DEPARTMENT OF TRANSPORTATION

2023-2024 Biennial Report on the

Bridge Inspection Quality Assurance

March 2025

Prepared by:

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DEPARTMENT OF TRANSPORTATION

395 John Ireland Boulevard
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July 31, 2025

The Honorable Erin Koegel, Co-Chair
House Transportation Finance & Policy Committee
5th Floor, Centennial Office Building
Saint Paul, MN 55155

The Honorable Jon Koznick, Co-Chair
House Transportation Finance & Policy Committee
2nd Floor, Centennial Office Building
Saint Paul, MN 55155

The Honorable Scott Dibble, Chair
Senate Transportation Finance & Policy Committee
3107 Minnesota Senate Building
Saint Paul, MN 55155

The Honorable John Jasinski
Ranking Minority Member
Senate Transportation Finance & Policy Committee
2227 Minnesota Senate Building
Saint Paul, MN 55155

RE: 2023-2024 Biennial Report on Bridge Inspection Quality Assurance

Dear Legislators:

I am pleased to provide the report on Bridge Inspection Quality Assurance. This report is required under Minnesota Statute 165.03, Subdivision 8.

The report highlights three components of bridge inspection and quality assurance, which include the following:

- Bridge inspection quality assurance and quality control procedures and recent changes to any of those procedures
- Findings from the bridge inspection quality reviews during the past two years and any actions taken as a result of the reviews
- Results of Federal Highway Administration bridge compliance reviews and any actions taken in response to those review findings.

Improving quality is a continuous process in MnDOT's quest to create and maintain a safe, efficient and sustainable transportation system. In partnership with the Federal Highway Administration and county and municipal agencies, MnDOT seeks to provide the best available technology and training to bridge inspections staff throughout the state. Collectively, these practices help ensure the safety of Minnesota's transportation system.

Please contact me if you have questions about this report, or you may contact Andrew Lawver in the Bridge Office at andrew.lawver@state.mn.us or at 507 380-1705.

Sincerely,

Nancy Daubenberger

Nancy Daubenberger, P.E. (MN)
Commissioner

Contents

Legislative Request

This report is issued to comply with Minnesota Statutes 165.03, subdivision 8.

165.03 STRENGTH OF BRIDGE INSPECTION.

Subdivision 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 Minnesota 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 less than $5000.

Summary

The Minnesota Department of Transportation Bridge Inspection Program conforms to all state and federal laws and regulations. The National Bridge Inspection Standards were established in 1971 by the Federal Highway Administration and were last revised in May of 2022. The NBIS is the basis for the FHWA's annual evaluation of MnDOT's Bridge Inspection Program.

MnDOT maintains the Bridge and Structure Inspection Program Manual, a comprehensive reference manual that promotes consistent and uniform methods of inspection and documentation of bridge conditions throughout the state. The BSIPM was last updated in March of 2025 and is referenced frequently in this report.

MnDOT developed a 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 districts, counties, municipalities, and other agencies. 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.

Minnesota has 13,399 structures meeting the NBIS definition of a "bridge" (over 20 ft. long and carrying a roadway). There are 20,091 structures meeting the Minnesota definition of a "bridge". This includes structures 10 ft. and longer carrying a roadway, as well as pedestrian and railroad bridges crossing over a public roadway.

The FHWA annually reviews MnDOT under its NBIS Oversight Program. This program is a standard method of assessing state DOT compliance within the federal requirements. This program splits the NBIS into 23 different focus areas, referred to as metrics. FHWA staff annually assess each metric, and if certain tolerances are exceeded, the state is required to provide a written plan on how it will make corrections to re-establish full compliance. At the end of 2024, MnDOT was in full compliance with all 23 metrics outlined in the FHWA "Metrics for the Oversight of the National Bridge Inspection Program".

The National Tunnel Inspection Standards (NTIS) were established in 2012. This inventory and assessment of tunnel structures carrying roadway traffic. MnDOT has designated 6 structures as NTIS tunnels. Three are owned by MnDOT District 1, two are owned by MnDOT Metro District, and one is owned by the Metropolitan Airports Commission. All state-owned tunnels are inspected by MnDOT's Bridge Office and district-certified tunnel team leaders. The MAC tunnel is inspected by consultants using certified tunnel team leader inspectors. Chapter C of the BSIPM details the tunnel inspection requirements and program.

FHWA established an NTIS Oversight Program in 2019 and made its first metric assessments of MnDOT's Tunnel Inspection Program in 2020. As of the 2024 FHWA review, MnDOT was found fully compliant in 12 of the 15 NTIS metrics and conditionally compliant in three metrics:

Metric 6 - Inspection Procedures (Quality Inspections)

- MnDOT will identify which functional systems must be inspected in accordance with the Tunnel Operations, Maintenance, Inspection, and Evaluation Manual and the NTIS.
- MnDOT will document inspection procedures for tunnel functional systems and train our inspectors to follow these procedures.

- MnDOT will document inspection procedures for tunnel functional systems.

Metric 7 - Inspection Procedures (Tunnel-Specific Inspection Procedures)

The NTIS defines "tunnel-specific inspection procedures" as written documentation of the directions necessary to plan for and conduct an inspection. Directions include coverage of inspection methods, interval of each method, inspection equipment, access equipment, identification of tunnel elements, components and functional systems, traffic coordination, and specialized qualifications for inspecting personnel.

- Owners will develop detailed inspection procedures for each NTIS tunnel.

Metric 8 - Inspection Procedures (Functional Systems Testing)

The NTIS defines “functional systems” as non-structural systems, such as electrical, mechanical, fire suppression, ventilation, lighting, communications, monitoring, drainage, traffic signals, emergency response (including egress, refuge room spacing, or carbon monoxide detection), or traffic safety components.

- Owners will identify which functional systems require testing and develop testing procedures for those specific tunnel functional systems for each NTIS tunnel.

- Owners will develop detailed inspection procedures for each NTIS tunnel.

MnDOT has completed a consultant contract to develop tunnel-specific inspection and testing procedures for the five NTIS Tunnels owned by MnDOT. These documents are in draft form and undergoing review. They should be completed by July of 2025. This includes identification of tunnel “functional systems” (such as electrical, mechanical, fire suppression, ventilation, lighting, communications, carbon monoxide detection, drainage, and traffic signals), as well as developing inspection and testing procedures for these systems. The MAC is using our template to develop functional system inspection procedures for their one NTIS tunnel.

Bridge Inspection Requirements

At the time of this report, MnDOT owned 4,827 bridges. Minn. Stat. 165.01, subd. 3 defines a bridge, "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…." The language also defines a bridge as having an opening measured horizontally along the center of the roadway of 10 feet or more:

- between undercopings of abutments
- between the spring lines of arches, or
- between the extreme ends of openings for multiple boxes

The statutory definition for bridges also includes culverts with multiple pipes where the clear distance between openings is less than one-half of the smaller contiguous opening. This definition includes only those railroad and pedestrian bridges over a public highway or street.

The table below summarizes the required interval of bridge inspections for MnDOT-owned bridges. Note that some MnDOT bridges are inspected by local agencies as defined by a partnership agreement. The assigned bridge inspection interval varies based on different risk factors, such as design of structure and condition of the structure. New or rehabilitated bridges owned by MnDOT are initially assigned a 90-day inspection interval as required by federal law.

Table 1: Required Interval Inspections

Required Inspection Interval [Months]	MnDOT-Owned Bridges to be Inspected Within Required Interval
3*	0
12	190
24	3,931
48	706

**New bridges are inspected on an initial 90-day interval; once inspected at the 90-day mark, they will then be put on a 24-month inspection cycle.*

In Minnesota, there are currently 69 Non-redundant Steel Tension Members bridges (formerly called fracture critical) bridges open to vehicular traffic. An NSTM 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 NSTM bridges in the state for the different owners of these bridges.

Table 2: NSTM Bridge Inspections Counts

NSTM Bridge Inspections	Count
MnDOT Inspected and Owned	**38***
MnDOT Inspected – County or Township Owned	**13**
MnDOT Inspected – City Owned	**10**
MnDOT Inspected – Department of Natural Resources Owned	**6**
Consultant Inspected – Railroad Owned	**1**
Consultant Inspected – Department of Administration Owned	**1**

**Two bridges, 69100 (Bong Bridge) and 82010 (Prescott Bascule Bridge), were inspected by WisDOT because of shared ownership with MnDOT.*

MnDOT also administers state-wide contracts to perform underwater inspections for MnDOT and locally owned bridges. Underwater inspections involve an in-depth examination of submerged bridge components using specialized scuba diving equipment. Underwater inspections in Minnesota were traditionally performed in a single year on a 4-year interval. The NBIS now requires some bridges to have underwater inspection on a 24-month interval and requires new bridges to have an underwater inspection within 12 months of opening to traffic. To comply with the revised NBIS, Minnesota is gradually transitioning to a schedule where one-quarter of the bridges will have an underwater inspection each year. The current underwater inspection contract (2024-2026) includes 823 bridges.

In 2023, 27 critical findings for bridges were reported in Minnesota. In 2024, there were 29 critical findings. Critical findings are conditions that threaten public safety and, if not promptly corrected, could result in the collapse or partial collapse of a bridge. All critical findings were promptly documented, reported, and resolved. Typical causes for critical findings include scour, deterioration, bridge hits from over-height vehicles, and settlement. Table 3 below is a summary of the critical finding details for 2023 and 2024 (each inspection year ends on February 15th to coincide with date submittal to the FHWA).

Table 3: Critical Finding Summary

Date	Bridge	Agency	Description
3/6/2023	L8730	Kandiyohi County	Hole in timber deck and severe decay on timber piling. Bridge closed and later removed (not replaced).
4/2/2023	R0745	Lake of the Woods County	Culvert washed out during flood, replaced with temporary culvert until new culvert 39J43 constructed.
4/11/2023	90471	City of Minneapolis	Shims on temporary supports missing and timber caps crushing. Bridge closed until repairs completed.
5/4/2023	89850	Redwood County	Crack found in bottom chord of an old steel truss. Bridge closed permanently.
5/4/2023	L8275	Clay County	Timber bridge damaged by flooding. Bridge closed permanently.
5/9/2023	14805	MnDOT District 4	Bridge struck by high load. Steel beams were heat-straightened and repaired.
6/6/2023	L2041	Lincoln County	Severe washout at old concrete box culvert. Replaced by new culvert 41J81.
6/9/2023	L5738	Brown County	Loss of backfill on timber abutment. Bridge closed until repairs completed.
6/14/2023	L8296	Clay County	Timber bridge damaged by fire (arson). Bridge remains closed.
7/20/2023	9876	MnDOT District 4	Bridge struck by high load (hit and run). Lane closure on bridge until repairs were completed.
7/27/2023	93091	Lake County	Timber pier piling split and abraded. Lane on bridge closed until repairs completed.
8/21/2023	L6393	City of Minneapolis	Abutment bearing anchorage failure on pedestrian bridge. Bridge closed until repairs completed.
9/14/2023	25530	Goodhue County	Timber pier cap with decay and crushing. Monitored weekly until repairs completed.
9/19/2023	L5931	City of Duluth	Culvert overtopped during flood, washing out roadway. Closed until emergency repairs completed.
10/6/2023	89354	Martin County	Decay on timber piling. Bridge temporary closed for load rating, later re-opened with a 10 Ton Posting.
9/19/2023	9071	MnDOT Metro	Bridge struck by high load. Lane closed on bridge until steel beams were heat-straightened and repaired.

Date	Bridge	Agency	Description
9/22/2023	R0616	Lake of the Woods County	Steel culvert had severe distortion. Closed and later replaced by new culvert 39J45.
9/24/2023	R0006	Jackson County	Steel pipe-arch culvert on Iowa border permanently closed due to excessive deflection. Part of SHV load rating contract.
10/30/2023	L6900	Redwood County	Steel pipe-arch culvert closed after load rating under the State Aid load contract. Replaced by new culvert 64J82.
10/30/2023	92230	Redwood County	Steel pipe-arch culvert permanently closed after load rating under the State Aid load contract.
10/30/2023	L6923	Redwood County	Steel pipe-arch culvert closed after load rating under the State Aid load contract. Replaced by new culvert 64J84.
10/30/2023	L6927	Redwood County	Steel pipe-arch culvert closed after load rating under the State Aid load contract. Replaced by new culvert 64J90.
10/30/2023	L9451	Redwood County	Steel pipe-arch culvert permanently closed after load rating under the State Aid load contract.
10/30/2023	L9453	Redwood County	Steel pipe-arch culvert closed after load rating under the State Aid load contract. Replaced by new culvert 64J89.
11/2/2023	5682	Lyon County	Truss members on a steel pony truss damaged by farm equipment. Bridge permanently closed.
1/8/2024	42503	Lyon County	Severe crushing on timber pier cap. Bridge closed until cap was replaced.
1/22/2024	07026	MnDOT District 7	Prestressed beam severely damaged by high load. Shoulder closed until beam could be replaced.
2/16/2024	L8923	City of Minneapolis	A load rating determined that the roadway width needed to be narrowed due to load capacity concerns.
3/20/2024	80502	Wadena County	Bridge closed due to decay and crushing of timber pier cap. Replaced by Bridge 80540.
4/2/2024	L2510	Goodhue County	Bridge permanently closed due to severe corrosion and section loss on the beams.
4/19/2024	27557	Hennepin County	Pedestrian bridge struck by high load, severely damaging a steel beam. Bridge closed and removed (no replacement).
5/2/2024	R0160	Morrison County	Steel culvert separated at seam and a hole formed in the in roadway during rainstorm. Roadway closed.
6/3/2024	3200	Sibley County	Concrete box culvert clogged with debris, resulting in washout of embankment. Shoulder closed until debris was removed and slope repaired.
6/10/2024	62023	MnDOT Metro	Pedestrian bridge struck by high load, severely damaging a steel beam. Bridge closed, being evaluated for repair or removal.
6/24/2024	L4149*	U.S. Forest Service	Steel pony truss bridge washed out during flood. *Federally owned bridges are not on the state inventory.
6/26/2024	07542	Blue Earth County	Rapidan Dam located just downstream of the bridge failed, resulting in scour exposing a pier footing (bridge closed).
6/26/2024	90512	Blue Earth County	Pedestrian walkway integral with the Rapidan Dam. The dam washed out during a flood and will be removed.
7/8/2024	62515	City of St. Paul	Severe corrosion and section loss on steel beams at cantilever hinge joint. Lane on bridge closed. City has hired a consultant to analyze the bridge and determine the appropriate course of action.
7/30/2024	80510	Wadena County	Prestressed voided slab panel had delamination due to water trapped inside (weep holes clogged). Bridge closed until new load rating completed (bridge is now posted).

Date	Bridge	Agency	Description
8/6/2024	5595	City of St. Paul	Railroad bridge struck by high load, damaging the concrete overhang and railing. Roadway below bridge closed until the railroad removed loose concrete and damaged railing.
8/30/2024	35505	Kittson County	Severe decay on timber pile. Bridge posted at 3 Tons until consultant can recommend a further course of action.
9/5/2024	60509	Polk County	Bridge closed due to large crack in a precast concrete channel beam.
10/3/2024	R0033	Mn DNR	Timber slab span bridge posted with a 15 Ton limit due to broken laminates adjacent to the panel connection points.
10/3/2024	L6119	City of Duluth	Abandoned railroad bridge over city street has steel columns with severe section loss and cracking. Consultant recommended closing roadway below the bridge. The city is considering removing the structure.
10/7/2024	27630	MnDOT Metro	High load struck bridge, damaging the prestressed concrete beams. Bridge closed until repairs are completed.
10/15/2024	46542	Martin County	Bridge closed due to severe decay and crushing of timber pier caps.
11/1/2024	56519	Otter Tail County	Timber pier cap has a severe split. Bridge will be monitored until a new load rating is performed.
11/18/2024	R0994	Renville County	Steel pony truss bridge in local park closed due to severe section loss on steel piling supporting the abutments.
11/20/2024	92963	Grant County	Scour undermining of abutment resulting in loss of backfill and hole in approach roadway. Bridge closed.
12/6/2024	64542	Redwood County	Timber pier cap has severe crushing. Bridge will remain closed until repaired or replaced.
1/2/2025	34520	Kandiyohi County	Timber bearing cap is crushing. Bridge will remain closed until replaced.
1/2/2025	34502	Kandiyohi County	Timber pile has severe decay. Bridge will remain closed until replaced.
1/16/2025	L8734	Kandiyohi County	Timber pilings have widespread decay. Bridge will remain closed until replaced.
1/16/2025	L0927	Otter Tail County	Steel bearing cap has hole rusted through. Bridge will remain closed until repairs are completed.
1/30/2025	L5584	Steele County	Timber abutment piling have decay and crushing. Bridge will remain closed until replaced.
2/10/2025	74514	Steele County	Timber pier piling have severe decay and crushing. Bridge will remain closed until replaced.

As of November 2024, there are 105 MnDOT employees, and 279 other employees from other agencies (cities, counties, Department of Natural Resources, private sector, etc.) certified to perform bridge inspections. Certification requires either an engineering degree or five years of experience performing bridge inspections. Also required are a FHWA-approved training course and successfully passing the Minnesota-designed field proficiency exam. Once certified, inspectors must attend at least three one-day bridge inspection refresher training classes during each five-year period to maintain their certification.

MnDOT's Bridge Office presented in-person and online bridge inspection training classes in 2023 and 2024. In addition to these classes, the Bridge Office coordinated the delivery of the National Highway Institute's comprehensive bridge inspection classes in 2023 and 2024. These initial NHI classes are required to become certified as a bridge 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. For the 2023 inspection season, **99.5** percent of all routine bridge inspections were completed on time. For the 2024 inspection season, **99.9** percent of all routine bridge inspections were performed on time.

MnDOT's Bridge Office evaluated the bridge inspection programs of several inspection agencies in 2023 and 2024. The in-depth review included several random bridge site visits, a more thorough review of the program and a report with findings and improvement recommendations. In 2023, in-depth reviews were conducted for 14 agencies (site visits to 31 bridges). No agencies were determined to be out of compliance with the NBIS for failing to meet inspection quality standards. In 2024, in-depth reviews were conducted for 11 agencies (site visits to 30 bridges). No agencies were determined to be out of compliance.

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 inspection refresher training classes.

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.

Since 2019, the MnDOT State Aid Office has created 4 new positions to assist with local agency bridge inspections. They travel throughout the state training bridge inspectors, operating bridge access equipment, demonstrating the use of specialized inspection equipment, and reviewing inspection reports.

Bridge Inspection Quality Assurance & Quality Control Procedures

MnDOT's quality assurance and quality control procedures governing its statewide bridge 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 and tunnel 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 have 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 a minimum of three one-day refresher training classes every five years. Failure to maintain qualifications can result in decertification or denial of appointment, making the person ineligible to perform bridge safety inspection activities.

At the time of this report, Minnesota's state and local bridge inspections are conducted by 214 different entities (MnDOT districts, counties, cities, and other agencies). Within these agencies, there are 162 appointed program administrators and 384 certified bridge inspection team leaders. 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. Nor is it uncommon for a team leader to serve multiple inspection agencies.

Inspection Quality and Intervals

The MnDOT Bridge Offices assigns bridge inspection intervals based upon condition and other factors. Generally, the higher risk structures are inspected on a 12-month interval and the lower risk structures on a 24-month or 48-month interval. Higher risk structures are defined as having at least one component in 'Poor' condition or containing at least one non-redundant steel tension member. Lower risk structures are bridges that have all components in 'Fair' or better condition. The NBIS requires that all new structures be inspected within 3 months of opening to traffic. Once the bridge receives the initial inspection, it is assigned a 24-month inspection interval. If the structure meets the defined criteria, the new interval is granted until the structure no longer meets the criteria, or the agency requests it to be changed.

Training

MnDOT offers initial bridge inspection training and refresher training each year. Prior to certification as a team leader, inspectors must take the NHI training course, "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 NHI bridge inspection classes hosted by MnDOT in 2023 and 2024 is shown below.

Table 4: 2023-2024 NHI Attendance

Course	2023 Attendees (1 Session)	2024 Attendees (2 Sessions)
Safety Inspection of In-Service Bridges	14 MnDOT 7 Local 1 Federal 8 Private/Consultant	14 MnDOT 27 Local 5 Federal 11 Private/Consultant

In addition to these courses, MnDOT staff annually conducts refresher training classes for program administrators and inspection team leaders. The classes 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 in-person and virtual (online) training classes in 2023 and 2024. There were 462 attendees in 2023 and 491 attendees in 2024.

All tunnel inspection team leaders and the program manager must be recertified every five years. Several inspectors will need to travel out-of-state in 2025 to complete refresher training, as it is not being hosted by MnDOT.

Compliance and Quality Reviews

FHWA performs an annual review of each state agency's bridge and tunnel 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 and NTIS. The focus of the review varies from year to year, but typically includes a random assessment of inspector qualifications, timeliness of bridge inspections, quality of notes for the correct elements, load ratings, inspection procedures and bridge scour documents.

Similarly, MnDOT reviews the bridge inspection programs of all 214 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 reviews are recommended for a poor-performing agency or for an 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 Summary of Findings from Bridge Inspection Quality Assurance Reviews 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 Office Monitoring of Inspection Timelines

The NBIS gives agencies up to 90 days to update their inspection data in the state inventory. This limits MnDOT's ability to effectively monitor if inspections have been performed within the required interval. For example, if a bridge is due for inspection in May, the agency has three months to fill out an inspection report. Using an electronic records review, MnDOT has no idea if the inspection has been completed but not entered or not inspected at all.

MnDOT corrected this issue for Metric 6 by implementing two changes:

1. Created a new policy requiring Minnesota inspection agencies to start an electronic report in the Structure Information Management System within three months of the inspection due date.

2. Created software to monitor the inspection database and email agencies that fail to meet the 3-month requirement. This ensures that the bridge was inspected, and if not inspected, allows an agency to correct the issue before the deadline is beyond tolerances.

Inspection Access Equipment

The NBIS requires in-depth inspection of non-redundant steel tension members on a 24-month interval. The NBIS also requires the use of access equipment during routine inspections if that is the only practical means of determining the condition of the bridge. The MnDOT bridge access vehicle fleet currently consists of the equipment listed in Table 5. A small number of local agencies have their own bridge access vehicles.

Table 5: Current MnDOT Bridge Inspection Assets and Status

Vehicle	Reach	Purchased	Comments	Location
A-75	75 feet	2000	Complete factory rebuild in 2012. Replacement planned for 2026.	Oakdale
UB-30	30 feet	2000	Complete factory rebuild in 2014.	Oakdale
A-62	62 feet	2008		Carlton
A-62	62 feet	2011		Rochester
A-62	62 feet	2012		Bemidji
Moog	15 feet	2024	Lighter weight platform for posted bridges.	Oakdale
A-62T	62 feet	2017	Specialized to access bridges with wide sidewalks.	St. Cloud

In addition, the Bridge Office, most MnDOT districts, some local agencies, and several consultants have purchased unmanned aircraft systems (drones) to provide bridge inspection access. Drones have been successfully used since the 2021 inspection season for better quality and worker safety.

Summary of Findings from Bridge Inspection Quality Assurance Reviews

MnDOT's Bridge Office conducts National Bridge Inspection Standards quality assurance reviews each year 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 interval – Lower risk bridges
#7: Routine inspection interval – 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 2022, the FHWA published the Specifications the National Bridge Inventory (SNBI). This replaced the 1995 Bridge Recording and Coding Guide. Minnesota will begin inspecting bridges in accordance with the SNBI in 2025. It includes several new and revised bridge condition items and many new inventory items. The FHWA National Bridge Inspection Program Compliance Review Manual is still in draft form but should be completed and implemented by 2028. MnDOT BSIPM Chapter E (Quality Control and Quality Assurance) will require substantial revisions when the new FHWA compliance manual is published.

Chapter C of the BSIPM is for NTIS tunnels, including a section to describe the process for compliance and quality reviews.

In 2023 and 2024, in-depth reviews were performed for the agencies and organizations listed in Table 6.

Table 6: 2023-2024 Locations of In-Depth Reviews

State Agencies	Counties	Cities	Other Bridge Owners
MnDOT District 1	Beltrami County	City of Duluth	
MnDOT District 2	Benton County	City of Fergus Falls	
MnDOT District 3	Clay County		
MnDOT District 4	Douglas County		
	Hubbard County		
	Itasca County		
	Lake County		
	Lake of the Woods County		
	Marshall County		
	Morrison County		
	Polk County		
	Sherburne County		
	St. Louis County		
	Swift County		

Actions Responding to Findings from Bridge Inspection Quality Assurance Reviews

Quality Assurance Review Findings and Follow-up

MnDOT's Bridge Office follows up on quality assurance 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 the 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 correct deficiencies. Agencies that do not adequately improve 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 Refresher Training

Since each agency receives an in-depth review roughly 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 refresher training classes for that purpose. Agendas for the classes are designed to address the common deficiencies found during agency reviews.

National Bridge and Tunnel Inspection Program Review

The 2023-2024 program assesses metrics, or focus areas, derived from the Code of Federal Regulations specific to the NBIS and NTIS. 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.

If the state then operates under the agreement, the state will be considered in conditional compliance until the terms of the agreement expire. For the NBIS, Minnesota is currently in full compliance with the 23 metrics. For the NTIS, Minnesota is currently in full compliance with 13 of the 15 metrics and in conditional compliance for three metrics:

NTIS Metric 6 - Inspection Procedures (Quality Inspections)

This determination was made because Minnesota has not yet identified the specific function systems that need to be inspected in accordance with the TOMIE/NTIS or developed inspection procedures for those systems

NTIS Metric 7 – Inspection Procedures (Tunnel-Specific Inspection Procedures)

This determination was made because Minnesota has not yet developed tunnel-specific inspection procedures.

NTIS Metric 8 – Inspection Procedures (Functional Systems Testing)

This determination was made because Minnesota has not yet developed procedures for the testing of specific tunnel functional systems.

Response to FHWA Compliance Review Findings

The following is a summary of MnDOT responses corresponding to each of the compliance reviews listed in the previous section, which were created after the FHWA reviews. MnDOT has formulated written plans to address the deficiencies in its inspection program as highlighted by these metric assessments.

Annual National Bridge Inspection Standards Compliance Review

No follow-up action was needed by MnDOT for any of the 22 NBIS metrics. MnDOT developed agreements with the FHWA to address the issues with the three conditionally compliant NTIS metrics:

NTIS Metric 6: Quality Inspections – estimated completion date July 2025

- **Action Item 1**: MnDOT will identify which functional systems must be inspected in accordance with the Tunnel Operations, Maintenance, Inspection, and Evaluation Manual and the NTIS.
- **Action Item 2**: MnDOT will document inspection procedures for tunnel functional systems and train our inspectors to follow these procedures.

NTIS Metric 7: Tunnel-Specific Inspection Procedures – estimated completion date July 2025

- **Action Item 1**: Owners will develop detailed inspection procedures for each NTIS tunnel.

NTIS Metric 8: Functional Systems Testing – estimated completion date July 2025

- **Action Item 1**: Owners will identify which functional systems require testing and develop testing procedures for those specific tunnel functional systems for each NTIS tunnel.

Appendix A: List of Acronyms

- **AASHTO:** American Association of State Highway and Transportation Officials
- **BII:** Bridge Inventory Inspection database used for reporting and compliance assessments
- **BSIPM:** Bridge and Structure Inspection Program Manual
- **FHWA:** Federal Highway Administration
- **MnDOT:** Minnesota Department of Transportation
- **NBIS:** National Bridge Inspection Standards
- **NSTM:** Non-redundant steel tension member. Bridges with these types of components require additional inspection procedures; also called fracture critical.
- **NTIS:** National Tunnel Inspection Standards
- **PCA:** Plan of Corrective Action
- **QA:** Quality assurance
- **QC:** Quality control
- **SNBI:** Specifications for the National Bridge Inventory
- **SNTI:** Specifications for the National Tunnel Inventory
- **TOMIE:** Tunnel Operations, Maintenance, Inspection, and Evaluation Manual
- **UBIV:** Under Bridge Inspection Vehicle
- **UW:** Underwater. This is a type of special bridge inspection that requires dive equipment for bridges in deep water.