

0-6835: Test Procedure for Validation of Automated Distress Data

Background

The Texas Department of Transportation (TxDOT) currently has several contractors to manually collect distress data over the state highway network at a cost of over \$2 million annually. This survey is conducted by driving along the shoulder, in the lane, or in the grass adjacent to the roadway. The survey is labor intensive, takes about four months to complete, and exposes the survey crew and the driving public to accident risks. Clearly, the need exists to examine the use of automated systems to collect pavement condition for the department's pavement management information system (PMIS) as well as other roadway geometric information for managing other elements of the state highway infrastructure.

What the Researchers Did

The researchers first conducted a literature review focusing on the quality assurance practices used by other state highway agencies for automated pavement condition surveys. The researchers also analyzed data provided by TxDOT to generate an initial performance-based specification.

The researchers then selected 204 asphalt pavement sections, 9 continuously reinforced concrete pavement sections, and 26 jointed concrete pavement sections in the Austin, Bryan, and Waco Districts. Each section was 0.1 mile in length. Four pavement condition data collection service providers (or vendors) collected pavement condition data on these sections. Researchers manually generated crack maps by

walking along each section. Researchers also conducted traditional manual PMIS ratings on most of these sections. The researchers then compared the vendors' results to the crack maps and PMIS ratings.

Researchers also evaluated the rut depths determined from automated pavement condition survey vehicles. Researchers set up test sections on two Farm-to-Market Roads in the Bryan District where test vehicles collected rut measurements. Two participating service providers processed the data collected from their systems and provided rut depths computed from the scans made on specific routes surveyed during this evaluation. Researchers then assessed the repeatability and accuracy of rut depth statistics determined from these measurements.

The researchers then developed a final performance-based specification for automated distress data collection systems based on the literature review, analysis of data provided by

Research Performed by:

Texas A&M Transportation Institute

Research Supervisor:

Andrew Wimsatt, TTI

Researchers:

Tom Freeman, TTI
Emmanuel Fernando, TTI
Nasir Gharaibeh, TTI
John Wikander, TTI
John Ragsdale, TTI
Arif Chowdhury, TTI

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TxDOT, analysis of data collected under this research study, and discussions with three experienced providers of distress data collection.

What They Found

For distress surveys of asphalt pavements, the automated results from two vendors compared reasonably closely in ratings to the manual methods. In addition, automated ratings for jointed concrete pavement show much greater inconsistency between different distress types than for asphalt or continuously reinforced concrete pavement types.

For the rut depth comparison, one vendor had more accurate rut depth measurements than the other based on the reference measurements obtained by the research team.

What This Means

Based on this research, it appears that TxDOT should be able to procure a pavement condition data collection service provider that can provide data comparable to traditional manual methods.

The contract language developed under this study has already been implemented as part of the request for proposals issued by TxDOT on July 18, 2016. In addition, TxDOT personnel plan to use the performance specification when auditing data from the service provider.

For More Information

Project Manager:

Sonya Badgley, TxDOT, (512) 416-4657

Research Supervisor:

Andrew Wimsatt, TTI, (512) 407-1143

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Research and Technology Implementation Office
Texas Department of Transportation
125 E. 11th Street
Austin, TX 78701-2483
www.txdot.gov
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