

North Central Superpave Center Update

by

Becky McDaniel
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What is the NCSC Up To?

- Research
- Equipment/Protocol Evaluations
- Training
- Communication and Technology Transfer
- Staffing
- Future Plans

Research

HMA Surface Friction

- Funded by Iowa, Indiana and SQDH
- Optimize microtexture and macrotexture in Superpave HMA
- Maintain friction level, but reduce need for imported high friction aggregates
- Identify test methods for lab use to test *mixtures*, not just aggregates

HMA Surface Friction

- Phase I completed October 2003
 - ◆ Preliminary report on SQDH website
<http://widget.ecn.purdue.edu/~sqdh/>
- Identified techniques for lab polishing; lab and field friction and surface texture measurement
- Phase II underway
- Project completion - April 2005

Dynamic Friction Tester



Circular Texture Meter



Field Data Comparison

Surface	DFT 20	CTM	F60
Porous	0.51	1.37	0.36
SMA	0.37	1.17	0.28
HMA	0.52	0.30	0.19

Porous and SMA tested before trafficking.

Slab Polisher



Future Applications

- Research
- Forensics
- Material selection
 - ◆ Especially new, unknown sources
- Other issues besides friction
 - ◆ Noise, for example
 - ◆ Variation in surface texture - segregation, uneven maintenance treatments, wear

Porous Asphalt for Noise Control

- Study funded by Institute for Safe, Quiet and Durable Highways
- Field trial of Porous Friction Course
 - ◆ Compare PFC, SMA and conventional
 - ◆ Compare different noise measurement techniques in field and lab
- Thanks to INDOT and Heritage Research

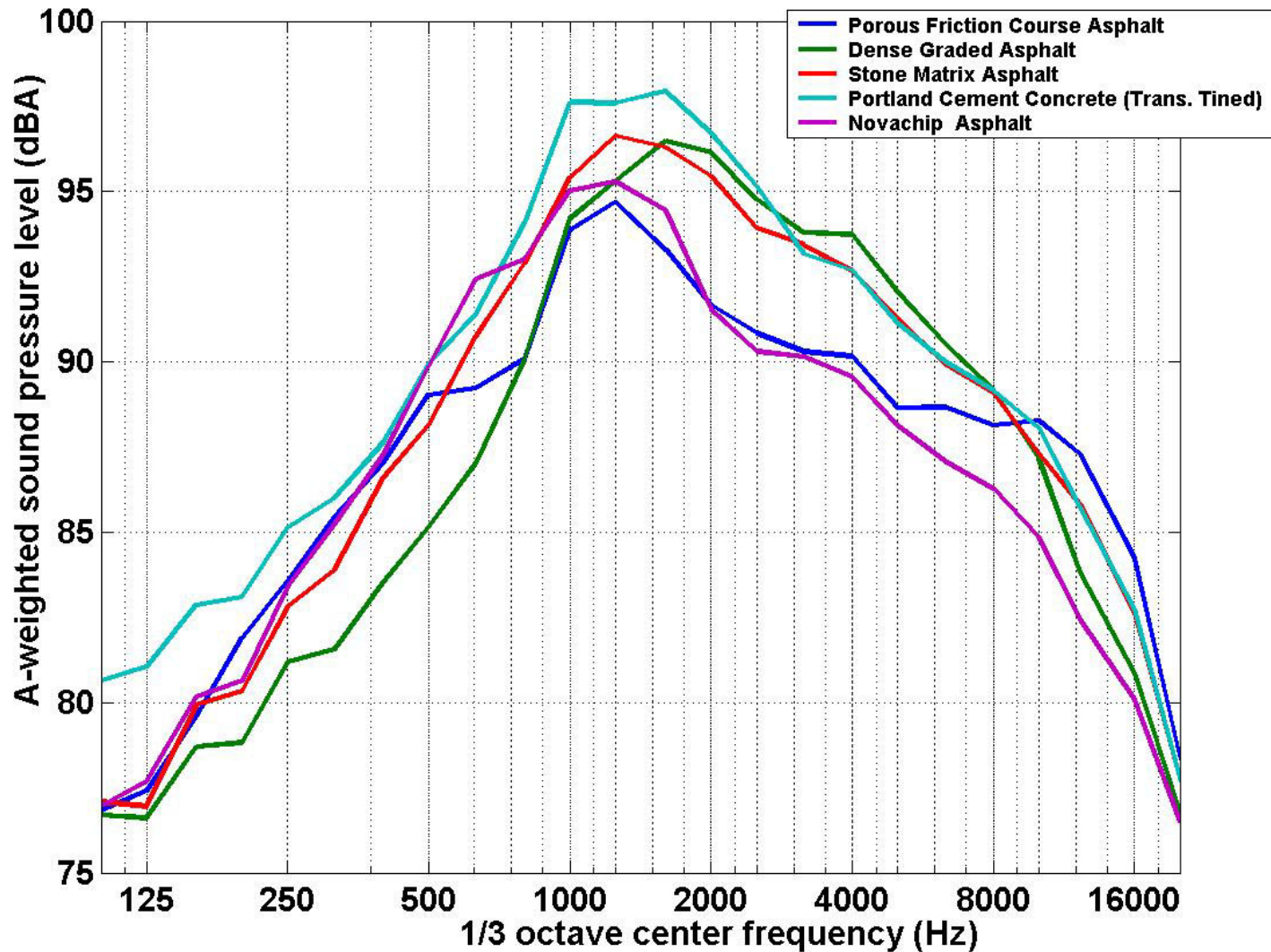
Sideline Noise Measurements



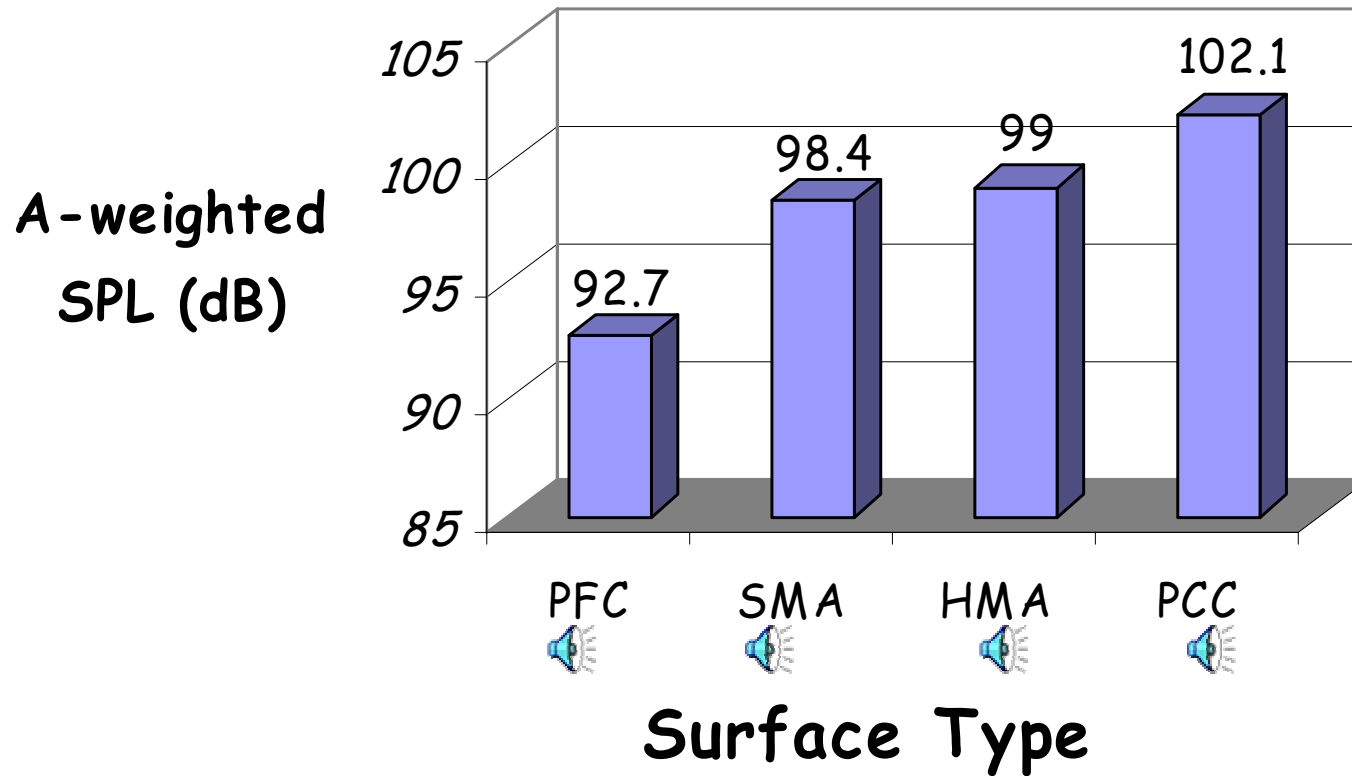
Close Proximity Trailer



Pavement Type/Noise (Treaded Tire, 60 mph, NCAT CPX Lead Mic. Location)



Overall A-weighted Sound Pressure Level



Preliminary Findings

- PFC significantly quieter than SMA or conventional HMA
- Examine spectrum of the noise
 - ◆ SMA perceived as quieter than HMA
 - ◆ Some frequencies more annoying
- In car noise significantly different and lower on PFC

Lab Testing

- Test in TPTA and impedance tubes in lab
- Correlate lab to field
- Predict noise levels without constructing field test sections

Tire-Pavement Test Apparatus



Asphalt TPTA Specimens



What's Next

- TPTA testing completed, analysis underway
- Follow-up long term performance
- Continue analysis of full spectrum data
- Report available in February or March on SQDH website
- Fundamental study of noise generation and propagation needed, proposed with NCAT

Other Research at the NCSC

- *Performance Certification of Indiana Superpave Hot Asphalt Mixes*
- *Superpave Simple Performance Testing*
- *Effects of Hot Plant Fuel Characteristics and Combustion Conditions on Asphalt Concrete Quality - SDDOT*
- *Evaluation of Surface (Top-Down) Longitudinal Wheel Path Cracking in Indiana*
- *Stiffness of HMA*
- *Ignition Oven for Dolomitic Aggregates*

Other Research at the NCSC

- Pending
 - ◆ Research for Mineral Wool Manufacturer
 - ◆ NCAT Pooled Fund study on Noise
 - ◆ Other new projects
- Planning
 - ◆ Bidding on NCHRP work
- *Open to research collaborations and suggestions*

Equipment/Protocol Evaluations

- FHWA sponsored evaluation of candidate simple performance tests
 - ◆ Testing completed, analysis underway
- Ruggedness testing on Binder Direct Tension completed
 - ◆ 600+ samples
- Iowa DOT/FHWA evaluation of various performance tests

Test Standardization

- AASHTO T166, Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface Dry Specimens
- Sent survey in October
- Responses from five states, one contractor and one province
- Need to follow up with remaining states
 - ◆ Could not locate test methods on-line

Test Standardization

- Most differences seem relatively minor
 - ◆ Some specify room temperature in addition to water temperature, others do not
 - ◆ Most use Method A, some use C for cores
 - ◆ MN specifies weighing to nearest tenth and drying and weighing within 15 seconds
 - ◆ KDOT has rapid method, Corelok method and T166 and method for open graded

Test Standardization

- Now have student to help with compiling and comparing information
- Will follow up with remaining states
- Summarize differences
- Prepare white paper
- Target date: March 24

Training in 2004

- Continued Emphasis
- Binder course, February 10-12
- Mix Design Fundamentals for Beginners, February 17-20
- Mix Design for Experienced Designers, February 26-27
- Customized courses available on request

Superpave Guidelines for Local Agencies

- Sponsored by Minnesota DOT
- Developing guidelines for gyratory designs for Minnesota agencies
 - ◆ Training materials
 - ◆ Written guidelines
 - ◆ Flow charts and summaries, etc.
- Largely completed in February 2004

Video Production

- New binder direct tension video has been posted on website. SGC and DAV being considered.
 - ◆ DSR, BBR, RV already there.
- RAP video, completed in 2002, will be distributed soon by TRB and/or NAPA.
 - ◆ Will be posted on our website by 2/1/04.

Communication

- *Another major emphasis area*
- *Newsletter (regional and national editions)*
 - ◆ hard copy mailed to ~4000 people
 - ◆ electronic copies available on web page
 - ◆ coordinated, printed and distributed by NCSC three times a year for two centers
 - ◆ Northeast may rejoin the effort through U Conn
 - ◆ Current contract with NCSC and SESC only
 - ◆ Next issue Late Winter 2004 (February)

Website

- ***Website***
 - ◆ Maintained and updated periodically
 - ◆ Addition/expansion continuing
- ***Searchable database well received and expanding***
- ***Training Videos***
- ***Calendar***
- ***Technical Information***
- ***Links***

<http://bridge.ecn.purdue.edu/~spave/>



Presentations

- Western Cooperative Test Group
- Association of Asphalt Paving Technologists
- TRB Committee on General Asphalt Problems
- Ohio Transportation Engineering Conference
- Kansas Asphalt Paving Conference
- Minnesota Association of Asphalt Paving Technologists
- ASTM



Staffing

- The “regulars” - Jan Olek, Becky McDaniel, Lynn Warble, Ayesha Shah, Steve Bowman
- James Esler - left in April 2003 for position in mechanical engineering
- Students - Rolando Garcia, Will Thornton (through SQDH)

Future Plans







More info:

Rebecca S. McDaniel

Technical Director

North Central Superpave Center

P. O. Box 2382

West Lafayette, IN 47906

765/463-2317 ext. 226

rsmcdani@purdue.edu

<http://bridge.ecn.purdue.edu/~spave/>

