



A CRH COMPANY



# Engineering City Paving Mixtures Through The Balanced Mix Design Concept

September 2, 2021

# Current State of Affairs

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1 What's more important: cracking resistance or rutting resistance?

2 Economics or performance?

3 Have we placed too many restrictions trying to prescribe what "good hot mix" should look like on paper?

4 Can we simply specify performance?



# Most Common Pavement Distresses

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**CRACKING DISTRESS**



**RUTTING DISTRESS**

# Engineering City Paving Mixtures

*MAC Mix was developed to find a **balance between historical data** from Specialty Mixes **and empirical data** from Test Analysis*

## Historical Data:



**Note:** MAC Mix is a concept based on performance and it is not proprietary to TexasBit.

## Empirical Data:

IDT and IDEAL CT



Overlay Test



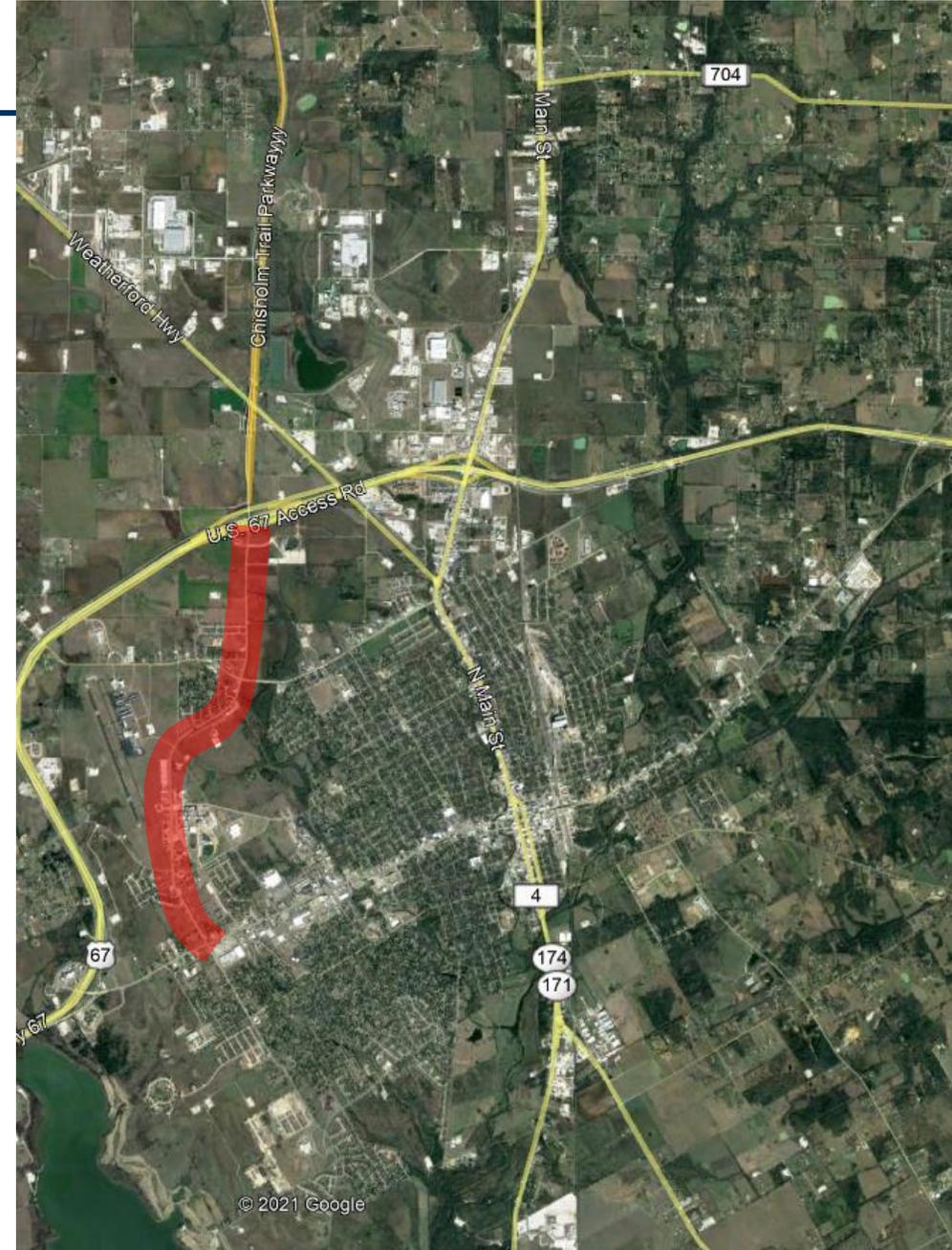
Hamburg



# Nolan River Road, City of Cleburne

Nolan River is 5 lanes wide and is a major roadway for the City

- Higher Traffic Counts
  - Lots of isolated base failures
  - The Chisolm Trail Tollway connects to this roadway
- 
- Major entry corridor of the City of Cleburne



# Nolan River Road, City of Cleburne

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**2013**



**2019**

# Nolan River Road, City of Cleburne

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- The City of Cleburne was looking for creative solutions to get the most out their limited pavement maintenance funds
- We needed to fix the road but did not have funds to rebuild
  - limited funding to do a full 2” Mill and Overlay
  - base failure repair was the needed most
- Wedge Mill and a 1.5” MAC Mix Overlay was the solution
  - Suggested by Texas Bit – History of successful projects
  - Test Section in Rio Vista
  - 1.5” overlay with MAC mix

# Nolan River Road, City of Cleburne



BMD SP-D PG 64-22 w/15% GTR with 11% RAP and 4% RAS

# Nolan River Road, City of Cleburne

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## **Current Condition?**

- Nolan River is a major corridor and it has only been a little over a year, the conditions and ride quality has been excellent

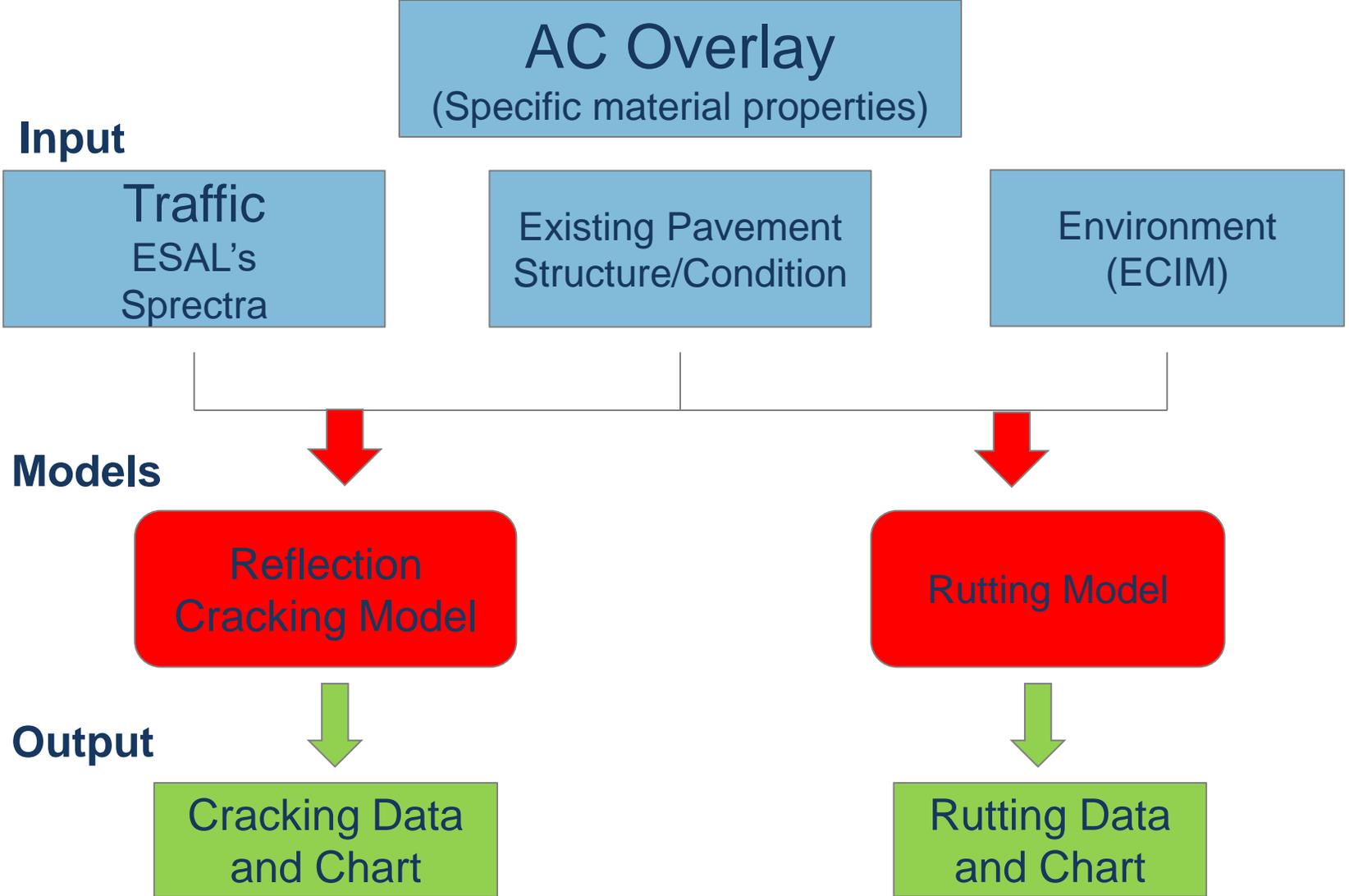
## **Was it worth it?**

- This option provided a solution based on the specific issues that the City faced with this section of roadway

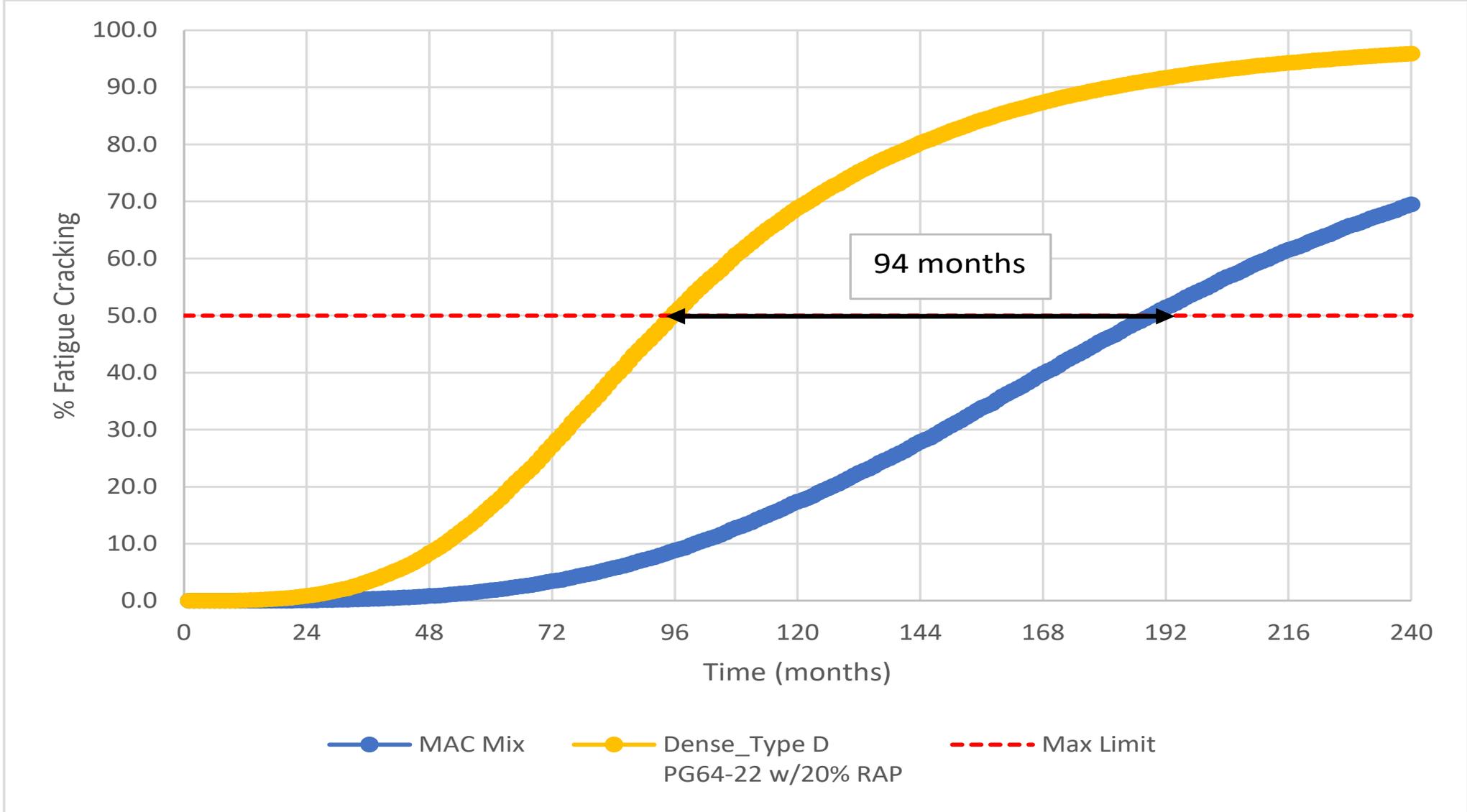
## **Would use it again?**

- If the situation warranted it...

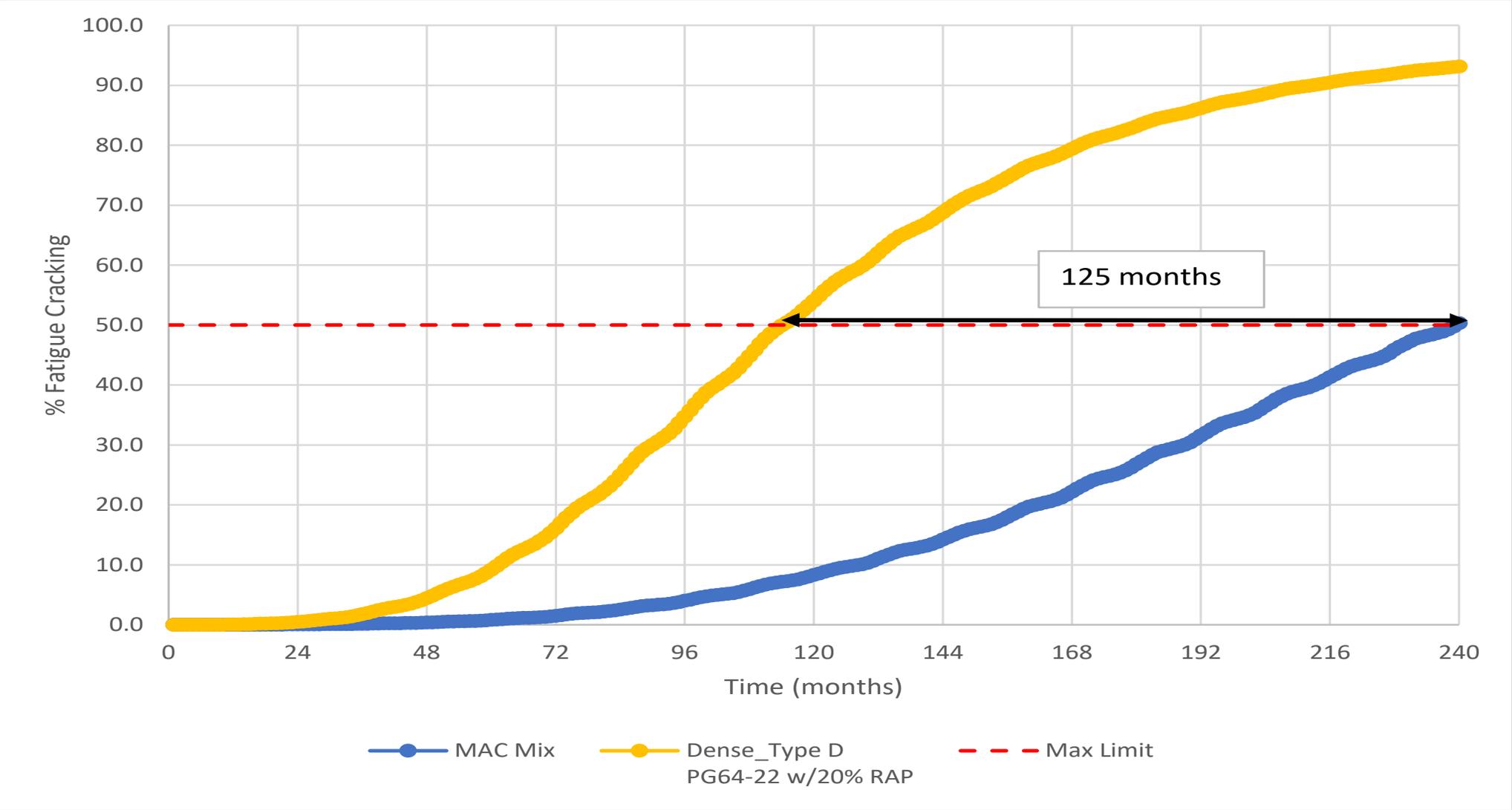
# TxME for Asphalt Overlays



# TxME - % Fatigue Cracking (Dallas)



# TxME - % Fatigue Cracking (Fort Worth)



# NCAT Test Track

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## *Research Case Study at NCAT Test Track*

- ❑ Validation of lab versus field performance

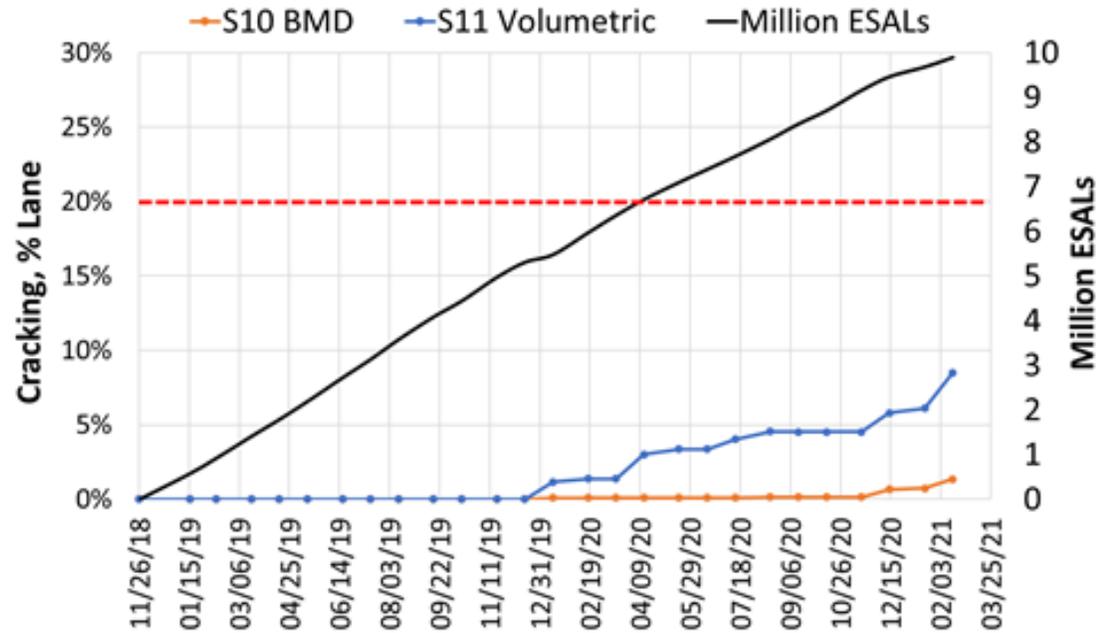
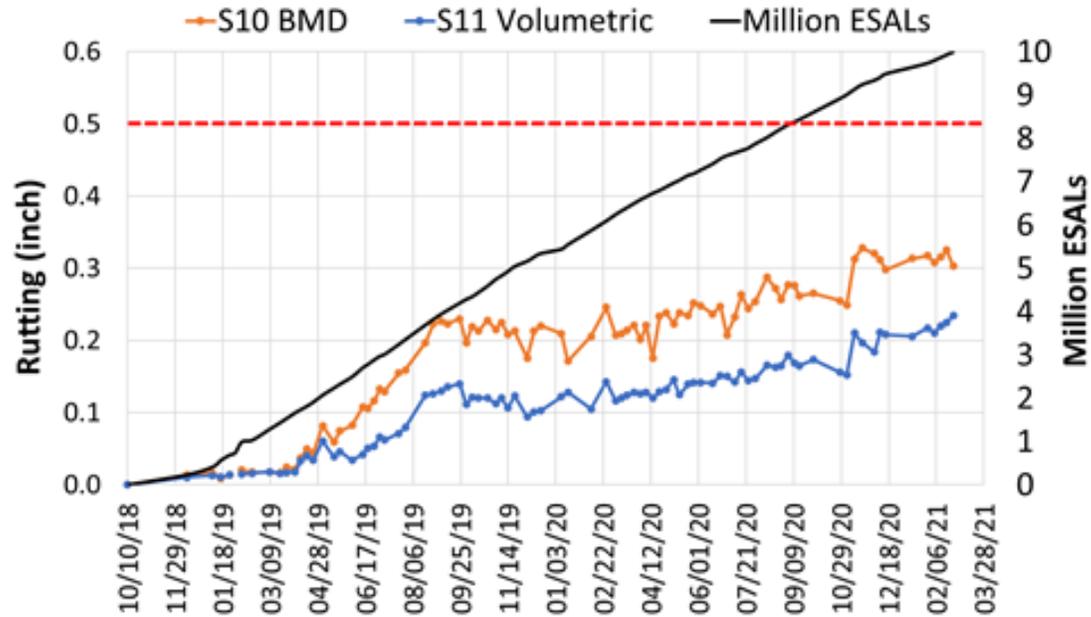


Pavement Test Track at National Center for Asphalt Technology



# NCAT Test Track BMD Test Section

In 2018 TXDOT sponsored two test sections on the NCAT test track comparing a volumetric design and a BMD design. Both test sections utilized Item 344 SP-C PG 70-22 w/18% RAP.



# Central Design Lab

## Capabilities

- Aggregate Testing
- Mix Designs
- Performance Testing
  - Hamburg Rutting Test
  - Overlay Cracking Testing
  - Ideal CT
- Auto Extraction Machine
  - Forensics Testing
  - Extract binder for testing
- Research
  - Binders
  - Additives – WMA, Fibers, etc.
  - New concept mixtures
- Tours



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# Questions



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