



# MICHIGAN

OFFICE OF THE AUDITOR GENERAL

## AUDIT REPORT



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

The auditor general shall conduct post audits of financial transactions and accounts of the state and of all branches, departments, offices, boards, commissions, agencies, authorities and institutions of the state established by this constitution or by law, and performance post audits thereof.

– Article IV, Section 53 of the Michigan Constitution

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Michigan  
*Office of the Auditor General*  
**REPORT SUMMARY**

*Performance Audit*

*Road and Bridge Construction Project  
Monitoring*

*Michigan Department of Transportation (MDOT)*

Report Number:  
591-0170-09

Released:  
September 2010

*MDOT is responsible for monitoring road and bridge construction projects. Construction project oversight, in part, consists of the verification and approval of contract work performed, materials used, and project payments. MDOT also monitors warranties applied to road and bridge construction projects. For the period October 1, 2006 through March 31, 2009, MDOT was responsible for 2,902 closed road and bridge construction projects costing \$3.2 billion. MDOT implemented the Statewide Warranty Administrative Database to track warranties and to identify warranties due for an inspection. As of June 1, 2009, MDOT had 665 active road and bridge warranties.*

***Audit Objective:***

To assess the effectiveness of MDOT's efforts to ensure that road and bridge construction projects are monitored in accordance with selected State and federal requirements.

***Audit Conclusion:***

We concluded that MDOT's efforts to ensure that road and bridge construction projects are monitored in accordance with selected State and federal requirements were moderately effective. We noted five reportable conditions (Findings 1 through 5).

***Reportable Conditions:***

MDOT's control procedures did not ensure that required State Administrative Board (SAB) and State Transportation Commission (STC) approvals were obtained for all contract modifications that exceeded specified financial approval limits. Also, MDOT had not taken

the necessary actions to review and submit all prior contract modifications identified by MDOT's Office of Commission Audit to SAB and STC for approval. (Finding 1)

MDOT needs to improve its monitoring of consultants hired to perform engineering and project monitoring services on road and bridge construction projects (Finding 2).

MDOT did not complete final estimate reviews of all construction projects in accordance with established procedures (Finding 3).

MDOT needs to develop a centralized process for monitoring contractor claims processed by its transportation service centers and regional offices (Finding 4).

MDOT did not review and approve incentive payments in accordance with its procedures (Finding 5).

**Noteworthy Accomplishments:**

In 2006, MDOT's FieldManager Administration Team received the American Association of State Highway and Transportation Officials President's Transportation Award for the development and implementation of FieldManager system enhancements, which MDOT estimated saves \$4.8 million annually.

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**Audit Objective:**

To assess the effectiveness of MDOT's efforts to ensure that road and bridge construction materials testing is completed in accordance with selected State and federal requirements.

**Audit Conclusion:**

We concluded that MDOT's efforts to ensure that road and bridge construction materials testing is completed in accordance with selected State and federal requirements were effective. Our report does not include any reportable conditions related to this audit objective.

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**Audit Objective:**

To assess the effectiveness of MDOT's efforts to monitor its road and bridge construction project warranties.

**Audit Conclusion:**

We concluded that MDOT's efforts to monitor its road and bridge construction project warranties were moderately effective. We noted one reportable condition (Finding 6).

**Reportable Condition:**

MDOT did not ensure that all roads and bridges with warranties were timely inspected and that necessary corrective actions were performed and adequately documented (Finding 6).

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**Agency Response:**

Our audit report includes 6 findings and 7 corresponding recommendations. MDOT's preliminary response indicates that MDOT concurs and will comply with all of the recommendations.

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A copy of the full report can be obtained by calling 517.334.8050 or by visiting our Web site at: <http://audgen.michigan.gov>



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September 17, 2010

Mr. Ted B. Wahby, Chair  
State Transportation Commission  
and  
Kirk T. Steudle, P.E., Director  
Michigan Department of Transportation  
Murray Van Wagoner Transportation Building  
Lansing, Michigan

Dear Mr. Wahby and Mr. Steudle:

This is our report on the performance audit of Road and Bridge Construction Project Monitoring, Michigan Department of Transportation.

This report contains our report summary; description of agency; audit objectives, scope, and methodology and agency responses and prior audit follow-up; 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.

AUDITOR GENERAL



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## Description of Agency

The Michigan Department of Transportation (MDOT) was organized under Act 380, P.A. 1965 (Sections 16.450 - 16.458 of the *Michigan Compiled Laws*). MDOT is governed by the State Transportation Commission (STC), which is composed of six members who are appointed by the Governor with the advice and consent of the Senate. STC is responsible for establishing policies. MDOT's director, who is appointed by the Governor, is responsible for organizing and administering MDOT and implementing the policies established by STC.

MDOT's central office, 7 regional offices, and 26 transportation service centers (TSCs) are responsible for monitoring road and bridge construction projects. Construction project oversight, in part, consists of selecting contractors and consultants to complete construction and manage projects, reviewing daily project progress reports, monitoring materials usage, performing on-site inspections, reviewing and approving project payments, reviewing and approving contract modifications\*, evaluating contractors and project consultants, and performing final inspections and procedures to close out the projects. For the period October 1, 2006 through March 31, 2009, MDOT was responsible for 2,902 closed road and bridge construction projects (construction completed and final payments processed) costing \$3.2 billion.

MDOT is also responsible for ensuring that all materials included in road and bridge construction projects are inspected and tested, verifying that materials are certified as meeting applicable specifications, ensuring that materials were obtained from suppliers whose materials were evaluated and approved for use on MDOT projects, and visually inspecting materials at the project site. MDOT or contracted project inspectors\* may inspect and test project materials at any time during their preparation, storage, or use.

MDOT began using warranties on pavement projects in 1996. Act 79, P.A. 1997, provides that MDOT shall, where possible, secure full replacement warranties of not less than five years on State trunkline\* projects. Subsequent appropriations acts directed MDOT to work with the road construction industry to develop performance warranties\* and materials and workmanship warranties\* for construction projects. As of June 1, 2009, MDOT had 626 active\* road construction warranties and 39 active bridge

\* See glossary at end of report for definition.

warranties. The length and type of warranties vary from two- to three-year performance warranties on bridge painting projects and pavement capital preventative maintenance\* projects to five-year materials and workmanship warranties on most pavement reconstruction\* and rehabilitation\* projects.

In 2003, MDOT implemented the Statewide Warranty Administrative Database (SWAD) as a tool for monitoring warranted construction projects. SWAD was designed to enable management to track warranties and to identify when warranties are due to expire to allow MDOT to schedule an inspection of the project.

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

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

### Audit Objectives

Our performance audit\* of Road and Bridge Construction Project Monitoring, Michigan Department of Transportation (MDOT), had the following objectives:

1. To assess the effectiveness\* of MDOT's efforts to ensure that road and bridge construction projects are monitored in accordance with selected State and federal requirements.
2. To assess the effectiveness of MDOT's efforts to ensure that road and bridge construction materials testing is completed in accordance with selected State and federal requirements.
3. To assess the effectiveness of MDOT's efforts to monitor its road and bridge construction project warranties.

### Audit Scope

Our audit scope was to examine the program and other records of the Michigan Department of Transportation's road and bridge construction project monitoring process. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Our audit procedures, conducted from March through December 2009, generally covered the period October 1, 2006 through June 30, 2009.

As part of our audit, we prepared supplemental information that relates to our audit objectives. Our audit was not directed toward expressing an opinion on this information and, accordingly, we express no opinion on it.

\* See glossary at end of report for definition.

## Audit Methodology

We conducted a preliminary review of MDOT's road and bridge construction project monitoring process to formulate a basis for defining our audit objectives and our audit scope. Our preliminary review included interviewing MDOT staff regarding their functions and responsibilities; reviewing applicable State and federal laws, regulations, policies, procedures, and manuals; analyzing available data and statistics; and examining reports from various internal and external audits and reviews.

To assess the effectiveness of MDOT's efforts to ensure that road and bridge construction projects are monitored in accordance with selected State and federal requirements, we examined project files at various MDOT transportation service centers and at consultants' offices that MDOT hired to perform construction and engineering testing services. We analyzed the files to assess MDOT's compliance with requirements related to construction project oversight, preparation of contractor and consultant evaluations, completion of final estimate reviews, claims processing procedures, and propriety of bonus performance program payments.

To assess the effectiveness of MDOT's efforts to ensure that road and bridge construction materials testing is completed in accordance with selected State and federal requirements, we examined agency records related to lab technician certifications, construction project quality control testing plans, and inspector reports of materials tested.

To assess the effectiveness of MDOT's efforts to monitor its road and bridge construction project warranties, we examined MDOT's evaluation of the effect of warranties on construction project quality, reviewed controls over the Statewide Warranty Administrative Database (SWAD), analyzed the completeness of inspection data in SWAD, and examined inspection reports to assess compliance with inspection requirements and the performance of warranty related repairs.

When selecting activities or programs for audit, we use an approach based on assessment of risk and opportunity for improvement. Accordingly, we focus our audit efforts on activities or programs having the greatest probability for needing improvement as identified through a preliminary review. Our limited audit resources are used, by design, to identify where and how improvements can be made. Consequently, we prepare our performance audit reports on an exception basis.

### Agency Responses and Prior Audit Follow-Up

Our audit report includes 6 findings and 7 corresponding recommendations. MDOT's preliminary response indicates that MDOT concurs and will comply with 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 the State of Michigan Financial Management Guide (Part VII, Chapter 4, Section 100) require MDOT to develop a formal response to our audit findings and recommendations within 60 days after release of the audit report.

Within the scope of this audit, we followed up all 7 prior audit recommendations from our April 2002 performance audit of the Construction and Technology Division, Bureau of Highway Technical Services, Michigan Department of Transportation (59-169-00). We also followed up all 3 prior audit recommendations from our April 2006 performance audit of the Use of Warranties, Michigan Department of Transportation (59-320-05). MDOT complied with 7 of the 10 prior audit recommendations included within the scope of our current audit. We combined and repeated the other 3 recommendations in this report.

COMMENTS, FINDINGS, RECOMMENDATIONS,  
AND AGENCY PRELIMINARY RESPONSES

## **MONITORING OF ROAD AND BRIDGE CONSTRUCTION PROJECTS**

### **COMMENT**

**Background:** During fiscal year 2007-08, the Michigan Department of Transportation (MDOT) awarded \$1.2 billion for 993 road and bridge construction projects. MDOT engineers at the transportation service centers (TSCs) are responsible for developing project progress schedules and determining whether the project would benefit from the use of MDOT's bonus performance program. MDOT uses either its own staff or a consultant's staff to supervise a project during construction. MDOT engineers are responsible for authorizing payments to contractors while a project is under construction and initiating the first estimate review process when a project is completed.

**Audit Objective:** To assess the effectiveness of MDOT's efforts to ensure that road and bridge construction projects are monitored in accordance with selected State and federal requirements.

**Audit Conclusion:** **We concluded that MDOT's efforts to ensure that road and bridge construction projects are monitored in accordance with selected State and federal requirements were moderately effective.** Our assessment disclosed reportable conditions\* related to contract modification approvals, monitoring of consultants, final estimate reviews, monitoring of claims, and incentive payments (Findings 1 through 5).

**Noteworthy Accomplishments:** In 2006, MDOT's FieldManager Administration Team received the American Association of State Highway and Transportation Officials President's Transportation Award for the development and implementation of FieldManager system enhancements. MDOT estimated that the system enhancements will result in an additional savings of \$4.8 million annually. FieldManager is a suite of road and bridge construction management software developed by MDOT in partnership with Info Tech, Inc., which is a Florida-based software company. FieldManager is the main repository of construction project information, allowing inspectors and contract staff to record and track everything from daily reports, materials usage, site conditions, and pay estimates. MDOT estimated that the use of FieldManager annually saves its staff approximately 567,000 hours performing contract management functions, resulting in an annual savings of \$28.5 million.

\* See glossary at end of report for definition.

## **FINDING**

### **1. Contract Modification Approvals**

MDOT's control procedures did not ensure that required State Administrative Board (SAB) and State Transportation Commission (STC) approvals were obtained for all contract modifications that exceeded specified financial approval limits. Also, MDOT had not taken the necessary actions to review and submit all prior contract modifications identified by MDOT's Office of Commission Audit (OCA) to SAB and STC for approval. As a result, MDOT processed contract modifications without proper authorization in noncompliance with State regulations established by SAB and STC and also lessened SAB and STC's oversight of MDOT's activities.

Contract modifications are a normal part of the road and bridge construction process and are required to authorize payment for additional project costs not in the original contract agreement. Contract modifications are also necessary to address changes in contract specifications that alter the quantity of materials used in the project, changes that require additional work or materials not specified in the original contract, monetary adjustments\* to an individual contract pay item or to the entire contract, changes to contract completion dates, and other miscellaneous changes to the contract.

In accordance with the *Michigan Compiled Laws*, SAB Resolution 2005-2, and MDOT Commission policy, MDOT must present all contract modifications exceeding specified spending limits to SAB and STC for review and approval.

Our review of MDOT contract modification controls and procedures disclosed:

- a. MDOT did not always identify and submit contract modifications to SAB and STC for approvals. MDOT control procedures consisted of centralized, decentralized, and automated controls. Without required approvals, there is increased risk of improper payments to contractors for performance of unneeded services.

We reviewed contract modifications pertaining to 32 projects that were closed (construction completed and final payments processed) during our audit period. Our audit disclosed that 29 of the 32 projects contained contract

\* See glossary at end of report for definition.

modifications that required SAB and/or STC review and approval because monetary contract adjustments related to cost overruns\* and extra work\* items exceeded specified limits. Contract modifications for 9 (31%) of 29 of these projects were not reviewed and approved by SAB or STC. More specifically, our analysis of the 9 projects noted:

- (1) MDOT did not obtain SAB approval of contract modifications for project overruns that exceeded specified financial limits for 4 of the projects that we reviewed. SAB must approve cumulative contract overruns that exceed the original contract price by 10% to 25%, depending on the original contract price, prior to MDOT making payments for the contract modifications. For these 4 projects, MDOT made payments to contractors that exceeded SAB overrun limits by approximately \$1,800 to \$76,300 without obtaining SAB approvals.
- (2) MDOT did not obtain STC approval of contract modifications for project overruns that exceeded specified financial limits for 1 of the projects that we reviewed. STC must approve cumulative contract overruns that exceed 15% of the original contract price, prior to MDOT making payments for the contract modifications. For this 1 project, MDOT made payments to contractors that exceeded STC overrun limits by approximately \$40,500 without obtaining STC approval.
- (3) MDOT did not obtain SAB approval of contract modifications authorizing extra work to be performed or other contract adjustments that exceeded specified financial approval limits for 5 of the projects that we reviewed. SAB must approve extra work items and adjustments if the cumulative total exceeds \$48,000; if the cumulative total exceeds 6% of the original contract price; or if an individual extra work item or adjustment exceeds \$100,000 (depending on the amount of the original contract price). For these 5 projects, MDOT processed contract modifications that included \$5.4 million of extra work items or adjustments that exceeded SAB without obtaining SAB approvals (total contract modifications ranged from approximately \$2,000 to approximately \$5 million for the 5 projects).

\* See glossary at end of report for definition.

- (4) MDOT did not obtain STC approval of contract modifications authorizing extra work to be performed or other contract adjustments that exceeded specified financial approval limits for 3 of the projects that we reviewed. STC must review and approve all contract extra work items and adjustments when the total of such exceeds 10% of the original contract price or when an individual extra work item or adjustment exceeds \$250,000. For these 3 projects, MDOT processed contract modifications that included \$5.1 million of extra work items or adjustments that exceeded STC limits without obtaining STC approvals (total contract modifications ranged from approximately \$2,000 to approximately \$5 million for the 3 projects).

One contract modification with approximately \$5 million of extra work items or adjustments was cited in both subparts (3) and (4).

- b. MDOT did not ensure that the contract modifications identified in the OCA audit report of the Construction and Technology Support Area for the period October 1, 2000 through September 30, 2005, issued July 2006, were submitted for SAB and STC approvals.

OCA included a finding related to contract modifications exceeding specified limits that were not submitted to SAB and/or STC for approvals. However, OCA's report indicated that no recommendation was made because the Construction and Technology Support Area had developed and began implementing draft procedures that required the review of all contract modifications submitted to ensure that all required approvals were obtained.

During its audit, OCA identified 64 contract modifications that contained extra contract items that required SAB and/or STC approvals because they exceeded established monetary limits. We examined these contract modifications and noted that 5 of the 64 contract modifications had received the required approvals prior to the release of the OCA audit. MDOT did not obtain approvals for the remaining 59 contract modifications.

- c. MDOT's FieldManager does not have the system capabilities to detect contract modifications that exceed specified limits that require SAB or STC approvals.

MDOT uses FieldManager as the repository for each construction contract and for tracking information such as daily progress reports, materials usage, contract change orders, and pay estimates. When contracts require modifications, the managing office engineer (MDOT, local governmental agency, or consultant) obtains the required approvals and updates FieldManager for the extra pay items not in the original contract or changes to existing pay items. Once in FieldManager, payments can be initiated for those items when work is completed or materials are used.

As projects are completed, project field inspectors record each pay item completed or materials used into their daily report, which is recorded into FieldManager. Information from the inspector's daily report is used to initiate payments to the contractors.

## **RECOMMENDATIONS**

We recommend that MDOT improve its control procedures to ensure that it obtains required SAB and STC approvals for all contract modifications that exceed specified financial approval limits.

We also recommend that MDOT take the necessary actions to review and submit all prior contract modifications identified by MDOT's OCA to SAB and STC for approval.

## **AGENCY PRELIMINARY RESPONSE**

MDOT concurs with the recommendations.

MDOT stated that subpart a.(1) and subpart a.(2) of the finding included four projects for which payments were made on overruns without SAB approval and one project for which payments were made on overruns without STC approval, respectively. MDOT stated that once the contract work was complete, it requested approval for additional contract dollars for the noted overruns. MDOT informed us that SAB and STC have approved these requests.

MDOT also informed us that subpart a.(3) and subpart a.(4) of the finding included a project that was closed during the audit period, although the contract modifications for that project were approved and processed prior to June 2002, which was prior to the audit period and prior to implementation of MDOT's new

contract modification review procedure. In response to the prior audit of the Construction and Technology Division by MDOT's OCA, in September 2005, changes to the procedures for monitoring contract modifications were made by the Construction Contracts Unit. MDOT stated that the changes required a review of all contract modifications received by the Unit to help ensure that proper approvals were obtained. MDOT also stated that, because the extras on this project were processed prior to its new review process, it is not reflective of its current practice. The extras for this project were \$5,039,891 of the \$5.4 million reported in the finding.

MDOT informed us that, in December 2009, its Bureau of Finance and Administration's Contract Services Division initiated a daily overrun report to provide notice of projects in overrun status prior to releasing payment. In addition, the Contract Services Division worked with programmers to provide MDOT with the data to produce an extra/adjustment item report for each active project. MDOT stated that the first version of the report is in production and being tested. The report gives notification of a project, for which extra/adjustment items of work exceed the limit of 6% of the contract amount and/or when this type of individual item exceeds \$100,000.

MDOT stated that a new enhancement to the FieldManager software is to be released that will help identify contract modifications that exceed SAB and/or STC limits for overruns, extra work, and adjustments. MDOT expects that this version will be available beginning in late 2010, with implementation in all offices occurring during winter 2010 and 2011, and that full implementation will be achieved by June 1, 2011.

MDOT also expects that program enhancements will allow the managers to know exactly what their contract status value is relative to the SAB and STC contract modification thresholds.

MDOT plans to review and enhance current procedures to ensure compliance with all requirements. MDOT stated that it held an initial meeting on June 30, 2010 and implementation will begin by April 1, 2011.

MDOT stated that it will also consult with the Transportation Division, Department of Attorney General, for advice and with SAB for guidance as to the course of

action needed for addressing the contract modifications that have not been approved as required.

## **FINDING**

### **2. Monitoring of Consultants**

MDOT needs to improve its monitoring of consultants hired to perform engineering and project monitoring services on road and bridge construction projects. Improved consultant monitoring would help MDOT ensure that construction projects are completed in accordance with project plans and specifications.

MDOT uses consultants to both manage and provide construction engineering services on road and bridge construction projects. Consultants help interpret and evaluate contract specifications, acceptability of materials furnished, work performed and manner of performance, and rate of construction progress. MDOT engineers at TSCs are responsible for overseeing the consultants working on projects in their respective areas. MDOT contracted with consultants to manage 220 (8%) of 2,902 road and bridge construction projects that were closed during the period October 1, 2006 through March 31, 2009.

We reviewed 6 of the 220 closed consultant-managed construction projects (with an average project cost of \$3.9 million) from 3 TSCs. Our review disclosed:

- a. TSCs did not conduct an expectations meeting with the consultants for any of the 6 projects in our review. MDOT's Bureau of Highway Instructional Memorandum 2002-14 requires the TSCs to meet with the consultant before work begins to ensure that the consultant clearly understands its project oversight expectations. The Instructional Memorandum suggests that the meeting should cover such topics as expected inspection practices, safety issues, submission of contractor pay estimates, and familiarization with applicable construction manuals.

We noted a similar condition in our prior audit of the Construction and Technology Division, Bureau of Highway Technical Services, Michigan Department of Transportation (59-169-00). In response to that audit report, MDOT stated that it would issue a Bureau of Highway Instructional

Memorandum by July 1, 2002 that would require a meeting to be held with the consultant before work begins on the project to discuss project expectations.

- b. TSCs did not conduct project update meetings with the consultants for 4 (67%) of the 6 projects. MDOT's Bureau of Highway Instructional Memorandum 2002-14 requires the engineer to meet periodically with the consultant, based on the complexity of the construction project, to ensure that consultant activities are properly monitored. Such meetings are to include site visits and a limited review of project records. TSCs indicated that they were in frequent contact with the consultants; however, they could not provide documentation of such meetings.
- c. TSCs did not prepare interim consultant evaluations for any of the 6 projects in our review. According to MDOT's Construction Manual, TSCs are required to complete an interim consultant evaluation each time they visit or drive through a construction site. Because construction projects can continue for several months or over multiple construction seasons, preparation of interim evaluations would enable TSCs to document and communicate any observations and necessary actions to the consultant during the project.

We noted a similar condition in our prior audit of the Construction and Technology Division, Bureau of Highway Technical Services, Michigan Department of Transportation (59-169-00). In response to that audit report, MDOT stated that it would issue a Bureau of Highway Instructional Memorandum by July 1, 2002 that would reiterate the requirement pertaining to interim consultant evaluations.

- d. TSCs did not prepare final evaluations for any of the 6 consultants in our review. MDOT's Construction Manual section 101 requires that, at the completion of each project, the TSC project engineer shall prepare a performance evaluation of the consultant who performed the construction engineering oversight services.

Evaluations provide consultants with documented feedback on their performance, promote project management/consultant communication, identify and document areas of potential improvements of consultant performance, and help to improve the overall quality of MDOT projects. Evaluation results

form the basis for the prequalification of contractors to bid on future projects. Negative evaluations can affect whether a consultant is allowed to perform further work for MDOT.

We noted a similar condition in our prior audit of the Construction and Technology Division, Bureau of Highway Technical Services, Michigan Department of Transportation (59-169-00). In response to that audit report, MDOT stated that it had developed safeguards to ensure the submission of consultant evaluations to the final consultant payment.

MDOT utilizes various functions to monitor consultants and construction project progress. Such monitoring functions include visiting the project site, contacting consultants, holding a preconstruction meeting to discuss project specifications, and reviewing inspector daily reports and payment estimates. However, improved consultant monitoring would provide MDOT with greater assurance that construction projects are completed in accordance with project plans and specifications.

### **RECOMMENDATION**

WE AGAIN RECOMMEND THAT MDOT IMPROVE ITS MONITORING OF CONSULTANTS HIRED TO PERFORM ENGINEERING AND PROJECT MONITORING SERVICES ON ROAD AND BRIDGE CONSTRUCTION PROJECTS.

### **AGENCY PRELIMINARY RESPONSE**

MDOT concurs with the recommendation.

MDOT stated that consultants now attend the preconstruction meeting with MDOT and the contractor and attend regularly scheduled progress meetings with MDOT and the contractor during the life of the project. Current MDOT procedures require service vendor performance evaluations for each contract or authorization, if an authorization was issued under an indefinite delivery services contract. MDOT stated that its contracts are indefinite services master contracts that may contain numerous independent and individual authorizations. MDOT also stated that its Contract Services Division payment technicians are required to verify that a performance evaluation is completed prior to making the final contract payment. However, MDOT indicated that there are times when final contract invoices are not

marked as final and, therefore, the payment technicians are not aware of the final invoice to ensure that the evaluation was completed.

MDOT stated that the Construction and Technology Division, in coordination with the Bureau of Finance and Administration's Contract Services Division, will review and strengthen its procedures to ensure that required meetings are being held and documented and to ensure timely completion of consultant evaluations as required. MDOT also stated that it held an initial meeting on June 30, 2010 and implementation will begin by April 1, 2011.

## **FINDING**

### **3. Final Estimate Reviews**

MDOT did not complete final estimate reviews of all construction projects in accordance with established procedures. As a result, MDOT could not ensure that the projects were completed in compliance with the projects' plans and specifications or that final payments to contractors were accurate.

MDOT procedures require that after completion of a construction project, either an MDOT or an independent engineer shall conduct a final estimate review of the project's records. However, if the project's engineer is certified by MDOT as meeting various eligibility criteria, no final estimate review for the project is required.

Final estimate reviews consist, in part, of verifying that contract pay item quantities (unique payment codes assigned to specific work activities or materials on a construction project) were properly supported, materials used were in accordance with project specifications, and materials testing procedures were properly completed.

MDOT's Construction Manual requires the final estimate review team to select 10% of the pay items for review, and if irregularities are found, the review is required to be expanded. Irregularities include discrepancies between material quantities used and corresponding documentation or weaknesses identified with the materials pertaining to materials testing procedures.

We examined the final estimate reviews for 18 construction projects (with an average contract price of \$2.2 million) and noted:

- a. Final estimate review teams did not review at least 10% of the pay items for 6 (33%) of the 18 construction projects. For these 6 projects, the review teams only reviewed between 6.7% and 9.6% of the project pay items. Failure to review the required number of pay items reduces MDOT's ability to identify potential materials testing or payment errors.
- b. Final estimate review teams noted irregularities in 10 (56%) of the 18 final estimate reviews. However, the review teams did not expand their test of pay items for any of the 10 projects. Failure to expand the testing of pay items reduces MDOT's ability to ensure that projects were completed in compliance with project plans and specifications.

We noted a similar condition in our prior audit of the Construction and Technology Division, Bureau of Highway Technical Services, Michigan Department of Transportation (59-169-00). In response to that audit report, MDOT stated that it would issue a Bureau of Highway Instructional Memorandum by July 1, 2002 to remind reviewers of proper review procedures.

### **RECOMMENDATION**

WE AGAIN RECOMMEND THAT MDOT COMPLETE FINAL ESTIMATE REVIEWS OF ALL CONSTRUCTION PROJECTS IN ACCORDANCE WITH ESTABLISHED PROCEDURES.

### **AGENCY PRELIMINARY RESPONSE**

MDOT concurs with the recommendation.

MDOT stated that the purpose of the final estimate review is to verify that proper inspection, measurement, testing, documentation, and payment of items have been performed on a project before processing the final estimate. MDOT also stated that the intent is to review a sample of each type of measurement and each type of work to ensure that proper procedures are followed. The different types of measurement with examples of corresponding units include linear (foot, yard, mile, station); area (square foot, square yard, acre); volume (cubic foot, cubic yard); weight (pound, ton); "each" items; "dollar" items; and lump sum items. The

different types of work include, but are not limited to, earthwork items, removal items, pavement items (both hot mix asphalt and concrete), bridge items, traffic control items, extra work items, and force account items. In addition, MDOT stated that, in general, 10 pay items should result in a sampling of each different type of measurement and type of work and will verify the proper inspection, measurement, testing, documentation, and payment of the work item reviewed. MDOT further stated that for projects with more than 100 individual pay items, it is not necessary to review more than 10 items to gain a level of confidence that proper procedures have been followed. Overall, MDOT stated that it may not be necessary to always review 10% of the pay items, on all projects, to provide assurance that proper procedures have been followed.

MDOT plans to review and modify its current procedures for completing final estimate reviews to reflect the current practices to ensure that proper procedures have been followed. MDOT stated that it held an initial meeting on June 30, 2010 and implementation will begin by April 1, 2011.

## **FINDING**

### **4. Monitoring of Claims**

MDOT needs to develop a centralized process for monitoring contractor claims processed by TSCs and regional offices. A centralized monitoring process would help MDOT ensure that contractor claims are processed fairly, timely, and in accordance with established procedures.

Contractor claims generally involve requests for additional compensation for work not clearly covered in the contract and are a normal part of the road and bridge construction process. Contractors first file a claim with the TSC, and the TSC's delivery engineer and the contractor attempt to resolve the claim. If an agreement concerning the claim cannot be resolved at the TSC, the contractor may appeal the claim to the regional office or to MDOT's central office.

MDOT's Bureau of Highway Instructional Memorandum 2008-2 refers to MDOT's development of a Statewide claims tracking database. Each TSC is to record general project information and claim information into the claims tracking database for each claim received. In addition, the Instructional Memorandum states that

MDOT shall analyze claims for any trends in cases decided at the regional office and central office levels for additional review.

MDOT has developed a claims tracking spreadsheet for the TSCs and regional offices to record pertinent claims information. However, MDOT has not developed a Statewide claims tracking database and has not obtained or analyzed information reported on the claims tracking spreadsheets.

MDOT awarded \$1.2 billion for 993 road and bridge construction projects during fiscal year 2007-08. MDOT paid contractors approximately \$474,000 for 7 claims filed during fiscal year 2007-08, or approximately \$68,000 per claim, for claims resolved by MDOT's central office. However, these amounts did not include claims processed at the TSCs because such information was not maintained by the TSCs or MDOT's central office.

Analyzing contractor claims would help MDOT ensure that claims were processed in accordance with its procedures and increase the efficiency\* of claims processing. The analysis would also provide MDOT with information about claim activity, reasons claims are occurring, detail employee costs associated with processing claims, identify which contractors are submitting claims, and detail claims resolution decisions. MDOT could use such information to better manage claims and assess the overall impact claims have on its operations.

## **RECOMMENDATION**

We recommend that MDOT develop a centralized process for monitoring contractor claims processed by TSCs and regional offices.

## **AGENCY PRELIMINARY RESPONSE**

MDOT concurs with the recommendation.

MDOT stated that it maintains a central office review historical information Web site available to all MDOT employees. This Web site provides the written decisions of all central office review claims since 1997 and can be used by construction personnel to research previous claims decisions. MDOT stated that the development of a Statewide database has been identified as an information

\* See glossary at end of report for definition.

technology need for MDOT and will be completed when funding is identified. MDOT also stated that, in the interim, the regions have been directed to maintain a spreadsheet with pertinent information regarding the resolution of all claims within the region. Specific instructions for use and submittal to the Construction Contracts Unit are included in Bureau of Highway Instructional Memorandum 2008-02. In addition, MDOT stated that on February 18, 2010, it conducted a review of the claims tracking spreadsheets, focusing on the time frames of the claims process. This process will be reviewed and revised on an annual basis to ensure compliance.

MDOT stated that it conducted a review of contractor claims heard at the central office for calendar year 2008 and that a similar review is scheduled for calendar year 2009 claims. These reviews focus on the content of the claims to help identify potential weaknesses in contract documents, including plans, proposals, and specifications, and current MDOT processes and procedures. MDOT plans to report on the findings from 2008 and 2009, along with any recommended changes to avoid future claims by November 1, 2010. MDOT stated that this review will be done on an annual basis and information will be shared with MDOT employees.

## **FINDING**

### **5. Incentive Payments**

MDOT did not review and approve incentive payments in accordance with its procedures. Without a review of incentive payments, MDOT could not ensure that the contractors' work met the incentive payment requirements and that payments were appropriately calculated.

MDOT uses a bonus performance program to encourage early completion of high-impact construction projects. MDOT's Bureau of Highway Instructional Memorandum 2002-14 states that during the project planning, MDOT should consider the project's impact on the public and, when determined that it is essential that inconvenience and delays be minimized, incentive provisions should be considered. The Instructional Memorandum also states that incentive payment provisions must be set forth in the construction contract and requires that the TSC manager review and approve all incentive payment calculations to ensure that incentive amounts were paid in accordance with the contract language. In addition,

the Instructional Memorandum requires that the TSC manager's review and approval be documented in the project files.

For the period October 1, 2006 through September 30, 2008, MDOT paid \$14.9 million in incentive payments to 49 construction-related projects.

Our review of 14 incentive payments totaling \$2.0 million disclosed that none of the payments were examined or approved by the TSC manager prior to payment in accordance with the Instructional Memorandum.

### **RECOMMENDATION**

We recommend that MDOT review and approve incentive payments in accordance with its procedures.

### **AGENCY PRELIMINARY RESPONSE**

MDOT concurs with the recommendation.

MDOT stated that, although the TSC manager may not have reviewed the incentive payments as required, current procedures do require review and approval of all construction work items, including incentive payments, by a delegated employee other than the inspector submitting the work for payment.

MDOT also stated that it has revised the final estimate package memorandum, Form 1105. This revision requires the TSC managers to certify that they have reviewed and approved the incentive/disincentive determination.

## **ROAD AND BRIDGE CONSTRUCTION MATERIALS TESTING**

### **COMMENT**

**Audit Objective:** To assess the effectiveness of MDOT's efforts to ensure that road and bridge construction materials testing is completed in accordance with selected State and federal requirements.

**Audit Conclusion:** We concluded that MDOT's efforts to ensure that road and bridge construction materials testing is completed in accordance with selected

**State and federal requirements were effective.** Our report does not include any reportable conditions related to this audit objective.

## **MONITORING OF ROAD AND BRIDGE CONSTRUCTION WARRANTIES**

### **COMMENT**

**Background:** MDOT began using warranties on pavement projects in 1996. As of June 1, 2009, MDOT had 626 active road construction warranties and 39 active bridge warranties. In 2003, MDOT implemented the Statewide Warranty Administrative Database (SWAD) as a tool for monitoring warranted construction projects. SWAD was designed to enable management to track warranties and to identify when warranties are due to expire to allow MDOT to schedule an inspection of the project.

**Audit Objective:** To assess the effectiveness of MDOT's efforts to monitor its road and bridge construction project warranties.

**Audit Conclusion:** We concluded that MDOT's efforts to monitor its road and bridge construction project warranties were moderately effective. Our assessment disclosed one reportable condition related to road and bridge warranties (Finding 6).

### **FINDING**

#### **6. Road and Bridge Warranties**

MDOT did not ensure that all roads and bridges with warranties were timely inspected and that necessary corrective actions were performed and adequately documented. As a result, MDOT cannot ensure that warranted roads and bridges are repaired prior to the expiration of their warranties.

MDOT utilizes SWAD to track and monitor all road and bridge projects with warranties. SWAD enables MDOT to track projects with warranties and corresponding warranty inspection dates, to track warranty expiration dates, to track the status of roads and bridges with warranties that were in need of corrective actions, and to document that corrective actions were properly completed.

Our review of 102 road and bridge project warranties pertaining to 81 projects disclosed exceptions with 24 of the projects reviewed. Our review disclosed:

- a. MDOT did not perform final warranty inspections on 5 (6%) of the 90 warranties that had final warranty inspections due. Without completing final warranty inspections prior to the warranty expiration, MDOT could not determine if warranty work was necessary and would not be able to hold contractors responsible for any corrective action required.
- b. MDOT did not enter the final warranty inspection completion dates into SWAD for 14 (16%) of 85 warranties for projects with final warranty inspections completed. From our review of warranty inspection reports, we determined that the inspections were completed. However, without this information recorded in SWAD, MDOT could not rely on the database to accurately identify projects in need of a final warranty inspection.
- c. MDOT did not enter the corrective action performed into SWAD for 14 (48%) of 29 warranties for projects that needed repairs. From our review of the warranty files, contractors completed the corrective action. However, without recording the corrective action into SWAD, MDOT could not rely on the database to accurately identify those projects in need of warranty corrective action.

### **RECOMMENDATION**

We recommend that MDOT ensure that all roads and bridges with warranties are timely inspected and that all necessary corrective actions are performed and adequately documented.

### **AGENCY PRELIMINARY RESPONSE**

MDOT concurs with the recommendation.

MDOT stated that SWAD produces monthly reports that list warranties requiring final inspections, warranties requiring interim inspections, warranty inspections due within the next 3 months, and warranties that have expired within the last 3 months (and whether these have had final inspections performed).

In addition, MDOT stated that SWAD has the capability to send e-mail reminders to the regions and TSCs informing them of warranties approaching expiration with no final inspection completed. MDOT also stated that 6 of the 7 regions are currently using this feature. In addition, MDOT stated that it has strengthened its procedures to require regions and TSCs to utilize the automated e-mail reminder function.

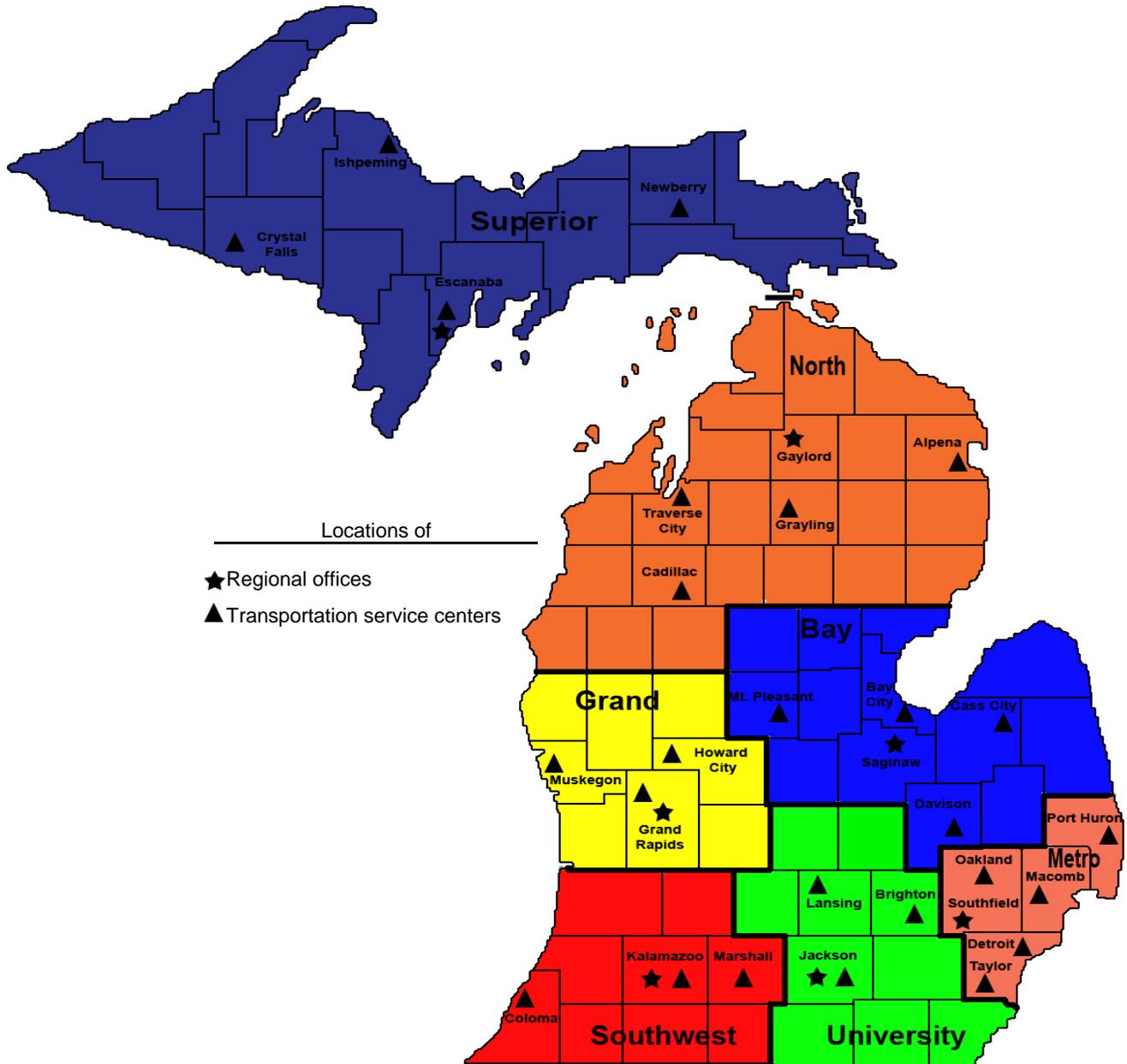
MDOT informed us that when SWAD was developed, the decision was made to not allow region and TSC users to enter inspection dates after a warranty had expired. It was deemed that this was important to the integrity of the database and to avoid the potential for entering a false inspection date after the warranty expired. An unforeseen consequence was that when a warranty inspection was done in a timely manner but was not entered into the database prior to the warranty expiration date, the user was not able to enter this date. MDOT also stated that it does have the ability to get the correct information entered by working with its information technology support staff.

In addition, MDOT stated that by April 1, 2011, it will review and strengthen current procedures to ensure accurate and timely entry of final inspection dates into the SWAD database. MDOT will also continue to communicate to the regions and TSCs the importance of entering this final inspection date prior to the warranty expiring and also continue to let them know that they can still get this information entered after the expiration date of the warranty.

MDOT further stated that by April 1, 2011, it will evaluate current practices and strengthen its procedures to ensure that inspections are performed and that inspection dates and corrective action performed are entered into the database in a timely manner. MDOT will also develop procedures to follow if the warranty has expired before the inspection date has been entered.

# SUPPLEMENTAL INFORMATION

ROAD AND BRIDGE CONSTRUCTION PROJECT MONITORING  
Michigan Department of Transportation (MDOT)  
MDOT Regions and Transportation Service Centers  
As of November 1, 2009



Source: The Office of the Auditor General prepared this exhibit based on information obtained from MDOT's Web site: <http://www.michigan.gov/mdot> as of November 1, 2009.

ROAD AND BRIDGE CONSTRUCTION PROJECT MONITORING  
Michigan Department of Transportation (MDOT)  
Summary of Road and Bridge Construction Projects Closed  
From October 1, 2006 through March 31, 2009

Region	Total Projects	
	Number of Projects	Cumulative Project Cost
Bay	451	\$ 517,083,359
Grand	397	368,851,065
Metro	470	1,004,893,423
North	369	245,125,200
Southwest	345	282,194,135
Superior	355	265,924,197
University	515	485,213,834
<b>Total</b>	<b>2,902</b>	<b>\$ 3,169,285,213</b>

Source: The Office of the Auditor General prepared this exhibit based on MDOT-provided listing of construction projects closed from October 1, 2006 through March 31, 2009.

ROAD AND BRIDGE CONSTRUCTION PROJECT MONITORING  
Michigan Department of Transportation (MDOT)  
Road and Bridge Active Warranties by Region  
As of June 1, 2009

Region	Total Warranties	Percentage by Region	Warranty Type	
			Pavement Warranties	Bridge Warranties
Bay	60	9%	55	5
Grand	77	12%	75	2
Metro	125	19%	109	16
North	155	23%	150	5
Southwest	54	8%	54	0
Superior	84	13%	82	2
University	110	17%	101	9
Total	665	100%	626	39

Source: The Office of the Auditor General prepared this exhibit based on MDOT-provided data as of June 1, 2009 from the MDOT Statewide Warranty Administrative Database.

# GLOSSARY

## Glossary of Acronyms and Terms

active warranty	A warranty on which MDOT has approved the original construction of the warranted work and the warranty has yet to reach its expiration date or has reached its expiration date but the warranty has not been accepted by MDOT.
adjustment	Monetary revision to a contract unit price or to the entire contract.
capital preventive maintenance	Cost-effective treatment to an existing road system that preserves or improves the condition of the system without significantly increasing structural capacity.
contract modification	Increases/decreases to existing bid items, extra work items and adjustments, contract completion time, and other miscellaneous changes to the contract.
effectiveness	Success in achieving mission and goals.
efficiency	Achieving the most outputs and outcomes practical with the minimum amount of resources.
extra work	All work determined to be essential to the satisfactory completion of a contract that did not appear in the proposal as a specific item of work and was not included in the price bid for other items in the contract.
inspector	A representative of the project engineer (either MDOT or a consultant) assigned to make inspections of contract performance.
materials and workmanship warranty	A road and bridge construction warranty in which the contractor is responsible for correcting defects in work elements within the contractor's control (materials and workmanship) during the warranty period.

MDOT	Michigan Department of Transportation.
OCA	Office of Commission Audit.
overrun	Quantity increases to existing bid items that increase the cost of a contract.
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 program operations, to facilitate decision making by parties responsible for overseeing or initiating corrective action, and to improve public accountability.
performance warranty	A warranty on pavement construction in which the contractor assumes full responsibility for pavement performance during the warranty period and is responsible for materials selection, workmanship, and certain aspects of design. The contractor is responsible for deficiencies under his or her control.
reconstruction	Complete removal and replacement of the existing pavement structure. Reconstruction may include new and/or recycled materials.
rehabilitation	Structural enhancements that extend the service life of an existing pavement and/or improve its load-carrying capability. Pavement rehabilitation techniques include restoration treatments and structural overlays.
reportable condition	A matter that, in the auditor's judgment, falls within any of the following categories: an opportunity for improvement within the context of the audit objectives; a deficiency in internal control that is significant within the context of the objectives of the audit; all instances of fraud; illegal acts unless they are inconsequential within the context of the audit objectives; significant violations of provisions of contracts or grant

agreements; and significant abuse that has occurred or is likely to have occurred.

SAB

State Administrative Board.

State trunkline

The network of road types (interstate, Michigan and U.S. routes) that supports the State's commercial activities.

STC

State Transportation Commission.

SWAD

Statewide Warranty Administrative Database.

TSC

transportation service center.







