650	5,275	45	39	E
		WB I-394 Exit	770	771	1,432	5,600	5,425	45	34	D	1,432	5,803	5,288	45	33	D	1,432	5,803	5,269	45	33	D	1,432	5,803	5,534	44	35	E	1,432	5,823	5,550	45	35	D	1,432	5,905	5,503	45	34	D	1,432	5,650	5,280	45	33	D	1,432	5,905	5,712	44	36	E	1,432	5,650	5,278	44	33	D
	WB I-394 Exit		771	772	508	3,050	2,999	52	19	B	508	3,103	2,883	52	19	B	508	3,103	2,874	51	19	B	508	3,103	2,993	51	19	B	508	3,223	3,133	51	20	C	508	3,295	3,139	51	20	C	508	3,020	2,810	52	18	B	508	3,295	3,243	51	21	C	508	3,020	2,796	52	18	B
		TH 55 Exit	772	774	544	3,050	2,999	54	16	B	544	3,103	2,883	54	15	B	544	3,103	2,876	54	15	B	544	3,103	2,994	54	16	B	544	3,223	3,135	54	17	B	544	3,295	3,141	53	17	B	544	3,020	2,810	54	15	B	544	3,295	3,244	53	17	B	544	3,020	2,797	54	15	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,660	2,611	54	16	B	400	2,703	2,521	54	16	B	400	2,703	2,517	54	16	B	400	2,703	2,617	54	16	B	400	2,813	2,719	54	17	B	400	2,885	2,752	54	17	B	400	2,640	2,446	54	15	B	400	2,885	2,835	54	18	B	400	2,640	2,442	54	15	B
	NB I-35W Flyover		256	6	890	1,600	1,545	18	85	F	890	1,701	1,509	16	93	F	890	1,701	1,509	17	92	F	470	1,701	1,643	29	58	F	890	1,481	1,401	24	59	F	890	1,612	1,507	17	88	F	890	2,151	1,906	28	68	F	890	2,151	1,588	29	55	F	470	2,151	1,904	26	73	F
			6	3	142	1,600	1,543	19	82	F	142	1,701	1,508	17	88	F	142	1,701	1,509	17	87	F	251	1,701	1,643	32	51	F	142	1,481	1,401	23	63	F	142	1,612	1,505	18	84	F	142	2,151	1,906	32	60	F	251	1,612	1,587	32	49	F	251	2,151	1,904	32	59	F
		4th Avenue Entrance	3	2	114	1,600	1,543	19	41	E	114	1,701	1,508	17	44	F	114	1,701	1,509	17	44	F							114	1,481	1,401	22	32	D	114	1,612	1,504	18	42	E	114	2,151	1,906	34	28	D																
		WB I-94	3	765																			200	1,701	1,642	38	44	F																			200	1,612	1,587	38	42	E	200	2,151	1,904	38	51	F
	4th Avenue		5	4	466	870	869	14	33	D	466	901	901	12	39	E	466	901	899	12	38	E	466	901	903	12	38	E	466	901	899	11	43	E	466	901	902	11	44	F							466	901	902	11	43	E						
		NB Flyover Entrance	4	2	160	870	868	20	25	C	160	901	899	20	26	C	160	901	900	20	26	C	160	901	903	20	26	C	160	901	900	20	26	C	160	901	900	20	26	C							160	901	901	20	26	C						
	NB Flyover Entrance		2	1	164	2,470	2,409	22	37	E	164	2,602	2,406	20	40	E	164	2,602	2,408	21	39	E	164	901	903	34	27	C	164	2,382	2,301	24	32	D	164	2,513	2,403	21	38	E	164	2,151	1,906	37	26	C	164	901	900	33	27	C						
		WB I-94	1	766	254	2,470	2,409	21	58	F	254	2,602	2,406	20	61	F	254	2,602	2,409	20	60	F	254	901	902	42	22	C	254	2,382	2,302	22	52	F	254	2,513	2,403	20	59	F	254	2,151	1,906	39	49	F	254	901	900	35	25	C						

Appendix D

2018 Evaluation Comparison Tables

Table D-1
I-35W Transit/Access Project
Freeway MOE Comparison

TRANSIT STATION COMPARISON

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 2						Model # 3						Model # 2						Model # 3					
					2018 No Build Conditions						2018 Transit Station Only Conditions						2018 No Build Conditions						2018 Transit Station Only Conditions					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Northbound I-35W/TH 65	**Begin NB I-35W**	TH 62 Entrance	102	104	744	4,850	4,893	62	20	C	744	4,850	4,896	62	20	C	744	5,101	5,129	62	21	C	744	5,101	5,127	62	21	C
	TH 62 Entrance	60th St Entrance	104	106	1,355	6,670	6,732	64	18	B	1,355	6,670	6,732	64	18	B	1,355	7,102	7,155	64	19	B	1,355	7,102	7,152	64	19	B
	60th St Entrance	Diamond Lake Exit	106	108	910	6,970	7,032	65	17	B	910	6,970	7,033	65	17	B	910	7,402	7,459	63	18	B	910	7,402	7,456	63	18	B
	Diamond Lake Exit		108	110	1,432	6,670	6,741	66	21	C	1,432	6,670	6,741	65	21	C	1,432	7,001	7,069	65	22	C	1,432	7,001	7,064	65	22	C
		Diamond Lake Entrance	110	112	1,225	6,670	6,738	63	21	C	1,225	6,670	6,735	62	22	C	1,225	7,001	7,065	63	22	C	1,225	7,001	7,064	63	22	C
	Diamond Lake Entrance		112	113	1,449	7,481	7,552	55	26	C	1,449	7,481	7,544	53	27	C	1,449	7,400	7,470	58	24	C	1,449	7,400	7,468	58	25	C
			113	114	542	7,481	7,546	59	26	C	542	7,481	7,529	55	28	C	542	7,400	7,466	63	24	C	542	7,400	7,464	63	24	C
		46th St Exit	114	116	1,462	7,481	7,530	53	28	C	1,462	7,481	7,493	49	30	D	1,462	7,400	7,465	64	22	C	1,462	7,400	7,462	64	22	C
	46th St Exit	46th St BRT Exit	116	118	238	7,281	7,320	45	29	D	238	7,281	7,273	42	31	D	238	6,800	6,879	65	18	B	238	6,800	6,866	65	18	B
	46th St BRT Exit	46th St BRT Entrance	118	120	2,201	7,281	7,245	36	42	E	2,201	7,281	7,176	34	44	F	2,201	6,800	6,874	65	21	C	2,201	6,800	6,862	65	21	C
	46th St BRT Entrance	46th St Entrance	120	122	378	7,281	7,183	28	45	F	378	7,281	7,094	28	46	F	378	6,800	6,881	65	18	B	378	6,800	6,870	65	18	B
	46th St Entrance		122	124	1,521	8,392	8,206	29	53	F	1,521	8,392	8,114	29	54	F	1,521	7,300	7,383	62	23	C	1,521	7,300	7,369	62	22	C
			124	126	818	8,392	8,133	31	54	F	818	8,392	8,050	30	54	F	818	7,300	7,379	62	24	C	818	7,300	7,365	63	24	C
		35/36th St Exit	126	128	1,514	8,392	8,068	30	52	F	1,514	8,392	7,994	30	52	F	1,514	7,300	7,369	60	24	C	1,514	7,300	7,353	60	24	C
	35/36th St Exit		128	130	1,485	8,192	7,820	30	53	F	1,485	8,192	7,747	30	52	F	1,485	6,800	6,852	57	25	C	1,485	6,800	6,842	54	26	C
		35/36th St Entrance	130	132	1,474	8,192	7,760	32	49	F	1,474	8,192	7,686	32	48	F	1,474	6,800	6,822	50	28	D	1,474	6,800	6,806	48	30	D
	35/36th St Entrance	31/Lake St Exit	132	134	604	9,402	8,840	35	43	E	604	9,402	8,780	34	43	E	604	7,600	7,598	44	30	D	604	7,600	7,585	43	31	D
	31/Lake St Exit	Existing - Lake St BRT Exit	134	136	1,029	8,512	7,973	42	35	E							1,029	6,700	6,688	43	30	D						
	31/Lake St Exit	New - Lake St BRT Exit	134	135							478	8,512	7,922	40	34	D							478	6,700	6,686	42	28	D
	New - Lake St BRT Exit		135	136							553	8,512	7,830	42	37	E							553	6,700	6,604	41	34	D
	Existing - Lake St BRT Exit	Existing - Lake St BRT Ent	136	138	721	8,512	7,950	45	35	E	718	8,512	7,816	44	35	E	721	6,700	6,664	42	33	D	718	6,700	6,592	41	34	D
	Existing - Lake St BRT Ent	New - Lake St BRT Ent	138	140	1,190	8,512	7,937	49	30	D	1,240	8,512	7,800	49	32	D	1,190	6,700	6,644	41	31	D	1,240	6,700	6,575	41	34	D
	New - Lake St BRT Ent		140	142	569	8,512	7,926	51	31	D	494	8,512	7,867	50	27	C	569	6,700	6,626	41	33	D	494	6,700	6,629	40	29	D
			142	144	1,061	8,512	7,920	55	29	D	1,061	8,512	7,862	54	29	D	1,061	6,700	6,615	41	32	D	1,061	6,700	6,616	41	33	D
		NB I-35W/TH 65 SPLIT	144	146	859	8,512	7,911	57	28	C	859	8,512	7,859	56	28	D	859	6,700	6,603	39	34	D	859	6,700	6,605	40	34	D
	Begin NB TH 65		146	148	498	4,952	4,644	57	27	C	498	4,952	4,612	56	27	C	498	3,700	3,643	31	40	E	498	3,700	3,675	31	40	E
			148	150	281	4,952	4,642	56	28	C	281	4,952	4,611	55	28	C	281	3,700	3,637	30	41	E	281	3,700	3,670	30	41	E
			150	152	284	4,952	4,641	53	29	D	284	4,952	4,609	53	29	D	284	3,700	3,635	29	43	E	284	3,700	3,666	29	43	E
			152	154	582	4,952	4,639	51	30	D	582	4,952	4,606	50	30	D	582	3,700	3,631	27	44	F	582	3,700	3,662	28	44	F
		WB I-94 Exit	154	156	644	4,952	4,636	46	27	C	644	4,952	4,602	46	27	C	644	3,700	3,625	24	41	E	644	3,700	3,655	23	44	F
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,072	3,032	53	19	B	983	3,072	3,015	53	19	B	983	1,999	2,113	53	13	B	983	1,999	2,140	53	13	B
	NB I-35W/TH 65 Split		146	161	665	3,560	3,263	51	32	D	665	3,560	3,244	51	32	D	665	3,000	2,953	48	31	D	665	3,000	2,927	45	33	D
			163	164	927	3,560	3,262	43	38	E	927	3,560	3,243	43	39	E	927	3,000	2,965	34	46	F	927	3,000	2,949	34	46	F
		5th Ave Entrance	164	165	965	3,560	3,262	28	58	F	965	3,560	3,237	29	57	F	965	3,000	2,981	25	61	F	965	3,000	2,968	25	60	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,959	3,658	35	48	F	1,048	3,959	3,628	35	47	F	1,048	3,799	3,796	34	52	F	1,048	3,799	3,783	33	52	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,078	4,744	49	30	D	1,024	5,078	4,714	49	30	D	1,024	4,940	4,905	46	34	D	1,024	4,940	4,898	46	34	D
	EB I-94 Exit		167	168	540	3,828	3,591	51	23	C	540	3,828	3,557	51	23	C	540	4,380	4,327	48	30	D	540	4,380	4,318	48	30	D
		Washington Ave Exit	168	169	448	3,828	3,589	52	23	C	448	3,828	3,556	52	23	C	448	4,380	4,327	50	29	D	448	4,380	4,318	50	29	D
	Washington Ave Exit		169	170	625	3,118	2,905	55	26	C	625	3,118	2,889	55	26	C	625	3,880	3,827	54	35	E	625	3,880	3,809	54	35	E
		END NB I-35W	170	171	523	3,118	2,903	57	25	C	523	3,118	2,888	57	25	C	523	3,880	3,828	56	34	D	523	3,880	3,810	56	34	D
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,489	2,488	57	23	C	1,074	2,489	2,487	57	22	C	1,074	2,000	1,999	57	18	B	1,074	2,000	1,996	57	18	B
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,789	2,792	51	25	C	892	2,789	2,790	51	25	C	892	2,600	2,604	46	25	C	892	2,600	2,602	47	25	C
	WB I-94 Entrance		366	367	1,871	3,430	3,429	48	32	D	1,871	3,430	3,417	48	32	D	1,871	3,700	3,650	37	45	F	1,871	3,700	3,624	39	42	E
			367	368	827	3,430	3,425	33	51	F	827	3,430	3,414	34	51	F	827	3,700	3,656	31	59	F	827	3,700	3,629	32	57	F
			368	369	483	3,430	3,422	41	42	E	483	3,430	3,411	41	42	E	483	3,700	3,658	41	45	F	483	3,700	3,630	41	45	F
			369	370	403	3,430	3,420	51	34	D	403	3,430	3,411	51	34	D	403	3,700	3,659	51	36	E	403	3,700	3,632	51	36	E
		SB TH 65 Entrance	374	376	627	3,430	3,415	55	31	D	627	3,430	3,407	55	31	D	627	3,700	3,660	54	34	D	627	3,700	3,633	55	33	D
	Begin SB TH 65	12th St Entrance	300	302	867	500	501	63	4	A	867	500	502	63	4	A	867	2,000	1,999	58	18	B	867	2,000	2,003	58	18	B
	12th St Entrance	EB I-94 Entrance	302	304	1,088	700	776	56	6	A	1,088	700	777	56	6	A	1,088	2,600	2,668	49	25	C	1,088	2,600	2,674	49	25	C
	EB I-94 Entrance		304	307	1,574	2,410	2,460	59	14	B	1,574	2,410	2,430	59	14	B	1,574	4,200	4,276	58	25	C	1,574	4,200	4,278	57	25	C
		SB I-35W Entrance	307	310	1,516	2,410	2,460	61	15	B	1,516	2,410	2,428	61	15	B	1,516	4,200	4,276	49	33	D	1,516	4,200	4,275	49	33	D
	SB I-35W Entrance		310	314	698	5,840	5,871	60	25	C	698	5,840	5,829	60	25	C	698	7,900	7,936	57	35	E	698	7,900	7,910	57	35	E
			314	318	379	5,840	5,870	62	24	C	379	5,840	5,829	62	24	C	379	7,900	7,937	59	34	D	379	7,900	7,912	59	34	D
		New - Lake St BRT Exit	318	320	900	5,840	5,868	64	23	C	972	5,840	5,829	64	21	C	900	7,900	7,937	59	34	D	972	7,900	7,911	59	30	D
	New - Lake St BRT Exit	Existing - Lake St BRT Exit	320	322	616	5,840	5,866	64	19	B	545	5,840	5,747	64	23	C	616	7,900	7,936	56	30	D	545	7,900	7,832	58	34	D
	Existing - Lake St BRT Exit	Existing - Lake St BRT Entrance	322	324	719	5,840	5,843	64	23	C	721	5,840	5,744	64	22	C	719	7,900	7,866	52	38	E	721	7,900	7,834	56	35	D
	Existing - Lake St BRT Entrance	31/Lake St Entrance	324	326	1,325	5,840	5,864	63	22	C	1,326	5,840	5,739	65	22	C	1,325	7,900	7,932	52	36	E	1,326	7,900	7,834	56	35	D
	31/Lake St Entrance	New - Lake St BRT Entrance	326	327							134	6,549	6,440	59	22	C							134	9,000	8,953	50	36	E
	New - Lake St BRT Entrance	35/36th St Exit	327	328							384	6,549	6,522	58	19	B							384	9,000	9,028	50	30	D
	31/Lake St Entrance	35/36th St Exit	326	328	518	6,549	6,564	59	22	C							518	9,000	9,059	52	35	D						
	35/36th St Exit		328	330	1,384	5,860	5,885	64	23	C	1,384	5,860	5,824	63	23	C	1,384	7,900	7,927	61	33	D	1,384	7,900	7,917	58	34	D
		35/36th St Entrance	330	332	1,712	5,860	5,880	65	23	C	1,712	5,860	5,820	65	23	C	1,712	7,900	7,928	59	33	D	1,712	7,900	7,915	57	35	D
	35/36th St Entrance		332	334	1,460	6,460	6,475	59	26	C	1,460	6,460	6,412	59	25	C	1,460	8,301	8,331	51	38	E	1,460	8,301	8,316	50	39	E
			334	336	544	6,460	6,472	64	26	C	544	6,460	6,409	64	25	C	544	8,301	8,331	55	38	E	544	8,301	8,317	55	38	E
		46th St Exit	336	338	1,512	6,460	6,471	65	21	C	1,512	6,460	6,407	65	21	C	1,512	8,301	8,333	59	30	D	1,512	8,301	8,315	59	30	D
	46th St Exit	46th St BRT Exit	338	340	780	6,060	6,083	65	17	B	780	6,060	6,008	65	17	B	780	7,501	7,524	63	22	C	780	7,501	7,487	64	21	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,060	6,073	66	18	B	2,275	6,060	6,002	66	18	B	2,275	7,501	7,514	65	23	C	2,275	7,501	7,481	65	23	C
	46th St BRT Entrance	46th St Entrance	342	344	393	6,060	6,074	65	16	B	393	6,060	6,006	65	16	B	393	7,501	7,527	63	21	C	393	7,501	7,496	63	21	C
	46th St Entrance		344	346	1,397	6,559	6,565	62	20	C	1,397	6,559	6,499	62	20	B	1,397	7,900	7,925	57	26	C	1,397	7,900	7,897	57	26	C
		60th St Exit	346	348	1,495	6,559	6,559	61	21	C	1,495	6,559	6,493	61	21	C	1,495	7,900	7,928	48	32	D	1,495	7,900	7,903	49	31	D
	60th St Exit	TH 62 Exit	348	350	2,036	6,259	6,236	60	21	C	2,036	6,259	6,176	60	21	C	2,036	7,301	7,332	53	28	C	2,036	7,301	7,298	54	27	C
	TH 62 Exit		350	352	1,409	2,980	2,969	65	15	B	1,409	2,980	2,947	65	15	B	1,409	3,301	3,295	64	17	B	1,409	3,301	3,269	64	17	B
			352	354	1,616	2,980	2,966	66	15	B	1,616	2,980	2,943	66	15	B	1,616	3,301	3,297	66	17	B	1,616	3,301	3,267	66	17	B
		END SB I-35W	354	356	719	2,980	2,963	66	15	B	719	2,980	2,939	66	15	B	719	3,301	3,298	66	17	B	719	3,301	3,267	66	17	B

Table D-2
I-35W Transit/Access Project
Freeway MOE Comparison

SOUTHBOUND BRAID BRIDGE

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 3						Model # 4						Model # 3						Model # 4					
					2018 Transit Station Only Conditions						2018 Transit Station, SB Braid, NB Flyover						2018 Transit Station Only Conditions						2018 Transit Station, SB Braid, NB Flyover					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,489	2,487	57	22	C	1,074	2,489	2,488	57	22	C	1,074	2,000	1,996	57	18	B	1,074	2,000	2,006	57	18	B
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,789	2,790	51	25	C	892	2,789	2,792	51	24	C	892	2,600	2,602	47	25	C	892	2,600	2,610	48	25	C
	WB I-94 Entrance		366	367	1,871	3,430	3,417	48	32	D	1,871	3,430	3,433	47	33	D	1,871	3,700	3,624	39	42	E	1,871	3,700	3,723	39	44	F
			367	368	827	3,430	3,414	34	51	F	827	3,430	3,426	33	51	F	827	3,700	3,629	32	57	F	827	3,700	3,717	31	60	F
			368	369	483	3,430	3,411	41	42	E	483	3,430	3,423	41	42	E	483	3,700	3,630	41	45	F	483	3,700	3,715	41	46	F
			369	370	403	3,430	3,411	51	34	D	205	3,430	3,422	49	35	D	403	3,700	3,632	51	36	E	205	3,700	3,715	49	38	E
		SB TH 65 Entrance	374	376	627	3,430	3,407	55	31	D	436	3,430	3,418	55	31	D	627	3,700	3,633	55	33	D	436	3,700	3,715	55	34	D
	Begin SB TH 65	12th St Entrance	300	302	867	500	502	63	4	A	867	500	502	63	4	A	867	2,000	2,003	58	18	B	867	2,000	2,005	58	18	B
	12th St Entrance	EB I-94 Entrance	302	304	1,088	700	777	56	6	A	1,088	700	776	55	6	A	1,088	2,600	2,674	49	25	C	1,088	2,600	2,673	49	25	C
	EB I-94 Entrance		304	307	1,574	2,410	2,430	59	14	B	1,574	2,410	2,447	59	14	B	1,574	4,200	4,278	57	25	C	1,574	4,200	4,257	58	24	C
		SB I-35W Entrance	307	310	1,516	2,410	2,428	61	15	B							1,516	4,200	4,275	49	33	D						
			307	308							718	2,410	2,446	62	13	B							718	4,200	4,256	54	26	C
		SB I-35W Entrance	308	310							825	2,410	2,445	61	15	B							825	4,200	4,254	50	32	D
	SB I-35W Entrance		310	314	698	5,840	5,829	60	25	C	698	5,840	5,856	60	25	C	698	7,900	7,910	57	35	E	698	7,900	7,967	57	35	E
			314	318	379	5,840	5,829	62	24	C	379	5,840	5,854	62	24	C	379	7,900	7,912	59	34	D	379	7,900	7,966	59	34	D
		New - Lake St BRT Exit	318	320	972	5,840	5,829	64	21	C	972	5,840	5,854	64	21	C	972	7,900	7,911	59	30	D	972	7,900	7,965	61	29	D
	New - Lake St BRT Exit		320	322	545	5,840	5,747	64	23	C	545	5,840	5,770	63	23	C	545	7,900	7,832	58	34	D	545	7,900	7,883	60	33	D
			322	324	721	5,840	5,744	64	22	C	721	5,840	5,770	63	23	C	721	7,900	7,834	56	35	D	721	7,900	7,881	60	33	D
		31/Lake St Entrance	324	326	1,326	5,840	5,739	65	22	C	1,326	5,840	5,767	64	23	C	1,326	7,900	7,834	56	35	D	1,326	7,900	7,879	58	34	D
	31/Lake St Entrance	New - Lake St BRT Ent	326	327	134	6,549	6,440	59	22	C	134	6,549	6,470	58	23	C	134	9,000	8,953	50	36	E	134	9,000	9,012	51	35	E
	New - Lake St BRT Ent	35/36th St Exit	327	328	384	6,549	6,522	58	19	B	384	6,549	6,552	57	20	B	384	9,000	9,028	50	30	D	384	9,000	9,086	50	31	D
	35/36th St Exit		328	330	1,384	5,860	5,824	63	23	C	1,384	5,860	5,861	63	23	C	1,384	7,900	7,917	58	34	D	1,384	7,900	7,973	58	34	D
		35/36th St Entrance	330	332	1,712	5,860	5,820	65	23	C	1,712	5,860	5,854	64	23	C	1,712	7,900	7,915	57	35	D	1,712	7,900	7,971	57	35	D
	35/36th St Entrance		332	334	1,460	6,460	6,412	59	25	C	1,460	6,460	6,445	57	26	C	1,460	8,301	8,316	50	39	E	1,460	8,301	8,372	50	40	E
			334	336	544	6,460	6,409	64	25	C	544	6,460	6,439	63	26	C	544	8,301	8,317	55	38	E	544	8,301	8,371	54	39	E
		46th St Exit	336	338	1,512	6,460	6,407	65	21	C	1,512	6,460	6,436	64	21	C	1,512	8,301	8,315	59	30	D	1,512	8,301	8,373	59	30	D
	46th St Exit	46th St BRT Exit	338	340	780	6,060	6,008	65	17	B	780	6,060	6,034	65	17	B	780	7,501	7,487	64	21	C	780	7,501	7,556	63	22	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,060	6,002	66	18	B	2,275	6,060	6,026	66	18	B	2,275	7,501	7,481	65	23	C	2,275	7,501	7,545	65	23	C
	46th St BRT Entrance	46th St Entrance	342	344	393	6,060	6,006	65	16	B	393	6,060	6,028	65	16	B	393	7,501	7,496	63	21	C	393	7,501	7,557	63	21	C
	46th St Entrance		344	346	1,397	6,559	6,499	62	20	B	1,397	6,559	6,522	62	20	B	1,397	7,900	7,897	57	26	C	1,397	7,900	7,957	57	27	C
		60th St Exit	346	348	1,495	6,559	6,493	61	21	C	1,495	6,559	6,515	61	21	C	1,495	7,900	7,903	49	31	D	1,495	7,900	7,958	47	32	D
	60th St Exit	TH 62 Exit	348	350	2,036	6,259	6,176	60	21	C	2,036	6,259	6,205	60	21	C	2,036	7,301	7,298	54	27	C	2,036	7,301	7,359	53	28	C
	TH 62 Exit		350	352	1,409	2,980	2,947	65	15	B	1,409	2,980	2,937	65	15	B	1,409	3,301	3,269	64	17	B	1,409	3,301	3,309	64	17	B
			352	354	1,616	2,980	2,943	66	15	B	1,616	2,980	2,934	66	15	B	1,616	3,301	3,267	66	17	B	1,616	3,301	3,309	66	17	B
		END SB I-35W	354	356	719	2,980	2,939	66	15	B	719	2,980	2,931	67	15	B	719	3,301	3,267	66	17	B	719	3,301	3,311	66	17	B

Table D-3
I-35W Transit/Access Project
Freeway MOE Comparison

SOUTHBOUND EXIT RAMP

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 4						Model # 5						Model # 4						Model # 5					
					2018 Transit Station, SB Braid, NB Flyover						2018 Build Lake St Ramps Only						2018 Transit Station, SB Braid, NB Flyover						2018 Build Lake St Ramps Only					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Southbound I-35W/TH 65	**Begin SB I-35W**	Washington CD Rd Entrance	364	365	1,074	2,489	2,488	57	22	C	1,074	2,988	2,988	55	28	C	1,074	2,000	2,006	57	18	B	1,074	2,600	2,602	53	25	C
	Washington CD Rd Entrance	WB I-94 Entrance	365	366	892	2,789	2,792	51	24	C	892	3,288	3,292	49	30	D	892	2,600	2,610	48	25	C	892	3,502	3,511	42	37	E
	WB I-94 Entrance		366	367	1,871	3,430	3,433	47	33	D	1,871	4,099	4,076	55	25	C	1,871	3,700	3,723	39	44	F	1,871	4,562	4,551	54	28	D
			367	368	827	3,430	3,426	33	51	F	827	4,099	4,073	38	36	E	827	3,700	3,717	31	60	F	827	4,562	4,551	37	42	E
			368	369	483	3,430	3,423	41	42	E	483	4,099	4,073	42	32	D	483	3,700	3,715	41	46	F	483	4,562	4,552	42	36	E
			369	370	205	3,430	3,422	49	35	D	205	4,099	4,070	52	26	C	205	3,700	3,715	49	38	E	205	4,562	4,552	51	30	D
		SB TH 65 Entrance	374	376	436	3,430	3,418	55	31	D	434	4,099	4,066	56	24	C	436	3,700	3,715	55	34	D	434	4,562	4,550	56	27	C
	Begin SB TH 65	12th St Entrance	300	302	867	500	502	63	4	A	867	600	602	63	5	A	867	2,000	2,005	58	18	B	867	1,980	1,979	58	17	B
	12th St Entrance	EB I-94 Entrance	302	304	1,088	700	776	55	6	A	1,088	800	876	56	7	A	1,088	2,600	2,673	49	25	C	1,088	2,570	2,639	49	25	C
	EB I-94 Entrance		304	307	1,574	2,410	2,447	59	14	B	1,574	2,600	2,628	59	15	B	1,574	4,200	4,257	58	24	C	1,574	4,250	4,312	42	35	D
			307	308	718	2,410	2,446	62	13	B	718	2,600	2,627	61	14	B	718	4,200	4,256	54	26	C	718	4,250	4,298	26	55	F
		SB I-35W Entrance	308	310	825	2,410	2,445	61	15	B	825	2,600	2,626	59	16	B	825	4,200	4,254	50	32	D	825	4,250	4,289	29	56	F
	SB I-35W Entrance		310	314	698	5,840	5,856	60	25	C	698	6,699	6,688	57	23	C	698	7,900	7,967	57	35	E	698	8,812	8,832	48	37	E
		Lake Street Exit Ramp	314	318	379	5,840	5,854	62	24	C	765	6,699	6,684	58	23	C	379	7,900	7,966	59	34	D	765	8,812	8,827	50	35	E
	Lake Street Exit Ramp	New - Lake St BRT Exit	318	320	972	5,840	5,854	64	21	C	586	6,098	6,064	62	21	C	972	7,900	7,965	61	29	D	586	8,002	8,028	55	31	D
	New - Lake St BRT Exit		320	322	545	5,840	5,770	63	23	C	545	6,098	5,979	63	24	C	545	7,900	7,883	60	33	D	545	8,002	7,949	57	35	D
			322	324	721	5,840	5,770	63	23	C	721	6,098	5,977	63	24	C	721	7,900	7,881	60	33	D	721	8,002	7,948	58	34	D
		31/Lake St Entrance	324	326	1,326	5,840	5,767	64	23	C	1,326	6,098	5,974	64	23	C	1,326	7,900	7,879	58	34	D	1,326	8,002	7,947	60	33	D
	31/Lake St Entrance	New - Lake St BRT Ent	326	327	134	6,549	6,470	58	23	C	134	6,697	6,570	59	23	C	134	9,000	9,012	51	35	E	134	8,992	8,953	53	34	D
	New - Lake St BRT Ent	35/36th St Exit	327	328	384	6,549	6,552	57	20	B	384	6,697	6,652	58	19	B	384	9,000	9,086	50	31	D	384	8,992	9,028	52	30	D
	35/36th St Exit		328	330	1,384	5,860	5,861	63	23	C	1,384	6,198	6,176	62	25	C	1,384	7,900	7,973	58	34	D	1,384	7,982	8,031	58	35	D
		35/36th St Entrance	330	332	1,712	5,860	5,854	64	23	C	1,712	6,198	6,170	63	24	C	1,712	7,900	7,971	57	35	D	1,712	7,982	8,029	57	35	E
	35/36th St Entrance		332	334	1,460	6,460	6,445	57	26	C	1,460	6,698	6,659	58	27	C	1,460	8,301	8,372	50	40	E	1,460	8,383	8,428	50	40	E
			334	336	544	6,460	6,439	63	26	C	544	6,698	6,655	63	27	C	544	8,301	8,371	54	39	E	544	8,383	8,427	54	39	E
		46th St Exit	336	338	1,512	6,460	6,436	64	21	C	1,512	6,698	6,650	64	22	C	1,512	8,301	8,373	59	30	D	1,512	8,383	8,426	59	30	D
	46th St Exit	46th St BRT Exit	338	340	780	6,060	6,034	65	17	B	780	6,298	6,245	65	18	B	780	7,501	7,556	63	22	C	780	7,573	7,611	63	22	C
	46th St BRT Exit	46th St BRT Entrance	340	342	2,275	6,060	6,026	66	18	B	2,275	6,298	6,238	66	19	B	2,275	7,501	7,545	65	23	C	2,275	7,573	7,600	65	24	C
	46th St BRT Entrance	46th St Entrance	342	344	393	6,060	6,028	65	16	B	393	6,298	6,241	65	17	B	393	7,501	7,557	63	21	C	393	7,573	7,612	62	21	C
	46th St Entrance		344	346	1,397	6,559	6,522	62	20	B	1,397	6,797	6,737	62	21	C	1,397	7,900	7,957	57	27	C	1,397	7,972	8,011	53	29	D
		60th St Exit	346	348	1,495	6,559	6,515	61	21	C	1,495	6,797	6,728	60	22	C	1,495	7,900	7,958	47	32	D	1,495	7,972	8,013	43	36	E
	60th St Exit	TH 62 Exit	348	350	2,036	6,259	6,205	60	21	C	2,036	6,597	6,502	59	22	C	2,036	7,301	7,359	53	28	C	2,036	7,473	7,521	52	29	D
	TH 62 Exit		350	352	1,409	2,980	2,937	65	15	B	1,409	3,098	3,014	65	15	B	1,409	3,301	3,309	64	17	B	1,409	3,434	3,456	63	18	B
			352	354	1,616	2,980	2,934	66	15	B	1,616	3,098	3,009	66	15	B	1,616	3,301	3,309	66	17	B	1,616	3,434	3,458	65	18	B
		END SB I-35W	354	356	719	2,980	2,931	67	15	B	719	3,098	3,005	66	15	B	719	3,301	3,311	66	17	B	719	3,434	3,458	66	18	B

Table D-4
I-35W Transit/Access Project
Freeway MOE Comparison

NORTHBOUND ENTRANCE RAMP

Northbound I-35W/TH 65

Location		Node		AM PEAK HOUR												PM PEAK HOUR											
				Model # 3						Model # 5						Model # 3						Model # 5					
				2018 Transit Station Only Conditions						2018 Build Lake St Ramps Only						2018 Transit Station Only Conditions						2018 Build Lake St Ramps Only					
From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Begin NB I-35W	TH 62 Entrance	102	104	744	4,850	4,896	62	20	C	744	4,840	4,883	62	20	C	744	5,101	5,127	62	21	C	744	5,380	5,416	61	23	C
TH 62 Entrance	60th St Entrance	104	106	1,355	6,670	6,732	64	18	B	1,355	6,660	6,726	64	18	B	1,355	7,102	7,152	64	19	B	1,355	7,410	7,468	64	20	B
60th St Entrance	Diamond Lake Exit	106	108	910	6,970	7,033	65	17	B	910	6,960	7,026	65	17	B	910	7,402	7,456	63	18	B	910	7,710	7,767	63	19	B
Diamond Lake Exit		108	110	1,432	6,670	6,741	65	21	C	1,432	6,660	6,734	66	21	C	1,432	7,001	7,064	65	22	C	1,432	7,218	7,270	64	23	C
	Diamond Lake Entrance	110	112	1,225	6,670	6,735	62	22	C	1,225	6,660	6,732	63	21	C	1,225	7,001	7,064	63	22	C	1,225	7,218	7,269	63	23	C
Diamond Lake Entrance		112	113	1,449	7,481	7,544	53	27	C	1,449	7,471	7,545	55	26	C	1,449	7,400	7,468	58	25	C	1,449	7,626	7,688	57	25	C
		113	114	542	7,481	7,529	55	28	C	542	7,471	7,534	60	25	C	542	7,400	7,464	63	24	C	542	7,626	7,685	62	25	C
	46th St Exit	114	116	1,462	7,481	7,493	49	30	D	1,462	7,471	7,510	56	26	C	1,462	7,400	7,462	64	22	C	1,462	7,626	7,683	64	23	C
46th St Exit	46th St BRT Exit	116	118	238	7,281	7,273	42	31	D	238	7,271	7,302	51	26	C	238	6,800	6,866	65	18	B	238	7,036	7,101	65	19	B
46th St BRT Exit	46th St BRT Entrance	118	120	2,201	7,281	7,176	34	44	F	2,201	7,271	7,221	40	38	E	2,201	6,800	6,862	65	21	C	2,201	7,036	7,094	65	22	C
46th St BRT Entrance	46th St Entrance	120	122	378	7,281	7,094	28	46	F	378	7,271	7,151	31	41	E	378	6,800	6,870	65	18	B	378	7,036	7,100	64	19	B
46th St Entrance		122	124	1,521	8,392	8,114	29	54	F	1,521	8,382	8,052	31	50	F	1,521	7,300	7,369	62	22	C	1,521	7,546	7,614	62	23	C
		124	126	818	8,392	8,050	30	54	F	818	8,382	7,977	31	52	F	818	7,300	7,365	63	24	C	818	7,546	7,613	63	24	C
	35/36th St Exit	126	128	1,514	8,392	7,994	30	52	F	1,514	8,382	7,912	29	52	F	1,514	7,300	7,353	60	24	C	1,514	7,546	7,615	63	23	C
35/36th St Exit		128	130	1,485	8,192	7,747	30	52	F	1,485	8,282	7,750	29	53	F	1,485	6,800	6,842	54	26	C	1,485	7,156	7,235	63	23	C
	35/36th St Entrance	130	132	1,474	8,192	7,686	32	48	F	1,474	8,282	7,687	31	50	F	1,474	6,800	6,806	48	30	D	1,474	7,156	7,232	63	23	C
35/36th St Entrance	31/Lake St Exit	132	134	604	9,402	8,780	34	43	E	604	9,392	8,620	33	44	F	604	7,600	7,585	43	31	D	604	7,766	7,842	60	22	C
31/Lake St Exit	New - Lake St BRT Exit	134	135	478	8,512	7,922	40	34	D	478	8,502	7,758	36	36	E	478	6,700	6,686	42	28	D	478	6,876	6,959	62	19	B
New - Lake St BRT Exit		135	136	553	8,512	7,830	42	37	E	553	8,502	7,669	37	42	E	553	6,700	6,604	41	34	D	553	6,876	6,887	63	22	C
		136	138	718	8,512	7,816	44	35	E	843	8,502	7,655	39	39	E	718	6,700	6,592	41	34	D	843	6,876	6,886	64	22	C
	New - Lake St BRT Entrance	138	140	1,240	8,512	7,800	49	32	D	1,112	8,502	7,634	41	37	E	1,240	6,700	6,575	41	34	D	1,112	6,876	6,888	63	22	C
New - Lake St BRT Entrance	Lake Street Entrance Ramp	140	142	494	8,512	7,867	50	27	C	496	8,502	7,696	42	31	D	494	6,700	6,629	40	29	D	496	6,876	6,957	60	20	C
Lake Street Entrance Ramp		142	144	1,061	8,512	7,862	54	29	D	1,061	9,513	8,667	46	32	D	1,061	6,700	6,616	41	33	D	1,061	7,586	7,668	58	22	C
	NB I-35W/TH 65 SPLIT	144	146	859	8,512	7,859	56	28	D	859	9,513	8,654	53	27	C	859	6,700	6,605	40	34	D	859	7,586	7,671	58	22	C
Begin NB TH 65		146	148	498	4,952	4,612	56	27	C	498	5,053	4,650	55	28	D	498	3,700	3,675	31	40	E	498	3,646	3,736	57	22	C
		148	150	281	4,952	4,611	55	28	C	281	5,053	4,648	56	28	C	281	3,700	3,670	30	41	E	281	3,646	3,737	56	22	C
		150	152	284	4,952	4,609	53	29	D	284	5,053	4,648	53	29	D	284	3,700	3,666	29	43	E	284	3,646	3,736	53	24	C
		152	154	582	4,952	4,606	50	30	D	582	5,053	4,648	52	30	D	582	3,700	3,662	28	44	F	582	3,646	3,736	50	25	C
	WB I-94 Exit	154	156	644	4,952	4,602	46	27	C	644	5,053	4,648	47	26	C	644	3,700	3,655	23	44	F	644	3,646	3,736	44	23	C
WB I-94 Exit	**END NB TH 65**	156	158	983	3,072	3,015	53	19	B	983	3,173	3,123	53	20	B	983	1,999	2,140	53	13	B	983	2,165	2,334	53	15	B
NB I-35W/TH 65 Split		146	161	665	3,560	3,244	51	32	D	174	4,460	3,998	53	25	C	665	3,000	2,927	45	33	D	174	3,940	3,936	53	25	C
	New - EB I-94 Exit	162	163							678	4,460	4,004	40	34	D							678	3,940	3,937	44	30	D
New - EB I-94 Exit		163	164	927	3,560	3,243	43	39	E	552	2,720	2,429	50	24	C	927	3,000	2,949	34	46	F	552	2,759	2,726	42	34	D
	5th Ave Entrance	164	165	965	3,560	3,237	29	57	F	965	2,720	2,428	36	34	D	965	3,000	2,968	25	60	F	965	2,759	2,712	25	57	F
5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,959	3,628	35	47	F	1,048	3,421	3,121	41	35	D	1,048	3,799	3,783	33	52	F	1,048	4,058	3,916	32	57	F
EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,078	4,714	49	30	D	1,024	4,741	4,397	48	29	D	1,024	4,940	4,898	46	34	D	1,024	5,420	5,301	43	39	E
EB I-94 Exit		167	168	540	3,828	3,557	51	23	C	540	4,241	3,895	50	26	C	540	4,380	4,318	48	30	D	540	4,720	4,637	46	34	D
	Washington Ave Exit	168	169	448	3,828	3,556	52	23	C	448	4,241	3,896	52	25	C	448	4,380	4,318	50	29	D	448	4,720	4,636	50	31	D
Washington Ave Exit		169	170	625	3,118	2,889	55	26	C	625	3,431	3,145	55	29	D	625	3,880	3,809	54	35	E	625	4,020	3,947	54	37	E
	END NB I-35W	170	171	523	3,118	2,888	57	25	C	523	3,431	3,145	57	28	C	523	3,880	3,810	56	34	D	523	4,020	3,946	56	35	E

Table D-5
I-35W Transit/Access Project
Freeway MOE Comparison

NORTHBOUND EXIT RAMP

Northbound I-35W/TH 65

Location		Node		AM PEAK HOUR												PM PEAK HOUR											
				Model # 5						Model # 6						Model # 5						Model # 6					
				2018 Build Lake St Ramps Only						2018 Full Build						2018 Build Lake St Ramps Only						2018 Full Build					
From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Begin NB I-35W	TH 62 Entrance	102	104	744	4,840	4,883	62	20	C	744	4,881	4,919	62	20	C	744	5,380	5,416	61	23	C	744	5,261	5,302	61	22	C
TH 62 Entrance	60th St Entrance	104	106	1,355	6,660	6,726	64	18	B	1,355	6,572	6,626	64	17	B	1,355	7,410	7,468	64	20	B	1,355	7,253	7,313	64	19	B
60th St Entrance	Diamond Lake Exit	106	108	910	6,960	7,026	65	17	B	910	6,972	7,025	65	17	B	910	7,710	7,767	63	19	B	910	7,553	7,614	63	19	B
Diamond Lake Exit		108	110	1,432	6,660	6,734	66	21	C	1,432	6,672	6,731	65	21	C	1,432	7,218	7,270	64	23	C	1,432	7,251	7,299	64	23	C
	Diamond Lake Entrance	110	112	1,225	6,660	6,732	63	21	C	1,225	6,672	6,729	62	22	C	1,225	7,218	7,269	63	23	C	1,225	7,251	7,299	63	23	C
Diamond Lake Entrance		112	113	1,449	7,471	7,545	55	26	C	1,449	7,473	7,526	52	28	C	1,449	7,626	7,688	57	25	C	1,449	7,650	7,707	57	26	C
		113	114	542	7,471	7,534	60	25	C	542	7,473	7,508	53	29	D	542	7,626	7,685	62	25	C	542	7,650	7,702	62	25	C
	46th St Exit	114	116	1,462	7,471	7,510	56	26	C	1,462	7,473	7,471	47	32	D	1,462	7,626	7,683	64	23	C	1,462	7,650	7,701	64	23	C
46th St Exit	46th St BRT Exit	116	118	238	7,271	7,302	51	26	C	238	7,273	7,255	41	32	D	238	7,036	7,101	65	19	B	238	7,050	7,113	65	19	B
46th St BRT Exit	46th St BRT Entrance	118	120	2,201	7,271	7,221	40	38	E	2,201	7,273	7,167	34	45	F	2,201	7,036	7,094	65	22	C	2,201	7,050	7,106	65	22	C
46th St BRT Entrance	46th St Entrance	120	122	378	7,271	7,151	31	41	E	378	7,273	7,090	27	46	F	378	7,036	7,100	64	19	B	378	7,050	7,109	65	19	B
46th St Entrance		122	124	1,521	8,382	8,052	31	50	F	1,521	8,464	8,095	29	53	F	1,521	7,546	7,614	62	23	C	1,521	7,550	7,611	62	23	C
		124	126	818	8,382	7,977	31	52	F	818	8,464	8,021	30	54	F	818	7,546	7,613	63	24	C	818	7,550	7,612	64	24	C
	35/36th St Exit	126	128	1,514	8,382	7,912	29	52	F	1,514	8,464	7,955	29	54	F	1,514	7,546	7,615	63	23	C	1,514	7,550	7,610	64	23	C
35/36th St Exit		128	130	1,485	8,282	7,750	29	53	F	1,485	8,364	7,787	27	58	F	1,485	7,156	7,235	63	23	C	1,485	7,151	7,215	64	23	C
	35/36th St Entrance	130	132	1,474	8,282	7,687	31	50	F	1,474	8,364	7,706	27	58	F	1,474	7,156	7,232	63	23	C	1,474	7,151	7,211	63	23	C
35/36th St Entrance	31/Lake St Exit	132	134	604	9,392	8,620	33	44	F	604	9,454	8,640	27	50	F	604	7,766	7,842	60	22	C	604	7,851	7,913	60	21	C
31/Lake St Exit	New - Lake St BRT Exit	134	135	478	8,502	7,758	36	36	E	478	8,954	8,138	28	42	E	478	6,876	6,959	62	19	B	478	7,251	7,326	59	18	B
New - Lake St BRT Exit		135	136	553	8,502	7,669	37	42	E	553	8,954	8,040	31	44	F	553	6,876	6,887	63	22	C	553	7,251	7,251	59	21	C
	28th Street Exit Ramp	136	138	843	8,502	7,655	39	39	E	843	8,954	8,023	37	36	E	843	6,876	6,886	64	22	C	843	7,251	7,244	57	22	C
28th Street Exit Ramp	New - Lake St BRT Entrance	138	140	1,112	8,502	7,634	41	37	E	1,112	8,354	7,481	43	35	D	1,112	6,876	6,888	63	22	C	1,112	6,751	6,743	55	25	C
New - Lake St BRT Entrance	Lake Street Entrance Ramp	140	142	496	8,502	7,696	42	31	D	496	8,354	7,547	44	30	D	496	6,876	6,957	60	20	C	496	6,751	6,804	50	24	C
Lake Street Entrance Ramp		142	144	1,061	9,513	8,667	46	32	D	1,061	9,354	8,520	46	31	D	1,061	7,586	7,668	58	22	C	1,061	7,451	7,493	47	27	C
	NB I-35W/TH 65 SPLIT	144	146	859	9,513	8,654	53	27	C	859	9,354	8,513	53	27	C	859	7,586	7,671	58	22	C	859	7,451	7,481	46	27	C
Begin NB TH 65		146	148	498	5,053	4,650	55	28	D	498	5,034	4,672	55	28	D	498	3,646	3,736	57	22	C	498	3,521	3,610	36	34	D
		148	150	281	5,053	4,648	56	28	C	281	5,034	4,670	56	28	C	281	3,646	3,737	56	22	C	281	3,521	3,606	34	36	E
		150	152	284	5,053	4,648	53	29	D	284	5,034	4,670	53	29	D	284	3,646	3,736	53	24	C	284	3,521	3,602	33	37	E
		152	154	582	5,053	4,648	52	30	D	582	5,034	4,669	51	30	D	582	3,646	3,736	50	25	C	582	3,521	3,595	31	39	E
	WB I-94 Exit	154	156	644	5,053	4,648	47	26	C	644	5,034	4,669	47	26	C	644	3,646	3,736	44	23	C	644	3,521	3,584	27	36	E
WB I-94 Exit	**END NB TH 65**	156	158	983	3,173	3,123	53	20	B	983	3,124	3,089	53	19	B	983	2,165	2,334	53	15	B	983	1,909	2,066	53	13	B
NB I-35W/TH 65 Split		146	161	174	4,460	3,998	53	25	C	174	4,320	3,838	53	24	C	174	3,940	3,936	53	25	C	174	3,930	3,861	53	25	C
	New - EB I-94 Exit	162	163	678	4,460	4,004	40	34	D	678	4,320	3,840	42	30	D	678	3,940	3,937	44	30	D	678	3,930	3,861	45	29	D
New - EB I-94 Exit		163	164	552	2,720	2,429	50	24	C	552	2,620	2,334	51	23	C	552	2,759	2,726	42	34	D	552	2,710	2,658	50	26	C
	5th Ave Entrance	164	165	965	2,720	2,428	36	34	D	965	2,620	2,331	36	32	D	965	2,759	2,712	25	57	F	965	2,710	2,656	33	40	E
5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,421	3,121	41	35	D	1,048	3,321	3,023	41	34	D	1,048	4,058	3,916	32	57	F	1,048	4,018	3,803	35	50	F
EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,741	4,397	48	29	D	1,024	4,600	4,268	49	27	C	1,024	5,420	5,301	43	39	E	1,024	5,380	5,184	44	37	E
EB I-94 Exit		167	168	540	4,241	3,895	50	26	C	540	4,100	3,768	50	25	C	540	4,720	4,637	46	34	D	540	4,671	4,561	46	33	D
	Washington Ave Exit	168	169	448	4,241	3,896	52	25	C	448	4,100	3,768	52	24	C	448	4,720	4,636	50	31	D	448	4,671	4,563	50	31	D
Washington Ave Exit		169	170	625	3,431	3,145	55	29	D	625	3,299	3,039	55	28	C	625	4,020	3,947	54	37	E	625	4,070	3,975	54	37	E
	END NB I-35W	170	171	523	3,431	3,145	57	28	C	523	3,299	3,038	57	27	C	523	4,020	3,946	56	35	E	523	4,070	3,975	56	35	E

Table D-6A
I-35W Transit/Access Project
Freeway MOE Comparison

NB FLYOVER COMPARISON (with 4th Ave)

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 3						Model # 4						Model # 3						Model # 4					
					2018 Transit Station Only Conditions						2018 Transit Station, SB Braid, NB Flyover						2018 Transit Station Only Conditions						2018 Transit Station, SB Braid, NB Flyover					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**		748	750	1,488	5,870	5,874	62	24	C	1,488	5,870	5,866	62	24	C	1,488	5,200	5,142	45	35	D	1,488	5,200	5,207	63	21	C
			750	752	590	5,870	5,870	62	24	C	590	5,870	5,862	62	24	C	590	5,200	5,087	40	48	F	590	5,200	5,202	62	21	C
			752	754	1,231	5,870	5,864	61	24	C	1,231	5,870	5,860	62	24	C	1,231	5,200	5,027	33	67	F	1,231	5,200	5,199	62	21	C
			754	756	1,378	5,870	5,858	61	24	C	1,378	5,870	5,857	61	24	C	1,378	5,200	4,947	24	86	F	1,378	5,200	5,196	62	21	C
			756	758	775	5,870	5,856	59	25	C	775	5,870	5,855	59	25	C	775	5,200	4,894	20	91	F	775	5,200	5,195	61	21	C
		Cedar Ave Exit	758	759	1,026	5,870	5,855	55	25	C	1,026	5,870	5,852	56	25	C	1,026	5,200	4,860	16	94	F	1,026	5,200	5,194	57	21	C
	Cedar Ave Exit		759	760	755	4,769	4,742	53	23	C	755	4,769	4,768	53	23	C	755	4,800	4,454	12	104	F	755	4,800	4,781	53	23	C
			760	761	1,114	4,769	4,739	51	23	C	1,114	4,769	4,766	52	23	C	1,114	4,800	4,427	12	94	F	1,114	4,800	4,782	52	23	C
		SB I-35W Exit	761	762	677	4,769	4,737	50	24	C	677	4,769	4,763	51	23	C	677	4,800	4,411	16	70	F	677	4,800	4,784	52	23	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	4,128	4,108	49	28	C	492	4,128	4,115	51	27	C	492	3,700	3,390	13	85	F	492	3,700	3,669	51	24	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,718	5,697	48	29	D	1,637	5,718	5,705	48	29	D	1,637	5,100	4,449	14	77	F	1,637	5,100	4,731	50	23	C
	11th St Exit		764	15							730	4,617	4,611	50	31	D							730	4,601	4,285	51	28	D
		NB I-35W Flyover	15	765							828	4,617	4,611	50	31	D							828	4,601	4,284	51	28	D
	11th St Exit		764	765	1,022	4,617	4,583	50	31	D							1,022	4,601	4,012	14	94	F						
		NB I-35W/4th Ave Entrance	765	766	1,082	4,617	4,578	43	36	E	490	6,497	6,211	48	33	D	1,082	4,601	4,017	15	91	F	490	6,302	5,926	48	31	D
	NB I-35W/4th Ave Entrance		766	767	717	6,797	6,437	36	43	E	717	6,797	6,505	47	31	D	717	7,203	6,430	26	59	F	717	7,203	6,829	44	35	E
		Lyndale/Hennepin Exit	767	768	1,834	6,797	6,428	48	31	D	1,834	6,797	6,497	49	31	D	1,834	7,203	6,431	48	32	D	1,834	7,203	6,829	48	33	D
	Lyndale/Hennepin Exit		768	769	1,590	5,697	5,342	37	48	F	1,590	5,697	5,418	37	49	F	1,590	5,803	5,263	37	47	F	1,590	5,803	5,534	37	50	F
			769	770	1,188	5,697	5,339	46	39	E	1,188	5,697	5,415	45	40	E	1,188	5,803	5,268	46	38	E	1,188	5,803	5,535	45	41	E
		WB I-394 Exit	770	771	1,432	5,697	5,337	44	34	D	1,432	5,697	5,411	44	35	D	1,432	5,803	5,269	45	33	D	1,432	5,803	5,534	44	35	E
	WB I-394 Exit		771	772	508	2,687	2,452	52	16	B	508	2,687	2,501	52	16	B	508	3,103	2,874	51	19	B	508	3,103	2,993	51	19	B
		TH 55 Exit	772	774	544	2,687	2,451	54	13	B	544	2,687	2,500	54	13	B	544	3,103	2,876	54	15	B	544	3,103	2,994	54	16	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,406	2,181	54	14	B	400	2,406	2,227	54	14	B	400	2,703	2,517	54	16	B	400	2,703	2,617	54	16	B
	NB I-35W Flyover		256	6	890	1,880	1,579	30	53	F	470	1,880	1,604	29	55	F	890	1,701	1,509	17	92	F	470	1,701	1,643	29	58	F
			6	3	142	1,880	1,576	31	51	F	251	1,880	1,603	33	49	F	142	1,701	1,509	17	87	F	251	1,701	1,643	32	51	F
		4th Avenue Entrance	3	2	114	1,880	1,576	33	24	C							114	1,701	1,509	17	44	F						
		WB I-94	3	765							200	1,880	1,603	38	43	E							200	1,701	1,642	38	44	F
	4th Avenue		5	4	466	300	299	10	15	B	466	300	299	10	15	B	466	901	899	12	38	E	466	901	903	12	38	E
		NB Flyover Entrance	4	2	160	300	298	19	9	A	160	300	298	19	9	A	160	901	900	20	26	C	160	901	903	20	26	C
	NB Flyover Entrance		2	1	164	2,180	1,872	34	18	B	164	300	298	34	9	A	164	2,602	2,408	21	39	E	164	901	903	34	27	C
		WB I-94	1	766	254	2,180	1,870	34	27	C	254	300	297	43	7	A	254	2,602	2,409	20	60	F	254	901	902	42	22	C
Northbound I-35W/TH 65 (truncated)	31/Lake St Exit	New - Lake St BRT Exit	134	135	478	8,512	7,922	40	34	D	478	8,512	7,972	40	34	D	478	6,700	6,686	42	28	D	478	6,700	6,817	60	19	B
	New - Lake St BRT Exit		135	136	553	8,512	7,830	42	37	E	553	8,512	7,882	42	37	E	553	6,700	6,604	41	34	D	553	6,700	6,748	62	22	C
			136	138	718	8,512	7,816	44	35	E	718	8,512	7,868	45	35	E	718	6,700	6,592	41	34	D	718	6,700	6,749	63	22	C
		New - Lake St BRT Ent	138	140	1,240	8,512	7,800	49	32	D	1,240	8,512	7,850	49	32	D	1,240	6,700	6,575	41	34	D	1,240	6,700	6,750	63	22	C
	New - Lake St BRT Ent		140	142	494	8,512	7,867	50	27	C	494	8,512	7,914	50	27	C	494	6,700	6,629	40	29	D	494	6,700	6,818	60	20	B
			142	144	1,061	8,512	7,862	54	29	D	1,061	8,512	7,907	54	29	D	1,061	6,700	6,616	41	33	D	1,061	6,700	6,818	59	23	C
		NB I-35W/TH 65 SPLIT	144	146	859	8,512	7,859	56	28	D	859	8,512	7,902	57	28	D	859	6,700	6,605	40	34	D	859	6,700	6,818	58	24	C
	Begin NB TH 65		146	148	498	4,952	4,612	56	27	C	498	4,952	4,620	57	27	C	498	3,700	3,675	31	40	E	498	3,700	3,820	57	22	C
			148	150	281	4,952	4,611	55	28	C	281	4,952	4,619	56	28	C	281	3,700	3,670	30	41	E	281	3,700	3,820	55	23	C
			150	152	284	4,952	4,609	53	29	D	284	4,952	4,617	53	29	D	284	3,700	3,666	29	43	E	284	3,700	3,820	53	24	C
			152	154	582	4,952	4,606	50	30	D	582	4,952	4,616	51	30	D	582	3,700	3,662	28	44	F	582	3,700	3,819	51	25	C
		WB I-94 Exit	154	156	644	4,952	4,602	46	27	C	644	4,952	4,611	46	27	C	644	3,700	3,655	23	44	F	644	3,700	3,818	44	23	C
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,072	3,015	53	19	B	983	3,072	2,999	53	19	B	983	1,999	2,140	53	13	B	983	1,999	2,173	53	14	B
	NB I-35W/TH 65 Split		146	161	665	3,560	3,244	51	32	D	665	3,560	3,281	52	32	D	665	3,000	2,927	45	33	D	665	3,000	2,998	50	30	D
			163	164	927	3,560	3,243	43	39	E	927	3,560	3,281	42	40	E	927	3,000	2,949	34	46	F	927	3,000	3,005	38	42	E
		5th Ave Entrance	164	165	965	3,560	3,237	29	57	F	965	3,560	3,281	27	60	F	965	3,000	2,968	25	60	F	965	3,000	3,017	26	60	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,959	3,628	35	47	F	1,048	3,959	3,676	35	49	F	1,048	3,799	3,783	33	52	F	1,048	3,799	3,829	34	52	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	5,078	4,714	49	30	D	1,024	5,078	4,761	49	31	D	1,024	4,940	4,898	46	34	D	1,024	4,940	4,965	45	34	D
	EB I-94 Exit		167	168	540	3,828	3,557	51	23	C	540	3,828	3,583	51	23	C	540	4,380	4,318	48	30	D	540	4,380	4,388	47	31	D
		Washington Ave Exit	168	169	448	3,828	3,556	52	23	C	448	3,828	3,584	52	23	C	448	4,380	4,318	50	29	D	448	4,380	4,387	50	29	D
	Washington Ave Exit		169	170	625	3,118	2,889	55	26	C	625	3,118	2,910	55	26	C	625	3,880	3,809	54	35	E	625	3,880	3,891	54	36	E
		END NB I-35W	170	171	523	3,118	2,888	57	25	C	523	3,118	2,910	57	25	C	523	3,880	3,810	56	34	D	523	3,880	3,891	56	35	D

Table D-6B
I-35W Transit/Access Project
Freeway MOE Comparison

NB FLYOVER COMPARISON (with 4th Ave)

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 6						Model # 8						Model # 6						Model # 8					
					2018 Full Build						2018 Full Build NB Flyover						2018 Full Build						2018 Full Build NB Flyover					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,000	5,999	62	25	C	1,488	6,000	5,995	62	25	C	1,488	5,180	5,182	62	21	C	1,488	5,180	5,186	63	21	C
			750	752	590	6,000	5,991	62	24	C	590	6,000	5,990	62	24	C	590	5,180	5,176	59	23	C	590	5,180	5,187	62	21	C
			752	754	1,231	6,000	5,984	61	24	C	1,231	6,000	5,988	61	24	C	1,231	5,180	5,157	54	27	C	1,231	5,180	5,187	62	21	C
			754	756	1,378	6,000	5,974	61	25	C	1,378	6,000	5,986	61	25	C	1,378	5,180	5,108	44	41	E	1,378	5,180	5,186	62	21	C
			756	758	775	6,000	5,970	59	25	C	775	6,000	5,982	59	25	C	775	5,180	5,051	37	52	F	775	5,180	5,185	61	21	C
		Cedar Ave Exit	758	759	1,026	6,000	5,972	55	25	C	1,026	6,000	5,979	56	25	C	1,026	5,180	5,008	31	58	F	1,026	5,180	5,185	57	21	C
	Cedar Ave Exit		759	760	755	4,899	4,878	53	23	C	755	4,899	4,878	53	23	C	755	4,880	4,672	24	75	F	755	4,880	4,878	53	23	C
			760	761	1,114	4,899	4,883	51	24	C	1,114	4,899	4,875	52	24	C	1,114	4,880	4,648	22	76	F	1,114	4,880	4,877	52	24	C
		SB I-35W Exit	761	762	677	4,899	4,887	50	24	C	677	4,899	4,872	52	24	C	677	4,880	4,633	23	61	F	677	4,880	4,878	51	24	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,967	3,954	50	26	C	492	3,967	3,951	51	26	C	492	3,710	3,498	20	75	F	492	3,710	3,692	51	24	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,466	5,449	49	27	C	1,637	5,466	5,449	49	27	C	1,637	5,100	4,593	18	70	F	1,637	5,100	4,790	49	24	C
	11th St Exit		764	15							780	4,365	4,346	50	29	D							780	4,601	4,320	50	29	D
		NB I-35W Flyover	15	765							828	4,365	4,346	51	29	D							828	4,601	4,321	50	29	D
	11th St Exit		764	765	1,022	4,365	4,340	50	29	D							1,022	4,601	4,137	16	91	F						
		NB I-35W/4th Ave Entrance	765	766	1,082	4,365	4,337	46	32	D	490	6,275	5,987	47	32	D	1,082	4,601	4,135	15	92	F	490	6,213	5,909	45	33	D
	NB I-35W/4th Ave Entrance		766	767	717	6,575	6,207	37	40	E	714	6,575	6,283	47	32	D	717	7,114	6,539	26	60	F	714	7,114	6,810	42	39	E
		Lyndale/Hennepin Exit	767	768	1,834	6,575	6,203	48	30	D	1,834	6,575	6,275	49	30	D	1,834	7,114	6,541	47	33	D	1,834	7,114	6,819	47	34	D
	Lyndale/Hennepin Exit		768	769	1,590	5,575	5,213	37	47	F	1,590	5,575	5,293	37	48	F	1,590	5,905	5,493	37	50	F	1,590	5,905	5,697	36	53	F
			769	770	1,188	5,575	5,211	46	38	E	1,188	5,575	5,290	45	39	E	1,188	5,905	5,499	45	40	E	1,188	5,905	5,706	45	43	E
		WB I-394 Exit	770	771	1,432	5,575	5,209	44	33	D	1,432	5,575	5,289	44	34	D	1,432	5,905	5,503	45	34	D	1,432	5,905	5,712	44	36	E
	WB I-394 Exit		771	772	508	2,576	2,355	52	15	B	508	2,576	2,414	52	16	B	508	3,295	3,139	51	20	C	508	3,295	3,243	51	21	C
		TH 55 Exit	772	774	544	2,576	2,355	54	12	B	544	2,576	2,413	54	13	B	544	3,295	3,141	53	17	B	544	3,295	3,244	53	17	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,305	2,110	54	13	B	400	2,305	2,158	54	13	B	400	2,885	2,752	54	17	B	400	2,885	2,835	54	18	B
	NB I-35W Flyover		256	6	890	1,910	1,575	31	52	F	470	1,910	1,645	29	57	F	890	1,612	1,507	17	88	F	470	1,612	1,588	29	55	F
			6	3	142	1,910	1,575	32	50	F	251	1,910	1,644	32	51	F	142	1,612	1,505	18	84	F	251	1,612	1,587	32	49	F
		4th Avenue Entrance	3	2	114	1,910	1,574	33	24	C							114	1,612	1,504	18	42	E						
		WB I-94	3	765							200	1,910	1,643	37	44	F							200	1,612	1,587	38	42	E
	4th Avenue		5	4	466	300	302	8	19	B	466	300	301	9	18	B	466	901	902	11	44	F	466	901	902	11	43	E
		NB Flyover Entrance	4	2	160	300	300	20	9	A	160	300	300	20	9	A	160	901	900	20	26	C	160	901	901	20	26	C
	NB Flyover Entrance		2	1	164	2,210	1,873	35	18	B	164	300	299	34	9	A	164	2,513	2,403	21	38	E	164	901	900	33	27	C
		WB I-94	1	766	254	2,210	1,873	35	27	C	254	300	299	41	7	A	254	2,513	2,403	20	59	F	254	901	900	35	25	C
Northbound I-35W/TH 65 (truncated)	31/Lake St Exit	New - Lake St BRT Exit	134	135	478	8,954	8,138	28	42	E	478	8,954	8,541	32	39	E	478	7,251	7,326	59	18	B	478	7,251	7,326	62	17	B
	New - Lake St BRT Exit		135	136	553	8,954	8,040	31	44	F	553	8,954	8,443	34	42	E	553	7,251	7,251	59	21	C	553	7,251	7,257	62	20	B
			136	138	843	8,954	8,023	37	36	E	843	8,954	8,423	40	36	E	843	7,251	7,244	57	22	C	843	7,251	7,260	60	20	C
		New - Lake St BRT Ent	138	140	1,112	8,354	7,481	43	35	D	1,112	8,354	7,836	46	34	D	1,112	6,751	6,743	55	25	C	1,112	6,751	6,776	62	22	C
	New - Lake St BRT Ent		140	142	496	8,354	7,547	44	30	D	496	8,354	7,903	46	30	D	496	6,751	6,804	50	24	C	496	6,751	6,843	60	20	B
			142	144	1,061	9,354	8,520	46	31	D	1,061	9,354	8,878	47	32	D	1,061	7,451	7,493	47	27	C	1,061	7,451	7,544	58	22	C
		NB I-35W/TH 65 SPLIT	144	146	859	9,354	8,513	53	27	C	859	9,354	8,869	54	28	C	859	7,451	7,481	46	27	C	859	7,451	7,545	58	22	C
	Begin NB TH 65		146	148	498	5,034	4,672	55	28	D	498	5,034	4,885	55	30	D	498	3,521	3,610	36	34	D	498	3,521	3,676	57	22	C
			148	150	281	5,034	4,670	56	28	C	281	5,034	4,883	55	30	D	281	3,521	3,606	34	36	E	281	3,521	3,676	56	22	C
			150	152	284	5,034	4,670	53	29	D	284	5,034	4,881	53	31	D	284	3,521	3,602	33	37	E	284	3,521	3,675	53	23	C
			152	154	582	5,034	4,669	51	30	D	582	5,034	4,879	51	32	D	582	3,521	3,595	31	39	E	582	3,521	3,675	51	24	C
		WB I-94 Exit	154	156	644	5,034	4,669	47	26	C	644	5,034	4,873	46	28	D	644	3,521	3,584	27	36	E	644	3,521	3,675	45	22	C
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,124	3,089	53	19	B	983	3,124	3,221	53	20	C	983	1,909	2,066	53	13	B	983	1,909	2,084	53	13	B
	NB I-35W/TH 65 Split		146	161	174	4,320	3,838	53	24	C	174	4,320	3,982	53	25	C	174	3,930	3,861	53	25	C	174	3,930	3,870	53	25	C
			163	164	552	2,620	2,334	51	23	C	552	2,620	2,417	51	24	C	552	2,710	2,658	50	26	C	552	2,710	2,644	50	26	C
		5th Ave Entrance	164	165	965	2,620	2,331	36	32	D	965	2,620	2,414	36	34	D	965	2,710	2,656	33	40	E	965	2,710	2,642	33	40	E
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,321	3,023	41	34	D	1,048	3,321	3,105	41	35	D	1,048	4,018	3,803	35	50	F	1,048	4,018	3,785	35	49	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,600	4,268	49	27	C	1,024	4,600	4,351	49	28	D	1,024	5,380	5,184	44	37	E	1,024	5,380	5,161	44	37	E
	EB I-94 Exit		167	168	540	4,100	3,768	50	25	C	540	4,100	3,848	50	26	C	540	4,671	4,561	46	33	D	540	4,671	4,534	46	33	D
		Washington Ave Exit	168	169	448	4,100	3,768	52	24	C	448	4,100	3,849	52	25	C	448	4,671	4,563	50	31	D	448	4,671	4,534	50	30	D
	Washington Ave Exit		169	170	625	3,299	3,039	55	28	C	625	3,299	3,111	55	28	D	625	4,070	3,975	54	37	E	625	4,070	3,950	54	37	E
		END NB I-35W	170	171	523	3,299	3,038	57	27	C	523	3,299	3,110	57	27	C	523	4,070	3,975	56	35	E	523	4,070	3,950	56	35	E

Table D-7A
I-35W Transit/Access Project
Freeway MOE Comparison

4th AVENUE COMPARISON (NB Flyover on Right)

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 6						Model # 7						Model # 6						Model # 7					
					2018 Full Build						2018 Full Build Without 4th Ave Ramp						2018 Full Build						2018 Full Build Without 4th Ave Ramp					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,000	5,999	62	25	C	1,488	5,969	5,970	62	25	C	1,488	5,180	5,182	62	21	C	1,488	5,140	5,146	63	21	C
			750	752	590	6,000	5,991	62	24	C	590	5,969	5,964	62	24	C	590	5,180	5,176	59	23	C	590	5,140	5,146	62	21	C
			752	754	1,231	6,000	5,984	61	24	C	1,231	5,969	5,961	61	24	C	1,231	5,180	5,157	54	27	C	1,231	5,140	5,144	62	21	C
			754	756	1,378	6,000	5,974	61	25	C	1,378	5,969	5,957	61	25	C	1,378	5,180	5,108	44	41	E	1,378	5,140	5,144	62	21	C
			756	758	775	6,000	5,970	59	25	C	775	5,969	5,951	59	25	C	775	5,180	5,051	37	52	F	775	5,140	5,143	61	21	C
		Cedar Ave Exit	758	759	1,026	6,000	5,972	55	25	C	1,026	5,969	5,946	55	25	C	1,026	5,180	5,008	31	58	F	1,026	5,140	5,144	57	21	C
	Cedar Ave Exit		759	760	755	4,899	4,878	53	23	C	755	4,868	4,862	53	23	C	755	4,880	4,672	24	75	F	755	4,840	4,826	53	23	C
			760	761	1,114	4,899	4,883	51	24	C	1,114	4,868	4,860	51	24	C	1,114	4,880	4,648	22	76	F	1,114	4,840	4,825	51	24	C
		SB I-35W Exit	761	762	677	4,899	4,887	50	24	C	677	4,868	4,860	50	24	C	677	4,880	4,633	23	61	F	677	4,840	4,824	51	24	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,967	3,954	50	26	C	492	3,987	3,996	50	27	C	492	3,710	3,498	20	75	F	492	3,750	3,724	51	24	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,466	5,449	49	27	C	1,637	5,477	5,485	49	27	C	1,637	5,100	4,593	18	70	F	1,637	5,130	4,901	50	24	C
	11th St Exit		764	15																								
		NB I-35W Flyover	15	765																								
	11th St Exit		764	765	1,022	4,365	4,340	50	29	D	1,022	4,376	4,358	51	29	D	1,022	4,601	4,137	16	91	F	1,022	4,720	4,503	51	30	D
		NB I-35W/4th Ave Entrance	765	766	1,082	4,365	4,337	46	32	D	1,082	4,376	4,357	49	29	D	1,082	4,601	4,135	15	92	F	1,082	4,720	4,504	47	32	D
	NB I-35W/4th Ave Entrance		766	767	717	6,575	6,207	37	40	E	717	6,466	6,078	42	36	E	717	7,114	6,539	26	60	F	717	6,871	6,410	38	42	E
		Lyndale/Hennepin Exit	767	768	1,834	6,575	6,203	48	30	D	1,834	6,466	6,077	49	29	D	1,834	7,114	6,541	47	33	D	1,834	6,871	6,410	49	31	D
	Lyndale/Hennepin Exit		768	769	1,590	5,575	5,213	37	47	F	1,590	5,466	5,111	37	46	F	1,590	5,905	5,493	37	50	F	1,590	5,650	5,269	37	47	F
			769	770	1,188	5,575	5,211	46	38	E	1,188	5,466	5,112	46	37	E	1,188	5,905	5,499	45	40	E	1,188	5,650	5,274	46	38	E
		WB I-394 Exit	770	771	1,432	5,575	5,209	44	33	D	1,432	5,466	5,112	44	32	D	1,432	5,905	5,503	45	34	D	1,432	5,650	5,280	45	33	D
	WB I-394 Exit		771	772	508	2,576	2,355	52	15	B	508	2,456	2,199	52	14	B	508	3,295	3,139	51	20	C	508	3,020	2,810	52	18	B
		TH 55 Exit	772	774	544	2,576	2,355	54	12	B	544	2,456	2,197	54	12	B	544	3,295	3,141	53	17	B	544	3,020	2,810	54	15	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,305	2,110	54	13	B	400	2,206	1,955	54	12	B	400	2,885	2,752	54	17	B	400	2,640	2,446	54	15	B
	NB I-35W Flyover		256	6	890	1,910	1,575	31	52	F	890	2,090	1,726	30	58	F	890	1,612	1,507	17	88	F	890	2,151	1,906	28	68	F
			6	3	142	1,910	1,575	32	50	F	142	2,090	1,725	32	54	F	142	1,612	1,505	18	84	F	142	2,151	1,906	32	60	F
		4th Avenue Entrance	3	2	114	1,910	1,574	33	24	C	114	2,090	1,725	34	25	C	114	1,612	1,504	18	42	E	114	2,151	1,906	34	28	D
Northbound I-35W/TH 65 (truncated)	31/Lake St Exit	New - Lake St BRT Exit	134	135	478	8,954	8,138	28	42	E	478	8,952	8,311	31	39	E	478	7,251	7,326	59	18	B	478	7,279	7,024	29	35	E
	New - Lake St BRT Exit		135	136	553	8,954	8,040	31	44	F	553	8,952	8,214	33	41	E	553	7,251	7,251	59	21	C	553	7,279	6,941	30	39	E
			136	138	843	8,954	8,023	37	36	E	843	8,952	8,195	38	36	E	843	7,251	7,244	57	22	C	843	7,279	6,929	34	34	D
		New - Lake St BRT Ent	138	140	1,112	8,354	7,481	43	35	D	1,112	8,351	7,638	44	35	D	1,112	6,751	6,743	55	25	C	1,112	6,889	6,560	40	33	D
	New - Lake St BRT Ent		140	142	496	8,354	7,547	44	30	D	496	8,351	7,710	44	30	D	496	6,751	6,804	50	24	C	496	6,889	6,618	41	28	C
			142	144	1,061	9,354	8,520	46	31	D	1,061	9,361	8,685	46	32	D	1,061	7,451	7,493	47	27	C	1,061	7,609	7,307	44	28	D
		NB I-35W/TH 65 SPLIT	144	146	859	9,354	8,513	53	27	C	859	9,361	8,674	53	27	C	859	7,451	7,481	46	27	C	859	7,609	7,302	46	27	C
	Begin NB TH 65		146	148	498	5,034	4,672	55	28	D	498	4,981	4,767	55	29	D	498	3,521	3,610	36	34	D	498	3,809	3,695	37	34	D
			148	150	281	5,034	4,670	56	28	C	281	4,981	4,765	55	29	D	281	3,521	3,606	34	36	E	281	3,809	3,692	36	35	D
			150	152	284	5,034	4,670	53	29	D	284	4,981	4,763	53	30	D	284	3,521	3,602	33	37	E	284	3,809	3,690	35	35	E
			152	154	582	5,034	4,669	51	30	D	582	4,981	4,761	51	31	D	582	3,521	3,595	31	39	E	582	3,809	3,687	34	36	E
		WB I-94 Exit	154	156	644	5,034	4,669	47	26	C	644	4,981	4,756	45	28	C	644	3,521	3,584	27	36	E	644	3,809	3,684	30	33	D
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,124	3,089	53	19	B	983	2,891	3,024	53	19	B	983	1,909	2,066	53	13	B	983	1,658	1,776	54	11	B
	NB I-35W/TH 65 Split		146	161	174	4,320	3,838	53	24	C	174	4,380	3,901	53	25	C	174	3,930	3,861	53	25	C	174	3,800	3,604	53	23	C
			163	164	552	2,620	2,334	51	23	C	552	2,640	2,346	51	23	C	552	2,710	2,658	50	26	C	552	2,651	2,493	51	25	C
		5th Ave Entrance	164	165	965	2,620	2,331	36	32	D	965	2,640	2,345	37	32	D	965	2,710	2,656	33	40	E	965	2,651	2,495	36	35	E
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,321	3,023	41	34	D	1,048	3,341	3,039	42	33	D	1,048	4,018	3,803	35	50	F	1,048	4,050	3,452	39	41	E
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,600	4,268	49	27	C	1,024	4,640	4,291	49	27	C	1,024	5,380	5,184	44	37	E	1,024	5,401	4,831	45	33	D
	EB I-94 Exit		167	168	540	4,100	3,768	50	25	C	540	4,140	3,789	50	25	C	540	4,671	4,561	46	33	D	540	4,701	4,364	48	31	D
		Washington Ave Exit	168	169	448	4,100	3,768	52	24	C	448	4,140	3,786	52	24	C	448	4,671	4,563	50	31	D	448	4,701	4,365	51	29	D
	Washington Ave Exit		169	170	625	3,299	3,039	55	28	C	625	3,330	3,033	55	28	C	625	4,070	3,975	54	37	E	625	4,001	3,695	54	34	D
		END NB I-35W	170	171	523	3,299	3,038	57	27	C	523	3,330	3,032	57	27	C	523	4,070	3,975	56	35	E	523	4,001	3,697	57	33	D

Table D-7B
I-35W Transit/Access Project
Freeway MOE Comparison

4th AVENUE COMPARISON (NB Flyover on Left)

	Location		Node		AM PEAK HOUR												PM PEAK HOUR											
					Model # 8						Model # 9						Model # 8						Model # 9					
					2018 Full Build NB Flyover						2018 Full Build NB Flyover w/o 4th Ave						2018 Full Build NB Flyover						2018 Full Build NB Flyover w/o 4th Ave					
	From	To	From	To	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS	Length (ft)	Traffic Demand	Traffic Served	Speed (mph)	Density (vplpm)	LOS
Westbound I-94	**Begin WB I-94**		748	750	1,488	6,000	5,995	62	25	C	1,488	5,969	5,966	62	24	C	1,488	5,180	5,186	63	21	C	1,488	5,140	5,142	63	21	C
			750	752	590	6,000	5,990	62	24	C	590	5,969	5,962	62	24	C	590	5,180	5,187	62	21	C	590	5,140	5,143	62	21	C
			752	754	1,231	6,000	5,988	61	24	C	1,231	5,969	5,960	61	24	C	1,231	5,180	5,187	62	21	C	1,231	5,140	5,143	62	21	C
			754	756	1,378	6,000	5,986	61	25	C	1,378	5,969	5,957	61	25	C	1,378	5,180	5,186	62	21	C	1,378	5,140	5,145	62	21	C
			756	758	775	6,000	5,982	59	25	C	775	5,969	5,953	59	25	C	775	5,180	5,185	61	21	C	775	5,140	5,148	61	21	C
		Cedar Ave Exit	758	759	1,026	6,000	5,979	56	25	C	1,026	5,969	5,948	56	25	C	1,026	5,180	5,185	57	21	C	1,026	5,140	5,147	57	21	C
	Cedar Ave Exit		759	760	755	4,899	4,878	53	23	C	755	4,868	4,858	53	23	C	755	4,880	4,878	53	23	C	755	4,840	4,829	53	23	C
			760	761	1,114	4,899	4,875	52	24	C	1,114	4,868	4,855	52	23	C	1,114	4,880	4,877	52	24	C	1,114	4,840	4,827	52	23	C
		SB I-35W Exit	761	762	677	4,899	4,872	52	24	C	677	4,868	4,852	52	24	C	677	4,880	4,878	51	24	C	677	4,840	4,824	51	24	C
	SB I-35W Exit	Washington CD Rd Entrance	762	763	492	3,967	3,951	51	26	C	492	3,987	3,982	51	26	C	492	3,710	3,692	51	24	C	492	3,750	3,753	51	25	C
	Washington CD Rd Entrance	11th St Exit	763	764	1,637	5,466	5,449	49	27	C	1,637	5,477	5,478	49	27	C	1,637	5,100	4,790	49	24	C	1,637	5,130	4,906	49	24	C
	11th St Exit		764	15	780	4,365	4,346	50	29	D	780	4,376	4,370	50	29	D	780	4,601	4,320	50	29	D	780	4,720	4,501	50	30	D
		NB I-35W Flyover	15	765	828	4,365	4,346	51	29	D	828	4,376	4,368	50	29	D	828	4,601	4,321	50	29	D	828	4,720	4,502	50	30	D
		NB I-35W/4th Ave Entrance	765	766	490	6,275	5,987	47	32	D	490	6,466	6,103	48	32	D	490	6,213	5,909	45	33	D	490	6,871	6,406	48	33	D
	NB I-35W/4th Ave Entrance		766	767	714	6,575	6,283	47	32	D	714	6,466	6,103	49	31	D	714	7,114	6,810	42	39	E	714	6,871	6,405	49	33	D
		Lyndale/Hennepin Exit	767	768	1,834	6,575	6,275	49	30	D	1,834	6,466	6,103	50	29	D	1,834	7,114	6,819	47	34	D	1,834	6,871	6,407	50	30	D
	Lyndale/Hennepin Exit		768	769	1,590	5,575	5,293	37	48	F	1,590	5,466	5,128	37	46	F	1,590	5,905	5,697	36	53	F	1,590	5,650	5,275	37	48	F
			769	770	1,188	5,575	5,290	45	39	E	1,188	5,466	5,128	45	38	E	1,188	5,905	5,706	45	43	E	1,188	5,650	5,275	45	39	E
		WB I-394 Exit	770	771	1,432	5,575	5,289	44	34	D	1,432	5,466	5,125	44	33	D	1,432	5,905	5,712	44	36	E	1,432	5,650	5,278	44	33	D
	WB I-394 Exit		771	772	508	2,576	2,414	52	16	B	508	2,456	2,215	52	14	B	508	3,295	3,243	51	21	C	508	3,020	2,796	52	18	B
		TH 55 Exit	772	774	544	2,576	2,413	54	13	B	544	2,456	2,215	54	12	B	544	3,295	3,244	53	17	B	544	3,020	2,797	54	15	B
	TH 55 Exit	**END WB I-94**	774	776	400	2,305	2,158	54	13	B	400	2,206	1,972	54	12	B	400	2,885	2,835	54	18	B	400	2,640	2,442	54	15	B
	NB I-35W Flyover		256	6	470	1,910	1,645	29	57	F	470	2,090	1,738	28	62	F	470	1,612	1,588	29	55	F	470	2,151	1,904	26	73	F
			6	3	251	1,910	1,644	32	51	F	251	2,090	1,736	32	54	F	251	1,612	1,587	32	49	F	251	2,151	1,904	32	59	F
		WB I-94	3	765	200	1,910	1,643	37	44	F	200	2,090	1,736	37	46	F	200	1,612	1,587	38	42	E	200	2,151	1,904	38	51	F
Northbound I-35W/TH 65 (truncated)	31/Lake St Exit	New - Lake St BRT Exit	134	135	478	8,954	8,541	32	39	E	478	8,952	8,334	30	40	E	478	7,251	7,326	62	17	B	478	7,279	7,105	29	35	E
	New - Lake St BRT Exit		135	136	553	8,954	8,443	34	42	E	553	8,952	8,239	33	42	E	553	7,251	7,257	62	20	B	553	7,279	7,024	30	39	E
			136	138	843	8,954	8,423	40	36	E	843	8,952	8,223	38	36	E	843	7,251	7,260	60	20	C	843	7,279	7,013	35	34	D
		New - Lake St BRT Ent	138	140	1,112	8,354	7,836	46	34	D	1,112	8,351	7,680	44	35	D	1,112	6,751	6,776	62	22	C	1,112	6,889	6,637	40	33	D
	New - Lake St BRT Ent		140	142	496	8,354	7,903	46	30	D	496	8,351	7,750	45	30	D	496	6,751	6,843	60	20	B	496	6,889	6,696	42	28	C
			142	144	1,061	9,354	8,878	47	32	D	1,061	9,361	8,736	46	31	D	1,061	7,451	7,544	58	22	C	1,061	7,609	7,393	43	28	D
		NB I-35W/TH 65 SPLIT	144	146	859	9,354	8,869	54	28	C	859	9,361	8,728	53	27	C	859	7,451	7,545	58	22	C	859	7,609	7,388	45	27	C
	Begin NB TH 65		146	148	498	5,034	4,885	55	30	D	498	4,981	4,796	55	29	D	498	3,521	3,676	57	22	C	498	3,809	3,718	36	34	D
			148	150	281	5,034	4,883	55	30	D	281	4,981	4,795	55	29	D	281	3,521	3,676	56	22	C	281	3,809	3,716	36	35	D
			150	152	284	5,034	4,881	53	31	D	284	4,981	4,794	53	30	D	284	3,521	3,675	53	23	C	284	3,809	3,715	35	36	E
			152	154	582	5,034	4,879	51	32	D	582	4,981	4,792	51	31	D	582	3,521	3,675	51	24	C	582	3,809	3,713	34	37	E
		WB I-94 Exit	154	156	644	5,034	4,873	46	28	D	644	4,981	4,788	45	28	D	644	3,521	3,675	45	22	C	644	3,809	3,711	29	35	D
	WB I-94 Exit	**END NB TH 65**	156	158	983	3,124	3,221	53	20	C	983	2,891	3,044	53	19	B	983	1,909	2,084	53	13	B	983	1,658	1,807	54	11	B
	NB I-35W/TH 65 Split		146	161	174	4,320	3,982	53	25	C	174	4,380	3,931	53	25	C	174	3,930	3,870	53	25	C	174	3,800	3,666	53	23	C
			163	164	552	2,620	2,417	51	24	C	552	2,640	2,360	50	24	C	552	2,710	2,644	50	26	C	552	2,651	2,549	48	27	C
		5th Ave Entrance	164	165	965	2,620	2,414	36	34	D	965	2,640	2,359	36	33	D	965	2,710	2,642	33	40	E	965	2,651	2,545	25	52	F
	5th Ave Entrance	EB I-94 Entrance	165	166	1,048	3,321	3,105	41	35	D	1,048	3,341	3,054	41	34	D	1,048	4,018	3,785	35	49	F	1,048	4,050	3,928	31	58	F
	EB I-94 Entrance	EB I-94 Exit	166	167	1,024	4,600	4,351	49	28	D	1,024	4,640	4,327	49	28	C	1,024	5,380	5,161	44	37	E	1,024	5,401	5,311	44	38	E
	EB I-94 Exit		167	168	540	4,100	3,848	50	26	C	540	4,140	3,819	50	25	C	540	4,671	4,534	46	33	D	540	4,701	4,608	47	33	D
		Washington Ave Exit	168	169	448	4,100	3,849	52	25	C	448	4,140	3,817	52	25	C	448	4,671	4,534	50	30	D	448	4,701	4,609	50	31	D
	Washington Ave Exit		169	170	625	3,299	3,111	55	28	D	625	3,330	3,051	55	28	C	625	4,070	3,950	54	37	E	625	4,001	3,913	54	36	E
		END NB I-35W	170	171	523	3,299	3,110	57	27	C	523	3,330	3,050	57	27	C	523	4,070	3,950	56	35	E	523	4,001	3,913	56	35	D

Appendix I

I-35W Lake Street Access Scenarios Memorandum

MEMORANDUM

TO: TAC Members
I-35W Transit Access Project

FROM: Graham Johnson, PE
Mike Kotila, PE

DATE: February 23, 2012

RE: I-35W Transit Access Project
Traffic Analysis Findings – Lake Street Access Scenarios
SEH No. AHENNC 113114

This memorandum summarizes traffic analysis findings for seven freeway access scenarios comprised of combinations of the existing access condition plus up to three potential new freeway ramps. Findings reported herein are focused on the future geometric needs at Lake Street intersections from Blaisdell Avenue to 5th Avenue. The forecast years for all future scenarios analyzed is the design year 2038 and year of opening 2018. Volumes served are those reported in the I-35W Transit Access Traffic Forecast Memorandum (final version dated January 13, 2012). Additional traffic findings will be provided for other intersections in the study area not addressed in this memorandum (i.e. Franklin Avenue, etc).

Summary of Findings

Specific capacity improvement recommendations along Lake Street have been related to specific freeway ramp connections that contribute to the need for each improvement. Recommended improvements are defined to achieve a level of service (LOS) D or better, based on arterial performance (average speed along corridor) and/or intersection LOS (delay) along Lake Street. Individual turning movement delay, queue lengths and the interaction between adjacent closely spaced intersections have also been considered as part of the performance criteria. All of the operational analysis was conducted based on AM and PM peak hour demands.

The general influence of each ramp is described below. More specific findings for each combination of ramp scenarios is provided in later sections of this memorandum.

> ***Southbound Exit from I-35W to Lake Street*:** This ramp does not require any geometric changes to Lake Street beyond those required by the 2038 Transit Station Only Scenario. The only change would be the new southbound approach of Stevens Avenue/I-35W Ramp to Lake Street would need to be configured as a one-way street with 4-lanes of approach; left, through-left, through-right, and a right turn lane.
>
> ***Northbound I-35W Entrance ramp from Lake Street*:** This ramp does require some signal timing changes as well as geometric improvements. The eastbound left turn storage lane at 2nd Avenue would need to extend through the Stevens Avenue intersection. The signal at 2nd Avenue would require an eastbound protected/ permissive left turn phase. In addition, a westbound right turn lane dramatically relieves congestion in the westbound through lanes, specifically in 2038, and would allow more gaps for the eastbound left turning traffic. The operational benefit of the right turn lane should be considered simultaneously with its related impacts (R/W need) as project scope decisions are made. Northbound 2nd Avenue would need to be restriped, removing the

existing on-street parking along 2nd Avenue, to allow northbound through movements from three lanes; through-left, through, through-right lanes. Alternatively, a third through lane plus construction of a parking bay could be considered. (See also – the influence of the 28th Street Exit below).

***28th Street Exit from I-35W*:** This ramp reduces traffic volumes served through Lake Street intersections, most notably the 2nd Avenue intersection, and does not require any capacity improvements on Lake Street. When considered in combination with the northbound entrance ramp, the scenario reduces the degree of capacity improvement needed to serve the northbound entrance demands. The reduced volumes at the Lake Street and 2nd Avenue intersection allow for the existing northbound configuration to operate well without an additional through lane; however the extended eastbound left turn lane is still needed while the benefit of a westbound right turn lane at 2nd Avenue is reduced. The 28th Street exit ramp also allows better progression of flow along Lake Street in all scenarios with which it has been considered.

Overview – Approach to Intersection Analysis and Corridor Performance

Lake Street intersections and traffic signals are closely spaced through the study segment (typically 330 feet). This condition limits vehicle storage length between intersections to about 10–12 vehicles per lane per block. When modeled (using Synchro/Simtraffic), the delay calculation recognizes only the delay for vehicles stored over the distance to the adjacent upstream signal. During peak flow conditions delays from one intersection often influence upstream segments beyond the segment length delays associated with the first signal. This is compounded at freeway interchange intersections where a high percentage of traffic chooses a specific through lane in advance of their desired turn lane. Under these circumstances, the modeled intersection delay and LOS calculations do not capture the full extent of the traffic operational issues in the corridor. Model outputs typically report that the "one block length" queues built up at intersections are served during one phase of the signal cycle - often with an intersection LOS value that is misleading if not considered in conjunction with other operational measures in the corridor.

To more meaningfully report the impact of the various ramp configurations, block by block speeds have been analyzed in conjunction with the intersection delays to help aid in determining potential mitigation measures. Segment speeds reported by Synchro/Simtraffic do include all traffic on a block by block basis, including turning traffic. Speeds of individual movements or groups of movements through the corridor cannot be isolated. The average speed analysis is consistent with practices recommended by the Federal Highway Capacity Manual (HCM) and Arterial LOS thresholds reported are consistent with those prescribed by the HCM. For this series of analyses, all scenarios have been analyzed using the same model assumptions and model limits so results are comparable to one another. LOS criteria are described in Table 1.

Table 1
Level of Service Criteria

LOS	Signal (seconds of Delay)	Stop Control (seconds of Delay)	Speed Criteria Class IV Arterial (speed mph)
A	0.0 to 10.0	0.0 to 10.0	Greater than 25
B	10.1 to 20.0	10.1 to 15.0	19 to 25
C	20.1 to 35.0	15.1 to 25.0	13 to 19
D	35.1 to 55.0	25.1 to 35.0	9 to 13
E	55.1 to 80.0	35.1 to 50.0	7 to 9
F	Above 80.0	Above 50.0	Less than 7

Table 2 provides a 2038 comparison of the Existing conditions and Transit Station Only scenarios to each of the individual ramp configuration scenarios. **Table 3** is a 2038 comparison of the Existing conditions and Transit Station Only scenarios to the Lake Street Only Ramps (SB exit and NB entrance) and the Full Build scenario (SB exit, NB entrance and 28th Street exit). **Table 4** is a 2018 comparison of the Existing conditions and Transit Station Only scenarios to the Lake Street Only Ramps (SB exit and NB entrance) and the Full Build scenario (SB exit, NB entrance and 28th Street exit).

Approach and intersection Measures of Effectiveness (MOE) comparison tables are provided in the attached Tables A1 through A6.

DESIGN YEAR 2038 SCENARIO OPERATIONS:

Transit Station Only:

The geometric changes recommended for the Transit Station Only scenario address existing operational issues as well as accommodate future growth through 2038 without freeway access changes. The improvements include side by side EB and WB left turn lanes under the I-35W Bridge (creating a 6-lane width under the freeway) and extending the westbound left turn storage lane through the 2nd Avenue intersection by approximately 150 feet. With the side by side left turn lanes, a slightly wider condition is created in the middle of the west leg of the Lake Street at Stevens Avenue intersection. This provides opportunity for a separate eastbound left turn lane – which is recommended as a safety enhancement for this scenario.

Average speeds along Lake Street, between Blaisdell Avenue and 5th Avenue, are in the acceptable range (LOS C) during both the AM peak hour and the PM peak hours (17 - 19 mph in the AM and 15 -16 mph in the PM peak). This condition indicates that expanding from the existing 5-lane condition to a 6 lane condition provides capacity that can be utilized in scenarios that also add new access ramps.

Southbound I-35W Exit Ramp:

The geometric changes made under the Transit Station Only scenario have enough capacity to handle the increase in traffic from the new southbound exit ramp to Lake Street. Average speeds on Lake Street are between 16 and 22 mph in the AM peak hour and between 15 and 16 in the PM peak hour (LOS C).

The new southbound exit from I-35W and the Stevens Avenue connection to the ramp is forecast to carry approximately 950 vph in the AM peak and 1200 vph in the PM peak to Lake Street. The approaching vehicles are approximately equally divided in their destination to either eastbound or westbound Lake Street or south on Stevens Avenue; though there is a slight leaning of traffic destined to westbound Lake Street.

The southbound exit ramp/Stevens Avenue approach to Lake Street was tested with both 3 and 4 lanes of approach. With 3-lanes of approach, the southbound approach delays are at LOS E, with the southbound through movement delay at a LOS F. With a 3 lane configuration, the SB queue for the shared through-left lane will extend approximately 500 feet and potentially impact both the freeway exit and the southbound Stevens Avenue connection. With 4-lanes of approach, delays are improved to LOS D and the southbound queue is reduced to just over 350 feet, which reduces safety concerns related to stopping on the freeway exit and provides better service for local traffic on southbound Stevens Avenue.

Figures 1.1 and 1.2 show the Southbound Exit ramp scenario speeds along Lake Street one a block by block and directional (eastbound and westbound) basis.

Southbound I-35W Exit Ramp with Northbound 28th Street Exit Ramp:

The 28th Street exit ramp does improve operations on Lake Street compared to the southbound exit only scenario. Since the operations with the southbound I-35W exit only are acceptable, the improvements with the 28th Street exit are slight and localized to the interchange area.

The 28th Street exit will reduce the amount of green time needed for the northbound approach at Lake Street and 2nd Avenue. Green time would be reallocated to the Lake Street approaches, slightly improving operations on Lake Street near 2nd Avenue.

Northbound I-35W Entrance Ramp:
The new entrance ramp from Lake Street to northbound I-35W is forecast to carry 1110 vph in the AM peak and 780 vph in the PM Peak. When combined with the demand on 2nd Avenue destined to 28th and 29th Streets, the northbound volume departing from Lake Street at the 2nd Avenue intersection is approximately 1620 vph in the AM peak and 1050 vph in the PM peak.

The Lake Street/2nd Avenue intersection experiences operational issues under this scenario requiring capacity improvements. The high eastbound left turn lane demand competes with the westbound right turning traffic as well as the high northbound 2nd Avenue volumes. The AM peak hour has the highest competing demands at the intersection, with a total entering volume of 2760 vehicles per hour at the intersection with 1620 vph departing northbound. The PM peak hour has the highest total demand at the intersection, with a total entering volume of 3200 vehicles per hour at the intersection with 1050 vph departing northbound.

With a major increase in the eastbound left turn volume at 2nd Avenue, the eastbound left turn lane needs to be a full block length storage lane and also need to be extended through the Stevens Avenue intersection. The westbound approach to 2nd Avenue would benefit from a right turn lane of 150 feet; this alleviates westbound queues along Lake Street and provides more gaps for eastbound left turning traffic. The northbound 2nd Avenue approach should be reconfigured to serve through movements from each of the three lanes in order to reduce the green time needed to serve that approach (NB through-left, through, and through-right lanes). The reconfiguration would remove the existing on-street parking along 2nd Avenue between 31st Street and Lake Street. An alternative approach would be to construct a parking bay along 2nd Avenue and operate the existing parking lane as a third through lane.

With the above improvements, the average speeds along Lake Street are between 9 and 14 mph (LOS C/D boundary). However, there is approximately a 3-block influence area approaching the intersection that has speeds between 5 and 8 mph in the westbound direction.

Adding additional auxiliary lanes or turn lanes along Lake Street were tested. This would improve operations slightly; however the impacts of additional roadway width do not provide enough operational improvements to justify them.

Figures 1.3 and 1.4 show the Northbound Entrance ramp Scenario average speeds along Lake Street.

Northbound I-35W Entrance Ramp with Northbound 28th Street Exit Ramp:
The 28th Street Exit ramp, in combination with the northbound entrance ramp, greatly improves operations during the AM peak hour. The lower demand on the northbound 2nd Avenue approach allows more green time to be allocated to Lake Street, greatly improving performance through the interchange. The PM peak hour improvements are not as great as the AM due to the lower PM demand on 2nd Avenue. The AM peak hour has the highest competing demands at the intersection, with a total entering volume of 2340 vehicles per hour at the intersection with 1190 vph departing northbound. The PM peak hour has

the highest total demand at the intersection, with a total entering volume of 2810 vehicles per hour at the intersection with 820 vph departing northbound.

The improvements on Lake Street are very similar to those for the northbound entrance ramp only scenario; however the 3-through northbound lanes along 2nd Avenue are not needed. The eastbound left turn lane at 2nd Avenue needs to be a full block length storage lane and extended through the Stevens Avenue intersection. On the westbound approach to 2nd Avenue a 150 foot long right turn should be considered; this alleviates the westbound queues along Lake Street and provides more gaps for eastbound left turning traffic.

With the above improvements, the average speeds along Lake Street in the AM peak hour are between 13 and 21 mph and between 12 and 15 in the PM peak hour. The operational influence area of the new entrance ramp is slightly reduced compared to the scenario without the 28th Street exit ramp; eastbound and westbound Lake Street has a 2-block influence with speeds between 7 and 8.

Northbound I-35W and Southbound I-35W Ramps:
With new ramps to and from Lake Street and I-35W, the ADT volumes along Lake Street will see a significant increase. The ramps increase the turning traffic at the Stevens and 2nd Avenue intersections as well as the eastbound and westbound through traffic at adjacent intersections; this creates more competition for the green time at each traffic signal in the corridor.

All of the signal timing and geometric changes analyzed could not fully mitigate the poor arterial performance (low average speeds) throughout the corridor to the extent achieved in the Transit Station Only scenario. The analyzed improvements do lessen the extent of the negative influence on traffic operations.

With a major increase in the eastbound left turn volume at 2nd Avenue, the eastbound left turn lane needs to be a full block length storage lane and extended through the Stevens Avenue intersection. On the westbound approach to 2nd Avenue a right turn lane of 150 feet should be considered; this alleviates westbound queues along Lake Street and provides more gaps for eastbound left turning traffic. The northbound 2nd Avenue approach should be reconfigured to serve through movements from each of the 3 lanes to reduce the green time needed. To improve progression along westbound Lake Street and improve speeds to an acceptable level between 2nd Avenue and 1st Avenue, a 150 foot westbound right turn lane could be added at 1st Avenue; however, right of way would need to be acquired and the benefit doesn't outweigh the impact.

With the above improvements, the average speeds along Lake Street are between 11 and 13 mph in the AM peak and between 8 and 13 mph in the PM peak. However there is approximately a 5-block influence area approaching the intersection that has low average speeds (5 - 9 mph).

Adding additional auxiliary lanes or turn lanes along Lake Street does improve operations slightly; however the impacts of additional roadway width do not provide enough operational improvements to justify them.

Figures 2.1 and 2.2 show the Lake Street Ramp scenario speeds along Lake Street.

Northbound I-35W, Southbound I-35W and 28th Street Ramps:
The 28th Street Exit ramp, in combination with the northbound entrance ramp, greatly improves Lake Street operations during the AM peak hour. The lower demand on the northbound 2nd Avenue approach allows for more green time to be allocated to Lake Street, greatly improving performance through the

interchange. The PM peak hour operational improvements are not as pronounced as the AM due to the lower PM demand on 2nd Avenue.

The capacity improvements on Lake Street are very similar to the Lake Street Only ramp scenario with the exception that the 3-through lanes for northbound 2nd Avenue are not needed.

With the above improvements, the average speeds along Lake Street in the AM peak hour are between 14 and 17 mph and between 9 and 14 in the PM peak hour. The operational influence area of the new entrance ramp is reduced compared to the scenario without the 28th Street exit ramp to approximately a 2-block influence area approaching the intersection that has low average speeds (6 - 8 mph).

Adding additional auxiliary lanes or turn lanes along Lake Street does improve operations slightly; however the impacts of additional roadway width do not provide enough operational improvements to justify them.

Figures 2.3 and 2.4 show the Full Build scenario speeds along Lake Street.

YEAR OF OPENING 2018 SCENARIO OPERATIONS:
For the Year of Opening analysis, only three (3) of the seven (7) Design Year scenarios were analyzed; Transit Station Only, Northbound and Southbound Lake Street Ramps, and the Northbound and Southbound Lake Street Ramps plus the 28th Street Exit Ramp.

All of the mitigations from the Design Year analysis were tested incrementally to see if some reduction in traffic impacts could be realized; however, the 2018 forecasts show that once the ramps are constructed, between 85 and 95% of the 2038 ramp volume will be attracted to the interchange. For that reason many of the mitigations from the design year will need to be constructed in the year of opening.

Transit Station Only:
Year of opening demands were analyzed with the geometric changes recommended for the design year Transit Station Only scenario. As would be expected, operations along Lake Street are improved in 2018 compared to 2038. Average speeds along Lake Street, between Blaisdell Avenue and 5th Avenue, are in the acceptable range (LOS C) during both the AM peak hour and the PM peak hours; 17 - 19 mph in the AM and 16 -17 mph in the PM peak.

Northbound I-35W and Southbound I-35W Ramps:
In the year of opening, many of the required design year mitigations are still needed. The eastbound left turn lane needs to be a full block length storage lane and extended through the Stevens Avenue intersection. The northbound 2nd Avenue approach should be reconfigured to serve through movements from each of the 3 lanes to reduce the green time needed. The westbound right turn lane at 2nd Avenue would still improve traffic operations; however deferring improvement could be considered.

With the above improvements, not including the westbound right turn lane, the average speeds along Lake Street are between 12 and 13 mph in the AM peak and between 8 and 16 mph in the PM peak. However there is approximately a 2-block influence area approaching the intersection that has low average speeds (5 - 6 mph).

With the above improvements, including the westbound right turn lane, the average speeds along Lake Street are between 14 and 16 mph in the AM peak and between 10 and 16 mph in the PM peak. The influence area approaching the intersection is reduced to 1-block that has low average speeds (7 mph).

Figures 3.1 and 3.2 show the Lake Street Ramp scenario speeds along Lake Street.

Northbound I-35W, Southbound I-35W and 28th Street Ramps:
The 28th Street Exit ramp, in combination with the northbound entrance ramp, greatly improves Lake Street operations during the AM peak hour. The PM peak hour operational improvements are not as pronounced as the AM due to the lower PM demand on 2nd Avenue. The eastbound left turn lane needs to be a full block length storage lane and extended through the Stevens Avenue intersection. The westbound right turn lane at 2nd would provide operational benefit; however the impacts at this time might be too great. The 3-through lanes for northbound 2nd Avenue are not needed in conjuction with the 28th Street Exit Ramp.

With the above improvements, not including the westbound right turn lane, the average speeds along Lake Street are between 14 and 18 mph in the AM peak and between 9 and 16 mph in the PM peak. However there is approximately a 2-block influence area approaching the intersection that has low average speeds (6-8 mph).

With the above improvements, including the westbound right turn lane, the average speeds along Lake Street are between 15 and 16 mph in the AM peak and between 10 and 16 mph in the PM peak. The influence area approaching the intersection is reduced to 1-block that has low average speeds (7 mph).

Figures 3.3 and 3.4 show the Full Build scenario speeds along Lake Street.

ADDITIONAL CONSIDERATIONS:
Bus Route Changes:
With the opening of Nicollet Avenue, north-south bus routes that currently use Lake Street between Blaisdell Avenue and 1st Avenue can be reconfigured. Today, the existing bus routes along Nicollet Avenue utilize Blaisdell Avenue and 1st Avenue near Lake Street in order to continue north or south along Nicollet Avenue. With Nicollet Avenue open, a direct bus route can be planned, possibly removing the need for some of the existing bus stop and transfer locations in the area. No route or stop location planning has been completed at this time, so further consideration is needed.

Unsignalized Intersections:
In the Lake Street project area, between Blaisdell Avenue and 5th Avenue, there are two unsignalized intersections; Lake Street at Clinton Avenue and at 5th Avenue. Both of these intersections have low volumes for the side street approaches and would not warrant a signal based on vehicular volumes. Based on an HCS analysis of the intersections in both the AM and PM peak hours, all 2038 forecast scenarios mentioned in this memorandum would result in side street approaches operating at a LOS E or LOS F; mainly due to the high volume of traffic along Lake Street.

The results in Tables A1 to A6 are from the SimTraffic simulation analysis and show much better results for the AM peak hours, typically LOS C or better for the side street approaches. However, in the PM peak hour, the high demands along Lake Street provide very little opportunity for side street traffic to access Lake Street. The mitigated scenarios typically improve operations along Lake Street enough so that the majority of the side street traffic at these intersections has available gaps to enter Lake Street.

The operational models do not account for human behavior changes where someone might adjust their trip based on delay times. An example would be a left or through vehicle that cannot find a gap in traffic might change to a right turning vehicle and change their route. These types of shifts would most likely reduce the number of users on the unsignalized side street approaches as vehicles either choose to make a right turn at the intersection or change their route to a signalized intersection. The volume demands on

these side street approaches are very low and these shifts would not have a noticeable impact on other intersections.

gtj
Attachments:
Table 2 – 2038 Lake Street Analysis: Separate Ramp Configurations (Speed Table)
Table 3 – 2038 Lake Street Analysis: Lake Street Only and Full Build (Speed Table)
Table 4 – 2018 Lake Street Analysis: Lake Street Only and Full Build (Speed Table)
Figure 1.1 – 2038 SB Ramp Configurations Comparison AM Peak Hour
Figure 1.2 – 2038 SB Ramp Configurations Comparison PM Peak Hour
Figure 1.3 – 2038 NB Ramp Configurations Comparison AM Peak Hour
Figure 1.4 – 2038 NB Ramp Configurations Comparison PM Peak Hour
Figure 2.1 – 2038 SB Ramp Lake Only and Full Build Comparison AM Peak Hour
Figure 2.2 – 2038 SB Ramp Lake Only and Full Build Comparison PM Peak Hour
Figure 2.3 – 2038 NB Ramp Lake Only and Full Build Comparison AM Peak Hour
Figure 2.4 – 2038 NB Ramp Lake Only and Full Build Comparison PM Peak Hour
Figure 3.1 – 2018 SB Ramp Lake Only and Full Build Comparison AM Peak Hour
Figure 3.2 – 2018 SB Ramp Lake Only and Full Build Comparison PM Peak Hour
Figure 3.3 – 2018 NB Ramp Lake Only and Full Build Comparison AM Peak Hour
Figure 3.4 – 2018 NB Ramp Lake Only and Full Build Comparison PM Peak Hour
Table A1 – 2038 Intersection MOE Table – AM Peak Hour Separate Ramp
Table A2 – 2038 Intersection MOE Table – PM Peak Hour Separate Ramp
Table A3 – 2038 Intersection MOE Table – AM Peak Hour Lake Only and Full Build
Table A4 – 2038 Intersection MOE Table – PM Peak Hour Lake Only and Full Build
Table A5 – 2018 Intersection MOE Table – AM Peak Hour Lake Only and Full Build
Table A6 – 2018 Intersection MOE Table – PM Peak Hour Lake Only and Full Build
Figure B1 – Transit Station Only Geometric Comparison
Figure B2 – Southbound I-35W Exit Ramp Only Geometric Comparison
Figure B3 – Southbound I-35W Exit and 28th Street Exit Geometric Comparison
Figure B4 – Northbound I-35W Entrance Ramp Only Geometric Comparison
Figure B5 – Northbound I-35W Entrance and 28th Street Exit Geometric Comparison
Figure B6 – Southbound I-35W Exit and Northbound I-35W Entrance Geometric Comparison
Figure B7 – Southbound I-35W Exit, Northbound I-35W Entrance and 28th Street Exit Geometric Comparison

Table 2
2038 Lake Street Analysis: Separate Ramp Configurations

AM Peak Period

Network Summary

Arterial		2010 Existing	Transit Only Mitigated	SB EXIT ONLY		SB & 28th EXIT ONLY		NB ENTRANCE ONLY		NB28 ENTRANCE & 28th	
				SB Only Build Base	SB Only Build Mitigated	SB & 28th Base	SB & 28th Mitigated	NB Only Build Base	NB Only Build Mitigated	NB28 & 28th Base	NB28 & 28th Mitigated
EB Lake Street	Delay (s/veh)	46.8	48.6	25.3	24.7	25.9	25.8	188.8	114.9	31.2	28.6
	Travel Time (sec)	109.3	111.2	87.3	86.6	87.6	87.4	250.7	176.5	92.2	89.6
	Speed (mph)	17.5	17.2	21.9	22.1	21.9	21.9	**7.6**	10.9	20.8	21.4
WB Lake Street	Delay (s/veh)	37.0	41.3	60.7	59.0	56.3	54.7	145.2	74.6	87.9	83.7
	Travel Time (sec)	98.2	103.1	120.7	119.3	116.1	114.6	206.6	135.9	149.0	144.9
	Speed (mph)	19.5	18.6	15.9	16.1	16.5	16.7	9.3	14.1	12.9	13.2
EB 31st Street	Delay (s/veh)	56.5	41.8	17.2	16.5	17.7	17.5	8.8	9.8	12.1	9.2
	Travel Time (sec)	78.5	63.4	38.9	38.2	39.7	39.5	30.5	31.5	34.5	31.6
	Speed (mph)	**8.7**	10.8	17.5	17.8	17.2	17.3	22.4	21.6	19.8	21.6
WB 31st Street	Delay (s/veh)	46.8	37.3	46.8	46.1	45.2	44.4	42.8	39.8	58.8	51.1
	Travel Time (sec)	68.7	58.6	68.6	67.8	67.3	66.5	64.7	61.6	81.2	73.4
	Speed (mph)	9.9	11.6	9.9	10.1	10.1	10.3	10.5	11.1	**8.4**	9.3

PM Peak Period

Network Summary

Arterial		2010 Existing	Transit Only Mitigated	SB EXIT ONLY		SB & 28th EXIT ONLY		NB ENTRANCE ONLY		NB28 ENTRANCE & 28th	
				SB Only Build Base	SB Only Build Mitigated	SB & 28th Base	SB & 28th Mitigated	NB Only Build Base	NB Only Build Mitigated	NB28 & 28th Base	NB28 & 28th Mitigated
EB Lake Street	Delay (s/veh)	48.3	57.5	61.9	48.9	57.6	46.7	113.3	69.1	71.6	62.0
	Travel Time (sec)	109.8	119.3	123.8	111.0	120.1	109.2	175.1	131.1	134.0	124.1
	Speed (mph)	17.4	16.1	15.5	17.3	16.0	17.5	10.9	14.6	14.3	15.4
WB Lake Street	Delay (s/veh)	100.5	60.3	87.0	89.2	87.0	90.6	243.7	137.9	213.7	99.4
	Travel Time (sec)	163.1	122.6	149.5	151.8	149.0	152.6	305.7	200.2	275.2	161.4
	Speed (mph)	11.7	15.6	12.8	12.6	12.9	12.6	**6.3**	9.6	**7.0**	11.9
EB 31st Street	Delay (s/veh)	43.4	40.2	26.5	17.9	31.1	17.9	40.6	19.8	31.4	33.3
	Travel Time (sec)	65.2	62.1	49.1	40.4	53.0	39.7	63.0	42.0	53.9	55.7
	Speed (mph)	10.5	11.0	13.9	16.9	12.9	17.2	10.8	16.2	12.6	12.2
WB 31st Street	Delay (s/veh)	74.3	93.7	47.8	52.8	48.0	52.1	85.1	64.4	63.6	62.9
	Travel Time (sec)	96.4	115.5	70.1	75.1	70.2	74.2	107.1	86.3	86.2	85.5
	Speed (mph)	**7.1**	**5.9**	9.7	9.1	9.7	9.2	**6.4**	**7.9**	**7.9**	**8.0**

NOTES:

SB Ramp Base: Transit Only changes; plus SB Ramp approach is left, through-left, right lanes.

SB Ramp Mitigation: SB Ramp expand from 3 lanes to 4 lanes of approach

NB Ramp Base: Transit Only Mitigation; plus an EB protected left turn phase at 2nd Avenue

NB Ramp Mitigation: EB Full length left turn at 2nd Ave with 150 foot extended turn lane through Stevens Ave. WB Right turn lane at 2nd Ave.

Speed calculations based on Travel Time on Lake Street between Blaisdell Avenue and 5th Avenue; on 31st Street between Nicollet Avenue and 2nd Avenue.

2000 HCM Urban St Level of Service		
LOS	Class III	**Class IV**
A	>30	**>25**
B	24-30	**19-25**
C	18-24	**13-19**
D	14-18	**9-13**
E	10-14	**7-9**
F	<10	**<7**

Table 3
2038 Lake Street Analysis: Lake Street Ramps Only and Full Build Scenario

AM Peak Period

Network Summary

Arterial		2010 Existing	Transit Only Mitigated	LAKE STREET RAMPS ONLY SCENARIO					FULL BUILD SCENARIO				
				Lake Build Base	Lake Build Mit Ver. 1	Lake Build Mit Ver. 2	Lake Build Mit Ver. 3	Lake Build Mit Ver. 4	Full Build Base	Full Build Mit Ver. 1	Full Build Mit Ver. 2	Full Build Mit Ver. 3	Full Build Mit Ver. 4
EB Lake Street	Delay (s/veh)	46.8	48.6	272.5	141.3	111.3	105.8	155.8	135.2	54.4	48.5	76.1	56.1
	Travel Time (sec)	109.3	111.2	334.1	202.9	172.4	167.3	217.3	196.8	115.9	110.0	137.7	117.5
	Speed (mph)	17.5	17.2	**5.7**	9.4	11.1	11.5	**8.8**	9.7	16.5	17.4	13.9	16.3
WB Lake Street	Delay (s/veh)	37.0	41.3	317.6	114.2	83.3	82.9	78.5	83.2	79.7	76.5	74.6	72.2
	Travel Time (sec)	98.2	103.1	378.8	175.6	144.6	144.0	139.6	144.1	140.6	137.1	135.7	133.0
	Speed (mph)	19.5	18.6	**5.1**	10.9	13.2	13.3	13.7	13.3	13.6	14.0	14.1	14.4
EB 31st Street	Delay (s/veh)	56.5	41.8	21.6	21.4	18.9	19.5	19.3	16.3	17.2	16.8	17.2	16.8
	Travel Time (sec)	78.5	63.4	43.3	43.2	40.8	41.1	41.3	38.6	39.6	39.3	39.6	39.1
	Speed (mph)	**8.7**	10.8	15.7	15.8	16.7	16.6	16.5	17.7	17.2	17.3	17.2	17.4
WB 31st Street	Delay (s/veh)	46.8	37.3	43.3	42.9	44.3	42.2	43.9	42.2	41.3	40.0	41.2	42.3
	Travel Time (sec)	68.7	58.6	65.4	64.9	66.5	64.1	66.0	64.3	63.5	62.2	63.4	64.4
	Speed (mph)	9.9	11.6	10.4	10.5	10.3	10.6	10.3	10.6	10.7	11.0	10.8	10.6

PM Peak Period

Network Summary

Arterial		2010 Existing	Transit Only Mitigated	LAKE STREET RAMPS ONLY SCENARIO					FULL BUILD SCENARIO				
				Lake Build Base	Lake Build Mit Ver. 1	Lake Build Mit Ver. 2	Lake Build Mit Ver. 3	Lake Build Mit Ver. 4	Full Build Base	Full Build Mit Ver. 1	Full Build Mit Ver. 2	Full Build Mit Ver. 3	Full Build Mit Ver. 4
EB Lake Street	Delay (s/veh)	48.3	57.5	62.6	73.9	79.3	77.3	80.1	60.8	73.0	73.3	68.1	78.8
	Travel Time (sec)	109.8	119.3	124.8	136.1	141.6	139.3	142.3	123.4	135.3	135.9	130.7	141.5
	Speed (mph)	17.4	16.1	15.4	14.1	13.5	13.8	13.5	15.5	14.2	14.1	14.7	13.5
WB Lake Street	Delay (s/veh)	100.5	60.3	259.8	222.4	183.2	157.1	133.2	257.8	169.0	136.9	115.3	113.3
	Travel Time (sec)	163.1	122.6	322.3	284.9	245.7	219.7	195.6	320.2	231.2	199.3	177.8	175.6
	Speed (mph)	11.7	15.6	**5.9**	**6.7**	**7.8**	**8.7**	9.8	**6.0**	**8.3**	9.6	10.8	10.9
EB 31st Street	Delay (s/veh)	43.4	40.2	32.7	24.6	25.1	25.3	17.1	15.7	23.5	18.7	22.1	19.3
	Travel Time (sec)	65.2	62.1	55.0	47.0	47.4	47.5	39.2	37.9	45.8	40.8	44.3	41.5
	Speed (mph)	10.5	11.0	12.4	14.5	14.4	14.4	17.4	18.0	14.9	16.7	15.4	16.4
WB 31st Street	Delay (s/veh)	74.3	93.7	259.6	49.3	48.4	60.0	59.9	64.1	58.0	68.8	74.7	67.5
	Travel Time (sec)	96.4	115.5	281.9	71.4	70.3	82.0	81.9	86.0	79.8	90.8	96.6	89.4
	Speed (mph)	**7.1**	**5.9**	**2.4**	9.5	9.7	**8.3**	**8.3**	**7.9**	**8.5**	**7.5**	**7.1**	**7.6**

NOTES:

Base:	Timings at Nicollet modified and offsets modified; WB Prot/Perm phase at 31st/Stevens. WB Full Length Left Turn Lane at Lake/Stevens, separate EB left turn at Lake/2nd
Mitigation Ver. 1:	EB Extended Left turn lane at Stevens Avenue to 2nd Avenue. NB 2nd Avenue 3-through lanes. 6 Lanes Under I-35W Bridge.
Mitigation Ver. 2:	Mitigation 1 Plus: WB Right Turn lane at 2nd Avenue. 6 Lanes Under I-35W Bridge.
Mitigation Ver. 3:	Mitigation 2 Plus: WB Right Turn lane at 1st Avenue. 6 Lanes Under I-35W Bridge.
Mitigation Ver. 4:	EB Through-Left lane from Nicollect to Left Turn lane at 2nd Avenue. WB Through-Right lane from 3rd Avenue to Nicollet Avenue. 7 Lanes Under I-35W Bridge.

Speed calculations based on Travel Time on Lake Street between Blaisdell Avenue and 5th Avenue; on 31st Street between Nicollet Avenue and 2nd Avenue.

2000 HCM Urban St	
LOS	**Class IV**
A	**>25**
B	**19-25**
C	**13-19**
D	**9-13**
E	**7-9**
F	**<7**

Table 4
2018 Lake Street Analysis: Lake Street Ramps Only and Full Build Scenario

AM Peak Period

Network Summary				LAKE STREET RAMPS ONLY SCENARIO			FULL BUILD SCENARIO		
Arterial		2010 Existing	Transit Only Mitigated	Lake Build Base	Lake Build Mit Ver. 1	Lake Build Mit Ver. 2	Full Build Base	Full Build Mit Ver. 1	Full Build Mit Ver. 2
EB Lake Street	Delay (s/veh)	46.8	49.5	298.2	84.5	53.7	52.2	42.3	54.7
	Travel Time (sec)	109.3	112.3	360.0	146.0	115.2	113.5	103.8	116.0
	Speed (mph)	17.5	17.1	**5.3**	13.1	16.6	16.9	18.5	16.5
WB Lake Street	Delay (s/veh)	37.0	42.1	199.8	96.5	72.9	77.2	73.0	69.8
	Travel Time (sec)	98.2	103.1	260.9	157.9	133.9	138.1	133.6	130.4
	Speed (mph)	19.5	18.6	**7.3**	12.1	14.3	13.9	14.3	14.7
EB 31st Street	Delay (s/veh)	56.5	43.2	20.4	21.4	21.4	26.1	16.3	17.1
	Travel Time (sec)	78.5	64.9	42.4	43.4	43.2	48.2	38.6	39.3
	Speed (mph)	**8.7**	10.5	16.1	15.7	15.8	14.1	17.7	17.3
WB 31st Street	Delay (s/veh)	46.8	37.5	40.8	23.5	22.9	41.6	37.9	39.0
	Travel Time (sec)	68.7	59.0	62.8	45.5	45.0	63.9	60.1	61.3
	Speed (mph)	9.9	11.6	10.9	15.0	15.2	10.7	11.3	11.1

PM Peak Period

Network Summary				LAKE STREET RAMPS ONLY SCENARIO			FULL BUILD SCENARIO		
Arterial		2010 Existing	Transit Only Mitigated	Lake Build Base	Lake Build Mit Ver. 1	Lake Build Mit Ver. 2	Full Build Base	Full Build Mit Ver. 1	Full Build Mit Ver. 2
EB Lake Street	Delay (s/veh)	48.3	48.6	67.2	57.0	54.7	52.6	57.3	57.4
	Travel Time (sec)	109.8	110.2	129.2	119.1	116.9	115.3	120.0	119.9
	Speed (mph)	17.4	17.4	14.8	16.1	16.4	16.6	16.0	16.0
WB Lake Street	Delay (s/veh)	100.5	57.7	243.5	165.5	133.6	196.9	146.9	128.9
	Travel Time (sec)	163.1	120.2	305.9	227.9	196.0	259.4	209.2	191.5
	Speed (mph)	11.7	15.9	**6.3**	**8.4**	9.8	**7.4**	9.2	10.0
EB 31st Street	Delay (s/veh)	43.4	29.3	20.4	21.4	21.6	14.6	17.3	20.0
	Travel Time (sec)	65.2	51.1	42.8	43.7	43.9	36.7	39.4	42.2
	Speed (mph)	10.5	13.3	15.9	15.6	15.5	18.6	17.3	16.2
WB 31st Street	Delay (s/veh)	74.3	86.0	120.2	44.1	44.8	49.7	48.3	52.1
	Travel Time (sec)	96.4	107.8	142.4	66.3	67.0	71.7	70.2	74.0
	Speed (mph)	**7.1**	**6.3**	**4.8**	10.3	10.2	9.5	9.7	9.2

NOTES:

Base:	Timings at Nicollet modified and offsets modified; WB Prot/Perm phase at 31st/Stevens. WB Full Length Left Turn Lane at Lake/Stevens, separate EB left turn at Lake/2nd
Mitigation Ver. 1:	EB Extended Left turn lane at Stevens Avenue to 2nd Avenue. NB 2nd Avenue 3-through lanes. 6 Lanes Under I-35W Bridge.
Mitigation Ver. 2:	Mitigation 1 Plus: WB Right Turn lane at 2nd Avenue. 6 Lanes Under I-35W Bridge.

Speed calculations based on Travel Time on Lake Street between Blaisdell Avenue and 5th Avenue; on 31st Street between Nicollet Avenue and 2nd Avenue.

2000 HCM Urban St Level of Service		
LOS	Class III	**Class IV**
A	>30	**>25**
B	24-30	**19-25**
C	18-24	**13-19**
D	14-18	**9-13**
E	10-14	**7-9**
F	<10	**<7**

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 19	Speed: 24	Speed: 15	Speed: 26	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29
Speed: 17	Speed: 23	Speed: 12	Speed: 20	Speed: 12	Speed: 25	Speed: 27	Speed: 11	Speed: 23	→

2038 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 16	Speed: 22	Speed: 15	Speed: 25	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29
Speed: 17	Speed: 22	Speed: 12	Speed: 20	Speed: 13	Speed: 21	Speed: 26	Speed: 11	Speed: 22	→

2038 SB Ramp Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 22	Speed: 11	Speed: 23	Speed: 18	Speed: 19	Speed: 25	Speed: 15	Speed: 29
Speed: 17	Speed: 22	Speed: 19	Speed: 23	Speed: 15	Speed: 24	Speed: 26	Speed: 21	Speed: 26	→

2038 SB Ramp Only Mitigated:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 22	Speed: 12	Speed: 25	Speed: 18	Speed: 19	Speed: 24	Speed: 15	Speed: 29
Speed: 17	Speed: 22	Speed: 20	Speed: 24	Speed: 15	Speed: 24	Speed: 26	Speed: 20	Speed: 26	→

SB Ramp Mitigation: SB Ramp expand from 3 lanes to 4 lanes of approach

2038 SB Ramp and 28th Exit Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 10	Speed: 22	Speed: 12	Speed: 20	Speed: 22	Speed: 20	Speed: 27	Speed: 15	Speed: 29
Speed: 17	Speed: 22	Speed: 17	Speed: 20	Speed: 21	Speed: 20	Speed: 26	Speed: 20	Speed: 26	→

2038 SB Ramp and 28th Exit Mitigated:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 10	Speed: 21	Speed: 11	Speed: 22	Speed: 21	Speed: 20	Speed: 27	Speed: 15	Speed: 29
Speed: 17	Speed: 22	Speed: 17	Speed: 20	Speed: 22	Speed: 21	Speed: 26	Speed: 20	Speed: 26	→

SB Ramp Mitigation: SB Ramp expand from 3 lanes to 4 lanes of approach

NOTES: SIMTRAFFIC Arterial Report Results

2038 LAKE STREET ANALYSIS
SEPARATE RAMP CONFIGURATIONS

Figure 1.1
AM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: **8**	Speed: 9	Speed: 13	Speed: 10	Speed: 14	Speed: 14	Speed: 22	Speed: 14	Speed: 29
Speed: 17	Speed: 23	Speed: 11	Speed: 9	Speed: 22	Speed: 19	Speed: 23	Speed: 22	Speed: 26	→

2038 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 15	Speed: 17	Speed: 18	Speed: 13	Speed: 20	Speed: 14	Speed: 21	Speed: 11	Speed: 28
Speed: 15	Speed: 14	Speed: 12	Speed: 14	Speed: 23	Speed: 16	Speed: 21	Speed: 12	Speed: 23	→

2038 SB Ramp Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: **8**	Speed: 15	Speed: 11	Speed: 18	Speed: 14	Speed: 14	Speed: 18	Speed: 12	Speed: 28
Speed: 13	Speed: 17	Speed: 16	Speed: 10	Speed: 14	Speed: 12	Speed: 19	Speed: 16	Speed: 23	→

2038 SB Ramp Only Mitigated:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 14	Speed: 9	Speed: 14	Speed: 15	Speed: 14	Speed: 18	Speed: 12	Speed: 28
Speed: 13	Speed: 17	Speed: 16	Speed: 11	Speed: 19	Speed: 22	Speed: 20	Speed: 15	Speed: 23	→

SB Ramp Mitigation: SB Ramp expand from 3 lanes to 4 lanes of approach

2038 SB Ramp and 28th Exit Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 15	Speed: 11	Speed: 17	Speed: 12	Speed: 14	Speed: 19	Speed: 12	Speed: 28
Speed: 15	Speed: 22	Speed: 15	Speed: 10	Speed: 15	Speed: 14	Speed: 20	Speed: 15	Speed: 22	→

2038 SB Ramp and 28th Exit Mitigated:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 14	Speed: 10	Speed: 14	Speed: 17	Speed: 15	Speed: 19	Speed: 12	Speed: 28
Speed: 15	Speed: 20	Speed: 15	Speed: 10	Speed: 20	Speed: 22	Speed: 21	Speed: 15	Speed: 22	→

SB Ramp Mitigation: SB Ramp expand from 3 lanes to 4 lanes of approach

NOTES: SIMTRAFFIC Arterial Report Results

2038 LAKE STREET ANALYSIS
SEPARATE RAMP CONFIGURATIONS

Figure 1.2
PM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 19	Speed: 24	Speed: 15	Speed: 26	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29
Speed: 17	Speed: 23	Speed: 12	Speed: 20	Speed: 12	Speed: 25	Speed: 27	Speed: 11	Speed: 23	→

2038 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 16	Speed: 22	Speed: 15	Speed: 25	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29
Speed: 17	Speed: 22	Speed: 12	Speed: 20	Speed: 13	Speed: 21	Speed: 26	Speed: 11	Speed: 22	→

2038 NB Ramp Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 17	Speed: 22	Speed: 14	Speed: 9	Speed: 4	Speed: 6	Speed: 11	Speed: 13	Speed: 29
Speed: 7	Speed: 5	Speed: 5	Speed: 7	Speed: 18	Speed: 28	Speed: 24	Speed: 15	Speed: 26	→

2038 NB Ramp Only Mitigated:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 17	Speed: 21	Speed: 10	Speed: 13	Speed: 8	Speed: 22	Speed: 23	Speed: 14	Speed: 29
Speed: 17	Speed: 9	Speed: 6	Speed: 6	Speed: 18	Speed: 22	Speed: 24	Speed: 15	Speed: 26	→

NB Ramp Mitigation: EB Full length left turn at 2nd Ave with extended turn lane through Stevens Ave. WB Right turn lane at 2nd Ave. NB 2nd Ave 3-NB Through Lanes.

2038 NB Ramp and 28th Exit Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 13	Speed: 20	Speed: 10	Speed: 9	Speed: 7	Speed: 18	Speed: 25	Speed: 15	Speed: 29
Speed: 19	Speed: 21	Speed: 16	Speed: 16	Speed: 23	Speed: 27	Speed: 28	Speed: 17	Speed: 26	→

2038 NB Ramp and 28th Exit Mitigated:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 13	Speed: 19	Speed: 10	Speed: 10	Speed: 8	Speed: 20	Speed: 25	Speed: 14	Speed: 29
Speed: 19	Speed: 22	Speed: 16	Speed: 18	Speed: 24	Speed: 26	Speed: 27	Speed: 18	Speed: 26	→

NB Ramp Mitigation: EB Full length left turn at 2nd Ave with extended turn lane through Stevens Ave. WB Right turn lane at 2nd Ave.

NOTES: SIMTRAFFIC Arterial Report Results

2038 LAKE STREET ANALYSIS
SEPARATE RAMP CONFIGURATIONS

Figure 1.3
AM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 8	Speed: 9	Speed: 13	Speed: 10	Speed: 14	Speed: 14	Speed: 22	Speed: 14	Speed: 29
Speed: 17	Speed: 23	Speed: 11	Speed: 9	Speed: 22	Speed: 19	Speed: 23	Speed: 22	Speed: 26	→

2038 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 15	Speed: 17	Speed: 18	Speed: 13	Speed: 20	Speed: 14	Speed: 21	Speed: 11	Speed: 28
Speed: 15	Speed: 14	Speed: 12	Speed: 14	Speed: 23	Speed: 16	Speed: 21	Speed: 12	Speed: 23	→

2038 NB Ramp Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 13	Speed: 20	Speed: 14	Speed: 10	Speed: 4	Speed: 4	Speed: 6	Speed: 3	Speed: 6
Speed: 9	Speed: 16	Speed: 9	Speed: 6	Speed: 17	Speed: 25	Speed: 25	Speed: 15	Speed: 23	→

2038 NB Ramp Only Mitigated:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 14	Speed: 16	Speed: 14	Speed: 8	Speed: 5	Speed: 7	Speed: 12	Speed: 9	Speed: 28
Speed: 13	Speed: 17	Speed: 10	Speed: 7	Speed: 19	Speed: 25	Speed: 23	Speed: 13	Speed: 24	→

NB Ramp Mitigation: EB Full length left turn at 2nd Ave with extended turn lane through Stevens Ave. WB Right turn lane at 2nd Ave. NB 2nd Ave 3-NB Through Lanes.

2038 NB Ramp and 28th Exit Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 14	Speed: 17	Speed: 14	Speed: 8	Speed: 5	Speed: 5	Speed: 7	Speed: 5	Speed: 17
Speed: 13	Speed: 14	Speed: 10	Speed: 8	Speed: 21	Speed: 27	Speed: 25	Speed: 14	Speed: 24	→

2038 NB Ramp and 28th Exit Mitigated:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 13	Speed: 17	Speed: 14	Speed: 8	Speed: 7	Speed: 13	Speed: 18	Speed: 11	Speed: 28
Speed: 11	Speed: 14	Speed: 10	Speed: 9	Speed: 21	Speed: 27	Speed: 22	Speed: 14	Speed: 24	→

NB Ramp Mitigation: EB Full length left turn at 2nd Ave with extended turn lane through Stevens Ave. WB Right turn lane at 2nd Ave.

NOTES: SIMTRAFFIC Arterial Report Results

2038 LAKE STREET ANALYSIS
SEPARATE RAMP CONFIGURATIONS

Figure 1.4
PM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH	
←	Speed: 19	Speed: 24	Speed: 15	Speed: 26	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29	
Speed: 17	Speed: 23	Speed: 12	Speed: 20	Speed: 12	Speed: 25	Speed: 27	Speed: 11	Speed: 23		→

2038 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH	
←	Speed: 16	Speed: 22	Speed: 15	Speed: 25	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29	
Speed: 17	Speed: 22	Speed: 12	Speed: 20	Speed: 13	Speed: 21	Speed: 26	Speed: 11	Speed: 22		→

2038 Lake St Ramps Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH	
←	Speed: 16	Speed: 18	Speed: 16	Speed: 8	Speed: 3	Speed: 3	Speed: 3	Speed: 4	Speed: 12	
Speed: 5	Speed: 5	Speed: 6	Speed: 6	Speed: 16	Speed: 19	Speed: 15	Speed: 15	Speed: 23		→

2038 Lake St Ramps Mitigation 1:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH	
←	Speed: 15	Speed: 17	Speed: 14	Speed: 9	Speed: 6	Speed: 8	Speed: 14	Speed: 12	Speed: 29	
Speed: 9	Speed: 5	Speed: 6	Speed: 7	Speed: 20	Speed: 23	Speed: 22	Speed: 15	Speed: 25		→

2038 Lake St Ramps Mitigation 2:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH	
←	Speed: 15	Speed: 16	Speed: 10	Speed: 12	Speed: 8	Speed: 16	Speed: 22	Speed: 13	Speed: 29	
Speed: 16	Speed: 7	Speed: 8	Speed: 7	Speed: 19	Speed: 24	Speed: 25	Speed: 15	Speed: 25		→

2038 Lake St Ramps Mitigation 3:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH	
←	Speed: 16	Speed: 16	Speed: 10	Speed: 13	Speed: 8	Speed: 17	Speed: 22	Speed: 13	Speed: 29	
Speed: 15	Speed: 9	Speed: 9	Speed: 8	Speed: 19	Speed: 24	Speed: 25	Speed: 15	Speed: 25		→

2038 Lake St Ramps Mitigation 4:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH	
←	Speed: 17	Speed: 19	Speed: 11	Speed: 12	Speed: 8	Speed: 15	Speed: 22	Speed: 13	Speed: 29	
Speed: 13	Speed: 8	Speed: 7	Speed: 5	Speed: 19	Speed: 24	Speed: 25	Speed: 15	Speed: 25		→

NOTES: SIMTRAFFIC Arterial Report Results

2038 LAKE STREET ANALYSIS
LAKE STREET RAMPS ONLY

Figure 2.1
AM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 8	Speed: 9	Speed: 13	Speed: 10	Speed: 14	Speed: 14	Speed: 22	Speed: 14	Speed: 29
Speed: 17	Speed: 23	Speed: 11	Speed: 9	Speed: 22	Speed: 19	Speed: 23	Speed: 22	Speed: 26	→

2038 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 15	Speed: 17	Speed: 18	Speed: 13	Speed: 20	Speed: 14	Speed: 21	Speed: 11	Speed: 28
Speed: 15	Speed: 14	Speed: 12	Speed: 14	Speed: 23	Speed: 16	Speed: 21	Speed: 12	Speed: 23	→

2038 Lake St Ramps Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 7	Speed: 13	Speed: 14	Speed: 4	Speed: 4	Speed: 5	Speed: 3	Speed: 5
Speed: 14	Speed: 14	Speed: 21	Speed: 9	Speed: 11	Speed: 22	Speed: 22	Speed: 13	Speed: 23	→

2038 Lake St Ramps Mitigation 1:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 8	Speed: 6	Speed: 9	Speed: 7	Speed: 5	Speed: 5	Speed: 7	Speed: 6	Speed: 20
Speed: 13	Speed: 10	Speed: 16	Speed: 8	Speed: 20	Speed: 20	Speed: 21	Speed: 13	Speed: 23	→

2038 Lake St Ramps Mitigation 2:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 8	Speed: 11	Speed: 7	Speed: 5	Speed: 6	Speed: 9	Speed: 8	Speed: 25
Speed: 14	Speed: 8	Speed: 14	Speed: 11	Speed: 21	Speed: 19	Speed: 18	Speed: 11	Speed: 21	→

2038 Lake St Ramps Mitigation 3:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 10	Speed: 12	Speed: 8	Speed: 6	Speed: 7	Speed: 11	Speed: 9	Speed: 26
Speed: 15	Speed: 8	Speed: 15	Speed: 11	Speed: 21	Speed: 19	Speed: 18	Speed: 12	Speed: 22	→

2038 Lake St Ramps Mitigation 4:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 11	Speed: 9	Speed: 10	Speed: 6	Speed: 10	Speed: 14	Speed: 11	Speed: 28
Speed: 14	Speed: 8	Speed: 14	Speed: 10	Speed: 22	Speed: 22	Speed: 19	Speed: 12	Speed: 22	→

NOTES: SIMTRAFFIC Arterial Report Results

2038 LAKE STREET ANALYSIS
LAKE STREET RAMPS ONLY

Figure 2.2
PM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 19	Speed: 24	Speed: 15	Speed: 26	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29
Speed: 17	Speed: 23	Speed: 12	Speed: 20	Speed: 12	Speed: 25	Speed: 27	Speed: 11	Speed: 23	→

2038 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 16	Speed: 22	Speed: 15	Speed: 25	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29
Speed: 17	Speed: 22	Speed: 12	Speed: 20	Speed: 13	Speed: 21	Speed: 26	Speed: 11	Speed: 22	→

2038 Full Build Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 18	Speed: 16	Speed: 9	Speed: 11	Speed: **8**	Speed: 16	Speed: 25	Speed: 13	Speed: 29
Speed: 15	Speed: **7**	Speed: 9	Speed: **7**	Speed: 18	Speed: 23	Speed: 25	Speed: 15	Speed: 25	→

2038 Full Build Mitigation 1:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 18	Speed: 16	Speed: 10	Speed: 11	Speed: **8**	Speed: 17	Speed: 25	Speed: 13	Speed: 29
Speed: 19	Speed: 13	Speed: 13	Speed: 10	Speed: 20	Speed: 23	Speed: 25	Speed: 17	Speed: 25	→

2038 Full Build Mitigation 2:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 17	Speed: 12	Speed: 10	Speed: 15	Speed: 10	Speed: 17	Speed: 26	Speed: 13	Speed: 29
Speed: 19	Speed: 14	Speed: 19	Speed: 10	Speed: 19	Speed: 23	Speed: 25	Speed: 16	Speed: 25	→

2038 Full Build Mitigation 3:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 17	Speed: 12	Speed: 11	Speed: 15	Speed: 10	Speed: 17	Speed: 25	Speed: 13	Speed: 29
Speed: 17	Speed: 10	Speed: 14	Speed: **8**	Speed: 19	Speed: 23	Speed: 25	Speed: 16	Speed: 25	→

2038 Full Build Mitigation 4:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 22	Speed: 18	Speed: 9	Speed: 13	Speed: 9	Speed: 17	Speed: 25	Speed: 13	Speed: 29
Speed: 19	Speed: 14	Speed: 15	Speed: 9	Speed: 22	Speed: 24	Speed: 24	Speed: 16	Speed: 25	→

NOTES: SIMTRAFFIC Arterial Report Results

2038 LAKE STREET ANALYSIS
FULL BUILD SCENARIO

Figure 2.3
AM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 8	Speed: 9	Speed: 13	Speed: 10	Speed: 14	Speed: 14	Speed: 22	Speed: 14	Speed: 29
Speed: 17	Speed: 23	Speed: 11	Speed: 9	Speed: 22	Speed: 19	Speed: 23	Speed: 22	Speed: 26	→

2038 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 15	Speed: 17	Speed: 18	Speed: 13	Speed: 20	Speed: 14	Speed: 21	Speed: 11	Speed: 28
Speed: 15	Speed: 14	Speed: 12	Speed: 14	Speed: 23	Speed: 16	Speed: 21	Speed: 12	Speed: 23	→

2038 Full Build Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 7	Speed: 10	Speed: 7	Speed: 5	Speed: 4	Speed: 6	Speed: 4	Speed: 10
Speed: 10	Speed: 12	Speed: 18	Speed: 8	Speed: 20	Speed: 22	Speed: 22	Speed: 15	Speed: 22	→

2038 Full Build Mitigation 1:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 10	Speed: 12	Speed: 13	Speed: 5	Speed: 6	Speed: 9	Speed: 7	Speed: 25
Speed: 11	Speed: 12	Speed: 13	Speed: 8	Speed: 14	Speed: 21	Speed: 21	Speed: 14	Speed: 22	→

2038 Full Build Mitigation 2:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 9	Speed: 11	Speed: 11	Speed: 6	Speed: 8	Speed: 15	Speed: 11	Speed: 28
Speed: 11	Speed: 12	Speed: 12	Speed: 10	Speed: 12	Speed: 22	Speed: 19	Speed: 13	Speed: 22	→

2038 Full Build Mitigation 3:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 11	Speed: 17	Speed: 15	Speed: 7	Speed: 9	Speed: 16	Speed: 11	Speed: 28
Speed: 11	Speed: 12	Speed: 13	Speed: 11	Speed: 12	Speed: 23	Speed: 18	Speed: 14	Speed: 22	→

2038 Full Build Mitigation 4:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 11	Speed: 11	Speed: 8	Speed: 10	Speed: 8	Speed: 12	Speed: 17	Speed: 11	Speed: 28
Speed: 12	Speed: 9	Speed: 20	Speed: 7	Speed: 14	Speed: 20	Speed: 19	Speed: 14	Speed: 22	→

NOTES: SIMTRAFFIC Arterial Report Results

2038 LAKE STREET ANALYSIS
FULL BUILD SCENARIO

Figure 2.4
AM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 19	Speed: 24	Speed: 15	Speed: 26	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29
Speed: 17	Speed: 23	Speed: 12	Speed: 20	Speed: 12	Speed: 25	Speed: 27	Speed: 11	Speed: 23	→

2018 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 17	Speed: 23	Speed: 14	Speed: 24	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29
Speed: 17	Speed: 23	Speed: 12	Speed: 19	Speed: 12	Speed: 21	Speed: 26	Speed: 11	Speed: 23	→

2018 Lake St Ramps Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 16	Speed: 17	Speed: 14	Speed: 9	Speed: 4	Speed: 4	Speed: 8	Speed: 8	Speed: 24
Speed: 7	Speed: 4	Speed: 6	Speed: 6	Speed: 17	Speed: 25	Speed: 22	Speed: 17	Speed: 25	→

2018 Lake St Ramps Base + Mitigation 1:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 17	Speed: 17	Speed: 14	Speed: 10	Speed: 6	Speed: 10	Speed: 18	Speed: 13	Speed: 29
Speed: 17	Speed: 10	Speed: 8	Speed: 8	Speed: 21	Speed: 25	Speed: 25	Speed: 18	Speed: 25	→

2018 Lake St Ramps Base + Mitigation 2:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 18	Speed: 17	Speed: 12	Speed: 12	Speed: 9	Speed: 17	Speed: 23	Speed: 13	Speed: 29
Speed: 19	Speed: 15	Speed: 12	Speed: 9	Speed: 22	Speed: 26	Speed: 25	Speed: 19	Speed: 25	→

NOTES: SIMTRAFFIC Arterial Report Results

2018 LAKE STREET ANALYSIS
LAKE STREET RAMPS ONLY

Figure 3.1
AM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 8	Speed: 9	Speed: 13	Speed: 10	Speed: 14	Speed: 14	Speed: 22	Speed: 14	Speed: 29
Speed: 17	Speed: 23	Speed: 11	Speed: 9	Speed: 22	Speed: 19	Speed: 23	Speed: 22	Speed: 26	→

2018 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 15	Speed: 18	Speed: 18	Speed: 13	Speed: 19	Speed: 15	Speed: 21	Speed: 12	Speed: 29
Speed: 16	Speed: 15	Speed: 11	Speed: 15	Speed: 24	Speed: 19	Speed: 22	Speed: 15	Speed: 24	→

2018 Lake St Ramps Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 10	Speed: 7	Speed: 12	Speed: 10	Speed: 4	Speed: 4	Speed: 6	Speed: 4	Speed: 10
Speed: 15	Speed: 12	Speed: 19	Speed: 8	Speed: 14	Speed: 20	Speed: 18	Speed: 15	Speed: 22	→

2018 Lake St Ramps Base + Mitigation 1:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 6	Speed: 11	Speed: 17	Speed: 5	Speed: 6	Speed: 11	Speed: 9	Speed: 27
Speed: 16	Speed: 13	Speed: 20	Speed: 11	Speed: 12	Speed: 22	Speed: 20	Speed: 14	Speed: 23	→

2018 Lake St Ramps Base + Mitigation 2:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 6	Speed: 10	Speed: 15	Speed: 7	Speed: 10	Speed: 16	Speed: 12	Speed: 28
Speed: 14	Speed: 13	Speed: 21	Speed: 12	Speed: 13	Speed: 21	Speed: 21	Speed: 14	Speed: 23	→

NOTES: SIMTRAFFIC Arterial Report Results

2018 LAKE STREET ANALYSIS
LAKE STREET RAMPS ONLY

Figure 3.2
PM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 19	Speed: 24	Speed: 15	Speed: 26	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29
Speed: 17	Speed: 23	Speed: 12	Speed: 20	Speed: 12	Speed: 25	Speed: 27	Speed: 11	Speed: 23	→

2018 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 17	Speed: 23	Speed: 14	Speed: 24	Speed: 22	Speed: 15	Speed: 26	Speed: 15	Speed: 29
Speed: 17	Speed: 23	Speed: 12	Speed: 19	Speed: 12	Speed: 21	Speed: 26	Speed: 11	Speed: 23	→

2018 Full Build Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 19	Speed: 16	Speed: 10	Speed: 12	Speed: 9	Speed: 17	Speed: 26	Speed: 14	Speed: 29
Speed: 18	Speed: 14	Speed: 14	Speed: 11	Speed: 20	Speed: 22	Speed: 25	Speed: 17	Speed: 26	→

2018 Full Build Base + Mitigation 1:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 19	Speed: 16	Speed: 10	Speed: 12	Speed: 10	Speed: 18	Speed: 26	Speed: 14	Speed: 29
Speed: 19	Speed: 16	Speed: 16	Speed: 12	Speed: 22	Speed: 24	Speed: 25	Speed: 17	Speed: 26	→

2018 Full Build Base + Mitigation 2:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 19	Speed: 17	Speed: 9	Speed: 14	Speed: 11	Speed: 17	Speed: 26	Speed: 13	Speed: 29
Speed: 19	Speed: 13	Speed: 13	Speed: 10	Speed: 21	Speed: 24	Speed: 25	Speed: 18	Speed: 26	→

NOTES: SIMTRAFFIC Arterial Report Results

2018 LAKE STREET ANALYSIS
FULL BUILD SCENARIO

Figure 3.3
AM PEAK HOUR

Existing Conditions:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 8	Speed: 9	Speed: 13	Speed: 10	Speed: 14	Speed: 14	Speed: 22	Speed: 14	Speed: 29
Speed: 17	Speed: 23	Speed: 11	Speed: 9	Speed: 22	Speed: 19	Speed: 23	Speed: 22	Speed: 26	→

2018 Transit Only Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 15	Speed: 18	Speed: 18	Speed: 13	Speed: 19	Speed: 15	Speed: 21	Speed: 12	Speed: 29
Speed: 16	Speed: 15	Speed: 11	Speed: 15	Speed: 24	Speed: 19	Speed: 22	Speed: 15	Speed: 24	→

2018 Full Build Base:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 7	Speed: 11	Speed: 7	Speed: 5	Speed: 6	Speed: 10	Speed: 7	Speed: 25
Speed: 14	Speed: 14	Speed: 20	Speed: 9	Speed: 21	Speed: 22	Speed: 20	Speed: 16	Speed: 23	→

2018 Full Build Base + Mitigation 1:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 11	Speed: 11	Speed: 7	Speed: 6	Speed: 8	Speed: 13	Speed: 11	Speed: 28
Speed: 14	Speed: 14	Speed: 13	Speed: 10	Speed: 21	Speed: 23	Speed: 21	Speed: 14	Speed: 23	→

2018 Full Build Base + Mitigation 2:

	BLAISDELL	NICOLLET	1ST	STEVENS	2ND	3RD	CLINTON	4TH	5TH
←	Speed: 9	Speed: 10	Speed: 10	Speed: 7	Speed: 7	Speed: 13	Speed: 17	Speed: 11	Speed: 28
Speed: 14	Speed: 14	Speed: 12	Speed: 10	Speed: 22	Speed: 23	Speed: 20	Speed: 15	Speed: 23	→

NOTES: SIMTRAFFIC Arterial Report Results

2018 LAKE STREET ANALYSIS
FULL BUILD SCENARIO

Figure 3.4
PM PEAK HOUR

Table A1
I-35W Transit Access Project
AM Peak Hour
SEPARATE RAMP BUILDS - MOE SUMMARY

Lake Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				SB EXIT TO LAKE STREET: SB Lake Street Ramp Only Base Condition				SB EXIT TO LAKE STREET: SB Lake Street Ramp Only Mitigated Condition				SB EXIT TO LAKE STREET & 28TH EXIT: SB Lake Street Ramp 28th St Exit Base Condition				SB EXIT TO LAKE STREET & 28TH EXIT: SB Lake Street Ramp 28th St Exit Mitigated Condition				NB ENTRANCE FROM LAKE STREET: NB Lake Street Ramp Only Base Condition				NB ENTRANCE FROM LAKE STREET: NB Lake Street Ramp Only Mitigated Condition				NB ENTRANCE FROM LAKE STREET & 28TH EXIT: NB Lake Street Ramp 28th Exit Base Condition				NB ENTRANCE FROM LAKE STREET & 28TH EXIT: NB Lake Street Ramp 28th Exit Mitigated Condition			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
Lake St at Blaisdell Ave	SB	19.7	B	17.5	B	19.8	B	18.6	B	19.5	B	21.3	C	20.6	C	21.9	C	19.1	B	20.9	C	19.1	B	20.9	C	24.0	C	64.8	E	24.1	C	20.3	C	22.4	C	17.9	B	22.7	C	18.2	B
	EB	23.8	C			25.6	C			26.0	C			25.7	C			25.8	C			25.8	C			106.8	F			25.2	C			19.4	B			19.7	B		
	WB	5.7	A			7.2	A			16.1	B			16.6	B			15.3	B			15.3	B			6.6	A			6.1	A			11.3	B			11.3	B		
Lake St at Nicollet Ave	NB	18.5	B	6.1	A	35.3	D	20.4	C	17.2	B	10.9	B	14.7	B	10.9	B	17.7	B	11.1	B	17.7	B	11.1	B	70.1	E	54.0	D	30.1	C	22.0	C	20.3	C	13.3	B	21.2	C	14.3	B
	SB	31.9	C			47.0	D			31.1	C			34.9	C			30.7	C			30.7	C			67.5	E			23.1	C			40.3	D			45.9	D		
	EB	3.4	A			5.6	A			4.6	A			5.2	A			4.8	A			4.8	A			64.3	E			23.8	C			5.6	A			5.9	A		
	WB	4.3	A			7.2	A			4.8	A			4.2	A			5.0	A			5.0	A			6.6	A			7.1	A			6.6	A			6.1	A		
Lake St at 1st Ave	NB	19.0	B	12.8	B	18.3	B	12.3	B	11.7	B	11.6	B	12.3	B	10.9	B	11.7	B	11.5	B	11.7	B	11.5	B	19.6	B	43.1	D	21.0	C	26.2	C	14.2	B	12.3	B	14.0	B	12.2	B
	EB	11.4	B			10.8	B			7.0	A			5.6	A			7.2	A			7.2	A			68.2	E			32.1	C			10.3	B			10.8	B		
	WB	8.4	A			8.2	A			16.5	B			15.5	B			16.0	B			16.0	B			9.2	A			16.7	B			16.5	B			14.9	B		
Lake St at Stevens Ave	SB	36.4	D	8.2	A	34.6	C	8.4	A	32.2	C	17.8	B	23.7	C	12.8	B	23.8	C	13.5	B	23.8	C	13.5	B	47.7	D	26.9	C	52.1	D	27.9	C	36.6	D	11.6	B	37.7	D	13.2	B
	EB	4.5	A			5.1	A			5.3	A			3.3	A			4.8	A			4.8	A			28.6	C			31.0	C			6.0	A			7.8	A		
	WB	4.4	A			5.0	A			8.5	A			6.0	A			6.8	A			6.8	A			16.0	B			12.8	B			14.1	B			15.6	B		
Lake St at 2nd Ave	NB	38.4	D	21.9	C	27.4	C	15.5	B	26.9	C	11.0	B	26.9	C	14.5	B	27.5	C	10.9	B	27.5	C	10.9	B	55.1	E	51.3	D	45.9	D	38.2	D	21.4	C	20.6	C	22.3	C	23.7	C
	EB	12.0	B			10.9	B			6.0	A			8.3	A			5.4	A			5.4	A			35.7	D			43.1	D			20.3	C			20.8	C		
	WB	3.2	A			3.6	A			3.5	A			5.7	A			3.5	A			3.5	A			67.0	E			21.2	C			20.3	C			29.0	C		
Lake St at 3rd Ave	NB	21.1	C	6.2	A	22.9	C	7.2	A	24.7	C	5.8	A	22.9	C	5.4	A	23.6	C	5.6	A	23.6	C	5.6	A	50.8	D	24.0	C	18.6	B	5.5	A	19.9	B	5.2	A	31.1	C	6.2	A
	SB	20.5	C			22.8	C			24.3	C			24.2	C			23.1	C			23.1	C			56.1	E			22.1	C			23.7	C			26.1	C		
	EB	3.0	A			3.7	A			3.7	A			2.8	A			3.6	A			3.6	A			2.6	A			6.1	A			3.1	A			2.7	A		
	WB	7.9	A			7.9	A			4.6	A			4.8	A			4.4	A			4.4	A			35.4	D			3.0	A			4.0	A			5.0	A		
Lake St at Clinton Ave	NB	6.5	A	1.3	A	9.2	A	1.8	A	11.0	B	1.7	A	11.2	B	2.1	A	13.3	B	1.8	A	13.3	B	1.8	A	73.6	F	13.5	B	14.7	B	2.7	A	13.7	B	2.1	A	14.0	B	2.0	A
	SB	5.9	A			7.8	A			8.0	A			8.0	A			7.4	A			7.4	A			264.1	F			9.4	A			9.6	A			9.3	A		
	EB	0.9	A			1.4	A			1.4	A			1.6	A			1.4	A			1.4	A			2.9	A			2.5	A			1.5	A			1.4	A		
	WB	1.5	A			1.6	A			1.5	A			1.8	A			1.6	A			1.6	A			12.0	B			2.1	A			1.9	A			1.7	A		
Lake St at 4th Ave	NB	29.8	C	13.0	B	35.5	D	14.8	B	33.5	C	10.1	B	40.3	D	11.6	B	35.5	D	10.5	B	35.5	D	10.5	B	38.2	D	14.5	B	38.3	D	14.5	B	48.0	D	14.7	B	47.2	D	14.2	B
	SB	25.3	C			24.7	C			20.7	C			17.4	B			20.6	C			20.6	C			18.2	B			17.8	B			21.4	C			21.4	C		
	EB	12.7	B			13.1	B			3.6	A			3.6	A			4.0	A			4.0	A			6.8	A			7.8	A			5.5	A			5.6	A		
	WB	6.5	A			7.4	A			7.2	A			7.8	A			7.2	A			7.2	A			11.1	B			10.2	B			8.8	A			8.3	A		
Lake St at 5th Ave	NB	10.3	B	2.0	A	14.4	B	2.4	A	14.9	B	2.1	A	14.2	B	1.9	A	16.2	C	2.1	A	16.2	C	2.1	A	18.3	C	2.4	A	19.2	C	2.5	A	14.6	B	2.3	A	13.7	B	2.1	A
	SB	8.8	A			11.0	B			10.4	B			10.6	B			8.7	A			8.7	A			11.5	B			12.4	B			12.7	B			11.0	B		
	EB	2.4	A			2.6	A			1.5	A			1.4	A			1.4	A			1.4	A			1.8	A			1.8	A			1.6	A			1.3	A		
	WB	1.0	A			1.2	A			1.4	A			1.2	A			1.4	A			1.4	A			1.6	A			1.5	A			1.7	A			1.6	A		

31st Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				SB EXIT TO LAKE STREET: SB Lake Street Ramp Only Base Condition				SB EXIT TO LAKE STREET: SB Lake Street Ramp Only Mitigated Condition				SB EXIT TO LAKE STREET & 28TH EXIT: SB Lake Street Ramp 28th St Exit Base Condition				SB EXIT TO LAKE STREET & 28TH EXIT: SB Lake Street Ramp 28th St Exit Mitigated Condition				NB ENTRANCE FROM LAKE STREET: NB Lake Street Ramp Only Base Condition				NB ENTRANCE FROM LAKE STREET: NB Lake Street Ramp Only Mitigated Condition				NB ENTRANCE FROM LAKE STREET & 28TH EXIT: NB Lake Street Ramp 28th Exit Base Condition				NB ENTRANCE FROM LAKE STREET & 28TH EXIT: NB Lake Street Ramp 28th Exit Mitigated Condition			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
29th St at Nicollet Ave	NB	2.6	A	2.0	A	2.5	A	3.0	A	1.9	A	2.4	A	1.9	A	2.7	A	1.9	A	2.4	A	1.9	A	2.4	A	2.4	A	3.0	A	2.3	A	3.1	A	2.3	A	2.7	A	2.4	A	2.7	A
	SB	0.7	A			1.7	A			1.4	A			1.5	A			1.3	A			1.3	A			1.4	A			1.5	A			1.4	A			1.3	A		
	WB	2.5	A			11.6	B			9.2	A			10.3	B			9.5	A			9.5	A			10.4	B			11.2	B			9.5	A			9.6	A		
31st St at Nicollet Ave	NB	18.9	B	14.8	B	27.8	C	22.5	C	25.4	C	20.1	C	27.1	C	20.9	C	27.2	C	20.6	C	27.2	C	20.6	C	161.3	F	65.0	E	25.7	C	20.6	C	24.7	C	21.4	C	24.8	C	21.7	C
	SB	4.8	A			22.9	C			10.5	B			12.5	B			9.2	A			9.2	A			14.8	B			16.2	B			12.0	B			12.9	B		
	EB	17.0	B			21.6	C			20.8	C			19.8	B			21.2	C			21.2	C			29.2	C			20.6	C			21.2	C			21.5	C		
	WB	10.3	B			13.1	B			18.6	B			18.9	B			18.8	B			18.8	B			19.8	B			16.2	B			24.2	C			24.2	C		
31st St at 1st Ave	NB	17.9	B	22.0	C	17.3	B	21.8	C	16.7	B	12.3	B	17.2	B	12.8	B	17.2	B	12.3	B	17.2	B	12.3	B	17.4	B	13.7	B	17.2	B	13.6	B	17.9	B	13.0	B	17.0	B	14.5	B
	EB	24.3	C			28.4	C			5.5	A			5.5	A			5.5	A			5.5	A			5.8	A			6.9	A			5.5	A			5.5	A		
	WB	23.0	C			17.1	B			17.3	B			18.4	B			17.2	B			17.2	B			20.8	C			19.2	B			19.2	B			24.1	C		
31st St at Stevens Ave	SB	33.1	C	19.1	B	31.5	C	17.2	B	28.0	C	17.6	B	28.4	C	17.9	B	29.6	C	18.1	B	29.6	C	18.1	B	30.1	C	13.1	B	23.8	C	11.6	B	27.5	C	15.7	B	26.2	C	17.3	B
	EB	9.6	A			5.6	A			11.6	B			10.6	B			11.0	B			11.0	B			2.9	A			3.3	A			4.2	A			6.3	A		
	WB	13.4	B			11.7	B			8.2	A			9.9	A			8.0	A			8.0	A			6.7	A			7.6	A			14.5	B			19.2	B		
31st St at 2nd Ave	NB	23.6	C	20.9	C	25.8	C	18.8	B	25.6	C	16.5	B	25.4	C	18.0	B	26.0	C	16.7	B	26.0	C	16.7	B	24.5	C	17.1	B	25.0	C	17.6	B	26.5	C	15.4	B	26.5	C	15.6	B
	EB	20.9	C			6.8	A			5.3	A			6.6	A			5.4	A			5.4	A			7.0	A			6.9	A			5.3	A			6.3	A		
	WB	10.7	B			9.0	A			7.7	A			8.6	A			7.0	A			7.0	A			9.5	A			9.8	A			6.3	A			6.3	A		

Table A2
I-35W Transit Access Project
PM Peak Hour
SEPARATE RAMP BUILDS - MOE SUMMARY

Lake Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				SB EXIT TO LAKE STREET: SB Lake Street Ramp Only Base Condition				SB EXIT TO LAKE STREET: SB Lake Street Ramp Only Mitigated Condition				SB EXIT TO LAKE STREET & 28TH EXIT: SB Lake Street Ramp 28th St Exit Base Condition				SB EXIT TO LAKE STREET & 28TH EXIT: SB Lake Street Ramp 28th St Exit Mitigated Condition				NB ENTRANCE FROM LAKE STREET: NB Lake Street Ramp Only Base Condition				NB ENTRANCE FROM LAKE STREET: NB Lake Street Ramp Only Mitigated Condition				NB ENTRANCE FROM LAKE STREET & 28TH EXIT: NB Lake Street Ramp 28th Exit Base Condition				NB ENTRANCE FROM LAKE STREET & 28TH EXIT: NB Lake Street Ramp 28th Exit Mitigated Condition			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
Lake St at Blaisdell Ave	SB	36.3	D	29.7	C	29.2	C	23.7	C	30.7	C	27.8	C	34.5	C	31.1	C	30.7	C	27.8	C	27.5	C	27.1	C	36.4	D	43.6	D	36.0	D	30.8	C	30.4	C	29.3	C	29.7	C	32.4	C
	EB	25.2	C			32.0	C			33.6	C			41.3	D			33.6	C			33.7	C			81.4	F			42.4	D			45.2	D			55.7	E		
	WB	25.1	C			12.3	B			21.6	C			21.6	C			21.6	C			22.7	C			13.9	B			13.5	B			12.3	B			13.9	B		
Lake St at Nicollet Ave	NB	46.1	D	17.6	B	31.3	C	26.6	C	27.0	C	21.5	C	29.3	C	27.9	C	27.0	C	21.5	C	22.7	C	21.5	C	34.6	C	25.1	C	34.1	C	23.4	C	29.7	C	20.9	C	30.5	C	23.2	C
	SB	36.3	D			62.4	E			50.8	D			63.6	E			50.8	D			51.0	D			63.1	E			58.3	E			42.5	D			54.1	D		
	EB	4.5	A			18.3	B			13.4	B			27.4	C			13.4	B			15.6	B			12.9	B			11.3	B			15.6	B			15.5	B		
	WB	16.7	B			9.0	A			10.3	B			10.1	B			10.3	B			10.8	B			5.5	A			8.1	A			7.8	A			8.3	A		
Lake St at 1st Ave	NB	26.1	C	14.3	B	29.2	C	12.5	B	22.6	C	17.2	B	20.6	C	17.2	B	22.6	C	17.2	B	22.1	C	19.3	B	26.2	C	16.7	B	23.2	C	14.5	B	27.7	C	15.3	B	27.2	C	15.0	B
	EB	11.8	B			10.3	B			12.2	B			10.6	B			12.2	B			12.6	B			18.1	B			15.1	B			14.6	B			13.8	B		
	WB	10.2	B			6.4	A			18.7	B			19.7	B			18.7	B			22.5	C			10.3	B			9.9	A			10.4	B			10.8	B		
Lake St at Stevens Ave	SB	37.1	D	20.7	C	39.8	D	17.0	B	73.5	E	36.8	D	42.5	D	25.3	C	73.5	E	36.8	D	34.9	C	22.1	C	182.5	F	57.5	E	39.2	D	26.1	C	138.7	F	39.9	D	51.9	D	25.2	C
	EB	16.3	B			10.6	B			17.3	B			15.3	B			17.3	B			16.1	B			63.8	E			25.1	C			28.8	C			19.3	B		
	WB	19.6	B			15.8	B			14.1	B			15.2	B			14.1	B			13.8	B			24.4	C			24.4	C			23.0	C			23.2	C		
Lake St at 2nd Ave	NB	16.2	B	9.9	A	26.1	C	9.4	A	15.5	B	11.1	B	20.4	C	11.0	B	15.5	B	11.1	B	18.6	B	8.7	A	48.6	D	42.8	D	36.7	D	32.2	C	16.7	B	31.8	C	17.9	B	22.2	C
	EB	3.8	A			4.1	A			9.1	A			8.7	A			9.1	A			6.7	A			32.1	C			28.9	C			27.6	C			26.4	C		
	WB	9.9	A			4.6	A			11.0	B			7.7	A			11.0	B			6.2	A			48.6	D			32.3	C			41.0	D			20.7	C		
Lake St at 3rd Ave	NB	23.4	C	9.8	A	22.2	C	9.9	A	25.2	C	10.0	B	23.4	C	8.0	A	25.2	C	10.0	B	23.4	C	8.0	A	43.8	D	35.2	D	24.4	C	19.2	B	23.4	C	28.7	C	24.3	C	9.6	A
	SB	25.0	C			32.0	C			25.4	C			26.5	C			25.4	C			24.8	C			72.3	E			32.4	C			39.9	D			32.1	C		
	EB	5.0	A			6.9	A			8.2	A			4.3	A			8.2	A			4.5	A			3.0	A			3.0	A			3.1	A			2.7	A		
	WB	10.8	B			8.9	A			9.2	A			8.5	A			9.2	A			8.2	A			51.8	D			27.2	C			42.5	D			10.5	B		
Lake St at Clinton Ave	NB	20.3	C	3.5	A	38.1	E	6.2	A	58.5	F	8.7	A	63.8	F	12.2	B	58.5	F	8.7	A	39.7	E	6.8	A	935.9	F	108.2	F	205.2	F	42.0	E	368.4	F	69.8	F	36.1	E	11.2	B
	SB	16.8	C			40.4	E			72.0	F			137.0	F			72.0	F			51.1	F			5221.3	F			777.2	F			2521.8	F			132.7	F		
	EB	2.5	A			4.6	A			5.0	A			5.0	A			5.0	A			4.4	A			2.0	A			3.0	A			2.9	A			4.0	A		
	WB	2.7	A			3.5	A			3.7	A			4.6	A			3.7	A			3.8	A			26.4	D			10.7	B			23.7	C			4.5	A		
Lake St at 4th Ave	NB	27.4	C	27.6	C	30.3	C	15.3	B	31.1	C	13.9	B	34.8	C	13.7	B	31.1	C	13.9	B	36.7	D	14.1	B	41.0	D	43.7	D	45.0	D	20.8	C	37.8	D	40.4	D	33.9	C	16.4	B
	SB	135.1	F			25.1	C			28.6	C			27.9	C			28.6	C			30.2	C			46.5	D			43.7	D			53.1	D			33.2	C		
	EB	3.4	A			10.9	B			7.5	A			7.2	A			7.5	A			7.1	A			7.2	A			9.0	A			8.2	A			8.4	A		
	WB	8.7	A			13.3	B			11.7	B			11.4	B			11.7	B			11.1	B			73.3	E			16.7	B			57.5	E			13.2	B		
Lake St at 5th Ave	NB	9.7	A	2.4	A	22.6	C	4.2	A	20.9	C	5.5	A	18.9	C	4.3	A	20.9	C	5.5	A	33.1	D	5.5	A	416.8	F	146.3	F	25.1	D	5.6	A	132.9	F	36.5	E	26.0	D	4.8	A
	SB	11.2	B			22.8	C			44.6	E			22.9	C			44.6	E			39.6	E			3709.9	F			36.9	E			443.4	F			31.8	D		
	EB	1.6	A			2.4	A			3.0	A			2.6	A			3.0	A			2.6	A			3.1	A			2.4	A			2.3	A			2.1	A		
	WB	2.1	A			2.9	A			3.3	A			3.1	A			3.3	A			3.2	A			168.6	F			3.5	A			30.3	D			3.3	A		

31st Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				SB EXIT TO LAKE STREET: SB Lake Street Ramp Only Base Condition				SB EXIT TO LAKE STREET: SB Lake Street Ramp Only Mitigated Condition				SB EXIT TO LAKE STREET & 28TH EXIT: SB Lake Street Ramp 28th St Exit Base Condition				SB EXIT TO LAKE STREET & 28TH EXIT: SB Lake Street Ramp 28th St Exit Mitigated Condition				NB ENTRANCE FROM LAKE STREET: NB Lake Street Ramp Only Base Condition				NB ENTRANCE FROM LAKE STREET: NB Lake Street Ramp Only Mitigated Condition				NB ENTRANCE FROM LAKE STREET & 28TH EXIT: NB Lake Street Ramp 28th Exit Base Condition				NB ENTRANCE FROM LAKE STREET & 28TH EXIT: NB Lake Street Ramp 28th Exit Mitigated Condition			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
29th St at Nicollet Ave	NB	4.8	A	2.2	A	2.5	A	4.2	A	1.8	A	3.7	A	2.0	A	4.1	A	1.8	A	3.7	A	2.0	A	3.4	A	2.4	A	5.4	A	2.3	A	3.7	A	2.2	A	3.7	A	2.3	A	3.7	A
	SB	1.1	A			2.9	A			2.3	A			2.7	A			2.3	A			1.9	A			4.0	A			2.0	A			1.9	A			2.2	A		
	WB	3.0	A			15.7	C			14.9	B			15.4	C			14.9	B			13.8	B			19.9	C			14.7	B			14.7	B			14.9	B		
31st St at Nicollet Ave	NB	29.5	C	17.1	B	24.7	C	23.6	C	22.8	C	23.8	C	20.9	C	24.7	C	22.8	C	23.8	C	22.1	C	26.8	C	22.3	C	23.9	C	21.9	C	26.4	C	22.0	C	25.1	C	23.4	C	27.0	C
	SB	16.0	B			19.1	B			18.7	B			20.7	C			18.7	B			21.9	C			16.1	B			17.7	B			12.6	B			12.7	B		
	EB	15.9	B			33.0	C			36.4	D			30.5	C			36.4	D			37.3	D			30.7	C			29.4	C			37.7	D			43.4	D		
	WB	9.6	A			20.0	C			18.2	B			25.3	C			18.2	B			24.3	C			25.1	C			32.7	C			25.8	C			26.1	C		
31st St at 1st Ave	NB	28.7	C	22.4	C	28.3	C	10.7	B	27.5	C	11.8	B	29.4	C	11.9	B	27.5	C	11.8	B	28.2	C	11.4	B	29.7	C	11.3	B	29.1	C	12.5	B	27.5	C	12.3	B	28.0	C	12.2	B
	EB	7.4	A			7.4	A			6.5	A			6.8	A			6.5	A			7.4	A			6.7	A			7.0	A			6.8	A			7.2	A		
	WB	30.5	C			6.6	A			11.2	B			9.7	A			11.2	B			9.5	A			7.2	A			10.0	B			11.1	B			10.5	B		
31st St at Stevens Ave	SB	39.1	D	43.7	D	35.2	D	46.4	D	29.0	C	26.1	C	32.6	C	26.3	C	29.0	C	26.1	C	33.0	C	26.9	C	39.7	D	42.6	D	30.4	C	25.1	C	28.3	C	24.8	C	30.5	C	27.0	C
	EB	17.4	B			14.5	B			23.3	C			13.2	B			23.3	C			13.7	B			15.0	B			9.4	A			11.9	B			13.2	B		
	WB	61.1	E			72.6	E			24.8	C			27.4	C			24.8	C			28.2	C			59.5	E			29.8	C			28.9	C			31.6	C		
31st St at 2nd Ave	NB	23.4	C	77.0	E	198.9	F	115.1	F	24.3	C	17.0	B	23.6	C	18.5	B	24.3	C	17.0	B	25.0	C	17.9	B	208.3	F	113.6	F	25.4	C	22.0	C	23.5	C	21.5	C	23.5	C	22.4	C
	EB	22.6	C			27.8	C			10.3	B			11.0	B			10.3	B			9.2	A			35.4	D			14.4	B			23.2	C			24.0	C		
	WB	198.9	F			67.1	E			13.3	B			16.8	B			13.3	B			16.1	B			49.6	D			22.0	C			18.6	B			20.3	C		

Table A3
I-35W Transit Access Project
AM Peak Hour - 2038 Forecast
LAKE ST ONLY AND FULL BUILD - MOE SUMMARY

Lake Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				LAKE STREET RAMPS ONLY SCENARIO: Lake Ramps Only Base Conditions				Lake Ramps Only Mitigated Ver. 1				Lake Ramps Only Mitigated Ver. 2				Lake Ramps Only Mitigated Ver. 3				FULL BUILD RAMP SCENARIO: Full Build Base Conditions				Full Build Mitigated Ver. 1				Full Build Mitigated Ver. 2				Full Build Mitigated Ver. 3			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
Lake St at Blaisdell Ave	SB	19.7	B	17.5	B	19.8	B	18.6	B	25.3	C	86.2	F	24.0	C	43.4	D	23.7	C	20.9	C	23.8	C	24.1	C	25.5	C	22.8	C	25.4	C	16.8	B	24.7	C	17.2	B	24.3	C	18.9	B
	EB	23.8	C			25.6	C			154.5	F			71.0	E			26.8	C			33.2	C			31.2	C			19.7	B			20.1	C			23.7	C		
	WB	5.7	A			7.2	A			7.8	A			8.1	A			8.7	A			8.0	A			6.5	A			5.8	A			7.3	A			6.9	A		
Lake St at Nicollet Ave	NB	18.5	B	6.1	A	35.3	D	20.4	C	32.0	C	77.3	E	42.5	D	41.1	D	38.3	D	30.8	C	39.9	D	32.9	C	29.6	C	42.2	D	43.9	D	20.4	C	44.8	D	20.8	C	47.9	D	29.0	C
	SB	31.9	C			47.0	D			110.9	F			54.8	D			30.8	C			31.7	C			22.1	C			24.5	C			23.5	C			25.8	C		
	EB	3.4	A			5.6	A			138.3	F			56.3	E			39.8	D			43.5	D			72.3	E			15.0	B			14.0	B			30.7	C		
	WB	4.3	A			7.2	A			7.3	A			8.0	A			8.9	A			8.6	A			9.9	A			9.7	A			12.5	B			13.2	B		
Lake St at 1st Ave	NB	19.0	B	12.8	B	18.3	B	12.3	B	17.6	B	34.3	C	17.1	B	23.7	C	17.7	B	20.6	C	17.4	B	17.5	B	17.4	B	17.1	B	18.1	B	12.9	B	13.7	B	10.2	B	15.0	B	11.6	B
	EB	11.4	B			10.8	B			58.2	E			35.5	D			25.8	C			21.0	C			17.5	B			10.3	B			6.0	A			9.9	A		
	WB	8.4	A			8.2	A			9.5	A			10.4	B			14.3	B			12.2	B			16.2	B			14.6	B			15.4	B			12.6	B		
Lake St at Stevens Ave	SB	36.4	D	8.2	A	34.6	C	8.4	A	37.0	D	31.5	C	29.2	C	26.0	C	29.0	C	24.5	C	26.5	C	22.2	C	162.2	F	72.5	E	30.2	C	21.1	C	25.4	C	18.1	B	28.0	C	21.2	C
	EB	4.5	A			5.1	A			32.1	C			27.7	C			26.2	C			22.9	C			27.2	C			16.3	B			15.6	B			20.4	C		
	WB	4.4	A			5.0	A			20.2	C			16.8	B			12.7	B			13.5	B			16.1	B			14.4	B			10.8	B			10.4	B		
Lake St at 2nd Ave	NB	38.4	D	21.9	C	27.4	C	15.5	B	141.7	F	83.7	F	48.7	D	39.7	D	51.9	D	36.2	D	56.9	E	37.9	D	25.7	C	27.6	C	25.0	C	25.6	C	26.6	C	23.5	C	27.5	C	24.0	C
	EB	12.0	B			10.9	B			35.0	D			30.6	C			30.2	C			29.3	C			30.2	C			26.7	C			25.3	C			26.4	C		
	WB	3.2	A			3.6	A			87.0	F			43.5	D			25.6	C			27.1	C			24.8	C			24.0	C			17.8	B			17.0	B		
Lake St at 3rd Ave	NB	21.1	C	6.2	A	22.9	C	7.2	A	115.0	F	44.9	D	22.6	C	12.3	B	23.6	C	6.1	A	25.9	C	6.0	A	23.3	C	6.7	A	23.5	C	6.1	A	26.3	C	6.2	A	21.9	C	5.9	A
	SB	20.5	C			22.8	C			112.9	F			24.4	C			22.6	C			25.3	C			26.3	C			27.9	C			28.7	C			28.7	C		
	EB	3.0	A			3.7	A			5.3	A			2.9	A			2.7	A			2.8	A			3.0	A			2.9	A			2.9	A			2.9	A		
	WB	7.9	A			7.9	A			80.6	F			20.8	C			7.0	A			6.6	A			7.6	A			6.5	A			6.2	A			6.0	A		
Lake St at Clinton Ave	NB	6.5	A	1.3	A	9.2	A	1.8	A	1079.9	F	48.9	E	59.5	F	8.2	A	16.8	C	3.1	A	18.9	C	2.9	A	17.8	C	2.5	A	20.1	C	2.6	A	16.9	C	2.5	A	15.7	C	2.5	A
	SB	5.9	A			7.8	A			1026.7	F			61.6	F			15.7	C			14.8	B			13.0	B			12.9	B			11.9	B			14.3	B		
	EB	0.9	A			1.4	A			9.6	A			3.5	A			2.2	A			2.2	A			1.9	A			2.0	A			2.0	A			1.8	A		
	WB	1.5	A			1.6	A			58.6	F			8.9	A			2.8	A			2.5	A			2.0	A			2.1	A			2.0	A			2.1	A		
Lake St at 4th Ave	NB	29.8	C	13.0	B	35.5	D	14.8	B	64.5	E	44.6	D	33.1	C	13.3	B	32.2	C	12.7	B	35.5	D	13.3	B	32.0	C	12.3	B	33.1	C	11.6	B	31.3	C	12.2	B	30.8	C	12.0	B
	SB	25.3	C			24.7	C			32.1	C			19.0	B			19.2	B			17.7	B			19.0	B			19.3	B			20.6	C			20.1	C		
	EB	12.7	B			13.1	B			7.7	A			7.7	A			7.6	A			8.0	A			7.2	A			5.9	A			6.6	A			6.6	A		
	WB	6.5	A			7.4	A			77.8	E			12.0	B			11.0	B			11.3	B			9.8	A			9.6	A			10.4	B			10.4	B		
Lake St at 5th Ave	NB	10.3	B	2.0	A	14.4	B	2.4	A	286.5	F	35.2	E	17.8	C	2.6	A	17.6	C	2.4	A	20.3	C	2.7	A	21.2	C	2.4	A	21.9	C	2.6	A	19.3	C	2.4	A	24.0	C	2.8	A
	SB	8.8	A			11.0	B			230.2	F			14.9	B			12.0	B			13.2	B			12.5	B			15.3	C			12.0	B			17.3	C		
	EB	2.4	A			2.6	A			3.2	A			2.0	A			1.8	A			2.1	A			1.7	A			1.8	A			1.7	A			1.9	A		
	WB	1.0	A			1.2	A			52.7	F			1.7	A			1.8	A			1.8	A			1.5	A			1.6	A			1.7	A			1.6	A		

31st Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				LAKE STREET RAMPS ONLY SCENARIO: Lake Ramps Only Base Conditions				Lake Ramps Only Mitigated Ver. 1				Lake Ramps Only Mitigated Ver. 2				Lake Ramps Only Mitigated Ver. 3				FULL BUILD RAMP SCENARIO: Full Build Base Conditions				Full Build Mitigated Ver. 1				Full Build Mitigated Ver. 2				Full Build Mitigated Ver. 3			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
29th St at Nicollet Ave	NB	2.6	A	2.0	A	2.5	A	3.0	A	2.3	A	4.1	A	2.5	A	2.9	A	2.6	A	2.9	A	2.7	A	3.0	A	2.7	A	3.1	A	2.4	A	2.8	A	2.6	A	3.1	A	2.2	A	2.6	A
	SB	0.7	A			1.7	A			4.7	A			1.5	A			1.4	A			1.5	A			1.5	A			1.5	A			1.6	A			1.5	A		
	WB	2.5	A			11.6	B			12.1	B			10.9	B			10.4	B			10.2	B			11.6	B			10.4	B			11.6	B			9.8	A		
31st St at Nicollet Ave	NB	18.9	B	14.8	B	27.8	C	22.5	C	26.1	C	20.5	C	24.7	C	20.5	C	26.3	C	21.5	C	27.8	C	21.7	C	26.4	C	22.0	C	24.2	C	21.5	C	26.1	C	21.9	C	26.4	C	21.9	C
	SB	4.8	A			22.9	C			14.2	B			12.5	B			13.5	B			12.2	B			13.4	B			11.6	B			12.2	B			12.3	B		
	EB	17.0	B			21.6	C			22.9	C			23.1	C			21.7	C			21.5	C			22.1	C			23.3	C			22.7	C			22.0	C		
	WB	10.3	B			13.1	B			12.4	B			17.2	B			21.1	C			20.7	C			22.6	C			23.3	C			22.7	C			23.6	C		
31st St at 1st Ave	NB	17.9	B	22.0	C	17.3	B	21.8	C	29.4	C	16.8	B	28.4	C	15.8	B	30.2	C	14.4	B	29.3	C	13.9	B	28.6	C	11.9	B	28.9	C	11.8	B	29.0	C	11.5	B	28.4	C	11.8	B
	EB	24.3	C			28.4	C			4.3	A			4.1	A			3.8	A			3.4	A			3.8	A			3.6	A			3.9	A			3.8	A		
	WB	23.0	C			17.1	B			22.4	C			20.3	C			15.3	B			14.8	B			11.5	B			10.6	B			10.2	B			10.8	B		
31st St at Stevens Ave	SB	33.1	C	19.1	B	31.5	C	17.2	B	21.1	C	14.3	B	15.6	B	12.5	B	18.3	B	13.8	B	16.2	B	13.1	B	20.2	C	15.1	B	16.9	B	14.6	B	16.4	B	14.2	B	16.0	B	14.2	B
	EB	9.6	A			5.6	A			11.2	B			12.2	B			12.7	B			13.0	B			12.1	B			12.9	B			12.4	B			12.5	B		
	WB	13.4	B			11.7	B			7.7	A			8.3	A			8.6	A			8.5	A			11.6	B			13.3	B			13.3	B			13.5	B		
31st St at 2nd Ave	NB	23.6	C	20.9	C	25.8	C	18.8	B	39.5	D	28.6	C	24.9	C	17.2	B	25.1	C	17.5	B	25.5	C	17.6	B	26.3	C	16.2	B	25.6	C	16.3	B	26.0	C	16.5	B	25.7	C	16.3	B
	EB	20.9	C			6.8	A			15.2	B			7.9	A			7.8	A			8.5	A			6.4	A			6.7	A			6.6	A			7.0	A		
	WB	10.7	B			9.0	A			17.2	B			9.0	A			9.7	A			8.7	A			7.4	A			7.9	A			7.9	A			7.7	A		

Table A4
I-35W Transit Access Project
PM Peak Hour - 2038 Forecast
LAKE ST ONLY AND FULL BUILD - MOE SUMMARY

Lake Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				LAKE STREET RAMPS ONLY SCENARIO: Lake Ramps Only Base Conditions				Lake Ramps Only Mitigated Ver. 1				Lake Ramps Only Mitigated Ver. 2				Lake Ramps Only Mitigated Ver. 3				FULL BUILD RAMP SCENARIO: Full Build Base Conditions				Full Build Mitigated Ver. 1				Full Build Mitigated Ver. 2				Full Build Mitigated Ver. 3			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
Lake St at Blaisdell Ave	SB	36.3	D	29.7	C	29.2	C	23.7	C	48.1	D	36.7	D	33.1	C	32.7	C	51.8	D	36.9	D	46.3	D	33.7	C	33.4	C	37.9	D	33.2	C	35.3	D	32.5	C	36.9	D	32.8	C	36.7	D
	EB	25.2	C			32.0	C			39.8	D			41.6	D			36.2	D			33.5	C			62.0	E			54.5	D			58.0	E			57.0	E		
	WB	25.1	C			12.3	B			24.3	C			26.2	C			24.7	C			23.0	C			23.7	C			22.6	C			25.3	C			25.5	C		
Lake St at Nicollet Ave	NB	46.1	D	17.6	B	31.3	C	26.6	C	32.5	C	27.6	C	50.4	D	33.8	C	45.9	D	40.2	D	46.7	D	32.9	C	30.6	C	26.0	C	34.0	C	29.4	C	36.7	D	25.2	C	42.1	D	25.9	C
	SB	36.3	D			62.4	E			45.6	D			50.6	D			90.4	F			58.3	E			35.7	D			70.2	E			41.0	D			47.6	D		
	EB	4.5	A			18.3	B			16.7	B			22.1	C			29.0	C			28.7	C			19.1	B			18.6	B			19.5	B			18.7	B		
	WB	16.7	B			9.0	A			26.0	C			29.2	C			20.0	C			17.4	B			25.4	C			15.9	B			18.2	B			15.3	B		
Lake St at 1st Ave	NB	26.1	C	14.3	B	29.2	C	12.5	B	18.4	B	13.5	B	24.3	C	18.4	B	20.4	C	15.3	B	19.6	B	13.1	B	19.2	B	15.3	B	23.8	C	16.8	B	23.7	C	17.3	B	24.5	C	13.2	B
	EB	11.8	B			10.3	B			7.7	A			12.2	B			10.0	B			10.0	B			10.3	B			12.9	B			13.9	B			12.7	B		
	WB	10.2	B			6.4	A			16.9	B			21.3	C			18.0	B			13.4	B			18.7	B			18.1	B			18.4	B			10.1	B		
Lake St at Stevens Ave	SB	37.1	D	20.7	C	39.8	D	17.0	B	50.4	D	31.4	C	41.5	D	31.8	C	32.8	C	27.0	C	29.0	C	24.4	C	39.6	D	29.0	C	34.3	C	25.0	C	34.8	C	22.3	C	28.4	C	18.2	B
	EB	16.3	B			10.6	B			19.6	B			23.7	C			15.3	B			14.6	B			23.0	C			22.8	C			17.2	B			16.0	B		
	WB	19.6	B			15.8	B			22.4	C			29.5	C			31.6	C			28.5	C			24.2	C			18.2	B			15.4	B			11.0	B		
Lake St at 2nd Ave	NB	16.2	B	9.9	A	26.1	C	9.4	A	49.5	D	37.8	D	25.1	C	31.5	C	21.8	C	26.9	C	23.4	C	25.5	C	18.3	B	30.3	C	31.3	C	28.6	C	19.4	B	18.7	B	19.0	B	17.3	B
	EB	3.8	A			4.1	A			23.3	C			30.4	C			24.9	C			23.8	C			22.3	C			19.1	B			10.7	B			9.6	A		
	WB	9.9	A			4.6	A			47.0	D			36.4	D			31.9	C			28.3	C			43.8	D			37.4	D			26.1	C			24.3	C		
Lake St at 3rd Ave	NB	23.4	C	9.8	A	22.2	C	9.9	A	22.9	C	27.5	C	23.5	C	23.7	C	24.4	C	19.4	B	24.1	C	16.4	B	24.0	C	25.9	C	22.1	C	19.9	B	26.8	C	14.5	B	23.2	C	12.6	B
	SB	25.0	C			32.0	C			36.2	D			35.4	D			31.7	C			31.4	C			31.2	C			35.6	D			29.4	C			27.3	C		
	EB	5.0	A			6.9	A			3.6	A			4.2	A			4.7	A			4.8	A			4.0	A			3.6	A			4.5	A			4.0	A		
	WB	10.8	B			8.9	A			50.1	D			38.5	D			30.0	C			24.2	C			44.3	D			31.5	C			20.1	C			17.2	B		
Lake St at Clinton Ave	NB	20.3	C	3.5	A	38.1	E	6.2	A	6166.5	F	97.5	F	1607.4	F	74.5	F	1545.8	F	69.7	F	441.2	F	68.4	F	1660.1	F	91.0	F	779.3	F	43.2	E	154.4	F	27.3	D	122.5	F	16.2	C
	SB	16.8	C			40.4	E			10121.7	F			3475.8	F			2005.8	F			1967.9	F			6034.3	F			891.3	F			488.4	F			170.3	F		
	EB	2.5	A			4.6	A			3.6	A			4.3	A			6.2	A			6.9	A			4.0	A			4.2	A			6.4	A			6.3	A		
	WB	2.7	A			3.5	A			32.7	D			22.1	C			16.0	C			12.1	B			27.2	D			15.6	C			7.1	A			6.5	A		
Lake St at 4th Ave	NB	27.4	C	27.6	C	30.3	C	15.3	B	36.5	D	52.8	D	36.2	D	38.9	D	40.3	D	28.7	C	41.0	D	21.5	C	38.0	D	38.6	D	34.8	C	21.4	C	33.5	C	15.3	B	35.1	D	15.0	B
	SB	135.1	F			25.1	C			155.8	F			141.5	F			85.7	F			53.8	D			70.8	E			34.2	C			30.5	C			30.6	C		
	EB	3.4	A			10.9	B			8.9	A			9.2	A			13.0	B			11.3	B			6.9	A			8.3	A			8.8	A			8.3	A		
	WB	8.7	A			13.3	B			60.1	E			30.1	C			21.8	C			17.6	B			55.3	E			26.4	C			13.0	B			12.8	B		
Lake St at 5th Ave	NB	9.7	A	2.4	A	22.6	C	4.2	A	1096.6	F	150.1	F	86.9	F	23.3	C	48.6	E	15.2	C	57.5	F	11.9	B	394.0	F	84.4	F	65.2	F	15.7	C	29.7	D	5.2	A	25.9	D	5.5	A
	SB	11.2	B			22.8	C			5637.5	F			253.8	F			185.9	F			131.7	F			1186.9	F			234.7	F			37.0	E			42.0	E		
	EB	1.6	A			2.4	A			2.7	A			2.8	A			3.5	A			3.4	A			2.7	A			2.9	A			3.1	A			2.7	A		
	WB	2.1	A			2.9	A			193.3	F			18.6	C			8.6	A			6.3	A			83.8	F			8.2	A			3.2	A			3.2	A		

31st Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				LAKE STREET RAMPS ONLY SCENARIO: Lake Ramps Only Base Conditions				Lake Ramps Only Mitigated Ver. 1				Lake Ramps Only Mitigated Ver. 2				Lake Ramps Only Mitigated Ver. 3				FULL BUILD RAMP SCENARIO: Full Build Base Conditions				Full Build Mitigated Ver. 1				Full Build Mitigated Ver. 2				Full Build Mitigated Ver. 3			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
29th St at Nicollet Ave	NB	4.8	A	2.2	A	2.5	A	4.2	A	2.2	A	3.6	A	1.9	A	3.7	A	2.1	A	8.8	A	2.1	A	3.9	A	2.2	A	3.4	A	1.9	A	8.1	A	2.0	A	3.4	A	2.2	A	3.7	A
	SB	1.1	A			2.9	A			2.1	A			2.1	A			7.7	A			2.2	A			1.7	A			5.0	A			1.9	A			2.0	A		
	WB	3.0	A			15.7	C			15.4	C			15.7	C			34.3	D			17.1	C			14.5	B			39.4	E			13.7	B			15.3	C		
31st St at Nicollet Ave	NB	29.5	C	17.1	B	24.7	C	23.6	C	22.1	C	23.7	C	24.4	C	23.3	C	22.1	C	23.4	C	24.8	C	23.9	C	22.4	C	25.1	C	23.0	C	28.6	C	23.1	C	28.6	C	22.4	C	29.4	C
	SB	16.0	B			19.1	B			14.6	B			14.5	B			14.3	B			14.0	B			13.8	B			15.7	B			15.1	B			14.5	B		
	EB	15.9	B			33.0	C			32.5	C			34.7	C			38.0	D			32.7	C			34.6	C			53.9	D			51.2	D			53.9	D		
	WB	9.6	A			20.0	C			24.5	C			20.9	C			20.0	C			24.4	C			27.7	C			21.0	C			24.2	C			24.9	C		
31st St at 1st Ave	NB	28.7	C	22.4	C	28.3	C	10.7	B	29.3	C	11.9	B	29.3	C	13.0	B	29.4	C	12.4	B	29.0	C	12.7	B	28.5	C	11.6	B	28.5	C	11.1	B	28.7	C	13.8	B	27.3	C	14.2	B
	EB	7.4	A			7.4	A			6.3	A			6.4	A			6.7	A			6.3	A			6.6	A			6.3	A			6.3	A			7.0	A		
	WB	30.5	C			6.6	A			10.1	B			12.4	B			11.0	B			11.7	B			10.4	B			9.6	A			15.0	B			15.4	B		
31st St at Stevens Ave	SB	39.1	D	43.7	D	35.2	D	46.4	D	38.8	D	92.3	F	34.9	C	26.8	C	32.4	C	27.4	C	32.5	C	29.6	C	32.4	C	29.3	C	26.5	C	28.5	C	28.7	C	28.4	C	27.7	C	30.0	C
	EB	17.4	B			14.5	B			15.6	B			18.1	B			17.8	B			17.9	B			12.1	B			17.6	B			12.6	B			13.4	B		
	WB	61.1	E			72.6	E			193.3	F			24.9	C			28.5	C			33.3	C			36.2	D			36.6	D			37.1	D			41.4	D		
31st St at 2nd Ave	NB	23.4	C	77.0	E	198.9	F	115.1	F	100.6	F	147.6	F	23.2	C	19.0	B	22.1	C	18.2	B	23.5	C	21.6	C	26.2	C	17.2	B	24.9	C	17.7	B	25.9	C	17.8	B	29.3	C	22.4	C
	EB	22.6	C			27.8	C			29.0	C			12.5	B			13.0	B			16.1	B			10.2	B			12.2	B			11.4	B			17.1	B		
	WB	198.9	F			67.1	E			312.4	F			17.8	B			16.8	B			22.6	C			14.1	B			15.3	B			15.2	B			20.2	C		

Table A5
I-35W Transit Access Project
AM Peak Hour - 2018 Forecast
LAKE ST ONLY AND FULL BUILD - MOE SUMMARY

Lake Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				LAKE STREET RAMPS ONLY SCENARIO: Lake Ramps Only Base Conditions				Lake Ramps Only Mitigated Ver. 1				Lake Ramps Only Mitigated Ver. 2				FULL BUILD RAMP SCENARIO: Full Build Base Conditions				Full Build Mitigated Ver. 1				Full Build Mitigated Ver. 2			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
Lake St at Blaisdell Ave	SB	19.7	B			20.4	C			25.1	C			36.4	D			41.0	D			24.4	C			23.6	C			24.3	C		
	EB	23.8	C	17.5	B	25.0	C	18.1	B	95.8	F	55.9	E	23.8	C	21.1	C	19.3	B	19.4	B	20.5	C	16.9	B	19.4	B	16.1	B	19.5	B	16.1	B
	WB	5.7	A			6.4	A			8.2	A			7.1	A			6.7	A			6.0	A			5.4	A			5.4	A		
Lake St at Nicollet Ave	NB	18.5	B			29.4	C			29.9	C			48.2	D			33.6	C			27.6	C			46.2	D			54.7	D		
	SB	31.9	C	6.1	A	44.9	D	18.6	B	37.4	D	85.7	F	42.1	D	28.8	C	32.3	C	17.9	B	20.2	C	16.8	B	23.6	C	19.5	B	25.8	C	23.4	C
	EB	3.4	A			5.9	A			183.4	F			27.9	C			11.2	B			14.9	B			11.4	B			16.5	B		
	WB	4.3	A			7.5	A			8.1	A			8.8	A			9.3	A			10.1	B			10.1	B			9.0	A		
Lake St at 1st Ave	NB	19.0	B			17.9	B			17.3	B			30.6	C			30.7	C			15.3	B			14.2	B			14.8	B		
	EB	11.4	B	12.8	B	10.4	B	12.3	B	50.4	D	30.5	C	20.5	C	18.9	B	11.5	B	15.1	B	9.0	A	11.9	B	7.4	A	10.8	B	9.8	A	12.4	B
	WB	8.4	A			9.1	A			10.2	B			10.2	B			11.7	B			15.1	B			15.0	B			15.6	B		
Lake St at Stevens Ave	SB	36.4	D			34.0	C			46.4	D			23.1	C			22.8	C			48.8	D			25.8	C			26.8	C		
	EB	4.5	A	8.2	A	5.5	A	8.6	A	31.6	C	34.3	C	22.7	C	21.1	C	19.6	B	19.9	B	15.7	B	27.2	C	13.3	B	17.8	B	16.7	B	19.3	B
	WB	4.4	A			4.9	A			18.6	B			15.1	B			15.7	B			13.3	B			13.1	B			11.4	B		
Lake St at 2nd Ave	NB	38.4	D			30.7	C			75.4	E			49.3	D			44.0	D			15.2	B			25.0	C			24.5	C		
	EB	12.0	B	21.9	C	11.9	B	17.5	B	36.0	D	59.7	E	29.4	C	37.1	D	27.7	C	30.9	C	26.0	C	21.9	C	25.5	C	23.3	C	26.6	C	22.5	C
	WB	3.2	A			3.7	A			77.3	E			34.4	C			19.4	B			20.6	C			18.1	B			14.0	B		
Lake St at 3rd Ave	NB	21.1	C			22.2	C			69.8	E			29.2	C			21.7	C			21.9	C			23.6	C			25.6	C		
	SB	20.5	C	6.2	A	21.2	C	7.2	A	58.6	E	29.6	C	21.2	C	9.7	A	24.2	C	5.7	A	23.8	C	6.5	A	27.6	C	5.9	A	29.8	C	6.1	A
	EB	3.0	A			3.9	A			2.6	A			2.2	A			2.4	A			4.2	A			2.6	A			2.7	A		
	WB	7.9	A			7.9	A			52.9	D			15.0	B			6.4	A			6.4	A			6.0	A			6.1	A		
Lake St at Clinton Ave	NB	6.5	A			9.3	A			314.1	F			70.9	F			16.6	C			17.7	C			17.4	C			16.2	C		
	SB	5.9	A	1.3	A	9.6	A	1.8	A	116.7	F	21.2	C	180.7	F	10.2	B	34.3	D	3.5	A	11.2	B	2.4	A	11.0	B	2.3	A	12.6	B	2.4	A
	EB	0.9	A			1.3	A			3.9	A			2.2	A			2.3	A			1.9	A			1.8	A			1.8	A		
	WB	1.5	A			1.6	A			19.8	C			4.6	A			2.4	A			1.9	A			1.9	A			1.9	A		
Lake St at 4th Ave	NB	29.8	C			30.7	C			33.6	C			30.6	C			31.9	C			28.9	C			32.4	C			28.5	C		
	SB	25.3	C	13.0	B	25.1	C	13.4	B	22.1	C	21.4	C	19.4	B	11.6	B	16.3	B	11.1	B	18.5	B	10.8	B	20.8	C	11.3	B	19.4	B	10.9	B
	EB	12.7	B			12.3	B			6.0	A			5.3	A			4.9	A			5.5	A			5.4	A			5.2	A		
	WB	6.5	A			7.2	A			32.6	C			11.2	B			10.3	B			9.1	A			9.0	A			9.8	A		
Lake St at 5th Ave	NB	10.3	B			13.6	B			53.2	F			17.7	C			19.1	C			18.7	C			16.5	C			16.3	C		
	SB	8.8	A	2.0	A	9.3	A	2.5	A	27.2	D	7.0	A	13.5	B	2.5	A	14.1	B	2.5	A	13.2	B	2.3	A	10.1	B	2.2	A	13.3	B	2.2	A
	EB	2.4	A			2.5	A			1.9	A			1.9	A			1.7	A			1.6	A			1.6	A			1.5	A		
	WB	1.0	A			1.4	A			8.6	A			1.7	A			1.8	A			1.4	A			1.5	A			1.5	A		

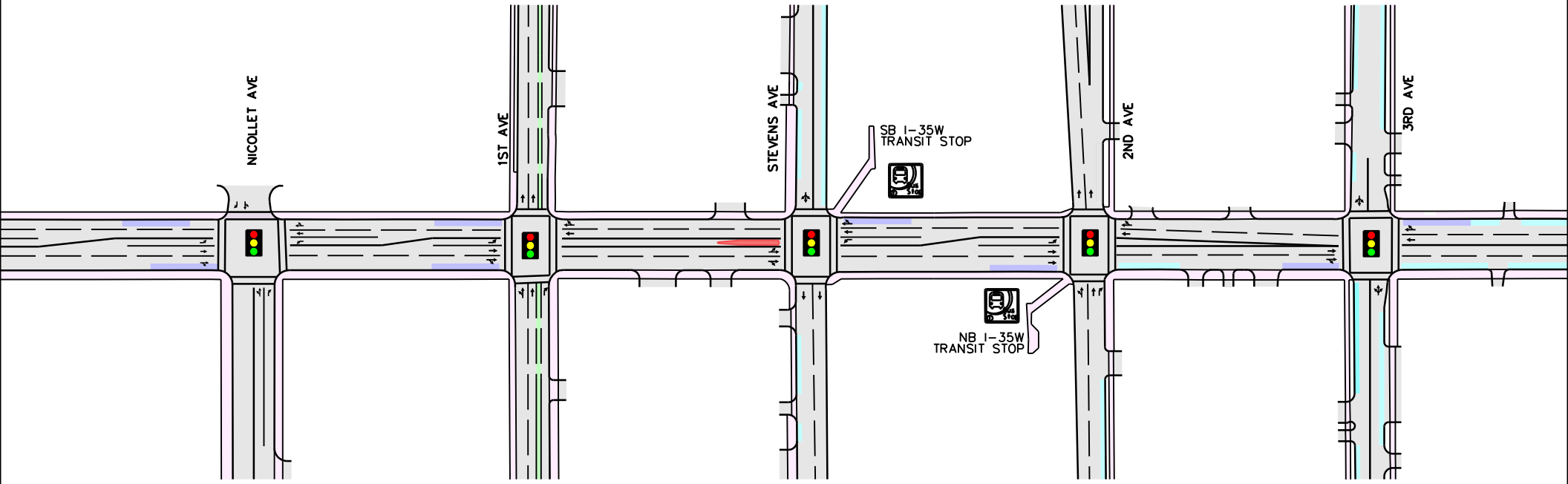
31st Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				LAKE STREET RAMPS ONLY SCENARIO: Lake Ramps Only Base Conditions				Lake Ramps Only Mitigated Ver. 1				Lake Ramps Only Mitigated Ver. 2				FULL BUILD RAMP SCENARIO: Full Build Base Conditions				Full Build Mitigated Ver. 1				Full Build Mitigated Ver. 2			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
29th St at Nicollet Ave	NB	2.6	A			2.5	A			2.5	A			2.4	A			2.4	A			2.3	A			2.5	A			2.4	A		
	SB	0.7	A	2.0	A	1.5	A	3.0	A	1.5	A	3.0	A	1.6	A	2.9	A	1.7	A	2.9	A	1.4	A	2.8	A	1.4	A	2.9	A	1.4	A	2.9	A
	WB	2.5	A			11.9	B			10.9	B			10.1	B			9.9	A			10.2	B			10.6	B			10.5	B		
31st St at Nicollet Ave	NB	18.9	B			24.6	C			23.8	C			23.9	C			23.9	C			23.6	C			25.0	C			25.6	C		
	SB	4.8	A	14.8	B	21.7	C	20.5	C	10.3	B	19.1	B	10.4	B	18.3	B	11.4	B	18.2	B	10.5	B	19.5	B	10.0	B	20.1	C	10.2	B	20.6	C
	EB	17.0	B			20.1	C			21.6	C			23.1	C			21.9	C			22.3	C			22.8	C			22.7	C		
	WB	10.3	B			12.1	B			15.5	B			10.0	B			10.5	B			17.7	B			18.3	B			19.4	B		
31st St at 1st Ave	NB	17.9	B			17.0	B			28.0	C			28.6	C			29.4	C			28.7	C			29.0	C			27.5	C		
	EB	24.3	C	22.0	C	27.6	C	21.1	C	4.3	A	15.3	B	5.0	A	12.6	B	5.0	A	12.8	B	4.0	A	12.1	B	4.5	A	12.6	B	4.3	A	12.4	B
	WB	23.0	C			16.3	B			19.1	B			10.2	B			9.3	A			11.6	B			12.6	B			12.2	B		
31st St at Stevens Ave	SB	33.1	C			29.5	C			19.7	B			30.1	C			30.0	C			18.1	B			17.8	B			17.4	B		
	EB	9.6	A	19.1	B	6.0	A	16.7	B	11.3	B	13.8	B	14.4	B	19.4	B	15.5	B	20.1	C	10.8	B	14.8	B	10.2	B	13.7	B	10.6	B	13.9	B
	WB	13.4	B			11.0	B			8.0	A			9.0	A			10.0	B			14.7	B			12.0	B			12.5	B		
31st St at 2nd Ave	NB	23.6	C			24.2	C			38.3	D			26.6	C			25.3	C			25.5	C			25.0	C			25.6	C		
	EB	20.9	C	20.9	C	7.8	A	18.7	B	9.9	A	25.7	C	10.3	B	18.8	B	10.4	B	18.0	B	15.4	B	18.3	B	7.6	A	15.9	B	7.0	A	16.1	B
	WB	10.7	B			9.7	A			11.2	B			9.2	A			9.2	A			7.0	A			7.3	A			6.8	A		

Table A6
I-35W Transit Access Project
PM Peak Hour - 2018 Forecast
LAKE ST ONLY AND FULL BUILD - MOE SUMMARY

Lake Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				LAKE STREET RAMPS ONLY SCENARIO: Lake Ramps Only Base Conditions				Lake Ramps Only Mitigated Ver. 1				Lake Ramps Only Mitigated Ver. 2				FULL BUILD RAMP SCENARIO: Full Build Base Conditions				Full Build Mitigated Ver. 1				Full Build Mitigated Ver. 2			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
Lake St at Blaisdell Ave	SB	36.3	D	29.7	C	30.3	C	23.1	C	30.9	C	28.2	C	31.1	C	28.0	C	29.4	C	28.4	C	28.2	C	28.8	C	29.6	C	29.4	C	28.4	C	28.3	C
	EB	25.2	C			28.9	C			33.1	C			30.7	C			35.2	D			37.2	D			39.2	D			35.6	D		
	WB	25.1	C			11.7	B			22.4	C			23.7	C			22.6	C			23.3	C			22.0	C			23.2	C		
Lake St at Nicollet Ave	NB	46.1	D	17.6	B	25.5	C	19.1	B	31.8	C	25.6	C	34.9	C	32.2	C	34.4	C	29.5	C	25.6	C	23.5	C	36.0	D	23.5	C	34.6	C	21.1	C
	SB	36.3	D			33.7	C			31.7	C			59.6	E			44.2	D			27.0	C			42.9	D			30.3	C		
	EB	4.5	A			16.7	B			18.2	B			16.9	B			17.8	B			16.3	B			16.9	B			16.2	B		
	WB	16.7	B			9.6	A			26.7	C			29.6	C			30.0	C			27.2	C			14.7	B			15.8	B		
Lake St at 1st Ave	NB	26.1	C	14.3	B	28.4	C	12.7	B	18.4	B	13.9	B	23.7	C	16.2	B	23.7	C	16.3	B	18.1	B	14.7	B	22.5	C	15.6	B	24.0	C	16.9	B
	EB	11.8	B			10.5	B			8.6	A			8.9	A			8.6	A			9.0	A			12.1	B			12.3	B		
	WB	10.2	B			6.5	A			16.6	B			19.4	B			19.8	B			18.8	B			16.4	B			18.6	B		
Lake St at Stevens Ave	SB	37.1	D	20.7	C	40.6	D	16.7	B	85.9	F	44.3	D	31.8	C	22.5	C	32.8	C	23.7	C	34.6	C	27.0	C	29.6	C	24.4	C	33.7	C	26.2	C
	EB	16.3	B			10.0	B			21.8	C			14.4	B			12.7	B			20.2	C			17.6	B			17.3	B		
	WB	19.6	B			15.5	B			24.3	C			20.8	C			24.7	C			26.0	C			25.6	C			27.0	C		
Lake St at 2nd Ave	NB	16.2	B	9.9	A	23.0	C	9.2	A	35.3	D	36.1	D	27.8	C	29.6	C	24.1	C	23.8	C	18.7	B	28.5	C	18.7	B	26.2	C	18.7	B	22.0	C
	EB	3.8	A			3.9	A			26.8	C			22.6	C			22.8	C			22.6	C			24.0	C			23.6	C		
	WB	9.9	A			4.9	A			46.4	D			37.6	D			24.5	C			37.7	D			30.9	C			21.7	C		
Lake St at 3rd Ave	NB	23.4	C	9.8	A	21.7	C	8.6	A	34.0	C	28.3	C	29.9	C	18.7	B	24.8	C	11.3	B	24.4	C	20.8	C	24.6	C	15.1	B	23.0	C	9.0	A
	SB	25.0	C			26.8	C			39.9	D			31.1	C			31.2	C			31.5	C			30.8	C			29.0	C		
	EB	5.0	A			4.8	A			5.5	A			3.7	A			4.0	A			3.9	A			3.3	A			3.1	A		
	WB	10.8	B			8.5	A			45.8	D			28.8	C			14.3	B			32.6	C			21.9	C			10.7	B		
Lake St at Clinton Ave	NB	20.3	C	3.5	A	26.4	D	5.1	A	1797.0	F	80.2	F	386.2	F	33.6	D	68.9	F	16.1	C	363.0	F	48.4	E	74.8	F	16.1	C	42.4	E	8.8	A
	SB	16.8	C			32.2	D			4309.3	F			607.7	F			215.2	F			933.2	F			193.0	F			71.4	F		
	EB	2.5	A			3.3	A			6.7	A			5.1	A			4.7	A			5.0	A			4.6	A			5.1	A		
	WB	2.7	A			3.3	A			26.6	D			10.9	B			5.7	A			14.2	B			8.5	A			4.8	A		
Lake St at 4th Ave	NB	27.4	C	27.6	C	27.9	C	12.8	B	38.8	D	34.2	C	35.1	D	17.0	B	35.5	D	15.1	B	33.9	C	19.4	B	33.1	C	15.2	B	33.2	C	14.0	B
	SB	135.1	F			23.4	C			61.3	E			34.8	C			32.6	C			33.3	C			30.0	C			26.4	C		
	EB	3.4	A			7.3	A			7.3	A			7.9	A			8.5	A			6.5	A			7.6	A			7.6	A		
	WB	8.7	A			11.2	B			48.3	D			16.5	B			12.1	B			23.3	C			13.8	B			12.5	B		
Lake St at 5th Ave	NB	9.7	A	2.4	A	16.3	C	3.5	A	843.3	F	90.6	F	35.5	E	7.8	A	26.2	D	5.4	A	33.3	D	10.1	B	20.5	C	4.4	A	20.6	C	4.7	A
	SB	11.2	B			19.4	C			1274.9	F			69.2	F			36.1	E			105.8	F			26.7	D			31.2	D		
	EB	1.6	A			1.9	A			3.0	A			2.4	A			2.7	A			2.5	A			2.3	A			2.5	A		
	WB	2.1	A			2.4	A			79.3	F			5.1	A			3.6	A			7.4	A			3.2	A			2.9	A		

31st Street Intersections		Existing Conditions				Transit Only - Nicollet Open Mitigated Conditions				LAKE STREET RAMPS ONLY SCENARIO: Lake Ramps Only Base Conditions				Lake Ramps Only Mitigated Ver. 1				Lake Ramps Only Mitigated Ver. 2				FULL BUILD RAMP SCENARIO: Full Build Base Conditions				Full Build Mitigated Ver. 1				Full Build Mitigated Ver. 2			
Intersection -	**Approach**	LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection		LOS By Approach		LOS By Intersection	
		Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS
29th St at Nicollet Ave	NB	4.8	A	2.2	A	2.3	A	3.6	A	1.9	A	3.5	A	1.9	A	3.8	A	2.0	A	3.5	A	1.9	A	3.3	A	2.0	A	3.4	A	1.9	A	3.1	A
	SB	1.1	A			2.3	A			2.1	A			2.3	A			2.0	A			1.9	A			2.0	A			1.7	A		
	WB	3.0	A			12.7	B			14.0	B			14.9	B			14.4	B			12.8	B			13.4	B			12.6	B		
31st St at Nicollet Ave	NB	29.5	C	17.1	B	24.0	C	22.9	C	20.8	C	21.7	C	20.8	C	23.3	C	20.9	C	22.5	C	22.4	C	24.1	C	21.3	C	23.4	C	21.4	C	29.3	C
	SB	16.0	B			18.3	B			11.3	B			15.0	B			14.8	B			12.7	B			12.0	B			12.3	B		
	EB	15.9	B			31.5	C			29.5	C			39.5	D			37.5	D			33.2	C			41.0	D			60.5	E		
	WB	9.6	A			19.8	B			24.3	C			19.1	B			18.5	B			26.5	C			18.8	B			20.5	C		
31st St at 1st Ave	NB	28.7	C	22.4	C	28.2	C	11.5	B	29.0	C	12.6	B	28.9	C	12.7	B	29.1	C	13.0	B	29.5	C	10.8	B	28.3	C	12.5	B	29.2	C	12.7	B
	EB	7.4	A			7.4	A			6.3	A			6.7	A			6.6	A			5.8	A			6.7	A			6.7	A		
	WB	30.5	C			8.3	A			11.5	B			11.3	B			11.6	B			9.0	A			12.5	B			12.4	B		
31st St at Stevens Ave	SB	39.1	D	43.7	D	50.1	D	47.3	D	36.6	D	55.3	E	33.7	C	24.2	C	32.9	C	25.1	C	31.6	C	23.0	C	33.9	C	25.3	C	33.5	C	26.5	C
	EB	17.4	B			12.3	B			13.9	B			15.8	B			15.5	B			11.5	B			12.6	B			13.9	B		
	WB	61.1	E			62.8	E			93.9	F			20.6	C			23.5	C			21.7	C			24.1	C			27.0	C		
31st St at 2nd Ave	NB	23.4	C	77.0	E	45.7	D	51.9	D	31.0	C	32.8	C	22.9	C	17.8	B	23.2	C	18.1	B	25.7	C	14.6	B	25.3	C	15.4	B	27.3	C	17.4	B
	EB	22.6	C			19.7	B			15.3	B			12.3	B			13.1	B			8.1	A			9.3	A			11.9	B		
	WB	198.9	F			78.2	E			46.6	D			14.6	B			14.9	B			10.1	B			11.1	B			12.5	B		

EXISTING CONFIGURATION



TRANSIT STATION ONLY CONFIGURATION (BASE SCENARIO)

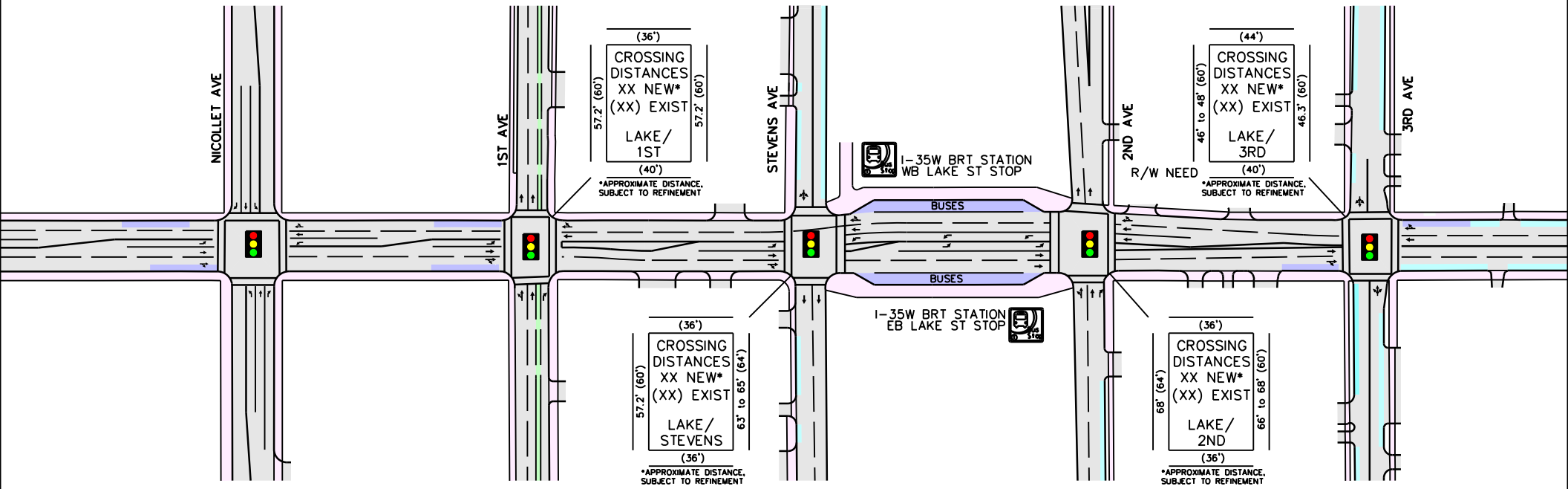
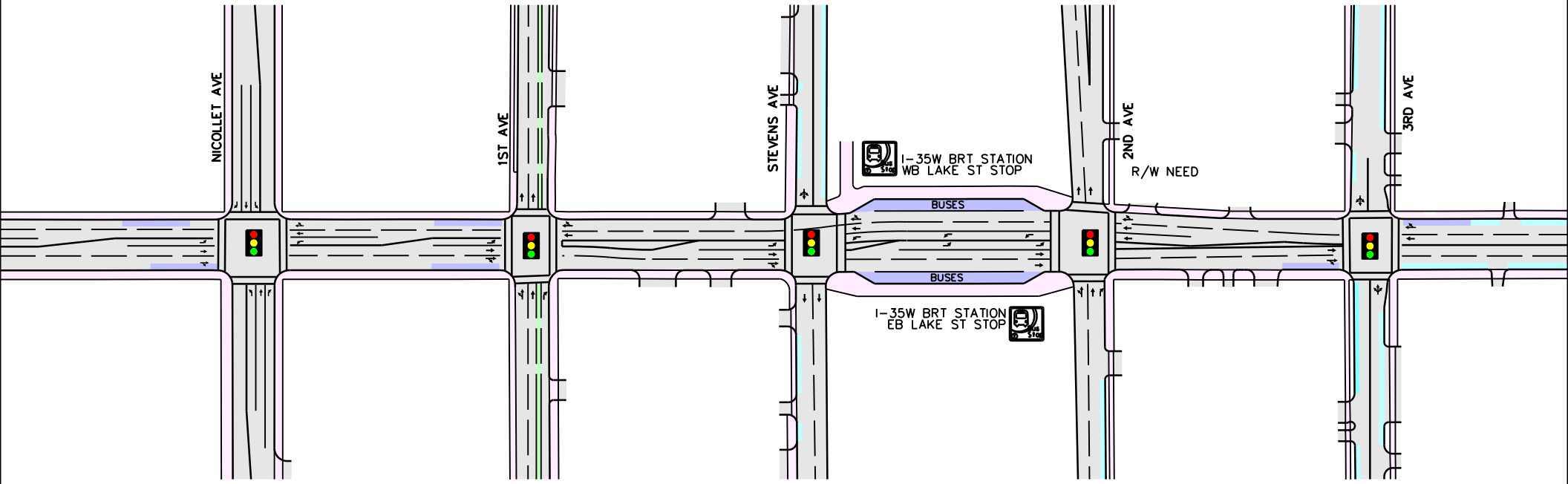
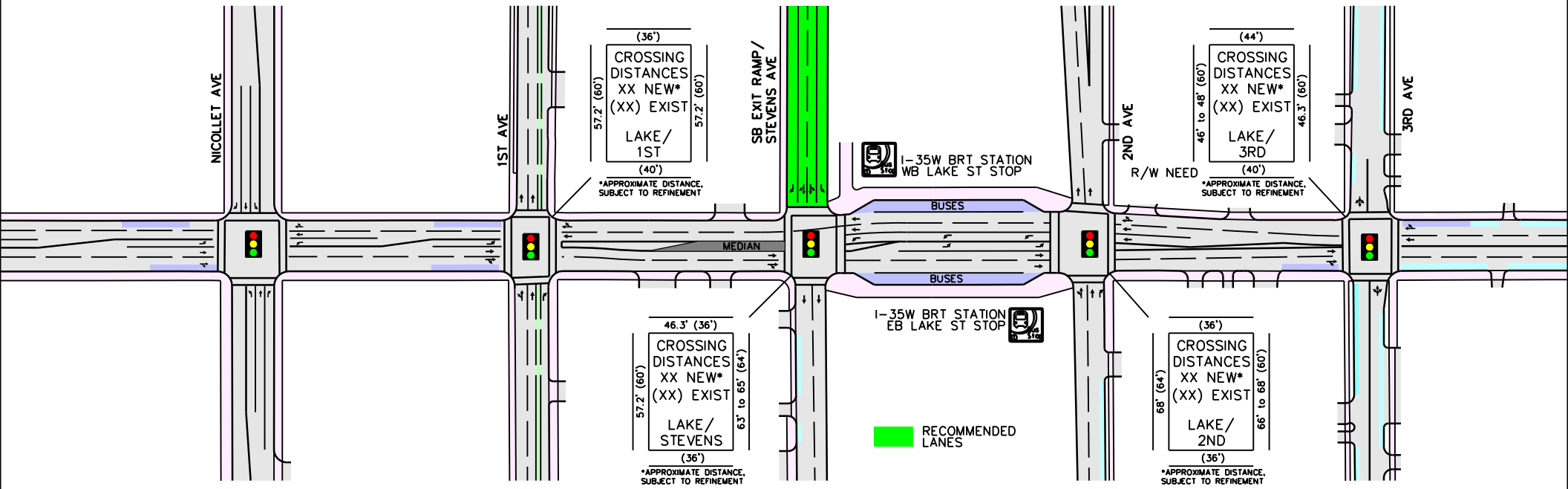


FIGURE B1
EXISTING AND BASE SCENARIO

TRANSIT STATION ONLY CONFIGURATION (BASE SCENARIO)



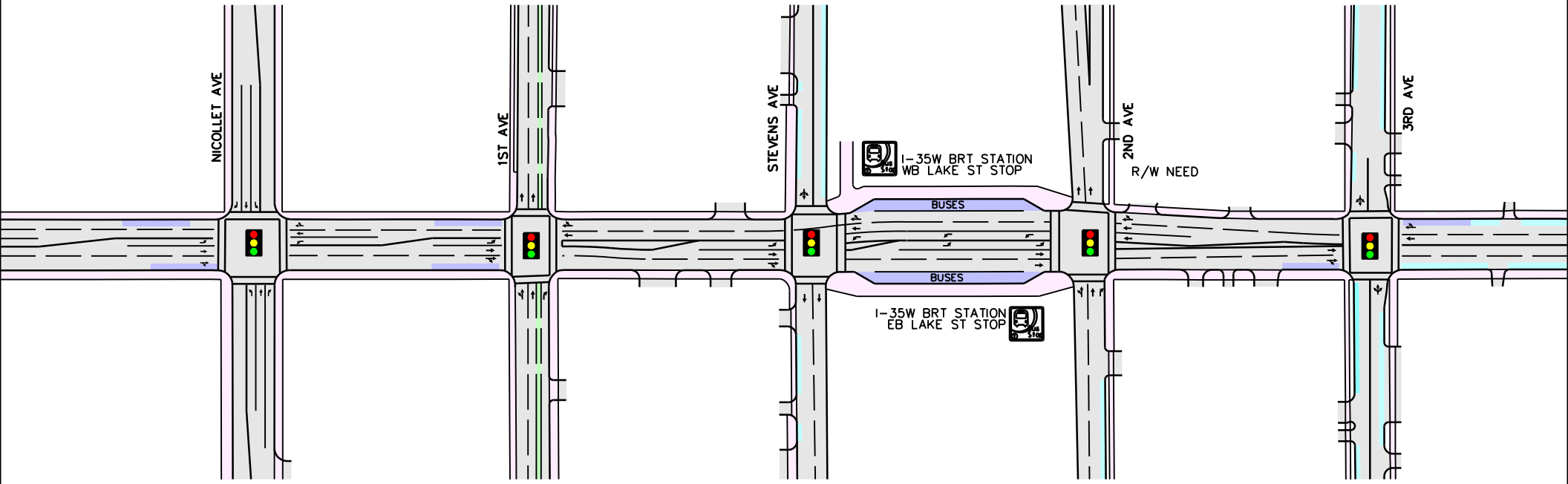
SOUTHBOUND I-35W EXIT RAMP



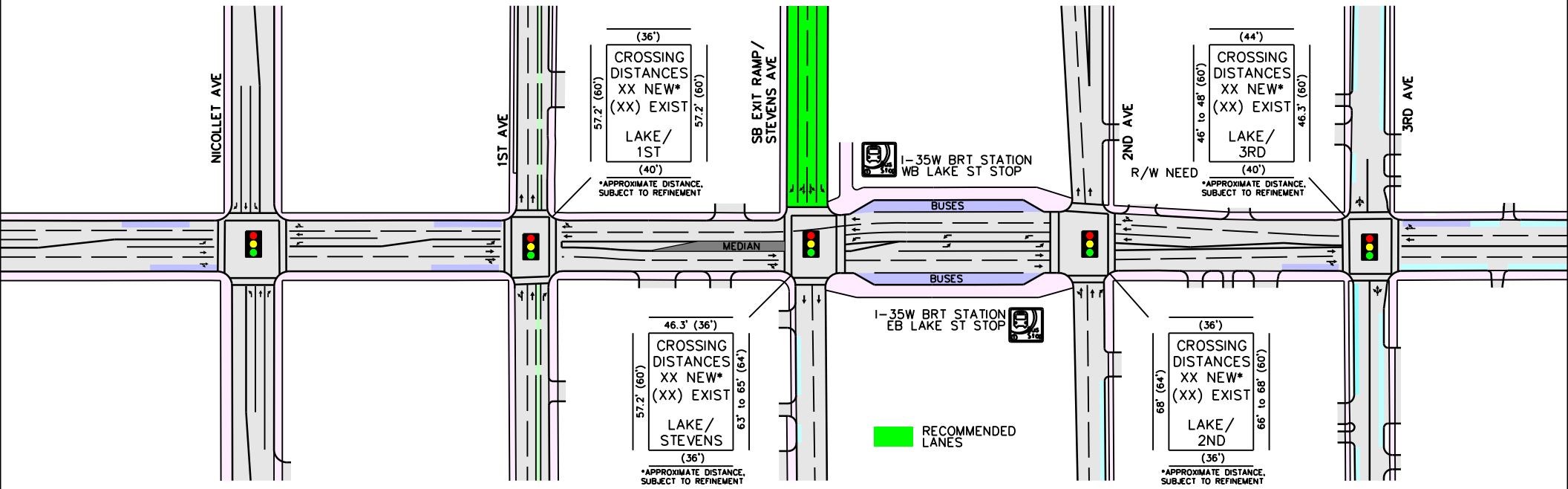
CHANGES FROM BASE SCENARIO

FIGURE B2
BASE SCENARIO AND SB EXIT

TRANSIT STATION ONLY CONFIGURATION (BASE SCENARIO)



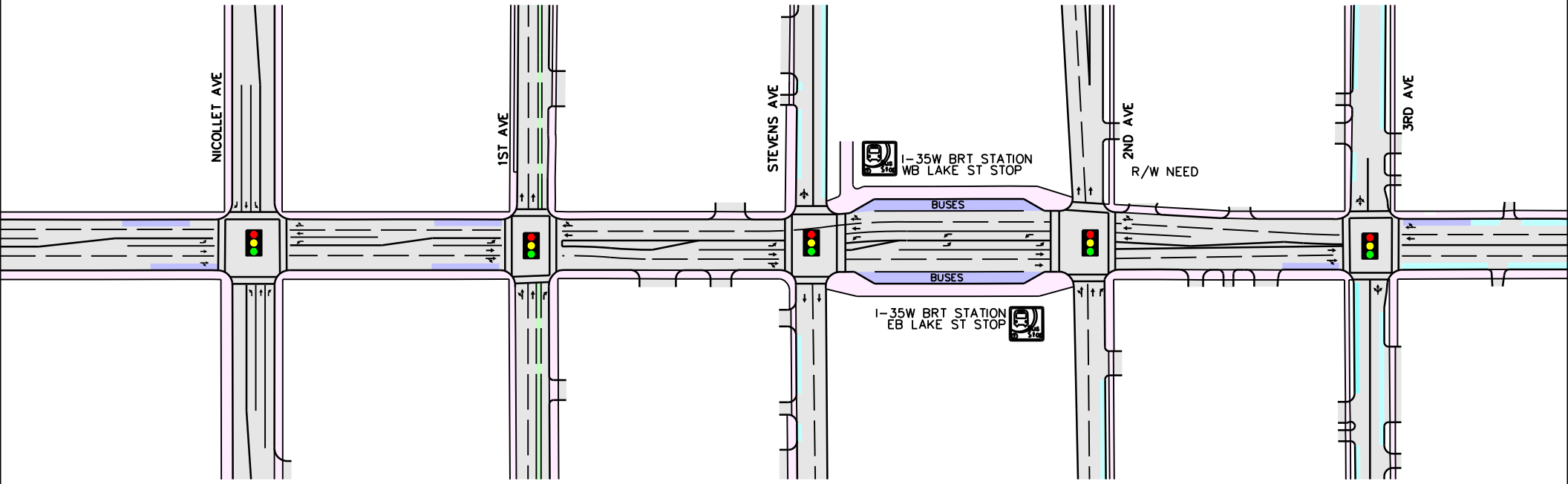
SOUTHBOUND I-35W EXIT RAMP AND 28TH STREET EXIT



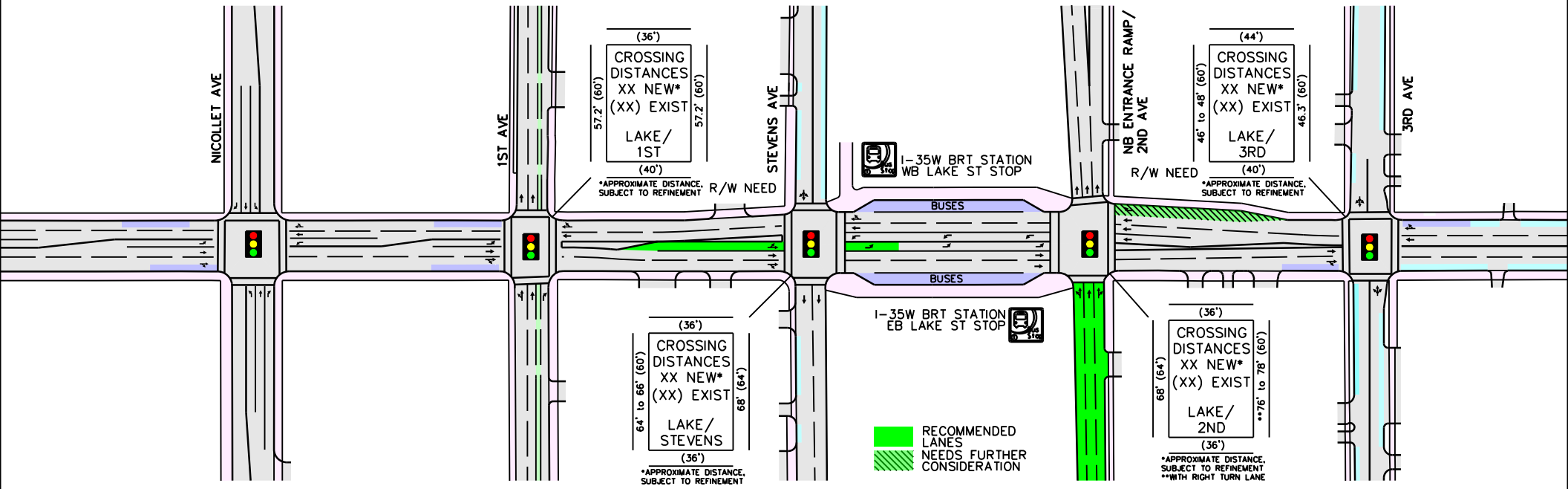
CHANGES FROM BASE SCENARIO

FIGURE B3
BASE SCENARIO AND SB EXIT & 28TH EXIT

TRANSIT STATION ONLY CONFIGURATION (BASE SCENARIO)



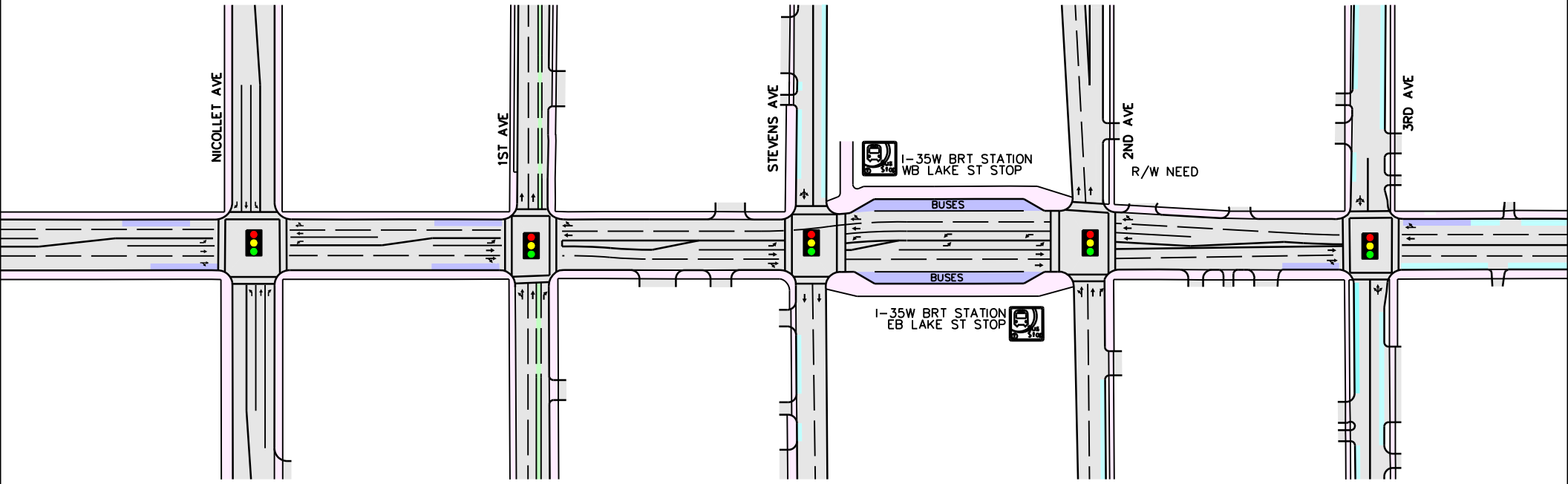
NORTHBOUND I-35W ENTRANCE RAMP ONLY



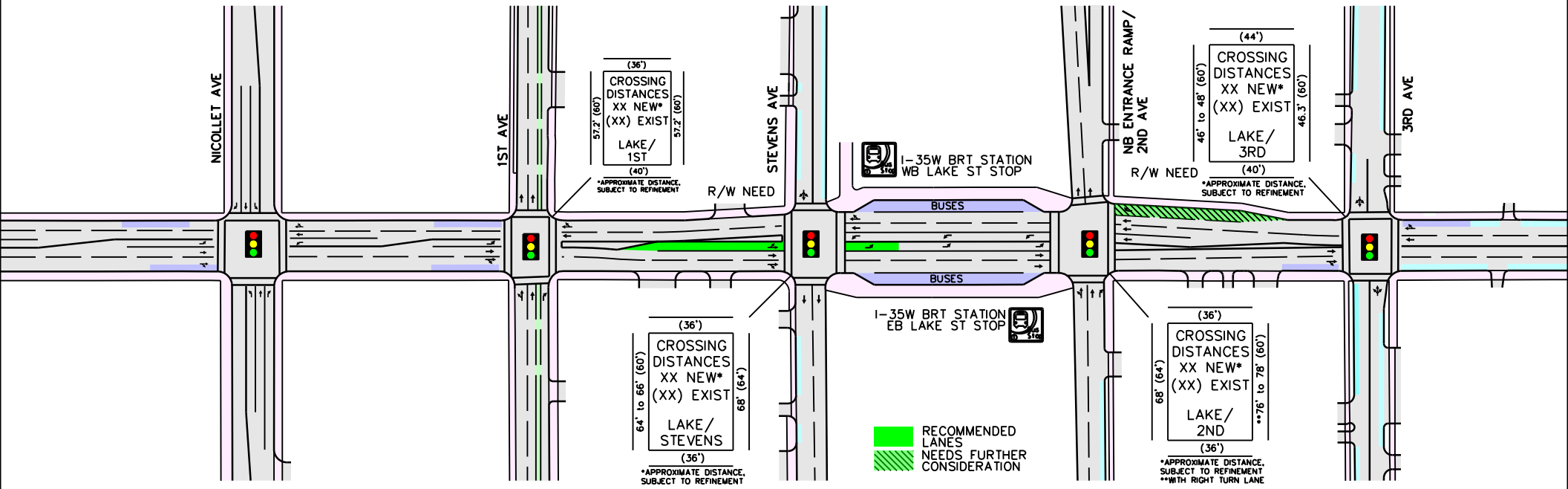
CHANGES FROM BASE SCENARIO

FIGURE B4
BASE SCENARIO AND NB EXIT

TRANSIT STATION ONLY CONFIGURATION (BASE SCENARIO)



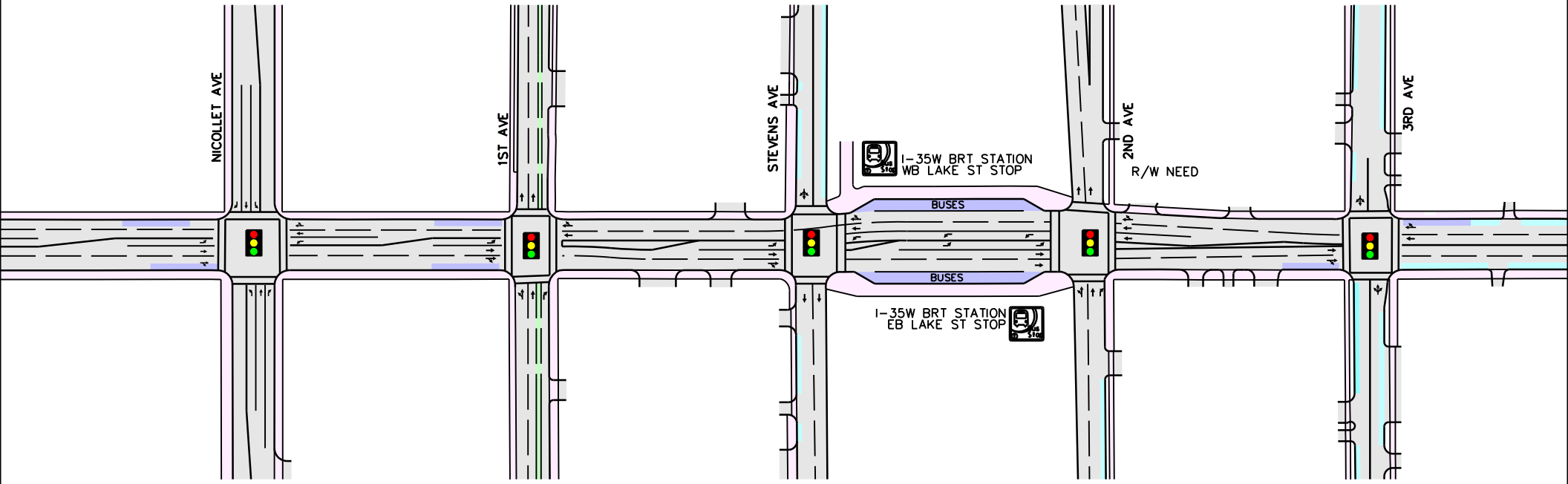
NORTHBOUND I-35W ENTRANCE RAMP AND 28TH STREET EXIT RAMP



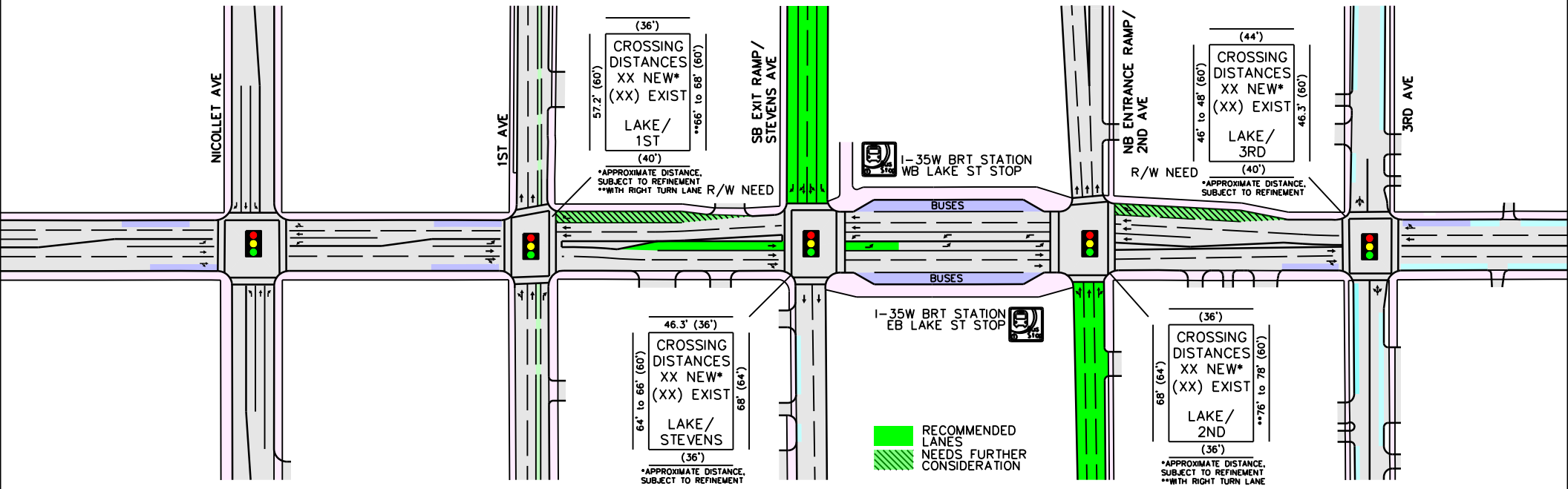
CHANGES FROM BASE SCENARIO

FIGURE B5
BASE SCENARIO AND NB EXIT & 28TH EXIT

TRANSIT STATION ONLY CONFIGURATION (BASE SCENARIO)



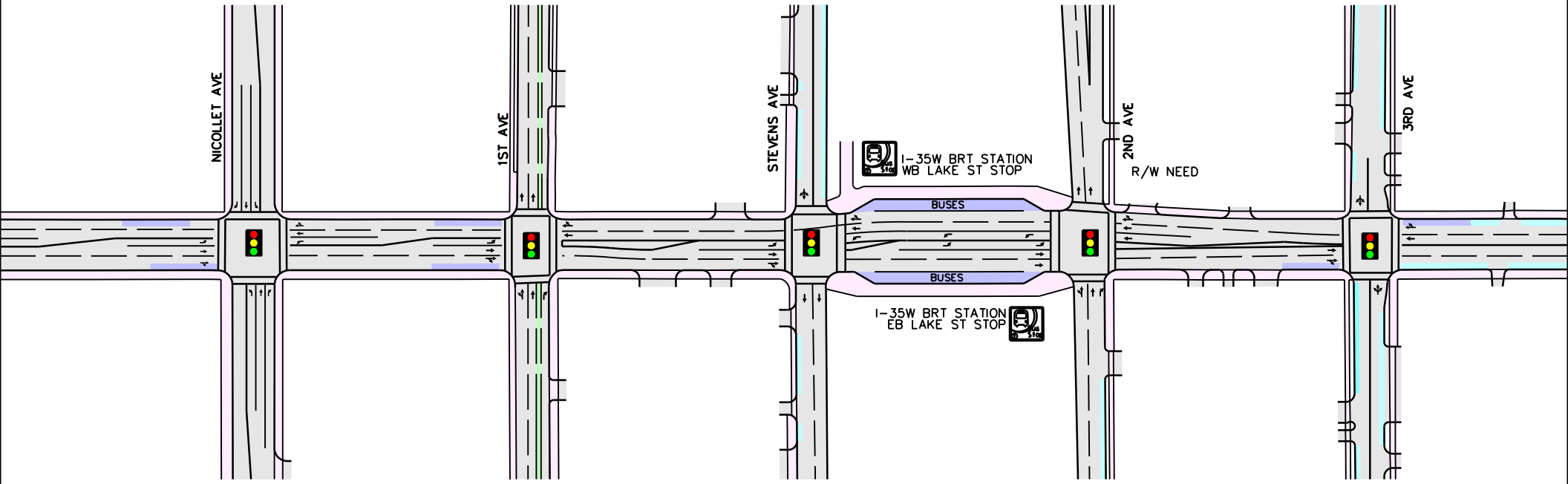
SOUTHBOUND EXIT RAMP AND NORTHBOUND ENTRANCE



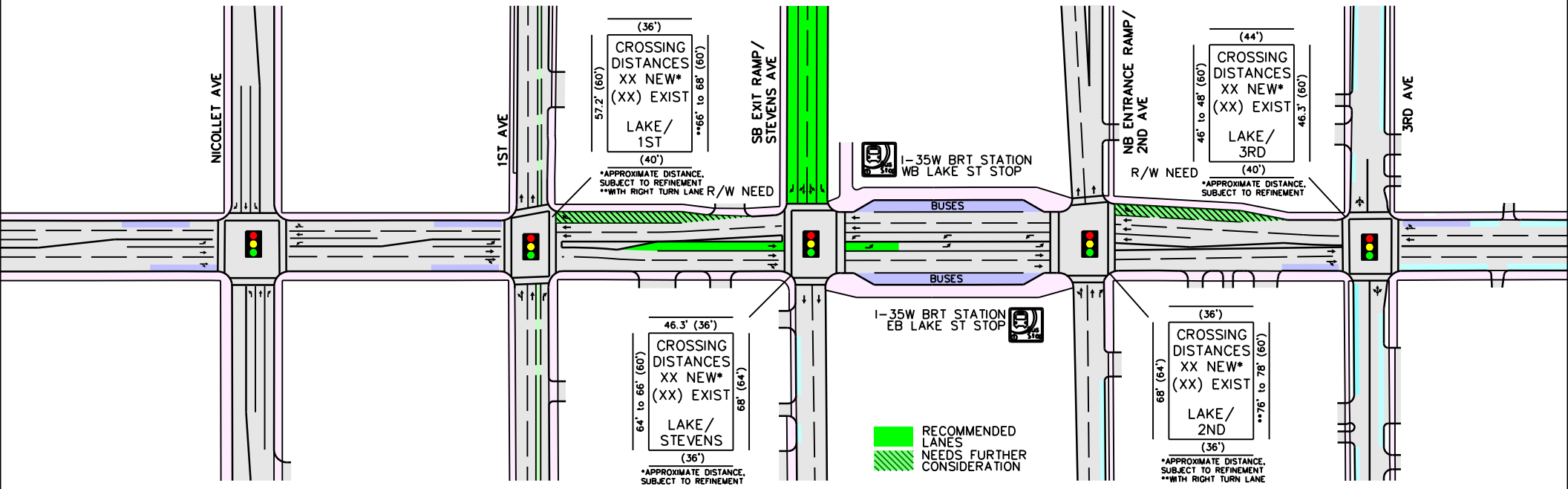
CHANGES FROM BASE SCENARIO

FIGURE B6
BASE SCENARIO AND NB & SB RAMPS

TRANSIT STATION ONLY CONFIGURATION (BASE SCENARIO)



SOUTHBOUND EXIT, NORTHBOUND ENTRANCE, 28TH ST EXIT RAMP



CHANGES FROM BASE SCENARIO

FIGURE B7
BASE SCENARIO AND FULL BUILD

Appendix J

I-35W Arterial Traffic Analysis Memorandum

MEMORANDUM

TO: TAC Members
I-35W Transit Access Project

FROM: Graham Johnson, PE
Mike Kotila, PE

DATE: November 13, 2013

RE: I-35W Transit Access Project
Arterial Traffic Analysis Findings
SEH No. AHENNC 113114

This memorandum summarizes arterial traffic analysis findings for the preferred freeway access scenario at the I-35W/Lake Street interchange. Findings reported herein are focused on the impacted arterials in the project area. The impacted arterials include:

- Lake Street intersections from Blaisdell Avenue to 5th Avenue
- 31st Street intersections from Nicollet Avenue to 2nd Avenue
- 28th Street intersections from Nicollet Avenue to 4th Avenue
- 26th Street intersections of Clinton Avenue and 5th Avenue
- Franklin Avenue intersection of 4th Avenue and 5th Avenue

The preferred build alternative from the Transit/Access project includes the following new transportation components:

- Center Transit Station at I-35W and Lake Street
- Southbound I-35W Exit Ramp to Lake Street
- Northbound I-35W Exit Ramp to 28th Street
- Reconstruction of the I-35W and TH 65 connections

The forecast years for all future scenarios analyzed is the design year 2038. Volumes served are those reported in the I-35W Transit Access Traffic Forecast Memorandum (final version dated January 13, 2012).

Summary of Findings
Recommended improvements are defined to achieve a level of service (LOS) D or better, based on intersection LOS (delay). Individual turning movement delay, queue lengths and the interaction between adjacent closely spaced intersections have also been considered as part of the performance criteria. All of the operational analysis was conducted based on AM and PM peak hour demands.

The general impact to each arterial is described below. More specific findings for each arterial are provided in later sections of this memorandum.

> ***Lake Street*:** Intersection improvements between Stevens Avenue and 2nd Avenue will be required to improve the operations to acceptable levels; side-by-side eastbound and westbound

left turn lanes between the two intersections. The new southbound exit ramp approach should include four lanes of approach to Lake Street; a separate left, left-through, through-right, and right turn lane. These improvements will provide enough additional capacity to serve the change in traffic patterns from the build scenario.

***31st Street*:** Intersection improvements at 31st Street and Stevens Avenue will be required to improve the operations to acceptable levels; include a westbound left turn phase and/or turn lane and reconfiguring the southbound entrance ramp to I-35W to accept two lanes of traffic. These improvements will provide enough additional capacity to serve the change in traffic patterns from the build scenario.

***28th Street*:** The existing 3-lane capacity on the 28th Street Bridge will provide enough capacity through the 2038 design year. The new northbound I-35W exit ramp will operate well under signalized traffic control with dual right turns for the ramp approach.

***26th Street*:** The existing 3-lane capacity on the 26th Street Bridge will provide enough capacity through the 2038 design year. However, the intersection with 5th Avenue will require some additional capacity along 5th Avenue, a northbound left turn lane, to provide acceptable operations.

***Franklin Avenue*:** The existing 4-lane capacity on the Franklin Avenue Bridge does not provide enough capacity under existing conditions nor would it through the 2038 design year. The existing four lane bridge should be expanded to a five lane bridge in order to accommodate a center left turn lane. The intersection with 5th Avenue will require some additional capacity along 5th Avenue, a two-lane northbound approach, to provide acceptable operations.

Overview – Approach to Intersection Analysis

The analysis software, Synchro/SimTraffic, provides measures of effectiveness (MOE's) for vehicle delay, level of service (LOS) and queues based on FHWA Highway Capacity Manual Methodology. LOS is a qualitative rating system used to describe the efficiency of traffic operations at an intersection. Six LOS values are defined, designated by letters A through F. LOS A represents the best operating conditions (no congestion), and LOS F represents the worst operating conditions (severe congestion)

Table 1
Level of Service Criteria

LOS	Signal (seconds of Delay)	Stop Control (seconds of Delay)
A	0.0 to 10.0	0.0 to 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	Above 80.0	Above 50.0

The study intersections and traffic signals are closely spaced through the project area (typically 330 feet). This condition limits vehicle storage length between intersections to about 10–12 vehicles per lane per block. When modeled (using Synchro/Simtraffic), the delay calculation recognizes only the delay for vehicles stored over the distance to the adjacent upstream signal. During peak flow conditions delays from one intersection often influence upstream segments beyond the segment length delays associated with the first signal. This is compounded at freeway interchange intersections where a high percentage of traffic chooses a specific through lane in advance of their desired turn lane. Under these circumstances,

the modeled intersection delay and LOS calculations do not capture the full extent of the traffic operational issues in the corridor. Model outputs typically report that the "one block length" queues built up at intersections are served during one phase of the signal cycle - often with an intersection LOS value that is misleading if not considered in conjunction with other operational measures in the corridor including queue lengths.

EXISTING CONDITIONS/OPERATIONS

Lake Street – Existing Conditions

Between Blaisdell Avenue and 2nd Avenue, Lake Street is a 4-lane undivided arterial with left turn lanes at all intersections. Between 2nd Avenue and 5th Avenue, Lake Street is a four lane undivided arterial. All intersections all operate under signalized traffic control with the exception of Clinton Avenue and 5th Avenue, which operate with minor street stop control. The existing ADT through this segment ranges from 18,500 to 20,500 vehicles per day.

In the AM peak hour, all intersections operate with a LOS C or better with the worst movements at a LOS D. In the PM peak hour, there are operational problems at the two intersections of Stevens Avenue and 2nd Avenue; however all intersections still operate at a LOS C or better. The southbound approach of 4th Avenue to Lake Street also experiences poor operations.

The Stevens Avenue intersection has two high volumes movements competing for green time that the existing intersection cannot effectively serve. The eastbound through movement competes with the westbound left turning demand that is destined for southbound I-35W. The westbound left turn movement operates at a LOS D; however the queue spills into the through lane and then to the upstream intersections. This creates a long queue for the westbound Lake Street approach to 2nd Avenue. Due to the short block lengths and relatively short cycle length of the traffic signals; the average delay per vehicle operates at a LOS D or better for the westbound movements.

At the intersection with 4th Avenue, the southbound approach operates at a LOS F. The high volume of traffic that comes from the Wells Fargo campus during the PM Peak hour sometimes overburdens 4th Avenue and then the maximum queue can extend well over 500 feet in the single lane.

Table 2 Existing Lake Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Lake Street @ Blaisdell Avenue (signal control)	SB	19.7 / B	17.5 / B	36.3 / D	29.7 / C
	EB	23.8 / C		25.2 / C	
	WB	5.7 / A		25.1 / C	
Lake Street @ Nicollet Avenue (signal control)	NB	18.5 / B	6.1 / A	46.1 / D	17.6 / B
	SB	31.9 / C		36.3 / D	
	EB	3.4 / A		4.5 / A	
	WB	4.3 / A		16.7 / B	
Lake Street @ 1st Avenue (signal control)	NB	19 / B	12.8 / B	26.1 / C	14.3 / B
	EB	11.4 / B		11.8 / B	
	WB	8.4 / A		10.2 / B	
Lake Street @ Stevens Avenue (signal control)	SB	36.4 / D	8.2 / A	37.1 / D	20.7 / C
	EB	4.5 / A		16.3 / B	
	WB	4.4 / A		19.6 / B	
Lake Street @ 2nd Avenue (signal control)	NB	38.4 / D	21.9 / C	16.2 / B	9.9 / A
	EB	12 / B		3.8 / A	
	WB	3.2 / A		9.9 / A	
Lake Street @ 3rd Avenue (signal control)	NB	21.1 / C	6.2 / A	23.4 / C	9.8 / A
	SB	20.5 / C		25 / C	
	EB	3 / A		5 / A	
	WB	7.9 / A		10.8 / B	
Lake Street @ Clinton Avenue (minor stop control)	NB	6.5 / A	1.3 / A	20.3 / C	3.5 / A
	SB	5.9 / A		16.8 / C	
	EB	0.9 / A		2.5 / A	
	WB	1.5 / A		2.7 / A	
Lake Street @ 4th Avenue (signal control)	NB	29.8 / C	13 / B	27.4 / C	27.6 / C
	SB	25.3 / C		**135.1 / F**	
	EB	12.7 / B		3.4 / A	
	WB	6.5 / A		8.7 / A	
Lake Street @ 5th Avenue (minor stop control)	NB	10.3 / B	2 / A	9.7 / A	2.4 / A
	SB	8.8 / A		11.2 / B	
	EB	2.4 / A		1.6 / A	
	WB	1 / A		2.1 / A	

31st Street – Existing Conditions

Between Nicollet Avenue and 2nd Avenue, 31st Street is a four lane undivided arterial; there is a eastbound left turn lane provided at 1st Avenue. The four intersections all operate under signalized traffic control. The existing ADT through this segment is 14,900 vehicles per day.

In the AM peak hour, all intersections operate with a LOS C or better with the worst movements at a LOS D.

In the PM peak hour, there are operational problems at the two ramp terminal intersections of Stevens Avenue and 2nd Avenue. The Stevens Avenue intersection has two high volume competing movements that the existing signal timing and phasing cannot effectively serve. The southbound through movement demand is very high as vehicles attempt to reach southbound I-35W simultaneously with a heavy westbound left turn demand from 31st Street is the same. The southbound approach operates at a LOS D; however the maximum queue often extends as far back as Lake Street, impacting intersection operations there. The westbound left turn movement operates at a LOS F and the queue spills into the upstream intersection and creates a long queue for the westbound approach to 2nd Avenue, which operates at a LOS F as well.

Table 3 Existing 31st Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
31st Street @ Nicollet Avenue (signal control)	NB	18.9 / B	14.8 / B	29.5 / C	17.1 / B
	SB	4.8 / A		16 / B	
	EB	17 / B		15.9 / B	
	WB	10.3 / B		9.6 / A	
31st Street @ 1st Avenue (signal control)	NB	17.9 / B	22 / C	28.7 / C	22.4 / C
	EB	24.3 / C		7.4 / A	
	WB	23 / C		30.5 / C	
31st Street @ Stevens Avenue (signal control)	SB	33.1 / C	19.1 / B	39.1 / D	43.7 / D
	EB	9.6 / A		17.4 / B	
	WB	13.4 / B		**61.1 / E**	
31st Street @ 2nd Avenue (signal control)	NB	23.6 / C	20.9 / C	23.4 / C	**77 / E**
	EB	20.9 / C		22.6 / C	
	WB	10.7 / B		**198.9 / F**	

28th Street – Existing Conditions

Between Nicollet Avenue and 4th Avenue, 28th Street is an eastbound one-way street with 3 continuous through lanes; all turns occur in the outer most through lanes. After the existing bridge over I-35W, a 4th through lane is added on the left hand side just before the 2nd Avenue intersection. All five intersections operate under signalized traffic control. The existing ADT through this segment ranges from 14,900 to 15,100 vehicles per day.

In both the AM and PM Peak hours, all intersections operate at LOS C or better; however there are some spot operational problems in the PM peak that are fairly minor. The northbound and southbound approaches of 1st Avenue operate at a LOS E due to both the turning traffic and the short green time. The

northbound approach of 4th Avenue to 28th Street has a high right turning volume that originates from the Wells Fargo parking ramp. The high volume of traffic that comes from the ramp during the PM Peak hour sometimes overburdens 4th Avenue and then the queue spills past the parking ramp access.

Table 4 Existing 28th Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
28th Street @ Nicollet Avenue (signal control)	NB	16 / B	24.7 / C	17 / B	20.9 / C
	SB	13.3 / B		15.9 / B	
	EB	26.6 / C		23.5 / C	
28th Street @ 1st Avenue (signal control)	NB	27.8 / C	9 / A	39.4 / D	26.1 / C
	SB	44.5 / D		**55.2 / E**	
	EB	3.3 / A		18.4 / B	
28th Street @ Stevens Avenue (signal control)	NB	25.7 / C	5.7 / A	22.8 / C	17.6 / B
	SB	30.6 / C		38.2 / D	
	EB	2.5 / A		12.1 / B	
28th Street @ Clinton Avenue (signal control)	NB	8.6 / A	3.8 / A	5.6 / A	3.1 / A
	EB	2.3 / A		2.5 / A	
28th Street @ 4th Avenue (signal control)	NB	15.5 / B	5.2 / A	28.5 / C	17.8 / B
	SB	35.6 / D		25.6 / C	
	EB	2.4 / A		13.8 / B	

26th Street – Existing Conditions

Between 5th Avenue and Clinton Avenue, 26th Street is a westbound one-way street with 3 continuous through lanes; all turns occur in the outer most through lanes. The intersection at 5th Avenue operates under signalized traffic control; however the intersection with Clinton Avenue operates under two-way stop control for Clinton Avenue. The existing ADT on this segment is 14,800 vehicles per day.

In both the AM and PM Peak hours, all intersections operate at LOS C or better; however there is a spot operational problems in the PM peak that is fairly minor. The northbound approach of 5th Avenue operates at a LOS D/E due to the high volume of left turning vehicles. The high volume of traffic that comes from the Wells Fargo campus during the PM Peak hour sometimes overburdens 5th Avenue and then the maximum queue can extend over 500 feet in the single lane.

Table 5 Existing 26th Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
26th Street @ Clinton Avenue (minor stop control)	NB	6.2 / A	1.5 / A	18 / C	2.2 / A
	SB	5.4 / A		10.6 / B	
	WB	1.3 / A		1.9 / A	
26th Street @ 5th Avenue (signal control)	NB	24.6 / C	12 / B	52.4 / D	22.1 / C
	SB	11.5 / B		11.2 / B	
	WB	8.9 / A		10.8 / B	

Franklin Avenue – Existing Conditions
Between 4th Avenue and 5th Avenue, Franklin Avenue is a four lane undivided roadway with both intersections operating under signalized traffic control. The existing ADT on this segment of Franklin Avenue is 19,500 vehicles per day.

In the AM Peak hour, both intersections operate at LOS B or better; however the PM Peak hour has severe congestion stemming from the 5th Avenue intersection. The northbound approach of 5th Avenue operates at a LOS F due to the high volume of through traffic using 5th Avenue to access I-35W and I-94. There is also a high volume of traffic from Franklin Avenue turning onto northbound 5th Avenue. All three of these movements compete for the limited green time and the queues extend through adjacent intersections. The queue spillback severely impacts the 4th Avenue intersection.

Table 6 Existing Franklin Avenue

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Franklin Avenue @ 4th Avenue (signal control)	NB	6.6 / A	4.6 / A	**68.8 / E**	**118.7 / F**
	SB	26.9 / C		**192.8 / F**	
	EB	4 / A		**263.9 / F**	
	WB	3 / A		4.7 / A	
Franklin Avenue @ 5th Avenue (signal control)	NB	34.2 / C	12.3 / B	**243.1 / F**	**71.3 / E**
	EB	11.1 / B		50.5 / D	
	WB	5.3 / A		13.5 / B	

TRAFFIC FORECASTS (Year 2038)
The forecast year for future No Build and Build scenarios analyzed is the design year 2038. Volumes analyzed are those reported in the I-35W Transit Access Traffic Forecast Memorandum (final version dated January 13, 2012).

All forecast scenarios assume the reopening of Nicollet Avenue between Lake Street and 29th Street. In the forecast analysis, it was determined that the primary change in traffic patterns resulting from the reopening of Nicollet Avenue are localized between Blaisdell Avenue and 1st Avenue on 31st Street, Lake Street, 26th Street and 28th Street.

TRAFFIC OPERATIONS ANALYSIS (Year 2038)
Lake Street – Operations Analysis:
This analysis assesses the impacts to Lake Street are related to the change in traffic patterns resulting from the construction of the project; transit station improvements on the freeway mainline and new ramp connections will require the reconstruction of the I-35W Bridge over Lake Street.

The background traffic growth along this corridor will increase by approximately 0.5% per year under the 2038 No Build alternative; the ADT is forecasted range is between 20,800 to 23,600 vehicles per day. Under the Build alternative, traffic demands will increase to between 24,200 to 25,700 vehicles per day.

The full assortment of Lake Street operations analysis for all of the analyzed build conditions are those reported in the I-35W Transit Access Project Traffic Analysis Findings – Lake Street Access Scenarios

Memorandum. This analysis will only focus on the preferred build options for both the freeway and arterial network.

No Build Scenario – Lake Street Analysis
The only change in this scenario from the existing conditions is the reopening of Nicollet Avenue; all other intersections remain unchanged. Therefore, the existing problems along Lake Street are only amplified by the increase in traffic demands.

The new traffic demands along Nicollet Avenue at Lake Street are over the current capacity of the southbound approach; the approach lane geometry assumed along Nicollet Avenue at Lake Street includes a shared left-through and a separate right turn lane for both approaches.

Table 7 No Build Lake Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Lake Street @ Blaisdell Avenue (signal control)	SB	19.5 / B	18.1 / B	36 / D	30.4 / C
	EB	25.3 / C		30.7 / C	
	WB	6.1 / A		24.3 / C	
Lake Street @ Nicollet Avenue (signal control)	NB	24.2 / C	16.7 / B	29.9 / C	38.2 / D
	SB	41 / D		**105.5 / F**	
	EB	5.6 / A		12.2 / B	
	WB	8.3 / A		22.8 / C	
Lake Street @ 1st Avenue (signal control)	NB	17.9 / B	12.6 / B	28.7 / C	17.3 / B
	EB	11.6 / B		12.8 / B	
	WB	8.6 / A		15.3 / B	
Lake Street @ Stevens Avenue (signal control)	SB	33.7 / C	8.4 / A	38.5 / D	25.2 / C
	EB	5.1 / A		21 / C	
	WB	5.3 / A		24.9 / C	
Lake Street @ 2nd Avenue (signal control)	NB	38.3 / D	19.9 / B	14.2 / B	14.3 / B
	EB	10.9 / B		5.6 / A	
	WB	4 / A		19.2 / B	
Lake Street @ 3rd Avenue (signal control)	NB	20.9 / C	7.2 / A	23.7 / C	16.5 / B
	SB	20.5 / C		33 / C	
	EB	4 / A		6.3 / A	
	WB	8 / A		21.4 / C	
Lake Street @ Clinton Avenue (minor stop control)	NB	9.9 / A	1.7 / A	**99 / F**	16.3 / C
	SB	8.1 / A		**207.4 / F**	
	EB	1.1 / A		3.9 / A	
	WB	1.6 / A		8.2 / A	
Lake Street @ 4th Avenue (signal control)	NB	34.8 / C	14.2 / B	33.1 / C	27.5 / C
	SB	26 / C		**102.1 / F**	
	EB	11.9 / B		8.7 / A	
	WB	7.3 / A		16.4 / B	
Lake Street @ 5th Avenue (minor stop control)	NB	13.9 / B	2.4 / A	27.7 / D	5.2 / A
	SB	8.8 / A		32 / D	
	EB	2.6 / A		2.4 / A	
	WB	1.2 / A		3.5 / A	

No Build Scenario Mitigated – Lake Street Analysis
To provide acceptable operations for the No Build scenario, changes between the Stevens Avenue and 2nd Avenue intersections are required to improve operations. Side-by-side eastbound and westbound left turn lanes will help separate and store turning vehicles from the heavy through traffic along Lake Street. The westbound left turn lane will need additional storage through the 2nd Avenue intersection. It should be noted that this mitigation would require the reconstruction of the I-35W Bridge over Lake Street to provide enough width.

The new traffic along Nicollet Avenue will require both approaches to Lake Street to include separate left, through, and right turn lanes. All other intersections remain unchanged from existing conditions with the exception of minor signal timing changes.

With the above improvements, both the AM and PM peak hours all intersections operate with a LOS C or better with the worst movements at a LOS E. The only exception is the Clinton Avenue approaches to Lake Street; the volumes would not warrant a signal so no mitigation is available.

Table 8 No Build Mitigated Lake Street

Intersection:	Approach	AM Peak Hour Approach (Delay/LOS)	AM Peak Hour Intersection (Delay/LOS)	PM Peak Hour Approach (Delay/LOS)	PM Peak Hour Intersection (Delay/LOS)
Lake Street @ Blaisdell Avenue (signal control)	SB	19.4 / B	18.5 / B	34 / C	25.5 / C
	EB	25.6 / C		31.5 / C	
	WB	6.9 / A		12.4 / B	
Lake Street @ Nicollet Avenue (signal control)	NB	44.6 / D	22.8 / C	32.6 / C	27.7 / C
	SB	47 / D		**67 / E**	
	EB	5.5 / A		18.6 / B	
	WB	7.6 / A		9.4 / A	
Lake Street @ 1st Avenue (signal control)	NB	18.2 / B	12.5 / B	35.1 / D	14 / B
	EB	11.1 / B		10.6 / B	
	WB	8.5 / A		6.7 / A	
Lake Street @ Stevens Avenue (signal control)	SB	34.2 / C	8.5 / A	43.3 / D	17.5 / B
	EB	5.4 / A		10.4 / B	
	WB	5 / A		16.2 / B	
Lake Street @ 2nd Avenue (signal control)	NB	23.7 / C	14.4 / B	20.7 / C	8.6 / A
	EB	11.7 / B		4 / A	
	WB	4 / A		4.7 / A	
Lake Street @ 3rd Avenue (signal control)	NB	21.5 / C	7 / A	23.8 / C	10.4 / B
	SB	21 / C		28.8 / C	
	EB	3.8 / A		8.6 / A	
	WB	7.6 / A		9.1 / A	
Lake Street @ Clinton Avenue (minor stop control)	NB	9.6 / A	1.9 / A	**35.9 / E**	5.8 / A
	SB	7.7 / A		**37.4 / E**	
	EB	1.4 / A		4.1 / A	
	WB	1.7 / A		3.6 / A	
Lake Street @ 4th Avenue (signal control)	NB	33.4 / C	14.4 / B	27 / C	15.1 / B
	SB	23.4 / C		25.9 / C	
	EB	13.3 / B		10.1 / B	
	WB	7.6 / A		13.6 / B	
Lake Street @ 5th Avenue (minor stop control)	NB	13.6 / B	2.5 / A	25.2 / D	4 / A
	SB	10.5 / B		20.8 / C	
	EB	2.7 / A		2.1 / A	
	WB	1.3 / A		3 / A	

Build Scenario – Lake Street Analysis

The build scenario includes a new southbound exit ramp to Lake Street that will increase demands entering the Lake Street intersection. The new 28th Street exit ramp will decrease demands along 2nd Avenue at the intersection with Lake Street. With the change in traffic patterns from the Build scenario, the mitigations needed in the No Build scenario will provide enough additional capacity to serve the change in traffic demands related to the proposed freeway access changes.

The new southbound exit ramp will need to include four approach lanes; a separate left, shared left-through, shared through-right and right turn lanes.

With the No Build improvements, both the AM and PM peak hours all intersections operate with a LOS C or better with the worst movements at a LOS D. The only exception is the Clinton Avenue approaches to Lake Street, which operates under stop sign control; the volumes would not warrant a traffic signal, so no mitigation is available.

Table 9 Build Lake Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Lake Street @ Blaisdell Avenue (signal control)	SB	20.1 / C	20.7 / C	26.2 / C	26.3 / C
	EB	25.2 / C		32.7 / C	
	WB	14.9 / B		22.4 / C	
Lake Street @ Nicollet Avenue (signal control)	NB	17.8 / B	11.3 / B	22.2 / C	24.5 / C
	SB	31.9 / C		**67.1 / E**	
	EB	4.6 / A		14 / B	
	WB	4.8 / A		10.3 / B	
Lake Street @ 1st Avenue (signal control)	NB	11.5 / B	11.1 / B	22.7 / C	18.2 / B
	EB	6.9 / A		11.6 / B	
	WB	15.2 / B		20.8 / C	
Lake Street @ Stevens Avenue (signal control)	SB	23.8 / C	13.6 / B	35 / D	23.1 / C
	EB	4.7 / A		15.8 / B	
	WB	7 / A		16.1 / B	
Lake Street @ 2nd Avenue (signal control)	NB	35.6 / D	13.2 / B	19.4 / B	9 / A
	EB	5.5 / A		7 / A	
	WB	3.4 / A		6.5 / A	
Lake Street @ 3rd Avenue (signal control)	NB	23.2 / C	5.4 / A	23.2 / C	7.9 / A
	SB	25.3 / C		27.6 / C	
	EB	3.3 / A		3.8 / A	
	WB	4.4 / A		8.4 / A	
Lake Street @ Clinton Avenue (minor stop control)	NB	12.6 / B	1.9 / A	**41.7 / E**	7.1 / A
	SB	7.5 / A		**52.6 / F**	
	EB	1.4 / A		4.2 / A	
	WB	1.6 / A		3.5 / A	
Lake Street @ 4th Avenue (signal control)	NB	35.5 / D	10.8 / B	32.6 / C	13.5 / B
	SB	21.9 / C		28.2 / C	
	EB	4.4 / A		6.9 / A	
	WB	7 / A		11.4 / B	
Lake Street @ 5th Avenue (minor stop control)	NB	13.8 / B	2 / A	27.5 / D	5.1 / A
	SB	10.5 / B		**36.3 / E**	
	EB	1.3 / A		2.4 / A	
	WB	1.4 / A		3.3 / A	

Recommendation – Lake Street
The existing congestion problems along Lake Street will continue to degrade operations through the 2038 design year. Intersection improvements between Stevens Avenue and 2nd Avenue will be required to improve the operations to acceptable levels; side-by-side eastbound and westbound left turn lanes between the two intersections. These improvements will provide enough additional capacity to serve the change in traffic patterns from the build scenario.

When Nicollet Avenue is opened between Lake Street and 29th Street, separate left, through and right turn lanes will be needed at both the northbound and southbound approaches of Nicollet Avenue to Lake Street.

31st Street – Operations Analysis:
This analysis assesses the impacts to 31st Street related to the change in traffic patterns resulting from construction of the project; transit station improvements on the freeway mainline will require the reconstruction of the I-35W Bridge over 31st Street. The background traffic growth along this corridor will increase by approximately 0.5% per year under the 2038 No Build alternative; the ADT is forecasted to 16,700 vehicles per day. Under the Build alternative, traffic demands will increase to 19,400 vehicles per day.

No Build Scenario – 31st Street Analysis
In the AM peak hour, all intersections operate with a LOS C or better with the worst movements at a LOS D. In the PM peak hour, there are operational problems at the two ramp terminal intersections of Stevens Avenue and 2nd Avenue.

As with the existing conditions, the Stevens Avenue intersection has two high volume competing movements that the existing signal timing and phasing cannot effectively serve. The southbound through movement demand is very high as vehicles attempt to reach southbound I-35W simultaneously with a high westbound left turn demand from 31st Street is the same. The southbound approach operates at a LOS D; however the maximum queue can extend as far back as Lake Street. The westbound left turn movement operates at a LOS F and the queue spills into the upstream intersection and creates a long queue for the westbound approach at 2nd Avenue, which operates at a LOS F as well.

Table 10 No Build 31st Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
31st Street @ Nicollet Avenue (signal control)	NB	33.2 / C	25.1 / C	45.3 / D	44.8 / D
	SB	26.1 / C		51.2 / D	
	EB	22 / C		52.5 / D	
	WB	13.1 / B		30.1 / C	
31st Street @ 1st Avenue (signal control)	NB	17.8 / B	23.8 / C	30.1 / C	20.5 / C
	EB	27.2 / C		7.8 / A	
	WB	25.3 / C		26.3 / C	
31st Street @ Stevens Avenue (signal control)	SB	29.1 / C	20.2 / C	28.4 / C	**56.9 / E**
	EB	13.9 / B		13 / B	
	WB	15.6 / B		**106 / F**	
31st Street @ 2nd Avenue (signal control)	NB	24.7 / C	20 / C	23 / C	**98.6 / F**
	EB	18.1 / B		15.5 / B	
	WB	9 / A		**262.8 / F**	

No Build Scenario Mitigated – 31st Street Analysis
To provide acceptable operations for the No Build scenario, changes to the Stevens Avenue intersection are required to improve operations. A westbound left turn phase will help serve the major movement heading to I-35W; the eastbound through volumes are relatively low and can be served with less green time. Another change required to improve operations for the southbound approach is to widen the entrance ramp from 31st Street to accept two lanes prior to the ramp meter. Currently only one of the southbound through lanes on Stevens Avenue can enter southbound I-35W, allowing both through lanes to feed the entrance ramp will improve the efficiency of the southbound approach and decrease the queue, decreasing its impact to Lake Street.

With the above improvements, both the AM and PM peak hours all intersections operate with a LOS C or better with the worst movements at a LOS D.

Table 11 No Build Mitigated 31st Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
31st Street @ Nicollet Avenue (signal control)	NB	30.4 / C	23.5 / C	26.3 / C	22.7 / C
	SB	22.6 / C		14.9 / B	
	EB	22.2 / C		31 / C	
	WB	13.5 / B		21.8 / C	
31st Street @ 1st Avenue (signal control)	NB	17.7 / B	21.8 / C	27.6 / C	11.3 / B
	EB	27.5 / C		7.3 / A	
	WB	17.7 / B		8.5 / A	
31st Street @ Stevens Avenue (signal control)	SB	31.8 / C	15.7 / B	29.6 / C	23.8 / C
	EB	4.4 / A		8.6 / A	
	WB	7.3 / A		26.8 / C	
31st Street @ 2nd Avenue (signal control)	NB	26.2 / C	18.9 / B	23.1 / C	18.4 / B
	EB	6.8 / A		9.4 / A	
	WB	8.4 / A		17.3 / B	

Additional analysis was completed to assess the benefits of adding a separate left turn lane for the westbound 31st Street approaching Stevens Avenue. While the analysis does indicate a slight improvement in traffic operations, the change was only slightly better than the left turn phase alone. However, there would be a big safety benefit of removing the turning traffic from the through lane that is not accounted for in the operations analysis.

The analysis included back to back left turn lanes under the I-35W Bridge with an approximate 200 foot westbound left turn lane and a 50 foot eastbound turn lane.

Build Scenario – 31st Street Analysis
In both the AM and PM peak hours, all intersections operate with a LOS C or better with the worst movements at a LOS D. The mitigations required to improve the No Build scenario provide enough capacity to serve the change in traffic patterns under the build scenario.

Table 12 Build 31st Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
31st Street @ Nicollet Avenue (signal control)	NB	24.6 / C	19.5 / B	22.5 / C	28.2 / C
	SB	10.2 / B		22.3 / C	
	EB	20.7 / C		43.5 / D	
	WB	17.2 / B		23.6 / C	
31st Street @ 1st Avenue (signal control)	NB	17.3 / B	12.4 / B	27.8 / C	11.2 / B
	EB	5.4 / A		7.1 / A	
	WB	17.7 / B		9.5 / A	
31st Street @ Stevens Avenue (signal control)	SB	29.5 / C	18.6 / B	33.2 / C	29.7 / C
	EB	11.2 / B		14 / B	
	WB	10.2 / B		34.7 / C	
31st Street @ 2nd Avenue (signal control)	NB	25.6 / C	17.5 / B	26.4 / C	19.1 / B
	EB	7.4 / A		11.2 / B	
	WB	9.7 / A		16.4 / B	

Recommendation – 31st Street
The existing congestion problems along 31st Street will continue to degrade operations through the 2038 design year. Intersection improvements at 31st Street and Stevens Avenue will be required to improve the operations to acceptable levels; include a westbound left turn phase and/or turn lane and reconfiguring the southbound entrance ramp to I-35W to accept two lanes of traffic from Stevens Avenue. These improvements will provide enough additional capacity to serve the change in traffic patterns from the build scenario.

28th Street – Operations Analysis:
This analysis assesses the impacts to 28th Street related to the change in traffic patterns resulting from the construction of the project; transit station improvements on the freeway mainline will require the reconstruction of the 28th Street Bridge over I-35W. The background traffic growth along this corridor will increase by approximately 0.5% per year under the 2038 No Build alternative; the ADT is forecasted to 15,000 vehicles per day. Under the Build alternative, traffic west of I-35W will have a slight increase in demand to 15,200 vehicles per day and on the east side of I-35W the demands will increase to17,300 vehicles per day.

It should be noted the increase on the east side of I-35W is both an increase in background traffic growth and a change in traffic patterns. With the new ramp, northbound I-35W traffic has direct access to 28th Street where today traffic would exit at 31st Street and follow 2nd Avenue to 28th Street or take any number of alternate roads to their destination. For instance, Park Avenue and Chicago Avenue both have large decreases in daily demands south of 28th Street under the build condition.

No Build Scenario – 28th Street Analysis

In both the AM and PM Peak hours, all intersections operate at LOS C or better. All intersections were benefitted from signal timing changes at all of the intersections.

Table 13 No Build 28th Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
28th Street @ Nicollet Avenue (signal control)	NB	25.3 / C	25.3 / C	21.1 / C	28.3 / C
	SB	14 / B		36.3 / D	
	EB	28.5 / C		26.6 / C	
28th Street @ 1st Avenue (signal control)	NB	36.4 / D	11.6 / B	25.4 / C	11.5 / B
	SB	49 / D		46.9 / D	
	EB	3.8 / A		3.2 / A	
28th Street @ Stevens Avenue (signal control)	NB	23.6 / C	6.3 / A	20 / C	12.3 / B
	SB	34.4 / C		37 / D	
	EB	2.7 / A		5.4 / A	
28th Street @ Clinton Avenue (signal control)	NB	11.5 / B	4.8 / A	4.4 / A	2.8 / A
	EB	2.7 / A		2.4 / A	
28th Street @ 4th Avenue (signal control)	NB	19.9 / B	6 / A	32.4 / C	15.1 / B
	SB	34.6 / C		24.4 / C	
	EB	3 / A		8.7 / A	

Build Scenario – 28th Street Analysis
In both the AM and PM Peak hours, all intersections operate at LOS C or better. The new intersection at the northbound I-35W exit ramp terminal will operate under signal control with dual right turns for the ramp approach; the eastbound 28th Street approach will continue to operate with 3-through lanes.

Table 14 Build 28th Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
28th Street @ Nicollet Avenue (signal control)	NB	13.9 / B	21.9 / C	21.9 / C	23.3 / C
	SB	13.2 / B		18 / B	
	EB	27.5 / C		26.3 / C	
28th Street @ 1st Avenue (signal control)	NB	32.5 / C	10.5 / B	24.8 / C	11.7 / B
	SB	**58 / E**		**55 / E**	
	EB	2.9 / A		3.1 / A	
28th Street @ Stevens Avenue (signal control)	NB	23.2 / C	6.8 / A	21.6 / C	11.1 / B
	SB	34.4 / C		34.8 / C	
	EB	3.1 / A		5 / A	
28th Street @ NB I-35W Exit Ramp (signal control)	NB	8.2 / A	5.1 / A	6.1 / A	6 / A
	EB	3.7 / A		6 / A	
28th Street @ 4th Avenue (signal control)	NB	17.1 / B	5.5 / A	36.2 / D	16.7 / B
	SB	34.3 / C		22 / C	
	EB	2.8 / A		10.6 / B	

Recommendation – 28th Street
The new northbound exit to 28th Street will operate very well and not have any negative traffic operational impacts to 28th Street. The new access will change traffic patterns on the east side of I-35W and reduce traffic along other local arterials including 2nd Avenue, Park Avenue and Chicago Avenue. The existing 3-lane 28th Street Bridge over I-35W, similar to the existing, would provide sufficient capacity through the 2038 design year.

26th Street – Operations Analysis
This analysis assesses the impacts to 26th Street related to an increase in traffic with the construction of the project; improvements on the freeway mainline will require the reconstruction of the 26th Street Bridge over I-35W. The background traffic growth along this corridor will increase by approximately 0.5% per year under the 2038 No Build alternative; the ADT is forecasted to 15,000 vehicles per day. Under the Build alternative, traffic will increase slightly with a forecast ADT of 15,800 vehicles per day.

No Build Scenario – 26th Street Analysis
In the AM peak hour both study intersections along 26th Street will operate at a LOS B or better. In the PM Peak hour, the northbound approach of 5th Avenue to 26th Street will fail. The northbound approach operates with a single shared through-left lane. The northbound approach of 5th Avenue operates at a LOS F due to both the high volume of left turning vehicles and the available green time. The high volume of traffic that comes from the Wells Fargo campus during the PM Peak hour sometimes overburdens 5th Avenue and then the maximum queue can extend over 500 feet in the single lane.

Table 15 2038 No Build 26th Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
26th Street @ Clinton Avenue (minor stop control)	NB	7.2 / A	1.6 / A	25.7 / D	2.6 / A
	SB	5.6 / A		13.5 / B	
	WB	1.3 / A		2.1 / A	
26th Street @ 5th Avenue (signal control)	NB	25.6 / C	12.6 / B	**192.3 / F**	**59.6 / E**
	SB	13 / B		11.4 / B	
	WB	9.1 / A		11.6 / B	

Build Scenario – 26th Street Analysis
In the Build condition, a left turn lane was added on the northbound approach of 5th Avenue to 26th Street. In both the AM and PM Peak hours, the intersections operate at LOS C or better. The northbound approach of 5th Avenue operates at a LOS D with the inclusion of the northbound left turn lane. This turn lane separates the slower turning traffic from the through traffic and uses the available green time more efficiently.

Table 16 2038 Build 26th Street

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
26th Street @ Clinton Avenue (minor stop control)	NB	7.1 / A	1.7 / A	27.2 / D	2.9 / A
	SB	6.4 / A		16 / C	
	WB	1.4 / A		2.3 / A	
26th Street @ 5th Avenue (signal control)	NB	24.5 / C	12.6 / B	44.1 / D	20.3 / C
	SB	12.7 / B		13.2 / B	
	WB	9.4 / A		11.4 / B	

Recommendation – 26th Street
Based on the above analysis, a 3-lane 26th Street Bridge over I-35W, similar to the existing, would provide sufficient capacity through the 2038 design year. However the intersection at 5th Avenue would need some mitigation to include a northbound left turn in order to provide enough capacity for the approach.

Franklin Avenue – Operations Analysis
This analysis assesses the traffic operations along Franklin Avenue related to the construction of the project; improvements on the freeway mainline will require the reconstruction of the Franklin Avenue Bridge over I-35W. The background traffic growth along this corridor will increase by approximately 0.5% per year under the 2038 No Build alternative; the ADT is forecasted to 21,800 vehicles per day. Under the Build alternative, traffic will decrease slightly with a forecast ADT of 21,200 vehicles per day.

No Build Scenario – Franklin Avenue Analysis

In the AM peak hour both study intersections along Franklin Avenue will operate at a LOS C or better. In the PM Peak hour, the northbound and eastbound approaches at the 5th Avenue intersection will fail. The northbound approach operates with a single shared through-left lane. The northbound approach of 5th Avenue operates at a LOS F due to both the high volume of through vehicles using 5th Avenue to get to the freeway. The eastbound left turning vehicles at 5th Avenue have limited green time or available gaps and the queue extends through the 4th Avenue intersection creating major delays.

Table 17 2038 No Build Franklin Avenue

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Franklin Avenue @ 4th Avenue (signal control)	NB	13.8 / B	8.9 / A	**474.2 / F**	**875 / F**
	SB	41.4 / D		**2114.5 / F**	
	EB	8.6 / A		**3000.6 / F**	
	WB	4.1 / A		6.3 / A	
Franklin Avenue @ 5th Avenue (signal control)	NB	45 / D	25.7 / C	**227.8 / F**	**81.7 / F**
	EB	31.4 / C		**84.8 / F**	
	WB	7.6 / A		18.9 / B	

Build Scenario – Franklin Avenue Analysis

In the Build condition, the reconstructed bridge would need to be expanded from four to five lanes to include a center left turn lane. Back to back left turn lanes were added on the new Franklin Avenue Bridge; the eastbound left turn takes the majority of the length. The northbound approach of 5th Avenue also needs capacity improvements in order to efficiently use the limited green time available at the intersection. Parking would need to be banned along the east side of 5th Avenue for approximately 200 feet south of Franklin Avenue in order to accommodate an additional lane at the intersection; this would provide a left-through and through-right lane for the northbound approach.

In the AM and PM peak hours, both intersections operate at LOS D or better. In the PM peak hour, the northbound approach of 5th Avenue operates at a LOS D with the inclusion of the two northbound through lanes; however the maximum queue still extends over 450 feet. The eastbound approach left turn lane will still have queues exceeding the storage; however overall the operations are much improved over the No Build conditions.

Table 18 2038 Build Franklin Avenue

Intersection:	Approach	AM Peak Hour		PM Peak Hour	
		Approach (Delay/LOS)	Intersection (Delay/LOS)	Approach (Delay/LOS)	Intersection (Delay/LOS)
Franklin Avenue @ 4th Avenue (signal control)	NB	13.7 / B	6.9 / A	30.2 / C	19.8 / B
	SB	31.4 / C		38.1 / D	
	EB	6.1 / A		34.7 / C	
	WB	3.8 / A		3.5 / A	
Franklin Avenue @ 5th Avenue (signal control)	NB	33.4 / C	16.2 / B	43.9 / D	40.4 / D
	EB	12.4 / B		30.3 / C	
	WB	13.7 / B		47 / D	

Recommendation – Franklin Avenue
Based on the above analysis, a 5-lane Franklin Avenue Bridge over I-35W would provide sufficient capacity through the 2038 design year. However the intersection at 5th Avenue would need some mitigation to include a two-lane northbound approach in order to provide enough capacity for the approach. An additional westbound right lane was also analyzed, results not shown, and showed improved operations; the lane separates the westbound traffic improving both the westbound approach and in turn improving the eastbound left turns.

gtj
Attachments:
Tables A1 through A8; Existing, No Build, No Build Mitigated, Build MOE Tables (AM and PM Peaks)

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Table A1
I-35W Transit Access Project
AM Peak Hour - Existing

Intersection - AM Peak Hour	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Lake St at Blaisdell Ave (Signal)	SB	43	208	32	283	24.2	C	20.7	C	7.5	A	19.7	B	17.5	B	626	65	125	0			250	16	39
	EB		606	36	642			24.3	C	16.6	B	23.8	C			1362	139	227	300			0		
	WB	12	316		328	13.5	B	5.5	A			5.7	A			373	38	94	150	7	31	0		
Lake St at Nicollet Ave (Signal)	NB	43	21	74	138	19.2	B	12.2	B	21.9	C	18.5	B	6.1	A	552	22	77	0			230	25	72
	SB	4	8	5	17	29.1	C	28.6	C	35.9	D	31.9	C			566	8	39	0			50	6	33
	EB	5	607	47	659	3.7	A	3.3	A	4.0	A	3.4	A			373	12	47	150		5	0		
	WB	26	344	8	378	18.1	B	3.4	A	2.2	A	4.3	A			273	15	48	100	17	65	0		
Lake St at 1st Ave (Signal)	NB	38	307	39	384	23.4	C	19.7	B	7.4	A	19.0	B	12.8	B	545	93	172	0			150	18	71
	EB	106	655		761	13.8	B	11.0	B			11.4	B			273	86	162	100	40	105	0		
	WB		315	70	385			8.8	A	6.5	A	8.4	A			267	61	123	0			0		
Lake St at Stevens Ave (Signal)	SB	14	143	6	163	36.9	D	36.9	D	19.3	B	36.4	D	8.2	A	584	96	189	0			0		
	EB	8	551	134	693	8.2	A	4.7	A	3.6	A	4.5	A			267	47	106	300			0		
	WB	107	375	52	534	8.8	A	3.6	A	2.2	A	4.4	A			272	44	106	95	44	98	0		
Lake St at 2nd Ave (Signal)	NB	128	579	139	846	40.3	D	44.8	D	9.4	A	38.4	D	21.9	C	527	238	378	0			0	54	126
	EB	101	450		551	17.3	B	10.9	B			12.0	B			272	63	106	95	42	109	0		
	WB		436	26	462			3.2	A	2.9	A	3.2	A			249	12	48	0			0		
Lake St at 3rd Ave (Signal)	NB	15	12	11	38	27.2	C	29.6	C	7.8	A	21.1	C	6.2	A	502	23	78	0			0		
	SB	18	10	16	44	34.8	C	15.9	B	6.7	A	20.5	C			586	25	77	0			0		
	EB	4	555	11	570	12.8	B	3.0	A	2.0	A	3.0	A			249	29	84	0			0		
	WB	1	432	32	465	11.2	B	8.0	A	5.8	A	7.9	A			288	79	146	0			0		
Lake St at Clinton Ave	NB	2	1	10	13	11.5	B	11.2	B	5.4	A	6.5	A	1.3	A	504	10	31	0			0		
	SB	6	0	8	14	9.6	A	0.0	A	4.0	A	5.9	A			585	13	35	0			0		
	EB	21	560	7	588	3.7	A	0.8	A	0.4	A	0.9	A			288	9	54	300			0		
	WB	19	453	15	487	4.8	A	1.3	A	1.6	A	1.5	A			260	10	61	0			0		
Lake St at 4th Ave (Signal)	NB	14	176	16	206	33.4	C	30.4	C	21.6	C	29.8	C	13.0	B	518	107	192	0			0		
	SB	10	31	22	63	47.1	D	30.0	C	11.7	B	25.3	C			540	36	102	0			0		
	EB	13	577	20	610	23.2	C	12.5	B	10.7	B	12.7	B			260	114	208	0			0		
	WB	2	402	214	618	15.7	B	7.1	A	5.3	A	6.5	A			280	81	160	0			0		
Lake St at 5th Ave	NB	7	17	8	32	9.3	A	13.6	B	5.8	A	10.3	B	2.0	A	517	23	62	0			0		
	SB	3	7	9	19	9.7	A	14.3	B	3.7	A	8.8	A			588	14	48	0			0		
	EB	36	561	8	605	6.3	A	2.2	A	1.7	A	2.4	A			280	21	99	0			0		
	WB	5	598	27	630	4.0	A	1.0	A	1.1	A	1.0	A			1594	2	35	0			0		
31st St at Nicollet Ave (Signal)	NB	30	126	66	222	25.6	C	23.2	C	8.6	A	18.9	B	14.8	B	647	71	198	0			80	22	93
	SB	19	41	7	67	9.0	A	4.0	A	1.3	A	4.8	A			552	13	44	0			80	1	24
	EB	10	304	26	340	18.0	B	17.8	B	7.2	A	17.0	B			1749	61	144	300			50	18	76
	WB	19	147	24	190	17.7	B	10.1	B	5.5	A	10.3	B			261	44	113	0			0		
31st St at 1st Ave (Signal)	NB	17	261	39	317	16.2	B	17.8	B	19.1	B	17.9	B	22.0	C	668	79	159	0			0		
	EB	101	314		415	32.1	C	22.0	C			24.3	C			261	91	179	130	66	147	0		
	WB		153	72	225			21.3	C	27.7	C	23.0	C			276	75	140	0			0		
31st St at Stevens Ave (Signal)	SB	13	365	35	413	36.7	D	35.7	D	4.1	A	33.1	C	19.1	B	546	188	330	0			100	18	68
	EB		190	130	320			9.3	A	10.2	B	9.6	A			276	76	175	0			0		
	WB	117	234		351	19.4	B	10.4	B			13.4	B			268	73	153	0			0		
31st St at 2nd Ave (Signal)	NB	99	800	99	998	27.2	C	24.5	C	12.5	B	23.6	C	20.9	C	679	179	288	0			0		
	EB	17	190		207	23.3	C	20.7	C			20.9	C			268	64	130	300			0		
	WB		250	5	255			10.8	B	2.6	A	10.7	B			977	46	119	0			0		
28th St at Nicollet Ave (Signal)	NB		102	5	107			16.4	B	4.7	A	16.0	B	24.7	C	302	49	116	0			0	2	31
	SB	72	36		108	15.5	B	9.1	A			13.3	B			627	14	55	80	26	80	0		
	EB	55	1060	3	1,118	30.4	C	26.4	C	27.4	C	26.6	C			944	189	416	100	37	124	0		
28th St at 1st Ave (Signal)	NB		247	99	346			35.6	D	7.6	A	27.8	C	9.0	A	554	138	266	0			0	37	92
	SB	13			13	44.5	D					44.5	D			637			0	11	47	0		
	EB	86	1091	0	1,177	2.5	A	3.4	A	0.0	A	3.3	A			282	20	58	0			0		
28th St at Stevens Ave (Signal)	NB		36	5	41			28.8	C	5.6	A	25.7	C	5.7	A	560	27	74	0			0		
	SB	40	86		126	33.8	C	29.0	C			30.6	C			637	78	193	0			0		
	EB	22	1220	79	1,321	3.9	A	2.5	A	2.2	A	2.5	A			250	48	99	300			0		
28th St at Clinton Ave (Signal)	NB			404	404				A	8.6	A	8.6	A	3.8	A	0			0			0	68	138
	EB		1190		1,190			2.3	A			2.3	A			925	35	103	0			0		
28th St at 4th Ave (Signal)	NB		19	61	80			33.7	C	9.9	A	15.5	B	5.2	A	580	41	104	0			0		
	SB	4	107		111	46.5	D	35.4	D			35.6	D			524	80	176	0			0		
	EB	118	1074	128	1,320	2.0	A	2.4	A	2.7	A	2.4	A			267	55	125	0			0		
26th St at Clinton	NB	2	3		5	4.7	A	7.0	A			6.2	A	1.5	A	672	5	31	0			0		
	SB		6	9	15			8.8	A	3.5	A	5.4	A			623	14	36	0			0		
	WB	1	581	20	602	0.0	A	1.3	A	1.4	A	1.3	A			0			0			0		
26th St at 5th Ave (Signal)	NB	33	133		166	27.2	C	24.0	C			24.6	C	12.0	B	647	78	147	0			0		
	SB		29	39	68			19.4	B	6.0	A	11.5	B			699	33	88	0			0		
	WB	67	512	51	630	7.8	A	9.2	A	6.8	A	8.9	A			1840	78	143	0			0		
Franklin at 4th Ave (Signal)	NB	3	1	45	49	25.2	C	17.3	B	5.1	A	6.6	A	4.6	A	654	25	59	0			0		
	SB	38	4	5	47	29.8	C	20.4	C	12.2	B	26.9	C			697	34	111	0			0		
	EB	2	733	8	743	0.0	A	4.0	A	2.7	A	4.0	A			926	60	160	0			0		
	WB	14	381	11	406	10.5	B	2.8	A	2.1	A	3.0	A			264	29	88	0			0		
Franklin at 5th Ave (Signal)	NB	36	184	9	229	34.2	C	34.3	C	32.1	C	34.2	C	12.3	B	650	124	234	0			0		
	EB	343	421	70	834	15.9	B	8.3	A	5.4	A	11.1	B			264	133	256	300			0		
	WB	6	390	163	559	8.3	A	5.7	A	4.2	A	5.3	A			986	66	136	0			0		

Table A2
I-35W Transit Access Project
PM Peak Hour - Existing

Intersection - PM Peak Hour	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Lake St at Blaisdell Ave (Signal)	SB	169	881	135	1,185	41.6	D	37.6	D	21.1	C	36.3	D	29.7	C	626	298	576	0			250	99	275
	EB		619	94	713			25.4	C	23.9	C	25.2	C			1362	161	269	300			0		
	WB	74	908		982	30.9	C	24.6	C			25.1	C			373	175	252	150	50	160	0		
Lake St at Nicollet Ave (Signal)	NB	129	73	136	338	57.9	E	51.1	D	29.9	C	46.1	D	17.6	B	552	156	305	0			230	81	219
	SB	33	46	22	101	35.9	D	32.3	C	44.6	D	36.3	D			566	56	117	0			50	24	74
	EB	24	578	50	652	20.1	C	3.9	A	4.3	A	4.5	A			373	19	64	150	17	58	0		
	WB	70	837	36	943	26.8	C	15.9	B	14.9	B	16.7	B			273	212	298	100	57	124	0		
Lake St at 1st Ave (Signal)	NB	59	366	67	492	35.7	D	27.9	C	9.0	A	26.1	C	14.3	B	545	129	247	0			150	40	172
	EB	114	673		787	21.5	C	10.2	B			11.8	B			273	104	178	100	57	122	0		
	WB		884	137	1,021			10.5	B	8.7	A	10.2	B			267	137	262	0			0		
Lake St at Stevens Ave (Signal)	SB	32	236	19	287	38.8	D	37.1	D	35.3	D	37.1	D	20.7	C	584	165	331	0			0		
	EB	16	598	119	733	37.1	D	16.9	B	10.9	B	16.3	B			267	104	217	300			0		
	WB	278	971	97	1,346	42.9	D	13.2	B	9.8	A	19.6	B			272	189	301	95	125	145	0		
Lake St at 2nd Ave (Signal)	NB	225	202	161	588	26.3	C	13.3	B	4.8	A	16.2	B	9.9	A	527	107	236	0			0	23	74
	EB	29	604		633	24.3	C	2.8	A			3.8	A			272	12	47	95	22	98	0		
	WB		1150	20	1,170			10.0	B	5.6	A	9.9	A			249	93	248	0			0		
Lake St at 3rd Ave (Signal)	NB	17	25	36	78	32.0	C	32.8	C	13.2	B	23.4	C	9.8	A	502	45	123	0			0		
	SB	24	20	44	88	36.2	D	28.5	C	16.9	B	25.0	C			586	50	107	0			0		
	EB	6	748	39	793	13.8	B	5.0	A	3.6	A	5.0	A			249	70	149	0			0		
	WB	7	1110	57	1,174	21.7	C	10.9	B	7.8	A	10.8	B			288	149	279	0			0		
Lake St at Clinton Ave	NB	4	2	17	23	49.7	E	40.5	E	11.0	B	20.3	C	3.5	A	504	20	58	0			0		
	SB	17	2	67	86	26.6	D	10.4	B	14.2	B	16.8	C			585	46	96	0			0		
	EB	41	747	10	798	14.2	B	1.9	A	1.5	A	2.5	A			288	40	118	300			0		
	WB	32	1071	40	1,143	7.8	A	2.6	A	2.0	A	2.7	A			260	40	165	0			0		
Lake St at 4th Ave (Signal)	NB	22	57	23	102	38.3	D	31.5	C	12.4	B	27.4	C	27.6	C	518	55	139	0			0		
	SB	25	128	181	334	145.2	F	144.8	F	127.3	F	135.1	F			540	393	572	0			0		
	EB	12	678	31	721	12.7	B	3.3	A	1.9	A	3.4	A			260	40	108	0			0		
	WB	10	862	41	913	20.2	C	8.7	A	7.2	A	8.7	A			280	116	249	0			0		
Lake St at 5th Ave	NB	6	4	35	45	17.2	C	25.0	D	6.3	A	9.7	A	2.4	A	517	27	58	0			0		
	SB	3	8	60	71	32.2	D	26.2	D	8.9	A	11.2	B			588	34	107	0			0		
	EB	20	675	43	738	7.5	A	1.4	A	1.2	A	1.6	A			280	21	86	0			0		
	WB	28	842	22	892	6.8	A	2.0	A	1.4	A	2.1	A			1594	25	100	0			0		
31st St at Nicollet Ave (Signal)	NB	63	212	80	355	37.7	D	32.7	C	13.9	B	29.5	C	17.1	B	647	151	298	0			80	34	105
	SB	66	121	29	216	19.6	B	16.6	B	6.0	A	16.0	B			552	72	153	0			80	20	100
	EB	27	299	53	379	25.9	C	16.6	B	6.4	A	15.9	B			1749	60	147	300			50	23	75
	WB	40	372	73	485	16.9	B	9.6	A	5.9	A	9.6	A			261	82	156	0			0		
31st St at 1st Ave (Signal)	NB	37	217	41	295	28.1	C	28.7	C	29.5	C	28.7	C	22.4	C	668	85	156	0			0		
	EB	122	375		497	12.3	B	5.9	A			7.4	A			261	51	96	130	47	113	0		
	WB		454	203	657			28.5	C	35.9	D	30.5	C			276	195	275	0			0		
31st St at Stevens Ave (Signal)	SB	32	639	67	738	48.8	D	41.5	D	12.3	B	39.1	D	43.7	D	546	373	565	0			100	27	78
	EB		319	135	454			17.6	B	16.8	B	17.4	B			276	86	177	0			0		
	WB	275	661		936	113.4	F	39.2	D			61.1	E			268	266	305	0			0		
31st St at 2nd Ave (Signal)	NB	261	565	123	949	33.7	C	21.8	C	9.1	A	23.4	C	77.0	E	679	228	464	0			0		
	EB	18	303		321	43.6	D	21.3	C			22.6	C			268	78	206	300			0		
	WB		609	9	618			200.4	F	123.3	F	198.9	F			977	449	880	0			0		
28th St at Nicollet Ave (Signal)	NB		201	8	209			17.2	B	6.8	A	17.0	B	20.9	C	302	90	202	0			0	3	30
	SB	140	163		303	20.4	C	11.9	B			15.9	B			627	56	147	80	58	104	0		
	EB	113	810	18	941	28.7	C	22.9	C	22.2	C	23.5	C			944	141	394	100	62	125	0		
28th St at 1st Ave (Signal)	NB		303	159	462			56.3	E	6.1	A	39.4	D	26.1	C	554	217	397	0			0	51	174
	SB	43			43	55.2	E					55.2	E			637			0	44	101	0		
	EB	58	837	0	895	19.0	B	18.4	B	0.0	A	18.4	B			282	173	252	0			0		
28th St at Stevens Ave (Signal)	NB		61	7	68			24.3	C	9.0	A	22.8	C	17.6	B	560	42	115	0			0		
	SB	73	181		254	41.2	D	37.2	D			38.2	D			637	149	298	0			0		
	EB	46	818	127	991	12.2	B	12.1	B	12.1	B	12.1	B			250	196	270	300			0		
28th St at Clinton Ave (Signal)	NB			214	214				A	5.6	A	5.6	A	3.1	A	0			0			0	40	69
	EB		884		884			2.5	A			2.5	A			925	5	54	0			0		
28th St at 4th Ave (Signal)	NB		139	318	457			35.4	D	25.5	C	28.5	C	17.8	B	580	218	442	0			0		
	SB	14	23		37	26.3	C	25.2	C			25.6	C			524	24	64	0			0		
	EB	64	1167	89	1,320	12.9	B	14.0	B	11.9	B	13.8	B			267	165	271	0			0		
26th St at Clinton	NB	3	7		10	10.2	B	21.1	C			18.0	C	2.2	A	672	7	37	0			0		
	SB		6	35	41			18.7	C	9.3	A	10.6	B			623	28	53	0			0		
	WB	6	1738	123	1,867	2.6	A	1.8	A	3.2	A	1.9	A			0			0			0		
26th St at 5th Ave (Signal)	NB	111	345		456	56.1	E	51.3	D			52.4	D	22.1	C	647	324	537	0			0		
	SB		9	13	22			21.3	C	5.5	A	11.2	B			699	14	53	0			0		
	WB	30	1107	86	1,223	9.4	A	10.8	B	11.7	B	10.8	B			1840	144	255	0			0		
Franklin at 4th Ave (Signal)	NB	18	5	87	110	56.4	E	110.9	F	69.1	E	68.8	E	118.7	F	654	95	255	0			0		
	SB	38	1	4	43	205.5	F	77.5	E	117.2	F	192.8	F			697	82	227	0			0		
	EB	3	799	20	822	412.5	F	265.7	F	169.5	F	263.9	F			926	630	957	0			0		
	WB	27	804	26	857	13.3	B	4.5	A	2.4	A	4.7	A			264	47	222	0			0		
Franklin at 5th Ave (Signal)	NB	53	447	10	510	243.7	F	243.3	F	231.4	F	243.1	F	71.3	E	650	602	677	0			0		
	EB	330	561	21	912	122.9	F	11.5	B	10.6	B	50.5	D			264	272	304	300			0		
	WB	1	841	280	1,122	16.0	B	13.6	B	13.2	B	13.5	B			986	188	332	0			0		

Table A3
I-35W Transit Access Project
AM Peak Hour - 2038 No Build
Nicollet Avenue Open

Intersection - AM Peak Hour	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Lake St at Blaisdell Ave (Signal)	SB	50	200	30	280	23.3	C	20.1	C	7.9	A	19.5	B	18.1	B	626	61	123	0			250	13	48
	EB		700	40	740			25.6	C	19.7	B	25.3	C			1362	159	261	300			0		
	WB	20	370		390	12.9	B	5.8	A			6.1	A			368	49	95	150	11	48	0		
Lake St at Nicollet Ave (Signal)	NB	60	420	80	560	30.8	C	23.8	C	21.1	C	24.2	C	16.7	B	552	137	419	150	41	162	230	37	185
	SB	60	190	90	340	67.9	E	35.9	D	35.5	D	41.0	D			830	110	270	150	52	147	150	64	172
	EB	100	620	80	800	12.8	B	4.6	A	4.8	A	5.6	A			368	16	58	150	38	95	0		
	WB	40	310	120	470	24.3	C	6.8	A	6.9	A	8.3	A			267	28	64	100	26	69	0		
Lake St at 1st Ave (Signal)	NB	70	280	80	430	24.4	C	18.8	B	8.0	A	17.9	B	12.6	B	545	89	166	0			150	36	120
	EB	50	690		740	15.1	B	11.3	B			11.6	B			267	97	204	100	24	61	0		
	WB		390	50	440			9.0	A	5.7	A	8.6	A			267	67	140	0			0		
Lake St at Stevens Ave (Signal)	SB	20	150	10	180	31.8	C	35.1	D	19.6	B	33.7	C	8.4	A	584	103	231	0			0		
	EB	10	630	150	790	10.4	B	5.3	A	3.9	A	5.1	A			267	52	93	300			0		
	WB	120	430	60	610	12.5	B	3.8	A	2.1	A	5.3	A			272	42	100	95	55	116	0		
Lake St at 2nd Ave (Signal)	NB	120	540	130	790	41.4	D	44.3	D	10.3	B	38.3	D	19.9	B	527	221	355	0			0	55	124
	EB	120	520		640	18.6	B	9.2	A			10.9	B			272	62	120	95	50	122	0		
	WB		510	40	550			4.0	A	3.6	A	4.0	A			249	19	62	0			0		
Lake St at 3rd Ave (Signal)	NB	20	20	20	60	31.7	C	24.9	C	8.5	A	20.9	C	7.2	A	502	34	95	0			0		
	SB	20	20	20	60	28.9	C	30.2	C	6.2	A	20.5	C			586	37	87	0			0		
	EB	10	630	20	660	11.6	B	3.9	A	2.2	A	4.0	A			249	37	99	0			0		
	WB	10	490	40	540	11.8	B	8.2	A	4.6	A	8.0	A			288	90	160	0			0		
Lake St at Clinton Ave	NB	10	10	20	40	14.8	B	10.6	B	6.9	A	9.9	A	1.7	A	504	24	64	0			0		
	SB	10	0	10	20	10.0	B	0.0	A	6.0	A	8.1	A			585	17	40	0			0		
	EB	30	630	10	670	4.1	A	1.0	A	0.5	A	1.1	A			288	13	65	300			0		
	WB	30	510	20	560	5.1	A	1.4	A	1.2	A	1.6	A			260	10	58	0			0		
Lake St at 4th Ave (Signal)	NB	20	200	20	240	39.7	D	35.5	D	22.8	C	34.8	C	14.2	B	518	147	244	0			0		
	SB	20	40	30	90	40.1	D	30.0	C	13.0	B	26.0	C			540	50	98	0			0		
	EB	20	650	30	700	21.6	C	11.8	B	8.5	A	11.9	B			260	124	210	0			0		
	WB	10	460	240	710	17.9	B	7.8	A	5.9	A	7.3	A			280	89	184	0			0		
Lake St at 5th Ave	NB	10	20	10	40	16.7	C	16.5	C	6.2	A	13.9	B	2.4	A	517	27	58	0			0		
	SB	10	10	20	40	9.4	A	13.2	B	5.5	A	8.8	A			588	24	53	0			0		
	EB	50	630	10	690	6.4	A	2.3	A	1.8	A	2.6	A			280	29	101	0			0		
	WB	10	680	40	730	4.0	A	1.2	A	1.5	A	1.2	A			1594	2	33	0			0		
31st St at Nicollet Ave (Signal)	NB	30	410	50	490	35.6	D	34.4	C	21.3	C	33.2	C	25.1	C	647	241	494	0			80	25	105
	SB	50	220	30	300	32.8	C	27.1	C	9.8	A	26.1	C			552	136	292	0			80	31	105
	EB	50	320	60	430	31.8	C	22.8	C	9.2	A	22.0	C			1743	87	185	300			50	32	75
	WB	30	140	80	250	21.9	C	13.9	B	8.5	A	13.1	B			256	62	135	0			0		
31st St at 1st Ave (Signal)	NB	20	280	50	350	14.7	B	17.8	B	18.6	B	17.8	B	23.8	C	668	87	177	0			0		
	EB	120	360		480	28.3	C	26.8	C			27.2	C			256	103	178	130	76	152	0		
	WB		180	90	270			23.4	C	30.0	C	25.3	C			276	100	181	0			0		
31st St at Stevens Ave (Signal)	SB	20	410	50	480	32.1	C	32.0	C	4.5	A	29.1	C	20.2	C	546	215	354	0			100	22	60
	EB		220	150	370			13.4	B	14.9	B	13.9	B			276	96	191	0			0		
	WB	130	270		400	22.2	C	12.6	B			15.6	B			268	79	151	0			0		
31st St at 2nd Ave (Signal)	NB	70	740	80	890	28.5	C	25.7	C	12.2	B	24.7	C	20.0	C	679	160	264	0			0		
	EB	30	230		260	24.7	C	17.4	B			18.1	B			268	67	127	300			0		
	WB		310	10	320			9.1	A	5.4	A	9.0	A			977	49	114	0			0		
28th St at Nicollet Ave (Signal)	NB		530	60	590			26.9	C	10.7	B	25.3	C	25.3	C	306	213	316	0			0	28	108
	SB	70	290		360	23.0	C	12.1	B			14.0	B			627	96	240	80	35	96	0		
	EB	30	1160	30	1,220	31.8	C	28.5	C	27.4	C	28.5	C			944	208	317	100	24	125	0		
28th St at 1st Ave (Signal)	NB		280	110	390			46.3	D	9.2	A	36.4	D	11.6	B	554	183	367	0			0	41	90
	SB	20			20	49.0	D					49.0	D			637			0	19	69	0		
	EB	110	1230	0	1,340	3.2	A	3.9	A	0.0	A	3.8	A			282	30	83	0			0		
28th St at Stevens Ave (Signal)	NB		50	10	60			26.5	C	4.5	A	23.6	C	6.3	A	560	34	94	0			0		
	SB	50	100		150	37.0	D	33.2	C			34.4	C			637	89	182	0			0		
	EB	30	1370	90	1,490	4.4	A	2.7	A	2.9	A	2.7	A			250	57	107	300			0		
28th St at Clinton Ave (Signal)	NB			460	460				A	11.5	B	11.5	B	4.8	A	0			0			0	85	166
	EB		1340		1,340			2.7	A			2.7	A			925	44	113	0			0		
28th St at 4th Ave (Signal)	NB		30	70	100			35.0	D	12.2	B	19.9	B	6.0	A	580	53	134	0			0		
	SB	10	120		130	34.9	C	34.6	C			34.6	C			524	87	182	0			0		
	EB	140	1210	150	1,500	2.5	A	3.0	A	3.7	A	3.0	A			267	71	170	0			0		
26th St at Clinton	NB	10	10		20	5.9	A	8.4	A			7.2	A	1.6	A	672	12	31	0			0		
	SB		10	20	30			7.6	A	4.6	A	5.6	A			623	20	47	0			0		
	WB	10	660	30	700	2.4	A	1.3	A	1.6	A	1.3	A			0			0			0		
26th St at 5th Ave (Signal)	NB	40	150		190	26.7	C	25.3	C			25.6	C	12.6	B	647	94	183	0			0		
	SB		40	50	90			20.3	C	7.3	A	13.0	B			699	41	96	0			0		
	WB	80	580	60	720	8.5	A	9.2	A	8.7	A	9.1	A			1840	86	165	0			0		
Franklin at 4th Ave (Signal)	NB	10	10	60	80	20.2	C	28.8	C	10.9	B	13.8	B	8.9	A	654	39	99	0			0		
	SB	50	10	10	70	44.3	D	45.1	D	20.3	C	41.4	D			697	55	150	0			0		
	EB	10	830	10	850	18.1	B	8.5	A	5.1	A	8.6	A			926	102	291	0			0		
	WB	20	430	20	470	14.1	B	3.8	A	2.4	A	4.1	A			264	39	106	0			0		
Franklin at 5th Ave (Signal)	NB	50	260	20	330	44.1	D	45.9	D	36.1	D	45.0	D	25.7	C	650	207	433	0			0		
	EB	450	500	90	1,040	46.1	D	20.6	C	16.3	B	31.4	C			264	214	285	300			0		
	WB	10	460	220	690	22.8	C	8.1	A	6.1	A	7.6	A			986	92	168	0			0		

Table A4
I-35W Transit Access Project
PM Peak Hour - 2038 No Build
Nicollet Avenue Open

Intersection - PM Peak Hour	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Lake St at Blaisdell Ave (Signal)	SB	180	850	130	1,160	40.7	D	37.1	D	22.7	C	36.0	D	30.4	C	626	300	525	0			250	102	273
	EB		720	110	830			30.5	C	32.1	C	30.7	C			1362	197	334	300			0		
	WB	90	1060		1,150	29.1	C	23.9	C			24.3	C			368	198	284	150	63	174	0		
Lake St at Nicollet Ave (Signal)	NB	140	210	130	480	40.2	D	24.2	C	31.3	C	29.9	C	38.2	D	552	129	304	150	85	174	230	87	250
	SB	150	380	120	650	109.2	F	102.6	F	111.2	F	105.5	F			830	635	817	150	107	174	150	108	175
	EB	80	590	100	770	45.9	D	8.4	A	13.3	B	12.2	B			368	63	166	150	57	134	0		
	WB	120	870	100	1,090	67.2	E	17.7	B	16.1	B	22.8	C			267	242	309	100	98	124	0		
Lake St at 1st Ave (Signal)	NB	100	330	100	530	43.2	D	29.9	C	11.5	B	28.7	C	17.3	B	545	136	231	0			150	60	175
	EB	90	790		880	21.2	C	12.0	B			12.8	B			267	139	311	100	47	125	0		
	WB		1020	90	1,110			15.4	B	14.0	B	15.3	B			267	171	324	0			0		
Lake St at Stevens Ave (Signal)	SB	40	250	30	320	33.9	C	39.5	D	37.0	D	38.5	D	25.2	C	584	181	341	0			0		
	EB	20	680	140	840	54.6	D	21.2	C	14.5	B	21.0	C			267	144	270	300			0		
	WB	300	1110	110	1,520	59.4	E	17.3	B	13.6	B	24.9	C			272	241	325	95	132	145	0		
Lake St at 2nd Ave (Signal)	NB	260	230	190	680	21.4	C	12.0	B	7.0	A	14.2	B	14.3	B	527	94	230	0			0	37	103
	EB	40	680		720	39.2	D	3.4	A			5.6	A			272	21	66	95	36	100	0		
	WB		1290	30	1,320			19.4	B	9.6	A	19.2	B			249	169	285	0			0		
Lake St at 3rd Ave (Signal)	NB	20	30	50	100	36.9	D	30.1	C	14.7	B	23.7	C	16.5	B	502	57	128	0			0		
	SB	30	30	50	110	38.5	D	34.7	C	28.7	C	33.0	C			586	73	170	0			0		
	EB	10	840	50	900	24.9	C	6.2	A	4.8	A	6.3	A			249	82	174	0			0		
	WB	10	1250	70	1,330	27.1	C	21.7	C	14.3	B	21.4	C			288	210	314	0			0		
Lake St at Clinton Ave	NB	10	10	20	40	127.9	F	69.7	F	92.8	F	99.0	F	16.3	C	504	48	153	0			0		
	SB	20	10	80	110	186.7	F	235.6	F	209.1	F	207.4	F			585	163	430	0			0		
	EB	50	840	20	910	21.9	C	3.0	A	1.5	A	3.9	A			288	58	178	300			0		
	WB	40	1200	50	1,290	14.9	B	8.1	A	3.6	A	8.2	A			260	109	284	0			0		
Lake St at 4th Ave (Signal)	NB	30	70	30	130	37.9	D	32.6	C	30.2	C	33.1	C	27.5	C	518	80	197	0			0		
	SB	30	150	210	390	98.2	F	107.7	F	98.8	F	102.1	F			540	348	560	0			0		
	EB	20	760	40	820	36.1	D	8.1	A	5.7	A	8.7	A			260	88	201	0			0		
	WB	20	970	50	1,040	27.2	C	16.5	B	10.9	B	16.4	B			280	175	313	0			0		
Lake St at 5th Ave	NB	10	10	40	60	37.3	E	47.9	E	19.3	C	27.7	D	5.2	A	517	41	112	0			0		
	SB	10	10	70	90	37.3	E	47.8	E	28.9	D	32.0	D			588	60	172	0			0		
	EB	30	760	50	840	9.3	A	2.2	A	1.9	A	2.4	A			280	29	126	0			0		
	WB	40	950	30	1,020	9.4	A	3.3	A	2.3	A	3.5	A			1594	41	181	0			0		
31st St at Nicollet Ave (Signal)	NB	60	340	60	460	52.6	D	46.8	D	29.5	C	45.3	D	44.8	D	647	266	622	0			80	29	105
	SB	140	440	70	650	53.9	D	51.6	D	43.1	D	51.2	D			552	411	561	0			80	46	105
	EB	60	300	100	460	105.8	F	53.3	D	14.9	B	52.5	D			1743	164	284	300			50	44	76
	WB	60	380	140	580	49.0	D	31.3	C	18.6	B	30.1	C			256	144	266	0			0		
31st St at 1st Ave (Signal)	NB	40	200	50	290	31.2	C	29.8	C	30.3	C	30.1	C	20.5	C	668	86	148	0			0		
	EB	130	430		560	15.2	B	5.4	A			7.8	A			256	48	106	130	63	147	0		
	WB		520	220	740			24.9	C	30.0	C	26.3	C			276	181	266	0			0		
31st St at Stevens Ave (Signal)	SB	40	720	80	840	30.3	C	30.0	C	12.6	B	28.4	C	56.9	E	546	290	482	0			100	31	112
	EB		360	160	520			12.8	B	13.5	B	13.0	B			276	86	153	0			0		
	WB	310	740		1,050	180.4	F	78.8	E			106.0	F			268	273	295	0			0		
31st St at 2nd Ave (Signal)	NB	240	600	110	950	29.2	C	22.6	C	10.9	B	23.0	C	98.6	F	679	214	384	0			0		
	EB	30	350		380	28.6	C	14.5	B			15.5	B			268	62	116	300			0		
	WB		710	20	730			266.3	F	155.7	F	262.8	F			977	684	1009	0			0		
28th St at Nicollet Ave (Signal)	NB		360	20	380			21.9	C	5.5	A	21.1	C	28.3	C	306	167	290	0			0	12	36
	SB	80	540		620	39.8	D	35.8	D			36.3	D			627	280	521	80	53	105	0		
	EB	100	920	120	1,140	28.0	C	25.4	C	33.9	C	26.6	C			944	193	293	100	58	125	0		
28th St at 1st Ave (Signal)	NB		340	170	510			33.6	C	9.2	A	25.4	C	11.5	B	554	179	323	0			0	53	123
	SB	50			50	46.9	D					46.9	D			637			0	41	86	0		
	EB	70	950	0	1,020	2.7	A	3.2	A	0.0	A	3.2	A			282	23	124	0			0		
28th St at Stevens Ave (Signal)	NB		70	10	80			21.4	C	11.8	B	20.0	C	12.3	B	560	40	94	0			0		
	SB	90	210		300	41.4	D	35.2	D			37.0	D			637	171	326	0			0		
	EB	60	920	150	1,130	6.5	A	5.3	A	6.0	A	5.4	A			250	75	136	300			0		
28th St at Clinton Ave (Signal)	NB			240	240				A	4.4	A	4.4	A	2.8	A	0			0			0	42	74
	EB		990		990			2.4	A			2.4	A			925	45	115	0			0		
28th St at 4th Ave (Signal)	NB		160	360	520			38.2	D	29.9	C	32.4	C	15.1	B	580	261	517	0			0		
	SB	20	30		50	24.8	C	24.2	C			24.4	C			524	31	89	0			0		
	EB	80	1310	100	1,490	6.4	A	8.7	A	10.1	B	8.7	A			267	102	179	0			0		
26th St at Clinton	NB	10	10		20	14.8	B	36.6	E			25.7	D	2.6	A	672	18	58	0			0		
	SB		10	40	50			21.1	C	12.1	B	13.5	B			623	31	85	0			0		
	WB	10	1950	140	2,100	3.9	A	2.0	A	3.5	A	2.1	A			586		11	0			0		
26th St at 5th Ave (Signal)	NB	130	390		520	180.8	F	196.1	F			192.3	F	59.6	E	647	557	690	0			0		
	SB		20	20	40			18.5	B	6.0	A	11.4	B			699	22	58	0			0		
	WB	40	1240	100	1,380	8.2	A	11.6	B	12.4	B	11.6	B			1840	157	259	0			0		
Franklin at 4th Ave (Signal)	NB	30	10	100	140	464.7	F	498.8	F	474.6	F	474.2	F	875.0	F	654	390	655	0			0		
	SB	50	10	10	70	2151.1	F	2233.2	F	1883.1	F	2114.5	F			697	499	706	0			0		
	EB	10	900	30	940	3522.5	F	2988.2	F	3171.3	F	3000.6	F			926	940	968	0			0		
	WB	40	910	30	980	12.7	B	6.0	A	6.9	A	6.3	A			264	59	274	0			0		
Franklin at 5th Ave (Signal)	NB	60	520	20	600	237.4	F	227.4	F	209.7	F	227.8	F	81.7	F	650	654	688	0			0		
	EB	390	630	30	1,050	207.0	F	13.0	B	11.6	B	84.8	F			264	272	310	300			0		
	WB	10	940	340	1,290	19.2	B	18.7	B	19.4	B	18.9	B			986	249	440	0			0		

Table A5
I-35W Transit Access Project
AM Peak Hour - 2038 No Build Mitigated
Nicollet Avenue Open

Intersection - AM Peak Hour	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Lake St at Blaisdell Ave (Signal)	SB	50	200	30	280	22.9	C	20.3	C	7.7	A	19.4	B	18.4	B	626	60	112	0			250	13	45
	EB		700	40	740			25.7	C	21.8	C	25.5	C			1362	160	248	300			0		
	WB	20	370		390	12.1	B	6.7	A			6.9	A			368	53	99	150	12	52	0		
Lake St at Nicollet Ave (Signal)	NB	60	420	80	560	50.6	D	44.6	D	40.0	D	44.6	D	22.6	C	552	273	545	150	50	174	230	60	253
	SB	60	190	90	340	84.7	F	38.7	D	40.2	D	46.1	D			830	118	246	150	55	138	150	66	172
	EB	100	620	80	800	13.1	B	4.4	A	5.3	A	5.5	A			368	17	56	150	38	112	0		
	WB	40	310	120	470	22.3	C	6.2	A	6.5	A	7.6	A			267	28	68	100	25	76	0		
Lake St at 1st Ave (Signal)	NB	70	280	80	430	26.8	C	18.7	B	8.1	A	18.2	B	12.5	B	544	89	163	0			150	38	143
	EB	50	690		740	15.4	B	10.8	B			11.1	B			267	93	166	100	25	88	0		
	WB		390	50	440			8.8	A	6.1	A	8.5	A			267	66	158	0			0		
Lake St at Stevens Ave (Signal)	SB	20	150	10	180	35.0	D	35.3	D	21.4	C	34.5	C	8.4	A	579	103	211	0			0		
	EB	10	630	150	790	13.0	B	5.5	A	4.3	A	5.3	A			267	60	130	300	5	36	0		
	WB	120	430	60	610	14.4	B	3.1	A	1.8	A	5.0	A			270	39	92	0	55	142	0		
Lake St at 2nd Ave (Signal)	NB	120	540	130	790	24.7	C	29.1	C	4.9	A	24.3	C	14.7	B	527	126	464	0			0	25	149
	EB	120	520		640	22.1	C	9.6	A			11.8	B			270	56	128	200	50	130	0		
	WB		510	40	550			4.0	A	3.0	A	3.9	A			248	14	49	0			0		
Lake St at 3rd Ave (Signal)	NB	20	20	20	60	32.8	C	24.1	C	7.1	A	21.6	C	7.1	A	496	34	77	0			0		
	SB	20	20	20	60	28.6	C	31.3	C	8.4	A	22.2	C			580	37	96	0			0		
	EB	10	630	20	660	12.3	B	3.8	A	2.9	A	3.9	A			248	54	137	0			0		
	WB	10	490	40	540	11.2	B	7.9	A	4.9	A	7.7	A			288	90	169	0			0		
Lake St at Clinton Ave	NB	10	10	20	40	13.0	B	12.9	B	6.0	A	9.3	A	1.8	A	503	24	62	0			0		
	SB	10	0	10	20	10.8	B	0.0	A	5.2	A	7.9	A			585	14	35	0			0		
	EB	30	630	10	670	4.4	A	1.3	A	1.2	A	1.4	A			288	11	59	300			0		
	WB	30	510	20	560	5.0	A	1.4	A	1.5	A	1.6	A			249	11	66	0			0		
Lake St at 4th Ave (Signal)	NB	20	200	20	240	41.5	D	34.4	C	25.0	C	34.1	C	14.5	B	518	138	241	0			0		
	SB	20	40	30	90	36.3	D	28.6	C	8.5	A	23.5	C			540	42	102	0			100	17	48
	EB	20	650	30	700	21.7	C	13.4	B	9.4	A	13.4	B			249	126	216	0			0		
	WB	10	460	240	710	17.8	B	8.0	A	6.1	A	7.5	A			280	92	190	0			0		
Lake St at 5th Ave	NB	10	20	10	40	16.3	C	15.4	C	6.4	A	13.2	B	2.5	A	517	25	68	0			0		
	SB	10	10	20	40	12.6	B	15.4	C	5.9	A	10.2	B			588	23	52	0			0		
	EB	50	630	10	690	7.0	A	2.4	A	2.0	A	2.7	A			280	32	138	0			0		
	WB	10	680	40	730	4.4	A	1.3	A	1.3	A	1.3	A			1594	4	47	0			0		
31st St at Nicollet Ave (Signal)	NB	30	410	50	490	34.3	C	31.5	C	17.3	B	30.3	C	23.6	C	647	230	435	50	14	55	80	22	105
	SB	50	220	30	300	30.1	C	23.3	C	7.4	A	22.9	C			552	103	217	150	36	142	80	24	102
	EB	50	320	60	430	34.0	C	23.2	C	8.9	A	22.5	C			1743	91	174	300			50	32	75
	WB	30	140	80	250	22.4	C	14.0	B	8.9	A	13.2	B			256	62	142	0			0		
31st St at 1st Ave (Signal)	NB	20	280	50	350	17.0	B	17.5	B	20.5	C	17.9	B	21.8	C	668	84	149	0			0		
	EB	120	360		480	26.5	C	28.0	C			27.6	C			256	110	196	130	77	146	0		
	WB		180	90	270			15.6	B	21.7	C	17.4	B			276	86	175	0			0		
31st St at Stevens Ave (Signal)	SB	20	410	50	480	37.2	D	34.4	C	9.9	A	31.9	C	15.7	B	541	127	233	0			100	41	125
	EB		220	150	370			4.2	A	4.5	A	4.3	A			276	21	85	0			0		
	WB	130	270		400	9.8	A	6.1	A			7.2	A			268	51	115	0			0		
31st St at 2nd Ave (Signal)	NB	70	740	80	890	30.6	C	27.4	C	14.4	B	26.4	C	19.1	B	679	172	262	0			0		
	EB	30	230		260	10.6	B	6.1	A			6.6	A			268	37	115	300			0		
	WB		310	10	320			8.5	A	6.2	A	8.4	A			977	46	117	0			0		
28th St at Nicollet Ave (Signal)	NB		530	60	590			27.4	C	11.7	B	25.6	C	25.2	C	306	216	316	0			0	30	101
	SB	70	290		360	22.2	C	11.7	B			13.6	B			627	87	238	80	33	84	0		
	EB	30	1160	30	1,220	32.9	C	28.2	C	28.9	C	28.3	C			944	208	331	100	27	125	0		
28th St at 1st Ave (Signal)	NB		280	110	390			43.3	D	9.1	A	33.8	C	11.0	B	554	179	327	0			0	43	99
	SB	20			20	49.2	D					49.2	D			637			0	19	74	0		
	EB	110	1230	0	1,340	3.1	A	3.9	A	0.0	A	3.8	A			282	29	79	0			0		
28th St at Stevens Ave (Signal)	NB		50	10	60			25.3	C	6.1	A	22.5	C	6.7	A	560	29	84	0			0		
	SB	50	100		150	38.6	D	34.1	C			35.6	D			637	96	186	0			0		
	EB	30	1370	90	1,490	5.0	A	3.0	A	2.9	A	3.0	A			250	62	118	300			0		
28th St at Clinton Ave (Signal)	NB			460	460				A	11.3	B	11.3	B	5.1	A	0			0			0	83	189
	EB		1340		1,340			3.2	A			3.2	A			925	54	155	0			0		
28th St at 4th Ave (Signal)	NB		30	70	100			33.9	C	12.1	B	19.4	B	6.1	A	580	52	135	0			0		
	SB	10	120		130	41.0	D	36.1	D			36.5	D			524	84	165	0			0		
	EB	140	1210	150	1,500	3.0	A	3.0	A	3.6	A	3.1	A			267	66	155	0			0		
26th St at Clinton	NB	10	10		20	5.3	A	9.4	A			7.4	A	1.7	A	672	15	44	0			0		
	SB		10	20	30			9.3	A	4.6	A	6.6	A			623	18	40	0			0		
	WB	10	660	30	700	2.6	A	1.4	A	1.6	A	1.4	A			581		6	0			0		
26th St at 5th Ave (Signal)	NB	40	150		190	30.4	C	24.3	C			25.6	C	12.7	B	647	84	191	100	28	91	0		
	SB		40	50	90			20.4	C	6.6	A	12.6	B			699	41	104	0			0		
	WB	80	580	60	720	8.0	A	9.4	A	8.8	A	9.2	A			1834	86	138	0			0		
Franklin at 4th Ave (Signal)	NB	10	10	60	80	34.0	C	36.3	D	8.9	A	13.7	B	6.9	A	648	37	82	0			0		
	SB	50	10	10	70	34.1	C	33.5	C	14.7	B	31.4	C			692	52	121	0			0		
	EB	10	830	10	850	10.9	B	6.1	A	2.8	A	6.1	A			926	88	219	0			0		
	WB	20	430	20	470	11.2	B	3.5	A	3.0	A	3.8	A			264	34	82	50	12	48	0		
Franklin at 5th Ave (Signal)	NB	50	260	20	330	34.6	C	33.7	C	26.6	C	33.4	C	16.2	B	650	94	184	0			0		
	EB	450	500	90	1,040	22.1	C	5.3	A	4.3	A	12.4	B			264	93	292	300	145	200	0		
	WB	10	460	220	690	19.1	B	14.5	B	12.0	B	13.7	B			985	130	226	0			0		

Table A6
I-35W Transit Access Project
PM Peak Hour - 2038 No Build Mitigated
Nicollet Avenue Open

Intersection - PM Peak Hour	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Lake St at Blaisdell Ave (Signal)	SB	180	850	130	1,160	39.0	D	34.8	C	22.4	C	34.0	C	25.5	C	626	282	490	0			250	101	275
	EB		720	110	830			31.4	C	32.4	C	31.5	C			1362	204	346	300			0		
	WB	90	1060		1,150	24.9	C	11.3	B			12.4	B			368	115	197	150	53	134	0		
Lake St at Nicollet Ave (Signal)	NB	140	210	130	480	50.3	D	22.9	C	34.3	C	32.6	C	27.7	C	552	130	252	150	102	174	230	91	213
	SB	150	380	120	650	72.9	E	63.9	E	70.3	E	67.0	E			830	428	739	150	106	174	150	90	175
	EB	80	590	100	770	64.8	E	13.2	B	18.7	B	18.6	B			368	98	181	150	67	144	0		
	WB	120	870	100	1,090	23.1	C	7.7	A	8.8	A	9.4	A			267	56	207	100	53	121	0		
Lake St at 1st Ave (Signal)	NB	100	330	100	530	52.0	D	37.2	D	9.4	A	35.1	D	14.0	B	544	138	239	0			150	59	175
	EB	90	790		880	22.4	C	9.3	A			10.6	B			267	104	173	100	48	122	0		
	WB		1020	90	1,110			6.8	A	5.9	A	6.7	A			267	85	204	0			0		
Lake St at Stevens Ave (Signal)	SB	40	250	30	320	41.6	D	44.3	D	36.7	D	43.3	D	17.5	B	579	196	449	0			0		
	EB	20	680	140	840	30.8	C	10.1	B	8.7	A	10.4	B			267	85	207	300	16	64	0		
	WB	300	1110	110	1,520	45.3	D	9.7	A	8.8	A	16.2	B			270	139	238	0	154	272	0		
Lake St at 2nd Ave (Signal)	NB	260	230	190	680	32.5	C	17.6	B	8.3	A	20.7	C	8.6	A	527	167	357	0			0	59	145
	EB	40	680		720	31.4	C	2.4	A			4.0	A			270	14	45	200	30	97	0		
	WB		1290	30	1,320			4.7	A	3.8	A	4.7	A			248	45	176	0			0		
Lake St at 3rd Ave (Signal)	NB	20	30	50	100	36.2	D	29.9	C	14.9	B	23.8	C	10.4	B	496	53	121	0			0		
	SB	30	30	50	110	40.4	D	31.6	C	21.5	C	28.8	C			580	60	134	0			0		
	EB	10	840	50	900	23.3	C	8.4	A	7.6	A	8.6	A			248	105	175	0			0		
	WB	10	1250	70	1,330	23.4	C	9.2	A	6.8	A	9.1	A			277	138	269	0			0		
Lake St at Clinton Ave	NB	10	10	20	40	49.4	E	59.7	F	19.2	C	35.9	E	5.8	A	503	28	78	0			0		
	SB	20	10	80	110	72.1	F	67.7	F	26.4	D	37.4	E			585	41	160	0			30	42	58
	EB	50	840	20	910	21.8	C	3.2	A	1.4	A	4.1	A			277	63	172	300			0		
	WB	40	1200	50	1,290	10.2	B	3.4	A	2.6	A	3.6	A			249	53	179	0			0		
Lake St at 4th Ave (Signal)	NB	30	70	30	130	36.9	D	27.4	C	15.7	B	27.0	C	15.1	B	518	68	133	0			0		
	SB	30	150	210	390	29.8	C	31.8	C	21.2	C	25.9	C			540	112	296	0			100	86	125
	EB	20	760	40	820	32.0	C	9.8	A	6.7	A	10.1	B			249	91	166	0			0		
	WB	20	970	50	1,040	25.2	C	13.7	B	8.5	A	13.6	B			280	158	267	0			0		
Lake St at 5th Ave	NB	10	10	40	60	33.3	D	46.2	E	17.6	C	25.2	D	4.0	A	517	39	123	0			0		
	SB	10	10	70	90	31.0	D	44.4	E	15.7	C	20.8	C			588	46	115	0			0		
	EB	30	760	50	840	9.6	A	1.9	A	1.5	A	2.1	A			280	22	69	0			0		
	WB	40	950	30	1,020	9.6	A	2.7	A	2.1	A	3.0	A			1594	37	182	0			0		
31st St at Nicollet Ave (Signal)	NB	60	340	60	460	33.4	C	27.0	C	14.2	B	26.3	C	22.7	C	647	179	373	100	38	124	80	25	105
	SB	140	440	70	650	19.7	B	14.4	B	8.8	A	14.9	B			552	173	322	150	75	174	80	40	105
	EB	60	300	100	460	58.4	E	31.4	C	13.2	B	31.0	C			1743	111	242	300			50	45	75
	WB	60	380	140	580	28.8	C	22.5	C	17.0	B	21.8	C			256	86	165	0			0		
31st St at 1st Ave (Signal)	NB	40	200	50	290	25.4	C	27.9	C	28.2	C	27.6	C	11.3	B	668	76	139	0			0		
	EB	130	430		560	15.5	B	5.0	A			7.3	A			256	43	96	130	56	122	0		
	WB		520	220	740			8.0	A	9.7	A	8.5	A			276	115	236	0			0		
31st St at Stevens Ave (Signal)	SB	40	720	80	840	27.7	C	30.8	C	20.3	C	29.6	C	23.8	C	541	205	298	0			100	64	125
	EB		360	160	520			8.2	A	9.4	A	8.6	A			276	57	149	0			0		
	WB	310	740		1,050	42.1	D	20.2	C			26.8	C			268	208	279	0			0		
31st St at 2nd Ave (Signal)	NB	240	600	110	950	29.7	C	22.4	C	11.8	B	23.1	C	18.4	B	679	215	352	0			0		
	EB	30	350		380	22.4	C	8.5	A			9.4	A			268	57	117	300			0		
	WB		710	20	730			17.4	B	14.8	B	17.3	B			977	132	310	0			0		
28th St at Nicollet Ave (Signal)	NB		360	20	380			21.9	C	5.3	A	21.0	C	22.3	C	306	182	286	0			0	15	43
	SB	80	540		620	27.9	C	17.5	B			18.8	B			627	216	489	80	45	105	0		
	EB	100	920	120	1,140	28.9	C	24.1	C	26.3	C	24.7	C			944	181	276	100	60	125	0		
28th St at 1st Ave (Signal)	NB		340	170	510			31.7	C	9.0	A	23.7	C	10.9	B	554	169	283	0			0	52	128
	SB	50			50	51.5	D					51.5	D			637			0	45	106	0		
	EB	70	950	0	1,020	2.3	A	3.1	A	0.0	A	3.0	A			282	18	52	0			0		
28th St at Stevens Ave (Signal)	NB		70	10	80			24.5	C	7.9	A	22.0	C	11.8	B	560	43	104	0			0		
	SB	90	210		300	38.6	D	34.6	C			35.8	D			637	168	300	0			0		
	EB	60	920	150	1,130	6.4	A	4.9	A	5.2	A	5.0	A			250	70	122	300			0		
28th St at Clinton Ave (Signal)	NB			240	240				A	8.8	A	8.8	A	3.5	A	0			0			0	45	101
	EB		990		990			2.3	A			2.3	A			925	32	140	0			0		
28th St at 4th Ave (Signal)	NB		160	360	520			47.0	D	38.5	D	41.1	D	16.1	B	580	295	577	0			0		
	SB	20	30		50	25.6	C	21.5	C			23.2	C			524	32	79	0			0		
	EB	80	1310	100	1,490	6.5	A	7.2	A	7.8	A	7.2	A			267	91	167	0			0		
26th St at Clinton	NB	10	10		20	17.9	C	24.4	C			21.9	C	2.6	A	672	18	63	0			0		
	SB		10	40	50			20.4	C	10.8	B	12.6	B			623	30	81	0			0		
	WB	10	1950	140	2,100	2.6	A	2.1	A	3.8	A	2.2	A			581	1	21	0			0		
26th St at 5th Ave (Signal)	NB	130	390		520	48.5	D	43.9	D			45.0	D	20.9	C	647	293	571	100	76	125	0		
	SB		20	20	40			22.2	C	9.3	A	15.6	B			699	25	68	0			0		
	WB	40	1240	100	1,380	9.8	A	11.6	B	14.7	B	11.8	B			1834	167	268	0			0		
Franklin at 4th Ave (Signal)	NB	30	10	100	140	47.8	D	33.7	C	25.2	C	30.2	C	19.8	B	648	81	171	0			0		
	SB	50	10	10	70	43.6	D	33.6	C	20.4	C	38.1	D			692	48	118	0			0		
	EB	10	900	30	940	104.7	F	34.9	C	6.6	A	34.7	C			926	285	616	0			0		
	WB	40	910	30	980	13.6	B	3.1	A	3.2	A	3.5	A			264	23	95	50	22	59	0		
Franklin at 5th Ave (Signal)	NB	60	520	20	600	46.8	D	44.0	D	34.5	C	43.9	D	40.4	D	650	214	465	0			0		
	EB	390	630	30	1,050	68.5	E	8.5	A	7.1	A	30.3	C			264	247	309	300	191	200	0		
	WB	10	940	340	1,290	51.4	D	45.4	D	51.5	D	47.0	D			985	445	781	0			0		

Table A7
I-35W Transit Access Project
AM Peak Hour - 2038 SB Exit and 28th Exit
Nicollet Avenue Open

Intersection - AM Peak Hour	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Lake St at Blaisdell Ave (Signal)	SB	50	240	40	330	24.9	C	21.1	C	8.9	A	20.1	C	20.7	C	626	69	127	0			250	21	60
	EB		690	50	740			25.6	C	20.3	C	25.2	C			1362	156	281	300			0		
	WB	20	440		460	24.7	C	14.5	B			14.9	B			368	94	165	150	16	48	0		
Lake St at Nicollet Ave (Signal)	NB	70	260	90	420	29.1	C	14.8	B	20.0	C	17.8	B	11.3	B	552	76	175	150	36	111	230	40	100
	SB	40	120	60	220	48.6	D	27.1	C	32.7	C	31.9	C			830	81	142	150	37	103	150	45	94
	EB	60	630	80	770	14.6	B	3.6	A	4.3	A	4.6	A			368	15	53	150	30	79	0		
	WB	40	420	90	550	11.5	B	4.1	A	5.1	A	4.8	A			267	23	61	100	22	58	0		
Lake St at 1st Ave (Signal)	NB	50	230	40	320	14.4	B	12.0	B	4.5	A	11.5	B	11.1	B	544	57	116	0			150	15	71
	EB	120	600		720	13.1	B	5.7	A			6.9	A			267	59	121	100	50	116	0		
	WB		520	150	670			15.6	B	13.9	B	15.2	B			250	114	219	0			0		
Lake St at Stevens Ave (Signal)	SB	270	320	360	950	30.4	C	32.7	C	10.9	B	23.8	C	13.6	B	579	131	226	500	83	160	500	60	128
	EB	0	550	150	700	0.0	A	4.9	A	3.8	A	4.7	A			250	50	158	300			0		
	WB	120	380	0	500	14.7	B	4.9	A	0.0	A	7.0	A			279	47	114	0	49	129	0		
Lake St at 2nd Ave (Signal)	NB	120	200	160	480	37.8	D	46.0	D	20.3	C	35.6	D	13.2	B	528	156	396	0	67	152	100	78	125
	EB	80	730		810	11.1	B	4.9	A			5.5	A			279	65	151	225	35	84	0		
	WB		430	50	480			3.4	A	3.6	A	3.4	A			254	23	67	0			0		
Lake St at 3rd Ave (Signal)	NB	20	20	20	60	30.0	C	26.5	C	10.7	B	23.2	C	5.4	A	496	35	87	0			0		
	SB	30	20	20	70	31.1	C	30.5	C	12.0	B	25.3	C			580	42	95	0			0		
	EB	0	810	20	830	0.0	A	3.3	A	2.7	A	3.3	A			254	43	117	0			0		
	WB	0	450	40	490	0.0	A	4.5	A	3.6	A	4.4	A			288	53	112	0			0		
Lake St at Clinton Ave	NB	10	10	10	30	14.8	B	14.4	B	8.2	A	12.6	B	1.9	A	503	24	52	0			0		
	SB	10	0	20	30	12.7	B	0.0	A	4.7	A	7.5	A			585	22	49	0			0		
	EB	40	740	20	800	5.0	A	1.2	A	0.9	A	1.4	A			288	19	77	300			0		
	WB	20	550	10	580	8.5	A	1.4	A	1.4	A	1.6	A			249	16	89	0			0		
Lake St at 4th Ave (Signal)	NB	20	230	20	270	39.1	D	35.9	D	28.6	C	35.5	D	10.8	B	518	150	287	0			0		
	SB	10	40	40	90	40.3	D	31.1	C	8.5	A	21.9	C			540	36	118	0			100	22	80
	EB	0	760	40	800	0.0	A	4.5	A	3.4	A	4.4	A			249	46	112	0			0		
	WB	0	430	240	670	0.0	A	7.3	A	6.4	A	7.0	A			280	89	200	0			0		
Lake St at 5th Ave	NB	10	30	10	50	14.0	B	15.7	C	8.0	A	13.8	B	2.0	A	517	32	74	0			0		
	SB	10	10	20	40	14.3	B	18.4	C	5.3	A	10.5	B			588	27	61	0			0		
	EB	50	670	20	740	5.3	A	1.1	A	1.0	A	1.3	A			280	23	79	0			0		
	WB	10	650	40	700	7.0	A	1.3	A	1.3	A	1.4	A			1594	4	50	0			0		
31st St at Nicollet Ave (Signal)	NB	40	370	60	470	32.1	C	25.5	C	14.8	B	24.6	C	19.5	B	647	185	394	50	25	75	80	25	105
	SB	40	200	30	270	19.7	B	9.4	A	3.2	A	10.2	B			552	44	131	150	24	70	80	8	54
	EB	50	370	70	490	25.7	C	22.0	C	10.5	B	20.7	C			1743	90	189	300			50	34	75
	WB	30	170	70	270	29.1	C	18.2	B	10.6	B	17.2	B			256	42	99	0			0		
31st St at 1st Ave (Signal)	NB	10	180	60	250	14.8	B	17.8	B	16.4	B	17.3	B	12.4	B	668	69	148	0			0		
	EB	70	410		480	10.6	B	4.6	A			5.4	A			256	31	70	130	32	79	0		
	WB		240	130	370			17.0	B	19.4	B	17.7	B			276	111	200	0			0		
31st St at Stevens Ave (Signal)	SB	70	440	120	630	33.8	C	33.8	C	12.6	B	29.5	C	18.6	B	541	167	273	0			100	81	125
	EB		220	180	400			9.3	A	14.3	B	11.2	B			276	68	142	0			0		
	WB	120	290		410	13.2	B	8.8	A			10.2	B			268	66	132	0			0		
31st St at 2nd Ave (Signal)	NB	120	420	120	660	28.7	C	26.5	C	19.3	B	25.6	C	17.5	B	679	172	292	0			0		
	EB	30	270		300	11.3	B	7.0	A			7.4	A			268	42	119	300			0		
	WB		290	10	300			9.7	A	9.8	A	9.7	A			989	48	127	0			0		
28th St at Nicollet Ave (Signal)	NB		460	50	510			15.0	B	4.6	A	13.9	B	21.9	C	306	134	260	0			0	19	61
	SB	50	250		300	22.7	C	11.5	B			13.2	B			627	82	198	80	29	87	0		
	EB	30	1160	40	1,230	27.4	C	27.5	C	28.8	C	27.5	C			944	214	319	100	21	96	0		
28th St at 1st Ave (Signal)	NB		280	110	390			41.7	D	9.9	A	32.5	C	10.5	B	554	169	297	0			0	45	96
	SB	20			20	58.0	E					58.0	E			637			0	21	70	0		
	EB	100	1130	0	1,230	2.2	A	3.0	A	0.0	A	2.9	A			282	14	57	0			0		
28th St at Stevens Ave (Signal)	NB		40	10	50			26.5	C	12.2	B	23.2	C	6.8	A	573	33	98	0			0		
	SB	50	100		150	34.7	C	34.3	C			34.4	C			637	87	185	0			0		
	EB	30	1250	90	1,370	4.1	A	3.1	A	2.7	A	3.1	A			250	51	94	300			0		
28th St at NB Exit Ramp (Signal)	NB			640	640				A	8.2	A	8.2	A			0			0			0	74	152
	EB		1310		1,310			3.7	A			3.7	A	5.1	A	587	41	95	0			0		
28th St at Clinton Ave (Signal)	NB			0	0				A	0.0	A	0.0	A	0.7	A	0			0			0		
	EB		1950		1,950			0.7	A			0.7	A			0			0			0		
28th St at 4th Ave (Signal)	NB		30	80	110			33.4	C	10.9	B	17.1	B	5.5	A	580	49	117	0			0		
	SB	10	130		140	38.9	D	33.9	C			34.3	C			524	85	190	0			0		
	EB	140	1420	160	1,720	3.8	A	2.7	A	3.3	A	2.8	A			267	75	131	0			0		
26th St at Clinton	NB	10	10		20	4.8	A	9.1	A			7.1	A	1.7	A	672	15	36	0			0		
	SB		10	20	30			9.4	A	4.8	A	6.4	A			623	22	40	0			0		
	WB	10	700	30	740	2.7	A	1.4	A	2.0	A	1.4	A			581		6	0			0		
26th St at 5th Ave (Signal)	NB	40	160		200	27.1	C	23.8	C			24.5	C	12.6	B	647	80	160	100	26	109	0		
	SB		40	50	90			19.8	B	7.7	A	12.7	B			699	40	105	0			0		
	WB	80	610	60	750	9.5	A	9.4	A	8.8	A	9.4	A			1834	90	158	0			0		

Table A8
I-35W Transit Access Project
PM Peak Hour - 2038 SB Exit and 28th Exit
Nicollet Avenue Open

Intersection - PM Peak Hour	Approach	Demand Volumes				Delay (s/veh)						LOS By Approach		LOS By Intersection		Queing Information (feet)								
																Through			Left Turn			Right Turn		
		L	T	R	Total	L	LOS	T	LOS	R	LOS	Delay (S/Veh)	LOS	Delay (S/Veh)	LOS	Link Length	Avg.	Max	Storage	Avg.	Max	Storage	Avg.	Max
Lake St at Blaisdell Ave (Signal)	SB	120	930	120	1,170	28.8	C	26.7	C	19.6	B	26.2	C	26.3	C	626	234	384	0			250	64	271
	EB		660	150	810			32.6	C	33.1	C	32.7	C			1362	205	319	300			0		
	WB	120	1180		1,300	30.5	C	21.5	C			22.4	C			368	210	323	150	73	163	0		
Lake St at Nicollet Ave (Signal)	NB	120	160	110	390	29.6	C	16.7	B	24.4	C	22.2	C	24.5	C	552	68	158	150	64	146	230	55	155
	SB	160	300	130	590	71.6	E	61.2	E	76.0	E	67.1	E			830	328	707	150	127	174	150	121	175
	EB	80	610	80	770	84.5	F	6.7	A	6.9	A	14.0	B			368	36	137	150	70	162	0		
	WB	100	1010	110	1,220	28.1	C	8.7	A	11.3	B	10.3	B			267	70	149	100	48	103	0		
Lake St at 1st Ave (Signal)	NB	80	270	50	400	37.9	D	20.9	C	7.9	A	22.7	C	18.2	B	544	86	178	0			150	22	75
	EB	160	690		850	37.5	D	5.5	A			11.6	B			267	77	216	100	90	125	0		
	WB		1220	220	1,440			20.4	C	23.1	C	20.8	C			250	234	294	0			0		
Lake St at Stevens Ave (Signal)	SB	340	400	440	1,180	30.8	C	37.2	D	36.2	D	35.0	D	23.1	C	579	191	376	500	108	194	500	141	301
	EB	0	600	140	740	0.0	A	16.2	B	13.9	B	15.8	B			250	135	248	300			0		
	WB	310	930	0	1,240	37.8	D	8.8	A	0.0	A	16.1	B			279	97	191	0	160	277	0		
Lake St at 2nd Ave (Signal)	NB	140	160	170	470	24.4	C	24.4	C	10.6	B	19.4	B	9.0	A	528	70	232	0	63	195	100	52	123
	EB	20	890		910	19.6	B	6.7	A			7.0	A			279	99	180	225	15	48	0		
	WB		1090	40	1,130			6.5	A	6.4	A	6.5	A			254	67	159	0			0		
Lake St at 3rd Ave (Signal)	NB	20	30	50	100	35.6	D	31.1	C	15.0	B	23.2	C	7.9	A	496	53	122	0			0		
	SB	30	30	50	110	37.4	D	31.3	C	18.9	B	27.6	C			580	65	141	0			0		
	EB	0	990	50	1,040	0.0	A	3.8	A	3.5	A	3.8	A			254	63	157	0			0		
	WB	0	1100	70	1,170	0.0	A	8.5	A	6.8	A	8.4	A			277	136	249	0			0		
Lake St at Clinton Ave	NB	10	10	30	50	55.2	F	56.8	F	31.7	D	41.7	E	7.1	A	503	41	118	0			0		
	SB	30	10	80	120	76.1	F	78.6	F	40.4	E	52.6	F			585	71	246	0			30	44	61
	EB	60	980	20	1,060	18.0	C	3.4	A	1.5	A	4.2	A			277	69	182	300			0		
	WB	40	1100	50	1,190	14.2	B	3.2	A	2.0	A	3.5	A			249	53	226	0			0		
Lake St at 4th Ave (Signal)	NB	30	80	30	140	38.4	D	33.9	C	22.7	C	32.6	C	13.5	B	518	82	193	0			0		
	SB	40	170	230	440	36.6	D	33.3	C	23.0	C	28.2	C			540	126	328	0			100	92	125
	EB	0	910	50	960	0.0	A	6.9	A	6.5	A	6.9	A			249	78	176	0			0		
	WB	0	990	60	1,050	0.0	A	11.5	B	10.3	B	11.4	B			280	160	283	0			0		
Lake St at 5th Ave	NB	10	10	50	70	53.6	F	59.6	F	17.7	C	27.5	D	5.1	A	517	41	122	0			0		
	SB	10	20	70	100	61.4	F	53.4	F	27.6	D	36.3	E			588	64	163	0			0		
	EB	30	880	50	960	11.0	B	2.1	A	1.8	A	2.4	A			280	32	137	0			0		
	WB	40	1020	30	1,090	11.5	B	3.0	A	2.3	A	3.3	A			1594	47	172	0			0		
31st St at Nicollet Ave (Signal)	NB	60	250	60	370	31.9	C	23.1	C	11.1	B	22.5	C	28.2	C	647	112	268	100	36	111	80	25	105
	SB	110	320	70	500	27.5	C	22.3	C	13.5	B	22.3	C			552	142	265	150	64	143	80	42	105
	EB	60	370	100	530	99.4	F	41.2	D	13.3	B	43.5	D			1743	159	284	300			50	43	76
	WB	60	460	120	640	37.0	D	23.5	C	17.2	B	23.6	C			256	97	224	0			0		
31st St at 1st Ave (Signal)	NB	40	150	50	240	26.9	C	28.6	C	26.0	C	27.8	C	11.2	B	668	70	134	0			0		
	EB	110	490		600	16.5	B	5.2	A			7.1	A			256	47	100	130	53	127	0		
	WB		600	180	780			9.1	A	10.8	B	9.5	A			276	121	249	0			0		
31st St at Stevens Ave (Signal)	SB	100	730	170	1,000	31.2	C	34.8	C	27.9	C	33.2	C	29.7	C	541	268	413	0			100	91	125
	EB		340	150	490			12.8	B	17.3	B	14.0	B			276	92	194	0			0		
	WB	310	700		1,010	54.8	D	25.4	C			34.7	C			268	224	291	0			0		
31st St at 2nd Ave (Signal)	NB	260	360	120	740	32.8	C	24.9	C	16.7	B	26.4	C	19.1	B	679	191	370	0			0		
	EB	30	400		430	24.0	C	10.3	B			11.2	B			268	61	162	300			0		
	WB		680	20	700			16.5	B	12.6	B	16.4	B			989	126	239	0			0		
28th St at Nicollet Ave (Signal)	NB		330	30	360			23.4	C	6.1	A	21.9	C	23.3	C	306	138	263	0			0	17	58
	SB	70	480		550	24.0	C	17.1	B			18.0	B			627	192	385	80	41	104	0		
	EB	90	940	130	1,160	27.4	C	25.7	C	30.2	C	26.3	C			944	197	296	100	50	125	0		
28th St at 1st Ave (Signal)	NB		340	190	530			33.5	C	9.9	A	24.8	C	11.7	B	554	180	310	0			0	60	143
	SB	50			50	55.0	E					55.0	E			637			0	47	99	0		
	EB	70	970	0	1,040	2.4	A	3.2	A	0.0	A	3.1	A			282	20	54	0			0		
28th St at Stevens Ave (Signal)	NB		70	10	80			23.0	C	12.0	B	21.6	C	11.1	B	573	45	116	0			0		
	SB	80	200		280	36.6	D	34.0	C			34.8	C			637	155	294	0			0		
	EB	60	930	150	1,140	5.3	A	4.9	A	5.8	A	5.0	A			250	74	135	300			0		
28th St at NB Exit Ramp (Signal)	NB			610	610				A	6.1	A	6.1	A	6.0	A	0			0			0	60	112
	EB		1020		1,020			6.0	A			6.0	A			587	80	135	0			0		
28th St at Clinton Ave (Signal)	NB			0	0				A	0.0	A	0.0	A	0.8	A	0			0			0		
	EB		1630		1,630			0.8	A			0.8	A			0			0			0		
28th St at 4th Ave (Signal)	NB		170	340	510			42.1	D	33.2	C	36.2	D	16.7	B	580	285	518	0			0		
	SB	20	30		50	26.2	C	20.0	C			22.0	C			524	29	94	0			0		
	EB	90	1440	120	1,650	7.9	A	10.7	B	12.0	B	10.6	B			267	142	215	0			0		
26th St at Clinton	NB	10	10		20	15.4	C	38.0	E			27.2	D	2.9	A	672	18	58	0			0		
	SB		10	50	60			33.6	D	12.8	B	16.0	C			623	36	84	0			0		
	WB	10	2080	150	2,240	3.0	A	2.2	A	4.2	A	2.3	A			581		6	0			0		
26th St at 5th Ave (Signal)	NB	140	400		540	47.1	D	43.1	D			44.1	D	20.3	C	647	284	541	100	80	125	0		
	SB		20	20	40			17.9	B	7.9	A	13.2	B			699	19	70	0			0		
	WB	40	1310	100	1,450	9.0	A	11.3	B	13.4	B	11.4	B			1834	164	263	0			0		

Appendix K

Westbound I-94 4th Avenue Entrance Study Memorandum

Building a Better World
for All of Us®

MEMORANDUM

TO: Scott Pedersen, PE
MnDOT

FROM: Roger Plum, PE
Graham Johnson, PE

DATE: June 2, 2015

RE: Westbound I-94 4th Avenue Entrance Closure - Arterial Traffic Operations
SEH No. MNTMD 126805 14.00

This memorandum summarizes the potential impacts of closing or managing the use of the 4th Avenue South entrance ramp onto westbound I-94. This memorandum will summarize how the traffic was redistributed on the arterial network, what the traffic impacts to the existing arterial roads would be, and identify potential mitigations to lessen those impacts. It also sets the stage for further evaluation of potential freeway system improvements to make egress out of downtown Minneapolis more efficient as an alternative to direct mitigation of impacts on the arterial network.

PROJECT BACKGROUND

As part of the I-35W Transit Access Project, the northbound I-35W flyover ramp bridge to westbound I-94 will need to be replaced by 2018 as part of the Chapter 152 Bridge Program. The existing configuration has the I-35W flyover ramp merging with the 4th Avenue South entrance ramp before entering westbound I-94 on the right hand side of the freeway.

A traffic operations analysis was conducted resulting in improved westbound I-94 operations with the flyover ramp entering on the left hand side of westbound I-94. The change removes a large portion of traffic from making a weaving maneuver between the 4th Avenue/I-35W entrance and the Hennepin/Lyndale exit ramp. Therefore, the northbound I-35W flyover ramp is proposed to be reconstructed to enter westbound I-94 on the left hand side of the mainline.

Leaving the 4th Avenue entrance ramp in place on the right side will still have a significant weaving demand along westbound I-94 that still creates both operational and safety problems. In addition, the 4th Avenue ramp contributes to demand through the tunnel and to its high volume to capacity (v/c) ratio; If the ramp demand were rerouted to enter the freeway system after the Lowry Tunnel, it would lower the traffic demands and the v/c ratio in the tunnel providing benefits to congested conditions experienced upstream from the tunnel. This study examines the potential impacts of closing the entrance ramp; and, alternatively examines the impacts of restricting use of the ramp to HOV only.

FREEWAY OPERATIONS SUMMARY

The existing and future freeway operations are documented in the “I-35W Freeway Operations Report” dated November 2012 and the “I-35W Transit Access Project Interstate Access Request”. The results of the westbound I-94 operations from that analysis are summarized below.

An HCM weaving analysis was performed for the different configurations along westbound I-94 between the I-35W flyover ramp and the Hennepin/Lyndale exit ramp, just prior to the Lowry Tunnel. The Highway Capacity Software (HCS), which utilizes the calculations in the HCM methodology, was used to analyze the proposed changes.

This analysis was conducted with the 2038 PM peak hour as this is the worst case scenario. The origin-destination information from the existing study was also incorporated into this analysis. The table below summarizes the HCS weaving analysis for the 2038 PM peak hour.

Table 1 – Westbound I-94 HCS Weave Summary

	Build – Flyover on Right, 4th Open	Build – Flyover on Right, 4th Closed	Build – Flyover on Left, 4th Open	Build – Flyover on Left, 4th Closed
Flow Rate (veh/hr)	8,643	8,316	8,643	8,316
Capacity (veh/hr)	5,308	5,812	7,929	7,909
Volume/Capacity Ratio	1.61	1.42	1.08	1.04
LOS	**F**	**F**	**F**	**F**

While all four scenarios are at a LOS F, it is clear that the left side flyover had the greatest improvement on operations; therefore that was the recommendation for the I-35W Transit Access Project. The combined left side entrance of the flyover ramp combined with the closure of the 4th Avenue ramp has only a minor increment of improvement in operations.

The existing ramp user study performed as a part of this analysis provided a better understanding of the 4th Avenue entering traffic and the reduction in traffic demands through the Lowry Tunnel are expected to be greater than what was forecast for the previous project.

At the time of the forecasting work, the regional travel demand model indicated a decrease of only 250 vehicles in the PM peak hour. From the user survey, described in the next section, it is believed the reduction could be as high as approximately 700 vehicles in the PM peak hour that would enter the freeway system after the Lowry Tunnel rather than through it. However, previous freeway system exercises have identified a latent demand to use the tunnel, so it is anticipated that the reduction of 4th Avenue users would attract trips to I-94 from other parts of the local and regional network.

USER SURVEY SUMMARY

As part of this study, a Ramp User Survey was conducted that resulted in a better understanding of traffic patterns for ramp users. The survey was designed to gather information from motorists using the ramp on the origin of their trips, the destinations of their trips, and potential roadway paths the users may take when the ramp is closed for construction. For more information regarding the results of the Ramp User Survey, see the technical memorandum "*Westbound I-94 4th Avenue Entrance User Survey*", dated August 15th, 2014.

Figure 1 shows the existing ramp configuration and how the northbound I-35W flyover ramp merges with the 4th Avenue ramp before the combined traffic enters westbound I-94.

Figure 1
Existing Ramp Configuration

The AM peak period was from 7:00 am to 9:00 am and the PM peak period was from 3:00 pm to 6:00 pm. During the 2-hour AM peak period, approximately 640 vehicles use the 4th Avenue ramp, but typically the AM peak is not the period during which significant problems arise. On the other hand, the 3-hour PM peak period has a ramp demand of approximately 2,580 vehicles and represents the worst traffic conditions.

Due to the low ramp volume in the morning rush hours, with an AM peak hour demand of approximately 350 vehicles per hour (vph), the analysis will focus on the evening rush hour. The PM peak hour for the 4th Avenue South ramp to westbound I-94 has recently been approximately 900 vph; in the past the traffic demands have at times exceeded 1,000 vph.

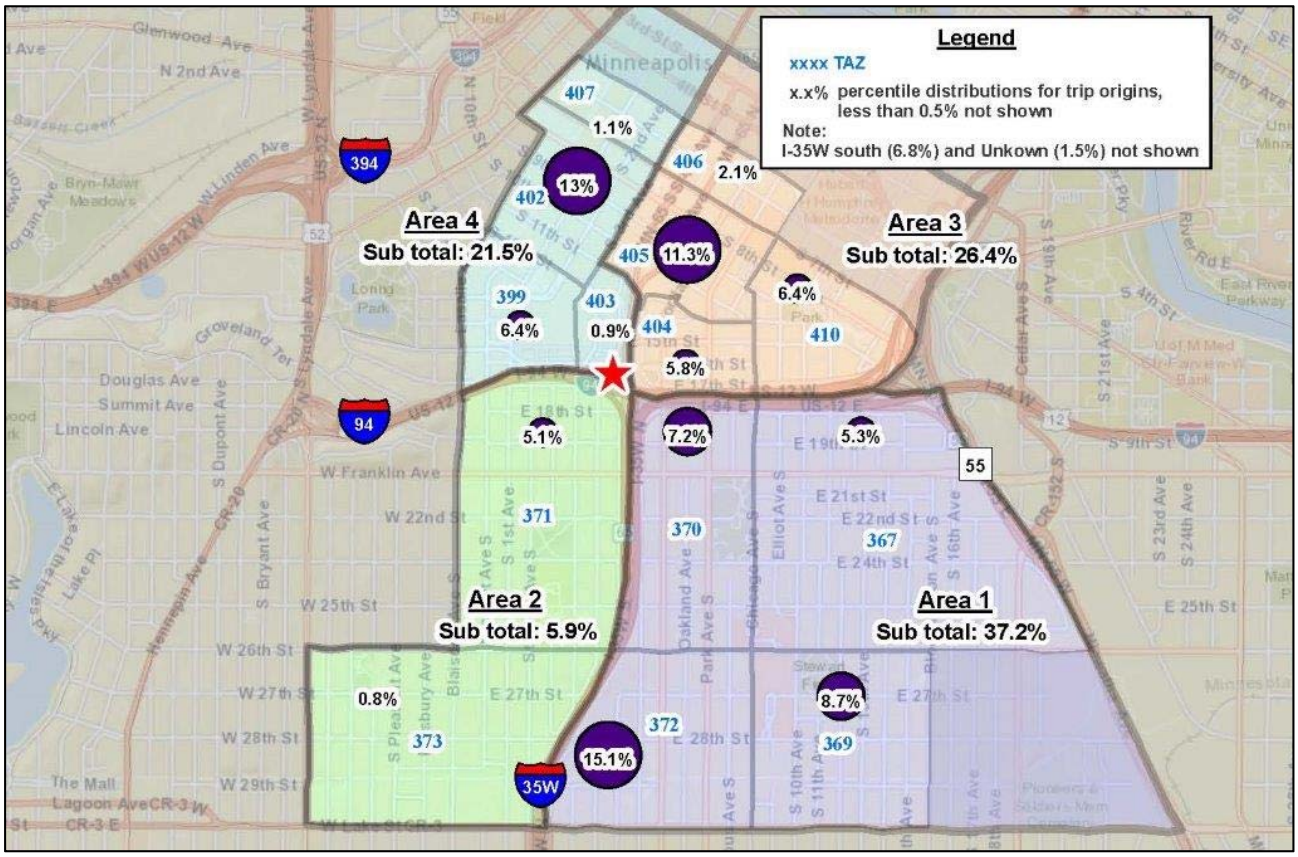
Occupancy Results
During the PM period approximately 87% of the vehicles are single occupant vehicles (SOV), with the remaining 13% high occupant vehicles (HOV), including motorcycles and buses.

Survey Results
A total of 530 PM peak period user survey responses were collected either by postage-paid survey cards being returned or by motorists accessing the survey website. A total of 2,142 survey cards were handed out, which equates to approximately a 24.7% return rate during the PM peak period.

The general locations of user origins were sorted according to the Twin Cities Regional Travel Demand Model (TCRTDM) traffic analysis zones (TAZ's). A TAZ is a land area coded into the regional travel demand model that includes socioeconomic census data and the major roadway network.

The following Figure 2 represent the PM peak period data on a map formatted with the TAZ zones.

Figure 2
PM Period Origins



The destinations of the trips after entering westbound I-94 from the 4th Avenue ramp were also obtained from the surveys, with approximately 40% of the users destined for westbound I-394, approximately 56% of the users destined for westbound I-94 beyond TH 55, and the remaining demands exiting either to the Hennepin/Lyndale exit (the first exit downstream of the 4th Avenue entrance) or to TH 55.

When asked which of the alternative access options would be used if the 4th Avenue ramp closed, approximately 46% of the users indicated they would use Lyndale Avenue near Loring Park or Dunwoody Boulevard, approximately 32% of the users would use one of the west side Downtown accesses (to I-94 and/or I-394 via 11th Street, via 7th Street or via 3rd Street), and approximately 7% of the users would use I-35W flyover ramp, entering northbound I-35W somewhere south of Lake Street. The remainder indicated they would use the east side of downtown, would find other alternative routes, or even potentially take arterial roads for their entire trip.

It should be noted that with the east side of downtown access, TH 55, and traffic from the south along I-35W, approximately 16% of the trips would enter westbound I-94 prior to the tunnel and not impact arterial intersections in the project area.

TRAFFIC DISTRIBUTION

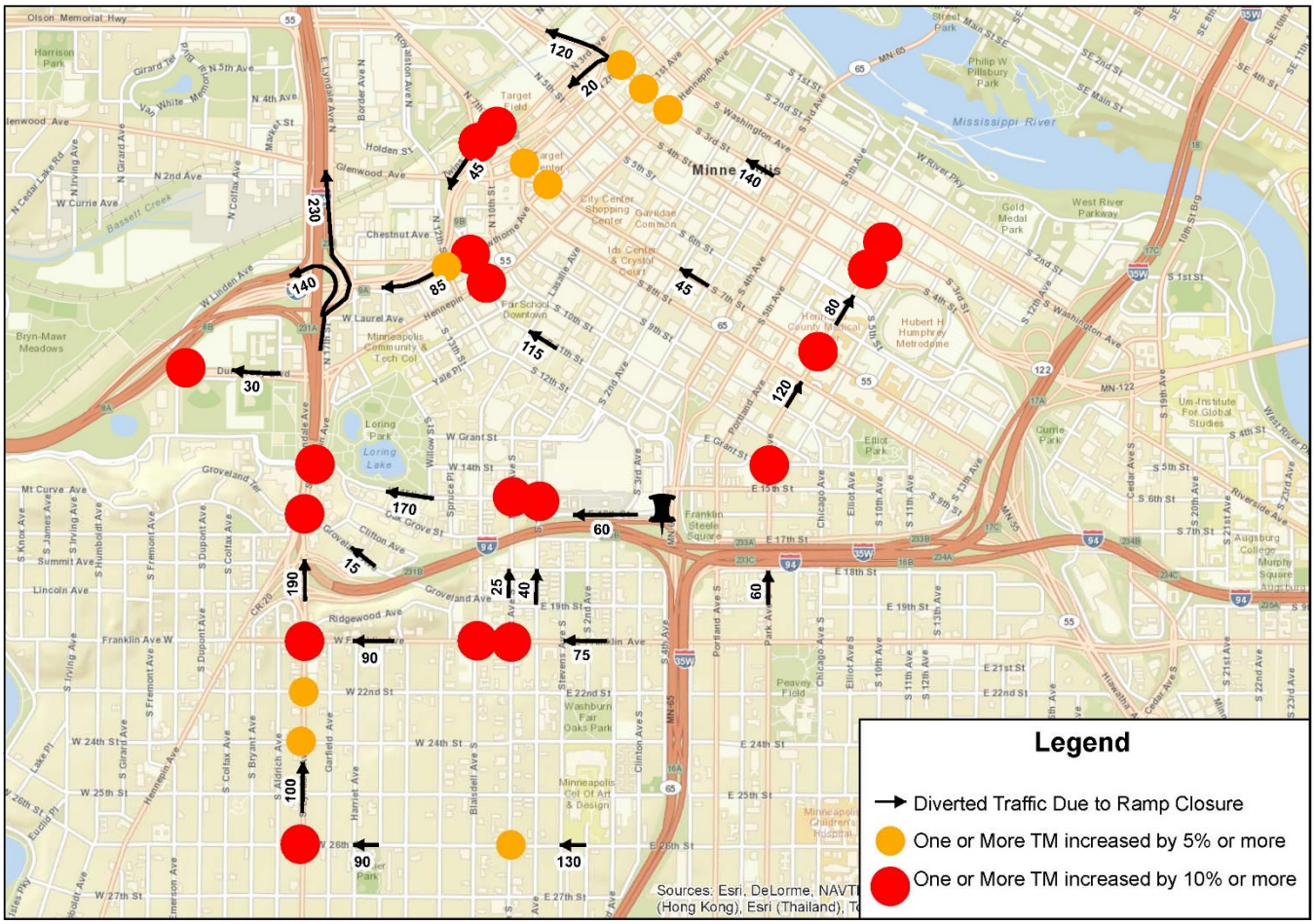
Based on the OD traffic survey data, the remaining approximate 755 PM peak hour trips, 84%, were distributed on the local street network from their origin locations to their potential new highway access locations. The distribution was based on the available roadway network for the trips to follow the most realistic paths based on travel distance, existing traffic congestion, and ease of routing.

The City of Minneapolis recently conducted a signal timing project throughout the downtown area that included many of the intersections within the influence area of the 4th Avenue ramp. The turning movement traffic data was collected in April of 2011 for the signal timing project and has been used in this evaluation.

The proposed traffic distribution was accounted for by appropriately adding and removing movements from the affected local intersections based on the traffic routing patterns. Each TAZ's origin location was separately distributed based on the destination for each TAZ group. After the distribution of the turning movements for each TAZ was completed, the diversion demands were added to the existing turning movement data to create the full traffic demands for the proposed ramp closure scenario.

The following figure shows the change in traffic demands on the major arterial roadways. The intersections with a significant increase in traffic demands (five percent or more) at the movement level are highlighted. The full turning movements at some of the major intersections can be seen in the attached Figures 4 and 5.

Figure 3
Traffic Distribution and Impacted Intersections (PM Peak Hour)



TRAFFIC INTERSECTION OPERATIONS

The City of Minneapolis provided the existing Synchro/SimTraffic models representing the current conditions in the downtown and south Minneapolis areas. Proposed operational changes in the Hennepin/Lyndale corridor between Franklin Avenue and Dunwoody Boulevard were incorporated into the existing conditions model. As a baseline for alternative comparisons, the models received from the City were examined, a few corrections were made, and the existing conditions (i.e., 4th Avenue South ramp open, no traffic diversion) were evaluated.

The arterial analysis included 37 intersections in the Central Business District (CBD), 18 intersections in South Minneapolis, and 3 intersections along the common segment of Lyndale and Hennepin Avenues.

The majority of intersections modeled operate at acceptable levels with and without the ramp closure. So only the problematic intersections are summarized in Tables 1-7 within the body of this memorandum; full MOE's for all 58 intersection can be found in attached comparison Tables A1, A2 and A3.

Existing Conditions

Under the existing conditions there are 3 intersections in the downtown CBD that operate poorly; 11th Street at LaSalle Avenue and 7th Street at both 2nd Avenue and Marquette Avenue. There is currently only 1 intersections in South Minneapolis that operates poorly at Franklin Avenue at Lyndale Avenue. All 3 intersections in the Lyndale/Hennepin Avenue commons operate very poorly; this includes the proposed changes to the area based on data provided by the City of Minneapolis. While there are other intersections with specific movements that may be failing, all operate with acceptable levels of delay for the total intersection.

Table 2 provides analysis results for the 7 poorly operating intersections as well as 3 additional intersections that will operate poorly with the extra diverted traffic. Total delays in the existing conditions operations models had approximately 721 hours of delay in the downtown CBD network, 212 hours of delay in the south Minneapolis network and 679 hours of delay in the Lyndale/Hennepin Avenue network.

Table 2 - Existing Conditions MOE's - Worst Intersections

Intersection		Northbound			Westbound			Southbound			Eastbound			Int.
		LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT	All
11th Street S at Harmon Place	Delay (s)	228.2	32.8		14.6	45.4	51.5		37.8	81.5				49.9
	LOS	F	C-		B	D	D-		D+	F				D-
11th Street S at LaSalle Avenue S	Delay (s)	111.7	23.4		344.2	331.3	310.6		64.7	83.8				217.6
	LOS	F	C+		F	F	F		E	F				F
7th Street S at Marquette Avenue S	Delay (s)	96.1	79.0		95.3	67.6	21.2		18.9	20.1				66.4
	LOS	F	E-		F	E	C+		B-	C+				E
7th Street S at 2nd Avenue S	Delay (s)	54.6	16.6		105.6	91.1	29.8		40.5	75.1				71.1
	LOS	D-	B		F	F	C		D+	E-				E
7th Street S at 4th Avenue S	Delay (s)				13.1	19.8			49.0	85.4				36.2
	LOS				B	B-			D-	F				D+
Franklin Avenue at Lyndale Avenue S	Delay (s)	24.8	26.8	37.6	198.5	215.1	285.1	63.9	32.1	35.2	45.6	29.4	30.6	85.9
	LOS	C+	C	D+	F	F	F	E	C-	D+	D	C	C-	F
3rd Street S at 4th Avenue S	Delay (s)				5.9	10.3			26.6	29.4				15.3
	LOS				A	B+			C	C				B
Lyndale Avenue S at Vineland Place	Delay (s)	85.9	48.6	63.3	215.4	129.0	101.0	942	412	383	69.5	72.3	52.4	247.6
	LOS	F	D-	E	F	F	F	F	F	F	E	E-	D-	F
Lyndale Avenue S at Groveland Terrace	Delay (s)		68.6	45.7	260.2	252.0	237.6		14.5	13.9	116	111	116	63.0
	LOS		E	D	F	F	F		B	B	F	F	F	E
Lyndale Avenue S at WB I-94 Ramp	Delay (s)		45.3		34.5		105.9				1861			396.4
	LOS		D		C-		F				F			F

Diverted Traffic Operations (Alternative 1)

The first step in the analysis consisted of evaluating the traffic impacts on the street system assuming that traffic signal timing would remain unchanged. The reason for this analysis was to identify the specific traffic impacts specific to the diverted traffic. With signal timing remaining unchanged, any intersection approach not carrying diverted traffic should operate essentially the same as it would before the diversion to the 4th Avenue ramp closure occurs.

In this analysis, when compared with existing conditions, several routes were identified which would be expected to exhibit operational problems due solely to the traffic diversion. These locations consisted of most of the intersections along 3rd Street, 7th Street and 11th Street in the downtown area and along Nicollet Avenue, Franklin Avenue and Lyndale Avenue in South Minneapolis.

Under this scenario there are 7 intersections in the downtown CBD that operate poorly. These include the 2 from the existing conditions and adds four more along 11th Street, 7th Street and 3rd Street. The Franklin Avenue and Lyndale Avenue intersection in South Minneapolis and the 3 intersections in the Lyndale/Hennepin Avenue commons area operate significantly worse.

While there are other intersections with specific movements that may be failing, all operate with acceptable levels of delay for the total intersection.

Table 3 shows the results for the 10 failing intersections. With the diverted trips added to the network, the network delays in the operations models increased to 1152 hours of delay in the downtown CBD network, 273 hours of delay in the south Minneapolis network, and 958 hours of delay in the Lyndale/Hennepin Avenue commons area; which is an approximate 60%, 29%, and 41% increase in delay times respectively.

Table 3
Diverted Trips Scenario 1 MOE's - Worst Intersections

Intersection		Northbound			Westbound			Southbound			Eastbound			Int.
		LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT	All
11th Street S at Harmon Place	Delay (s)	368.4	104.8		17.4	48.5	59.0		38.6	102.2				61.7
	LOS	F	F		B-	D-	E+		D+	F				E+
11th Street S at LaSalle Avenue S	Delay (s)	213.5	56.3		739.6	758.7	726.1		145.5	168.7				481.7
	LOS	F	E+		F	F	F		F	F				F
7th Street S at Marquette Avenue S	Delay (s)	85.2	69.5		123.5	74.6	22.5		20.0	21.1				66.0
	LOS	F	E		F	E-	C+		C+	C+				E
7th Street S at 2nd Avenue S	Delay (s)	37.7	17.1		141.3	126.1	94.1		55.2	103.6				97.2
	LOS	D+	B-		F	F	F		E+	F				F
7th Street S at 4th Avenue S	Delay (s)				15.6	24.0			187.5	242.6				99.0
	LOS				B	C+			F	F				F
Franklin Avenue at Lyndale Avenue S	Delay (s)	28.1	31.0	35.9	334.8	360.8	469.8	71.4	33.5	37.3	42.6	30.1	27.7	127.2
	LOS	C	C-	D+	F	F	F	E	C-	D+	D	C-	C	F
3rd Street S at 4th Avenue S	Delay (s)				27.9	53.3			905.4	1101				242.7
	LOS				C	D-			F	F				F
Lyndale Avenue S at Vineland Place	Delay (s)	73.8	48.7	61.5	607.9	518.5	496.4	925	415.0	411.9	66.0	62.2	45.0	311.2
	LOS	E-	D-	E+	F	F	F	F	F	F	E	E+	D	F
Lyndale Avenue S at Groveland Terrace	Delay (s)		75.8	51.1	355.3	365.5	337.6		14.8	14.5	75.6	77.1	80.3	72.2
	LOS		E-	D-	F	F	F		B	B	E-	E-	F	E-
Lyndale Avenue S at WB I-94 Ramp	Delay (s)		56.4		149.2		409.6				6257			702.8
	LOS		E+		F		F				F			F

While there is only a single failing intersection along 3rd Street, all intersection see a significant increase in total delay times. Under the existing conditions all of the intersections operate at a LOS C or better; however the diverting trips will add between 12 and 24 seconds of total intersection delay at many of the other intersections along 3rd Street.

Diverted Traffic Operations with Signal Timing Improvements (Alternative 2)

For the second step of the analysis, signal timing adjustments were made in an attempt to improve operations at those locations which demonstrated capacity and/or congestion problems in the first step analysis.

The reason for this analysis was to identify to what extent the operational issues identified in the first step analysis could be mitigated through only modifications in signal timing. Signal timing changes can be implemented for relatively low cost. Signal timing modifications consisted primarily of split changes, with a few minor offset changes, but the current 110-second cycle was retained to maintain signal coordination in the downtown area.

The results of this analysis revealed that many of the problems found in the first step can indeed be mitigated through signal timing adjustments. Specifically, operations along 7th Street were significantly improved by signal timing changes east of Hennepin Avenue. On the other hand, SimTraffic simulations also showed that signal timing modifications alone provided only marginal relief to problem locations along 3rd Street, 11th Street, Franklin Avenue and Lyndale Avenue, with many movements projected to operate at level of service (LOS) E or F, with delays and queuing significantly worse than current existing conditions.

This result was not unexpected. These routes currently operate very close to capacity, so the introduction of another 100 to 200 vehicles per hour in the PM peak periods were likely to exceed that capacity.

Table 4 shows the results of the 10 previous failing intersections; with timing improvements only 6 intersections still operate under failing conditions. The network delays in the operations models were improved to approximately 864 hours of delay in the downtown CBD network, 268 hours of delay in the south Minneapolis network, and 878 hours of delay in the Lyndale/Hennepin Avenue commons network; which is an approximate 20%, 29%, and 29% increase in delay times over existing conditions respectively.

The timings changes were unable to improve operations at the Franklin Avenue and Lyndale Avenue intersection.

Table 4
Diverted Trips Scenario 2 MOE's - Worst Intersections

Intersection		Northbound			Westbound			Southbound			Eastbound			Int.
		LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT	All
11th Street S at Harmon Place	Delay (s)	157.1	41.2		15.6	18.0	11.0		31.9	54.2				25.8
	LOS	F	D+		B	B-	B+		C-	D-				C
11th Street S at LaSalle Avenue S	Delay (s)	55.6	14.1		590.3	557.7	531.1		27.4	29.0				324.9
	LOS	E+	B		F	F	F		C	C				F
7th Street S at Marquette Avenue S	Delay (s)	35.3	23.8		26.7	27.0	12.2		19.9	22.1				25.4
	LOS	D+	C+		C	C	B+		B-	C+				C
7th Street S at 2nd Avenue S	Delay (s)	48.5	18.2		30.8	17.8	3.9		25.9	34.5				22.6
	LOS	D-	B-		C-	B-	A		C	C-				C+
7th Street S at 4th Avenue S	Delay (s)				10.0	9.9			25.2	23.8				16.8
	LOS				B+	A-			C	C+				B
Franklin Avenue at Lyndale Avenue S	Delay (s)	25.8	27.8	33.7	301.0	333.3	431.6	81.2	40.8	40.0	47.8	29.3	31.0	120.6
	LOS	C	C	C-	F	F	F	F	D+	D+	D	C	C-	F
3rd Street S at 4th Avenue S	Delay (s)				29.4	53.9			1024	1356				257.4
	LOS				C	D-			F	F				F
Lyndale Avenue S at Vineland Place	Delay (s)	81.3	48.2	57.4	785.8	701.1	658.0	933	418.1	394.7	80.3	78.7	56.4	327.3
	LOS	F	D-	E+	F	F	F	F	F	F	F	E-	E+	F
Lyndale Avenue S at Groveland Terrace	Delay (s)		64.8	48.7	395.2	404.0	384.0		10.5	10.7	203	203	210	76.8
	LOS		E	D-	F	F	F		B+	B+	F	F	F	E-
Lyndale Avenue S at WB I-94 Ramp	Delay (s)		63.2		500.6		992.8				1388			452.9
	LOS		E		F		F				F			F

While there is only a single failing intersection along 3rd Street, all intersection see a significant increase in total delay times. Under the existing conditions all of the intersections operate at a LOS C or better; however the diverting trips will add between 12 and 24 seconds of total intersection delay at many of the other intersections along 3rd Street.

GEOMETRIC INTERSECTION IMPROVEMENTS (Alternative 3)

As a result of still having operational problems which are still significantly worse at a few spot locations, the third step of the analysis was to identify geometric mitigation measures which would be necessary to improve the operation with diverted traffic to the point where delays and queuing problems would be essentially as they are today. Geometric changes were analyzed initially on an intersection-by-intersection basis with the hope that a solution at one or two intersections would clear up projected traffic problems along an entire route.

This, in fact, proved to be the case in the south Minneapolis (south of I-94) portion of the analysis area at the Franklin Avenue and Lyndale Avenue intersection. Unfortunately, similar one- or two-intersection improvements were not sufficient on the other problem routes of 3rd Street and 11th Street in the downtown area and the Lyndale/Hennepin Avenue commons area.

With the following improvements in place, the total network delays in the operations models were improved to approximately 487 hours of delay in the downtown CBD network, 177 hours of delay in the south Minneapolis network, and 620 hours of delay in the Lyndale/Hennepin Avenue commons network; which is an approximate 33%, 17%, and 9% decrease in delay times over the existing conditions, respectively.

Franklin Avenue at Lyndale Avenue

It was determined that the addition of a right-turn bay westbound on Franklin Avenue at Lyndale Avenue, along with signal modifications to enable protected westbound right turns simultaneously with protected southbound left turns, would in effect resolve the increased delay and queuing problems in the previous analysis on Lyndale Avenue, on Franklin Avenue, and on LaSalle Avenue as it approaches Franklin Avenue.

The table below compares the existing conditions to the 4th Avenue closure scenarios with signal retiming and geometric improvements. The 4th Avenue ramp closure will have an increase in delay times at the intersection of approximately 40%; the westbound approach takes the brunt of the delay increase. While the right turn storage and phasing overlap would have a significant improvement in operations, even over the existing conditions, constructing the turn bay would require significant right of way and utility impacts.

Table 5 - Intersection MOE's – Franklin Ave at Lyndale Ave

Intersection			Northbound			Westbound			Southbound			Eastbound			Int.
			LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT	All
Franklin Avenue at Lyndale Avenue S	Exist	Delay (s)	24.8	26.8	37.6	198.5	215.1	285.1	63.9	32.1	35.2	45.6	29.4	30.6	85.9
		LOS	C+	C	D+	F	F	F	E	C-	D+	D	C	C-	F
Franklin Avenue at Lyndale Avenue S	Alt 2	Delay (s)	25.8	27.8	33.7	301.0	333.3	431.6	81.2	40.8	40.0	47.8	29.3	31.0	120.6
		LOS	C	C	C-	F	F	F	F	D+	D+	D	C	C-	F
Franklin Avenue at Lyndale Avenue S	Alt 3	Delay (s)	26.2	27.7	33.4	46.9	30.8	38.6	70.2	32.2	34.2	282	32.8	32.6	39.6
		LOS	C	C	C-	D	C-	D+	E	C-	C-	F	C-	C-	D+

The figure below shows the existing Franklin Avenue and Lyndale Avenue intersection. Franklin Avenue is currently a 4-lane undivided roadway with no separate turn lanes. The existing buildings are directly abutting the sidewalks, which include overhead power lines parallel to Franklin Avenue. The addition of the westbound right turn lane on Franklin Avenue would involve significant impacts.

Figure 6 - Franklin Avenue and Lyndale Avenue Intersection

11th Street Corridor

Along the 11th Street corridor, using geometric changes to improve the operation at one intersection simply moved the problem upstream or downstream one block. Consequently, to offset the negative impacts of traffic diversion due to the closure of the 4th Avenue ramp, it was determined that an additional lane extending along several blocks would be required.

11th Street currently has 3 westbound lanes, a striped bicycle lane, and on-street parking on some blocks. The proposed improvements would expand the existing width to include 4 westbound lanes between Nicollet Mall and Hawthorne Avenue. Trying to maintain both parking and the existing bicycle lane, while expanding the roadway capacity, would create severe impacts to the existing non-motorized facilities as well as potential right of way impacts.

Potential impacts, on a block by block basis, were evaluated based on a quick assessment of existing conditions:

- Between Nicollet Mall and LaSalle Avenue:
  - approximately 55 feet curb to curb
  - remove on-street parking
  - restripe with 4 lanes and a bicycle lane
- Between LaSalle Avenue and Harmon Place:
  - approximately 55 feet curb to curb
  - remove on-street parking
  - restripe with 4 lanes and a bicycle lane
- Between Harmon Place and Hennepin Avenue:
  - approximately 45 feet curb to curb
  - no existing on-street parking
  - widen roadway to accommodate 4-lanes and bicycle lane
  - sidewalk and right of way impacts
- Between Hennepin Avenue and Hawthorne Avenue:
  - approximately 45 feet curb to curb
  - no existing on-street parking
  - widen roadway to accommodate 4-lanes and bicycle lane
  - sidewalk and right of way impact

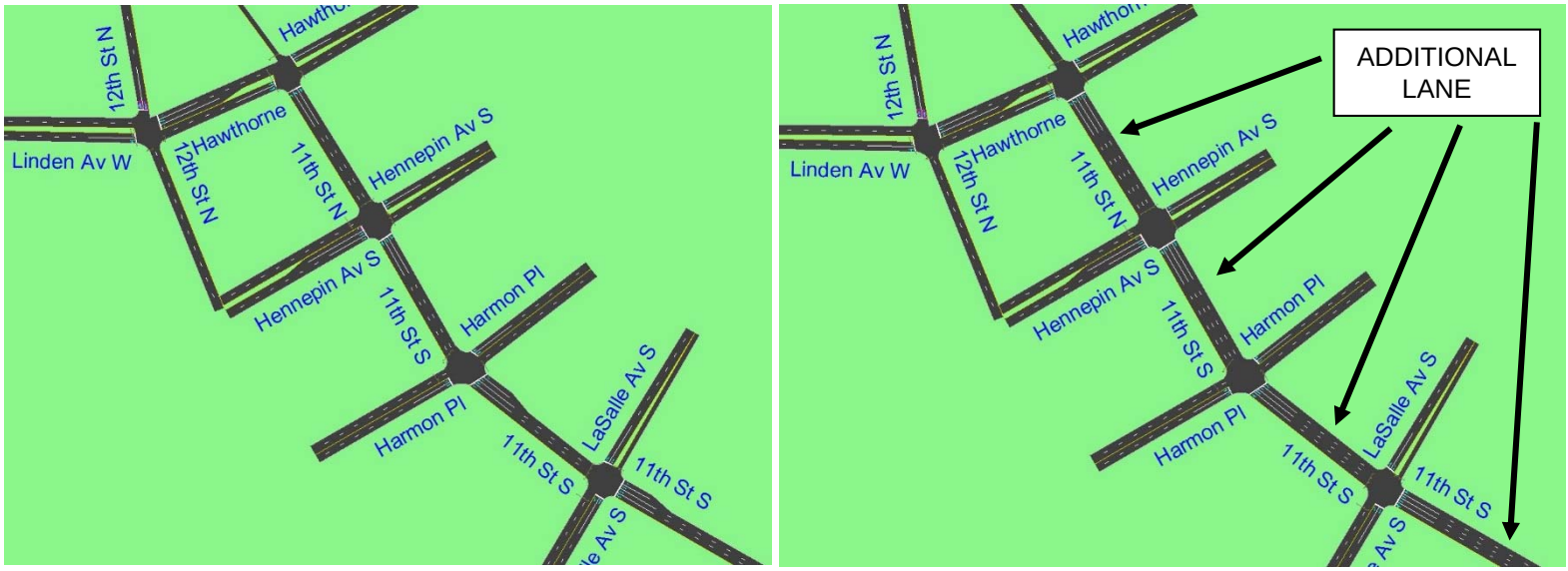
Table 6 compares the existing conditions to the 4th Avenue closure scenarios with signal retiming and geometric improvements. The 4th Avenue ramp closure will have an increase in delay times at the 11th Street and LaSalle Avenue intersection. Localized intersection improvements only moved the problems downstream and therefore additional capacity was investigated. The resulting operations with the lane add between Nicollet Mall and Hawthorne Avenue provides improved operations along the 11th Street corridor, even over existing conditions.

Figures 7, 8 and 9 show both the existing conditions and the mitigated conditions along 11th Street between Nicollet Mall and Hawthorne Avenues; each image is extracted directly from the Synchro model.

Table 6
11th Street Intersection MOE's

Intersection	Existing		4th Closed-Retimed Only		4th Closed – Improved	
	Delay	LOS	Delay	LOS	Delay	LOS
11th Street S at LaSalle Avenue S	217.6	F	324.9	F	104.4	F
11th Street S at Harmon Place	49.9	D-	25.8	C	16.4	B
11th Street S at Hennepin Avenue S	30.3	C-	24.8	C+	25.0	C
11th Street S at Hawthorne Avenue W	22.5	C+	23.8	C+	25.3	C

Figure 7
11th Street Intersections – Existing and Mitigated



3rd Street Corridor
Along the 3rd Street corridor, using geometric changes to improve the operation at one intersection simply moved the problem upstream or downstream one block. Consequently, to offset the negative impacts of traffic diversion due to the closure of the 4th Avenue ramp, it was determined that an additional lane extending along several blocks would be required.

3rd Street currently has 3 westbound lanes, a striped bicycle lane, and on-street parking on both sides of the street for most blocks. The proposed improvements would expand the existing width to include 4 westbound lanes between 4th Avenue and 2nd Avenue N. Trying to maintain both parking and the existing bicycle lane, while expanding the roadway capacity, would create severe impacts to the existing non-motorized facilities.

Potential impacts, on a block by block basis, were evaluated based on a quick assessment of existing conditions. The entire portion of 3rd Street that needs mitigation fits into the general category of:

- Between 4th Avenue S and 2nd Avenue N:
    - approximately 55 feet curb to curb
    - remove both sides of on-street parking
    - restripe with 4 lanes and a bicycle lane

Table 7 shows the changes in total intersection delays along 3rd Street between the existing conditions and with the 4th Avenue Ramp diverted trips. While only the 3rd Street and 4th Avenue intersection operates under failing conditions, all of the intersections between Park Avenue and Nicollet Mall have significant increases in total intersection delays. Localized intersection improvements only moved the problems downstream and therefore additional capacity was investigated. The resulting operations with the lane add between 4th Avenue S and 2nd Avenue N provides improved operations along the 3rd Street corridor, even over existing conditions.

The following figures shows both the existing conditions and the proposed conditions along 3rd Street between 4th Avenue S and 2nd Avenue N; each image is extracted directly from the Synchro model.

Table 7
3rd Street Intersection MOE's

Intersection	Existing		4th Closed-Retimed Only		4th Closed – Improved	
	Delay	LOS	Delay	LOS	Delay	LOS
3rd Street S at Park Avenue S	14.9	B	29.7	C	13.2	B
3rd Street S at Portland Avenue S	14.3	B	35.3	D+	12.6	B+
3rd Street S at 5th Avenue S	11.8	B+	35.3	D+	11.3	B+
3rd Street S at 4th Avenue S	15.3	B	257.4	F	12.4	B+
3rd Street S at 3rd Avenue S	27.1	C	44.1	D	23.4	C+
3rd Street S at 2nd Avenue S	16.6	B	39.2	D+	13.3	B
3rd Street S at Marquette Avenue S	24.5	C+	36.7	D+	20.1	C+
3rd Street S at Nicollet Mall	16.0	B	28.9	C	8.1	A-
3rd Street S at Hennepin Avenue S	36.9	D+	31.6	C-	23.8	C+
3rd Street S at 1st Avenue N	20.2	C+	23.8	C+	18.3	B-
3rd Street S at 2nd Avenue N	18.8	B-	19.5	B-	16.3	B

Figure 8
3rd Street Intersections – Existing

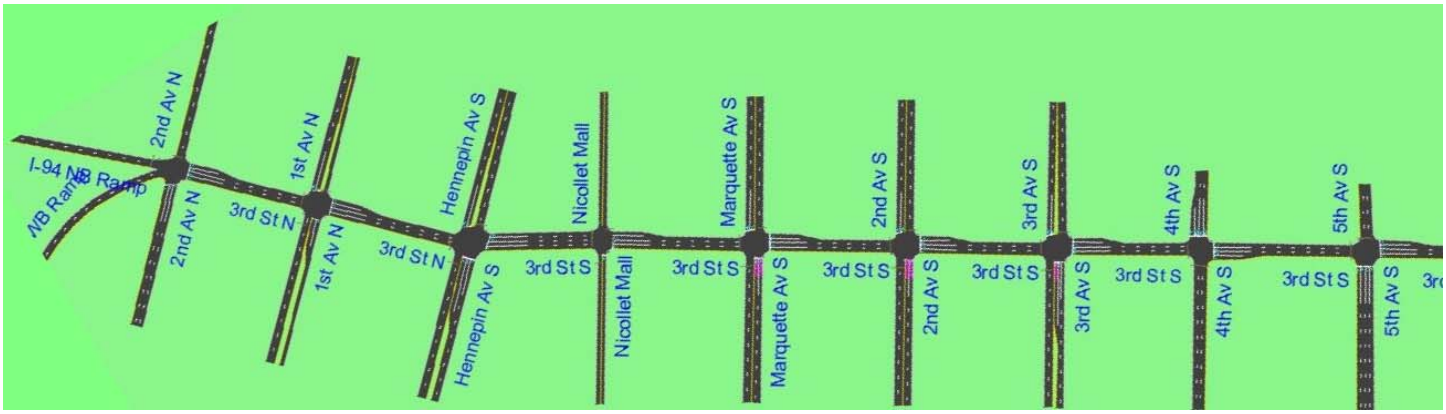
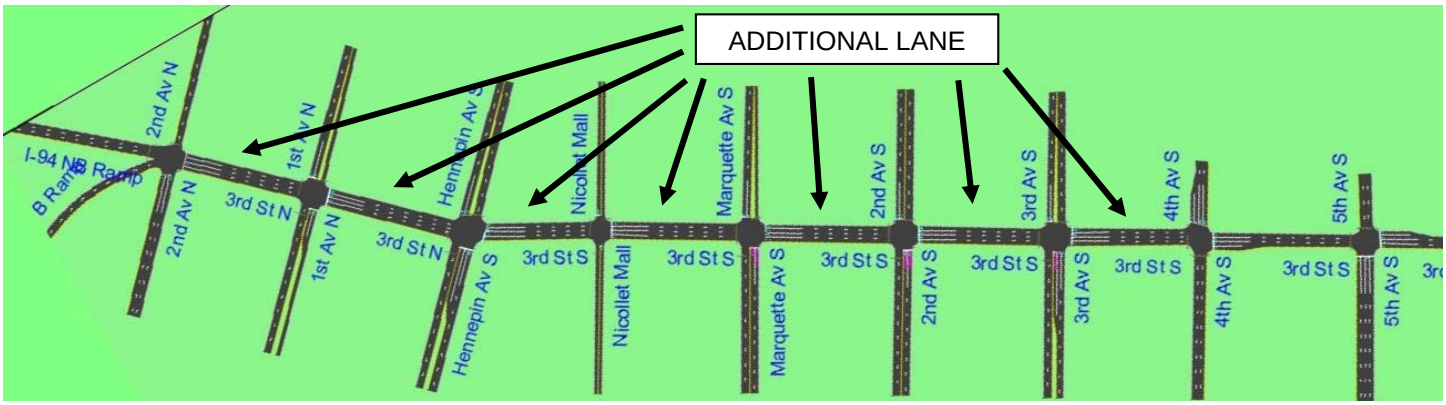


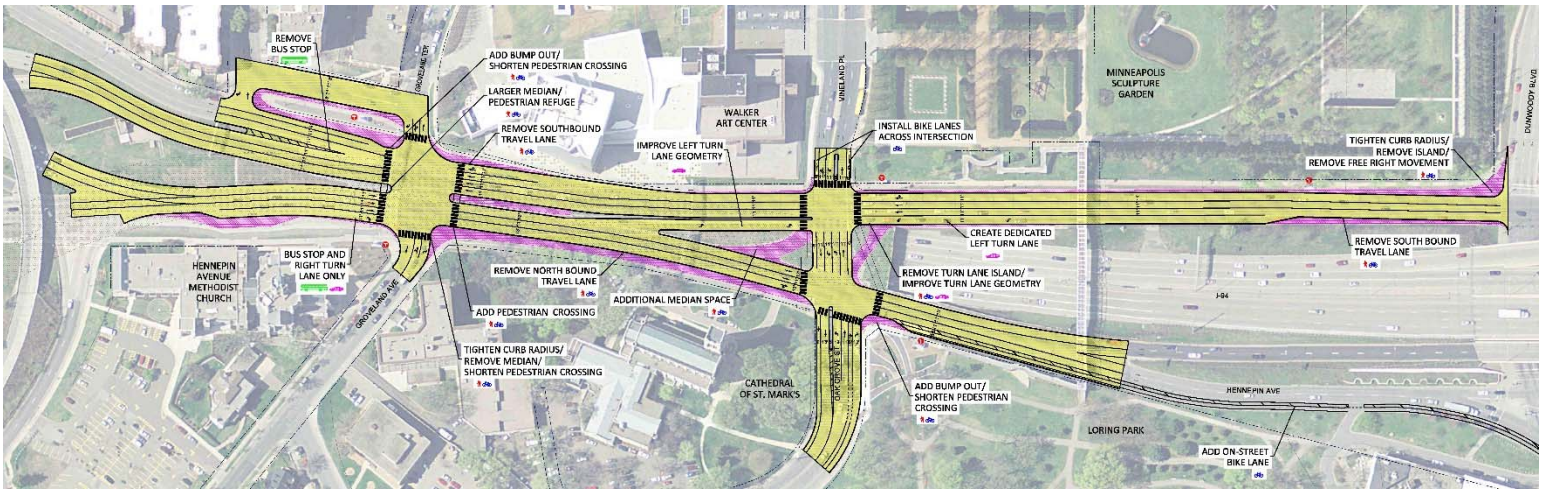
Figure 9
3rd Street Intersections – Mitigated



Lyndale/Hennepin Avenue Corridor

The City of Minneapolis is currently planning to reconstruct the Lyndale/Hennepin Avenue corridor in 2015. The project consists of pavement rehabilitation, more efficient traffic lane geometry and pedestrian/bicycle facility improvements. The project is represented by the preliminary design figure below.

Figure 10
Lyndale/Hennepin Avenue Reconstruction



For traffic vehicle operations, the proposed improvements reduce capacity for both the northbound and southbound directions by removing a travel lane in each direction. However the lane assignments will be more easily followed by users and provide a better balance of lane volumes to more efficiently use the signal time provided.

As this concept was recently approved by the City and is in the final design stages, no major physical geometric improvements were proposed to mitigate the additional diverted traffic from the 4th Avenue ramp closure.

To improve traffic operations without major alterations, two changes were made at the Vineland Place/Oak Grove intersection. A westbound right turn overlap phase was added to allow the movement to occur as the southbound left turn phase was active. The proposed, dedicated southbound left turn lane was expanded to include dual southbound left turn lanes to more effectively use the signal time provided; two accepting lanes would need to be provided along Oak Grove Street.

Table 8 compares the proposed conditions to the 4th Avenue closure scenarios with signal retiming and geometric improvements. The 4th Avenue ramp closure will have an increase in delay times at all 3 intersections. The dual southbound left turn lanes and right turn overlap would have a significant improvement on delay times; however all three intersections would still have failing operations.

Table 8
Lyndale/Hennepin Avenue Intersection MOE's

Intersection	Proposed		4th Closed-Retimed Only		4th Closed – Improved	
	Delay	LOS	Delay	LOS	Delay	LOS
Lyndale Avenue S at Vineland/Oak Grove	247.6	F	327.3	F	160.5	F
Lyndale Avenue S at Groveland Avenue	63.0	E	76.8	E-	81.8	F
Lyndale Avenue S at I-94 WB Ramp	396.4	F	452.9	F	371.5	F

Managed 4th Avenue Ramp (HOV/Bus/Motorcycle)

In an attempt to potentially reduce the negative impacts of the 4th Avenue ramp diversion, or to reduce the geometric mitigation measures described above to minimize impacts, an investigation was conducted to determine if restricting the 4th Avenue ramp to high occupancy vehicles only (including motorcycles and buses) would sufficiently reduce the diversion demand.

As mentioned earlier, the vehicle survey conducted as part of this project determined that 87 percent of the 4th Avenue ramp traffic consisted of single-occupant vehicles, which means the diversion demand for this alternative would be reduced by 13 percent. Under the most optimal circumstance for the arterial network, it was assumed that the 13% HOV traffic was part of the 84% diverted ramp traffic on the arterial network. This resulted in a distribution of only approximately 71% of the existing ramp traffic to the local network.

Upon re-distributing the lower diversion demand across the network and conducting traffic simulations, it was found that the improvement in traffic operations was very slight and that the geometric changes mentioned previously would still be necessary to reach operating conditions approximately equal to those experienced today.

CONCLUSIONS

In summary, the existing PM peak hour traffic demand utilizing the 4th Avenue ramp to westbound I-94 are significant (about 860 vehicles per hour). Closure of the existing ramp would reroute a large percentage of the demand, approximately 84%, on the local arterial network for the vehicles to gain access to their destination of westbound I-94 or westbound I-394.

The existing arterial network cannot handle the additional traffic demands without signal timing changes and additional lane capacity. The geometric changes required to maintain operations with 4th Avenue ramp traffic diverted to comparable operations under existing conditions, would consist of:

1. At Franklin Avenue & Lyndale Avenue South, add a westbound right turn bay (approximately 250 feet long) on Franklin, to separate the through traffic from the right turning traffic, with a signal overlap displaying a westbound green right arrow simultaneously with the southbound green left arrow.
2. Expand 3rd Street from three to four through lanes from Park Avenue South through 2nd Avenue North.
3. Expand 11th Street from 3 to 4 through lanes from Nicollet Mall through Hennepin Avenue; then at Hawthorne Avenue retain the two left turn lanes, but add a second through lane.
4. At Lyndale Avenue & Vineland Place, add an additional southbound left turn lane and add a signal overlap phase displaying a westbound green right arrow simultaneously with the southbound green left arrow. The departing lanes on Oak Grove Street would also need expansion to accommodate the dual left turn movement.

The signal timing and geometric changes described above would be successful in essentially maintaining the status quo from a delay and congestion viewpoint on the downtown, south Minneapolis and Lyndale/Hennepin networks. However, given the right-of-way impacts and parking impacts associated with the required mitigation, they are not easily implementable. At this time, both the City of Minneapolis and MnDOT recognize that the impacts of direct mitigation on the arterial network are too great to be realistically pursued.

Managing the 4th Avenue entrance ramp to westbound I-94 by limiting the use to HOV, motorcycles, and buses would have a minimal change in the impacts to the local arterial system as the percentage of existing users is only approximately 13%.

NEXT STEPS

MnDOT and the City of Minneapolis will consider the findings presented in this memorandum and work towards a consensus on the feasibility of closing or managing volumes on the 4th Avenue entrance ramp.

If closing or managing the use of the entrance ramp is to be considered further, other improvements should be defined that enhance the overall capacity to egress downtown via the freeway system. Such improvements might serve displaced 4th Avenue ramp users to westbound I-94 and I-394 but not necessarily improvements on the local network.

Two examples of potential egress improvements include removing existing bottlenecks to westbound I-394 or westbound I-94 that would benefit a greater pool of users from the downtown and south Minneapolis networks.

Further high level evaluation of potential downtown egress improvements will be considered and reported in a separate memorandum being prepared as part of this ramp closure study.

gtj

Attachments
Figure 4 Existing Turning Movements
Figure 5 Existing plus Diverted Turning Movements
Table Comparison 1 – Existing versus Diverted (no change)
Table Comparison 2 – Existing versus Diverted with Signal Timing Changes
Table Comparison 3 – Existing versus Diverted with Signal Timing Changes and Geometric Improvements

c: Ron Rauchle – MnDOT
Tony Fischer – MnDOT
Allan Klugman – Minneapolis

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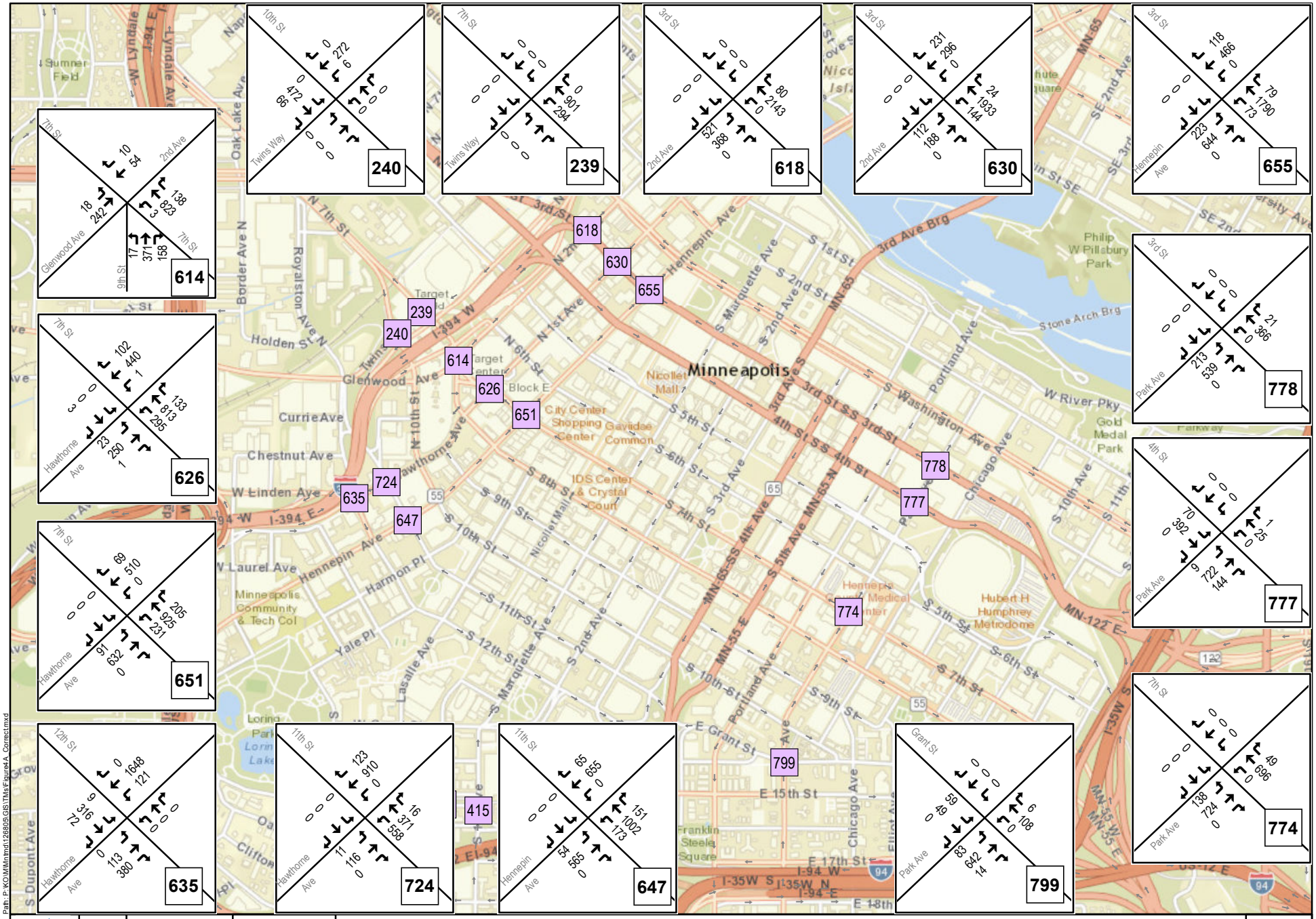


SEH

N

3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110
PHONE: (651) 490-2000
FAX: (888) 908-8166
TF: (800) 325-2055

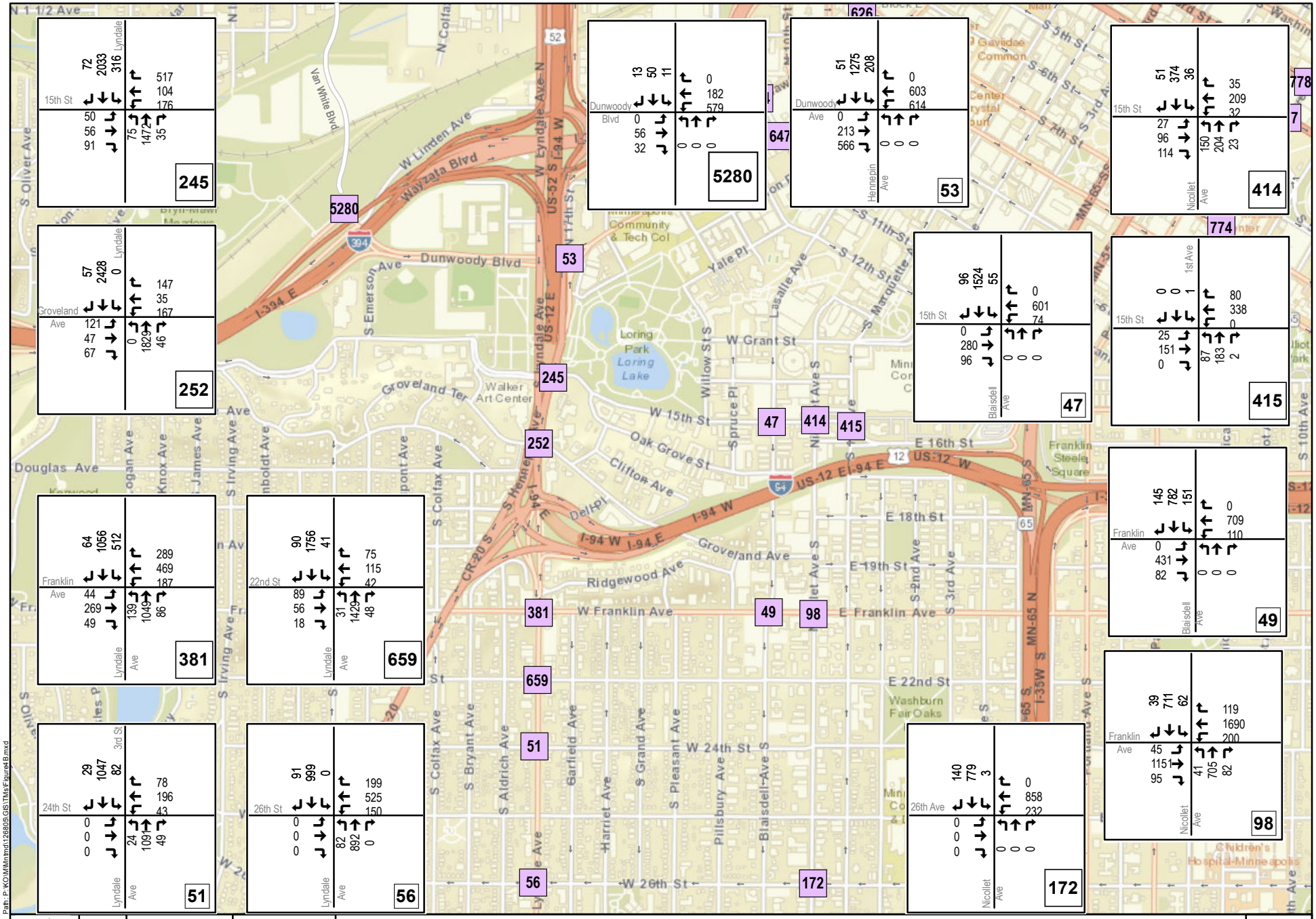
Project: MNTMD 126805
Print Date: 5/1/2015

Map by: msteuernagel
Projection:
Source:

PM Peak Hour - No Build Conditions

WB I-94/4th Avenue Entrance Ramp Closure Study

Figure 4A



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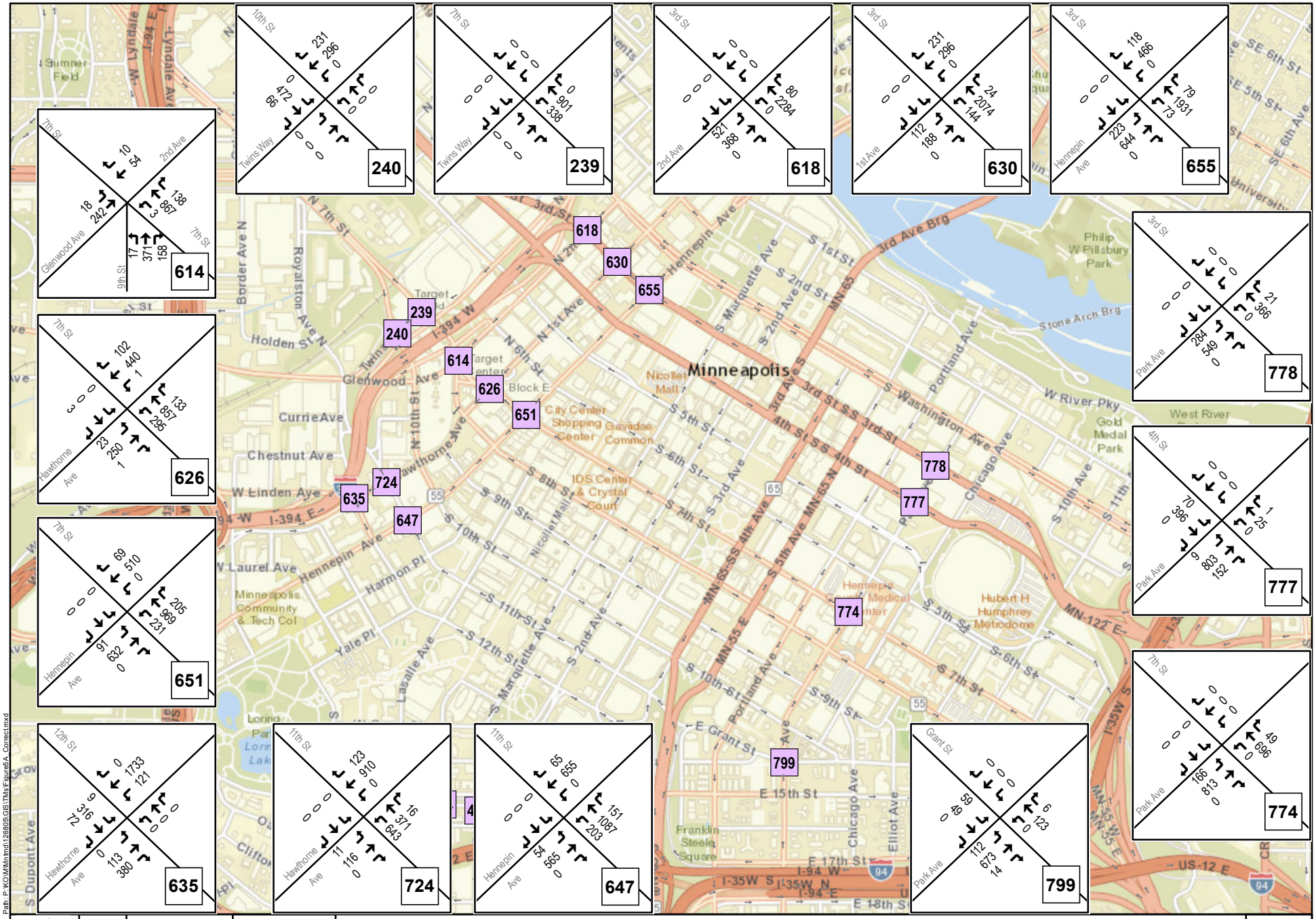
Project: MNTMD 126805
Print Date: 4/30/2015

Map by: msteuernagel
Projection:
Source:

PM Peak Hour - No Build Option

WB I-94/4th Avenue Entrance Ramp Closure Study

Figure 4B



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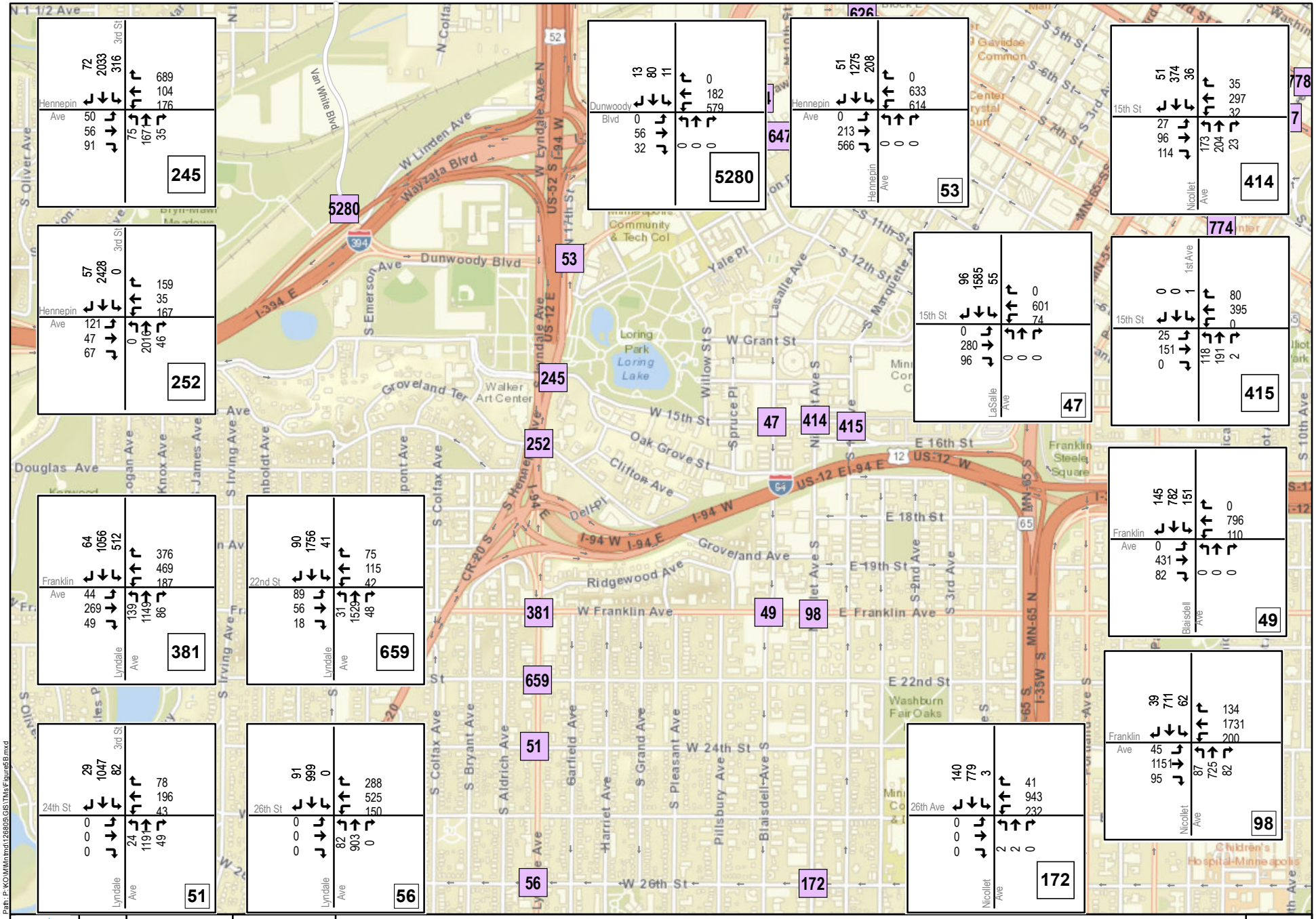
Project: MNTMD 126805
Print Date: 5/1/2015

Map by: msteuernagel
Projection:
Source:

PM Peak Hour - 4th Ave Ramp Closed

WB I-94/4th Avenue Entrance Ramp Closure Study

Figure 5A



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TF: (800) 325-2055

Project: MNTMD 126805
Print Date: 4/30/2015
Map by: msteuernagel
Projection:
Source:

PM Peak Hour - 4th Ave Ramp Closed

WB I-94/4th Avenue Entrance Ramp Closure Study

Figure 5B

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A1

CBD INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

239 **7th St N & Twins Way**	WBL	WBT	All								
Delay / Veh (s)	4	2.9	3.2								
LOS	A	A+	A								
% of Volume	96	100	99								
Denied Entry After	0	0	0								
609 **7th St S & Mid-Block Driveway**	WBT	All									
Delay / Veh (s)	12.2	12.2									
LOS	B+	B+									
% of Volume	92	92									
Denied Entry After	0	0									
614 **7th St N & 2nd Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR	All
Delay / Veh (s)	24.8	24	23.2	37.5	33.2	30	11.9	28.6	30.1	33.8	27.9
LOS	C+	C+	C+	D+	C-	C-	B+	C	C-	C-	C
% of Volume	100	97	99	112	100	89	100	89	99	102	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0
618 **I-94 NB Ramp & 2nd Av N**	WBL	WBT	WBR	NBL2	NBL	NBT	All				
Delay / Veh (s)	11.6	11	6.4	39.9	37.8	32.8	18.8				
LOS	B+	B+	A	D+	D+	C-	B-				
% of Volume	100	99	95	99	102	103	100				
Denied Entry After	0	0	0	0	0	0	0				
626 **7th St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	22.7	8.6	4	36.4	20.6	19.2	19	15.5			
LOS	C+	A-	A	D+	C+	B-	B-	B			
% of Volume	92	97	93	94	100	99	100	97			
Denied Entry After	0	0	0	0	0	0	0	0			
630 **3rd St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	13.3	14.1	7.6	65.8	34.8	26.2	30.4	20.2			
LOS	B	B	A-	E	C-	C	C-	C+			
% of Volume	97	99	108	97	98	101	105	99			
Denied Entry After	0	0	0	0	0	0	0	0			
635 **12th St N & Hawthorne Av W**	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All			
Delay / Veh (s)	38.8	36.6	36.2	8.4	8.5	10.1	7.8	12.5			
LOS	D+	D+	D+	A-	A-	B+	A-	B+			
% of Volume	98	103	100	96	98	104	96	97			
Denied Entry After	0	0	0	0	0	0	0	0			
647 **11th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	28	46	66.8	39.8	15.6	15.9	17.1	30.3			
LOS	C	D	E	D+	B	B	B-	C-			
% of Volume	94	89	88	93	101	100	99	95			
Denied Entry After	0	0	0	0	0	0	0	0			
651 **7th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	74.3	39.2	15.7	36	17.7	18.6	20.1	29.9			
LOS	E-	D+	B	D+	B-	B-	C+	C			
% of Volume	88	93	91	101	101	103	101	96			
Denied Entry After	0	0	0	0	0	0	0	0			
655 **3rd St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	16.4	17.5	5.2	154.7	47.6	37.9	40.6	36.9			
LOS	B	B-	A	F	D	D+	D+	D+			
% of Volume	98	100	102	98	99	105	99	100			
Denied Entry After	0	0	0	4	10	0	0	14			
667 **11th St S & Harmon Pl**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	14.6	45.4	51.5	228.2	32.8	37.8	81.5	49.9			
LOS	B	D	D-	F	C-	D+	F	D-			
% of Volume	90	88	93	90	106	97	112	90			
Denied Entry After	0	0	0	0	0	0	0	0			
678 **11th St S & LaSalle Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	344.2	331.3	310.6	111.7	23.4	64.7	83.8	217.6			
LOS	F	F	F	F	C+	E	F	F			
% of Volume	85	86	92	92	104	98	96	91			
Denied Entry After	36	158	30	0	0	7	5	236			

	No Diversion		4th Ave Ramp Diversion	
	All	Movement(s)	All	Movement(s)
239	All	WBL	All	WBL
Delay / Veh (s)	3.2	4	3.4	4.3
LOS	A	A	A	A
% of Volume	99	96	96	98
Denied Entry After	0	0	0	0
609	All	WBT	All	WBT
Delay / Veh (s)	12.2	12.2	12.9	12.9
LOS	B+	B+	B+	B+
% of Volume	92	92	90	90
Denied Entry After	0	0	0	0
614	All	WBT	All	WBT
Delay / Veh (s)	27.9	24	27.8	25
LOS	C	C+	C	C
% of Volume	99	97	95	94
Denied Entry After	0	0	0	0
618	All	WBL	WBT	All	WBL	WBT
Delay / Veh (s)	18.8	11.6	11	19.3	12	11.4
LOS	B-	B+	B+	B-	B+	B+
% of Volume	100	100	99	97	95	94
Denied Entry After	0	0	0	0	0	0
626	All	WBT	All	WBT
Delay / Veh (s)	15.5	8.6	15.7	8.7
LOS	B	A-	B	A-
% of Volume	97	97	94	92
Denied Entry After	0	0	0	0
630	All	WBT	All	WBT
Delay / Veh (s)	20.2	14.1	19.5	14.8
LOS	C+	B	B-	B
% of Volume	99	99	96	94
Denied Entry After	0	0	0	0
635	All	SBT	All	SBT
Delay / Veh (s)	12.5	7.8	13.1	8.7
LOS	B+	A-	B	A-
% of Volume	97	96	97	95
Denied Entry After	0	0	0	0
647	All	WBT	All	WBT
Delay / Veh (s)	30.3	46	31.8	47.3
LOS	C-	D	C-	D
% of Volume	95	89	93	85
Denied Entry After	0	0	1	0
651	All	WBT	All	WBT
Delay / Veh (s)	29.9	39.2	30.3	39.6
LOS	C	D+	C-	D+
% of Volume	96	93	95	90
Denied Entry After	0	0	0	0
655	All	WBT	All	WBT
Delay / Veh (s)	36.9	17.5	35.2	25.3
LOS	D+	B-	D+	C
% of Volume	100	100	96	94
Denied Entry After	14	0	7	0
667	All	WBT	All	WBT
Delay / Veh (s)	49.9	45.4	61.7	48.5
LOS	D-	D	E+	D-
% of Volume	90	88	86	83
Denied Entry After	0	0	2	0
678	All	WBT	All	WBT
Delay / Veh (s)	217.6	331.3	481.7	758.7
LOS	F	F	F	F
% of Volume	91	86	86	77
Denied Entry After	236	158	470	327

CBD INTERSECTIONS WITH DIVERSION DUE TO 4TH AVE S RAMP CLOSURE, NO SIGNAL RETIMING

239 **7th St N & Twins Way**	WBL	WBT	All								
Delay / Veh (s)	4.3	3	3.4								
LOS	A	A	A								
% of Volume	98	94	96								
Denied Entry After	0	0	0								
609 **7th St S & Mid-Block Driveway**	WBT	All									
Delay / Veh (s)	12.9	12.9									
LOS	B+	B+									
% of Volume	90	90									
Denied Entry After	0	0									
614 **7th St N & 2nd Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR	All
Delay / Veh (s)	22.7	25	20	42.5	31.8	33.7	16.2	27.9	29.4	33.8	27.8
LOS	C+	C	C+	D	C-	C-	B	C	C	C-	C
% of Volume	75	94	93	88	95	96	119	96	99	99	95
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0
618 **I-94 NB Ramp & 2nd Av N**	WBL	WBT	WBR	NBL2	NBL	NBT	All				
Delay / Veh (s)	12	11.4	6.8	39.9	38.5	33.7	19.3				
LOS	B+	B+	A	D+	D+	C-	B-				
% of Volume	95	94	96	101	103	106	97				
Denied Entry After	0	0	0	0	0	0	0				
626 **7th St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	23.8	8.7	4	33.4	21.3	19.2	19.3	15.7			
LOS	C+	A-	A	C-	C+	B-	B-	B			
% of Volume	93	92	93	94	98	98	94	94			
Denied Entry After	0	0	0	0	0	0	0	0			
630 **3rd St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	14.9	14.8	8.4	51.1	27.6	26	29.7	19.5			
LOS	B	B	A-	D-	C	C	C	B-			
% of Volume	95	94	98	91	101	102	102	96			
Denied Entry After	0	0	0	0	0	0	0	0			
635 **12th St N & Hawthorne Av W**	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All			
Delay / Veh (s)	39.1	38.1	35.3	8.2	9.3	12	8.7	13.1			
LOS	D+	D+	D+	A-	A-	B+	A-	B			
% of Volume	92	100	101	100	99	93	95	97			
Denied Entry After	0	0	0	0	0	0	0	0			
647 **11th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	27.7	47.3	73.2	48.1	15.8	16.3	18.5	31.8			
LOS	C	D	E-	D-	B	B	B-	C-			
% of Volume	86	85	82	101	100	100	102	93			
Denied Entry After	0	0	1	0	0	0	0	1			
651 **7th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	74.9	39.6	15.1	37.4	18.3	18.2	20.1	30.3			
LOS	E-	D+	B	D+	B-	B-	C+	C-			
% of Volume	87	90	89	99	100	100	105	95			
Denied Entry After	0	0	0	0	0	0	0	0			
655 **3rd St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	24.1	25.3	6.5	112.7	34.8	35.9	39.2	35.2			
LOS	C+	C	A	F	C-	D+	D+	D+			
% of Volume	96	94	91	98	98	100	106	96			
Denied Entry After	0	0	0	2	5	0	0	7			
667 **11th St S & Harmon Pl**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	17.4	48.5	59	368.4	104.8	38.6	102.2	61.7			
LOS	B-	D-	E+	F	F	D+	F	E+			
% of Volume	87	83	84	90	92	103	112	86			
Denied Entry After	0	0	0	2	0	0	0	2			
678 **11th St S & LaSalle Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	739.6	758.7	726.1	213.5	56.3	145.5	168.7	481.7			
LOS	F	F	F	F	E+	F	F	F			
% of Volume	79	77	80	93	102	98	101	86			
Denied Entry After	59	327	51	7	5	13	8	470			

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A1

CBD INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

									No Diversion			4th Ave Ramp Diversion		
									All	Movement(s)		All	Movement(s)	
689 **7th St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	85.3	36.6	20.1	28.6	24.7	24	24.8	35.8	35.8	36.6		40.7	42.3	
LOS	F	D+	C+	C	C+	C+	C+	D+	D+	D+		D+	D	
% of Volume	85	92	75	100	104	108	92	93	93	92		90	89	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
693 **3rd St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	15.4	15.3	5.5	34.8	27.9	25.8	21.5	16	16	15.3		27.5	27.5	
LOS	B	B	A	C-	C	C	C+	B	B	B		C	C	
% of Volume	75	100	125	90	92	95	100	100	100	100		94	94	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
702 **7th St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	95.3	67.6	21.2	96.1	79	18.9	20.1	66.4	66.4	67.6		66	74.6	
LOS	F	E	C+	F	E-	B-	C+	E	E	E		E	E-	
% of Volume	100	91	82	99	99	103	106	94	94	91		93	87	
Denied Entry After	0	0	0	4	15	0	0	19	19	0		4	0	
706 **3rd St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	17.5	17.5	10.2	47.6	23	34.2	33.7	24.5	24.5	17.5		37.9	39.9	
LOS	B-	B-	B+	D	C+	C-	C-	C+	C+	B-		D+	D+	
% of Volume	100	101	112	99	100	98	112	100	100	101		96	93	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		1	0	
716 **7th St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	105.6	91.1	29.8	54.6	16.6	40.5	75.1	71.1	71.1	91.1		97.2	126.1	
LOS	F	F	C	D-	B	D+	E-	E	E	F		F	F	
% of Volume	94	91	100	75	98	98	98	94	94	91		91	87	
Denied Entry After	8	43	0	0	0	13	3	67	67	43		119	74	
720 **3rd St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	16.9	15.7	7.4	24.1	17.5	18.7	17.6	16.6	16.6	15.7		35.5	42.5	
LOS	B	B	A-	C+	B-	B-	B-	B	B	B		D+	D	
% of Volume	97	102	112	99	99	95	100	100	100	102		95	92	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
724 **11th St N & Hawthorne Av W**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBL	WBT	All	WBL	WBT
Delay / Veh (s)	18.2	20.1	15.3	66.8	16.7	25.8	25.1	22.5	22.5	18.2	20.1	24.2	21.8	19.8
LOS	B-	C+	B	E	B	C	C	C+	C+	B-	C+	C+	C+	B-
% of Volume	90	89	97	89	97	100	93	95	95	90	89	95	88	88
Denied Entry After	0	0	0	0	0	3	1	4	4	0	0	3	0	0
730 **7th St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All			All		
Delay / Veh (s)	70.9	50.6	12.1	28.6	14.9	20.1	22.2	32	32			32.7		
LOS	E	D-	B+	C	B	C+	C+	C-	C-			C-		
% of Volume	92	95	98	97	99	98	100	97	97			95		
Denied Entry After	0	0	0	1	1	0	0	2	2			0		
734 **3rd St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	38.6	33.9	20.7	32.9	17.7	25.1	25.7	27.1	27.1	33.9		43.8	72.2	
LOS	D+	C-	C+	C-	B-	C	C	C	C	C-		D	E-	
% of Volume	97	101	107	103	101	98	93	101	101	101		95	91	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		5	2	
744 **7th St S & 4th Av S**	WBL	WBT	SBT	SBR	All				All			All		
Delay / Veh (s)	13.1	19.8	49	85.4	36.2				36.2			99		
LOS	B	B-	D-	F	D+				D+			F		
% of Volume	101	97	94	94	96				96			90		
Denied Entry After	0	0	50	19	69				69			155		
748 **3rd St S & 4th Av S**	WBL	WBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	5.9	10.3	26.6	29.4	15.3				15.3	10.3		242.7	53.3	
LOS	A	B+	C	C	B				B	B+		F	D-	
% of Volume	100	103	101	96	101				101	103		84	96	
Denied Entry After	0	0	1	1	2				2	0		307	17	
755 **7th St S & 5th Av S**	WBT	WBR	NBL	NBT	All				All			All		
Delay / Veh (s)	9.6	9.5	16	19.6	14.4				14.4			16.5		
LOS	A-	A-	B	B-	B				B			B		
% of Volume	97	94	100	100	99				99			98		
Denied Entry After	0	0	0	0	0				0			0		

CBD INTERSECTIONS WITH DIVERSION DUE TO 4TH AVE S RAMP CLOSURE, NO SIGNAL RETIMING

689 **7th St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	100.4	42.3	20.6	32	24.9	23	28.5	40.7
LOS	F	D	C+	C-	C+	C+	C	D+
% of Volume	65	89	150	100	104	98	117	90
Denied Entry After	0	0	0	0	0	0	0	0
693 **3rd St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	23.2	27.5	14	32.5	28.4	24.1	22.7	27.5
LOS	C+	C	B	C-	C	C+	C+	C
% of Volume	125	94	100	100	91	104	75	94
Denied Entry After	0	0	0	0	0	0	0	0
702 **7th St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	123.5	74.6	22.5	85.2	69.5	20	21.1	66
LOS	F	E-	C+	F	E	C+	C+	E
% of Volume	75	87	86	100	101	97	131	93
Denied Entry After	0	0	0	1	3	0	0	4
706 **3rd St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	35	39.9	21.1	51.5	22	33.6	30.5	37.9
LOS	D+	D+	C+	D-	C+	C-	C-	D+
% of Volume	112	93	88	100	100	96	112	96
Denied Entry After	0	0	0	1	0	0	0	1
716 **7th St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	141.3	126.1	94.1	37.7	17.1	55.2	103.6	97.2
LOS	F	F	F	D+	B-	E+	F	F
% of Volume	86	87	80	125	104	95	93	91
Denied Entry After	15	74	1	0	0	21	8	119
720 **3rd St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	36.3	42.5	23.4	23.8	16.5	18.4	20.4	35.5
LOS	D+	D	C+	C+	B	B-	C+	D+
% of Volume	93	92	100	98	112	100	101	95
Denied Entry After	0	0	0	0	0	0	0	0
724 **11th St N & Hawthorne Av W**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	21.8	19.8	18.8	65.3	15.1	28.1	28.9	24.2
LOS	C+	B-	B-	E	B	C	C	C+
% of Volume	88	88	78	89	100	100	103	95
Denied Entry After	0	0	0	0	0	2	1	3
730 **7th St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	80.1	52.9	11.3	27.2	15.1	19.4	20.9	32.7
LOS	F	D-	B+	C	B	B-	C+	C-
% of Volume	88	91	94	97	97	101	108	95
Denied Entry After	0	0	0	0	0	0	0	0
734 **3rd St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	67.1	72.2	49.1	37.3	17.3	25.6	26.3	43.8
LOS	E	E-	D-	D+	B-	C	C	D
% of Volume	93	91	85	96	100	99	108	95
Denied Entry After	0	2	0	1	2	0	0	5
744 **7th St S & 4th Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	15.6	24	187.5	242.6	99			
LOS	B	C+	F	F	F			
% of Volume	94	95	84	85	90			
Denied Entry After	0	0	114	41	155			
748 **3rd St S & 4th Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	27.9	53.3	905.4	1101.3	242.7			
LOS	C	D-	F	F	F			
% of Volume	95	96	59	54	84			
Denied Entry After	3	17	217	70	307			
755 **7th St S & 5th Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	13.1	8	17.6	20.6	16.5			
LOS	B	A-	B-	C+	B			
% of Volume	93	98	101	102	98			
Denied Entry After	0	0	0	0	0			

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A1

CBD INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

									No Diversion			4th Ave Ramp Diversion		
									All	Movement(s)		All	Movement(s)	
759 **3rd St S & 5th Av S**	WBT	WBR	NBL	NBT	All				All	WBT		All	WBT	
Delay / Veh (s)	8.7	6	10.1	16.4	11.8				11.8	8.7		27.9	46.5	
LOS	A-	A	B+	B	B+				B+	A-		C	D	
% of Volume	104	105	99	97	100				100	104		99	95	
Denied Entry After	0	0	0	0	0				0	0		1	1	
765 **7th St S & Portland Av S**	WBL	WBT	SBT	SBR	All				All			All		
Delay / Veh (s)	14.3	23.8	13.8	15.2	18.1				18.1			19.3		
LOS	B	C+	B	B	B-				B-			B-		
% of Volume	97	96	102	104	99				99			95		
Denied Entry After	0	0	0	0	0				0			0		
769 **3rd St S & Portland Av S**	WBL	WBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	7.6	8.8	26.2	12.2	14.3				14.3	8.8		21.6	20.9	
LOS	A-	A-	C	B+	B				B	A-		C+	C+	
% of Volume	98	104	97	102	101				101	104		99	98	
Denied Entry After	0	0	0	0	0				0	0		0	0	
771 **10th St S & Park Av S**	EBL	EBT	WBR	NBT	NBR	All			All	NBT		All	NBT	
Delay / Veh (s)	13.9	24.2	9.9	14.6	10.7	15.4			15.4	14.6		16.4	15.5	
LOS	B	C+	A-	B	B+	B			B	B		B	B	
% of Volume	98	102	97	103	150	102			102	103		101	102	
Denied Entry After	0	0	0	0	0	0			0	0		0	0	
773 **8th St S & Park Av S**	EBL	EBT	NBT	NBR	All				All	NBT		All	NBT	
Delay / Veh (s)	18.3	20.3	9.2	9.8	14.7				14.7	9.2		15	9.9	
LOS	B-	C+	A-	A-	B				B	A-		B	A-	
% of Volume	104	98	101	102	100				100	101		101	101	
Denied Entry After	0	0	0	0	0				0	0		0	0	
774 **7th St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBL	NBT	All	NBL	NBT
Delay / Veh (s)	22.6	16.7	6	6.2	13.2				13.2	6	6.2	27.3	7.4	6.4
LOS	C+	B	A	A	B				B	A	A	C	A-	A
% of Volume	99	100	102	101	100				100	102	101	99	96	102
Denied Entry After	0	0	0	0	0				0	0	0	17	0	0
775 **6th St S & Park Av S**	EBL	EBT	NBT	NBR	All				All	NBT		All	NBT	
Delay / Veh (s)	18.3	17.9	8.8	10.6	14.5				14.5	8.8		15.8	13	
LOS	B-	B-	A-	B+	B				B	A-		B	B	
% of Volume	94	99	103	96	100				100	103		100	102	
Denied Entry After	0	0	0	0	0				0	0		0	0	
776 **5th St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBT		All	NBT	
Delay / Veh (s)	5.8	10.2	34.3	32.4	26.3				26.3	32.4		36.4	44.3	
LOS	A	B+	C-	C-	C				C	C-		D+	D	
% of Volume	105	106	102	101	102				102	101		101	102	
Denied Entry After	0	0	0	0	0				0	0		0	0	
777 **4th St S & Park Av S**	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All	All	NBT		All	NBT	
Delay / Veh (s)	22	17.2	15.1	9	6	3.9	4.7	8.9	8.9	3.9		9.1	4.1	
LOS	C+	B-	B	A-	A	A	A	A-	A-	A		A-	A	
% of Volume	102	101	89	100	100	101	99	100	100	101		102	100	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
778 **3rd St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBL		All	NBL	
Delay / Veh (s)	24.6	11.8	8.1	4.7	14.9				14.9	8.1		16	11.9	
LOS	C+	B+	A-	A	B				B	A-		B	B+	
% of Volume	104	97	97	101	102				102	97		100	100	
Denied Entry After	0	0	0	0	0				0	0		0	0	
959 **9th St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBT		All	NBT	
Delay / Veh (s)	26.2	22.9	6.3	9.2	13.6				13.6	9.2		13.4	9.4	
LOS	C	C+	A	A-	B				B	A-		B	A-	
% of Volume	99	98	103	101	101				101	101		100	100	
Denied Entry After	0	0	0	0	0				0	0		0	0	
1025 **7th St S &**	WBT	NBL	All						All	WBT		All	WBT	
Delay / Veh (s)	8.7	24.4	8.9						8.9	8.7		9.5	9.2	
LOS	A-	C+	A-						A-	A-		A-	A-	
% of Volume	92	100	92						92	92		90	90	
Denied Entry After	0	0	0						0	0		0	0	
1031 **7th St S &**	WBT	SBR	All						All			All		
Delay / Veh (s)	2.4	256.6	79.7						79.7			71		
LOS	A+	F	E-						E-			E		
% of Volume	100	90	97						97			93		
Denied Entry After	0	46	46						46			65		

CBD INTERSECTIONS WITH DIVERSION DUE TO 4TH AVE S RAMP CLOSURE, NO SIGNAL RETIMING

759 **3rd St S & 5th Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	46.5	25.4	14.2	16.2	27.9			
LOS	D	C	B	B	C			
% of Volume	95	96	104	100	99			
Denied Entry After	1	0	0	0	1			
765 **7th St S & Portland Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	14.1	25.4	14.7	17.9	19.3			
LOS	B	C	B	B-	B-			
% of Volume	92	93	100	96	95			
Denied Entry After	0	0	0	0	0			
769 **3rd St S & Portland Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	11.8	20.9	26.4	19.7	21.6			
LOS	B+	C+	C	B-	C+			
% of Volume	97	98	101	90	99			
Denied Entry After	0	0	0	0	0			
771 **10th St S & Park Av S**	EBL	EBT	WBR	NBT	NBR	All		
Delay / Veh (s)	18	22.2	9.4	15.5	14.3	16.4		
LOS	B-	C+	A-	B	B	B		
% of Volume	98	101	100	102	100	101		
Denied Entry After	0	0	0	0	0	0		
773 **8th St S & Park Av S**	EBL	EBT	NBT	NBR	All			
Delay / Veh (s)	21.7	20.2	9.9	10.1	15			
LOS	C+	C+	A-	B+	B			
% of Volume	99	101	101	97	101			
Denied Entry After	0	0	0	0	0			
774 **7th St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	58	46.9	7.4	6.4	27.3			
LOS	E+	D	A-	A	C			
% of Volume	96	100	96	102	99			
Denied Entry After	14	3	0	0	17			
775 **6th St S & Park Av S**	EBL	EBT	NBT	NBR	All			
Delay / Veh (s)	18.7	17.9	13	11.2	15.8			
LOS	B-	B-	B	B+	B			
% of Volume	101	98	102	101	100			
Denied Entry After	0	0	0	0	0			
776 **5th St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	5.6	10.8	49.1	44.3	36.4			
LOS	A	B+	D-	D	D+			
% of Volume	100	92	106	102	101			
Denied Entry After	0	0	0	0	0			
777 **4th St S & Park Av S**	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Delay / Veh (s)	22.2	17.9	15.7	6.9	4.3	4.1	5	9.1
LOS	C+	B-	B	A	A	A	A	A-
% of Volume	104	106	100	150	108	100	99	102
Denied Entry After	0	0	0	0	0	0	0	0
778 **3rd St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	26.4	13.8	11.9	4.6	16			
LOS	C	B	B+	A	B			
% of Volume	99	91	100	101	100			
Denied Entry After	0	0	0	0	0			
959 **9th St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	26.1	22.6	6.6	9.4	13.4			
LOS	C	C+	A	A-	B			
% of Volume	98	106	105	100	100			
Denied Entry After	0	0	0	0	0			
1025 **7th St S &**	WBT	NBL	All					
Delay / Veh (s)	9.2	33	9.5					
LOS	A-	C-	A-					
% of Volume	90	119	90					
Denied Entry After	0	0	0					
1031 **7th St S &**	WBT	SBR	All					
Delay / Veh (s)	2.8	231.7	71					
LOS	A+	F	E					
% of Volume	96	87	93					
Denied Entry After	0	65	65					

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A1

SOUTH MPLS INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

47 **15th St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	14.8	14.1	26.6	22.1	19.6	17.8	16.3	18.8
LOS	B	B	C	C+	B-	B-	B	B-
% of Volume	95	96	106	102	103	105	96	102
Denied Entry After	0	0	0	0	0	0	0	0

48 **Oak Grove St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	46	40.3	30.2	27.2	6.7	4.8	4.9	6.5
LOS	D	D+	C-	C	A	A	A	A
% of Volume	100	106	100	100	75	105	106	104
Denied Entry After	0	0	0	0	0	0	0	0

49 **Franklin Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	17.3	18.5	12.4	5.5	48.5	47.9	40.3	26.4
LOS	B-	B-	B+	A	D-	D	D+	C
% of Volume	99	107	95	103	103	103	104	102
Denied Entry After	0	0	0	0	0	0	0	0

51 **24th St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	47.4	42.7	14.9	42.3	29.1	14.6	23.4	13.6	11.8	16.9	6.8	4.5	13.6
LOS	D	D	B	D	C	B	C+	B	B+	B	A	A	B
% of Volume	105	95	109	94	98	107	78	100	99	86	99	95	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

56 **26th St W & Lyndale Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	39.5	35.8	29.5	39.3	17.6	9.4	9.3	22.5
LOS	D+	D+	C	D+	B-	A-	A-	C+
% of Volume	97	98	99	109	102	100	101	100
Denied Entry After	0	0	0	0	0	0	0	0

92 **Groveland Av W & Nicollet Av S**	EBL	EBT	EBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	35.3	29.9	16.7	14.4	11.1	8.2	18.7	10.9	9.4	13.1
LOS	D+	C	B	B	B+	A-	B-	B+	A-	B
% of Volume	116	100	96	102	97	120	100	102	102	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0

93 **18th St E & Nicollet Av S**	WBL	WBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	32.2	13	4.6	3.6	9.7	5.1	7.1
LOS	C-	B	A	A	A-	A	A-
% of Volume	94	107	99	100	100	103	101
Denied Entry After	0	0	0	0	0	0	0

98 **Franklin Av W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	33.9	8.5	8	25	15.9	16.4	55.8	38.3	44	70.2	32.9	31.8	23.7
LOS	C-	A-	A-	C	B	B	E+	D+	D	E	C-	C-	C+
% of Volume	98	101	95	97	102	99	103	96	89	104	99	100	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

113 **26th St W & Grand Av S**	WBL	WBT	NBL	SBR	All
Delay / Veh (s)	1.8	6	8.5	10.6	6.2
LOS	A+	A	A-	B+	A
% of Volume	100	100	100	102	100
Denied Entry After	0	0	0	0	0

171 **26th St W & Nicollet Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	20.9	20.3	19	36.6	23.8	14.3	10.2	20
LOS	C+	C+	B-	D+	C+	B	B+	C+
% of Volume	95	99	97	98	95	99	106	99
Denied Entry After	0	0	0	0	0	0	0	0

172 **26th St W & Blaisdell Av S**	WBL	WBT	SBT	SBR	All
Delay / Veh (s)	5.4	4.8	11.1	15.7	7.7
LOS	A	A	B+	B	A-
% of Volume	103	100	101	104	101
Denied Entry After	0	0	0	0	0

353 **24th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	32.4	29.6	18.6	39.9	37	19.9	12.7	6.1	4.6	14.1	8.9	7.4	14.1
LOS	C-	C	B-	D+	D+	B-	B+	A	A	B	A-	A-	B
% of Volume	93	94	106	114	96	92	107	95	87	89	99	101	97
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

	No Diversion All	No Diversion Movement(s)		4th Ave Ramp Diversion All	4th Ave Ramp Diversion Movement(s)	
47	All	WBT		All	WBT	
Delay / Veh (s)	18.8	22.1		20	21.7	
LOS	B-	C+		C+	C+	
% of Volume	102	102		99	100	
Denied Entry After	0	0		0	0	
48	All			All		
Delay / Veh (s)	6.5			9.2		
LOS	A			A-		
% of Volume	104			98		
Denied Entry After	0			6		
49	All	WBT	SBR	All	WBT	SBR
Delay / Veh (s)	26.4	5.5	40.3	32.3	14.7	79.5
LOS	C	A	D+	C-	B	E-
% of Volume	102	103	104	97	99	87
Denied Entry After	0	0	0	1	0	0
51	All	NBT		All	NBT	
Delay / Veh (s)	13.6	13.6		14.1	14.4	
LOS	B	B		B	B	
% of Volume	99	100		98	99	
Denied Entry After	0	0		0	0	
56	All	WBR		All	WBR	
Delay / Veh (s)	22.5	29.5		23	33.2	
LOS	C+	C		C+	C-	
% of Volume	100	99		99	99	
Denied Entry After	0	0		0	0	
92	All			All		
Delay / Veh (s)	13.1			12.5		
LOS	B			B+		
% of Volume	100			100		
Denied Entry After	0			0		
93	All			All		
Delay / Veh (s)	7.1			6.8		
LOS	A-			A		
% of Volume	101			99		
Denied Entry After	0			0		
98	All	WBT		All	WBT	
Delay / Veh (s)	23.7	15.9		26.7	24.3	
LOS	C+	B		C	C+	
% of Volume	100	102		99	100	
Denied Entry After	0	0		9	7	
113	All	WBT		All	WBT	
Delay / Veh (s)	6.2	6		6.3	6.1	
LOS	A	A		A	A	
% of Volume	100	100		100	100	
Denied Entry After	0	0		0	0	
171	All	WBT		All	WBT	
Delay / Veh (s)	20	20.3		20.8	20.9	
LOS	C+	C+		C+	C+	
% of Volume	99	99		100	99	
Denied Entry After	0	0		0	0	
172	All	WBT		All	WBT	
Delay / Veh (s)	7.7	4.8		7.5	5.4	
LOS	A-	A		A-	A	
% of Volume	101	100		98	100	
Denied Entry After	0	0		0	0	
353	All			All		
Delay / Veh (s)	14.1			14.6		
LOS	B			B		
% of Volume	97			100		
Denied Entry After	0			0		

SOUTH MPLS INTERSECTIONS WITH DIVERSION DUE TO 4TH AVE S RAMP CLOSURE, NO RETIMING

47 **15th St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	16.8	11.8	29.6	21.7	22	19.4	18.3	20
LOS	B	B+	C	C+	C+	B-	B-	C+
% of Volume	94	94	100	100	100	100	102	99
Denied Entry After	0	0	0	0	0	0	0	0

48 **Oak Grove St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	37.9	44.4	63.7	41.2	12.7	7.3	8	9.2
LOS	D+	D	E	D+	B+	A-	A-	A-
% of Volume	50	106	100	125	100	97	108	98
Denied Entry After	0	0	0	0	0	5	1	6

49 **Franklin Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	18.1	20.9	19	14.7	50.8	51.7	79.5	32.3
LOS	B-	C+	B-	B	D-	D-	E-	C-
% of Volume	100	96	93	99	93	96	87	97
Denied Entry After	0	0	0	0	0	1	0	1

51 **24th St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	43	39.8	14.9	43.7	29.8	15.1	22.8	14.4	11.7	16.8	7.4	5.8	14.1
LOS	D	D+	B	D	C	B	C+	B	B+	B	A-	A	B
% of Volume	95	96	118	94	100	104	91	99	95	105	98	98	98
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

56 **26th St W & Lyndale Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	39.3	34.9	33.2	36.9	17.6	10.1	8.9	23
LOS	D+	C-	C-	D+	B-	B+	A-	C+
% of Volume	94	99	99	102	100	98	106	99
Denied Entry After	0	0	0	0	0	0	0	0

92 **Groveland Av W & Nicollet Av S**	EBL	EBT	EBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	31.2	29.1	15.6	14.7	10.3	7.2	19	10.9	8.2	12.5
LOS	C-	C	B	B	B+	A-	B-	B+	A-	B+
% of Volume	103	104	111	94	101	100	105	98	100	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0

93 **18th St E & Nicollet Av S**	WBL	WBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	32.9	13.9	4.3	2.3	8.9	4.8	6.8
LOS	C-	B	A	A+	A-	A	A
% of Volume	92	93	101	114	83	98	99
Denied Entry After	0	0	0	0	0	0	0

98 **Franklin Av W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	41.2	9	7.4	32.2	24.3	21.3	56.9	36.1	40.7	64.2	32.7	39.7	26.7
LOS	D+	A-	A-	C-	C+	C+	E+	D+	D+	E	C-	D+	C
% of Volume	100	98	105	97	100	100	96	98	96	96	102	100	99
Denied Entry After	0	0	0	1	7	1	0	0	0	0	0	0	9

113 **26th St W & Grand Av S**	WBL	WBT	NBL	SBR	All
Delay / Veh (s)	4.9	6.1	24.8	10.8	6.3
LOS	A	A	C+	B+	A
% of Volume	100	100	100	107	100
Denied Entry After	0	0	0	0	0

171 **26th St W & Nicollet Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	21.7	20.9	19.6	34.2	25.9	15.4	11.1	20.8
LOS	C+	C+	B-	C-	C	B	B+	C+
% of Volume	102	99	100	108	102	101	104	100
Denied Entry After	0	0	0	0	0	0	0	0

172 **26th St W & Blaisdell Av S**	WBL	WBT	SBT	SBR	All
Delay / Veh (s)	5	5.4	10.7	14.6	7.5
LOS	A	A	B+	B	A-
% of Volume	102	100	95	98	98
Denied Entry After	0	0	0	0	0

353 **24th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	33.9	31.8	23.1	42.5	37.5	24.1	11.9	5.9	4.7	12.8	9.5	8.3	14.6
LOS	C-	C-	C+	D	D+	C+	B+	A	A	B+	A-	A-	B
% of Volume	93	90	106	79	104	108	100	99	116	94	102	99	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A1

SOUTH MPLS INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

381 **Franklin Av W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	45.6	29.4	30.6	198.5	215.1	285.1	24.8	26.8	37.6	63.9	32.1	35.2	85.9
LOS	D	C	C-	F	F	F	C+	C	D+	E	C-	D+	F
% of Volume	101	99	105	99	93	97	103	100	100	101	98	97	98
Denied Entry After	0	0	0	0	0	0	0	0	0	1	3	0	4
396 **Groveland Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	39.5	39.1	41.9	38.7	5.2	5.4	4.7	11.1					
LOS	D+	D+	D+	D+	A	A	A	B+					
% of Volume	96	100	103	102	110	104	104	103					
Denied Entry After	0	0	0	0	0	0	0	0					
414 **15th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	28.9	18.3	12.2	36	34.5	21.7	19.1	10.9	10.1	22.9	17.2	14	21.2
LOS	C	B-	B+	D+	C-	C+	B-	B+	B+	C+	B-	B	C+
% of Volume	96	94	103	100	99	105	110	93	93	113	105	114	101
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0
585 **24th St W & Blaisdell Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	13.4	15	30.8	19.3	9.2	9.8	9.3	12					
LOS	B	B	C-	B-	A-	A-	A-	B+					
% of Volume	93	95	106	97	103	102	111	101					
Denied Entry After	0	0	0	0	0	0	0	0					
606 **15th St W & Willow St S**	EBL	EBT	WBT	WBR	SBL	SBR	All						
Delay / Veh (s)	18	6.6	6.8	4.6	47.3	40.2	18.2						
LOS	B-	A	A	A	D	D+	B-						
% of Volume	103	98	101	102	92	103	101						
Denied Entry After	0	0	0	0	0	1	1						
659 **22nd St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	42.9	37.2	21.5	41.5	37.4	26.3	22.5	6.7	4.9	18.1	6	5	9.5
LOS	D	D+	C+	D+	D+	C	C+	A	A	B-	A	A	A-
% of Volume	100	100	110	106	103	100	84	101	103	86	98	101	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

	No Diversion All	No Diversion Movement(s)		4th Ave Ramp Diversion All	4th Ave Ramp Diversion Movement(s)	
381 Delay / Veh (s)	85.9	26.8	285.1	127.2	31	469.8
381 LOS	F	C	F	F	C-	F
381 % of Volume	98	100	97	96	99	86
381 Denied Entry After	4	0	0	6	0	2
396 Delay / Veh (s)	11.1			20.1		
396 LOS	B+			C+		
396 % of Volume	103			96		
396 Denied Entry After	0			0		
414 Delay / Veh (s)	21.2	19.1	34.5	29.2	18.9	52.7
414 LOS	C+	B-	C-	C	B-	D-
414 % of Volume	101	110	99	99	111	97
414 Denied Entry After	0	0	0	2	0	2
585 Delay / Veh (s)	12			11.5		
585 LOS	B+			B+		
585 % of Volume	101			97		
585 Denied Entry After	0			0		
606 Delay / Veh (s)	18.2	6.8		17.8	6.9	
606 LOS	B-	A		B-	A	
606 % of Volume	101	101		99	100	
606 Denied Entry After	1	0		0	0	
659 Delay / Veh (s)	9.5	6.7		10.1	7.2	
659 LOS	A-	A		B+	A-	
659 % of Volume	99	101		99	99	
659 Denied Entry After	0	0		0	0	

SOUTH MPLS INTERSECTIONS WITH DIVERSION DUE TO 4TH AVE S RAMP CLOSURE, NO RETIMING

381 **Franklin Av W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	42.6	30.1	27.7	334.8	360.8	469.8	28.1	31	35.9	71.4	33.5	37.3	127.2
LOS	D	C-	C	F	F	F	C	C-	D+	E	C-	D+	F
% of Volume	104	98	110	87	87	86	83	99	113	100	99	104	96
Denied Entry After	0	0	0	1	2	2	0	0	0	0	1	0	6
396 **Groveland Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	39.6	37.6	43.6	33.7	7.7	16.7	12.7	20.1					
LOS	D+	D+	D	C-	A-	B	B+	C+					
% of Volume	107	102	91	101	93	96	90	96					
Denied Entry After	0	0	0	0	0	0	0	0					
414 **15th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	30	21.8	15.3	53.7	52.7	35.9	18.9	12.7	7.7	23.6	16.3	17.2	29.2
LOS	C-	C+	B	D-	D-	D+	B-	B+	A-	C+	B	B-	C
% of Volume	88	103	95	102	97	95	111	97	93	92	97	97	99
Denied Entry After	0	0	0	0	2	0	0	0	0	0	0	0	2
585 **24th St W & Blaisdell Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	10.9	15	26.7	18.9	8	9.6	8.5	11.5					
LOS	B+	B	C	B-	A-	A-	A-	B+					
% of Volume	98	91	103	101	91	96	95	97					
Denied Entry After	0	0	0	0	0	0	0	0					
606 **15th St W & Willow St S**	EBL	EBT	WBT	WBR	SBL	SBR	All						
Delay / Veh (s)	17	7.3	6.9	4.5	47.4	39.5	17.8						
LOS	B-	A-	A	A	D	D+	B-						
% of Volume	98	93	100	100	104	103	99						
Denied Entry After	0	0	0	0	0	0	0						
659 **22nd St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	43.9	38.7	21.5	43.5	37.6	27.4	25.4	7.2	5.7	21.4	6.7	4.8	10.1
LOS	D	D+	C+	D	D+	C	C	A-	A	C+	A	A	B+
% of Volume	98	108	100	100	114	102	95	99	113	83	98	101	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

LYNDALE/HENNEPIN AREA INTERSECTIONS PROPOSED CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

245 **Vineland Place W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	69.5	72.3	52.4	215.4	129	101	85.9	48.6	63.3	943	413	384	248
LOS	E	E-	D-	F	F	F	F	D-	E	F	F	F	F
% of Volume	103	100	99	97	98	98	86	86	85	74	79	75	84
Denied Entry After	0	0	0	2	1	1	0	0	0	82	442	16	544
252 **Groveland Terrace W & Hennepin L**	EBL	EBT	EBR2	WBL	WBT	WBR	NBT	NBR	SBR	SBR2	All		
Delay / Veh (s)	116.3	111.4	116.7	260.2	252	237.6	68.6	45.7	14.5	13.9	63		
LOS	F	F	F	F	F	F	E	D	B	B	E		
% of Volume	98	92	111	99	92	95	82	91	81	90	84		
Denied Entry After	0	0	0	7	2	6	0	0	0	0	15		
253 **I-94 WB Ramp & Lyndale Av S**	EBL	WBL	WBR	NBT	All								
Delay / Veh (s)	1862	34.5	105.9	45.3	396.4								
LOS	F	C-	F	D	F								
% of Volume	50	102	96	101	86								
Denied Entry After	263	1	0	0	264								

	No Diversion All	No Diversion Movement(s)		4th Ave Ramp Diversion All	4th Ave Ramp Diversion Movement(s)	
245 Delay / Veh (s)	247.6	48.6	101	311.2	48.7	496.4
245 LOS	F	D-	F	F	D-	F
245 % of Volume	84	86	98	81	78	86
245 Denied Entry After	544	0	1	699	0	101
252 Delay / Veh (s)	63	68.6	237.6	72.2	75.8	337.6
252 LOS	E	E	F	E-	E-	F
252 % of Volume	84	82	95	81	74	92
252 Denied Entry After	15	0	6	15	0	7
253 Delay / Veh (s)	396.4	45.3		702.8	56.4	0
253 LOS	F	D		F	E+	
253 % of Volume	86	101		77	101	
253 Denied Entry After	264	0		506	0	

LYNDALE/HENNEPIN AREA WITH DIVERSION DUE TO 4TH AVE S RAMP CLOSURE, NO RETIMING

245 **Vineland Place W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	66	62.2	45	607.9	518.5	496.4	73.8	48.7	61.5	926	415	412	311.2
LOS	E	E+	D	F	F	F	E-	D-	E+	F	F	F	F
% of Volume	100	109	99	84	85	86	77	78	81	73	81	77	81
Denied Entry After	0	0	0	27	16	101	0	0	0	86	448	21	699
252 **Groveland Terrace W & Hennepin L**	EBL	EBT	EBR2	WBL	WBT	WBR	NBT	NBR	SBR	SBR2	All		
Delay / Veh (s)	75.6	77.1	80.3	355.3	365.5	337.6	75.8	51.1	14.8	14.5	72.2		
LOS	E-	E-	F	F	F	F	E-	D-	B	B	E-		
% of Volume	98	102	89	97	102	92	74	79	82	82	81		
Denied Entry After	0	0	0	7	1	7	0	0	0	0	15		
253 **I-94 WB Ramp & Lyndale Av S**	EBL	WBL	WBR	NBT	All								
Delay / Veh (s)	6258	149.2	409.6	56.4	702.8								
LOS	F	F	F	E+	F								
% of Volume	25	91	82	101	77								
Denied Entry After	497	5	4	0	506								

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A2

CBD INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

												No Diversion All	No Diversion Movement(s)		4th Ave Ramp Diversion All	4th Ave Ramp Diversion Movement(s)	
239 **7th St N & Twins Way**	WBL	WBT	All									All	WBL		All	WBL	
Delay / Veh (s)	4	2.9	3.2									3.2	4		3.6	4.2	
LOS	A	A+	A									A	A		A	A	
% of Volume	96	100	99									99	96		101	100	
Denied Entry After	0	0	0									0	0		0	0	
609 **7th St S & Mid-Block Driveway**	WBT	All										All	WBT		All	WBT	
Delay / Veh (s)	12.2	12.2										12.2	12.2		7.4	7.4	
LOS	B+	B+										B+	B+		A-	A-	
% of Volume	92	92										92	92		100	100	
Denied Entry After	0	0										0	0		0	0	
614 **7th St N & 2nd Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR	All	All	WBT		All	WBT	
Delay / Veh (s)	24.8	24	23.2	37.5	33.2	30	11.9	28.6	30.1	33.8	27.9	27.9	24		30.4	30.3	
LOS	C+	C+	C+	D+	C-	C-	B+	C	C-	C-	C	C	C+		C-	C-	
% of Volume	100	97	99	112	100	89	100	89	99	102	99	99	97		101	101	
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
618 **I-94 NB Ramp & 2nd Av N**	WBL	WBT	WBR	NBL2	NBL	NBT	All					All	WBL	WBT	All	WBL	WBT
Delay / Veh (s)	11.6	11	6.4	39.9	37.8	32.8	18.8					18.8	11.6	11	19.5	12.9	12.2
LOS	B+	B+	A	D+	D+	C-	B-					B-	B+	B+	B-	B+	B+
% of Volume	100	99	95	99	102	103	100					100	100	99	96	95	94
Denied Entry After	0	0	0	0	0	0	0					0	0	0	0	0	0
626 **7th St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	22.7	8.6	4	36.4	20.6	19.2	19	15.5				15.5	8.6		15.4	8.7	
LOS	C+	A-	A	D+	C+	B-	B-	B				B	A-		B	A-	
% of Volume	92	97	93	94	100	99	100	97				97	97		99	99	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
630 **3rd St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	13.3	14.1	7.6	65.8	34.8	26.2	30.4	20.2				20.2	14.1		23.8	22.1	
LOS	B	B	A-	E	C-	C	C-	C+				C+	B		C+	C+	
% of Volume	97	99	108	97	98	101	105	99				99	99		95	94	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
635 **12th St N & Hawthorne Av W**	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All				All	SBT		All	SBT	
Delay / Veh (s)	38.8	36.6	36.2	8.4	8.5	10.1	7.8	12.5				12.5	7.8		13.6	9.3	
LOS	D+	D+	D+	A-	A-	B+	A-	B+				B+	A-		B	A-	
% of Volume	98	103	100	96	98	104	96	97				97	96		97	94	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
647 **11th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	28	46	66.8	39.8	15.6	15.9	17.1	30.3				30.3	46		24.8	27.5	
LOS	C	D	E	D+	B	B	B-	C-				C-	D		C+	C	
% of Volume	94	89	88	93	101	100	99	95				95	89		93	88	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
651 **7th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	74.3	39.2	15.7	36	17.7	18.6	20.1	29.9				29.9	39.2		21	16.1	
LOS	E-	D+	B	D+	B-	B-	C+	C				C	D+		C+	B	
% of Volume	88	93	91	101	101	103	101	96				96	93		99	99	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
655 **3rd St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	16.4	17.5	5.2	154.7	47.6	37.9	40.6	36.9				36.9	17.5		31.6	26.9	
LOS	B	B-	A	F	D	D+	D+	D+				D+	B-		C-	C	
% of Volume	98	100	102	98	99	105	99	100				100	100		96	93	
Denied Entry After	0	0	0	4	10	0	0	14				14	0		0	0	
667 **11th St S & Harmon Pl**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	14.6	45.4	51.5	228.2	32.8	37.8	81.5	49.9				49.9	45.4		25.8	18	
LOS	B	D	D-	F	C-	D+	F	D-				D-	D		C	B-	
% of Volume	90	88	93	90	106	97	112	90				90	88		89	87	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
678 **11th St S & LaSalle Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	344.2	331.3	310.6	111.7	23.4	64.7	83.8	217.6				217.6	331.3		324.9	557.7	
LOS	F	F	F	F	C+	E	F	F				F	F		F	F	
% of Volume	85	86	92	92	104	98	96	91				91	86		90	82	
Denied Entry After	36	158	30	0	0	7	5	236				236	158		335	243	

CBD INTERSECTIONS WITH DIVERSION AND SIGNAL RETIMING

239 **7th St N & Twins Way**	WBL	WBT	All								
Delay / Veh (s)	4.2	3.3	3.6								
LOS	A	A	A								
% of Volume	100	101	101								
Denied Entry After	0	0	0								
609 **7th St S & Mid-Block Driveway**	WBT	All									
Delay / Veh (s)	7.4	7.4									
LOS	A-	A-									
% of Volume	100	100									
Denied Entry After	0	0									
614 **7th St N & 2nd Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR	All
Delay / Veh (s)	26.8	30.3	23	38.8	32.5	29.4	14.4	24.3	31.4	33.4	30.4
LOS	C	C-	C+	D+	C-	C	B	C+	C-	C-	C-
% of Volume	67	101	96	83	101	91	100	86	106	101	101
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0
618 **I-94 NB Ramp & 2nd Av N**	WBL	WBT	WBR	NBL2	NBL	NBT	All				
Delay / Veh (s)	12.9	12.2	7	40.6	37.1	31.8	19.5				
LOS	B+	B+	A-	D+	D+	C-	B-				
% of Volume	95	94	87	104	99	101	96				
Denied Entry After	0	0	0	0	0	0	0				
626 **7th St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	22	8.7	4.6	36.3	21.5	19.5	20.5	15.4			
LOS	C+	A-	A	D+	C+	B-	C+	B			
% of Volume	93	99	107	103	98	99	102	99			
Denied Entry After	0	0	0	0	0	0	0	0			
630 **3rd St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	21.4	22.1	12.3	50.6	26.1	23.9	26.3	23.8			
LOS	C+	C+	B+	D-	C	C+	C	C+			
% of Volume	92	94	98	100	101	98	97	95			
Denied Entry After	0	0	0	0	0	0	0	0			
635 **12th St N & Hawthorne Av W**	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All			
Delay / Veh (s)	38.7	37.8	39.3	8.5	9.2	11.4	9.3	13.6			
LOS	D+	D+	D+	A-	A-	B+	A-	B			
% of Volume	95	101	106	103	101	95	94	97			
Denied Entry After	0	0	0	0	0	0	0	0			
647 **11th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	22.1	27.5	38	55.5	18.8	20.4	21.1	24.8			
LOS	C+	C	D+	E+	B-	C+	C+	C+			
% of Volume	87	88	87	100	100	99	95	93			
Denied Entry After	0	0	0	0	0	0	0	0			
651 **7th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	36.6	16.1	7.9	42.5	22.5	23.6	22.5	21			
LOS	D+	B	A-	D	C+	C+	C+	C+			
% of Volume	106	99	101	93	99	95	94	99			
Denied Entry After	0	0	0	0	0	0	0	0			
655 **3rd St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	26.6	26.9	7.2	63.5	24.9	41.3	45.7	31.6			
LOS	C	C	A-	E	C+	D+	D	C-			
% of Volume	97	93	88	97	99	101	101	96			
Denied Entry After	0	0	0	0	0	0	0	0			
667 **11th St S & Harmon Pl**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	15.6	18	11	157.1	41.2	31.9	54.2	25.8			
LOS	B	B-	B+	F	D+	C-	D-	C			
% of Volume	92	87	86	88	100	93	98	89			
Denied Entry After	0	0	0	0	0	0	0	0			
678 **11th St S & LaSalle Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	590.3	557.7	531.1	55.6	14.1	27.4	29	324.9			
LOS	F	F	F	E+	B	C	C	F			
% of Volume	86	82	85	100	100	105	102	90			
Denied Entry After	50	243	42	0	0	0	0	335			

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A2

CBD INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

									No Diversion			4th Ave Ramp Diversion		
689 **7th St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	Movement(s)		All	Movement(s)	
Delay / Veh (s)	85.3	36.6	20.1	28.6	24.7	24	24.8	35.8	35.8	36.6		12.3	10.2	
LOS	F	D+	C+	C	C+	C+	C+	D+	D+	D+		B+	B+	
% of Volume	85	92	75	100	104	108	92	93	93	92		100	100	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
693 **3rd St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	15.4	15.3	5.5	34.8	27.9	25.8	21.5	16	16	15.3		28.9	29.1	
LOS	B	B	A	C-	C	C	C+	B	B	B		C	C	
% of Volume	75	100	125	90	92	95	100	100	100	100		93	93	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
702 **7th St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	95.3	67.6	21.2	96.1	79	18.9	20.1	66.4	66.4	67.6		25.4	27	
LOS	F	E	C+	F	E-	B-	C+	E	E	E		C	C	
% of Volume	100	91	82	99	99	103	106	94	94	91		101	101	
Denied Entry After	0	0	0	4	15	0	0	19	19	0		2	0	
706 **3rd St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	17.5	17.5	10.2	47.6	23	34.2	33.7	24.5	24.5	17.5		36.7	41.3	
LOS	B-	B-	B+	D	C+	C-	C-	C+	C+	B-		D+	D+	
% of Volume	100	101	112	99	100	98	112	100	100	101		95	92	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
716 **7th St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	105.6	91.1	29.8	54.6	16.6	40.5	75.1	71.1	71.1	91.1		22.6	17.8	
LOS	F	F	C	D-	B	D+	E-	E	E	F		C+	B-	
% of Volume	94	91	100	75	98	98	98	94	94	91		100	100	
Denied Entry After	8	43	0	0	0	13	3	67	67	43		0	0	
720 **3rd St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	16.9	15.7	7.4	24.1	17.5	18.7	17.6	16.6	16.6	15.7		39.2	47.5	
LOS	B	B	A-	C+	B-	B-	B-	B	B	B		D+	D	
% of Volume	97	102	112	99	99	95	100	100	100	102		94	92	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
724 **11th St N & Hawthorne Av W**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBL	WBT	All	WBL	WBT
Delay / Veh (s)	18.2	20.1	15.3	66.8	16.7	25.8	25.1	22.5	22.5	18.2	20.1	23.8	19.9	21.7
LOS	B-	C+	B	E	B	C	C	C+	C+	B-	C+	C+	B-	C+
% of Volume	90	89	97	89	97	100	93	95	95	90	89	95	90	89
Denied Entry After	0	0	0	0	0	3	1	4	4	0	0	1	0	0
730 **7th St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All			All		
Delay / Veh (s)	70.9	50.6	12.1	28.6	14.9	20.1	22.2	32	32			23.3		
LOS	E	D-	B+	C	B	C+	C+	C-	C-			C+		
% of Volume	92	95	98	97	99	98	100	97	97			100		
Denied Entry After	0	0	0	1	1	0	0	2	2			0		
734 **3rd St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	38.6	33.9	20.7	32.9	17.7	25.1	25.7	27.1	27.1	33.9		44.1	69.5	
LOS	D+	C-	C+	C-	B-	C	C	C	C	C-		D	E	
% of Volume	97	101	107	103	101	98	93	101	101	101		94	89	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		1	1	
744 **7th St S & 4th Av S**	WBL	WBT	SBT	SBR	All				All			All		
Delay / Veh (s)	13.1	19.8	49	85.4	36.2				36.2			16.8		
LOS	B	B-	D-	F	D+				D+			B		
% of Volume	101	97	94	94	96				96			100		
Denied Entry After	0	0	50	19	69				69			0		
748 **3rd St S & 4th Av S**	WBL	WBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	5.9	10.3	26.6	29.4	15.3				15.3	10.3		257.4	53.9	
LOS	A	B+	C	C	B				B	B+		F	D-	
% of Volume	100	103	101	96	101				101	103		82	97	
Denied Entry After	0	0	1	1	2				2	0		333	7	
755 **7th St S & 5th Av S**	WBT	WBR	NBL	NBT	All				All			All		
Delay / Veh (s)	9.6	9.5	16	19.6	14.4				14.4			14		
LOS	A-	A-	B	B-	B				B			B		
% of Volume	97	94	100	100	99				99			100		
Denied Entry After	0	0	0	0	0				0			0		

CBD INTERSECTIONS WITH DIVERSION AND SIGNAL RETIMING

689 **7th St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	14.4	10.2	7.1	40.5	30.9	29.9	21.4	12.3
LOS	B	B+	A-	D+	C-	C	C+	B+
% of Volume	100	100	125	75	106	90	133	100
Denied Entry After	0	0	0	0	0	0	0	0
693 **3rd St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	31.6	29.1	15.1	38.4	27.1	24.9	26.7	28.9
LOS	C-	C	B	D+	C	C+	C	C
% of Volume	75	93	75	90	92	96	100	93
Denied Entry After	0	0	0	0	0	0	0	0
702 **7th St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	26.7	27	12.2	35.3	23.8	19.9	22.1	25.4
LOS	C	C	B+	D+	C+	B-	C+	C
% of Volume	100	101	99	96	103	100	106	101
Denied Entry After	0	0	0	0	2	0	0	2
706 **3rd St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	33.5	41.3	23.9	41.5	20	32.2	34.5	36.7
LOS	C-	D+	C+	D+	C+	C-	C-	D+
% of Volume	100	92	93	99	99	101	112	95
Denied Entry After	0	0	0	0	0	0	0	0
716 **7th St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	30.8	17.8	3.9	48.5	18.2	25.9	34.5	22.6
LOS	C-	B-	A	D-	B-	C	C-	C+
% of Volume	101	100	100	75	97	99	100	100
Denied Entry After	0	0	0	0	0	0	0	0
720 **3rd St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	42.6	47.5	22.6	26	18	17.9	19.7	39.2
LOS	D	D	C+	C	B-	B-	B-	D+
% of Volume	91	92	88	91	111	101	104	94
Denied Entry After	0	0	0	0	0	0	0	0
724 **11th St N & Hawthorne Av W**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	19.9	21.7	21.9	67.8	15	27.3	28.4	23.8
LOS	B-	C+	C+	E	B	C	C	C+
% of Volume	90	89	97	96	102	98	101	95
Denied Entry After	0	0	0	0	0	1	0	1
730 **7th St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	46.3	25.7	8.6	26.6	16.1	25.5	26.5	23.3
LOS	D	C	A-	C	B	C	C	C+
% of Volume	99	99	103	105	97	100	106	100
Denied Entry After	0	0	0	0	0	0	0	0
734 **3rd St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	59.5	69.5	42.9	33	20.1	31.7	36	44.1
LOS	E+	E	D	C-	C+	C-	D+	D
% of Volume	94	89	92	105	100	92	106	94
Denied Entry After	0	1	0	0	0	0	0	1
744 **7th St S & 4th Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	10	9.9	25.2	23.8	16.8			
LOS	B+	A-	C	C+	B			
% of Volume	100	98	101	102	100			
Denied Entry After	0	0	0	0	0			
748 **3rd St S & 4th Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	29.4	53.9	1024	1356.2	257.4			
LOS	C	D-	F	F	F			
% of Volume	92	97	53	47	82			
Denied Entry After	2	7	238	86	333			
755 **7th St S & 5th Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	8.4	9.1	16.1	20	14			
LOS	A-	A-	B	C+	B			
% of Volume	98	102	98	102	100			
Denied Entry After	0	0	0	0	0			

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A2

CBD INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

									No Diversion			4th Ave Ramp Diversion		
									All	Movement(s)		All	Movement(s)	
759 **3rd St S & 5th Av S**	WBT	WBR	NBL	NBT	All				All	WBT		All	WBT	
Delay / Veh (s)	8.7	6	10.1	16.4	11.8				11.8	8.7		35.3	63.3	
LOS	A-	A	B+	B	B+				B+	A-		D+	E	
% of Volume	104	105	99	97	100				100	104		98	94	
Denied Entry After	0	0	0	0	0				0	0		4	4	
765 **7th St S & Portland Av S**	WBL	WBT	SBT	SBR	All				All			All		
Delay / Veh (s)	14.3	23.8	13.8	15.2	18.1				18.1			16.4		
LOS	B	C+	B	B	B-				B-			B		
% of Volume	97	96	102	104	99				99			100		
Denied Entry After	0	0	0	0	0				0			0		
769 **3rd St S & Portland Av S**	WBL	WBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	7.6	8.8	26.2	12.2	14.3				14.3	8.8		35.3	41.5	
LOS	A-	A-	C	B+	B				B	A-		D+	D+	
% of Volume	98	104	97	102	101				101	104		98	97	
Denied Entry After	0	0	0	0	0				0	0		2	0	
771 **10th St S & Park Av S**	EBL	EBT	WBR	NBT	NBR	All			All	NBT		All	NBT	
Delay / Veh (s)	13.9	24.2	9.9	14.6	10.7	15.4			15.4	14.6		16.4	15.6	
LOS	B	C+	A-	B	B+	B			B	B		B	B	
% of Volume	98	102	97	103	150	102			102	103		100	102	
Denied Entry After	0	0	0	0	0	0			0	0		0	0	
773 **8th St S & Park Av S**	EBL	EBT	NBT	NBR	All				All	NBT		All	NBT	
Delay / Veh (s)	18.3	20.3	9.2	9.8	14.7				14.7	9.2		16.7	13.3	
LOS	B-	C+	A-	A-	B				B	A-		B	B	
% of Volume	104	98	101	102	100				100	101		101	101	
Denied Entry After	0	0	0	0	0				0	0		0	0	
774 **7th St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBL	NBT	All	NBL	NBT
Delay / Veh (s)	22.6	16.7	6	6.2	13.2				13.2	6	6.2	14.7	10.1	9.3
LOS	C+	B	A	A	B				B	A	A	B	B+	A-
% of Volume	99	100	102	101	100				100	102	101	100	100	102
Denied Entry After	0	0	0	0	0				0	0	0	1	0	0
775 **6th St S & Park Av S**	EBL	EBT	NBT	NBR	All				All	NBT		All	NBT	
Delay / Veh (s)	18.3	17.9	8.8	10.6	14.5				14.5	8.8		13.8	7.1	
LOS	B-	B-	A-	B+	B				B	A-		B	A-	
% of Volume	94	99	103	96	100				100	103		100	103	
Denied Entry After	0	0	0	0	0				0	0		2	0	
776 **5th St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBT		All	NBT	
Delay / Veh (s)	5.8	10.2	34.3	32.4	26.3				26.3	32.4		9.6	5.1	
LOS	A	B+	C-	C-	C				C	C-		A-	A	
% of Volume	105	106	102	101	102				102	101		102	101	
Denied Entry After	0	0	0	0	0				0	0		0	0	
777 **4th St S & Park Av S**	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All	All	NBT		All	NBT	
Delay / Veh (s)	22	17.2	15.1	9	6	3.9	4.7	8.9	8.9	3.9		9.4	4.9	
LOS	C+	B-	B	A-	A	A	A	A-	A-	A		A-	A	
% of Volume	102	101	89	100	100	101	99	100	100	101		100	102	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
778 **3rd St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBL		All	NBL	
Delay / Veh (s)	24.6	11.8	8.1	4.7	14.9				14.9	8.1		29.7	9.4	
LOS	C+	B+	A-	A	B				B	A-		C	A-	
% of Volume	104	97	97	101	102				102	97		100	99	
Denied Entry After	0	0	0	0	0				0	0		11	0	
959 **9th St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBT		All	NBT	
Delay / Veh (s)	26.2	22.9	6.3	9.2	13.6				13.6	9.2		11.7	6.5	
LOS	C	C+	A	A-	B				B	A-		B+	A	
% of Volume	99	98	103	101	101				101	101		99	100	
Denied Entry After	0	0	0	0	0				0	0		0	0	
1025 **7th St S &**	WBT	NBL	All						All	WBT		All	WBT	
Delay / Veh (s)	8.7	24.4	8.9						8.9	8.7		4	3.5	
LOS	A-	C+	A-						A-	A-		A	A	
% of Volume	92	100	92						92	92		100	100	
Denied Entry After	0	0	0						0	0		0	0	
1031 **7th St S &**	WBT	SBR	All						All			All		
Delay / Veh (s)	2.4	256.6	79.7						79.7			18		
LOS	A+	F	E-						E-			B-		
% of Volume	100	90	97						97			98		
Denied Entry After	0	46	46						46			2		

CBD INTERSECTIONS WITH DIVERSION AND SIGNAL RETIMING

759 **3rd St S & 5th Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	63.3	33.5	15.7	17.4	35.3			
LOS	E	C-	B	B-	D+			
% of Volume	94	98	102	101	98			
Denied Entry After	4	0	0	0	4			
765 **7th St S & Portland Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	9.3	13.5	21	23.3	16.4			
LOS	A-	B	C+	C+	B			
% of Volume	95	99	102	102	100			
Denied Entry After	0	0	0	0	0			
769 **3rd St S & Portland Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	18.8	41.5	23	97.8	35.3			
LOS	B-	D+	C+	F	D+			
% of Volume	95	97	100	98	98			
Denied Entry After	0	0	2	0	2			
771 **10th St S & Park Av S**	EBL	EBT	WBR	NBT	NBR	All		
Delay / Veh (s)	16.1	25.1	9.9	15.6	9.7	16.4		
LOS	B	C	A-	B	A-	B		
% of Volume	96	98	96	102	125	100		
Denied Entry After	0	0	0	0	0	0		
773 **8th St S & Park Av S**	EBL	EBT	NBT	NBR	All			
Delay / Veh (s)	19.6	20.9	13.3	11.6	16.7			
LOS	B-	C+	B	B+	B			
% of Volume	108	99	101	101	101			
Denied Entry After	0	0	0	0	0			
774 **7th St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	22.8	15.4	10.1	9.3	14.7			
LOS	C+	B	B+	A-	B			
% of Volume	98	103	100	102	100			
Denied Entry After	1	0	0	0	1			
775 **6th St S & Park Av S**	EBL	EBT	NBT	NBR	All			
Delay / Veh (s)	18.5	18.3	7.1	9.3	13.8			
LOS	B-	B-	A-	A-	B			
% of Volume	96	98	103	101	100			
Denied Entry After	1	1	0	0	2			
776 **5th St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	24.7	27.9	5.8	5.1	9.6			
LOS	C+	C	A	A	A-			
% of Volume	105	100	110	101	102			
Denied Entry After	0	0	0	0	0			
777 **4th St S & Park Av S**	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Delay / Veh (s)	22.4	18.1	15.5	6.3	7.7	4.9	4.2	9.4
LOS	C+	B-	B	A	A-	A	A	A-
% of Volume	101	99	96	125	83	102	93	100
Denied Entry After	0	0	0	0	0	0	0	0
778 **3rd St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	57.2	28.5	9.4	5.9	29.7			
LOS	E+	C	A-	A	C			
% of Volume	98	91	99	104	100			
Denied Entry After	11	0	0	0	11			
959 **9th St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	26.1	23.7	5.9	6.5	11.7			
LOS	C	C+	A	A	B+			
% of Volume	95	108	99	100	99			
Denied Entry After	0	0	0	0	0			
1025 **7th St S &**	WBT	NBL	All					
Delay / Veh (s)	3.5	52	4					
LOS	A	D-	A					
% of Volume	100	100	100					
Denied Entry After	0	0	0					
1031 **7th St S &**	WBT	SBR	All					
Delay / Veh (s)	1.7	52.7	18					
LOS	A+	D-	B-					
% of Volume	98	99	98					
Denied Entry After	0	2	2					

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A2

SOUTH MPLS INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

47 **15th St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	14.8	14.1	26.6	22.1	19.6	17.8	16.3	18.8					
LOS	B	B	C	C+	B-	B-	B	B-					
% of Volume	95	96	106	102	103	105	96	102					
Denied Entry After	0	0	0	0	0	0	0	0					
48 **Oak Grove St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	46	40.3	30.2	27.2	6.7	4.8	4.9	6.5					
LOS	D	D+	C-	C	A	A	A	A					
% of Volume	100	106	100	100	75	105	106	104					
Denied Entry After	0	0	0	0	0	0	0	0					
49 **Franklin Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	17.3	18.5	12.4	5.5	48.5	47.9	40.3	26.4					
LOS	B-	B-	B+	A	D-	D	D+	C					
% of Volume	99	107	95	103	103	103	104	102					
Denied Entry After	0	0	0	0	0	0	0	0					
51 **24th St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	47.4	42.7	14.9	42.3	29.1	14.6	23.4	13.6	11.8	16.9	6.8	4.5	13.6
LOS	D	D	B	D	C	B	C+	B	B+	B	A	A	B
% of Volume	105	95	109	94	98	107	78	100	99	86	99	95	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0
56 **26th St W & Lyndale Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All					
Delay / Veh (s)	39.5	35.8	29.5	39.3	17.6	9.4	9.3	22.5					
LOS	D+	D+	C	D+	B-	A-	A-	C+					
% of Volume	97	98	99	109	102	100	101	100					
Denied Entry After	0	0	0	0	0	0	0	0					
92 **Groveland Av W & Nicollet Av S**	EBL	EBT	EBR	NBL	NBT	NBR	SBL	SBT	SBR	All			
Delay / Veh (s)	35.3	29.9	16.7	14.4	11.1	8.2	18.7	10.9	9.4	13.1			
LOS	D+	C	B	B	B+	A-	B-	B+	A-	B			
% of Volume	116	100	96	102	97	120	100	102	102	100			
Denied Entry After	0	0	0	0	0	0	0	0	0	0			
93 **18th St E & Nicollet Av S**	WBL	WBR	NBT	NBR	SBL	SBT	All						
Delay / Veh (s)	32.2	13	4.6	3.6	9.7	5.1	7.1						
LOS	C-	B	A	A	A-	A	A-						
% of Volume	94	107	99	100	100	103	101						
Denied Entry After	0	0	0	0	0	0	0						
98 **Franklin Av W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	33.9	8.5	8	25	15.9	16.4	55.8	38.3	44	70.2	32.9	31.8	23.7
LOS	C-	A-	A-	C	B	B	E+	D+	D	E	C-	C-	C+
% of Volume	98	101	95	97	102	99	103	96	89	104	99	100	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0
113 **26th St W & Grand Av S**	WBL	WBT	NBL	SBR	All								
Delay / Veh (s)	1.8	6	8.5	10.6	6.2								
LOS	A+	A	A-	B+	A								
% of Volume	100	100	100	102	100								
Denied Entry After	0	0	0	0	0								
171 **26th St W & Nicollet Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All					
Delay / Veh (s)	20.9	20.3	19	36.6	23.8	14.3	10.2	20					
LOS	C+	C+	B-	D+	C+	B	B+	C+					
% of Volume	95	99	97	98	95	99	106	99					
Denied Entry After	0	0	0	0	0	0	0	0					
172 **26th St W & Blaisdell Av S**	WBL	WBT	SBT	SBR	All								
Delay / Veh (s)	5.4	4.8	11.1	15.7	7.7								
LOS	A	A	B+	B	A-								
% of Volume	103	100	101	104	101								
Denied Entry After	0	0	0	0	0								
353 **24th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	32.4	29.6	18.6	39.9	37	19.9	12.7	6.1	4.6	14.1	8.9	7.4	14.1
LOS	C-	C	B-	D+	D+	B-	B+	A	A	B	A-	A-	B
% of Volume	93	94	106	114	96	92	107	95	87	89	99	101	97
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

	No Diversion			4th Ave Ramp Diversion		
	All	Movement(s)		All	Movement(s)	
47 **15th St W & LaSalle Av S**	All	WBT		All	WBT	
Delay / Veh (s)	18.8	22.1		18.6	21	
LOS	B-	C+		B-	C+	
% of Volume	102	102		99	99	
Denied Entry After	0	0		0	0	
48 **Oak Grove St W & LaSalle Av S**	All			All		
Delay / Veh (s)	6.5			6.5		
LOS	A			A		
% of Volume	104			99		
Denied Entry After	0			1		
49 **Franklin Av W & LaSalle Av S**	All	WBT	SBR	All	WBT	SBR
Delay / Veh (s)	26.4	5.5	40.3	31.4	17.7	85.6
LOS	C	A	D+	C-	B-	F
% of Volume	102	103	104	99	98	90
Denied Entry After	0	0	0	1	0	0
51 **24th St W & Lyndale Av S**	All	NBT		All	NBT	
Delay / Veh (s)	13.6	13.6		15.2	16	
LOS	B	B		B	B	
% of Volume	99	100		100	103	
Denied Entry After	0	0		0	0	
56 **26th St W & Lyndale Av S**	All	WBR		All	WBR	
Delay / Veh (s)	22.5	29.5		17.5	17.5	
LOS	C+	C		B-	B-	
% of Volume	100	99		101	103	
Denied Entry After	0	0		0	0	
92 **Groveland Av W & Nicollet Av S**	All			All		
Delay / Veh (s)	13.1			14.7		
LOS	B			B		
% of Volume	100			99		
Denied Entry After	0			0		
93 **18th St E & Nicollet Av S**	All			All		
Delay / Veh (s)	7.1			7.1		
LOS	A-			A-		
% of Volume	101			99		
Denied Entry After	0			0		
98 **Franklin Av W & Nicollet Av S**	All	WBT		All	WBT	
Delay / Veh (s)	23.7	15.9		31.7	29.1	
LOS	C+	B		C-	C	
% of Volume	100	102		99	99	
Denied Entry After	0	0		8	6	
113 **26th St W & Grand Av S**	All	WBT		All	WBT	
Delay / Veh (s)	6.2	6		6.3	6	
LOS	A	A		A	A	
% of Volume	100	100		102	103	
Denied Entry After	0	0		0	0	
171 **26th St W & Nicollet Av S**	All	WBT		All	WBT	
Delay / Veh (s)	20	20.3		23.7	20.9	
LOS	C+	C+		C+	C+	
% of Volume	99	99		100	100	
Denied Entry After	0	0		0	0	
172 **26th St W & Blaisdell Av S**	All	WBT		All	WBT	
Delay / Veh (s)	7.7	4.8		8.3	5.4	
LOS	A-	A		A-	A	
% of Volume	101	100		101	102	
Denied Entry After	0	0		0	0	
353 **24th St W & Nicollet Av S**	All			All		
Delay / Veh (s)	14.1			17.2		
LOS	B			B-		
% of Volume	97			100		
Denied Entry After	0			0		

SOUTH MPLS INTERSECTIONS WITH DIVERSION AND SIGNAL RETIMING

47 **15th St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	15.2	11.4	26.9	21	17.3	18	16.5	18.6					
LOS	B	B+	C	C+	B-	B-	B	B-					
% of Volume	102	96	95	99	94	99	103	99					
Denied Entry After	0	0	0	0	0	0	0	0					
48 **Oak Grove St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	30.2	42.4	40.2	48.9	4.2	4.6	4.8	6.5					
LOS	C-	D	D+	D-	A	A	A	A					
% of Volume	100	108	50	125	100	99	98	99					
Denied Entry After	0	0	0	0	0	1	0	1					
49 **Franklin Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	21.2	24.3	24	17.7	39.9	42.7	85.6	31.4					
LOS	C+	C+	C+	B-	D+	D	F	C-					
% of Volume	101	111	96	98	101	100	90	99					
Denied Entry After	0	0	0	0	0	1	0	1					
51 **24th St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	49.2	42.9	14.5	45.1	32.5	15.9	22.1	16	15	19.4	7.2	5.3	15.2
LOS	D-	D	B	D	C-	B	C+	B	B	B-	A-	A	B
% of Volume	95	89	114	103	100	96	83	103	104	107	97	104	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0
56 **26th St W & Lyndale Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All					
Delay / Veh (s)	19.9	17.6	17.5	39.3	21.1	13	14.6	17.5					
LOS	B-	B-	B-	D+	C+	B	B	B-					
% of Volume	97	102	103	105	104	98	88	101					
Denied Entry After	0	0	0	0	0	0	0	0					
92 **Groveland Av W & Nicollet Av S**	EBL	EBT	EBR	NBL	NBT	NBR	SBL	SBT	SBR	All			
Delay / Veh (s)	26	26.4	13.6	20.7	13.7	10.5	20.8	13	10.6	14.7			
LOS	C	C	B	C+	B	B+	C+	B	B+	B			
% of Volume	91	91	105	105	97	110	100	99	102	99			
Denied Entry After	0	0	0	0	0	0	0	0	0	0			
93 **18th St E & Nicollet Av S**	WBL	WBR	NBT	NBR	SBL	SBT	All						
Delay / Veh (s)	35.3	15.4	4.4	3.8	10	4.8	7.1						
LOS	D+	B	A	A	B+	A	A-						
% of Volume	89	97	98	86	108	101	99						
Denied Entry After	0	0	0	0	0	0	0						
98 **Franklin Av W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	36.8	9	9	36.6	29.1	27.6	65.3	47	50.6	77.9	39.2	49.2	31.7
LOS	D+	A-	A-	D+	C	C	E	D	D-	E-	D+	D-	C-
% of Volume	107	100	114	102	99	101	93	96	103	97	99	104	99
Denied Entry After	0	0	0	1	6	0	0	1	0	0	0	0	8
113 **26th St W & Grand Av S**	WBT	NBL	SBR	All									
Delay / Veh (s)	6	29	15.7	6.3									
LOS	A	C	B	A									
% of Volume	103	50	95	102									
Denied Entry After	0	0	0	0									
171 **26th St W & Nicollet Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All					
Delay / Veh (s)	22.6	20.9	20.8	33.1	24.9	35.4	37.7	23.7					
LOS	C+	C+	C+	C-	C+	D+	D+	C+					
% of Volume	106	100	105	98	99	97	113	100					
Denied Entry After	0	0	0	0	0	0	0	0					
172 **26th St W & Blaisdell Av S**	WBL	WBT	SBT	SBR	All								
Delay / Veh (s)	5.4	5.4	12.3	15.6	8.3								
LOS	A	A	B+	B	A-								
% of Volume	95	102	101	101	101								
Denied Entry After	0	0	0	0	0								
353 **24th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	23.5	17.2	10.4	30.7	24.1	13.8	16.3	10.5	6.3	29.7	22.5	16.1	17.2
LOS	C+	B-	B+	C-	C+	B	B	B+	A	C	C+	B	B-
% of Volume	93	96	100	86	105	100	90	100	106	89	102	101	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A2

SOUTH MPLS INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

381 **Franklin Av W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	45.6	29.4	30.6	198.5	215.1	285.1	24.8	26.8	37.6	63.9	32.1	35.2	85.9
LOS	D	C	C-	F	F	F	C+	C	D+	E	C-	D+	F
% of Volume	101	99	105	99	93	97	103	100	100	101	98	97	98
Denied Entry After	0	0	0	0	0	0	0	0	0	1	3	0	4
396 **Groveland Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	39.5	39.1	41.9	38.7	5.2	5.4	4.7	11.1					
LOS	D+	D+	D+	D+	A	A	A	B+					
% of Volume	96	100	103	102	110	104	104	103					
Denied Entry After	0	0	0	0	0	0	0	0					
414 **15th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	28.9	18.3	12.2	36	34.5	21.7	19.1	10.9	10.1	22.9	17.2	14	21.2
LOS	C	B-	B+	D+	C-	C+	B-	B+	B+	C+	B-	B	C+
% of Volume	96	94	103	100	99	105	110	93	93	113	105	114	101
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0
585 **24th St W & Blaisdell Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	13.4	15	30.8	19.3	9.2	9.8	9.3	12					
LOS	B	B	C-	B-	A-	A-	A-	B+					
% of Volume	93	95	106	97	103	102	111	101					
Denied Entry After	0	0	0	0	0	0	0	0					
606 **15th St W & Willow St S**	EBL	EBT	WBT	WBR	SBL	SBR	All						
Delay / Veh (s)	18	6.6	6.8	4.6	47.3	40.2	18.2						
LOS	B-	A	A	A	D	D+	B-						
% of Volume	103	98	101	102	92	103	101						
Denied Entry After	0	0	0	0	0	1	1						
659 **22nd St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	42.9	37.2	21.5	41.5	37.4	26.3	22.5	6.7	4.9	18.1	6	5	9.5
LOS	D	D+	C+	D+	D+	C	C+	A	A	B-	A	A	A-
% of Volume	100	100	110	106	103	100	84	101	103	86	98	101	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

No Diversion — All Movement(s)

All	NBT	WBR
85.9	26.8	285.1
F	C	F
98	100	97
4	0	0
All		
11.1		
B+		
103		
0		
All	NBL	WBT
21.2	19.1	34.5
C+	B-	C-
101	110	99
0	0	0
All		
12		
B+		
101		
0		
All	WBT	
18.2	6.8	
B-	A	
101	101	
1	0	
All	NBT	
9.5	6.7	
A-	A	
99	101	
0	0	

4th Ave Ramp Diversion — All Movement(s)

All	NBT	WBR
120.6	27.8	431.6
F	C	F
96	100	84
11	0	3
All		
17.8		
B-		
99		
0		
All	NBL	WBT
25	28.9	34.9
C	C	C-
99	98	99
2	0	2
All		
13		
B		
101		
0		
All	WBT	
17.4	6.2	
B-	A	
101	100	
1	0	
All	NBT	
11.7	11.4	
B+	B+	
99	102	
0	0	

SOUTH MPLS INTERSECTIONS WITH DIVERSION AND SIGNAL RETIMING

381 **Franklin Av W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	47.8	29.3	31	301	333.3	431.6	25.8	27.8	33.7	81.2	40.8	40	120.6
LOS	D	C	C-	F	F	F	C	C	C-	F	D+	D+	F
% of Volume	96	97	108	83	90	84	97	100	123	103	98	102	96
Denied Entry After	0	0	0	1	2	3	0	0	0	1	3	1	11
396 **Groveland Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	37.5	43.1	39.8	34.8	14.8	13.2	12.4	17.8					
LOS	D+	D	D+	C-	B	B	B+	B-					
% of Volume	89	116	111	102	97	99	88	99					
Denied Entry After	0	0	0	0	0	0	0	0					
414 **15th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	28.4	16.6	10.2	35.5	34.9	25.3	28.9	17	12.9	29.2	19.9	17.8	25
LOS	C	B	B+	D+	C-	C	C	B-	B+	C	B-	B-	C
% of Volume	79	102	101	86	99	105	98	99	71	97	105	111	99
Denied Entry After	0	0	0	0	2	0	0	0	0	0	0	0	2
585 **24th St W & Blaisdell Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	10.8	14.6	25	17.6	11.1	12.1	12.1	13					
LOS	B+	B	C	B-	B+	B+	B+	B					
% of Volume	97	107	106	99	88	102	100	101					
Denied Entry After	0	0	0	0	0	0	0	0					
606 **15th St W & Willow St S**	EBL	EBT	WBT	WBR	SBL	SBR	All						
Delay / Veh (s)	17.8	6.5	6.2	5.2	47.5	40.4	17.4						
LOS	B-	A	A	A	D	D+	B-						
% of Volume	103	101	100	93	104	101	101						
Denied Entry After	0	0	0	0	0	1	1						
659 **22nd St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	39.2	35.1	21	39.5	34.9	23	28.7	11.4	7.7	24.6	7.2	5.2	11.7
LOS	D+	D+	C+	D+	C-	C+	C	B+	A-	C+	A-	A	B+
% of Volume	102	92	120	91	100	90	89	102	100	97	97	94	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

LYNDALE/HENNEPIN AREA INTERSECTIONS PROPOSED CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

245 **Vineland Place W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	69.5	72.3	52.4	215.4	129	101	85.9	48.6	63.3	943	413	384	248
LOS	E	E-	D-	F	F	F	F	D-	E	F	F	F	F
% of Volume	103	100	99	97	98	98	86	86	85	74	79	75	84
Denied Entry After	0	0	0	2	1	1	0	0	0	82	442	16	544
252 **Groveland Terrace W & Hennepin L**	EBL	EBT	EBR2	WBL	WBT	WBR	NBT	NBR	SBR	SBR2	All		
Delay / Veh (s)	116.3	111.4	116.7	260.2	252	237.6	68.6	45.7	14.5	13.9	63		
LOS	F	F	F	F	F	F	E	D	B	B	E		
% of Volume	98	92	111	99	92	95	82	91	81	90	84		
Denied Entry After	0	0	0	7	2	6	0	0	0	0	15		
253 **I-94 WB Ramp & Lyndale Av S**	EBL	WBL	WBR	NBT	All								
Delay / Veh (s)	1862	34.5	105.9	45.3	396.4								
LOS	F	C-	F	D	F								
% of Volume	50	102	96	101	86								
Denied Entry After	263	1	0	0	264								

All	NBT	WBR
247.6	48.6	101
F	D-	F
84	86	98
544	0	1
All	NBT	WBR
63	68.6	237.6
E	E	F
84	82	95
15	0	6
All	NBT	
396.4	45.3	
F	D	
86	101	
264	0	

All	NBT	WBR
327.3	48.2	658
F	D-	F
82	84	79
807	0	135
All	NBT	WBR
76.8	64.8	384
E-	E	F
84	83	90
22	0	10
All	NBT	0
452.9	63.2	
F	E	
83	98	
304	0	

LYNDALE/HENNEPIN AREA WITH DIVERSION AND SIGNAL RETIMING

245 **Vineland Place W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	80.3	78.7	56.4	785.8	701.1	658	81.3	48.2	57.4	934	418	395	327.3
LOS	F	E-	E+	F	F	F	F	D-	E+	F	F	F	F
% of Volume	81	106	94	86	82	79	81	84	92	75	81	80	82
Denied Entry After	0	0	0	42	27	135	0	0	0	89	492	22	807
252 **Groveland Terrace W & Hennepin L**	EBL	EBT	EBR2	WBL	WBT	WBR	NBT	NBR	SBR	SBR2	All		
Delay / Veh (s)	203.4	203.5	210.2	395.2	404	384	64.8	48.7	10.5	10.7	76.8		
LOS	F	F	F	F	F	F	E	D-	B+	B+	E-		
% of Volume	96	107	90	90	92	90	83	91	82	81	84		
Denied Entry After	0	0	0	8	4	10	0	0	0	0	22		
253 **I-94 WB Ramp & Lyndale Av S**	EBL	WBL	WBR	NBT	All								
Delay / Veh (s)	1389	500.6	992.8	63.2	452.9								
LOS	F	F	F	E	F								
% of Volume	62	73	66	98	83								
Denied Entry After	233	39	32	0	304								

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A3

CBD INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

												No Diversion All	No Diversion Movement(s)		4th Ave Ramp Diversion All	4th Ave Ramp Diversion Movement(s)	
239 **7th St N & Twins Way**	WBL	WBT	All									All	WBL		All	WBL	
Delay / Veh (s)	4	2.9	3.2									3.2	4		3.5	4.2	
LOS	A	A+	A									A	A		A	A	
% of Volume	96	100	99									99	96		99	100	
Denied Entry After	0	0	0									0	0		0	0	
609 **7th St S & Mid-Block Driveway**	WBT	All										All	WBT		All	WBT	
Delay / Veh (s)	12.2	12.2										12.2	12.2		7.1	7.1	
LOS	B+	B+										B+	B+		A-	A-	
% of Volume	92	92										92	92		99	99	
Denied Entry After	0	0										0	0		0	0	
614 **7th St N & 2nd Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR	All	All	WBT		All	WBT	
Delay / Veh (s)	24.8	24	23.2	37.5	33.2	30	11.9	28.6	30.1	33.8	27.9	27.9	24		29.7	29.2	
LOS	C+	C+	C+	D+	C-	C-	B+	C	C-	C-	C	C	C+		C	C	
% of Volume	100	97	99	112	100	89	100	89	99	102	99	99	97		100	101	
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
618 **I-94 NB Ramp & 2nd Av N**	WBL	WBT	WBR	NBL2	NBL	NBT	All					All	WBL	WBT	All	WBL	WBT
Delay / Veh (s)	11.6	11	6.4	39.9	37.8	32.8	18.8					18.8	11.6	11	16.3	10.6	6.5
LOS	B+	B+	A	D+	D+	C-	B-					B-	B+	B+	B	B+	A
% of Volume	100	99	95	99	102	103	100					100	100	99	100	100	100
Denied Entry After	0	0	0	0	0	0	0					0	0	0	0	0	0
626 **7th St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	22.7	8.6	4	36.4	20.6	19.2	19	15.5				15.5	8.6		15.3	8.3	
LOS	C+	A-	A	D+	C+	B-	B-	B				B	A-		B	A-	
% of Volume	92	97	93	94	100	99	100	97				97	97		100	100	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
630 **3rd St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	13.3	14.1	7.6	65.8	34.8	26.2	30.4	20.2				20.2	14.1		18.3	13.2	
LOS	B	B	A-	E	C-	C	C-	C+				C+	B		B-	B	
% of Volume	97	99	108	97	98	101	105	99				99	99		101	100	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
635 **12th St N & Hawthorne Av W**	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All				All	SBT		All	SBT	
Delay / Veh (s)	38.8	36.6	36.2	8.4	8.5	10.1	7.8	12.5				12.5	7.8		13.9	10.2	
LOS	D+	D+	D+	A-	A-	B+	A-	B+				B+	A-		B	B+	
% of Volume	98	103	100	96	98	104	96	97				97	96		97	97	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
647 **11th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	28	46	66.8	39.8	15.6	15.9	17.1	30.3				30.3	46		25	26.2	
LOS	C	D	E	D+	B	B	B-	C-				C-	D		C	C	
% of Volume	94	89	88	93	101	100	99	95				95	89		98	98	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
651 **7th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	74.3	39.2	15.7	36	17.7	18.6	20.1	29.9				29.9	39.2		20.8	15.4	
LOS	E-	D+	B	D+	B-	B-	C+	C				C	D+		C+	B	
% of Volume	88	93	91	101	101	103	101	96				96	93		100	98	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
655 **3rd St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	16.4	17.5	5.2	154.7	47.6	37.9	40.6	36.9				36.9	17.5		23.8	13.7	
LOS	B	B-	A	F	D	D+	D+	D+				D+	B-		C+	B	
% of Volume	98	100	102	98	99	105	99	100				100	100		101	101	
Denied Entry After	0	0	0	4	10	0	0	14				14	0		2	0	
667 **11th St S & Harmon Pl**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	14.6	45.4	51.5	228.2	32.8	37.8	81.5	49.9				49.9	45.4		16.4	13	
LOS	B	D	D-	F	C-	D+	F	D-				D-	D		B	B	
% of Volume	90	88	93	90	106	97	112	90				90	88		97	96	
Denied Entry After	0	0	0	0	0	0	0	0				0	0		0	0	
678 **11th St S & LaSalle Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	344.2	331.3	310.6	111.7	23.4	64.7	83.8	217.6				217.6	331.3		104.4	150.2	
LOS	F	F	F	F	C+	E	F	F				F	F		F	F	
% of Volume	85	86	92	92	104	98	96	91				91	86		96	95	
Denied Entry After	36	158	30	0	0	7	5	236				236	158		91	64	

CBD INTERSECTIONS WITH DIVERSION, RETIMING AND GEOMETRIC CHANGES (3RD ST, 11TH ST)

239 **7th St N & Twins Way**	WBL	WBT	All								
Delay / Veh (s)	4.2	3.2	3.5								
LOS	A	A	A								
% of Volume	100	99	99								
Denied Entry After	0	0	0								
609 **7th St S & Mid-Block Driveway**	WBT	All									
Delay / Veh (s)	7.1	7.1									
LOS	A-	A-									
% of Volume	99	99									
Denied Entry After	0	0									
614 **7th St N & 2nd Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR	All
Delay / Veh (s)	27.6	29.2	22.4	34.6	32.4	29.9	11.6	27.2	30.5	32.9	29.7
LOS	C	C	C+	C-	C-	C	B+	C	C-	C-	C
% of Volume	75	101	99	100	99	100	94	93	101	100	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0
618 **I-94 NB Ramp & 2nd Av N**	WBL	WBT	WBR	NBL2	NBL	NBT	All				
Delay / Veh (s)	10.6	6.5	7.2	39.3	36.1	32.5	16.3				
LOS	B+	A	A-	D+	D+	C-	B				
% of Volume	100	100	104	98	101	101	100				
Denied Entry After	0	0	0	0	0	0	0				
626 **7th St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	22	8.3	4.6	37.2	21.5	19.6	19.5	15.3			
LOS	C+	A-	A	D+	C+	B-	B-	B			
% of Volume	99	100	102	97	99	102	100	100			
Denied Entry After	0	0	0	0	0	0	0	0			
630 **3rd St N & 1st Av N**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	15.7	13.2	12.4	57.3	26.8	25.1	28.6	18.3			
LOS	B	B	B+	E+	C	C	C	B-			
% of Volume	103	100	115	94	102	98	107	101			
Denied Entry After	0	0	0	0	0	0	0	0			
635 **12th St N & Hawthorne Av W**	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All			
Delay / Veh (s)	39.8	37.2	37.1	8.1	8.9	12.3	10.2	13.9			
LOS	D+	D+	D+	A-	A-	B+	B+	B			
% of Volume	98	98	108	98	100	92	97	97			
Denied Entry After	0	0	0	0	0	0	0	0			
647 **11th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	36	26.2	12.5	66.3	20.3	21.8	25.1	25			
LOS	D+	C	B+	E	C+	C+	C	C			
% of Volume	95	98	95	101	98	100	96	98			
Denied Entry After	0	0	0	0	0	0	0	0			
651 **7th St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	34.9	15.4	7.3	44	21.7	24.5	25.4	20.8			
LOS	C-	B	A-	D	C+	C+	C	C+			
% of Volume	101	98	100	111	98	100	103	100			
Denied Entry After	0	0	0	0	0	0	0	0			
655 **3rd St N & Hennepin Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	16.8	13.7	15.4	68.4	25.5	36.3	39.8	23.8			
LOS	B	B	B	E	C	D+	D+	C+			
% of Volume	102	101	105	99	100	98	103	101			
Denied Entry After	0	0	0	1	1	0	0	2			
667 **11th St S & Harmon Pl**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	18.3	13	9.4	43.8	28.1	28.6	24.9	16.4			
LOS	B-	B	A-	D	C	C	C+	B			
% of Volume	96	96	105	106	96	100	92	97			
Denied Entry After	0	0	0	0	0	0	0	0			
678 **11th St S & LaSalle Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All			
Delay / Veh (s)	178.7	150.2	139.3	55.9	16.2	29.4	31.5	104.4			
LOS	F	F	F	E+	B	C	C-	F			
% of Volume	89	95	93	96	101	98	101	96			
Denied Entry After	15	64	12	0	0	0	0	91			

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A3

CBD INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

									No Diversion			4th Ave Ramp Diversion		
689 **7th St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	Movement(s)		All	Movement(s)	
Delay / Veh (s)	85.3	36.6	20.1	28.6	24.7	24	24.8	35.8	35.8	36.6		11.3	9.2	
LOS	F	D+	C+	C	C+	C+	C+	D+	D+	D+		B+	A-	
% of Volume	85	92	75	100	104	108	92	93	93	92		98	99	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
693 **3rd St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	15.4	15.3	5.5	34.8	27.9	25.8	21.5	16	16	15.3		8.1	6.4	
LOS	B	B	A	C-	C	C	C+	B	B	B		A-	A	
% of Volume	75	100	125	90	92	95	100	100	100	100		102	102	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
702 **7th St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	95.3	67.6	21.2	96.1	79	18.9	20.1	66.4	66.4	67.6		23.4	25.8	
LOS	F	E	C+	F	E-	B-	C+	E	E	E		C+	C	
% of Volume	100	91	82	99	99	103	106	94	94	91		99	100	
Denied Entry After	0	0	0	4	15	0	0	19	19	0		2	0	
706 **3rd St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	17.5	17.5	10.2	47.6	23	34.2	33.7	24.5	24.5	17.5		20.1	13.3	
LOS	B-	B-	B+	D	C+	C-	C-	C+	C+	B-		C+	B	
% of Volume	100	101	112	99	100	98	112	100	100	101		102	102	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
716 **7th St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	105.6	91.1	29.8	54.6	16.6	40.5	75.1	71.1	71.1	91.1		22.4	16.4	
LOS	F	F	C	D-	B	D+	E-	E	E	F		C+	B	
% of Volume	94	91	100	75	98	98	98	94	94	91		100	99	
Denied Entry After	8	43	0	0	0	13	3	67	67	43		0	0	
720 **3rd St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	16.9	15.7	7.4	24.1	17.5	18.7	17.6	16.6	16.6	15.7		13.3	9.3	
LOS	B	B	A-	C+	B-	B-	B-	B	B	B		B	A-	
% of Volume	97	102	112	99	99	95	100	100	100	102		101	102	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
724 **11th St N & Hawthorne Av W**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBL	WBT	All	WBL	WBT
Delay / Veh (s)	18.2	20.1	15.3	66.8	16.7	25.8	25.1	22.5	22.5	18.2	20.1	25.3	55.9	13.7
LOS	B-	C+	B	E	B	C	C	C+	C+	B-	C+	C	E+	B
% of Volume	90	89	97	89	97	100	93	95	95	90	89	97	99	99
Denied Entry After	0	0	0	0	0	3	1	4	4	0	0	0	0	0
730 **7th St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All			All		
Delay / Veh (s)	70.9	50.6	12.1	28.6	14.9	20.1	22.2	32	32			23		
LOS	E	D-	B+	C	B	C+	C+	C-	C-			C+		
% of Volume	92	95	98	97	99	98	100	97	97			100		
Denied Entry After	0	0	0	1	1	0	0	2	2			1		
734 **3rd St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All	All	WBT		All	WBT	
Delay / Veh (s)	38.6	33.9	20.7	32.9	17.7	25.1	25.7	27.1	27.1	33.9		23.4	22.3	
LOS	D+	C-	C+	C-	B-	C	C	C	C	C-		C+	C+	
% of Volume	97	101	107	103	101	98	93	101	101	101		101	103	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
744 **7th St S & 4th Av S**	WBL	WBT	SBT	SBR	All				All			All		
Delay / Veh (s)	13.1	19.8	49	85.4	36.2				36.2			16.7		
LOS	B	B-	D-	F	D+				D+			B		
% of Volume	101	97	94	94	96				96			100		
Denied Entry After	0	0	50	19	69				69			0		
748 **3rd St S & 4th Av S**	WBL	WBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	5.9	10.3	26.6	29.4	15.3				15.3	10.3		12.4	8.2	
LOS	A	B+	C	C	B				B	B+		B+	A-	
% of Volume	100	103	101	96	101				101	103		101	103	
Denied Entry After	0	0	1	1	2				2	0		0	0	
755 **7th St S & 5th Av S**	WBT	WBR	NBL	NBT	All				All			All		
Delay / Veh (s)	9.6	9.5	16	19.6	14.4				14.4			14.1		
LOS	A-	A-	B	B-	B				B			B		
% of Volume	97	94	100	100	99				99			100		
Denied Entry After	0	0	0	0	0				0			0		

CBD INTERSECTIONS WITH DIVERSION, RETIMING AND GEOMETRIC CHANGES (3RD ST, 11TH ST)

689 **7th St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	12.3	9.2	5.9	26.7	31.7	30.1	23	11.3
LOS	B+	A-	A	C	C-	C-	C+	B+
% of Volume	75	99	125	75	103	93	92	98
Denied Entry After	0	0	0	0	0	0	0	0
693 **3rd St S & Nicollet Mall**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	5.7	6.4	7.6	45.8	38.3	30.1	16.3	8.1
LOS	A	A	A-	D	D+	C-	B	A-
% of Volume	75	102	125	85	97	93	75	102
Denied Entry After	0	0	0	0	0	0	0	0
702 **7th St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	31.8	25.8	11.3	31.7	20.6	18.1	21.5	23.4
LOS	C-	C	B+	C-	C+	B-	C+	C+
% of Volume	100	100	100	93	98	99	112	99
Denied Entry After	0	0	0	1	1	0	0	2
706 **3rd St S & Marquette Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	15.6	13.3	13.9	41.5	20.1	28.6	19.9	20.1
LOS	B	B	B	D+	C+	C	B-	C+
% of Volume	81	102	107	104	100	99	100	102
Denied Entry After	0	0	0	0	0	0	0	0
716 **7th St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	33.2	16.4	2.4	50.4	18	26.6	34.5	22.4
LOS	C-	B	A+	D-	B-	C	C-	C+
% of Volume	100	99	115	75	93	104	99	100
Denied Entry After	0	0	0	0	0	0	0	0
720 **3rd St S & 2nd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	13.9	9.3	8.3	31.8	21.9	23.4	22.4	13.3
LOS	B	A-	A-	C-	C+	C+	C+	B
% of Volume	99	102	125	93	102	99	96	101
Denied Entry After	0	0	0	0	0	0	0	0
724 **11th St N & Hawthorne Av W**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	55.9	13.7	12.3	37.9	8.8	17.8	17.4	25.3
LOS	E+	B	B+	D+	A-	B-	B-	C
% of Volume	99	99	100	100	98	95	99	97
Denied Entry After	0	0	0	0	0	0	0	0
730 **7th St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	44.4	26.5	8.4	26.7	16.2	23.7	24.7	23
LOS	D	C	A-	C	B	C+	C+	C+
% of Volume	96	101	98	95	102	98	96	100
Denied Entry After	0	0	0	1	0	0	0	1
734 **3rd St S & 3rd Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	30.5	22.3	22.8	28.8	17.8	30.5	29.1	23.4
LOS	C-	C+	C+	C	B-	C-	C	C+
% of Volume	100	103	104	101	99	100	100	101
Denied Entry After	0	0	0	0	0	0	0	0
744 **7th St S & 4th Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	10.8	10.3	24.3	23.8	16.7			
LOS	B+	B+	C+	C+	B			
% of Volume	100	100	101	101	100			
Denied Entry After	0	0	0	0	0			
748 **3rd St S & 4th Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	5.5	8.2	25.5	14.7	12.4			
LOS	A	A-	C	B	B+			
% of Volume	97	103	99	101	101			
Denied Entry After	0	0	0	0	0			
755 **7th St S & 5th Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	8.3	8.1	17.2	20.1	14.1			
LOS	A-	A-	B-	C+	B			
% of Volume	98	103	103	101	100			
Denied Entry After	0	0	0	0	0			

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A3

CBD INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

									No Diversion			4th Ave Ramp Diversion		
									All	Movement(s)		All	Movement(s)	
759 **3rd St S & 5th Av S**	WBT	WBR	NBL	NBT	All				All	WBT		All	WBT	
Delay / Veh (s)	8.7	6	10.1	16.4	11.8				11.8	8.7		11.3	6.7	
LOS	A-	A	B+	B	B+				B+	A-		B+	A	
% of Volume	104	105	99	97	100				100	104		100	101	
Denied Entry After	0	0	0	0	0				0	0		0	0	
765 **7th St S & Portland Av S**	WBL	WBT	SBT	SBR	All				All			All		
Delay / Veh (s)	14.3	23.8	13.8	15.2	18.1				18.1			16.3		
LOS	B	C+	B	B	B-				B-			B		
% of Volume	97	96	102	104	99				99			99		
Denied Entry After	0	0	0	0	0				0			0		
769 **3rd St S & Portland Av S**	WBL	WBT	SBT	SBR	All				All	WBT		All	WBT	
Delay / Veh (s)	7.6	8.8	26.2	12.2	14.3				14.3	8.8		12.6	7.7	
LOS	A-	A-	C	B+	B				B	A-		B+	A-	
% of Volume	98	104	97	102	101				101	104		101	100	
Denied Entry After	0	0	0	0	0				0	0		0	0	
771 **10th St S & Park Av S**	EBL	EBT	WBR	NBT	NBR	All			All	NBT		All	NBT	
Delay / Veh (s)	13.9	24.2	9.9	14.6	10.7	15.4			15.4	14.6		17.3	16.5	
LOS	B	C+	A-	B	B+	B			B	B		B-	B	
% of Volume	98	102	97	103	150	102			102	103		100	101	
Denied Entry After	0	0	0	0	0	0			0	0		1	1	
773 **8th St S & Park Av S**	EBL	EBT	NBT	NBR	All				All	NBT		All	NBT	
Delay / Veh (s)	18.3	20.3	9.2	9.8	14.7				14.7	9.2		16.6	12.7	
LOS	B-	C+	A-	A-	B				B	A-		B	B+	
% of Volume	104	98	101	102	100				100	101		99	99	
Denied Entry After	0	0	0	0	0				0	0		0	0	
774 **7th St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBL	NBT	All	NBL	NBT
Delay / Veh (s)	22.6	16.7	6	6.2	13.2				13.2	6	6.2	15.4	10.7	9
LOS	C+	B	A	A	B				B	A	A	B	B+	A-
% of Volume	99	100	102	101	100				100	102	101	99	99	98
Denied Entry After	0	0	0	0	0				0	0	0	0	0	0
775 **6th St S & Park Av S**	EBL	EBT	NBT	NBR	All				All	NBT		All	NBT	
Delay / Veh (s)	18.3	17.9	8.8	10.6	14.5				14.5	8.8		13.8	6.8	
LOS	B-	B-	A-	B+	B				B	A-		B	A	
% of Volume	94	99	103	96	100				100	103		99	99	
Denied Entry After	0	0	0	0	0				0	0		3	0	
776 **5th St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBT		All	NBT	
Delay / Veh (s)	5.8	10.2	34.3	32.4	26.3				26.3	32.4		9.4	5	
LOS	A	B+	C-	C-	C				C	C-		A-	A	
% of Volume	105	106	102	101	102				102	101		99	99	
Denied Entry After	0	0	0	0	0				0	0		0	0	
777 **4th St S & Park Av S**	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All	All	NBT		All	NBT	
Delay / Veh (s)	22	17.2	15.1	9	6	3.9	4.7	8.9	8.9	3.9		9.6	5.3	
LOS	C+	B-	B	A-	A	A	A	A-	A-	A		A-	A	
% of Volume	102	101	89	100	100	101	99	100	100	101		100	98	
Denied Entry After	0	0	0	0	0	0	0	0	0	0		0	0	
778 **3rd St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBL		All	NBL	
Delay / Veh (s)	24.6	11.8	8.1	4.7	14.9				14.9	8.1		13.2	7.6	
LOS	C+	B+	A-	A	B				B	A-		B	A-	
% of Volume	104	97	97	101	102				102	97		99	99	
Denied Entry After	0	0	0	0	0				0	0		0	0	
959 **9th St S & Park Av S**	WBT	WBR	NBL	NBT	All				All	NBT		All	NBT	
Delay / Veh (s)	26.2	22.9	6.3	9.2	13.6				13.6	9.2		12.3	6.8	
LOS	C	C+	A	A-	B				B	A-		B+	A	
% of Volume	99	98	103	101	101				101	101		99	99	
Denied Entry After	0	0	0	0	0				0	0		0	0	
1025 **7th St S &**	WBT	NBL	All						All	WBT		All	WBT	
Delay / Veh (s)	8.7	24.4	8.9						8.9	8.7		3.5	3.2	
LOS	A-	C+	A-						A-	A-		A	A	
% of Volume	92	100	92						92	92		99	99	
Denied Entry After	0	0	0						0	0		0	0	
1031 **7th St S &**	WBT	SBR	All						All			All		
Delay / Veh (s)	2.4	256.6	79.7						79.7			23.2		
LOS	A+	F	E-						E-			C+		
% of Volume	100	90	97						97			99		
Denied Entry After	0	46	46						46			5		

CBD INTERSECTIONS WITH DIVERSION, RETIMING AND GEOMETRIC CHANGES (3RD ST, 11TH ST)

759 **3rd St S & 5th Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	6.7	4.4	11.2	16.8	11.3			
LOS	A	A	B+	B	B+			
% of Volume	101	98	103	99	100			
Denied Entry After	0	0	0	0	0			
765 **7th St S & Portland Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	9.7	13.7	20.6	21.9	16.3			
LOS	A-	B	C+	C+	B			
% of Volume	97	99	100	95	99			
Denied Entry After	0	0	0	0	0			
769 **3rd St S & Portland Av S**	WBL	WBT	SBT	SBR	All			
Delay / Veh (s)	5.8	7.7	23.1	14.7	12.6			
LOS	A	A-	C+	B	B+			
% of Volume	101	100	101	107	101			
Denied Entry After	0	0	0	0	0			
771 **10th St S & Park Av S**	EBL	EBT	WBR	NBT	NBR	All		
Delay / Veh (s)	17.1	25.4	10.7	16.5	11.6	17.3		
LOS	B-	C	B+	B	B+	B-		
% of Volume	96	97	96	101	125	100		
Denied Entry After	0	0	0	1	0	1		
773 **8th St S & Park Av S**	EBL	EBT	NBT	NBR	All			
Delay / Veh (s)	19	21	12.7	13.5	16.6			
LOS	B-	C+	B+	B	B			
% of Volume	91	99	99	99	99			
Denied Entry After	0	0	0	0	0			
774 **7th St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	24.5	14.6	10.7	9	15.4			
LOS	C+	B	B+	A-	B			
% of Volume	99	107	99	98	99			
Denied Entry After	0	0	0	0	0			
775 **6th St S & Park Av S**	EBL	EBT	NBT	NBR	All			
Delay / Veh (s)	18.4	18.4	6.8	8.2	13.8			
LOS	B-	B-	A	A-	B			
% of Volume	98	98	99	96	99			
Denied Entry After	0	3	0	0	3			
776 **5th St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	23.1	30.1	6.8	5	9.4			
LOS	C+	C-	A	A	A-			
% of Volume	99	106	98	99	99			
Denied Entry After	0	0	0	0	0			
777 **4th St S & Park Av S**	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Delay / Veh (s)	23.6	17.1	16.8	11.3	5.6	5.3	4.5	9.6
LOS	C+	B-	B	B+	A	A	A	A-
% of Volume	104	101	107	50	108	98	101	100
Denied Entry After	0	0	0	0	0	0	0	0
778 **3rd St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	20.8	10.7	7.6	6.3	13.2			
LOS	C+	B+	A-	A	B			
% of Volume	100	100	99	98	99			
Denied Entry After	0	0	0	0	0			
959 **9th St S & Park Av S**	WBT	WBR	NBL	NBT	All			
Delay / Veh (s)	27	29.9	6.1	6.8	12.3			
LOS	C	C	A	A	B+			
% of Volume	98	92	105	99	99			
Denied Entry After	0	0	0	0	0			
1025 **7th St S &**	WBT	NBL	All					
Delay / Veh (s)	3.2	32.6	3.5					
LOS	A	C-	A					
% of Volume	99	94	99					
Denied Entry After	0	0	0					
1031 **7th St S &**	WBT	SBR	All					
Delay / Veh (s)	1.8	67.7	23.2					
LOS	A+	E	C+					
% of Volume	98	102	99					
Denied Entry After	0	5	5					

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A3

SOUTH MPLS INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

47 **15th St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	14.8	14.1	26.6	22.1	19.6	17.8	16.3	18.8
LOS	B	B	C	C+	B-	B-	B	B-
% of Volume	95	96	106	102	103	105	96	102
Denied Entry After	0	0	0	0	0	0	0	0

48 **Oak Grove St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	46	40.3	30.2	27.2	6.7	4.8	4.9	6.5
LOS	D	D+	C-	C	A	A	A	A
% of Volume	100	106	100	100	75	105	106	104
Denied Entry After	0	0	0	0	0	0	0	0

49 **Franklin Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	17.3	18.5	12.4	5.5	48.5	47.9	40.3	26.4
LOS	B-	B-	B+	A	D-	D	D+	C
% of Volume	99	107	95	103	103	103	104	102
Denied Entry After	0	0	0	0	0	0	0	0

51 **24th St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	47.4	42.7	14.9	42.3	29.1	14.6	23.4	13.6	11.8	16.9	6.8	4.5	13.6
LOS	D	D	B	D	C	B	C+	B	B+	B	A	A	B
% of Volume	105	95	109	94	98	107	78	100	99	86	99	95	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

56 **26th St W & Lyndale Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	39.5	35.8	29.5	39.3	17.6	9.4	9.3	22.5
LOS	D+	D+	C	D+	B-	A-	A-	C+
% of Volume	97	98	99	109	102	100	101	100
Denied Entry After	0	0	0	0	0	0	0	0

92 **Groveland Av W & Nicollet Av S**	EBL	EBT	EBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	35.3	29.9	16.7	14.4	11.1	8.2	18.7	10.9	9.4	13.1
LOS	D+	C	B	B	B+	A-	B-	B+	A-	B
% of Volume	116	100	96	102	97	120	100	102	102	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0

93 **18th St E & Nicollet Av S**	WBL	WBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	32.2	13	4.6	3.6	9.7	5.1	7.1
LOS	C-	B	A	A	A-	A	A-
% of Volume	94	107	99	100	100	103	101
Denied Entry After	0	0	0	0	0	0	0

98 **Franklin Av W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	33.9	8.5	8	25	15.9	16.4	55.8	38.3	44	70.2	32.9	31.8	23.7
LOS	C-	A-	A-	C	B	B	E+	D+	D	E	C-	C-	C+
% of Volume	98	101	95	97	102	99	103	96	89	104	99	100	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

113 **26th St W & Grand Av S**	WBL	WBT	NBL	SBR	All
Delay / Veh (s)	1.8	6	8.5	10.6	6.2
LOS	A+	A	A-	B+	A
% of Volume	100	100	100	102	100
Denied Entry After	0	0	0	0	0

171 **26th St W & Nicollet Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	20.9	20.3	19	36.6	23.8	14.3	10.2	20
LOS	C+	C+	B-	D+	C+	B	B+	C+
% of Volume	95	99	97	98	95	99	106	99
Denied Entry After	0	0	0	0	0	0	0	0

172 **26th St W & Blaisdell Av S**	WBL	WBT	SBT	SBR	All
Delay / Veh (s)	5.4	4.8	11.1	15.7	7.7
LOS	A	A	B+	B	A-
% of Volume	103	100	101	104	101
Denied Entry After	0	0	0	0	0

353 **24th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	32.4	29.6	18.6	39.9	37	19.9	12.7	6.1	4.6	14.1	8.9	7.4	14.1
LOS	C-	C	B-	D+	D+	B-	B+	A	A	B	A-	A-	B
% of Volume	93	94	106	114	96	92	107	95	87	89	99	101	97
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

No Diversion

	All	Movement(s)	
47	All	WBT	
48	All		
49	All	WBT	SBR
51	All	NBT	
56	All	WBR	
92	All		
93	All		
98	All	WBT	
113	All	WBT	
171	All	WBT	
172	All	WBT	
353	All		

4th Ave Ramp Diversion

	All	Movement(s)	
47	All	WBT	
48	All		
49	All	WBT	SBR
51	All	NBT	
56	All	WBR	
92	All		
93	All		
98	All	WBT	
113	All	WBT	
171	All	WBT	
172	All	WBT	
353	All		

SOUTH MPLS WITH DIVERSION, RETIMING AND GEOMETRIC CHANGES (FRANKLIN & LYNDALE)

47 **15th St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	15.9	11.8	26.1	20.7	19	18.1	17.5	18.7
LOS	B	B+	C	C+	B-	B-	B-	B-
% of Volume	98	97	93	99	82	102	95	99
Denied Entry After	0	0	0	0	0	0	0	0

48 **Oak Grove St W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	44.2	42.7	54.7	25.9	5.9	4.6	5	6.3
LOS	D	D	D-	C	A	A	A	A
% of Volume	50	100	50	50	100	102	98	101
Denied Entry After	0	0	0	0	0	0	0	0

49 **Franklin Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Delay / Veh (s)	21.3	24.1	16.1	8.5	35.6	34.9	27.9	22.3
LOS	C+	C+	B	A-	D+	C-	C	C+
% of Volume	102	106	99	101	95	104	96	101
Denied Entry After	0	0	0	0	0	0	0	0

51 **24th St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	44.8	42.3	15	40.3	30.5	15.8	25	16.2	13.7	19.9	7.9	6.4	15.1
LOS	D	D	B	D+	C-	B	C	B	B	B-	A-	A	B
% of Volume	93	84	91	94	103	102	96	99	103	102	99	102	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

56 **26th St W & Lyndale Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	18.8	16.6	15.4	39.8	20.8	13.6	13.7	17
LOS	B-	B	B	D+	C+	B	B	B-
% of Volume	101	99	97	103	102	98	101	99
Denied Entry After	0	0	0	0	0	0	0	0

92 **Groveland Av W & Nicollet Av S**	EBL	EBT	EBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	30	28.6	17	14.8	11.5	8.6	20	11.2	8.8	13.1
LOS	C-	C	B-	B	B+	A-	C+	B+	A-	B
% of Volume	100	100	100	103	94	70	109	105	100	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0

93 **18th St E & Nicollet Av S**	WBL	WBR	NBT	NBR	SBL	SBT	All
Delay / Veh (s)	33.8	14.6	4.2	2.5	10.7	5.1	7.2
LOS	C-	B	A	A+	B+	A	A-
% of Volume	100	86	96	86	83	106	100
Denied Entry After	0	0	0	0	0	0	0

98 **Franklin Av W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	34.1	9.3	9	29.8	17.6	16.8	45.3	33.1	40.8	68.7	31.1	35.4	23.3
LOS	C-	A-	A-	C	B-	B	D	C-	D+	E	C-	D+	C+
% of Volume	93	101	114	96	100	93	97	95	102	103	99	119	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

113 **26th St W & Grand Av S**	WBL	WBT	NBL	SBR	All
Delay / Veh (s)	6.9	5.8	25.3	11.3	6
LOS	A	A	C	B+	A
% of Volume	100	100	150	93	99
Denied Entry After	0	0	0	0	0

171 **26th St W & Nicollet Av S**	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Delay / Veh (s)	22.5	20.8	20.5	34.8	23.7	35	37.1	23.5
LOS	C+	C+	C+	C-	C+	D+	D+	C+
% of Volume	95	99	91	85	99	101	87	98
Denied Entry After	0	0	0	0	0	0	0	0

172 **26th St W & Blaisdell Av S**	WBL	WBT	SBT	SBR	All
Delay / Veh (s)	5.5	4.8	11.6	17	7.8
LOS	A	A	B+	B-	A-
% of Volume	95	100	103	96	100
Denied Entry After	0	0	0	0	0

353 **24th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	23.8	20.4	13.6	28.6	22.9	13.1	22.6	10.9	5.9	26.6	22.4	15.5	17.6
LOS	C+	C+	B	C	C+	B	C+	B+	A	C	C+	B	B-
% of Volume	95	94	106	107	106	104	87	96	106	111	99	100	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

DELAY AND LEVEL OF SERVICE COMPARISON

COMPARISON TABLE A3

SOUTH MPLS INTERSECTIONS EXISTING CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

381 **Franklin Av W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	45.6	29.4	30.6	198.5	215.1	285.1	24.8	26.8	37.6	63.9	32.1	35.2	85.9
LOS	D	C	C-	F	F	F	C+	C	D+	E	C-	D+	F
% of Volume	101	99	105	99	93	97	103	100	100	101	98	97	98
Denied Entry After	0	0	0	0	0	0	0	0	0	1	3	0	4
396 **Groveland Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	39.5	39.1	41.9	38.7	5.2	5.4	4.7	11.1					
LOS	D+	D+	D+	D+	A	A	A	B+					
% of Volume	96	100	103	102	110	104	104	103					
Denied Entry After	0	0	0	0	0	0	0	0					
414 **15th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	28.9	18.3	12.2	36	34.5	21.7	19.1	10.9	10.1	22.9	17.2	14	21.2
LOS	C	B-	B+	D+	C-	C+	B-	B+	B+	C+	B-	B	C+
% of Volume	96	94	103	100	99	105	110	93	93	113	105	114	101
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0
585 **24th St W & Blaisdell Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	13.4	15	30.8	19.3	9.2	9.8	9.3	12					
LOS	B	B	C-	B-	A-	A-	A-	B+					
% of Volume	93	95	106	97	103	102	111	101					
Denied Entry After	0	0	0	0	0	0	0	0					
606 **15th St W & Willow St S**	EBL	EBT	WBT	WBR	SBL	SBR	All						
Delay / Veh (s)	18	6.6	6.8	4.6	47.3	40.2	18.2						
LOS	B-	A	A	A	D	D+	B-						
% of Volume	103	98	101	102	92	103	101						
Denied Entry After	0	0	0	0	0	1	1						
659 **22nd St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	42.9	37.2	21.5	41.5	37.4	26.3	22.5	6.7	4.9	18.1	6	5	9.5
LOS	D	D+	C+	D+	D+	C	C+	A	A	B-	A	A	A-
% of Volume	100	100	110	106	103	100	84	101	103	86	98	101	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

No Diversion — All Movement(s)

All	NBT	WBR
85.9	26.8	285.1
F	C	F
98	100	97
4	0	0
All		
11.1		
B+		
103		
0		
All	NBL	WBT
21.2	19.1	34.5
C+	B-	C-
101	110	99
0	0	0
All		
12		
B+		
101		
0		
All	WBT	
18.2	6.8	
B-	A	
101	101	
1	0	
All	NBT	
9.5	6.7	
A-	A	
99	101	
0	0	

4th Ave Ramp Diversion — All Movement(s)

All	NBT	WBR
39.6	27.7	38.6
D+	C	D+
100	100	100
0	0	0
All		
9.8		
A-		
101		
0		
All	NBL	WBT
30.2	29.8	47.3
C-	C	D
98	98	99
2	0	2
All		
13.3		
B		
102		
0		
All	WBT	
17.3	6	
B-	A	
98	96	
0	0	
All	NBT	
13.2	13.3	
B	B	
99	99	
0	0	

SOUTH MPLS WITH DIVERSION, RETIMING AND GEOMETRIC CHANGES (FRANKLIN & LYNDALE)

381 **Franklin Av W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	282	32.8	32.6	46.9	30.8	38.6	26.2	27.7	33.4	70.2	32.2	34.2	39.6
LOS	F	C-	C-	D	C-	D+	C	C	C-	E	C-	C-	D+
% of Volume	91	104	102	103	100	100	97	100	84	105	99	104	100
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0
396 **Groveland Av W & LaSalle Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	39.2	36	38.3	34.8	4.5	4.1	4.1	9.8					
LOS	D+	D+	D+	C-	A	A	A	A-					
% of Volume	104	98	97	105	97	102	90	101					
Denied Entry After	0	0	0	0	0	0	0	0					
414 **15th St W & Nicollet Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	21.3	17.6	11.6	52	47.3	40.4	29.8	15.1	17.2	31.3	21.6	18	30.2
LOS	C+	B-	B+	D-	D	D+	C	B	B-	C-	C+	B-	C-
% of Volume	92	92	99	100	99	95	98	94	93	110	108	100	98
Denied Entry After	0	0	0	0	2	0	0	0	0	0	0	0	2
585 **24th St W & Blaisdell Av S**	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All					
Delay / Veh (s)	10.6	15.3	29.8	17.8	11.1	12.4	11.6	13.3					
LOS	B+	B	C	B-	B+	B+	B+	B					
% of Volume	94	98	100	99	103	104	100	102					
Denied Entry After	0	0	0	0	0	0	0	0					
606 **15th St W & Willow St S**	EBL	EBT	WBT	WBR	SBL	SBR	All						
Delay / Veh (s)	17.7	6.7	6	4.3	46.3	39.4	17.3						
LOS	B-	A	A	A	D	D+	B-						
% of Volume	92	99	96	105	100	102	98						
Denied Entry After	0	0	0	0	0	0	0						
659 **22nd St W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	36.6	34.9	19.3	46.3	33.6	25.6	28.9	13.3	10.2	32.3	8.5	5.8	13.2
LOS	D+	C-	B-	D	C-	C	C	B	B+	C-	A-	A	B
% of Volume	108	92	105	91	103	105	111	99	110	93	99	102	99
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0	0

LYNDALE/HENNEPIN AREA INTERSECTIONS PROPOSED CONDITIONS (4TH AVE S RAMP OPEN, NO DIVERSION)

245 **Vineland Place W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	69.5	72.3	52.4	215.4	129	101	85.9	48.6	63.3	943	413	384	248
LOS	E	E-	D-	F	F	F	F	D-	E	F	F	F	F
% of Volume	103	100	99	97	98	98	86	86	85	74	79	75	84
Denied Entry After	0	0	0	2	1	1	0	0	0	82	442	16	544
252 **Groveland Terrace W & Hennepin L**	EBL	EBT	EBR2	WBL	WBT	WBR	NBT	NBR	SBR	SBR2	All		
Delay / Veh (s)	116.3	111.4	116.7	260.2	252	237.6	68.6	45.7	14.5	13.9	63		
LOS	F	F	F	F	F	F	E	D	B	B	E		
% of Volume	98	92	111	99	92	95	82	91	81	90	84		
Denied Entry After	0	0	0	7	2	6	0	0	0	0	15		
253 **I-94 WB Ramp & Lyndale Av S**	EBL	WBL	WBR	NBT	All								
Delay / Veh (s)	1862	34.5	105.9	45.3	396.4								
LOS	F	C-	F	D	F								
% of Volume	50	102	96	101	86								
Denied Entry After	263	1	0	0	264								

No Diversion

All	NBT	WBR
247.6	48.6	101
F	D-	F
84	86	98
544	0	1
All	NBT	WBR
63	68.6	237.6
E	E	F
84	82	95
15	0	6
All	NBT	
396.4	45.3	
F	D	
86	101	
264	0	

4th Ave Ramp Diversion

All	NBT	WBR
160.5	51.8	243.4
F	D-	F
89	85	94
276	0	42
All	NBT	WBR
81.8	61.3	471.5
F	E+	F
89	85	88
47	0	19
All	NBT	0
371.5	61.3	
F	E+	
86	99	
235	0	

LYNDALE/HENNEPIN AREA WITH DIVERSION, RETIMING AND GEOMETRIC CHANGES

245 **Vineland Place W & Lyndale Av S**	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Delay / Veh (s)	65.2	54.4	42.8	292.9	264.1	243.4	188.6	51.8	62	681	148	155	160.5
LOS	E	D-	D	F	F	F	F	D-	E+	F	F	F	F
% of Volume	89	101	100	96	96	94	85	85	89	78	92	93	89
Denied Entry After	0	0	0	13	8	42	0	0	0	31	175	7	276
252 **Groveland Terrace W & Hennepin L**	EBL	EBT	EBR2	WBL	WBT	WBR	NBT	NBR	SBR	SBR2	All		
Delay / Veh (s)	264.4	266.2	262.7	501	476.5	471.5	61.3	45.4	10.2	12.5	81.8		
LOS	F	F	F	F	F	F	E+	D	B+	B+	F		
% of Volume	94	103	95	89	90	88	85	90	92	93	89		
Denied Entry After	3	1	0	19	5	19	0	0	0	0	47		
253 **I-94 WB Ramp & Lyndale Av S**	EBL	WBL	WBR	NBT	All								
Delay / Veh (s)	1556	72.8	281.1	61.3	371.5								
LOS	F	E-	F	E+	F								
% of Volume	58	94	90	99	86								
Denied Entry After	235	0	0	0	235								

Appendix L

Interchange Review Committee Letter and Response

Hennepin County Transportation Department

Transportation Department
1600 Prairie Drive
Medina, MN 55340-5421

612-596-0300, Phone
612-321-3410, FAX
www.hennepin.us

April 14, 2015

Ms. Karen Scheffing, Interchange Coordinator
MnDOT Metro – Waters Edge
1500 West County Road B2
Roseville, MN 55113

Re: I-35W Transit Access Project proposed Access Changes

Dear Ms. Scheffing,

The purpose of this letter is to formally request support from the Metro District Interchange Planning Review Committee for the construction of the I-35W Transit Access Project. The proposed project includes two new freeway exit ramps in South Minneapolis including a new exit ramp from southbound I-35W to Lake Street and a new exit from northbound I-35W to 28th Street East.

It should be noted that the design of the I-35W Transit Access Project does not preclude a future northbound entrance ramp from Lake Street to northbound I-35W and all proposed bridges are designed to accommodate the future ramp.

Background

Hennepin County has been working in partnership with the FHWA, City of Minneapolis, Metro Transit and MnDOT through a preliminary design and environmental review process for three separate but related project initiatives in the I-35W corridor:

- I-35W Rehabilitation Project (43rd Avenue South to 32nd Avenue South) – Pavement rehabilitation and addition of a southbound managed lane.
- I-35W Transit Access Project (32nd Avenue South to East 26th Street) – BRT Station over Lake Street, MnPASS lanes, a new southbound exit to Lake Street, and a new northbound exit to 28th Street. Both exit ramps will be constructed with auxiliary lanes.
    - A northbound entrance ramp from Lake Street was evaluated but resulted in significant impacts that were too severe at this time. The current design does not preclude the construction if such an action is deemed appropriate at a later date.
- Chapter 152 Bridge Replacement Project (East 26th Street into the I-94 Commons) – Replacement of the northbound TH 65 "flyover bridge" to westbound I-94 and the southbound I-35W "braid" bridge over TH 65.

The proposed Lake Street exit and 28th Street exit are part of the Transit Access Project segment that includes improved regional connectivity to the Lake Street area serving South Minneapolis residential and employment destinations in Phillips West, Phillips, Ventura Village, Whittier and adjoining neighborhoods.

Appendix F of the 2040 Metropolitan Council Transportation Policy Plan prescribes six Qualifying Criteria for consideration of a new or modified interchange on an existing freeway. The following responses address how the proposed new exit ramps from southbound I-35W to Lake Street and northbound I-35W to 28th Street satisfy each of the criteria.

Qualifying Criteria No. 1
Additional interchange capacity should be considered only when it supports Thrive MSP 2040 and the Transportation Policy Plan, and local comprehensive plans approved by the Metropolitan Council.

Discussion: This is a critical objective. In addition to solving highway capacity deficiencies, new interchanges or major interchange modifications should be consistent with regional plans and regionally approved local plans, and should support land uses shown in these local plans. In most cases, a new interchange should be in the Metropolitan Urban Service Area or a rural center.

Response:
Thrive MSP 2040 includes Land Use Policies to guide land use and regional development. The Access, Mobility, and Transportation policy includes policies reflected in the outcomes of the proposed Lake Street and 28th Street exit ramps, including the following:

- *Support investments to safely operate, preserve and improve regional highway system, which includes principal and A-minor arterials, by providing transit advantage, MnPASS lanes, and implementing cost-effective management, spot mobility, and strategic capacity improvements.*

  The exit ramps and auxiliary lanes provide cost-effective capacity improvements for both the freeway system and arterial system.

- *Use Council investments and policies to reduce vehicle miles traveled (VMT) and carbon per unit of fuel, which are key drivers of the region's generation of greenhouse gas emissions.*

  The proposed Lake Street exit reduces the total VMT on the existing roadway network by approximately 11,000 miles per day, while the proposed 28th Street exit reduces the total VMT by approximately 44,500 miles per day; based on the 2038 Twin Cities Regional Travel Demand model.

Thrive MSP 2040 and the Transportation Policy Plan:
The Metropolitan Council's Transportation Policy Plan (TPP) serves as an implementation document for Thrive MSP 2040. The TPP guides development of the region's transportation system through establishment of strategies and policies that are supportive of the Council's development principals. Many of the TPP's goals are reflected in the anticipated outcomes of the I-35W Transit Access Project and the proposed exit ramps including the following:

Goal #1: Transportation System Stewardship
Sustainable investments in the transportation system are protected by strategically preserving, maintaining and operating system assets. Objective B: Operate the regional transportation system to efficiently and cost-effectively connect people and freight to destinations.

The improvement elements included in the Transit Access Project, when considered separately or in combination, are aligned to efficiently connect people and freight to their destinations. The new exit ramps from I-35W to the arterial system provide a more

direct connection of people to their destinations. The improved capacity along I-35W, including the transit station and MnPASS lanes, provide more efficient travel for all users of the roadway network.

The southbound exit ramp to Lake Street provides a direct connection for people and freight to the many businesses and employment centers along Lake Street. The proposed access will relieve the 35th Street exit ramp of the commercial traffic that must currently use the 35th Street interchange and travel through residential areas to gain access to the commercial district.

The 28th Street exit is proposed to function in support of the existing 31st/Lake Street interchange and will be constructed as an element of a much larger project. When viewed as a component of the larger project, it will provide significant mobility and safety benefits at a relatively low level of investment. Widening of the freeway for the center BRT Station and accommodation of the future northbound entrance requires the removal of the existing 2nd Avenue connection between Lake Street and 28th Street, which without the 28th Street exit would result in a major loss in connectivity for northbound I-35W traffic traveling to employment and commercial and residential destinations in south Minneapolis north of Lake Street.

Goal #2: Safety and Security
The regional transportation system is safe and secure for all users. Objective A: Reduce crashes and improve safety and security for all modes of passenger travel.

The Transit Access Project is projected to result in a significant reduction in crashes for the local and regional roadway networks. The access and capacity improvements on the freeway system, and improvements to the arterial network not only provide safer facilities for all users through a reduction in the number of safety conflicts, but they also result in a reduction in vehicle miles traveled.

The proposed exit ramp to Lake Street will provide a reduction in crashes on both the freeway and arterial systems. On the freeway, the exit will be constructed with a full auxiliary lane between the westbound I-94 entrance and the Lake Street exit. This new auxiliary lane will provide needed capacity and reduce congestion and congestion related crashes along the freeway. On the arterial system the exit will reduce backtracking through many signalized intersections in South Minneapolis as traffic will have more direct access to destinations.

The proposed exit ramp to 28th Street will provide a reduction in crashes on both the freeway and arterial systems. On the freeway, the exit will be constructed with the extension of the existing sub-standard auxiliary lane between the 35th Street entrance and the 31st Street exit. This extension will reduce weaving crashes along the freeway. On the arterial system the exit will reduce demands through signalized intersections that experience high crash rates.

Goal #3: Access to Destinations
People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond. An objective is to increase travel time reliability and predictability for travel on highway and transit systems.

The Transit Access Project aligns with the objective of linking land use and facilities. The Project will better connect South Minneapolis employment and growth centers to the regional roadway system. The new ramp from northbound I-35W to 28th Street and the new ramp from southbound I-35W to Lake Street will provide a direct link between the freeway system and large employment centers along 28th Street, the Lake Street area businesses and Nicollet Avenue business districts. The new transit station and MnPASS lanes will also provide more reliable and predictable travel times for all users.

The 28th exit will better connect the regional roadway to destinations in South Minneapolis, one of the Twin City's largest employment centers, that includes Wells Fargo Home Mortgage, Midtown Exchange, Allina Corporate Headquarters, Abbott Northwestern Hospital, Children's Hospital, Lake Street area businesses and Nicollet Avenue business districts.

Goal #4: Competitive Economy
The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and state. Objectives: A. Improve multi-modal access to regional job concentrations identified in Thrive MSP 2040; C. Support the region's economic competitiveness through efficient movement of freight.

The Lake Street and 28th Street exits will be served by the I-35W MnPASS facility. Many of the largest employers in South Minneapolis provide transit and car pool incentives to their employees who will utilize the MnPASS system.

Goal #5: Healthy Environment
The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments. Objective A: Reduce transportation-related air emissions, and Objective B: Reduce impacts of transportation construction, operations, and use on the natural, cultural, and developed environments.

The overall Transit Access Project and each component will reduce air emissions for the freeway and arterial systems by providing a more direct route to driver destinations and more capacity on the roadway network.

The Lake Street and 28th Street exits contribute to a reduction in air emissions for the freeway and arterial systems by providing a more direct route to driver destinations and lowering the VHT and VMT for the freeway and the arterial networks. The 28th Street exit also causes a reduction in traffic demands along 2nd Avenue near the historic Healy Block district and lessens the need for arterial expansion.

Hennepin County Transportation Plan:
Among its tenets, the Hennepin County Transportation Plan identifies the county's role in transportation *"to enhance residents' mobility."* As such, Hennepin County provides systems that link regional facilities with local facilities. The Lake Street exit from southbound I-35W more directly links the regional highway network to dense population and commercial centers along Lake Street and South Minneapolis neighborhoods. The 28th Street exit from northbound I-35W more directly links the regional highway network to dense population centers of South Minneapolis neighborhoods.

The Hennepin County Transportation Plan identifies Lake Street as a County operated A-Minor arterial roadway. 28th Street is a B-minor arterial roadway (but not a county route) that provides relief to Lake Street and 31st Street. These east-west streets work in concert to collect and distribute trips to and from the freeway. The 28th Street exit will provide an additional connection from the regional system relieving demand on facilities that currently experience over-capacity conditions and long freeway exit queues during peak periods and off-peak periods.

The Transit Access Project's scope and purpose as well as the project development process that has been followed are supported by the Hennepin County Transportation Plan's implementation policies: Agency Collaboration and Preservation of the Roadway System.

City of Minneapolis Comprehensive Plan: The Transit Access Project is supported by the Minneapolis Plan. Chapter 11 of the Plan refers to and relies on the Access Minneapolis Plan for specific guidance on transportation.

The Plan specifically supports investments such as the I-35W / 28th Street exit and I-35W / Lake Street exit. As stated in Chapter 2 – Transportation:

- *Policy 2.1*: Encourage growth and reinvestment by sustaining the development of a multi-modal transportation system. *Subparagraph 2.1.3*: Ensure continued growth and investment through strategic transportation investments and partnerships.

- *Policy 2.6*: Manage the role and impact of automobiles in a multi-modal transportation system. *Subparagraph 2.6.5* Encourage the design and completion of needed improvements to the street network, including the freeway system, which promote the efficient, safe movement of traffic.

Qualifying Criteria No. 2
Need for additional capacity or safety improvements must be demonstrated and documented before a new interchange, new ramps or expanded ramp capacity are considered.

Discussion: Subjective arguments alone should not be used to justify interchange design revisions. Volume forecasts and capacity calculations are required to document the need for a design revision. Volume and capacity figures should be consistent with the Council-approved land use plans and with the transportation element of those local plans.

Response:
Travel demand forecasts and freeway operations and capacity analyses have been performed and documented by studies performed as part of the I-35W Transit Access Project. The demand to exit northbound I-35W to 31st and Lake Street and to exit southbound I-35W to 35th Street exceeds the capacity of existing routes. Key findings, documented in the Transit Access Project studies, include analysis results for the freeway as well as for the arterial street network.

A. Freeway Capacity Key Findings:

- The proposed southbound Lake Street exit ramp will provide relief to existing weaving demand issues experienced between the 31st Street entrance and the 35th

Street exit. Currently the 35th Street exit experiences queues that commonly spill back onto the freeway during off-peak and peak periods. The demand to exit at 35th Street is forecast to be reduced by 22% in the PM peak period as well as on a daily basis which will significantly reduce weaving conflicts. The existing weaving length will be slightly extended and a full escape lane will be included; providing a capacity benefit as well as a safety benefit.

- The proposed Lake Street exit ramp and auxiliary lane will more efficiently serve regional demands. The daily total network vehicle miles traveled and vehicle hours traveled are reduced by 11,000 miles and 9,300 hours.
- The proposed northbound 28th Street exit ramp will provide relief to existing weaving demand issues experienced between the 35th Street entrance and the 31st Street exit. The proposed auxiliary lane extension from the 31st Street exit to the 28th Street exit lengthens the weaving distance providing a capacity benefit as well as a safety benefit.
- The proposed 28th Street exit ramp and auxiliary lane will more efficiently serve regional demands. The daily total network vehicle miles traveled and vehicle hours traveled are reduced by 44,500 miles and 8,600 hours.

B. Arterial Capacity Key Findings

- The proposed Lake Street exit will efficiently serve the forecasted demands on the arterial system. The intersection improvements will add capacity and reduce potential crashes by reducing congestion. Demands and long queues at the 35th Street exit will be relieved.
- During the morning peak period, access from northbound I-35W to area employment centers is currently provided by the 31st Street exit with 2nd Avenue distributing traffic to 31st Street, Lake Street and 28th Street then on to destinations generally north of Lake Street and east of I-35W. Afternoon traffic patterns from the 31st Street exit serve a greater demand to residential areas west of I-35W.
- The proposed 28th Street exit will reduce congestion and improve safety on the 31st Street exit and 2nd Avenue by containing the queues on the freeway exit ramp approaching 31st Street rather than the freeway mainline.
- The northbound approach of 2nd Avenue to 31st Street is a local frontage road that merges into the 31st Street freeway ramp prior to the intersection signal. While the delays at the intersection can be optimized to achieve acceptable delays, the maximum northbound queue has potential to spill on the freeway. In the No Build scenario the maximum queue extends over 600 feet from the signal and would impact the freeway operations. In a Build scenario without the 28th Street exit, the downstream capacity improvements would draw more trips to the 31st Street exit ramp, and the queue would increase to over 900 feet extending onto the freeway. In the proposed Build condition, the ramp queue will be contained to approximately 400 feet and not have any impact on the freeway operations.

Qualifying Criteria No. 3

Freeway interchanges should only connect to other principal arterials or to an "A" minor arterial as defined in the functional classification system adopted by the Transportation Advisory Board to the Metropolitan Council.

Response:
The southbound exit will connect I-35W to Lake Street which is an A-Minor Arterial roadway. The existing interchange at Lake Street currently only provides freeway access to and from the south via 31st Street. The proposed southbound exit ramp will move towards the goal of a full access interchange at an A-Minor Arterial roadway. It should be noted that while the northbound entrance ramp from Lake Street is not proposed as part of this project, the design does not preclude the construction of the entrance ramp at a future time.

The 28th Street exit is proposed to augment the function of the existing 31st Street/Lake Street interchange. The existing 31st Street exit connects to 31st Street (Major Collector), Lake Street, (A-Minor Arterial) and to 28th Street (B-Minor Arterial) via a connection along 2nd Avenue. 31st, Lake and 28th Streets operate together to distribute trips. 28th Street operates as a one-way pair with 26th Street, also a B-Minor Arterial, and combined the pair carries more traffic than either Lake Street or 31st Street. The freeway widening for the Lake Street BRT Station and MnPASS lane will remove the existing connection of 2nd Avenue to 28th Street.

The addition of a northbound exit to 28th Street is proposed as both a replacement of the existing arterial connection and as a complimentary component to the existing Lake Street interchange configuration rather than as a new interchange. In fact, the 28th Street exit was originally proposed as a combined, common exit ramp with the 31st/Lake exit. A single exit from northbound I-35W, separated from the freeway, would split to 31st/Lake Street and to 28th Street via a flyover of Lake Street to 28th Street. The impacts and costs of the flyover configuration were unbearable. The plan evolved through impact reduction efforts to the current auxiliary lane and exit configuration.

Qualifying Criteria No. 4

New or expanded interchanges are not to be provided if the need for additional capacity is justified only as a convenience for short trips; to compensate for lack of an adequate complimentary minor arterial or collector system; to compensate for deficient minor arterial or frontage road capacity; or to correct collector or minor arterial capacity deficiencies caused by poor design or excessive access to adjacent parcels.

Response:
Along southbound I-35W, destinations between I-94 and Lake Street have very limited access; through the I-94 commons area there is not an exit ramp from southbound I-35W for over 2.5 miles in a very densely developed urban area. Traffic destined from I-35W to the local system must travel down to the 35th Street exit ramp to enter the local street system and then back track north to their final destinations, a high percentage of which are business and residential trips served by 31st Street, Lake Street, 28th Street and 26th Street.

The new Lake Street exit ramp will remove traffic demands from the 35th Street exit ramp, resulting in an approximate 25% reduction in the design year forecasts. This reduction will improve operations at the 35th Street interchange, which has failing operations under existing conditions, and remove demand from the short weaving segment between 31st Street and 35th Street improving both safety and operations on I-35W.

Due to right of way limitations and proximity to historic properties (Healy Block Historic District) the existing 31st Street exit and 2nd Avenue cannot be expanded to better serve

existing and future demands. The proposed 28th Street exit will improve regional mobility by improving access to regional destinations. Reinvestment in existing urban core infrastructure (i.e., an existing interchange) is needed to lower improvement costs and provide greater mobility to one of the most densely developed, highest-traveled, greatest accessed areas in the Twin Cities.

Currently the 31st Street exit is the last exit from northbound I-35W before the I-94 commons and downtown exits. The proposed improvements will provide additional accessibility for regional trips destined for South Minneapolis neighborhoods and employment centers. Without the ability to expand 2nd Avenue, the queues from the 2nd Avenue/31st Street intersection, as discussed in Criteria #2, will continue to spill onto the freeway perpetuating a major safety concern.

Qualifying Criteria No. 5

When an interchange is to be constructed or expanded, the operational integrity of the mainline and associated weaving sections must be maintained. The new or expanded interchange or related system change must be acceptable in terms of route design and standards as specified by the MnDOT, conforming to such factors as basic number of lanes, lane continuity, lane balance, lane drops, continuity of mainline levels of service and other general design criteria.

Response:

On southbound I-35W, the existing auxiliary lane between the 31st Street entrance and the 35th Street exit is sub-standard in length (450 feet provided while 1,500 feet minimum is prescribed) and serves a high weaving volume resulting in weaving conflicts and safety issues throughout the day. Currently a sub-standard escape lane is provided for the weaving section. The proposed project does improve the weaving section operations although does not resolve it completely. Improvements include extending the weaving section to approximately 570 feet, and providing a standard escape lane after the weaving segment, while the proposed southbound Lake Street exit ramp will reduce the total weaving demand.

On northbound I-35W, the existing auxiliary lane between the 35th Street entrance and the 31st Street exit is sub-standard in length (580 feet provided while 1,500 feet minimum is prescribed) and serves a high weaving volume resulting in weaving conflicts and safety issues throughout the day. Currently no escape lane is provided. The proposed Transit Access Project includes extension of the existing auxiliary lane on I-35W from the 35th Street entrance beyond the existing 31st Street exit to the new 28th Street exit for a total length of 2,500 feet.

The proposed 28th Street exit will be constructed such that a future northbound entrance from Lake Street can be incorporated thereby completing the Lake Street interchange to serve all movements and serve the arterial roadways at acceptable levels.

Qualifying Criteria No. 6

Interchanges on the principal arterial system should be spaced at a minimum of one mile (center to center). If it is determined appropriate, to locate an interchange at less than one mile apart or modify an existing interchange, the safe operation of the main roadway must be maintained.

Response:
The addition of the Lake Street exit ramp will result in both "off" and "on" movements along southbound I-35W. The proposed ramp spacing for the exit ramp meets AASHTO and MnDOT ramp spacing guidelines and the auxiliary lane provides added capacity to improve both operations and safety on the mainline.

The 28th Street exit ramp, considered as an extension of the Lake Street and 31st Street interchange will not diminish safety. AASHTO and MnDOT ramp spacing guidelines for consecutive exits suggest a minimum of 1,000 feet – typically considered when exiting traffic must exit from a through lane. In the proposed condition each of these two exit ramps (31st and 28th exits) will depart from an auxiliary lane resulting in minor flow disruption of the adjacent through lane.

While considering regional transportation system benefits and economic benefits related to the proposed improvements, and recognizing that the proposed 28th Street exit ramp will serve to protect valued assets in the community, such as the historic Healy Block, Hennepin County believes the proposed improvements adhere to the 2040 Metropolitan Council Policy Plan Appendix F Qualifying Criteria. The county respectfully requests the Interchange Planning Review Committee support of the proposed southbound I-35W exit ramp to Lake Street and the proposed northbound I-35W exit ramp to 28th Street.

Thank you for your attention to this matter and do not hesitate to contact me at James.Grube@hennepin.us or at 612-596-0305 if you need any additional information.

Sincerely,

James N. Grube

James Grube, P.E.
Hennepin County Director, Transportation Department, and County Engineer

Cc: Interchange Committee Members
Scott Pedersen, MnDOT Metro
Jeni Hagar, City of Minneapolis

Minnesota Department of Transportation
Metropolitan District
Waters Edge Building
1500 County Road B2 West
Roseville, MN 55113

May 1, 2015

Jim Grube, P.E.
Director, Transportation Department, and County Engineer Hennepin County
1600 Prairie Drive
Medina, MN 55340

Dear Mr. Grube,

This letter is to serve as your notification that the Interchange Review Committee has determined that the I-35W Transit Access Project is consistent with the qualifying criteria found in Appendix F of the Council's Transportation Policy Plan and no additional documentation is necessary.

The one inconsistency the Committee noted was that the proposed northbound exit ramp to 28th Street does not connect to an A Minor arterial, since 28th Street is designated as a B minor arterial. It was discussed, and the Committee concluded, that the one way pairs of 26th and 28th Streets function as relievers for Lake Street, which is designated as an A Minor, and that no changes to the City's functional class need to be made at this time.

The committee also discussed the high number of trips currently exiting northbound I-35W at the 31st / Lake Street interchange. These trips are not local, but predominantly longer trips destined for regional employment centers near Lake/28th/26th Streets, or returning to residential areas from employment centers or commercial districts in the south metro area. The committee concluded that the regional forecast model shows that the proposed 28th Street exit ramp will relieve this demand. In addition, existing safety issues between the 35th and 31st Street ramps will be relieved by the proposed auxiliary lanes in the area.

As the project layout and design progresses, please work with MnDOT and the Met Council to assure the technical and design criteria of Appendix F continue to be met and that the appropriate steps are taken to complete the Metropolitan Council's Controlled Access Approval and FHWA's Interstate Access Request (IAR) when needed.

Thank you for the opportunity to review this project. We look forward to working with you in the future. If you have any questions concerning this review contact me at 651-234-7784.

Sincerely,

Karen Scheffing
Principal Transportation Planner

Copy sent via E-Mail:
Tom Styrbicki, MnDOT
Allan Klugman, Minneapolis
Mike Kotila, SEH
Steve Peterson, Met Council
Graham Johnson, SEH
Scott Pederson, MnDOT
Tony Fischer, MnDOT
Nnaemeka Ezekwemba, FHWA
Brian Isaacson, MnDOT
Connie Kozlak, Met Council
April Crockett, MnDOT

Appendix M

Approved Layout and Signing Layout

Level 1 Layout Approval

Level 2 Layout Approval

Level 3 Layout Approval

Final Design

Project Manager

Project Engineer

Project Number

Project Name

Project Location

Project Description

Project Purpose

Project Limits

Project Length

Project Type

Project Funding

Project Sponsor

Project Partners

Project Contact

Project Phone

Project Email

Project Website

Project Schedule

Project Budget

Project Status

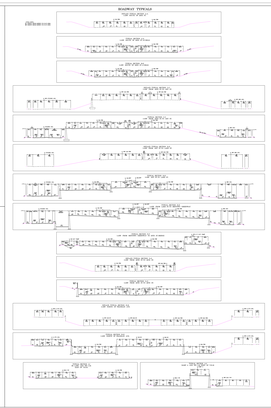
Project Notes

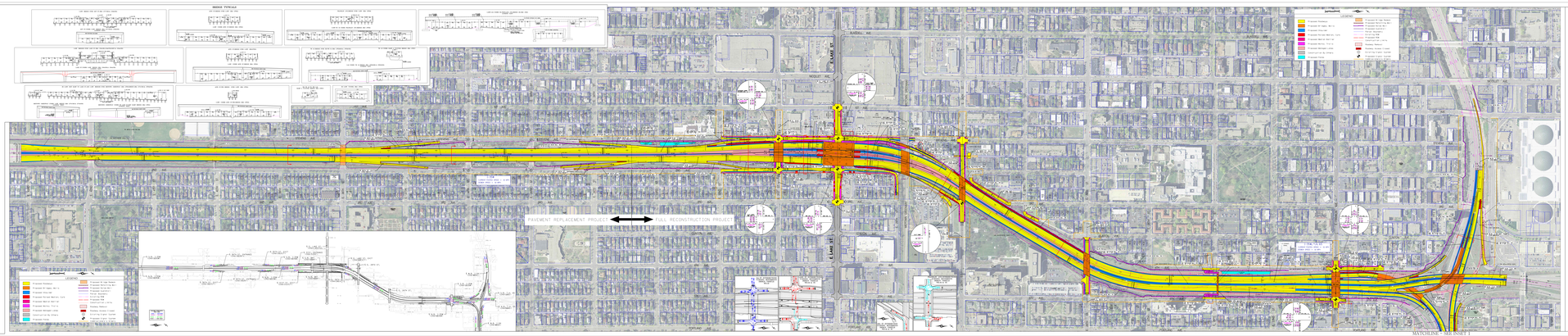
Project Comments

Project Comments Other Disciplines Requirements

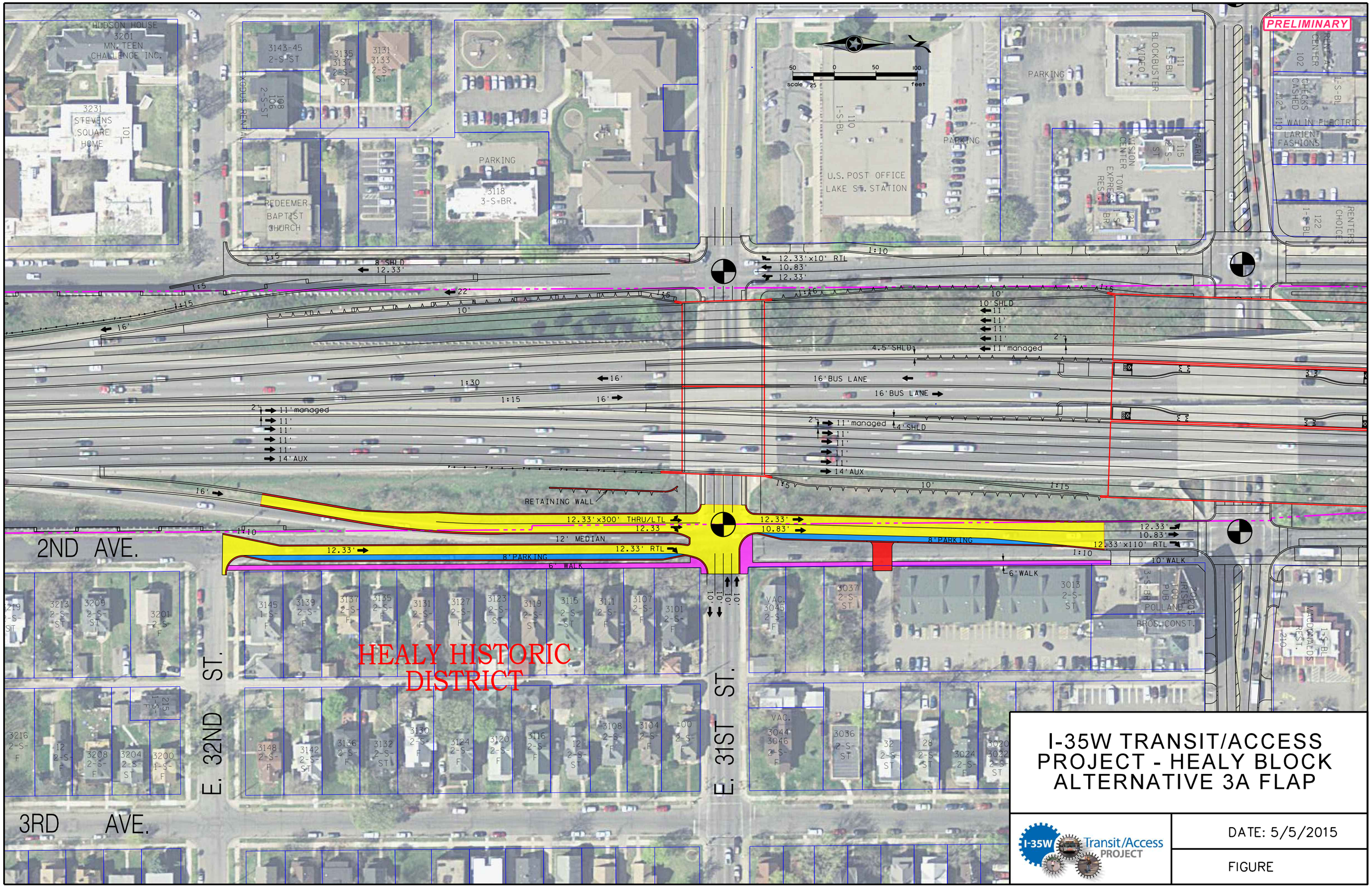
Project Design

1. Design Speed
2. Lane Widths
3. Shoulder Widths
4. Lane Configurations
5. Median Widths
6. Median Configurations
7. Horizontal Alignment
8. Vertical Alignment
9. Cross Slopes
10. Clear Zones
11. Lighting
12. Signing
13. Pavement Marking
14. Signal Systems





MATCHLINE - SEE INSET 1



I-35W TRANSIT/ACCESS PROJECT - HEALY BLOCK ALTERNATIVE 3A FLAP

I-35W Transit/Access PROJECT

DATE: 5/5/2015

FIGURE

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