Asphalt Expert Task Groups

Provide a forum for Government, Industry, and Academia in the discussion of ongoing asphalt binder and mixture technology and to provide technical input for current and future research, development, and specifications.
Asphalt Expert Task Groups

• Asphalt Mixture & Construction ETG
  • Week of March 19th in Baton Rouge, LA

• Asphalt Binder ETG
  • Week of March 19th in Baton Rouge, LA

• Warm Mix Asphalt TWG
  • July, 2012

• High RAP/RAS ETG
  • July, 2012

• Pavement Sustainability TWG
  • April 25-26 at UC Davis in Sacramento, CA
Technical Discussion & Input

Asphalt Program

- Mixture & Construction ETG
  - WMA Task Group
  - RAP/RAS Task Group
  - Performance Testers TG
  - Construction Task Group
  - Others as Needed
- Binder ETG
  - MSCR Task Group
  - Linear Amplitude Sweep TG
- Models ETG
  - GTR Task Group
  - Others as Needed
- Sustainability ETG

Others as Needed
Asphalt Binder ETG – Key Activities

• Multiple Stress Creep Recovery Specifications
  — TP-70 MSCR Test of Asphalt Binder Using DSR
  — Performance-Graded Asphalt Binder Using MSCR

• CRM within the PG System

• Clean-up AASTO test Standards

• Input to SOM
Multiple Stress Creep Recovery Test Method

• Challenge:
  — Current Superpave HT Binder spec, $G^*/\sin \delta$ inadequately predicts modifier behavior

• Solution... MSCR ($J_{nr}$):
  — Existing equipment but at actual pavement temperatures
  — AASHTO MP-19 and TP-70
  — Correlates to rutting for both neat & polymer modified binders
MSCR - Implementation Efforts

- Regional workshops AI / FHWA
- AI/FHWA/AMRL testing Precision & Bias
- Developing user literature – AI / FHWA
- User Producer Groups “round robin” repeatability testing (NE & SE)
Ground Tire Rubber, GTR

- GTR blending study – size, source, %
- Evaluate GTR modified binders to PG and MSCR specifications
- Potential crude source dependency
- GTR size will effect test results
  - Particles should 1 mm size or less in DSR
  - DSR fixture change
- Careful formulation is needed to meet all $J_{nr}$ specs
  - but it can be done successfully
AI and the FHWA

- FHWA is working with the Asphalt Institute to assist States to effectively understand and implement MSCR & better understand GTR
Asphalt Mix ETG – Key Activities

• Asphalt Mixture Performance Tester

• Mix Design Manual  NCHRP 9-33

• Mixing & Compaction Temperature (NCHRP 9-39)

• Input to SOM
Asphalt Mix Performance Tester

- Refined under NCHRP 9-29
- Provides DARWin™ input (MEPDG)
- Dynamic Modulus $|E^*|$ and Flow (Fn)
- AASHTO TP-79 procedure
- Pooled Fund & Training
AMPT

- Dynamic Modulus, $|E^*|$
  - key input for DARWin asphalt mixtures
- Flow Number (Fn)
  - relation to mixture rutting performance
  - More than 1 approach to determine Fn
Asphalt Mix Performance Tester
Equipment & Training

• Pooled fund for training and equipment purchase AMPT - 22 States (TPF5-178)

• Technician training for operation of the equipment (AAT contractor/NCAT Lab)

• Remaining issue with determination Fn– Current Round Robin
AMPT Pooled Fund Study
TPF-5(178)

- Objectives
  - Procure AMPT for highway agencies
  - Provide training on AMPT
  - Support national AMPT implementation

- Progress and Schedule
  - 12 AMPTs delivered
  - Remainder in 2012
  - Training course completed/materials available
  - National Pooled Fund Conference 2012
    - September 21st 2012 in Atlanta, GA
  - 2012 Regional Conferences TBD
  - 2013 International Performance Tester Conference
    - FHWA working with NCAT
AMPT Pooled Fund Study
TPF-5(178)

- Participants
  - Alabama
  - Colorado
  - Connecticut
  - Florida
  - Georgia
  - Illinois
  - Kansas
  - Kentucky
  - Maine
  - Maryland
  - Nevada
  - New Hampshire
  - New Jersey
  - New York
  - North Carolina
  - Oregon
  - Pennsylvania
  - Tennessee
  - Utah
  - Virginia
  - Wisconsin
  - Wyoming
  - Ontario
  - FHWA – Lead agency
NCAT and FHWA

- FHWA is working with NCAT (Cooperative Agreement) to assist States to effectively address flexible pavement challenges in AMPT & DARWin.
Mix Design Manual
NCHRP 9-33 (AAT) & 9-33A (ASU)

- Report: [http://www.trb.org/Main/Blurbs/165467.aspx](http://www.trb.org/Main/Blurbs/165467.aspx)
  - A Manual for Design of Hot-Mix Asphalt with Commentary
  - Adapting Specification Criteria for Simple Performance Tests to HMA Mix Design

- Performance Tester Criteria
- 9-33 maintain existing N_{design} criteria
- Proposed Specification: to be used as a preliminary selection of mix parameters as a starting point for mix testing...
RAP/RAS ETG – Key Activities

- **High RAP Mix Design NCHRP 9-46 (Active)**
  - NCAT
  - Investigation of Low Temp RAP-Mix Properties
  - Contribution of RAP/RAS binder % toward total binder % in the mix

- RAS Pooled Fund
- Workshops/ Publications

Website: www.moreRAP.us
RAP/RAS ETG – Key Activities

• Usage: NAPA Member Survey

Current Guidelines

AASHTO M 323 Standard Specification
for Superpave Volumetric Mix Design

<table>
<thead>
<tr>
<th>Recommended Virgin Asphalt Binder Grade</th>
<th>Percent RAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>No change in binder selection</td>
<td>&lt; 15</td>
</tr>
<tr>
<td>Select virgin binder grade one grade softer than normal</td>
<td>15 – 25</td>
</tr>
<tr>
<td>Follow recommendations from blending charts</td>
<td>&gt; 25</td>
</tr>
</tbody>
</table>
RAP % Based on % Binder

• Historically, Agency limit RAP based on % by weight of total mix – need change to M323?
• With high RAP contents, the primary issue is impact on binder properties
• Determine contribution of RAP binder toward total binder in the mix, by weight
  • Example, “70% of binder content must be virgin” or “no more than 30% binder content can come from RAP or RAP & RAS”
NCHRP 9-46
“Mix Design and Evaluation Procedure for High Reclaimed Asphalt Pavement Content in HMA”

- Develop mix design method & specification for Mixes containing up to 50% RAP
- Test method for measuring properties of composite binder, test mix back-calculate binder properties
- Specification for RAP quality and processing
Performance of Recycled Asphalt Shingles in Hot Mix Asphalt – Pooled Fund Study

- Best practices for using RAS in Mixes with focus on material properties & mixture performance
- Participants FHWA, MO, IA, MN, IN, and CO
- Also QC/QA concerns, demo projects, performance database

http://www.pooledfund.org/projectdetails.asp?id=1208&status=1
FHWA Field Support – Mobile Lab

• Mobile Asphalt Testing Laboratory (MATL)
  – Site Visit
  – Field Data/Testing
  – Use/Demo Emerging Test Devices
Pavement Website
http://www.fhwa.dot.gov/pavement
Thank You