

NORTH CENTRAL SUPERPAVE CENTER

2010 UPDATE

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Overland Park, KS
February 3, 2010



Topics

- Current Activities
- Highlights of Selected Research
- Big News!

Emphasis Areas

- Technology Transfer
- Technical Support
- Equipment and Protocol Evaluations
- Training
- Research

Technology Transfer

- Newsletter
 - ◆ New issue within two months
 - IC, Shingles, WMA, etc.
 - ◆ Sign up for free subscriptions
- Website
 - ◆ <https://engineering.purdue.edu/NCSC/>
- Presentations

Technical Support

- 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
 - ◆ Noise testing – field and lab
- Technical Review

Equipment and Protocol Evaluations

- ABCD Device ruggedness testing
- Comparison of extraction/recovery techniques
- RAP-Virgin Binder Blending assessment
- Review of new SGC Evaluation
- Available on request

Training

- Customized training available on request
- Your place or ours
 - ◆ One-on-one or group
- Other resources available
 - ◆ On website, FHWA CDs, etc.
- Exploring webinars as a delivery option to be more accessible to more people

Research Areas

- Recycling/Sustainability
 - ◆ High RAP Mixes
 - ◆ Shingles
 - ◆ Plant Mixed RAP Materials
- Tire/Pavement Noise
 - ◆ Porous Friction Course Evaluation
 - ◆ Quiet Pavements

Research Areas

- Friction and Surface Characteristics
 - ◆ Use of Local Materials
 - ◆ RAP for Surface Mixtures
 - ◆ Management of Pavement Friction
 - ◆ Low Air Void Mixes
 - ◆ Testing friction of new aggregate sources, other materials for pavements (tack coats, seal coats, pavement marking materials, etc.)
 - ◆ Collaboration with NCAT

Low-Temperature Performance Properties of Hot Mix Asphalt Containing RAP, Phase 2

- ◆ 2006 -- Evaluated plant-produced mixes with up to 40% RAP and two virgin binder grades
- ◆ Results suggested 25% RAP did not need grade change
- ◆ 2007 -- Expanded – four more contractors
- ◆ FHWA funded

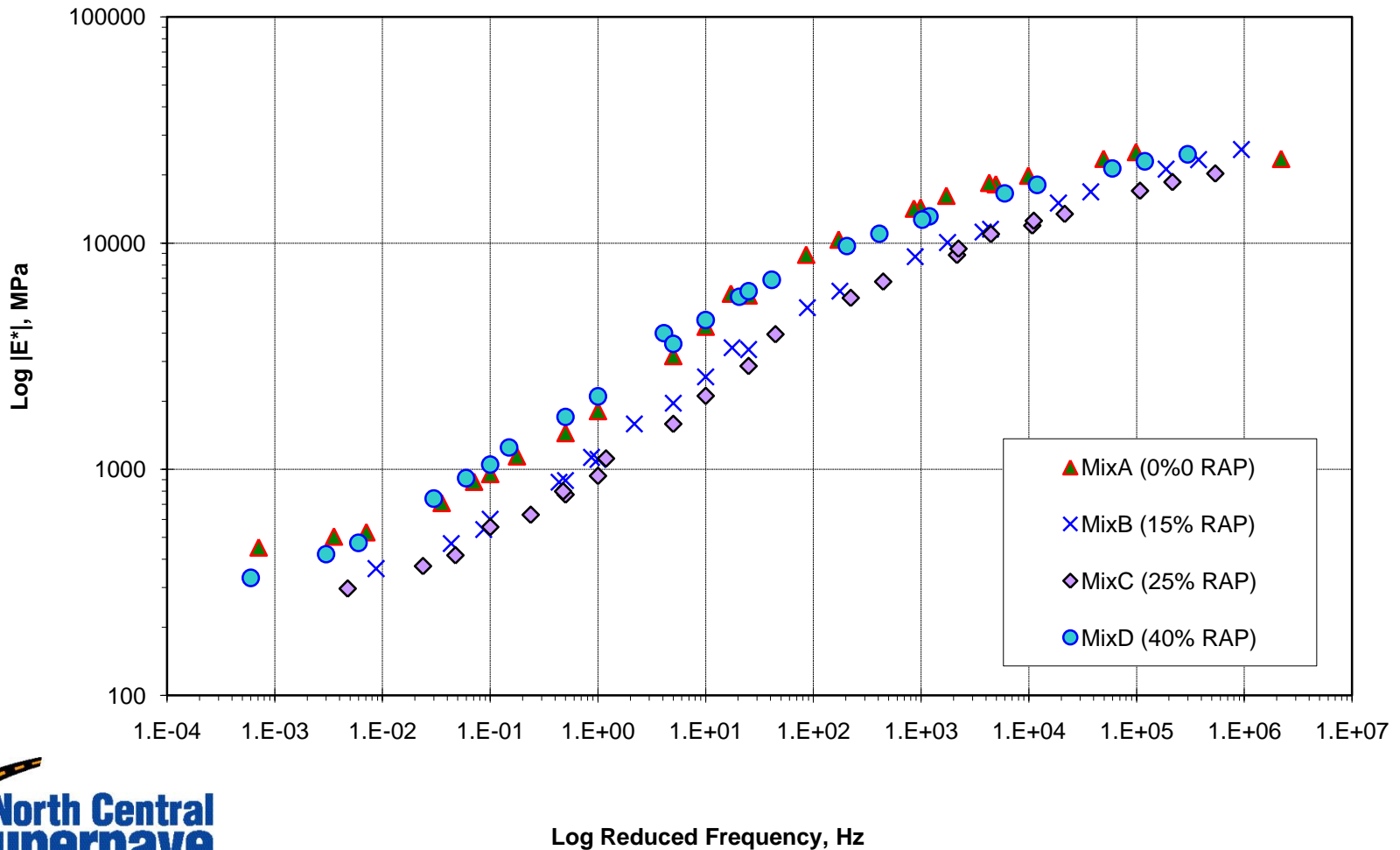
Experimental Design

	Reclaimed Asphalt Pavement			
Binder Grade	0%	15%	25%	40%
PG 58-28			X	X
PG 64-22	X	X	X	X

X = Replicated in 2006

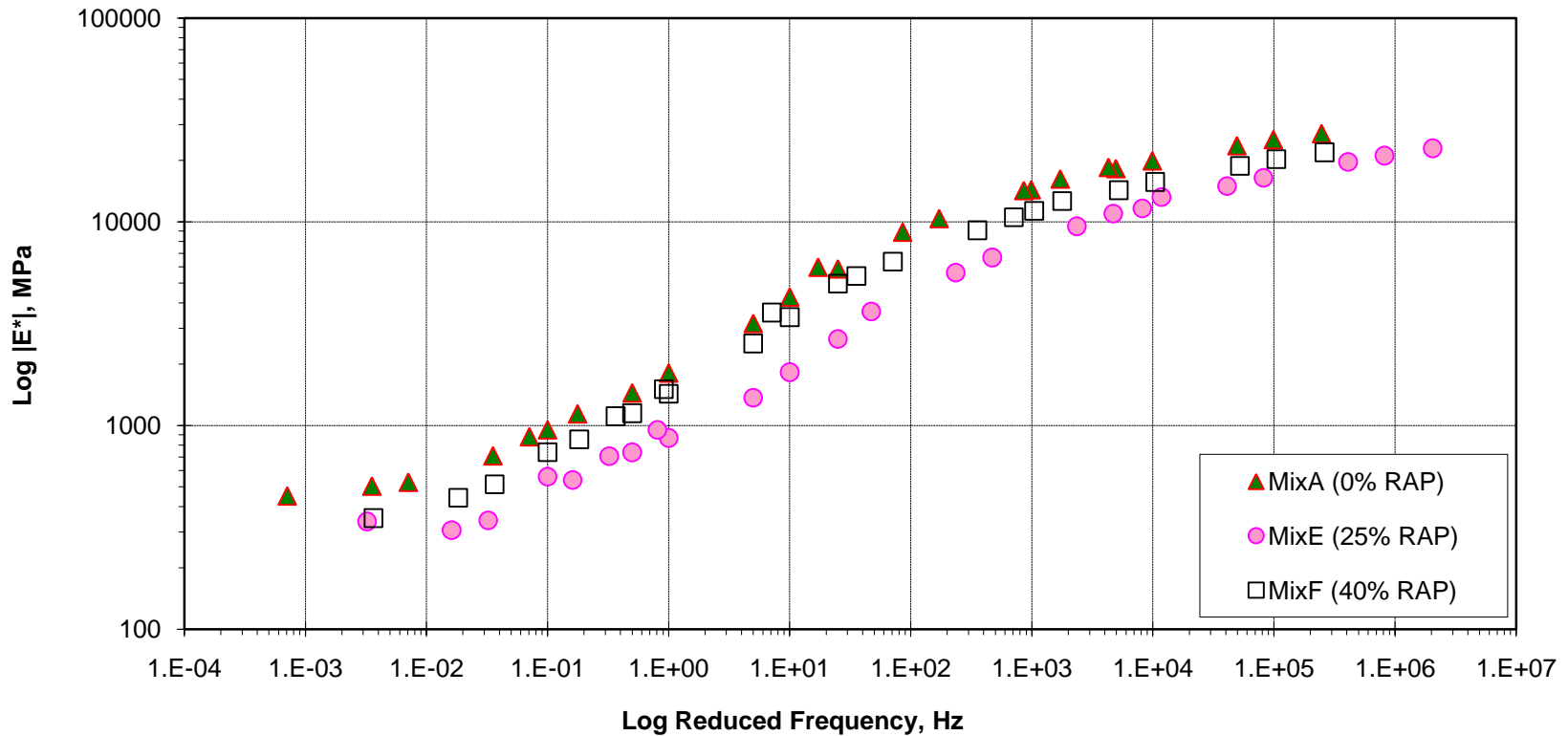
Comparison of RAP Contents

PG64-22

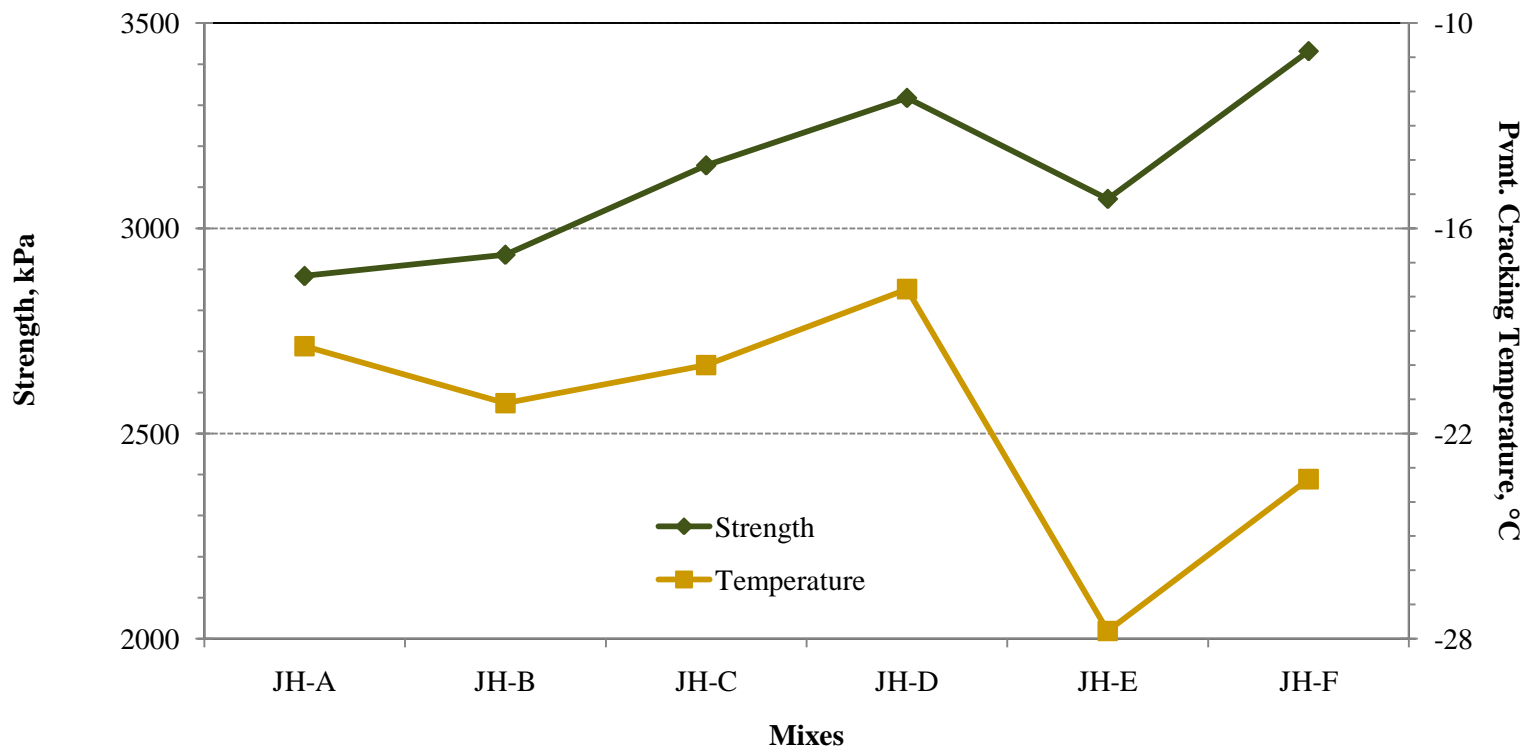


One Example - Mix |E*|

Control versus PG58-28



IDT Strength Example 1



Based on this research

- And testing RAP sources from across the state
- INDOT increased RAP contents to:
 - ◆ 25% with no change in grade
 - ◆ 40% with a grade change
- Spec change has been adopted

Porous Friction Course Performance

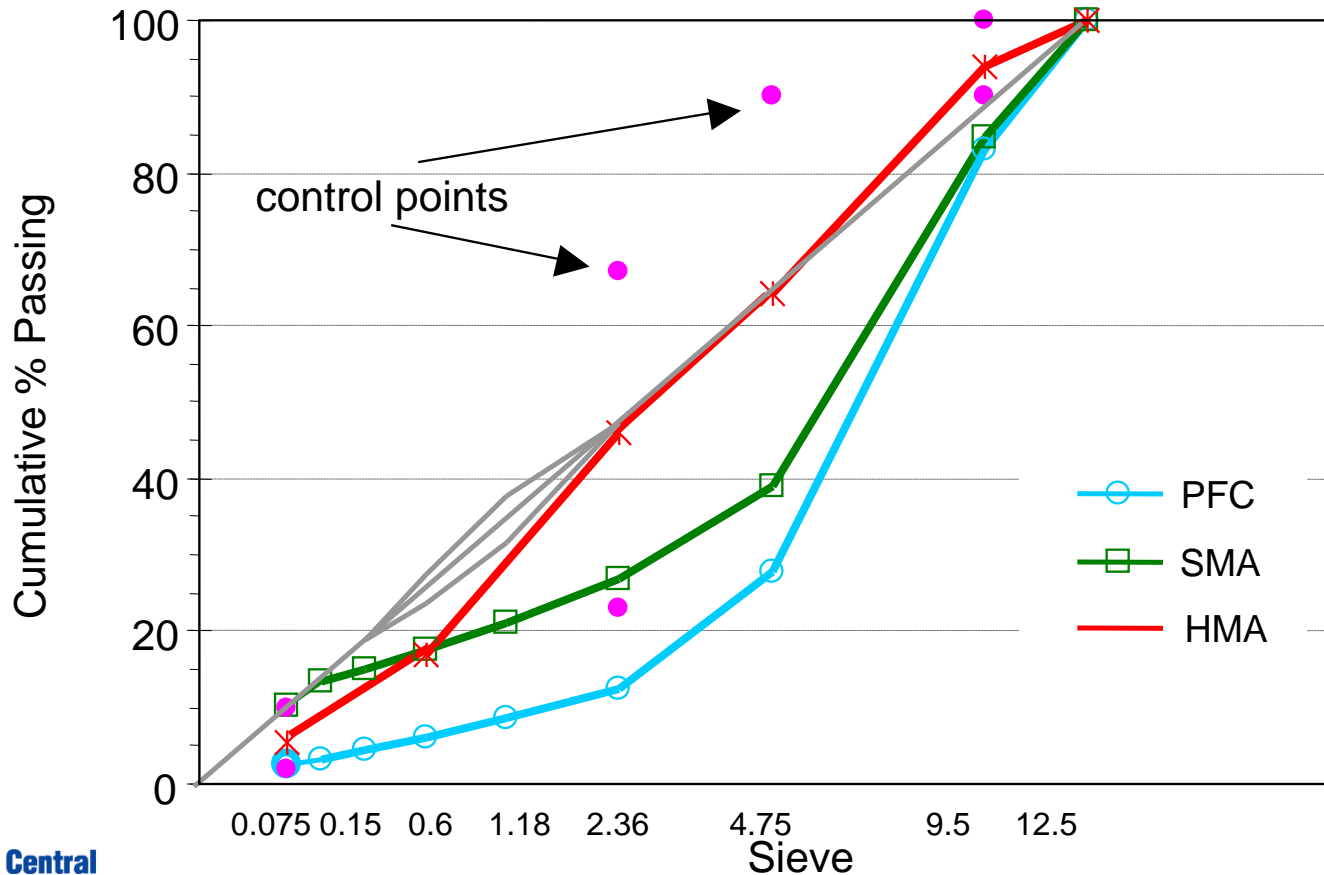


- I74 Eastbound East of Indianapolis
- Constructed August 2003
- Steel Slag SMA and Steel Slag PFC
 - ◆ PFC = Porous Friction Course
- Conventional HMA Section on US52, West Lafayette, constructed July 2003

The Materials

- 9.5mm mixtures used Steel Slag and PG76-22 binder
- PFC designed at 18-22% air voids
 - ◆ Old OGFC designed at 12-15% voids
 - ◆ Polymer modified binder and fiber
- SMA has fairly open aggregate structure, but voids are largely filled with matrix of binder and filler (fiber)

Design Gradations



Construction







Preliminary Findings

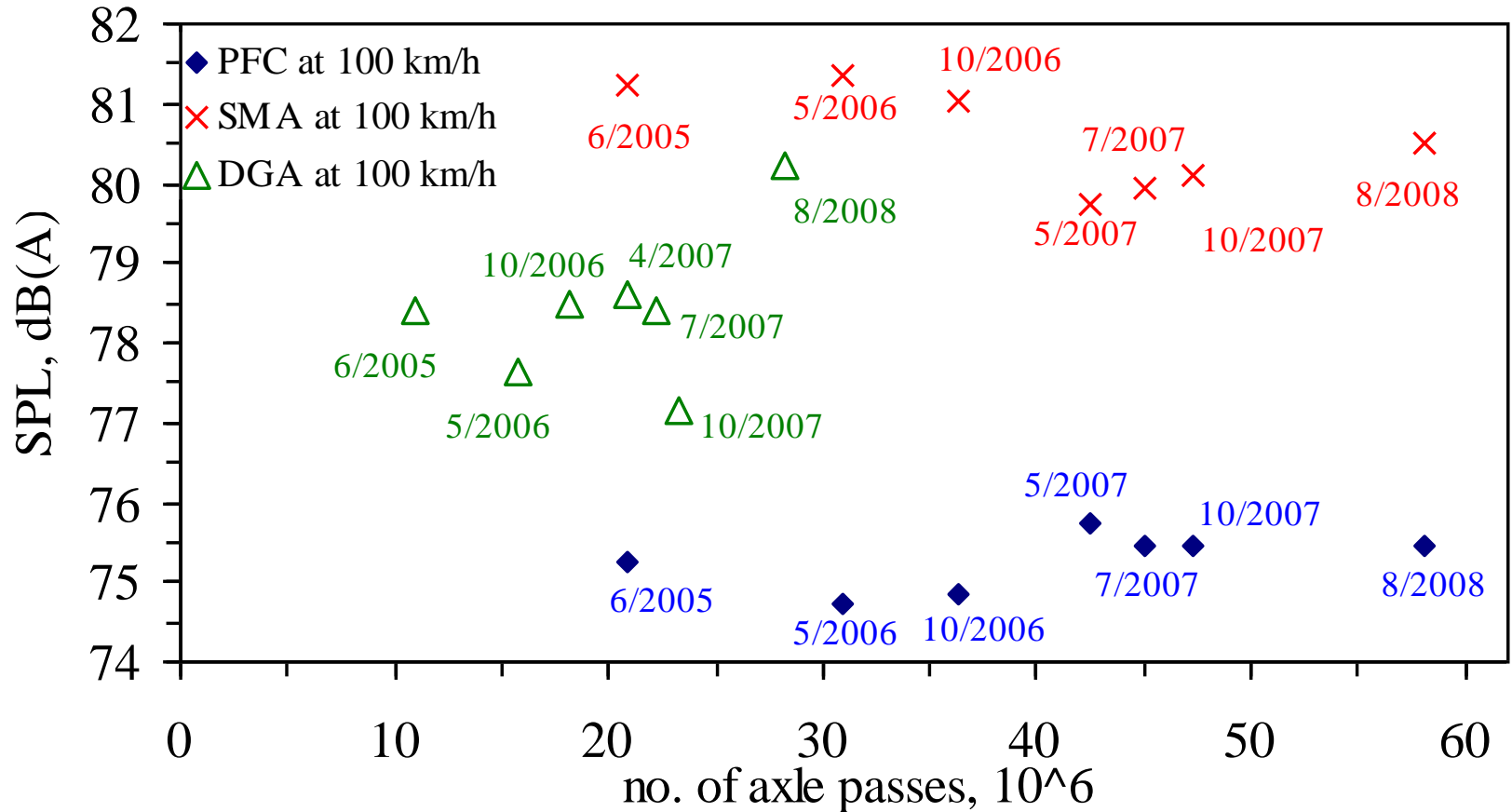
- PFC significantly quieter than SMA or conventional HMA – CPX and sideline
- In car noise significantly different and lower on PFC
- PFC provides higher macrotexture than SMA and much higher than HMA
- Friction levels were higher for PFC and SMA than HMA
- Significantly reduced splash and spray

Splash and Spray

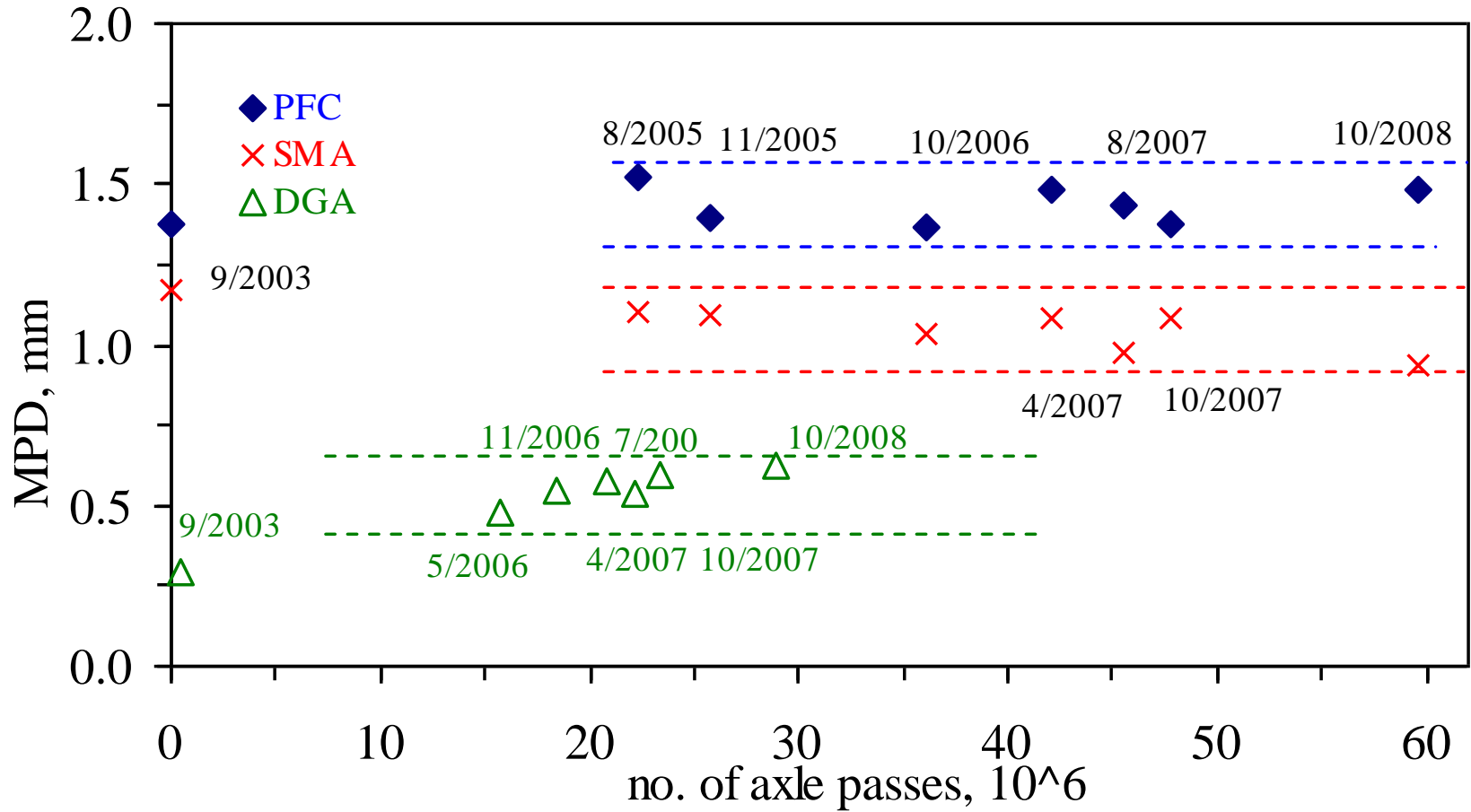


Video on NCSC website
(<http://bridge.ecn.purdue.edu/~spave/>)

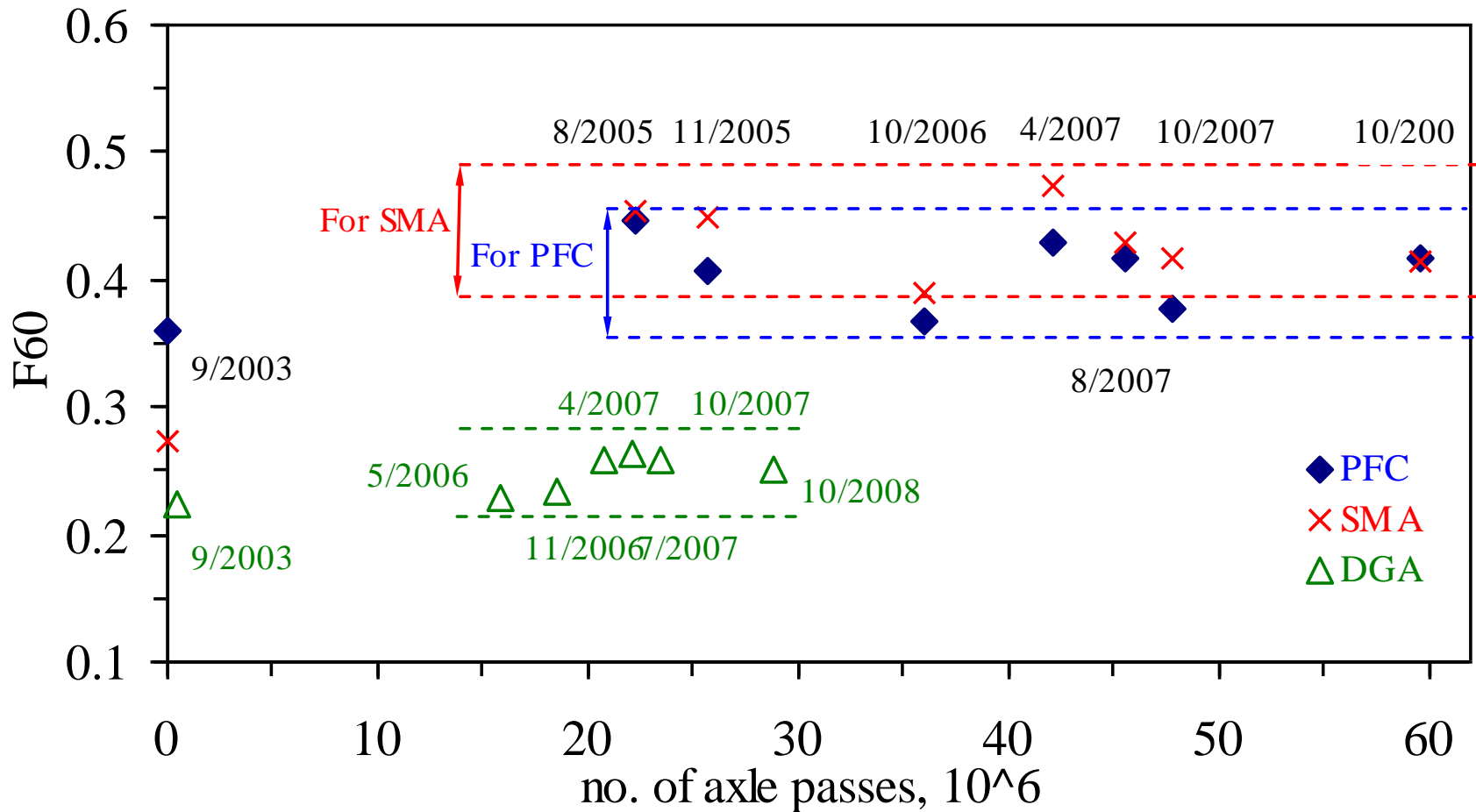
Changes in Noise vs. Traffic



Changes in Texture



Changes in Friction (F60)



Conclusions

- Porous Friction Courses can perform well for many years – how long?
- Void structure was maintained
 - ◆ Proper material selection and mix design
 - ◆ Proper maintenance
 - ◆ Proper application (high speed)

And now our big
announcement



**American Association of State Highway and Transportation Officials
AASHTO Accreditation Program - Certificate of Accreditation**

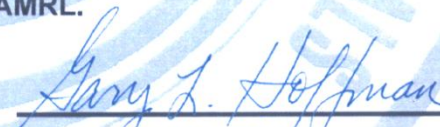
This is to signify that

**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

1914

AAR[®]
AASHTO R18

As an accredited lab

- We can serve as third party lab for dispute resolution.
- More credibility for other testing.
- More potential for research funding.
- You can have more confidence in our results.

Aggregate, Binder, Mixture



Regional Resource

- Information
- Technical advice and support
- Research
- Training
- Testing
- And more



More info:

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