

BALANCED MIX DESIGN UPDATE

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Presentation Overview

BMD Update -

- VDOT objective
- Implementation status
- Key elements of focus

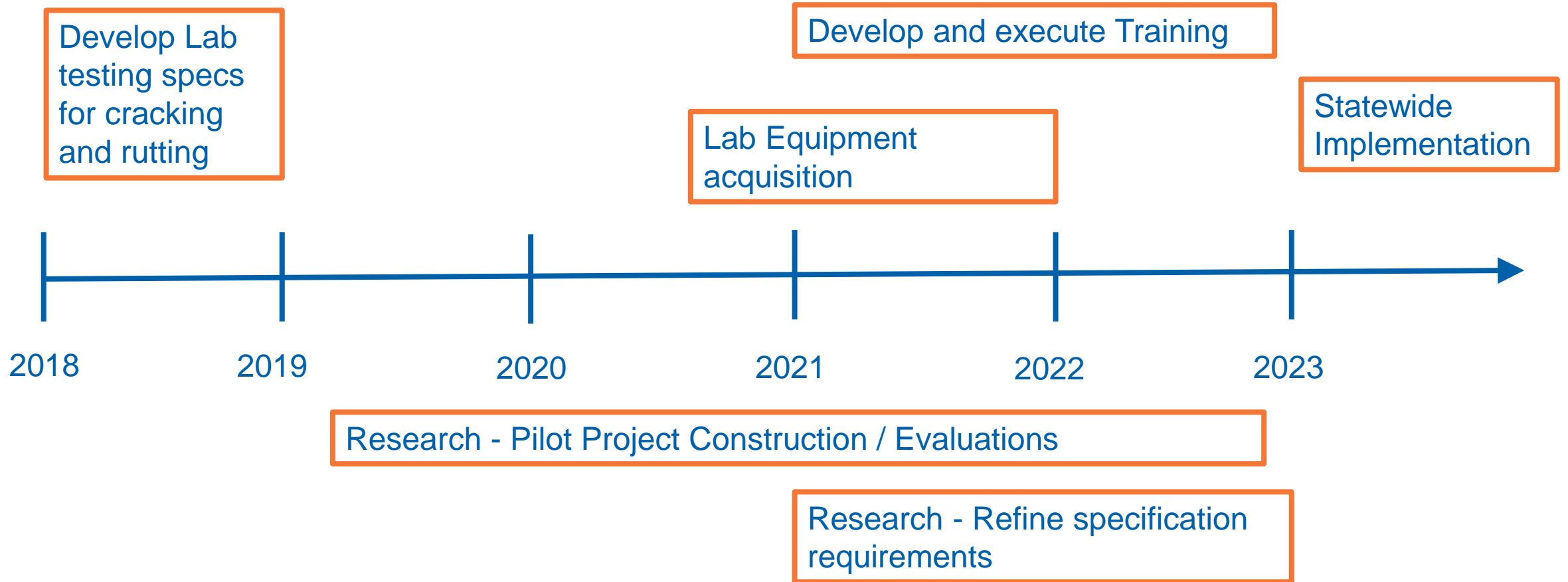
VDOT Objective

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



Status

Research activities to date:

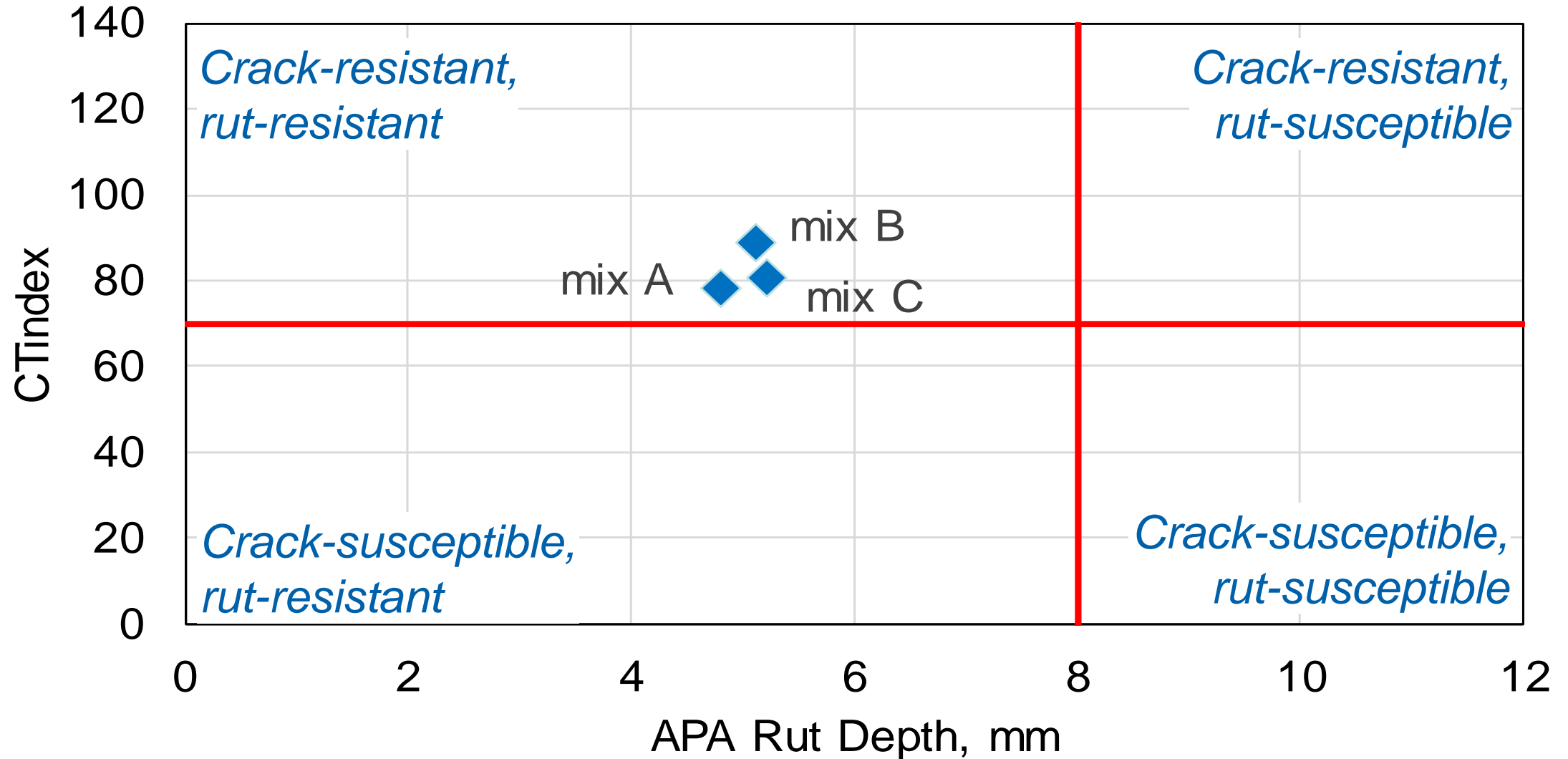
- ❑ **Baselining current surface mixes against cracking, rutting, and durability performance metrics**
 - 13 mixes from 2018

- ❑ **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

Date	District	Producer	Location	Mixes
June 27-28 July 15-18, 24-25 Aug. 22, 26-27	NoVa	Superior Paving	Logmill Rd. Catharpin Rd.	SM-9.5 30% RAP PG 64S-22 SM-9.5 40% RAP PG 64S-22, rejuv. SM-9.5 40% RAP PG 58-28 SM-9.5 30% RAP PG 58-28 SM-9.5 40% RAP PG 64S-22
July 12, 17, 24	Salem & Lynchburg	Boxley	Rt. 460, Salem Rt. 60, Lynchburg	SM-9.5 26% RAP PG 64S-22 SM-9.5 26% RAP PG 64S-22, rejuv. 1 SM-9.5 26% RAP PG 64S-22, rejuv. 2

Example Performance Space



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?

