



2015-2016 Biennial Report on

Bridge Inspection Quality Assurance

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Legislative Request

This report is issued to comply with [Minnesota Statutes 165.03, subdivision 8](#).

Subd. 8. **Biennial report on bridge inspection quality assurance.**

By February 1 of each odd-numbered year, the commissioner shall submit a report electronically to the members of the senate and house of representatives committees with jurisdiction over transportation policy and finance concerning quality assurance for bridge inspections. At a minimum, the report must:

- (1) summarize the bridge inspection quality assurance and quality control procedures used in Minnesota;
- (2) identify any substantive changes to quality assurance and quality control procedures made in the previous two years;
- (3) summarize and provide a briefing on findings from bridge inspection quality reviews performed in the previous two years;
- (4) identify actions taken and planned in response to findings from bridge inspection quality reviews performed in the previous two years;
- (5) summarize the results of any bridge inspection compliance review by the Federal Highway Administration; and
- (6) identify actions in response to the Federal Highway Administration compliance review taken by the department in order to reach full compliance.

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

Summary

The Minnesota Department of Transportation Bridge Inspection Program strives to conform to all state and federal laws and regulations. The National Bridge Inspection Standards are issued by the Federal Highway Administration and were last revised in December 2009. The NBIS is the most comprehensive bridge inspection document available and is the basis for the FHWA's annual evaluation of MnDOT's Bridge Inspection Program.

MnDOT went through a major effort in 2016 to update the Bridge and Structure Inspection Program Manual. The [BSIPM](#), posted on MnDOT's website, is the comprehensive reference that promotes consistent and uniform methods of inspection and documentation of bridge conditions throughout the state.

MnDOT wrote an extensive Quality Control/Quality Assurance plan for its bridge inspection program in 2008, which is incorporated into the BSIPM as Chapter E. The plan is primarily a compilation of current practice assembled into a formal document, with new processes added to comply with changes to the NBIS, and more directly address quality assurance. The plan defines and delegates responsibilities for the statewide inspection programs to 206 districts, counties, municipalities and other agencies throughout the state. It also describes the certification and training program for qualified bridge inspectors and sets up a process for quality assurance reviews of state and local agency inspection programs.

To gather baseline data about initial bridge condition, a significant change for the 2017 inspection program is that all new bridges need to be inspected by certified safety inspectors within 90 days of open to traffic date for MnDOT bridges and 180 days for local bridges. FHWA required this change to our inspection program. Previous state practice was for construction staff to perform inspection and within the next year to have first certified safety inspector inspection. The initial inspection helps establish a baseline condition for deterioration curve modelling.

The passage in 2012 of federal legislation, Moving Ahead for Progress in the 21st Century Act, or MAP-21, requires the Secretary of Transportation to establish national standards for tunnel inspection. FHWA established the National Tunnel Inspection Standards for proper inventory and assessment of tunnel assets. Based on a MnDOT assessment of structures and assets, there are five tunnels that meet the requirements laid out in the law. Previously, MnDOT inspected those tunnels as part of the bridge inspection program.

In the latest version of BSIPM, MnDOT made improvements to the critical deficiency procedure. A new flow chart and clarified responsibilities in the BSIPM along with improved software reporting helps the program administrator through the process.

At the time of this report, MnDOT owns 4,821 bridges. "Bridge" is defined as a structure, including supports erected over a depression or an obstruction, such as water, a highway, or a railway, having a track or passageway for carrying traffic or other moving loads. Bridge is also defined as having an opening measured horizontally along the center of the roadway of 10 feet or more between under

copings of abutments, between the spring line of arches, or between the extreme ends of openings for multiple boxes. Bridge also includes multiple pipes where the clear distance between openings is less than one-half of the smaller contiguous opening and along with all the tunnels. This definition includes only those railroad and pedestrian bridges over a public highway or street.

The table below summarizes the required frequency for MnDOT responsible bridge inspections. Note that some MnDOT bridges are inspected by local agencies as defined by the partnership agreement.

Table 1: Required Frequency Inspections

Required Inspection Frequency [Months]	Count of MnDOT Owned Bridges to be Inspected Within Required Frequency
12	368
24	3,809
48	439

The state of Minnesota currently has 100 fracture critical bridges open to vehicular traffic. The term fracture critical bridge is defined by the FHWA as having at least one primary load carrying steel member in tension, or with a tension element, whose failure would probably cause a portion of or the entire bridge to collapse. MnDOT inspects the majority of fracture critical bridges in the state for the different owners of these bridges.

Table 2: Fracture Critical Bridge Inspections Counts

Fracture Critical Bridge Inspections	Count
MnDOT Inspected and Owned	51
MnDOT Inspected – County Owned	20
MnDOT Inspected – City Owned	12
MnDOT Inspected – Township Owned	10
MnDOT Inspected – Department of Natural Resources Owned	5
Consultant Inspected – Railroad Owned	2

MnDOT also administers contracts to perform underwater inspections for 201 MnDOT and 380 locally owned bridges. Underwater inspections involve an in-depth look at bridge components residing underwater and that have to be accessed with specialized scuba diving equipment. The state inspected these structures in 2016 and will again in the future using a four-year cycle.

In 2015, six critical bridge deficiencies were reported in Minnesota. In 2016, there were 11 (as of Nov. 29, 2016). Critical deficiencies are conditions that threaten public safety and, if not promptly corrected, could result in the collapse or partial collapse of a bridge. All critical deficiencies were resolved.

There are currently 89 MnDOT employees and 265 local agency employees and consultants certified to perform bridge inspections. Certification requires either an engineering degree or five years of experience performing bridge inspections, along with two weeks of training in an FHWA-approved course and a field proficiency exam. Certified inspectors are also required to attend a one-day bridge inspection refresher seminar twice in a four-year period.

MnDOT's Bridge Office presented inspection seminars at seven locations statewide in 2015 and 10 locations in 2016. In addition to these seminars, the Bridge Office coordinated the delivery of comprehensive inspection classes in 2015 and 2016. The two week class is required for certification as an inspection team leader.

In response to findings by the Legislative Auditor in 2008, MnDOT created new performance measures to document the timeliness of bridge inspections and follow-up maintenance actions. In both 2015 and 2016, 99 percent of all routine bridge inspections were completed on time.

High-priority reactive bridge maintenance items are a best-practice scheduled event for completion within one year of identification and can include any deficiency that may affect the safe functioning of a bridge or cause it to deteriorate to a critical condition. In 2015 and 2016, 99 percent of high-priority reactive maintenance items were completed on time.

MnDOT's Bridge Office evaluated the bridge inspection programs of all Minnesota's local agencies in 2015 and 2016. Thirty-nine percent of agencies received an in-depth review. The in-depth review includes several random bridge site visits, a more thorough review of program and report with findings and improvement recommendations. In 2015, no agencies were determined to be out of compliance with the NBIS. In 2016 one local agency was determined out of compliance for inspecting their bridges grossly beyond the due date. The local agency has taken steps in coordination with the MnDOT bridge office to ensure that their bridge inspections are inspected on time in the future.

During these in-depth examinations, important findings from the local agency are reviewed with state and local bridge inspection staff who attended the annual bridge inspections seminars. Additionally, each agency has access to MnDOT's website listing custom reports the agency can use to review the current status of its bridges. Even the agencies that did not have a full, formal program evaluation are asked to provide additional information and documentation concerning out-of-date bridge ratings, plans to monitor scour and late or incomplete inspections.

FHWA annually assesses the management of the statewide bridge inspection program through a set of 23 metrics. In 2015 and 2016, all Minnesota bridge owners were found in full compliance for 16 metrics and in conditional compliance for seven metrics. MnDOT addressed the seven conditional compliance metrics through training, consultant contracts, revising policies and additional auditing of local bridge inspection documents and practices. Additional information regarding these changes is detailed in the body of the report.

Bridge Inspection Quality Assurance and Quality Control Procedures

MnDOT's quality assurance and quality control procedures governing its statewide inspection program are described comprehensively in Chapter E of the [BSIPM](#).

Below is a summary of the major components of the program.

Quality Control Responsibilities

Within MnDOT, there is a bridge inspection program manager. The specific responsibilities of MnDOT's bridge inspection program manager are described along with those responsibilities delegated to district and local agency program administrators and inspection team leaders.

Inspection Program Qualifications

MnDOT maintains a program to certify bridge inspectors as team leaders and approves the appointment of program administrators who meet the NBIS minimum experience and training requirements. Program administrators are required to be registered professional engineers. Inspection team leaders are required to be engineers, or have five years of bridge inspection experience, and completed a FHWA approved two-week bridge inspector training course.

In addition, MnDOT certification requires inspection team leaders to pass a field proficiency test. All program administrators and team leaders are required to attend two days of refresher training every four years and must submit documentation that they have competently performed their duties and responsibilities. Failure to maintain qualifications can result in decertification or denial of appointment, making the person ineligible to perform bridge safety inspection or program administrative activities.

As of January 2017, Minnesota's state and local bridge inspections are conducted by 206 different entities (MnDOT districts, counties, cities and other agencies). Within these agencies, there are 149 appointed program administrators and 354 certified bridge inspection team leaders. Of the 354 inspection team leaders, 89 are MnDOT employees. Many program administrators serve dual roles for different agencies. It is not uncommon for the county engineer to also represent a city, or for one consultant to serve as a program administrator for many cities.

Inspection Quality and Frequencies

MnDOT sets minimum requirements on the frequency of bridge inspections based on criteria established by the MnDOT Bridge Office. Generally, the higher risk structures are inspected on a 12-month cycle and the lower risk structures on a 24 or 48-month cycle. Higher risk structures are defined by having at least one component in ‘Poor’ condition, or containing a fracture critical element. Lower risk structures are bridges that have all components in ‘Fair’ or better condition. According to the NBIS, all new structures owned by the state need to be inspected within 90 days of the structure opening to traffic and 180 days for all other owners. Once the bridge receives the initial inspection, the bridge is set to a 24-month cycle. If the structure meets the defined criteria, the new frequency is granted until the structure no longer meets the criteria, or the agency requests it to be changed.

Training

MnDOT offers several inspector training classes and seminars each year. An introductory, one-week class called, “Engineering Concepts for Bridge Inspectors” is required for new inspectors who do not meet the experience or education requirements for team leader. Prior to certification as a team leader, inspectors must take the two-week course entitled, “Safety Inspections of In-Service Bridges.” The course is taught by instructors from the National Highway Institute and is an FHWA-approved comprehensive bridge inspection training course. Other National Highway Institute courses on advanced topics are scheduled periodically.

Attendance for classes taught in 2015 and 2016 is shown below:

Table 3: 2015 and 2016 Attendance

Course	2015 Attendees	2016 Attendees
Safety Inspections of In-Service Bridges	13 MnDOT 12 Local 3 Consultant	13 MnDOT 12 Local 3 Consultant

In addition to these courses, MnDOT staff annually conducts refresher training seminars for program administrators and inspection team leaders. The seminars are held at various locations throughout the state. Topics typically include sharing best practices, a review of deficiencies found during inspection program quality reviews, FHWA compliance review findings, load rating issues and inspection manual updates. MnDOT conducted 14 training seminars around the state in 2015 and 2016. There were 432 attendees in 2015 and 497 attendees in 2016.

Compliance and Quality Reviews

FHWA performs an annual review of the agency's bridge inspection program. The purpose of the review is to evaluate whether the State's policies, procedures and operating practices meet the requirements of the NBIS. The focus of the review varies from year to year, but typically will include a random assessment of inspector qualifications, timeliness of bridge inspections and, quality of notes, correct elements, load ratings, and fracture critical and bridge scour documents.

Similarly, MnDOT reviews the bridge inspection programs of all 206 Minnesota agencies each year. A series of database queries is used to estimate the level of compliance with the NBIS for each of the agencies. In depth review is usually recommended when there is a poor-performing agency that has not been reviewed for five years. The in-depth review involves a meeting with the bridge inspection program administrator and a field review with the bridge inspection team leader(s). Agencies selected for the in-depth review and the agencies reviewed solely by database queries are sent a report of their compliance for the year. MnDOT then annually follows up with each agency to ensure action. Additional information regarding this practice is detailed in section 3 of this document.

Changes to Quality Assurance & Quality Control Procedures

Most of the quality control and quality assurance processes used by MnDOT were not modified in the past two years. Substantive changes are described in this section.

Bridge Inspection Element Definition Change

Modifications and requirements to the law that were first implemented in the Moving Ahead for Progress in the 21st Century Act, or MAP-21, continue in the Fixing America's Surface Transportation Act, or FAST Act. The law requires each state and appropriate federal agency to report bridge element level data to the U.S. Secretary of Transportation. Element level inspections are a more detailed look at bridge features as opposed to providing a broad summary called component inspection. Minnesota has operated under element level inspections since the early 90s, but in December 2013 the American Association of State Highway and Transportation Officials released the 2013 Manual for Bridge Element Inspection. The manual replaced the existing 1994 Commonly Recognized Elements that MnDOT was operating under.

The 2013 AASHTO manual created a major change to the old inspection methodology. MnDOT adopted these requirements in March 2016 by undergoing the following:

- A complete revision to the MnDOT Bridge Inspection Field Manual
- An upgrade of the Structure Information Management System, SIMS
- Migrating the existing data to the new format
- Reformulation of the data dependencies housed within MnDOT

MnDOT retrained the 354 bridge inspection team leaders and 149 bridge inspection program administrators on the revised bridge inspection procedures and reporting requirements. This was accomplished by offering 10 bridge inspection refresher seminars instead of the normal seven.

Overall implementation has been a success. Many inspectors adopted the new policies and procedures without the need for additional assistance. The data migration was not a flawless translation, and this was emphasized during the inspection seminars. It was stressed that the rough edges of the data conversion needs to be smoothed out by the inspectors. Future MnDOT compliance reviews will take a close look at the resulting data and ensure that this expectation was met. The largest hurdle with the implementation was the upgrade of the SIMS software; major efforts were made to de-customize the solution and align with the commercial off the shelf version of the product. The implementation had its share of bugs, but impact to the routine inspector/administrator was minimal.

Inspection Equipment

Recent modifications to NBIS changes increased the frequency of Fracture Critical Bridge Inspections. The increased frequency and number of inspections required the purchase of additional inspection equipment. Prior to 2007, MnDOT operated four under-bridge inspection vehicles. Since then, five new UBIVs were purchased to accommodate the more frequent inspection mandate. MnDOT plans to order a new specialized snooper in 2017 to accommodate access to some bridges with a wide sidewalk. The fracture critical bridge inspection fleet currently consists of the equipment listed in the following graph:

Table 4: Current Bridge Inspection Assets and Status

Vehicle	Reach	Purchased	Comments	Location
UB50	50 feet	1988	Owned by Metro District; out of service as it needs a rebuild.	Maplewood
UB75	75 feet	2000	Complete Factory Rebuild in 2012	Oakdale
UB30	30 feet	2000	Complete Factory Rebuild in 2014	Oakdale
UB62	62 feet	2007		Rochester
UB62	62 feet	2008		Carlton
UB62	62 feet	2011		St. Cloud
UB62	62 feet	2012		Bemidji
Moog	15 feet	2009	Lighter Weight Platform for Posted Bridges	Oakdale

Summary of Findings from Bridge Inspection Quality Reviews

MnDOT's Bridge Office Data Management Unit each year conducts National Bridge Inspection Standards Compliance Reviews of local agency inspection programs. A new process for evaluating agencies began in 2012. The review now aims to mirror the FHWA metric evaluation of Minnesota and apply the same appraisal to local agencies using the FHWA [Metrics for the Oversight of the National Bridge Inspection Program](#) manual. The review annually assesses a compliance level for all agencies statewide based on eight of the 23 metrics using a series of database queries. Listed below are the eight metrics assessed with this method.

- #2: Qualifications of personnel – Program Administrator
- #3: Qualifications of personnel – Team Leader(s)
- #6: Routine inspection frequency – Lower risk bridges
- #7: Routine inspection frequency – Higher risk bridges
- #12: Inspection procedures – Quality Inspections
- #13: Inspection procedures – Load Rating
- #14: Inspection procedures – Post or Restrict
- #23: Inventory – Timely Updating of Data

In-depth reviews are scheduled with agencies every year. Agencies are selected for an in-depth review based on poor performance with the eight metrics or because the agency has not had an in-depth review in the past five years. In-depth reviews incorporate the assessment of five additional metrics. These reviews require a field review and an office meeting with agency personnel. Listed below are the five additional metrics assessed during an in-depth review.

- #15: Inspection procedures – Bridge Files
- #17: Inspection procedures – Underwater
- #18: Inspection procedures – Scour Critical Bridges
- #21: Inspection procedures – Critical Findings
- #22: Inventory – Prepare and Maintain

In 2015 and 2016, in-depth reviews were performed for the following agencies:

Table 5: 2015-16 Locations of In-Depth Reviews

Beltrami County	City of Fergus Falls	City of Rochester	Faribault County	Pipestone County
Brown County	City of Grand Rapids	City of Rosemount	Fillmore County	Pope County
Canadian National Railroad	City of Hastings	City of Savage	Freeborn County	Ramsey County
Cass County	City of Hermantown	City of Shoreview	Goodhue County	Renville County
Chippewa County	City of Hibbing	City of South St. Paul	Hennepin County	Rice County
Chisago County	City of Hopkins	City of St. Anthony	Lac Qui Parle County	Rock County
City of Albert Lea	City of Inver Grove Heights	City of St. Louis Park	Lake County	Scott County
City of Blaine	City of Lakeville	City of St. Paul	Lincoln County	Steele County
City of Brainerd	City of Little Canada	City of St. Peter	Lyon County	Swift County
City of Burnsville	City of Maple Grove	City of Stillwater	Mahnomen County	Three Rivers Park District
City of Chanhassen	City of New Hope	City of Victoria	MnDOT District 6	Traverse County
City of Chisholm	City of Northfield	City of Wayzata	MnDOT Metro	U of M Transit
City of Corcoran	City of Owatonna	City of Winona	Morrison County	Wabasha County
City of Cottage Grove	City of Prior Lake	Cook County	Mower County	Washington County
City of Edina	City of Red Wing	DNR	Olmsted County	Winona County
City of Farmington	City of Robbinsdale	Dodge County	Pennington County	Wright County

Actions Taken in Response to Findings from Bridge Inspection Quality Reviews

Quality Assurance Review Findings and Follow-up

MnDOT's Bridge Inventory Management Unit follows up on quality review findings by sending a letter to each agency to notify it of areas where improvement is needed. Agencies falling out of compliance are subject to additional review and may need to provide a Plan of Corrective Action. MnDOT's State Aid Division may withhold funding from agencies that are repeatedly out of compliance with NBIS rules or with the AASHTO Manual for Bridge Evaluation. In addition to notifying agencies about their specific levels of compliance with the NBIS, the letters list the individual performance for each metric and the data that was used to compute compliance level. This allows the agency to see which areas need improvement and offers an opportunity to check the data for accuracy. Agencies selected for the in-depth review were generally receptive to the findings about areas needing improvement and indicated they will take steps to do so. Agencies that do not improve enough by the next cycle may be selected again for another in-depth review and then may be required to provide a PCA to ensure improvement of the program.

Findings Discussed at Bridge Inspection Seminars

Since each agency receives an in-depth review only once every five years, it is important MnDOT develop other methods to more frequently communicate some of the more common problems found during agency reviews. MnDOT uses the annual bridge inspection seminars for that purpose. Agendas for the seminars are designed to address the common deficiencies found during agency reviews.

Reports Available Electronically to All Agencies

In 2011, MnDOT started using new software (called the Structure Information Management System) to track and manage inspection data. SIMS offers substantial improvements in comparison to the previously used program. Inspectors can now upload photos, bridge documents and inspection data to a web-based program that can be accessed anywhere with an internet connection. SIMS then feeds this data into an AASHTO-developed bridge management system called BRM. Data from BRM is used to generate the compliance scores and identify deficiencies in an agency's inspection program or data. BRM also allows MnDOT to offer several standard reports that access recent data to help agencies better understand the overall condition of their bridge inventory and identify bridges needing inspection, missing data or that may need new load ratings. These and other reports are continuously available to agencies that log on to the [Bridge Reports Page](#) located on [MnDOT's Bridges and Structures](#) website. A few of the reports used during local reviews include:

- Bridge Inspections Due – Lists inspections that are due and overdue.
- Bridge Inspection Frequency – Lists the bridges on a 12-month, 24-month, or 48-month inspection frequency and those eligible to be changed.

- Bridge Scour F, G, J – Lists bridges that have not been evaluated for scour, have unknown foundations or require further evaluation.
- Bridge Scour Plan of Action – Lists whether bridges that are susceptible to scour have written plans of action guiding agency response during flood events.
- Bridge Rating and Posting – Lists bridges with capacity ratings, posting signs and those that are missing rating sheets or are in poor or serious conditions, which may require a new rating.
- FC, UW, PA – Lists bridges that are coded to require fracture critical, underwater or special pinned assembly type inspections.

Summary of Findings from FHWA Bridge Inspection Compliance Reviews

The FHWA is responsible for evaluating the overall quality and conformance to the NBIS of each state's bridge inspection program. MnDOT is evaluated on the management and inspection of its trunk highway bridges and its management and oversight of local agency bridge owners. Typically, the FHWA meets with the Minnesota State Bridge Engineer and staff to discuss findings, provide additional information and access inspection files as requested. Following the review, the FHWA Division Bridge Engineer submits a letter to the commissioner of transportation stating whether MnDOT was found in compliance with the NBIS and lists findings in the form of recommendations to improve the program based on its review. In 2011, the review process changed significantly. In the past, a state's program was given one overall determination of compliance. The new program is a data-driven and risk-based system that establishes 23 metrics for review and evaluation. The program strives to clearly define terms and processes and to better establish national consistency in program reviews between states.

National Bridge Inspection Program Review

The 2015-2016 program reviews assessed 23 metrics, or focus areas, derived from the NBIS. Each of the metrics is cyclically reviewed by the FHWA on an intermediate or in-depth level, and if the state is not operating to a defined level of expected performance, an agreement (either called an Improvement Plan or Plan of Corrective Action) between FHWA and MnDOT is put into place.

As long as the state then operates under the agreement, the state will be considered in conditional compliance until the terms of the agreement expire. MnDOT is currently in full compliance with 16 of the 23 metrics, conditional compliance for six metrics and out of compliance for one metric.

- **Metric 6** – Lower Risk Inspection Frequency. In 2015, 94 percent of bridges due for inspection were inspected on time, short of the required 100 percent. Common reasons for delay include weather, construction/workload overlap and optimization of inspection schedule. One county exceeded the inspection frequency by four months for 28 structures which made the entire state out of compliance for this metric. The county collaborated with the Bridge Office and developed an action plan to address this issue for future inspections.

- **Metric 13** – Load Ratings. FHWA determined that a subset of bridges require a new load rating calculation.
- **Metric 15** – Bridge Files. In a random sample, FHWA determined that a subset of bridges requiring channel cross sections were missing from the bridge file.
- **Metric 18** – Scour Critical Bridges. In a random sample, FHWA determined that a subset of bridges requiring a scour Plan of Action were missing details such as detour plan or critical scour depth from the documentation.
- **Metric 19** – Complex Bridges. FHWA determined two complex bridges had incomplete or dispersed documentation to support the inspection procedures of these bridges.
- **Metric 21** – Critical Findings. FHWA determined that Minnesota needs to establish written procedures and timelines for handling a critical finding during an unscheduled inspection event, such as a bridge hit from over height truck or scour event.
- **Metric 23** – Update of Data. FHWA requires updating the inventory within 90 days for a state owned bridge, and 180 days for other owned. Minnesota was 96 percent compliant with this for the 2015 inspection season, short of the required 100 percent.

Response to FHWA Compliance Review Findings

The following is a summary of MnDOT responses corresponding to each of the compliance reviews listed in Section 5, which were created after the 2015 or 2016 FHWA reviews:

Annual National Bridge Inspection Standards Compliance Review

No follow-up action was needed by MnDOT for any of the 16 metrics that are currently in full compliance. MnDOT developed agreements with the FHWA to address the issues with the six conditionally compliant and one out of compliance metrics. These agreements and actions that are actively being pursued are:

Metric 6: Inspection Frequency

- **Action Item 1: Education to Agencies on Consequences of Inspecting Late.** MnDOT's Bridge Office will educate agencies during the 2017 & 2018 bridge inspection seminars about the case example where one agency inspected bridges more than four months beyond their scheduled due date.

Metric 13: Load Rating

- **Action Item 1: Resolve Unreasonable Inventory and Operating Ratings.** MnDOT's Bridge Office will investigate and correct the unreasonable inventory and operating ratings resulting from the PY2016 MAR Report 13A.
- **Action Item 2: Finalize Existing Load Ratings.** MnDOT's Bridge Office will finalize the remaining paperwork for the bridges that have had an independent load rating completed, but have yet to be entered into the inventory.
- **Action Item 3: Complete Load Ratings for Recently Built Structures.** MnDOT's Bridge Office will perform independent load ratings for the list of recently built structures through internal resources or consultant.
- **Action Item 4: Complete Load Ratings for Recently Built Steel Continuous Beam and Post-Tensioned Structures.** MnDOT's Bridge Office will pursue independent load ratings of the set of post tensioned box girder bridges through internal resources or consultant.

Metric 15: Bridge Files

- **Action Item 1: Education to Program Administrators and Team Leaders.** MnDOT's Bridge Office will educate Program Administrators and Team Leaders at inspection refresher seminars about the requirement to provide channel cross sections at a minimum five year cycle for all scour critical bridges (MnDOT scour codes of R, D or U) and any channel NBI (FHWA Item 61) of three or less.

- **Action Item 2: Audit by Bridge Office.** MnDOT's Bridge Office will audit agencies as part of their random selection of Scour Plan of Actions Audit (Action Item for Metric 18) at the end of 2015. Agencies that do not have channel cross sections will be required to define the timeline to complete the cross sections, MnDOT will review the timelines and approve based on a risk determination.
- **Action Item 3: Annual Review by Bridge Office.** MnDOT's Bridge Office will spot-check agencies regarding performance with this metric during the in-depth Quality Assurance reviews. Agencies that fail to meet compliance requirements two years in a row will have to implement a Plan of Corrective Action.

Metric 18: Scour Critical Bridges

- **Action Item 1: Ongoing Education/Follow-up.** MnDOT's Bridge Office will educate program administrators and team leaders at inspection refresher seminars on the importance of complete information in regards to compliance and documentation requirements.
- **Action Item 2: Annual Review by Bridge Office and Contact with Program Administrators.** MnDOT's Bridge Office Waterway Unit will perform an audit of Bridge Owners of scour critical bridges to review the completeness of the Scour Critical Bridge Plans of Action.
- **Action Item 3: Correction of POAs.** Bridge Owners found to not be in compliance will submit all of their POAs to the Waterway Unit for review and to determine the corrections needed. MnDOT will then work with the appropriate program administrators to rectify any structures missing data.

Metric 19: Complex Bridges

- **Action Item 1: Prepare Complex Inspection Procedures.** Bridge 4654 (Stillwater Lift Bridge).
- **Action Item 2: Prepare Complex Inspection Procedures.** Work with City of Duluth to Prepare Complex Inspection Procedures for Bridge L6116 (Duluth Lift Bridge).

Metric 21: Critical Findings

- **Action Item 1: Revision to Minnesota's Bridge & Structure Inspection Program Manual.** MnDOT's Bridge Office will revise the Minnesota Bridge & Structure Inspection Program Manual to incorporate policy for handling critical findings during non-routine inspections.
- **Action Item 2: Retire Existing MnDOT's Technical Memorandum for Critical Findings.** MnDOT will retire Technical Memorandum 11-12-B-04 regarding critical findings as the new and official language will be referenced in the Minnesota Bridge & Structure Inspection Program Manual.

Metric 23: Timely Updating of Data

- **Action Item 1: Annual Report by Bridge Office.** MnDOT's Bridge Office to include a Metric 23 section in the annual compliance report to agencies with regards to their performance in updating inspection reports within the required timeframe.

- **Action Item 2: Annual Review by Bridge Office.** MnDOT’s Bridge Office will follow-up with delinquent agencies regarding poor performance with this metric during the in-depth Quality Assurance reviews. Agencies that fail to meet compliance requirements two years in a row will have to implement a Plan of Corrective Action.
- **Action Item 3: Education to Program Administrators and Team Leaders.** MnDOT’s Bridge Office will educate program administrators and team leaders at inspection refresher seminars about the importance of submitting, reviewing and approving bridge inspection reports within the required timeframe.

Appendix A: List of Acronyms

AASHTO: American Association of State Highway and Transportation Officials

BSIPM: Bridge and Structure Inspection Program Manual

CoRe: Commonly Recognized Elements

FC: Fracture Critical-type of special bridge inspection

FHWA: Federal Highway Administration

MnDOT: Minnesota Department of Transportation

NBIS: National Bridge Inspection Standards

PA: Pinned Assembly-type of special bridge inspection

PCA: Plan of Corrective Action

BRM: AASHTO-developed bridge management system; SIMS feeds data to BRM

SHV: Specialized Hauling Vehicle

SIMS: Structure Information Management System

UBIV: Under Bridge Inspection Vehicle

UW: Underwater-type of special bridge inspection