

# **NORTH CENTRAL SUPERPAVE CENTER**

## **2012 UPDATE**

Rebecca McDaniel, NCSC  
NCAUPG Technical Conference

February 15, 2012

# Topics

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- ▶ Current Activities
- ▶ Highlights of Selected Research
- ▶ What we can offer the region



# Technical Support

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- ▶ **Requests for Information**
  - ▶ E-mail or call with requests
- ▶ **Testing**
  - ▶ RAP mix design support
  - ▶ CIR mix design support
  - ▶ Binder evaluations
  - ▶ Friction and texture testing – field and lab
  - ▶ Material characterization
  - ▶ Noise testing – field and lab
- ▶ **Technical Review**



# Training Activities

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- ▶ **Customized training on request**
  - ▶ Our place or yours
  - ▶ Example – Wisconsin Project Manager (Field Personnel) Training
    - ▶ Five sites around the state in 2010, one in 2012
    - ▶ Half day classroom, afternoon plant/project tour
- ▶ **Webinars**



# NCSC Focus Areas

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## ▶ Recycling

- ▶ RAP ETG
- ▶ RAP Evaluation and CIR Mix Design
- ▶ RAP in Surface Courses (2011 report)

## ▶ Pavement Performance

- ▶ Porous Friction Course Performance (2010)
- ▶ Low Void Mixes (2012)
- ▶ Continued Evaluation of SPS9 Project (2012)
- ▶ Optimizing Lab Compaction (2012)



# NCSC Focus Areas

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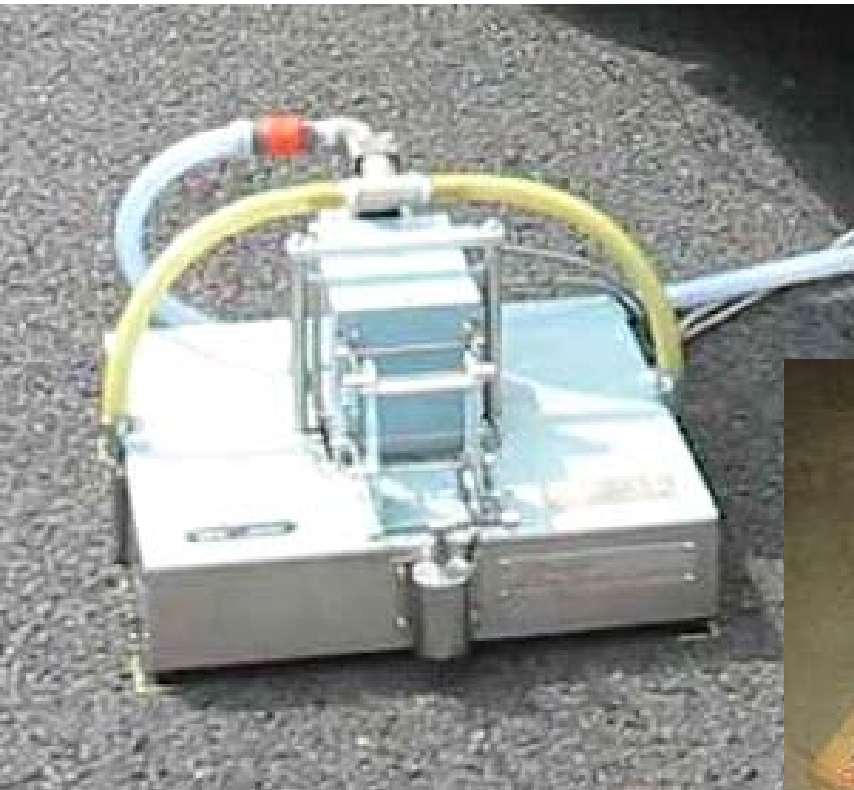
## ▶ Surface Characteristics

- ▶ Use of Local Materials (2012 report)
- ▶ Quiet Pavements (2012)
- ▶ Friction in Pavement Management (2012)
- ▶ MnROAD Noise Study (2013)
- ▶ Friction Evaluation of New Materials (as needed)
  - ▶ New aggregate sources or new mixes
  - ▶ Thermoplastic pavement marking material
  - ▶ Microsurfacing



# Surface Characteristics

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## *Evaluation of RAP for Surface Mixtures*

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- ▶ Evaluated effect of poor quality RAP on friction
- ▶ Lab study of “crummy” RAP blended with steel slag, ACBF slag, crushed gravel
- ▶ Field evaluation of RAP surfaces
  
- Determine threshold level of RAP that has minimal effect or method to test aggregates in the RAP





# Experimental Design

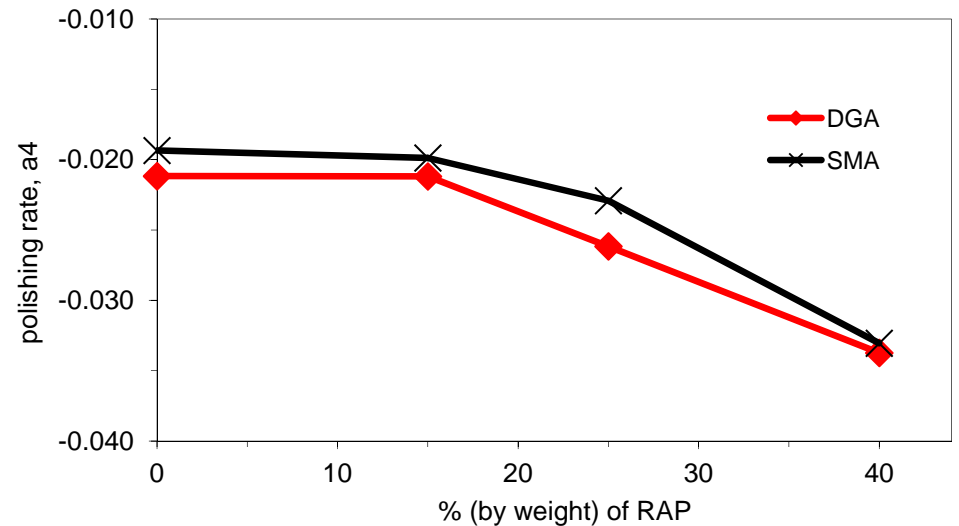
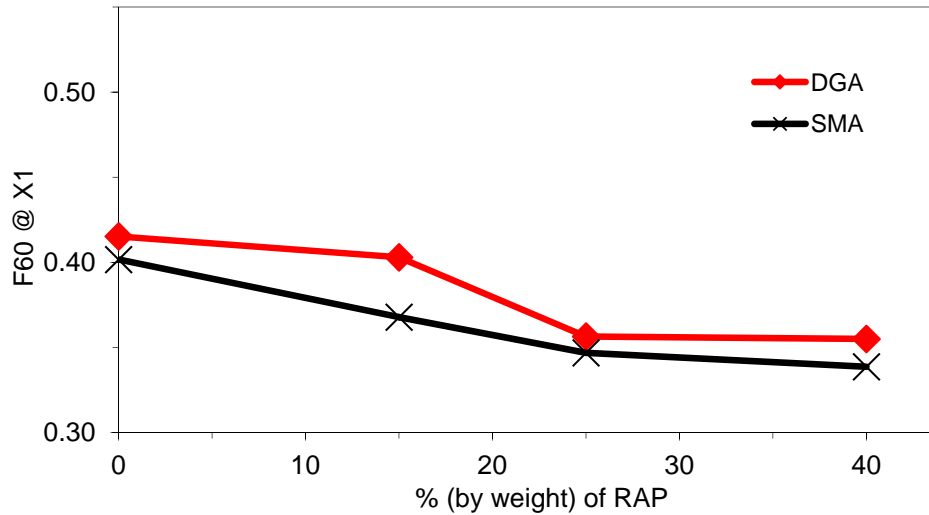
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- ▶ Mix Type – HMA and SMA
- ▶ Lab Fabricated “Worst Case” RAP
- ▶ RAP Content – 0, 15, 25, 40%
- ▶ Friction Aggregate – Steel Slag and ACBF Slag
- ▶ Field testing of 8 existing surfaces (15-25% RAP)



# Change in Frictional Properties

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# Findings and Recommendations

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- ▶ Report not officially accepted yet.
- ▶ Adding small quantities of poor quality RAP had little effect on friction.
- ▶ Adding higher amounts of RAP had an effect on friction.
- ▶ When blended with high quality friction aggregates, performance was still acceptable at 25% RAP.
- ▶ Adding more RAP without changing binder grade increased critical cracking temperature.



# Findings and Recommendations

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- ▶ Field friction testing suggests 15% RAP is acceptable and higher RAP contents are possible for medium volume roadways.
- ▶ Recommended limit of 20% RAP by binder replacement for Category 3 and 4 roadways.
  - ▶ Further field testing for Category 5.
  - ▶ On case by case basis, consider higher RAP contents when RAP aggregates can be known.



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# *The Superpave Mix Design System: Anatomy of a Research Project*

- ▶ NCHRP 9-42
- ▶ To be published as NCHRP 711



# History of Superpave

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- ▶ How did the Superpave system come to be?
  - ▶ Document the decisions made and paths taken
- ▶ What lessons can be learned from large scale research?
- ▶ Pre-Research, Research and Implementation phases.



# Approach

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- ▶ Research team of Gerald Huber, Rita Leahy, Jim Moulthrop, Ted Ferragut and me
- ▶ Over 70 interviews of people involved at all levels
- ▶ Review of reports, notes, meeting minutes, slides, photos and much more





## Fascinating Stories



- ▶ How did this program see the light of day?
- ▶ Where did the name Superpave come from?
- ▶ Why the Superpave Gyrotory?
- ▶ How did we end up with a  $1.25^\circ$  internal angle?
- ▶ What personal challenges arose?
- ▶ How did this affect people's careers?



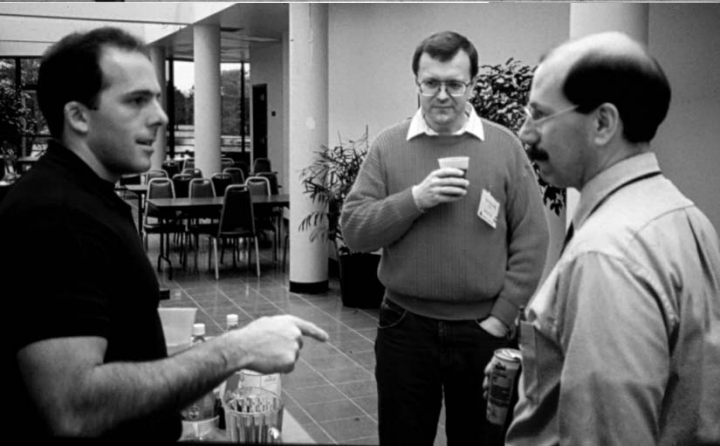


# Research Lessons

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- ▶ Clear vision of the scope and complexity
- ▶ Team philosophy
- ▶ Cooperative community
- ▶ Politics of ideas
- ▶ Ancillary benefits





# Implementation Lessons

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- ▶ Recognize size and scope
  - ▶ Need strong champion
  - ▶ Involve researchers
  - ▶ Get the technology out to stakeholders
  - ▶ Training and sharing information
  - ▶ Benchmark
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Photos by G.A. Huber and others

# Regional Resource

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## ▶ Testing Capabilities

- Field and Lab
- AMRL Accredited Laboratory
- Binder, mixture and components
- Formal research and informal forensics/evaluations
- Equipment and test protocol evaluations

## ▶ Training Resources

- ▶ Internships, one on one, our place or yours

## ▶ Technical Advice

- Proposal review
- Strategic planning
- Research in progress/Literature synthesis
- Speakers



## More info:

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