

What's New in Pavement Preservation?

A look into MnDOT

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MnDOT

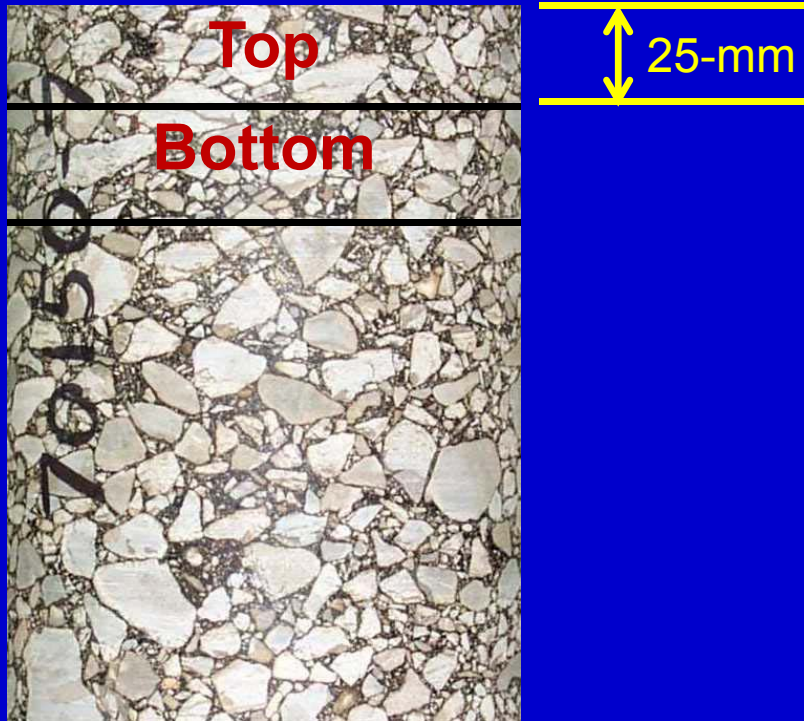
Topics

- When to chip seal
- Fog Sealing
- Micro Milling & PMT
- Micro Surfacing Research
- Texas Under Seal (TUS)

When to Apply Chip Seal

- Built aging study
 - Because 15 years take 15 years
- 3 inch Mill & Fill 1999
 - PG 58-28 binder
 - Chip seal 1 mile section each year starting in 2000
 - Last sections was chip seal 2004

TH56 Cores

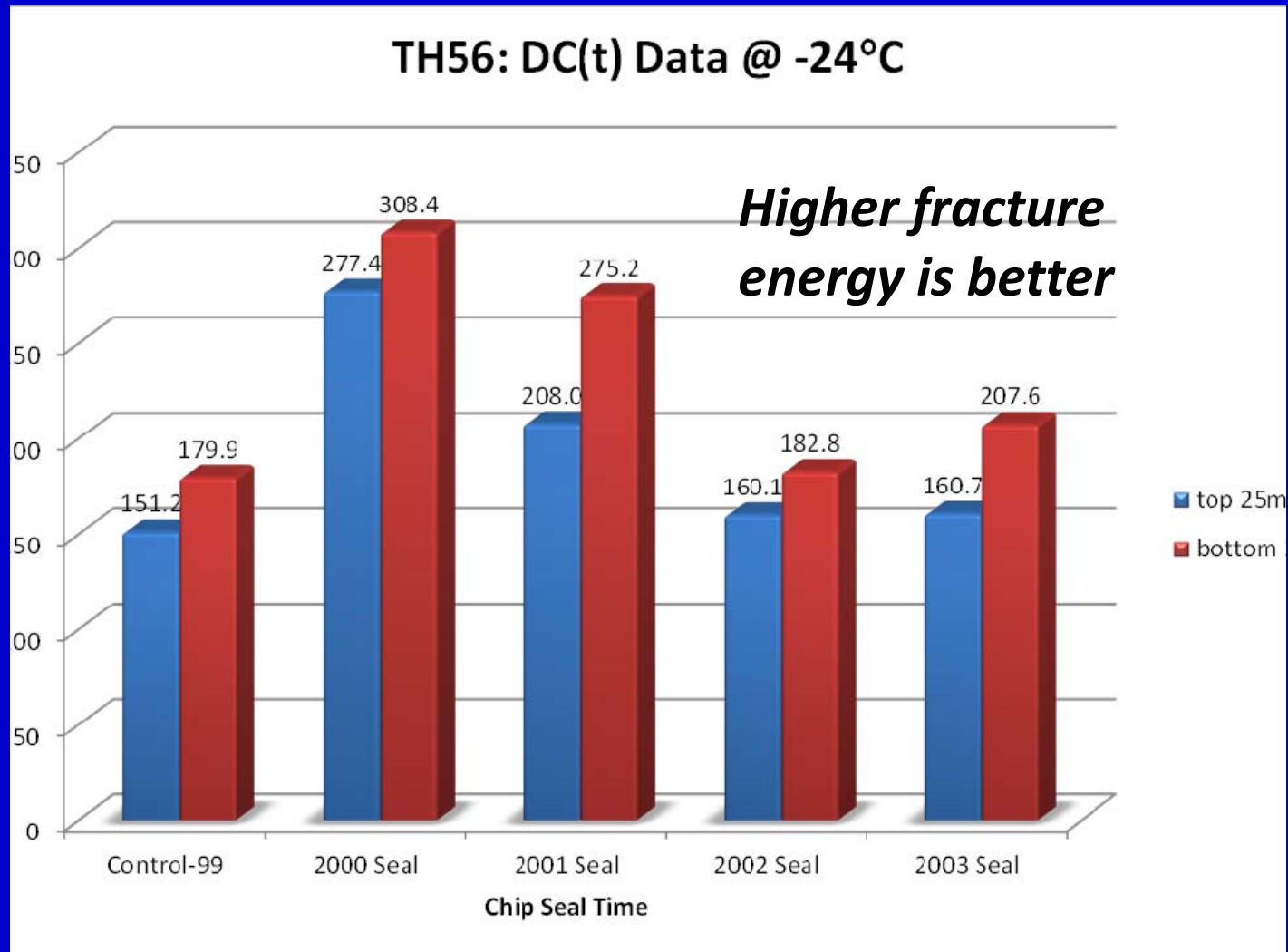


- Cores
 - Remove chip seal (if any)
 - Cut into two 25-mm layers
 - Test for fracture energy (cracking potential)
 - Recover component asphalt to check aging

Disk-Shaped Compact Tension Test: DC(T)



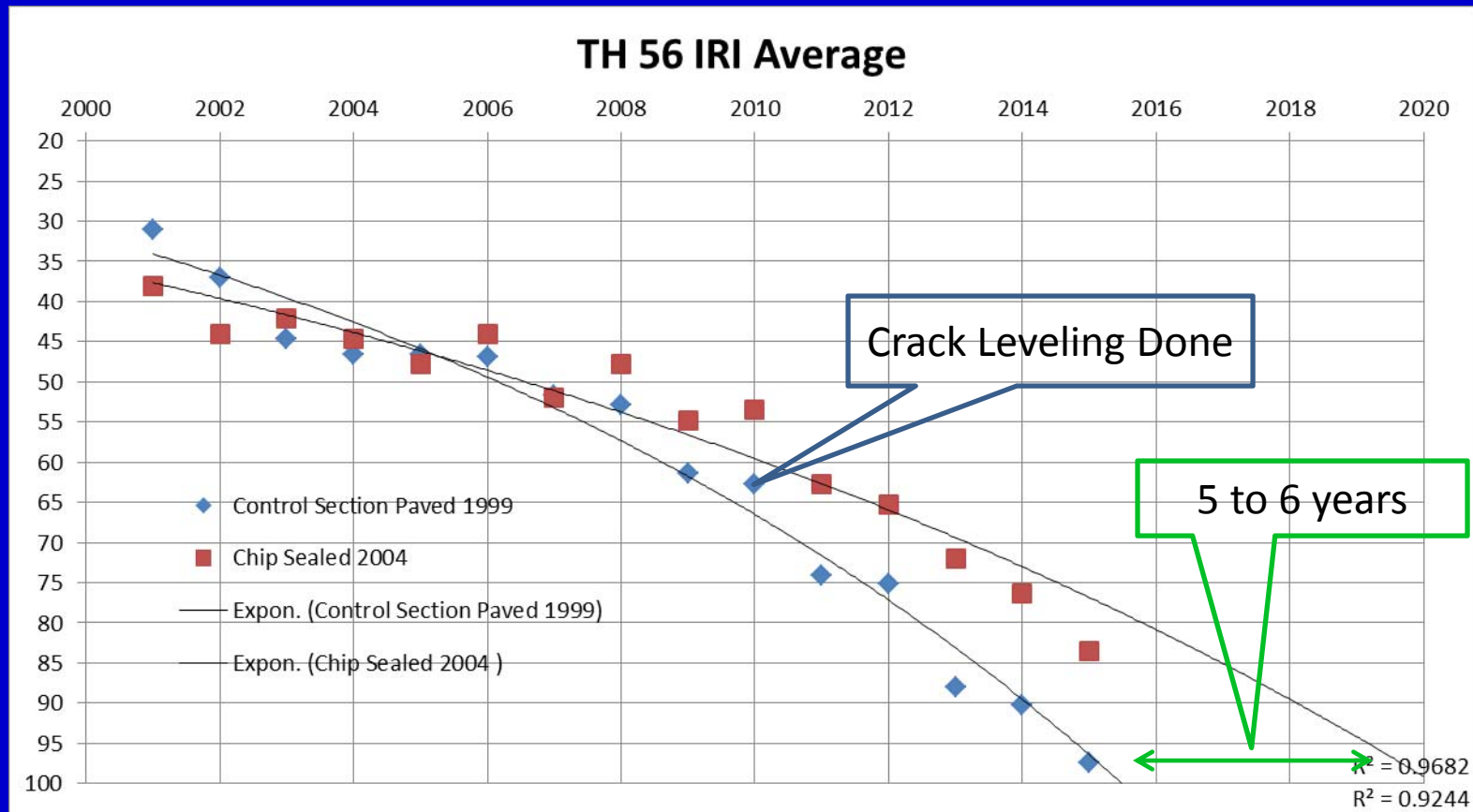
DC(T) Results: TH-56



Asphalt Institute's Findings

- Sealing improves resistance to aging (cracking)
- Sooner is better when sealing
 - Waiting for 3 or more years to seal after construction produced similar results as unsealed pavement related to DCT
 - Sealing after 1 or 2 years showed improvement in resistance to aging (cracking)

MnDOT's Pavement Management Ride Data



Control Section Never Chip Sealed



Last Section Chip Sealed 2004



Value of Fog Sealing



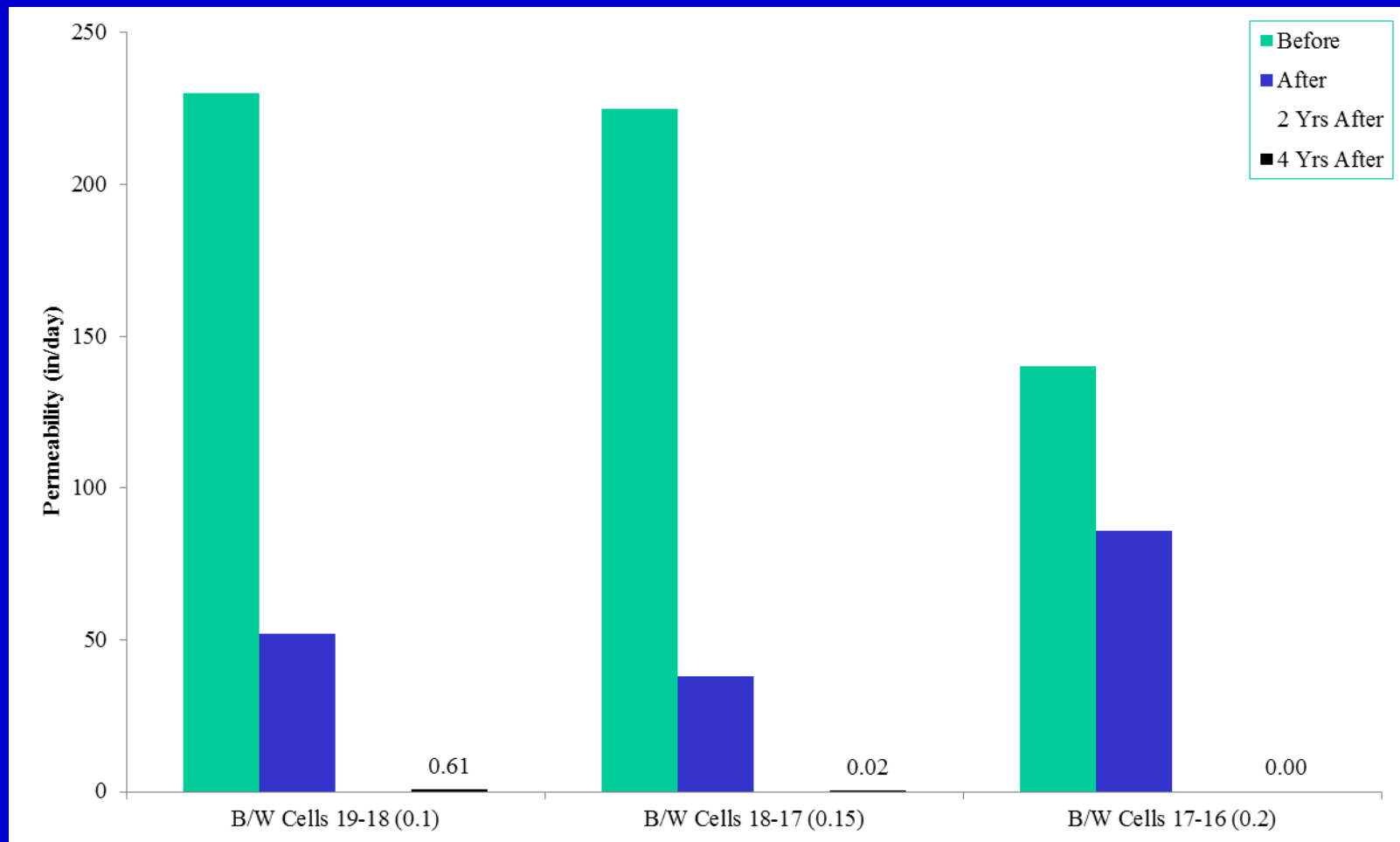
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Why Fog Sealing Shoulders (Picture taken in 2009)



Fog Seal
applied 2001

Fog Sealing still working after 4 years



Micro Milling with PM Treatments



Micro Milling with Chip Seal or Micro Surfacing

- Why?
 - Need lower cost alternative to 1 ½ inch over lay
 - To improve ride
- What are the performance targets
 - Equal to 1½ inch over lay

Micro Milling with Chip Seal or Micro Surfacing

- Quicker than overlay
- Less costly overlay
 - Chip seal 40% of the cost of 1½ inch over lay
 - Micro Surfacing 60% cost of 1 ½ inch over lay

Micro Milling

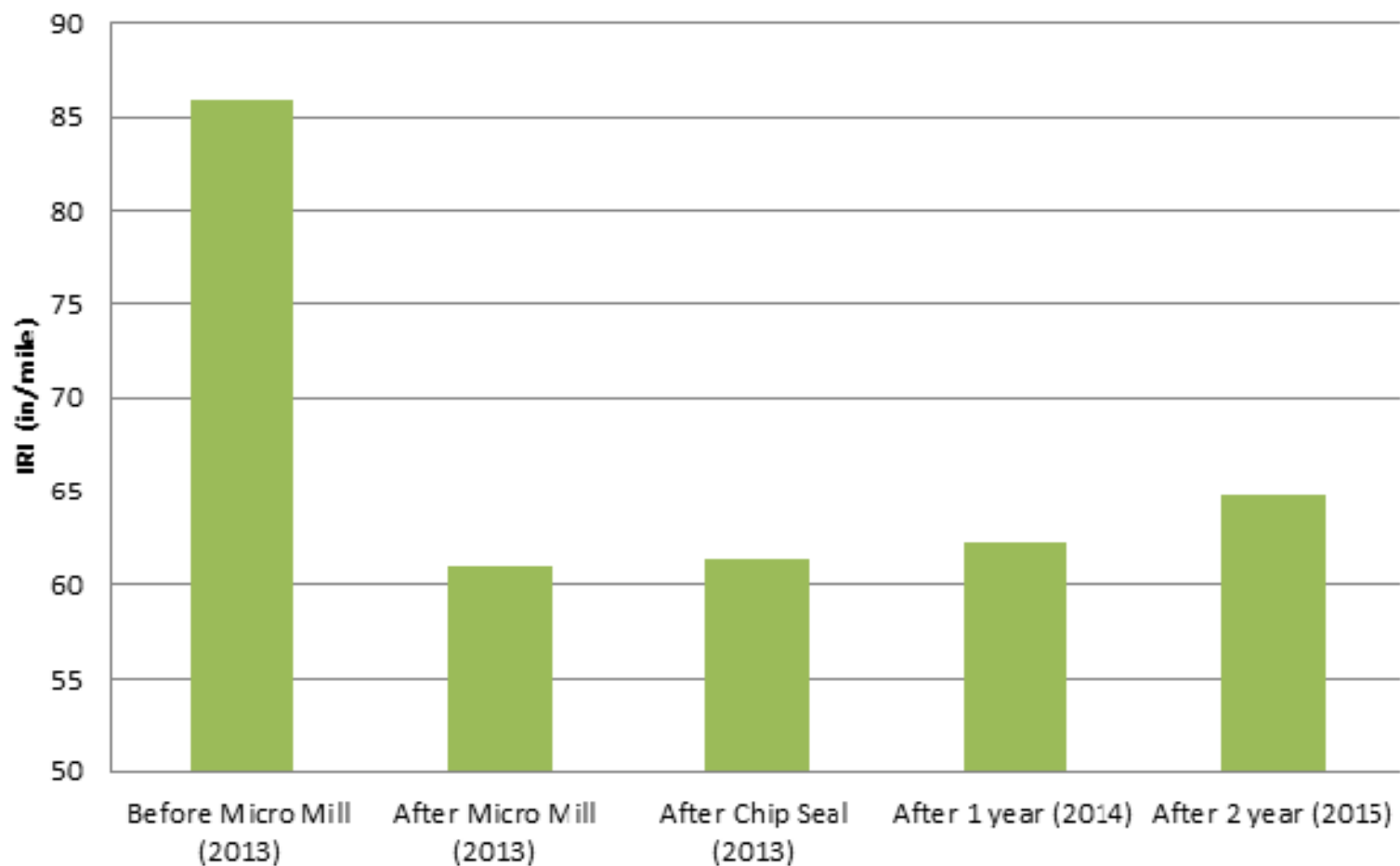


Micro Milling with Chip Seal



Results for Chip Seal

Southbound RWP TH89 RP 60-74 Micro Mill /
Chipseal



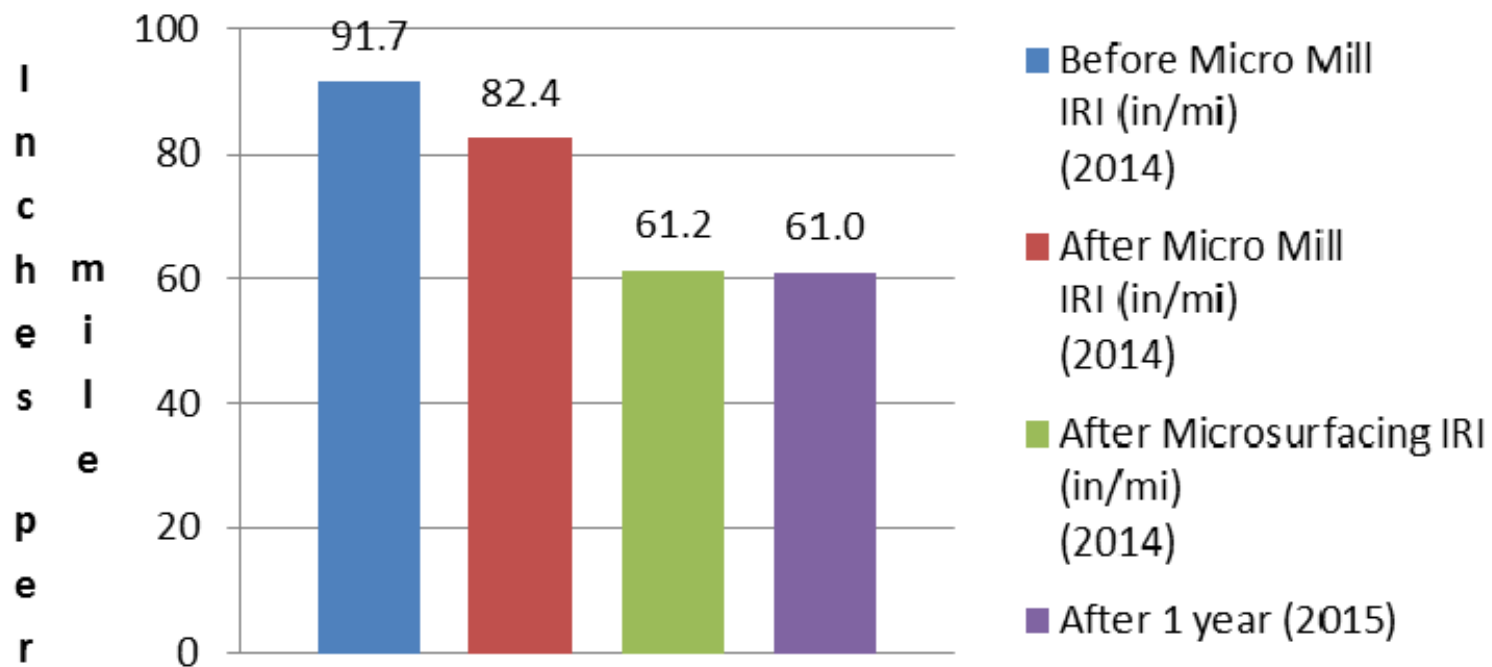
Micro Milling with Micro Surfacing





Results using Micro Surfacing

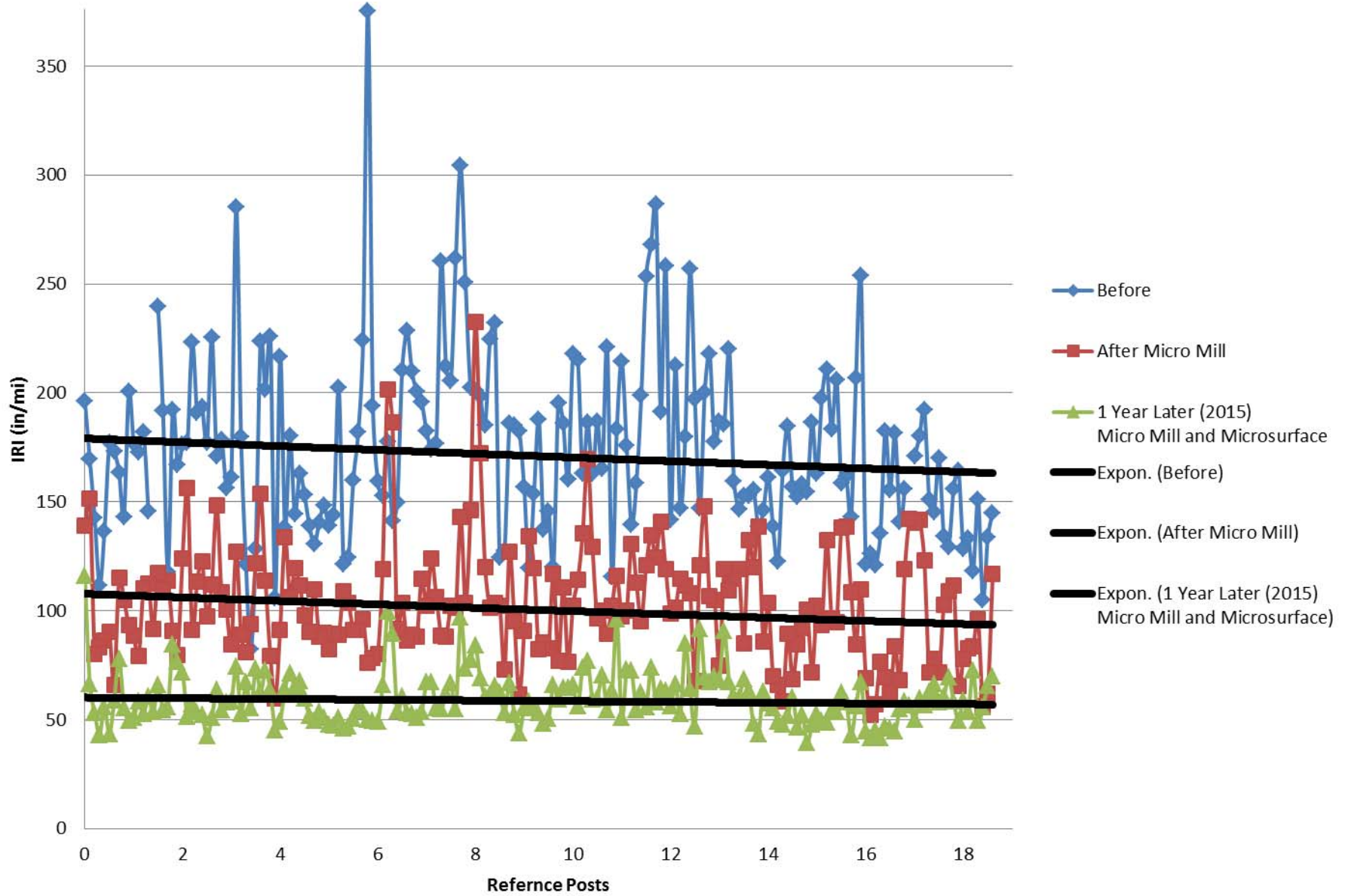
TH 12 Micro Milling & Micro Surfacing Ride Data



TH 64 Pre Condition



SB TH 64 Average of Both Wheel Paths



Current Condition



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Micro Surfacing Research



On Going Research Efforts

- How to reduce snow plow damage
- Hard based asphalt PG 64-22 (CQS-1Hp)
- Softer base asphalt PG 58-28 (CQS-1p)
 - 2013 and 14 allowed

On Going Research Efforts

- Required in 2015
- Allowed PG 49-34 construction season 2015
 - Two project built successfully so far with PG 49-34
- Have seen less snow plow damage on pavement markings with softer based asphalt

On Going Research Efforts

- Smoother surface
- Allow use of SBS modified asphalt in place of latex modifications
 - Contractor/Supplier choice

On Going Research Efforts

- Working on higher asphalt content micro surfacing
 - Normal asphalt content 7 to 8%
 - Testing performance of micro with 10 to 12 % asphalt content

On Going Research Efforts

- Hypothesis is higher asphalt content will
 - Reduce reflective cracks
 - More durability/longer life

On Going Research Efforts

- Results
- No issue with tracking or rutting
- Appears to increase wear resistance
 - Less snow plow chatter marks
- Has greatly reduced # of cracks
- Seem to heal during hot weather

TH 23 Pre-Condition Hard Based Micro Surfacing



TH 23 Current Condition



TH 64 Pre Condition Soft Based Micro Surfacing



Current Condition



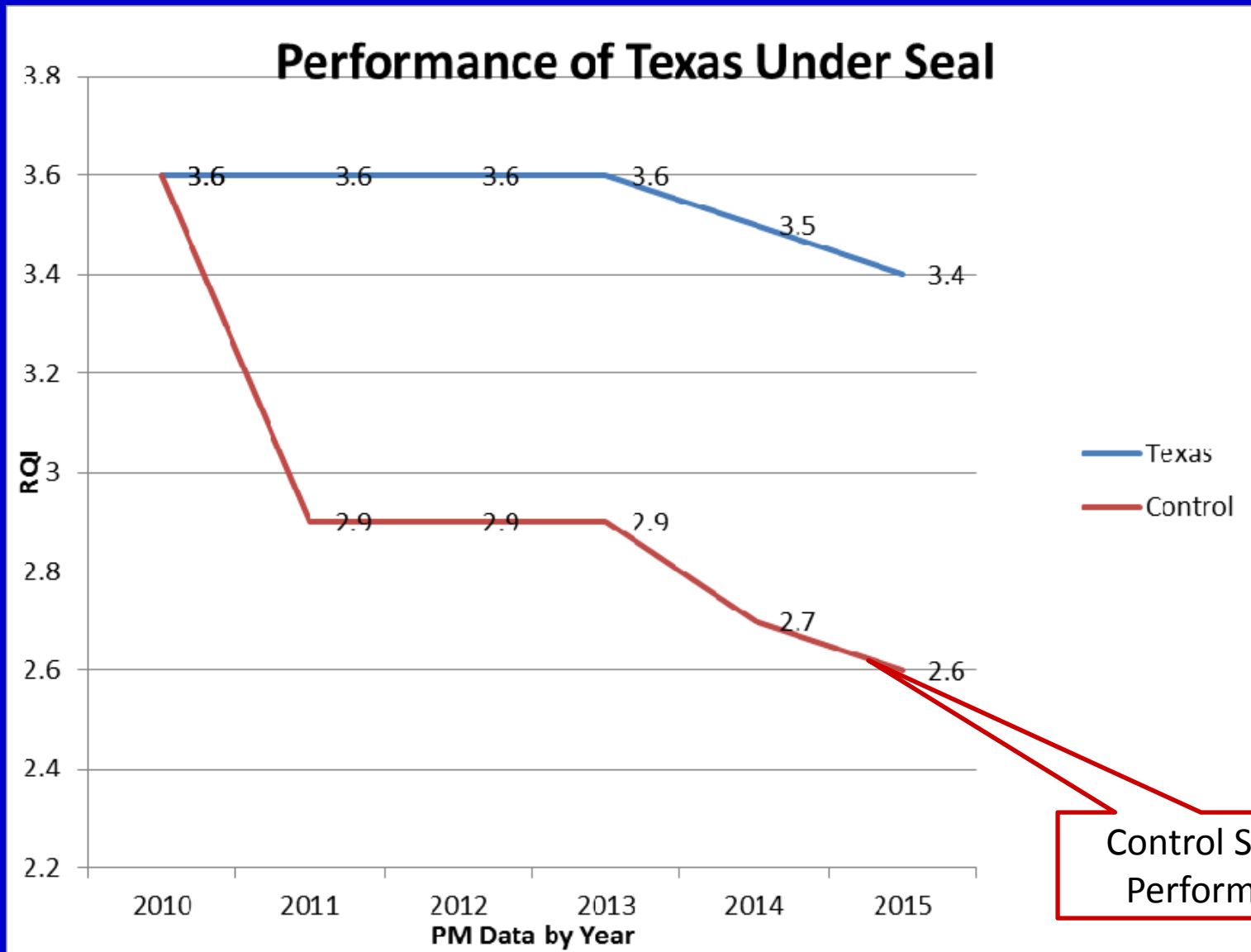
Texas Under Seal



Texas Under Seal

- Chip Seal applied before HMA Overlay
 - Milled surface
 - Non milled surface
- $\frac{3}{8}$ " minus chip
- CRS-2p
- Light on cover aggregate
- Can pave as soon as rolling & sweeping is completed

PM Performance Data



Texas Under Seal

- Why does it perform
 - Acts as stress relief membrane?
 - Super Tack?
 - Have had other tack methods with higher peak strengths
 - Limits water infiltration from base?
- As of end of 2015 construction year 11 projects have been built

Question?



THANK YOU