What MnDOT is Doing to Improve PM Treatments Performance

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Topics

- Brief look at MnDOT Spec's and Methods
- The Most Over Looked Factors for Building Successful PMT
- Micro Milling & PMT Update
- Micro Surfacing Research
- Texas Underseal Update
- NRRA

MnDOT Chip Seal Video

 Available at https://www.youtube.com/watch?v=OI5R7n8z
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- Micro Surfacing
 - Require calibration of all machines with all materials used
 - Night time test strip for all projects
 - Apply scratch course on all projects

- Pay for aggregate by ton
- Emulsion by gallon
- Require yield spot check numerous time per day
- Both on aggregate and emulsion
- Check curing rate

- Chip Sealing
 - Strict gradation requirement
 - < 1 % passing # 200 sieve</p>
 - Crushing required on all natural gravels

- Require a design to determine starting application rate of material to be completed
- Limitation on working season
- Pay items to encourage proper application

- Sweep same day
- Fog seal all chip seal
- Contractor responsible for all vehicle damage until permeant pavement marks are placed

- Crack Sealing / Filling
 - Use only pre-approved products
 - Sample from end of wand
 - Temperature
 - At recommend pouring
 - Pay by road station

The Most Over Looked Factors for Building Successful PMT



What is the goal of the project

- Is it a true PM project
- Correcting defects
 - Rutting
 - Raveling
 - Segregation

What is the goal of the project

- Safety enhancements
 - Friction
 - Hydroplaning
- Ride improvement

What is Success

- What measure will you use to determine success
 - Are your goals realistic for the roadway in question and the treatment you have choosen
- Just because you understand your goals doesn't mean the public does

What is the Right Treatment?





Evaluate Your Existing Pavement

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Evaluate Your Existing Pavement



Pick the Correct Project



Bidding

- What is needed to succeed
 - How much aggregate
 - How much binder
 - # of layers
 - Combinations of treatments
- Does the specification insure wanted out comes

Project Planning

- Post letting
 - Do you have trained inspectors
 - Training sources
 - Upper Great Plains Transportation Institute
 - NCPP
 - Your State DOT
 - ISSA

MnDOT is developing PMT Experts in each District

Construction

- Pre-con meeting
 - Discuss special requirements with Contractor
 - Does the Contractor have trained employees that understand your requirements
 - Pick time and location for calibration of equipment
 - Make sure all designs are completed
 - Test strip if required

Outcome a Successful Project



Micro Milling with PM Treatments



Micro Milling with Chip Seal or Micro Surfacing

- Why?
 - Need lower cost alternative to 1 $\frac{1}{2}$ inch over lay
 - To improve ride
- What are the performance targets
 Equal to 1½ inch over lay

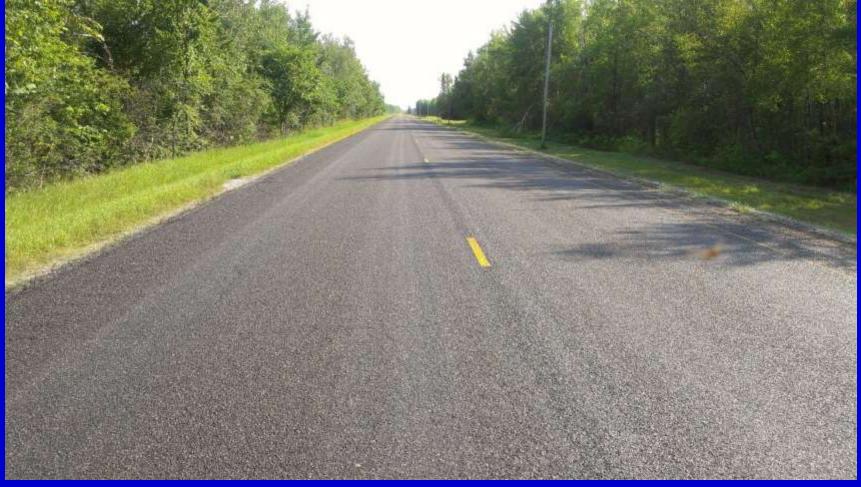
Micro Milling with Chip Seal or Micro Surfacing

- 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

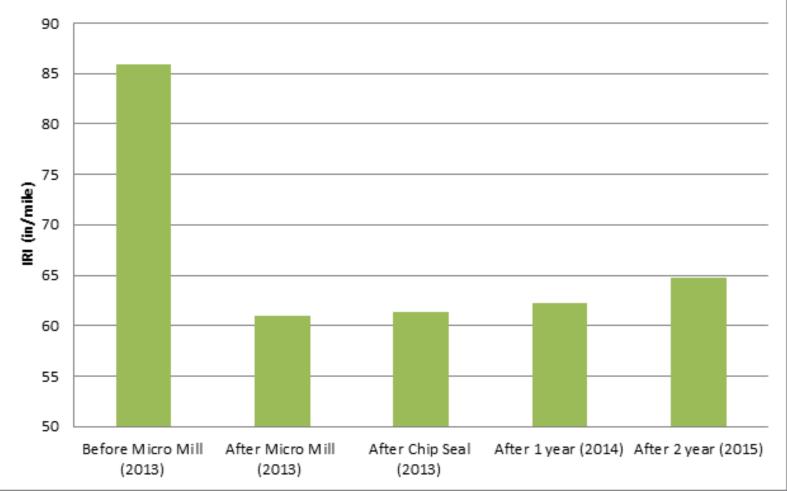


Micro Milling with Chip Seal



Results for Chip Seal

Southbound RWP TH89 RP 60-74 Micro Mill / Chipseal



Micro Milling with Micro Surfacing

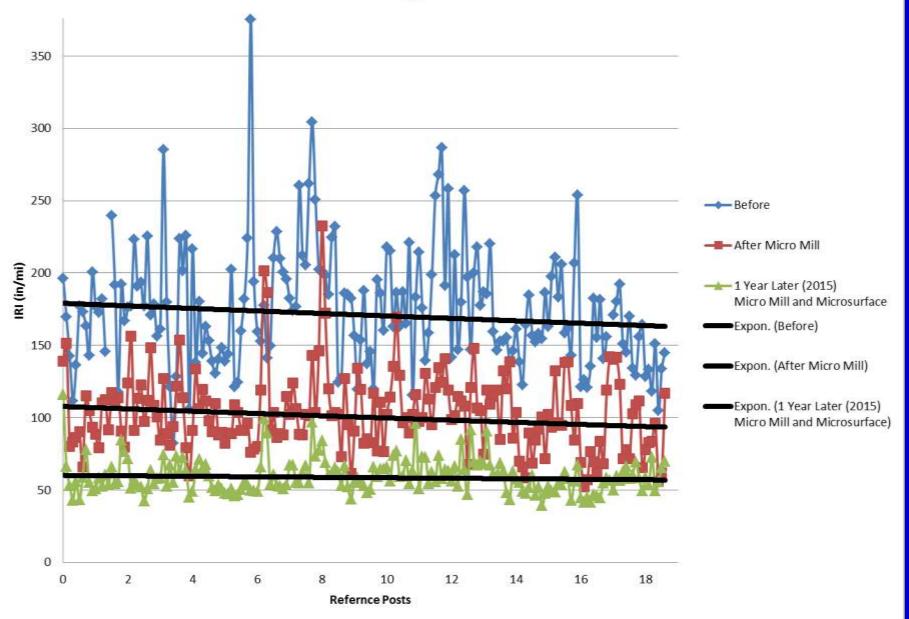




TH 64 Pre Condition



SB TH 64 Average of Both Wheel Paths



Current Condition



Micro Surfacing Research



Issues with Micro Surfacing

- Brittle Mixture
- All cracks reflect thru
- Delamination
- Snow plow damage
- Poor performance of pavement markings
- Wear off in 5 to 7 years on high volume roadways

Hypothesis

- Higher asphalt content will
 - Reduce reflective cracks
 - More durability/longer life
 - Help with delamination
 - Last longer
- Softer base asphalt will reduce reflective cracks

Where MnDOT Currently is

- Past hard based asphalt 40 90 Pen (PG 64-22) (CQS-1Hp)
- Current softer base asphalt 90 200 Pen (PG 58-28) (CQS-1p)
- 2017 Very soft base asphalt 200 300 Pen (PG 49-34) (CQS-1?p)

- 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

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

- Working on higher asphalt content micro surfacing
 - Normal asphalt content 7 to 8%
 - Testing performance of micro with 9 to 12 % asphalt content
- Higher polymer loading
 - 4 ½ % verses 3 %

- 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
- Pavement marking perform similar to HMA over lay

TH 23 Pre-Condition Hard Based Micro Surfacing



TH 23 Current Condition



TH 64 Pre Condition Soft Based Micro Surfacing



Current Condition



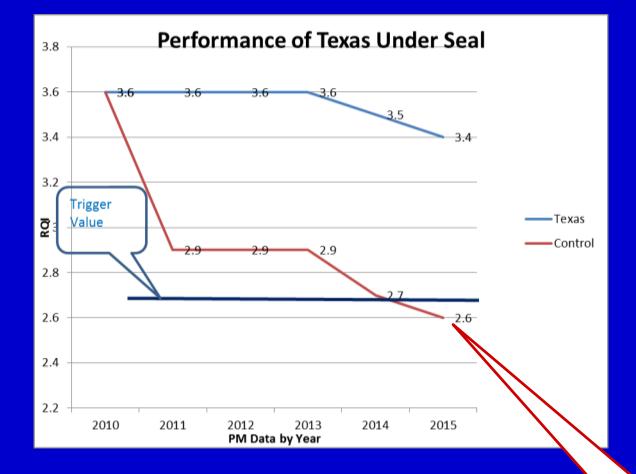
Texas Under Seal Update



Texas Under Seal

- Chip Seal applied before HMA Overlay
 - Milled surface
 - Non milled surface
- ¾" minus chip
- CRS-2p
- Light on cover aggregate
- Can pave as soon as rolling & sweeping is completed

PM Performance Data



Control Section Performance

Texas Under Seal

- Lesson Learned
 - Lay out test sections to count existing cracks
 - Be careful with fog sealing
- Next Steps
 - Placing Ultra Thin Bonded Wearing Course directly over concrete then traditional over lay
 - Trying to substitute paving with a spray paver in place of under seal



National Road Research Alliance

Strategic Implementation through Cooperative Pavement Research

Develop < Collaborate < Research < Implement



What is NRRA?

- Non-traditional pooled fund
- Collaboration between transportation agencies, industry, and academia.
- Direct the future of MnROAD research
 - -\$2.5 million in MnDOT construction funding

Develop < Collaborate < Research < Implement

MAPA Contractor's Workshop 2016



Initial Development

2014 National Peer Exchange

- Pavement experts focusing on
 - Quantifying & Communicating the Value of Research
 - Development of MnROAD's Future Research

+Ontario

13 Participating Agencies+LRRB+FHWA+TRB+ University of Washington

Develop < Collaborate < Research < Implement

MAPA Contractor's Workshop 2016

Question?

THANK YOU

UDIT