

3/29/2018

CONGESTION MANAGEMENT SAFETY PLAN (CMSP) | PHASE IV

System Problem Statement Technical Memorandum

MARCH 2018

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BACKGROUND

The Congestion Management Safety Plan (CMSP) is a funding program that seeks to implement lower-cost/high-benefit improvements to address congestion and safety problems on Minnesota Department of Transportation's (MnDOT) Metro District trunk highway system. Identification of problem locations and selection of solutions is completed using a data driven process to maximize the return on investment in terms of benefits for highway users. Solutions are intended to address specific problems under existing conditions, and while they are not always intended to be 100 percent effective, they should make conditions noticeably better than they are today. Solutions are also typically lower-cost and smaller in scope than traditional highway investments, which is intended to allow them to be delivered more quickly and simply.

Several previous phases of CMSP have been undertaken over the past decade. The first phase, titled Congestion Management Planning Study, was completed in 2007 and identified 186 potential highway improvements on Metro District roadways. From these, 19 of the most promising solutions were recommended as demonstration projects, and 13 of these have been implemented since that time.

Phase 2 of the Congestion Management Safety Plan, undertaken in 2009-2010, addressed several policy considerations for adoption of the lower-cost/high-benefit investment approach for the region. Workshops were conducted to facilitate instruction and dialogue on flexible design and managed corridors, and to better define the range of solutions for the low-cost, high-benefit approach. In addition, the System Problem Statement was developed as part of this study to identify and characterize congestion and safety issues on the Metro highway system. The System Problem Statement utilized the annual Congestion Report produced by MnDOT's Regional Transportation Management Center (RTMC) to identify locations with recurring congestion on the freeway system. Each location was then characterized by a description of the problem's underlying causes such as entering traffic, lane drop, or weaving.

CMSP Phase 3 began with an extensive outreach effort in which the study team met with County and City representatives to confirm highway problem locations and gather feedback on the CMSP process. This phase then built on these results to screen the locations in the System Problem Statement and identify the most pressing issues. Lower-cost/high-benefit improvement concepts were developed for these locations in design charrettes, and their costs, benefits, and effectiveness were estimated. These factors were used to develop a return period, or anticipated length of time for the benefits to equal the cost, to prioritize the strongest solutions. From a list of 53 opportunities, several Phase 3 projects have also been constructed. In addition, 25 of these project opportunities are in the process of further design and study, and 11 are programmed for construction over the next four years.

Phase 4, the current phase of CMSP, repeats many of the key activities undertaken in Phases 2 and 3, by updating the System Problem Statement and developing a new list of opportunities that reflect changes to the Metro District highway system over recent years. Travel time reliability has also been added as an additional performance measure as part of the System Problem Statement. Reliability describes the variability in travel time experienced by highway users, due to factors such as weather, crashes, and changes in demand.

INTRODUCTION

As part of this effort, an overview of system problems has been undertaken to identify safety and mobility problem locations across MnDOT's Metro District trunk highway system. Congestion, reliability, and safety problem statement data was combined using GIS software, which allows it to be illustrated on maps and will also facilitate technical analysis in subsequent steps. Finally, all of the observed safety and mobility problem locations were characterized using a variety of problem descriptions, and will become candidates for CMSP solutions.

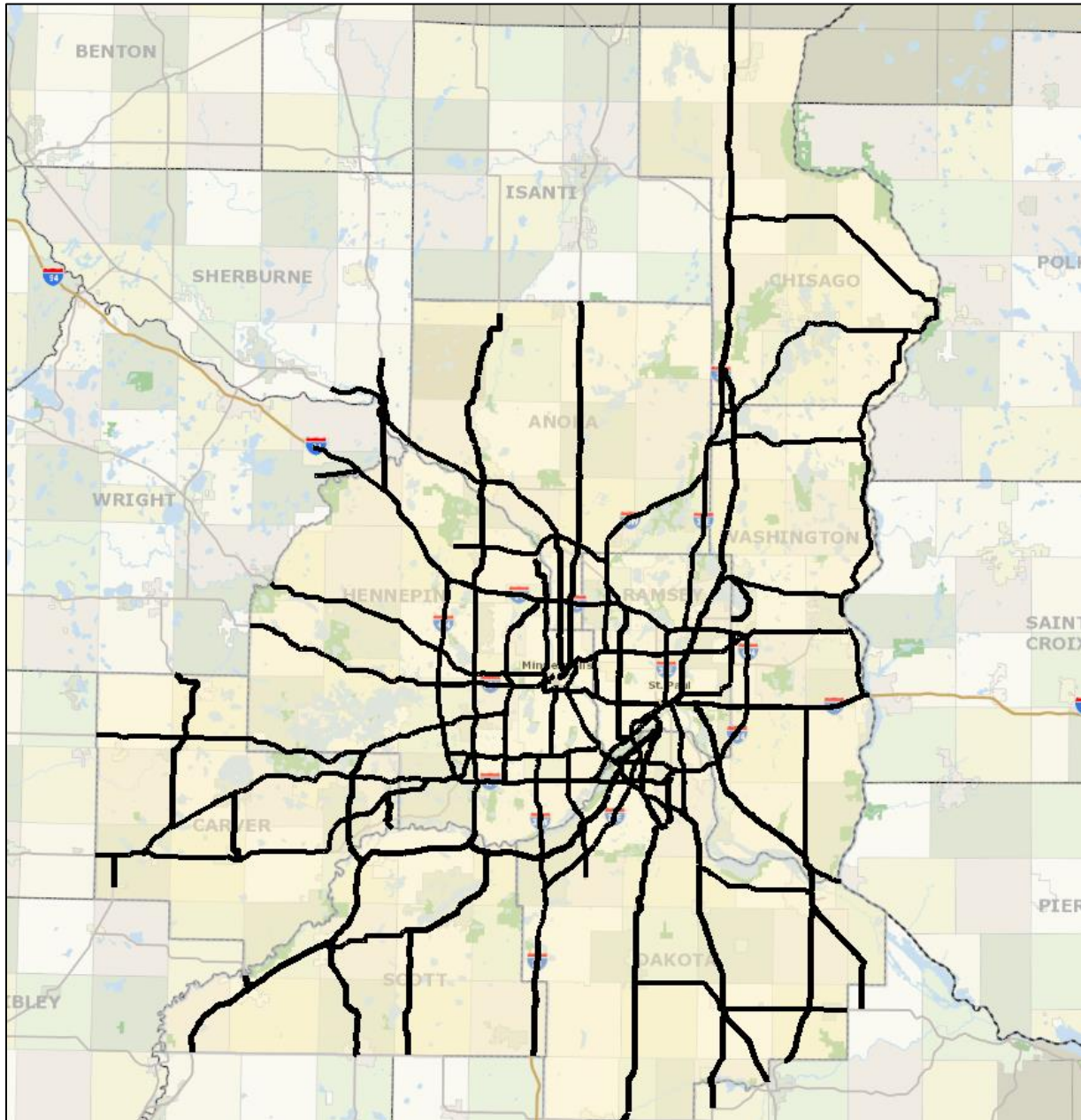
METHODS

System Problem Statement

The System Problem Statement has been developed to provide an overview of the mobility and safety issues observed on MnDOT's Metro District trunk highway system. The accompanying maps and lists illustrate and denote the problems that are understood to be occurring based on observed traffic conditions. This summary provides a brief overview of the information contained in the maps and lists and how they can be interpreted.

Study Area

The study area considered in the CMSP system problem statement includes all MnDOT-owned trunk highways within the eight-county Metro District. In addition, segments of highways in contiguous urbanized areas of Sherburne and Wright Counties have also been included, as these fall within Metropolitan Council's planning area. In all, this covers 2,200 direction miles of highway in this analysis.



Roadway Section

Different types of roadways represented on MnDOT's trunk highway system have been categorized based on the number of lanes, access control, and cross section. The types of roadways include:

- 2-lane rural
- 2-lane urban
- 4+ lane urban

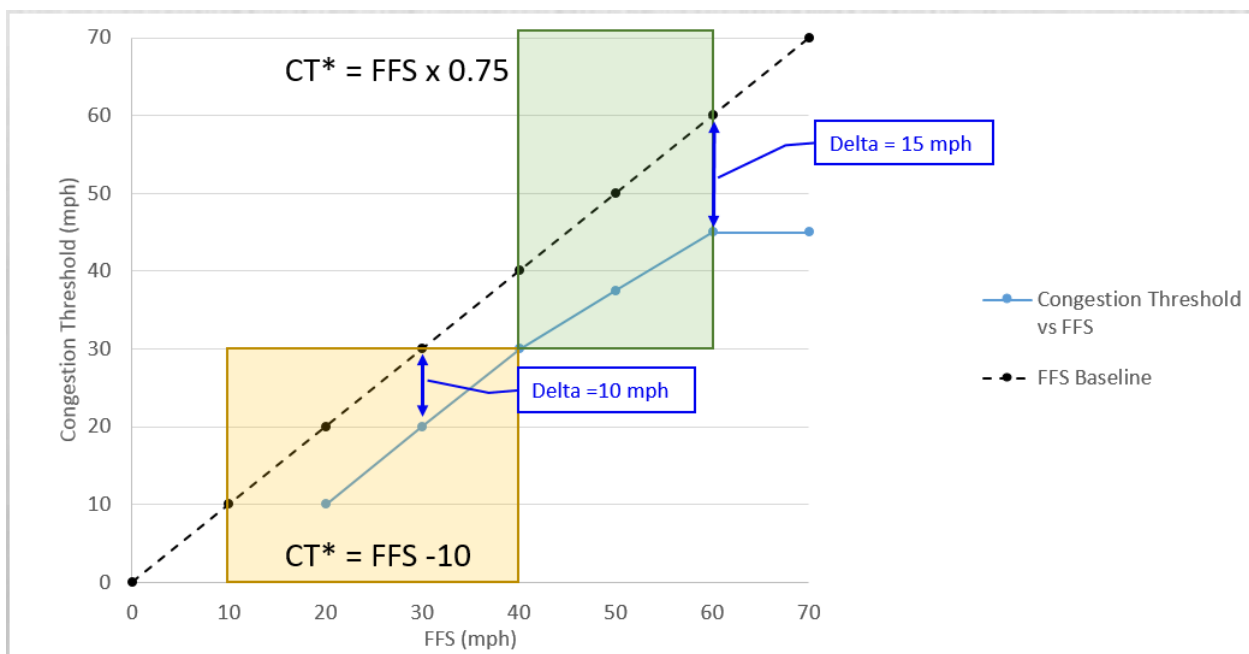
- 4+ lane expressway
- 4-lane freeway
- 6+lane freeway

This helps to provide context regarding the types of congestion and safety issues that may occur in a given location.

Recurring Congestion

Measurement of recurring congestion focuses on identifying the length of time speeds fall meaningfully below free-flow speeds, resulting in loss of operational effectiveness of the facility and delay costs for travelers. MnDOT reports recurring congestion on the freeway system in the Metropolitan Freeway System Congestion Report, which is updated annually to keep a record of changes in congestion levels and locations. This effort built on the 2015 Congestion Report by expanding coverage beyond the freeway system. Data reported on the freeway system in the Congestion Report was obtained from loop detectors and carried forward for CMSP, INRIX GPS speed data was obtained for the non-freeway facilities.

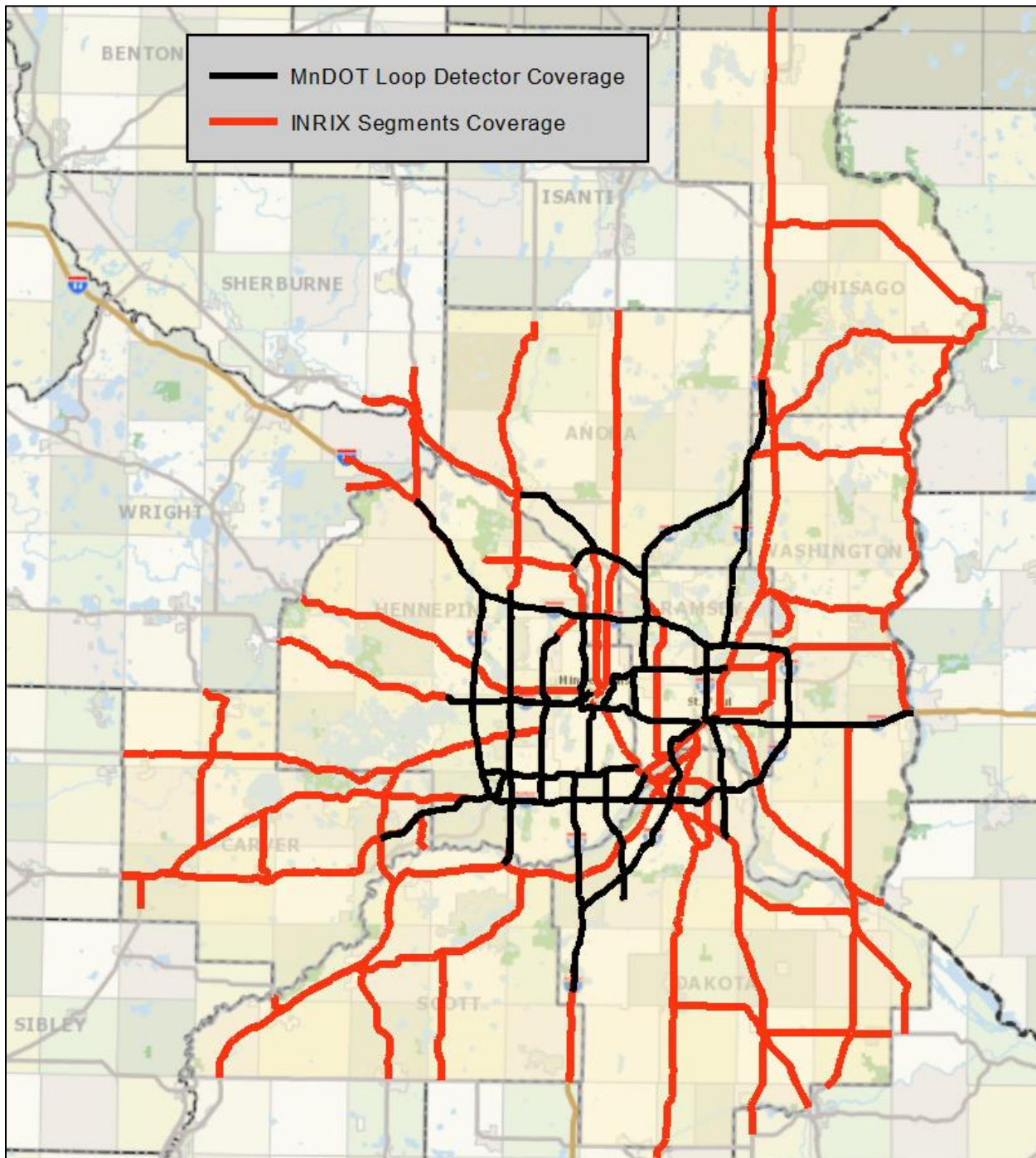
MnDOT defines the congestion threshold as 45 miles per hour (mph) or less on freeways. Freeways often have free-flow speeds of 60 mph or higher. Free-flow speed is defined as 85th percentile of off-peak hour speeds. Additional investigation was conducted to define the congestion thresholds for non-freeways with free-flow speeds below 60 mph. The resulting thresholds were defined as 75 percent of free-flow speeds on highways with free-flow speeds between 40 and 60 mph, and as 10 mph below free-flow speed on highways with free-flow speeds below 40 mph. This is shown below in the figure below:



*CT : Congestion Threshold; FFS: Free-flow speed

Observations cover AM and PM peak periods on Tuesdays, Wednesdays, and Thursdays from October 2015. The INRIX data collection window was consistent with the MnDOT congestion report with peak periods defined as 5 to 10 AM and 2 to 7 PM.

Results of the recurring congestion evaluation are provided on the AM and PM peak period congestion maps. Colors on the maps illustrate the duration of congestion the highway segment experiences during the peak period in one-hour increments.



Reliability

Evaluation of travel time reliability involves measuring the variability in travel times experienced by highway users. This area of transportation system performance is emerging as an important factor affecting user behavior and impacts. Unreliable travel times – due to weather, incidents, or fluctuations in demand – make it difficult for travelers to plan their trips and may force them to budget unnecessary additional time or risk arriving late. This is understood to present an economic cost to society much like user delays resulting from recurring congestion.

Reliability performance on trunk highways evaluated for CMSP was measured as the standard deviation of travel times during the AM and PM peak periods. Travel time (speed) data was obtained from MnDOT loop detectors on the freeway system, and INRIX GPS data on the non-freeway facilities. The analysis period included all weekdays for through the entirety of year 2015.

The observed reliability performance is presented for AM and PM peak periods in the reliability maps. Darker colors show segments where higher variability (e.g. less reliable) was observed during peak periods. In some cases, locations with high levels of recurring congestion are also observed to have poor reliability, however there are also locations that have little recurring congestion but do show higher levels of travel time variability. This suggests that these highway segments are vulnerable to disruptions from crashes, incidents, and severe weather.

Safety

The safety measure provides a summary of historical crash concentrations on study area highways. This was expressed as a “crash density” in order to focus on concentrations of crashes along the trunk highway system. It also recognizes that individual crash records are known to have slight inaccuracy in location, and attempts to account for this by displaying clusters of crash history rather than specific locations.

The crash density calculations were performed by dividing the trunk highways into 0.05-mile increments. Crash records were then distributed using a normal probability distribution to the increments up to 0.1 miles upstream and downstream of the location stated in the crash record. Then all of the crash probabilities assigned to network were aggregated to produce the crash density along each highway.

Crash data was filtered and assigned to roadway segments in each direction on divided highways. In contrast, crash density includes both directions on undivided highways, since crashes are more likely to affect both directions of travel. The map represents three-year crash data (July 1, 2012 – June 30, 2015) and was obtained from MnDOT Office of Traffic, Safety, and Technology.

Problem Descriptions

Observed safety and mobility problem locations were reviewed to characterize the causes of congestion. Using readily available traffic volume data and roadway geometry, problem descriptions were assigned based on several standardized categories. Symbols on the maps correspond to the different causes of congestion along the trunk highways.



Entering Traffic – An entering ramp volume added to the mainline volume puts the flow downstream of the merge at the capacity of that roadway area, causing queuing and congestion.



Exit Capacity – At an exit ramp, the volume desiring to exit exceeds the capacity of that ramp, or of its downstream connections, causing back-ups from the ramp onto the mainline.



Intersection Capacity – An intersection on an arterial or expressway, typically signal controlled, that experiences volumes exceeding capacity, resulting in delays on one or more approaches.

**Note: several locations with this condition along Principal Arterials are identified in the “PAICS Intersections” category described below.*



Lane Drop - A mainline lane drop without a corresponding loss of traffic causes a bottleneck resulting in queuing and congestion.



Mainline Weaving – Where freeway mainline movements are required to weave or change lanes, the flows can become turbulent due to significant numbers of vehicles changing lanes, and result in reduced capacity. Locations with left entrances and exits often experience similar issues.



Ramp to Ramp Weaving – Locations with heavy weaving movements between an entrance and exit ramp causes congestion because it reduces the capacity of the outside lane. As queues develop, congestion can grow and impact all lanes.



Standard Geometry or Other – A variety of other conditions can occur on the highway system that are not characterized by the standard descriptions. Some examples include sharp curves, steep grades, sight distance restrictions, or reduced lateral clearances that may result in reduced capacity and increased congestion.

PAICS Intersections – These intersection locations were identified through the *Principal Arterial Intersection Conversion Study (PAICS)* recently completed by the Metropolitan Council. These locations denote existing access points to non-freeway principal arterials in the Metropolitan Council’s planning area. These locations have been incorporated into CMSP4 to be included in the process of identifying lower-cost/high-improvements across MnDOT’s Metro District highway system. Note that PAICS intersections on non-trunk highway principal arterials have not been included as these facilities are not part of the CMSP evaluation area. The CMSP primary screening process will focus on intersections with mainline traffic control for potential lower-cost/high-benefit improvements.



PAICS Intersections with Mainline Traffic Control – Traffic signal or all-way stop control impacts the trunk highway mainline, contributing to delay, congestion, and unreliable travel.



Other PAICS Intersections – Traffic control (stop, yield, or uncontrolled) applies to side street approaches only and the mainline is not expected to experience a bottleneck at this point.

Construction Areas

Several highway sections with current construction projects are shaded on the maps. Congestion issues along these sections are not expected to undergo further evaluation as the changes being implemented along these highways are expected to result in improvement of these problem locations.

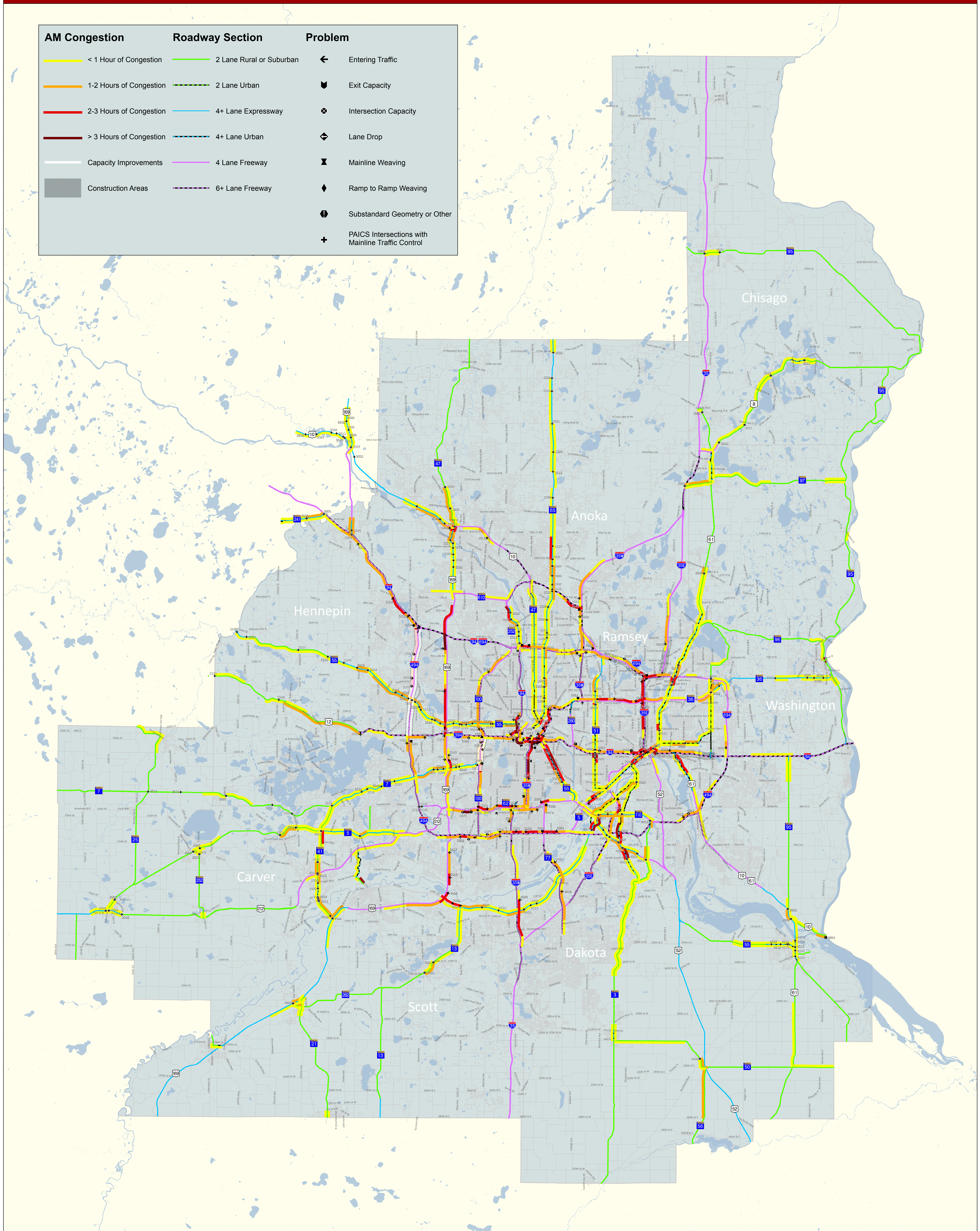
APPENDICES

Problem Location Map and List

The following pages of this memorandum include the Study Area Map with 2015 AM and PM Congestion Problems along with the comprehensive List of all Problem Locations.

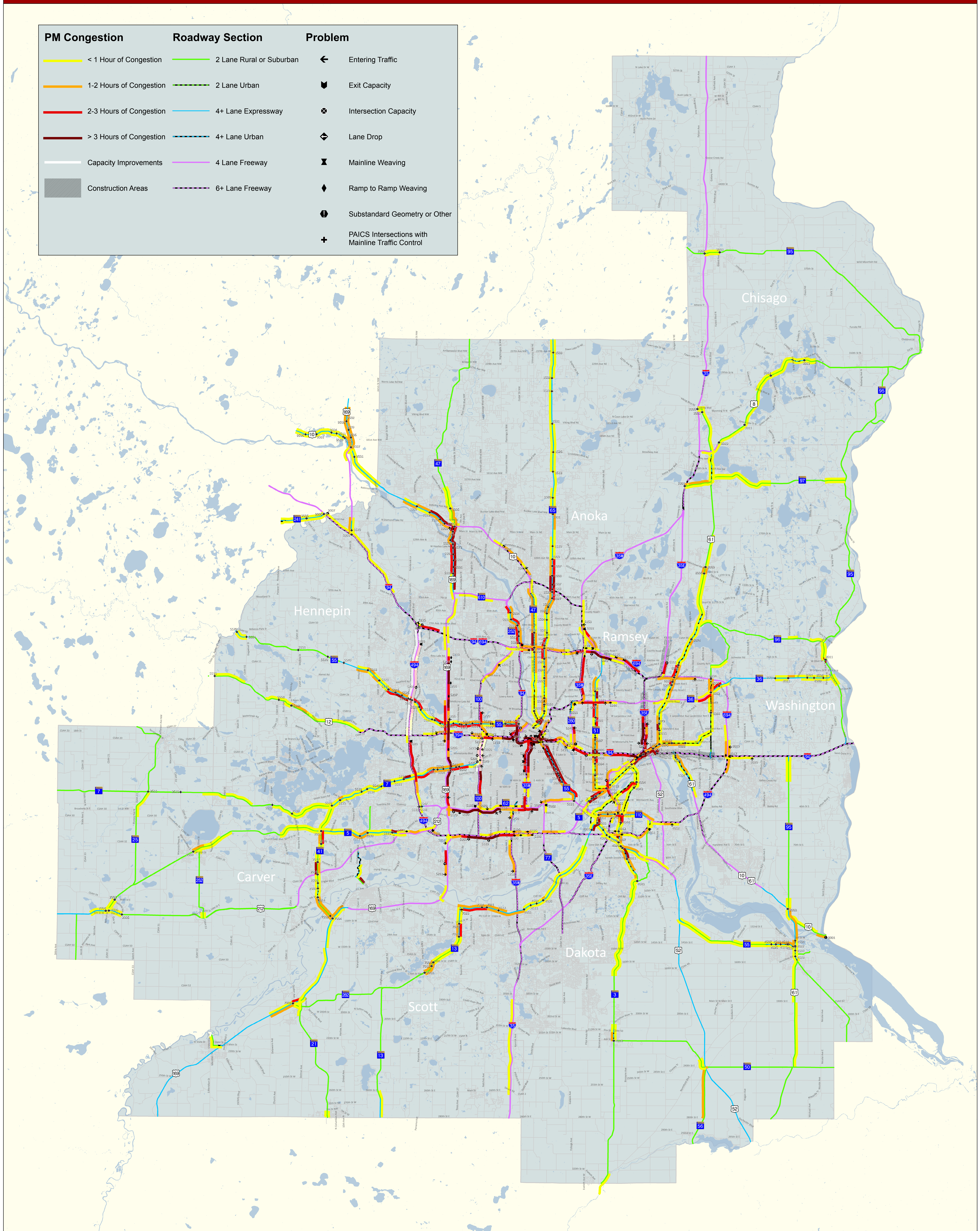
CMSP – 2015 AM Congestion Problems

AM Congestion	Roadway Section	Problem
< 1 Hour of Congestion	2 Lane Rural or Suburban	Entering Traffic
1-2 Hours of Congestion	2 Lane Urban	Exit Capacity
2-3 Hours of Congestion	4+ Lane Expressway	Intersection Capacity
> 3 Hours of Congestion	4+ Lane Urban	Lane Drop
Capacity Improvements	4 Lane Freeway	Mainline Weaving
Construction Areas	6+ Lane Freeway	Ramp to Ramp Weaving
		Substandard Geometry or Other
		PAICS Intersections with Mainline Traffic Control



CMSP – 2015 PM Congestion Problems

PM Congestion	Roadway Section	Problem
< 1 Hour of Congestion	2 Lane Rural or Suburban	Entering Traffic
1-2 Hours of Congestion	2 Lane Urban	Exit Capacity
2-3 Hours of Congestion	4+ Lane Expressway	Intersection Capacity
> 3 Hours of Congestion	4+ Lane Urban	Lane Drop
Capacity Improvements	4 Lane Freeway	Mainline Weaving
Construction Areas	6+ Lane Freeway	Ramp to Ramp Weaving
		Substandard Geometry or Other
		PAICS Intersections with Mainline Traffic Control



CMSP System Problem Statement

Map Ref ID	Road Type	County	Problem Type	Highway Number	Descriptions	Annual Total Cost
Anoka County						
1001	2 Lane Rural	Anoka	Intersection	MN97	I-35	\$ 51,834
1002	4+ Lane Expressway	Anoka	Intersection	TH10	TH 10 & RAMSEY BLVD	\$ 1,440,483
1003	4 Lane Freeway	Anoka	Entering Traffic	US10	W Main St	\$ 609,921
1004	2 Lane Rural	Anoka	Intersection	MN47	Alpine Dr	\$ 27,067
1005	2 Lane Rural	Anoka	Intersection	MN47	Bunker Lake Blvd	\$ 404,080
1006	4+ Lane Urban	Anoka	Intersection	TH169	FERRY ST N & HIGHWAY 10	\$ 1,287,788
1007	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & 105TH AVE	\$ 2,997,302
1008	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & 99TH AVE	\$ 3,616,133
1009	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & 109TH AVE	\$ 1,075,208
1010	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & I-694 WB RAMPS	\$ 474,124
1011	4 Lane Freeway	Anoka	Entering Traffic	US10	Main St	\$ 822,735
1012	6+ Lane Freeway	Anoka	Exit Capacity	I694	I-94 EB/TH 252 SB	\$ 3,889,893
1014	4 Lane Freeway	Anoka	Entering Traffic	I35W	Lake Dr	\$ 2,134,445
1015	4+ Lane Urban	Anoka	Intersection	TH169	FERRY ST N & FERRY ST S & MAIN ST W	\$ 2,358,080
1022	4+ Lane Expressway	Anoka	Intersection	TH10	TH 10 & SUNFISH LAKE BLVD	\$ 3,265,748
1024	4+ Lane Urban	Anoka	Intersection	MN65	44th Ave	\$ 430,653
1025	4+ Lane Expressway	Anoka	Intersection	MN65	49th Ave	\$ 516,432
1027	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 NE & LINCOLN ST	\$ 539,132
1031	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & BUNKER LAKE BLVD	\$ 1,380,180
1033	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & 89TH AVE	\$ 832,684
1035	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 NE & OSBORNE RD	\$ 540,656
1036	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & MEDTRONIC PKWY	\$ 687,428
1038	4+ Lane Urban	Anoka	Intersection	MN47	I-694 WB Ramps	\$ 368,425
1039	4+ Lane Urban	Anoka	Intersection	MN47	Mississippi St	\$ 717,744
1041	4+ Lane Urban	Anoka	Intersection	MN47	53rd Ave	\$ 445,259
1044	4 Lane Freeway	Anoka	Lane Drop	US10	Hanson Blvd	\$ 3,423,903
1045	6+ Lane Freeway	Anoka	Entering Traffic	US10	Foley Blvd	\$ 1,157,491
1046	6+ Lane Freeway	Anoka	Ramp to Ramp Weaving	I694	East River Rd to I-94/TH 252	\$ 2,024,199
1502	4+ Lane Expressway	Anoka	Intersection	TH65	221ST AVE NE & HIGHWAY 65 NE	\$ 116,403
1503	4+ Lane Expressway	Anoka	Intersection	TH65	237TH AVE NE & HIGHWAY 65 NE	\$ 766,254
1504	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & 73RD AVE	\$ 661,023
1505	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & 81ST AVE	\$ 589,755
1507	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & 93RD LN	\$ 2,546,624
1509	4+ Lane Expressway	Anoka	Intersection	TH65	ANDOVER BLVD NE & HIGHWAY 65 NE	\$ 74,103
1510	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & CLOUD DR	\$ 633,250
1513	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & CONSTANCE BLVD	\$ 191,951
1514	4+ Lane Expressway	Anoka	Intersection	TH10	TH 10 & THURSTON AVE	\$ 2,012,166
1515	4+ Lane Expressway	Anoka	Intersection	TH10	TH 10 & FAIROAK AVE	\$ 623,531
1518	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & TH 10 WB RAMPS	\$ 1,221,911
1519	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & MISSISSIPPI ST	\$ 313,552
1520	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & MOORE LAKE DR	\$ 122,492
1522	4+ Lane Expressway	Anoka	Intersection	TH65	HIGHWAY 65 NE & SIMS RD NE	\$ 63,118
1523	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & TH 10 EB RAMPS	\$ 858,332
1526	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & CROSSTOWN BLVD	\$ 264,482
1531	4+ Lane Expressway	Anoka	Intersection	TH65	TH 65 & VIKING BLVD	\$ 412,954
Carver County						
2003	2 Lane Rural	Carver	Intersection	MN5	CSAH 34/1st St NW	\$ 24,988
2004	2 Lane Rural	Carver	Intersection	MN5	TH 212	\$ 93,654
2005	4+ Lane Expressway	Carver	Intersection	US212	CR 134/Tacoma Ave	\$ 42,473
2006	4+ Lane Expressway	Carver	Intersection	TH212	HIGHWAY 212 & REFORM ST N/MN5	\$ 72,887
2008	2 Lane Rural	Carver	Intersection	MN5	CSAH 10	\$ 267,860
2009	2 Lane Rural	Carver	Intersection	MN284	TH 5	\$ 79,127
2010	2 Lane Rural	Carver	Intersection	MN284	CSAH 10	\$ 22,149
2011	2 Lane Rural	Carver	Intersection	MN5	CSAH 13	\$ 729,809
2012	2 Lane Rural	Carver	Intersection	MN5	Victoria Dr	\$ 176,758

CMSP System Problem Statement

Map Ref ID	Road Type	County	Problem Type	Highway Number	Descriptions	Annual Total Cost
2013	4+ Lane Expressway	Carver	Intersection	MN5	CSAH 101	\$ 531,258
2014	4+ Lane Urban	Carver	Intersection	TH41	CHASKA BLVD & CHESTNUT ST N	\$ 117,035
2015	2 Lane Rural	Carver	Intersection	TH41	CHESTNUT ST N & HIGHWAY 212	\$ 285,076
2016	2 Lane Rural	Carver	Intersection	TH41	CHESTNUT ST N & HIGHWAY 212	\$ 159,393
2017	2 Lane Rural	Carver	Intersection	MN41	CSAH 14/Pioneer Trl	\$ 273,041
2018	2 Lane Rural	Carver	Intersection	MN41	TH 5	\$ 1,360,239
2019	4+ Lane Urban	Carver	Intersection	TH41	2ND ST E & 2ND ST W & CHESTNUT ST N	\$ 536,143
2020	4+ Lane Urban	Carver	Intersection	TH41	4TH ST E & 4TH ST W & CHESTNUT ST N	\$ 99,943
2030	4+ Lane Expressway	Carver	Intersection	MN5	CSAH 101 North	\$ 432,549
2036	2 Lane Rural	Carver	Intersection	MN41	CSAH 18/Lyman Blvd	\$ 240,590
2503	4+ Lane Urban	Carver	Intersection	TH41	CHESTNUT ST N & CROSSTOWN BLVD & VICTORIA DR	\$ 31,738
2508	4+ Lane Urban	Carver	Intersection	TH41	CHESTNUT ST N & ENGLER BLVD	\$ 67,252
2509	2 Lane Rural	Carver	Intersection	TH7	HIGHWAY 7 & ROLLING ACRES RD & SMITHTOWN RD	\$ 7,143
2510	2 Lane Rural	Carver	Intersection	TH7	HIGHWAY 7 & COUNTY ROAD 10	\$ 66,270
2511	2 Lane Rural	Carver	Intersection	TH7	HIGHWAY 7 & HIGHWAY 25	\$ 28,016
Chisago County						
3001	2 Lane Rural	Chisago	Intersection	US61	Wyoming Trl	\$ 135,265
3002	2 Lane Rural	Chisago	Intersection	MN95	I-35	\$ 208,488
3003	2 Lane Rural	Chisago	Intersection	MN95	Forest Blvd	\$ 44,161
3006	2 Lane Rural	Chisago	Intersection	US61	I-35	\$ 12,183
3010	2 Lane Rural	Chisago	Intersection	TH8	Greenway Ave	\$ 432,574
3011	2 Lane Rural	Chisago	Intersection	TH8	Green Lake Trl	\$ 388,160
3012	2 Lane Rural	Chisago	Intersection	TH8	Lofton Ave/Old Towne Rd	\$ 333,074
3013	2 Lane Rural	Chisago	Intersection	TH8	Akerson St	\$ 169,941
Dakota County						
4001	4+ Lane Expressway	Dakota	Intersection	TH13	TH 13 & NICOLLET AVE	\$ 516,015
4002	2 Lane Urban	Dakota	Intersection	TH110	HIGHWAY 110 & HIGHWAY 13	\$ 215,480
4003	4+ Lane Expressway	Dakota	Intersection	MN13	Mendota Heights Road	\$ 114,912
4004	2 Lane Urban	Dakota	Intersection	MN13	MN 149	\$ 57,332
4006	2 Lane Rural	Dakota	Intersection	MN50	CH47/Northfield Boulevard	\$ 33,733
4007	4+ Lane Expressway	Dakota	Intersection	TH55	COMMERS DR & DODD RD & HIGHWAY 55	\$ 1,681,323
4008	4+ Lane Expressway	Dakota	Intersection	TH55	DODD RD & HIGHWAY 55 & HOLIDAY LN	\$ 1,552,024
4009	4+ Lane Expressway	Dakota	Intersection	TH55	TH 55 & ARGENTA TRL	\$ 286,026
4011	4+ Lane Urban	Dakota	Intersection	MN149	Yankee Doodle Road	\$ 450,881
4012	4+ Lane Urban	Dakota	Intersection	MN149	I-494	\$ 156,586
4014	2 Lane Urban	Dakota	Intersection	MN149	MN 110	\$ 869,089
4015	2 Lane Rural	Dakota	Intersection	MN3	MN 55	\$ 26,585
4016	4+ Lane Urban	Dakota	Intersection	MN3	MN 110	\$ 171,803
4018	6+ Lane Freeway	Dakota	Entering Traffic	I494	From Concord St S	\$ 784,223
4019	6+ Lane Freeway	Dakota	Entering Traffic	TH77	From Cliff Rd	\$ 2,410,835
4020	6+ Lane Freeway	Dakota	Entering Traffic	I35W	From Cliff Rd	\$ 6,800,275
4021	4 Lane Freeway	Dakota	Lane Drop	I35E	At MN 110	\$ 2,733,435
4022	4 Lane Freeway	Dakota	Lane Drop	I494	At Concord St	\$ 2,049,031
4023	4 Lane Freeway	Dakota	Exit Capacity	I35E	MN 13	\$ 546,911
4025	4+ Lane Urban	Dakota	Intersection	TH55	HIGHWAY 55 & PLEASANT DR	\$ 56,530
4026	4+ Lane Expressway	Dakota	Intersection	TH 55	Lone Oak Rd	\$ 322,051
4027	4+ Lane Urban	Dakota	Intersection	TH61	10TH ST E & VERMILLION ST	\$ 272,951
4028	4+ Lane Urban	Dakota	Intersection	MN3	TH 50	\$ 79,222
4031	4+ Lane Expressway	Dakota	Intersection	TH55	HIGHWAY 13 & HIGHWAY 55	\$ 845,663
4036	4+ Lane Expressway	Dakota	Intersection	TH13	COUNTY ROAD 11 & HIGHWAY 13 E & RIVER HILLS DR W	\$ 405,331
4040	2 Lane Rural	Dakota	Intersection	MN149	Robert Trl	\$ 174,643
4043	2 Lane Urban	Dakota	Intersection	MN149	Delaware Ave	\$ 28,063
4044	2 Lane Urban	Dakota	Intersection	MN149	Mendota Heights Road	\$ 121,789
4046	4+ Lane Expressway	Dakota	Intersection	TH110	HIGHWAY 110 & INTERSTATE 35E	\$ 1,126,328
4050	6+ Lane Freeway	Dakota	Ramp to Ramp Weaving	I494	I-494 to Dodd Rd	\$ 1,229,867
4051	6+ Lane Freeway	Dakota	Exit Capacity	I494	MN 3	\$ 1,097,200

CMSP System Problem Statement

Map Ref ID	Road Type	County	Problem Type	Highway Number	Descriptions	Annual Total Cost
4052	6+ Lane Freeway	Dakota	Entering Traffic	I494	7th Ave S	\$ 938,523
4053	6+ Lane Freeway	Dakota	Ramp to Ramp Weaving	I494	MN 149 to I-35E	\$ 484,051
4054	4 Lane Freeway	Dakota	Entering Traffic	I35E	TH 110	\$ 1,513,501
4055	4 Lane Freeway	Dakota	Entering Traffic	I35E	MN 13	\$ 1,081,573
4502	4+ Lane Expressway	Dakota	Intersection	TH13	TH 13 & 12TH AVE	\$ 117,895
4503	4+ Lane Urban	Dakota	Intersection	TH316	15TH ST E & VERMILLION ST	\$ 275,828
4504	4+ Lane Urban	Dakota	Intersection	TH61	4TH ST E & VERMILLION ST	\$ 197,006
4505	4+ Lane Expressway	Dakota	Intersection	TH55	BLUE GENTIAN RD & HIGHWAY 55 & LEXINGTON AVE S	\$ 366,193
4506	4+ Lane Expressway	Dakota	Intersection	TH55	EAGANDALE BLVD & HIGHWAY 55	\$ 104,444
4507	4+ Lane Urban	Dakota	Intersection	TH55	GENERAL SIEBEN DR & HIGHWAY 55	\$ 148,586
4510	4+ Lane Expressway	Dakota	Intersection	TH110	HIGHWAY 110 & LEXINGTON AVE S	\$ 257,597
4511	4+ Lane Expressway	Dakota	Intersection	TH13	TH 13 & PORTLAND AVE	\$ 86,238
4512	4+ Lane Expressway	Dakota	Intersection	TH13	TH 13 & WASHBURN AVE	\$ 1,733,999
4513	4+ Lane Expressway	Dakota	Intersection	TH55	HIGHWAY 55 & MENDOTA HEIGHTS RD	\$ 574,019
4514	4+ Lane Urban	Dakota	Intersection	TH55	HIGHWAY 55 & PINE ST	\$ 8,988
4516	4+ Lane Urban	Dakota	Intersection	TH55	HIGHWAY 55 & RIVER ST	\$ 41,185
4517	4+ Lane Urban	Dakota	Intersection	TH316	HIGHWAY 55 & VERMILLION ST	\$ 205,885
4518	4+ Lane Urban	Dakota	Intersection	TH55	HIGHWAY 55 & WESTVIEW DR	\$ 90,256
4522	4+ Lane Urban	Dakota	Intersection	TH316	COUNTY ROAD 46 & VERMILLION ST	\$ 312,624
Hennepin County						
5001	2 Lane Rural	Hennepin	Intersection	TH7	HIGHWAY 7 & MAIN ST	\$ 31,590
5003	4+ Lane Expressway	Hennepin	Intersection	MN101	I-94	\$ 703,540
5004	4+ Lane Urban	Hennepin	Intersection	TH169	JEFFERSON HWY N & WEST RIVER RD N	\$ 783,824
5005	4+ Lane Urban	Hennepin	Intersection	MN65	37th Ave	\$ 396,280
5006	4+ Lane Urban	Hennepin	Intersection	MN65	St. Anthony Pkwy	\$ 164,821
5007	4+ Lane Urban	Hennepin	Intersection	MN65	Lowry Ave	\$ 34,963
5008	4+ Lane Urban	Hennepin	Intersection	MN65	Hennepin Ave	\$ 278,436
5009	4+ Lane Urban	Hennepin	Intersection	MN65	Washington Ave	\$ 13,023
5010	4+ Lane Urban	Hennepin	Intersection	MN47	Broadway St	\$ 79,912
5011	4+ Lane Urban	Hennepin	Intersection	MN47	Central Ave	\$ 256,366
5012	6+ Lane Freeway	Hennepin	Intersection	MN65	10th St	\$ 645,234
5013	4+ Lane Urban	Hennepin	Intersection	TH55	6TH AVE N & HIGHWAY 55 & LYNDALE AVE N	\$ 445,496
5014	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & WINNETKA AVE N	\$ 697,692
5015	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & SOUTH SHORE DR	\$ 653,059
5016	4+ Lane Expressway	Hennepin	Intersection	TH55	TH 55 & VICKSBURG LN	\$ 1,222,242
5017	4+ Lane Expressway	Hennepin	Intersection	TH55	I-494	\$ 777,112
5018	4+ Lane Expressway	Hennepin	Intersection	TH55	TH 55 & CSAH 101/SIOUX DR	\$ 660,537
5019	4+ Lane Expressway	Hennepin	Intersection	TH55	TH 55 & CSAH 116	\$ 184,178
5020	6+ Lane Freeway	Hennepin	Entering Traffic	US12	CSAH 6	\$ 75,646
5021	4+ Lane Expressway	Hennepin	Intersection	TH7	HIGHWAY 7 & HOPKINS XRD	\$ 824,384
5024	4+ Lane Urban	Hennepin	Intersection	TH55	38TH ST E & HIAWATHA AVE	\$ 1,997,435
5025	4+ Lane Urban	Hennepin	Intersection	MN55	28th St	\$ 1,351,363
5027	4+ Lane Urban	Hennepin	Intersection	TH55	46TH ST E & HIAWATHA AVE	\$ 1,359,317
5029	4 Lane Freeway	Hennepin	Intersection	TH252	TH 252 & 66TH AVE	\$ 1,938,756
5031	4 Lane Freeway	Hennepin	Intersection	TH252	TH 252 & BROOKDALE DR	\$ 1,378,400
5032	4 Lane Freeway	Hennepin	Entering Traffic	TH100	France Ave	\$ 2,212,443
5033	4 Lane Freeway	Hennepin	Intersection	TH252	TH 252 & 81ST AVE	\$ 1,759,553
5034	4 Lane Freeway	Hennepin	Intersection	TH252	TH 252 & 85TH AVE	\$ 752,178
5036	4 Lane Freeway	Hennepin	Entering Traffic	US169	Old Shakopee Rd	\$ 1,121,755
5037	4 Lane Freeway	Hennepin	Entering Traffic	US169	Anderson Lakes Pkwy	\$ 2,232,225
5039	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	US169	36th St to Minnetonka Blvd	\$ 4,325,361
5040	4 Lane Freeway	Hennepin	Entering Traffic	US169	Minnetonka Blvd	\$ 2,767,239
5041	4 Lane Freeway	Hennepin	Entering Traffic	US169	Minnetonka Blvd	\$ 2,829,992
5042	4 Lane Freeway	Hennepin	Entering Traffic	US169	I-394 EB entrance	\$ 3,354,091
5043	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	US169	I-394 to TH 55	\$ 14,546,360
5044	4 Lane Freeway	Hennepin	Entering Traffic	US169	36th Ave	\$ 1,242,190

CMSP System Problem Statement

Map Ref ID	Road Type	County	Problem Type	Highway Number	Descriptions	Annual Total Cost
5047	4 Lane Freeway	Hennepin	Entering Traffic	US169	I-94	\$ 2,738,833
5049	6+ Lane Freeway	Hennepin	Substandard Geometry or Other	TH100	Railroad underpass	\$ 11,514,345
5050	6+ Lane Freeway	Hennepin	Entering Traffic	TH100	Cedar Lake Rd	\$ 5,337,153
5051	6+ Lane Freeway	Hennepin	Entering Traffic	TH100	TH 7	\$ 8,924,859
5052	6+ Lane Freeway	Hennepin	Entering Traffic	TH100	I-394 CD Road	\$ 2,561,248
5053	6+ Lane Freeway	Hennepin	Exit Capacity	TH100	CD Road Exit	\$ 2,760,166
5054	6+ Lane Freeway	Hennepin	Entering Traffic	TH100	TH 55	\$ 4,234,291
5055	4 Lane Freeway	Hennepin	Entering Traffic	I494	Bass Lake Rd	\$ 6,987,920
5056	4 Lane Freeway	Hennepin	Entering Traffic	I494	n/a	\$ 3,853,185
5057	4 Lane Freeway	Hennepin	Entering Traffic	I494	CSAH 9	\$ 1,816,882
5058	6+ Lane Freeway	Hennepin	Entering Traffic	I494	I-394 EB entrance	\$ 105,427
5059	6+ Lane Freeway	Hennepin	Entering Traffic	I494	TH 169 NB entrance	\$ 3,725,464
5060	6+ Lane Freeway	Hennepin	Lane Drop	I494	East Bush Lake Rd	\$ 4,244,734
5061	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I494	TH 100	\$ 3,854,327
5062	6+ Lane Freeway	Hennepin	Entering Traffic	I494	France Ave	\$ 8,108,713
5063	6+ Lane Freeway	Hennepin	Entering Traffic	I494	34th Ave	\$ 1,566,924
5064	6+ Lane Freeway	Hennepin	Exit Capacity	I494	TH 77 entrance	\$ 5,045,104
5066	6+ Lane Freeway	Hennepin	Entering Traffic	I494	Portland Ave to Nicollet Ave	\$ 4,872,010
5068	6+ Lane Freeway	Hennepin	Entering Traffic	I494	Lyndale Ave to I-35W NB	\$ 1,916,275
5069	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I494	Penn Ave to France Ave	\$ 5,726,727
5070	6+ Lane Freeway	Hennepin	Lane Drop	I494	France Ave	\$ 2,359,729
5071	6+ Lane Freeway	Hennepin	Exit Capacity	I694	I-94 EB exit	\$ 6,321,430
5072	4 Lane Freeway	Hennepin	Lane Drop	TH62	Gleason Rd	\$ 3,404,724
5073	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	TH62	TH 100 loop-to-loop	\$ 2,383,901
5074	4 Lane Freeway	Hennepin	Entering Traffic	TH62	I-35W to TH 77	\$ 3,398,291
5075	4 Lane Freeway	Hennepin	Entering Traffic	TH62	TH 77 NB	\$ 5,195,577
5076	4 Lane Freeway	Hennepin	Entering Traffic	TH62	Xerxes Ave	\$ 3,570,946
5077	4+ Lane Urban	Hennepin	Entering Traffic	TH62	Lyndale Ave	\$ 2,269,405
5078	4 Lane Freeway	Hennepin	Entering Traffic	TH62	Valley View Rd	\$ 3,009,672
5079	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	TH62	Aalley View Rd to TH 100 NB exit	\$ 1,798,049
5080	6+ Lane Freeway	Hennepin	Exit Capacity	I494	I-394 EB exit	\$ 9,168,217
5081	6+ Lane Freeway	Hennepin	Entering Traffic	TH77	Old Shakopee Rd	\$ 1,813,387
5082	4 Lane Freeway	Hennepin	Exit Capacity	TH77	TH 62 WB exit	\$ 902,575
5083	6+ Lane Freeway	Hennepin	Entering Traffic	I35W	46th St	\$ 9,542,879
5084	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I35W	35th St to Lake St	\$ 14,594,335
5085	6+ Lane Freeway	Hennepin	Exit Capacity	I35W	I-35W NB exit	\$ 14,190,290
5086	6+ Lane Freeway	Hennepin	Entering Traffic	I35W	5th Ave entrance	\$ 4,632,193
5087	6+ Lane Freeway	Hennepin	Entering Traffic	I35W	I-94 EB entrance	\$ 4,071,700
5088	6+ Lane Freeway	Hennepin	Entering Traffic	I35W	Hiawatha entrance	\$ 3,268,168
5089	6+ Lane Freeway	Hennepin	Entering Traffic	I35W	Johnson St entrance	\$ 2,221,451
5090	6+ Lane Freeway	Hennepin	Exit Capacity	I35W	Washington Ave	\$ 7,548,954
5091	6+ Lane Freeway	Hennepin	Exit Capacity	I35W	CD Road Exit	\$ 5,056,256
5092	6+ Lane Freeway	Hennepin	Entering Traffic	I35W	I-94 WB entrance	\$ 4,633,597
5093	6+ Lane Freeway	Hennepin	Exit Capacity	I35W	TH 62 exit	\$ 3,286,262
5094	6+ Lane Freeway	Hennepin	Entering Traffic	I35W	TH 62 entrance	\$ 1,295,250
5095	6+ Lane Freeway	Hennepin	Entering Traffic	I35W	66th St entrance	\$ 2,128,413
5097	6+ Lane Freeway	Hennepin	Entering Traffic	I394	Ridgedale Dr	\$ 1,428,590
5098	6+ Lane Freeway	Hennepin	Lane Drop	I394	Louisiana lane drop	\$ 2,384,224
5099	6+ Lane Freeway	Hennepin	Exit Capacity	I394	I-94 EB exit	\$ 11,889,254
5100	6+ Lane Freeway	Hennepin	Entering Traffic	I394	I-94 & Dunwoody entrances	\$ 4,300,183
5101	6+ Lane Freeway	Hennepin	Entering Traffic	I94	TH 101 entrance	\$ 1,863,420
5102	6+ Lane Freeway	Hennepin	Entering Traffic	I94	Maple Grove Pkwy	\$ 6,715,396
5103	6+ Lane Freeway	Hennepin	Entering Traffic	I94	Weaver Lake Rd	\$ 5,079,007
5104	6+ Lane Freeway	Hennepin	Exit Capacity	I94	I-494	\$ 1,909,438
5105	6+ Lane Freeway	Hennepin	Entering Traffic	I94	Broadway St	\$ 1,745,079
5106	6+ Lane Freeway	Hennepin	Entering Traffic	I94	TH 55	\$ 823,292

CMSP System Problem Statement

Map Ref ID	Road Type	County	Problem Type	Highway Number	Descriptions	Annual Total Cost
5108	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I94	5th Ave to TH 55	\$ 4,096,635
5110	6+ Lane Freeway	Hennepin	Entering Traffic	I94	CD Road entrance	\$ 4,431,638
5112	6+ Lane Freeway	Hennepin	Entering Traffic	I94	TH 65 to Hennepin/Lyndale	\$ 5,569,431
5113	6+ Lane Freeway	Hennepin	Exit Capacity	I94	I-394	\$ 1,893,898
5114	4 Lane Freeway	Hennepin	Substandard Geometry or Other	TH62	uphill grade	\$ 3,704,253
5115	6+ Lane Freeway	Hennepin	Mainline Weaving	I94	Hennepin/Lyndale to I-35W SB	\$ 20,784,675
5116	6+ Lane Freeway	Hennepin	Entering Traffic	TH252	Entrance from I-694 WB	\$ 97,768
5119	4+ Lane Expressway	Hennepin	Intersection	TH169	TH 169 & 109TH AVE N	\$ 2,192,401
5123	4+ Lane Expressway	Hennepin	Intersection	TH55	TH 55 & CSAH 101/PEONY LN	\$ 762,082
5126	4+ Lane Expressway	Hennepin	Intersection	TH55	TH 100 NB Ramps	\$ 1,098,863
5127	4+ Lane Urban	Hennepin	Intersection	TH55	HIGHWAY 55 & PENN AVE N	\$ 611,730
5129	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	TH55	Cedar Ave	\$ 388,396
5131	4 Lane Freeway	Hennepin	Intersection	TH55	TH 62	\$ 483,233
5139	4+ Lane Expressway	Hennepin	Intersection	TH55	I-494	\$ 750,405
5141	4+ Lane Expressway	Hennepin	Intersection	TH55	TH 55 & CSAH 24	\$ 747,790
5144	2 Lane Rural	Hennepin	Intersection	TH12	BAKER PARK RD & HIGHWAY 12 & WAYZATA BLVD W	\$ 599,463
5145	4+ Lane Expressway	Hennepin	Intersection	MN5	CSAH 4	\$ 2,167,649
5147	4+ Lane Expressway	Hennepin	Intersection	MN7	NB TH 169 Ramps	\$ 667,801
5149	4+ Lane Expressway	Hennepin	Intersection	MN7	TH 100	\$ 145,067
5150	4+ Lane Expressway	Hennepin	Intersection	TH7	HIGHWAY 7 & RAMP HIGHWAY 169	\$ 469,642
5154	4+ Lane Expressway	Hennepin	Intersection	TH7	TH 7 & WILLISTON RD	\$ 1,449,053
5155	4+ Lane Expressway	Hennepin	Intersection	TH7	HIGHWAY 7 & OAK ST	\$ 679,014
5158	4+ Lane Urban	Hennepin	Intersection	MN65	Broadway St	\$ 251,332
5161	4+ Lane Urban	Hennepin	Intersection	MN65	18th Ave	\$ 78,672
5178	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	US212	Prairie Center Dr to TH 5	\$ 1,223,327
5179	4 Lane Freeway	Hennepin	Lane Drop	TH62	CD Road Lane Drop	\$ 1,386,477
5180	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	TH62	TH 169 to TH 100	\$ 2,732,179
5181	4 Lane Freeway	Hennepin	Entering Traffic	TH62	Xerxes Ave entrance	\$ 18,259,009
5184	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	TH62	Penn Ave to Xerxes Ave	\$ 425,379
5186	4 Lane Freeway	Hennepin	Exit Capacity	TH62	TH 100 NB exit	\$ 1,804,016
5189	6+ Lane Freeway	Hennepin	Lane Drop	I494	France Ave	\$ 11,935,631
5190	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I494	I-35W NB to Lyndale Ave	\$ 5,687,375
5191	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I494	Lyndale Ave to Nicollet Ave	\$ 1,744,906
5192	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I494	Nicollet Ave to Portland Ave	\$ 1,135,516
5195	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I494	Portland Ave to Nicollet Ave	\$ 2,856,425
5196	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I494	Lyndale Ave to I-35W NB	\$ 2,672,112
5198	6+ Lane Freeway	Hennepin	Exit Capacity	I494	TH 212 exit	\$ 1,041,643
5201	4 Lane Freeway	Hennepin	Lane Drop	I494	TH 55 to Rockford Rd	\$ 3,741,131
5203	4 Lane Freeway	Hennepin	Exit Capacity	I494	I-94 WB	\$ 2,235,945
5204	4 Lane Freeway	Hennepin	Entering Traffic	US169	Bren Rd	\$ 4,026,031
5205	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	US169	Cedar Lake Rd	\$ 1,082,026
5206	4 Lane Freeway	Hennepin	Entering Traffic	US169	TH 55	\$ 7,708,298
5207	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	US169	36th Ave	\$ 3,504,879
5208	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	US169	CSAH 9	\$ 2,673,806
5209	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	US169	CSAH 10 EB	\$ 4,554,223
5210	4 Lane Freeway	Hennepin	Ramp to Ramp Weaving	US169	CSAH 10 WB	\$ 760,077
5211	4 Lane Freeway	Hennepin	Entering Traffic	US169	I-394 EB entrance	\$ 15,481,916
5212	4 Lane Freeway	Hennepin	Lane Drop	US169	Anderson Lakes Pkwy lane drop	\$ 1,971,433
5213	4 Lane Freeway	Hennepin	Entering Traffic	US169	Pioneer Trail	\$ 1,431,010
5214	4 Lane Freeway	Hennepin	Entering Traffic	US169	I-494 EB/WB entrance	\$ 858,784
5217	6+ Lane Freeway	Hennepin	Entering Traffic	TH100	36th St	\$ 7,666,118
5218	6+ Lane Freeway	Hennepin	Entering Traffic	TH100	Minnetonka Blvd	\$ 4,045,458
5220	6+ Lane Freeway	Hennepin	Entering Traffic	TH100	Duluth St	\$ 3,098,399
5221	4 Lane Freeway	Hennepin	Entering Traffic	TH100	Brooklyn Blvd	\$ 2,541,734
5223	6+ Lane Freeway	Hennepin	Lane Drop	TH100	Cedar Lake Rd	\$ 6,577,040
5224	6+ Lane Freeway	Hennepin	Lane Drop	TH100	Minnetonka Blvd	\$ 3,092,517

CMSP System Problem Statement

Map Ref ID	Road Type	County	Problem Type	Highway Number	Descriptions	Annual Total Cost
5225	6+ Lane Freeway	Hennepin	Lane Drop	TH100	TH 7	\$ 2,301,550
5229	6+ Lane Freeway	Hennepin	Entering Traffic	I94	I-35W NB entrance	\$ 6,414,839
5230	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I94	6th St to 25th/Riverside	\$ 1,221,402
5231	6+ Lane Freeway	Hennepin	Lane Drop	I94	TH 280	\$ 1,673,520
5234	6+ Lane Freeway	Hennepin	Lane Drop	I94	I-494 exit	\$ 4,399,192
5235	6+ Lane Freeway	Hennepin	Mainline Weaving	I94	I-494 to Weaver Lake Rd	\$ 170,563
5237	6+ Lane Freeway	Hennepin	Lane Drop	I394	MnPASS lane drop	\$ 1,584,515
5238	6+ Lane Freeway	Hennepin	Entering Traffic	I394	TH 100 NB entrance	\$ 3,495,345
5240	4 Lane Freeway	Hennepin	Lane Drop	I394	I-94 WB lane drop	\$ 1,206,589
5242	6+ Lane Freeway	Hennepin	Exit Capacity	I394	TH 100 CD Road exit	\$ 1,215,171
5243	6+ Lane Freeway	Hennepin	Entering Traffic	I394	TH 100 CD Road entrance	\$ 1,698,314
5244	6+ Lane Freeway	Hennepin	Entering Traffic	I394	TH 169 CD Road entrance	\$ 1,506,470
5246	6+ Lane Freeway	Hennepin	Exit Capacity	I35W	I-35W NB exit	\$ 17,532,505
5247	6+ Lane Freeway	Hennepin	Mainline Weaving	I35W	I-35W SB to 35th St	\$ 11,044,174
5248	6+ Lane Freeway	Hennepin	Exit Capacity	I35W	35th St exit	\$ 2,253,108
5249	6+ Lane Freeway	Hennepin	Mainline Weaving	I35W	36th St to 46th St	\$ 4,222,525
5250	6+ Lane Freeway	Hennepin	Entering Traffic	I35W	66th St	\$ 1,343,131
5252	6+ Lane Freeway	Hennepin	Entering Traffic	I35W	W Old Shakopee Rd	\$ 5,023,628
5253	6+ Lane Freeway	Hennepin	Exit Capacity	I35W	I-94 CD Road	\$ 6,110,089
5257	6+ Lane Freeway	Hennepin	Ramp to Ramp Weaving	I35W	Hiawatha to University	\$ 7,255,944
5258	6+ Lane Freeway	Hennepin	Exit Capacity	I35W	I-94 WB entrance	\$ 7,503,096
5259	6+ Lane Freeway	Hennepin	Exit Capacity	I94	I-35W SB exit	\$ 10,967,864
5260	6+ Lane Freeway	Hennepin	Entering Traffic	I94	TH 65 NB entrance	\$ 14,307,213
5261	4 Lane Freeway	Hennepin	Mainline Weaving	TH 62	Croesstown mainline and ramps	\$ 1,245,102
5262	6+ Lane Freeway	Hennepin	Mainline Weaving	I94	I-35W	\$ 6,660,657
5263	6+ Lane Freeway	Hennepin	Mainline Weaving	I94	I-35W	\$ 796,494
5264	4 Lane Freeway	Hennepin	Entering Traffic	TH 62	Portland Ave	\$ 2,387,401
5265	4 Lane Freeway	Hennepin	Entering Traffic	TH 62	France Ave S	\$ 1,962,218
5501	4+ Lane Expressway	Hennepin	Intersection	TH169	114TH AVE N & JEFFERSON HWY N & ELM CREEK PKWY	\$ 575,180
5502	4+ Lane Expressway	Hennepin	Intersection	TH169	117TH AVE N & JEFFERSON HWY N	\$ 398,701
5503	4+ Lane Expressway	Hennepin	Intersection	TH169	120TH AVE N & JEFFERSON HWY N	\$ 355,624
5504	4+ Lane Expressway	Hennepin	Intersection	TH7	12TH AVE N & HIGHWAY 7	\$ 113,643
5506	4+ Lane Urban	Hennepin	Intersection	TH55	32ND ST E & HIAWATHA AVE	\$ 1,184,568
5507	4+ Lane Urban	Hennepin	Intersection	TH55	35TH ST E & HIAWATHA AVE	\$ 860,516
5509	4+ Lane Expressway	Hennepin	Intersection	TH7	5TH AVE N & HIGHWAY 7 & OAK RIDGE RD	\$ 181,314
5512	4+ Lane Expressway	Hennepin	Intersection	TH252	TH 252 & 70TH AVE	\$ 1,227,600
5513	4+ Lane Expressway	Hennepin	Intersection	TH252	TH 252 & 73RD AVE	\$ 691,799
5515	2 Lane Rural	Hennepin	Intersection	TH12	BABCOCK BLVD & COUNTY LINE RD & HIGHWAY 12	\$ 10,044
5516	4+ Lane Expressway	Hennepin	Intersection	TH55	BOONE AVE N & HIGHWAY 55	\$ 419,562
5519	2 Lane Rural	Hennepin	Intersection	TH7	COUNTY ROAD 44 & HIGHWAY 7	\$ 14,000
5520	4+ Lane Expressway	Hennepin	Intersection	TH101	HIGHWAY 101 & DIAMOND LAKE RD S	\$ 477,866
5521	4+ Lane Expressway	Hennepin	Intersection	TH55	TH 55 & FERNBROOK LN	\$ 312,188
5522	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & INDUSTRIAL PARK BLVD	\$ 429,356
5523	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & MEADOW LN N	\$ 185,018
5524	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & MEDICINE LAKE DR W	\$ 274,759
5525	4+ Lane Expressway	Hennepin	Intersection	TH55	TH 55 & NIAGARA LN	\$ 763,322
5527	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & REVERE LN N	\$ 564,043
5528	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & RHODE ISLAND AVE N	\$ 157,119
5529	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & THEODORE WIRTH PKWY	\$ 48,672
5530	2 Lane Rural	Hennepin	Intersection	TH55	HIGHWAY 55 & WILLOW DR	\$ 2,348
5531	4+ Lane Expressway	Hennepin	Intersection	TH62	HIGHWAY 62 & INTERSTATE 494	\$ 945
5532	4+ Lane Expressway	Hennepin	Intersection	TH7	HIGHWAY 7 & OLD MARKET RD	\$ 322,769
5533	4+ Lane Expressway	Hennepin	Intersection	TH7	TH 7 & WOODLAND RD	\$ 188,964
5534	4+ Lane Expressway	Hennepin	Intersection	TH7	HIGHWAY 7 & VINE HILL RD	\$ 383,975
5538	4+ Lane Expressway	Hennepin	Intersection	TH62	HIGHWAY 62 & INTERSTATE 494	\$ 12,057
5540	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & ARROWHEAD DR	\$ 42,582

CMSP System Problem Statement

Map Ref ID	Road Type	County	Problem Type	Highway Number	Descriptions	Annual Total Cost
5541	4+ Lane Expressway	Hennepin	Intersection	TH7	TH 7 & BLAKE RD	\$ 1,382,314
5542	4+ Lane Expressway	Hennepin	Intersection	TH7	TH 7 & TEXAS AVE	\$ 383,277
5543	4+ Lane Urban	Hennepin	Intersection	TH55	42ND ST E & HIAWATHA AVE	\$ 763,639
5547	4+ Lane Expressway	Hennepin	Intersection	TH62	BEACH RD & HIGHWAY 62	\$ 117,526
5549	4+ Lane Expressway	Hennepin	Intersection	TH7	TH 7 & CSAH 101	\$ 817,092
5551	2 Lane Rural	Hennepin	Intersection	TH55	COUNTY ROAD 19 & HIGHWAY 55	\$ 48,142
5553	4+ Lane Expressway	Hennepin	Intersection	TH55	COUNTY ROAD 6 & HIGHWAY 55	\$ 248,812
5554	4+ Lane Expressway	Hennepin	Intersection	TH55	DOGWOOD ST & HIGHWAY 55	\$ 15,072
5555	4+ Lane Expressway	Hennepin	Intersection	TH55	TH 55 & DOUGLAS DR	\$ 389,154
5556	4+ Lane Expressway	Hennepin	Intersection	TH55	GLENWOOD AVE & HIGHWAY 55	\$ 582,414
5557	4+ Lane Urban	Hennepin	Intersection	TH169	HIGHWAY 169 & DAYTON RD	\$ 1,472,185
5558	2 Lane Rural	Hennepin	Intersection	TH12	HALGREN RD & HIGHWAY 12	\$ 5,479
5559	4+ Lane Expressway	Hennepin	Intersection	TH7	HAZELTINE BLVD & HIGHWAY 7 & WOODRUFF AVE	\$ 642,009
5560	4+ Lane Urban	Hennepin	Intersection	TH55	HIGHWAY 55 & LYNDAL AVE N	\$ 960,001
5564	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & XENIUM LN N	\$ 741,623
5570	4+ Lane Expressway	Hennepin	Intersection	TH55	HIGHWAY 55 & REBECCA PARK TR	\$ 15,834
5572	4+ Lane Expressway	Hennepin	Intersection	TH169	TH 169 & HAYDEN LAKE RD E	\$ 390,899
Ramsey County						
6002	4 Lane Freeway	Ramsey	Exit Capacity	US10	I-694	\$ 610,788
6003	4+ Lane Expressway	Ramsey	Intersection	MN51	Co Rd C	\$ 1,137,496
6004	4+ Lane Expressway	Ramsey	Intersection	MN51	Co Rd B	\$ 1,393,022
6005	4+ Lane Urban	Ramsey	Intersection	MN51	University Ave	\$ 1,065,179
6006	4+ Lane Urban	Ramsey	Intersection	MN51	St. Anthony Ave	\$ 2,512,146
6007	4+ Lane Urban	Ramsey	Intersection	MN51	Concordia Ave	\$ 1,719,251
6008	4+ Lane Urban	Ramsey	Intersection	MN51	Selby Ave	\$ 1,244,432
6012	4 Lane Freeway	Ramsey	Entering Traffic	MN5	Mississippi River Blvd/Shepard Rd	\$ 179,581
6013	4+ Lane Urban	Ramsey	Intersection	MN5	Davern St	\$ 559,837
6015	4+ Lane Urban	Ramsey	Intersection	MN5	St. Paul Ave	\$ 1,537,475
6016	4+ Lane Urban	Ramsey	Intersection	MN5	TH 51	\$ 797,340
6017	4+ Lane Urban	Ramsey	Intersection	MN5	Kellogg Blvd	\$ 349,247
6018	4+ Lane Urban	Ramsey	Intersection	MN5	Wabasha St	\$ 184,256
6019	4+ Lane Urban	Ramsey	Intersection	MN5	Jackson St	\$ 230,559
6020	4+ Lane Urban	Ramsey	Intersection	MN5	Lafayette Rd/US 52	\$ 528,645
6021	4+ Lane Urban	Ramsey	Intersection	MN5	US 61/Mounds Blvd	\$ 437,179
6022	4+ Lane Urban	Ramsey	Intersection	MN5	Smith Ave	\$ 218,795
6028	2 Lane Urban	Ramsey	Intersection	MN5	White Bear Ave	\$ 543,686
6031	4+ Lane Urban	Ramsey	Intersection	US61	I-94/Mpund Blvd	\$ 356,427
6032	2 Lane Urban	Ramsey	Intersection	TH36	TH 36 & TH 120 (CENTURY AVE)	\$ 2,346,632
6034	4+ Lane Urban	Ramsey	Intersection	MN120	I-694 WB Ramps	\$ 323,958
6035	2 Lane Urban	Ramsey	Intersection	US61	Maryland Ave	\$ 333,503
6036	4+ Lane Urban	Ramsey	Intersection	US61	Co Rd E	\$ 520,285
6037	4+ Lane Urban	Ramsey	Intersection	US61	I-694 WB Ramps	\$ 746,902
6039	4+ Lane Urban	Ramsey	Intersection	US61	Co Rd D	\$ 1,047,166
6040	4+ Lane Urban	Ramsey	Intersection	US61	Beam Ave	\$ 1,159,121
6042	6+ Lane Freeway	Ramsey	Exit Capacity	US10	I-35W	\$ 2,833,379
6043	4 Lane Freeway	Ramsey	Mainline Weaving	I694	Lexington to Victoria	\$ 8,404,505
6044	4 Lane Freeway	Ramsey	Lane Drop	I694	I-35W	\$ 1,424,142
6045	6+ Lane Freeway	Ramsey	Exit Capacity	I694	I-35W	\$ 2,517,701
6046	4 Lane Freeway	Ramsey	Lane Drop	I694	Victoria St	\$ 1,548,788
6048	6+ Lane Freeway	Ramsey	Exit Capacity	I694	I-694 WB	\$ 859,016
6050	6+ Lane Freeway	Ramsey	Entering Traffic	I35W	Co Rd I	\$ 1,398,814
6051	6+ Lane Freeway	Ramsey	Entering Traffic	I35W	I-694 EB	\$ 5,582,445
6052	4 Lane Freeway	Ramsey	Entering Traffic	I35E	Co Rd 96	\$ 4,048,972
6053	6+ Lane Freeway	Ramsey	Entering Traffic	I35E	I-694	\$ 1,559,651
6054	6+ Lane Freeway	Ramsey	Entering Traffic	I35E	TH 36	\$ 6,400,684
6057	4 Lane Freeway	Ramsey	Entering Traffic	TH36	I-35E	\$ 1,568,913

CMSP System Problem Statement

Map Ref ID	Road Type	County	Problem Type	Highway Number	Descriptions	Annual Total Cost
6059	4 Lane Freeway	Ramsey	Entering Traffic	TH36	Dale St	\$ 2,065,489
6060	4 Lane Freeway	Ramsey	Ramp to Ramp Weaving	TH36	Lexington Ave/Snelling Ave	\$ 2,529,701
6061	6+ Lane Freeway	Ramsey	Exit Capacity	TH36	I-35W SB	\$ 3,649,434
6062	6+ Lane Freeway	Ramsey	Entering Traffic	I94	US 61/US 10	\$ 4,203,735
6064	6+ Lane Freeway	Ramsey	Entering Traffic	I94	US 52	\$ 4,326,652
6065	6+ Lane Freeway	Ramsey	Ramp to Ramp Weaving	I94	I-94/I-35E	\$ 2,281,347
6066	6+ Lane Freeway	Ramsey	Substandard Geometry or Other	I94	12th St Left Entrance	\$ 2,199,030
6067	6+ Lane Freeway	Ramsey	Lane Drop	I94	Snelling Ave	\$ 5,466,051
6068	6+ Lane Freeway	Ramsey	Substandard Geometry or Other	I94	TH 280	\$ 2,691,461
6074	4+ Lane Urban	Ramsey	Intersection	US61	CSAH 96	\$ 770,626
6075	4+ Lane Urban	Ramsey	Intersection	US61	TH 5 East Jct	\$ 56,998
6076	4+ Lane Urban	Ramsey	Intersection	US61	I-694	\$ 1,019,425
6079	2 Lane Urban	Ramsey	Intersection	US61	Wheelock Pkwy	\$ 119,040
6088	2 Lane Urban	Ramsey	Intersection	MN120	34th St	\$ 61,266
6092	4 Lane Freeway	Ramsey	Exit Capacity	US10	I-35W	\$ 623,069
6093	4+ Lane Urban	Ramsey	Intersection	MN51	Randolph Ave	\$ 161,595
6094	4+ Lane Urban	Ramsey	Intersection	MN51	Grand Ave	\$ 339,092
6097	4+ Lane Urban	Ramsey	Intersection	MN51	Pierce Butler Rte	\$ 292,520
6098	4+ Lane Expressway	Ramsey	Intersection	MN51	Larpenteur Ave	\$ 1,015,901
6112	4+ Lane Urban	Ramsey	Intersection	MN5	I-35E	\$ 53,701
6119	2 Lane Urban	Ramsey	Intersection	MN5	Johnson Pkwy	\$ 133,112
6132	4 Lane Freeway	Ramsey	Lane Drop	I694	I-35W	\$ 3,928,470
6134	4 Lane Freeway	Ramsey	Entering Traffic	I694	White Bear Ave	\$ 2,467,311
6135	4 Lane Freeway	Ramsey	Mainline Weaving	I694	Victoria St	\$ 1,548,788
6136	4 Lane Freeway	Ramsey	Mainline Weaving	I694	Victoria St	\$ 1,097,581
6137	4 Lane Freeway	Ramsey	Ramp to Ramp Weaving	I694	I-35W/US 10	\$ 591,196
6139	6+ Lane Freeway	Ramsey	Lane Drop	I94	Snelling Ave	\$ 4,467,536
6140	6+ Lane Freeway	Ramsey	Exit Capacity	I94	I-94/I-35E	\$ 12,774,810
6143	4 Lane Freeway	Ramsey	Entering Traffic	TH36	Snelling Ave	\$ 2,662,898
6144	4 Lane Freeway	Ramsey	Ramp to Ramp Weaving	TH36	Lexington Ave to Dale Ave	\$ 546,186
6146	4 Lane Freeway	Ramsey	Entering Traffic	TH280	Energy Park Dr	\$ 941,511
6147	6+ Lane Freeway	Ramsey	Exit Capacity	TH280	I-35W	\$ 293,895
6152	6+ Lane Freeway	Ramsey	Ramp to Ramp Weaving	I35W	I-694 Loops	\$ 2,390,459
6153	6+ Lane Freeway	Ramsey	Entering Traffic	I35W	TH 10	\$ 1,517,489
6154	6+ Lane Freeway	Ramsey	Entering Traffic	I35E	I-94/I-35E	\$ 2,082,919
6155	6+ Lane Freeway	Ramsey	Entering Traffic	I35E	Pennsylvania Ave	\$ 1,881,826
6159	6+ Lane Freeway	Ramsey	Entering Traffic	I35E	Maryland Ave	\$ 728,314
6161	4 Lane Freeway	Ramsey	Lane Drop	I35E	Co Rd E	\$ 2,010,592
6162	6+ Lane Freeway	Ramsey	Entering Traffic	I35E	Pennsylvania Ave	\$ 11,303,742
6163	4 Lane Freeway	Ramsey	Lane Drop	I35E	TH 5/W 7th St	\$ 2,195,782
6164	4 Lane Freeway	Ramsey	Entering Traffic	I35E	Shepard Rd	\$ 2,704,973
6165	4 Lane Freeway	Ramsey	Exit Capacity	TH280	I-94	\$ 1,758,531
6166	4 Lane Freeway	Ramsey	Entering Traffic	I694	Hamline Ave	\$ 451,836
6501	4+ Lane Urban	Ramsey	Intersection	TH61	TH 61 & BURNS AVE	\$ 226,271
6502	4+ Lane Urban	Ramsey	Intersection	TH61	TH 61 & WARNER RD	\$ 1,030,208
6503	4+ Lane Urban	Ramsey	Intersection	TH280	TH 280 & BROADWAY ST	\$ 484,289
6504	4+ Lane Urban	Ramsey	Intersection	TH61	HIGHWAY 61 & LOWER AFTON RD	\$ 635,351
Scott County						
7001	2 Lane Rural	Scott	Intersection	MN13	160th St SE	\$ 297,561
7002	2 Lane Rural	Scott	Intersection	MN13	Panama Ave	\$ 24,939
7003	4+ Lane Expressway	Scott	Ramp to Ramp Weaving	MN13	US 169 to MN 13	\$ 1,873,730
7004	4+ Lane Expressway	Scott	Intersection	TH169	CHESTNUT BLVD & COUNTY ROAD 78 & HIGHWAY 169	\$ 1,451,491
7005	4 Lane Freeway	Scott	Entering Traffic	US169	From MN 13	\$ 7,409,045
7007	4+ Lane Expressway	Scott	Intersection	TH169	TH 169 & TH 282	\$ 1,013,149
7009	4+ Lane Expressway	Scott	Ramp to Ramp Weaving	MN13	MN 13 to TH 169	\$ 1,183,028
7018	2 Lane Rural	Scott	Intersection	MN13	CH 21	\$ 775,130

CMSP System Problem Statement

Map Ref ID	Road Type	County	Problem Type	Highway Number	Descriptions	Annual Total Cost
7020	4+ Lane Expressway	Scott	Intersection	MN13	McColl Dr	\$ 668,734
7021	4+ Lane Expressway	Scott	Intersection	TH13	TH 13 & LYNN AVE	\$ 1,191,866
7023	4+ Lane Expressway	Scott	Entering Traffic	MN13	MN 13 NB	\$ 1,311,971
7024	4+ Lane Expressway	Scott	Intersection	MN13	CH 42	\$ 203,623
7502	2 Lane Rural	Scott	Intersection	TH41	CHESTNUT BLVD & DEM CON DR	\$ 584,860
7504	4+ Lane Expressway	Scott	Intersection	TH13	TH 13 & QUENTIN AVE	\$ 850,014
Washington County						
8001	2 Lane Rural	Washington	Substandard Geometry or Other	US10	St Croix River Crossing	\$ 18,748
8002	2 Lane Rural	Washington	Intersection	TH61	HIGHWAY 10 & POINT DOUGLAS DR S	\$ 444,724
8003	2 Lane Rural	Washington	Intersection	TH61	HIGHWAY 61 & MANNING AVE S	\$ 467,166
8005	2 Lane Rural	Washington	Intersection	TH36	CHESTNUT ST E & MAIN ST S	\$ 158,442
8006	2 Lane Rural	Washington	Intersection	US61	140th ST N	\$ 261,254
8007	4 Lane Freeway	Washington	Ramp to Ramp Weaving	I694	10th St N to I-694	\$ 1,583,095
8009	2 Lane Rural	Washington	Intersection	US61	Frenchman Rd	\$ 112,223
8011	2 Lane Rural	Washington	Intersection	TH36	Chestnut St E	\$ 133,051
8013	4+ Lane Expressway	Washington	Intersection	TH36	TH 36 & MANNING AVE	\$ 748,716
8017	6+ Lane Freeway	Washington	Exit Capacity	I494	Ramp to I-94 EB	\$ 2,075,097
8018	6+ Lane Freeway	Washington	Ramp to Ramp Weaving	I694	I-94 Loops	\$ 2,517,882
8019	4 Lane Freeway	Washington	Entering Traffic	I694	10th ST N	\$ 1,056,785
8020	6+ Lane Freeway	Washington	Entering Traffic	I94	Radio Dr	\$ 1,815,396
8501	4+ Lane Expressway	Washington	Intersection	TH36	WASHINGTON & HIGHWAY 36	\$ 393,992
8502	4+ Lane Expressway	Washington	Intersection	TH36	TH 36 & LAKE ELMO AVE N	\$ 766,425
8505	4+ Lane Expressway	Washington	Intersection	TH36	TH 36 & HADLEY AVE	\$ 1,031,768
8508	4+ Lane Expressway	Washington	Intersection	TH36	OSGOOD AVE N & HIGHWAY 36	\$ 588,681
8509	4+ Lane Expressway	Washington	Intersection	TH36	HIGHWAY 36 & GREELEY ST & OAKGREEN AVE	\$ 904,635
Sherburne County						
9501	4+ Lane Expressway	Sherburne	Intersection	TH10	171ST AVE NW & 171ST ST NW & HIGHWAY 10	\$ 422,014
9502	4+ Lane Expressway	Sherburne	Intersection	TH169	TH 169 & 197TH AVE	\$ 680,490
9503	4+ Lane Expressway	Sherburne	Intersection	TH10	HIGHWAY 10 & JOPLIN ST NW	\$ 731,161
9504	4+ Lane Expressway	Sherburne	Intersection	TH10	HIGHWAY 10 & UPLAND AVE NW	\$ 597,209
9505	4+ Lane Expressway	Sherburne	Intersection	TH10	HIGHWAY 10 & WACO ST NW	\$ 320,659
9506	4+ Lane Expressway	Sherburne	Intersection	TH169	TH 169 & MAIN ST	\$ 1,371,377
9507	4+ Lane Expressway	Sherburne	Intersection	TH169	TH 169 & HIGHWAY 10 WB RAMPS	\$ 854,149
9508	4+ Lane Expressway	Sherburne	Intersection	TH169	TH 169 & 193RD AVE	\$ 1,294,562
9509	4+ Lane Expressway	Sherburne	Intersection	TH169	TH 169 & SCHOOL ST	\$ 1,399,084
9510	4+ Lane Expressway	Sherburne	Intersection	TH10	HIGHWAY 10 & JACKSON AVE NW	\$ 470,116
9511	4+ Lane Expressway	Sherburne	Intersection	TH10	HIGHWAY 10 & PROCTOR AVE NW	\$ 253,199
9512	4+ Lane Expressway	Sherburne	Intersection	TH10	HIGHWAY 10 & MAIN ST	\$ 486,125
Wright County						
9005	4+ Lane Expressway	Wright	Intersection	MN241	I-94	\$ 753,877
9006	4+ Lane Expressway	Wright	Intersection	MN241	Naber Ave	\$ 924,321
9007	6+ Lane Freeway	Wright	Lane Drop	I-94	TH 241	\$ 1,568,066

Reliability and Safety Measures

The next few pages of this memorandum consist of Reliability and Safety Measure Maps:

- 2015 AM Reliability Measures
- 2015 PM Reliability Measures
- 2013-2015 Crash Density

CMSP – 2013-2015 Crash Density

Crashes/0.05 Mile - 3 Years

