

PERFORMANCE AUDIT
OF THE
MAINTENANCE DIVISION

BUREAU OF HIGHWAY TECHNICAL SERVICES
MICHIGAN DEPARTMENT OF TRANSPORTATION

July 2002

EXECUTIVE DIGEST

MAINTENANCE DIVISION

INTRODUCTION

This report, issued in July 2002, contains the results of our performance audit* of the Maintenance Division, Bureau of Highway Technical Services, Michigan Department of Transportation (MDOT).

AUDIT PURPOSE

This performance audit was conducted as part of the constitutional responsibility of the Office of the Auditor General. Performance audits are conducted on a priority basis related to the potential for improving effectiveness* and efficiency*.

BACKGROUND

MDOT was organized under Sections 16.450 - 16.458 of the *Michigan Compiled Laws* (sections of the Executive Organization Act of 1965). MDOT was established to provide the people of Michigan with a safe, efficient, and environmentally sound total transportation system in the most cost-effective manner.

The Maintenance Division is 1 of 5 divisions within the Bureau of Highway Technical Services. It provides specialized maintenance services and support to MDOT staff in Lansing and at the 7 regional offices and 26 transportation service centers. The Division's mission* is to provide technical expertise and assistance for Statewide maintenance and preservation activities in a responsive

* See glossary at end of report for definition.

and timely manner, which addresses the need to improve services provided to MDOT's customers. The Division is organized into four sections: Office Administration, Pavement and Roadside, Structural Maintenance, and Operational Services.

The Pavement and Roadside Section is responsible for coordinating maintenance of rest areas, roadside parks, and scenic turnouts. This Section coordinates the Statewide vegetation management program, summer youth program, Adopt-A-Highway Program, and chemical program, which provides assistance to contract maintenance counties and municipalities for construction of road salt storage facilities.

The Structural Maintenance Section is responsible for performing emergency repairs to bridges needed because of damage caused by overweight and over height vehicles. This Section is also responsible for routine maintenance and emergency repairs to the State's movable bridges, including structural, electrical, and mechanical systems.

The Operational Services Section repairs, fabricates, and installs large overhead signs throughout the State. This Section is also responsible for traffic signal installation and monitoring and inspecting installations done under contract for MDOT. In addition, this Section performs routine and preventive maintenance on MDOT-owned facilities throughout the State and administers the development of maintenance service contracts for central and regional offices.

The Division operating budget totaled approximately \$15.2 million for the fiscal year ended September 30, 2001. As of September 30, 2001, the Division had 116 full-time equated employees.

AUDIT OBJECTIVES
AND CONCLUSIONS

Audit Objective: To assess the effectiveness of MDOT's oversight of State trunkline maintenance services.

Conclusion: We concluded that MDOT's oversight of State trunkline maintenance services was generally effective. However, we noted a reportable condition* related to maintenance oversight procedures (Finding 1).

Audit Objective: To assess the effectiveness and efficiency of MDOT's specialized maintenance services.

Conclusion: We concluded that MDOT's specialized maintenance services were generally effective and efficient. However, we noted reportable conditions related to pump house unit operation, activity reporting, and unrecovered damage costs to highway property (Findings 2 through 4).

AUDIT SCOPE AND
METHODOLOGY

Our audit scope was to examine the program and other records of the Maintenance Division. 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.

Our audit procedures included examination of the Division's records and activities primarily for the period October 1, 1998 through October 31, 2001. We conducted a preliminary survey of the Division to develop an understanding of its responsibilities and the methods that it used to monitor the accomplishment of these responsibilities. We reviewed prior audit reports and working papers of audits conducted by MDOT's Office of

* See glossary at end of report for definition.

Commission Audits. We also reviewed other states' audit reports on functions similar to those performed by the Division.

We reviewed the Division's maintenance manuals that have been developed to guide field maintenance activities. We met with MDOT staff at selected regional offices and transportation service centers to review and evaluate the methods used to monitor trunkline maintenance.

We obtained reports on work activities of the Division's specialized work units. We used this information to evaluate the effectiveness and efficiency of these units.

**AGENCY RESPONSES
AND PRIOR AUDIT
FOLLOW-UP**

Our audit report contains 4 findings and 4 corresponding recommendations. The agency preliminary responses indicated that MDOT concurs with all 4 recommendations. In addition, MDOT informed us that it has initiated or will initiate corrective action for all of the recommendations.

MDOT complied with 5 of the 8 prior audit recommendations included within the scope of our current audit. Of the other 3 recommendations, 1 was repeated in this audit report and 2 were rewritten to address current conditions.



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

July 24, 2002

Mr. Barton W. LaBelle, Chairperson
State Transportation Commission
and
Mr. Gregory J. Rosine, Director
Michigan Department of Transportation
Transportation Building
Lansing, Michigan

Dear Mr. LaBelle and Mr. Rosine:

This is our report on the performance audit of the Maintenance Division, Bureau of Highway Technical Services, Michigan Department of Transportation.

This report contains our executive digest; description of agency; audit objectives, scope, and methodology and agency responses and prior audit follow-up; comments, findings, recommendations, and agency preliminary responses; 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.

AUDITOR GENERAL

This page left intentionally blank.

TABLE OF CONTENTS

MAINTENANCE DIVISION BUREAU OF HIGHWAY TECHNICAL SERVICES MICHIGAN DEPARTMENT OF TRANSPORTATION

INTRODUCTION

	<u>Page</u>
Executive Digest	1
Report Letter	5
Description of Agency	8
Audit Objectives, Scope, and Methodology and Agency Responses and Prior Audit Follow-Up	10

COMMENTS, FINDINGS, RECOMMENDATIONS, AND AGENCY PRELIMINARY RESPONSES

Maintenance Oversight Efforts	12
1. Maintenance Oversight Procedures	12
Specialized Maintenance Services	14
2. Pump House Unit Operation	14
3. Activity Reporting	16
4. Unrecovered Damage Costs to Highway Property	17

GLOSSARY

Glossary of Acronyms and Terms	20
--------------------------------	----

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 was established to provide the people of Michigan with a safe, efficient, and environmentally sound total transportation system in the most cost-effective manner.

The Maintenance Division is 1 of 5 divisions within the Bureau of Highway Technical Services. It provides specialized maintenance services and support to MDOT staff in Lansing and at the 7 regional offices and 26 transportation service centers. The Division's mission is to provide technical expertise and assistance for Statewide maintenance and preservation activities in a responsive and timely manner, which addresses the need to improve services provided to MDOT's customers. The Division is organized into four sections: Office Administration, Pavement and Roadside, Structural Maintenance, and Operational Services.

The Pavement and Roadside Section is responsible for coordinating maintenance of rest areas, roadside parks, and scenic turnouts. This Section coordinates the Statewide vegetation management program, summer youth program, Adopt-A-Highway Program, and chemical program, which provides assistance to contract maintenance counties and municipalities for construction of road salt storage facilities.

The Structural Maintenance Section is responsible for performing emergency repairs to bridges needed because of damage caused by overweight and over height vehicles. This Section is also responsible for routine maintenance and emergency repairs to the State's movable bridges, including structural, electrical, and mechanical systems.

The Operational Services Section repairs, fabricates, and installs large overhead signs throughout the State. This Section is also responsible for traffic signal installation and monitoring and inspecting installations done under contract for MDOT. In addition, this Section performs routine and preventive maintenance on MDOT-owned facilities

throughout the State and administers the development of maintenance service contracts for central and regional offices.

The Division's funding is provided from vehicle gasoline, 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 - 247.674 of the *Michigan Compiled Laws* (Act 51, P.A. 1951). Funding is also provided by the U.S. Department of Transportation from federal fuel and excise taxes on certain commodities.

The Division operating budget totaled approximately \$15.2 million for the fiscal year ended September 30, 2001. As of September 30, 2001, the Division had 116 full-time equated employees.

Audit Objectives, Scope, and Methodology and Agency Responses and Prior Audit Follow-Up

Audit Objectives

Our performance audit of the Maintenance Division, Bureau of Highway Technical Services, Michigan Department of Transportation (MDOT), had the following objectives:

1. To assess the effectiveness of MDOT's oversight of State trunkline maintenance services.
2. To assess the effectiveness and efficiency of MDOT's specialized maintenance services.

Audit Scope

Our audit scope was to examine the program and other records of the Maintenance Division. 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 July through October 2001, included examination of the Division's records and activities primarily for the period October 1, 1998 through October 31, 2001. We conducted a preliminary survey of the Division to develop an understanding of its responsibilities and the methods that it used to monitor the accomplishment of these responsibilities. We reviewed prior audit reports and working papers of audits conducted by MDOT's Office of Commission Audits. We also reviewed other states' audit reports on functions similar to those performed by the Division.

We reviewed the Division's maintenance manuals that have been developed to guide field maintenance activities. We obtained MDOT's standard maintenance contract with counties that perform trunkline maintenance for MDOT to determine MDOT's oversight responsibilities.

We met with MDOT staff at selected regional offices and transportation service centers to review and evaluate the methods used to monitor trunkline maintenance.

We obtained reports on work activities of the Division's specialized work units. We used this information to evaluate the effectiveness and efficiency of these units.

Agency Responses and Prior Audit Follow-Up

Our audit report contains 4 findings and 4 corresponding recommendations. The agency preliminary responses indicated that MDOT concurs with all 4 recommendations. In addition, MDOT informed us that it has initiated or will initiate corrective action for all of the recommendations.

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.

MDOT complied with 5 of the 8 prior audit recommendations included within the scope of our current audit. Of the other 3 recommendations, 1 was repeated in this audit report and 2 were rewritten to address current conditions.

COMMENTS, FINDINGS, RECOMMENDATIONS, AND AGENCY PRELIMINARY RESPONSES

MAINTENANCE OVERSIGHT EFFORTS

Audit Objective: To assess the effectiveness of the Michigan Department of Transportation's (MDOT's) oversight of State trunkline maintenance services.

Conclusion: We concluded that MDOT's oversight of State trunkline maintenance services was generally effective. However, we noted a reportable condition related to maintenance oversight procedures.

FINDING

1. Maintenance Oversight Procedures

MDOT needs to implement maintenance oversight procedures to help ensure that contracted maintenance activities meet contract requirements.

MDOT contracts with 66 counties and 154 municipalities to provide maintenance on approximately 76% of the 9,725 miles of State trunkline. Maintenance on the remaining trunkline is provided by MDOT work forces. MDOT has delegated the responsibility of overseeing maintenance contracts to staff in the 7 MDOT regions. Transportation service center (TSC) staff within each region carry out the actual contract oversight.

In September 1999, MDOT issued revised procedures and forms for monitoring contract maintenance activities. We visited 6 TSCs in 3 MDOT regions to evaluate whether these procedures and forms were used to oversee and direct contracted maintenance activities. We determined that the procedures and methods used to document oversight activities and the frequency of the oversight varied by TSC. We noted:

- a. Staff at 3 TSCs routinely inspected the condition of the trunklines in their respective areas on a monthly or semimonthly basis and documented their observations on the revised MDOT field review forms, in accordance with the revised procedures.

- b. Staff at the remaining 3 TSCs did not conduct routine inspections of the trunklines in their areas. Staff at 2 of these 3 TSCs recorded trunkline conditions in personal notebooks that were not a part of MDOT's official record and only used MDOT field review forms to document problems that were noted. Staff at the remaining TSC, which was responsible for trunklines in 6 contract maintenance counties, did not regularly document trunkline conditions. We determined that this TSC had documentation of only one trunkline evaluation during the 37-month period from October 1, 1998 through October 31, 2001.

- c. Staff at 3 of the 6 TSCs did not document annual spring meetings during which TSC staff and county representatives inspected trunklines and planned summer maintenance projects. Documentation of these inspections would allow MDOT to later evaluate the performance of the contract maintenance counties' efforts to meet agreed upon maintenance activities.

Implementation of maintenance oversight procedures would help MDOT to ascertain whether its oversight of contract maintenance performance results in effective and efficient use of trunkline resources. In addition, implementation of oversight procedures would help to ensure compliance with contract specifications and MDOT's goals for the State trunklines.

RECOMMENDATION

We recommend that MDOT implement maintenance oversight procedures to help ensure that contracted maintenance activities meet contract requirements.

AGENCY PRELIMINARY RESPONSE

MDOT concurs with the recommendation. MDOT informed us that it issued Statewide maintenance contracting guidelines on February 11, 2002. The guidelines specifically addressed maintenance contract monitoring, changing the source of maintenance service providers, and unit price contracting. In addition, MDOT provided Statewide training for maintenance personnel in February and March 2002. This training covered provisions of the State trunkline maintenance contract as well as procedures for monitoring and oversight of the contract.

SPECIALIZED MAINTENANCE SERVICES

Audit Objective: To assess the effectiveness and efficiency of MDOT's specialized maintenance services.

Conclusion: We concluded that MDOT's specialized maintenance services were generally effective and efficient. However, we noted reportable conditions related to pump house unit operation, activity reporting, and unrecovered damage costs to highway property.

FINDING

2. Pump House Unit Operation

The Maintenance Division needs to evaluate alternatives for its current methods for maintaining records, the frequency of preventive maintenance, and the personnel used for out-State pump maintenance.

The pump house unit is responsible for maintaining 51 pump stations located along State trunklines. The number of pump stations in MDOT's 7 regions ranges from 1 each in 3 regions to 20 in 1 region. Each pump station contains from 1 to 6 pumps that remove water in low areas to prevent flooding of State trunklines. The unit has 5 employees whose primary responsibility is to perform preventive maintenance on these pumps. In addition, these employees periodically respond to emergency calls when a pump fails and occasionally assist other Division work crews.

Our review of the unit operations disclosed areas in which the effectiveness and efficiency of the unit could be improved. We noted:

- a. The unit does not maintain central records to document work performed at each pump station. A logbook is maintained at each pump station that provides detailed information about each pump station, but central records of this information are not kept. Maintaining central records of work performed at each pump station would provide historical information for evaluating equipment and the need for preventive maintenance. In addition, it would provide a complete off-site record in the event that the logbook at a pump station is destroyed.

- b. Unit management needs to evaluate the frequency with which preventive maintenance is performed on pump stations. Currently, the unit has an informal policy that provides that unit staff perform preventive maintenance on most pump stations on a weekly basis. According to unit management, this informal policy is in place to minimize the possibility of a pump failure that could result in a flooded roadway. We reviewed the frequency with which unit staff performed preventive maintenance on pump stations during the 18-month period ended March 31, 2001 and noted that, in 2 of the 7 regions, the pump stations either had no preventive maintenance performed on them at all or had preventive maintenance performed less than once a month. We found no documentation that the pump stations in either of these regions had failed at any time during this 18-month period.

We contacted the Wayne County Road Commission, which MDOT contracts with to maintain 119 pump stations in Wayne County. We were informed that the Road Commission performed preventive maintenance on these pumps on a biweekly basis. We determined that the Road Commission has approximately the same frequency of emergency calls for pump failures as the MDOT pump house unit. Reducing the frequency of preventive maintenance visits to pump stations would increase the availability of unit staff for assisting other Division work crews.

- c. The Division needs to consider alternatives to using Lansing-based staff to maintain out-State pump stations. Travel time to and from pump stations accounted for 40% of the staff time charged to pump station activities. Six of the 7 regions have MDOT maintenance garages in them with staff who could perform preventive maintenance on the pump stations in their respective regions. Using region staff to perform pump station maintenance would reduce the work load of unit staff and further increase their availability for assisting other Division work crews.

RECOMMENDATION

We recommend that the Division evaluate alternatives for its current methods for maintaining records, the frequency of preventive maintenance, and the personnel used for out-State pump maintenance.

AGENCY PRELIMINARY RESPONSE

MDOT concurs with the recommendation. MDOT informed us that pump house unit staff are utilized to provide pump house maintenance and repair, pump house preventive maintenance, and assistance at other maintenance facilities. As a result of the recent early-out retirement program, MDOT is undergoing a thorough departmentwide evaluation and assessment of all functions performed. The evaluation and assessment and any resulting changes in the process will be completed by June 30, 2003 and will include the review of out-State pump maintenance, MDOT's methods for maintaining records, the frequency of preventive maintenance, and the personnel to be used.

FINDING

3. Activity Reporting

The Division needs to implement controls to improve the accuracy of the records that its operational units use for reporting activities.

The Division has several specialty work units that perform work on different types of structures throughout the State. Staff assigned to these work units charge their time to specific projects that they are working on to allow management to monitor the units' activity and to initiate cost recovery for repairs when they are the result of vehicle accidents.

We reviewed the reports generated by two of the Division's work units and noted numerous differences between the summary reports and the supporting documentation. For example:

- a. During February 2001, the Building Maintenance Unit, which is responsible for performing work on MDOT buildings and equipment throughout the State, completed 110 work orders. We compared the information from 23 work orders included in the Unit's February 2001 summary report with the employee activity reports that were used to prepare the work orders and noted differences in information on 16 (70%) work orders. Of these 16, 11 (69%) involved differences between the hours recorded on work orders and activity reports, with differences ranging from one-half hour to 19 hours. The remaining 5 (31%) involved differences in either the dates that work was reportedly performed or the actual work activity for which time was charged.

- b. The Bridge Repair Operations Unit is responsible for repairing trunkline bridges damaged by overweight or over height vehicles. A bridge repair cost report is generated for each repair and is used when attempting to recover the cost of the repair from the responsible party. We compared the information on 24 bridge repair cost reports with supporting employee activity reports and noted that the hours reported on 12 (50%) bridge repair cost reports did not agree with the respective employee activity reports. We noted instances in which the number of hours recorded on bridge repair cost reports varied by 2 to 19.5 hours from the hours recorded on the employee activity reports. In addition to using the hours reported on the employee activity reports for charging employee costs, the Division also used employee hours for charging the hourly rate for equipment used for the repair. Therefore, time reporting errors affect both labor and equipment charges on the bridge repair cost reports.

An accurate activity reporting and recording system is essential for management to be able to assess the effectiveness and efficiency of its operations. In addition, accurate reporting would ensure that MDOT recovers all applicable repair costs caused by overweight or over height vehicles.

RECOMMENDATION

We recommend that the Division implement controls to improve the accuracy of the records that its operational units use for reporting activities.

AGENCY PRELIMINARY RESPONSE

MDOT concurs with the recommendation. The Division will conduct an evaluation and assessment of all operational unit reporting activities. Procedures will be implemented to address the consistency and accuracy of employee activity reports and field work orders by September 2002.

FINDING

4. Unrecovered Damage Costs to Highway Property

MDOT needs to require that field staff process damage claims in a timely manner for the cost of repairs to State property resulting from motorists' traffic accidents. Claims for repair costs must be provided within 12 months from the date of the accident in order for MDOT to invoice motorists.

The Division is responsible for forwarding accident reports involving State property to the respective regional offices for processing. It is then the responsibility of the regional offices to assess the costs associated with the damage and return the information to the Division so that the claim can be processed. Section 500.3145 of the *Michigan Compiled Laws* allows MDOT up to 12 months from the date of an accident to identify and assess the vehicle owner for highway repair costs. Repair costs not assessed within 12 months are not recoverable.

Our review of calendar year 1999 accident reports disclosed that 1,881 (42%) of the 4,469 reports that the Division had forwarded to the regional offices were more than 12 months old. We noted similar conditions during our prior audit, as did MDOT's Office of Commission Audits during a subsequent audit. In response to the Office of Commission Audits report, the Division developed a guidance document to identify responsibilities at different phases of the process with the goal of improving damage cost recoveries. According to the Division's fiscal year 1998-99 annual review, damage cost recovery collections increased approximately \$730,000 from the previous fiscal year. However, we compared damage cost recoveries since our prior audit and determined that the percentage of recoveries had not improved. During our prior audit, we had noted that, for calendar year 1992, approximately 29% of 2,906 accident reports were more than 12 months old. The Office of Commission Audits determined that, for calendar year 1994, approximately 31% of 3,594 accident reports were more than 12 months old. We recognize that the number of accident reports has increased approximately 24% between each review period; however, the percentage and number of reports over 12 months old have increased 32% and 69%, respectively, between review periods. We contacted 3 regional offices to determine the reasons why cost assessments had not been returned on a timely basis. MDOT regional staff informed us that this resulted from there being insufficient resources and the priority level placed on processing accident reports in relation to other responsibilities.

We estimate, based on the amount of damage claims that MDOT recovered during 1999, that an additional \$1.6 million could be recovered if all accident reports were processed on a timely basis.

RECOMMENDATION

WE AGAIN RECOMMEND THAT MDOT REQUIRE THAT FIELD STAFF PROCESS DAMAGE CLAIMS IN A TIMELY MANNER FOR THE COST OF REPAIRS TO STATE PROPERTY RESULTING FROM MOTORISTS' TRAFFIC ACCIDENTS.

AGENCY PRELIMINARY RESPONSE

MDOT concurs with the recommendation. MDOT has started to review the current process and will implement revised procedures for improving the damage claim process by June 2003. MDOT informed us that considerable attention has been placed on this issue in that there has been significant progress made in the past two years in regard to the timeliness in which accident reports are obtained from the Michigan Department of State Police. In addition, MDOT is currently participating in a project with the Michigan Department of State Police to upgrade and enhance the crash data system. Ultimately, this system will provide MDOT with more timely access to the crash data and related information, enabling MDOT to enhance the timeliness of its process. MDOT also informed us that the process improvements and attention given by region staff have resulted in significant revenue gains over the past three years. Property damage claims in the amount of \$2,818,644 were submitted for collection in fiscal year 2000-01, which represents an increase of 10% from the previous fiscal year.

Glossary of Acronyms and Terms

effectiveness	Program success in achieving mission and goals.
efficiency	Achieving the most outputs and outcomes practical with the minimum amount of resources.
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.
TSC	transportation service center.