# North Central Superpave Center

## *Update on Center Status and Activities*

*JTRP Executive Committee Meeting*

*Indianapolis, IN*

*June 11, 2013*

# Organization, Mission and Vision

# Vision, Mission and Goals

- The North Central Superpave Center (NCSC) is administered by the Joint Transportation Research Program (JTRP)
- NCSC takes direction from a Steering Committee composed of agency and industry representatives from each state in the region (IL, IN, IA, KS, MI, MN, MO, WI, sometimes NE and OH)
- This Steering Committee has guided the operations of the NCSC since its inception in 1994.

# Vision, Mission and Goals

- The Center's vision, mission and goals were established by the Steering Committee and are reviewed periodically. Current versions are as follows:
- Vision: Be a recognized source of hot mix asphalt (HMA) expertise.
- Mission: To provide services to advance and transfer HMA technology.
- Goals: Research, Training, Technology Transfer, Technical Support and Third Party Testing.
- https://engineering.purdue.edu/NCSC

# Financial Model

- Self-Supporting Research Center with an annual operating budget of around $400k
- Support generated through the combination of the base funding ($25k/year – number of participating states vary, handled through the polled fund study), research and service funding

# NCSC Staff

- Jan Olek, Director, Ph.D., P.E.
- Becky McDaniel, Technical Director, Ph.D., P.E.
- Ayesha Shah, Research Engineer, Ph.D., P.E.
- Ali Hekmatfar, Grad Student
- Ali Behnood, Grad Student
- Undergraduate Helpers (as needed)

# Current Activities and Recent Accomplishments

- Research
- Technology Transfer
- Technical Support
- Training – not a major effort now, but always looking for needs
  - Recently provided training on meaning of specifications for all five Wisconsin districts
  - Preparing customized training for Missouri

# Research

# RECYCLING/SUSTAINABILITY

Long history of working in this field. NCHRP project led to three AASHTO Standards that are widely used.

Recent/Current Research Projects

- *Use of RAP in Surface Courses* (funded by INDOT); final report published in March 2012
  - Established a threshold level for INDOT mixes to provide acceptable friction and cracking performance
  - Supported INDOT specification changes.

Technical Support

- RAP characterization for contractor mix design
- Requests for information

# RECYCLING/SUSTAINABILITY

Technology Transfer

- Paper at AAPT, April 2012, Austin, TX
- Member of FHWA Recycling Expert Task Group until its absorption into Mix ETG
- Recent Invited Presentations on Recycling (Missouri, IMAA, Purdue Road School, Rhode Island Transportation Forum)
- NAPA Webinar on Putting Research into Practice – with Matt Beeson, INDOT OMM

# Tire/Pavement Noise

## Research

- MnROAD *Hot Mix Asphalt Surface Characteristics Related to Ride, Texture, Friction, Noise and Durability*
  - Developing a model to predict noise based on pavement and material properties
  - Completion date: February 28, 2014

## Technology Transfer

- Two 2012 TRB papers published (one award winning)
- Television – *Modern Marvels* still airs episode

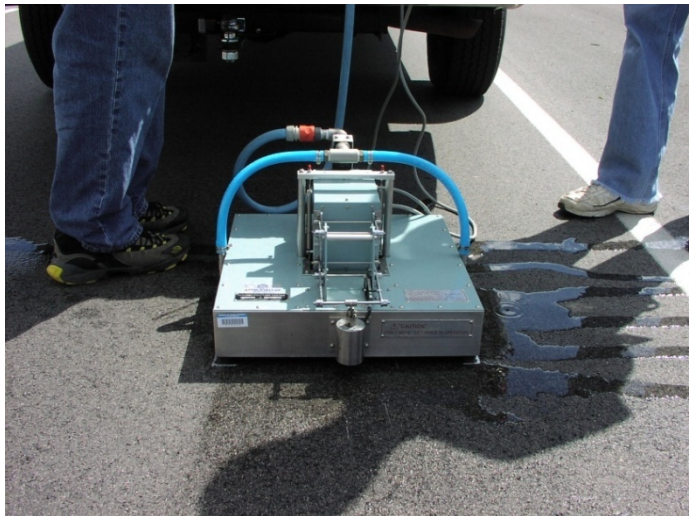
# Surface Characteristics

Research Efforts

- *RAP in Surface Courses* – previously mentioned
- *Maximizing the Use of Local Aggregates*
  - Blending poor frictional quality aggregates with steel and blast furnace slag in HMA and SMA
  - Final report published
- *Risk Management of Low Air Void Mixes*
  - Sections on NCAT Track and in APT with low air voids
  - Paper presented at APT 2012 meeting, Davis, CA, September 2012
  - Draft report submitted

# Surface Characteristics

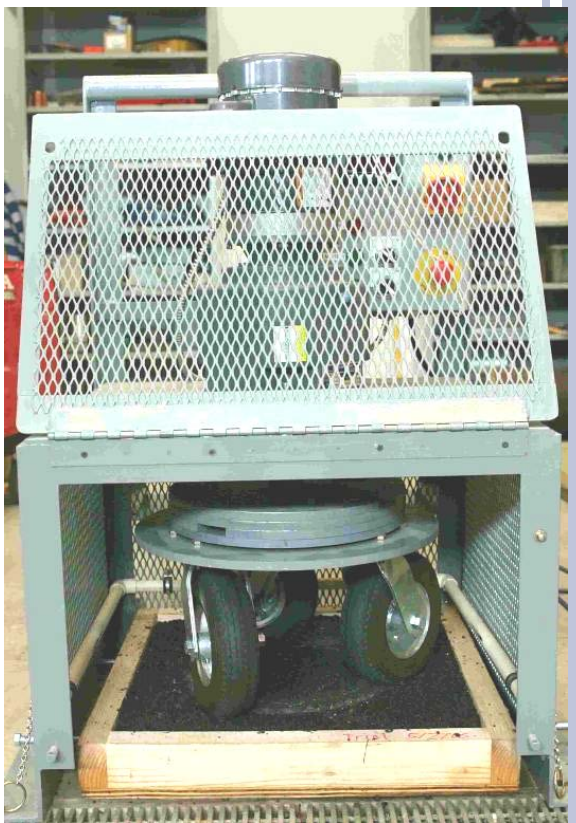
- *Friction in Pavement Management*
  - Correlation of towed friction trailer, DFT/CTM and high speed laser texture measurements.
  - With currently available data and technology, correlation is not feasible – may change soon.
  - Final report published 2012.



# Surface Characteristics

Technical Support

- Tested pavement marking materials
- New INDOT procedure to approve Polish Resistant Aggregates
  - Testing underway for one supplier
- Past applications
  - Forensic analysis of I-80 paving materials for PennDOT
  - Tack Coat Texture Testing
  - Seal Coat Texture and Permeability Testing
  - Microsurfacing material
  - New aggregate sources



# Ongoing Project – Performance

- *Optimizing Laboratory Mixture Design as it Relates to Field Compaction in Order to Improve Hot-Mix Asphalt Durability*
  - Design mixes at 5% air voids and compact to 5% in the field
  - Started 7/1/2011, test section to be placed this summer
  - Results to date also presented at TRB Committee AFK50 and Missouri Asphalt Conference

# NCHRP Synthesis Project

- *Pavement Patching Practices*
  - Patching practices for asphalt and concrete pavements
  - Programming, equipment, monitoring, materials, performance, etc.
  - Survey and literature review
  - First draft submitted; panel meeting next week
  - To be completed by Fall 2013

# Seeking New Research Opportunities

- Partnered to bid on NCHRP 9-51, *Material Properties of Cold In-Place Recycled and Full-Depth Reclamation Asphalt Concrete for Pavement Design*
- Partnered to bid on NCHRP 9-55, *Recycled Asphalt Shingles in Asphalt Mixtures with Warm Mix Asphalt Technologies*
- Bid on Wisconsin research project on *Critical Factors Affecting Asphalt concrete Durability*

- *Always seeking collaborations and projects.*

# Technology Transfer

# Technology Transfer

- Many invited presentations, including keynote presentation at Rhode Island Transportation Forum, (along with Victor Mendez), Rocky Mountain Asphalt Pavement Conference and elsewhere
- RAP presentations for Brazilian Asphalt Association and International Society of Asphalt Pavements
- Member of select committee to review USDOT Strategic Research Plan in February

# Technology Transfer

- Organizer of the annual conferences for the North Central Asphalt User Producer Group (NCAUPG)
- Maintaining the web page for the NCAUPG

  https://engineering.purdue.edu/~ncaupg/
- Publisher of the newsletter for the North Central and Southeast Superpave Centers (newsletter contains both regional and national news)

# TECHNOLOGY TRANSFER


Volume 7, Number 1 Winter 2012-13

***We're back!*** Publication of this newsletter was temporarily stalled as a new contract was being hammered out. The missing contract has been found, dusted off and signed, so we are back in business and happy to be updating you on the latest happenings in the region and across the country!

**Inside this Issue**

**Regional News**



## Regional, National Information Shared at Conference

by Rebecca McDaniel

Over 125 people attended the 2013 North Central Asphalt User Producer Group Asphalt Technical Conference in St. Louis, Missouri, January 23-24, where they heard about current practices in the region and the latest advancements in asphalt technology. Copies of the presentations are available at engineering.purdue.edu/~ncaupg/.

The meeting opened with a welcome address by Dave Ahlvers, Missouri DOT State Construction and Materials Engineer. Ahlvers said that innovation is needed but innovations

completed research projects dealing with use of RAP, and another focusing on increasing the use of poorer quality aggregates while maintaining adequate friction. She also reminded everyone that the NCSC laboratory is AMRL accredited in aggregates, binder and mix testing and that they provide various types of technical support for states and contractors in the region and beyond.

The next session focused on accelerated pavement testing. Tim Clyne, Minnesota DOT, gave an overview of the MnROAD

# TECHNOLOGY TRANSFER

national superpave news

Volume 7, Issue 1, Fall/Winter 2012-13

## RAP and WMA Become Mainstream

by Rebecca McDaniel

While reclaimed asphalt pavement (RAP) has been used to some extent since the 1970s, the use of warm mix asphalt (WMA) in the US is only about a decade old. Both technologies, however, are being used so frequently in many states that they have become routine. In fact, because they have become so mainstream, two groups that had been formed to explore issues with these technologies are now being disbanded.

As the use of RAP in Superpave mixes was becoming more common and RAP contents were increasing, various issues arose. The FHWA recognized that national guidance on the use of RAP was needed, especially for high RAP contents. Therefore, in 2007, FHWA formed the tended to lag behind the allowable RAP contents in state specifications. This was likely due to contractors' concerns about meeting mixture requirements with higher amounts of RAP and the frequent need to use softer binders for higher RAP contents; these softer binders were sometimes not readily available or were more expensive. Overall, the surveys were eye-opening and helped identify areas of improvement regarding RAP usage. Information about the surveys and other activities of the RAP ETG is online at www.morerap.us.

Also in 2007, the National Asphalt Pavement Association (NAPA) and Federal Highway Administration (FHWA) formed the Warm Mix Asphalt Technical

The newest NCHRP WMA project will address issues related to the use of recycled asphalt shingles with WMA technologies. This project is slated to begin in May 2013 and will last over three years. Because virgin binders are not heated as much when WMA is produced, there is some thinking that the reduced binder oxidation could be beneficial when mixed with the highly oxidized shingle binder. On the other hand, because the production temperatures are lower, there is concern that the shingle binder might not be softened enough to blend with the virgin binder. Understanding how the shingle and virgin binders work together is one issue the project will explore.

# Technical Support

# Third Party Testing

- Testing aggregate source for Polish Resistance for contractor
  - Expected to increase with new Indiana test method
- Binder extraction and testing for contractors for RAP mix design
- Mix testing for contractor experimenting with recycling agent
- Friction testing of thermoplastic material

# American Association of State Highway and Transportation Officials

## AASHTO Accreditation Program - Certificate of Accreditation

This is to signify that

**North Central Superpave Center**

**West Lafayette, Indiana**

has demonstrated proficiency for the testing of construction materials
and has met the minimum requirements in AASHTO R18
set forth by the AASHTO Highway Subcommittee on Materials.

The scope of accreditation can be obtained by viewing
the AAP Directories of Accredited Laboratories (www.amrl.net)
or by contacting AMRL.

Executive Director

Chair, AASHTO Highway
Subcommittee on Materials

AAP®
AASHTO R18

# AMRL Accreditation

- Continuing to maintain records and accreditation
- Accreditation definitely attracting attention and interest
- Required for some research projects

# Other Things We Can Offer

- Testing Capabilities
  - Field and Lab
  - 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

# Questions