

West Virginia DOH Construction Materials Conference 2024

NCAT Update

Topics

NCAT Test Track:



Pavement Test Track

- 1.7 mile oval track
- 8th research cycle started in 2021
- 46 Test Sections, 200 ft. each
- 5 trucks each pulling 3 heavily loaded trailers
- Test sections are evaluated continuously
 - 3 year cycles.

A photograph of a white semi-truck driving on a paved road that curves to the right. The road is flanked by dry, brownish vegetation in the foreground and dense green trees in the background under a clear blue sky. Large, bold, white text is overlaid on the center of the image, reading "11 MILLION MILES".

**11 MILLION
MILES**

2021 Test Track Summary

- 8th Cycle
- Funding:
 - 11 State DOTs
 - 8 Private Sector partners
 - FHWA
- 32 Sponsored Sections
 - 16 Traffic continuations
 - 7 Mill/inlay sections
 - 9 Structural sections



Traffic Continuations

- Higher RAP with recycling agents – CA_{N3}
- Foamed cold central plant recycle (CCPR) base – VA_{N4}
- High performance thinlays (DGA, SMA) – $AL_{N10,N11}$
- Interlayer strategies for crack prevention – $GA_{N12,N13}$
- Soybean based polymer modified asphalt – SB_{W10}



Traffic Continuations

- BMD via recycling agents, gradation change, etc. – OK_{S1} , $TX_{S10,S11}$
- Impact of base stabilization, subgrade modification – MS_{S2}
- Long term benefit of surface rejuvenators – MS_{S3}
- Full depth rapid rebuilds (grinding vs thinlays, HiMA) – SC_{S9}
- Rejuvenation of open graded friction surface course – SR_{E1}
- Impact of density on performance – $FL_{E5,E6}$



New Mill/Inlay Sections

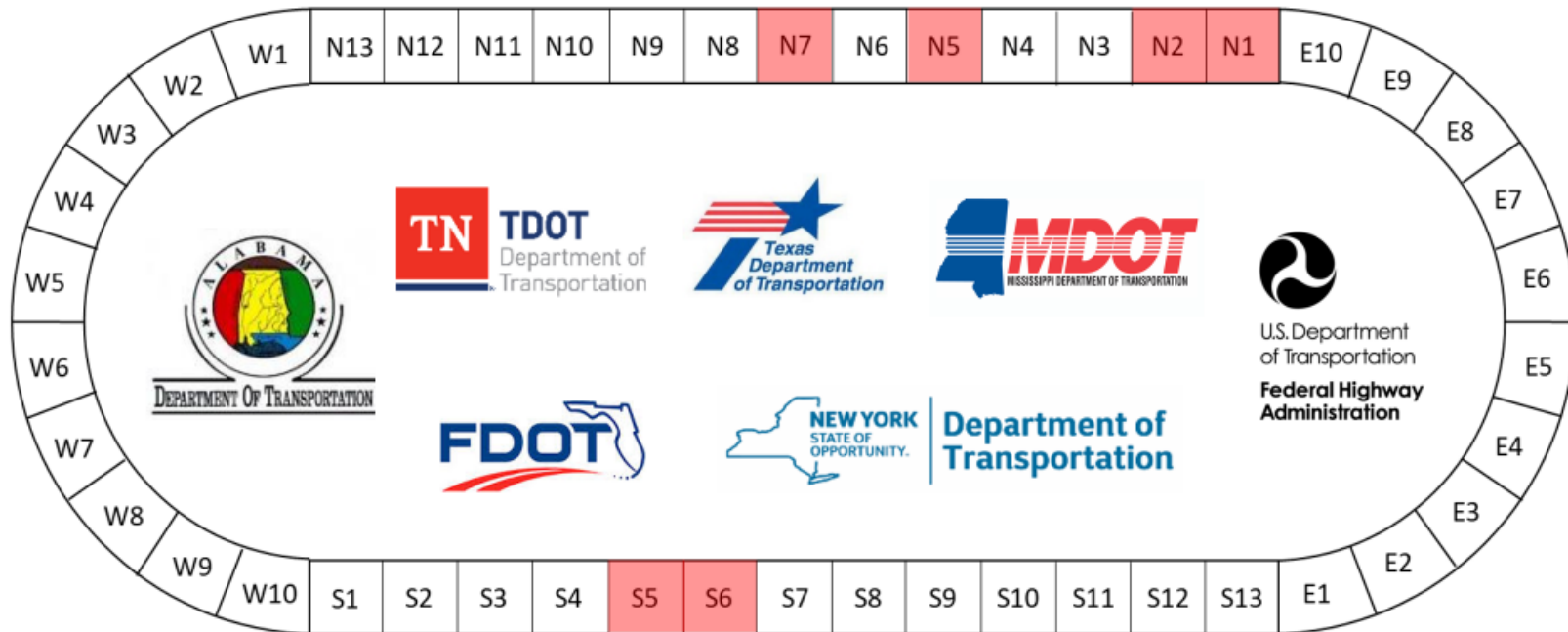
- BMD via recycling agents, gradation, etc. – $OK_{N8,N9}$, TX_{N6}
- BMD with SGC for design and Marshall for QC – TN_{S4}
- Bond strength with different tack products and/or rates – NC_{W4}
- Friction performance mix optimization – KY_{S7}
- High performance open graded friction course surface – AL_{E9} .



New Structural Sections₉

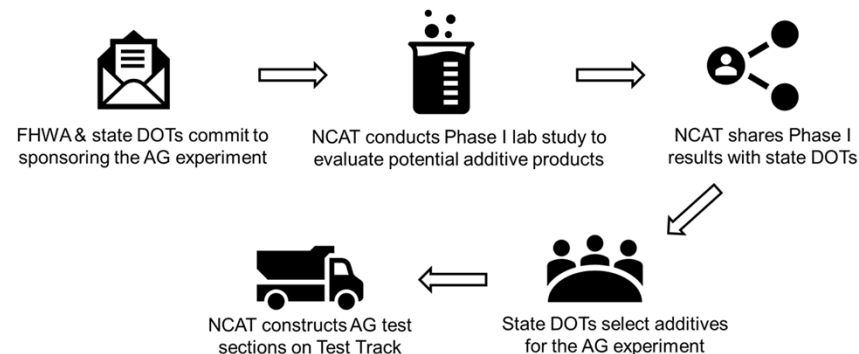
- Minimum HMA thickness over cold (re)recycling – VA_{S12}
- Additive Group (AG) study for additive impact on pavement life
- “AG+” New polymer from old recycled tire rubber – Sigmabond HP_{S8}
- “AG+” High polymer performance with reduced viscosity – BASF_{S13}.

Additive Group (AG) Study



2021 Additive Group (AG) Study

- Phase 1 BMD + performance testing/modeling
- Phase 2 NCAT Pavement Test Track 5½ inch sections
 - Recycled tire rubber (N1 “Dry” Smart Mix, N2 “Wet” Entech)
 - Recycled low density plastic (S5 “Dry” pellets, S6 “Wet” Dow)
 - High strength aramid fibers (N5 Surface Tech ACE XP)
 - N7 “All American” Control with 20% RAP using PG 76-22
- Phase 3 MnROAD “Cracking Challenge” (summer 2022)



NCAT TEST TRACK



NCAT Report 21-03

September 2021



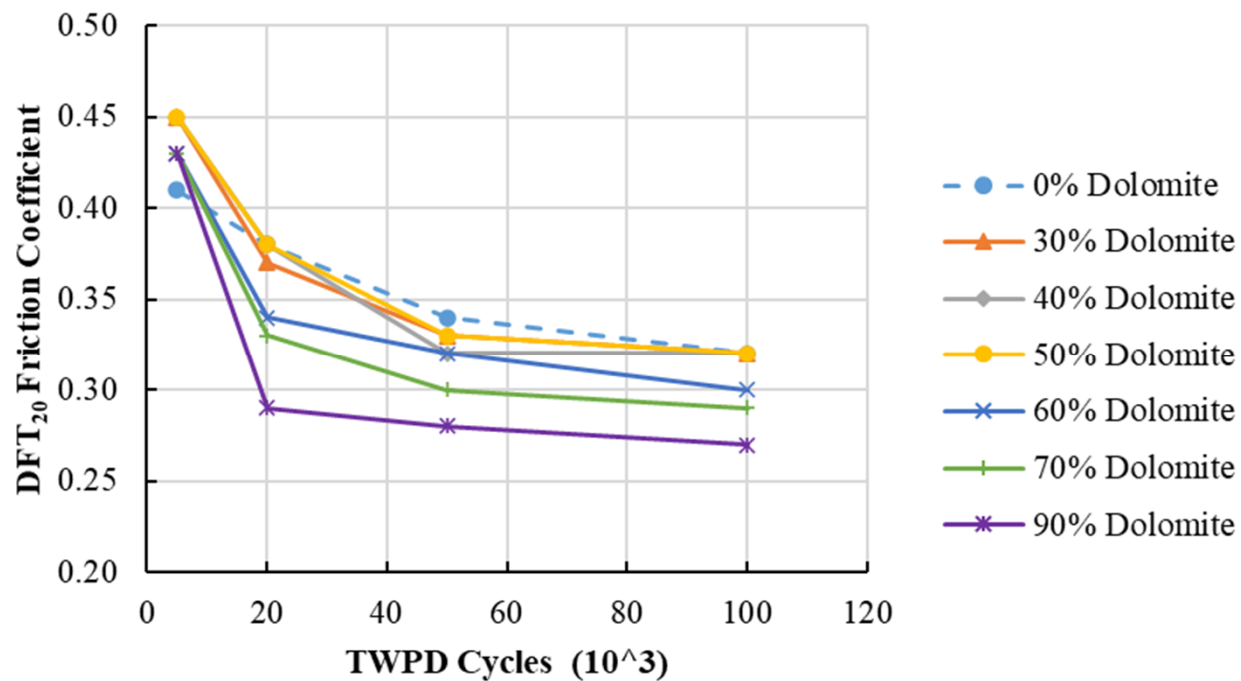
Phase VII (2018-2021) NCAT Test Track Findings

Randy West, David Timm, Buzz Powell, Nam Tran, Fan Yin,
Benjamin Bowers, Carolina Rodezno, Fabricio Leiva, Adriana
Vargas, Fan Gu, Raquel Moraes, Mostafa Nakhaei

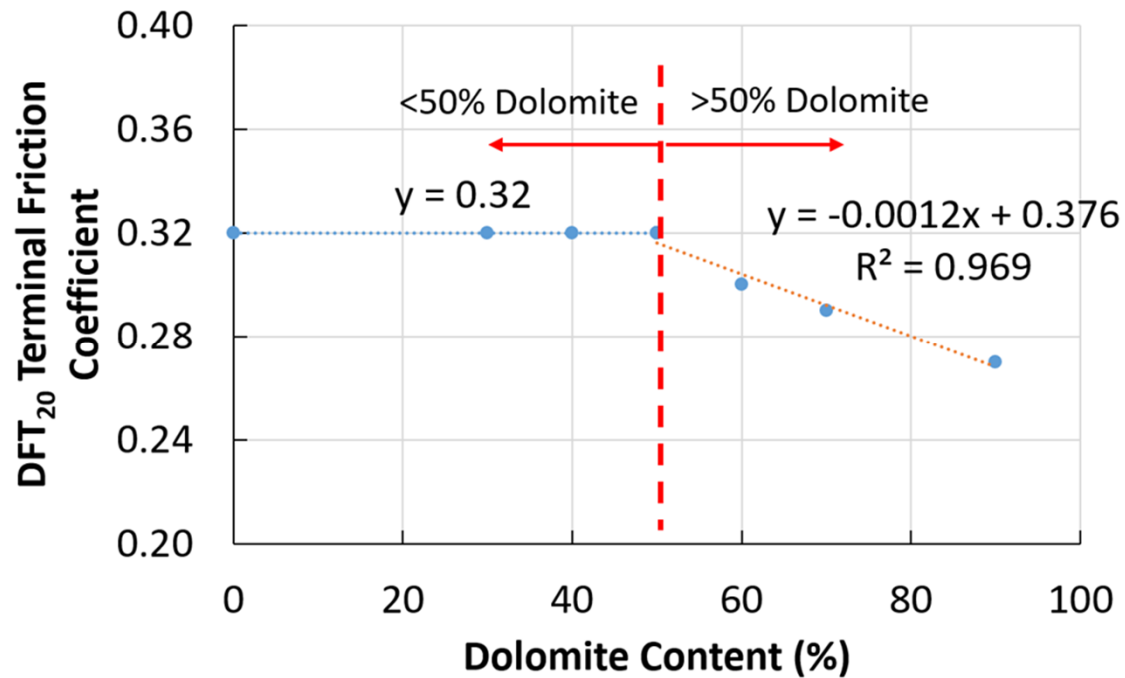




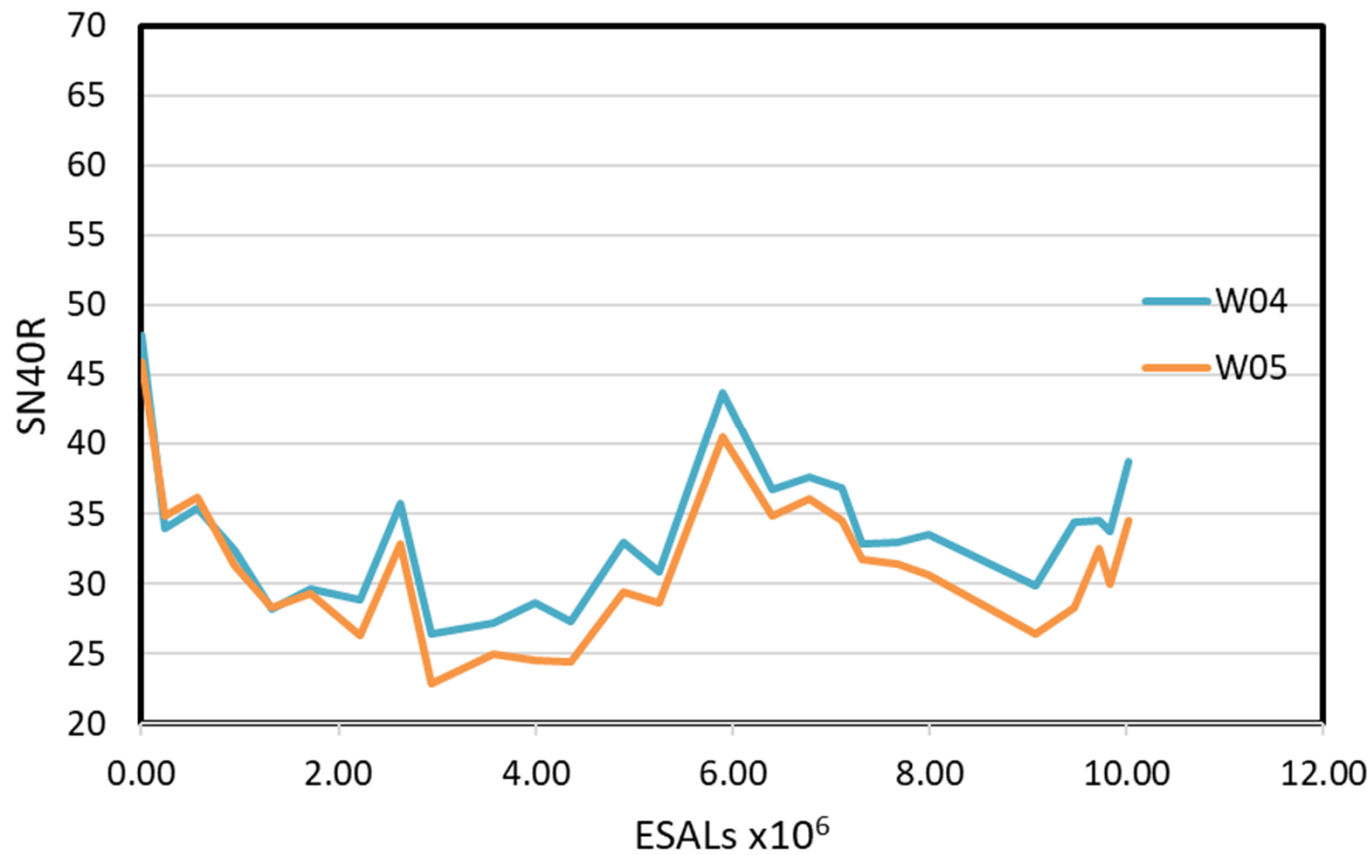
WV on NCAT Test Track



WV on NCAT Test Track



WV on NCAT Test Track



Balanced Mix Design

How to find BMD Information...



Google

🔍 NAPA BMD Resource Guide



Google Search

I'm Feeling Lucky

NAPA BMD Resource Guide

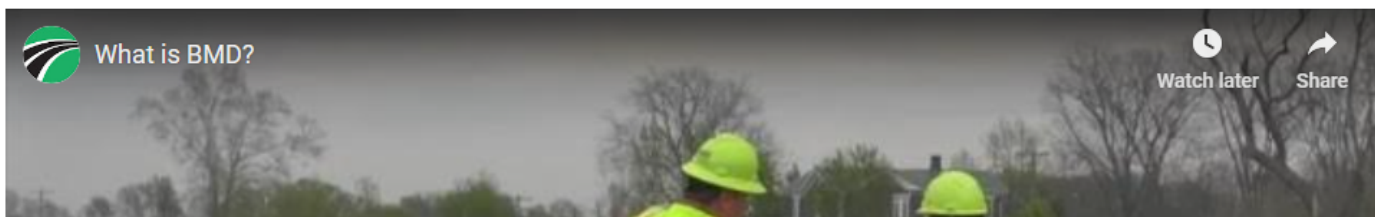
[ABOUT NAPA](#)[EXPERTISE](#)[PROGRAMS](#)[MEMBERSHIP](#)[NEWS & RESOURCES](#)[HOME](#) | [EXPERTISE](#) | [ENGINEERING](#) | [RESOURCES](#) | [BALANCED MIX DESIGN RESOURCE GUIDE](#)

BALANCED MIX DESIGN RESOURCE GUIDE

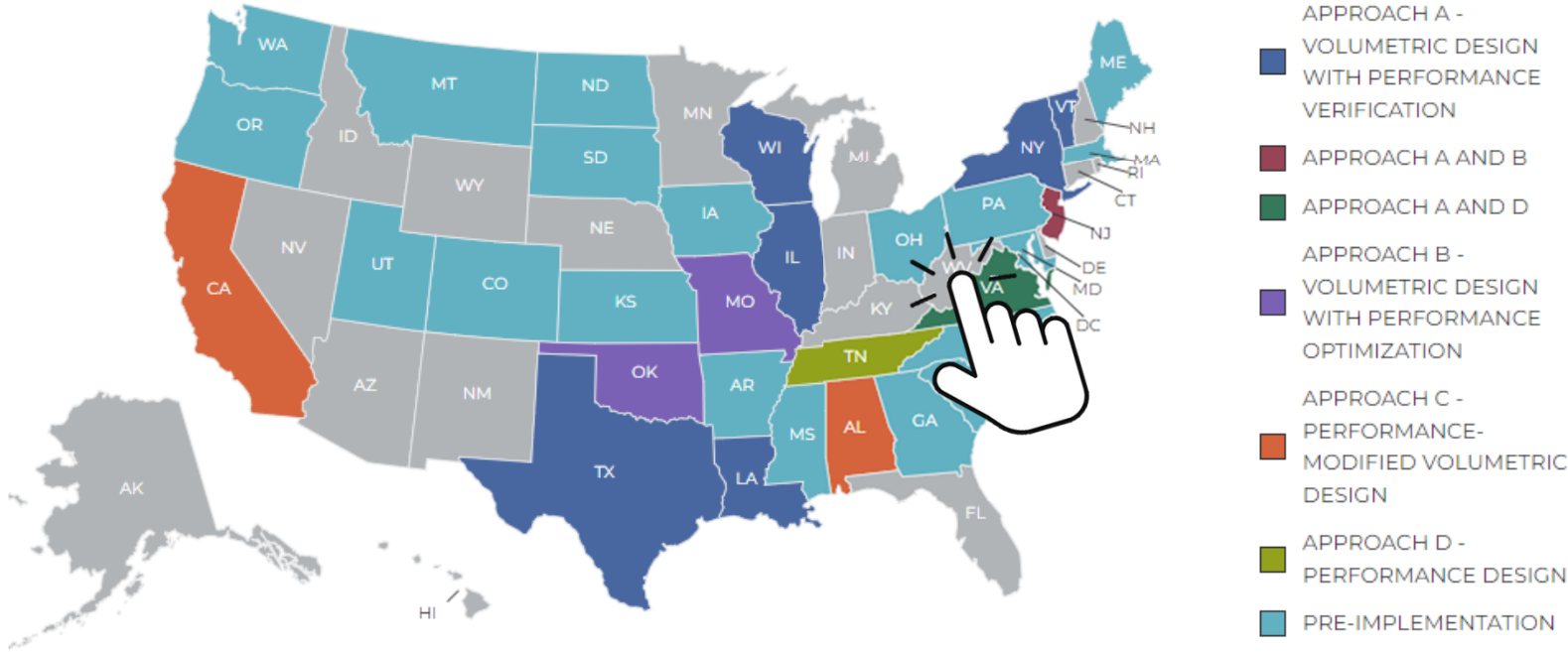
[APPROACHES](#)[TESTS](#)[IMPLEMENTATION EFFORTS](#)[TRAINING & RESOURCES](#)[TOOLS](#)[WORKING GROUP](#)

What is Balanced Mix Design?

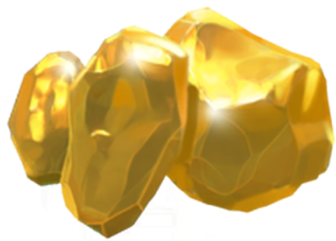
Balanced Mix Design (BMD) is defined as "asphalt mix design using performance tests on appropriately conditioned specimens that address multiple modes of distress taking into consideration mix aging, traffic, climate and location within the pavement structure" per AASHTO PP 105-20. This definition was initially established by the former Federal Highway Administration (FHWA) Expert Task Group (ETG) Balanced Mix Design Task Force in 2015.



BMD Implementation Status



2023 AASHTO COMP Survey: Most Pre-Implementation States are looking at Method A



Other Nuggets



Plastics in Asphalt Pavements

- Has been studied for several decades
- Has received wide development in India, however their process for specification and standards are far different from the US
- In the US, the scale of opportunity is significant since asphalt pavements represent 94% of all paved roads
 - Optimistic projections would use about 240,000 tons of plastic per year if we replaced polymers in asphalt binders
 - This is based on dry process dosage of 0.5% by weight dosage and 12% of mixes (historic polymer usage)
 - This is approximately 1.4% of the waste polyethylene generated in the US each year

Asphalt AI Tool

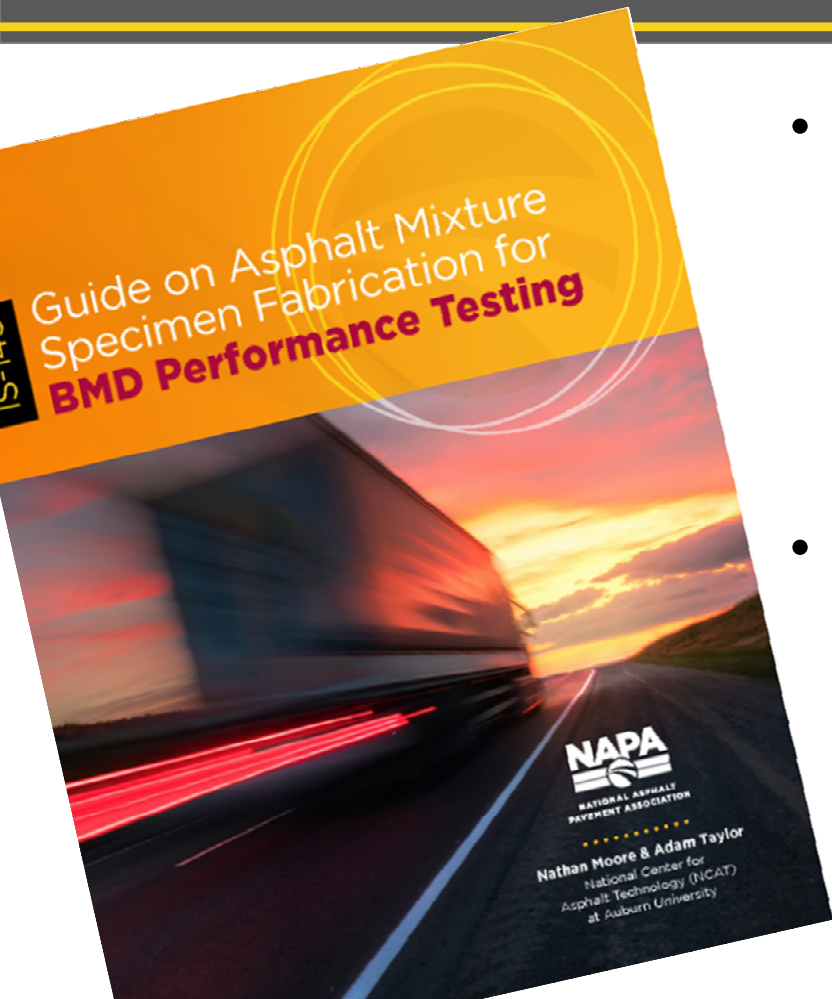


HeyNAPA.com

- Built with the ChatGPA software
- Only draws from vetted asphalt research and publications
 - NAPA
 - FHWA
 - NCAT
- Gives citations with responses



Sample Preparation Guide



- As the asphalt industry moves toward BMD and performance testing it is important to remember that the preparation of the samples being tested can effect the results of the testing.
- The 'Guide on Asphalt Mixture Specimen Fabrication for BMD Performance Testing' is helpful to obtain consistent results



Online Opportunities



presents

FROM RESEARCH TO IMPLEMENTATION

WEBINAR SERIES

Topic:

Mix Selection for Layers

January 15, 2024 : 10-11am CT

REGISTER TODAY

Buzz Powell (NCAT) and a guest will discuss ways to use more locally available aggregates and RAP in mixes to better utilize existing resources.

Free to Test Track Sponsors : \$25 for Non-Sponsors

TAKE NCAT WITH YOU



TRAINING IN YOUR
POCKET



ASPHALT TRAINING
QUICK VIDEO SESSIONS



Free to everyone.

CAPRI Chats



Webinar series highlighting asphalt topics

**Guidelines and Recommendations
for Field Validation of Test Criteria
for BMD Implementation**

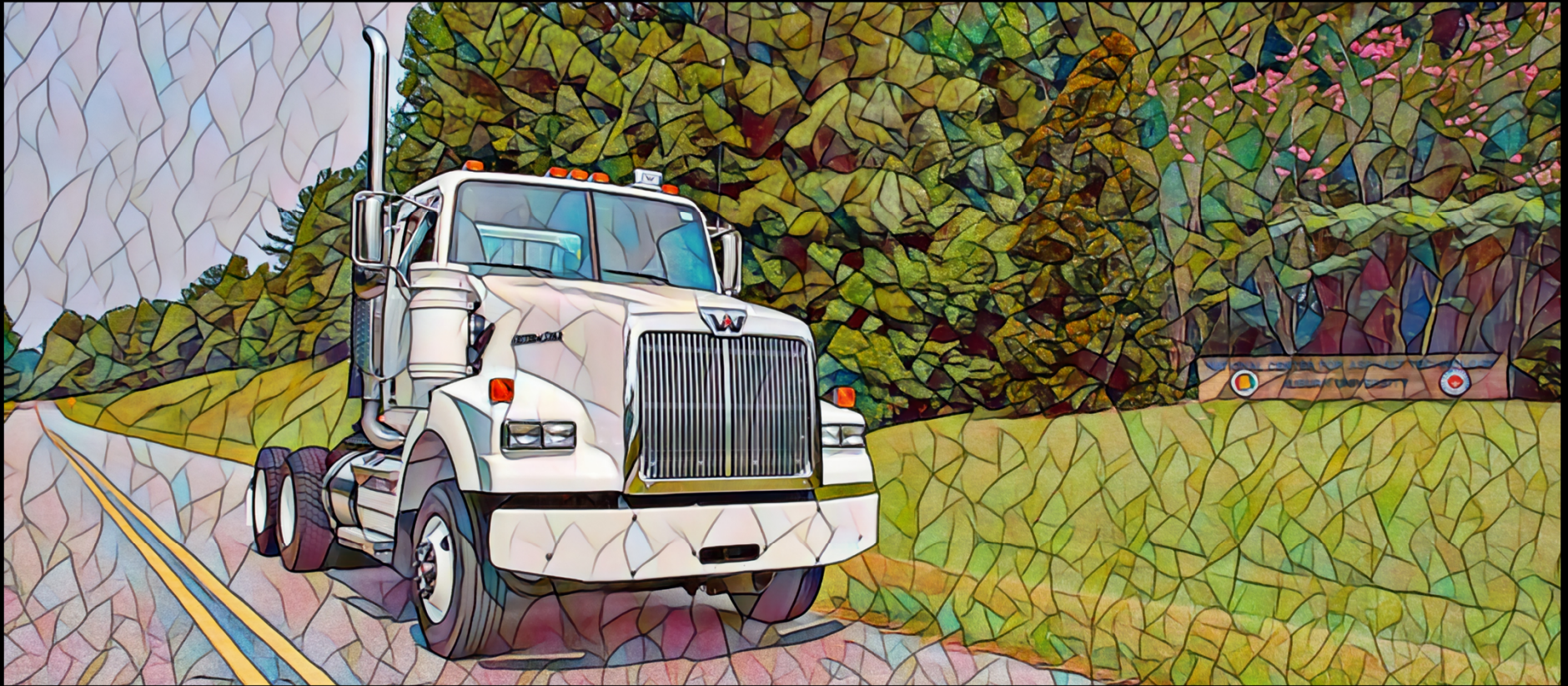
February 12, 2024 : 12 PM – 1PM EST
Presenter: Tom Harman, NCAT

**Register
Today**



URL: aub.ie/CAPRIchats

NCAT TEST TRACK CONFERENCE



aub.ie/2024TTC

MAY 7-9, 2024
AUBURN, ALABAMA

Thank you!



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