

Chip Seals, Micro Surfaces, and Combinations:  
Lessons Learned  
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# Background

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- ❑ Chip seals and micro surfaces are some of the most popular treatments
- ❑ Relatively inexpensive
- ❑ Can be very effective
- ❑ Cost-effectiveness is maximized with proper treatment selection

# What to Expect

- SHRP 2 Report S2-R26-RR-2 (2011)

Treatment	Expected Performance	
	Treatment Life (yr)	Pavement Life Extension (yr)
Microsurfacing		
Single course	3–6	3–5
Double course	4–7	4–6
Chip seal		
Single course	3–7	5–6
Double course	5–10	8–10

# PG Study Sections

## CHIP SEALS

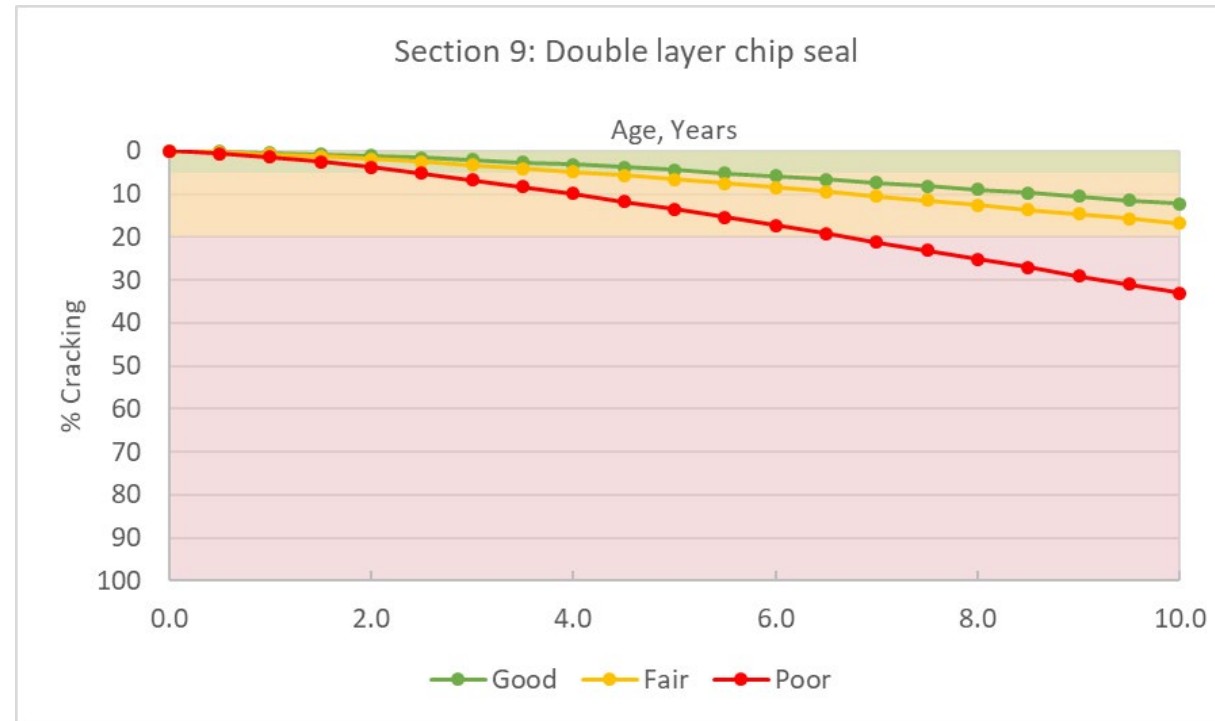
- ❑ Single layer
- ❑ Double layer
- ❑ Triple layer
- ❑ Single layers with crack sealing
- ❑ Fibermat
- ❑ Scrub seals\*

## MICRO SURFACES

- ❑ Single layer
- ❑ Double layer
- ❑ Single layers with crack sealing
- ❑ Fibers
- ❑ HiMA

# What We've Learned

- Target GOOD pavements
- There's always *some* benefit even if pavement is in poor condition
  - ▣ Not cost-effective

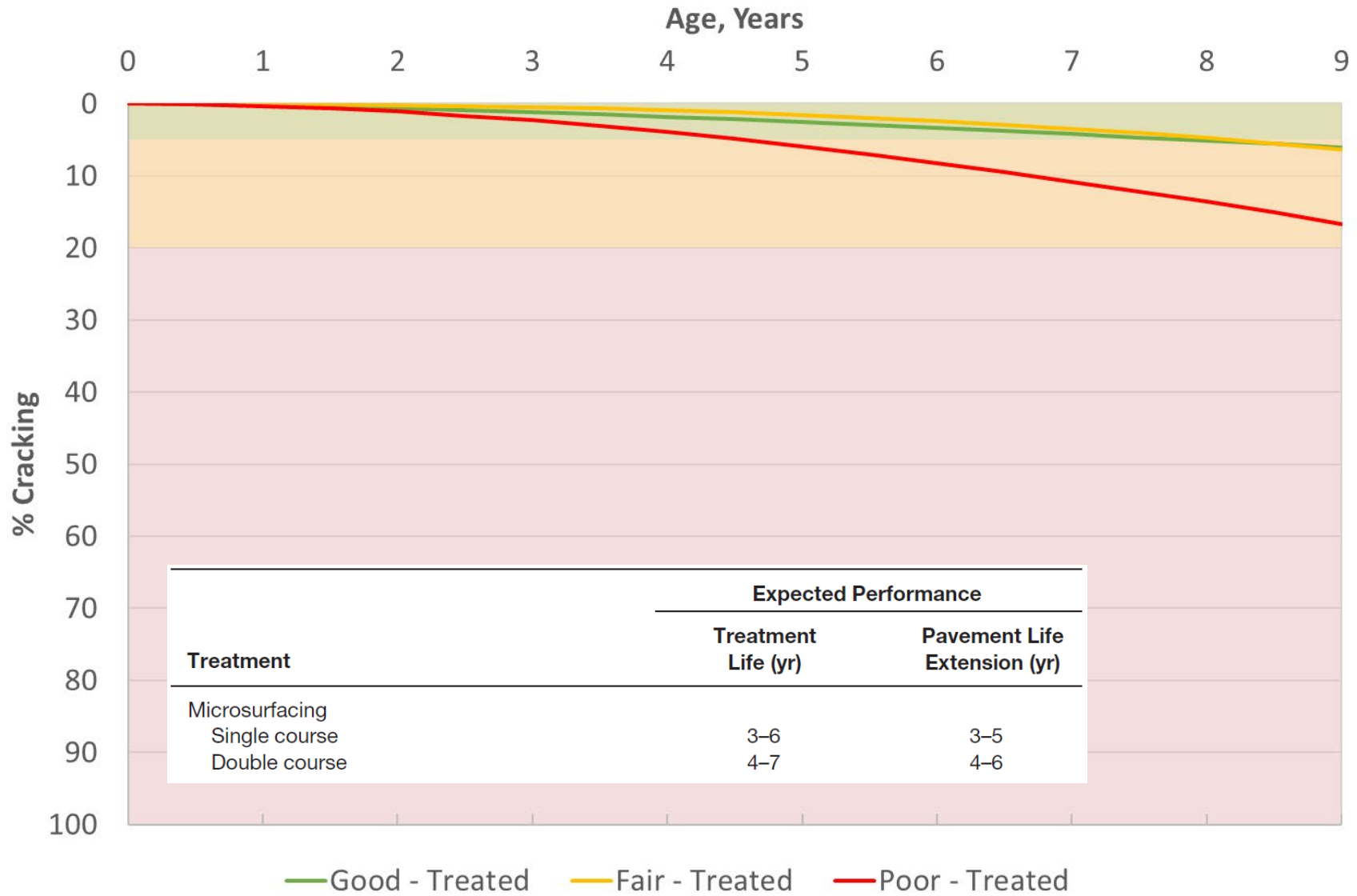


# What We've Learned

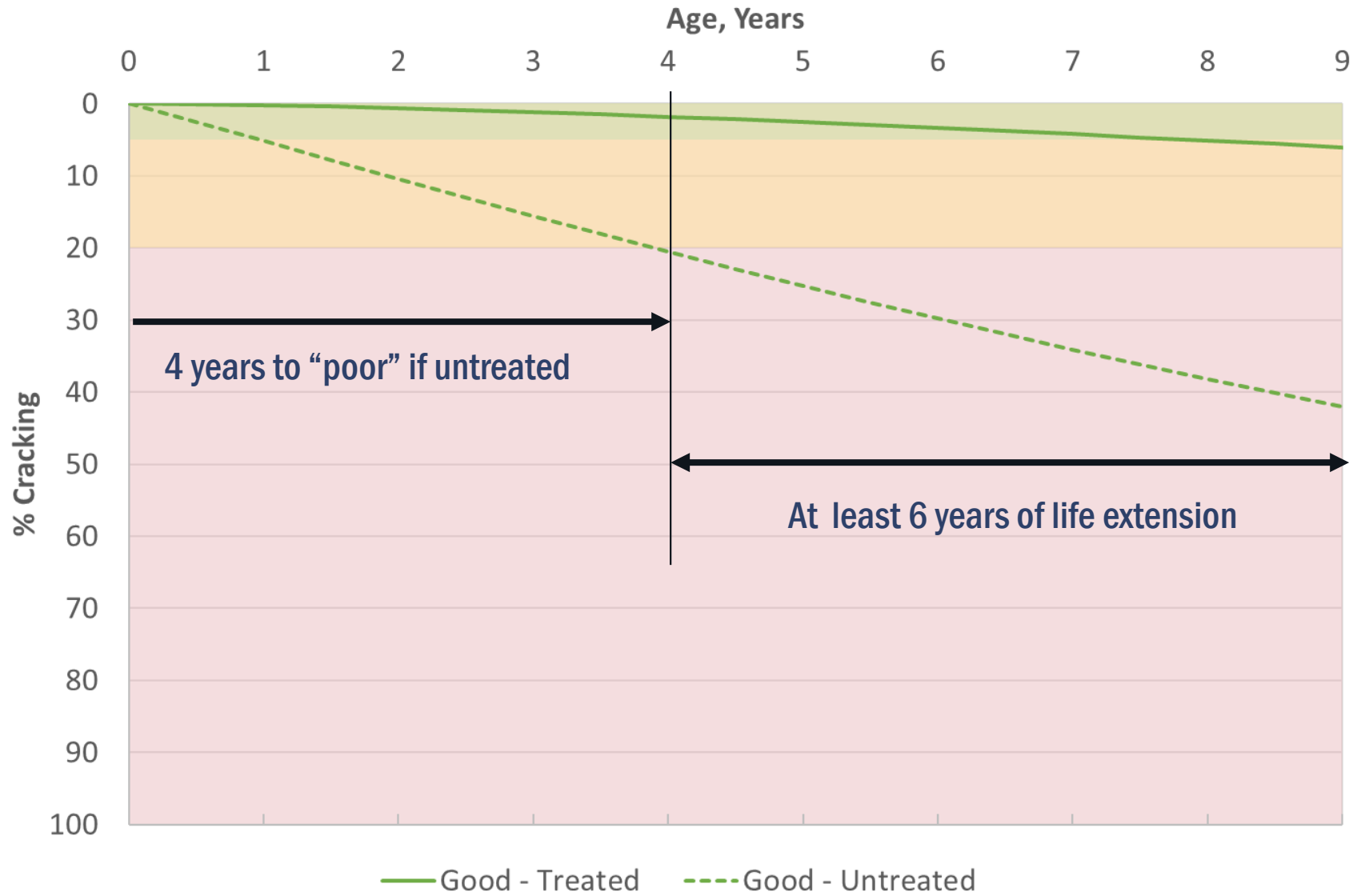
- Life extension may be higher than typically reported
  - Good materials
  - Good designs
  - Good treatment selection
  - Good construction



## Section 13: Double layer micro surfacing



# Section 13: Double layer micro surfacing



At year 9, treated pavement is barely transitioning to "fair" condition

4 years to "poor" if untreated

At least 6 years of life extension



# What We've Learned

- The more you do, the more you get
  - Multiple layers
  - Crack sealing
  - Treatment combinations (Cape seals)



**UNTREATED**



**SINGLE LAYER CHIP SEAL**



**SINGLE LAYER CHIP SEAL +  
CRACK SEAL**





**SCRUB SEAL**



**DOUBLE LAYER CHIP SEAL**



**FIBERMAT CHIP SEAL**



**TRIPLE LAYER CHIP SEAL**

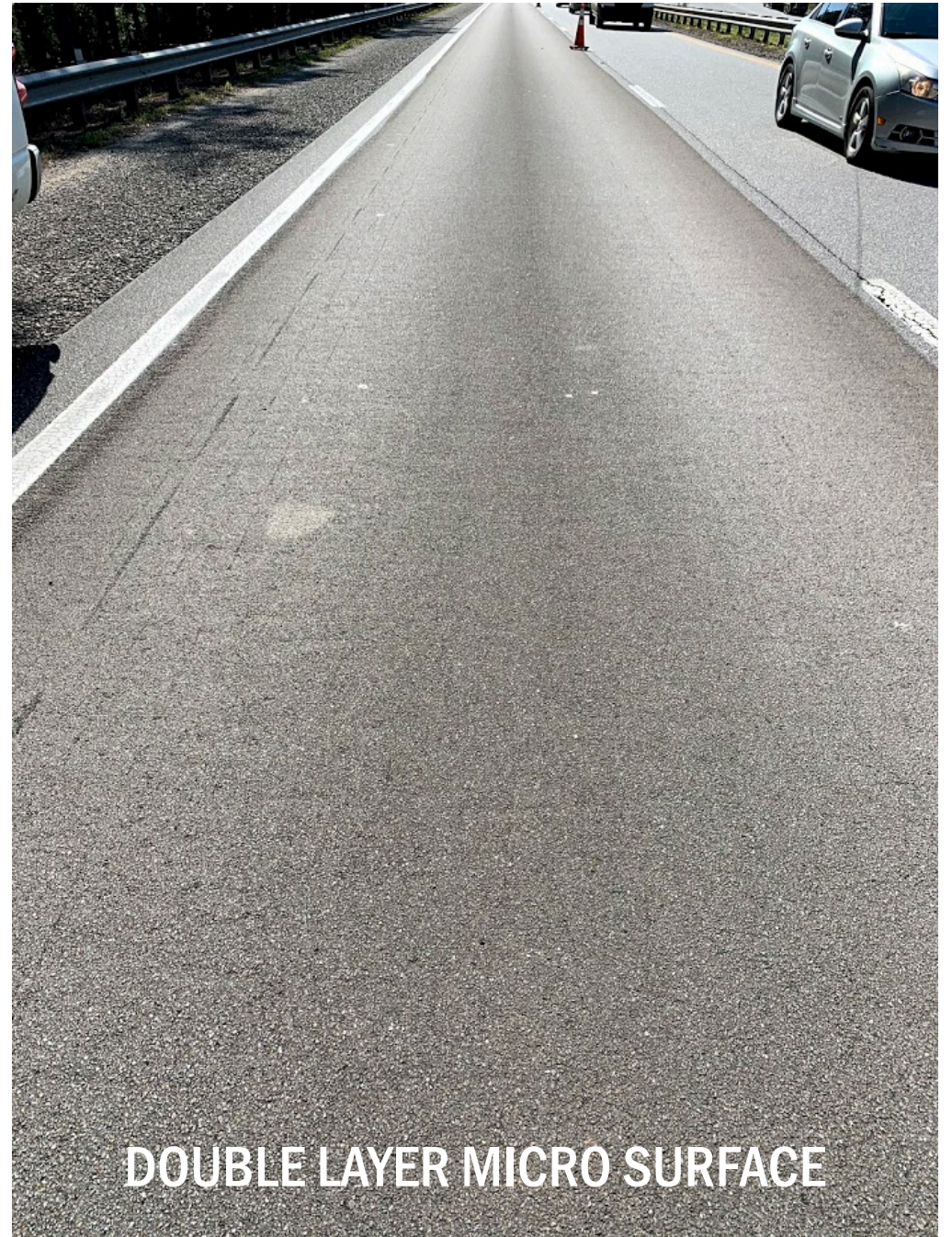


**SINGLE MICRO SURFACE  
WITH CRACK SEALING**

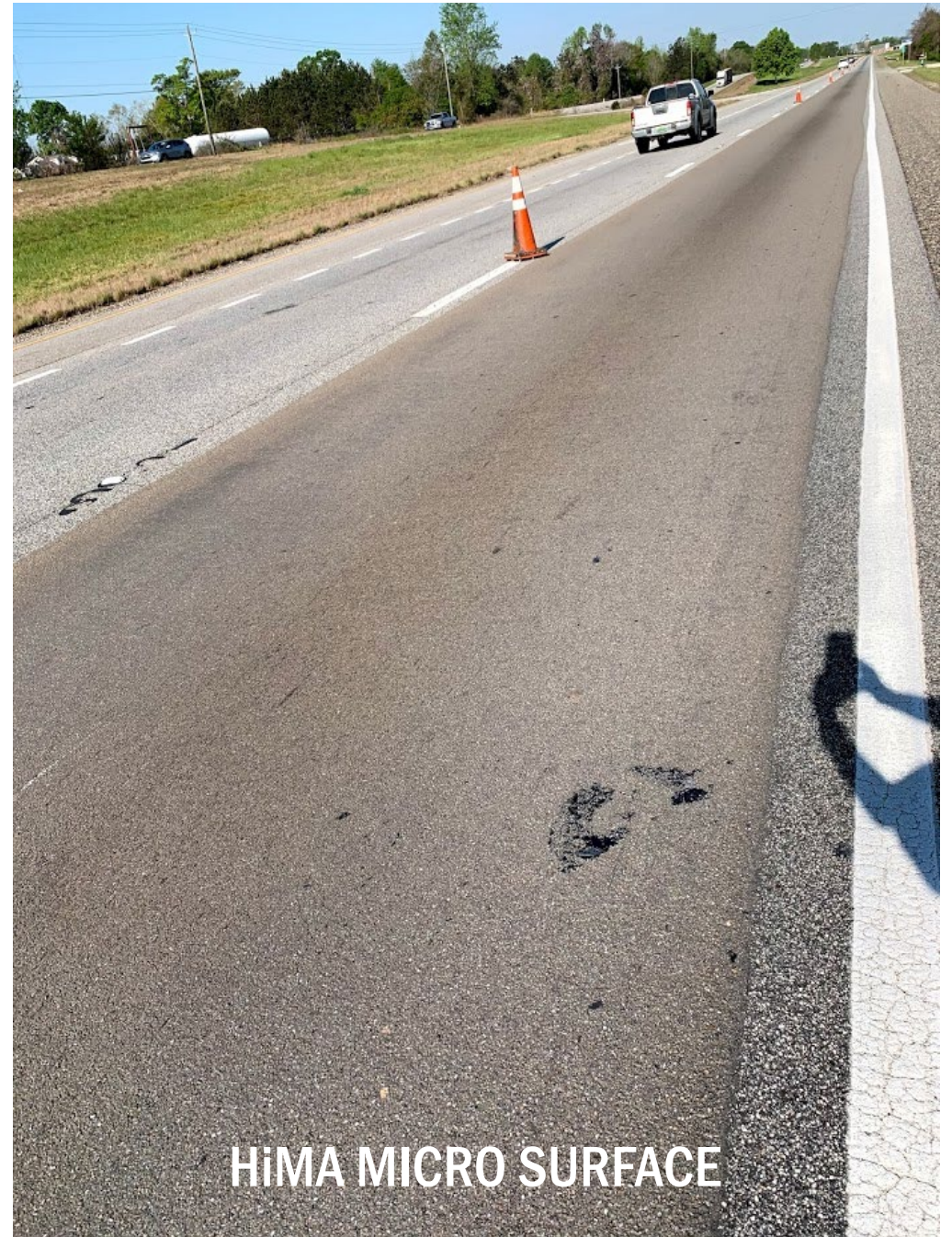
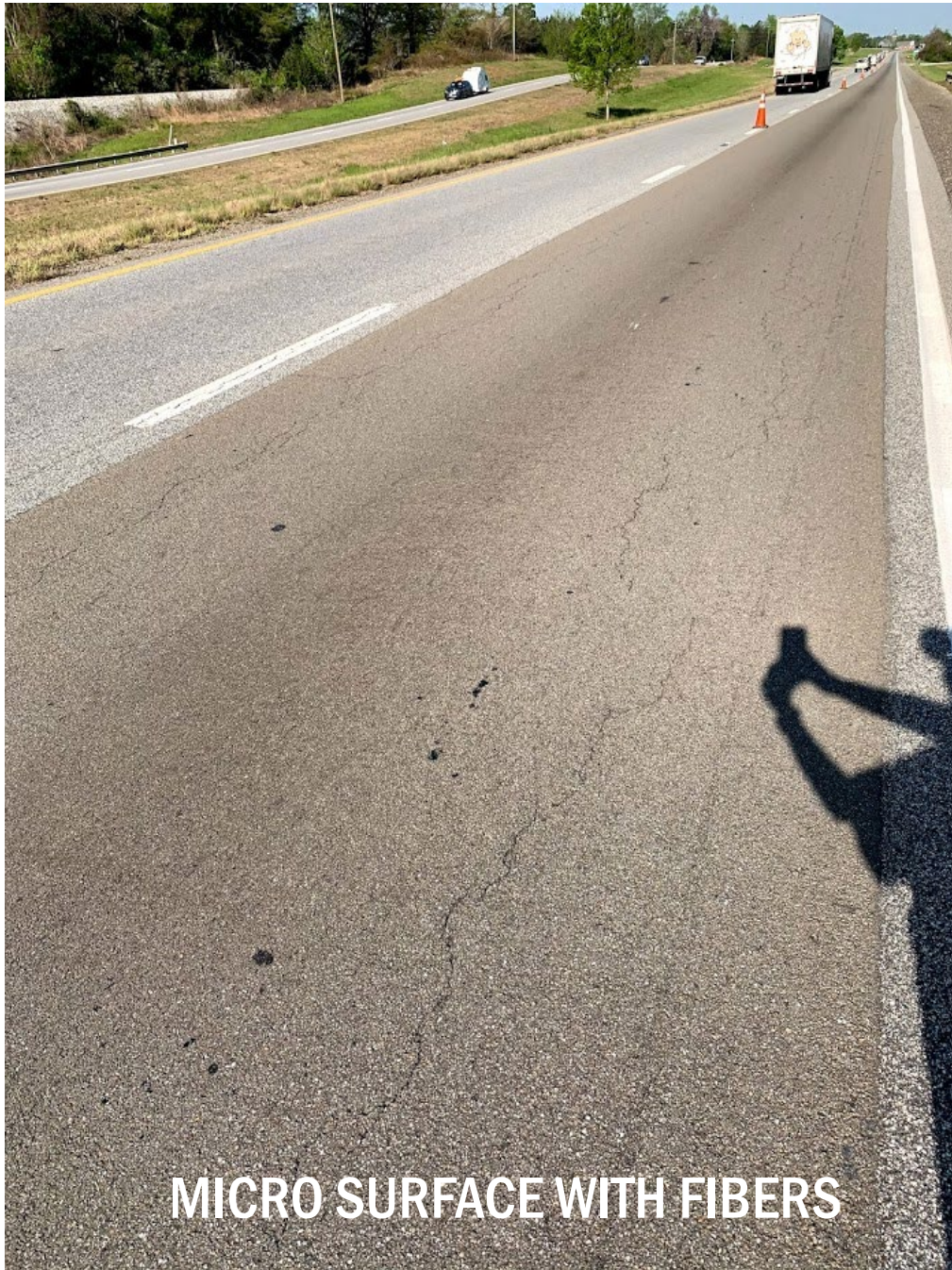
**SINGLE MICRO SURFACE**



**SINGLE LAYER MICRO SURFACE**



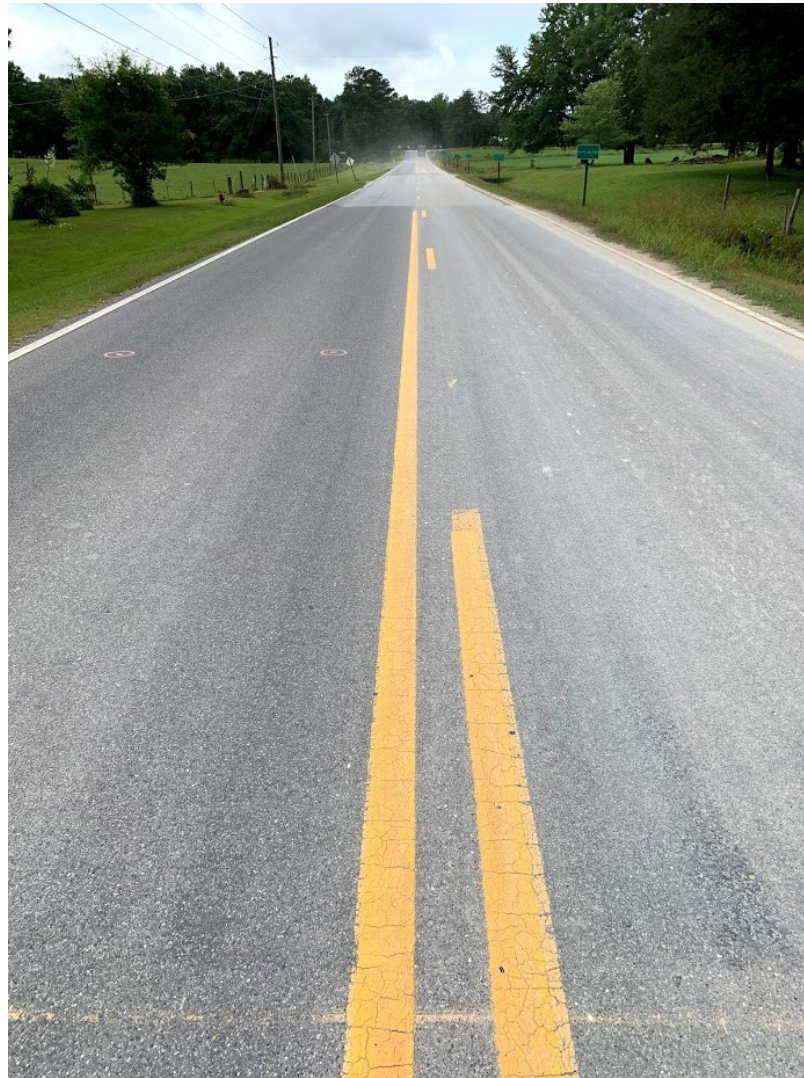
**DOUBLE LAYER MICRO SURFACE**



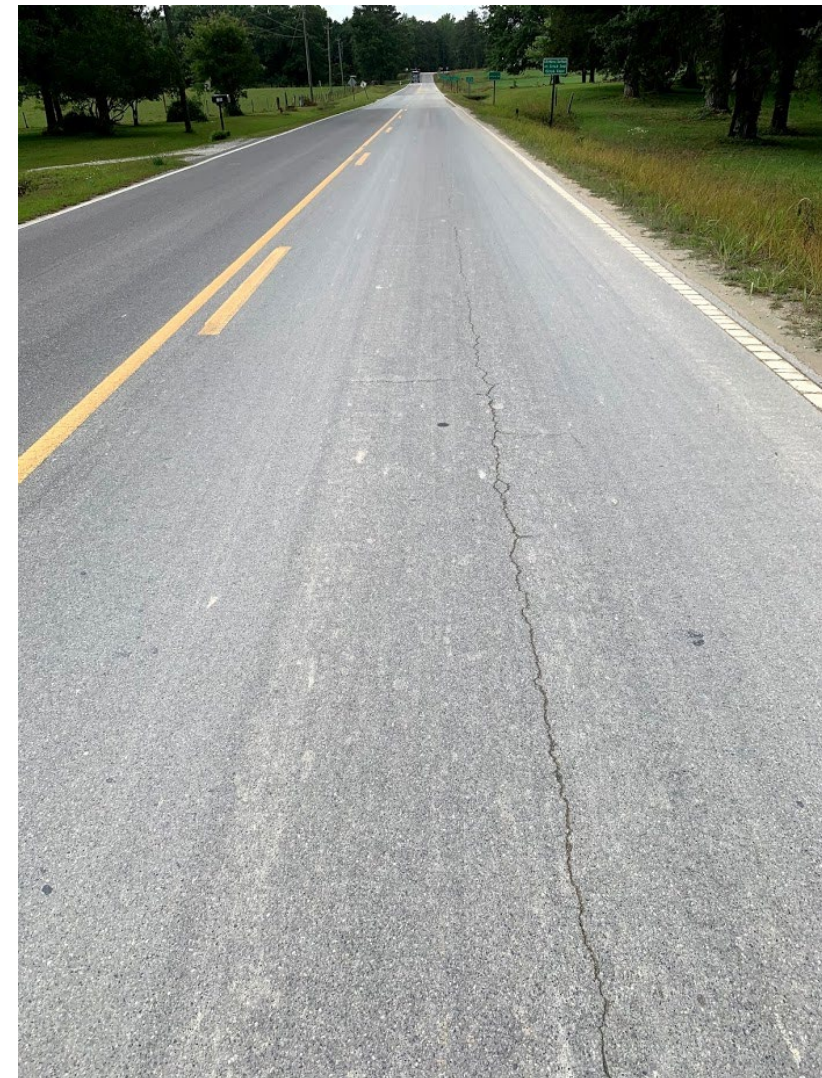
**CAPE SEAL**



**SCRUB CAPE SEAL**



**FIBERMAT CAPE SEAL**



**CAPE SEAL**

**SCRUB CAPE SEAL**

**FIBERMAT CAPE SEAL**





# What We've Learned

- Treatments can work under different conditions
  - ▣ Don't immediately rule out based on traffic or climate

BUT...

- ▣ Be cautious



**CHIP SEAL**



**FIBERMAT CHIP SEAL**



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**CHIP SEAL**



**FIBERMAT CHIP SEAL**



## TRIPLE LAYER CHIP SEAL



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# What We've Learned

- Cracking reduction is most notable benefit
  - ▣ Easy to see
  - ▣ It is not the only parameter
- What are you targeting?



## Time to 20% Cracking – Lee Road 159

Treatment	Poor	Fair	Good
Single chip seal	4.4	7.7	7.7
Single chip seal + crack seal	7.3	7.3	8.6
Double chip seal	6.7	9+	9+
Triple chip seal	9+	9+	9+
Fibermat chip seal	7.0	8.7	9+
Scrub seal	9+	9+	9+

## % Crack Reduction at Year 9 – Lee Road 159

Treatment	Poor	Fair	Good
Single chip seal	14	20	19
Single chip seal + crack seal	20	31	17
Double chip seal	38	46	35
Triple chip seal	56	54	39
Fibermat chip seal	41	39	30
Scrub seal	55	46	32

## Time to 20% Cracking – Lee Road 159

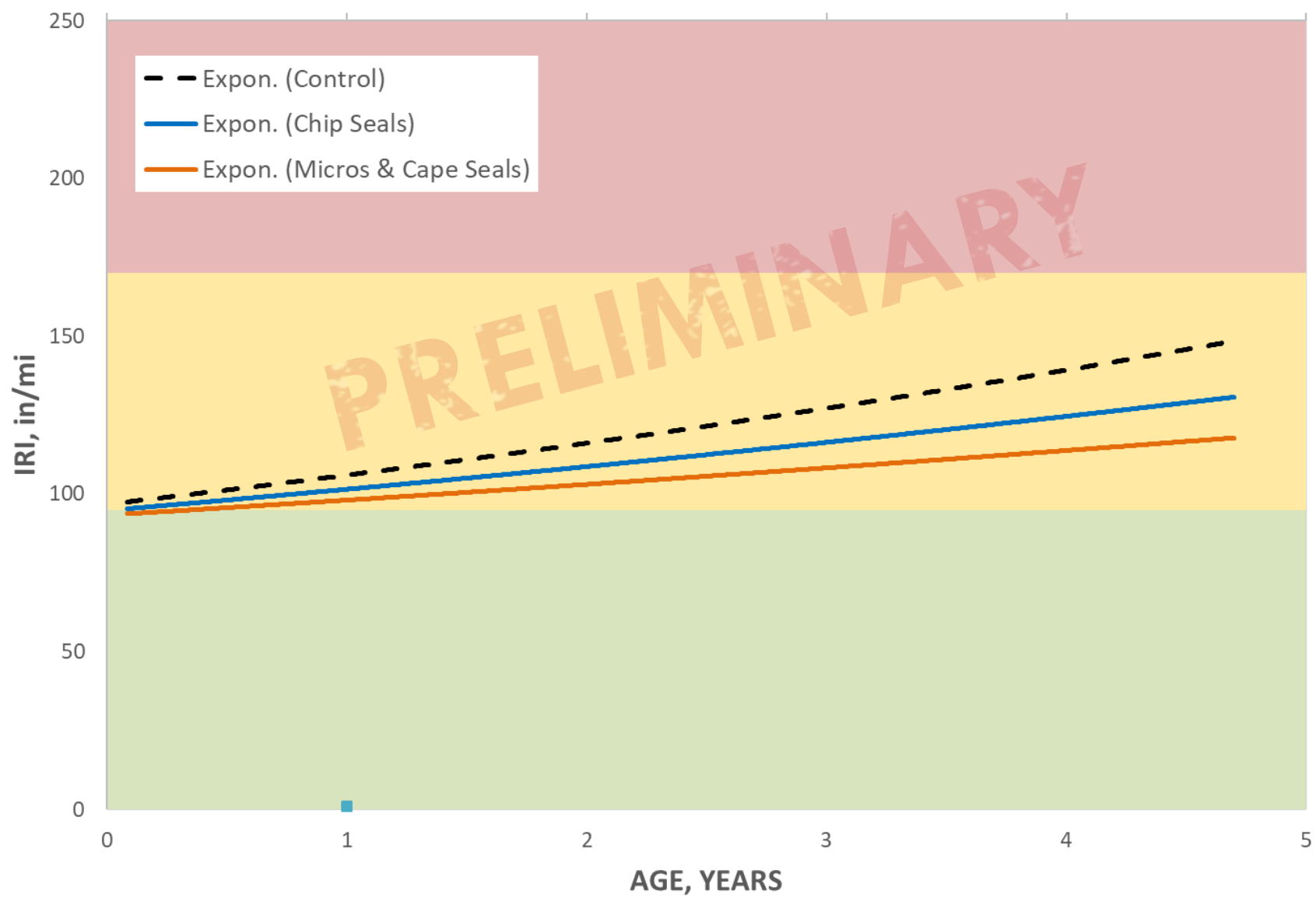
Treatment	Poor	Fair	Good
Single micro surface	1.7	4.5	5.0
Single micro + crack seal	4.6	6.1	5.1
Double micro surface	9+	9+	9+
Cape seal	9+	9+	9+
Fibermat cape seal	9+	9+	9+
Scrub cape seal	9+	9+	9+



## % Crack Reduction at Year 9 – Lee Road 159

Treatment	Poor	Fair	Good
Single micro surface	6	18	11
Single micro + crack seal	31	27	2
Double micro surface	59	55	40
Cape seal	61	56	40
Fibermat cape seal	72	64	43
Scrub cape seal	68	56	40

# RIDE QUALITY - CSAH 8

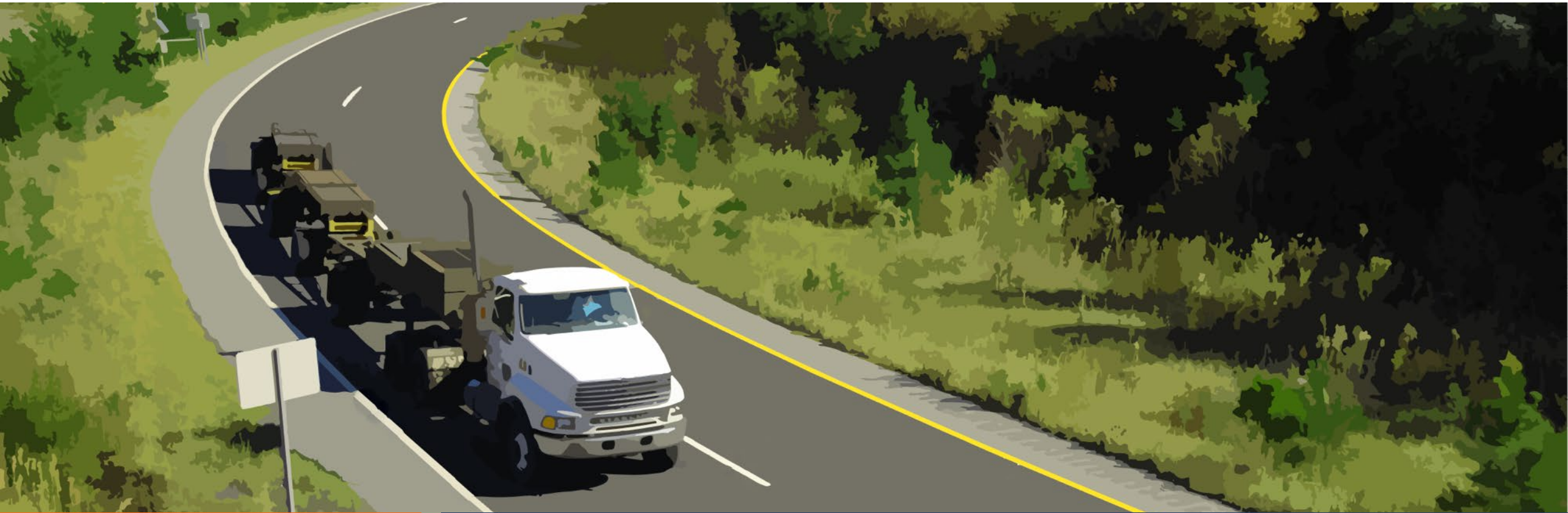


# Summary

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- Chip seals and micro surfacing extend pavement life
  - ▣ Combinations = added benefits
- Some treatments within same category have similar performance
  - ▣ Unit costs for each agency will determine cost-effectiveness
- No major issues in any location
  - ▣ Adjust to your particular conditions

# Questions and Answers



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