



STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

RICK SNYDER
GOVERNOR

KIRK T. STEUDLE
DIRECTOR

May 13, 2015

Mr. Jeffrey Bankowski, Director
Office of Internal Audit Services
Office of the State Budget
George W. Romney Building
111 South Capitol Avenue, Sixth Floor
Lansing, Michigan 48913

Dear Mr. Bankowski:

In accordance with the State of Michigan's Financial Management Guide, Part VII, Chapter 4, Section 100, enclosed is a summary table identifying our responses and a corrective action plan. These address the recommendations contained within the Office of Auditor General's audit report for the performance audit of the Bridge Inspection Program, Michigan Department of Transportation, covering the period of October 1, 2011 through August 31, 2014 (Project 591-0169-14). The Office of Internal Audit Services, Office of the State Budget, approved distribution of the plan.

Questions regarding the summary table or corrective action plan should be directed to either Corey Rogers, P.E., Engineer of Bridge Field Services, Operations Field Services Division, at 517-322-3320, or Jack Cotter, CPA, CGMA, Commission Auditor, at 517-373-1500.

Sincerely,

Signature Redacted

Kirk T. Steudle
Director

Enclosures

cc: Executive Office
Office of the Auditor General
Senate Fiscal Agency
Senate Transportation Appropriations Subcommittee
Senate Transportation Standing Committee
House Fiscal Agency
House Transportation Appropriations Subcommittee
House Transportation Standing Committee
State Transportation Commission Chair
Operations Field Services Division
Office of Commission Audits

Bridge Inspection Program
Michigan Department of Transportation
Summary Table of Agency Responses to Recommendations
October 1, 2011 through August 31, 2014

A. Audit recommendations the agency has complied with:

Findings 3, 4, and 5.

B. Audit recommendations the agency agrees with and will comply:

Findings 1 and 2.

C. Audit recommendations the agency partially agrees with:

None.

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A. Audit recommendations the agency has complied with:

FINDING

3. Inspection Frequencies for Structurally Deficient Bridges

RECOMMENDATION

We recommend that MDOT institute a sufficient process to ensure that inspectors consistently increase the bridge inspection frequencies for structurally deficient bridges or document an acceptable rationale for not doing so.

AGENCY RESPONSE

MDOT concurs with the recommendation.

In addition to consideration of consistency, MDOT will also continue to consider engineering judgment relative to bridge inspections. The engineering judgment is based on engineers' technical knowledge of structural analysis and behavior, as well as knowledge of materials used for civil-engineering structures. The function of MDOT Bridge Inspection Program management is to develop policy and procedures that provide guidance and promote statewide consistency in inspections. However, an individual qualified inspector's engineering judgment will always have a role in the inspection process.

The National Bridge Inspection Standards (NBIS) require states to develop criteria for inspecting bridges at less than the maximum intervals. Since the previous audit of the Bridge Inspection Program, MDOT updated the "*Guidelines for Bridge Inspection Frequencies*" in Bridge Advisory BA-2013-01. MDOT subsequently released an updated version of the guidelines on November 25, 2014, which includes additional recommendations regarding in-depth inspections. Maximum spans of time between inspections (frequencies) are established by NBIS. Bridge inspection frequencies that are less than the maximum are recommended based on the condition of the structure and the inspector's confidence that the structure will remain in its current condition until the next inspection cycle. The purpose of the updated frequency guidelines is to provide additional clarification for inspecting structures at less than the maximum intervals. Evaluation of the conditions encountered during the inspection for each bridge requires engineering judgment to verify the propriety of the frequencies of future inspections. The updated frequency guidelines are to be used as reference for bridge inspectors to maintain consistency statewide. MDOT recommends to bridge owners and inspectors the review and use of the *Guidelines for Bridge Inspection Frequencies* during MDOT's statewide Quality Assurance/Quality Control (QA/QC) process and encourages implementation of increased level of inspections for structures meeting the listed criteria.

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In April 2015, as part of the April 7, 2015, release of the MiBRIDGE web-based application, MDOT added a Frequency Justification data field on the inspection reports for the inspector to provide justification when the frequency recommended by the inspector exceeds the frequency guideline criteria for structures that are considered structurally deficient.

FINDING

4. Inspection Timeliness

RECOMMENDATION

We recommend that MDOT continue to implement additional measures to ensure that local bridge owners and MDOT regional offices complete routine inspections, inspection of the underwater structural elements of bridges, and fracture critical member inspections in accordance with time frames established in State statute and NBIS.

We also recommend that MDOT sufficiently document its follow-up actions related to late or potentially late bridge inspections.

AGENCY RESPONSE

MDOT concurs with the recommendations.

MDOT will continue implementation of measures that it set in place to ensure that local agency bridge owners are completing inspections within the timeliness required by the NBIS. MDOT will also continue to sufficiently document follow-up actions related to late or potentially late bridge inspections.

MDOT has already taken the following actions regarding inspection timeliness:

- As documented in Chapter 3 of the Michigan Structure Inspection Manual (MiSIM), a 30-day inspection report entry procedure was implemented. The procedure requires inspectors to enter inspection results in the MiBRIDGE application within 30 days of completing the field portion of the inspection. This improves upon current Federal Highway Administration (FHWA) requirements of 90 days for state-owned structures or 180 days for local agency owned structures.
- As documented in Chapter 3 of MiSIM, “Notifications of Unassigned Inspections,” MDOT has implemented a procedure to issue monthly notifications to bridge owners and qualified consultants for agencies with unassigned inspections one month prior to the date inspection reports are due.
- In September 2014, MDOT developed and implemented an internal process to improve the coordination of actions taken by various areas within MDOT regarding noncompliance by local agency bridge owners. As of October 1, 2014, MDOT has

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implemented a process to monitor inspection timeliness monthly. The process requires advertising of unassigned inspections, contacting each agency with inspections greater than one month past due, and publicly advertising a list of the agencies that have not complied with NBIS. The process prompts preparation and submittal by MDOT to the local agency owner of formal notification that federal and state transportation funds will be withheld from the nonresponsive agency.

- MDOT Bridge Field Services staff has, on a quarterly basis, provided bridge inspection program timeliness summaries to senior management, including the Chief Operations Officer, region engineers, and Highway Operations bureau directors for review and comment. MDOT has updated this timeliness report to be more aligned with FHWA timeliness criteria and began distribution of this new timeliness report in January of 2015. The updated report provides specific details of the agencies not meeting the FHWA compliance criteria.

FINDING

5. False Decking

RECOMMENDATION

We recommend that MDOT provide consistent guidance to inspectors regarding the inspection of bridges with plywood false decking.

We also again recommend that MDOT ensure that all bridges with false decking are correctly identified in BMS [Bridge Management System].

We further recommend that MDOT adequately inspect the underside of bridges with plywood false decking.

AGENCY RESPONSE

MDOT concurs with the recommendations.

For bridge decks that are completely false decked with timber, a portion must be removed for inspection purposes, and there is consideration for replacing the timber false decking with metal mesh panels. The use of metal mesh panels facilitates the inspection of the underside of the bridge deck. It is rare that the underside of a bridge deck is completely false decked. Generally, false decking is used over traveled roadway (driving lanes and shoulders) to protect the public. Often, significant portions of the underside of the deck are still visible for inspection (such as the spans over slope paving between the abutments and adjacent piers). In most cases, the remaining portion of the deck soffit and superstructure is exposed for the inspector to ascertain the overall condition of the components. In some cases, there are structures that are completely false decked under the deck soffit, and, in these cases, the current policy requires a representative amount of false

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decking to be removed to verify the condition of the components. Therefore, in regard to the third recommendation of this finding, MDOT is able to effectively inspect and rate bridges with false decking without requiring all of the false decking be removed.

MDOT has already taken the following actions regarding false decking:

- In regard to the first recommendation, MDOT has provided additional guidance to the inspectors for the inspection of structures containing false decking. This guidance is incorporated in the Routine Inspection Procedures section of the MiSIM, and was also released as part of the Bridge Advisory “*Guidelines for Bridge Inspection Frequencies*,” BA-2013-01, in April 2013.
- In regard to the second recommendation, MDOT has already implemented the new American Association of State Highway Transportation Officials (AASHTO) element inspection procedures, which will document and track quantities of false decking on the State Trunkline System. MDOT created two new agency developed elements to track the condition, type, and amount of false decking material that is placed below the bridge deck.
- In regard to the third recommendation, MDOT has already updated the inspection reports to provide a data field for the inspector to document when an inspection resulted in the removal of false decking. The April 7, 2015, release of the MiBRIDGE web-based application added a data field to the inspection report that requires the inspector to note if timber false decking is present, and if it is present, whether the timber false decking was removed to facilitate the inspection.

B. Audit recommendations the agency agrees with and will comply:

FINDING

1. Risk-Based Bridge Inspection Frequencies

RECOMMENDATION

We recommend that MDOT consider seeking amendatory legislation to establish risk-based bridge inspection frequencies.

We also recommend that MDOT consider seeking FHWA approval to lengthen the inspection intervals for state-owned and locally-owned bridges or categories of bridges that warrant longer intervals, as determined through analysis of available inspection and other data.

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AGENCY RESPONSE

MDOT concurs with the recommendations.

MDOT will consider seeking amendatory legislation to establish risk-based bridge inspection frequencies and will also consider seeking FHWA approval to lengthen the inspection intervals for state-owned and locally-owned bridges or categories of bridges that warrant longer intervals.

It should be noted that the biennial inspection of bridges provides to the department, and the public, reassurance that bridges are safe, and provides condition-state data that is used by a variety of department programs to calculate deterioration rates and to determine rehabilitation strategies given the overall network condition. The data used for scoping and programming of projects starts with inspection data that is collected at regular intervals. To consider extending frequencies, MDOT would need to work with FHWA to develop specific guidelines for structure types and a range-of-condition states that would allow for extended frequencies.

In addition, per congressional direction of MAP-21 (the Moving Ahead for Progress in the 21st Century Act, signed into law in July 2012), FHWA began the process of implementing a risk-based process for bridge inspection frequencies. A National Cooperative Highway Research Project (NCHRP) Report 782, *NCHRP Projects 12-82 and NCHRP 12-82(01), Proposed Guideline for Reliability-Based Bridge Inspection Practices*, was completed in March 2014. MDOT has begun internal discussions of a risk-based approach and has identified possible extended frequency bridges that meet FHWA criteria. However, current state law requires a biennial inspection and MDOT will continue its efforts to comply with the law until further legislation has been approved.

To date, MDOT has developed preliminary criteria for bridges that could qualify for risk-based inspection frequencies. Also, although MDOT will continue to comply with current state law, which requires biennial inspection, MDOT has already worked with legislative offices regarding language to amend current law to allow for risk-based inspection frequencies.

Because the current state law applies to only MDOT-owned structures, MDOT will plan to work with local agencies to implement extended bridge inspection frequencies meeting the approved requirements for local agency owned structures. In addition, MDOT will continue to work with FHWA to develop statewide requirements and procedures for extending bridge inspection frequencies for local agency owned structures.

MDOT expects to be in compliance by June 30, 2015.

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FINDING

2. Plans of Action (POAs) for Scour Critical Bridges

RECOMMENDATION

We recommend that MDOT continue to implement measures to ensure that the POAs developed for scour critical bridges contain all recommended information.

AGENCY RESPONSE

MDOT concurs with the recommendation.

MDOT agrees that refinement of the POAs is needed to ensure the most efficient use of MDOT and local-agency resources. Prior to the Office of the Auditor General audit, MDOT has already begun to modify its pre-2011 POAs in consideration of the current (2012) Hydrologic Engineering Center (HEC) manual. MDOT has been in the process of updating and modifying scour POAs to take into account revisions to federal standards and applicable changes to each bridge site, such as the installation of scour countermeasures and/or the replacement of the bridge. The function of the MDOT Scour Committee, which reports to the Statewide Bridge Committee, is to develop and implement policy related to the effective management of scour critical bridges.

MDOT has already taken the following actions regarding scour critical bridges:

- MDOT has completed scour evaluations and developed initial POAs for all state-owned scour critical bridges, and has also assisted local agencies in doing the same for locally-owned bridges.
- MDOT and local agencies have continued to monitor scour critical bridges and, in many cases, have closed structures based on flood events. These bridges were closed as a precautionary measure to protect the public. The bridge closures have been a direct result of efforts by MDOT and local agencies to evaluate and monitor the scour criticality of higher-risk structures.
- MDOT issued the MiSIM, which includes a section on scour critical bridge inspections that provides clarification of scour and scour inspections.

MDOT will also be taking the following actions regarding scour critical bridges:

- The MDOT Scour Committee is in the process of updating a guidance document for scour, which includes coding and rating requirements for scour criticality and a description of how ratings are impacted by the implementation of scour countermeasures. The guidance document is expected to be completed by June 30, 2015.

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- The MDOT Scour Committee is currently working on revising POAs forms to include all FHWA-recommended information. By December 31, 2015, the revised POAs forms will be incorporated into MDOT's MiBRIDGE web-based application.
- MDOT will continue to enhance the scour POAs to include additional items to meet the minimum requirements as defined by FHWA. By December 31, 2015, additional guidance will be developed and sent to the local agency bridge owners to clarify the minimum requirements as the requirements are added to the scour POAs.

C. Audit recommendations the agency partially agrees with:

None.