S4 TN DOT Thin Lift General Performance Study

Michael Heitzman PE, PhD
S4 Study Objective

Measure pavement performance for thin lift mixture placed as a thicker lift
S4 Mix Design and Construction

- Mix design by TN DOT
- 4.75 mm NMAS dense graded
- 60% hard limestone, 10% soft limestone, 15% natural sand, 15% RAP
- 5.9% PG 64 -22
- Dust:binder ratio 1.38 design, 1.7 plant
- Placed 1.50 inch thick, 95% $G_{mm}$
S4 Surface Change

Post constr   Feb 2016   Jul 2016   Apr 2017
Accelerated Lab Friction

- Lab slab CTM texture = 0.21 mm MPD
Field Friction and Texture

S4 TN DOT Thin Asphalt Overlay

Friction (SN40R)

0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70

Friction (DFT40) & Texture (mm)

Time

09/03/15 05/10/16 01/15/17 09/22/17

SN40R  DFT(40)  CTM MPD  laser MTD
General Field Performance

### Graph

- **Y-axis:** IRI (m/km)
- **X-axis:** Equivalent Single Axle Loadings (ESALs), Millions

**Lines:**
- Mean IRI (m/km)
- Laser Rut (mm)
- Cracking (% Lane)

**Legend:**
- Mean IRI (m/km)
- Laser Rut (mm)
- Cracking (% Lane)
S4 Study Conclusions

- Thin lift surface mixture was successfully placed 1.50 inches thick.
- Thin lift demonstrated good ride, rutting, and cracking performance
- Accelerated lab friction caused more friction loss than field friction in tangent track section.
- High-speed laser and CTM texture measures did not agree.
THANKS!

Any questions?
Reach me at
mah0016@auburn.edu

2018 NCAT Test Track Conference