Advancement of Innovative Asphalt Technology
FHWA NAPA Cooperative Agreement

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National Asphalt Pavement Association
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What we’re going to talk about...

- Goal
- Government and Industry Partnership
- Technical Approach for Advancing Asphalt Technology
- Outcomes & Deliverables
Goal:
Advance Research and Deploy Innovative Asphalt Technology to Enhance Performance and Reduce Cost
FHWA/NAPA COOPERATIVE AGREEMENT

• NAPA has been awarded a $2.5 million agreement for “Advancement of Innovative Asphalt Technology”

• Partnership provides a mechanism to advance innovative technologies

• Agreement is for 5 years, FY 2014-2018
Leverage NAPA’s expertise in leading innovation advancement including:

- Conferences and workshops
- Presentations at government and industry events
- Webinars, Publications
- Surveys for benchmarking
- Multimedia tools
• The innovation team includes:
  • NCAT
  • Texas A&M Transportation Institute
  • Advanced Asphalt Technologies
  • Industry Consultants
  • State Asphalt Pavement Associations
Purpose and Objectives

• Purpose: “the advancement of new and innovative technologies to design, specify, construct, and preserve pavements.”

• Objectives

  1. Promote the deployment and adoption of state-of-the-art innovative materials, design procedures, specifications, practices, and construction methods to improve asphalt pavement performance and extend the life of our transportation facilities.

  2. Replace or update multiple documents that have been developed in the last decade or earlier to improve the performance of asphalt pavements to reflect today’s technology.
Target Audience

- Asphalt Material Community
  - State and local agencies
  - Industry
  - Manufacturers
  - Suppliers
  - Producers
  - Field construction companies
  - Researchers/academia

- Group Involvement
  - AASHTO
  - Transportation Research Board
    - National Cooperative Highway Research Program
  - Strategic Highway Research Program
  - Expert Task Groups
  - Technical Working Groups
Tasks

Task 1: Kick-off Meeting – COMPLETE

Task 2: Agreement Work Plan Process

Task 3: Support Deployment and Rapid Adoption of Innovations

Task 4: Administrative and Technical Support of Technical Information
**Innovation Areas**

A. Materials

B. Recycling Materials for Asphalt Pavements

C. Design, Specifications, Best Practices

D. Real-time Pavement Construction Controls

<table>
<thead>
<tr>
<th>Reference Number</th>
<th>Technical Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1</td>
<td>Identify, enhance, revisit for implementation of advanced asphalt material technologies. (WMA, SMA’s, Perpetual Pavements, etc.)</td>
</tr>
<tr>
<td>A.2</td>
<td>Implement improved methods for materials testing with emphasis on relation to pavement design (AASHTO Pavement-ME, perpetual pavements, etc.) and pavement performance.</td>
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<tr>
<td>B.1</td>
<td>Identify, enhance and implement recycled/reclaimed materials in advanced asphalt material technologies (RAP, Binder Replacement, RAS, GTR, etc.).</td>
</tr>
<tr>
<td>B.2</td>
<td>Effects of RAP, RAS, GTR, etc. on mixture performance.</td>
</tr>
<tr>
<td>B.3</td>
<td>Industrial Resource Council materials used in asphalt materials (coal combustion products, foundry sands, iron, steel slags, etc.).</td>
</tr>
<tr>
<td>C.1</td>
<td>Promote technologies that aid in rapid asphalt mixture production and construction, and acceptance including minimum oversight warranties.</td>
</tr>
<tr>
<td>C.2</td>
<td>Identify and advance various risk assessment tools that impact asphalt mixture Quality Assurance standards/specifications (statistical based criteria for testing materials and production operations, Percent Within Limits (PWL), SpecRisk, etc.).</td>
</tr>
<tr>
<td>C.3</td>
<td>Understand and promote the benefits of the use of Volumetrics in the asphalt materials acceptance process and the critical related information to advance pavement performance.</td>
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<tr>
<td>C.4</td>
<td>Synthesize for implementation asphalt sustainability life cycle analysis (LCA) tools.</td>
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<tr>
<td>C.5</td>
<td>Synthesize for implementation economically sound life cycle cost analysis (LCCA) tools related to asphalt materials.</td>
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<tr>
<td>C.6</td>
<td>Identify, update or develop, “best practices” for the use of: Shingles, ground tire rubber, pavement compaction, and flow number, rut testers, etc.</td>
</tr>
<tr>
<td>C.7</td>
<td>Identification and promotion of the critical asphalt material compaction issues (Plant, laydown, and rolling temperatures, moisture in the mixtures, equipment, construction operations, compaction measurement tools, specifications, etc.).</td>
</tr>
<tr>
<td>D.1</td>
<td>Identification and promotion of the relationships of mixture properties as related to the compaction of the asphalt materials.</td>
</tr>
<tr>
<td>D.2</td>
<td>Identification and promotion of the relationships of layer thickness as related to the compaction of the asphalt materials.</td>
</tr>
<tr>
<td>D.3</td>
<td>Advance further implementation of Intelligent Compaction processes including pass coverage, uniformity and pavement temperatures.</td>
</tr>
<tr>
<td>D.4</td>
<td>Promote implementation of thermal profiling during for construction operations.</td>
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Deliverables – FY2014-15

- Cooperative Agreement Overview Presentation
- Pavement Economics and LCCA for Asphalt Pavements
  - Article in Asphalt Pavement magazine – March/April 2014 issue
  - Webinar – June 4th, 2014
- High Binder Replacement (Recycled) Mixtures
  - Tech Brief
  - Webinar – Sept. 25th, 2014
- RAP Management Best Practices Industry Publication
- Recycled Materials and WMA Survey for 2013
- Porous Asphalt Pavements Tech Brief
- Support for Sustainability Conference – November 2014
Deliverables – FY2014-15 continued...

• Recycled Materials and WMA Survey for 2014
• Best Practices for Recycled Tire Rubber in Asphalt Pavements
  • Publication
  • Tech Brief
• National Conference – High Performance Asphalt Pavements for Long-Life
General Deliverables

• Annual Work Planning and Review – October – December

• Quarterly Reports

• Annual Report due in July

• Yearly Summary Report due in September
An Eye towards the Future:
Over the next five years....
<table>
<thead>
<tr>
<th>Industry Publications For Updating</th>
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<table>
<thead>
<tr>
<th>Innovation Area</th>
<th>Publication ID</th>
<th>Publication Title, Month/Year of Publication</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>IS-128E</td>
<td>HMA Pavement Mix Type Selection Guide 2/01</td>
<td>NAPA and FHWA pub part of Superpave implementation. Change so fine graded mixes may be recommended for high volume roads.</td>
</tr>
<tr>
<td>A.1</td>
<td>IS-131E</td>
<td>Porous Asphalt Pavements for Stormwater Management 11/08</td>
<td>Include growing use of porous pavements for roads and shoulders. Include parking lots at rest areas and park and rides.</td>
</tr>
<tr>
<td>A.1, A.2</td>
<td>QIP-122E</td>
<td>Designing and Constructing SMA Mixtures 1/99</td>
<td>Joint FHWA/NAPA publication. Should be updated to reflect recent changes.</td>
</tr>
<tr>
<td>A.1</td>
<td>IS-132E</td>
<td>Rubblization 1/06</td>
<td>See IS-117 above.</td>
</tr>
<tr>
<td>A.1</td>
<td>QIP-125</td>
<td>WMA: Best Practices 1/12</td>
<td>Based on 2\textsuperscript{nd} International WMA Conference, may need updating after NCHRP WMA projects are complete.</td>
</tr>
<tr>
<td>B, B.1, B.2</td>
<td>IS-136E</td>
<td>Guidelines for the Use of Reclaimed Asphalt Shingles in Asphalt Pavements 11/09</td>
<td>Needs updating based on current research results, e.g. Missouri led pooled fund study</td>
</tr>
<tr>
<td>B, B.1, B.2</td>
<td>QIP-124E</td>
<td>Designing HMA Mixtures With High RAP Content: A Practical Guide 3/07</td>
<td>NCHRP 9-46 project and synthesis on binder replacement should provide information to update this publication.</td>
</tr>
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## Industry Publications For Updating

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<tr>
<td>C</td>
<td>QIP-123E</td>
<td>Design, Construction, and Performance of Heavy Duty Mixes 6/02</td>
<td>High volume roads and intermodal facilities are covered.</td>
</tr>
<tr>
<td>C.6, C.7</td>
<td>QIP-121E</td>
<td>Longitudinal Joints: Problems and Solutions 1/98</td>
<td>Out of date.</td>
</tr>
<tr>
<td>C, D</td>
<td>QIP-112</td>
<td>Constructing Quality HMA Pavements - A Troubleshooting Guide 2/03</td>
<td>NAPA’s most popular publication of benefit to contractors and agencies. Needs updating.</td>
</tr>
<tr>
<td>D, D.3</td>
<td>IS-121E</td>
<td>Roller Operations For Quality 1/02</td>
<td>Needs update of latest technology including intelligent compaction.</td>
</tr>
<tr>
<td>D.4</td>
<td>IS-125E</td>
<td>Paver Operations For Quality 12/02</td>
<td>Out of date.</td>
</tr>
<tr>
<td>D</td>
<td>QIP-110E</td>
<td>Segregation: Causes &amp; Cures for HMA 8/77</td>
<td>Joint NAPA /AASHTO. Needs to account for thermal segregation and possibly use of infrared bar.</td>
</tr>
<tr>
<td>D</td>
<td>QIP-118E</td>
<td>Cold Weather Compaction 4/92</td>
<td>Out of date. Update with WMA and MultiCool</td>
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</table>
New Publication Topics

- Pavement and Mixture Design for Low Volume Roadways
  - Based on NCAT Report 13-05 Thin HMA Overlays for Pavement Preservation and Low Volume Asphalt Roads

- LCCA Practices for Asphalt Pavements

- Incorporating Performance Testing into Mix Design Procedures

- Best Practices for Using Real Time Feedback During Construction

- Rapid Construction and Paving Operations
Additional Topics

- Incorporating User Delay Costs in LCCA – Tech Brief
- Rapid Construction and Improvements in QC Testing
- Education and Training of Consultants and Large Design-Build Firms
- Perpetual/Long-life Pavements
  - Holistic Approach for Design of Asphalt Pavements with Perpetual Concepts
- Demonstration Projects
- Industrial Resource Council Materials in Asphalt Pavements
- Minimum Oversight Warranties
- The Use of Volumetrics
- Minimum Layer Thickness needed for Compaction
For More Information:
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