RESEARCH
PROJECT CAPSULE
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13-1C
TECHNOLOGY TRANSFER PROGRAM

Evaluation of MIT-SCAN-T2 for Thickness Quality Control for PCC and HMA Pavements

JUST THE FACTS:

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12 months

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POINTS OF INTEREST:

Problem Addressed / Objective of Research / Methodology Used Implementation Potential

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PROBLEM

Thickness is currently a pay item for portland cement concrete (PCC) pavements and a quality control item for both PCC and hot mix asphalt (HMA) pavements. A change in pavement thickness of 0.5 in. can result in a reduction of multiple years of service. Current thickness measurements are performed by destructively coring the finished pavement and measuring the thickness of the core. This is frequently performed at the end of the project construction and only five representative samples are collected for each lot. Today, multiple non-destructive pavement evaluation tools are available and the accuracy of such devices has significantly increased in recent years. Non-destructive thickness measurements will allow the Department a more efficient and effective method of maintaining pavement quality without damaging the pavement.

OBJECTIVE

The objective of this research is to evaluate the MIT-SCAN-T2 as a non-destructive pavement thickness measuring device for quality control and quality assurance purposes. A ruggedness study will be performed in the laboratory to determine factors of influence on thickness measurements. Field evaluations will be performed to test the device in actual production conditions.

METHODOLOGY

A literature review will be conducted using available knowledge bases such as TRB's TRID and from states that have run trial sections with the MIT-SCAN-T2.

The MIT-SCAN-T2 is based on magnetic imaging tomography.

MIT-SCAN-T2

Most concrete materials have no effect on magnetic fields; however, metallic objects in close proximity could influence the measurements, such as vehicles, steel toe boots, or dowel bars. A ruggedness study will be performed to identified the proximity limits and investigate other factors, such as target shape and orientation.

A one-mile test section on three PCC pavements and three HMA pavements will be used for field evaluation. Statistical analysis descripted in *ASTM 1169: Standard Practice for Conducting Ruggedness Tests* will be used to determine factors of influence. An operating procedure for quality control and quality acceptance will be developed based on positive results. A final report and implementation plan will be prepared to include the results and findings of this study.

IMPLEMENTATION POTENTIAL

With non-destructive means of testing other quality control items, such as the nuclear density gauge for HMA roadway density or compression testing of cast cylinders for PCC roadway strength, the MIT-SCAN-T2 allows for a non-destructive means of measuring thickness. Implementation of the MIT-SCAN-T2 will reduce the need for destructive testing, while allowing for an increase sampling frequency at earlier ages. The research results can be easily implemented on PCC and HMA paving projects.