PERFORMANCE AUDIT
OF THE

BRIDGE PROGRAMS

MICHIGAN DEPARTMENT OF TRANSPORTATION

June 2003

59-165-02

Michigan

Office of the Auditor General

REPORT SUMMARY

Performance Audit

Bridge Programs

Michigan Department of Transportation

Report Number:
59-165-02

Released:
June 2003

The Michigan Department of Transportation's (MDOT's) oversight of the State and federal bridge rehabilitation and replacement programs is carried out by the Construction and Technology Division which administers the State trunkline bridge rehabilitation program, State bridge inspection program, and annual reporting of all bridges in the State to the Federal Highway Administration (FHWA) and the Design Division which administers the local agency critical bridge program.

Audit Objective:
To assess the effectiveness of MDOT's State bridge inspection program.

Audit Conclusion:
We concluded that MDOT's State bridge inspection program was generally effective. MDOT has established and staffed a State bridge inspection program that meets FHWA requirements. Bridge inspection training is provided to staff on a periodic basis in order to maintain a sufficient number of trained staff to conduct bridge inspections. However, we noted reportable conditions involving bridge inspections and bridge inventory.

Reportable Conditions:
MDOT did not obtain inspection reports of all local agency bridges. Also, MDOT did not conduct bridge inspections of all State-owned bridges biennially as required by the FHWA and State statute. (Finding 1)

MDOT needs to identify and correct variances in reporting from its bridge management database (Finding 2).

Agency Response:
MDOT's preliminary response indicated that it concurred with the corresponding recommendations and that it was implementing corrective action.

~ ~ ~ ~ ~ ~ ~ ~ ~ ~

Audit Objective:
To assess the effectiveness of MDOT's process for selecting and monitoring bridge projects.

Audit Conclusion:
We concluded that MDOT's process for selecting and monitoring bridge projects was generally effective. However, we noted reportable conditions involving the four-year contract award requirement and the critical bridge selection formula.

Reportable Conditions:
MDOT did not enforce its critical bridge procedure requiring local agencies to complete the work necessary to allow MDOT to award construction contracts on critical bridge projects within four years of receiving funding approval (Finding 3).

MDOT, in cooperation with the critical bridge advisory committee, needs to update the critical bridge selection formula to reflect current conditions to ensure that the bridges most in need of repair receive funding (Finding 4).

Agency Response:
MDOT's preliminary response indicated that it concurred with the corresponding recommendations and that it was implementing corrective action.

~ ~ ~ ~ ~ ~ ~ ~ ~ ~

Audit Objective:
To assess the effectiveness of MDOT's efforts to evaluate the quality of its bridge programs.

Audit Conclusion:
We concluded that MDOT's efforts to evaluate the quality of its bridge programs were effective. MDOT periodically trains staff who perform bridge inspections to ensure that staff consistently inspect and rate the condition of bridges. Also, MDOT is completing a quality assurance/quality control manual for the State bridge inspection program that will help meet this goal. Our report does not contain any reportable conditions related to this audit objective.

~ ~ ~ ~ ~ ~ ~ ~ ~ ~

A copy of the full report can be obtained by calling 517.334.8050 or by visiting our Web site at: www.state.mi.us/audgen/

Michigan Office of the Auditor General
201 N. Washington Square
Lansing, Michigan 48913

Thomas H. McTavish, C.P.A.
Auditor General

James S. Neubecker, C.P.A., C.I.A., D.P.A.
Executive Deputy Auditor General

Scott M. Strong, C.P.A., C.I.A.
Director of Audit Operations

STATE OF MICHIGAN
OFFICE OF THE AUDITOR GENERAL
201 N. WASHINGTON SQUARE
LANSING, MICHIGAN 48913
(517) 334-8050
FAX (517) 334-8079

THOMAS H. MCTAVISH, C.P.A.
AUDITOR GENERAL

June 16, 2003

Mr. Ted B. Wahby, Chairperson
State Transportation Commission
and
Ms. Gloria J. Jeff, Director
Michigan Department of Transportation
Transportation Building
Lansing, Michigan

Dear Mr. Wahby and Ms. Jeff:

This is our report on the performance audit of the Bridge Programs, Michigan Department of Transportation.

This report contains our description of agency; audit objectives, scope, and methodology and agency responses; comments, findings, recommendations, and agency preliminary responses; three exhibits, presented as supplemental information; and a glossary of acronyms and terms.

Our comments, findings, and recommendations are organized by audit objective. The agency preliminary responses were taken from the agency's responses subsequent to our audit fieldwork. The *Michigan Compiled Laws* and administrative procedures require that the audited agency develop a formal response within 60 days after release of the audit report.

We appreciate the courtesy and cooperation extended to us during this audit.

Sincerely,

Thomas H. McTavish, C.P.A.
Auditor General

This page left intentionally blank.

TABLE OF CONTENTS

BRIDGE PROGRAMS
MICHIGAN DEPARTMENT OF TRANSPORTATION

	Page
INTRODUCTION	
Report Summary	1
Report Letter	3
Description of Agency	7
Audit Objectives, Scope, and Methodology and Agency Responses	8
COMMENTS, FINDINGS, RECOMMENDATIONS, AND AGENCY PRELIMINARY RESPONSES	
State Bridge Inspection Program	10
1. Bridge Inspections	10
2. Bridge Inventory	13
Bridge Project Selection and Monitoring	15
3. Four-Year Contract Award Requirement	15
4. Critical Bridge Selection Formula	17
Bridge Program Quality Evaluation	19
SUPPLEMENTAL INFORMATION	
Exhibit A - Condition Ratings and Number of County Bridges With Past Due Inspections	21
Exhibit B - Condition Ratings and Number of Municipality Bridges With Past Due Inspections	22
Exhibit C - Illustrations of Structural Elements Causing a Bridge to Be Rated "Poor"	23

GLOSSARY

Glossary of Acronyms and Terms 26

Description of Agency

The Michigan Department of Transportation (MDOT) was organized under Sections 16.450 - 16.458 of the *Michigan Compiled Laws* (sections of the Executive Organization Act of 1965). MDOT is governed by the State Transportation Commission, which is made up of six members who are appointed by the Governor with the advice and consent of the Senate. The Commission is responsible for establishing policies. MDOT is managed by a director, appointed by the Governor, who is responsible for administering MDOT and implementing the policies established by the Commission. MDOT's mission* is to provide the highest-quality transportation for economic benefit and improved quality of life.

MDOT's funding is provided from vehicle gas, weight, and value taxes plus sales taxes on vehicles, parts, and accessories. This funding is distributed to transportation programs in accordance with Sections 247.651 - 247.675 of the *Michigan Compiled Laws* (Act 51, P.A. 1951, as amended). Funding is also provided by the U.S. Department of Transportation from federal fuel and excise taxes on certain commodities.

MDOT oversees the State and federal bridge rehabilitation and replacement programs for bridges on State trunklines and local governmental agency (local agency*) roads. This oversight is delegated to the Construction and Technology Division and the Design Division.

The Construction and Technology Division administers the State trunkline bridge rehabilitation and replacement program, which includes the State bridge inspection program and the annual reporting of all bridges in the State to the Federal Highway Administration. During fiscal year 2000-01, MDOT expended approximately $185 million on State trunkline bridge rehabilitation and replacement.

The Design Division administers the local agency critical bridge program. This program prioritizes local agency funding applications for bridge rehabilitation or replacement and then, based on available funds, provides funding to the local agencies for such work. During fiscal year 2000-01, local agencies received approximately $26.1 million for local agency bridge rehabilitation and replacement.

** See glossary at end of report for definition.*

Audit Objectives, Scope, and Methodology and Agency Responses

Audit Objectives

Our performance audit* of the Bridge Programs, Michigan Department of Transportation, had the following objectives:

1. To assess the effectiveness* of MDOT's State bridge inspection program.

2. To assess the effectiveness of MDOT's process for selecting and monitoring bridge projects.

3. To assess the effectiveness of MDOT's efforts to evaluate the quality of its bridge programs.

Audit Scope

Our audit scope was to examine the program and other records of the Michigan Department of Transportation's bridge programs. Our audit was conducted in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States and, accordingly, included such tests of the records and such other auditing procedures as we considered necessary in the circumstances.

Audit Methodology

Our audit procedures, conducted from November 2001 through March 2002, covered the period October 1, 1999 through March 31, 2002. Our audit methodology included conducting a preliminary survey of MDOT's bridge programs to develop an understanding of the State and local agency bridge programs. We met with staff from the Construction and Technology Division and the Design Division as both divisions are involved in MDOT's bridge programs. We reviewed copies of federal and State regulations involving the State and local agency bridge programs. We also reviewed State statutes and appropriations acts related to these programs.

We obtained records from the Construction and Technology Division related to the State's bridge inventory and conducted tests to verify its accuracy. Also, we reviewed records to determine if persons conducting bridge inspections met Federal Highway

** See glossary at end of report for definition.*

Administration inspector qualifications. We tested bridge inspection records to determine if bridges that the State was responsible for inspecting were inspected as required. Our review of State trunkline bridge rehabilitation and replacement included determining if the condition rating assigned to State bridges requiring rehabilitation correlated to the order in which the bridges were scheduled for repair. We also reviewed the programs in place to evaluate, identify, and improve the State and local agency critical bridge programs.

We obtained records of the local agency critical bridge program from the Design Division. These included Critical Bridge Advisory Committee* meeting minutes, local agencies' application information, and listings of project awards. We met with program staff to understand the responsibilities of the various operational aspects of the program. We reviewed program activities that Design Division staff oversee as well as those activities that field staff are responsible for overseeing.

Agency Responses

Our audit report contains 4 findings and 5 recommendations. MDOT's preliminary response indicated that it concurred with all of the recommendations and that it was implementing corrective action.

The agency preliminary response that follows each recommendation in our report was taken from the agency's written comments and oral discussion subsequent to our audit fieldwork. Section 18.1462 of the *Michigan Compiled Laws* and Department of Management and Budget Administrative Guide procedure 1280.02 require MDOT to develop a formal response to our audit findings and recommendations within 60 days after release of the audit report.

** See glossary at end of report for definition.*

COMMENTS, FINDINGS, RECOMMENDATIONS, AND AGENCY PRELIMINARY RESPONSES

STATE BRIDGE INSPECTION PROGRAM

COMMENT

Background: The Federal Highway Administration (FHWA) defines a bridge as being any structure over a depression or obstruction, such as water, highway, or railroad, for carrying traffic or other movable loads that is over 20 feet between end supports. The FHWA has established bridge inspection and reporting requirements for all bridges on public roads. The Michigan Department of Transportation (MDOT) is responsible for inspecting all State-owned bridges. Local governmental agencies (local agencies) are responsible for inspecting all locally owned bridges and reporting the results of the inspections to MDOT. MDOT is required to annually report the status of all bridges in the State to the FHWA.

Audit Objective: To assess the effectiveness of MDOT's State bridge inspection program.

Conclusion: We concluded that MDOT's State bridge inspection program was generally effective. MDOT has established and staffed a State bridge inspection program that meets FHWA requirements. Bridge inspection training is provided to staff on a periodic basis in order to maintain a sufficient number of trained staff to conduct bridge inspections. However, we noted reportable conditions* involving bridge inspections and bridge inventory.

FINDING

1. **Bridge Inspections**

   MDOT did not obtain inspection reports of all local agency bridges to allow it to report the condition of all bridges in the State as required by federal regulations. As a result, MDOT could not be certain that local agency bridges were inspected

** See glossary at end of report for definition.*

as required and it could not accurately report the condition of all bridges in the State to the FHWA. Also, MDOT did not conduct bridge inspections of all State-owned bridges biennially as required by the FHWA and State statute.

Section 254.19a of the *Michigan Compiled Laws* required MDOT to implement a systematic biennial inspection of all bridges under its jurisdiction. In addition, Title 23, Part 650C, sections 650.305 and 650.311 of the *Code of Federal Regulations* require that all bridges serving public roads be inspected at a minimum of every two years and that MDOT collect and report bridge inspection data on all bridges in the State. In response to these requirements, MDOT established a State bridge inspection program for all State-owned bridges and a biennial inspection-reporting requirement for local agency bridges.

We obtained an MDOT bridge inspection status report and determined that, for the year ended December 31, 2001, MDOT and local agencies reported inspecting 2,723 and 1,959 bridges, respectively. However, we noted that, as of December 31, 2001, 952 bridges were reported as not having been inspected within the preceding two years. Of these, 934 (98%) were the responsibility of the local agencies to inspect and the remaining 18 (2%) were the responsibility of the State to inspect. Further review of the report disclosed:

a. Of the 934 bridges that the local agencies were responsible for inspecting, 748 (80%) served local agency roads with the remaining 186 (20%) being non-highway (pedestrian, railroad, and non-vehicular) bridges that crossed local agency roads. The last inspections reported to MDOT for the 748 bridges showed that inspections were last made from 25 to 67 months earlier, making them from 1 to 43 months overdue. In addition, during the last inspections of 112 (15%) of the 748 bridges, at least 1 of 3 main structural elements (i.e., the deck, superstructure, and substructure) was in poor condition resulting in a structurally deficient bridge (see Exhibits A and B). Illustrations of structural elements causing a bridge to be rated "poor" are included in Exhibit C.

b. Of the 18 bridges that the State was responsible for inspecting, 11 (61%) were on highways, with the remaining 7 (39%) being non-highway (pedestrian, railroad, and pipeline) bridges that crossed highways. Inspections of these 18 bridges were last made from 25 to 53 months earlier, making them from 1 to

29 months overdue. Subsequent to our audit, MDOT conducted inspections of these 18 bridges and determined that none of them were in poor condition.

The FHWA requirement that MDOT annually report the condition of all bridges in the State does not give MDOT the authority to require local agencies to submit bridge inspection reports. However, MDOT has the authority to withhold federal funds from a local agency for its failure to comply with the FHWA inspection and reporting requirement.

MDOT's inability to ensure that all local agency bridges are inspected as required could allow a deficiency to progress to an unsafe condition. Also, while MDOT's subsequent inspection of the 18 bridges with overdue inspections disclosed that the State bridges were not in poor condition, the overdue inspections could allow deficiencies to result in more costly repairs. In addition, MDOT's failure to comply with FHWA inspection and reporting requirements could result in the FHWA's withholding of federal funds and/or the approval of further projects in the State.

RECOMMENDATIONS

We recommend that MDOT obtain inspection reports of all local agency bridges to allow it to report the condition of all bridges in the State as required by federal regulations.

We also recommend that MDOT conduct bridge inspections of all State-owned bridges biennially as required by the FHWA and State statute.

AGENCY PRELIMINARY RESPONSE

MDOT indicated that it concurred with the recommendations. MDOT informed us that it is in the process of establishing a Web site where MDOT and the local agencies will be able to conveniently enter and retrieve bridge inspection data. The Web site is scheduled for release in summer 2003.

MDOT also informed us that it will increase efforts to meet with those agencies that are perennially late, counsel with them on the importance of the program, and seek cooperation and compliance. In November 2002, Local Agency Programs of the Design Support Area of MDOT sent noncompliance letters to 36 counties and 60 cities and villages that were in noncompliance with their bridge inspections. MDOT is now sending noncompliance letters to local agencies on a bimonthly basis. As of

February 18, 2003, 16 counties and 34 cities and villages remain in noncompliance for bridge inspection reports. These agencies are not eligible for federal aid until the bridge inspections are performed and submitted to MDOT or remedial action has been scheduled to the satisfaction of MDOT.

MDOT further informed us that new quality assurance and quality control processes have been implemented to help prevent missed or overlooked bridge inspections on State-owned bridges. This includes software applications indicating when inspections are due and notification to bridge inspectors emphasizing the timeliness of their bridge inspections.

FINDING

2. Bridge Inventory

MDOT needs to identify and correct variances in reporting from its bridge management database.

MDOT maintains a bridge management database to monitor the inventory, condition, and inspection status of all bridges in the State. MDOT uses this database to generate required annual reports to the FHWA. The condition and number of bridges that MDOT reports to the FHWA is used to determine the federal bridge rehabilitation funds that the State will receive for repair and replacement of both State-owned and local agency bridges. In addition, this database is used to produce MDOT's five-year road and bridge report and to report on the State's infrastructure conditions that the Governmental Accounting Standards Board now requires in the *State of Michigan Comprehensive Annual Financial Report* (*SOMCAFR*).

We compared bridge inventory counts that MDOT reported in its five-year road and bridge report with that reported to the FHWA and in the *SOMCAFR* and noted that none of these reports agreed. These bridge inventory counts were generated from

MDOT's bridge management database for approximately the same time, but differed significantly, as noted in the following table:

Report	Bridge Inventory Count
2001 FHWA Annual Bridge Report	4,275
MDOT 2001 Five-Year Road and Bridge Report	4,655
Fiscal Year 2000-01 *SOMCAFR*	5,679

While a portion of the variances could be explained, MDOT had not documented the reason for these variances but stated that staff not using the FHWA definition of a bridge when querying the database likely caused the reporting variances.

Inconsistent bridge inventory reporting reduces the effectiveness of the reports generated from the database, may affect the amount of federal funds received for bridge repair and replacement, and may misstate the valuation of the infrastructure reported in the *SOMCAFR*.

RECOMMENDATION

We recommend that MDOT identify and correct variances in reporting from its bridge management database.

AGENCY PRELIMINARY RESPONSE

MDOT indicated that it concurred with the recommendation. MDOT will ensure that reports on the bridge inventory are generated using consistent criteria. MDOT informed us that it is now using consistent definitions for generating reports on the bridge inventory, documenting requests for bridge information, and keeping on file the Sort Query Language (SQL) script used to generate the data. MDOT also informed us that it is in the process of establishing standard reports issued at defined intervals to avoid inconsistent reporting. The full spectrum of reporting requirements will be in place by April 1, 2004.

BRIDGE PROJECT SELECTION AND MONITORING

COMMENT

Background: MDOT is responsible for construction, reconstruction, and maintenance of all bridges on State trunklines. Local agencies have the same responsibilities for bridges on the local road network. In 1973, the Legislature established the State Critical Bridge Program within MDOT. The purpose of this Program was to provide funding to repair or replace bridges on both the State and local road network. Funding for the Program was originally set at $1.0 million and was raised to $5.0 million in 1978, where it remained at the time of our audit. In addition to these funds, MDOT provides local agencies with Federal Highway Bridge Replacement and Rehabilitation Program funds to repair or replace bridges on the local road network. During fiscal year 2000-01, local agencies received approximately $5.7 million from the State Critical Bridge Program and $20.4 million from the Federal Bridge Replacement and Rehabilitation Program.

Local agencies annually submit applications to MDOT requesting to have bridges considered for funding by either program. The Critical Bridge Advisory Committee prioritizes critical bridge projects for placement on a waiting list. Each year, MDOT notifies local agencies of which bridges on the waiting list will be moved to an active, funded, project list. After a project is placed on the funded list, the local agency must complete certain requirements to allow a construction contract to be awarded. Because this process can take a few years to complete, MDOT places more projects on this list than can be funded from any one-year's appropriation, so that a sufficient number of projects become ready for contract award to utilize each year's available funds.

Audit Objective: To assess the effectiveness of MDOT's process for selecting and monitoring bridge projects.

Conclusion: We concluded that MDOT's process for selecting and monitoring bridge projects was generally effective. However, we noted reportable conditions involving the four-year contract award requirement and the critical bridge selection formula.

FINDING

3. Four-Year Contract Award Requirement

MDOT did not enforce its critical bridge procedure requiring local agencies to complete the work necessary to allow MDOT to award construction contracts on

critical bridge projects within four years of receiving funding approval. As a result, critical bridge projects with higher replacement priority may remain on the unfunded waiting list longer than necessary.

When MDOT notifies a local agency that one of its bridges on the critical bridge list has been selected for funding, the local agency must begin the necessary work to allow MDOT to award the construction contract for the project. This work includes securing design plans, right of way (if necessary), environmental and utility permits, and proof that the local agency can provide its share of the construction costs. In October 1995, MDOT, in cooperation with the Critical Bridge Advisory Committee, established a procedure that required local agencies to complete the work necessary to allow MDOT to award construction contracts for critical bridge projects within four years of MDOT's notification that the projects had been selected for funding. Projects approved for funding prior to October 1995 had to have their construction contracts awarded within four years from the date that the procedure was established. Exceptions could be granted for delays, such as securing environmental permits, historic bridge clearance, or funding.

Our review of approved critical bridge projects disclosed that MDOT did not enforce the four-year contract award requirement. We determined that since the four-year requirement was established, 18 (5%) of 358 projects did not have construction contracts awarded within four years and had not been granted exceptions to it. We also determined that 14 (78%) of the 18 projects still did not have construction contracts awarded as of the end of March 2002. These projects had been approved for funding from over 4 to over 10 years with the average being approximately 8.4 years.

MDOT's failure to enforce the four-year construction procedure results in the delay of other critical bridge projects placement on the active, funded project list.

RECOMMENDATION

We recommend that MDOT enforce its critical bridge procedure requiring local agencies to complete the work necessary to allow MDOT to award construction contracts on critical bridge projects within four years of receiving funding approval.

AGENCY PRELIMINARY RESPONSE

MDOT indicated that it concurred with the recommendation. MDOT informed us that, in November 2002, it wrote to each bridge owner who exceeded the four-year rule, requiring them to document the circumstances that caused them to delay their bridge projects. Most of the projects had environmental issues and the owners are actively working to resolve the issues with the resource agency. MDOT has granted extensions for each of the bridges which exceeded the four-year rule that had not been let to contract. The extensions are valid for one year and will be reviewed again in fall 2003.

FINDING

4. Critical Bridge Selection Formula

MDOT, in cooperation with the Critical Bridge Advisory Committee, needs to update the critical bridge selection formula to reflect current conditions to ensure that the bridges most in need of repair receive funding.

MDOT and the Critical Bridge Advisory Committee use a nine-element formula to select critical bridge projects to receive funding from the State Critical Bridge Program and the Federal Highway Bridge Replacement and Rehabilitation Program. These elements include the bridge's capacity rating, functional adequacy, safety, bridge and approach features, functional classification, the local agencies' financial capability, the local agencies' transportation needs, traffic volume, and detour considerations. A project can receive up to 98 points from this formula. Of these, 71 (72%) points are calculated from information in the bridge management database that MDOT maintains, with the remaining 27 (28%) points being scored by the nine members of the Critical Bridge Advisory Committee. The more points scored, the sooner a project may be funded.

Our review of the formula disclosed that MDOT and the Critical Bridge Advisory Committee:

a. Estimated a local agency's financial ability to pursue bridge repairs using 1979 costs of $55 per square foot of bridge deck surface rather than the current estimated costs of approximately $125 per square foot. Using current estimated square foot costs could have an impact on an agency's ability to

fund the project and, therefore, directly impact a project's funding possibilities. This element of the formula represents up to 15 (15%) of the 98 points.

b. Used 1979 data to estimate a local agency's overall transportation needs. This data includes population demographics, economic development, bridge conditions, etc. Changes in this data since 1979 could affect the number of points awarded to a local agency for this element. This element of the formula represents up to 15 (15%) of the 98 points.

c. Used 1979 average daily traffic (ADT) statistics for calculating the points that are assigned for a bridge's traffic volume. However, local agencies use current ADT statistics when submitting applications for critical bridge projects. Bridges located on roadways that exceed the ADT statistics receive the greatest possible points for this element. This element of the formula represents up to 15 (15%) of the 98 points.

d. Did not revise the formula to correct for a recognized scoring deficiency involving railing improvements. MDOT and the Critical Bridge Advisory Committee recognized that the safety element of the formula penalized local agencies that upgraded railings on deficient bridges by eliminating points from the total score for corrections that were made. On September 25, 1996, the Critical Bridge Advisory Committee accepted suggestions to correct this deficiency, but as of our audit, no changes had been made to this element of the formula. This element of the formula represents up to 8 (8%) of the 98 points.

Periodic review and update of data in the critical bridge selection formula would help ensure that those bridges most in need of repairs are given the highest consideration for funding.

RECOMMENDATION

We recommend that MDOT, in cooperation with the Critical Bridge Advisory Committee, update the critical bridge selection formula to reflect current conditions to ensure that the bridges most in need of repair receive funding.

AGENCY PRELIMINARY RESPONSE

MDOT indicated that it concurred with the recommendation. MDOT informed us that it is initiating an effort to re-engineer the process of how the State critical bridge funds are distributed. The new method will eliminate the outdated formulas and rating process. The effort began at the end of March 2003 and is to be completed by the end of June 2003. The revised process will be presented to the Critical Bridge Advisory Committee, which has final approval authority on how the State critical bridge funds are distributed.

MDOT also informed us that the changes in the scoring for the railing upgrades have not progressed since the approval of the subcommittee in September 1996. MDOT will review this issue as a part of the re-engineering effort.

BRIDGE PROGRAM QUALITY EVALUATION

Audit Objective: To assess the effectiveness of MDOT's efforts to evaluate the quality of its bridge programs.

Conclusion: We concluded that MDOT's efforts to evaluate the quality of its bridge programs were effective. MDOT periodically trains staff who perform bridge inspections to ensure that staff consistently inspect and rate the condition of bridges. Also, MDOT is completing a quality assurance/quality control manual for the State bridge inspection program that will help meet this goal. Our report does not contain any reportable conditions related to this audit objective.

SUPPLEMENTAL INFORMATION

BRIDGE PROGRAMS
Condition Ratings and Number of County Bridges With Past Due Inspections
As of December 31, 2001

County (a)	Number of Bridges Not Inspected Within 24 Months	Bridge Ratings During Last Inspection (b)		Number of Months Since Last Inspection	
		Good	Poor	Least	Greatest
Alger	29	18	11	26	28
Allegan	1	1			36
Alpena	17	15	2	40	40
Bay	2	1	1	45	45
Berrien	20	5	15	25	45
Branch	1	1			43
Calhoun	42	35	7	26	58
Clinton	54	35	19	27	34
Crawford	1	1			29
Eaton	1	1			31
Genesee	3	1	2	33	33
Gogebic	3	3		38	38
Huron	50	48	2	25	25
Jackson	28	25	3	29	32
Kent	170	162	8	25	37
Lake	1	(c)			27
Lapeer	6	5	1	28	67
Leelanau	1	1			49
Lenawee	2	2		34	34
Livingston	69	55	14	26	65
Macomb	10	6 (d)	2	27	31
Menominee	2	1	1	30	30
Midland	3		3	29	29
Monroe	1	1			45
Oakland	8	8		37	43
Oceana	14	14		33	34
Ogemaw	9	9		26	26
Ontonagon	23	18	5	26	26
Osceola	2	2		31	31
Otsego	1	1			34
Sanilac	3	3		38	38
Schoolcraft	17	17		25	25
Shiawassee	1		1		31
Tuscola	56	54	2	25	26
Washtenaw	1	1			27
Wayne	4	3 (c)		28	42
	656	553 (e)	99		

(a) Counties that are not listed had no past due bridge inspections.

(b) The Michigan Department of Transportation (MDOT) and local agencies utilize the National Bridge Inventory Rating to rate the condition of bridges under their jurisdictions. The Inventory rates the three major structural elements (i.e., the deck, superstructure, and substructure) of a bridge using a 10-point scale. An element rated 9 is considered to be in excellent condition, a rating of 4 means the element is in poor condition, and a rating of 0 means that the element has failed and is beyond corrective action. Bridges receiving a rating of 4 or less for any of the three structural elements are considered to be structurally deficient. For this exhibit, we reported any bridge with a rating of 4 or less for one or more elements as poor.

(c) No inspection information available on 1 bridge.

(d) No inspection information available on 2 bridges.

(e) Plus the 4 bridges referred to in Notes (c) and (d).

Source: MDOT's Bridge Management Database

BRIDGE PROGRAMS
Condition Ratings and Number of Municipality Bridges With Past Due Inspections
As of December 31, 2001

Municipality (a)	Number of Bridges Not Inspected Within 24 Months	Bridge Ratings During Last Inspection (b)		Number of Months Since Last Inspection	
		Good	Poor	Least	Greatest
Almont	1		1		45
Baldwin	1		1		28
Bellaire	2	2		31	31
Benton Harbor	2	2		38	38
Bessemer	1	1			37
Birch Run	1	1			36
Brooklyn	1	(c)			36
Caro	1	1			45
Cedar Springs	1	1			26
Centreville	1		1		44
Columbiaville	2	2		26	26
Croswell	2	1	1	31	31
Dearborn	2	2		27	41
Douglas	1	1			40
Dowagiac	1		1		31
Elk Rapids	1	1			27
Fairgrove	1	1			25
Farmington	2	2		35	35
Ferrysburg	2	2		33	33
Hart	1	1			66
Iron River	3	2	1	35	35
Ironwood	1	(c)			27
Ishpeming	1		1		27
Jackson	1	1			33
Kent City	10	9 (d)		28	32
Lake Orion	2	2		33	33
Lawrence	2	2		33	33
Marine City	1	1			43
Marion	1		1		31
Marquette	1	(e)			(e)
Millington	1	1			36
Morenci	2	2		30	30
Munising	1	1			32
New Buffalo	1	1			58
Novi	2	1 (d)		27	36
Petoskey	3	3		29	29
Pontiac	3	2	1	27	29
Rose City	1		1		31
Sparta	2	1	1	32	32
Stevensville	1	1			57
Traverse City	7	6	1	26	26
Ubly	2	1	1	42	43
Union City	2	2		34	34
Wakefield	4	4		37	37
Wayne	2	2		45	61
Ypsilanti	5	5		28	28
Detroit Metropolitan Wayne County Airport	3	3		58	60
	92	74 (f)	13		

(a) Municipalities that are not listed had no past due bridge inspections.

(b) The Michigan Department of Transportation (MDOT) and local agencies utilize the National Bridge Inventory Rating to rate the condition of bridges under their jurisdictions. The Inventory rates the three major structural elements (i.e., the deck, superstructure, and substructure) of a bridge using a 10-point scale. An element rated 9 is considered to be in excellent condition, a rating of 4 means the element is in poor condition, and a rating of 0 means that the element has failed and is beyond corrective action. Bridges receiving a rating of 4 or less for any of the three structural elements are considered to be structurally deficient. For this exhibit, we reported any bridge with a rating of 4 or less for one or more elements as poor.

(c) No inspection data regarding bridge condition.

(d) No inspection data for 1 bridge.

(e) No inspection data regarding bridge condition or inspection dates.

(f) Plus the 5 bridges referred to in Notes (c), (d), and (e).

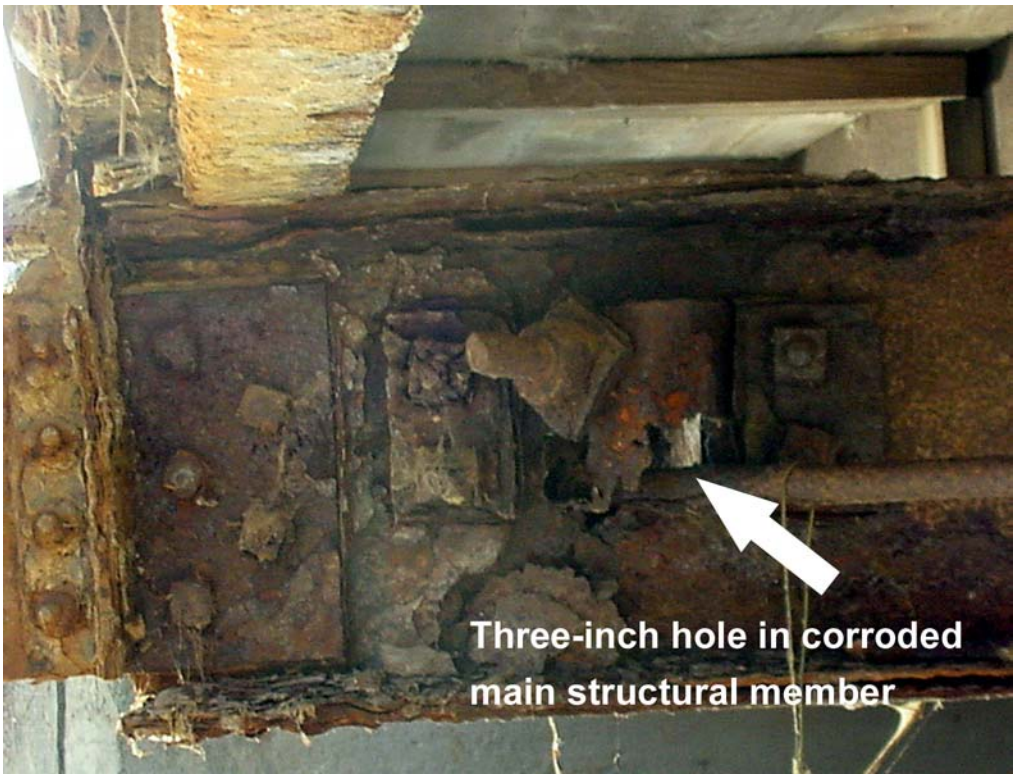
Source: MDOT's Bridge Management Database

Exhibit C

BRIDGE PROGRAMS
Illustrations of Structural Elements
Causing a Bridge to Be Rated "Poor"

These pictures are not intended to illustrate the condition of all bridges with poor ratings, but rather to illustrate examples of conditions that can exist on such bridges.

Truss member
completely
corroded
through


Three-inch hole in corroded
main structural member

Hole in bridge deck
concrete next to main
structural member

Corroded holes in I-beams
supporting bridge deck

Glossary of Acronyms and Terms

ADT	average daily traffic.
Critical Bridge Advisory Committee	A 9-member committee appointed by the director of MDOT. The membership is composed of 3 members representing MDOT, 3 members representing the counties, and 3 members representing cities and villages.
effectiveness	Program success in achieving mission and goals.
FHWA	Federal Highway Administration.
local agency	Local governmental agency. This may be a city, village, township, or county.
MDOT	Michigan Department of Transportation.
mission	The agency's main purpose or the reason that the agency was established.
performance audit	An economy and efficiency audit or a program audit that is designed to provide an independent assessment of the performance of a governmental entity, program, activity, or function to improve public accountability and to facilitate decision making by parties responsible for overseeing or initiating corrective action.
reportable condition	A matter that, in the auditor's judgment, represents either an opportunity for improvement or a significant deficiency in management's ability to operate a program in an effective and efficient manner.
SOMCAFR	*State of Michigan Comprehensive Annual Financial Report.*