Presentation Overview

BMD Update -

- VDOT objective
- Implementation status
- Key elements of focus
Why move to BMD approach?

Achieve improved pavement performance; optimization of cracking and rutting resistance using Balanced Mix Design methodology.

Foster innovation; mix performance approach vs. totally prescriptive specifications, incentivize quality attributes.
Status

2018 2019 2020 2021 2022 2023

- Develop Lab testing specs for cracking and rutting
- Research - Pilot Project Construction / Evaluations
- Lab Equipment acquisition
- Develop and execute Training
- Research - Refine specification requirements
- Statewide Implementation
Status

Research activities to date:

- Baselining current surface mixes against cracking, rutting, and durability performance metrics
  - 13 mixes from 2018

- Gathering data on experimental mixes
  - Balanced Mix Design Field Trials
    - High RAP and use of rejuvenators and softer binders
    - 2 projects to date, 8 mixes
    - NoVa and Salem/Lynchburg districts
## 2019 BMD Projects

<table>
<thead>
<tr>
<th>Date</th>
<th>District</th>
<th>Producer</th>
<th>Location</th>
<th>Mixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 27-28</td>
<td>NoVa</td>
<td>Superior Paving</td>
<td>Logmill Rd.</td>
<td>SM-9.5 30% RAP PG 64S-22, SM-9.5 40% RAP PG 64S-22, SM-9.5 40% RAP PG 58-28</td>
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<tr>
<td>July 15-18, 24-25</td>
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<td>Catharpin Rd.</td>
<td>SM-9.5 30% RAP PG 64S-22, rejuv. 1, SM-9.5 30% RAP PG 64S-22, rejuv. 2</td>
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<tr>
<td>Aug. 22, 26-27</td>
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<td></td>
<td></td>
<td>SM-9.5 40% RAP PG 64S-22, rejuv. 1, SM-9.5 30% RAP PG 64S-22, rejuv. 2</td>
</tr>
<tr>
<td>July 12, 17, 24</td>
<td>Salem &amp; Lynchburg</td>
<td>Boxley</td>
<td>Rt. 460, Salem Rt. 60, Lynchburg</td>
<td>SM-9.5 26% RAP PG 64S-22, SM-9.5 26% RAP PG 64S-22, rejuv. 1</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>SM-9.5 26% RAP PG 64S-22, rejuv. 2</td>
</tr>
</tbody>
</table>
Example Performance Space

- Crack-resistant, rut-resistant
- Crack-susceptible, rut-resistant
- Crack-susceptible, rut-susceptible
- Crack-resistant, rut-susceptible

Virginia Department of Transportation
Status – 2020 Plans

Research work in progress for 2020

- Balanced Mix Design Field Trials
  - Evaluate production mixes and field performance
  - Impacts of rejuvenators and/or softer binder
  - Typical and high RAP contents

- Impact of Production Variability on BMD in VA
  - Assess influence of production variability (AC, gradation) on mass loss, APA rut depths, and CTindex responses of mixes
  - Develop information to minimize risk of failures during production due to acceptable mix variability
Status – 2020 Plans

Research work planned for 2020

- Feasibility of Using the IDT test for Evaluating Rut Performance
  - Assess the use of a high temp IDT test (similar to IDEAL-CT) to assess rutting potential

- Evaluating Rejuvenator Acceptance for Virginia: Test Protocols and Performance-based Threshold Criteria
  - Develop a testing protocol to evaluate the effectiveness of rejuvenators in both short-term and aged condition
  - Provide performance-based parameter(s) with threshold limits/criteria for product acceptance
Status – 2020 Plans

Research work planned for 2020

- IDEAL-CT Round Robin
  - To address testing variability, tolerance
  - To see any difference between different test equipment
  - Phase 1: Testing variation
  - Phase 2: Including sample preparation
BMD Tech Committee Meeting

- Had 5 meetings
  - Members: VDOT & Industry
  - Develop Specs for BMD and High RAP pilot projects
  - Develop general project information as a guideline for pilot
  - All the technical aspects
  - Other research updates including NCAT
  - Report to Advisory Group
Key Things to Focus on:

- Confirming the test(s) and equipment to be used
  - IDEAL CT? (cracking)
  - APA? (rutting)
  - Cantabro? (durability)
  - Tolerance

- Confirming the test threshold values needed for improved performance

- Equipment purchase(s) & training

- Need more pilot projects
Key Elements of Focus

- QC/QA requirements for our contract specifications

- Appropriate quality attributes & how do we accept/pay for the desired results?
  - Traditional AC and Gradation?
  - Volumetric properties?
  - BMD properties?

- Ultimately - correlation of lab testing results to long term performance
QUESTIONS?