

# Balanced Mix Design (BMD) Task Force Update

FHWA Mixture and Construction ETG

Bozeman, Montana

September 2017



# BMD Task Force Membership

- Continues to grow.
- Contact Shane Buchanan if interested in participating.
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## Balanced Mix Design Task Force

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# Current BMD Task Force Activities

- Information Outreach
  - Present BMD concepts
  - Highlight the benefit of BMD concepts
- Field Acceptance
  - Define various approaches for acceptance protocols within a BMD approach

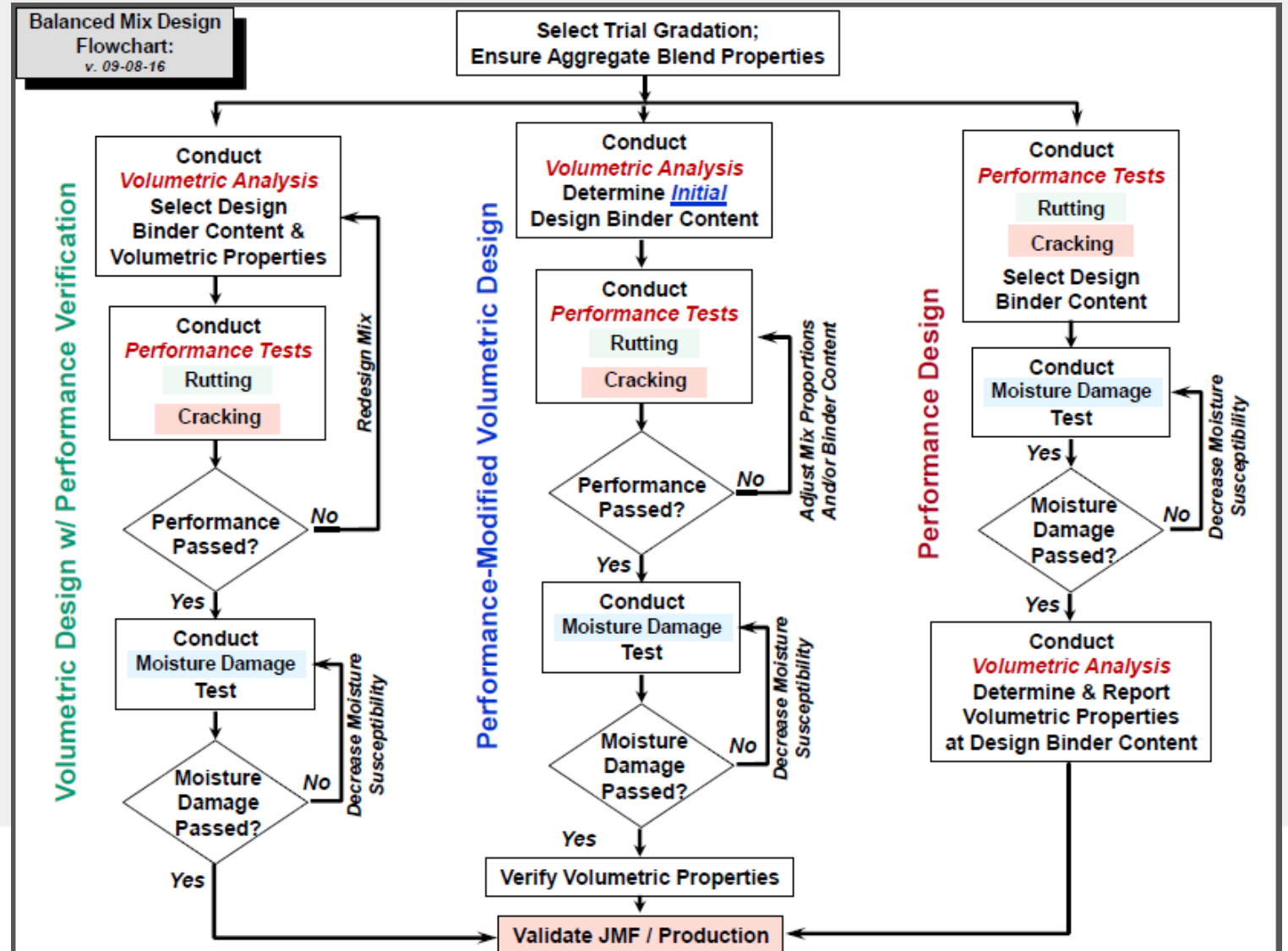


# BMD Information Outreach – Highlighting Task Force Work and BMD Concepts

1. Virginia Asphalt Association (VAA) Fall Conference, Oct. 3rd
2. NAPA Paving for Performance: Designed to Perform Conference, Oct. 12th
3. Northeast State Materials Engineer Association (NESMEA) Meeting, Oct. 18th
4. Northeast Asphalt User Producer Group (NEAUPG) Meeting, Oct. 18th
5. Kansas Asphalt Pavement Association (KAPA) Fall Forum, Oct. 25th
6. Washington Asphalt Pavement Association (WAPA) Fall Meeting, Nov. 9th
7. Illinois Bituminous Paving Conference, Dec. 12th
8. AAPT BMD Webinar Series, Nov. 2nd, 9th, 16th

# BMD Mix Design Approaches – A Refresher

- Three main approaches were identified for potential use.



# BMD Field Acceptance Protocols

- Initial survey of states yielded three primary acceptance approaches.
  - Volumetric
  - Volumetric + Performance
  - Performance
- Key notes
  1. Variety of performance tests utilized
  2. Differing levels of volumetric acceptance
- States determine (past, present, and future) the best protocols for their given situation and need.

Case Histories of Field Acceptance of Balanced Mix Designs

	State	Mix Design	Acceptance Quality Characteristics	Initial Verification Go / No Go	Ongoing Go / No Go	Information Only	Notes on Aging for Cracking Test
Model 1 Volumetric	California	Volumetric Beam fatigue and frequency sweep Repeated Shear Hamburg	AC/VTM/VMA Field Density			Beam fatigue and frequency sweep Repeated Shear Hamburg	
Model 2 Volumetric plus Performance	Texas	Volumetric Overlay Tester Hamburg	VTM Field Density	Overlay Tester Hamburg	AC/VMA Overlay Tester Hamburg		STA only
	Wisconsin	Volumetric SCB, DC(t) Hamburg	VTM Field Density	DC(t) Hamburg	***DC(t) Hamburg	SCB	Researching 2 types of LTA
	Illinois	Volumetric IL-SCB* Hamburg	AC/VTM/VMA Field Density	IL-SCB* Hamburg	**IL-SCB Hamburg	DC(t)	Researching different types of LTA
Model 3 Performance	New Jersey	Volumetric APA Beam Fatigue Overlay Tester	Field Density	APA Beam Fatigue Overlay Tester	****APA Beam Fatigue Overlay Tester		None
	Louisiana	Volumetric SCB Hamburg	Field Density	SCB Hamburg	****SCB Hamburg AC/Grad.		Researching 2 types of LTA

\*IL-SCB is now called the Illinois Flexibility Index Test (I-FIT).

Ongoing Go / No Go – \*\*Frequency at engineer's discretion

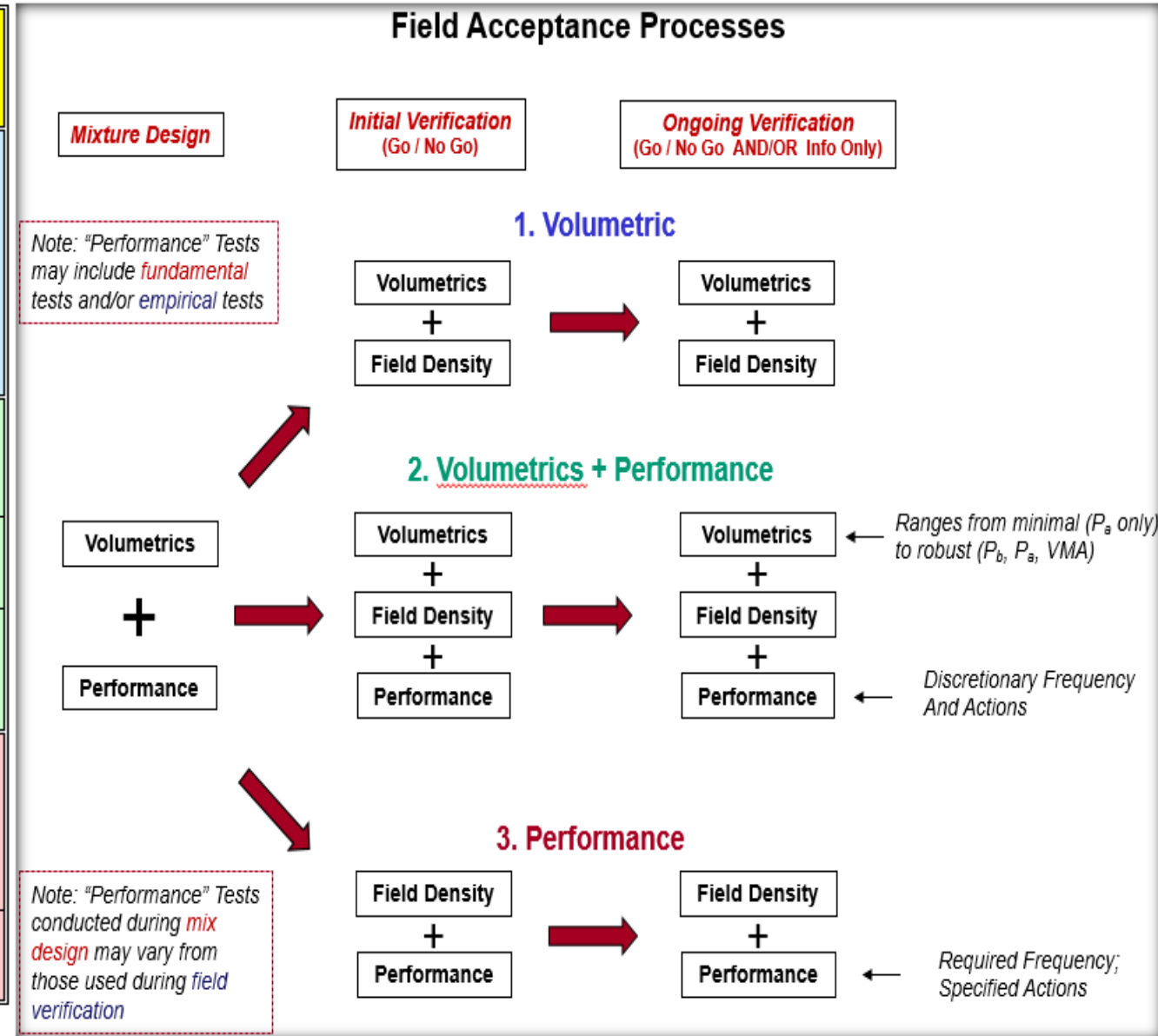
\*\*\*Required frequency- engineer's judgement on addressing test results

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	Illinois	Volumetric IL-SCB* Hamburg	AC/VTM/VMA Field Density	IL-SCB* Hamburg	**IL-SCB Hamburg	DC(t)	Researching different types of LTA
Model 3 Performance	New Jersey	Volumetric APA Beam Fatigue Overlay Tester	Field Density	APA Beam Fatigue Overlay Tester	****APA Beam Fatigue Overlay Tester		None
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Field Acceptance Processes



Graphic Developed by Kevin Hall, 9/14/2017

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\*\*\*\*Required frequency – required results

# BMD Field Acceptance – Important Areas and Considerations

<b>Area</b>	<b>Critical Considerations (from Draft Field Acceptance Guidelines, 2016)</b>
<b>Test Standardization</b>	Ensure each test selected for the balanced mix design is well documented with a standard test procedure.
<b>Equipment / Training</b>	Make sure that there is adequate equipment and personnel for the effort. This may include equipment purchases at various locations around the state. This may include technician training. Conduct an inter-laboratory reproducibility study (round robin) with various agency, consultant, and contractor labs in the State.
<b>Field Correlation</b>	Establish mix design acceptance criteria based on pavements of known field performance.
<b>Acceptance Criteria / Threshold</b>	Establish field acceptance criteria based on the results of the inter-laboratory reproducibility study.
<b>Project Use Decision</b>	Establish project selection guidelines. Based on testing equipment and staffing, this approach may be more suitable for more significant projects. At the beginning of implementation, a pilot project approach is recommended.



# NCHRP 20-07 Task 406 Project Development of a Framework for Balanced Asphalt Mixture Design and Gap Analysis

- **Time/Funding:** 1 yr. / \$100K
- **Objective:** Develop a framework that addresses **alternate approaches** to devise and implement balanced mix design procedures incorporating performance testing and criteria. The framework shall be presented in the format of an **AASHTO recommended practice** and shall encompass a wide variety of testing procedures and criteria.

## NCHRP 20-07/Task 406 [Active]

Development of a Framework for Balanced Asphalt Mixture Design  
[ [NCHRP 20-07 \(Research for AASHTO Standing Committee on Highways\)](#) ]

### Project Data

<b>Funds:</b>	\$100,000
<b>Staff Responsibility:</b>	Edward Harrigan
<b>Research Agency:</b>	National Center for Asphalt Technology
<b>Principal Investigator:</b>	Randy West
<b>Effective Date:</b>	5/18/2017
<b>Completion Date:</b>	5/18/2018



# Thank You!

