



Department of Transportation Audit of Roadway Maintenance Maricopa County Internal Audit August 2019

Why This Audit Is Important

The Maricopa County Department of Transportation (MCDOT) is responsible for preserving and maintaining the County's transportation infrastructure. This includes maintenance of roadways, bridges, culverts, guardrails, street signs, and traffic signals within unincorporated Maricopa County. Effective roadway maintenance helps provide residents safe access to incorporated areas and emergency services. The roadway maintenance budget totaled \$39.6 million in FY2019.

We performed this audit to ensure that adequate processes are in place for: 1) maintaining infrastructure assets in accordance with established standards, 2) outsourcing maintenance of projects, 3) managing project efficiencies and backlogs, and 4) complying with Federal and State training requirements.

Key Findings

- Maintenance standards for critical transportation assets were not documented, and related maintenance plans were not established and tracked in MCDOT's Cartegraph system.
- For maintenance projects not required by State statute to be put out for bid, written procedures and criteria were not established to help determine if outsourcing these projects is in the economic interest of the County.
- Delays in maintenance projects could be reduced by implementing formal policies and performance standards for planning and monitoring projects, reducing inconveniences to drivers.
- Employees were current with most safety training requirements. Tracking and monitoring the completion of safety training can be improved.

All key findings were addressed through agreed-upon management action plans.

What We Audited

Below is a summary of work performed and findings. Corresponding recommendations and responses start on page 3. The responses were approved by Jennifer Toth, MCDOT Director, on August 9, 2019. More detailed observations and recommendations were communicated to management throughout the audit process.

Maintenance Standards

Background – Maintenance standards are established to help define the maintenance needs of critical transportation assets (e.g., roadways, bridges, traffic lights). Standards can vary based on the asset type and each standard often prescribes a recommended maintenance plan. MCDOT utilizes the Cartegraph system for tracking transportation assets and maintenance activities.

Observations – We obtained a listing of MCDOT asset categories and selected a sample to verify existing maintenance standards. We found that maintenance standards were not fully documented for most of the asset types. We also noted there were no documented maintenance plans for the assets and that recurring maintenance work orders were not established in Cartegraph. Establishing standards and maintenance plans can help prevent premature deterioration of transportation assets and more costly repairs or replacement (**Recommendations 1 & 2**).

Maintenance Project Outsourcing

Background – Roadway maintenance construction or reconstruction projects exceeding \$66,000 are required, by State statute, to be put out to bid. For projects not requiring a bid, MCDOT has the option to perform the project internally, or to outsource the project.

Observations – We reviewed MCDOT’s process for selecting whether a maintenance project should be completed internally or outsourced. We learned there were no established written procedures and criteria to help ensure that decisions were made in the economic interest of the County. Instead, decisions were made using informal practices and supported by unverified assumptions regarding the relative savings MCDOT will experience with outsourcing, the availability of required equipment, and the need to maintain employee technical skills.

Formal evaluations of whether maintenance projects should be performed internally can help ensure projects are completed using the most economical means, allowing for more maintenance activities within budget constraints and increasing the quality of the County transportation system (**Recommendation 3**).

Maintenance Efficiency & Backlog

Background – Measuring the performance and timely completion of roadway maintenance projects can be difficult. Factors such as weather conditions, insufficient labor resources, or contractor issues may delay maintenance completion, resulting in a backlog.

Observations – We reviewed several FY2018 maintenance projects and compared estimated project durations to actual project durations. Some projects were delayed for reasons outside of MCDOT’s control; however, other projects were delayed for reasons inside its control. There were no established written policies or formal performance standards to plan and monitor maintenance projects for timely completion. Setting formal policies and performance standards can promote timely completions of projects, reducing inconveniences to the driving public and improving driver safety (**Recommendations 4 & 5**).

Safety Training

Background – Roadway maintenance employees are required to meet Federal, State, and internal training requirements.

Observations – We reviewed a sample of active employees to verify that all required training was obtained as of February 2019. Overall, employee training records showed the employees were current with most training requirements.

Some training documentation was not retained and the practices for tracking training completion were decentralized. There were no written policies and procedures for tracking and following up on required training. Improving controls over tracking and monitoring the completion of safety training can reduce the risk of accidents due to unsafe operation or maintenance of equipment, thus reducing potential for County liability (**Recommendation 6**).

Additional Information

This audit was approved by the Board of Supervisors and was conducted in conformance with International Standards for the Professional Practice of Internal Auditing. This report is intended primarily for the County Board of Supervisors, County leadership, and other County stakeholders. However, this report is a public record and its distribution is not limited.

If you have any questions about this report, please contact Mike McGee, County Auditor, at 602-506-1585.

Recommendations and Responses

Recommendations	Responses
1 Update written maintenance standards for each asset type managed, and ensure standards are loaded into Cartegraph for each asset type.	Concur – in progress MCDOT is currently working with a consultant to update written maintenance standards to be consistent with industry standards. Cartegraph will be updated with recurring work orders based on maintenance standards, established target goals, and asset conditions. Target Date: 12/31/2019
2 Document routine maintenance plans for all transportation assets and enter the plans into Cartegraph.	Concur – in progress MCDOT is currently working with a consultant to update maintenance plans and define target goals. Cartegraph will be updated with recurring work orders based on maintenance standards, target goals, and asset conditions. Target Date: 12/31/2019

Recommendations	Responses
<p>3 Develop written policies and procedures to ensure that decisions about outsourcing are made in the best interest of the County by conducting a cost-benefit analysis relative to maintenance project procurement decisions.</p>	<p>Concur – will implement with modifications</p> <p>Written procedures will be developed to capture informal practices and standards for capturing certain project cost information in Cartegraph. MCDOT is currently implementing this recommendation through a newly developed Maintenance Request Form and to-be developed Maintenance Project Manual. The data from the Request Form will allow MCDOT to perform project cost comparison analysis based on cost, resource availability, schedule, and other needs.</p> <p>Target Date: 12/31/2020</p>
<p>4 Establish written policies and procedures to ensure that all maintenance projects are appropriately planned and monitored for timely completion of projects. Policies should include requirements to accurately track project resource data (e.g., labor hours, material usage) in Cartegraph to predict future project requirements.</p>	<p>Concur – in progress</p> <p>MCDOT will create written policies and procedures to plan and monitor maintenance projects for timely completion. Target and actual dates for key milestones are already tracked through the TIP/MIP application, a project management application designed by ITC. Cartegraph functionality will be explored to track cost information for in-house maintenance projects.</p> <p>Target Date: 12/31/2019</p>
<p>5 Develop key performance standards and measures (for planning and performance within MCDOT’s control) that help promote efficiency and timely completion of maintenance projects.</p>	<p>Concur – in progress</p> <p>MCDOT is developing performance measures and standards for maintenance projects similar to TIP projects.</p> <p>Target Date: 12/31/2019</p>
<p>6 Develop written policies and procedures to identify required training for each employee classification and ensure that employees are timely trained, certified, and recertified as required by their job responsibilities, and that appropriate documentation is maintained.</p>	<p>Concur – in progress</p> <p>MCDOT is currently developing a program to identify and track required training for employees.</p> <p>Target Date: 7/1/2020</p>