

Research in Progress

Implementing the AASHTO Mechanistic –Empirical Pavement Design Guide (Phase III)

Research Need

AASHTO's new Mechanistic-Empirical Pavement Design (PMED) method can be a significant improvement in pavement design but the models must be calibrated using local data to accurately predict design performance.

Goals/Objectives

Due to the complexity of the research problem, a four-phased approach over several years was deployed.

Following the completion of Phase I – Literature Review & State of Practice Assessment in 2021 and Phase II – Development of an AASHTOWare® Pavement M-E User Manual and Development of a Local Experimental Plan and Sampling Template in 2022, this third phase is to evaluate the sample size for distress prediction models, and to collect/obtain relevant field data (such as distress data, Falling Weight Deflectometer data, etc.) and laboratory data (such as mixture production data, mixture performance data, binder properties, etc.) that are needed for the local calibration of the AASHTO Level 1 PEMD prediction models. The data collected in this phase will be then used for research effort in Phase IV – Calibration and Validation of the M-E Prediction Models based on Massachusetts conditions.

Project Information

This project is being conducted as part of the Massachusetts Department of Transportation (MassDOT) Research Program with funding from Federal Highway Administration (FHWA) State Planning and Research (SPR) funds.

Principal Investigators:

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Performing Organization:

University of Massachusetts Dartmouth

Project Champion:

Edmund Naras, MassDOT

Project Start Date:

November 22, 2022

Expected Project Completion Date:

May 31, 2024

Methodology

The experimental plan designed for this phase of the project includes:

1. Review the previously developed local experimental plan and sampling template from Phase II.
2. Evaluate the estimated sample size for bias and precision for each of the distress prediction models.
3. Select roadway segments and plant produced mixtures. Mixtures that represent the spectrum of mixtures produced in Massachusetts will be collected and tested in Phase III.
4. Continued laboratory testing of mixtures to obtain data for Level 1 PMED implementation.
5. Conduct field and forensic investigations.
6. Establish a calibration database using excel.

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