

Local Aggregate SMA Interstate Applications



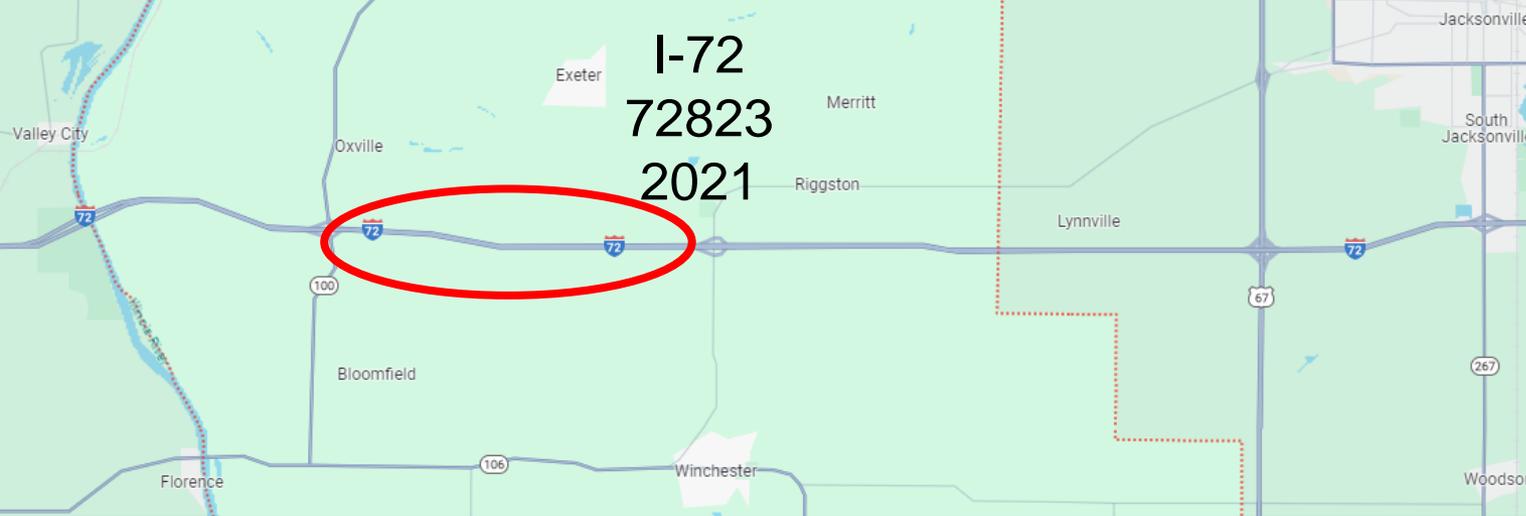
Greg Heckel IDOT District 6

Expanding the Types and Sources of Aggregates Available for SMA Production *in District 6*

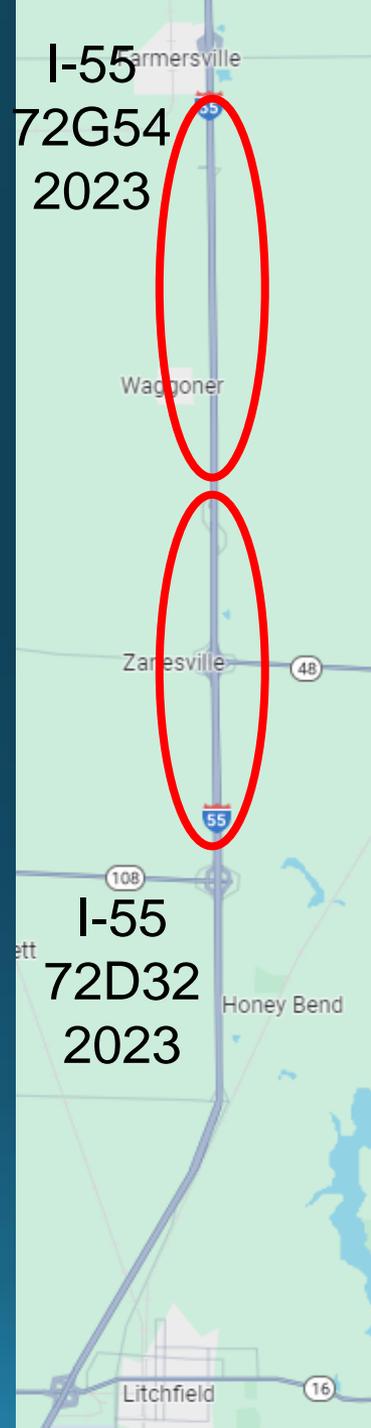
- In District 6, a local aggregate means limestone.
- IDOT Specifications currently allow limestone in an N50 SMA Binder or an N50 SMA C Surface.

Expanding
the Types
and Sources
of
Aggregates
Available for
SMA
Production

*How valid is the 10 million ESAL
limit that separates an N50 SMA
from an N80 SMA?*



I-72
72823
2021



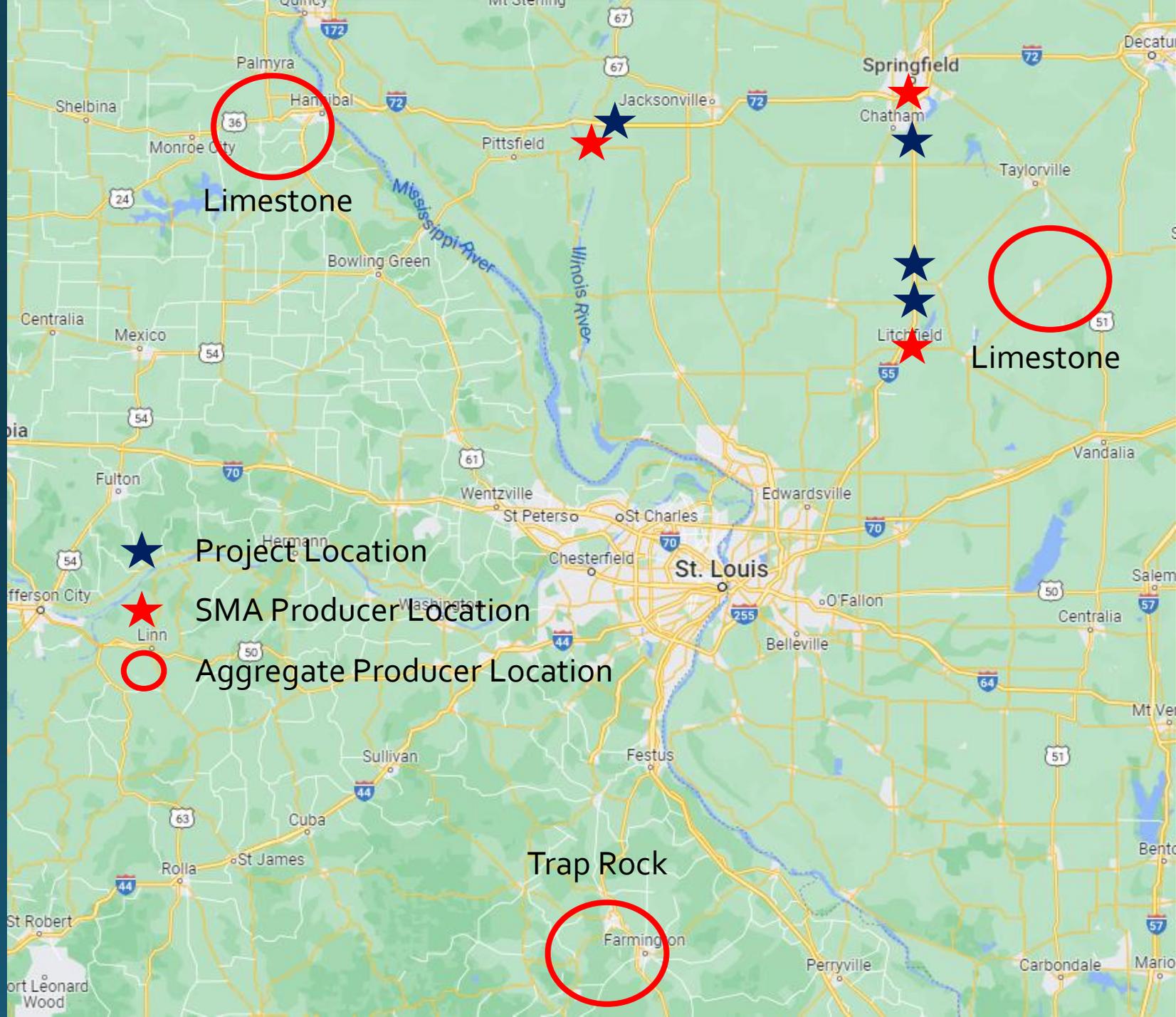
I-55
72G54
2023

I-55
72D32
2023



I-55
72G46
2020

D6 Interstate N50 SMA Projects



Project Location



SMA Producer Location



Aggregate Producer Location

Limestone

Limestone

Trap Rock

Traffic Information

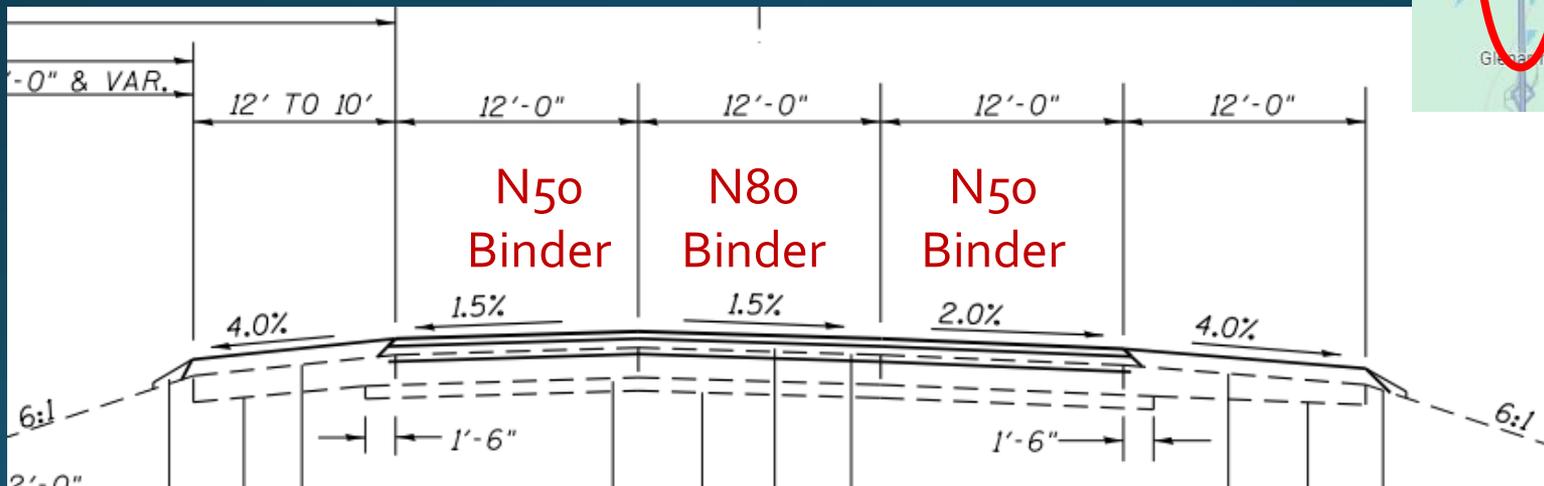
	I-55	I-72
ESALS (million)	32	12

Remember...

Current specifications limit N50 SMAs to 10 million ESALS or less.

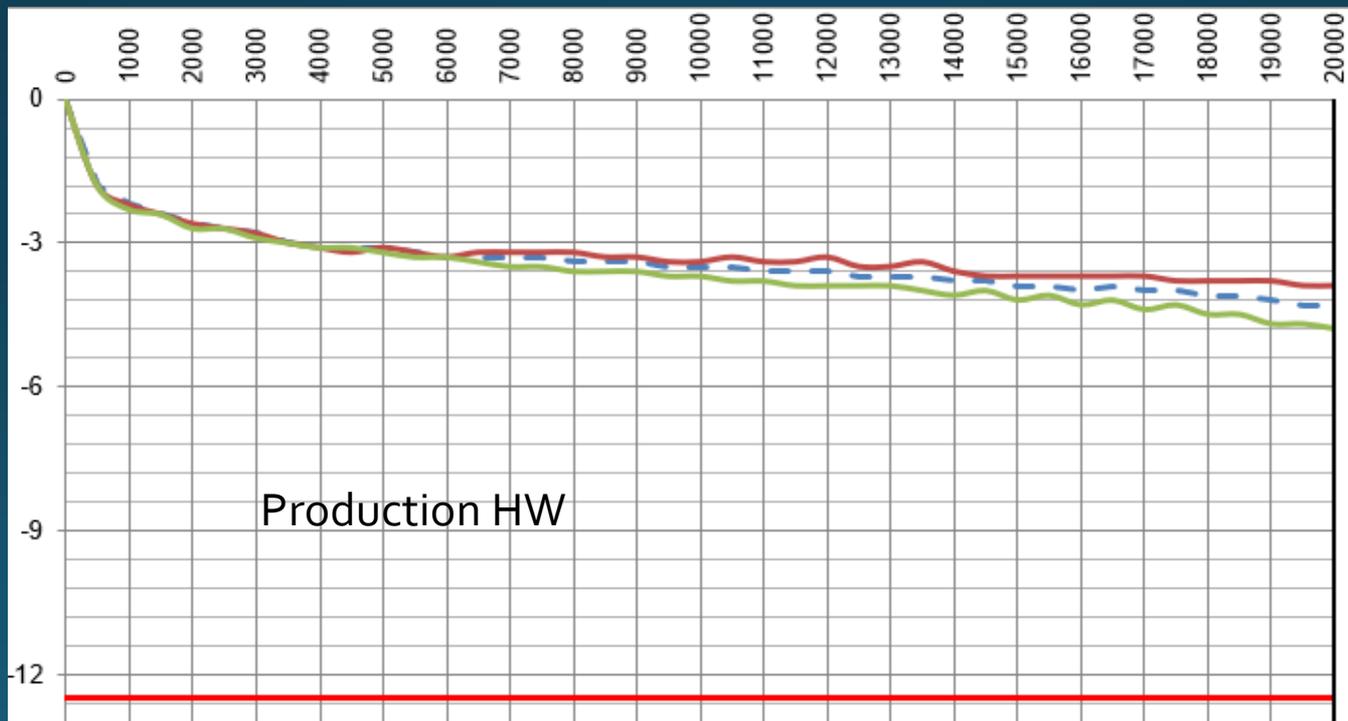
I-55 2020

- Remove Existing HMA & Replace with SMA on CRCP
- 2-inch SMA-12.5 Binder
- 2-inch SMA-12.5 E Surface



I-55 2020 N50 SMA-12.5 Binder

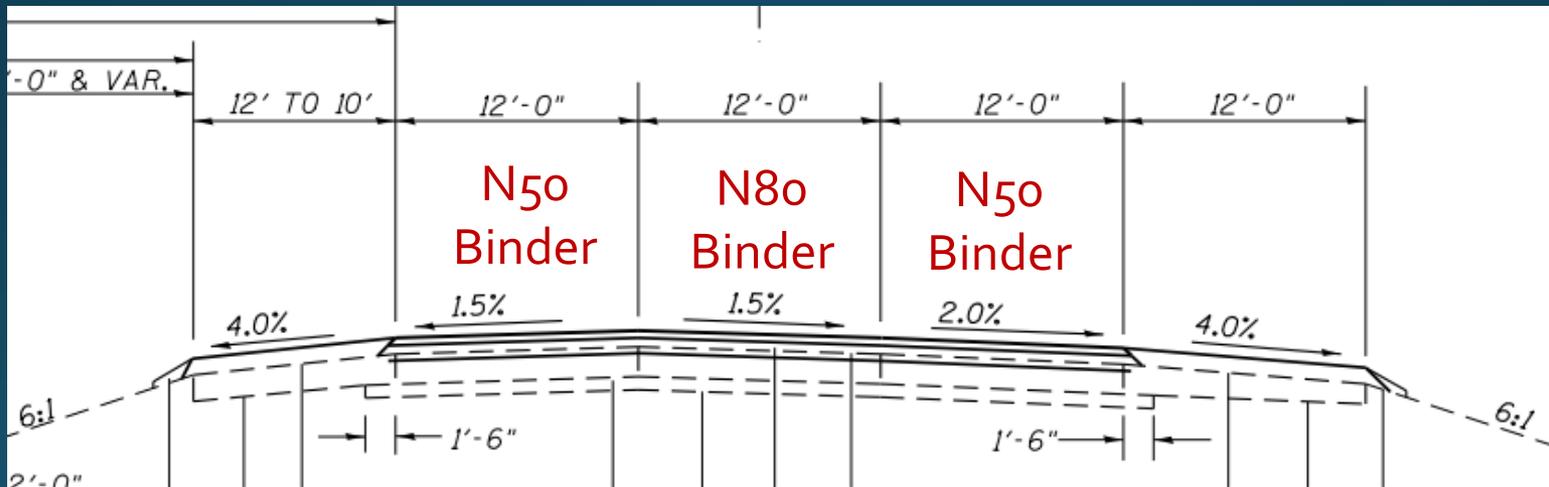
- Blend of CM14 & CM16 A-Quality Limestone
- Design 6.2% SBS PG76-22 with 8% ABR
- Production Flexibility Index = 6 Resample = 15 ★



I-55 2020 Performance in 2023

August 2023 Average Rut Depth, Inches

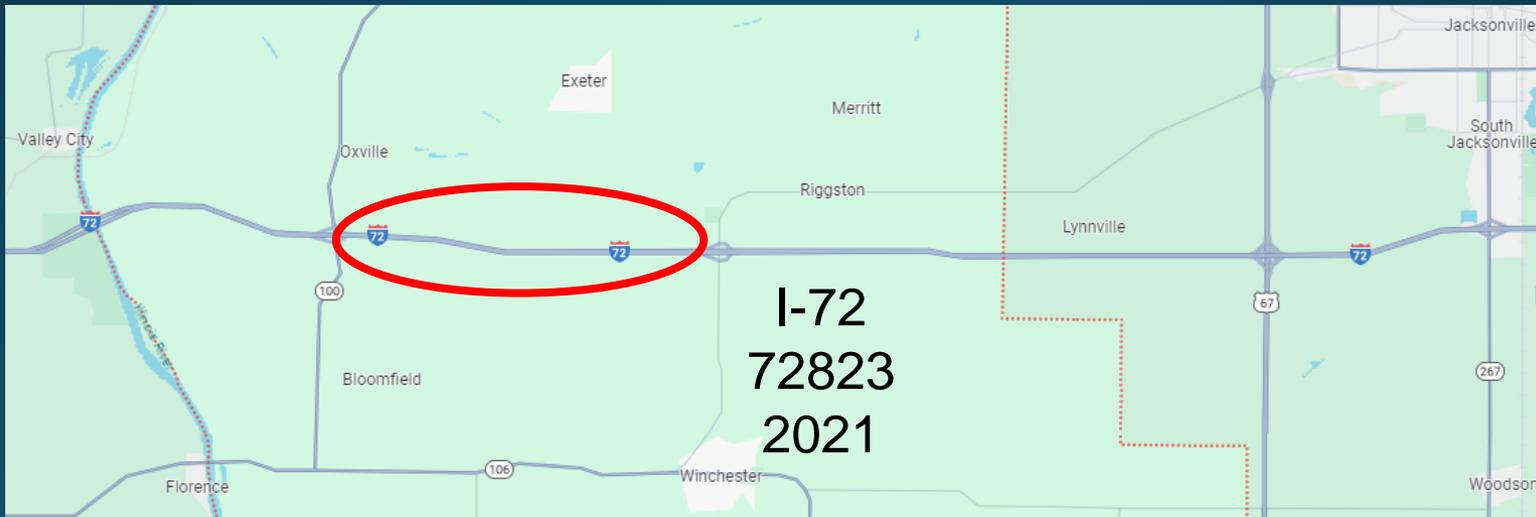
	Inside Lane	Center Lane	Outside Lane
Southbound	0.06	0.13	0.16
Northbound	0.09	0.15	0.12



Rutting Data obtained using a transverse pavement profiler and wireline analysis methods.

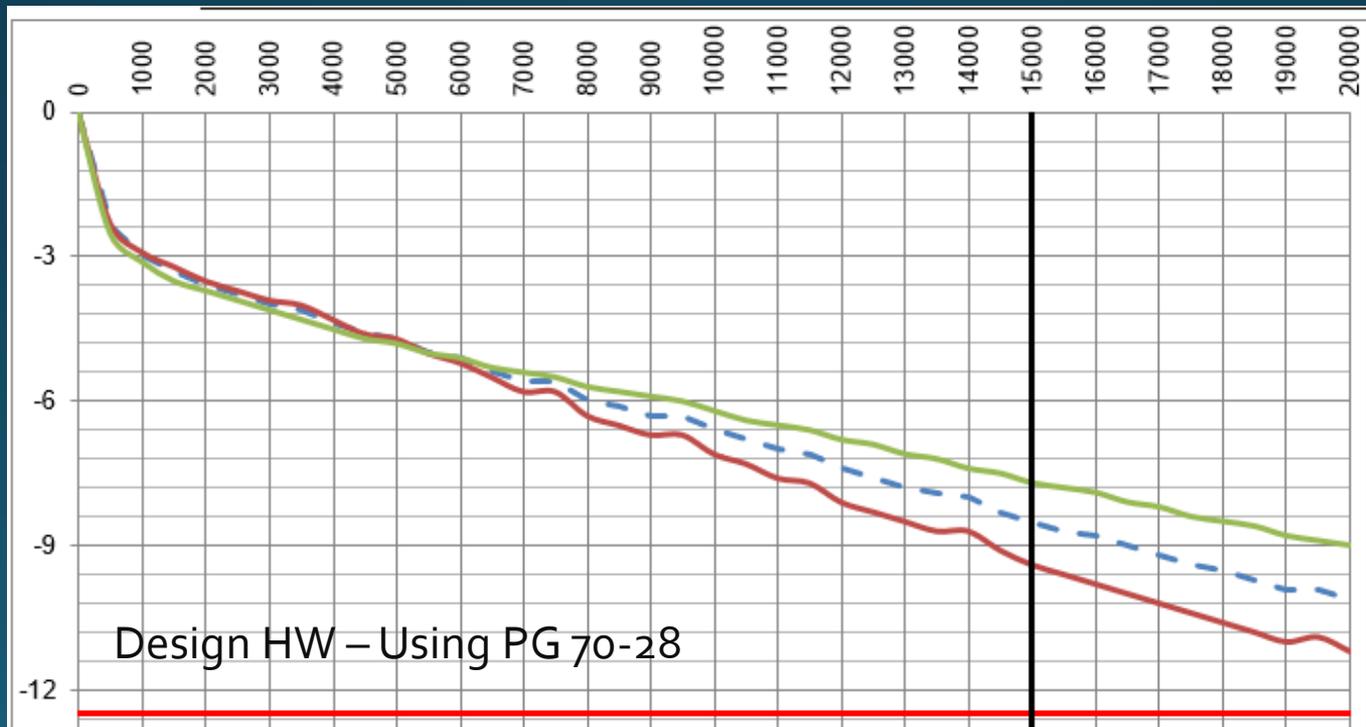
I-72

- Overlay of CRCP in 2021
- 2-inch N50 SMA-12.5 Binder
- 2-inch N50 SMA-12.5 D Surface

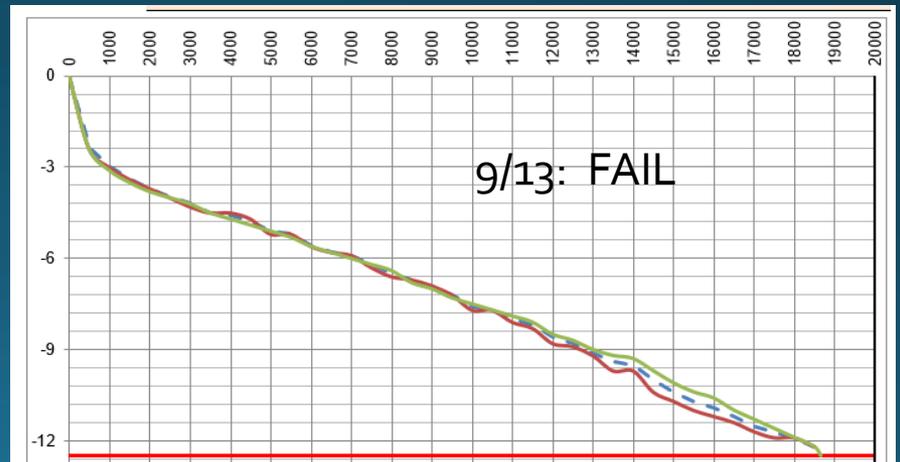
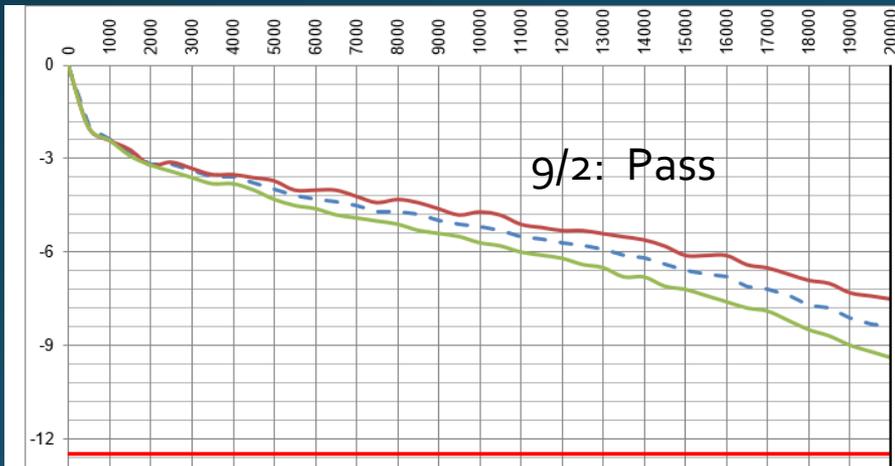
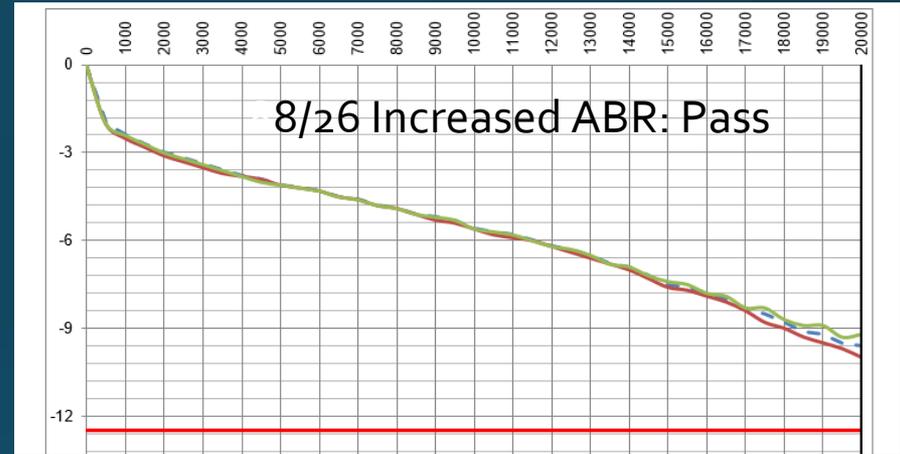
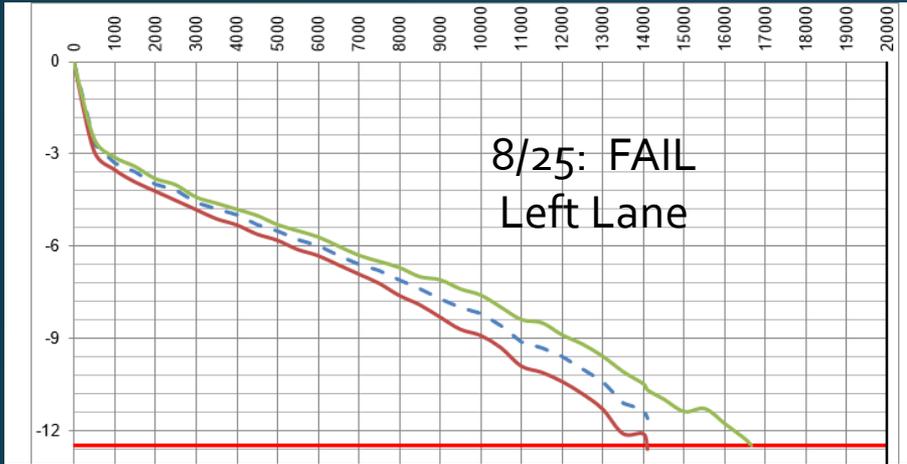


I-72 N50 SMA-12.5 Binder

- Blend of CM14 & CM16 A-Quality Limestone
- Design 5.8% SBS PG76-28 with 10% ABR
- Production Flexibility Index = 40



I-72 N50 Binder Production HW



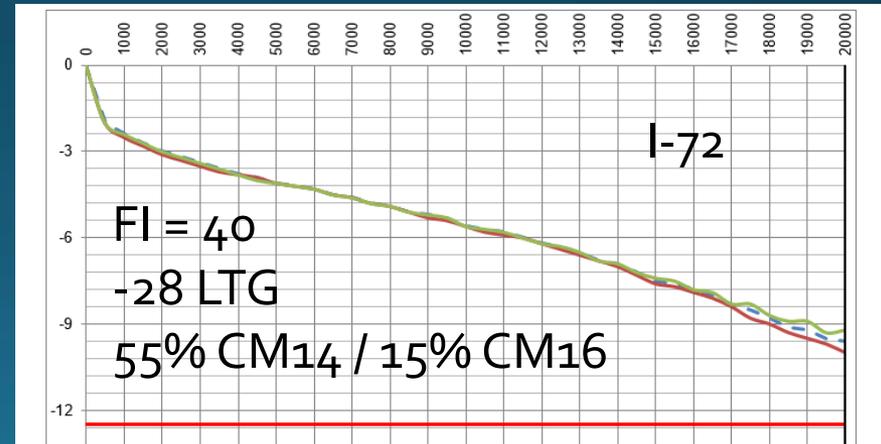
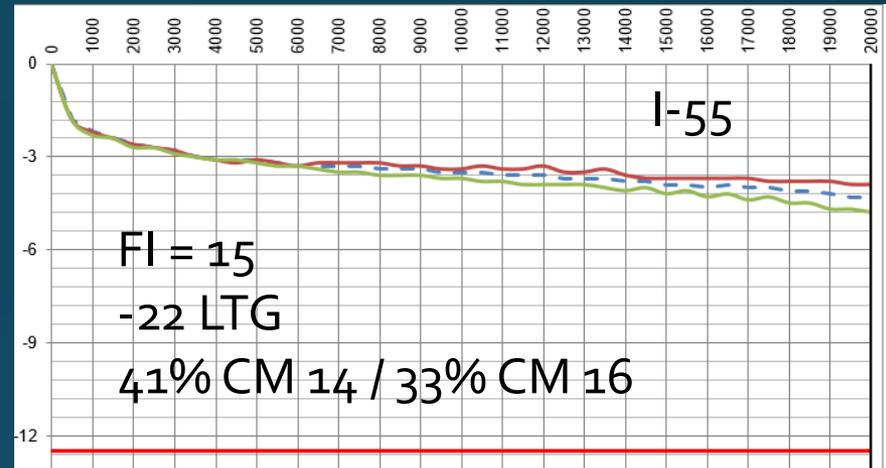
Verified Production PG Grade Multiple Times

2020 I-55 & I-72 N50 Binder Performance

- Production FI?
- AC Low Temp Grade?
- Mix Design CA Blends?
- Aggregate Properties?

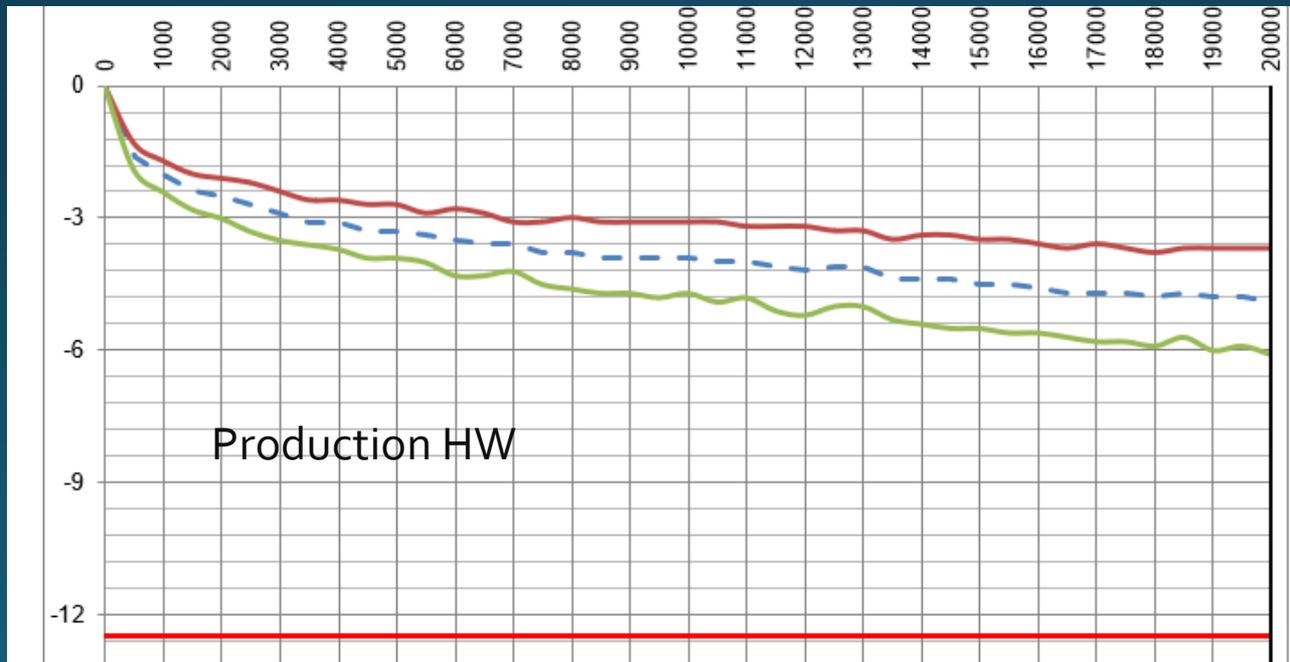
I-72 Limestone	25.7% LA Abrasion Loss
I-55 Limestone	22.7% LA Abrasion Loss

	3 - 1	5 - 1
I-72 Limestone	15.0%	0.5%
I-55 Limestone	15.5%	2.3%



I-72 N50 SMA-12.5 D Surface

- Blend of CM13, CM14, & CM16 Trap Rock
- Design 6.3% SBS PG76-28 with 11% ABR
- Production Flexibility Index: Unaged = 40 Aged = 18



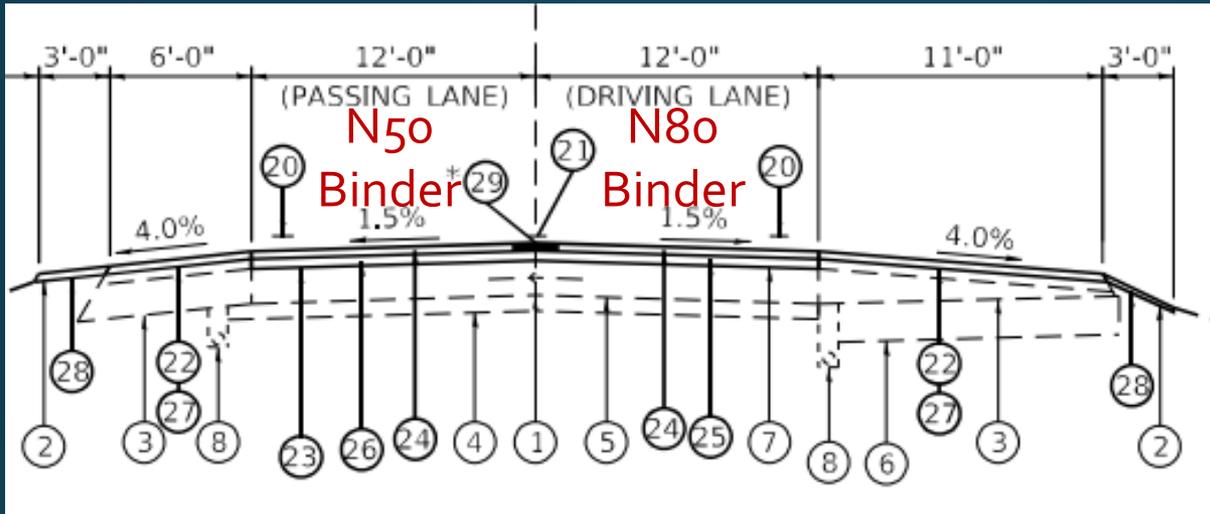
I-72 Performance

	2022	2023
Eastbound	0.04	0.03
Westbound	0.05	0.05

Average Rut Depth, inches – Right Lane

Rutting Data obtained using the CRS Data Collection Vehicle and AASHTO analysis methods.

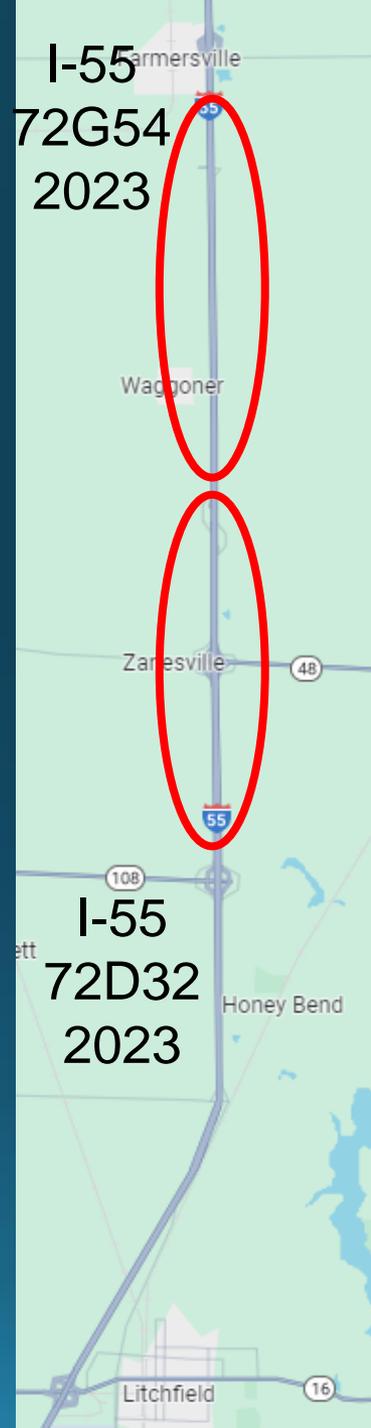
I-55 2023



I-55
72G54
2023

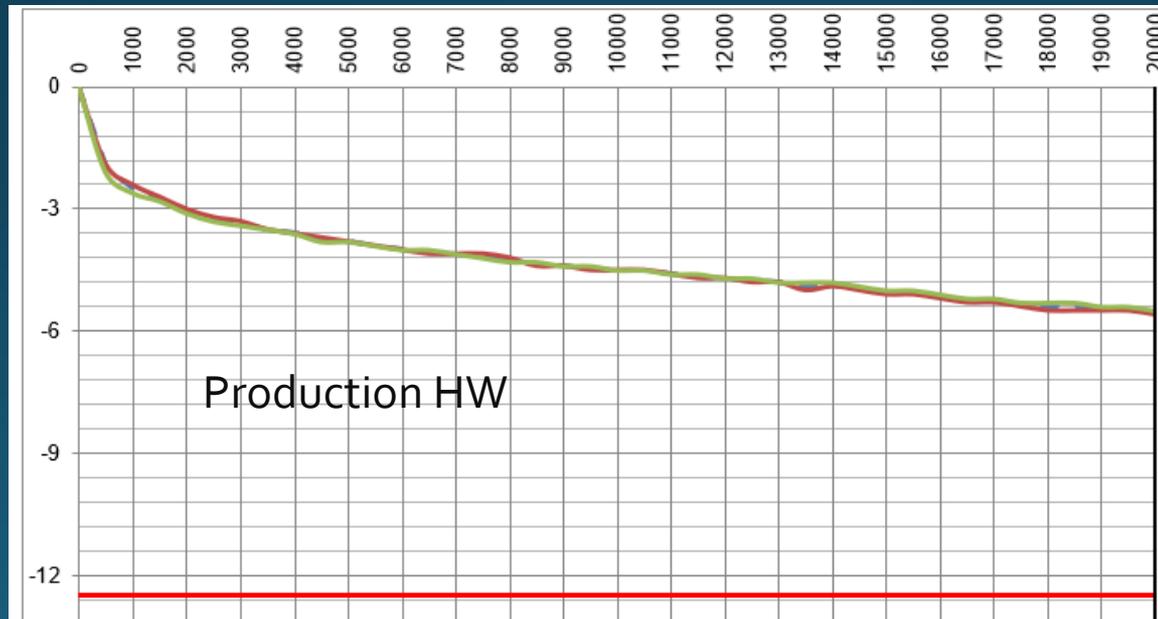
I-55
72D32
2023

	72G54	72D32
Surface	1.5" N80 SMA-9.5	1.5" N80 SMA-9.5
Top Binder	N/A	1.5" N80 SMA-9.5
Bottom Binder	3" N50/N80 SMA-12.5	2.5" N50/N80 SMA-12.5



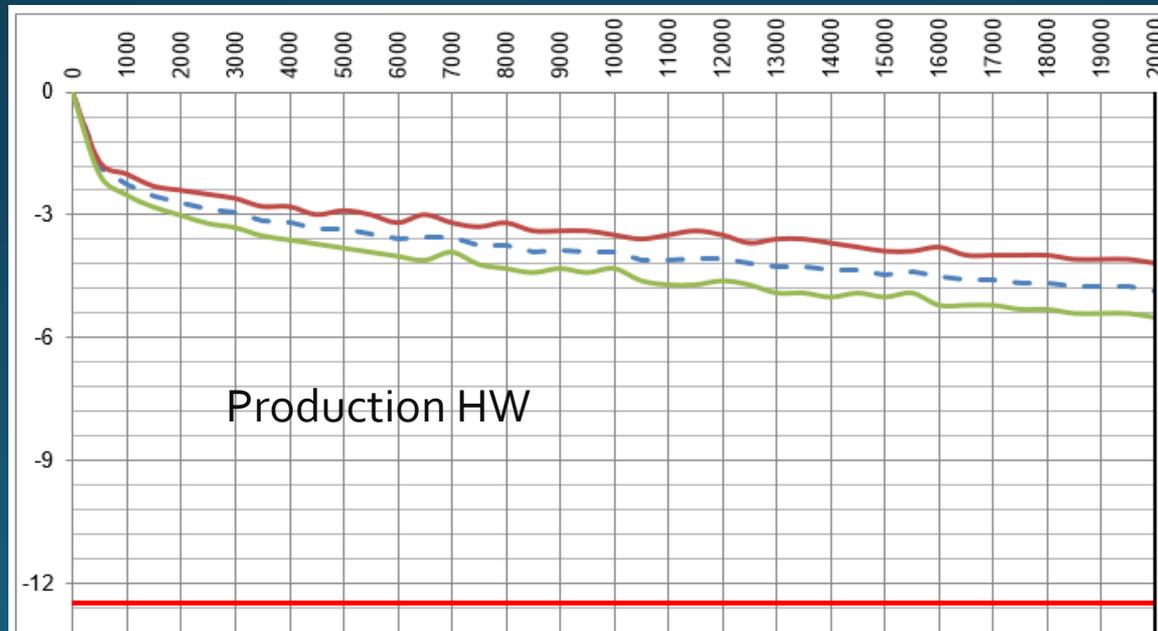
I-55 72G54 SMA-12.5 N50

- Blend of CM14 & CM16 A-Quality Limestone
- Production 6.2% SBS PG76-22 with 11% ABR
- Unaged Production Flexibility Index = 37



I-55 72D32 SMA-12.5 N50

- Blend of CM14 & CM16 A-Quality Limestone
 - Different Source of CM16 Compared to 72G54
- Production 6.3% SBS PG76-28 with 10% ABR
- Unaged Production Flexibility Index = 23



D6 Challenges

- Limestone sources are not normally producing aggregate for SMAs.
- Limestone sources have limited secondary product opportunities when producing CM14 resulting in more by-product waste.
- Current Friction Aggregate requirements prohibit limestone in surface mixes at higher traffic volumes.
 - *Note: A 2024 D6 experimental feature project allows an A-Quality Limestone to be used alone for a "D" N50 SMA Surface off-interstate.*

Summary

- Field performance data indicates N50 SMA mixtures can be successfully used at greater than 10 million ESALs.
- What about cost?
- The ICT Research Team will provide valuable information for a wider variety of local sources statewide.
- D6 will be continuing to explore options for using N50 SMAs with our local limestone.

Questions?