RESEARCH
PROJECT CAPSULE [18-4P]
July 2018
TECHNOLOGY TRANSFER PROGRAM

Cost-Effective Detection and Repair of Moisture Damage in Pavements

Figure 1
Pavement damage caused by infiltration of water

PROBLEM

Moisture damage is a significant distress that affects the overall performance of asphalt pavements in Louisiana. Moisture damage only appears at the surface after detrimental damage has already progressed in the underlying pavement layers.

To ensure adequate long-term pavement performance, methods of early detection and repair of moisture damage are critically needed. The conventional method to detect moisture damage is through core extraction, a destructive and time-consuming process. However, nondestructive evaluation (NDE) techniques can also be used to assess as-built conditions and to evaluate pavement damage and deterioration.

OBJECTIVE

By evaluating NDE methods for detecting moisture damage in pavements and analyzing the performance and cost-effectiveness of appropriate pavement preservation techniques, the research team will develop a testing protocol for detecting moisture damage in pavements and will recommend cost-effective maintenance and rehabilitation strategies.

METHODOLOGY

Initially, the research team will perform a literature review of methods for detection and repair of moisture damage in pavements. Previously collected deflection measurements are stored in the DOTD pavement management system (PMS). The research team will correlate these measurements with the locations of moisture damage that were identified from extracted cores.

The method of repair that was used at these locations will also be determined. Data from the DOTD PMS will be used to assess the performance of the repair methods. Performance curves for distresses and treatment methods will be developed so that remaining service life of the damaged sections may be predicted.

An economic evaluation will be performed for all of the moisture damage locations. Total cost of treatment method, obtained from bid costs, will be divided by predicted service life extension to obtain a normalized cost value for each location.

JUST THE FACTS:

Start Date:
May 1, 2018

Duration:
27 months

End Date:
July 31, 2020

Funding:
SPR: TT-Fed/TT-Reg

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POINTS OF INTEREST:

Problem Addressed / Objective of Research / Methodology Used
Implementation Potential

Based on results from these initial tasks, the project review committee may recommend field testing of the most-promising moisture damage detection methods. For selected methods, the research team will conduct a comprehensive field evaluation on a wide range of road sections. Moisture damage detections will be compared against core conditions to assess a method's rate of success for identifying below-surface moisture deterioration.

IMPLEMENTATION POTENTIAL

Ultimately, an easily-implementable guide document that recommends procedure(s) for moisture damage detection and most cost-effective repair techniques will be developed. It is expected that implementation of the guide will reduce premature failure of pavement preservation activities and improve the performance and functionality of repair methods.