



Trunk Highway Bridge Improvement Program Chapter 152

January 2016



Prepared by

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Cover Photo: Photo of the newly completed Lafayette Bridge on Hwy 52 in St. Paul; taken by MnDOT's Rich Kemp.

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Legislative Request

This report is issued to comply with [Minnesota Statute 165.14](#).

Subdivision 1. **Definition**

For purposes of this section, "program" means the trunk highway bridge improvement program established under this section.

Subd. 2. **Program created**

The commissioner shall develop a trunk highway bridge improvement program for accelerating repair and replacement of trunk highway bridges throughout the state. The program receives funding for bridge projects as specified by law.

Subd. 3. **Program requirements**

(a) The commissioner shall develop an inventory of bridges included in the program. The inventory must include all bridges on the trunk highway system in Minnesota that are classified as fracture-critical or structurally deficient, or constitute a priority project, as identified by the commissioner. In determining whether a bridge is a priority project, the commissioner may consider national bridge inventory (NBI) condition codes, bridge classification as functionally obsolete, the year in which the bridge was built, the history of bridge maintenance and inspection report findings, the average daily traffic count, engineering judgments with respect to the safety or condition of the bridge, and any other factors specifically identified by the commissioner.

(b) For each bridge included in the inventory, the commissioner must provide the following information: a summary of the bridge, including but not limited to, county and department district, route number, feature crossed, the year in which the bridge was built, average daily traffic count, load rating, bridge length and deck area, and main span type; the condition ratings for the deck, superstructure, and substructure; identification of whether the bridge is structurally deficient, functionally obsolete, or fracture-critical; the sufficiency rating; a brief description of the work planned for the bridge, including work type needed; an estimate of total costs related to the bridge, which may include general and planning cost estimates; and, the year or range of years in which the work is planned.

Subd. 4. **Prioritization of bridge projects**

(a) The commissioner shall classify all bridges in the program into tier 1, 2, or 3 bridges, where tier 1 is the highest tier. Unless the commissioner identifies a reason for proceeding otherwise, before commencing bridge projects in a lower tier, all bridge projects within a higher tier must to the extent feasible be selected and funded in the approved state transportation improvement program, at any stage in the project development process, solicited for bids, in contract negotiation, under construction, or completed.

(b) The classification of each tier is as follows:

(1) tier 1 consists of any bridge in the program that (i) has an average daily traffic count that is above 1,000 and has a sufficiency rating that is at or below 50, or (ii) is identified by the commissioner as a priority project;

(2) tier 2 consists of any bridge that is not a tier 1 bridge, and (i) is classified as fracture-critical, or (ii) has a sufficiency rating that is at or below 80; and

(3) tier 3 consists of any other bridge in the program that is not a tier 1 or tier 2 bridge.

(c) By June 30, 2018, all tier 1 and tier 2 bridges originally included in the program must be under contract for repair or replacement with a new bridge that contains a load-path-redundant design, except that a specific bridge may remain in continued service if the reasons are documented in the report required under subdivision 5. Bridges that are not originally included in the program and additional bridges identified for contract after the trunk highway bridge improvement program concludes on June 30, 2018, must be prioritized according to subdivision 7.

(d) All bridge projects funded under this section in fiscal year 2012 or later must include bicycle and pedestrian accommodations if both sides of the bridge are located in a city or the bridge links a pedestrian way, shared-use path, trail, or scenic bikeway.

Bicycle and pedestrian accommodations would not be required if:

- (1) a comprehensive assessment demonstrates that there is an absence of need for bicycle and pedestrian accommodations for the life of the bridge; or
- (2) there is a reasonable alternative bicycle and pedestrian crossing within one-quarter mile of the bridge project.

All bicycle and pedestrian accommodations should enable a connection to any existing bicycle and pedestrian infrastructure in close proximity to the bridge. All pedestrian facilities must meet or exceed federal accessibility requirements as outlined in Title II of the Americans with Disabilities Act, codified in United States Code, title 42, chapter 126, subchapter II, and Section 504 of the Rehabilitation Act of 1973, codified in United States Code, title 29, section 794.

(e) The commissioner shall establish criteria for determining the priority of bridge projects within each tier, and must include safety considerations as a criterion.

Subd. 5. Statewide transportation planning report

In conjunction with each update to the Minnesota statewide transportation plan, or at least every six years, the commissioner shall submit a report to the chairs and ranking minority members of the House of Representatives and senate committees with jurisdiction over transportation finance. The report must include:

- (1) an explanation of the criteria and decision-making processes used to prioritize bridge projects;
- (2) a historical and projected analysis of the extent to which all trunk highway bridges meet bridge performance targets;
- (3) a summary of bridge projects (i) completed in the previous six years or since the last update to the Minnesota statewide transportation plan, and (ii) currently in progress under the program;
- (4) a summary of bridge projects scheduled in the next four fiscal years and included in the state transportation improvement program;

- (5) a projection of annual needs over the next 20 years;
- (6) a calculation funding necessary to meet the completion date under subdivision 4, paragraph (c), compared to the total amount of bridge-related funding available; and
- (7) for any tier 1 fracture-critical bridge that is repaired but not replaced, an explanation of the reasons for repair instead of replacement.

Subd. 6. Annual report

Annually by January 15, the commissioner shall submit a report on the program to the chairs and ranking minority members of the House of Representatives and senate committees with jurisdiction over transportation finance. The report must include the inventory information required under subdivision 3, and an analysis, including any recommendations for changes, of the adequacy and efficacy of

- (1) the program requirements under subdivision 3, and (2) the prioritization requirements under subdivision 4.

Subd. 7. Prioritization of subsequent trunk highway bridge projects.

The trunk highway bridge improvement program described in subdivisions 1 through 6 concludes on June 30, 2018, and applies to bridge projects identified at the inception of the program. Additional bridges that did not qualify for the initial trunk highway bridge improvement program under the tiered classification system that may subsequently need repair or replacement must be prioritized as follows:

- (1) the commissioner shall develop a prioritization method for scheduling bridge repairs and replacements that will include consideration of the risk of service interruption resulting in temporary road closures or restrictions of existing bridges;
- (2) the prioritization system must consider factors including but not limited to bridge condition, age, load capacity, type of bridge, susceptibility to flood damage, fracture-critical design features, traffic volume, detour length, and functional classification of highway route;
- (3) the prioritization system must be utilized in conjunction with department knowledge of the bridge infrastructure to establish the repair and replacement program; and
- (4) the commissioner shall establish a risk-based prioritization system no later than February 1, 2011.

The cost of preparing this report is \$5,000.

Summary

Purpose and Scope of the Report

The Trunk Highway Bridge Improvement Program Report, the sixth since 2009, is submitted in accordance with the requirements of [Minn. Stat. 165.14](#). The information in this report is current as of November 2015.

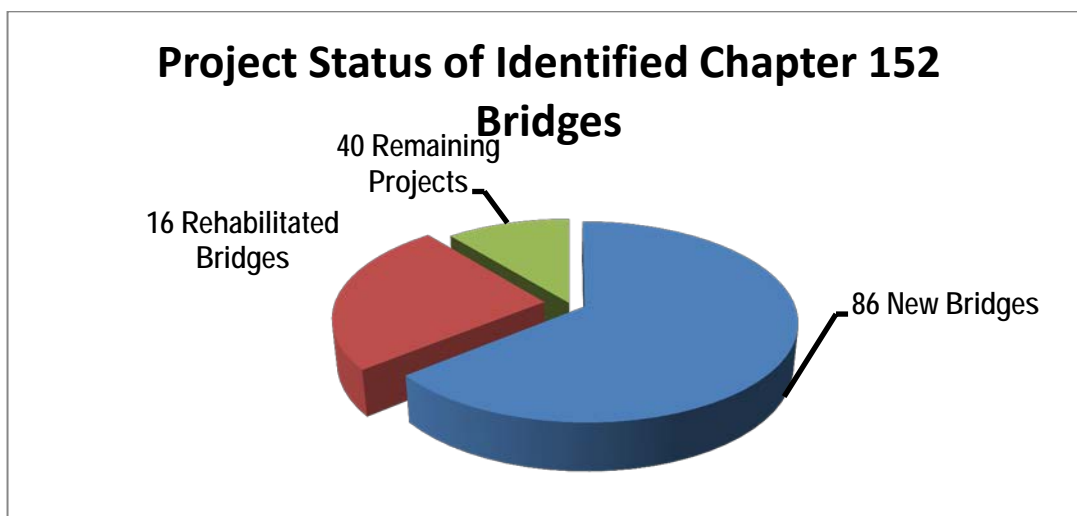
All of the bridge projects in this report are part of a master bridge list developed on March 1, 2008 (revised on April 23, 2008) identifying 172 bridges that met the criteria established in [Laws of Minnesota 2008, Chapter 152](#). This program focuses on those bridges classified as either structurally deficient or fracture critical.

Of the 172 bridges identified as part of the Chapter 152 program, an estimated 120 bridges will be under contract to be replaced or rehabilitated by June 30, 2018. The remaining bridges were either under construction at the time the program was established; classified as “Tier 3” under the priority system and were not required to be funded as part of the program (although many were already programmed for work); privately owned; or deemed in good working order and only need routine maintenance until after June 30, 2018.

Project Status

The status of the 172 bridges is as follows:

- 102 bridges are substantially complete - 86 are new bridges and 16 are bridge rehabilitation projects.
- 12 bridges will be complete by the end of the 2016 construction season.
- 7 bridges will be completed in 2017.
- 21 bridges are scheduled to be under contract for repair or replacement in 2017-18.
- 32 bridges only need routine maintenance during the Chapter 152 program years.
- 2 bridges are privately owned.
- 1 bridge is closed to traffic and therefore will not receive any work under Chapter 152.



NOTE: Project status of 142 bridges identified under Chapter 152 program that need work

Tier System

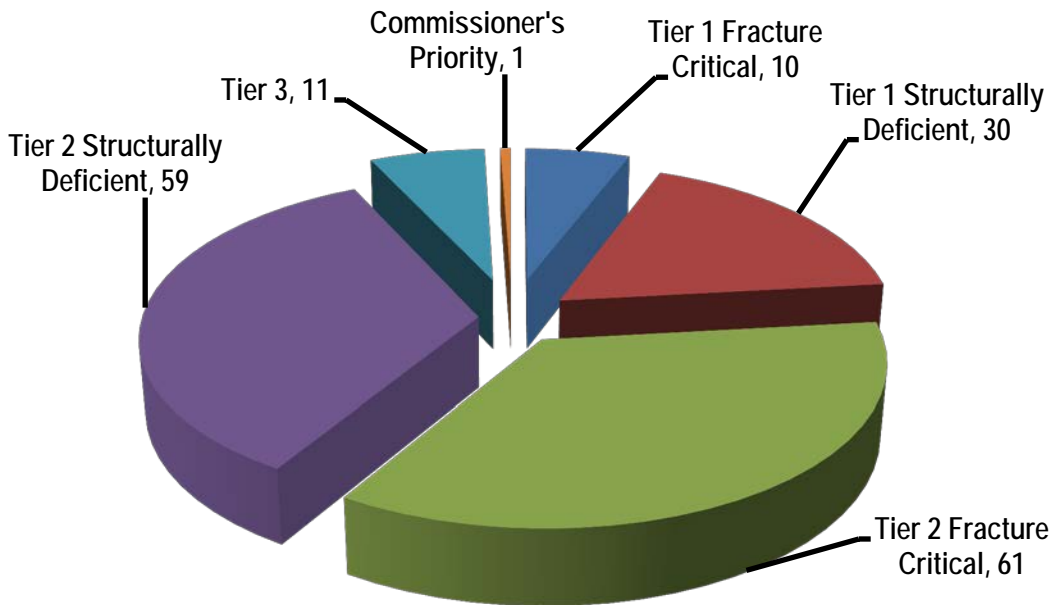
The legislation created a tier system to prioritize bridges based on each bridge's overall condition and usability. All bridges inventoried are classified as a Tier 1, Tier 2 or Tier 3 bridge, where Tier 1 is the highest priority tier. Unless the commissioner identifies a reason for proceeding otherwise, all bridge projects within a higher tier must, to the extent feasible, be selected and funded in the approved State Transportation Improvement Program before beginning bridge projects in a lower tier. This can occur at any stage in the project development process—during bid solicitation, contract negotiations, construction or at completion.

- Tier 1: Any bridge with an average daily traffic count greater than 1,000 and a sufficiency rating that is at or below 50; or is identified by the commissioner as a priority project.
- Tier 2: Any bridge that is not a Tier 1 bridge, and is classified as fracture critical, or has a sufficiency rating that is at or below 80.
- Tier 3: Any other bridge meeting the program criteria (structurally deficient) that is not a Tier 1 or Tier 2 bridge.

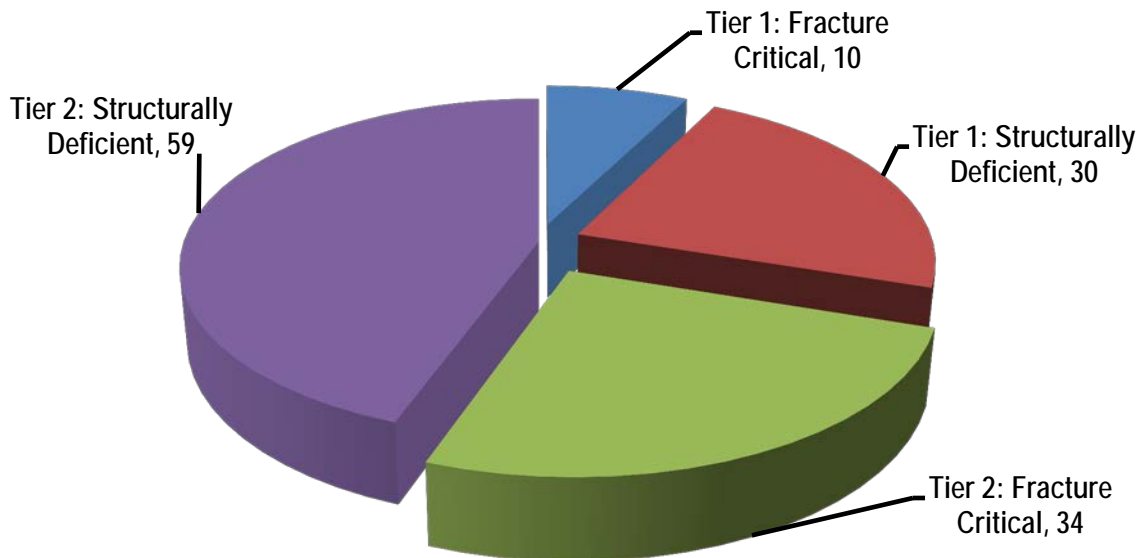
The Bridge Office and the Office of Transportation System Management met with all MnDOT districts at the time the program was established to review the Tier 1 and Tier 2 bridge projects. Together, they identified the needed improvements for each bridge, such as rehabilitation, redeck, minor maintenance or replacement.

The outcome of those meetings provided information to the districts for determining project scopes, cost estimates and preliminary construction dates associated with the identified bridge improvements. The project scopes and cost estimates for the bridge projects were completed in December 2008 and are updated annually. There are several major bridges included in this program where ownership is shared with Canada, Wisconsin or North Dakota. For the purposes of this report, only Minnesota's cost share of those bridges is reported.

Total Number of Chapter 152 Bridges Identified



Number of Tier 1 and 2 Bridges to be Rehabilitated, Replaced or Are Under Construction



NOTE: Tier 3 and Commissioner's Priority bridges are not represented in above diagram

Chapter 152 Bridge Inventory

A bridge inventory is included in this report that identifies the following information:

- Bridge number
- County
- MnDOT district
- Route number
- Facility carried and feature crossed
- National Bridge Inspection Standards condition ratings (deck, superstructure, substructure)
- Bridge classification(s): structurally deficient, fracture-critical or functionally obsolete
- Sufficiency rating
- Year built
- Average daily traffic count
- Load (operating) rating
- Length
- Deck area
- Main span type
- Brief description of the work planned
- Total project costs
- Year (or range of years) in which the work is planned
- Any notes on the bridge regarding history of bridge maintenance and inspection report findings, engineering judgments about the safety or condition of the bridge, or any other factors specifically identified by the commissioner

Each project within the four-year STIP has a total project cost estimate associated with it. Projects planned for years beyond the STIP time frame identify a total project cost estimate range.

MnDOT will accomplish the following by June 30, 2018 as part of the Chapter 152 Trunk Highway Bridge Improvement Program:

- Tier 1: Replace, renovate or have under construction all 10 fracture critical bridges.
- Tier 1: Replace, renovate or have under construction all 30 of the structurally deficient bridges that are not fracture critical.
- Tier 2: Replace an estimated 13 of the 61 fracture critical bridges. Of the remaining fracture critical bridges, 24 will be repaired or renovated, two are currently under study to determine if they will be replaced or rehabilitated, two are privately owned, and one does not carry trunk highway traffic. The remaining Tier 2 fracture critical bridges that are not being repaired or replaced within this 10-year program have performed well and are only in need of routine maintenance at this time. Some of these bridges are planned for replacement just beyond 2018.
- Tier 2: Replace or repair all 59 structurally deficient bridges, based on load posting status, maintenance history, condition and sufficiency ratings.
- Tier 3: Prioritize replacement of the 11 structurally deficient bridges, based on load posting status, maintenance history and condition ratings.

- Commissioner's Priority: One load-posted bridge (neither structurally deficient nor fracture critical) was added to this program as a commissioner's priority.
- Program for replacement or repair additional bridges that become structurally deficient during the next decade, as funding allows.

Assumptions that may affect the Chapter 152 Bridge Program include:

- The current appropriation schedule for bond funds during the 10-year program does not match the current schedule for bridge improvements, which creates a negative balance in the program. Redistribution of bond appropriations may be needed to match the current bridge schedule and estimates.
- The current projections of inflation rates were used to calculate cost estimates to the year of construction or the mid-year of construction for multi-year, large-scale bridges. There were 13 large-scale bridges identified in the inventory. The inventory spreadsheet for these bridges is Appendix A. TH 99 over the Minnesota River in St. Peter and Sorlie Bridge, US 2B over the Red River in East Grand Forks will be rehabilitated in-place and are no longer considered large-scale bridge projects.
- Schedule changes for any individual large-scale bridge may require a shift in the overall bridge project schedule for one or more of the other large-scale bridges.
- Current bridge conditions were used to develop this program. Significant changes in bridge conditions may affect the order and magnitude of funding needed to deliver this program.
- One-time, near-term funding allocations may affect the completion schedule of the Chapter 152 Bridge Improvement Program.

As better information is gathered regarding these assumptions, any negative change could adversely impact the bridge program and potentially delay MnDOT's ability to deliver this entire program by June 30, 2018.

Scheduling

Scheduling of projects will occur according to the following priorities:

1. Bridge projects currently programmed in the 2016-19 STIP will be delivered as planned.
2. Large-scale bridges will be scheduled based on bond availability, project readiness, remaining bridge life and condition.
3. Other bridge projects will be scheduled prior to the end of the program as follows:
 - a. Remaining bridges will be replaced in order of tiers.
 - b. Within the tiers, projects generally were ranked in the following priority:
 - i. Load posted
 - ii. History of maintenance issues or inspection findings
 - iii. Condition Code Four or less for superstructure
 - iv. Condition Code Four or less for substructure
 - v. Sufficiency rating less than 50
 - vi. Permit restricted
 - vii. Sufficiency rating less than 80
 - viii. Functional class (principal arterials before others)

Requirements and Recommendations for Changes

Per [Minn. Stat. 165.14, subdivision 6](#), the commissioner is to report on the adequacy and efficacy of (1) the program requirements under subdivision 3, and (2) the prioritization requirements under subdivision 4.

Under subdivision 3, the program requires the commissioner to develop an inventory of bridges on the trunk highway system that are classified as fracture critical or structurally deficient, or constitute a priority project. In determining whether a bridge is a priority project, the commissioner may consider national bridge inventory condition codes, bridge classification (such as functionally obsolete), the year in which the bridge was built, the history of bridge maintenance and inspection report findings, the average daily traffic count, and engineering judgments with respect to the safety or condition of the bridge.

Structurally Deficient Bridges

Prior to the enactment of this legislation, structurally deficient bridges were considered for replacement or rehabilitation as a part of programming and planning bridge projects. Prioritization occurred using the same criteria established in this legislation.

Newer Fracture Critical Bridges

Only certain fracture critical bridges have been considered by the commissioner to be programmed or planned for replacement within the time frame of this program. Many fracture critical bridges on the trunk highway system were built after the mid-1970s, when the engineering community came to know more about steel fatigue. These newer bridges were designed and fabricated with improved details for resistance to fatigue. Steel specifications in the mid-1970s required steel “toughness” properties that provide resistance to fatigue. A Fracture Control Plan published in 1978 by the American Association of State Highway and Transportation Officials also served as a guide for fabricating bridges using improved welding techniques for assembly. Many of these bridges need only regularly scheduled maintenance or minor repairs within the time frame of this program and are not recommended by the commissioner for replacement until they near the end of their usable life. For this reason, the commissioner has taken a broad interpretation of the legislation to allow specific bridges to remain in service if the reasons are documented.

Historic Fracture Critical Bridges

MnDOT has coordinated with the Federal Highway Administration to implement the Historic Fracture Critical Bridge program. Under Section 106 of the National Historic Preservation Act, older fracture critical bridges eligible for the National Register of Historic Places required an in-depth study of the feasibility of rehabilitating these bridges prior to moving forward with a replacement project. As a part of these rehabilitation feasibility studies, MnDOT examined the potential for retrofitting fracture critical structures in order to provide load path redundancy. This is feasible for some types of fracture critical bridges. In other cases, such as truss bridges, the retrofit options examined did not provide designs that yield the 75-year service life expected from such a large invest-

ment. Additionally, some of the options examined would have created visual impacts that render the structure ineligible for the National Register. As with the newer fracture critical bridges described above, historic fracture critical bridges are also being considered as candidates for continued service.

Tier System

Prioritization parameters under [Minn. Stat. 165.14, subd. 4](#) require the commissioner to classify all bridges in the program into Tier 1, Tier 2 or Tier 3, with Tier 1 as the highest priority tier. Before beginning a bridge project prioritized within either Tier 2 or Tier 3, all bridge projects within Tier 1 must be funded in the approved STIP. The Tier 1 projects must be in some stage of the project development process, including bid solicitation, contract negotiation, under construction, or completed.

The commissioner may identify projects within the lower tiers with special circumstances and decide to prioritize those projects ahead of Tier 1 bridges. The prioritizing criteria laid out in the legislation used much of the same criteria the commissioner used to prioritize bridges before the legislation was passed, except that the commissioner had not previously categorized bridges in tiers. Since the Chapter 152 program was implemented, MnDOT has found the tier system workable and has no changes to suggest regarding its adequacy and efficacy.

Other Factors Considered

Due to MnDOT's large program and the complexities in delivering large bridge projects that require engineering, public involvement, environmental process, right of way acquisition, permits, utilities relocation, etc., not all Tier 1 bridges will be under construction prior to addressing Tier 2 bridges. However, all Tier 1 bridge projects are currently in some stage of project development.

Prioritization of Later Trunk Highway Bridge Projects

Assessing Risk

Legislation passed during the 2010 session requires expansion of the current planning process to include risk-based criteria for project identification outside of the Chapter 152 Bridge Improvement Program. The intent of introducing risk assessments is to provide a comprehensive look at factors that affect the likelihood of a service interruption and the impacts of an interruption to the traveling public. The risk assessment process considers the following factors:

- condition of the deck
- condition of the superstructure
- condition of the substructures
- age
- fracture criticality
- scour susceptibility
- geometric factors
- special vulnerabilities
- traffic volume
- heavy commercial traffic
- detour length
- highway classification

MnDOT has developed a process called Bridge Replacement and Improvement Management to incorporate the risk assessment tool. BRIM was developed and calibrated for use in the planning of bridge improvements and replacements. The BRIM process consists of three steps:

- Identifying improvement needs
- Ranking each bridge based on the bridge planning index
- Conducting an expert review

Improvement needs are developed based on bridge inspection and inventory data for each individual bridge using the expected deterioration of each bridge. The result is a draft list of bridge needs, including cost and schedule.

The next step incorporates the bridge planning index, or BPI, which applies the principles of risk assessment to the planning process and includes the factors mentioned previously. The BPI rates each individual bridge from 0 (highest priority) to 100 (lowest priority).

The last step in the BRIM process is the expert review with the MnDOT district offices. This step provides an opportunity for local experts with a more intimate knowledge of the bridges to ensure projects are programmed appropriately based on the local transportation needs, scope and schedule.

The expert review process is further refined by meeting with the MnDOT districts and making final changes based on the feedback collected. The updated bridge improvement needs are used as a basis for planning investments in state trunk highway bridges.

Statewide Performance Program and District Risk Management Program

For many years, MnDOT has allocated a large portion of revenue to its eight districts to progress towards performance targets and key objectives, and to address district-specific risks. Since the passage of MAP-21 in 2012, federal policy and performance requirements direct the majority of federal funds to the National Highway System. This will continue in the newest federal transportation legislation, Fixing America's Surface Transportation Act of 2015, otherwise known as FAST. Continuing to allocate most revenue to the eight districts might not meet NHS targets in an optimal way. Further, MnDOT must carefully manage the risk that the condition of state highways might negatively affect Minnesota's bond rating. Therefore, MnDOT developed the Statewide Performance Program and District Risk Management Program to respond to these changes.

Project selection in both programs, SPP and DRMP, will continue to require coordination with local and regional units of government and the eight Area Transportation Partnerships, as well as outreach and information sharing with other stakeholders and the general public.

The SPP focus will be on federal performance conditions, which require MnDOT to make progress towards pavement, bridge, safety and congestion performance targets. A failure to do so may result in the loss of some federal funding flexibility. MnDOT's functional and district offices will work collaboratively to select appropriate projects. These projects will focus on existing pavement conditions, bridges, roadside infrastructure rehabilitation and replacement, and will include some lower cost, high-benefit projects to improve safety and mobility.

The DRMP will focus on non-NHS highways and address unique conditions at the district level. Revenue will be allocated to the districts to identify and prioritize projects in this program; however, project selections will be evaluated across districts in a collaborative process to ensure each district is balancing district-level risks and making progress towards statewide goals. Projects will focus on pavement, bridge, roadside infrastructure, safety and mobility.

Bicycle and Pedestrian Accommodations

During the 2010 session, legislation passed requiring all bridge projects funded under the Chapter 152 program in fiscal year 2012 or later to include bicycle and pedestrian accommodations. The requirement applies if both sides of the bridge are located within a municipality or if the bridge links a pedestrian way, shared-use path, trail or scenic bikeway. Bicycle and pedestrian accommodations are not required if a comprehensive assessment demonstrates there is no need or there is a reasonable alternative within one-quarter mile of the bridge project. Bicycle and pedestrian accommodations are being implemented in accordance with the requirements of the legislation.

Appendix A: Status of Large-Scale Bridge Projects

Name/Location	County	MnDOT District	Bridge No.	Status
DeSoto, in St. Cloud; TH23 over the Mississippi River & Riverside Dr.	Stearns	3	6748	Replacement complete
Robbin-Drayton; TH11 over the Red River of the North	Kittson	2	6690	Replacement complete
Hastings; US61 over the Mississippi River, RR, Streets	Dakota	Metro	5895	Replacement complete
Lafayette; US52 over the Mississippi River, RR, Streets	Ramsey	Metro	9800	Replacement underway
Dresbach; I-90 over the Mississippi River	Winona	6	9320	Replacement underway
St. Peter; TH99 over the Minnesota River*	<i>LeSueur</i>	7	4930	Rehabilitation planned for FY 2016*
Cayuga; I-35 over Cayuga Street & BNSF RR	Ramsey	Metro	6515	Replacement underway
St. Croix River Crossing in Stillwater; TH36 over the St. Croix River	Washington	Metro	4654	Replacement underway
Winona; TH43 over the Mississippi River, RR, Streets	Winona	6	5900	Rehabilitation planned for FY 2016 and new bridge replacement underway
Sorlie Bridge, E Grand Forks; US 2B over the Red River of the North*	<i>Polk</i>	2	4700	Rehabilitation complete*
TH72 over the Rainy River in Baudette	Lake of the Woods	2	9412	Rehabilitation or replacement planned for FY 2018
Red Wing; US63 over the Mississippi River & CP Rail	Goodhue	6	9040	Replacement planned for FY 2017
New Ulm; TH14 over the Minnesota River	Brown	7	9200	Replacement planned for FY 2018

* TH 99 over the Minnesota River in St. Peter and Sorlie Bridge, US 2B over Red River in E. Grand Forks will be rehabilitated in-place and are no longer considered large-scale bridge projects.

Appendix B: Abbreviations and Definitions

Abbreviation	Definition
ADT	Average daily traffic
Bridge length	Length of bridge from abutment to abutment
Bridge number	Unique number assigned to a specific bridge
Chapter 152 work planned	Type of work planned for bridge
Chap. 152 tier	Classification created by the Legislature in MS 165.14 - See Summary
Condition (NBIS rating)	National Bridge Inspection Standards rating given to a part of a bridge to identify its condition
Construction year planned	Estimated year construction is to begin
CCONC	Continuous concrete
CSTL	Continuous steel
Deck area	Total bridge deck area (square feet)
Deck	Deck rating
District	MnDOT construction district; there are eight MnDOT districts
Facility/feature crossed	Facility carried by the bridge/feature being crossed by bridge
Fracture critical (Y=Yes, N=No)	A fracture critical bridge typically has a steel superstructure with load (tension)-carrying members arranged in a manner in which, if one fails, the bridge would collapse. Examples of fracture critical bridges are two-girder bridges or truss bridges. The classification of fracture critical does not mean the bridge is inherently unsafe.
Functionally obsolete (Y=Yes, N=No)	A functionally obsolete bridge is one that was built to standards that no longer meet the minimum federal clearance requirements for a new bridge. These bridges are not automatically rated as structurally deficient, nor are they inherently unsafe. Functionally obsolete bridges include those that have sub-standard geometric features such as narrow lanes, narrow shoulders, poor approach alignment or inadequate vertical under clearance. The classification of a bridge as functionally obsolete also indicates a priority status for federal funding eligibility.
Load (operating) rating	Load ratings based on the operating rating level generally describe the maximum permissible live load to which the structure may be subjected. Allowing unlimited numbers of vehicles to use the bridge at operating level may shorten the life of the bridge.

Abbreviation	Definition
Load posting	The placement of regulatory signs at a bridge indicating the safe load carrying capacity of the bridge.
Main span type	Type of main span superstructure
Notes	Notes on a specific bridge
OL	Overlay
PRESTR	Prestressed
PT	Paint
RDK	Re-deck
Rehab	Rehabilitation
RE-OL	Re-overlay
Route Number	Trunk Highway, US Highway or Interstate on which project is located
RPL	Replace
Substructure	Structural parts of the bridge that support the superstructure and distributes all traffic and bridge loads into the ground. Substructures are typically referred to as piers or abutments.
Structurally deficient (Y=Yes, N=No)	Bridges are classified as structurally deficient if they have a general condition rating of 4 or less for the deck, superstructure, substructure or culvert, or if the road approaches regularly take on water due to flooding. The fact that a bridge is structurally deficient does not imply that it is unsafe. For bridge owners, the classification is a reminder that the bridge may need further analysis that may result in load posting, maintenance, rehabilitation, replacement or closure. If unsafe conditions are identified during a physical inspection, the structure will be closed. Structurally deficient is a term used to indicate a priority for federal funding eligibility.
SP #	State project number
SUB	Substructure rating
Substantially complete	Bridge is open to traffic

Abbreviation	Definition
Sufficiency rating	A computed numerical value that is used to determine eligibility for federal funding. The sufficiency rating formula result varies from 0 to 100. The formula includes factors for structural condition, bridge geometry and traffic considerations. The sufficiency rating formula is contained in the December 1995 edition of the "Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges." A bridge that is structurally deficient or functionally obsolete with a sufficiency rating of 80 or less is eligible for federal rehabilitation funding. Of those, a bridge with a sufficiency rating of less than 50 is eligible for federal replacement funding.
SUP	Superstructure rating
Superstructure	The portion of the bridge that directly supports the traffic and spans from one support to another support. Typical superstructure types include beams/girders, arches, and trusses.
Total project cost estimate	All project costs associated with the construction, engineering and right of way acquisition (including inflation out to the mid-year of construction and contingency)
Value in ()	Current value, updated from the 2008 value
VD	Voided
Year built	Year the bridge was originally constructed
Year of substantial completion	Year the bridge is open to traffic after construction of the planned Chapter 152 work

Appendix C: Fracture Critical and Structurally Deficient Bridges

CHAPTER 152 BRIDGE IMPROVEMENT PROGRAM ANNUAL REPORT
Fracture Critical and Structurally Deficient Trunk Highway Bridges as of March 1, 2008

District	Bridge Number	Chapter 152 Tier	Route Number	State Project Number	Facility-Feature Crossed	County	Year Built	Total Project Cost Estimate	Planned Year of Construction	Substantially Complete?	Year of Substantial Completion	Chapter 152 Work Planned	ADT	NBIS Rating			Bridge Length	Deck Area	Main Span Type	Load (Operating) Rating	Structurally Deficient	Functionally Obsolete	Fracture Critical	Sufficiency Rating			
														Deck	Sup	Sub											
1	6496	2	Hwy. 1	6901-27	HWY. 1 OVER FLINT CREEK	ST LOUIS	1952	\$976,370	2009	YES	2009	RPL	500	4	5	6	113	3,899	STEEL BEAM SPAN	HS 28.3	Y (N)	N	N	76.6			
1	69100	2	Hwy. 2	6937.69100D	HWY. 2 OVER ST LOUIS RIVER, HWY. 35, & RR (BONG)	ST LOUIS	1982	\$10,541,000	2014	YES	2015	OL & PT	19,400	5	7	7	8320.3	687,257	STEEL TIED ARCH	HS 40.6	N	N	Y	80.6 (79.5) (79.2)			
1	69101	2	Hwy. 2	6937-101	HWY. 2 WB OFF RAMP OVER HWY. 35 RAMP, RR, LAKE	ST LOUIS	1983	\$442,993	2013	YES	2014	RDK	4,500	7	7	7	1426.2	36,796	CSTL BEAM SPAN	HS 45.2	N	N	Y	97.7			
1	69101	2	Hwy. 2	6937-102	HWY. 2 WB OFF RAMP OVER HWY. 35 RAMP, RR, LAKE	ST LOUIS	1983	\$793,750	2018	NO	2018	PIER CAP RETROFIT															
1	69102	2	Hwy. 2	6937-101	HWY. 2 EB ON RAMP OVER HWY. 35, RR, LAKE	ST LOUIS	1983	\$2,640,000	2018	NO	2018	RDK	4,500	7	6	8 (7)	2642.2	85,872	CSTL BEAM SPAN	HS 37.1	N	N	Y	97.7			
1	69102	2	Hwy. 2	6937-102	HWY. 2 EB ON RAMP OVER HWY. 35, RR, LAKE	ST LOUIS	1983	\$793,750	2018	NO	2018	Pier cap Retrofit															
1	5470	2	Hwy. 23	0901-67	HWY. 23 OVER BNSF RR	CARLTON	1936	\$5,000,000	2015	NO	2016	RPL	730 (710)	4	4	5	201.1	6,757	STEEL BEAM SPAN	HS 24.9 (HS 19.4)	Y	N	N	54.2 (45.0) (45.3)			
1	9782	2	Hwy. 23	5880-179	HWY. 23 OVER I 35	PINE	1959	\$1,990,409	2010	YES	2010	RPL	4,550	4	5	7	205.5	7,295	CSTL BEAM SPAN	HS 43.5	Y (N)	N	N	67.0			
1	69831	2	I 35	6982-290	I 35 SB OVER DM&IR RY & BNSF RR	ST LOUIS	1967	\$7,578,442	2011	YES	2011	RPL	21,500 (24,000)	6	(5)	6	(5)	6	(5)	1104.5	39,431	CSTL DECK GIRD	HS 30.4	N	N	Y	82.2 (81.6) (69.1)
1	69832	2	I 35	6982-290	I 35 NB OVER DM&IR RY & BNSF RR	ST LOUIS	1967	\$5,881,284	2010	YES	2010	RPL	21,500 (24,000)	6	5	6	(5)	1170.5	41,787	CSTL DECK GIRD	HS 31.4	N	N	Y	71.1 (70.9)		
1	69880	2	I 35	6982-290	I 35 OVER RECYCLE WAY & ONETA ST.	ST LOUIS	1968	\$8,790,152	2010	YES	2011	RPL	44,000	4	5	7	1162.9	95,840	CSTL BEAM SPAN	HS 44.0	Y (N)	N	Y	86.4 (74.8)			
1	6544	2	Hwy. 39		HWY. 39; RR OVER ST LOUIS RIVER	ST LOUIS	1916					None - Privately Owned	1,900 (2,150)	8	6	(5)	6	1888.7	47,218	STEEL MOVEABLE	HS 33.0	N	Y	Y	69.6 (69.3)		

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Fracture Critical and Structurally Deficient Trunk Highway Bridges as of March 1, 2008

District	Bridge Number	Chapter 152 Tier	Route Number	State Project Number	Facility-Feature Crossed	County	Year Built	Total Project Cost Estimate	Planned Year of Construction	Substantially Complete?	Year of Substantial Completion	Chapter 152 Work Planned	ADT	NBIS Rating			Bridge Length	Deck Area	Main Span Type	Load (Operating) Rating	Structurally Deficient	Functionally Obsolete	Fracture Critical	Sufficiency Rating
														Deck	Sup	Sub								
1	69004	2	Hwy. 53	6918-80	HWY. 135 OVER HWY. 53 NB, SB ON RAMP	ST LOUIS	1961	\$90,000,000	2015	NO	2016	RPL	8,300	4	6	6 (5)	139.5	6,905	PRESTR BEAM SPAN	HS 39.0 (HS 29.5)	Y	N	N	62.9 (90.3) (88.2)
1	69029	2	Hwy. 53	6916-103	HWY. 33 NB OVER HWY. 53 SB	ST LOUIS	1966	\$2,537,858	2012	YES	2012	RPL	1,450	4	5	6	125.6	3,228	CSTL BEAM SPAN	HS 42.1	Y (N)	N	N	79.9
1	90249	2	Hwy. 53		HWY. 53 SB OVER RAINY RIVER	KOOCHICHING	1912					None - Privately Owned	1,575 (3724)	6	5	5	941	31,560	STEEL HIGH TRUSS	HS 50.0 (HS 11.0)	N (Y)	Y (N)	Y	62.8 (62.6) (36.9)
1	6736	2	Hwy. 65	3110-12	HWY. 65 OVER SWAN RIVER	ITASCA	1950	\$1,518,662	2009	YES	2009	RPL	880	3	5	5	128	4,416	STEEL BEAM SPAN	HS 29.7	Y (N)	N	N	77.7
1	6767	2	Hwy. 65	3609-34	HWY. 65 OVER HAY CREEK	KOOCHICHING	1951	\$1,047,298	2013	YES	2013	RPL	90 (115)	6	6	4	27	810	STEEL BEAM SPAN	HS 25.1	Y (N)	N	N	64.9 (63.9)
1	5718	2	Hwy. 123	5802-5718A	HWY. 123 OVER KETTLE RIVER & ST	PINE	1948	\$2,426,242	2013	YES	2013	OL & PT	2,050	6 (8)	5 (6)	7 (6)	402.8	15,951	CSTL DECK TRUSS	HS 20.4	N	N	Y	78.6 (62.3)
1	69003	2	Hwy. 169	6934-113	HWY. 169 OVER BN RR (ABAN) & TRAIL	ST LOUIS	1961	\$3,403,817	2009	YES	2009	See note	14,400 (15,100)	6	4	6	198.1	13,312	CSTL BEAM SPAN	HS 31.2	Y	N	N	59.1 (58.8)
1	69839	2	Hwy. 194	6933-95	NB MICHIGAN ST OVER HWY. 194 SB	ST LOUIS	1969	\$1,905,000	2018	NO	2018	RPR, Redeck & Retrofit	4,200 (5,500)	5	7 (6) (5)	6 (7)	317.5	10,700	CSTL BEAM SPAN	HS 46.8	N	Y	Y	77.6 (76.4) (65.3)
1	69840	2	Hwy. 194	6933-	HWY. 194 NB OVER SUPERIOR ST	ST LOUIS	1968	1.9-2.4 million	2017	NO	2018	RPR & Retrofit	9,250	7 (6)	6	8 (7) (6)	299.5	10,093	CSTL BEAM SPAN	HS 38.1	N	Y (N)	Y	78.1 (80.1)
1	09001	2	Hwy. 210	0916-11	HWY. 210 OVER ST LOUIS RIVER	CARLTON	1961	\$3,265,179	2012	YES	2012	RPR & Retrofit	1,350 (1,300)	5 (4) (8)	5 (6)	6 (5) (6) (7)	223	7,850	STEEL HIGH TRUSS	HS 23.0 (HS 13.0)	N (Y) (N)	N	Y	51.7 (48.7) (39.6) (56.9)
1	9030	2	I 535	6981-9030E	I 535 OVER ST LOUIS R; RR, STREET (Blatnik)	ST LOUIS	1961	\$11,311,829	2012	YES	2013	Deck Seal & Paint	28,000	8 (6)	6 (4) (5)	7 (6) (5)	7980	594,187	CSTL HIGH TRUSS	HS 21.6	N (Y)	Y (N)	Y	72.3 (53.8) (42.8)
1	9030	2	I 535	6981-25	I 535 OVER ST LOUIS R; RR, STREET (Blatnik)	ST LOUIS	1961	\$1,270,000	2016	No	2016	Gusset Plate Repair												

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District	Bridge Number	Chapter 152 Tier	Route Number	State Project Number	Facility-Feature Crossed	County	Year Built	Total Project Cost Estimate	Planned Year of Construction	Substantially Complete?	Year of Substantial Completion	Chapter 152 Work Planned	ADT	NBIS Rating			Bridge Length	Deck Area	Main Span Type	Load (Operating) Rating	Structurally Deficient	Functionally Obsolete	Fracture Critical	Sufficiency Rating
														Deck	Sup	Sub								
1	69824	2	I 535		I 535 SB ON RAMP OVER I 535 NB & I 35 NB	ST LOUIS	1969		2019-2027	NO		RPL	5,625	6 (7)	7 (6)	6	1430.1	36,754	CSTL DECK GIRD	HS 25.9 (HS 23.4)	N	Y (N) (Y)	Y	86.6 (82.0)
1	69825	2	I 535		I 535 NB OFF RAMP OVER BNSF RAILROAD	ST LOUIS	1969		2019-2027	NO		RPL	5,625	5 (8)	7 (6) (7)	7	876.8	22,534	CSTL DECK GIRD	HS 23.7 (HS 22.8)	N	N	Y	84.4 (85.4) (83.9)
1	69801C	2	I 535		I 535 SB ON RAMP OVER RAILROAD & FILL	ST LOUIS	1969		2019-2027	NO		RPL	3,300	7 (6)	7 (6) (7)	6 (5)	665.7	17,108	CSTL BEAM SPAN	HS 25.7 (HL-93 0.91)	N (Y)	N	Y	89.4 (78.4) (78.3) (36.1)
1	69801F	2	I 535		I 535 SB SEG 1 OVER I 35 & RAMP TO I 35 SB	ST LOUIS	1969		2019-2027	NO		RPL	6,625	7	7 (6)	5 (6)	576	21,139	CSTL BEAM SPAN	HS 22.9 (HL-93 0.88)	N	N (Y)	Y	63.9 (64.9) (75.0) (24.8)
1	69801J	2	I 535		I 535 NB SEG 1 OVER I 35 NB & SB OFF RAMP	ST LOUIS	1969		2019-2027	NO		RPL	6,625	7 (6)	7 (6)	6	488.8	12,562	CSTL BEAM SPAN	HS 25.0 (HS 20.6)	N	N	Y	87.2 (79.5)
1	69801K	2	I 535		I 535 NB OFF RAMP OVER I 35 SB	ST LOUIS	1969		2019-2027	NO		RPL	3,300	6 (7)	6 (7)	7 (6)	597	15,343	CSTL BEAM SPAN	HS 26.7 (HL-93 1.09)	N	N (Y)	Y	88.6 (89.6) (35.1)
1	69801N	2	I 535		I 535 NB SEG 3 OVER CP RAIL	ST LOUIS	1969		2019-2027	NO		RPL	4,400 (7,750)	7	7 (6)	7	296	7,607	CSTL BEAM SPAN	HS 25.0 (HS 25.2)	N	N	Y	88.4 (88.1) (88.7)
2	04001	2	Hwy. 1	0401-08	HWY. 1 OVER OVERFLOW CHANNEL	BELTRAMI	1962	\$2,400,000	2016	NO	2017	RPL	55 (45)	5	4 (3)	6 (5)	217.4	7,566	PRECST CHAN SPAN	HS 50.0 (HS 31.5)	Y	N	N	71.7 (71.0)
2	4561	2	Hwy. 1	0401-11	HWY. 1 OVER DITCH	BELTRAMI	1926	\$2,936,879	2009	YES	2009	RPL W/ CULVERT	55	5	4	4	24.7	692	STEEL BEAM SPAN	HS 19.0	Y (N)	N	N	54.4
2	9100	2	Hwy. 1	4509-05	HWY. 1 OVER RED RIVER OF THE NORTH (Oslo)	MARSHALL	1959	\$20,000,000	2018	NO	2019	RPL	1,400 (1,350)	7	5	6	792.2	25,905	STEEL HIGH TRUSS	HS 27.1	N	N	Y	55.6 (54.8)
2	9090	2	Hwy. 2	6018-02	HWY. 2 OVER RED RIVER & CITY ST (Kennedy)	POLK	1963	\$22,000,000	2017	NO	2018	Redeck & Paint	21,500 (20,740)	6 (7) (5)	7 (6)	5 (4)	1261	81,965	STEEL HIGH TRUSS	HS 26.8	N (Y)	N	Y	73.2 (61.2) (63.4) (48.2)

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Fracture Critical and Structurally Deficient Trunk Highway Bridges as of March 1, 2008

District	Bridge Number	Chapter 152 Tier	Route Number	State Project Number	Facility-Feature Crossed	County	Year Built	Total Project Cost Estimate	Planned Year of Construction	Substantially Complete?	Year of Substantial Completion	Chapter 152 Work Planned	ADT	NBIS Rating			Bridge Length	Deck Area	Main Span Type	Load (Operating) Rating	Structurally Deficient	Functionally Obsolete	Fracture Critical	Sufficiency Rating
														Deck	Sup	Sub								
2	5557	2	Hwy. 11	3902-21	HWY. 11 OVER RAPID RIVER	LAKE OF THE WOODS	1950	\$3,414,358	2009	YES	2010	RPL	760 (784)	5	4	6	216	8,942	CONC ARCH	HS 18.0	N	N	N	49.1 (48.8)
2	35007	2	Hwy. 171	NA	HWY. 171 OVER RED RIVER OF THE NORTH	KITSON	1982	\$903,972	2009	YES	2009	RPR	800 (701)	6	7	4 (8)	2080	115,024	CSTL BEAM SPAN	HS 34.0 (HS 29.9)	Y (N)	N	N	68.3 (96.7)
2	6522	2	Hwy. 200	5407-28	HWY. 200 FRNT RD OVER MARSH RIVER	NORMAN	1924	\$344,334	2014	YES	2014	RPL	4	6	5	6 (5)	41.3	826	STEEL LOW TRUSS	HS 20.7	N	N	Y	70.6
2	5872	2	Hwy. 317	4514-03	HWY. 317 OVER RED RIVER OF THE NORTH (Grafton)	MARSHALL	1939	\$1,335,262	2013	YES	2013	Repair & PNT	320 (285)	7	5	7 (5)	412	10,712	STEEL HIGH TRUSS	HS 20.7	N	N	Y	52.7 (52.9) (51.9)
2	4700	2	Hwy. 2B	6015-07	HWY. 2B (BUSINESS) OVER RED RIVER (Sorlie)	POLK	1929	\$5,644,974	2015	NO	2016	REHAB	12,700	6	5	6	602.6	24,887	STEEL HIGH TRUSS	HS 23.2	N	N (Y)	Y	50.6 (48.4) (50.4)
3	9086	2	Hwy. 23	7306-93	HWY. 23 OVER 10TH AVE	STEARNS	1958	\$14,748,529	2009	YES	2009	RPL	29,000	4	4	4	189.1	15,015	STEEL BEAM SPAN	HS 54.9	Y (N)	N	N	55.0
3	91049	2	Hwy. 169	0115-41	HWY. 169 OVER RIPPLE RIVER	AITKIN	1964	\$1,004,562	2009	YES	2009	RPL	3,950	N	N	N	27.2	0	CONC BOX CULV	HS 24.0	Y (N)	N	N	58.1
3	91050	2	Hwy. 169	0115-41	HWY. 169 OVER RIPPLE RIVER	AITKIN	1964	SEE NOTE	2009	YES	2009	RPL	3,950	N	N	N	27.2	0	CONC BOX CULV	HS 24.0	Y (N)	N	N	58.1
4	6456	2	Hwy. 12	0602-24	HWY. 12 OVER MINNESOTA RIVER	BIG STONE	1953	\$1,672,758	2012	YES	2012	RPL	4,300 (4200)	4	7	7	63	2,539	CONC DECK GIRD	HS 28.3 (HS 25.4)	Y (N)	N	N	76.3 (73.0) (72.9)
4	6552	2	Hwy. 29	7607-29	HWY. 29 OVER DITCH	SWIFT	1948	\$8,850,000	2014	YES	2014	RPL	1,200 (1,299)	7	7	7	92	3,220	CONC SLAB SPAN	HS 20.6	Y (N)	N	N	54.1 (53.1) (52.9)
4	5186	2	Hwy. 75	8408-44	HWY. 75 OVER WHISKEY CREEK	WILKIN	1932	\$12,560,000	2015	NO	2016	RPL	1,300 (1,150)	5	5	6	42.4	1,429	STEEL BEAM SPAN	HS 17.9	Y	N	N	53.3 (54.3)
4	21813	2	Hwy. 29	2102-58	HWY. 29 SB OVER I 94	DOUGLAS	1965	SEE NOTE	2016	NO	2016	RPL	10,400	4	5	5	235.4	10,099	CSTL BEAM SPAN	HS 44.1	Y	N	N	79.0 (78.0)

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Fracture Critical and Structurally Deficient Trunk Highway Bridges as of March 1, 2008

District	Bridge Number	Chapter 152 Tier	Route Number	State Project Number	Facility-Feature Crossed	County	Year Built	Total Project Cost Estimate	Planned Year of Construction	Substantially Complete?	Year of Substantial Completion	Chapter 152 Work Planned	ADT	NBIS Rating			Bridge Length	Deck Area	Main Span Type	Load (Operating) Rating	Structurally Deficient	Functionally Obsolete	Fracture Critical	Sufficiency Rating
														Deck	Sup	Sub								
4	21814	2	Hwy. 29	2102-58	HWY. 29 NB OVER I 94	DOUGLAS	1965	\$22,500,000	2016	NO	2016	RPL	10,400	4	6	5	235.4	8,404	CSTL BEAM SPAN	HS 44.1 (HS 34.2)	Y	N	N	66.7
6	5234	2	Hwy. 14	8501-62	HWY. 14 OVER STREAM	WINONA	1932	\$2.01 - \$2.27	2023-2028	NO		RPL	4,500 (4459)	6	6	6	46	1,840	CONC DECK GIRD	HS 68.6 (HS 30.8)	Y (N)	N	N	55.0 (56.0) (96.6)
6	74820	2	Hwy. 14	7401-34	HWY. 14 EB OVER I 35	STEELE	1965	\$1,900,000	2010	YES	2011	RPL	6,050	4	5	5	202	5,191	CSTL BEAM SPAN	HS 35.7	Y (N)	N	N	74.4
6	23004	2	Hwy. 43	2306-22	HWY. 43 OVER S FORK ROOT RIVER	FILLMORE	1931	\$2,958,530	2012	YES	2012	RPL	540 (484)	6 (5)	5 (3) (4)(6)	6 (5) (7)	78	2,184	STEEL LOW TRUSS	HS 20.0	N (Y) (N)	N	Y	65.5 (31.3) (45.3)
6	4148	2	Hwy. 44	2308-26	HWY. 44 OVER STREAM	FILLMORE	1923	\$240,000	2013	YES	2013	RPL W/CULVERT	2,300 (1,745)	N	N	N	23	0	CONC BOX CULV	HS 24.0 (HS 21.6)	Y (N)	N	N	66.9 (60.4) (59.4)
6	4150	2	Hwy. 44	2308-26	HWY. 44 OVER STREAM	FILLMORE	1923	\$240,000	2013	YES	2013	RPL W/CULVERT	2,100 (1,844)	N	N	N	22.5	0	CONC BOX CULV	HS 24.0 (HS 21.6)	Y (N)	N	N	67.2 (60.2) (59.2)
6	4151	2	Hwy. 44	2308-26	HWY. 44 OVER STREAM	FILLMORE	1923	\$240,000	2013	YES	2013	RPL W/CULVERT	2,100 (1,844)	N	N	N	22.5	0	CONC BOX CULV	HS 24.0 (HS 21.6)	Y (N)	N	N	67.2 (60.2) (59.2)
6	5905	2	Hwy. 56	5005-58	HWY. 56 FARM ENT OVER N BR UPPER IOWA RIVER	MOWER	1940	\$1.06 - \$1.20	2015	NO		RPL	5	7	6	4	38	825	STEEL BEAM SPAN	HS 25.4 (HS 30.9)	Y	N	N	66.3 (68.9)
6	5397	2	Hwy. 60	7903-45	HWY. 60 OVER TROUT BROOK	WABASHA	1935	\$2.30 - \$2.60	2014	YES	2014	RPL	630	7	6	6 (7)	67.2	1,908	STEEL THRU GIRD	HS 19.0	N	N	Y	73.0 (72.0)
6	9798	2	Hwy. 60	7903-41	HWY. 60 OVER STREAM	WABASHA	1961	\$1,996,439	2011	YES	2012	RPL	630	5	4 (3)	5	93.6	2,948	STEEL BEAM SPAN	HS 27.0 (HS 26.6)	Y (N)	N	N	70.1 (47.7)
6	79000	2	Hwy. 60		HWY. 60 OVER MISS R, RR, & STS	WABASHA	1987					Only Normal Maintenance Needed	4,750	7	7	7	2462	106,605	STEEL HIGH TRUSS	HS 39.2	N	N	Y	73.5
6	6808	2	I 90	5080-153	I 90 EB OVER TWP RD & TURTLE CRK	MOWER	1959	\$3,945,382	2009	YES	2010	RPL	7,700	5	4	5	243	10,741	PRESTR BEAM SPAN	HS 33.0	Y	N	N	65.5

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														Deck	Sup	Sub									
6	9320	2	190	8580-149	190 OVER MISSISSIPPI RIVER (DRESBACH)	WINONA	1967	\$212,800,000	2012	NO	2016	RPL	26,000	5	(4)	6 (5)	6	2490.2	175,894	CSTL DECK GIRD	HS 33.0	N	N	Y	77.0 (66.0) (65.0)
6	85807	2	190	8580-157	190 WB OVER TWP 323	WINONA	1963	\$5,012,266	2009	YES	2009	RPL	10,600	4	4	6	118.7	5,045	PRESTR VD SLAB SPAN	HS 44.0	Y	N	N	63.7	
6	85808	2	190	8580-157	190 EB OVER TWP 323	WINONA	1963	\$1,862,967	2010	YES	2010	RPL	10,600	4	4 (5)	6	118.7	5,045	PRESTR VD SLAB SPAN	HS 44.0	Y	N	N	63.7	
6	85809	2	190	8580-157	190 WB OVER TWP 312	WINONA	1963	\$1,680,872	2009	YES	2009	RPL	10,600	4	4	5	95	4,038	PRESTR VD SLAB SPAN	HS 46.0	Y	N	N	61.6	
6	85810	2	190	8580-157	190 EB OVER TWP 312	WINONA	1963	\$1,774,254	2010	YES	2010	RPL	10,600	4	4 (5)	5 (6)	95	4,038	PRESTR VD SLAB SPAN	HS 46.0	Y	N	N	61.6	
6	6975	2	Hwy. 250	2319-16	HWY. 250 OVER S BR ROOT RIVER	FILLMORE	1931	\$8,220,000	2016	NO		RPL	840 (787)	7	(6)	7	6 (5) (6)	104	2,808	STEEL HIGH TRUSS	HS 17.0	N	Y	Y	57.5 (57.6) (47.1) (57.6)
6	6977	2	Hwy. 250	2319-16	HWY. 250 OVER N BR ROOT RIVER	FILLMORE	1924	see note	2016	NO		RPL	380 (413)	7 (6)	6	6 (5) (6)(5)	144	3,456	STEEL HIGH TRUSS	HS 15.0 (HS 22.5)	N	Y	Y	50.6 (47.0) (65.1) (65.3)	
7	6749	2	Hwy. 4	0801-31	HWY. 4 OVER LITTLE COTTONWOOD RIVER	BROWN	1951	\$2,324,929	2011	YES	2011	RPL	1,250 (1,400)	7	4	5	98	3,381	STEEL BEAM SPAN	HS 32.0 (HS 32.7)	Y	N	N	66.4 (60.9)	
7	4014	2	Hwy. 22	5205-31	HWY. 22 OVER ROBARTS CREEK	NICOLLET	1923	\$331,463	2013	YES	2013	RPL	1,200 (939)	N	N	N	22.5	0	CONC BOX CULV	HS 24.0	Y	N	N	68.2	
7	5834	2	Hwy. 30	1702-10	HWY. 30 OVER BR OF WATONWAN R	COTTONWOOD	1939	\$1,019,930	2011	YES	2011	RPL	740 (850)	4	5	5	32	1,072	STEEL BEAM SPAN	HS 30.0 (HS 30.6)	Y	N	N	79.1 (74.5)	
7	6889	2	Hwy. 71	1705-11	HWY. 71 OVER DES MOINES RIVER	COTTONWOOD	1956	\$3,210,447	2010	YES	2010	RPL	2,350	4	4	4	143	4,919	STEEL BEAM SPAN	HS 48.0	Y	N	N	58.2	
7	6245	2	Hwy. 75	6704-19	HWY. 75 OVER POPLAR CREEK	ROCK	1932	\$853,080	2013	YES	2014	RPL	9,500 (6,900)	N	N	N	22.8	0	CONC BOX CULV	HS 24.0	Y	N	N	52.8 (53.2)	

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Fracture Critical and Structurally Deficient Trunk Highway Bridges as of March 1, 2008

District	Bridge Number	Chapter 152 Tier	Route Number	State Project Number	Facility-Feature Crossed	County	Year Built	Total Project Cost Estimate	Planned Year of Construction	Substantially Complete?	Year of Substantial Completion	Chapter 152 Work Planned	ADT	NBIS Rating			Bridge Length	Deck Area	Main Span Type	Load (Operating) Rating	Structurally Deficient	Functionally Obsolete	Fracture Critical	Sufficiency Rating
														Deck	Sup	Sub								
7	4930	2	Hwy. 99	4008-25	HWY. 99 OVER MINNESOTA RIVER (ST. PETER)	LE SUEUR	1931	\$4,900,000	2017	NO		REHAB	7,000 (5,077)	5	5	5 (6)	402.3	12,512	CSTL HIGH TRUSS	HS 23.6	N	N (Y) (N)	Y	56.0 (48.5) (50.5)
7	6535	2	Hwy. 258	0809-12	HWY. 258 OVER COTTONWOOD RIVER	BROWN	1949	\$3,381,311	2012	YES	2012	RPL	700 (470)	4	5	4	163	4,564	STEEL HIGH TRUSS	HS 22.7	Y	N	Y	45.2 (45.6)
7	6821	2	Hwy. 270	6706-13	HWY. 270 OVER MUD CREEK	ROCK	1953	\$1,369,237	2011	YES	2011	RPL	740 (840)	4	5	5	37.9	1,251	STEEL BEAM SPAN	HS 29.1	N	N	N	78.6 (74.6)
8	9114	2	Hwy. 7	1201-32	HWY. 7 OVER CHIPPEWA RIVER	CHIPPEWA	1932	\$5,500,000	2014	YES	2014	RPL	1,850 (2,200)	5	5 (4)	5	182	5,951	STEEL HIGH TRUSS	HS 24.1 (HS 22.0)	N (Y)	N	Y	63.7 (43.6) (43.8)
8	4667	2	Hwy. 19		HWY. 19 ACCESS RD OVER SULPHER L	REDWOOD	1927				N/A	Only Normal Maintenance Needed	50 (5)	4	4 (3)	4 (3)	122	3,416	STEEL HIGH TRUSS	HS 17.2	Y	N	Y	44.0 (33.0)
8	5380	2	Hwy. 40	1209-22	HWY. 40 OVER LAC QUI PARLE L	CHIPPEWA	1938	\$2,500,000	2015	NO		REHAB	610 (540)	4	4	5	220.5	6,284	STEEL HIGH TRUSS	HS 18.0	Y	N	Y	38.9 (39.3)
8	6962	2	Hwy. 68	6407-28	HWY. 68 OVER DITCH	REDWOOD	1900	\$400,525	2009	YES	2009	RPL	1,350	5	5	4	26	905	STEEL BEAM SPAN	HS 24.1	Y	N	N	48.5
8	87005	2	Hwy. 274		HWY. 274 OVER YELLOW MEDICINE RIVER	YELLOW MEDICINE	1968				N/A	Only Normal Maintenance Needed	920 (1,042)	8 (7)	8 (7)	5	186.9	8,186	PRESTR BEAM SPAN	HS 45.4	Y (N)	N	N	66.9 (83.0) (88.1)
8	6816	2	Hwy. 277	1213-12	HWY. 277 OVER CO DITCH # 22	CHIPPEWA	1952	\$1,300,000	2017	NO		RPL	310 (365)	6	6	4	28.5	1,015	STEEL BEAM SPAN	HS 30.3	Y	N	N	67.9 (70.8)
M	9300	2	Hwy. 5	6201-86	HWY. 5 WEST 7TH ST OVER MISSISSIPPI RIVER	RAMSEY	1961	\$12,127,500	2014	NO	2016	RDK	56,000 (28,500)	5 (4)	5 (4)(5) (4)	5	1198.5	87,850	CSTL DECK GIRD	HS 37.0	N (Y)	N	Y	67.0 (66.0) (64.0)
M	5462	2	Hwy. 7	2734-33	HWY. 7 (COUNTY ROAD 25) OVER HWY. 100	HENNEPIN	1939		2014	NO		RPL	36,000	4	5	5	190.4	15,080	CONC DECK GIRD	HS 38.5	Y	N	N	71.2
M	82010	2	Hwy. 105	8216-XX	HWY. 10 (PRESCOTT) OVER ST CROIX RIVER	WASHINGTON	1990	\$300,000	2018	NO	2024	OL	13,500 (15,700)	6	7	6	683.8	35131	STEEL MOVEABLE	HS 50.0	N	N	Y	61.9

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Fracture Critical and Structurally Deficient Trunk Highway Bridges as of March 1, 2008

District	Bridge Number	Chapter 152 Tier	Route Number	State Project Number	Facility-Feature Crossed	County	Year Built	Total Project Cost Estimate	Planned Year of Construction	Substantially Complete?	Year of Substantial Completion	Chapter 152 Work Planned	ADT	NBIS Rating			Bridge Length	Deck Area	Main Span Type	Load (Operating) Rating	Structurally Deficient	Functionally Obsolete	Fracture Critical	Sufficiency Rating	
														Deck	Sup	Sub									
M	82815	2	Hwy. 35	8280-47	HWY 8 WB OVER I 35	WASHINGTON	1967	\$45,400,000	2018	NO		RPL	10,500	7 (5)	7 (6)	7 (6)	355.9	12,706	CSTL DECK GIRD	HS 26.6	N	N	Y	75.9 (74.9)	
M	5723	2	Hwy. 36	6212-148	HWY. 36 OVER LEXINGTON AVE(COUNTY ROAD 51)	RAMSEY	1938	\$16,100,000	2016	NO	2016	RPL	85,000	4	4	5	64	10,115	CONC RIGID FRAME	HS 55.0 (HS 40.0)	Y	N	N	61.0	
M	62026	2	Hwy. 52	6244-36	LAFAYETTE (HWY. 52) OVER UP RR & EATON ST	RAMSEY	1965	\$7,725,836	2011	YES	2012	RDK	74,000	6 (5) (7)	4 (5)	5 (7)	580.3	59,017	CSTL BEAM SPAN	HS 34.8 (HS 31.2)	Y	N	N	59.1 (56.9) (57.0) (58.2)	
M	94277	2	Hwy. 55	2751-51	HWY. 55 OVER BASSETT CREEK	HENNEPIN	1939	\$2,026,276	2019	NO		RPL	27,500 (20,500)	N	N	N	20.3	0	CONC BOX CULV	HS 18.0	Y (N)	N	N	36.9 (38.4) (55.1) (54.3)	
M	27046	2	Hwy. 77	2758-75	HWY. 77 SB COLL RD OVER KILLEBREW DRIVE	HENNEPIN	1988	\$823,068	2017	NO	2017	RE-OL	5,000	6	7	(6)	7	504.8	23,170	CSTL BEAM SPAN	HS 62.0	N	N	Y	95.6 (96.6) (97.6)
M	27048	2	Hwy. 77	2758-XX	HWY. 77 SB OFF RAMP OVER 81ST STREET	HENNEPIN	1988		2028-2034	NO		RE-OL & Paint	3,450	7	7	(6)	7	525.6	24,170	CSTL BEAM SPAN	HS 94.0	N	N	Y	94.7 (95.7)
M	27052C	2	Hwy. 77	2758-XX	HWY. 77 NB COLL RD OVER 79TH ST & EB 494/5 RAMPS	HENNEPIN	1989		2028-2034	NO		RE-OL	10,000	7	7	7	603.3	25,253	CSTL BEAM SPAN	HS 46.0	N	N	Y	96.2 (97.2)	
M	9600N	2	Hwy. 77	1925-52	HWY. 77 NB OVER MINNESOTA R & BLACK DOG	HENNEPIN	1978	\$2,140,000	2014	YES	2015	Paint	47,000	6	6	7 (6)	5159.1	308,514	STEEL TIED ARCH	HS 34.0 (HS 35.6)	N	N	Y	91.5	
M	9600S	2	Hwy. 77	1925-52	HWY. 77 SB OVER MINNESOTA R & BLACK DOG	HENNEPIN	1978	SEE NOTE	2014	YES	2015	Paint	47,000	6	6	7 (6)	5184.7	310,045	STEEL TIED ARCH	HS 34.0 (HS 35.6)	N	N	Y	91.5	
M	27728	2	I 94	2781-452	I 94 NB ON RAMP OVER GLENWOOD AVE & RR	HENNEPIN	1978	\$1,700,000	2017	NO		RE-OL	7,100	6 (5)	6	6 (5)	1475.2	64,614	CSTL BEAM SPAN	HS 42.5	N	N	Y	98.5 (99.5) (98.5) (87.4)	
M	27842	2	I 94	2782-327	I 94 WB ON RAMP OVER I 94 & HWY. 65	HENNEPIN	1966	\$313,600,000	2018	NO		RPL	20,000	4 (4)	(5) (4)	4 (5)	6	534.1	13,566	CCONC BOX GIRD	HS 36.0 (HS 28.0)	Y	N	N	64.8 (64.4)
M	27861	2	I 94	2781-27861	I 94 WB OFF RAMP OVER CP RAIL & CITY ST	HENNEPIN	1968	\$930,936	2010	YES	2010	RDK	11,000	4 (8) (7)	5 (6)	4 (7)	268	6,888	CSTL BEAM SPAN	HS 31.6	Y	N	N	65.0	

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Fracture Critical and Structurally Deficient Trunk Highway Bridges as of March 1, 2008

District	Bridge Number	Chapter 152 Tier	Route Number	State Project Number	Facility-Feature Crossed	County	Year Built	Total Project Cost Estimate	Planned Year of Construction	Substantially Complete?	Year of Substantial Completion	Chapter 152 Work Planned	ADT	NBIS Rating			Bridge Length	Deck Area	Main Span Type	Load (Operating) Rating	Structurally Deficient	Functionally Obsolete	Fracture Critical	Sufficiency Rating
														Deck	Sup	Sub								
M	27726B	2	I 94	2781-452	I 94 SB OFF RAMP OVER LYNDAL AVE N & RR	HENNEPIN	1979	\$1,700,000	2016	NO	2017	RE-OL	10,900	6	6	7	1099.6	28,919	CSTL BEAM SPAN	HS 44.0	N	Y	Y	93.3 (94.3)
M	27727B	2	I 94	2781-452	I 94 SB ON RAMP OVER GLENWOOD AVE & RR'S	HENNEPIN	1978	\$1,700,000	2016	NO	2017	RE-OL	8,000	6	6 (5)	6 (5)	1896.25	54,542	PRESTR BEAM SPAN	HS 40.0 (HS 33.8)	N	Y (N)	Y	94.4 (95.4) (86.3)
M	27799R	2	I 94	2781-452	I 94 EB ON RAMP OVER LYNDAL AVENUE SB	HENNEPIN	1969		2028-2034	NO		RDK	25,400	6	7 (6)	7	783.7	29,470	CSTL BEAM SPAN	HS 42.0 (HS 41.0)	N	N	Y	85.8
M	5598	2	Hwy. 100	2734-33	MINNETONKA BLVD OVER HWY. 100	HENNEPIN	1939	\$83,884,993	2014	YES	2015	RPL	19,100	4	4	5	163.6	12,794	CONC DECK GIRD	HS 40.1 (HS 40.2)	Y	N	N	63.0
M	27789	2	Hwy. 100	NA	HWY. 100 SB CD OVER SB CD RP & FRNT RD	HENNEPIN	1989		2019-2027	NO		RE-OL	2,000	6	6	7 (6)	966.6	38,228	CSTL BEAM SPAN	HS 70.0 (HS 31.0)	N	N	Y	90.0 (91.0)
M	27791	2	Hwy. 100	NA	HWY. 100 SB ON RAMP OVER GLENWOOD AVE TO SB 100	HENNEPIN	1989		2028-2034	NO		RE-OL	2,000	7	7 (6)	7	495	13,910	CSTL BEAM SPAN	HS 55.0	N	N	Y	97.0 (98.0)
M	62090	2	Hwy. 149	6223-20	HWY. 149 (SMITH AVE) OVER MISSISSIPPI R & RAILROAD	RAMSEY	1986	\$15,210,915	2017	NO	2017	RDK	18,000 (14,000)	6 (5)	7 (6)	7	2769.7	150,395	CSTL TIED ARCH	HS 42.0	N	N	Y	85.1 (91.1) (90.7)
M	6347	2	Hwy. 243	1311-6347A	HWY. 243 (OSCEOLA) OVER ST CROIX RIVER	CHISAGO	1953	\$909,311	2010	YES	2010	OL & PT	7,600 (6,985)	7 (6) (5)	6	7 (6)	674	23,051	STEEL DECK TRUSS	HS 19.5 (HS 26.2)	N	N	Y	65.6 (72.4)
M	27753	2	I 394		I 394R RAMP OVER NB HWY. 100 TO 394 HOV EB	HENNEPIN	1989		2028-2034	NO		RE-OL	7,600	7	7 (6)	7	520	13,572	CSTL BEAM SPAN	HS 48.0	N	N	Y	97.0 (98.0)
M	27788	2	I 394		I 394 EB ON RAMP OVER HWY. 100 NB ON RAMP	HENNEPIN	1989		2028-2034	NO		RE-OL	4,500	7	7 (6)	7	288.6	7,590	CSTL BEAM SPAN	HS 56.0 (HS-93 1.2)	N	N (Y)	Y	94.0 (95.0) (36.0)
M	27753A	2	I 394		I 394R RAMP OVER 394 HOV WB TO NB HWY. 100	HENNEPIN	1989		2028-2034	NO		RE-OL	3,800	7	7 (6)	7	360.3	9,404	CSTL BEAM SPAN	HS 48.0	N	N	Y	97.0 (98.0)
M	27776A	2	I 394		I 394R OVER I 394 WB, DUNWOODY BLVD	HENNEPIN	1987		2028-2034	NO		RE-OL	7,600	7	7 (6)	7	2738.41	154,403	CSTL BEAM SPAN	HS 43.0	N	N	Y	93.8 (94.8)

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District	Bridge Number	Chapter 152 Tier	Route Number	State Project Number	Facility-Feature Crossed	County	Year Built	Total Project Cost Estimate	Planned Year of Construction	Substantially Complete?	Year of Substantial Completion	Chapter 152 Work Planned	ADT	NBIS Rating			Bridge Length	Deck Area	Main Span Type	Load (Operating) Rating	Structurally Deficient	Functionally Obsolete	Fracture Critical	Sufficiency Rating	
														Deck	Sup	Sub									
M	27776B	2	I 394		I 394R EB OVER I 394 & DOWNTOWN RAMPS	HENNEPIN	1987		2028-2034	NO		RE-OL	2,175	7	7	(6)	7	538	25,078	CSTL BEAM SPAN	HS 43.0	N	N	Y	94.7 (95.7)
M	27789A	2	I 394		I 394 EB OFF RAMP OVER SB HWY. 100	HENNEPIN	1989		2019-2027	NO		RE-OL	6,000	7	7	(6)	7	161.8	1,877	CSTL BEAM SPAN	HS 70.0 (HS 31.0)	N	N	Y	99.0 (100.0)
M	9197	2	I 694	6280-304	I 694 WB OVER BNSF RR	RAMSEY	1960		2007	YES	2009	RPL w/ Unweave/Weave Proj.	51,500	4	6	5	123.3	9,211	PRESTR BEAM SPAN	HS 57.0	Y	N	N	71.0	
M	6513	2	I 35E	6280-353	MARYLAND (COUNTY ROAD 31) OVER I 35E	RAMSEY	1958	\$14,546,185	2012	YES	2012	RPL	22,500 (27,900)	4	5	5	198.7	19,930	STEEL BEAM SPAN	HS 32.0 (HS 48.0)	Y	N	N	77.0	
M	6517	2	I 35E	6280-308	I 35E OVER BNSF RR	RAMSEY	1963		2014	YES	2015	RPL	148000 (149,000)	4	4	4	297.8	34,992	CSTL BEAM SPAN	HS 31.3 (HS 30.6)	Y	N	N	53.0 (51.8)	
M	9265	2	I 35E	6280-308	I 35E OVER PENNSYLVANIA AVE	RAMSEY	1964		2014	YES	2015	RPL	144,000 (154,000)	4	4	4	164.8	19,166	STEEL BEAM SPAN	HS 44.0	Y	N	N	64.0	
M	9570	2	I 35W	6284-163	COUNTY ROAD E2 (COUNTY ROAD 73) OVER I 35W	RAMSEY	1964	\$13,617,140	2016	NO	2016	RPL	5,700 (10,100)	7	4	5	213.5	8,284	PRESTR BEAM SPAN	HS 55.0 (HS 39.3)	Y	N	N	52.0	
M	27930	2	I 35W	2782-281	HWY. 121 NB OVER I 35W SB	HENNEPIN	1964		2007	YES	2009	RPL	6,000	4	5	6	307	10,254	CSTL BEAM SPAN	HS 31.5	Y	N	N	62.4	
M	27937	2	I 35W	2782-281	HWY. 62 WB OVER I 35W NB	HENNEPIN	1964		2007	YES	2009	RPL w/ Crosstown Project	49,000	4	4	6	224.3	5,720	CCONC BOX GIRD	HS 38.5	Y	N	N	55.4	
M	27938	2	I 35W	2782-281	35W SB TO EB HWY. 62 OVER I 35 NB	HENNEPIN	1964		2007	YES	2009	RPL w/ Crosstown Project	22,750	4	4	7	289.5	7,382	CCONC BOX GIRD	HS 45.2	Y	N	N	64.2	
M	27939	2	I 35W	2782-281	I 35W SB OVER E 60TH ST	HENNEPIN	1963		2007	YES	2009	RPL w/ Crosstown Project	85,000	4	4	7	126.6	7,786	CSTL BEAM SPAN	HS 33.7	Y	N	N	58.1	
M	27940	2	I 35W	2782-281	I 35W NB OVER E 60TH ST	HENNEPIN	1963		2007	YES	2009	RPL w/ Crosstown Project	85,000	4	4	7	126.6	7,786	CSTL BEAM SPAN	HS 33.7	Y	N	N	58.1	

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M	27941	2	I 35W	2782-281	35W SB TO HWY. 62 EB OVER HWY. 62 WB	HENNEPIN	1964		2007	YES	2009	RPL w/ Crosstown Project	22,750	4	4	5	243.6	6,212	CCONC BOX GIRD	HS 62.1	Y	N	N	64.2	
M	62853	2	I 35W		I35W RAMP TO HWY. 36 EB OVER HWY. 280 NB	RAMSEY	1970		2019-2027	NO		RPL	10,000	6	6	6	294.4	12,777	CSTL BEAM SPAN	HS 37.0	N	N	Y	97.3	
M	27776C	2	I 394		I 394R WB OVER I 394 WB ON RAMP	HENNEPIN	1987		2028-2034	NO		RE-OL	2,175	7	7	(6)	7	626	32,446	CSTL BEAM SPAN	HS 43.0	N	N	Y	95.7 (96.7)
M	27776F	2	I 394		394R EB RAMP OVER I 94 EB (ST. PAUL)	HENNEPIN	1987		2028-2034	NO		RE-OL	1,087	7	7	(6)	7	1199.98	31,403	CSTL BEAM SPAN	HS 43.0	N	N	Y	95.8 (96.8)

Note 1: Newer bridges were designed and fabricated with improved details for resistance to fatigue. Steel specifications in the mid-1970's required steel "toughness" properties that provide resistance to fatigue. A Fracture Control Plan published in 1978 by AASHTO was also utilized to fabricate bridges using improved welding techniques for assembly. Purple cells denote that the bridge has been replaced by a new structure and the values in parenthesis are updated information based on newer inspections.