

NCAT + MnROAD

Pavement Preservation Study



2016 Ohio Asphalt Paving Conference
Columbus, Ohio
February 3, 2016
Mary Robbins, PhD



One Project, Two Climates, Four Sites

2015 Preservation Group

One Project

Develop *independent* life-extending benefit curves for a range of pavement preservation treatments, under varying traffic levels and climates

Two Climates

Alabama: Hot, wet, no-freeze

Minnesota: Cold, wet, freeze

Four Sites

AL - LR 159 (Low Vol); US 280 (High Vol)

MN – CR 8 (Low Vol); US 169 (High Vol)

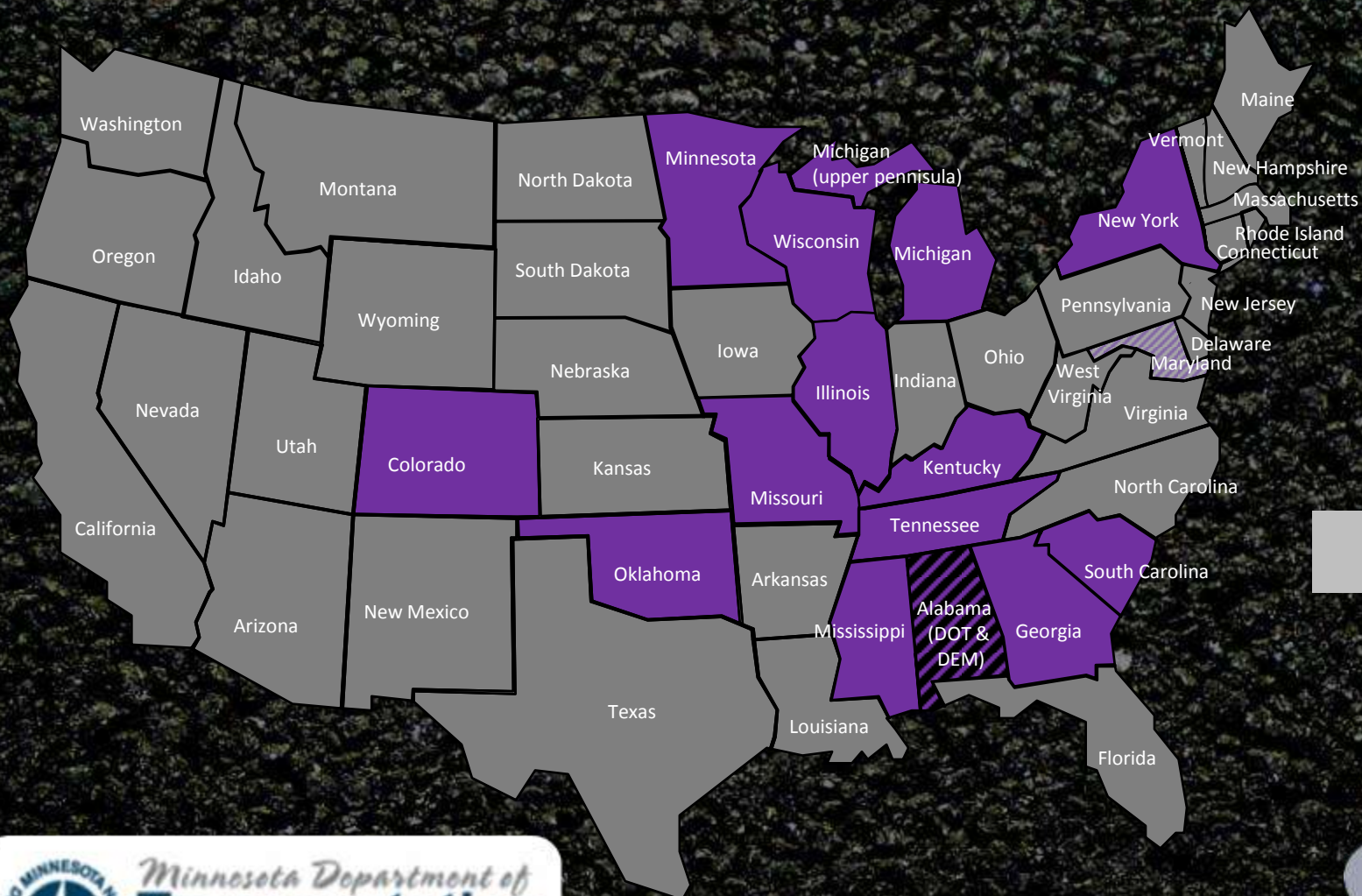


PG 2012 Research Sponsors



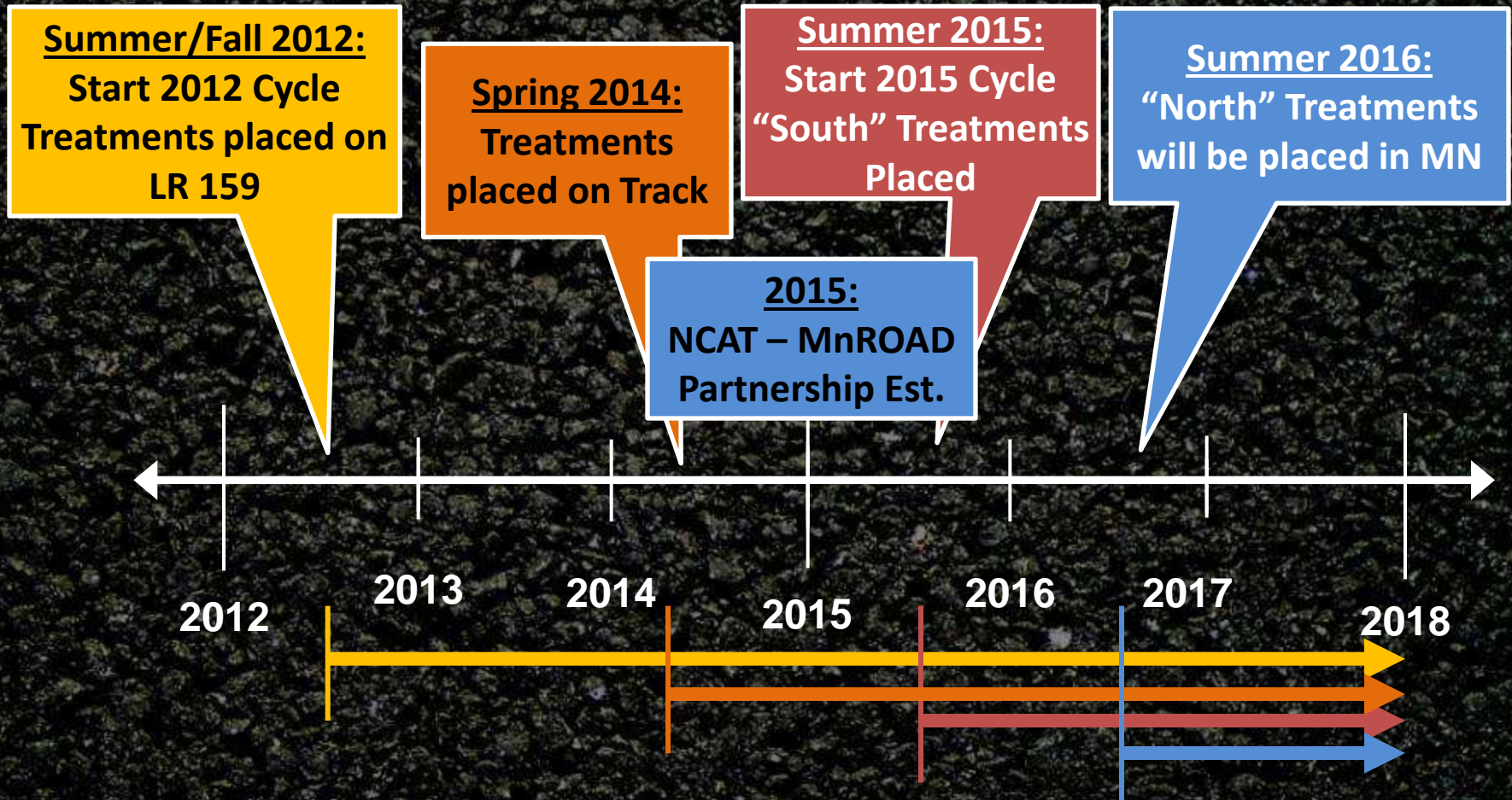
FP²

PG 2015 Research Sponsors

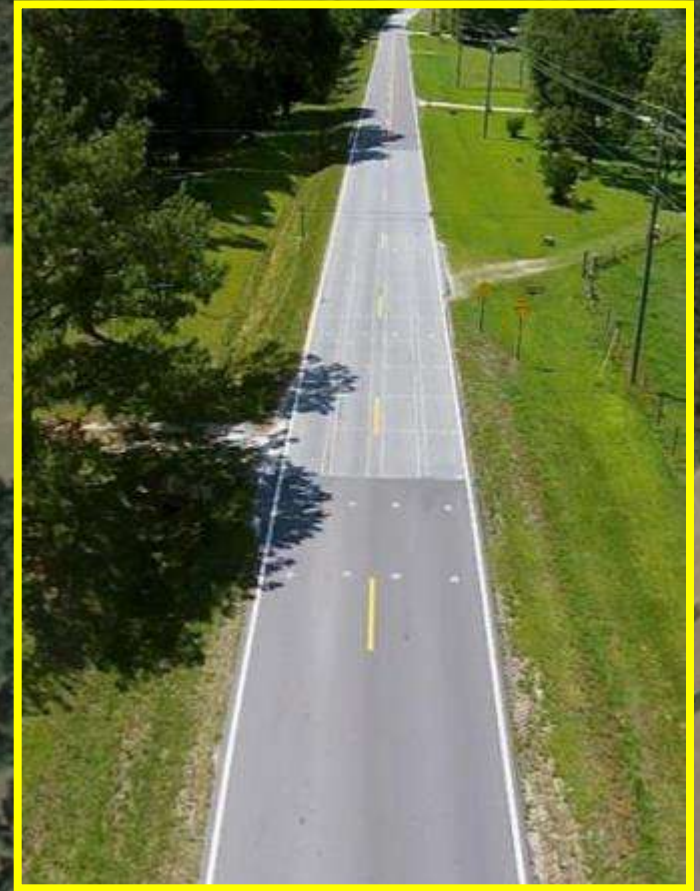


FP²

Preservation Group Experiment: History

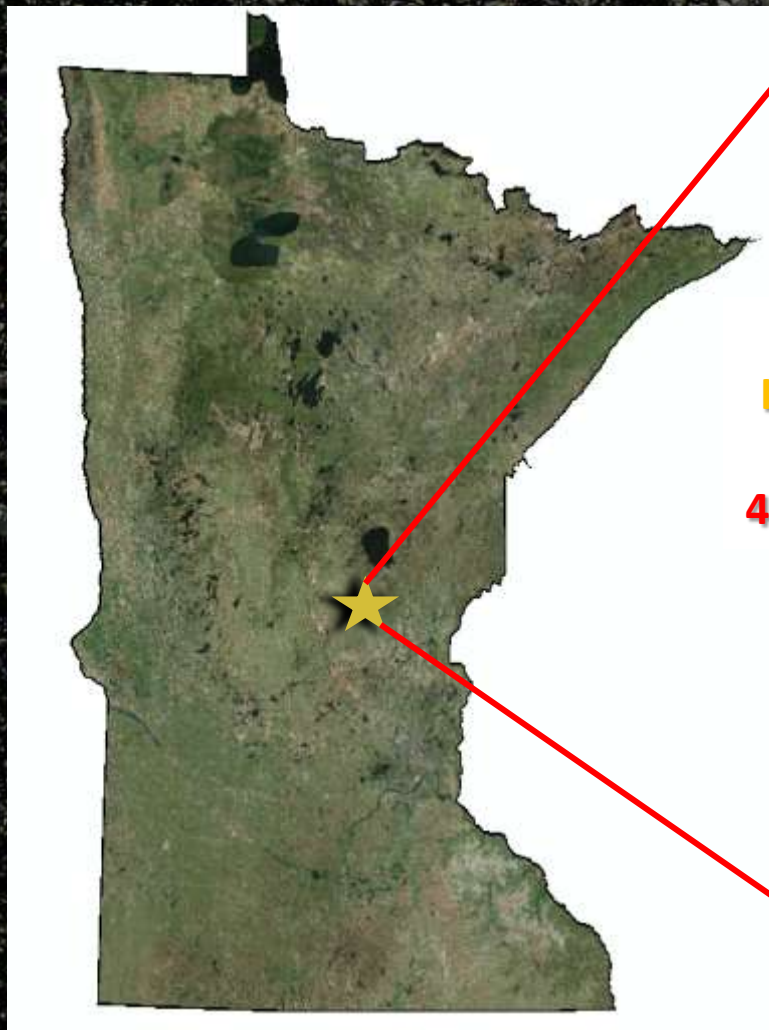


Lee Road 159 – Low Volume

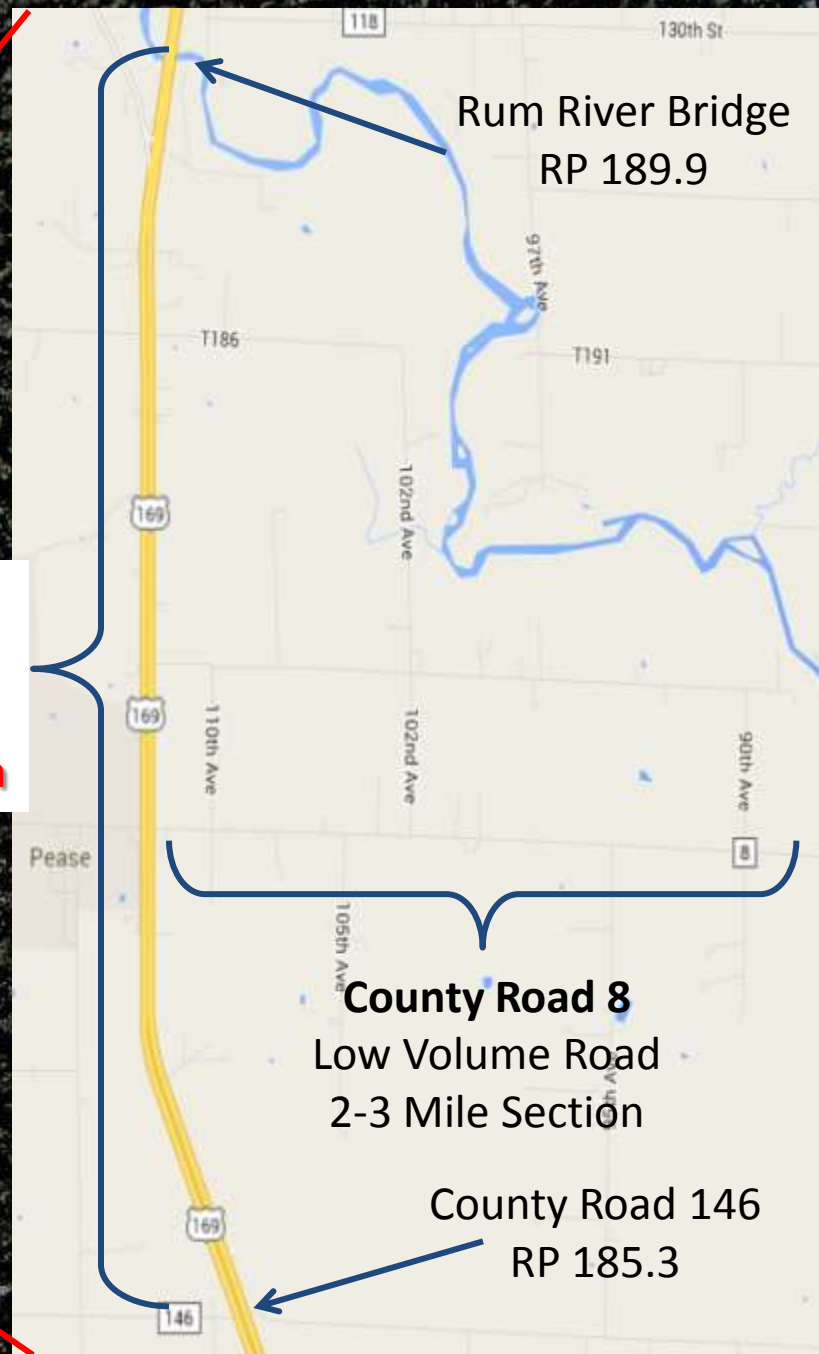


US 280 - Higher Volume

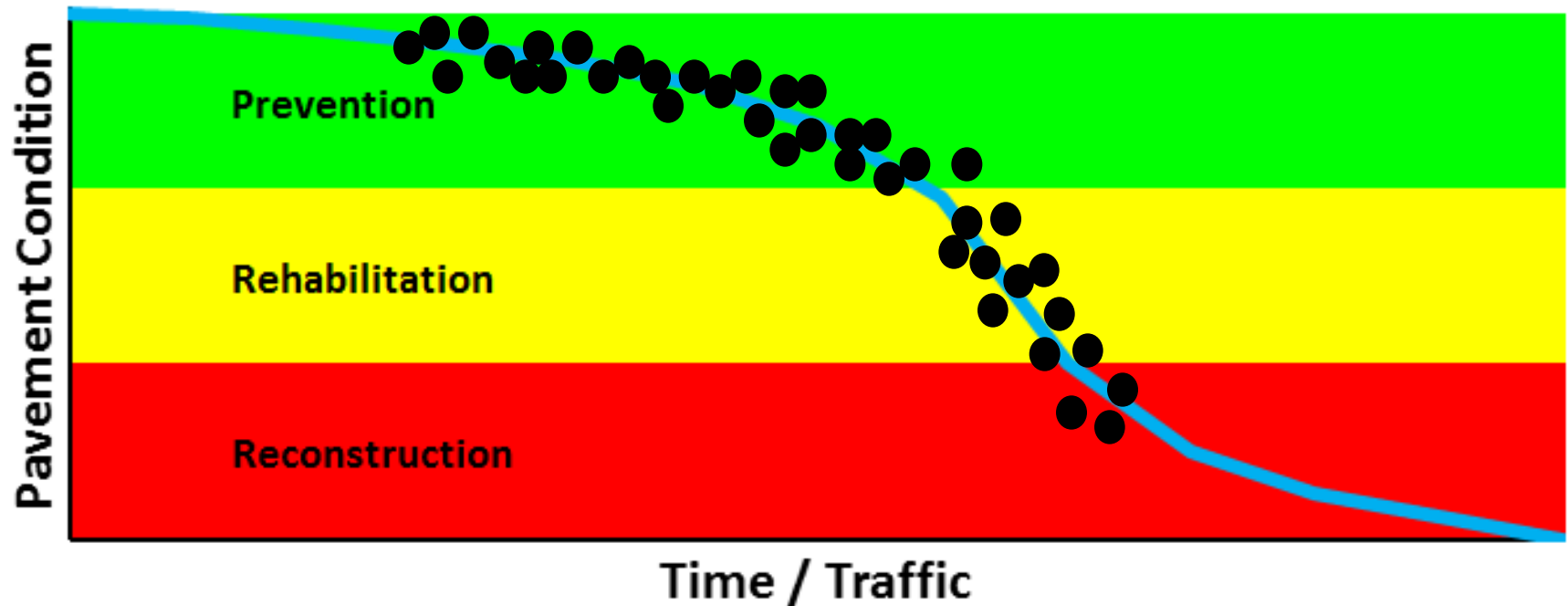




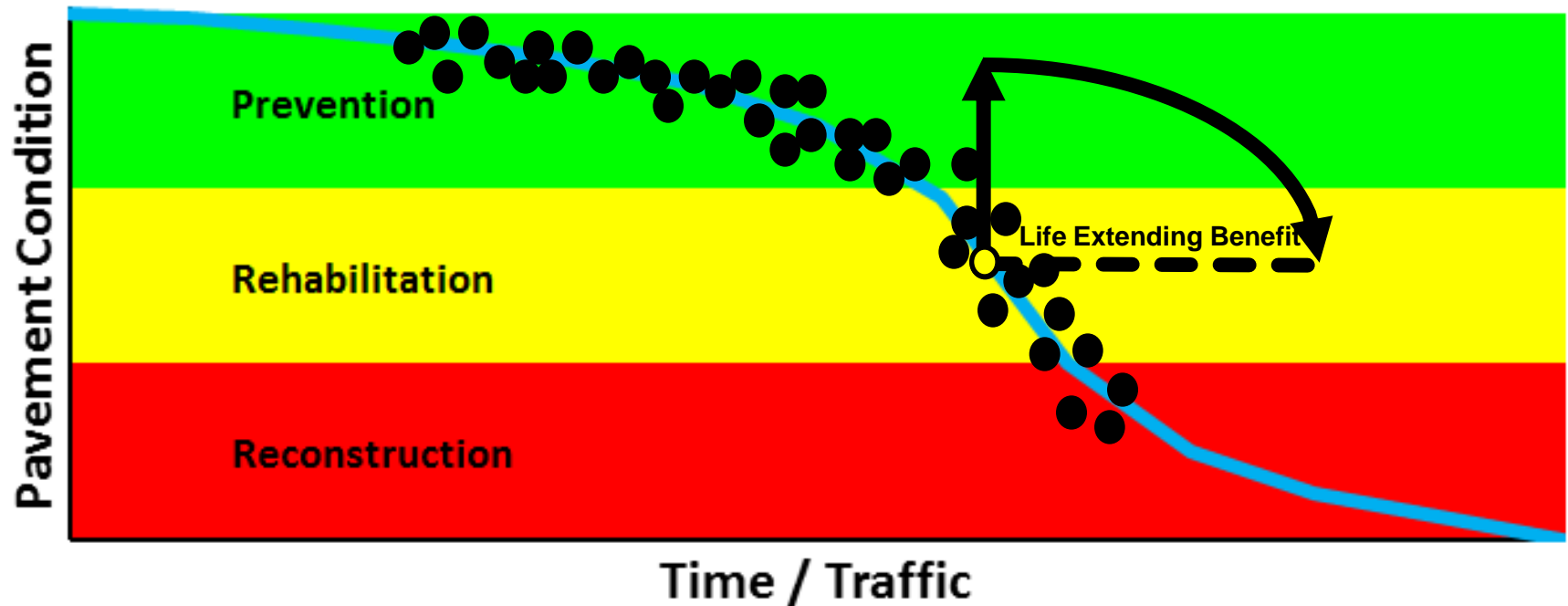
US 169
High Volume
Road
4 Mile Section



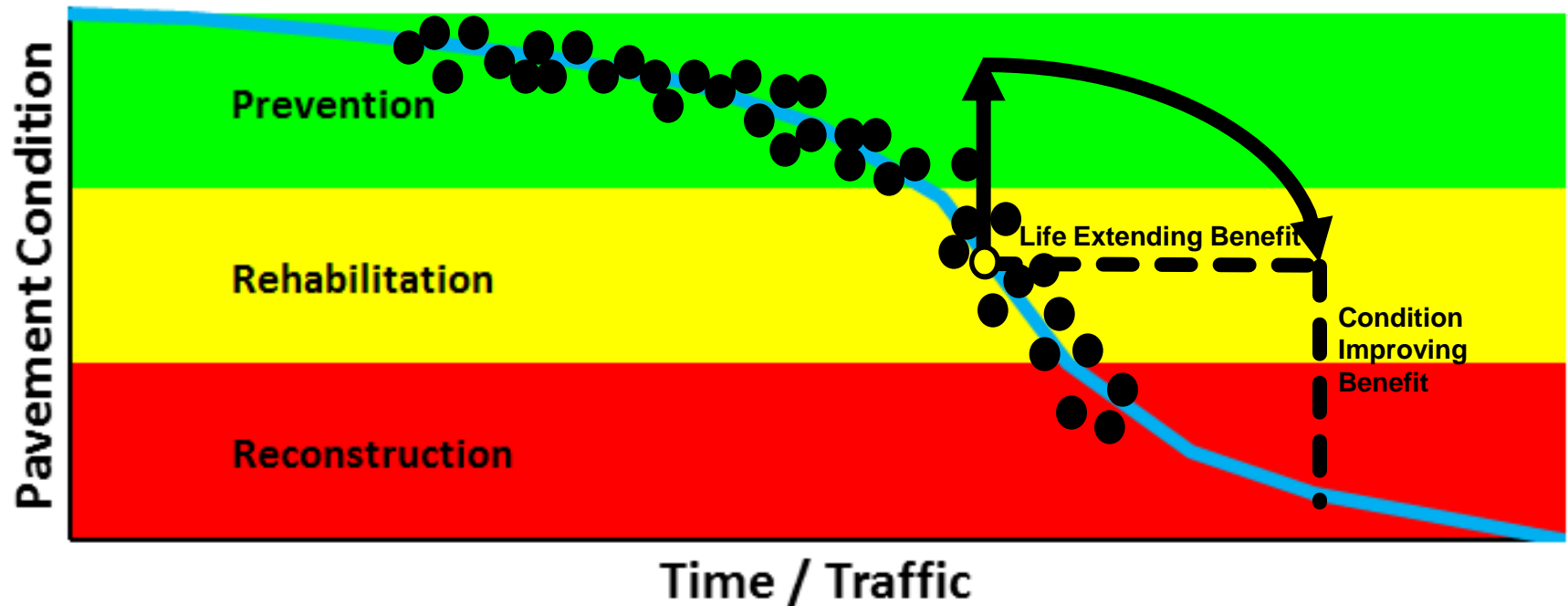
Pavement Preservation



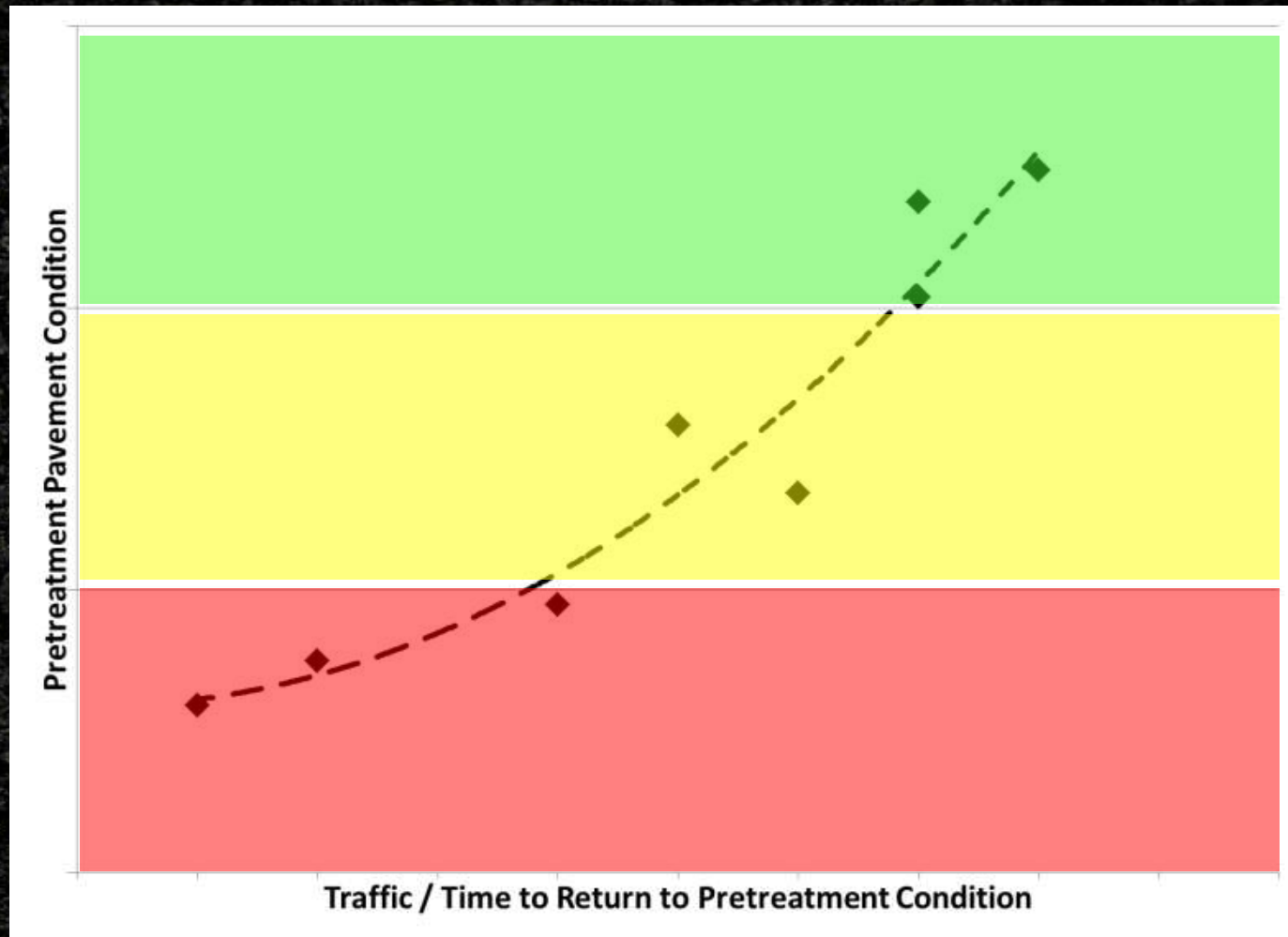
Pavement Preservation



Pavement Preservation

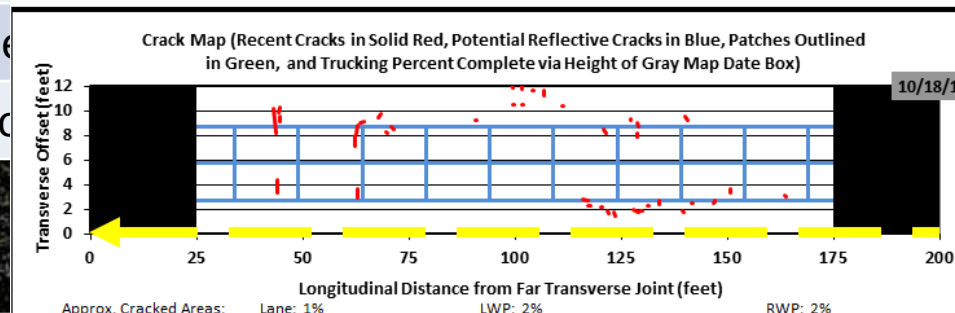
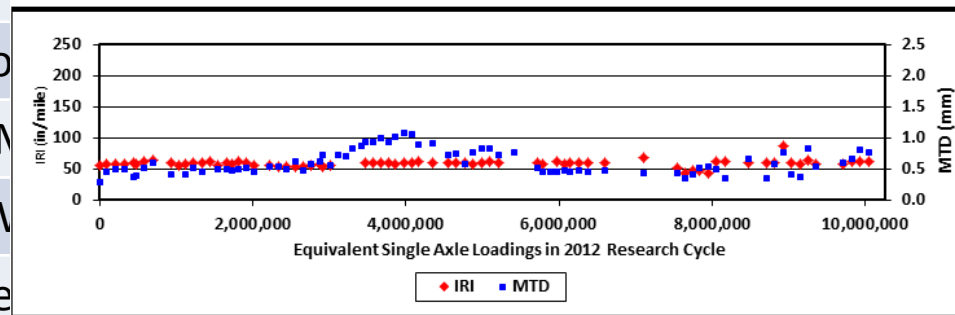
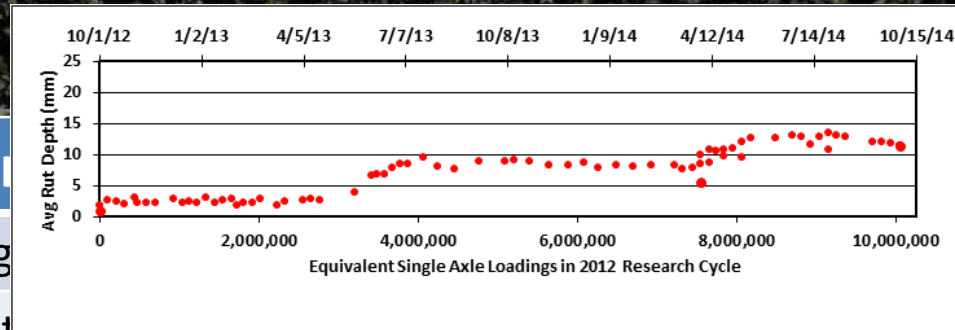


Life Extending Benefit Curves



Monitoring Plan

Parallel	US-280
Roughness	Weekly
Rut Depth	Weekly
Macrotexture	Weekly
Crack Map	Monthly+
Full Depth Reconstruct	Quarterly
Surface Temperature	Monthly
Permeability	Quarterly
Noise	Quarterly



PG - South

TREATMENT TYPES

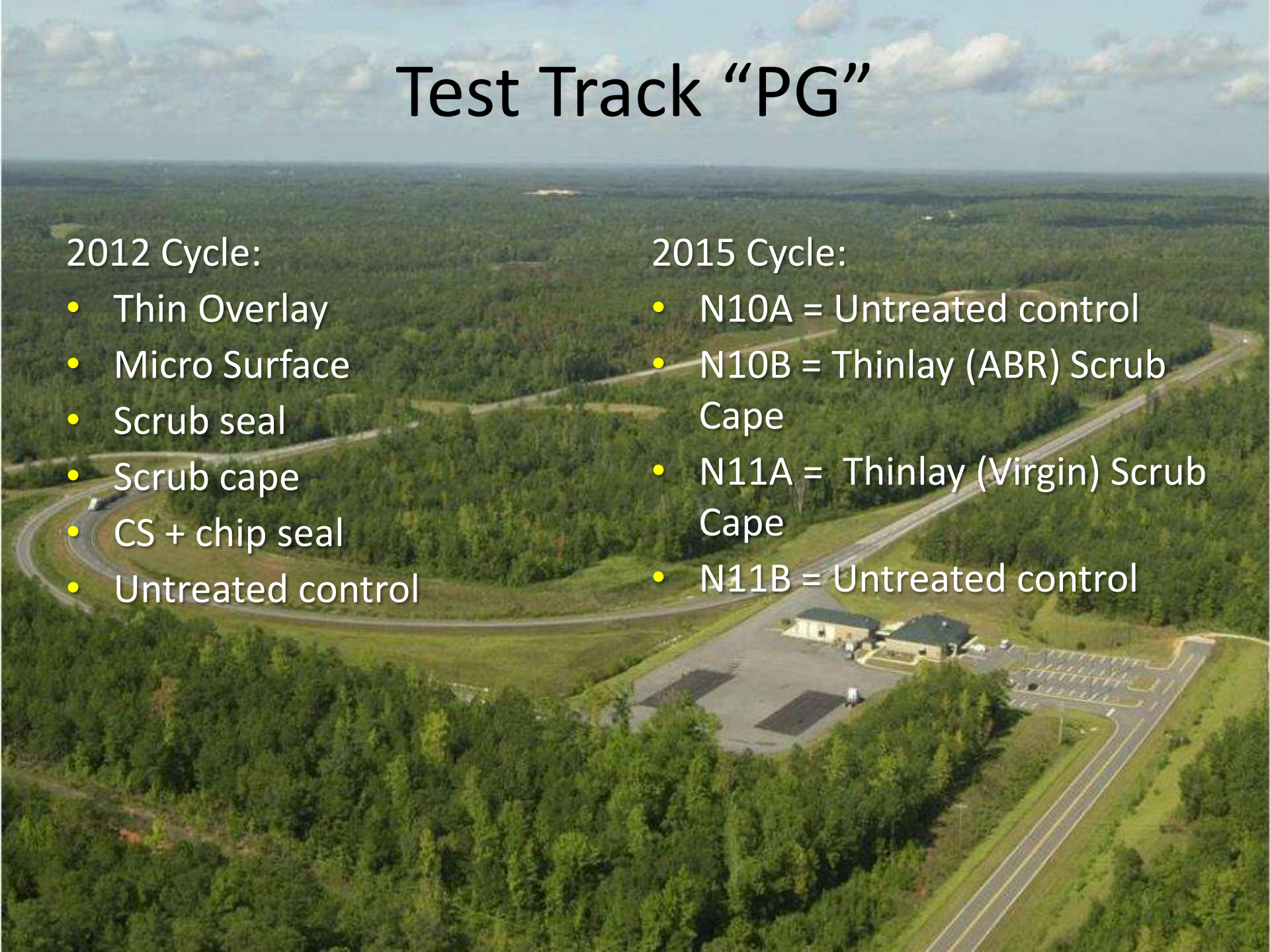
Test Track “PG”

2012 Cycle:

- Thin Overlay
- Micro Surface
- Scrub seal
- Scrub cape
- CS + chip seal
- Untreated control

2015 Cycle:

- N10A = Untreated control
- N10B = Thinlay (ABR) Scrub Cape
- N11A = Thinlay (Virgin) Scrub Cape
- N11B = Untreated control



US 280 Build

- Completed September 14, 2015
 - 6 untreated control sections
 - 34 treated sections placed
 - 5 empty sections
 - 1 empty – traffic loop



US 280

Control Sections:

Cracking

Rutting

IRI

Texture



US 280

Surface Treatments



Crack Seal
Fog Seals
Chip Seal
Scrub Seal
FiberMat Chip Seal
Micro Surface*

US 280

Combination of Surface Treatments



- Crack seal + Chip seal
- Crack Seal + Micro Surface
- Surface Treatment + Micro Surface = Cape Seal
- Chip Seal (Double, Triple)
- Double Micro Surface

Thin Overlays

Lee Road 159:

- 4.75 mm Mixes
 - 50% RAP
 - 5% PCRAS
 - Standard binder grades
 - Highly polymer modified
- Ultra-thin bonded wearing course

US 280:

- 4.75 mm Mixes
 - High ABR
 - Virgin
- Ultra-thin bonded Wearing course
- OGFC
 - Varying tack types/rates

Combinations – Thin Overlays

- Micro Surface on Thin overlay
- Thin Overlay + Surface Treatment = Thin Overlay Cape
 - Chip Seal
 - FiberMat Chip Seal
 - Scrub Seal



Cold Recycling



BENEFITS OF PAVEMENT PRESERVATION



Current Life Extension Based on Ranges

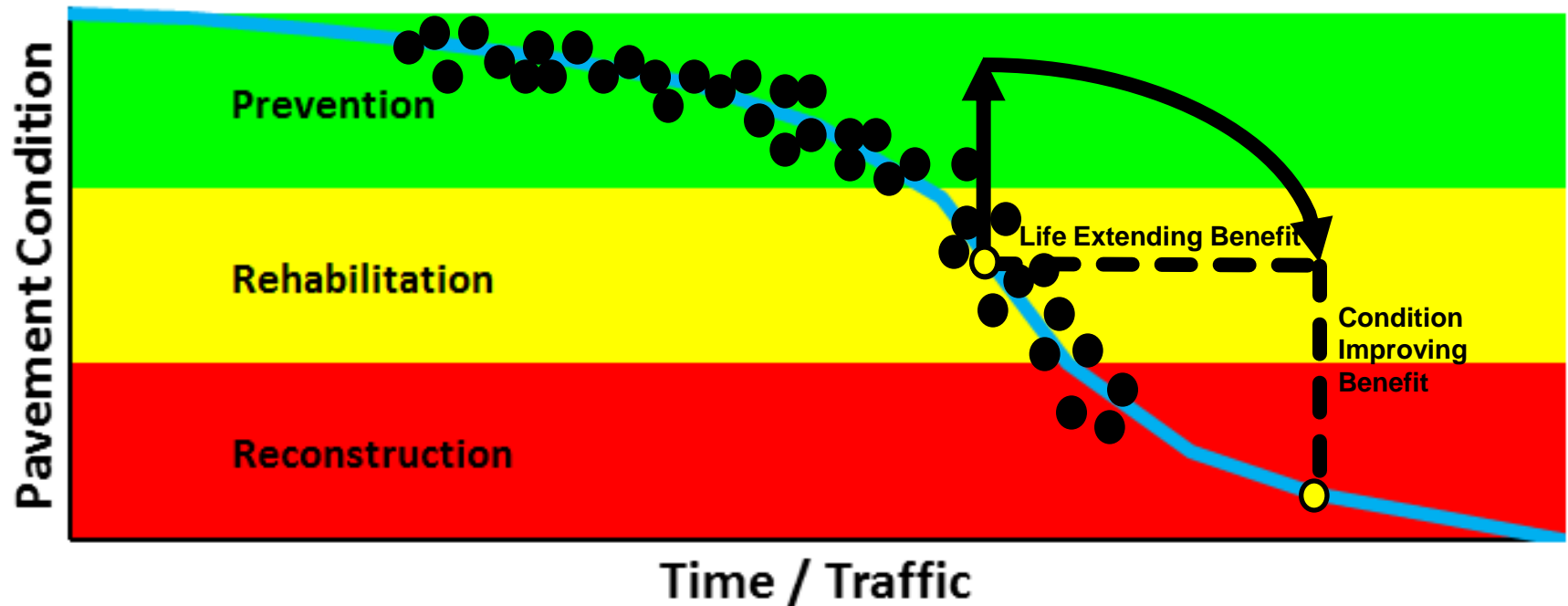
Treatment	Reported Extended Service Life Range (Years)
Thin Overlay	3-23
Chip Seal	3-8
Microsurfacing	3-8
Crack Sealing	0-4
Mill and Resurfacing	4-20
Hot In-place Recycling	3-8
Slurry Seal	4-7
Fog Seal	4-5
Cold In-place Recycling	4-17
Full Depth Reclamation	10-20
Structural Overlay (Mill and Fill)	6-17
Whitetopping	3-17

FHWA-HIF-10-020, January 2010,
<http://www.fhwa.dot.gov/pavement/preservation/pubs/perfeval/chap00.cfm>

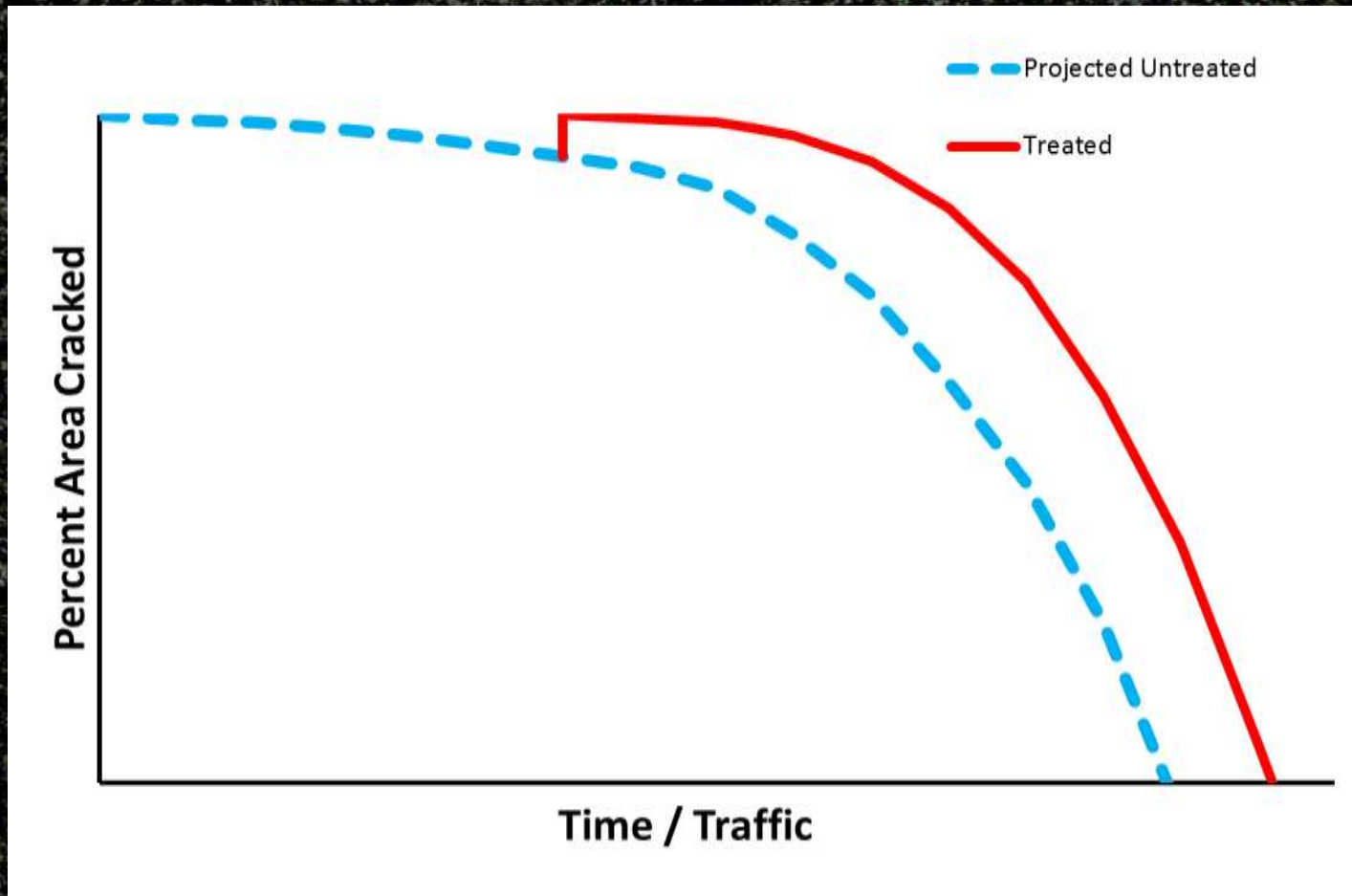
Quantifying Benefits of Pavement Preservation



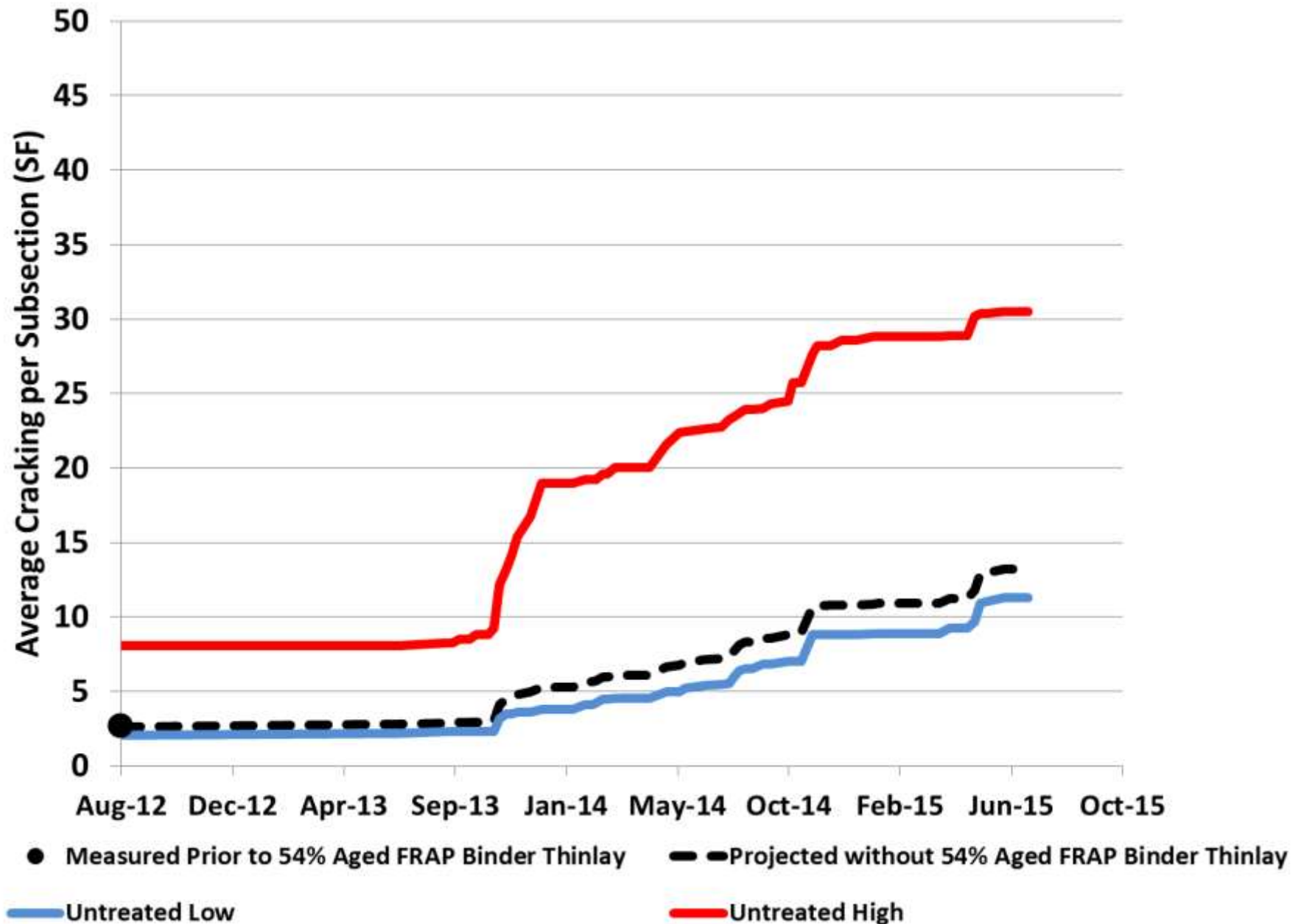
Pavement Preservation



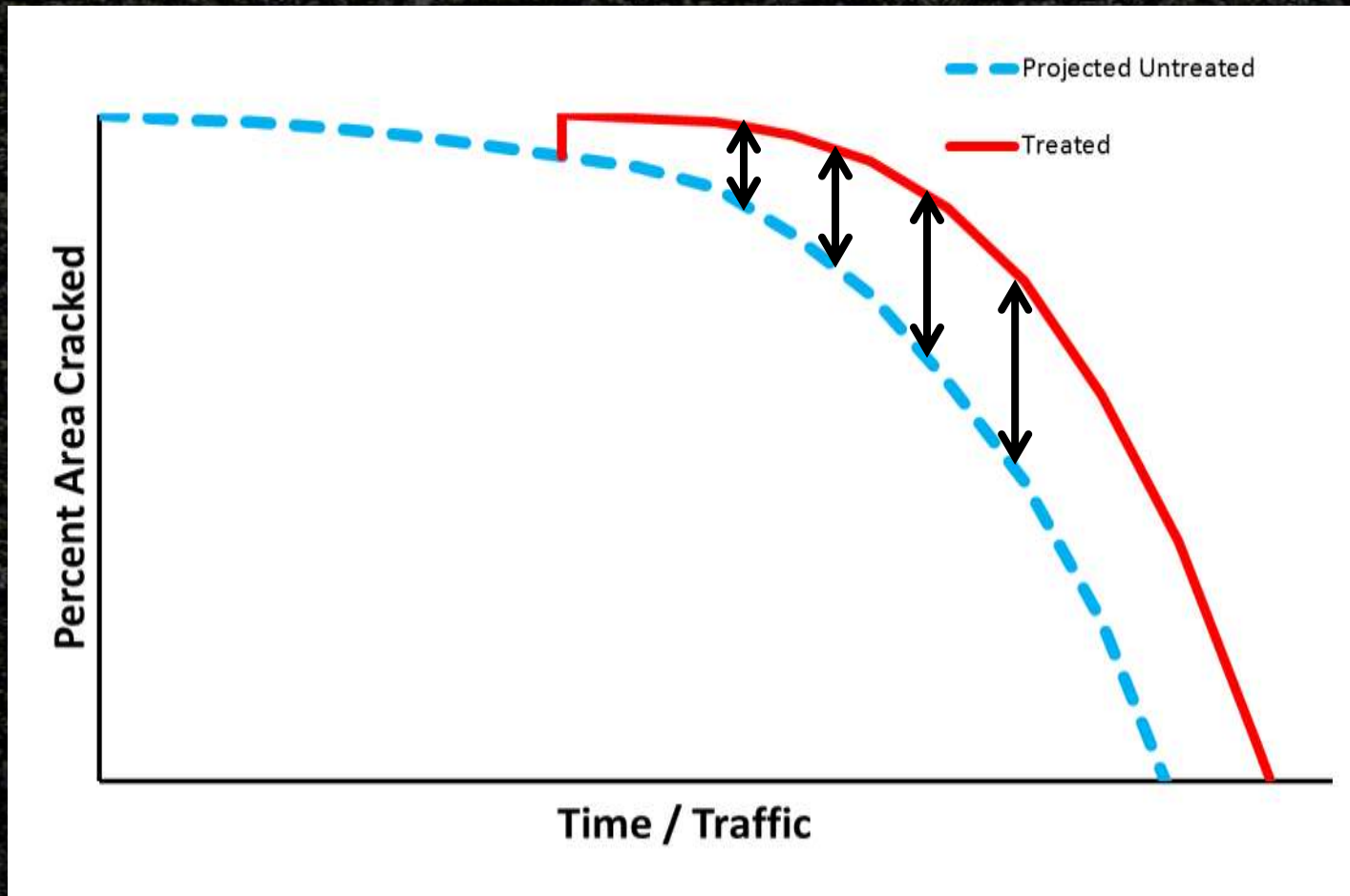
Reduction in Cracking



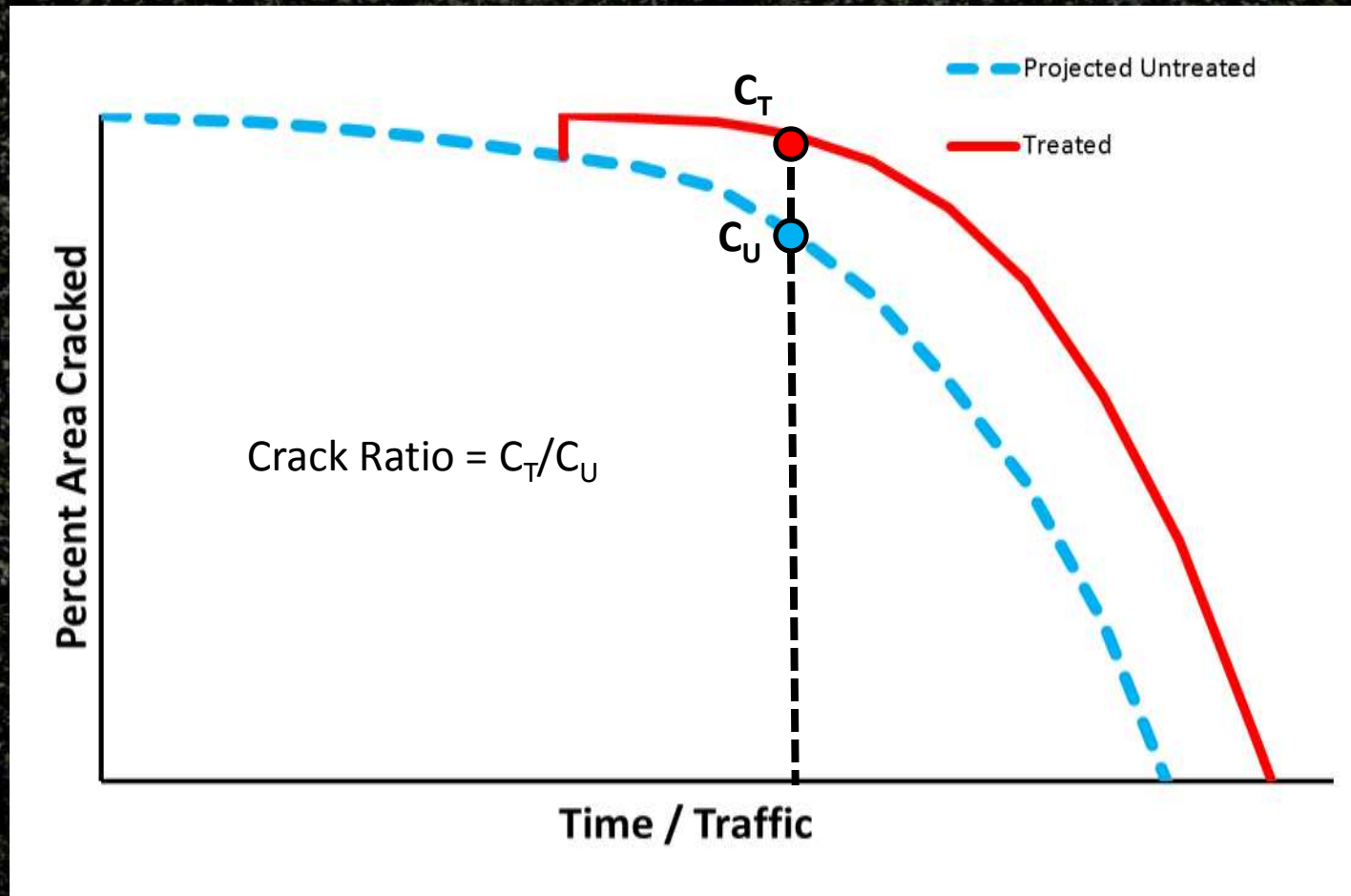
Projection of Cracking – What if left untreated?



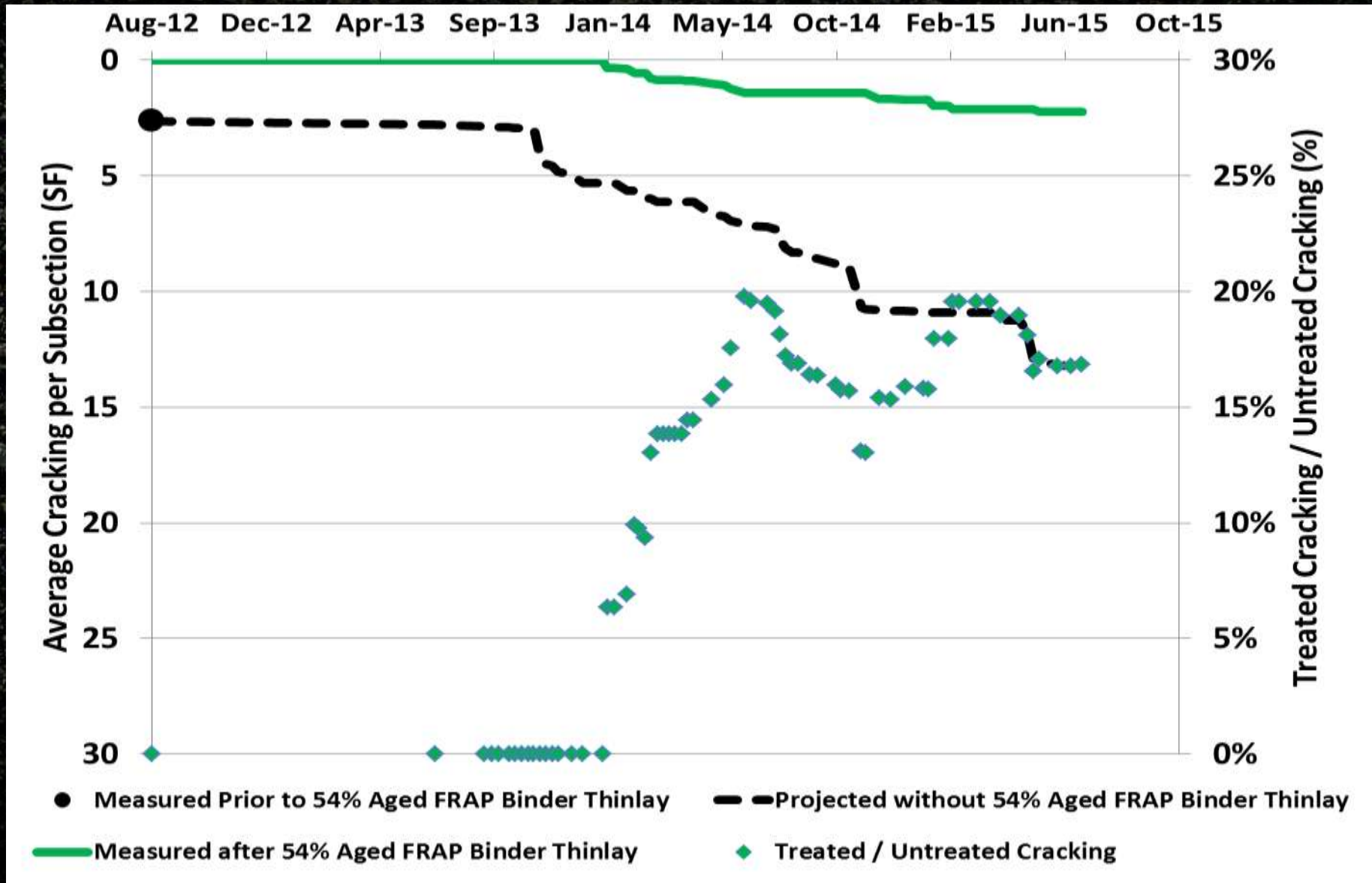
2015 Preservation Group (PG15)



Ratio of Cracking – Treated vs Untreated



Ratio of Cracking – Treated vs Untreated





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