

# Rolling Out!



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

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Senior Asphalt Pavement Engineer  
Federal Highway Administration – HQ  
Office of Preconstruction, Construction and Pavements



# Acronyms



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



# Agenda



## MATC

- Status
- Future Vision
- Activities

## ABML-ID

- Background
- Process
- Project logistics



# Mobile Asphalt Technology Center (MATC)



## Program Goal

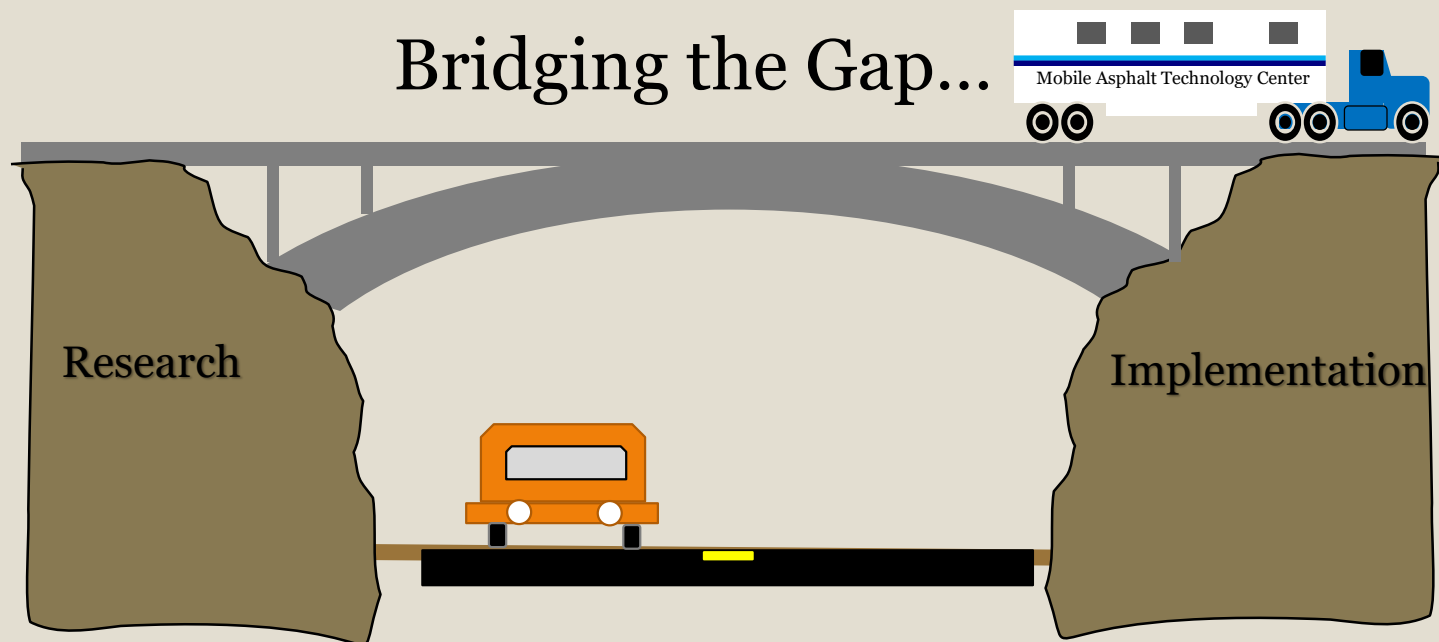
Innovative technologies and practices are implemented by agencies and industry to provide longer-lasting, safer, sustainable, and more cost-effective asphalt pavements on our nation's highways



# 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



Independent party  
with a national  
perspective

## **Project Site Visits**

Test results and  
observations  
facilitates  
implementation

## **Customized Training Workshops**

Loan equipment  
to partners to gain  
hands-on  
experience

## **Equipment Loan Program**

Topical guidance  
documents based  
on national trends

## **Technical Guidance**





## Past Focus of MATT

Planning

End of Service

Use

## Future Focus of MATC

Planning

End of Service  
Recycled materials  
Pavement Reuse

Pavements as resources  
• Life cycle thinking  
• Performance impacts

Use  
Distress monitoring  
Preservation & Maintenance

Data that supports:  
• Pavement management  
• Smoothness

Materials

- Performance tests
- Deployment of R&D (FTIR, XRF, etc.)
- Specification review & materials QA

Design

- Inputs for pavement design (includes AASHTO ME and FlexPAVE)
- Assess new & in-service pavements for resiliency (LiDAR, UAS, etc.)

Construction

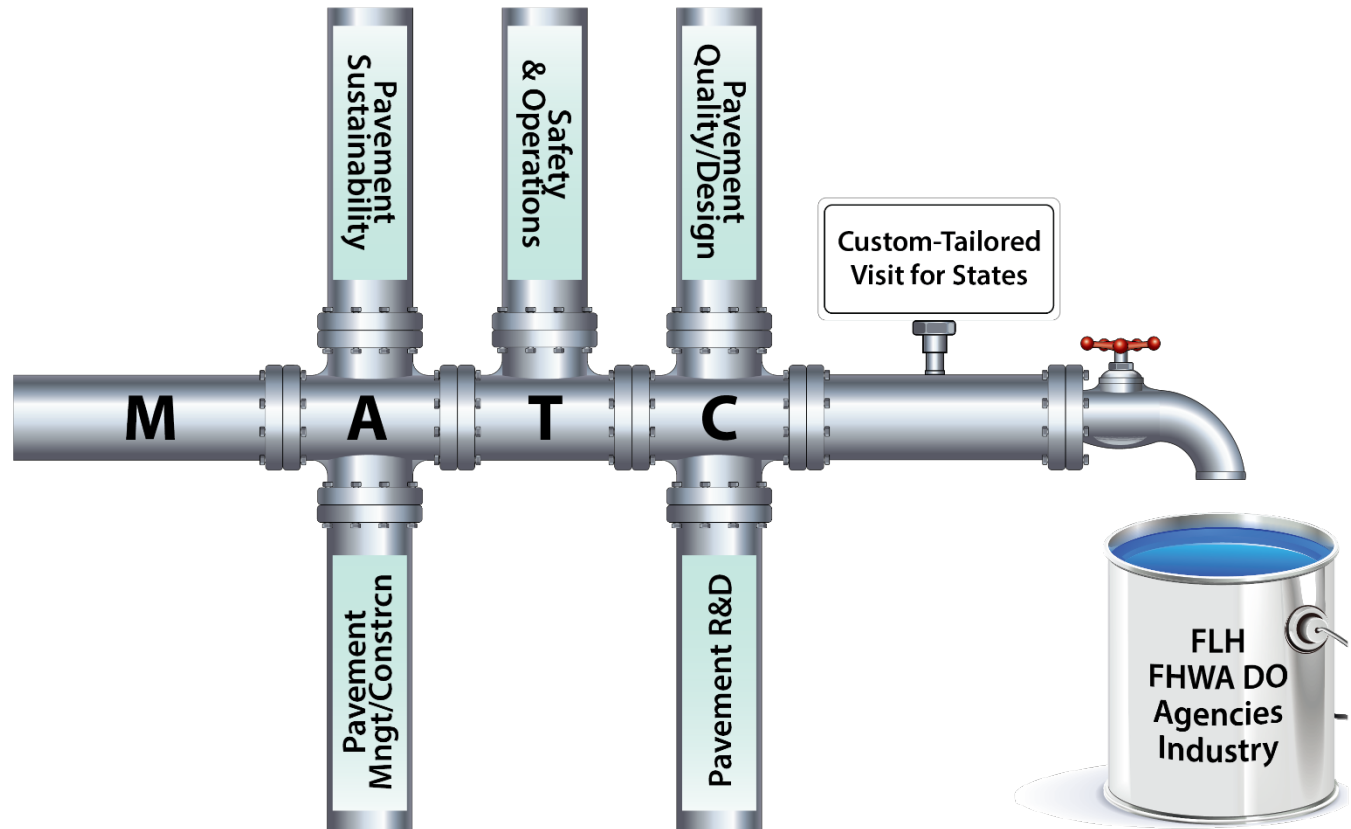
- Mat and joint density monitoring (DPS, IR scanner)
- Intelligent construction techniques
- Specification review & construction QA



U.S. Department of Transportation  
**Federal Highway Administration**  
Office of Infrastructure

*Unless otherwise noted, FHWA is the source for all images.*

# MATC Program “Pipeline”



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



Mixture Tests	Materials Tests	Field Tests
AMPT suite of tests ( $ E^* $ , cyclic fatigue) for PRS	X-Ray Fluorescence (XRF) Spectrometer for binder's or markings' chemical elements	Paver-mounted thermal infrared (Pave-IR) for real-time mat temperatures
Overlay Test for reflective cracking	ABT (true grade of binder)	MIT-Scan 3 for in-place pavement thickness
Flexibility index test (I-FIT) for fracture resistance	* FTIR looks at molecules in binder (lime, polymers,...)	Circular Texture Meter for measuring mean profile depth
ITC (IDEAL-CT) for crack resistance	* Binder grade verification	Density profiling system (DPS) for in-place density
	* Done at TFHRC	

## **Other support activities:**

PaveME Design analysis

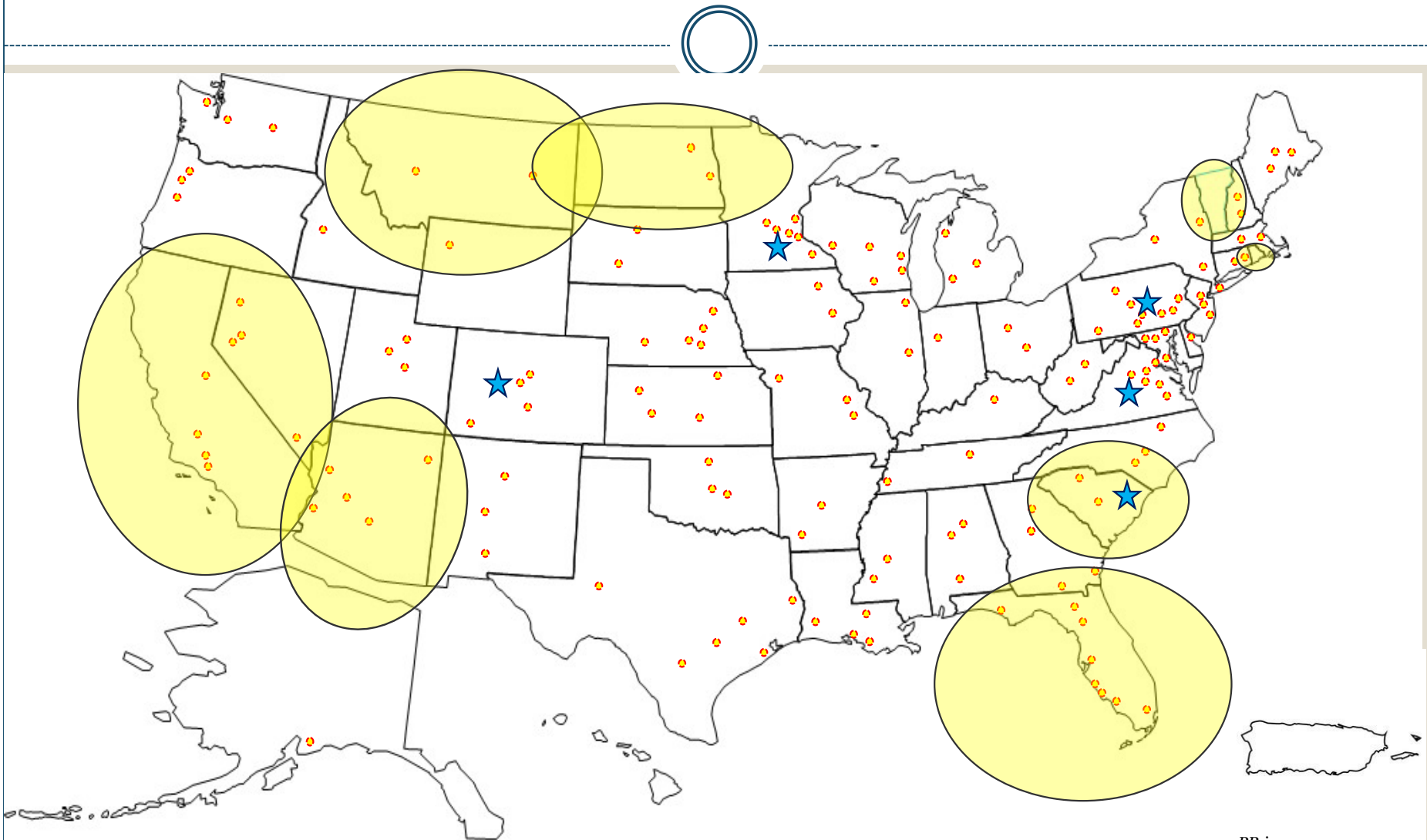
\* FlexMAT & FlexPAVE

HMA materials spec review

Construction density spec review (mat and joints)



# 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.

**Total Time:**  
**5 mos.**

**Onsite Time:**  
**3 weeks**

Start  
*1-hr call  
webinar*

During  
*60 days  
emails*

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

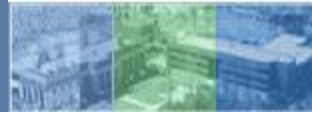
2nd week on-site  
*2-hr presentations  
(plus web access),  
2-hr tour at MATC*

2.5 – 3 weeks  
at MATC and at  
paving site

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

Within 60 days after site visit  
*1.5-hr webinar*



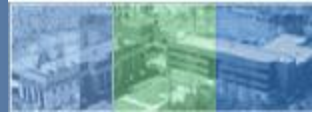


# **Asphalt Binder and Mixture Laboratory – *Implementation and Delivery* (ABML-ID)**

David J. Mensching  
(202) 493-3232  
[David.Mensching@dot.gov](mailto:David.Mensching@dot.gov)





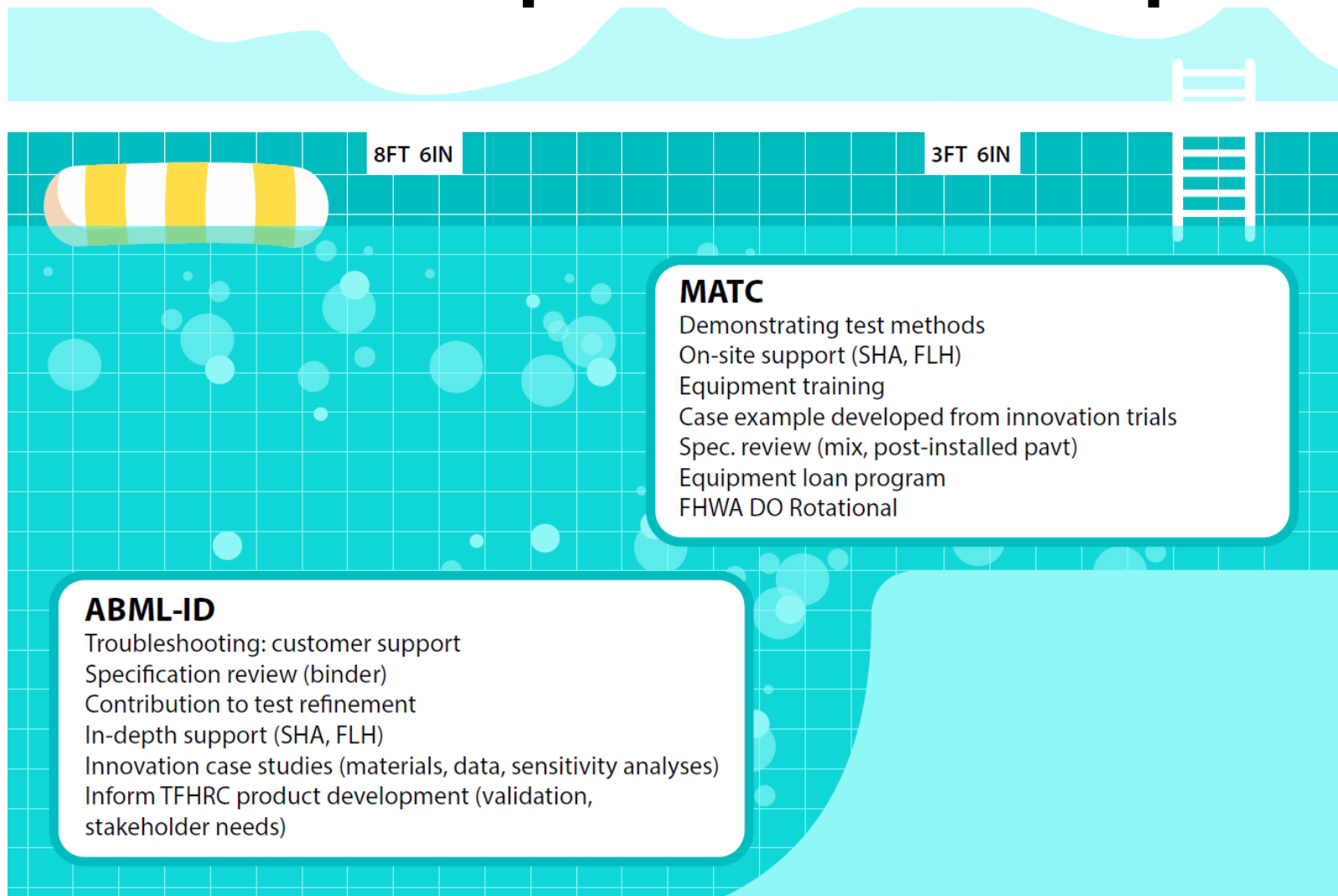


# What Led Us to ABML-ID?

- 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





# 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

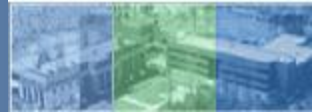




# Project Logistics

- 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





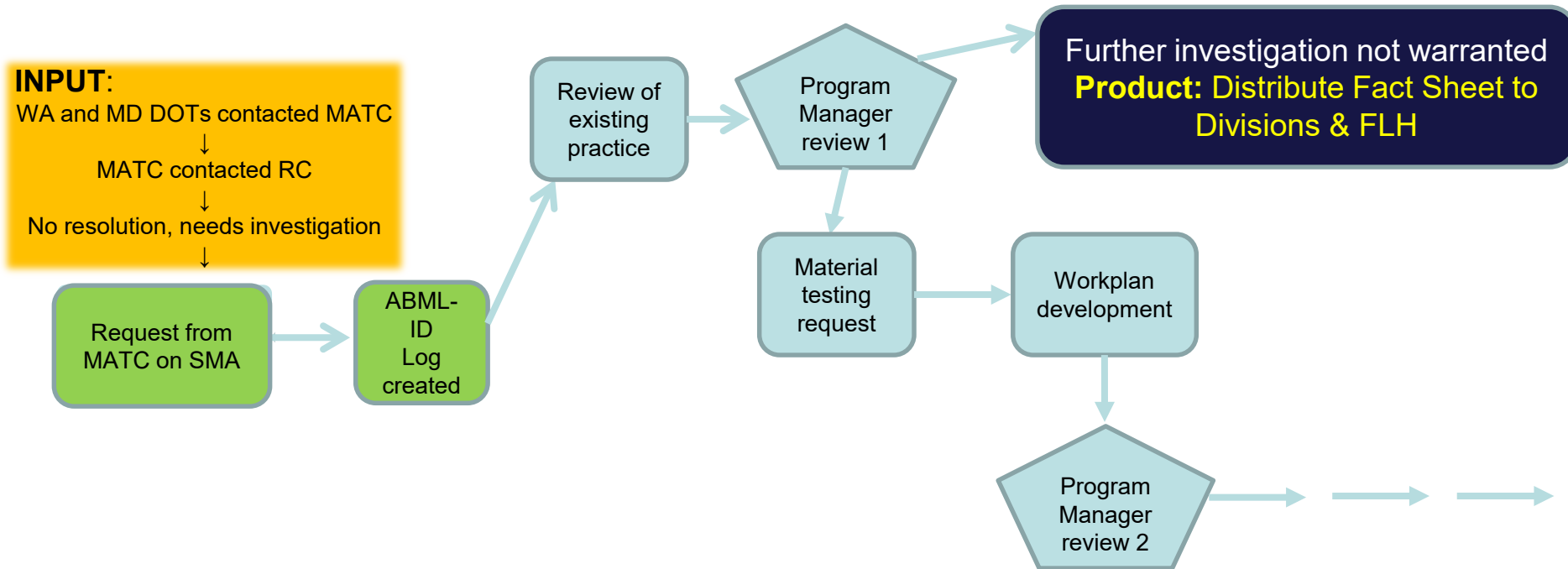
# Project Coordination

- 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

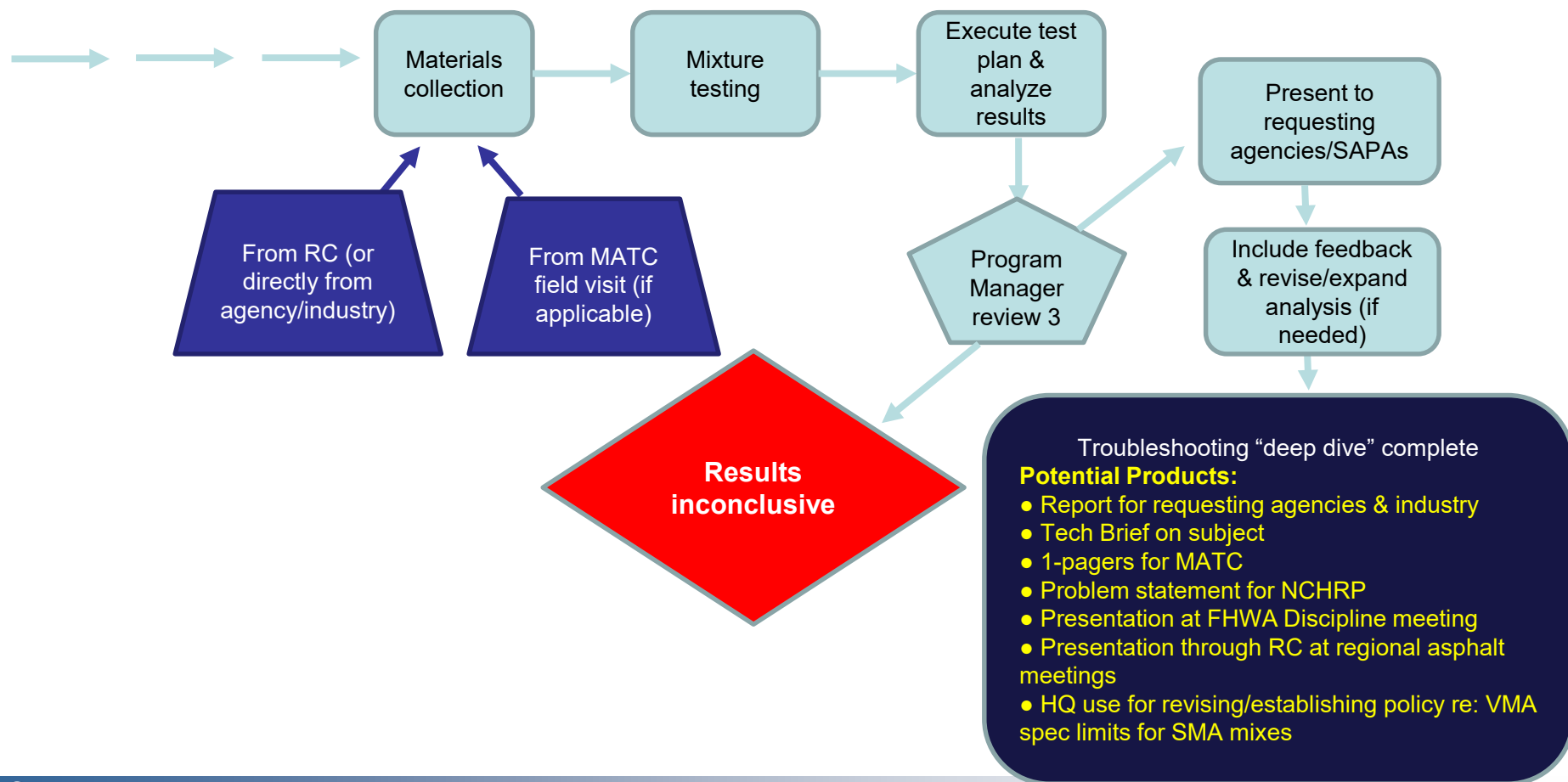




# ABML-ID Sample Scenario: SMA Performance (ID-19003)



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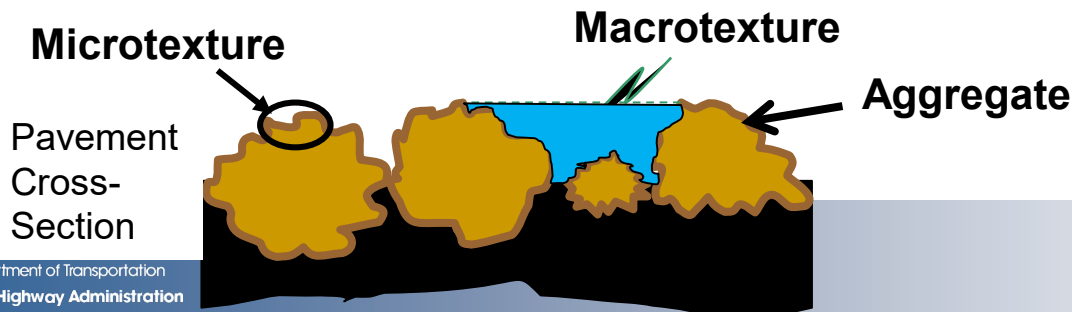
# MATC Service Request: OK16106 XRF and FTIR (ID-19004)

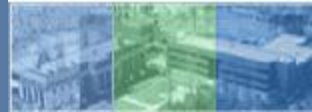
- Identified need for further analysis
- Coordination with TFHRC Chemistry Lab
- Save data for regional/national trend monitoring
- *Completed within 3 weeks*
- REOB content is 1.5%
  - Research conducted at TFHRC suggests this level of REOB content does not impact mixture performance



# 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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(202) 493-3232

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