RESEARCH
PROJECT CAPSULE
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[17-1P]
TECHNOLOGY TRANSFER PROGRAM

Improving the Use of Crack Sealing to Asphalt Pavement in Louisiana

JUST THE FACTS:

Start Date:
November 1, 2016

Duration:
27 months

End Date:
January 31, 2019

Funding:
SPR: TT-Fed/TT-Reg

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POINTS OF INTEREST:

Problem Addressed / Objective of Research / Methodology Used
Implementation Potential

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PROBLEM

Pavement performance depends on the effectiveness and timeliness of maintenance efforts. Deferred maintenance increases the severity of distresses and leads to a more rapid decline of a pavement's condition. An effective maintenance program delays deterioration and corrects pavement deficiencies.

Figure 1
Typical crack filling application

Crack sealing (or filling) can keep water from entering the pavement structure, thus preventing the weakening of the pavement and delaying its deterioration. Years of service life may be added to the pavement at a relatively low cost, assuming that an appropriate sealant material is correctly installed at the right time in the pavement life. Various studies have demonstrated the cost effectiveness of crack sealing.

The use of crack sealing in Louisiana has been limited since studies conducted in the 1960s showed that the performance of this maintenance practice can be affected by high groundwater table conditions. According to these studies, crack sealing can prevent water from escaping through the cracks, causing accelerated stripping of the asphalt concrete.

It seems intuitive that any impermeable treatment on top of a pavement with high groundwater table may cause the same problem. However, after more than 50 years since the original studies, it is unclear if the same conditions still exist and whether current construction practices affect the findings from those studies.

OBJECTIVE

The main objective of this study is to quantify the performance and benefits of using crack sealing and other impermeable surface treatments (e.g., seal coat and chip seal) on roadways with various groundwater table conditions. Additionally, a user guideline will be developed for applying impermeable surface treatments on Louisiana highways.

METHODOLOGY

After collecting and critically reviewing all published studies of the performance, cost-effectiveness, design, construction, and quality control of crack sealing and other impermeable surface treatments, the research team will conduct a review and survey of Louisiana's state-of-practice. Historical performance data will be collected from DOTD and Pavement Management System databases and by contacting district personnel.

The research team will evaluate crack sealant and seal coat materials in the laboratory to identify those most suitable for Louisiana's hot and humid climate. Historical performance data will be analyzed and assessed using the "service life" concept for different groundwater table conditions, and a cost-benefit analysis for the materials will be conducted.

A guide document detailing the recommended use of crack sealing and other impermeable surface treatments will be developed. The guide will identify conditions for which crack sealing materials are most cost-effective, including optimum timing for application and points of caution for installation.

IMPLEMENTATION POTENTIAL

The research team will develop and present an implementation plan to enhance and optimize the use of crack sealing and other impermeable surface treatments in Louisiana.