

The Asphalt Pavement Alliance Presents:

A Five-Part Webinar Series On Mechanistic Empirical Pavement Design Guide (MEPDG) Implementation Specific to Asphalt Pavements

- Part 1: Pavement Design, Where We've Come From and What We're Trying to Accomplish
- Part 2: Local Calibration
- Part 3: Individual Distress Models
- Part 4: Major Inputs – Where Do They Come From & How Do We Get Them?**
- Part 5: Moving Beyond Data Input (Advanced)

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The Asphalt Pavement Alliance Presents:

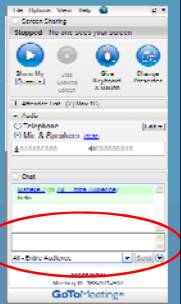
A Five-Part Webinar Series On Mechanistic Empirical Pavement Design Guide (MEPDG) Implementation Specific to Asphalt Pavements

- **Today's Webinar: Part-4**
Major Inputs – Where Do They Come From & How Do We Get Them?
- **Speaker:**
Kevin Hall, PhD., P.E.
Professor and Head of the Department of Civil Engineering at the University of Arkansas
- **Moderator:**
Mike Kvach, APA

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Webinar Protocol:

- **Audio Quality**
 - All attendees have been muted upon joining.
- **Questions & Answers**
 - Questions Box – Make sure to change the drop-down menu to "Organizer & Panelists Only"
- **Recorded Webinars**
 - www.asphaltfacts.com/webinars/
 - Click on: "View Webinars"



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Part 4:
Major Inputs – Where Do They Come From & How Do We Get Them?

- **Speaker:**
Kevin Hall, Ph.D., P.E.
Professor and Head of the Department of Civil Engineering at the University of Arkansas
- **Panelist:**
David Newcomb, Ph.D., P.E.
Senior Research Scientist with the Texas Transportation Institute

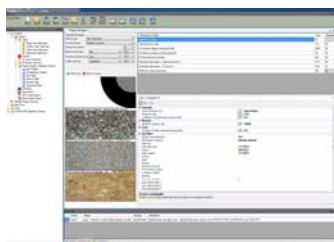
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Major Inputs for Pavement-ME™ :
Where do we get them?

Kevin D. Hall, Ph.D., P.E.
Professor and Head, Dept. of Civil Engineering
21st Century Leadership Chair in Civil Engineering

Dave Newcomb, Ph.D., P.E.
Senior Research Engineer
TTI / Texas A&M University

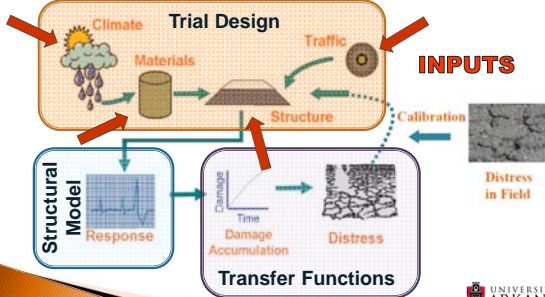
Pavement-ME™ Webinar Series
Presentation #4
Asphalt Pavement Alliance
September 11, 2013



UNIVERSITY OF ARKANSAS
COLLEGE OF ENGINEERING

Pavement-ME™ = MEPDG?

Quick note about terms: "Pavement-ME" is the software package which contains the "Mechanistic-Empirical Pavement Design Guide" (MEPDG). We will use the terms rather interchangeably...



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MEPDG Input Intricacies...

- ▶ Design “Levels”
 - Level 1: Detailed, site-specific; increased “accuracy” and/or “reliability” ???
 - Level 2: Some local, site-specific knowledge; locally-developed correlations
 - Level 3: Default inputs, based on ‘national’ averages; **the level for national calibration!!**
- ▶ Models, models, models...
 - Materials-inputs
 - Traffic
 - Climate
 - And, oh by the way - *performance predictions*



Let’s take a peek at:

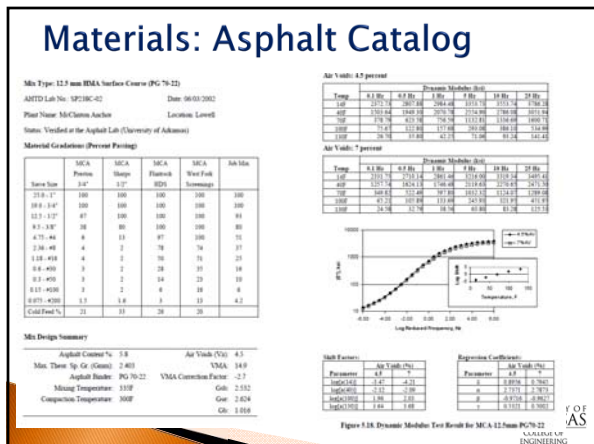
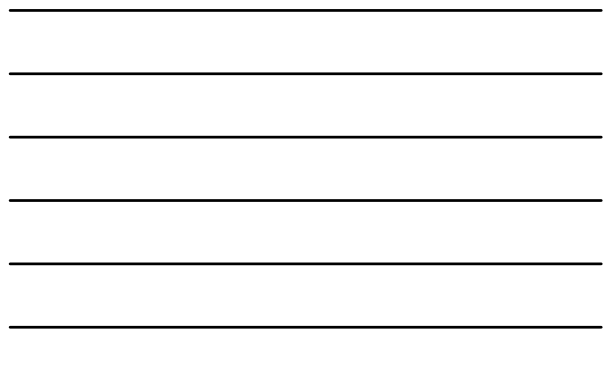
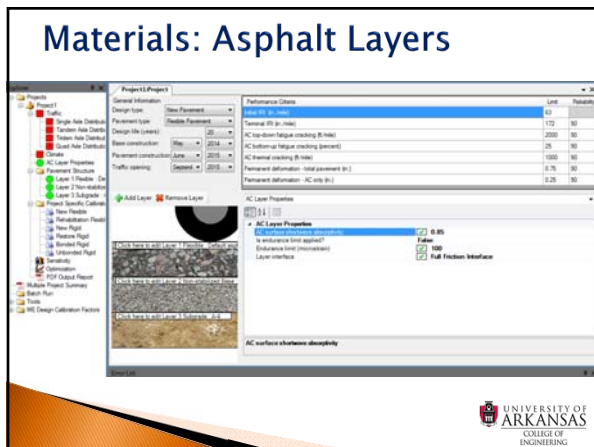
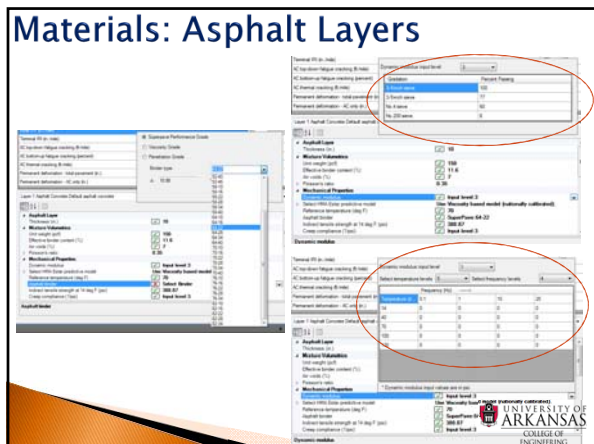


Materials: Asphalt Layers

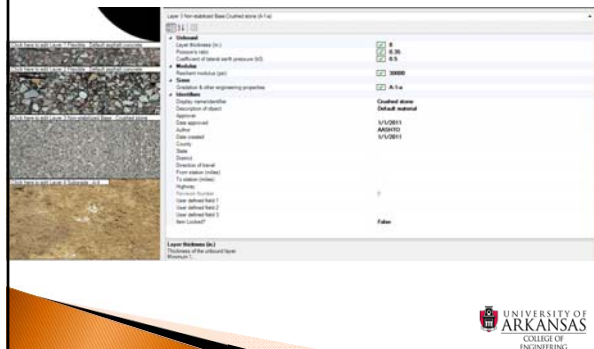
The screenshot displays the software interface for defining an asphalt layer material. It includes a list of properties and their values:

- Asphalt Layer**
 - Thickness (in): 10
 - Mixture Volumetrics
 - Unit weight (pcf): 150
 - Effective binder content (%): 11.6
 - Air voids (%): 7
 - Porosity ratio: 0.30
 - Mechanical Properties
 - Dynamic modulus: Input level 3
 - Select HMA-Elast predictive model: Use Viscoelastic based model (nationally calibrated)
 - Rheometric temperature (deg F): 30
 - Asphalt binder: Select Binder
 - Indirect tensile strength at 14 day F (psi): 269.87
 - Creep compliance (1/psi): Input level 3
 - Thermal
 - Thermal conductivity (BTU/hr-ft-deg F): 0.62
 - Heat capacity (BTU/hr-deg F): 0.23
 - Thermal contraction: 1.301E-05 (calculated)
 - Metadata
 - Default name/identifier: Default asphalt concrete
 - Description of object
 - Author
 - Date created: 10/26/2010
 - Apprver
 - Date approved: 10/26/2010
 - State
 - District
 - County

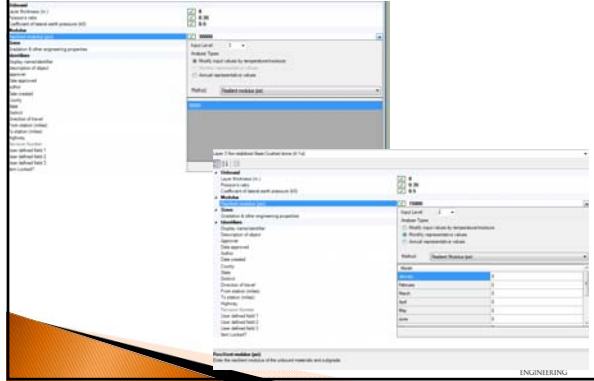




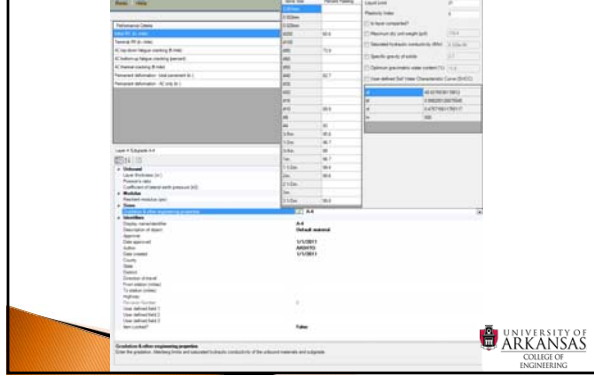
Materials: Unbound Layers



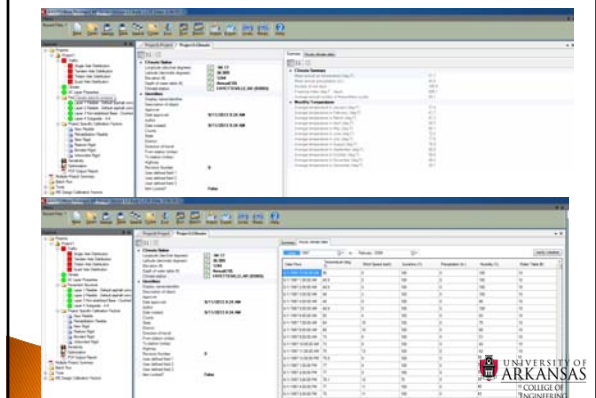
Materials: Unbound Layers



Materials: Unbound Layers



Climate



Climate

"Station" File:

Lat, Long, Elev

93993,FAYETTEVILLE|AR,DRAKE FIELD AIRPORT,36.005,-94.17,1244,19970601,C,20060228

Station Identifiers

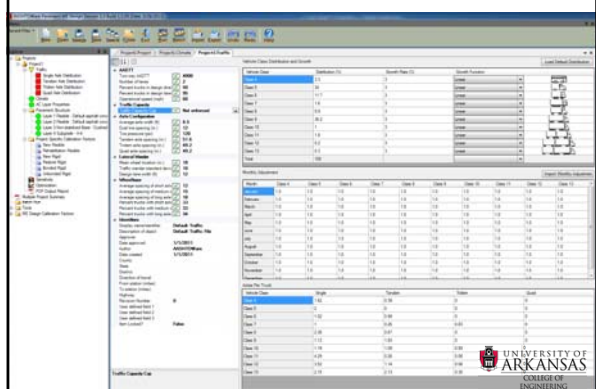
Start Date
"C" - Complete; "M" - Missing
End Date

"HCD" File (one record):

Temp (F) Windspeed (mph) % Rel Humidity
 1997060215,73,5,0,0,57
 Date: Year Mo Day Hr Precip (in)
 Percent Sunshine (% - % Cloud Cover)



Traffic



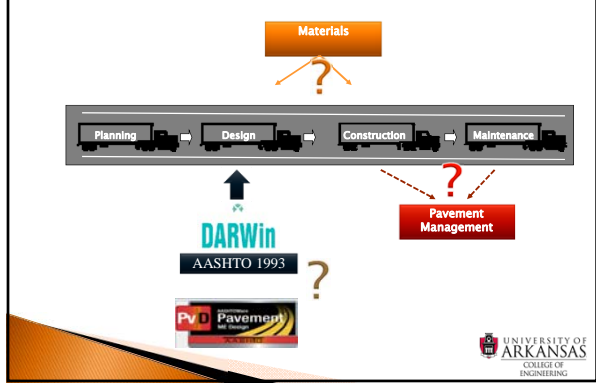
Traffic

The screenshot shows a software interface with a large data table. The table has columns for time (from 0:00 to 24:00) and various traffic-related metrics. The data is organized into rows, likely representing different road segments or vehicle types. The University of Arkansas logo is visible in the bottom right corner.

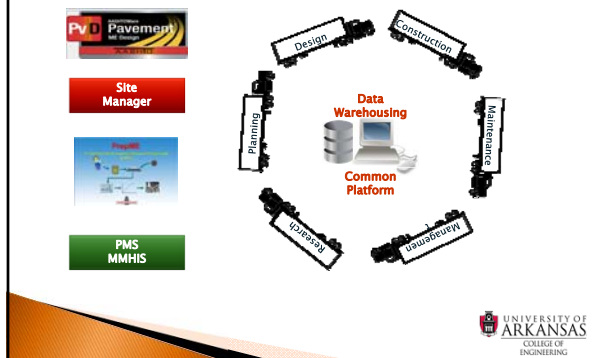
Traffic

The screenshot shows a software interface with a dialog box open. The dialog box contains various configuration options, including a list of vehicle types and their associated parameters. The University of Arkansas logo is visible in the bottom right corner.

Current System???



Vision: Pavement System Engineering



Workflow...

- ▶ Understand (fully) the Current State of Practice
- ▶ Establish Data Flow and "Ownership" (responsible party)
- ▶ Identify line(s) of communication

The University of Arkansas logo is in the bottom right corner.

Data Platform(s)...

Issues

- ▶ Data type(s) and format(s)
- ▶ Existing database properties
- ▶ Missing data

The diagram shows a central 'Data Warehouse' represented by several blue server icons. Five arrows point towards it from labels: 'Traffic', 'Material Test', 'Design record', 'Construction record', and 'Maintenance record'. Above the warehouse is an orange box labeled 'GIS-based User Interface' with a yellow arrow pointing down to the warehouse. A small icon of a person at a computer is to the right. The University of Arkansas logo is in the bottom right corner.

LET'S WRAP IT UP...



- Pavements are **systems** - we must engineer them as such
- Lots of folks/divisions/sections/offices are involved in generating a pavement design using Pavement-ME™
 - **Communication is more critical than ever**
- Agencies & Contractors must establish a clear work flow for data
- Design and materials catalogs are a very reasonable approach to generating needed data
- Defaults are good! Make **wise** investments in generating inputs



QUESTIONS?



Thank You!

Next Webinar: Thursday, September 12th

Part 5: Moving Beyond Data Input (Advanced)

Register at: www.asphaltfacts.com/webinars/

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