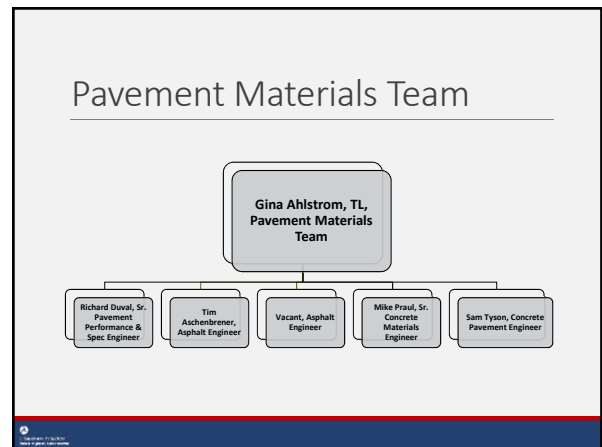
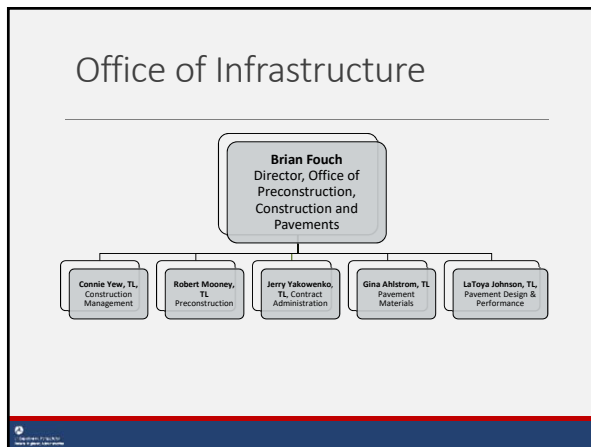
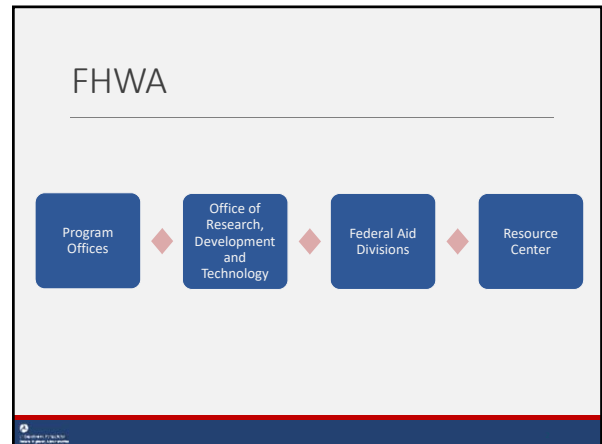


FHWA Asphalt Pavement Program

GINA M. AHLSTROM
PAVEMENT MATERIALS TEAM LEADER
OFFICE OF ASSET MANAGEMENT, PAVEMENTS,
AND CONSTRUCTION



U.S. Department of Transportation
Federal Highway Administration
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Who We Are


Richard Duval- program coordination for Performance Engineered Mixtures and Design and Performance Related Specifications

Tim Aschenbrener- asphalt pavements, Asphalt QA, increased density, asphalt recycling

Vacant- asphalt engineer, Mobile Asphalt Testing Trailer


Mike Praul- concrete pavements and materials, concrete QA, Mobile Concrete Trailer

Sam Tyson- long-life concrete pavement strategies (CRCP, PCP), concrete repair strategies, concrete recycling and industrial byproducts, concrete overlays



What We Do

- All things Asphalt Materials
- All things Concrete Materials
- Technologies for pavements and materials
- Movement toward Performance Engineered Mixture Design- Asphalt and Concrete
- Accelerated Implementation and Deployment of Pavement Technologies Program (under FAST Act)



Our Main Programmatic Focus

PERFORMANCE ENGINEERED MIXTURE DESIGN




Motivation for PEMD

- Increase in premature deterioration
- MAP-21 and FAST ACT legislation focus on performance
 - Transportation Performance Management
- Desire by public agencies and industry to move toward performance
 - Optimize mixture designs for traffic, climate, environment
 - Improved durability
 - Sustainability- recycled materials, reducing footprint, etc.
 - Innovative materials
- SHRP-SUPERPAVE original program intent – focus on performance and not fully realized
- Testing technology advancements
- Changes in agency and industry skills and personnel levels

Performance Engineered Mixture Design (PEMD)- ASPHALT

Key characteristics:

- Design and field control of mixtures around engineering properties related to performance
- Move from index based approaches and towards a more fundamental engineered approach
- Develop performance test procedures
- Develop performance specifications
- Starting point – Asphalt Mixture Performance Tester (AMPT) index testing approach and/or Performance Volumetric relationship (PVR) acceptance program.

The End Goal

- Design and field control of mixtures around engineering properties related to performance.
- Performance Related Specifications (PRS)
- Performance testing in the field
- Validate models and refine mixtures via construction QA and asset performance monitoring

The Journey to PEMD - Asphalt

1989-97

- Superpave

2002

- NCHRP 9-19, Task C Simple Performance Test for Superpave Mix Design Developed

1999

- FHWA Implementation - Superpave Support & Performance Models, Phase I - Becomes NCHRP 9-19

2008-18

- FHWA Development of Asphalt Mixture Performance-Related Specifications Models
- 2008 - TPF 5-178 AMPT Pooled Fund

2013-19


- FHWA Develop and Deploy Performance Related Specifications (PRS) for Pavement Construction
- 2015 – AASHTO TP107 Large Specimen Cyclic Fatigue


2017-20

- FHWA Ruggedness and Interlaboratory Studies for Asphalt Mixture Performance Tester (AMPT) Cyclic Fatigue Test

August 2018

- AASHTO COMP Submittal for AMPT Small Specimen Cyclic Fatigue & Stress Sweep Rutting Tests






Hamburg Wheel Tracking

- Hamburg
- APA
- Texas Overlay
 - Marshal Stability
 - Hveem Stability

Cyclic Fatigue (small specimen)

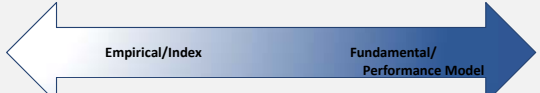


Fundamental/ Performance Model

- Illinois iFit
- SCB
- IDEAL CT

FHWA Performance Tests


- Bending Beam Fatigue
- Cyclic Fatigue
- Dynamic Modulus
- Stress Sweep
- Disk Shaped Compact Tension
- Flow Number



Empirical/Index → **Fundamental/ Performance Model**

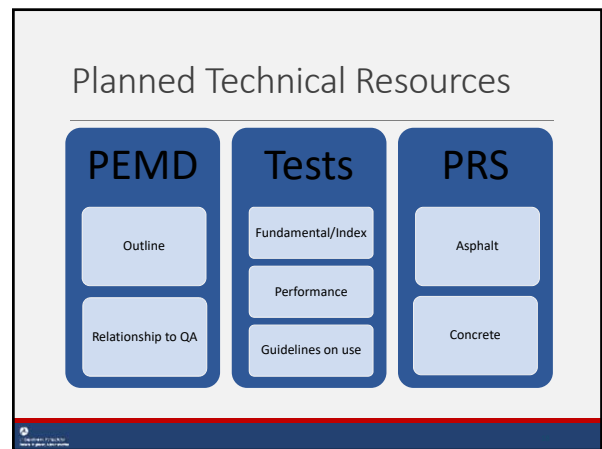
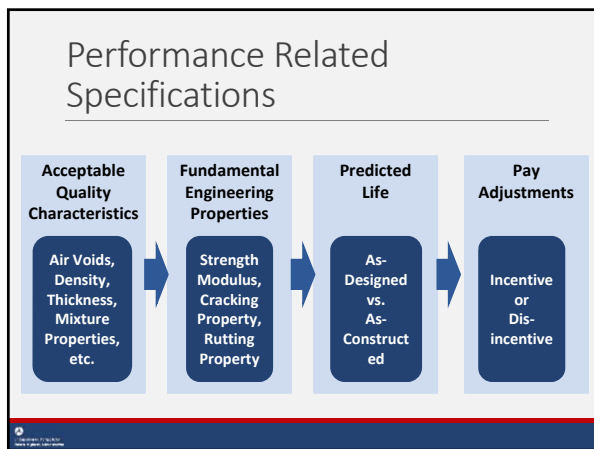
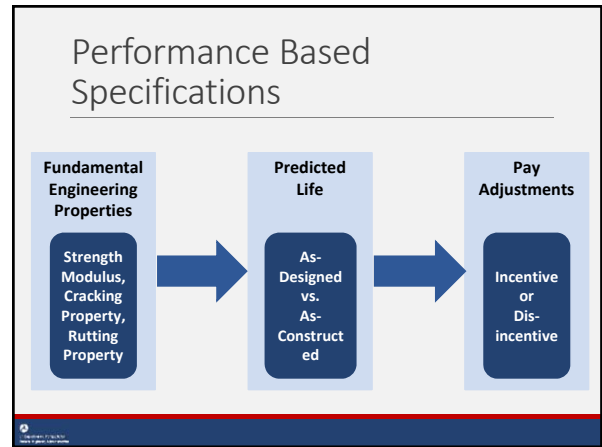
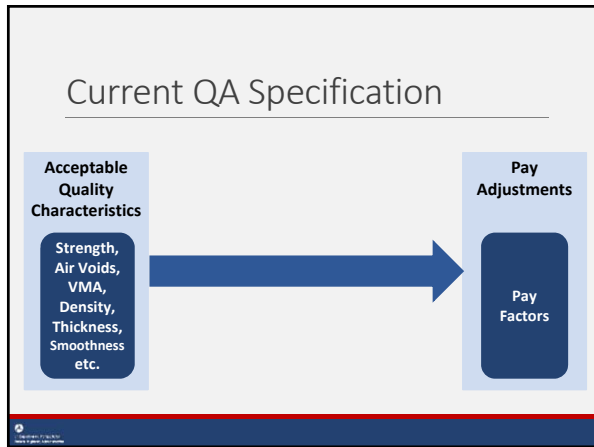
Asphalt Mixture Performance Tester (AMPT)

- Servo-hydraulic loading machine
- Temperature range from 4° to 70°C
- Computer-controlled device
 - Software built-in for various test procedures
- Fundamental tests
 - Stress and strain modeling
 - "Bulk testing"
 - PASSPave™ and Pavement ME Design



Why Performance Related Specifications?

- Improved Design-to-Construction Relationship
- Rational and Defendable Pay Factors
- Improved and Fundamental Focused Testing
- Improved Tradeoff Analyses
- Improved Understanding of Performance
- Improved Quality Focus
- Improved Distinction in Roles and Responsibilities
- More Innovation



Slide 13

AG(7) Need approved pictures with source- ask Richard
Ahlstrom, Gina (FHWA), 10/24/2018

FHWA Mobile Asphalt Testing Trailer

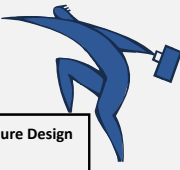


- Field visits
 - Kickoff meeting
 - Open house
 - Hands-on training
 - Mix design replication
 - Shadow QA testing
 - AMPT testing
 - Binder grading
 - Binder performance testing
- Training
- Workshops & Conferences

What's Next?

- Implement shadow testing on field projects to:
 - Increase State and industry familiarity with PEMD/AMPT/PRS concepts and new tests
 - Gather field data to refine new tests and continue to develop testing technologies that support PEMD/AMPT/PRS concepts
 - Provide actual experience to help develop practical specifications
- Training for both engineers and technicians on new tests
- Develop performance specifications
- Provide guidance on addressing problems today
- Pooled Fund Projects Ongoing- AMPT

Performance Engineering Mixture Design



3-5 yrs

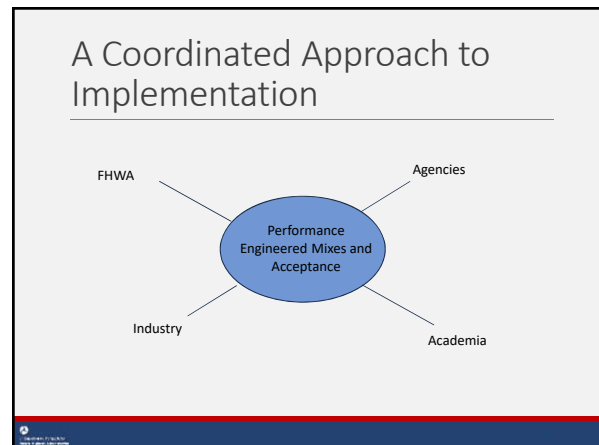
Link to Performance Modeling (PRS)

Present to 5 years

Performance Engineered Mixture Design (PEMD)

Present

Volumetrics (ACC)



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