Research Project Brief

Report 27-R05: Local Calibration of AASHTOWare Pavement ME Design Coefficients for VDOT's Upgrade to Web-Based Software for New Pavement Design

VTRC Virginia Transportation Research Council

Background

VDOT adopted AASHTOWare Pavement ME Design (version 2.2.6) in 2018 as the standard methodology for all new construction, reconstruction, and pavement widening projects on interstate, primary, and secondary routes with an annual average daily truck traffic of more than 10,000. Since its implementation, substantial advancements in the software have been made, including updates to global calibration coefficients, revisions to distress models, and the transition from a desktop to a web-based platform. These changes necessitate updated local calibration efforts to ensure continued design reliability under Virginia-specific conditions.

Research Objectives

- Develop updated local calibration coefficients for the distress transfer functions in the AASHTOWare Pavement ME web-based platform (version 3) that best represent observed pavement performance across VDOT's network.
- Provide data that supports VDOT's transition from the desktop to the web-based Pavement ME software.
- Generate recommendations and implementation guidance for long-term use, user training, and periodic recalibration.

Approach

- Compile performance data for the flexible, semi-rigid, and continuously reinforced concrete pavement sections used in the calibration process and analyze data quality.
- Conduct a preliminary calibration of the pavement distress model coefficients.
- Further refine the locally calibrated coefficients to ensure that distress predictions are representative of the VDOT roadway network.

Outcomes

- Provided recommended local calibration coefficients that offer improved pavement distress predictions for the VDOT roadway network over the global coefficients.
- Detailed considerations to be made when using the coefficients and recommendations provided in the research.

Research Benefits

Implementing the new Pavement ME Design software, procedure, and coefficients will support the development of pavement structures that are better optimized based on cost and service life for the VDOT network versus those produced using global coefficients. Integrating these newly developed models into the web-based version will help ensure a smooth and efficient transition from the existing desktop platform. The transition to the web-based version will provide a more efficient design process and improved modeling approaches for roadway design within VDOT.

Principal Investigators

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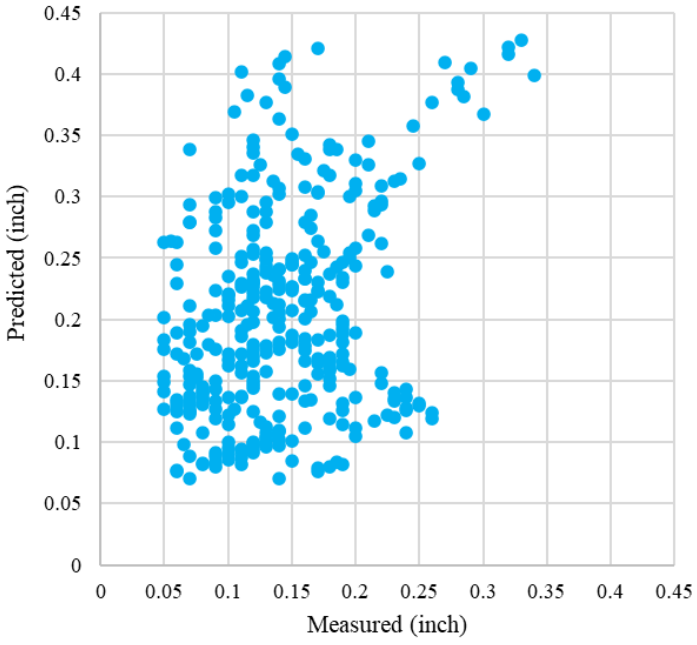
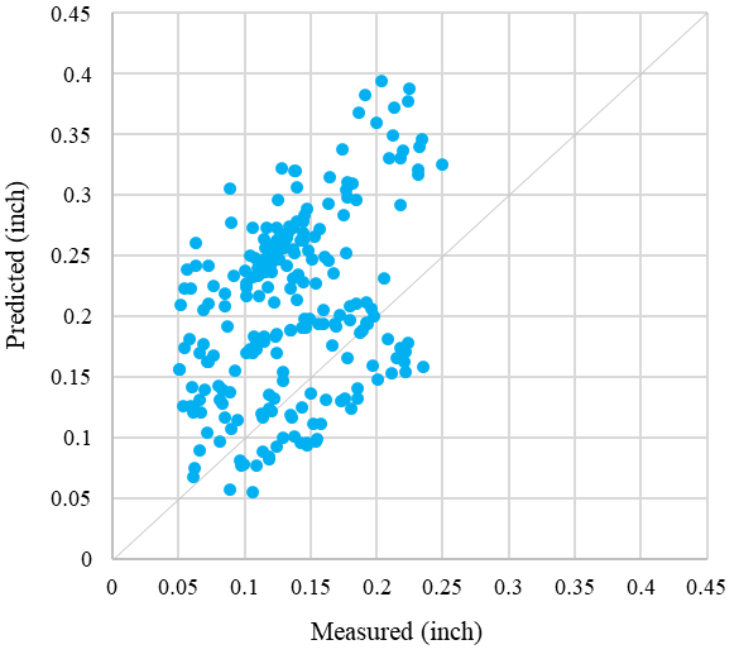
Research Findings



Predicted Versus Measured Total Rutting Data Using Global Coefficients



Predicted Versus Measured Total Rutting Data Using Locally Calibrated Coefficients

Global AASHTOWare Pavement ME Design Software Version 3 Coefficients Do Not Accurately Predict Pavement Distresses Measured in VDOT's Roadway Network.

Local calibrations were conducted to optimize the coefficients so that the predicted distresses match the measured distresses.

Locally Calibrated Coefficients are Recommended for VDOT Use in the Implementation of the Web-Based Software.

VDOT should incorporate the recommended calibration coefficients identified in this study into future new pavement designs within the AASHTOWare Pavement ME Design web-based software.