PROJECT SUMMARY REPORT

0-7175: Develop Best Practices for Flexible Pavement Repairs

Background

Texas maintains one of the largest roadway networks in the U.S., with a goal of keeping 90% of its system in good or better condition. Preventive Maintenance (PM), particularly seal coats, is a key strategy for achieving this goal. The success of PM depends on timely and effective preparatory repair work. Pre-PM repairs, performed by in-house maintenance forces or contractors, may include crack-seal, fog seal, milling, level-up, and localized repairs. Completing these repairs well before the PM contract is critical to ensure proper curing and compatibility with the new surface. The study focuses on identifying the main flexible pavement repair types, determining best practices for both in-house and contracted repairs, and developing procedures to define repair limits and evaluate repair performance and its impact on PM surfacing.

What the Researchers Did

The research team analyzed TxDOT's Pavement Management Information System (PMIS) data from 2019–2023 and surveyed 21 districts to understand current practices for flexible pavement repairs before PM. They evaluated repair types, decision-making processes, and constraints. Advanced tools, including Grind Diagnostic, Falling Weight Deflectometer (FWD), Dynamic Cone Penetrometer (DCP), and Ground Penetrating Radar (GPR), were assessed for improving repair planning. The team developed a standardized decision flow and best-practice guidelines for repair selection, timing, and curing. The decision flow and evaluation framework for best-practice prePM repair are summarized in Figure 1 and Table 1.

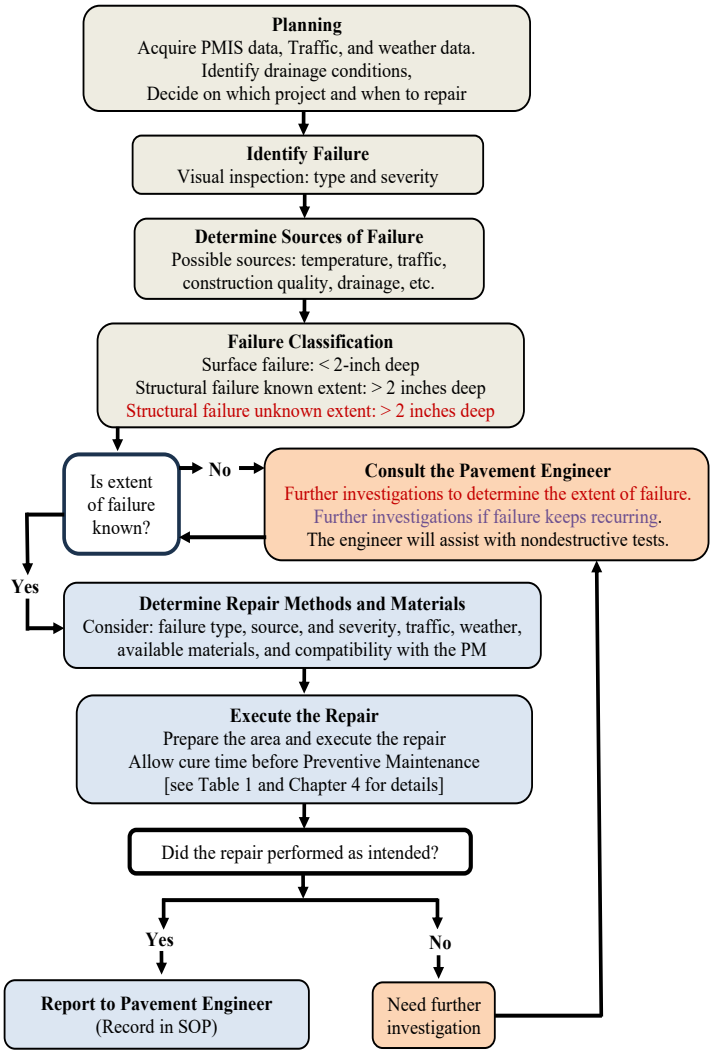

Figure 1. Decision Framework.

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What They Found

Repair decisions rely heavily on visual inspection and PMIS scores, with limited use of nondestructive testing. A uniform, data-driven, NDT-informed workflow across TxDOT districts will ensure consistent decision-making for pre-PM repairs. Proper curing windows, material compatibility, and seasonal timing are essential to prevent premature failures and ensure seal coat stability. Overall, the study confirmed that systematic planning and proper curing significantly extends PM life and reduces costs.

What This Means

Implementing these best practices statewide will improve PM performance, reduce premature failures, and save TxDOT millions annually. The best Pre-PM repair ensures "the right repair on the right road at the right time," thereby enhancing system reliability and helping achieve TxDOT's performance goals.

Table 1. Evaluation Framework for Pre-PM Repairs.

Step	Key Actions	Purpose
Evaluate pavements for repair options.	- Screen candidate sections using PMIS distress/ride scores. - Visual inspections; mark limits extending into sound pavement. - Deploy Non-Destructive Test (NDT) for suspected structural issues.	Identify sections needing repair and classify failure type.
Evaluate viable repair options based on resources.	- Confirm material availability (hot mix, crack sealants, RAP/LRA). - Align repair methods with available equipment. - Decide in-house vs. contractor based on scope and crew skill.	Ensure feasibility and resource alignment.
Evaluate repair options based on cost and time.	- Use Grind Diagnostic or other TxDOT tools for quantities and cost estimates. - Apply TxDOT bid item references for budgeting. - Integrate curing windows into schedule planning.	Optimize cost-effectiveness and timing.
Evaluate the timing of completing the repair.	- Consider seasonal/weather conditions and traffic exposure. - Apply fog seal when the cure time is short. - Plan bleeding mitigation (hydroblasting or adjust binder rate ad).	Minimize risks from climate and traffic; ensure proper curing.
Evaluate the repair method based on the type and limits.	- Classify failure (Surface vs. Structural). - Define limits beyond sound pavement; avoid joints in wheel paths. - Ensure material compatibility with PM treatment.	Achieve durable and compatible repairs.
Evaluate the repair method based on performance.	- Conduct 3–6 month audits for flushing and early distress. - Compare pre/post PMIS and ride scores. - Update SOPs and VoR assumptions annually.	Monitor effectiveness and feed insights into future planning.

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