PAVESUITE
A Suite of Pavement Evaluation Tools for Improved Pavement Data Analysis, Enhanced Safety, and Reduced Costs

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Background

The Technology Implementation Group (TIG) is a committee of the American Association of State Highway and Transportation Officials (AASHTO) that champions the implementation of technology among AASHTO member agencies, local agencies, and their industry partners to improve the nation's transportation system. Each year, TIG solicits nominations of high-payoff, ready-to-use, and innovative technologies that have recently been adopted by one or more AASHTO member state and found to be highly beneficial. TIG evaluates these nominations and normally selects three that offer particular promise to benefit other transportation agencies. The selected nominations become TIG focus technologies for that year and a plan is developed to carry out marketing and implementation support activities.

In 2010, TIG selected four Florida Department of Transportation (FDOT) pavement-related technologies to promote as a group. These technologies are referred to, thereafter, as PaveSuite.

What is PaveSuite?

PaveSuite is a group of four pavement analysis tools developed by the State Materials Office at the Florida Department of Transportation. The tools provide for a faster and more comprehensive approach to (1) interpret visually pavement data using contour plots, (2) locate joints and cracks in concrete to measure faulting, (3) identify vibration sensitive work zones based on Falling Weight Deflectometer (FWD) data, and (4) evaluate cross-slope and other drainage path characteristics. They also provide information critical to support informed decision making and the determination of appropriate cost-effective strategies to rehabilitate and preserve existing highway transportation infrastructure while ensuring the safety of the traveling public.

Technology 1: Improving Decision Making with Contour Plots

The conventional method for presenting Non-Destructive Testing (NDT) survey data is through a two-dimensional scatter plot. Scatter plots provide a simple and useful method for viewing data for a given survey path, but they can be difficult to interpret as the number of survey paths increases. A contour plot is a two-dimensional representation of three-dimensional data that allows multiple two-dimensional plots to be merged onto one. Contour plots can be generated from data obtained using a variety of survey equipment. For example, contour plots can depict pavement stiffness using FWD data and can depict pavement density using GPR data. Contour plotting allows for an efficient presentation of a large amount of NDT data and provides an improved methodology for selecting the most critical areas for destructive testing. It, therefore, Saves money and reduces pavement damage by eliminating unnecessary destructive tests, reduces lane closures and safety hazards. FDOT estimates that the number of destructive tests has been reduced by 50 percent, saving approximately $73,000 per year.

Technology 2: Identifying Vibration-Sensitive Work Zones

Vibrations caused by the use of large vibratory rollers during pavement construction in urban areas could adversely affect nearby businesses, residences, and underground infrastructure, and can be disruptive to people. PaveSuite software uses FWD data to predict ground motion induced by vibrations, and helps engineers derive the adequate vibration level to predict the appropriate distance restrictions from the roller's edge to nearby structures and people. More accurate identification of the distance necessary to avoid adverse impacts allows engineers to determine where vibratory rollers can be used, decreasing the risk of structural damage and annoyance complaints.

Technology 3: Automated Faulting Method

"Faulting" refers to the difference in elevation across a pavement joint or crack. Faulting has a direct impact on roadway lifecycle and vehicle operation costs. FDOT typically has measured faulting with a faultmeter. However, this method is slow and labor intensive, disrupts traffic, and presents safety hazards. Collecting fault data with an automated high speed profiler (HSP) provides a more efficient and cost-effective alternative. PaveSuiite is then used to analyze the data to identify the location of the joints and transverse cracks and to quantify the amount of faulting, if any, automatically. PaveSuite allows for a more accurate measurement of faulting and helps FDOT more effectively allocate funds for roadway improvements, thereby improving driver safety and extending pavement life.

Technology 4: Automated Cross-Slope and Drainage Path Evaluation

PaveSuite software detects areas on roadways prone to poor drainage and surface water entrapment. These roadway characteristics can cause hazardous driving conditions such as hydroplaning. A multi-purpose survey vehicle (MPSV) traveling at highway speeds collects cross-slope and vertical grade data. PaveSuite software calculates drainage length and generates results in tabular form as well as two- and three-dimensional plots. It identifies areas prone to water retention and areas with inadequate cross-slope. The user can identify areas with slow surface runoff and evaluate the effectiveness of various corrective actions.

About TIG

Dedicated to sharing high-payoff, market-ready technologies among transportation agencies across the United States, TIG promotes technological advancements in transportation, sponsors technology transfer efforts, and encourages implementation of those advancements. For more information, visit www.aashtotig.org

How do I learn more?

AASHTO's Technology Implementation Group - or TIG - is leading an effort to promote the adoption by transportation agencies of PaveSuite software analysis tools. These tools allow roadway engineers to collect and analyze large amounts of pavement data quickly and to make better-informed maintenance and repair decisions.

TIG's Lead States Team includes DOT representatives with PaveSuite experience who can help you implement these technologies in your agency. Turn to team members for insight, expertise, and advice.

For more information about PaveSuite technology, contact:

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