

# **Extending the Life and Performance of OGFC in North Carolina**

**SEPPP Annual Meeting**

**May 29, 2014**

**Louisville, Kentucky**

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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

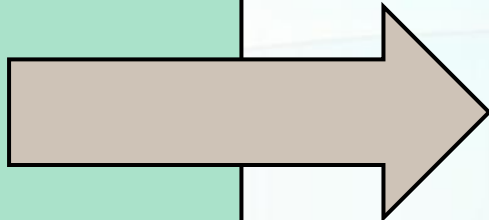
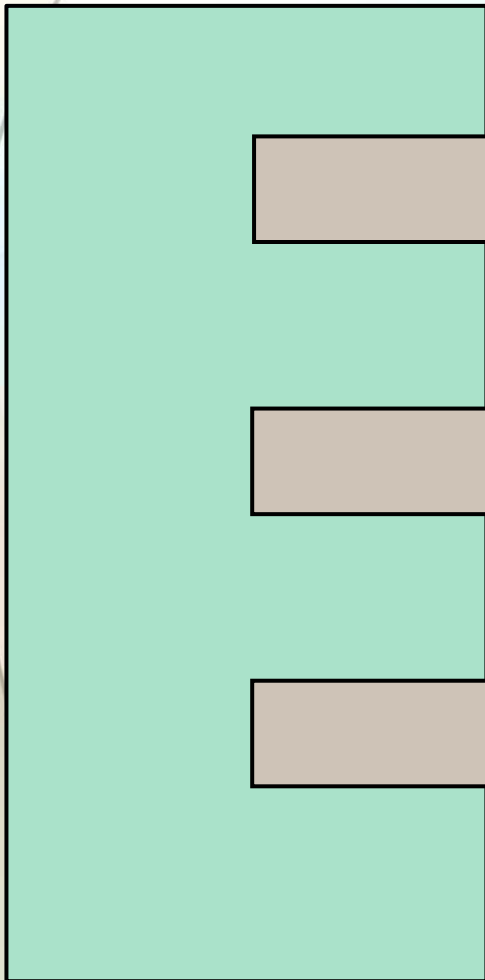
- **Pavement Preservation not Possible**
  - Well past the “top of the curve”
- **When Will It Fail?**
- **Can Failure be Delayed?**
- **What Options Exist?**
- **How to Fund?**
- **Some Action Required Soon**

# Issues Faced

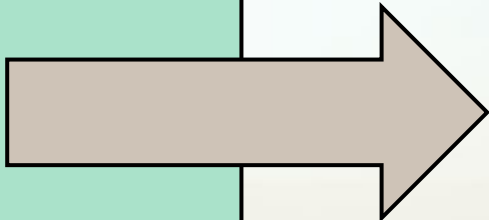
- **How to Extend Life Until Funds Available?**
- **How to Restore Friction and Reduce Wet Crashes?**

# Solutions

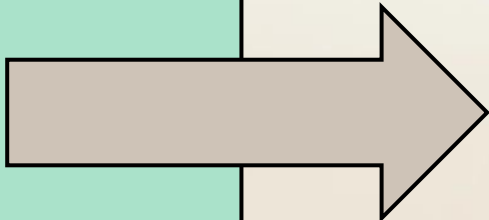
How can issues be addressed?



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**



# Texturing



# **Initial Results**

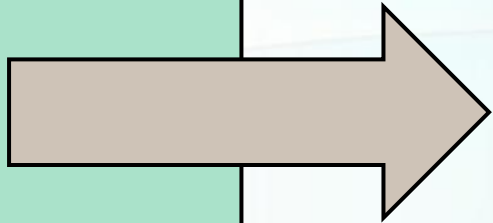
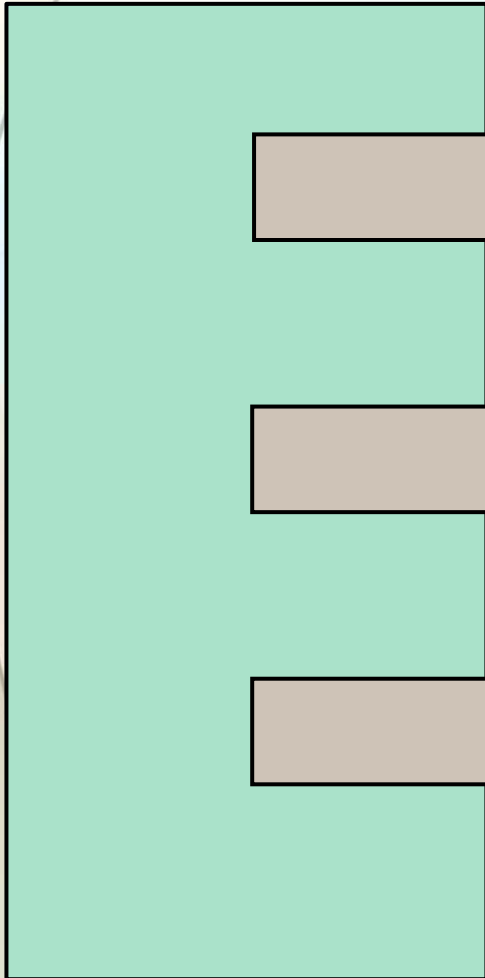
- **Performance Requirements Met**
  - **OGFC Outflow improved 39%**
  - **Dense graded Outflow improved 73%**
  - **Viscosity improved 32.4%**
  - **Skid number improved ~30%**

# **Initial Skid Numbers**

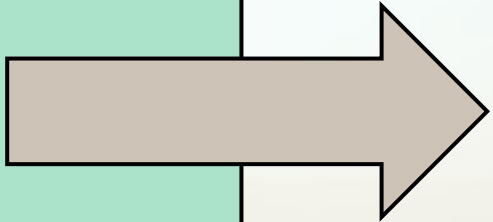
- **39.63 - Prior to beginning work**
- **72.56 – Immediately after texturing**
- **49.93 – Immediately after Rejuvenator**
- **56.42 – 48 hours after Rejuvenator**

# Post Construction

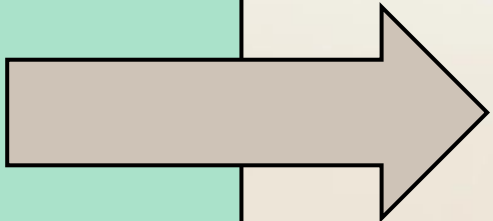
## Current Status



Accident Data analyzed by DOT



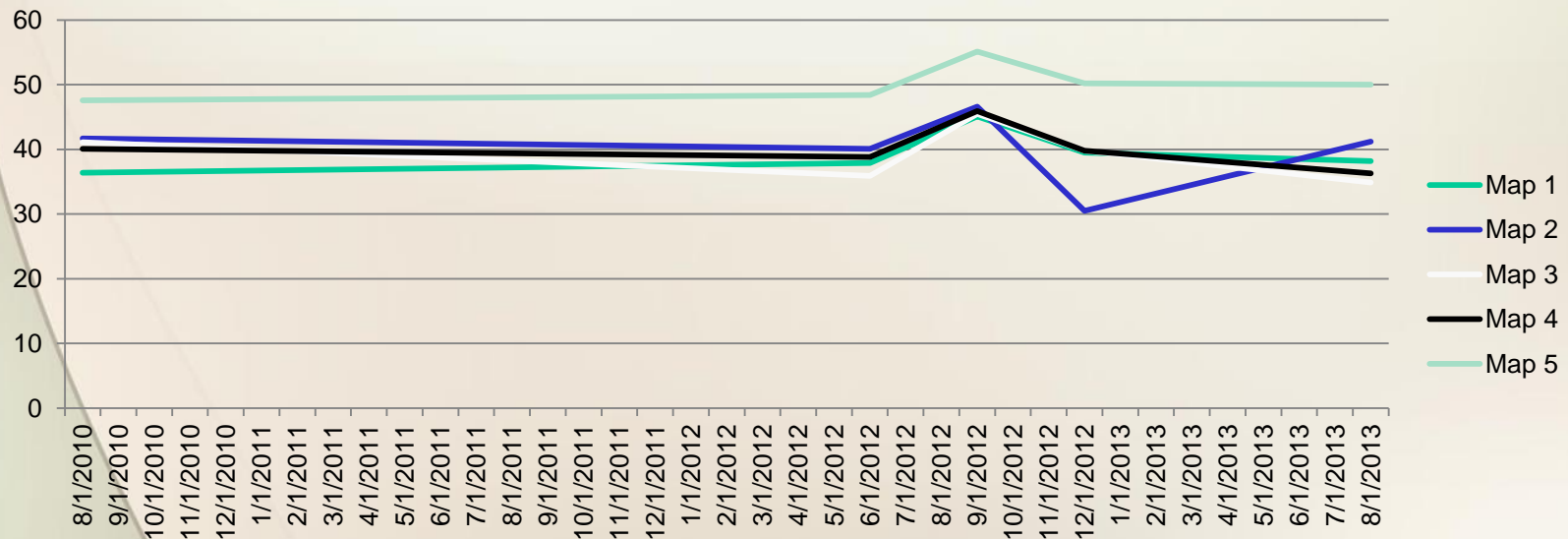
No visible raveling of aggregates



Surface Aggregates Polishing

# Skid Results

	8/12/10	6/21/12	9/11/12	12/10/12	8/20/13
Map 1	35.4	37.9	45.1	39.5	38.2
Map 2	41.7	40.1	46.6	39.5	41.2
Map 3	41.1	35.9	45.5	39.8	34.9
Map 4	40.1	38.8	45.9	39.8	36.3
Map 5	47.6	48.4	55.1	50.2	50.0





# 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

- **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

- **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)**

**Questions?**

**Thank You!**