Appendix B

Purpose and Need Report

Purpose and Need Statement

I-35W North Corridor Preliminary Design Project

Report Version 6.0

Minnesota Department of Transportation

Metro District

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Chapter 1 What Are Purpose and Need

The purpose and need for a project define the transportation problems that the project will address. The purpose and need also act as "measuring sticks" for the project alternatives, helping determine to what extent each alternative meets each project need. Alternatives that do not meet the project purpose of the project are not studied further. Assuming all other concerns are equal, if one alternative meets the project purpose and need better than another, then that alternative may be identified as the Preferred Alternative.

The purpose and need also help decide where a project will begin and end by defining the "who, what, where, when and why" of the transportation needs. This allows an agency to create alternatives that satisfy the project's needs.

The Purpose and Need has been divided into the following four chapters to help the reader better understand how the transportation problem has been solved.

- Background Information: The Background Information chapter summarizes existing conditions and discusses previous studies related to the I-35W project corridor (Chapter 2).
- Project Need: The Project Need chapter discusses transportation problems identified within the project area (Chapter 3).
- Additional Goals and Objectives: The Additional Goals and Objectives chapter describes other considerations that will help guide the project development process (Chapter 4).
- Purpose Statement: The Purpose Statement chapter identifies the objective for addressing the project's needs that are to be met by project alternatives, and also summarizes other objectives that were taken into account when developing and evaluating alternatives (Chapter 5).

Alternatives that do not meet the transportation purpose are not considered viable, and therefore, will not be analyzed in the Environmental Assessment (EA). Additional information regarding project alternatives and "Alternatives Considered but Rejected" will be described in the EA.

Chapter 2 Background Information

2.1 I-35W North Project Corridor

2.1.1 Project Location

The I-35W north corridor is a major radial freeway corridor connecting greater Minnesota and the north suburbs of the Twin Cities Metropolitan Area to downtown Minneapolis. The I-35W North Corridor Project is located in Anoka and Ramsey counties, and includes the cities of Roseville, New Brighton, Arden Hills, Mounds View, Shoreview, Lexington, Blaine and Lino Lakes. The logical termini for the project are Trunk Highway (TH) 36 interchange in Roseville and the County State Aid Highway (CSAH) 23 interchange in Lino Lakes. The physical project limits extend from just south of the County Road (CR) C interchange to just north of the Sunset Avenue (CR 53) overpass. The project area is illustrated in Figure 2.1 (Project Location Map).

Logical termini are the rational endpoints for a transportation improvement and environmental review.

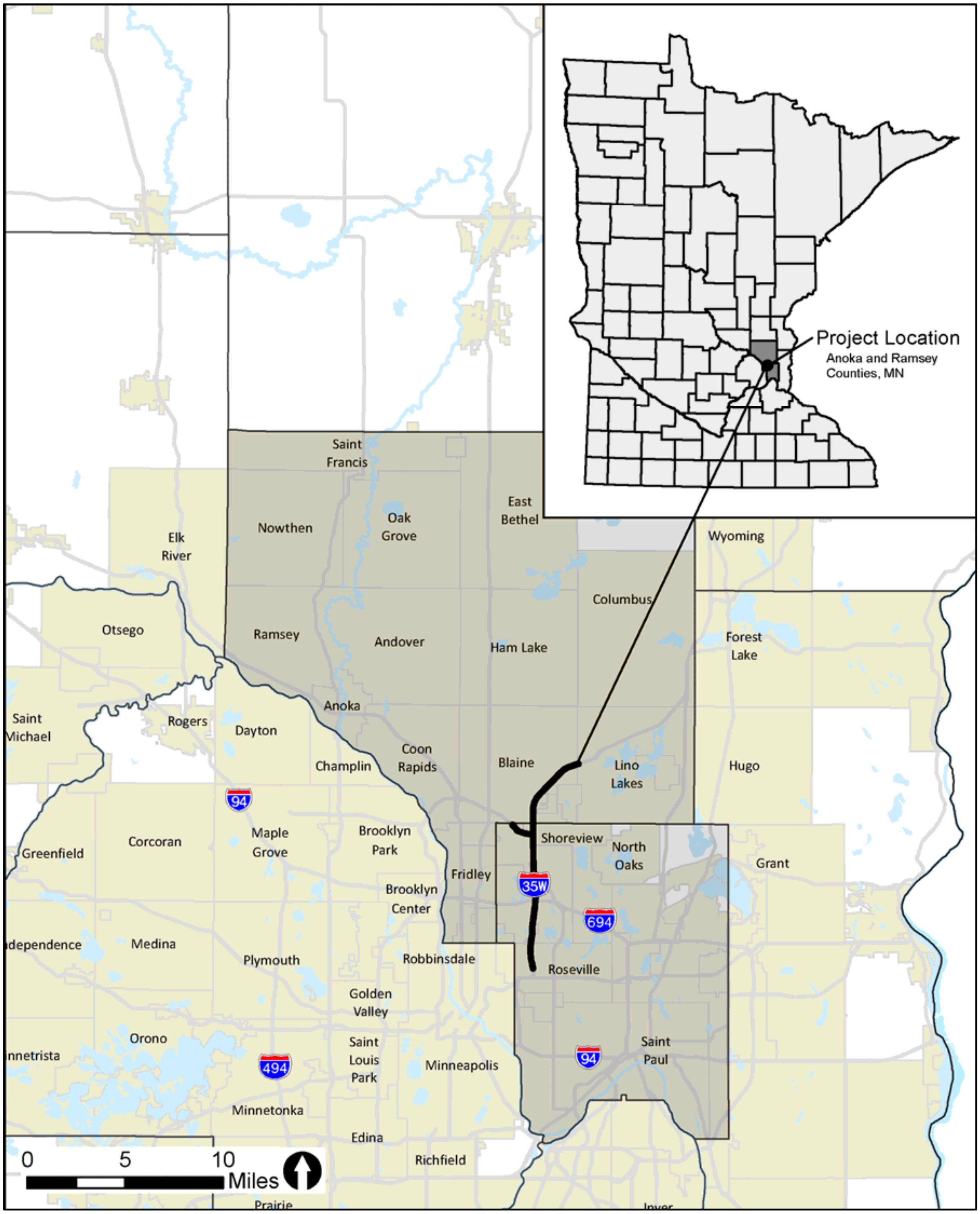
2.1.2 Existing Traffic Characteristics

The I-35W north corridor generally carries commuter-oriented traffic from northern Twin Cities suburbs to employment centers in Minneapolis or neighboring communities, destinations further south on I-35W, or east and west along I-94. This results in peak period travel patterns predominately southbound in the morning and northbound in the afternoon. The I-35W north project corridor also connects to other principal arterial routes, including TH 10, I-694, and TH 36. Existing daily traffic volumes on the I-35W project segment range from approximately 42,400 vehicles per day (vpd) at the north end of the corridor near Sunset Avenue to approximately 127,000 vpd in the I-35W/TH 10 commons area (see also Table 3.1 in Section 3.1). Additional details regarding existing traffic characteristics, including peak hour characteristics, transit use, and freight traffic can be found in Chapter 3 of the *I-35W North Managed Lanes Corridor Study Final Report* (June 2013).[1]

Existing daily traffic volumes on the I-35W north project corridor range from **42,400 vehicles per day (vpd) to 127,000 vpd.**

[1] Minnesota Department of Transportation. June 2013. *I-35W North Managed Lanes Corridor Study Final Report*. Chapter 3 – Existing Conditions available at http://www.dot.state.mn.us/metro/projects/i35wstudy/index.html.

Figure 2.1 Project Location Map



2.1.3 Existing Physical Characteristics

The I-35W north project corridor (TH 36 to CSAH 23) consists of three main cross sections:

- A rural four-lane section roadway[2] north of CR J (see Figure 2.2);
- A rural six-lane section roadway from CR J to the I-35W/TH 10 commons area, and south of the I-35W/TH 10 commons area to TH 36 (see Figure 2.3); and
- An eight-lane roadway with a center median barrier and rural section to the outside shoulders in the I-35W/TH 10 commons area (see Figure 2.4).

Figure 2.2 I-35W (Existing Rural Four-Lane Section Roadway)

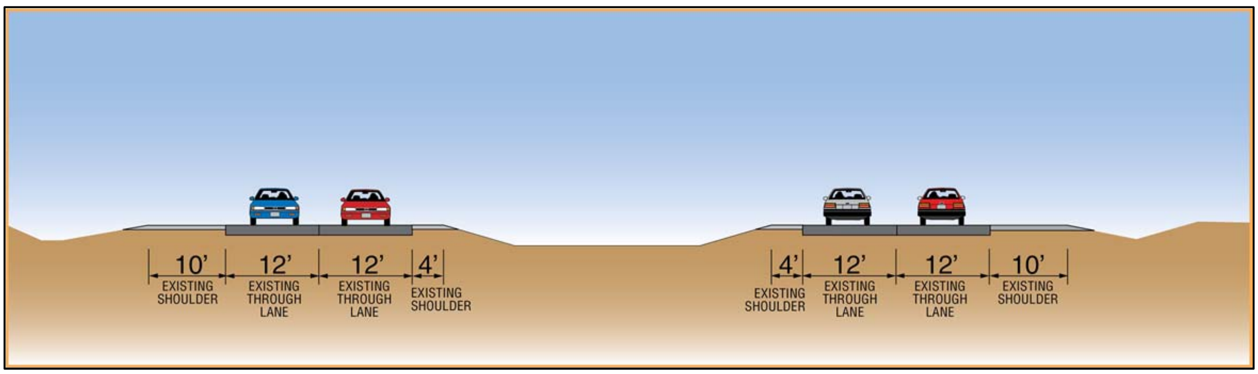
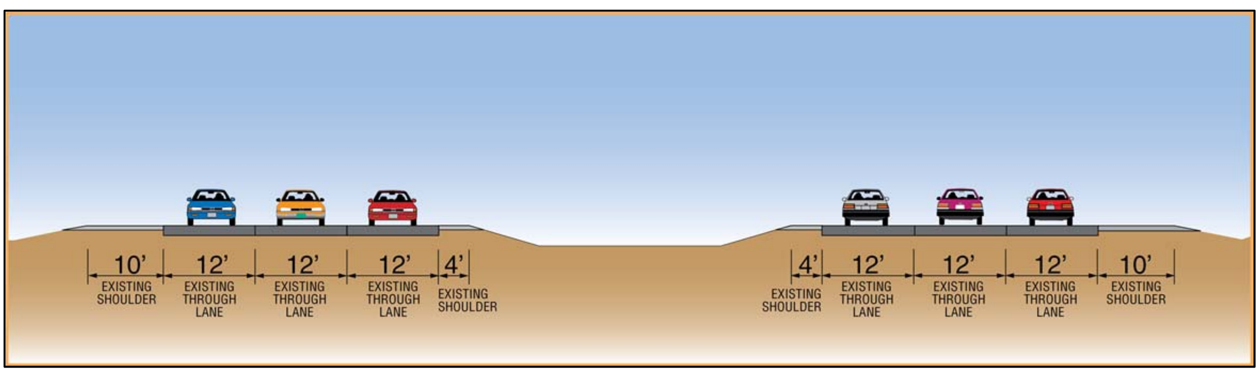


Figure 2.3 I-35W (Existing Rural Six-Lane Section Roadway



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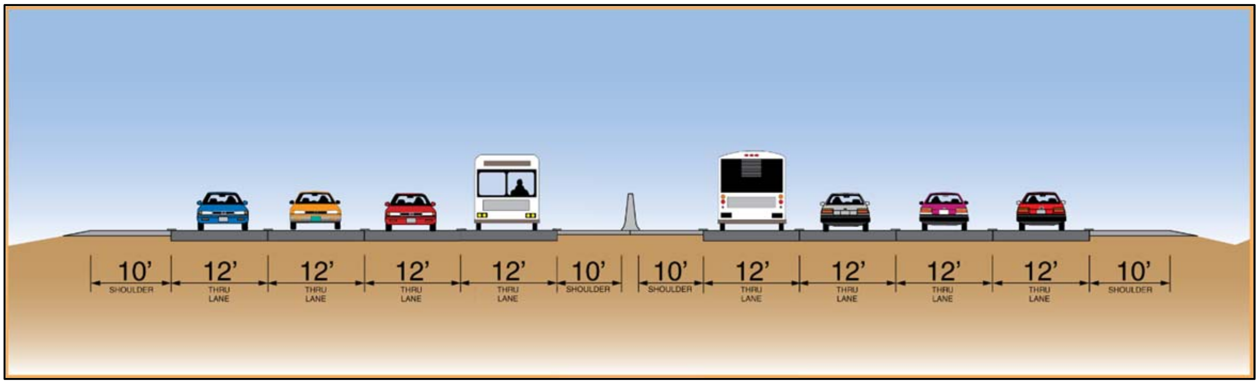
[2] A rural section roadway uses roadside ditches to collect and convey runoff from the roadway surface. An urban section roadway uses curb and gutter and storm drain systems to collect and convey runoff from the roadway surface.

Figure 2.4 I-35W (Existing Eight-Lane Section Roadway With Center Median Barrier)



There are multiple locations along the corridor where auxiliary lanes exist and shoulder widths vary. There are 13 interchanges along the I-35W project corridor between TH 36 and CSAH 23. Posted speed limits range from 60 miles per hour (MPH) south of I-694, 65 MPH from I-694 to Lake Drive, and 70 MPH north of Lake Drive.

2.1.4 Transit and High Occupancy Vehicles

Metro Transit currently operates three express bus routes that use the I-35W project corridor between the northern suburbs and downtown Minneapolis area. A total of 87 express buses traverse the corridor on these three routes on a typical weekday during the peak periods (defined as between 6:00 a.m. and 9:30 a.m. and between 3:00 p.m. and 6:30 p.m.) (see Table 2.1).

Table 2.1 Existing Transit Route Profiles

Route #	Type	Service Times	Frequency	# of Daily Northbound Trips (1)	# of Daily Southbound Trips (1)	Total # of Daily Trips (1)
250 (Downtown Minneapolis to Lino Lakes)	Express	Weekday Peak Hours (2)	5-15 min.	31	35	66
252 (Univ. of Minnesota to Blaine)	Express	Weekday Peak Hours (2)	N/A	3	3	6
288 (Downtown Minneapolis to Forest Lake)	Express	Weekday Peak Hours (2)	N/A	7	8	15
			Total	41	46	87

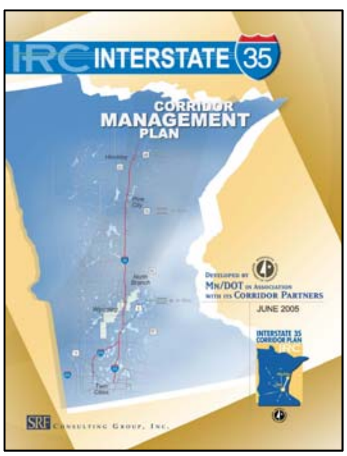
(1) Number of daily trips (northbound and southbound) as of December 2014.

In addition, there are five Metro Transit park and ride lots which service the three bus routes operating on the I-35W project corridor. Park and ride lot characteristics are summarized in Table 2.2.

Table 2.2 Existing Park and Ride Locations

Park and Ride Lot #	Name	Location	Routes Served	Parking Spaces	2013 Weekday Usage
1	Forest Lake Transit Center	1955 Forest Rd. N	288	308	94
2	Running Aces	15201 Zurich St. NE	288	300	110
3	St. Joseph's Church	171 Elm St.	250	12	5
4	95th Ave Park and Ride	3249 95th Ave. NE	250, 252, 288	1,482	1,051
5	I-35W & CR H	2146 CR H	250	211	140

Source: Metro Transit. November 2013. *2013 Annual Regional Park-and-Ride System Report* available at http://www.metrocouncil.org/METC/files/7e/7e3854e0-1457-4e23-aa9e-c123f52630a3.pdf.



Existing transit advantages along the I-35W project corridor include bus only shoulders and entrance ramp HOV bypass lanes. In the northbound direction, bus only shoulders are designated between CR C and 95th Avenue. In the southbound direction, bus only shoulders are designated between CSAH 23 and TH 36. The northbound and southbound I-35W bus-only shoulders continue south of the project corridor to 8th Street in Minneapolis. Transit buses are subject to specific operating rules, including a maximum speed of 35 MPH that is no more than 15 MPH greater than the adjacent traffic.

There are two metered entrance ramps along the southbound I-35W that include HOV bypass advantages: one at Lake Drive and one at 95th Avenue.

2.2 Previous Studies

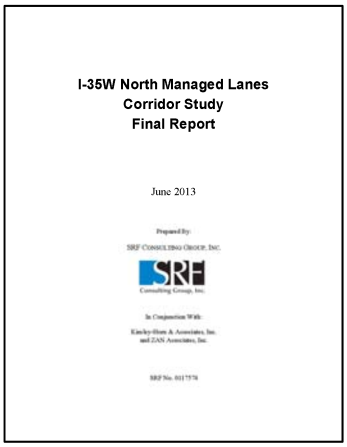
2.2.1 Interstate 35 Corridor Management Plan

The *Interstate 35 Corridor Management Plan* report was completed by MnDOT in 2005. The purpose of the Interstate 35 Corridor Management Plan was to develop a long-term corridor vision, focused on preserving and enhancing safety and mobility. The limits of the Interstate 35 Corridor Management Plan extend approximately 84 miles from I-694 in the Twin Cities to TH 48 in Hinckley.

Existing mobility problems on I-35W were recognized in the *Interstate 35 Corridor Management Plan* report, which stated the following regarding the segment between I-694 and Lexington Avenue:

Volumes in the southern part of the corridor exceed the capacity of I-35W as evident by long queues and congestion between I-694 and Lexington Avenue during the a.m. peak period. Segments in this area have long traffic queues, higher rear-end crashes and significant vehicle/motorist delays.

2.2.2 I-35W North Managed Lanes Corridor Study



I-35W North Managed Lanes
Corridor Study
Final Report

June 2013

Prepared By:

SRF Consulting Group, Inc.

The I-35W North Managed Lanes Corridor Study was completed by MnDOT in 2013. The purpose of the I-35W North Managed Lanes Corridor Study was to identify and evaluate lower-cost/high-benefits options for improving traffic operations along I-35W as well as to evaluate options for providing a managed lane in the corridor. One of the first tasks completed as part of the I-35W North Managed Lanes Corridor Study was a review of the existing operational issues and causes of congestion along the I-35W north corridor.

The traffic analysis reported in the *I-35W North Managed Lanes Corridor Study Final Report* (June 2013) identified two major causes of congestion and several additional secondary causes of congestion along the I-35W segment between TH 36 and Lexington Avenue. The two major congestion locations and their causes are summarized below.

- Southbound I-35W (I-694 Interchange): Entering vehicles from CSAH 96 and exiting vehicles to westbound I-694 created a weaving section that results in two to three hours of recurring congestion per day. Entering vehicles from eastbound I-694 caused southbound I-35W to reach capacity, resulting in one to two hours of recurring congestion per day.

- Northbound I-35W (CR D to I-694): Entering vehicles from CR D and CSAH 88 added to congestion in this area. Northbound I-35W at CR D and CR 88 is congested from two to three hours per day. At the I-694 interchange, the volumes on the entrance and exit loops created an over-capacity weave segment. This area at the I-694 interchange experiences more than three hours of recurring congestion per day.

Additional secondary causes of congestion along the I-35W project corridor included:

- Entering traffic from Lake Drive and CR J caused southbound I-35W to reach capacity. When combined with congestion south of TH 10, backups on southbound I-35W extended as far north as the park and ride lot at 95th Avenue. This area along southbound I-35W is congested from one to two hours per day.
- Merging traffic on southbound I-35W at the CR E2 and CR D interchanges affected right-lane operations, which in turn affected southbound travel speeds. This results in less than one hour of congestion per day.
- Entering traffic from TH 10 and exiting traffic to CR I results in a weaving section that affected northbound I-35W travel speeds and results in less than one hour of congestion per day.

A **freeway weaving segment** is where two or more streams of traffic traveling in the same general direction cross paths without the aid of a traffic control device.

The complete *I-35W North Managed Lanes Corridor Study Final Report* is available on the MnDOT website at http://www.dot.state.mn.us/metro/projects/i35wstudy/index.html.

Chapter 3 Project Need

This chapter discusses transportation needs in the project area. The primary needs for the project are to address existing pavement conditions, improve highway mobility, improve trip reliability, and to maintain or improve transit and HOV advantages along I-35W between TH 36 and CSAH 23. Additional project goals and objectives are described in the following chapter (see Chapter 4, "Additional Goals and Objectives").

Existing (year 2014) and future (year 2040) traffic volumes on the I-35W project corridor are tabulated in Table 3.1. Daily traffic volumes on I-35W between TH 36 and CSAH 23 are projected to increase by approximately 12,200 vpd to 41,200 vpd by year 2040. The projected increase in traffic volumes under future (year 2040) No Build conditions is expected to result in increased congestion throughout the project corridor (see Section 3.2, "Mobility and Congestion"), poor travel time reliability and decreases in transit performance (see Section 3.3, "Trip Reliability").

Table 3.1 I-35W Existing and Future Traffic Volumes

From	To	I-35W Daily Traffic Volumes Vehicles Per Day Existing Conditions	I-35W Daily Traffic Volumes Vehicles Per Day 2040 No Build Alternative
TH 36	CR C	115,100	138,900
CR C	CR D	115,200	137,000
CR D	CR 88 ramps	107,500	128,100
CR 88 ramps	CR E2	116,400	139,000
CR E2	I-694	117,200	143,000
I-694	CSAH 96	120,700	143,800
CSAH 96	TH 10 / CSAH 10	113,700	132,900
TH 10 / CSAH 10	CR H	138,200	173,800
CR H	CR I	143,000	183,800
CR I	TH 10	136,600	177,800
TH 10	Lake Drive	87,200	111,800
Lake Drive	95th Avenue	63,500	81,700
95th Avenue	Lexington Avenue	54,300	70,600
Lexington Avenue	CSAH 23	42,400	54,600

3.1 Pavement Conditions

3.1.1 Existing Conditions

The south end of the project corridor (north of CR C) consists of a bituminous pavement surface. A bituminous pavement overlay was completed on I-35W from south of CR C to CR J in 2002. A pavement repair project from I-694 to just north of Lake Drive was completed in 2010. This previous bituminous pavement overlay is at the end of its remaining service life. A bituminous mill and overlay project from CR C to I-694 will be completed in the summer of 2016 (S.P. 6284-166).

The north end of the project corridor from CR H to Sunset Avenue consists of a bituminous overlay constructed over continuously reinforced concrete pavement (CRCP). A bituminous pavement overlay was last completed on the I-35W/TH 10 commons segment in 2002 and north of the I-35W/TH 10 commons segment in 1999. CRCP pavements tend to break-up unevenly compared to other types of concrete pavements. This results in poor surface pavement conditions, ultimately requiring more frequent patching and overlays to maintain an adequate pavement surface condition. The segment of I-35W north of CR H is characterized by numerous asphalt patches that have been constructed on an as-needed basis.

North of Sunset Avenue through the CSAH 23 interchange to the I-35E split, I-35W consists of an unbonded concrete overlay. This unbonded concrete overlay was completed in 2000 and has a high remaining service life (see Section 3.1.2).

3.1.2 MnDOT Pavement Condition Indices

MnDOT uses four indices for reporting pavement conditions. Each of these indices describes a different aspect of pavement conditions and can be used to rank pavement sections and predict the need for future maintenance and rehabilitation. The MnDOT pavement condition indices are described in Table 3.2.[3]

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[3] Minnesota Department of Transportation. Office of Materials and Road Research. Pavement Management Unit. *2014 Pavement Conditions Annual Report* available at http://www.dot.state.mn.us/materials/pvmtmgmt.html.

Table 3.2 MnDOT Pavement Condition Indices

Pavement Condition Index	Description	Rating Scale
Ride Quality Index (RQI)	MnDOT's ride, or smoothness, index. RQI reflects the "seat of the pants" feeling the average user experiences traveling down the roadway.	RQI ratings range from 0.0 to 5.0, with 0.0 being considered very poor and 5.0 being considered very good. The higher the RQI value, the smoother the road is.
Surface Rating (SR)	MnDOT uses SR to describe pavement distress. Pavement distresses are visible defects on the pavement surface. These defects are symptoms that indicate problems of pavement deterioration.	SR ratings range from 0.0 to 4.0. A higher SR rating indicates a road in better condition. A road with no defects is rated at 4.0. A road in need of major repair or rehabilitation will have an SR rating of near or below 2.5.
Pavement Quality Index (PQI)	MnDOT uses PQI as an overall measure of pavement condition, taking into account both smoothness and cracking.	PQI ratings range from 0.0 to 4.5. A higher PQI rating indicates a better overall condition of the roadway.
Remaining Service Life (RSL)	RSL is an estimate, in years, until the RQI will reach a value of 2.5, which is generally considered the end of a pavement's design life. Most pavements will need some type of major rehabilitation when the RQI has reached a value of 2.5.	RSL is considered "high" when the number of years until reaching an RQI of 2.5 is 12 or more years. RSL is considered "low" when the number of years until reaching an RQI of 2.5 is 0 to 3 years.

Every year, the MnDOT Pavement Management Unit collects pavement roughness and digital image data of all the highways on the entire state trunk highway network. From this information, pavement condition indices are calculated and mapped for each of the State's eight districts. The 2014 Pavement Conditions maps for the MnDOT Metro District are illustrated in Figure 3.1 (Ride Quality Index), Figure 3.2 (Surface Rating), Figure 3.3 (Pavement Quality Index), and Figure 3.4 (Remaining Service Life). The I-35W project corridor is indicated in blue each of the pavement conditions figures. The pavement conditions on the I-35W project corridor are briefly described below.

- The Ride Quality Index (RQI) ranges from fair (2.1 to 3.0) to good (3.1 to 5.0) condition categories. MnDOT's criterion for pavement preservation is a RQI generally between 2.5 to 3.0, depending on the type of roadway facility.
- The Surface Rating (SR) generally falls into the good (2.5 to 4.0) condition category.

- The Pavement Quality Index (PQI) ranges from the fair (1.9 to 2.7) to good (2.8 to 4.5) condition categories.
- The Remaining Service Life (RSL) ranges from low (0 to 3 years) south of I-694, high (12 or more years) in the TH 10 commons area, to moderate (4 to 11 years) north of TH 10. As noted above, a bituminous mill and overlay project from CR C to I-694 will be completed in the summer of 2016. This improvement is projected to have a service life of approximately 10 years, after which time additional pavement rehabilitation activities will likely be warranted. Pavement repairs, patching and preservation projects can prolong pavement life and temporarily improve driving conditions; however, a longer term solution is ultimately needed to address pavement conditions.

Figure 3.1 Metro District 2014 Pavement Conditions Map – Ride Quality Index

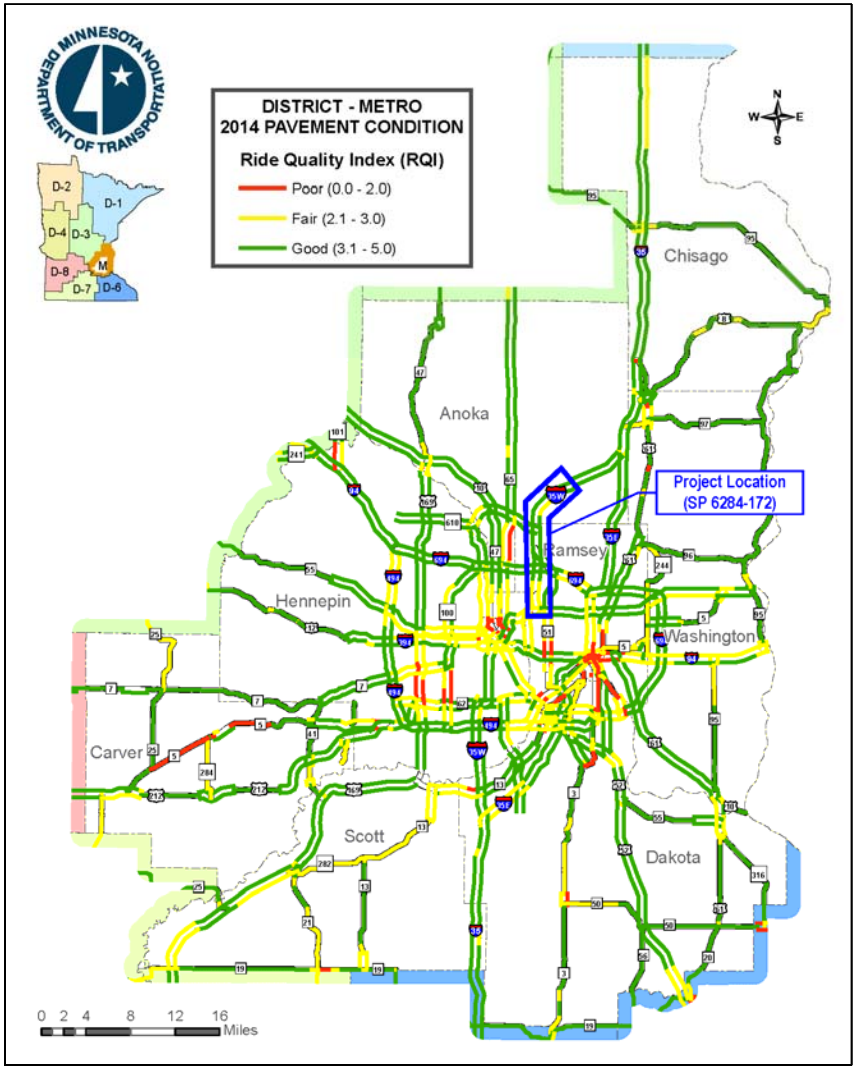


Figure 3.2 Metro District 2014 Pavement Conditions Map – Surface Rating

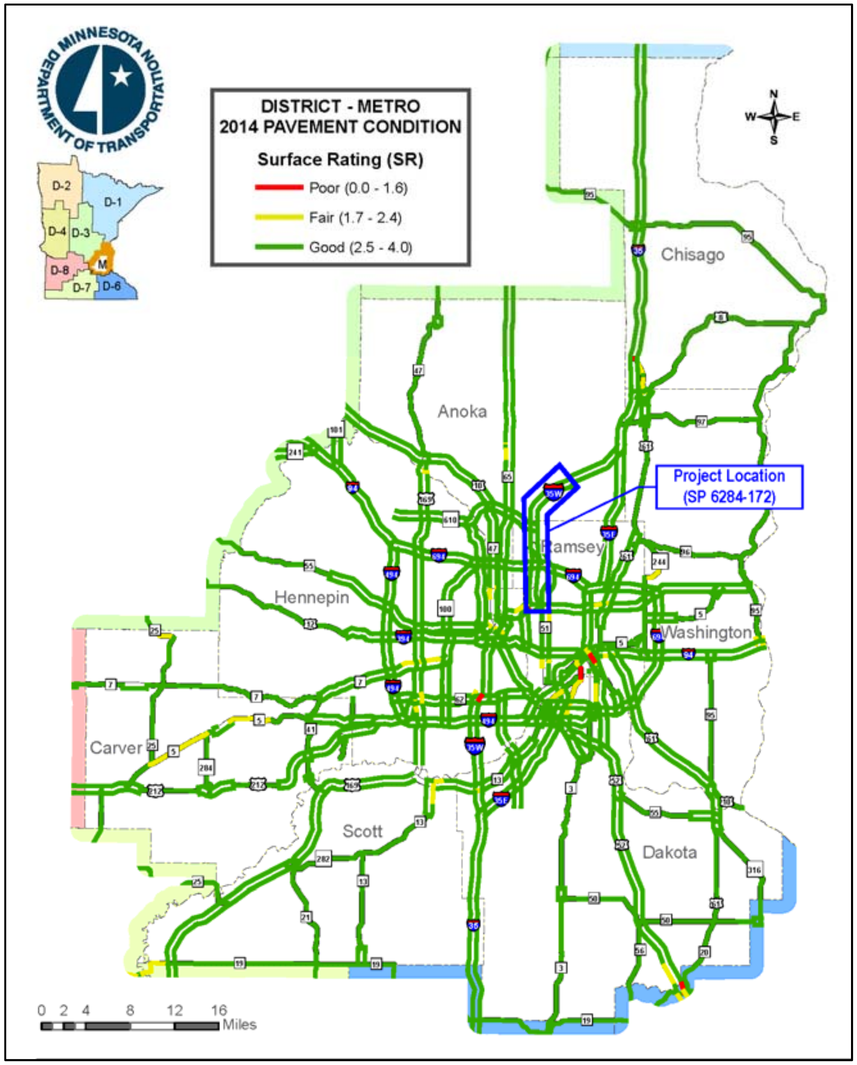


Figure 3.3 Metro District 2014 Pavement Conditions Map – Pavement Quality Index

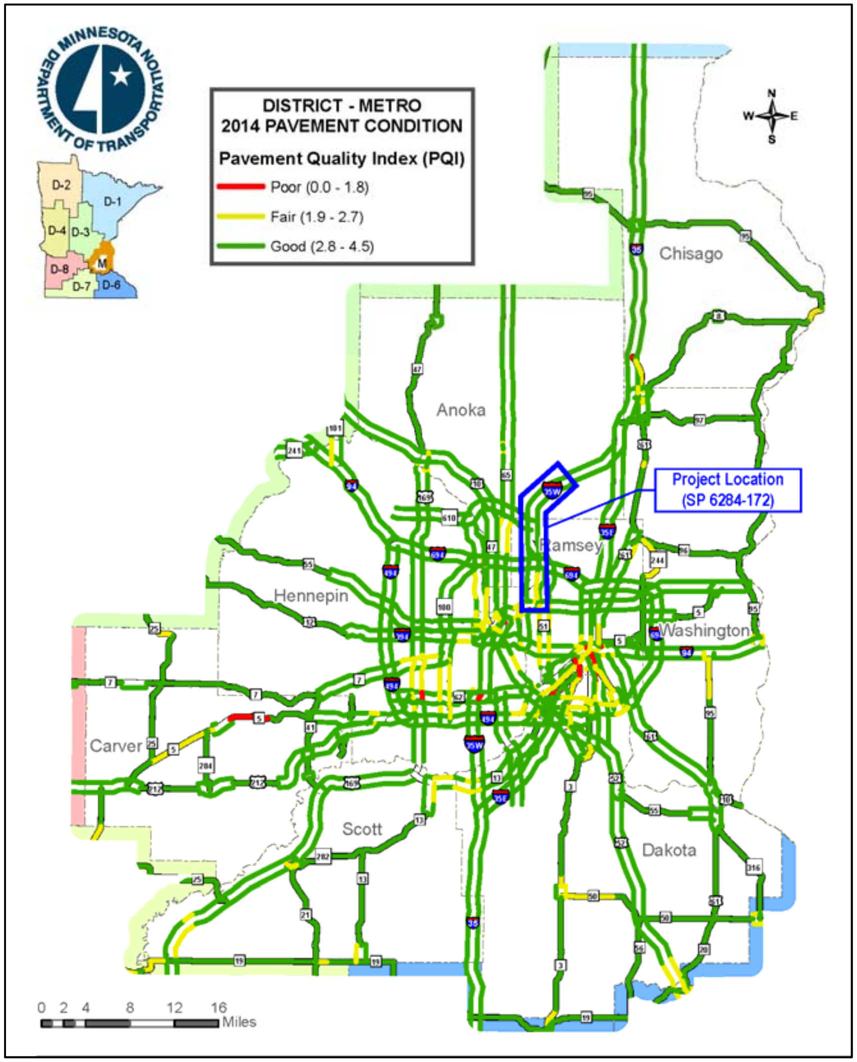
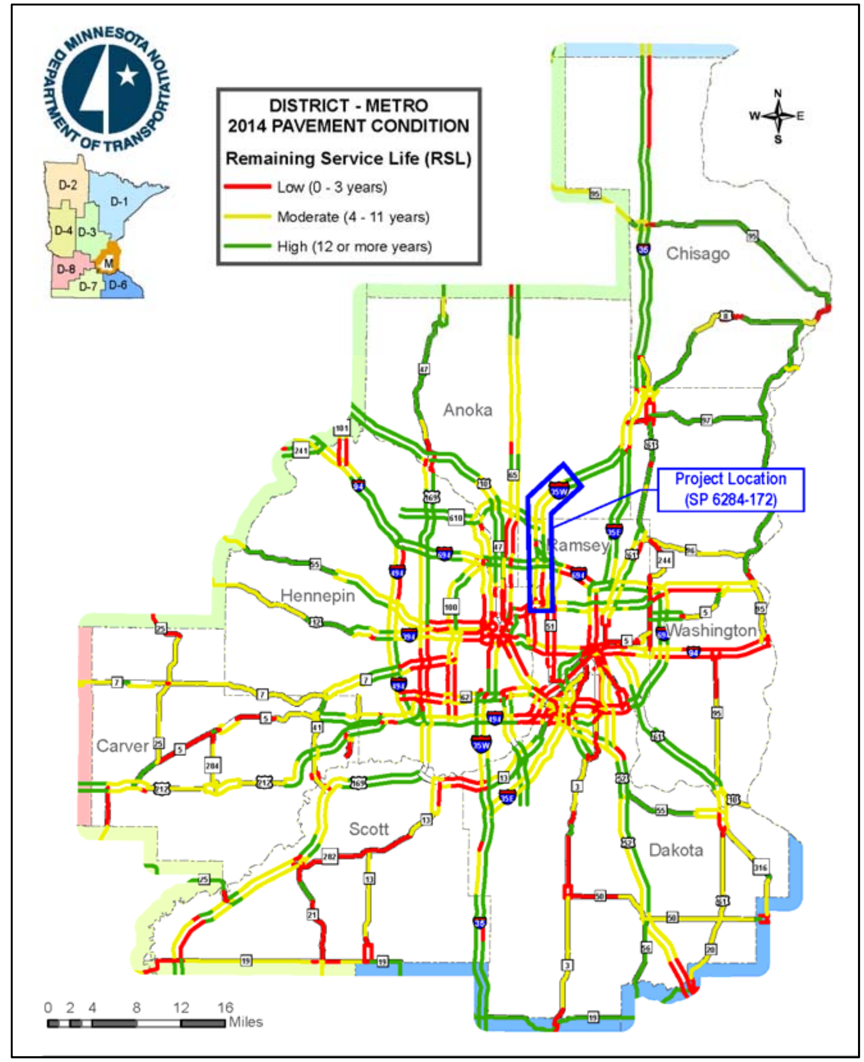


Figure 3.4 Metro District 2014 Pavement Conditions Map – Remaining Service Life



3.2 Mobility and Congestion

The existing highway mobility on the I-35W north corridor is considered deficient based on congestion levels and operational issues during the morning and afternoon peak travel periods. Congestion is expected to increase in the future as additional growth and development occur in communities along I-35W and the greater Twin Cities Metropolitan Region. The following information from the *Metropolitan Freeway System 2014 Congestion Report* (May 2015) and current I-35W North Corridor Project traffic studies further describes the mobility needs for the project.

3.2.1 Metropolitan Freeway System 2014 Congestion Report

Every year, MnDOT's Regional Transportation Management Center (RTMC) prepares the Metropolitan Freeway System Congestion Report. This report documents segments of the freeway system in the Twin Cities that experience recurring congestion. Congestion on a freeway is defined as traffic flowing at speeds less than or equal to 45 MPH, and does not include delays that may occur at speeds greater than 45 MPH. Congestion data is derived from surveillance detectors in roadways and field observations by MnDOT staff. Traffic data from the month of October is used for the congestion reports as this month generally reflects regular patterns of traffic.

MnDOT defines congestion as freeway traffic flowing at speeds less than or equal to **45 miles per hour (MPH)**.

The *Metropolitan Freeway System 2014 Congestion Report* includes freeway maps which display color coding corresponding to a certain number of hours of recurring congestion. The typical legend for congestion reports use a range of color coding; no color represents no recurring congestion while gradually moving to a dark red color that represents multiple hours of recurring congestion. Morning (5:00 a.m. to 10:00 a.m.) and afternoon (2:00 p.m. to 7:00 p.m.) congestion figures from the *Metropolitan Freeway System 2014 Congestion Report* are illustrated in Figure 3.5 and Figure 3.6, respectively.[4]

[4] The complete *Metropolitan Freeway System 2014 Congestion Report* is available on the MnDOT website at http://www.dot.state.mn.us/rtmc/reports/2014congestionreport.pdf.

Figure 3.5 2014 Metro Freeway Congestion (Morning)

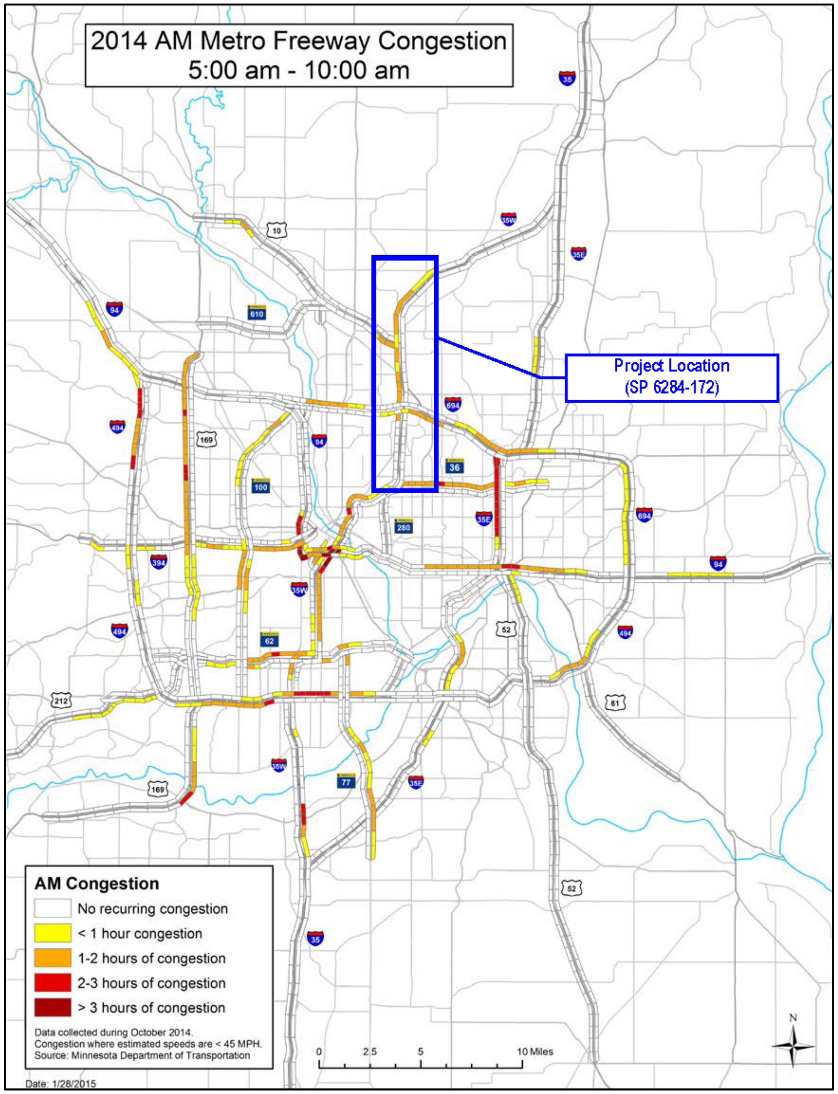
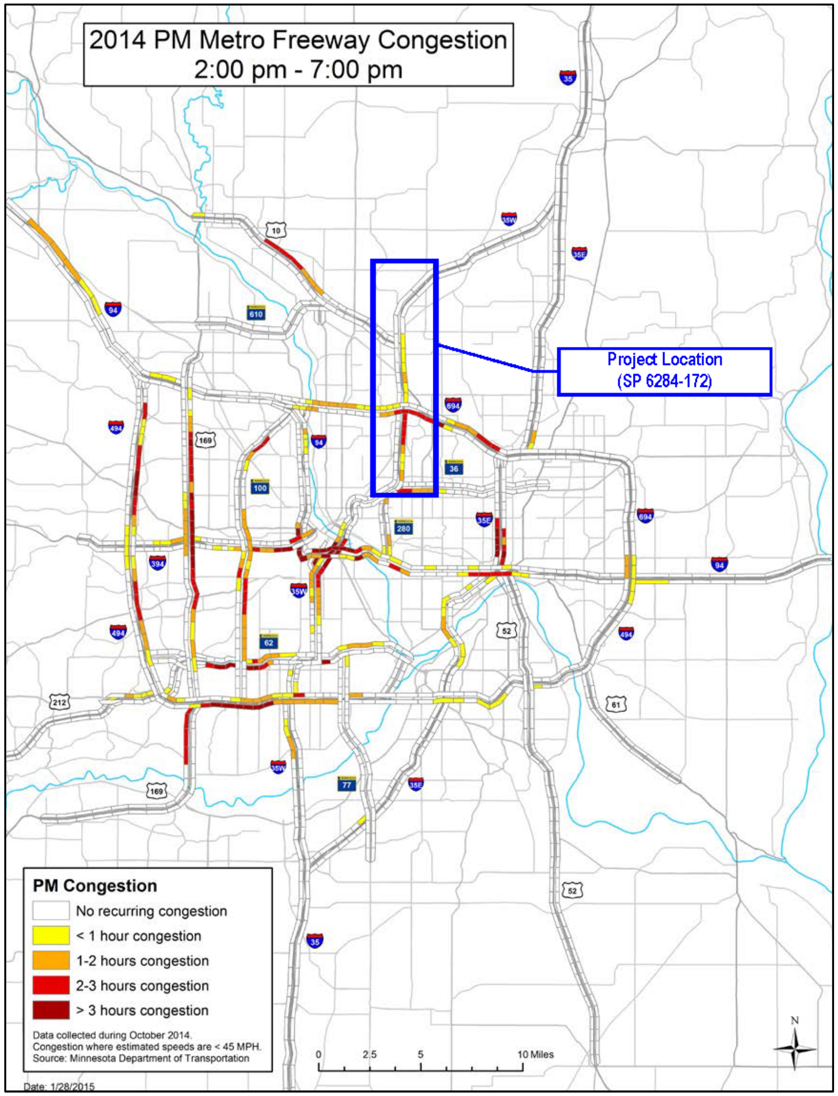


Figure 3.6 2014 Metro Freeway Congestion (Afternoon)



The *Metropolitan Freeway System 2014 Congestion Report* was examined as an initial investigation into congestion on I-35W. During the morning period (5:00 to 10:00 AM), the southbound direction of I-35W shows one to two hours of congestion from north of I-694 through the TH 10 interchange to 95th Avenue, and less than one hour of congestion from 95th Avenue to Lexington Avenue. No recurring congestion was observed in the northbound direction during the AM period (see Figure 3.5). During the afternoon period, the northbound direction of I-35W shows one to two hours of congestion north of TH 36, two to three hours of congestion approaching I-694, and less than one hour of congestion north of I-694 through the TH 10 interchange (see Figure 3.6).

Congestion (i.e., speeds less than or equal to 45 MPH) on I-35W typically ranges from **one to three hours during morning and afternoon peak periods**.

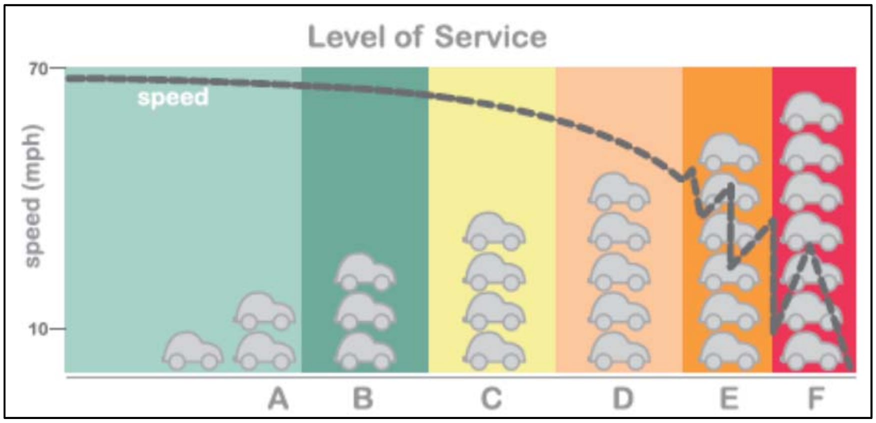
3.2.2 Operational Traffic Analysis

An operational traffic analysis was conducted as part of the I-35W North Corridor Preliminary Design Project. An existing conditions CORSIM traffic model was developed to simulate existing travel lane conditions during the morning and afternoon peak periods for existing (year 2014) conditions. A future year 2040 CORSIM traffic model was also developed incorporating programmed highway improvements and forecast 2040 traffic volumes.[5] The freeway modeling limits include I-35W from the Mississippi River in Minneapolis through the CSAH 23 interchange in Lino Lakes, TH 36 from I-35W to east of Snelling Avenue in Roseville, I-694 from Silver Lake Road in New Brighton to Old Highway 10 in Arden Hills, and TH 10 from I-35W to west of the 93rd Lane interchange in Blaine.

Corridor Simulation (**CORSIM**) is a computer model used by traffic engineers to study and evaluation traffic operations on freeways and surface streets.

The modeling results are measured in terms of a Level of Service (LOS). LOS is a grading system ranging from A to F, which describes the range of congestion on the freeway. The LOS for freeway segments on I-35W, which has only interchange access, is based on vehicle density, as measured in vehicles per lane per hour. The graphic at the top of the following page shows this relationship of LOS A-F in terms of density of vehicles (cars, buses, freight) on the freeway. The speed of vehicles on the freeway can be maintained at higher densities as illustrated in the speed line, however; as the density increases to LOS E and F, speeds can fluctuate greatly.

[5] Details regarding the future (year 2040) traffic volume forecasts developed for the I-35W North Corridor Preliminary Design Project are described in the I-35W North Corridor Preliminary Design Traffic Forecast Technical Memorandum, prepared by SRF Consulting Group Inc., May 20, 2015.



The following sections describe the traffic operations analysis results for the morning and afternoon periods. The I-35W project corridor generally carries commuter-oriented traffic from the northern suburbs to employment centers in Minneapolis and neighboring communities, destinations further south on I-35W, or east and west on I-94. This results in peak period travel patterns that are predominately southbound during the morning and predominately northbound during the afternoon. As such, results presented below emphasize southbound I-35W operations for the morning peak period and northbound I-35W operations for the afternoon peak period.

Operations Analysis Results (Morning)

The operational traffic analysis results for southbound I-35W under existing conditions during the morning are illustrated in Figure 3.7. In general, southbound I-35W currently operates at LOS E-F during the morning peak hour (6:15 a.m. to 7:15 a.m.). The LOS F conditions can extend for up to 2-3 hours at various locations on southbound I-35W and eastbound TH 10 during the morning peak period (6:00 a.m. to 9:00 a.m.). This congestion is caused by a lack of capacity on southbound I-35W. For example, vehicles entering southbound I-35W north of the I-35W/I-694 interchange cause I-35W to reach capacity. This creates congestion and operational problems on southbound I-35W and causes traffic queues to spill back to the north of the I-35W/I-694 interchange. In addition, there are large traffic volumes weaving over relatively short distances as motorists enter and exit the freeway.

The operational traffic analysis results for southbound I-35W under 2040 No Build Alternative conditions during the morning are illustrated in Figure 3.8. Under year 2040 No Build conditions, the I-35W/TH 10 commons segment becomes the dominant bottleneck for southbound I-35W. Congestion is projected to spill back from the I-35W/TH 10 commons segment to the I-35W/CSAH 23 interchange, and LOS F conditions are projected to last for more than three hours (i.e., beyond the 6:00 a.m. to 9:00 a.m. morning peak period). This bottleneck is projected to reduce the volume of traffic that can get through to the I-694 interchange. As a result, the congestion and LOS on southbound I-35W south of the I-694 interchange under 2040 No Build conditions are similar to existing conditions (LOS E).

Operations Analysis Results (Afternoon)

The operational traffic analysis results for northbound I-35W under existing conditions during the afternoon are illustrated in Figure 3.9. In general, northbound I-35W operates at LOS E-F during the afternoon peak hour (3:30 p.m. to 4:30 p.m.) from the CR I interchange south to the CR C interchange. This congestion (LOS F) lasts for approximately 2-3 hours in the I-35W/TH 10 commons segment between CR I and the westbound TH 10 entrance ramp. South of the CR 96 interchange, northbound I-35W currently experiences more than three hours of LOS F conditions during the afternoon (i.e., beyond the 3:00 p.m. to 6:00 p.m. peak period). This congestion is caused by a lack of capacity on northbound I-35, along with large volumes of weaving traffic. For example, the northbound I-35W entering and exiting traffic at the I-694 interchange create an over-capacity weaving segment, and the entering traffic at CR D and CR 88 add to I-35W congestion.

The operational traffic analysis results for northbound I-35W under 2040 No Build Alternative conditions during the afternoon are illustrated in Figure 3.10. Poor traffic operations on northbound I-35W in the I-35W/TH 10 commons segment are projected to worsen (2-3 hours of LOS F conditions during the afternoon peak period). Congestion and poor levels of service (LOS F) are projected to spill back from the I-35W/TH 10 commons segment, through the I-694 and TH 36 interchanges, and to Industrial Boulevard in Minneapolis. The northbound I-35W segment south of the westbound TH 10 is projected to be congested (LOS F) for more than three hours during the afternoon (i.e., beyond the 3:00 p.m. to 6:00 p.m. peak period). Poor operations and congestion on northbound I-35W under future No Build conditions are caused by a lack of capacity. Other factors that contribute to poor operations on northbound I-35W during the afternoon include congestion caused by weaving movements at the I-694 interchange and vehicles entering I-35W from the westbound TH 10 entrance ramp.

Figure 3.7 I-35W Operational Traffic Analysis LOS Results (Existing Conditions) (Morning Peak Period)

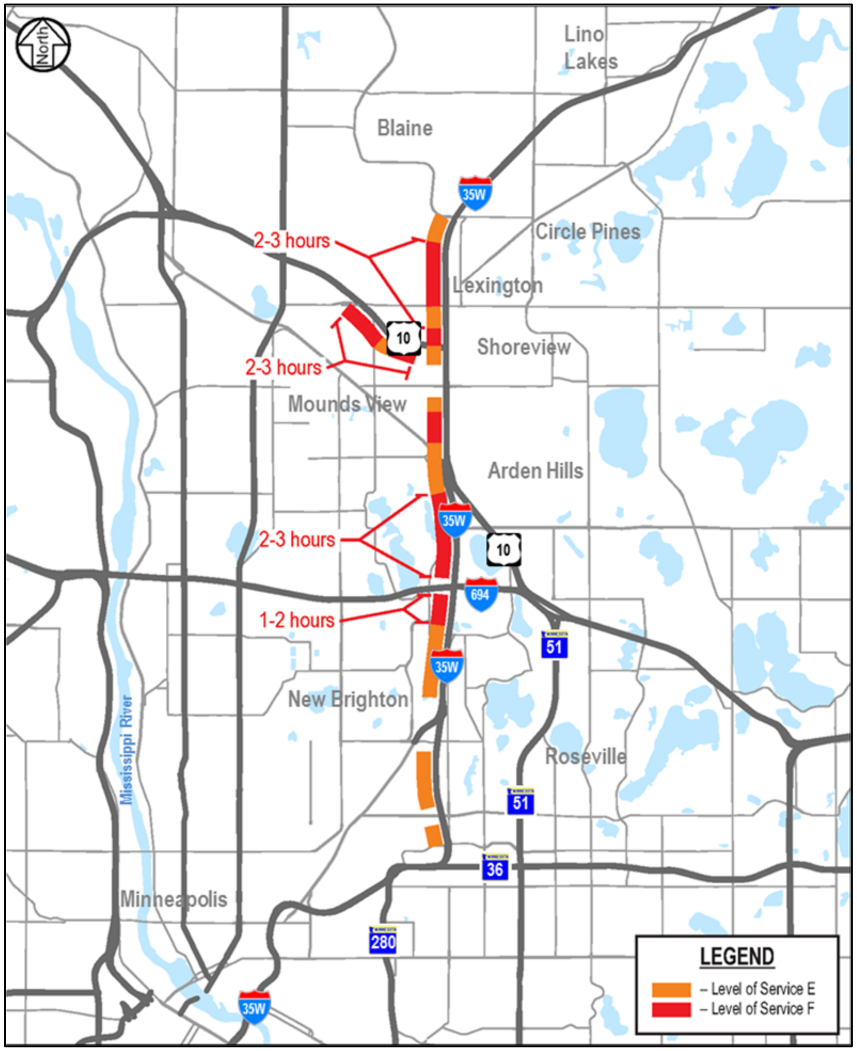


Figure 3.8 I-35W Operational Traffic Analysis LOS Results (2040 No Build Alternative) (Morning Peak Period)

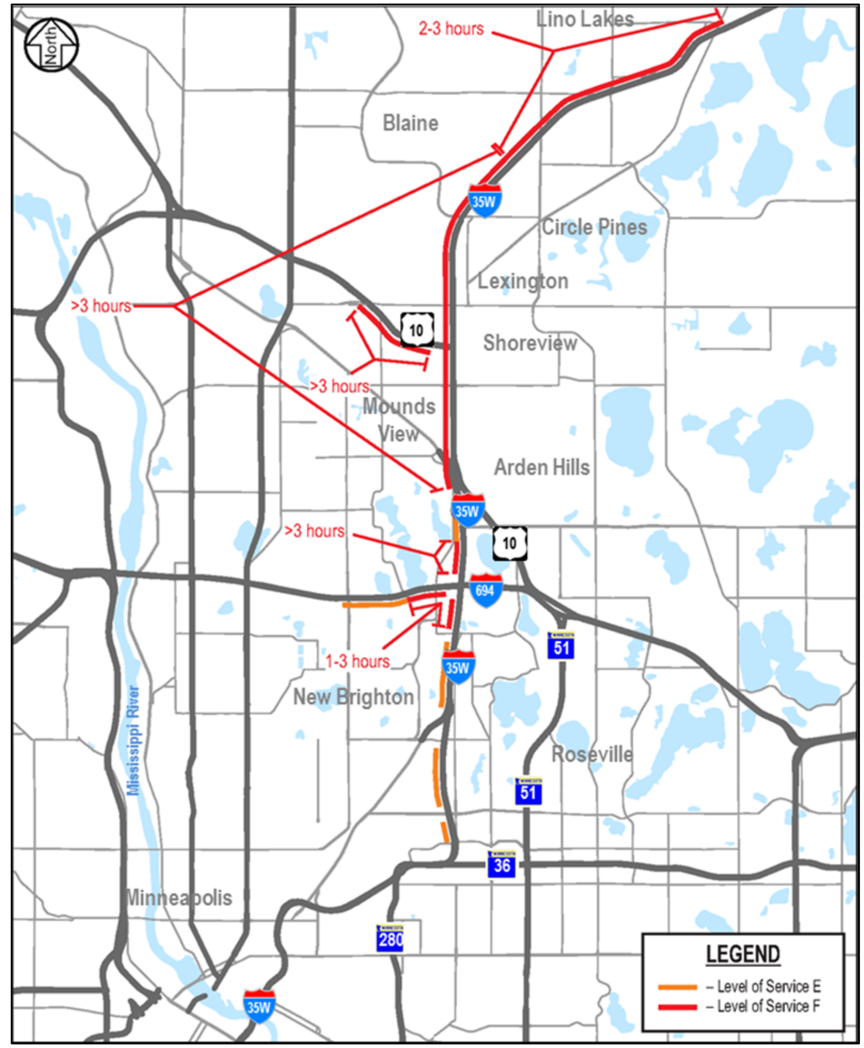


Figure 3.9 I-35W Operational Traffic Analysis LOS Results (Existing Conditions) (Afternoon Peak Period)

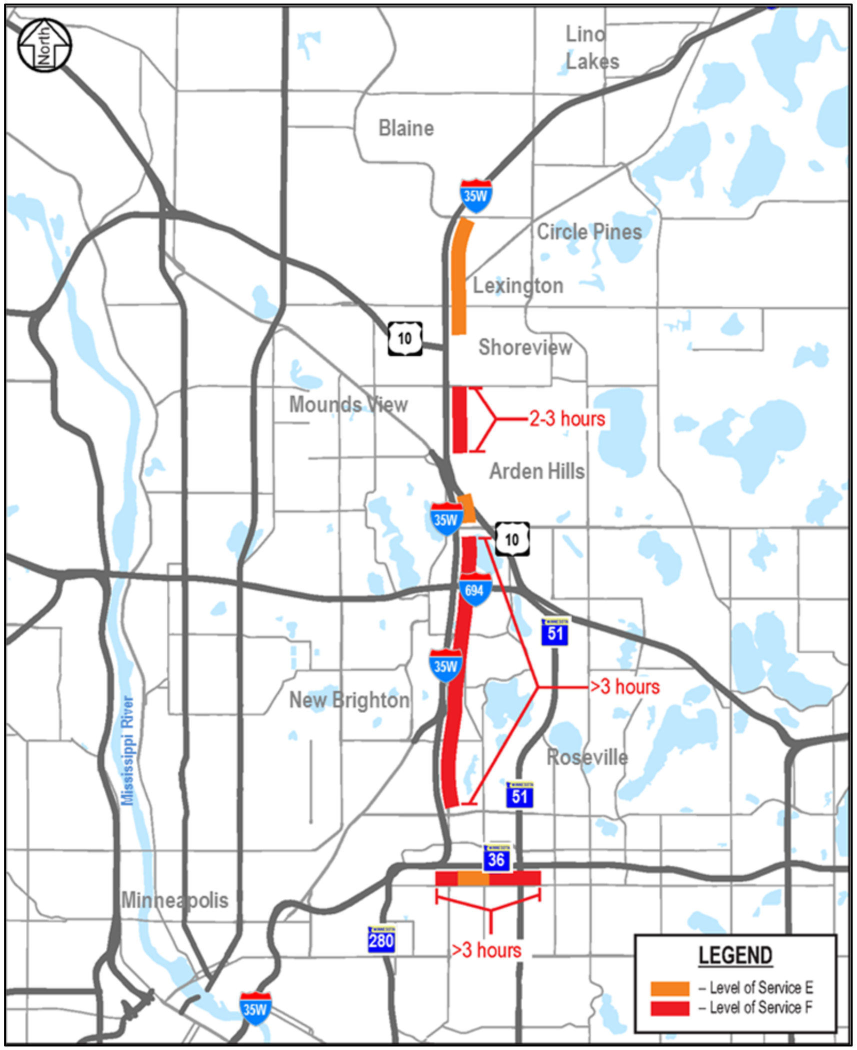
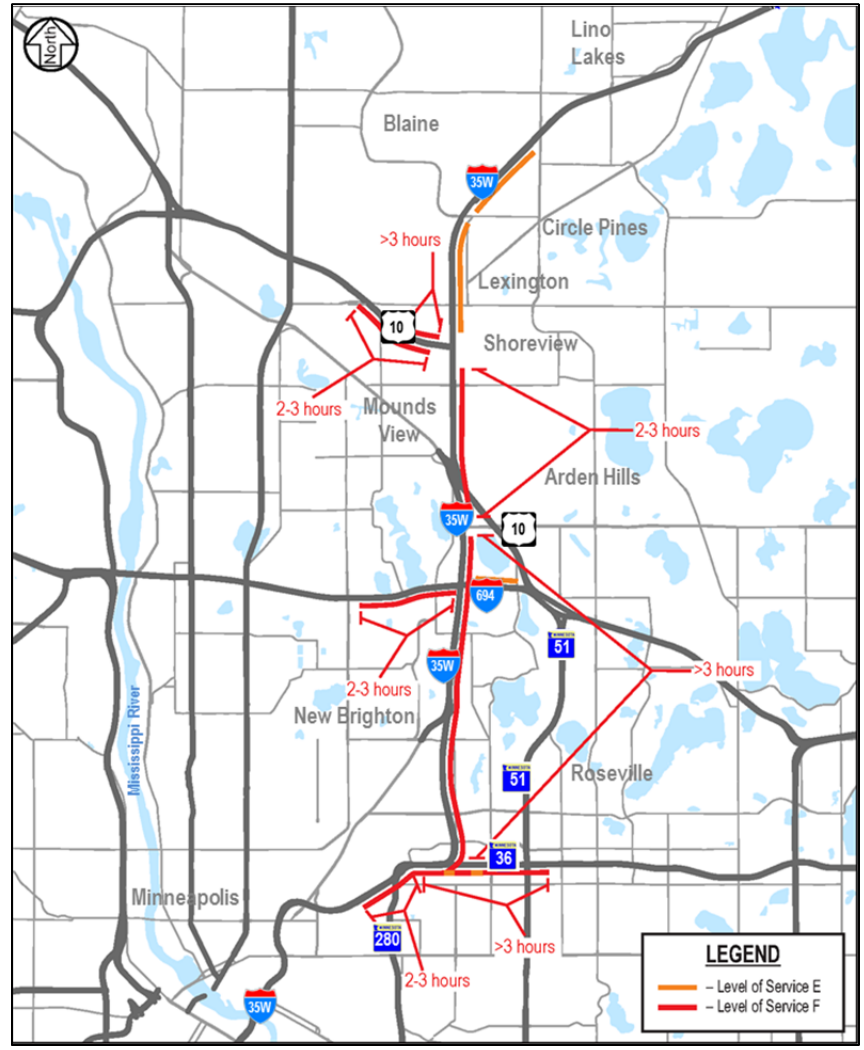


Figure 3.10 I-35W Operational Traffic Analysis LOS Results (2040 No Build Alternative) (Afternoon Peak Period)



3.2.3 Existing and Forecast Travel Times

One of the consequences of the increases in congestion described in Section 3.2.2 is a corresponding increase in travel times. Travel times on I-35W between Lino Lakes (I-35W/CSAH 23 interchange) and Minneapolis (I-35W Mississippi River Bridge) for existing and 2040 No Build Alternative conditions are tabulated in Table 3.3. Morning peak period travel times are shown for southbound I-35W and afternoon peak period travel times are shown for northbound I-35W. Travel times for express buses reflect use of bus-only shoulders and corresponding operating rules (i.e., maximum speed of 35 MPH that is no more than 15 MPH greater than the adjacent traffic).

Average travel times on the I-35W corridor are projected to increase by approximately 13 minutes during the morning peak period from existing conditions to the 2040 No Build Alternative, and approximately 21 minutes during the afternoon peak period. While existing transit advantages would allow for faster travel times compared to general purpose lane traffic under the 2040 No Build Alternative (e.g., 33 minutes for express buses in the afternoon peak period compared to 42 minutes for all general purpose traffic), bus-only shoulder operating rules, including a maximum speed of 35 MPH that is no more than 15 MPH greater than the adjacent traffic, restrict the extent to which express buses can navigate through congested conditions. As such, express bus routes along I-35W are also expected to experience an increase in travel times (see also Section 3.4).

Table 3.3 I-35W Travel Time Summary (Morning and Afternoon Peak Periods Between Lino Lakes and Minneapolis) (1)

Peak Period Average Travel Times (2)	Morning Peak Period (SB I-35W, Express Buses) (3)	Morning Peak Period (SB I-35W, General Purpose Lanes) (4)	Afternoon Peak Period (NB I-35W, Express Buses) (3)	Afternoon Peak Period (NB I-35W, General Purpose Lanes) (4)
Existing Conditions	20 minutes	20 minutes	21 minutes	21 minutes
2040 No Build Conditions	26 minutes	33 minutes	33 minutes	42 minutes
Increase in Travel Times (No Build-Existing)	6 minutes	13 minutes	12 minutes	21 minutes

(1) The morning peak period is from 6:00 a.m. to 9:00 a.m. The afternoon peak period is from 3:00 p.m. to 6:00 p.m.

(2) Weighted average travel times (by hourly volume) over the three-hour a.m. peak period and the three-hour p.m. peak period.

(3) Bus travel times under existing conditions and the 2040 No Build Alternative include use of bus-only shoulders.

(4) Travel times in the general purpose lanes for all vehicles.

3.3 Trip Reliability

One of the effects of congestion is an increase in travel times for all highway users (single-occupancy motorists, carpools, transit, and freight carriers). However, variability in congestion (i.e., severe congestion on one day, moderate congestion on the next day, limited to no congestion on another day, etc.) is also impacts roadway users. Recurring congestion along with non-recurring factors can cause travel times to fluctuate in an unpredictable manner. Variability in congestion combined with non-recurring events ultimately results in poor travel time reliability and requires all travelers to increase their "planning time" to account for potential travel time delays.

3.3.1 Travel Time Reliability

To better understand the effects of recurring congestion and non-recurring events on variability in travel times, a travel time reliability analysis was conducted as part of the I-35W North Corridor Preliminary Design Project. The limits of the travel time reliability analysis were from the I-35W Mississippi River crossing in Minneapolis to the I-35W/Lexington Avenue interchange in Blaine. The analysis involved gathering travel time and volume data for I-35W in 15-minute intervals for every day in year 2014. Data for non-recurring events was also collected, including crash data from Department of Public Safety (DPS) records and weather information from the National Oceanic and Atmospheric Administration (NOAA). The crash and weather data were then integrated with the travel time and volume data to assign delays by event. This exercise was repeated incorporating forecast year 2040 traffic volumes, simulating the potential travel time variability under future No Build Alternative conditions.

The outcome of this analysis was a corridor-level estimate of the typical variability in travel times experienced by users along the I-35W corridor. These estimates represent a range of travel times, from travel times with free-flow conditions (i.e., travel at and above posted speed limits) up to the worst travel time that could be expected to occur approximately once per month. For purposes of this analysis, the data were limited to the morning and afternoon peak periods, representing one month (20 days) of typical commuting times for the corridor.

Travel time variability results presented below emphasize southbound I-35W for the morning peak period (6:00 AM to 9:00 AM) and northbound I-35W for the afternoon peak period (3:00 p.m. to 6:00 p.m.). Morning peak period results under existing conditions are shown in Figure 3.11. Afternoon peak period results for existing conditions are shown in Figure 3.12. The colors in Figure 3.11 and 3.12 are representative of I-35W corridor travel times relative to free-flow conditions. For example, the light green color in the "< free flow" category represents the range of travel times at speeds between the posted speed limit and 45 mph. MnDOT defines congestion as speeds traveling less than 45 mph. The tan color represents travel times that would be approximately two times greater than I-35W travel times under free flow conditions (e.g., "2.0 x Free Flow").

During the morning peak period, typical commuting times under existing conditions for most days of the month typically range from approximately 15 minutes to nearly 22 minutes. On at least one day during the month, the typical morning commute could approach approximately 38 minutes. During the afternoon peak period, commuting times typically range from approximately 16 minutes to nearly 25 minutes for more than half the typical month. However, during the afternoon peak period, a user along the I-35W corridor is more likely to experience travel times greater than 25 minutes, and on at least one day, the afternoon commute could also approach nearly 38 minutes.

Increases in congestion and non-recurring events such as traffic incidents and weather conditions is likely to increase variability in travel times, requiring all travelers to increase their **"planning time"** to account for potential travel time delays.

The extent to which I-35W is congested during the morning and afternoon peak periods, both in terms of location and duration, is projected to increase from existing to future 2040 No Build Alternative conditions (see Section 3.2.2). Segments of I-35W that are currently not congested cannot be relied upon to operate at or near free-flow conditions in the future. As congestion increases, along with non-recurring events such as traffic incidents and weather conditions, the variability in travel times along the I-35W project corridor is also anticipated to increase. Variability in congestion combined with non-recurring events ultimately results in poor travel time reliability and requires all travelers to increase their "planning time" to account for potential travel time delays.

Figure 3.11 Southbound I-35W Travel Time Variability (Blaine to Minneapolis, Existing Conditions, Morning Peak Period)

Mon-Fri 6:00 AM to 9:00 AM

Days/Month	Travel Time
1	14.6
2	14.9
3	15.1
4	15.4
5	15.6
6	15.9
7	16.2
8	16.5
9	16.8
10	17.2
11	17.7
12	18.4
13	19.3
14	20.3
15	21.6
16	23.5
17	25.3
18	27.6
19	31.6
20	37.9

Travel Time Index

- > 4.0 x Free Flow
- 4.0 x Free Flow
- 3.5 x Free Flow
- 3.0 x Free Flow
- 2.5 x Free Flow
- 2.0 x Free Flow
- 1.5 x Free Flow
- < Free Flow
- Free Flow

Existing Conditions Travel Times (Minutes)

Figure 3.12 Northbound I-35W Travel Time Variability (Minneapolis to Blaine, Existing Conditions, Afternoon Peak Period)

Mon-Fri 3:00 PM to 6:00 PM

Days/Month	Travel Time
1	16.1
2	16.6
3	17.0
4	17.6
5	18.1
6	18.5
7	18.9
8	19.7
9	20.5
10	21.8
11	23.2
12	24.5
13	25.4
14	26.3
15	27.2
16	28.2
17	29.5
18	31.6
19	34.4
20	38.2

Travel Time Index

- > 4.0 x Free Flow
- 4.0 x Free Flow
- 3.5 x Free Flow
- 3.0 x Free Flow
- 2.5 x Free Flow
- 2.0 x Free Flow
- 1.5 x Free Flow
- < Free Flow
- Free Flow

Existing Conditions Travel Times (Minutes)

3.3.2 Transit Reliability

Reliability is a key feature of transit systems. Indeed, express bus users identified reliability (i.e., service is on schedule) as one of the highest ranking priorities in the 2014 Metro Transit River Survey.[6] Metro Transit uses several different metrics for evaluating transit service reliability, including schedule deviation times and on-time performance. Schedule deviation times and on-time performance for the three I-35W project corridor express bus routes are described below.

Schedule Deviation Times

Metro Transit buses are equipped with GPS systems (onboard vehicle locators) that allow Metro Transit to track the amount of time that buses deviate from scheduled arrival times. A sample of real-time schedule deviation data for I-35W express buses from mid-March 2015 are tabulated in Table 3.4. The range of minutes behind or ahead of scheduled arrival times at the first stop location in Minneapolis during the morning peak period are shown on the left. The range of minutes behind or ahead of scheduled arrival times at park and ride facilities in Blaine and Columbus during the afternoon peak period are shown on the right.

Table 3.4 Express Bus Route Schedule Deviation (Minutes Behind or Ahead of Schedule) (1)

Express Bus Route #	Morning Peak Period Arrival Location (Southbound I-35W)	Morning Peak Period (2) Minutes Behind/Ahead of Schedule (3)	Afternoon Peak Period Arrival Location (Northbound I-35W)	Afternoon Peak Period (2) Minutes Behind/Ahead of Schedule (3)
Route 250	Washington Avenue/11th Avenue (Minneapolis)	-3.9 to 6.0	95th Avenue Park and Ride (Blaine)	-3.6 to 1.5
Route 252	Cedar Avenue/ Washington Avenue (Minneapolis)	-3.7 to -3.2	95th Avenue Park and Ride (Blaine)	-2.7 to 1.6
Route 288	Washington Avenue/11th Avenue (Minneapolis)	-1.6 to 6.2	Running Aces Park and Ride (Columbus)	3.9 to 7.9

[6] Metro Transit. 2014 Metro Transit Rider Survey. Final Report 2.15.2015 available at https://www.metrotransit.org/Data/Sites/1/media/blog/metro-transit-rider-survey-2014---final.pdf.

(1) Morning and afternoon peak period schedule deviation times for March 17, 2015.

(2) Morning peak period trips between 6:00 a.m. and 9:30 a.m. Afternoon peak period trips between 3:00 p.m. and 6:30 p.m.

(3) Negative numbers indicate the number of minutes behind schedule (late trips) whereas positive numbers indicate the number of minutes ahead of schedule (early trips).

On-Time Performance

Metro Transit defines "on-time" as arriving one minute before the scheduled arrival time to five minutes late of the scheduled arrival time. For example, a bus that is scheduled to arrive at 5:00 p.m. would be considered on-time if it arrived between 4:59 p.m. and 5:05 p.m. On-time performance results (percent of trips that are early, late or on-time) for the mid-March to mid-June 2015 period for the three express bus routes using the I-35W project corridor are tabulated in Table 3.5. On-time performance at the first stop in downtown Minneapolis during the morning peak period is shown on the left. On-time performance at the first stop in the northern suburbs during the afternoon peak period is shown on the right. For routes at their first stop location, the on-time performance represents the percent of trips that departed on-time to their next stop location. For routes at their last stop location, the on-time performance represents the percent of trips that arrived on-time.

Table 3.5 I-35W Express Bus Route On-Time Performance (1)

Express Bus Route #	Morning Peak Period Location (Southbound I-35W)	Morning Peak Period On-Time Performance	Afternoon Peak Period Location (Northbound I-35W)	Afternoon Peak Period On-Time Performance
Route 250	Washington Avenue/11th Avenue (Minneapolis)	78.2% (2)	95th Avenue Park and Ride (Blaine)	100% (2)
Route 252	Cedar Avenue/ Washington Avenue (Minneapolis)	54.5% (2)	95th Avenue Park and Ride (Blaine)	100% (3)
Route 288	Washington Avenue/11th Avenue (Minneapolis)	86.8% (2)	Running Aces Park and Ride (Columbus) (2)	100% (2)

(1) On-time performance for the March 9, 2015 to June 12, 2015 reporting period.

(2) First stop in downtown Minneapolis during morning peak period or first stop in northern suburbs during afternoon peak period. Percent of trips departing on time to the next stop location.

(3) Last stop on route. Percent of trips arriving on time.

Existing congestion on I-35W already has some effect on transit reliability. Morning peak period express bus routes traveling I-35W had an on-time performance ranging from 54.5% to 86.8% during the March to June 2015 period, whereas express bus routes had an on-time performance of 100% in the afternoon peak period. As described in Section 3.3.1, increases in peak period congestion under 2040 No Build Alternative conditions along with non-recurring events (e.g., traffic incidents, weather conditions) are likely to result in greater variability in travel times along the I-35W project corridor, affecting the reliability of transit services.

3.4 Transit and HOV Advantages

In addition to the mobility and trip reliability needs described above, another primary reason for undertaking this project is to improve transit and expand HOV advantages. The Metropolitan Council defines transit advantages as follows:

Transit advantages are any infrastructure improvement that gives transit vehicles a speed or reliability advantage over general traffic and thereby make transit more attractive and competitive with the car.[7]

Existing transit advantages on the I-35W project corridor include bus only shoulders. HOV advantages are limited to two southbound I-35W bypass ramps (see Section 2.1.1). Additional details regarding transit and HOV issues are described below.

3.4.1 Existing and Future Transit Demand

More than **4,300 daily transit users** are projected to travel on the I-35W project corridor by year 2040.

The I-35W project corridor between TH 36 and Lexington Avenue currently supports a substantial amount of transit use. As described in Section 2.1.1, 87 express buses travel the corridor on a typical weekday during the morning and afternoon peak periods. More than 2,500 daily transit users currently ride the three express bus routes that travel on the I-35W project corridor the northern suburbs and downtown Minneapolis and the University of Minnesota[8]. The number of daily transit users on I-35W is projected to increase to approximately 4,300 daily transit users by year 2040 under No Build conditions, an increase of approximately 40 percent. It is important to note that these transit forecasts do not include any capacity constraints on the system, either in bus or park and ride capacity.

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[7] Metropolitan Council. August 2008. *2030 Transit Master Study. Twin Cities Metropolitan Area.*

[8] 2011 ridership data from Metro Transit. Source: *I-35W North Managed Lanes Corridor Study Final Report.* 2013. Table 3.4 – Route Profiles. Since completion of the *I-35W North Managed Lanes Corridor Study Final Report*, ten bus trips have been added to the express bus routes using the I-35W project corridor (five bus trips to Route 252 and five bus trips to Route 288).

3.4.2 Transit Advantages

Operational challenges associated with the existing bus only shoulders along the I-35W project corridor were documented in the *I-35W North Managed Lanes Corridor Study Final Report*:

Metro Transit bus operators that drive routes along the I-35W north corridor use the bus only shoulder primarily during the "peak of the peak period," which they indicate as between 6:45 a.m. and 8:00 a.m. and between 4:15 p.m. and 5:30 p.m. A number of factors go into a driver's choice to use the bus only shoulder, including traffic moving consistently below 35 MPH, comfort using the shoulder, pressure from riders and other buses, and lack of operational challenges. Operational challenges associated with bus shoulder lane use include narrow shoulders, snow and inclement weather, pot holes/poor pavement condition, traffic merging onto I-35W north across the shoulder, and vehicles blocking the shoulder.[9]

Express bus riders also identified reasonable travel times as one of the top priorities for express bus routes in the 2014 Metro Transit River Survey. As the I-35W corridor becomes more congested under future year 2040 No Build conditions, it will become more and more difficult to maintain reasonable transit travel times along the I-35W project corridor. Operational challenges described above will persist, making it increasingly difficult for transit buses to navigate the corridor. Increases in congestion and corresponding decreases in travel speeds results in increases in travel times. Total round trip bus travel times[10] are projected to increase by almost 20 minutes under the future 2040 No Build Alternative compared to existing conditions (see Table 3.6).

Table 3.6 Bus Travel Time Summary (Round Trip Between Lino Lakes and Minneapolis)

Travel Times	Morning Peak Period (Southbound I-35W) (Minutes)	Afternoon Peak Period (Northbound I-35W) (Minutes)	Total Round Trip (Minutes)
Existing Conditions	20.1	21.0	41.1
2040 No Build Alternative	26.2	32.9	59.1

[9] Minnesota Department of Transportation. June 2013. *I-35W North Managed Lanes Corridor Study Final Report*. Chapter 3, Section 3.6. Transit and High Occupancy Vehicles.

[10] Total round trip bus travel time = southbound I-35W morning peak period bus travel time (Lino Lakes to Minneapolis) + northbound I-35W afternoon peak period bus travel time (Minneapolis to Lino Lakes).

3.4.3 HOV Advantages

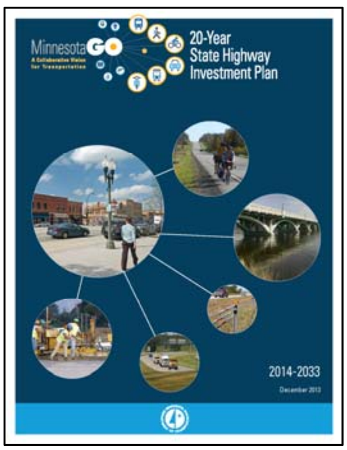
High occupancy vehicles (HOV), or carpooling, helps reduce congestion by increasing the amount of travel by modes other than single-occupant vehicles. Carpooling also improves the throughput of the facility by moving more people per vehicle. Carpools currently operate within mixed traffic on I-35W between TH 36 and Lexington Avenue, and are subject to the same travel time delays during peak periods that impact all motorists on the I-35W project corridor (see Table 3.3). There are no existing time saving advantages along the project corridor that would encourage carpooling (at times when ramp meters are in operation) other than the two existing HOV bypass ramps entering southbound I-35W at Lake Drive and 95th Avenue.

Chapter 4 Additional Goals and Objectives

In addition to the Project Needs, the following goals and objectives were identified to help guide the project development process and alternatives evaluation. Additional project goals and objectives include consistency with regional transportation plans, utilizing existing and future infrastructure investments, and fiscal considerations.

4.1 Consistency with State and Regional Transportation Plans

4.1.1 Minnesota State 20-Year Highway Investment Plan 2014-2033 (MnSHIP)



MnDOT released the *Minnesota State 20-Year Highway Investment Plan 2014-2033* (MnSHIP) in December 2013. MnSHIP is MnDOT's planning document for communicating capital investment priorities for the state highway system for the 20-year period from 2014 through 2033. MnSHIP is available on the MnDOT website at http://www.dot.state.mn.us/planning/mnship/.

Chapter 3 of MnSHIP describes the level of investments needed on the state highway system for the 20-year period from 2014 to 2033 for five investment areas. One of these five investment areas, "Critical Connections", includes the "Twin Cities Mobility" investment category. The Twin Cities Mobility category refers to improvements needed to manage the effects of congestion and improve traffic flow on the urban freeway system. An estimated $3.9 billion is needed in the Twin Cities Mobility investment category over the next 20 years to meet federal and state performance requirements. However, approximately $520 million (approximately three percent of the total federal and state revenues) is identified for Twin Cities Mobility improvements.[11]

With many transportation infrastructure needs and limited financial resources, MnDOT must prioritize investments to align with statewide transportation goals. Chapter 4 and Chapter 5 of MnSHIP addresses MnDOT's investment priorities and strategies for the different investment categories identified in the plan, including the "Twin Cities Mobility"

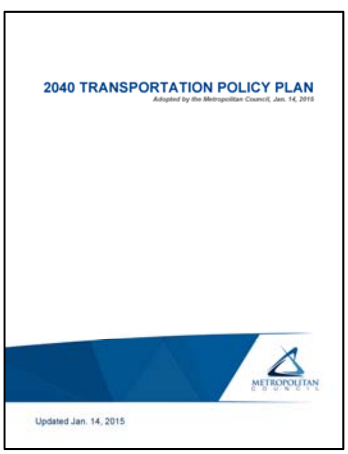
[11] Minnesota Department of Transportation. December 2013. *Minnesota State 20-Year Highway Investment Plan 2014-2033*. Chapter 3. Transportation Needs.

category. Optimization strategies described in MnSHIP to address mobility concerns will guide the alternatives development and evaluation process for the Project and include:[12]

- Leverage existing resources for all available transportation modes in order to optimize mobility.
- Emphasize reliable and predictable travel options.
- Develop congestion performance measures that reflect the goals and objectives sought through the current congestion management strategies (i.e., active traffic management, spot mobility improvements, MnPASS priced managed lanes, strategic capacity enhancements).
- Focus mobility investments on projects that address multiple objectives.

4.1.2 Metropolitan Council 2040 Transportation Policy Plan

The Metropolitan Council, as the designated planning agency for the Twin Cities Metropolitan Region, is required by federal regulations to prepare a transportation policy plan (TPP). The TPP establishes a series of transportation-related policies and strategies, and responds to federal planning requirements. The most recent version of the TPP, the Metropolitan Council's *2040 Transportation Policy Plan*, was adopted on January 14, 2015 and is available on the Metropolitan Council's website at http://metrocouncil.org/Transportation/Planning-2/Key-Transportation-Planning-Documents/Transportation-Policy-Plan-(1)/The-Adopted-2040-TPP-(1).aspx.



Transportation Policy Plan Strategies

Chapter 2 of the *2040 Transportation Policy Plan* identifies specific strategies and actions to address how the Twin Cities Metropolitan Region will achieve its transportation goals and objectives. Strategies documented in the *2040 Transportation Policy Plan* that will guide the alternatives development and evaluation process for the Project includes:

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[12] Minnesota Department of Transportation. December 2013. *Minnesota Go: 20-Year State Highway Investment Plan, 2014-2033*. Chapter 5. 20-Year Investment Plan. Twin Cities Mobility. Optimization Strategies, pp. 116-117.

- Strategy C3: The Council, working with MnDOT through their Enhancing Financial Effectiveness (EFE) efforts, and other relevant jurisdictions, will continue to maintain a Congestion Management Process for the region's principal arterials to meet federal requirements. The Congestion Management Process will incorporate and coordinate the various activities of MnDOT, transit providers, counties, cities and transportation management organizations to increase the multimodal efficiency and people-moving capacity of the National Highway System.
- Strategy C4: Regional transportation partners will promote multimodal travel options and alternatives to single occupant vehicle travel and highway congestion through a variety of travel demand management initiatives, with a focus on major job, activity, and industrial and manufacturing concentrations on congested highway corridors and corridors served by regional transit service.
- Strategy C5: The Council will work with MnDOT and local governments to implement a system of MnPASS lanes and transit advantages that support fast, reliable alternatives to single-occupancy vehicle travel in congested highway corridors.
- Strategy C7: Regional transportation partners will manage and optimize the performance of the principal arterial system as measured by person throughput.
- Strategy C8: Regional transportation partners will prioritize all regional highway capital investments based on a project's expected contributions to achieving the outcomes, goals, and objectives identified in *Thrive MSP 2040* and the Transportation Policy Plan.

Highway Investment Strategies

Chapter 5 of the *2040 Transportation Policy Plan* describes 10 types of highway investment strategies, including a collection of five categories referred to a "regional mobility improvements". These categories include: traffic management technology investments, spot mobility improvements, MnPASS system expansion, highway strategic capacity enhancements, and highway access investment. The following excerpt from the *2040 Transportation Policy Plan* describes the direction and approach to address highway capacity issues, and will guide the alternatives development and evaluation process for the I-35W North Corridor Project.

If physical capacity is needed, the next category of investment should be to investigate implementing lower cost/high-return-on-investment spot mobility improvements. Spot mobility improvements include smaller, lower-cost projects such as lane striping, improved *signal timing, or adding turn lanes. If traffic management technologies and spot mobility improvements do not address the highway capacity issue identified, adding more physical capacity – expansion improvements – should be explored.*

Expansion improvements include new or extended MnPASS lanes, strategic capacity enhancements, and highway access investments. The regional objective of providing a congestion-free, reliable option for transit users, carpoolers and those willing to pay through MnPASS lanes is the region's priority for expansion improvements. General purpose lane strategic capacity enhancements should only be considered if adding capacity through MnPASS lanes has been evaluated and found to not be feasible, the improvement is affordable, and the improvement is approached with a lower cost/high-return-on-investment philosophy.

Transit System Improvements

Chapter 6 of the *2040 Transportation Policy Plan* describes the transit investment plan for the Twin Cities Metropolitan Region, and includes a discussion of expanding transit advantages along Metro area freeways, signalized highways, and city streets. Transit advantages work to maintain transit travel times and reliability, and can increase the amount of person throughput on a highway corridor. The *2040 Transportation Policy Plan* states the following regarding transit advantages and highway improvements:

While some express and local transit corridors are currently well supported by transit advantages, there are a number of locations that need improvements to maintain or improve transit travel times and reliability. In addition, opportunities to coordinate with planned road improvements, or to adequately serve planned community development projects through enhanced transit service, provide high returns on capital transit infrastructure investment.

Part of the need for the project includes addressing transit advantages along I-35W in order to maintain or improve transit travel times and reliability over the long-term from existing to future year 2040 conditions. Opportunities for providing transit advantages will also guide the alternatives development and evaluation process for the I-35W North Corridor Project.

4.2 Utilize Existing and Future Infrastructure Investments

4.2.1 Use Existing and Future Infrastructure Investments

One of the categories described in Chapter 5 of the Metropolitan Council's *2040 Transportation Policy Plan* includes the lower cost/higher-return-on-investment philosophy for mobility improvements. These types of improvements provide bottleneck relief, improve roadway geometrics, and address safety hazards while maximizing the use of existing

The lower-cost/high-benefit philosophy emphasizes smaller-scale, more affordable projects at key locations to remove bottlenecks and improve traffic flow.

pavement and highway right of way. The 2013 I-35W North Managed Lanes Corridor Study developed and evaluated a range of localized concepts to address areas of congestion in the I-35W corridor. These concepts were developed based on the objective to better use existing and future infrastructure investments and to develop lower cost/high benefit strategies to address these areas of congestion. Opportunities for incorporating design elements that utilize existing and future infrastructure investments to address localized areas of congestion, consistent with the lower cost/high benefit approach, should be considered in project development where feasible.

4.2.2 Bridge Preservation

There are 23 bridges located along the I-35W project corridor between TH 36 and CSAH 23. Many of these bridges and other infrastructure elements along the I-35W project corridor are nearing the end of their useful lives and are in need of replacement or rehabilitation. Indeed, MnDOT has recently completed or has programmed replacement of several of the existing bridges spanning over the project segment of I-35W (CR E2, CR F, CSAH 96, and CR H).

The need for bridge preservation activities along the I-35W project corridor is independent of the pavement, mobility, reliability, and transit advantage needs described above. However, opportunities for addressing bridge preservation where feasible and where future cost savings could potentially be realized should be considered in project development.

Chapter 5 Project Purpose

5.1 Project Purpose

The purpose of this project is to provide a long-term, sustainable option for all highway users (transit and non-transit) that improves pavement conditions, increases mobility, improves travel time reliability, and maintains or improves transit advantages on I-35W between TH 36 in the City of Roseville and CSAH 23 in the City of Lino Lakes. In addition, state and regional transportation plan policies and strategies, including goals and objectives to better use existing and future infrastructure investments, will help guide project development.