



Materials Division Updates VAA Spring Meeting

March 22, 2013

Andy Babish, P.E.

State Materials Engineer

Materials Division Updates

Quiet Pavement Technology

VDOT's Pavement Recycling Initiative

Asphalt Quality Task Force

Pavement Design – AASHTOWARE ME (formerly MEPD)

R&B Specifications Book (211 and 315)

MITIS/PLAID Database system

Materials Division Updates

Quiet Pavement Technology

- **Legislation passed extending study to 2015**
 - **NCAT test sections constructed in 2012**
(durability and noise abatement properties)
 - **Extended period to further evaluate Virginia sites**
(winter impacts and noise abatement properties)
- **Preliminary; Greatest reduction in noise**
AR – PFC 9.5, 3-4 dBA in reduction compared to SMA control

Materials Division Updates

Quiet Pavement Technology



Materials Division Updates

VDOT's Pavement Recycling Initiative

- Specifications and Project Selection Guidelines published in November of 2012
- Research – NCAT Test Sections constructed
 - Evaluating durability, engineering properties



Materials Division Updates

Asphalt Quality Task Force

- **Joint Density readings required**
- **Performance milling option**
- **Rideability spec applications**
 - Effectiveness of Incentive only?
 - Are current monetary adjustments commiserate with effort?
- **Uniformity/segregation measurement?**



Materials Division Updates

Mechanistic-Empirical Pavement Design Initiative (MEPD)

- **New AASHTO Pavement Design Methodology and software**
- **Incorporates Engineering properties of Materials as input**
- **Utilizes performance characteristics of materials in modeling and predicting behavior over time**
- **Replaces the current 1993 AASHTO procedure**

Materials Division Updates

Mechanistic-Empirical Pavement Design Initiative (MEPD)

Existing Design procedure based on 1950's AASHO Road Tests. Results were empirical relationships for design based on 1950's era traffic.

Current designs are based on traffic volumes an order of magnitude greater than design procedure was based on.

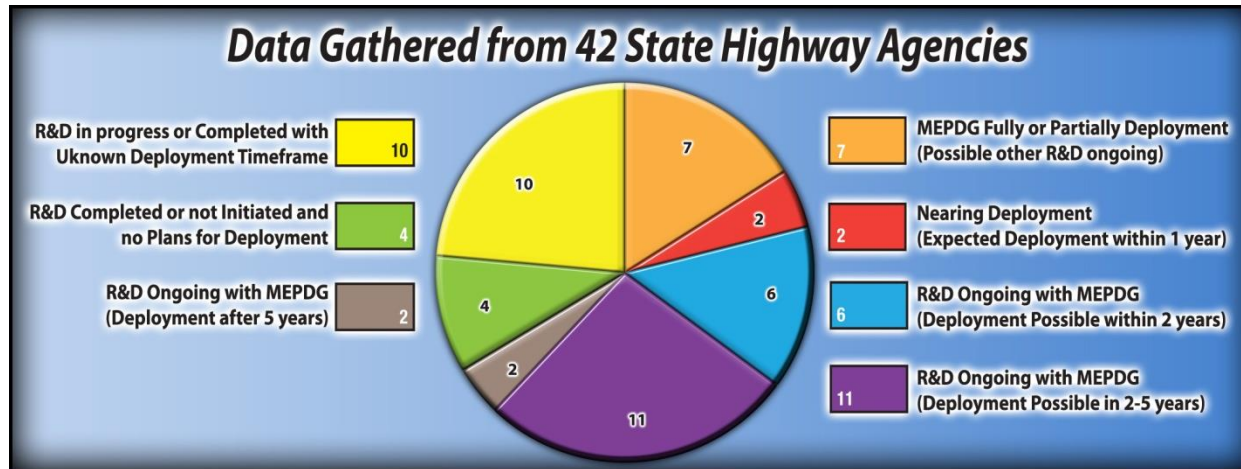
Current design procedure has no mechanism to adequately predict performance, relies on empiricism.

Materials Division Updates

MEPD

- **National efforts –**
 - **AASHTO Interim Design Guide published in 2008**
 - **AASHTO Software made available in 2011**
 - **Multiple on going research projects related to the refinement and implementation**
 - **More than 30 states are currently in some phase of implementation**
 - **7 States have implemented (partially or fully) and currently using as the design method**

Materials Division Updates



Materials Division Updates

MEPD

- **Inputs and Outputs**

In any analysis;

Quality of information going in has an impact on reliability of information coming out.

Inputs

Materials Characterization – Establishing catalog of engineering properties for associated materials used;

Sugrade Materials

Subbase and Base Aggregate Materials

HMA materials

Materials Division Updates

MEPD

- **Inputs (cont)**

 - Traffic loading characteristics

 - Environmental conditions

 - Performance expectations (failure criteria);

 - Ride-ability

 - Rutting

 - Cracking

 - Punchouts

 - Faulting

- **Outputs**

 - **Pavement structure that meets performance expectations under given input conditions.**

 - Predicts various distresses over the design life

 - Predicted distresses varies with different levels of reliability

Materials Division Updates

- **Target Deployment Timeframe – Winter of 2014**
- **Status of efforts :**
 - **Materials characterization – *complete May 2013***
 - **Traffic load characterization – *complete (13 WIM sites collecting data)***
 - **Software acquisition – *complete***
 - **Training – *ongoing***
 - **Performance model calibration – *Summer 2013***
 - **Publication of interim user manual – *Summer 2013***

Future activities:

Training

Continued refinement

Inclusion of recycled materials

Materials Division Updates

Challenges

- New design procedure; element of “unknown”
- MEPD will not provide the exact same designs as 1993 AASHTO method
- Performance model predictions; never been incorporated in AASHTO pavement design tool before.
- Dynamic; ongoing national efforts revising the models
- MEPD is a journey
 - Learning curve
 - We crawl, we walk, we run...

Over time, we will be able to more adequately predict performance thus improving the links between;

Design – Construction – Performance

Design Optimization can yield cost savings

Materials Division Updates

2014 Road & Bridge Specifications

- Incorporate standard specifications adopted into practice since last publishing of book
 - Supplemental Specifications
 - Special Provisions

Book to be published late Spring – early summer 2014

Materials Division Updates

MITTS and PLAID Database system

- Mandatory now for HMA
- Implementing CMA this construction season
- Mandatory for CMA in 2014

MITTS – For VDOT user (within firewall)

PLAID – For external users

Need PC and internet connection

- Continued refinement with usage

Thank You!