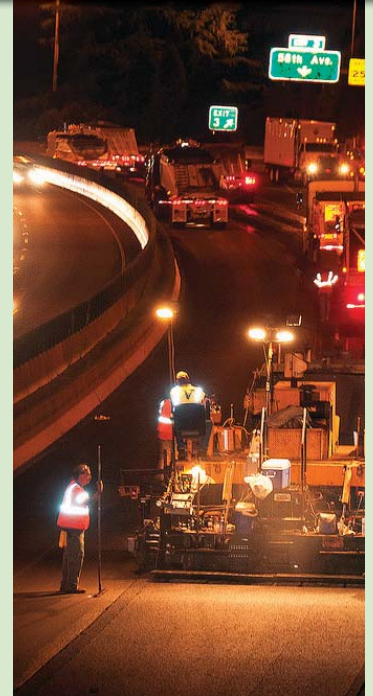
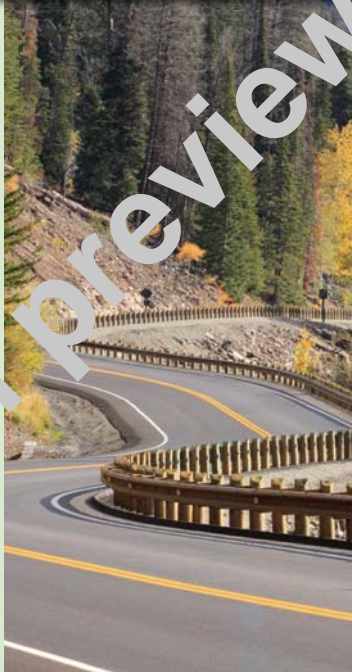




# Mechanistic-Empirical Pavement Design Guide

~ A Manual of Practice ~

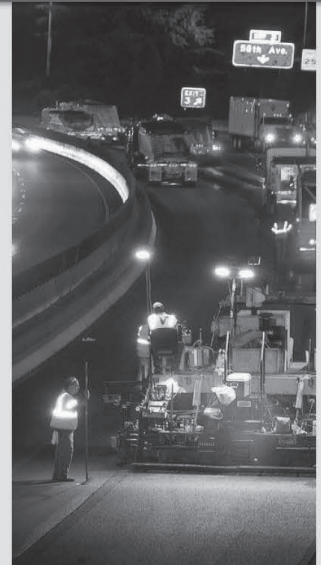


August 2015 • Second Edition



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~ A Manual of Practice ~



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AMERICAN ASSOCIATION  
OF STATE HIGHWAY AND  
TRANSPORTATION OFFICIALS  
**AASHTO**

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## PREFACE

This document describes a pavement design methodology that is based on engineering mechanics and has been validated with extensive road test performance data. This methodology is termed mechanistic-empirical (M-E) pavement design, and it represents a major change from the pavement design methods in practice today.

Interested agencies have already begun implementation activities in terms of staff training, collection of input data (materials library, traffic library, etc.), acquiring of test equipment, and setting up field sections for local calibration. This manual presents the information necessary for pavement design engineers to begin to use the MEPDG design and analysis method.

This manual refers to AASHTOWare Pavement Me Design™, M-E Pavement design software, which is commercially available through AASHTOWare, AASHTO's software development program (see <http://www.aashtoware.org/Pavement/Pages/default.aspx>). AASHTOWare Pavement Me Design has been revised from the software described in the previous edition of this manual based upon evaluations performed by state Departments of Transportation and others in the community of practice.

The following table summarizes the key differences noted between the format and calibration factors used in the MEPDG version 1.1 software and the AASHTOWare Pavement ME Design software.

Table i-1. Summary of Key Differences in Software Format and Calibration Factors

Format and Calibration Factors	MEPDG Version 1.1	AASHTOWare Pavement ME Design
Output Format	Excel-based	PDF- and Excel-based
Climatic Data in Output Summary	Not included	Included
Axle Configuration Data in Output Summary	Not included	Included
Special Axle Load Configuration	Included	Not included
Reflection Cracking	Not included	Included
Coefficient of Thermal Expansion (CTE)	CTE for Basalt of 4.6	CTE for Basalt of 5.0
PCC Zero Stress Temperature	PCC Zero Stress Temperature (Range 60° to 120°F)	PCC Set Temperature (Range 70° to 200°F)
Heat Capacity of Asphalt Pavement	Default value of 0.23 BTU/lb-°F	Default value of 0.28 BTU/lb-°F
Thermal Conductivity of Asphalt Pavement	Default value of 0.67 BTU/(ft)(hr)(F)	Default value of 1.0 BTU/(ft)(hr)(F)
Surface Shortwave Absorptivity	Default value of 0.95	Default value of 0.85
Global Calibration Coefficient for Unbound Materials and Soils in Flexible Pavement Subgrade Rutting Model	$k_{s1}$ granular of 1.63	$k_{s1}$ granular of 2.03
Global Field Calibration Coefficients in the Fatigue Cracking Prediction Model in Flexible Pavement	$k_2$ of -3.9492	$k_2$ of 3.9492
	$k_3$ of -1.281	$k_3$ of 1.281
Global Field Calibration Coefficients in the Thermal Cracking Model for HMA	$k_t$ (Level 1) of 5.0	$k_t$ (Level 1) of 1.5
	$k_t$ (Level 2) of 1.5	$k_t$ (Level 2) of 0.5
	$k_t$ (Level 3) of 3.0	$k_t$ (Level 3) of 1.5
Global Field Calibration Coefficients in the Rut Depth Prediction Model	$k_{2r}$ of 0.4791	$k_2$ of 1.5606
	$k_{3r}$ of 1.5606	$k_3$ of 0.4791
Calibration Coefficients in the Rigid Pavement Faulting Prediction Model	$C_1$ of 1.29	$C_1$ of 1.0184
	$C_2$ of 1.1	$C_2$ of 0.91656
	$C_3$ of 0.001725	$C_3$ of 0.0021848
	$C_4$ of 0.0008	$C_4$ of 0.0008837
	$C_7$ of 1.2	$C_7$ of 1.83312
Calibration Coefficient in the Rigid Pavement Puck-Out Prediction Model	$A_{PO}$ of 195.789	$C_3$ of 216.8421
	$\alpha_{PO}$ of 19.8947	$C_4$ of 33.15789
	$\beta_{PO}$ of -0.526316	$C_5$ of -0.58947

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