

Surface Characteristics Of Preservation
Treatments
Buzz Powell

SEVENTH
RESEARCH CYCLE

NCAT TEST TRACK CONFERENCE

Background

- MAP-21 relates more to “structural performance”
 - Cracking, roughness, and rutting on/in structure
- Surface characteristics are “functional performance”
 - Safety of drivers/riders
 - Comfort of drivers/riders and nearby residents
- May be consideration in treatment selection process.

What Measurements are Included?



FRICITION



TEXTURE

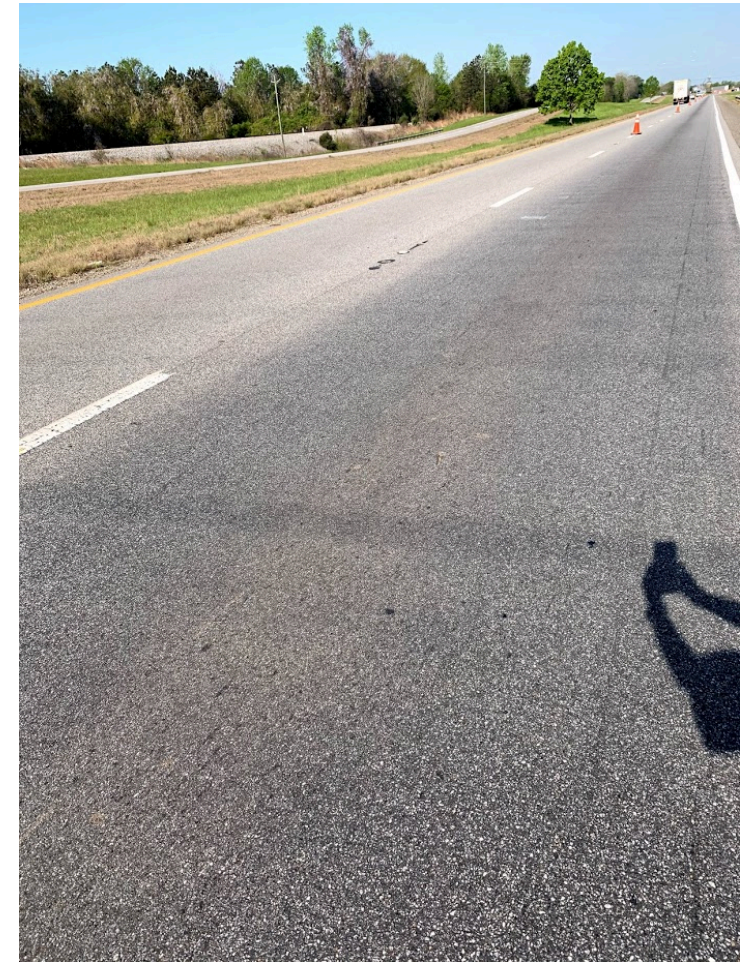
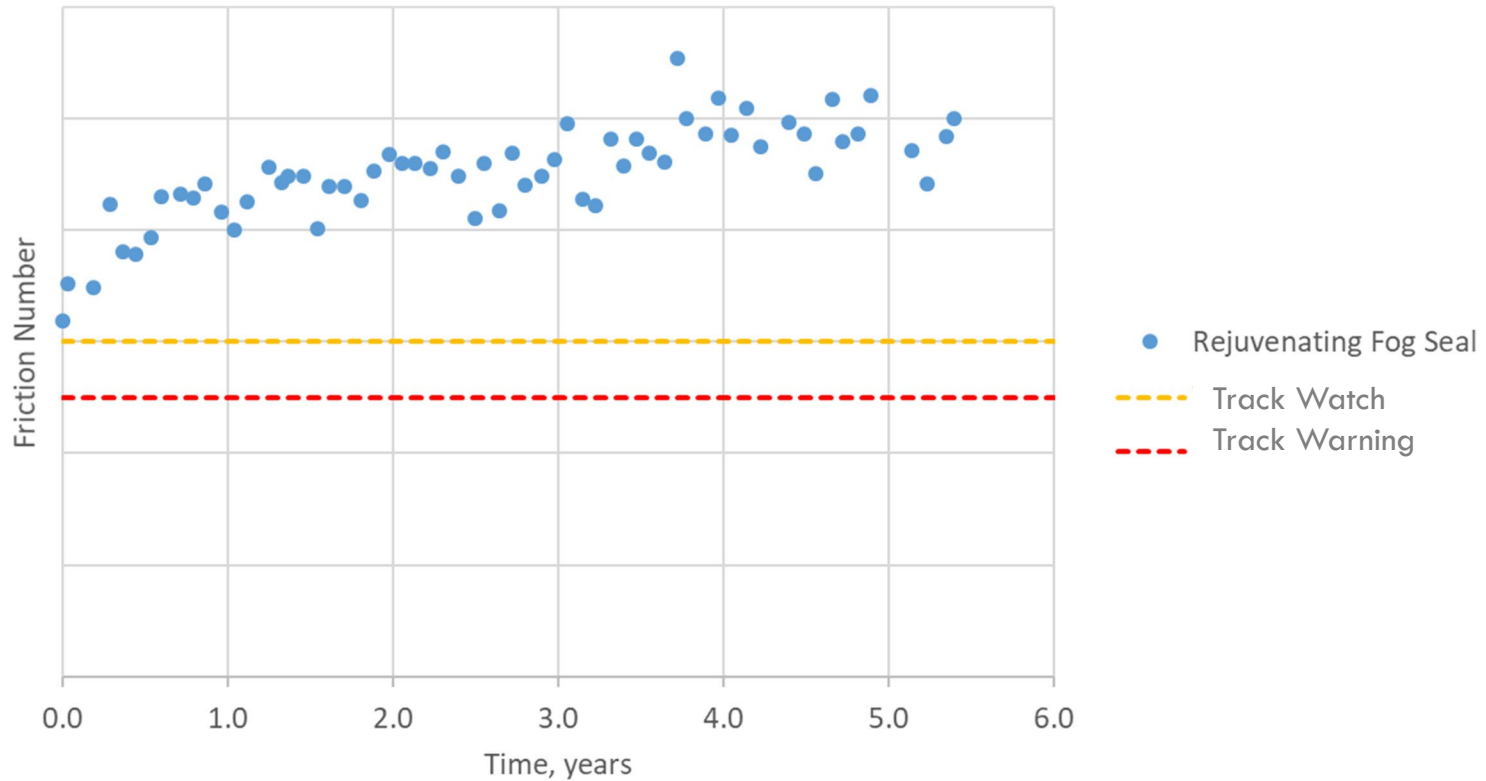


NOISE

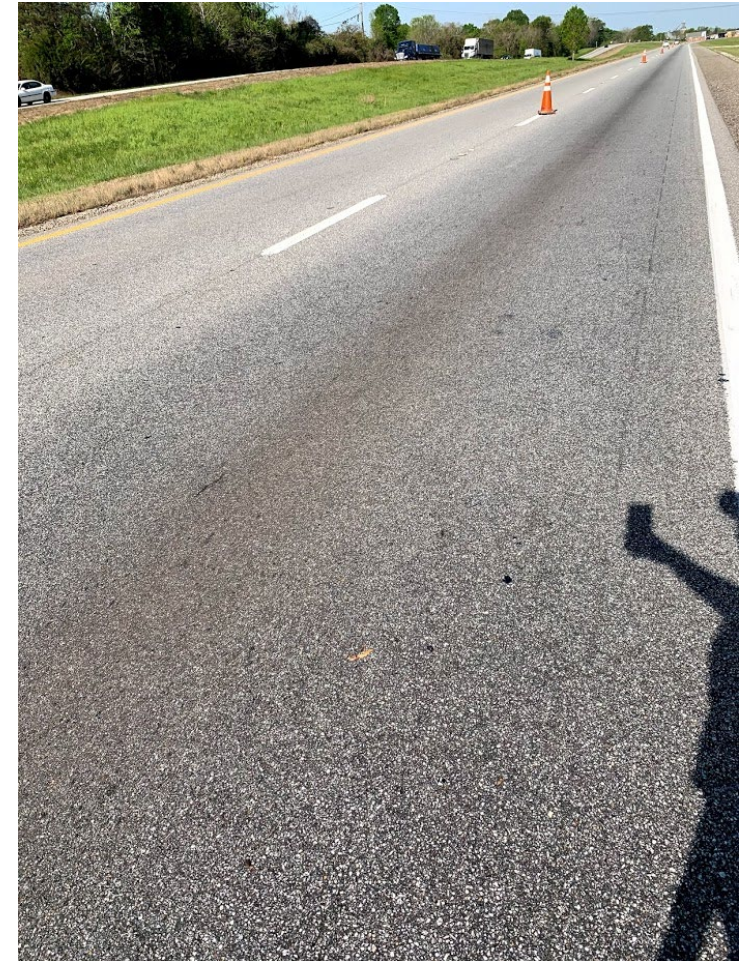
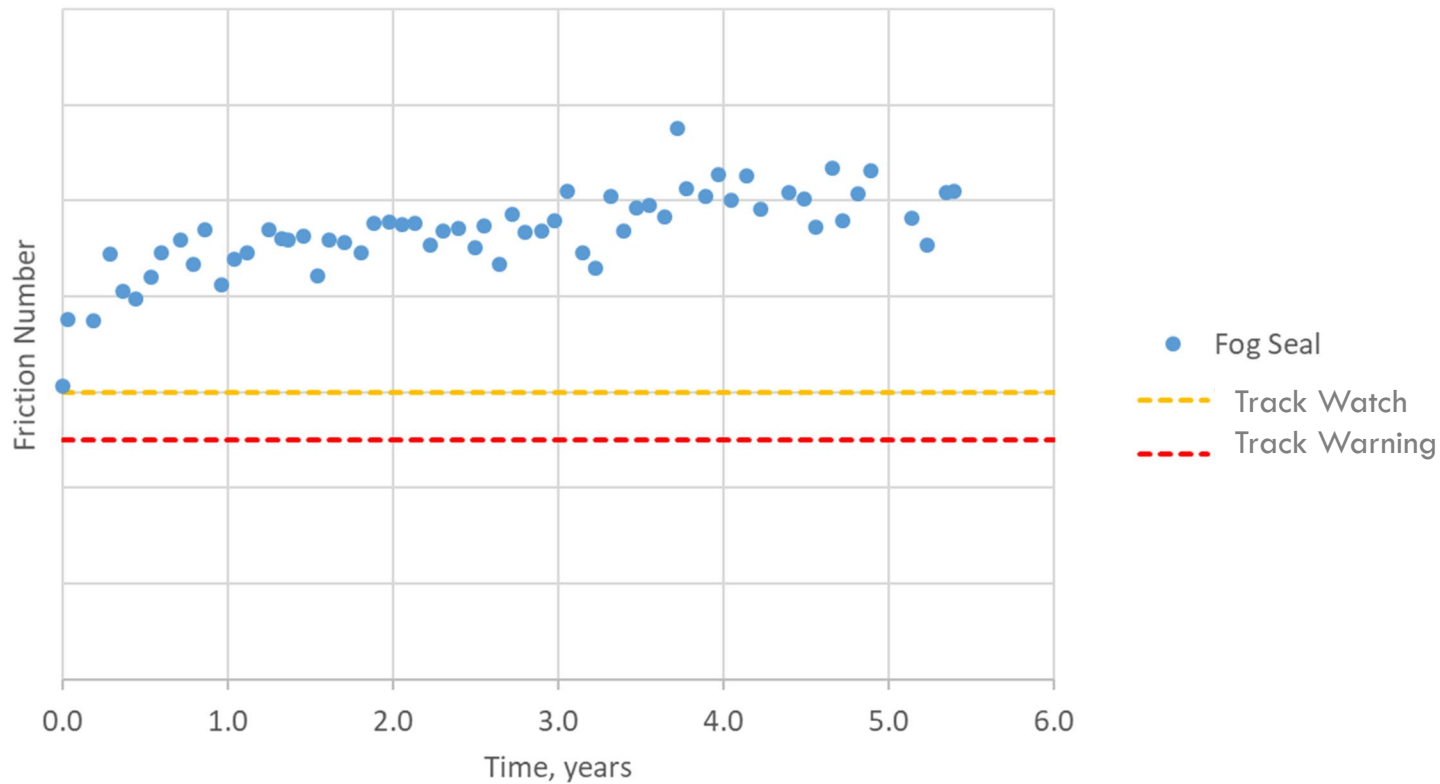
Friction

- Essential for the safety of the motoring public
 - ▣ Critical on high- volume, high-speed roadways
- Some treatments are selected to improve friction
 - ▣ Chip seals (typically single or double)
 - ▣ Micro surfacing (Type II or III)
 - ▣ Thinlays (open graded, gap graded, or coarse DGA)
- Other treatments may temporarily reduce friction
 - ▣ Fog seals and rejuvenating fog seals.

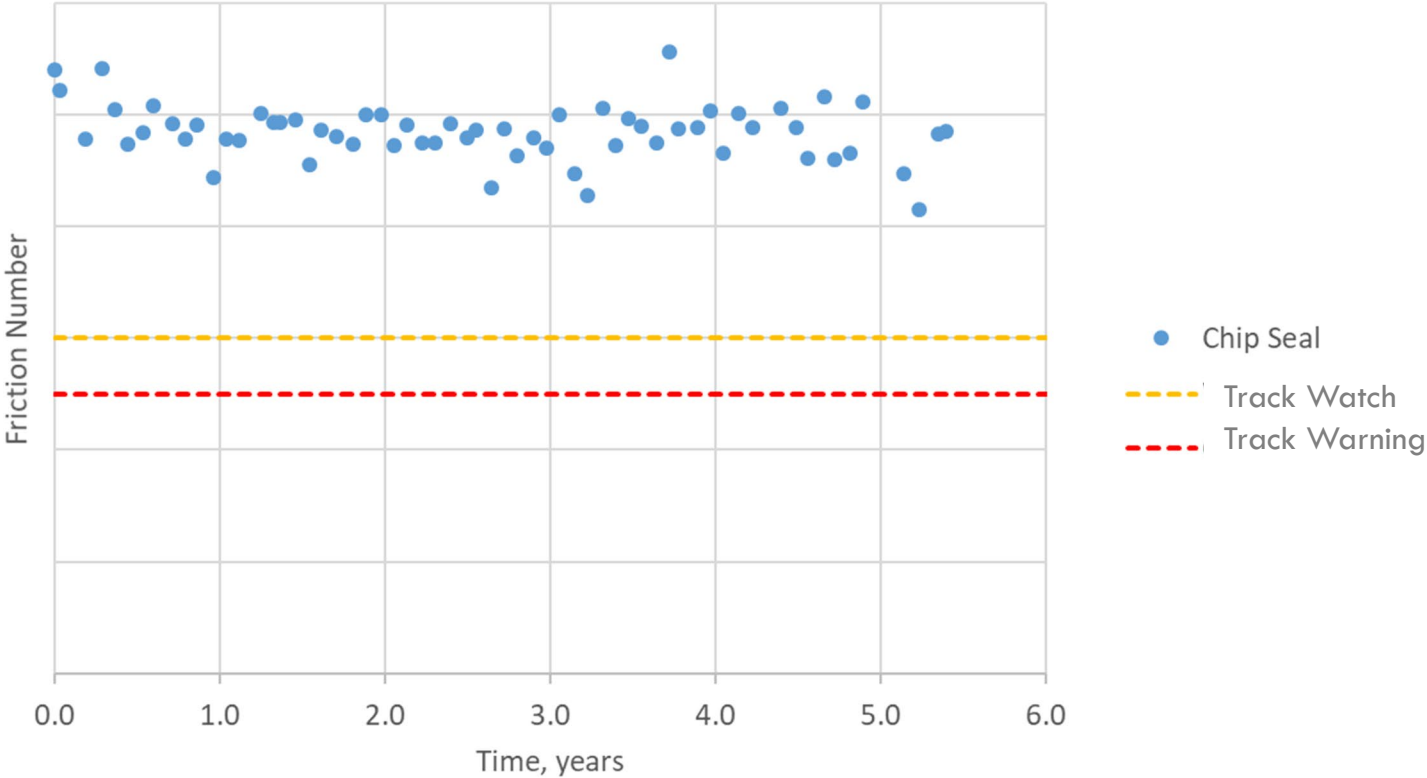
Friction – US 280



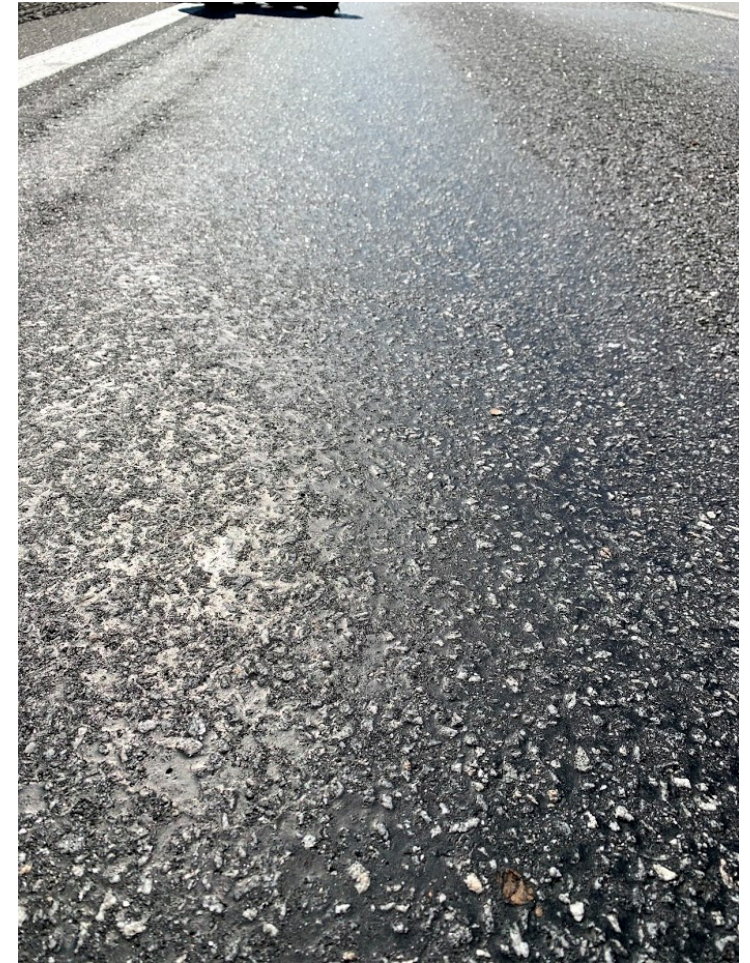
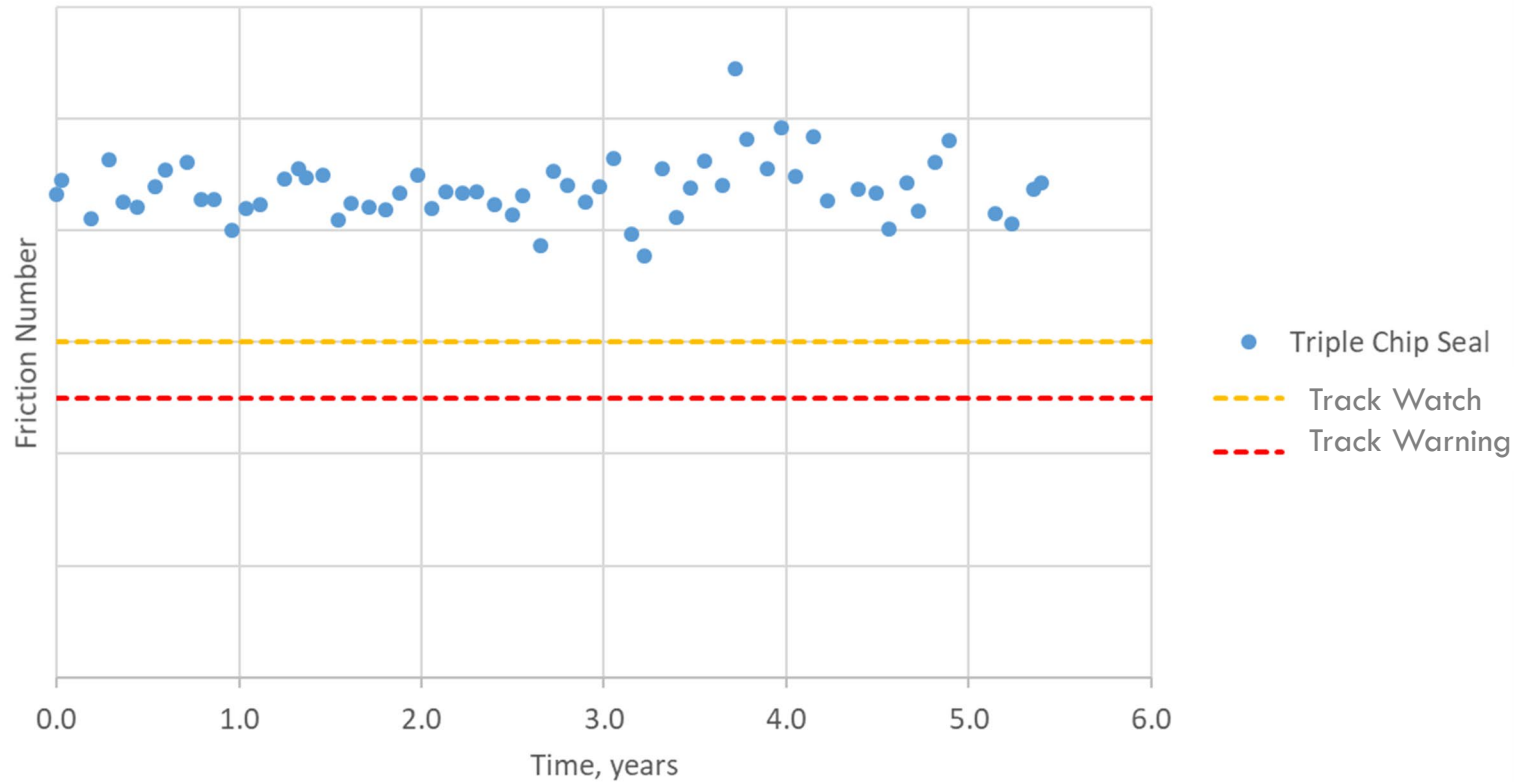
Friction - US 280



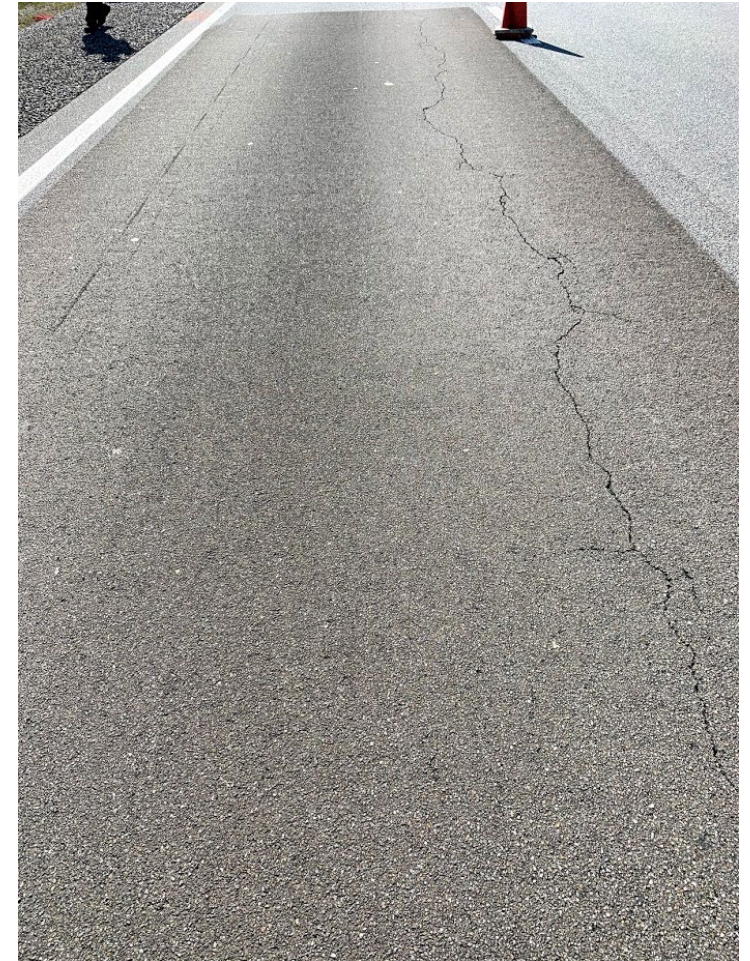
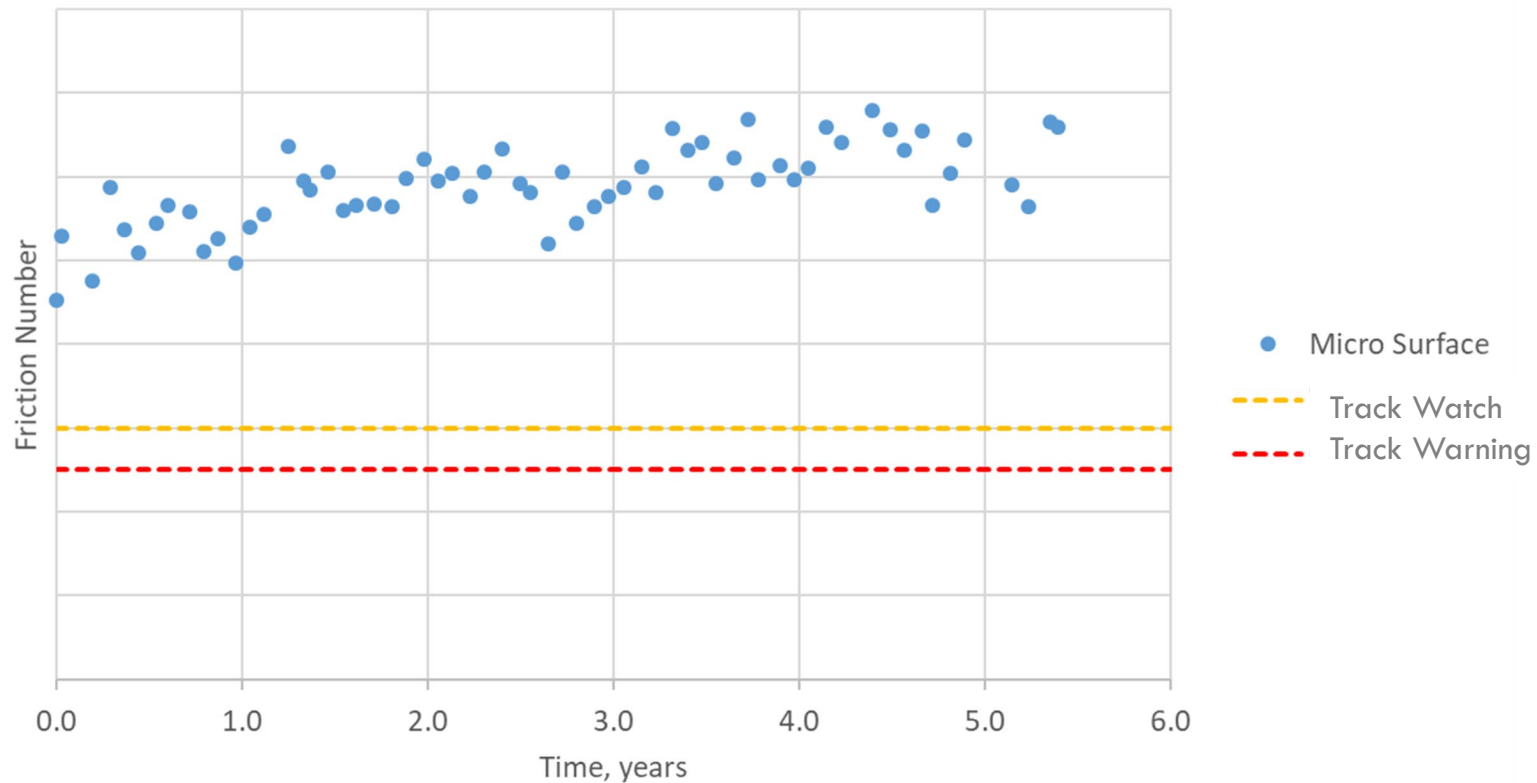
Friction - US 280



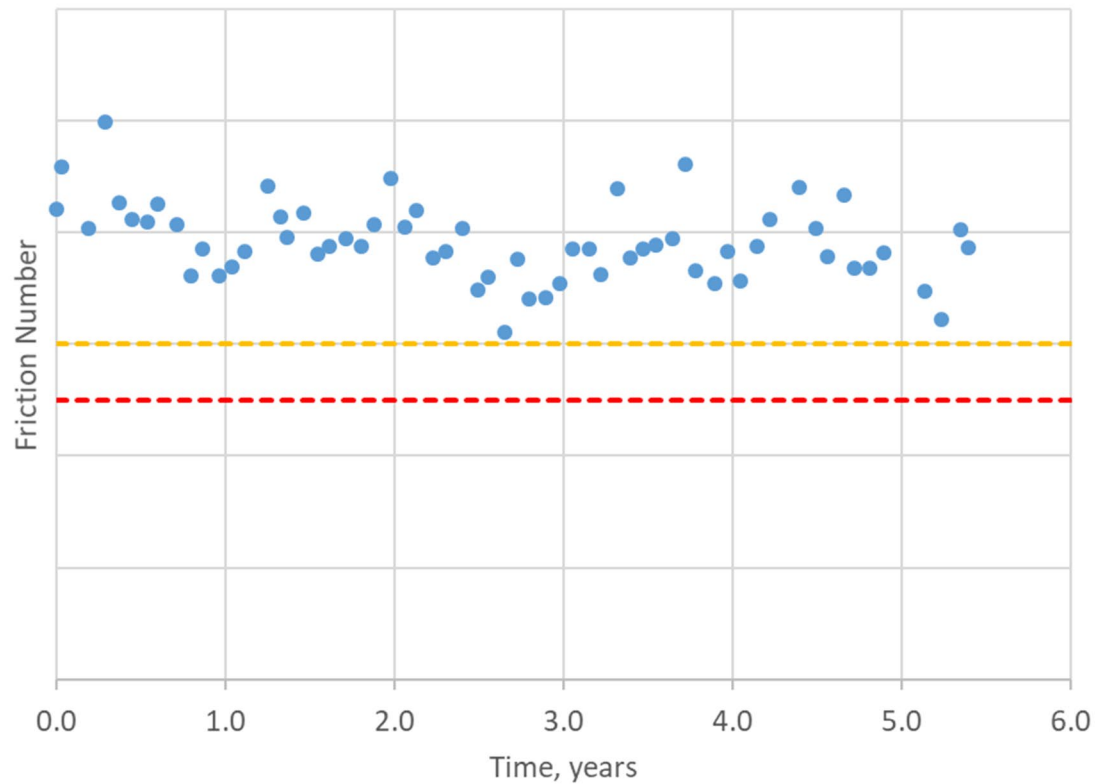
Friction - US 280



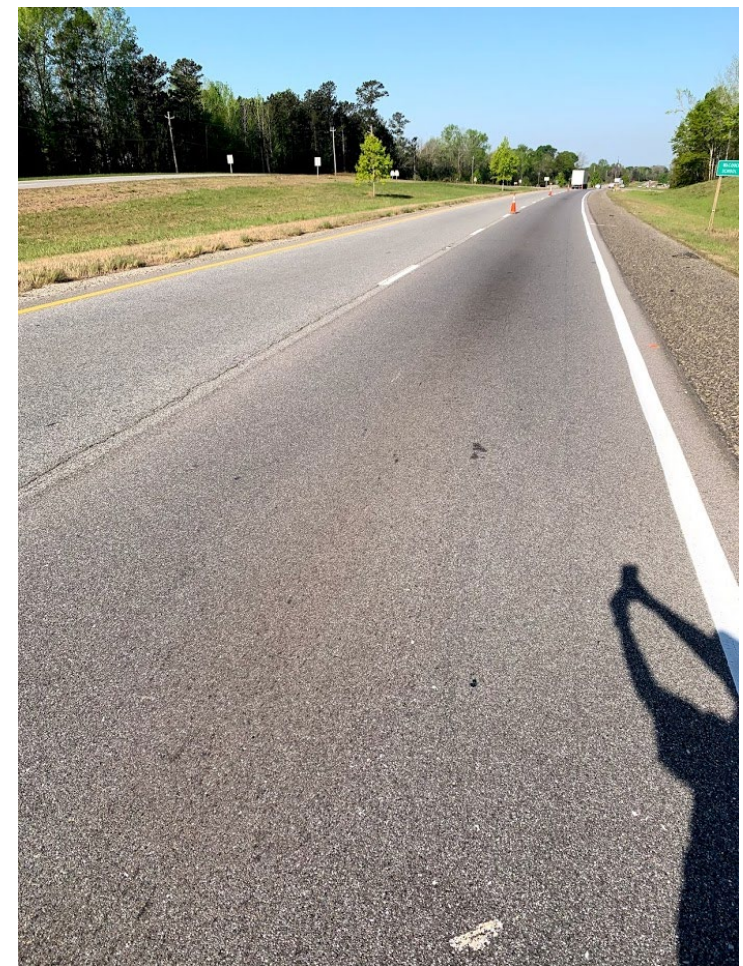
Friction - US 280



Friction - US 280



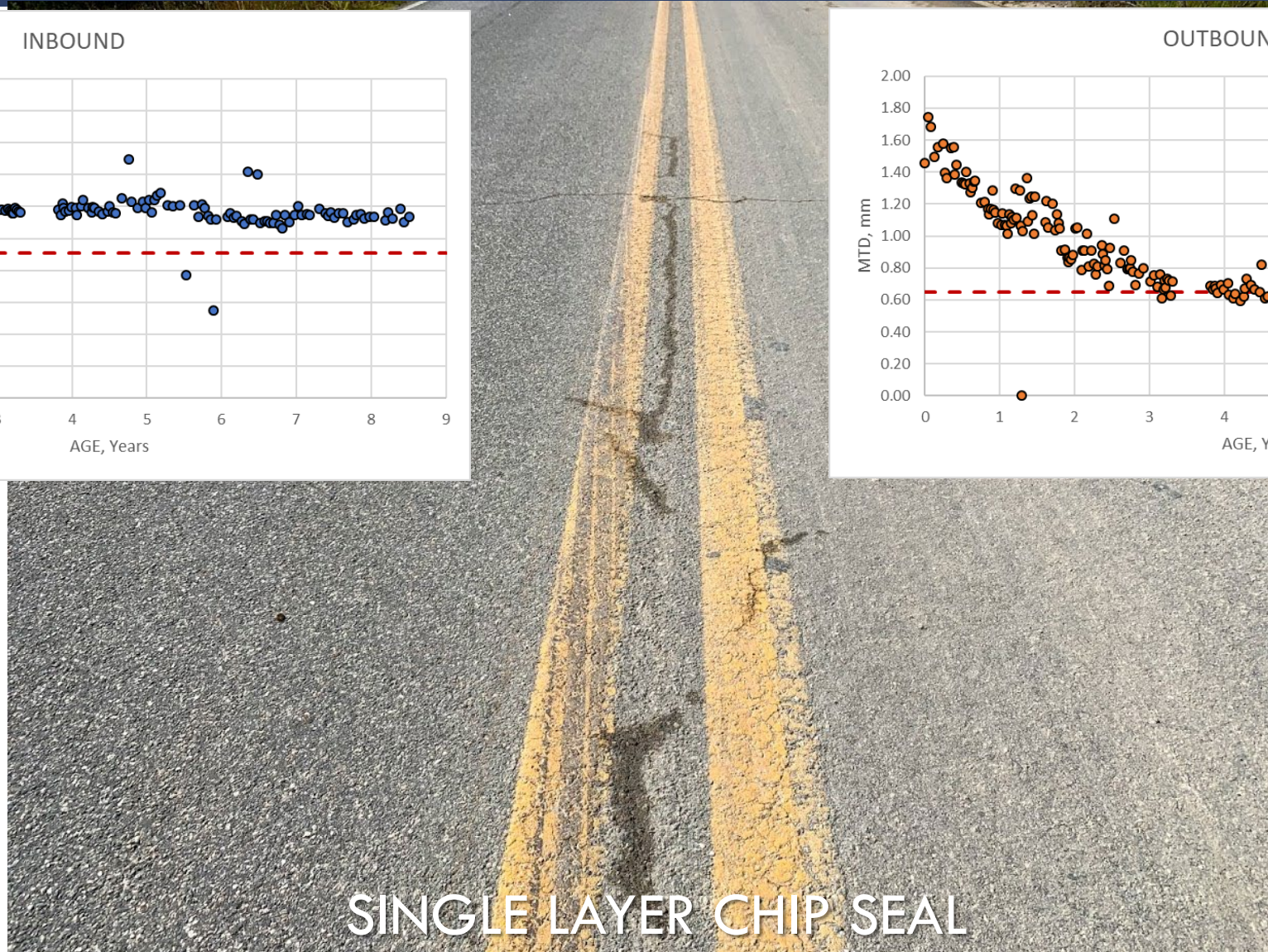
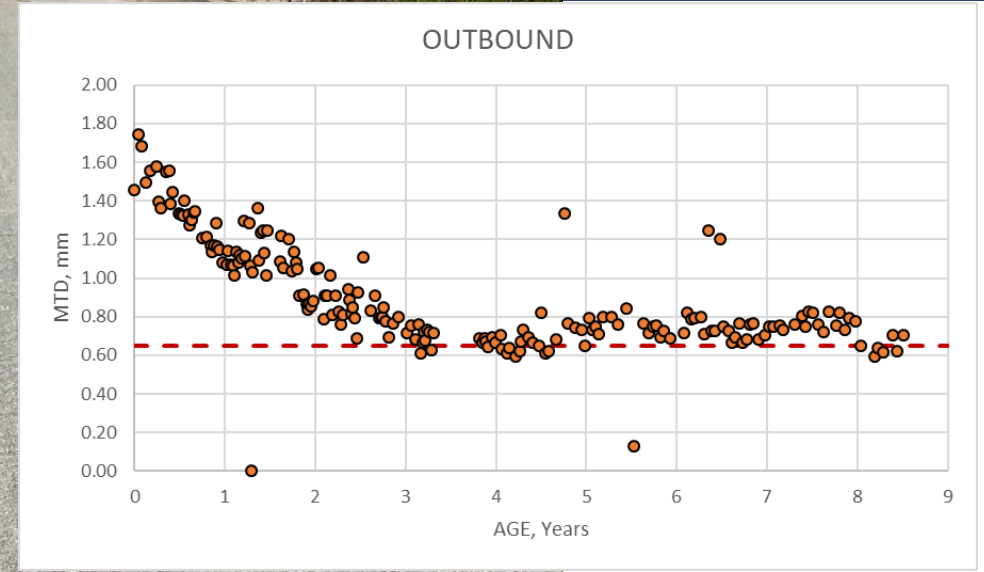
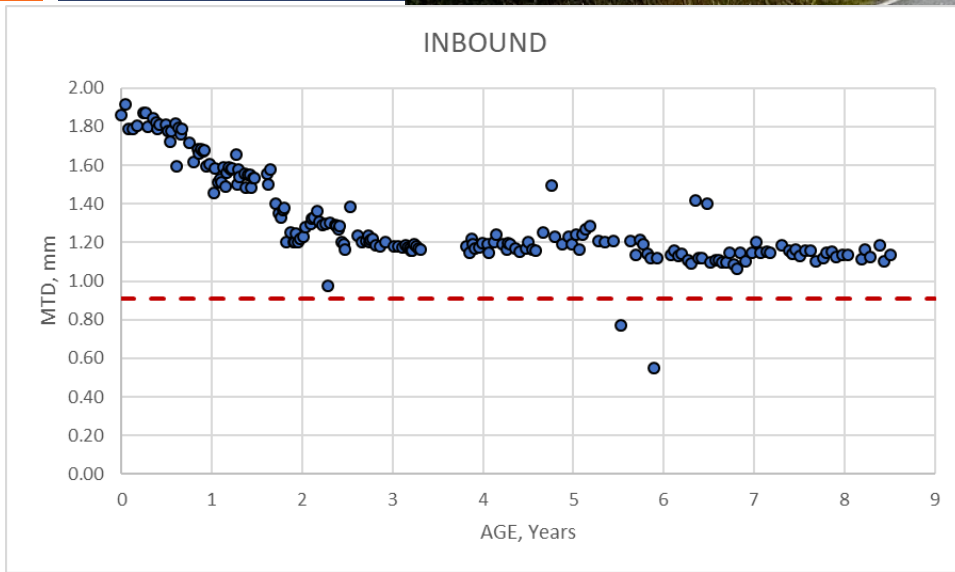
- Virgin Thinlay Control
- Track Watch
- Track Warning



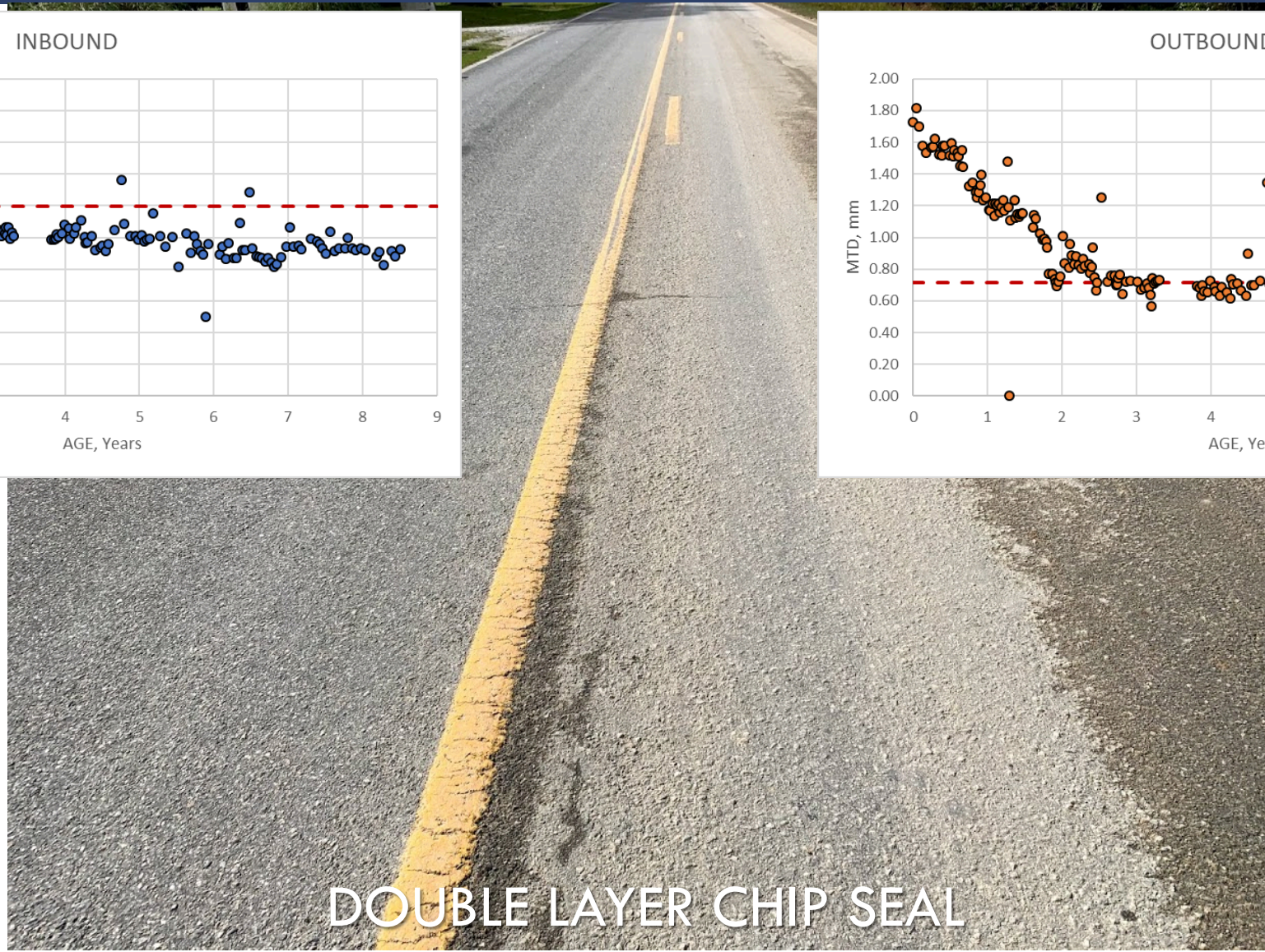
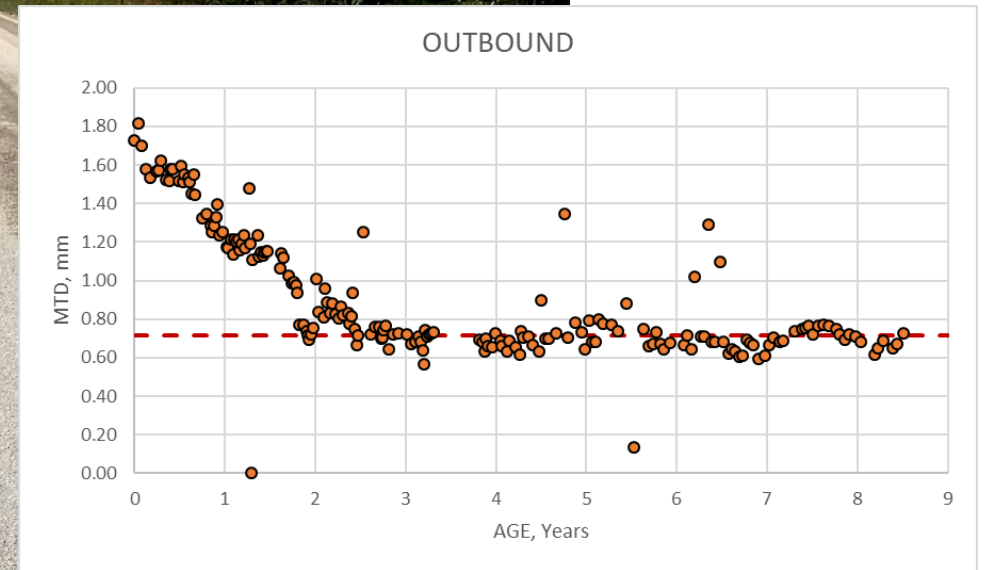
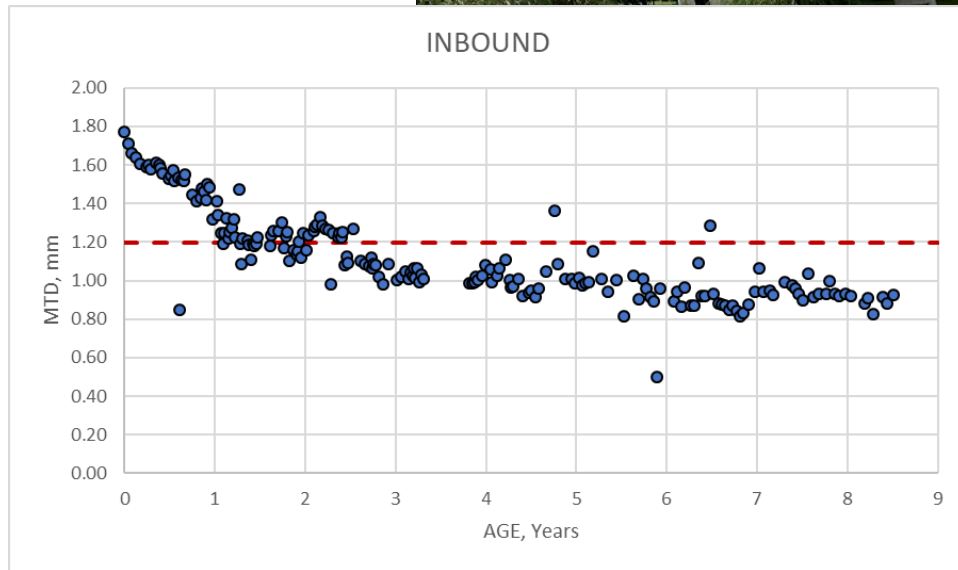
Macrotexture

- ❑ Provides escape for water with low/no tread depth
- ❑ Not a good correlation with wet ribbed friction
- ❑ Increases road noise(*) and rolling resistance
- ❑ Can indicate if a treatment is raveling/wearing off
- ❑ Can indicate if treatment aggregate is embedding
- ❑ Can indicate if a treatment is flushing or bleeding
- ❑ Impacted by high ESALs and/or high ADT (axles).

Macrotexture – Lee Road 159

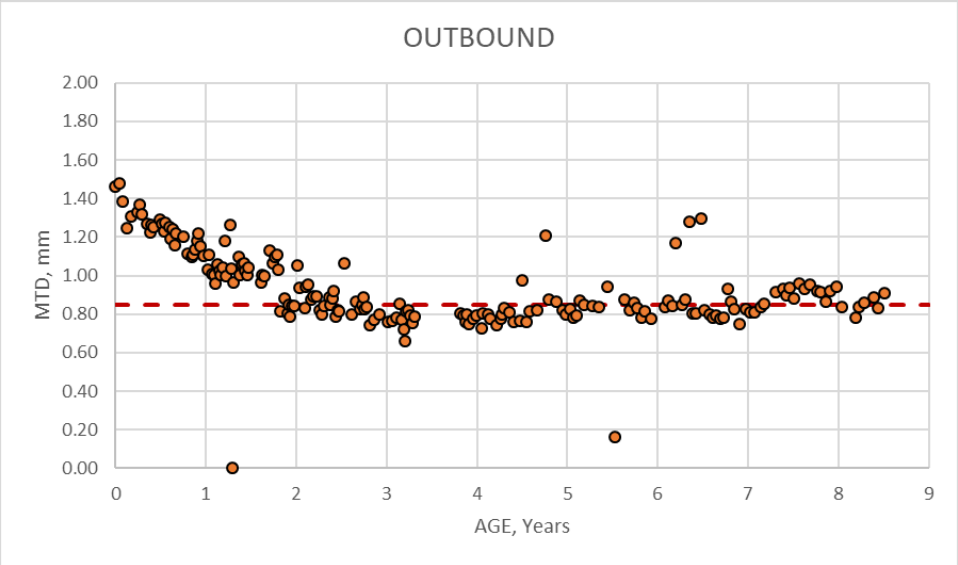
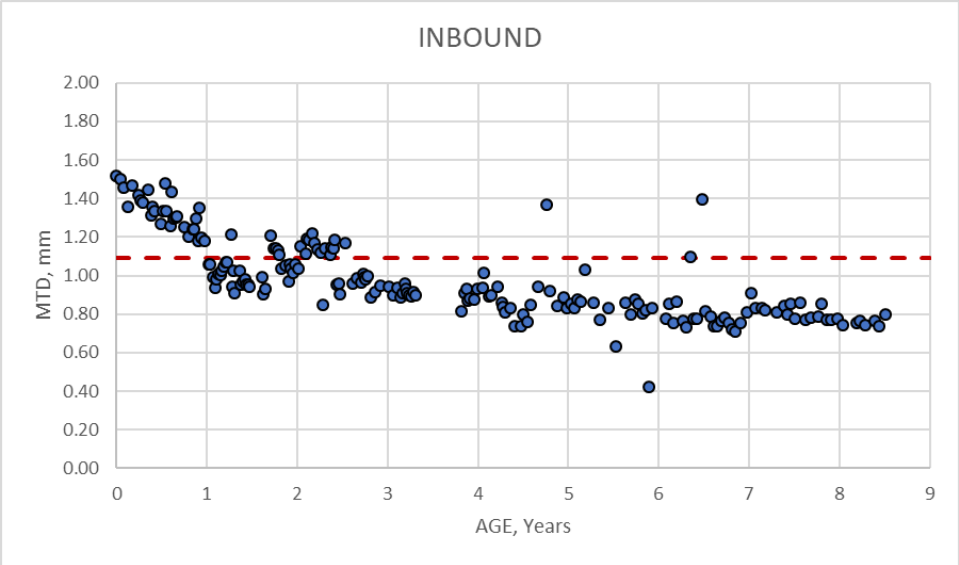


Macrotexture – Lee Road 159



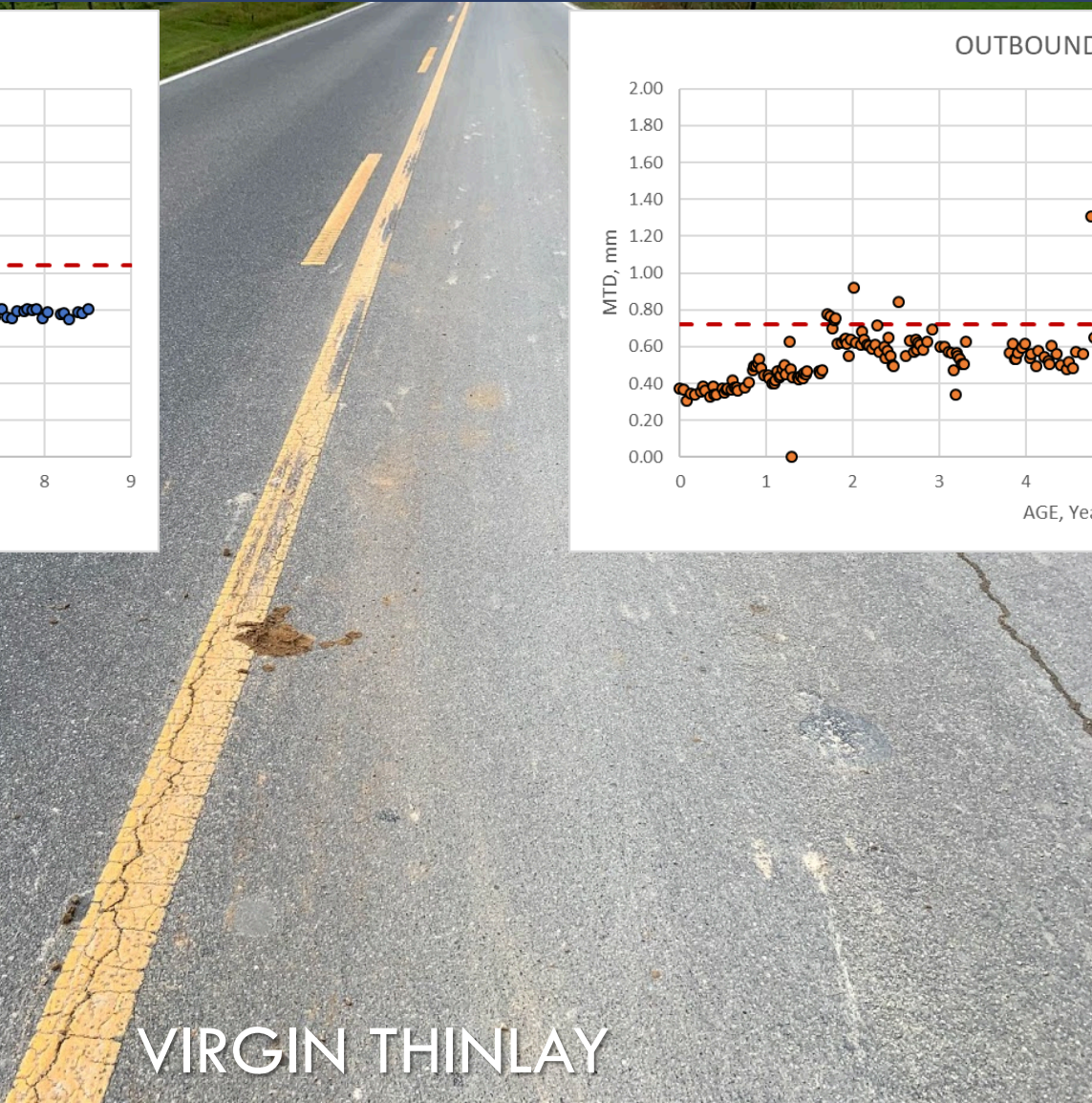
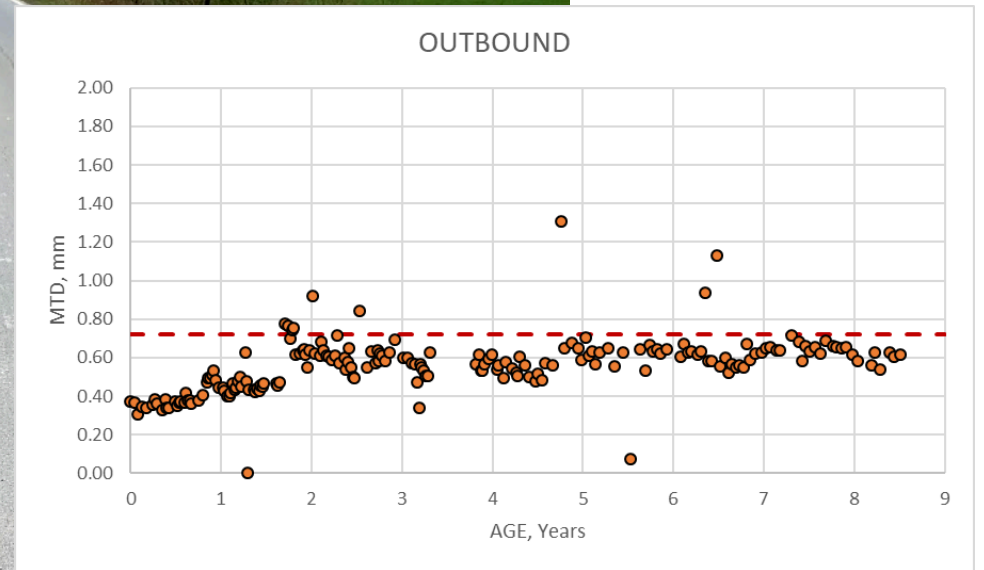
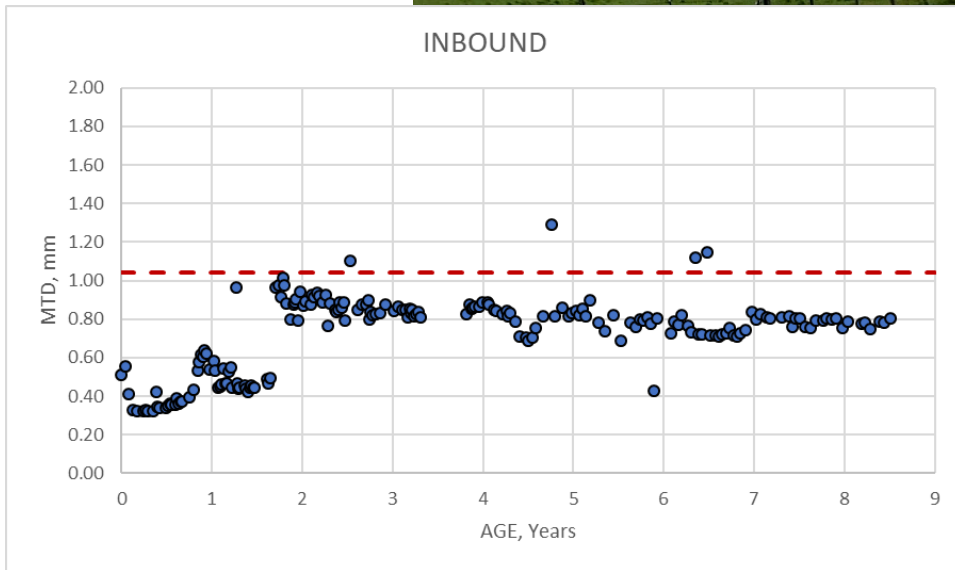
DOUBLE LAYER CHIP SEAL

Macrotexture – Lee Road 159



TRIPLE LAYER CHIP SEAL

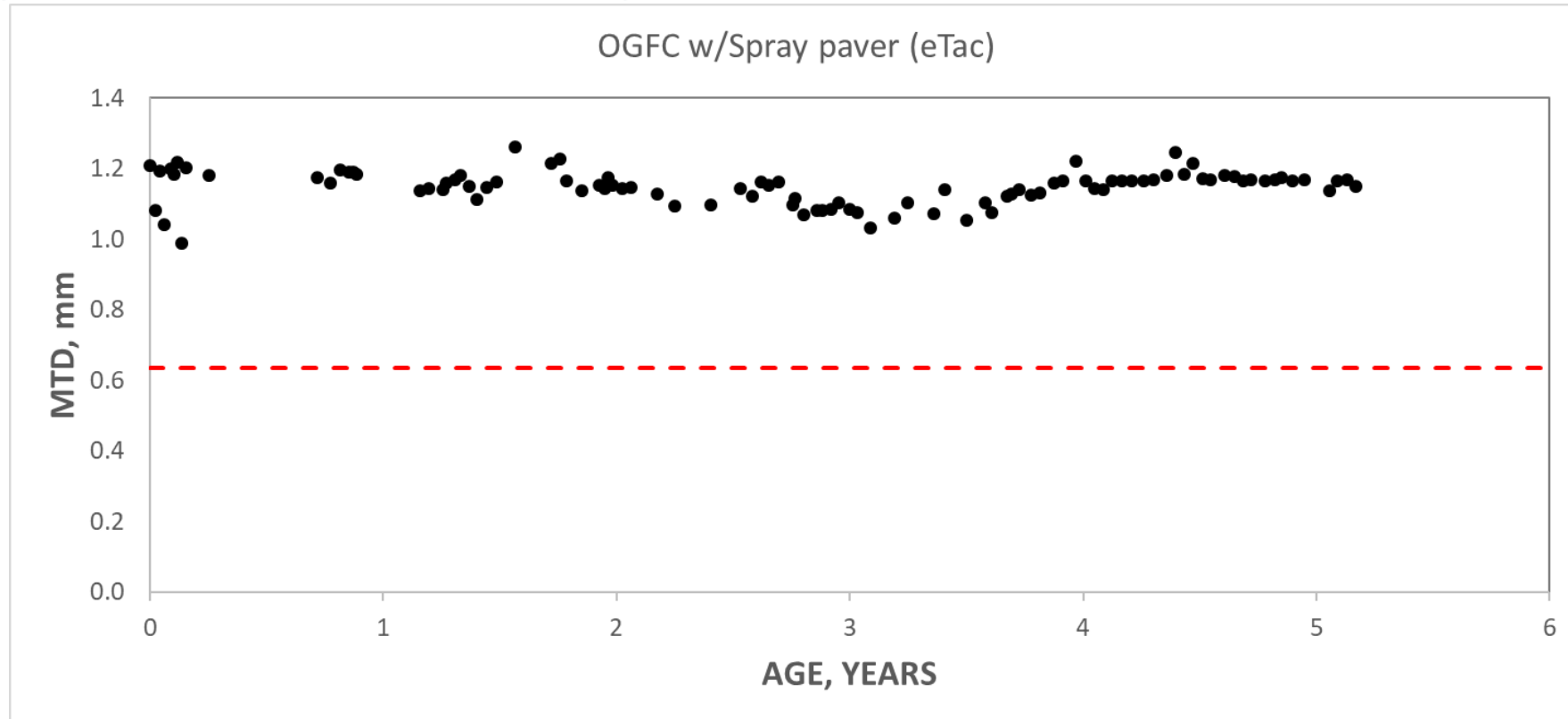
Macrotexture – Lee Road 159



VIRGIN THINLAY

Macrotexture – US 280

- Change indicative of raveling in OGFCs – No issues to date

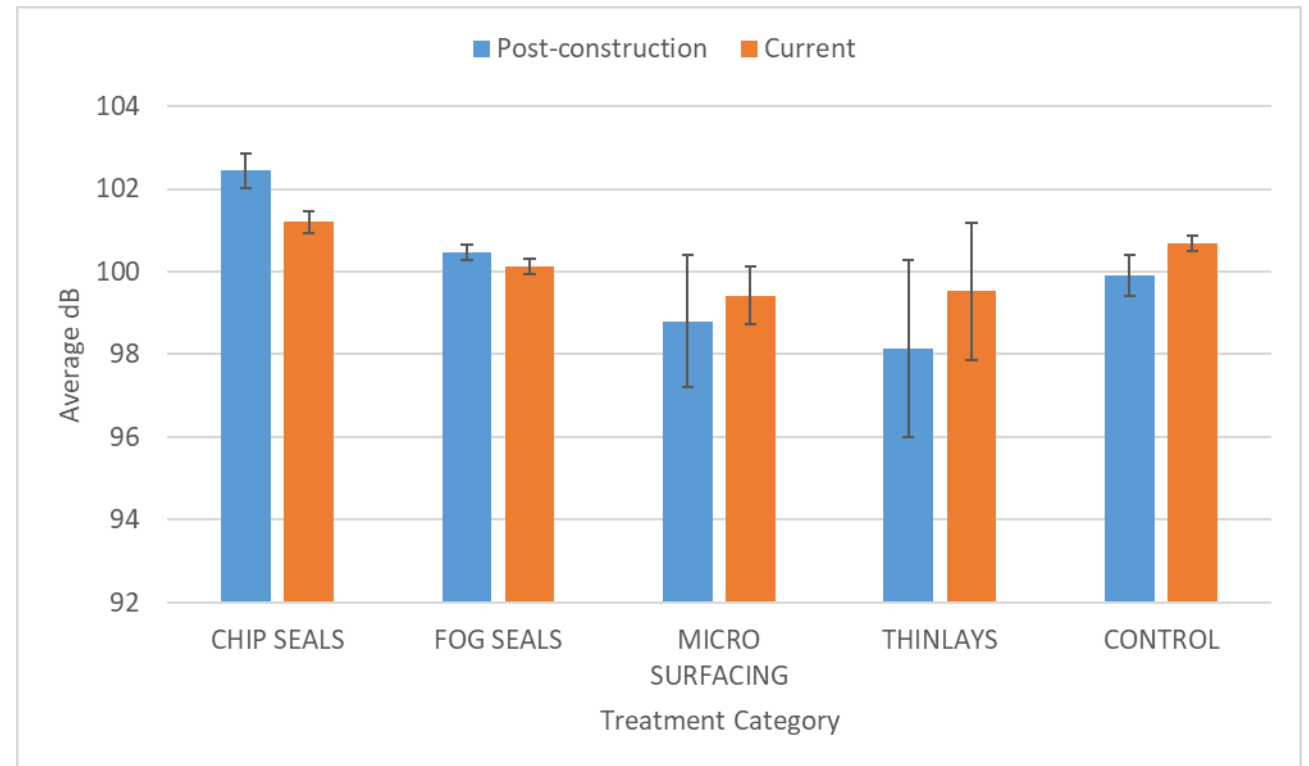


Noise

- **Comfort of drivers and passengers**
- **Complaints of nearby residents**
- **Noise walls help, but sound radiates beyond**
- **Ideal to reduce noise of pavement-tire interaction**
- **Function of surface texture (and accessible voids)**
- **Changes as function of time and traffic.**

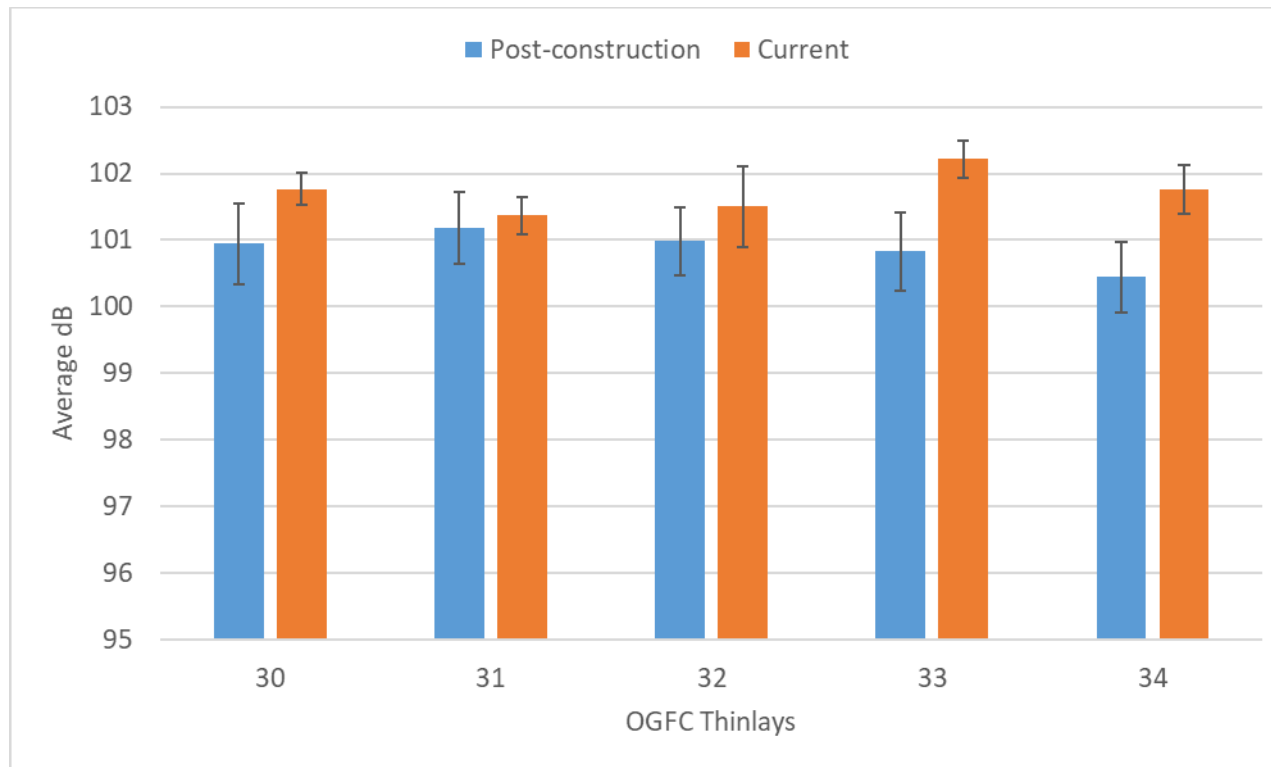
Noise – US 280

- Chip seals generate more noise, but get quieter over time
- Micro surfaces and thinlays get noisier over time

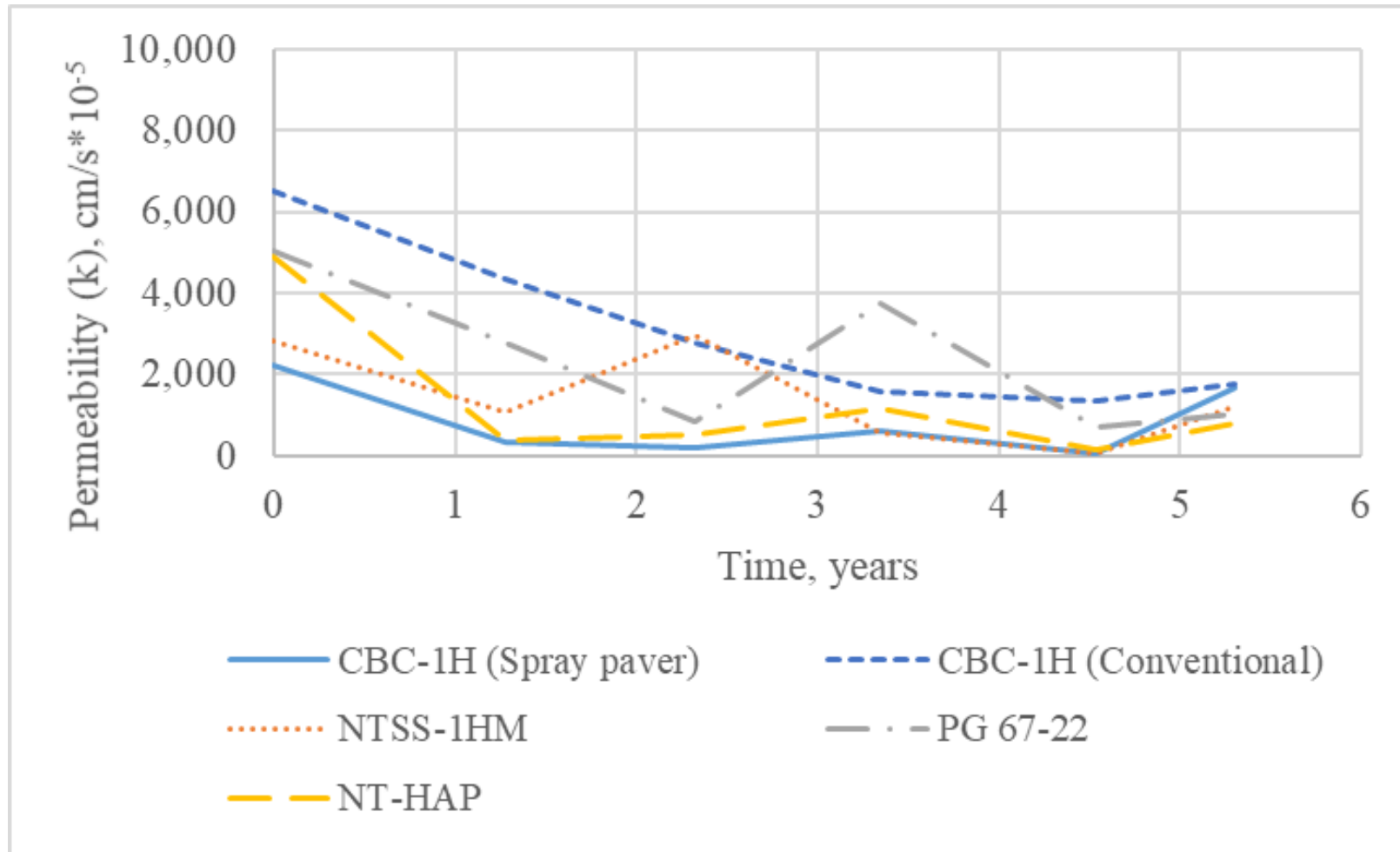


Noise – US 280

- OGFC thinlays get noisier over time due to clogging



Permeability – US 280 OGFC Cores



Road Spray Reduction from OGFC

- ❑ Significant with initial high permeability
- ❑ Still helpful when permeability drops over time
- ❑ Higher macrotexture near end of surface life
- ❑ Important to have void structure for flow, but...
- ❑ Critical to design for long term quality/durability
- ❑ Research focus in the 2021 research cycle.

Takeaways

- ❑ Macrotexture won't necessarily "fix" friction
- ❑ Change (higher or lower) indicative of something
- ❑ Can reduce road noise with internal voids, but
- ❑ Can also increase road noise (time and traffic)
- ❑ Keeps water out of the pavement-tire interface
- ❑ Spray reduction is worth resource investment!

Questions and Answers



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