

Regional Issues

North Central Superpave Center Update

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Today's Topics



- Regional Issues
- NCSC Activities
 - Research Areas
 - RAP ETG
 - Training
 - Lab Services
 - Communication



Regional Issues

- ❑ Economy
- ❑ Recycling
- ❑ Warm Mix Asphalt
- ❑ Compaction – longitudinal joints
- ❑ Quality and Performance
- ❑ Safety



NCSC Focus Areas

- Recycling
 - *RAP ETG*
 - RAP Evaluation and CIR Mix Design
 - *RAP in Surface Courses*
- Surface Characteristics
 - Use of Local Materials
 - Quiet Pavements
 - Friction in Pavement Management



NCSC Focus Areas

- Pavement Performance
 - *Porous Friction Course Performance*
 - Low Void Mixes
 - Longitudinal Joints
 - Continued Evaluation of SPS9 Project



Planned New Research Projects

- Effects of Foaming in WMA Mixes
- Optimizing Lab and Field Compaction
- Frictional Performance of 4.75mm Mixes
- Tire-Pavement Noise Monitoring

- And more!



National Interest in RAP

- ❑ Strong incentives to increase RAP use
 - Material and energy costs
 - Binder costs rose over 300% in 2007 & 2008
 - Material supply issues
 - Environmental concerns
- ❑ Growing demand
 - RAP in more mixes (i.e. surfaces)
 - Higher RAP quantities
- ❑ Major research efforts nationwide



HMA Recycling ETG

- FHWA initiated in May 2007
- Purpose – Coordinate, develop national guidance and recommendations on RAP use
- Demo projects, document performance, share info, best practices, research



RAP mixes can perform as well
as or better than virgin mixes.

RAP ETG wants to show states how to
successfully use 25% RAP and more.



NCSC Study on RAP Plant Mixes

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

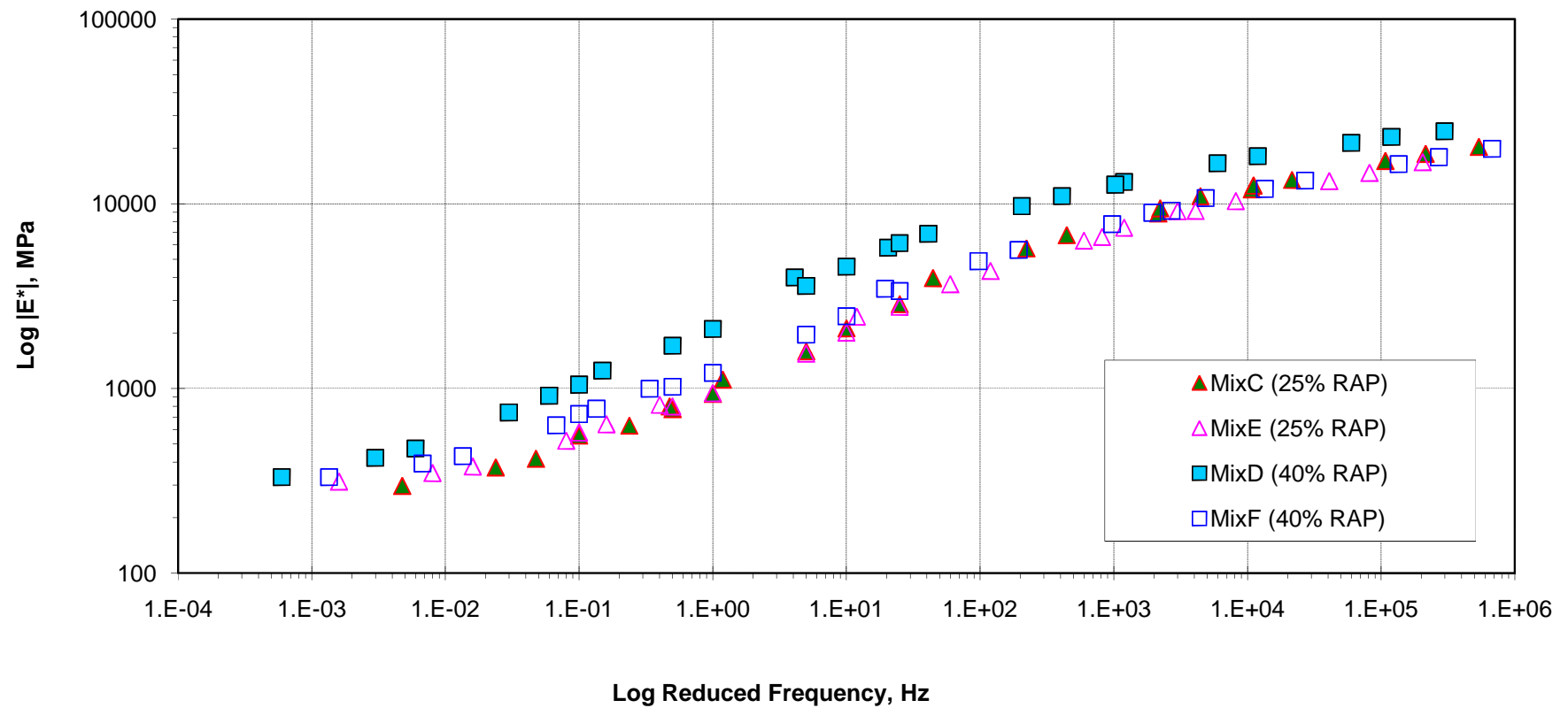


Results

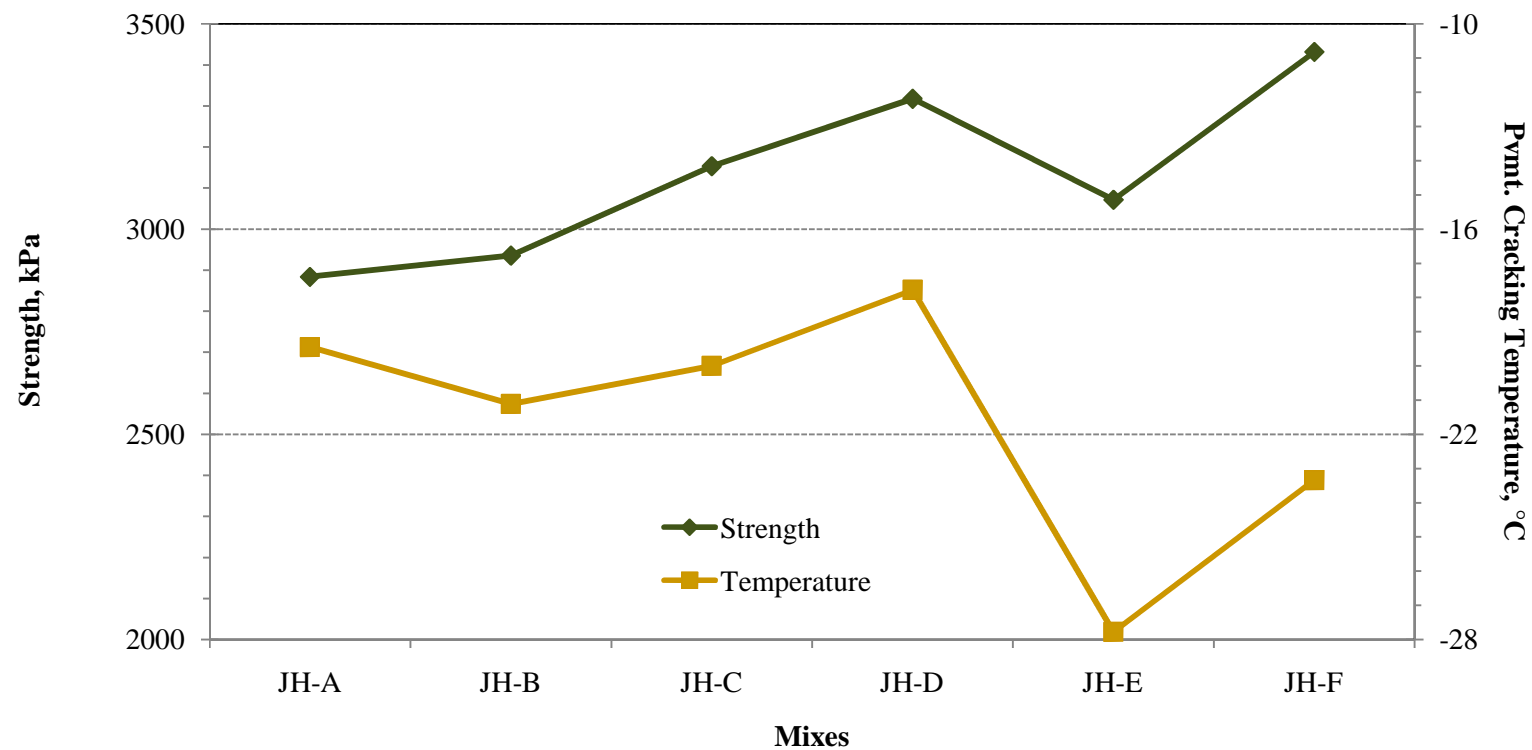
- Five plants and five sets of materials studied.
- The RAP mixes were not as stiff as expected.
 - High, intermediate and low temperatures
- The binder did not stiffen linearly with increasing RAP content.
- In most cases, dropping the virgin grade to PG58-28 for 25% RAP was not necessary.

One Example

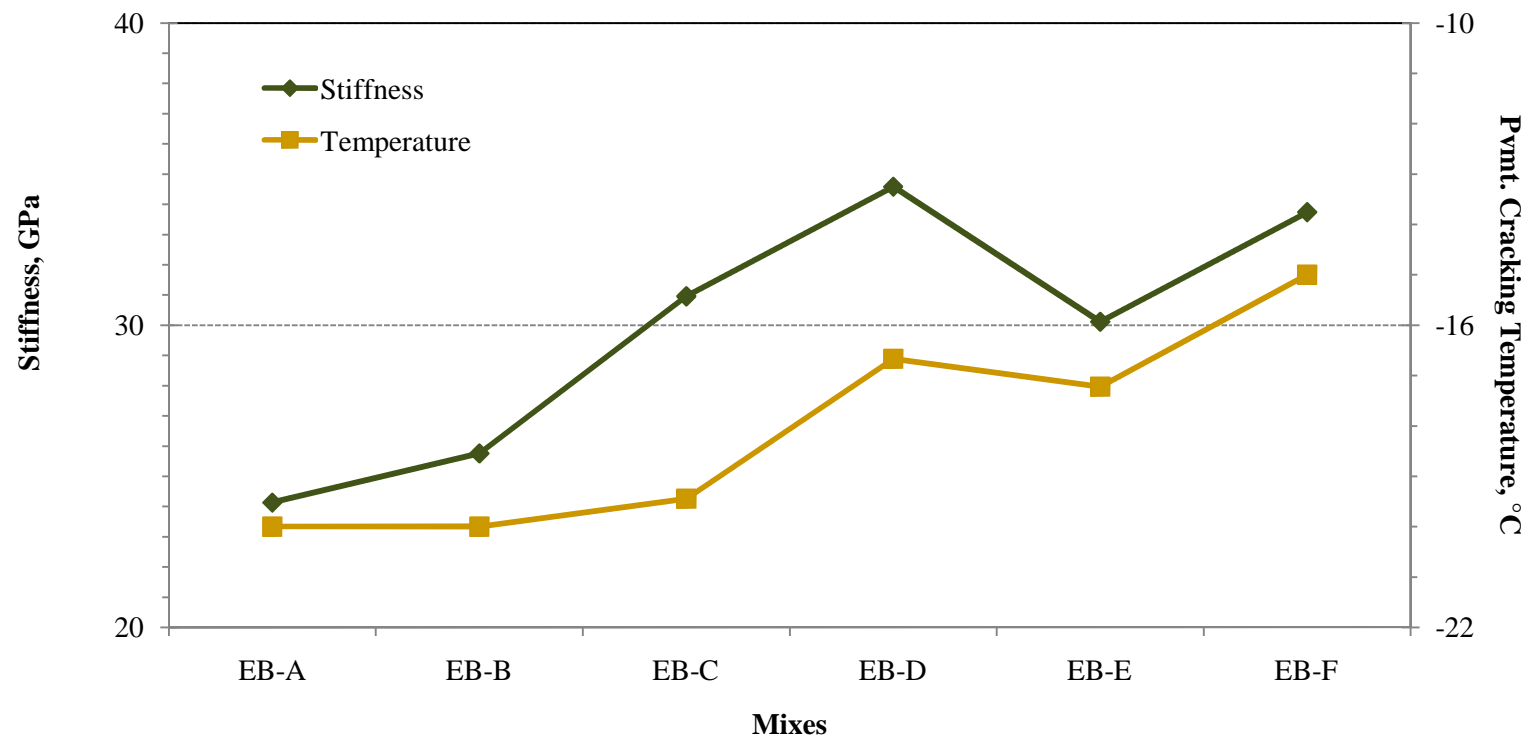
PG64-22 versus PG58-28



IDT Strength Example 1



IDT Stiffness Example 2





For these materials

- Grade change at 15% not necessary
- Low, intermediate and high temperature properties acceptable to 25%
- Pretty good blending of RAP and virgin binders to 25% RAP



Based on this research

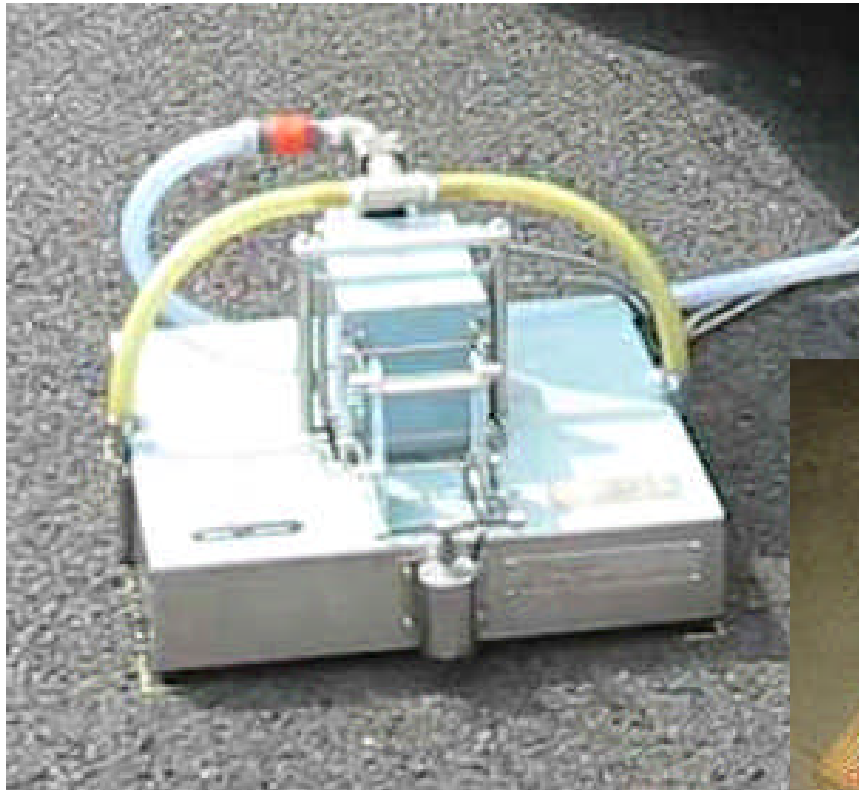
- And testing RAP sources from across the state
- INDOT increased RAP contents to:
 - 25% with no change in grade
 - 40% with a grade change
- Spec change has been adopted



RAP in Surface Courses

- ❑ Evaluate 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 on low volume roads
- ❑ Data analysis underway; report by Spring

Surface Characteristics





Surface Characteristics/Performance

- ❑ RAP in Surface Courses
- ❑ Friction – NMAS, aggregate type, gradation
- ❑ Use of Local Aggregates in Surfaces
- ❑ Friction in Pavement Management System
- ❑ Thermoplastic Pavement Marking Material
- ❑ Evaluation of new aggregate sources

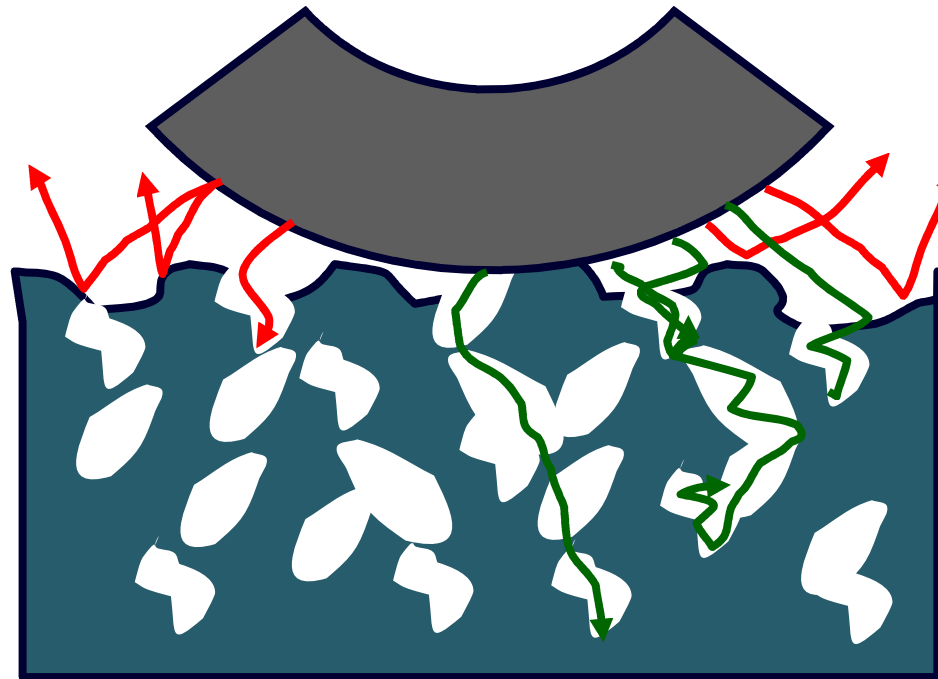


Porous Asphalt Surfaces

- New Generation Open Graded Friction Courses
- Porous European Mix
- Porous Friction Course

- For noise control and safety
 - Reduced splash and spray
 - High friction (macrotexture)

Pavement Porosity





Long Term Field Evaluation

- I74 Eastbound East of Indianapolis
- Constructed August 2003

- Comparison of SMA, PFC and HMA
 - Texture
 - Friction
 - Noise
 - Performance

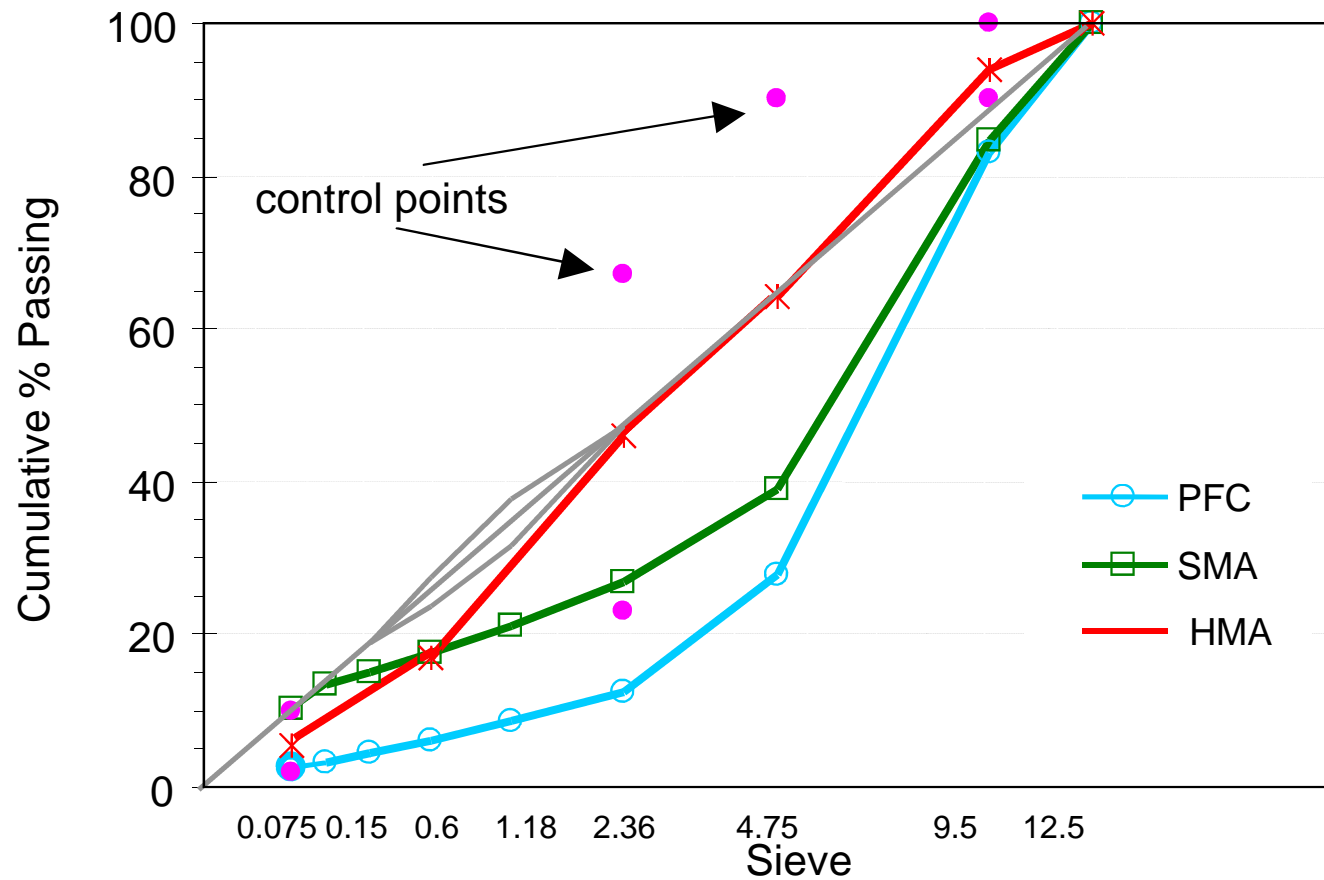


The Materials

- 9.5mm mixtures, Steel Slag and PG76-22

- PFC designed at 18-22% air voids
 - Old OGFC designed at 12-15% voids
 - Polymer modified binder and fiber

Design Gradations





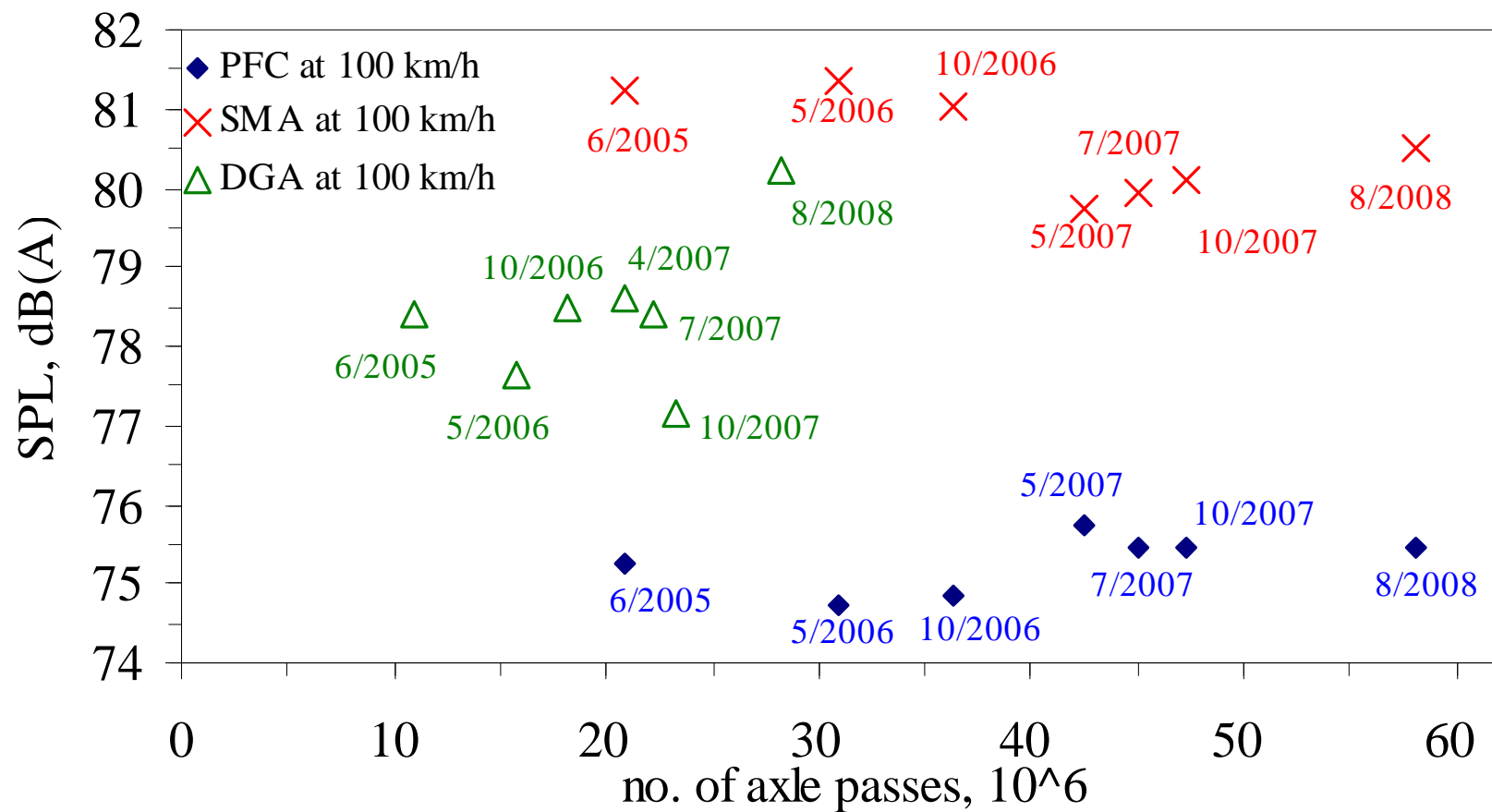
SMA vs. PFC



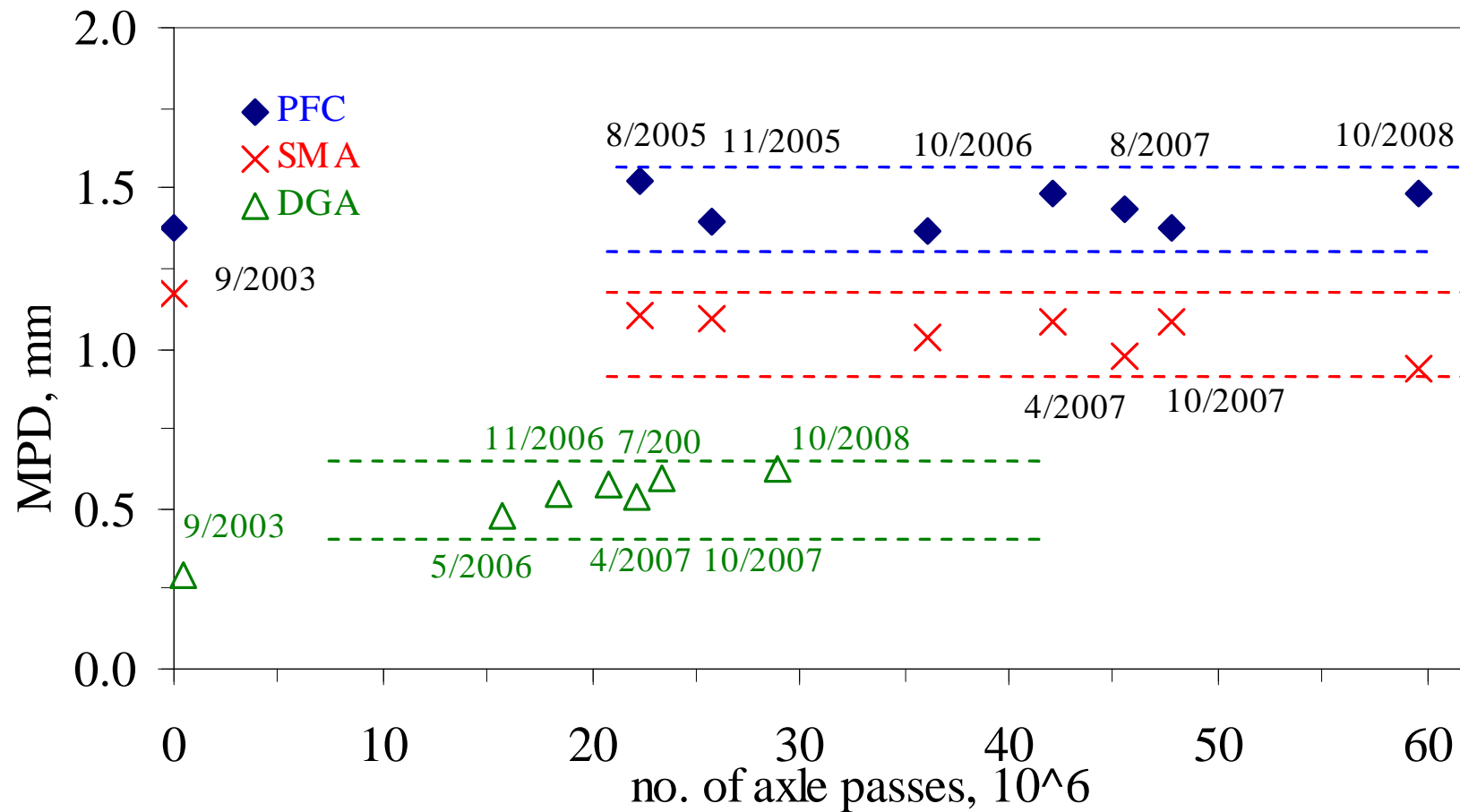
Conventional HMA



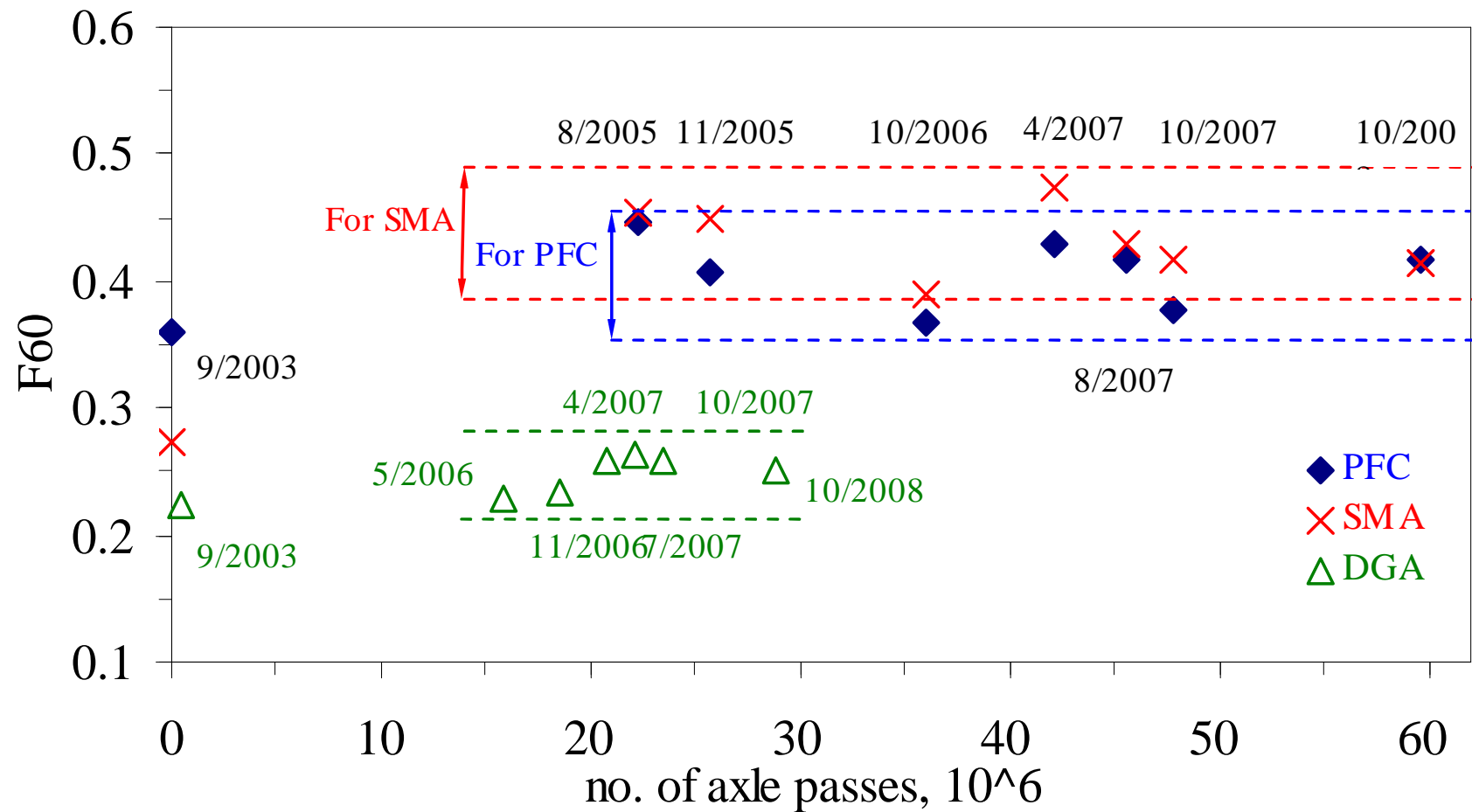
Changes in Noise vs. Traffic



Changes in Texture



Changes in Friction (F60)





After Five Years

- ❑ Texture decreased slightly after two years then stabilized
- ❑ Noise increased slightly, now steady
- ❑ PFC significantly quieter
- ❑ PFC and SMA friction the same
- ❑ PFC reduced splash and spray
- ❑ PFCs can hold up in Midwestern applications (when used properly)
- ❑ Did require somewhat more salt



Other Studies

□ Quiet Pavements

- European style surfaces in American terms
- Extensive lab study
- FHWA funded

□ Low Void Mixes

- How low is too low?
- NCAT Track performance, Accelerated Pavement Testing and lab testing



Training Activities

- Customized training on request
 - Our place or yours
 - Example – Wisconsin Project Manager (Field Personnel) Training
 - Five sites around the state
 - Half day classroom, afternoon plant/project tour
- Webinars
 - Perpetual Pavements
 - More planned



Laboratory Services

- AMRL Accredited Lab
 - Binder, Mixture, Aggregates
- Third Party Testing
- Research Testing
- New Product Evaluations
- Test Equipment/Protocol Evaluations



Communications

- Newsletter
 - Publication resuming in Spring
 - Free distribution
 - On-line versions available
- Website
 - Searchable database
 - Technical information
 - Calendar of events



Communications

- Presentations
 - Recycling Best Practices
 - Pavement Design
 - Factors Affecting Durability
 - Effect of Low Air Voids
 - Research Updates - National, Regional, Local



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