

MAINTENANCE of OGFC PAVEMENTS

THE NORTH CAROLINA EXPERIANCE

2014 MPPP ANNUAL MEETING

&

R-26 WORKSHOP

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- **Project History**
- **Issues Faced**
- **Project Design**
- **Initial Results**
- **Current Status**

Project History

- **I-40 near Wilmington, NC**
- **OGFC Placed in 2001**
- **Other Sections Failed**
 - **Severe Raveling**
 - **Poor Surface Friction**
 - **OGFC Removed & Replaced**
- **Similar Pattern Beginning**

Issues Faced

- **OGFC Raveling**
- **Lower Surface Friction**
 - **Wet crashes increasing**
- **Needed Attention**
- **Funding Not Available to Replace**
- **DOT Seeking Options**

Issues Faced

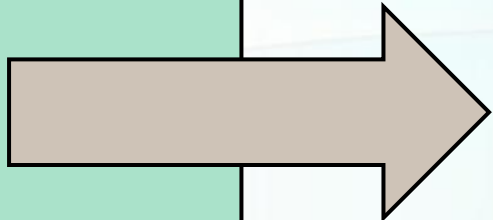
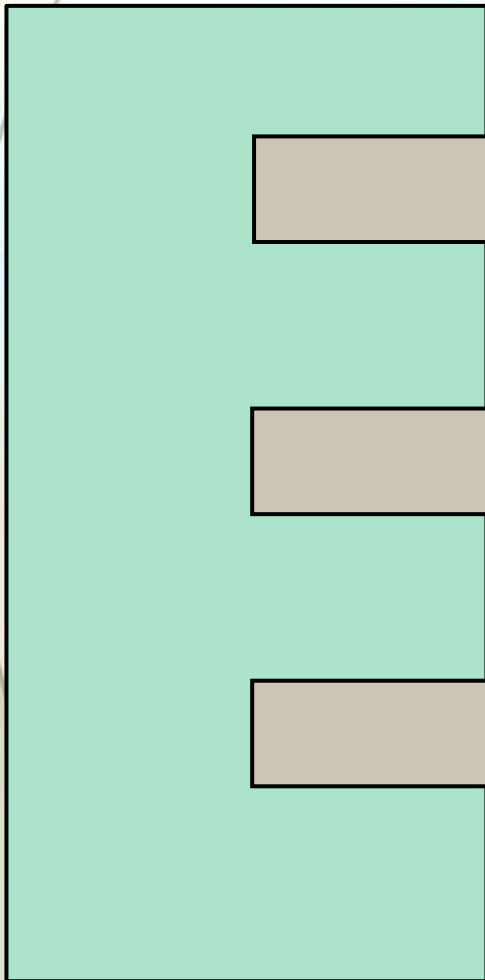
- **Pavement Preservation not Possible**
 - Well past the “top of the curve”
- **When Will It Fail?**
- **Can Failure be Delayed?**
- **What Options Exist?**
- **How to Fund?**
- **Some Action Required Soon**

Issues Faced

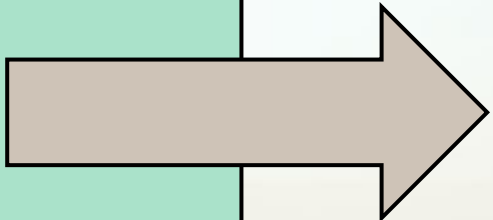
- **How to Extend Life Until Funds Available?**
- **How to Restore Friction and Reduce Wet Crashes?**

Solutions

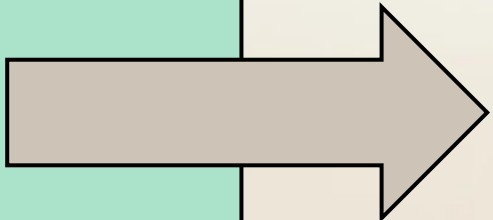
How can issues be addressed?



Texturing solves friction, but not raveling



Rejuvenation may retard raveling, but decreases friction (at least temporarily)



Combination of technologies may solve both issues

Project Design

➤ Performance Specification



- **Outflow Meter (ASTM E2380) Results average 10 seconds or less per lot**
- **Recovered Binder Exhibit 20% Viscosity improvement two weeks after treatment (AASHTO T 316)**
- **Friction Testing (ASTM 274) Required**
 - No limits set

➤ First time used in Combination

- **Some risk involved**

Project Design Concerns

➤ Texturing

- May break aggregate bond
- Will not prevent future polishing

➤ Rejuvenating

- First use on OGFC in NC
- Net friction improvement should be positive
- Highly oxidized Polymer Modified Binder



Project Design

- **Five Sections, 18.6 Lane Miles**
- **Retain Existing Pavement Markings**
 - **Texturing between markings**
 - **Rejuvenator will not discolor markings**
- **Testing By Contractor**
 - **Outflow Meter by Contractor, observed by DOT**
 - **Viscosity testing by independent lab**
 - **Friction testing by independent consultant (and DOT)**

Project Sequence

- **Pre construction viscosity readings**
- **Initial Outflow and skid readings**
- **Texturing (two tandem units)**
- **Outflow and skid readings taken**
- **Rejuvenator application**
- **Outflow and skid readings taken**
- **Opened to traffic within 30 minutes**
- **Post construction viscosity readings taken 2 weeks later**

Initial Results

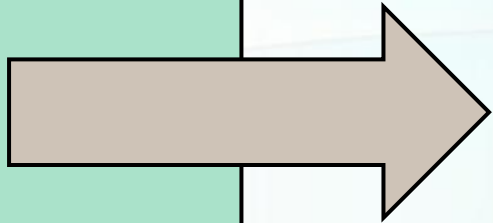
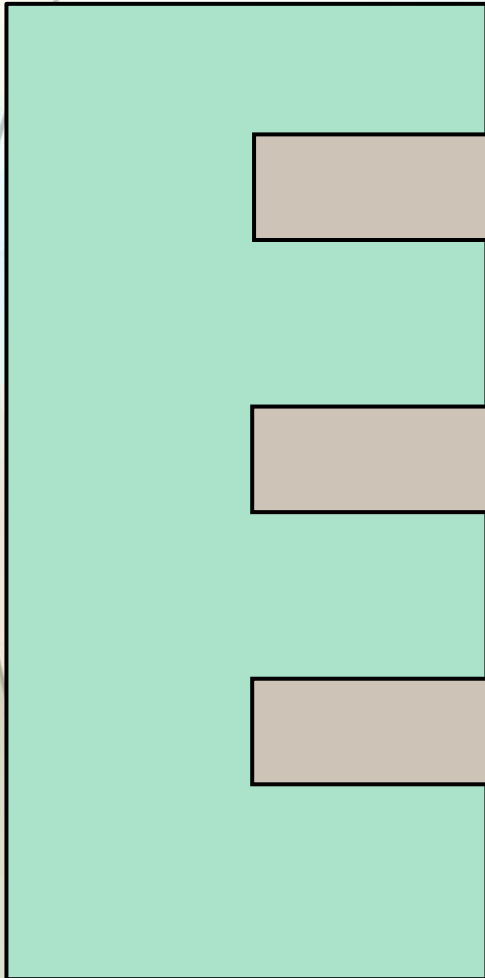
- **Performance Requirements Met**
 - **OGFC Outflow improved 39%**
 - **Dense graded Outflow improved 73%**
 - **Viscosity improved 32.4%**
 - **Skid number improved ~30%**

Texturing

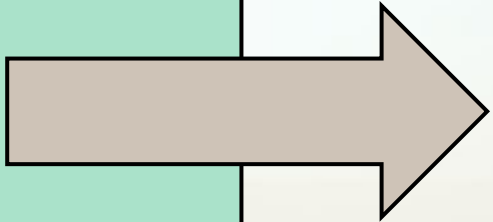


Post Construction

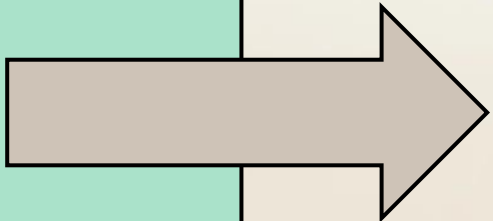
Current Status



Accident Data analyzed by DOT



No visible raveling of aggregates



Surface Aggregates Polishing

Accident Data

- **After 1.5 years compared to previous 3 years (as reported Feb. 20, 2014)**
 - **14% Decrease in total crashes**
 - Range -83% to +33%
 - **72% Decrease in wet crashes**
 - Range -100% to -35%
 - **16% Decrease in lane departure crashes**
 - Range -78% to + 35%
 - **75% Decrease in lane departure wet crashes**
 - Range -100% to -35%

Observations & Current Status

- **Project a Success**
- **Skid Numbers Near Original Readings**
 - Texturing may still be providing surface drainage on individual aggregate particles
- **Rejuvenation Reducing Brittleness of Binder**
 - Aggregates not raveling

Observations & Current Status

- **Project Should Extend Service Life**
 - **Until funding becomes available for replacement**
 - **Resolved urgency of action**
- **DOT Continues to Monitor Accidents**
- **Track Pavement Condition Survey Data**
- **Technique Seems Appropriate for Pavement Preservation (earlier during the service life)**

Project Cost

- **Approximately \$ 2.20 per Square Yard**
 - **Including Pre and Post Construction testing**

Questions?