Session 52

Bruce Dietrich

FDOT

Mechanistic/Emprical Pavement Design Guide Calibration

Topic Description

Scope and status of Florida DOT calibration efforts for the new Mechanistic/Empirical Pavement Design Guide (MEPDG)that is being developed through NCHRP research.

Speaker Biography

Bruce Dietrich is a registered professional engineer in Florida. Bruce Dietrich has worked with the Florida DOT since 1979. He was named State Pavement Design Engineer in 1993. Prior to coming to FDOT, he spent four years of active duty service as a construction officer with the US Army Corps of Engineers. He is a 1975 graduate of Georgia Tech with a degree in Civil Engineering.

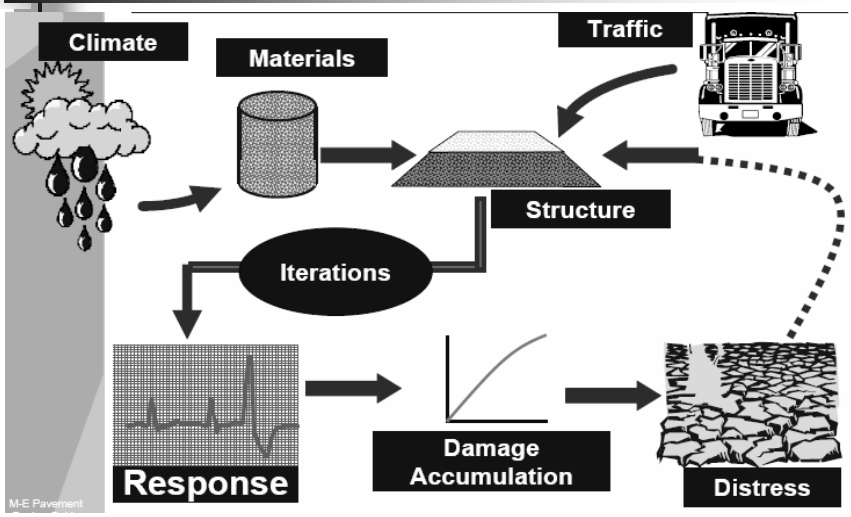
IMPLEMENTATION SUPPORT FOR MECHANISTIC-EMPIRICAL PAVEMENT DESIGN GUIDE IN FLORIDA

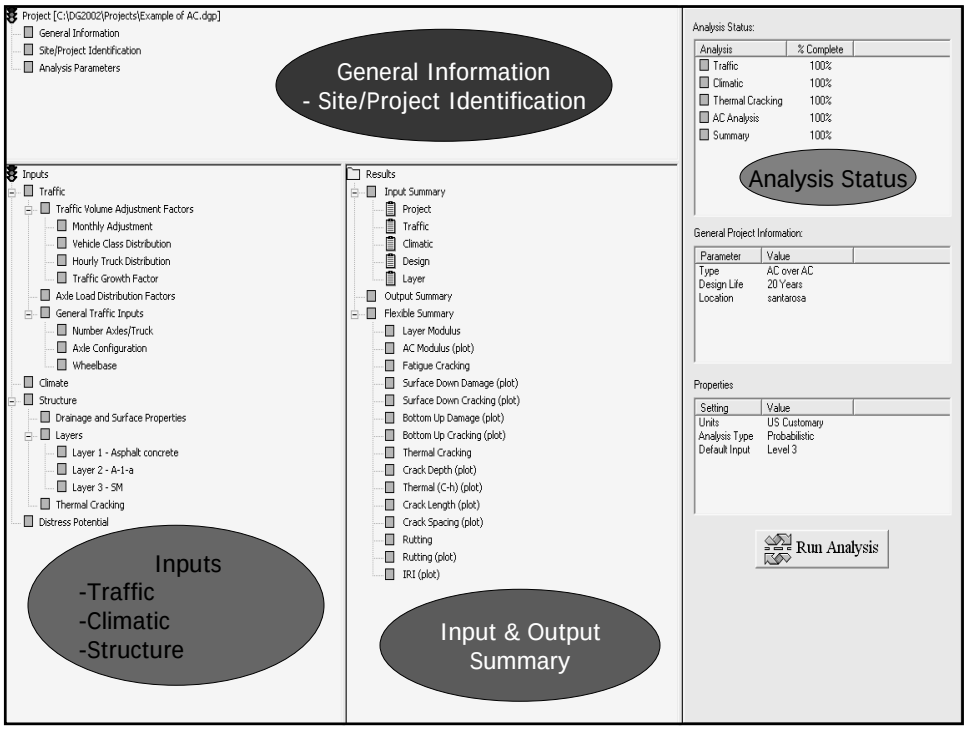
Project Manager	Bruce Dietrich, P.E., FDOT
Researchers	Emmanuel Fernando, TTI Jeongho Oh, TTI

M-E Pavement Design Program

- M-E PDG developed under NCHRP 1-37A
- Transition from empirical to mechanistic-empirical
- Iterative analysis program

Overview of ME-PDG Program





National Implementation Efforts

- FHWA workshops, conferences and training courses
- Continued technical development:
  - Reflection cracking (NCHRP 1-41)
  - Top-down cracking (NCHRP 1-42)
- NCHRP 1-39
- NCHRP 1-40

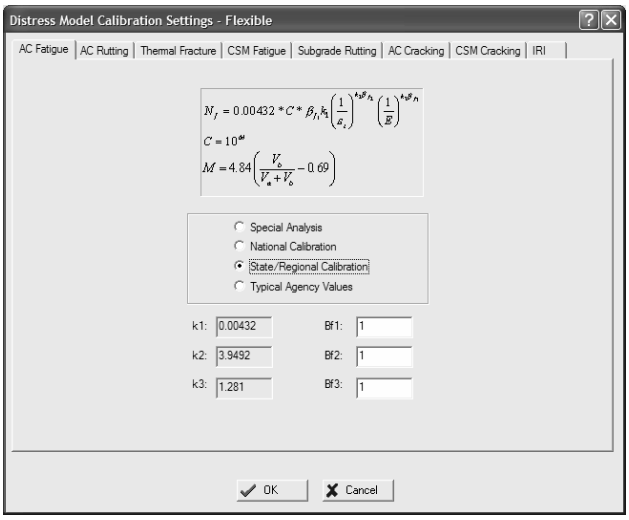
M-E Pavement Design Program

- Available from the web at http://www.trb.org/mepdg/
- Program is a research product for pavement analysis
- Modifications arising from other research are expected
- Calibration is a critical part of implementation

Model Calibration

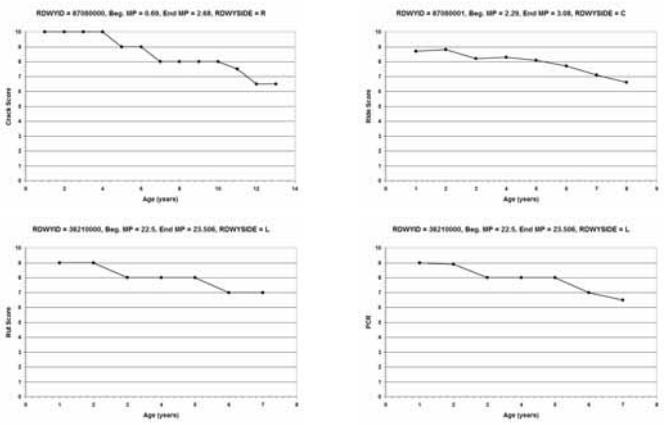
- M-E PDG models calibrated using a national data base of LTPP sections
- Calibration to local conditions is important
- Calibration factors input to program for specific distresses

Model Calibration Factors

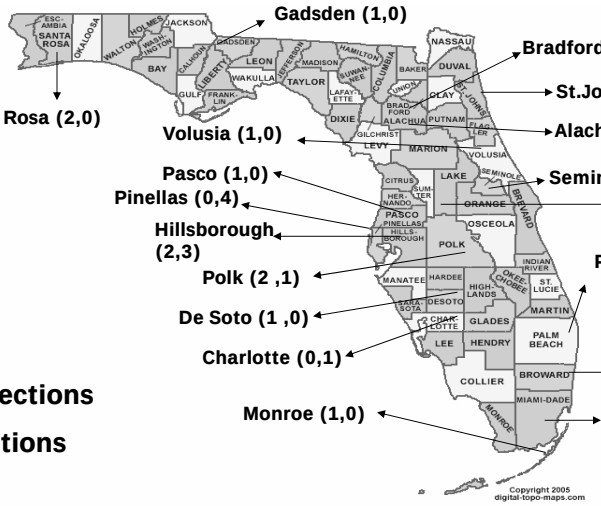


Data Base of Calibration Sections

- **Sections selected from PCS data base**



Proposed Calibration Sections



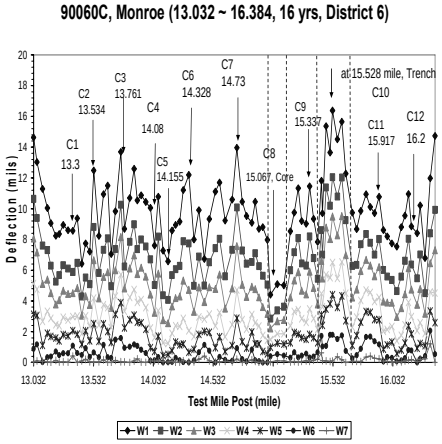
18 HAMC Sections

16 PCC Sections

Proposed Field Tests on Calibration Sections

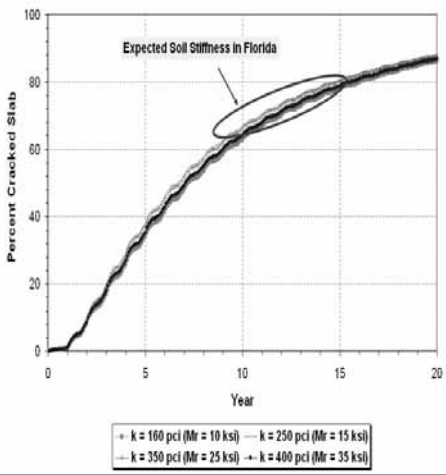
- Falling Weight Deflectometer
- Coring
- Soil Sampling
- Boring

Determination of Coring and Trenching Locations

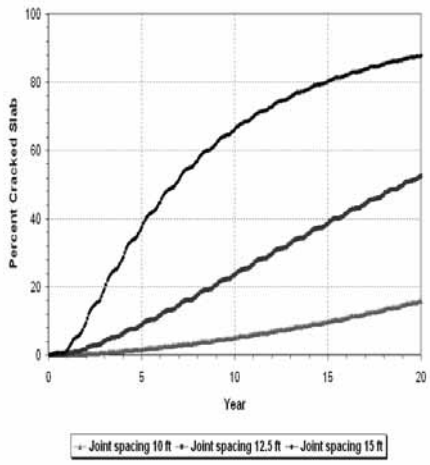


Sensitivity of Predicted PCC Pavement Performance

Subgrade modulus of reaction k

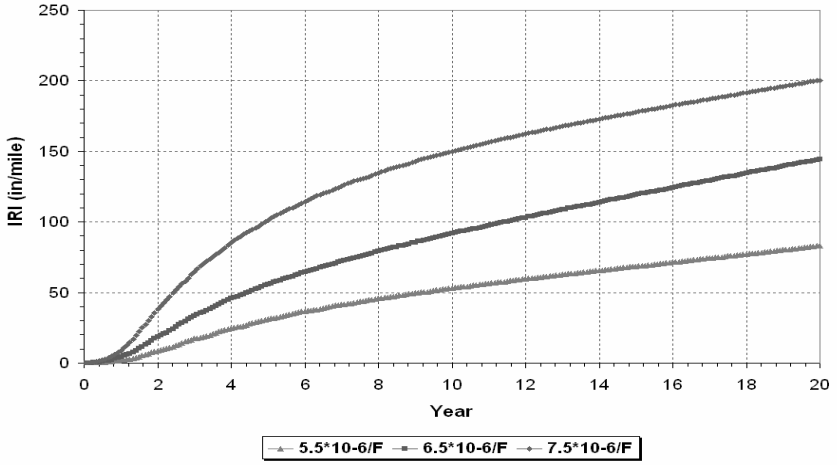


Joint spacing



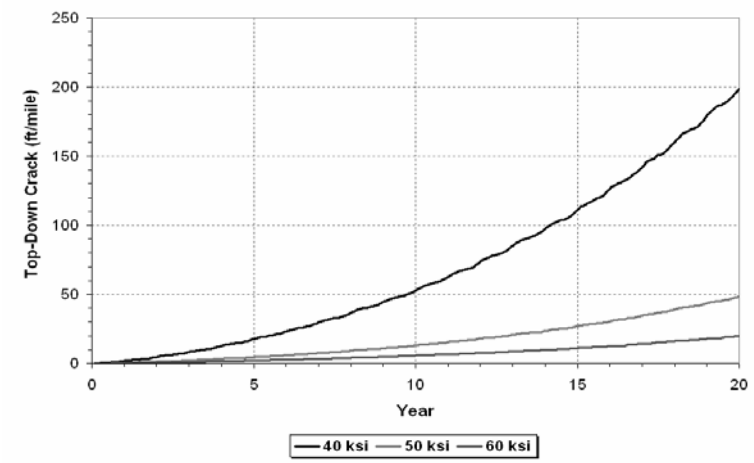
Sensitivity of Predicted PCC Pavement Performance

Coefficient of thermal expansion



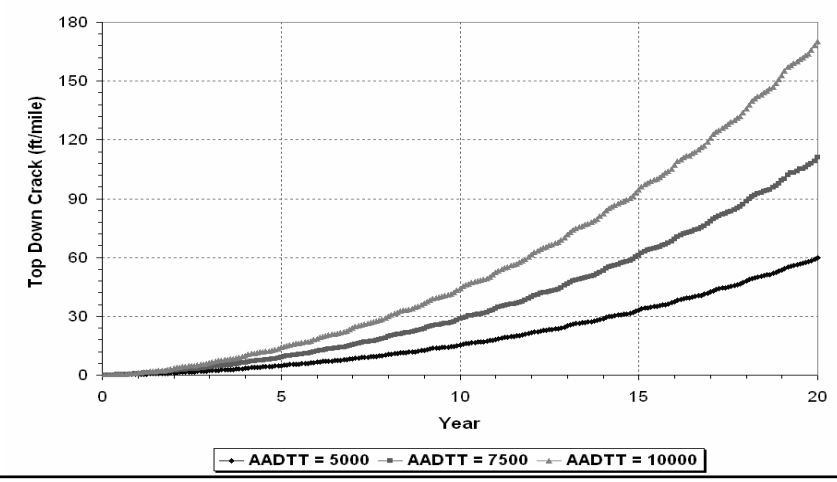
Sensitivity of Predicted HMAC Pavement Performance

Base modulus



Sensitivity of Predicted HMAC Pavement Performance

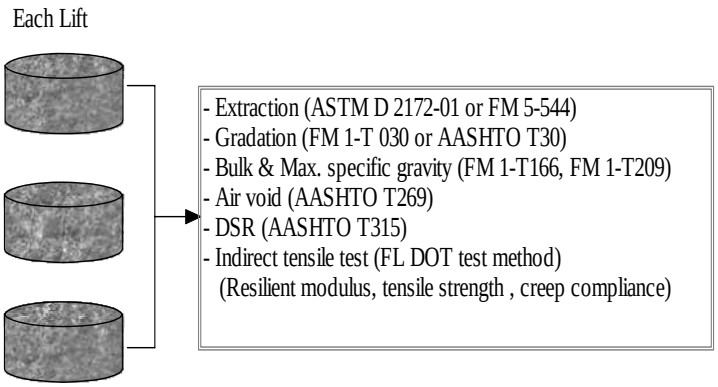
Traffic



Field Test Plan

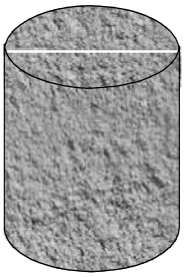
- Coring
- Trenching
- Boring
- Field Measurements
  - → check AC cores to verify crack type
  - → measure layer and lift thickness
  - → measure joint spacing
  - → get ground water table depth

Laboratory Tests on AC Cores

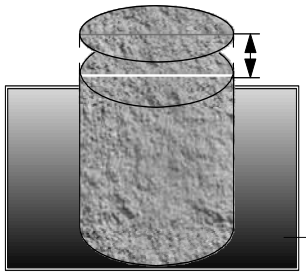


Laboratory Tests on PCC Cores

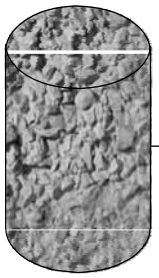
Compression strength
FM 1-T 022 or AASHTO T22



Coefficient of thermal expansion
(AASHTO TP 60)



Laboratory Tests of Underlying Materials



- Gradation (AASHTO T27 or FM 1-T 027)
- Atterberg limits (AASHTO T90 or FM 1-T 090)
- Moisture-density curve (AASHTO T180 or FM 1-T 180)
- Resilient modulus (AASHTO T307)
- Soil suction (Filter paper method)

ME-PDG Project Status

- Calibration sections established
- Field and lab test programs set up
- Coordination visits with Districts underway
- ME-PDG version 0.9 to be released in June
- ME-PDG version 1.0 to be reviewed by AASHTO joint technical committee on pavements in January 2007

Thanks to the Technical Panel

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