PrepME for the Mechanistic-Empirical Pavement Design Guide (MEPDG)

A Presentation to AASHTO

Civil Engineering
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Project Staff

- Principal Investigators
  - Kelvin Wang and Kevin Hall

- Research Staff and Contributors
  - Qiang Li, Vu Nguyen
  - Weiguco Gong, Zhiqiong Hou

- Supported by Arkansas Highways (July 2006 to June 2009)
Existing Project Objectives

- Identify All the Required Inputs & Data
- Design the Supporting Database Tables
- Locate Possible Data Sources
- Develop a 3rd Party Software (PrepME) for MEPDG
  - Import All Raw Data
  - Check the Data Quality and Filter Data Sets
  - Generate Files for MEPDG Software Inputs
  - Integrate All Data Preparation into A Single Platform, PrepME
Required Data for Calibration

- General
- Climate
- Traffic
- Structure & Material

\{ 
- Performance
- Construction & Related Testing Data
- Maintenance
- Research
\} 

Design Inputs

Calibration
Database Structures

- Materials
- Climate
- Traffic

**MEPDG Master Table:**
- Project_ID
- Section_ID
- Latitude
- Longitude
- Elevation
- Functional_Class
- TTC_Class

**Project Files:**
- Performance
- Construction
- Maintenance
PrepME Capabilities

- Import Raw Data
- Traffic Data Check
- Interpolate Climate and Traffic Data
- Retrieve Material Data
- Generate All Input Files for MEPDG
PrepME
For the Mechanistic Empirical Pavement Design Guide
M-EPDG

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Geo-Mapping Utility
Traffic Weight Data Check

PropME Traffic Weight Data Check

MEFD's supporting database files for quality control

Load Spectra
- Axle Type
  - Single
  - Tandem
  - Tridem
  - Quad

Class
- Class 4
- Class 5
- Class 6
- Class 7
- Class 8
- Class 9
- Class 10
- Class 11
- Class 12
- Class 13
- All (4 to 13)

Data Compensation
- None
- Bad Data
- Missing Data

Relaxation Type
- Multiplier
  - 2.0

Station ID: 480037

Processing Done!

Close & Save Changes
Commentary
Traffic Classification Data Check

Vehicle Class Distribution by Month

Station ID: 40432

Year (Month) of Available Data:
- 2004 (Oct, Nov)
- 2005 (Jan, Feb, Mar, Apr, May, Jun, Jul, Aug)
- 2006 (Jan, Feb, Mar, Apr, May, Jun, Jul, Aug)
- 2007 (Jan, Feb, Mar, Apr, May, Jun, Jul, Aug)

QC Details:
- Station ID: 40432
- Manual Count Criteria: N/A
- Percentage of Class 1 Criteria: Pass
- Percentage of Un-Class Criteria: Pass
- Standard Deviation Check: Accepted
- Conclusion: Accepted
- QC Method: Automatic
Software Capabilities-Generated Files

Traffic Files: 11 in total

Materials

Can be imported to MEPDG software

Summary Report

Climate
Importing Data Files into MEPDG Software

- **Import Climate File**
  - Weather Related Data Sets
  - Water Table Depth
  - Elevation

- **Import Traffic Files**
  - Import All the 11 files to MEPDG.

- **Import Retrieved Material Files**
  - Import E* and DSR data.
  - Manually input CTE data.
Import Traffic Files to MEPDG

1. Traffic Volume Adjustment
2. Import/Export Traffic
3. 11 Traffic Files in Total
Future Work

- Traffic Loading Grouping/Clustering
- More Flexible and Powerful Traffic Data QC
- Usable in Multiple State DOTs
- Enhance the Geo-Referencing Features for Design Locations
- Help Facilities Within PrepME Software
- Others
PrepME Software Demo