Mobile Asphalt Technology Center (MATC) & Asphalt Binder and Mixture Laboratory – Implementation & Delivery (ABML-ID)

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Federal Highway Administration – HQ
Office of Preconstruction, Construction and Pavements
<table>
<thead>
<tr>
<th>Acronyms</th>
<th>Description</th>
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<tbody>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
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<tr>
<td>ABML-ID</td>
<td>Asphalt Binder and Mixture Laboratory – Implementation Division</td>
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<tr>
<td>AIDPT</td>
<td>Accelerated Implementation and Deployment of Pavement Technologies</td>
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<tr>
<td>AIMS</td>
<td>Aggregate Imaging Measurement System</td>
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<td>AMPT</td>
<td>Asphalt Mixture Performance Tester</td>
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<td>ASTM</td>
<td>American Society for Testing and Materials</td>
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<td>BMD</td>
<td>Balanced Mix Design</td>
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<td>DO</td>
<td>FHWA Division Office</td>
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<td>DPS</td>
<td>Density Profiling System</td>
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<td>ETG</td>
<td>Expert Task Group</td>
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<td>FLH</td>
<td>FHWA Federal Lands Highway</td>
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<td>FTIR</td>
<td>Fourier Transform Infrared Spectroscopy</td>
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<td>GTR</td>
<td>Ground Tire Rubber</td>
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<td>HICP</td>
<td>FHWA Office of Preconstruction, Construction, and Pavements</td>
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<td>I-FiT</td>
<td>Illinois Fatigue Test</td>
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<td>MATC</td>
<td>Mobile Asphalt Technology Center</td>
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<td>NCHRP</td>
<td>National Cooperative Highway Research Program</td>
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<td>NDE</td>
<td>Nondestructive Evaluation</td>
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<td>PEM</td>
<td>Performance Engineered Mixtures</td>
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<td>PMS</td>
<td>Pavement Management System</td>
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<td>PRS</td>
<td>Performance-Related Specifications</td>
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<td>QA</td>
<td>Quality Assurance</td>
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<td>R&amp;D</td>
<td>Research &amp; Development</td>
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<td>RC</td>
<td>FHWA Resource Center</td>
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<td>SAPA</td>
<td>State Asphalt Pavement Associations</td>
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<td>SCB</td>
<td>Semi-circular Bend</td>
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<td>SMA</td>
<td>Stone Matrix Asphalt</td>
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<td>SSR</td>
<td>Stress Sweep Rutting</td>
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<tr>
<td>SSR</td>
<td>Stress Sweep Rutting</td>
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<td>TFHRC</td>
<td>Turner-Fairbank Highway Research Center</td>
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<td>TxOT</td>
<td>Texas Overlay Text</td>
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<tr>
<td>UAS</td>
<td>Unmanned Aerial Systems</td>
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<tr>
<td>XRF</td>
<td>X-Ray Florescence</td>
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Agenda

MATC
- Status
- Future Vision
- Activities

ABML-ID
- Background
- Process
- Project logistics
Mobile Asphalt Technology Center (MATC)

Program Goal

Innovative technologies and practices are implemented by agencies and industry to provide longer-lasting, safer, sustainable, and more cost-effective asphalt pavements on our nation’s highways.
MATC - MISSION

Bridging the Gap...
MATC – Team Members

Leslie McCarthy
Federal Program Manager

Brendan Morris
Project Manager
Asphalt Mixture Design, Production, Field Operations, Quality Control / Testing

James Barker
Senior Laboratory Technician
Electro/Mechanical Mixture Design / Testing

Ram Veeraragavan
Project Engineer
Data Analysis Performance Testing

Samantha Grove
Marketing Specialist
Marketing, Communications Social Media

Otto Arrieta-Cardenas
Field Technician
Field Operations / Field Testing

Michael Huner
Subject Matter Expert
Materials and Construction Specifications
MATC Objectives

- Demonstrate emerging technologies & maintain focus on customer needs
  - Tiered technical assistance and troubleshooting
  - Specification review and development
  - Equipment loan program
- Deploy technology from TFHRC, Every Day Counts, other research & development (R&D)
  - Workshop activities that yield measurable outcomes
- Leverage the asset for whole Pavements program & increase MATC’s impact
  - Integrated more fully with FHWA R&D, Resource Center, Federal Lands Highway, and Division Offices
MATC Mission Approach

- **Project Site Visits**: Independent party with a national perspective
- **Customized Training Workshops**: Test results and observations facilitates implementation
- **Equipment Loan Program**: Loan equipment to partners to gain hands-on experience
- **Technical Guidance**: Topical guidance documents based on national trends
MATC can serve as conduit to deploy initiatives and tools from many pavement-related areas.
MATC Activities

Core Activities of MATC

- Support performance engineered pavements (PEP)
- Demonstrating test methods
- On-site support (States, FLH)
- Equipment training
- Case examples developed from innovation trials
- Specification review (QA, materials, construction)
- Equipment loan program
- FHWA DO Rotational

Deployment
- Quality in Asphalt Paving Workshop: multiday, focused on flexible pavement
- Recorded video briefs: topical to MATC equipment

Level of troubleshooting
- On-site: within scope of standard or agency spec.
- In-depth: direct to FHWA ABML-ID

Post-installed pavement
- Density, sustainability, M&P option selection
- Surface characteristics (smoothness, etc.)
- Monitoring performance (handheld, other tech.)
New MATC Activities for 2020

- Offer construction & materials specification review for each project
- MATC program webpage updates & recorded video briefs
- Deploy Equipment Loan Program
- Grow the FHWA DO and FLH Rotational Assignments (6 already pending for 2020)
- Develop Asphalt Quality and Innovation Workshop
- Demonstrate additional materials & construction tools
# Technologies offered by MATC

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<tr>
<th><strong>Mixture Tests</strong></th>
<th><strong>Materials Tests</strong></th>
<th><strong>Field Tests</strong></th>
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<tr>
<td>AMPT suite of tests ($</td>
<td>E^*</td>
<td>$, cyclic fatigue) for PRS</td>
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<td>Overlay Test for reflective cracking</td>
<td>ABT (true grade of binder)</td>
<td>MIT-Scan 3 for in-place pavement thickness</td>
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<td>Flexibility index test (I-FIT) for fracture resistance</td>
<td>* FTIR looks at molecules in binder (lime, polymers,...)</td>
<td>Circular Texture Meter for measuring mean profile depth</td>
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<tr>
<td>ITC (IDEAL-CT) for crack resistance</td>
<td>* Binder grade verification</td>
<td>Density profiling system (DPS) for in-place density</td>
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<tr>
<td></td>
<td>* Done at TFHRC</td>
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**Other support activities:**
- PaveME Design analysis
- * FlexMAT & FlexPAVE
- HMA materials spec review
- Construction density spec review (mat and joints)

* Done at TFHRC
Past Visits and 2020 Requests... so far

PR image: Courtesy of Vector Stock
Typical Site Visit by MATC

**Planning Call**
with DOT and FHWA Div.

**Logistics**
with DOT and Contractor

**Kickoff Meeting**
with DOT, Contractor, and FHWA Div. on-site

**Open House**
with DOT, SAPA members, LPAs, ACEC, etc.

**On-Site Testing**
at Plant and Field sites

**Closeout Meeting**
with DOT, Contractor, and FHWA Div. on-site

**Final Close-out Webinar & Report**
with DOT, Contractor, SAPA, and FHWA Div.

**Start**
1-hr call webinar

**During**
60 days emails

**First week on-site**
2-hr meeting & call-in

**2nd week on-site**
2-hr presentations (plus web access), 2-hr tour at MATC

**2.5 – 3 weeks**
at MATC and at paving site

**End of last week at MATC**
1-hr meeting

**Total Time:**
5 mos.

**Onsite Time:**
3 weeks

**Within 60 days after site visit**
1.5-hr webinar
Asphalt Binder and Mixture Laboratory – Implementation and Delivery (ABML-ID)

David J. Mensching
(202) 493-3232
David.Mensching@dot.gov
What Led Us to ABML-ID?

• The Mobile Asphalt Testing Trailer had operated the Asphalt Binder Testing Laboratory for 25+ years
  – Primarily housed at TFHRC
  – Recently housed at AAT in Kearneysville, WV

• Critical review conducted by D. Mensching in 2017/18
  – Need for revamp of binder lab location and resource identified
  – Summer/Fall 2018 – determination made within FHWA to move to TFHRC, operate under ABML with AIDPT funding
The “Deeper Dive” Concept

MATC
- Demonstrating test methods
- On-site support (SHA, FLH)
- Equipment training
- Case example developed from innovation trials
- Spec. review (mix, post-installed pavt)
- Equipment loan program
- FHWA DO Rotational

ABML-ID
- Troubleshooting: customer support
- Specification review (binder)
- Contribution to test refinement
- In-depth support (SHA, FLH)
- Innovation case studies (materials, data, sensitivity analyses)
- Inform TFHRC product development (validation, stakeholder needs)
Purpose and Resources

• Purpose:
  – Create active support mechanism for implementation-focused activities of FHWA – PRODUCT-DRIVEN LABORATORY
  – Lead advancement of HRDI products into field evaluation and deployment
  – Engage internal stakeholders to actively respond to State/FLH concerns in short-order

• Staffing:
  – 1 full-time engineer, 1 half-time technician

• Testing capabilities:
  – Mixture, binder, aggregate, chemistry through TFHRC
  – NDE under discussion, also through TFHRC
Process

• What would be an ideal requested project?
  – High-impact (multiple States and FHWA interest)
  – Short-duration (less than 6 months to completion)
  – Will generate multiple products that can be broadcast to national audience

• How do I request a project?
  – Send a request form to D. Mensching via FHWA Division Office P&M engineer
  – Form is available now
    • Potential products identified upfront
    • Follow-up discussion with requestor possible
Project Logistics

• Ideas received and added to ABML-ID Master Tracker
• Panel will meet quarterly to select projects
  – Office of Infrastructure Research and Development – David Mensching
  – HICP – Leslie McCarthy
  – Office of Technical Services – Chris Wagner (replaced by new hire in 2020)
  – Division – Matt Daly (WV) – 1-year rotation
  – FLH – Mohammad Elias (Eastern Fed Lands) – 1-year rotation
• Requests from active MATC field projects do not undergo panel selection
Project Coordination

• Regular status update meetings on ABML-ID projects
• Monthly sharing of ABML-ID Master Tracker
• Quarterly panel meetings
  – Review project requests and make selections
  – Discuss internal/external research products to be evaluated by ABML-ID
• Brainstorm implementation plan to move through agency to deployment
ABML-ID Sample Scenario: SMA Performance (ID-19003)

INPUT:
WA and MD DOTs contacted MATC
MATC contacted RC
No resolution, needs investigation

Request from MATC on SMA
ABML-ID Log created

Review of existing practice
Program Manager review 1
Material testing request
Workplan development
Program Manager review 2

Further investigation not warranted
Product: Distribute Fact Sheet to Divisions & FLH
ABML-ID Sample Scenario: SMA Performance (ID-19003)

Materials collection

Mixture testing

Execute test plan & analyze results

Program Manager review 3

Present to requesting agencies/SAPAs

Include feedback & revise/expand analysis (if needed)

Troubleshooting “deep dive” complete

Potential Products:
- Report for requesting agencies & industry
- Tech Brief on subject
- 1-pagers for MATC
- Problem statement for NCHRP
- Presentation at FHWA Discipline meeting
- Presentation through RC at regional asphalt meetings
- HQ use for revising/establishing policy re: VMA spec limits for SMA mixes
MATC Service Request:
OK16106 XRF and FTIR (ID-19004)

- Identified need for further analysis
- Coordination with TFHRC Chemistry Lab
- Save data for regional/national trend monitoring
- Completed within 3 weeks
- REOB content is 1.5%
  - Research conducted at TFHRC suggests this level of REOB content does not impact mixture performance
Macrotexture on Dense-Graded Asphalt (DGA) (ID-19005)

- To identify systems for evaluating DGA macrotexture in lab using “more routine” geometry
- Device investigation is underway to determine feasibility for lab and field use on cores
- Follow-up with MATC field testing of Circular Track Meter to further inform recommendations
Closing

• MATC and ABML-ID are agency resources
• ABML-ID: High-impact, short-duration “deeper dives”
• ABML-ID: Requests made through FHWA staff
  – Can come from anywhere within Discipline!
  – Project selection panel meets quarterly
• These are intended to be dynamic elements of FHWA’s technical “catalog”
  – Feedback always welcome!
Contact Us

Ideas on Technologies or Practices to Deploy? Trends that you’ve observed?
Let us know!

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