



## Workshop: Monday August 3<sup>rd</sup>, 2020

### **Part 1: Concrete Workshop (11:10-14:10 Central US Time):**

Title: **PASSRigid™ for the Integration of Concrete Mixture Design, Pavement Design, and Durability**

Instructors: **Jason Weiss OSU and Matt Corrigan FHWA**

Recently, the Federal Highway Association (FHWA) extended their program on performance specifications to further develop tests, models, and tools for designing jointed plain concrete (JCPC) mixtures and pavements; specifically focused on long term durability. This workshop is designed to introduce and discuss the performance test methods, models, and software programs that support the PASSRigid™ system\* that integrates concrete mixture design, pavement design, and durability into a performance-related specification (PRS). PRS relate measurable quality characteristics with pavement performance through computer simulations that incorporate physical distress models. The work builds on the use of non-destructive testing procedures to obtain measures of pavement quality. The workshop will outline the recently added tests and models for durability. It will describe the modeling and assumptions used in PASSRigid™ to enable longer lasting, cost-effective pavements.

This workshop provides an overview of recent developments in the durability models for concrete pavements through a half-day session that will focus on:

1. Describe the Tests Used for Populating the Durability Models
2. Mechanistic Freeze-Thaw Modeling Framework
3. Empirical Establishment of Freeze-Thaw Joint Damage Mixture Composition Design Limits
4. The Utilization of Thermodynamic Simulations, Mixture Proportions and their Relation to Durability, and
5. Demonstration of the PASSRigid™ software and capabilities.

\*All PASSRigid™ software and analysis tools will be freely available to the public from FHWA.

## **Part 2: Asphalt Workshop (14:15-17:15 Central US Time):**

Title: **PASSFlex™ for the Integration of Asphalt Mixture Design, Pavement Design, and Performance**

Instructors: **Richard Kim NCSU and Matt Corrigan FHWA**

Recently, the Federal Highway Association (FHWA) extended their program on performance specifications to further develop tests, models, and tools for designing asphalt mixtures and pavements. This workshop is designed to introduce and discuss the performance test methods, models, and software programs that support the PASSFlex™ system\* that integrates asphalt mixture design, pavement design, and performance-related specifications (PRS). The Asphalt Mixture Performance Tester (AMPT) based performance tests include the axial unconfined compression dynamic modulus test (AASHTO TP 132), uniaxial tension cyclic fatigue test (AASHTO TP 133), and stress sweep rutting test (AASHTO TP 134).

FlexMAT™, an Excel-based material-level analysis program, is used to analyze the AMPT performance test data to characterize the simplified viscoelastic continuum damage (S-VECD) model, shift permanent deformation model, NCHRP 9-54 long-term aging model, and coefficient of thermal contraction. The outputs from FlexMAT™ are used in FlexPAVE™ to predict pavement responses, fatigue cracking (both top-down and bottom-up), thermal cracking, and rutting under moving loads and realistic climatic conditions for a project.

The AMPT performance tests, material analysis program FlexMAT™, and pavement performance analysis program FlexPAVE™, serve as the basis of performance-engineered mixture design (PEMD). The index-based PEMD utilizes index parameters,  $S_{app}$  and ATR, for cracking and allowable traffic for rutting. The predictive PEMD applies the performance-volumetric relationship (PVR) to determine the optimum aggregate gradation and asphalt content. An Excel-based program, FlexMIX™, can be used to develop the PVR and provides assistance to users for following the PEMD steps.

This workshop provides an overview of recent developments in the tests and models for asphalt pavements through a half-day session that will focus on:

1. Mechanistic Principles behind the S-VECD Model and Shift Model
2. Describe the AMPT Based Test Methods
3. Discuss the index-based and predictive PEMD procedures
4. Introduction of the PVR concept and use
5. Introduce the FlexMAT™, FlexMIX™, and FlexPAVE™ Analysis Tools, and
6. Demonstration of the PASSFlex™ software and capabilities

\*All PASSFlex™ software and analysis tools will be freely available to the public from FHWA.

**Registration:** <https://www.am3pconferenceregistration2020.com/>