

0-7101: Synthesis for Best Practices for Developing 4-Year Pavement Management Plans

Background

This project investigated and synthesized best practices for the development and execution of 4-year pavement management plans (PMPs) within the Texas Department of Transportation. Successful 4-year PMPs help provide the traveling public with a safe, comfortable, and reliable roadway network. The deployment of these plans at a granular level (i.e., area office [AO] and maintenance office [MO] level) ensures that local knowledge of the system's needs and appropriate repair methodologies are used. However, the overall success of 4-year PMPs must feed up from each maintenance section to the district level, which feeds up to the state level.

What the Researchers Did

Researchers reviewed statewide performance metrics and literature to develop an initial online survey. Using district-specific performance metrics, individualized survey questions were developed for each district's personnel to answer. Researchers received 68 survey responses with at least one response coming from all 25 districts. Using survey responses and performance analysis, initial PMP best practices were identified. Using the district-specific questions, detailed follow-up questions were developed for a select number of respondents in high-performing districts. Combining multiple survey responses with performance metric analysis led to the creation of PMP best practices.

What They Found

The synthesis identified the following as current PMP practices:

- Local knowledge is vital to PMP development.
- Because of the importance of local knowledge, districts start the process by asking AOs/MOs for potential projects.
- Project rides are used to prioritize projects. Who attends those rides varies across districts.
- Current network condition data play an important role in PMP development.
- Prior condition data play a much lower role in PMP development than current data.
- Distress data are given more consideration than ride data.
- District seal coat programs play a large role in PMP development and success.
- PMP success depends on the success of a district's seal coat program, with the likely exception of the Houston District.

Further exploration of the survey responses found that best practices can be summarized in one of four categories: district-wide practices, the role of district seal coat, non-seal coat projects, and understanding PMP risks.

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Districts performing well indicated wholistic buy-in within the district. The PMPs in these districts were well communicated and championed by district leadership. High-performing districts also noted that project rides were integral to the PMP and scoring projects during those rides helped with decision making. Successful districts typically had some version of a prioritization tool, with Austin's being the most comprehensive. Finally, all districts must understand that the maintenance supervisors play as important a role in the PMP success as anyone and should be supported as such.

If a maintenance supervisor is the employee with the most influence on the PMP, the district seal coat is the activity with the highest influence. High-performing districts make seal coat preparation a maintenance section's highest priority and strive to finish at least 6 months prior to the construction of the new seal coat surface.

For highly ranked districts, non-seal coat projects are accompanied with a thorough pavement design, informed by sampling and testing. This helps avoid inadequate underlying layer construction.

Attrition and loss of institutional knowledge present the biggest risk to successful execution of PMPs, and all districts are perplexed with how to address this looming crisis.

What This Means

Districts should use this synthesis project to evaluate current PMP practices and determine if potential areas for improvement exist. To

facilitate this improvement, the following questions can be asked:

- What metrics are important to the district?
- What goals does the district want to achieve associated with the metrics?
- Do all district employees understand the metrics and goals?
- Does each section's work plan help the district meet the goals?
- Did the district execute the plan as expected?
- How have the metrics changed?

Furthermore, districts can evaluate their current practices with the components in the following list and identify areas for improvement to assist with PMP development and execution:

- Ensure project rides are performed and that a scoring mechanism is used to score each project.
 - The scoring mechanism should be attached to district goals.
 - Develop a scoping document to use during project rides.
- Develop a district specific prioritization tool to assist with project selection and the pursuit of district goals.
- Ensure the district follows a structured pavement design process using sampling and testing.
- Tie seal coat preparation to district goals.
- Develop a plan to complete seal coat preparation at least 6 months prior to seal coat construction.
- Develop an attrition plan to avoid knowledge loss.

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