AMERICAN ASSOCIATION OF
STATE HIGHWAY AND
TRANSPORTATION OFFICIALS

AASHTO
THE VOICE OF TRANSPORTATION

DRIVING INNOVATION FOR TRANSPORTATION

TIG
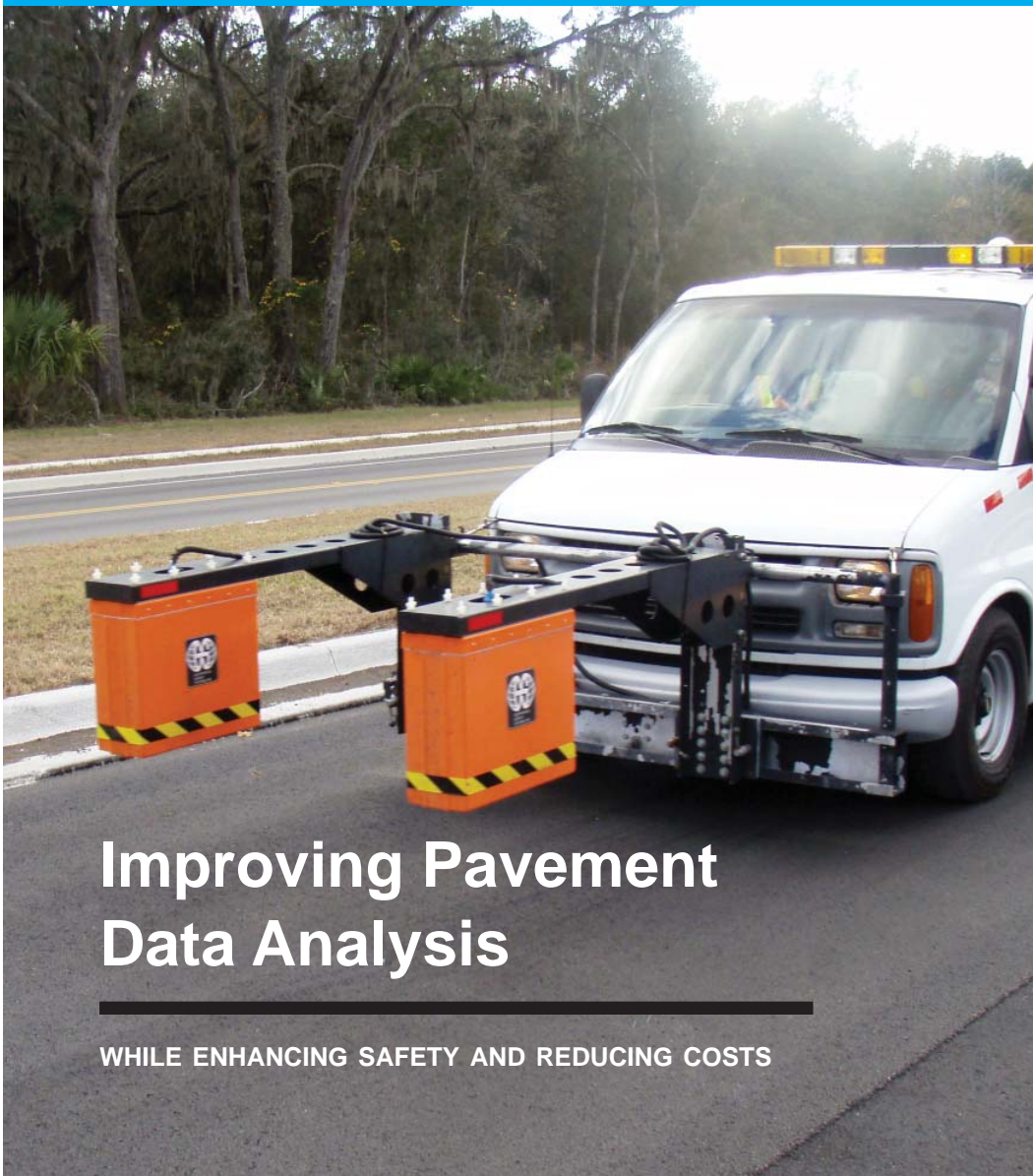AASHTO TECHNOLOGY IMPLEMENTATION GROUP

PAVESUITE | PAVEMENT EVALUATION TOOLS

Improving Pavement
Data Analysis

WHILE ENHANCING SAFETY AND REDUCING COSTS

What is PaveSuite?

PaveSuite is a group of four pavement software analysis tools developed by the State Materials Office at the Florida Department of Transportation. These tools enable roadway engineers to collect and analyze large amounts of data quickly to determine the condition of roads and to make better informed maintenance and repair decisions.

Applying these technologies to the analysis of roadway pavement conditions reduces technician exposure to highway traffic, eliminates traffic disruptions, and saves taxpayer money through the application of state-of-the-art data analysis technology.

PaveSuite Enhances Safety and Improves Data Analysis

To manage facilities optimally and to diagnose problems efficiently, engineers need accurate, complete, and reliable pavement data. Historically, engineers have collected pavement data manually or with slow moving survey equipment. Now, more efficient survey vehicles can gather pavement characteristics at highway speeds, thereby eliminating the necessity of disrupting traffic flow. However, as the amount of captured data increases, so does the need for a strategy to summarize the data more efficiently.

PaveSuite, a group of software products that automates the detection of roadway characteristics and the evaluation of pavement information, enables engineers to collect and analyze data more efficiently and safely, and to achieve more accurate results. The products give engineers the ability to (1) visually interpret 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.
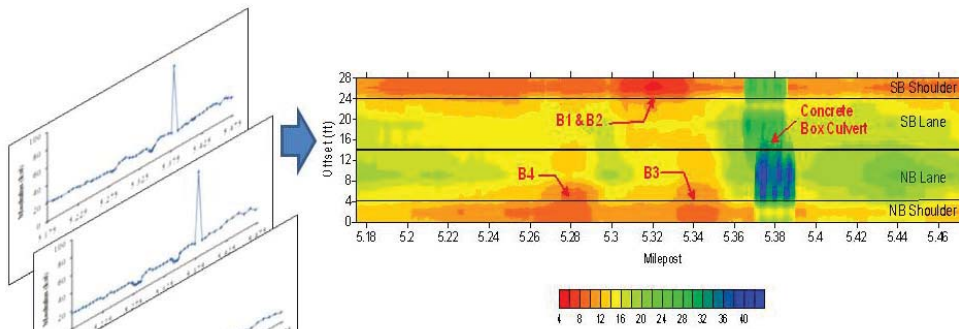
Technology 1: Improving Decision Making with Contour Plots

PaveSuite enables three-dimensional data to be depicted on a two dimensional contour plot. It also enables multiple, two-dimensional plots to be merged into one. Contour plots can depict pavement stiffness using Falling Weight Deflectometer (FWD) data and pavement density using ground penetrating radar (GPR) data.

Contour plots allow for the efficient presentation and visualization of a large amount of non-destructive test (NDT) data, providing roadway engineers with an improved methodology for selecting the most critical roadway areas for limited destructive testing and reducing the total number of destructive tests performed.

Benefits at a glance:

- Predicts more accurately areas where destructive tests are warranted

- Saves money and reduces pavement damage by eliminating unnecessary destructive tests

- Reduces lane closures and safety hazards

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Technology 2: Identifying Vibration-Sensitive Work Zones

Vibrations caused by the use of large vibratory rollers to compact fresh asphalt can 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.

Benefits at a glance:

- Identifies the distance necessary to avoid adverse impacts to buildings, infrastructure, and people

- Ensures that vibratory rollers are used where appropriate, resulting in greater asphalt density that increases pavement life
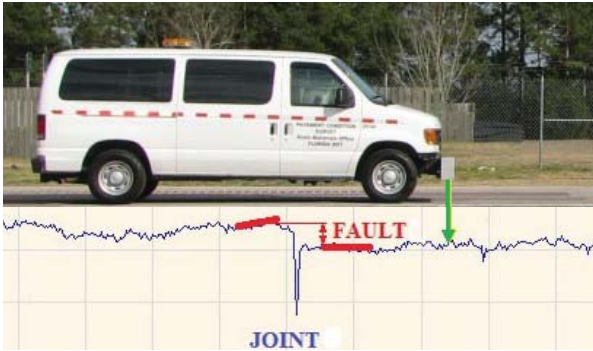
Technology 3: Automated Faulting Method

PaveSuite software detects the location of joints and transverse cracks in concrete pavements and estimates faulting at these locations. A high-speed profiler (HSP) mounted on a survey vehicle traveling at highway speeds collects profile data in both wheel paths to identify pavement characteristics such as rut depth, smoothness, and texture. PaveSuite identifies spikes in the longitudinal profile data for locating joints and transverse cracks. It also emulates AASHTO standard practices for estimating faulting at these locations. The method for identifying joints has been incorporated in ProVAL, an engineering software application used to analyze pavement profiles.

Benefits at a glance:

- Detects joints and transverse cracks and estimates faulting accurately and efficiently

- Identifies spikes in longitudinal profile data

- Eliminates dangerous and tedious manual data collection

- Eliminates traffic control and lane closures

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.

Benefits at a glance:

- Identifies exact trouble spots and evaluates corrective actions

- Eliminates hazardous and tedious manual data collection

- Increases speed, safety, and cost-effectiveness of data collection

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
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