Research in Progress

Implementing the AASHTO Mechanistic-Empirical Pavement Design Guide (Phase I)

Research Need

MassDOT is striving to improve its highway infrastructure's resiliency to climate change, environmental impacts, and traffic loading by implementing new technologies that can provide valuable return on investment. These improvements should begin with the pavement design process which currently utilizes antiquated empirical design methods from the 1960's. AASHTO's new Mechanistic-Empirical (M-E design) pavement design method is currently used by 33 state agencies and would be a significant improvement in design. AASHTO M-E design predicts pavement distresses utilizing prediction models that were developed and nationally calibrated using in-service pavements. To accurately predict the design performance in Massachusetts, these models need to be calibrated according to Massachusetts local conditions.

Goals/Objectives

Due to the complexity of the research problem, a multi-phase (four phase) approach over several years was suggested. The objectives for this introductory phase are:

1. Determine the overall state-of-practice with regards to AASHTO M-E design and implementation.
2. Conduct initial testing of already sampled mixtures to accelerate future phases of this research.

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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.

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Performing Organization:
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Project Champions:
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Project Start Date:
April 1, 2020

Expected Project Completion Date:
June 30, 2021

Methodology

The experimental plan designed for this project includes:

1. Conduct a literature review to examine and assess research projects that are closely related to local calibration of M-E performance predictions. The focus of the literature review will be on material related to flexible pavements.
2. Gather information from state agencies that have successfully completed local calibration in an attempt to understand the steps to M-E implementation (data, software, tests, calibration, etc.), potential problems associated with calibration, and potential benefits from using the methodology.
3. Conduct initial dynamic modulus testing that is required for the M-E design using numerous plant-produced mixtures already sampled.

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