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de Vialidad y Tránsito

8º EXPOVIAL ARGENTINA

3 AL 6 DE NOVIEMBRE 2014

HOTEL PANAMERICANO - Buenos Aires, Argentina



Construction Innovations and How to Construct Smooth, Durable, and Quiet Concrete Pavements

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Senior Director of Pavement Technology
American Concrete Pavement Association



X CONGRESO INTERNACIONAL ITS
X SIMPOSIO DEL ASFALTO



X SIMPOSIO
DEL ASFALTO

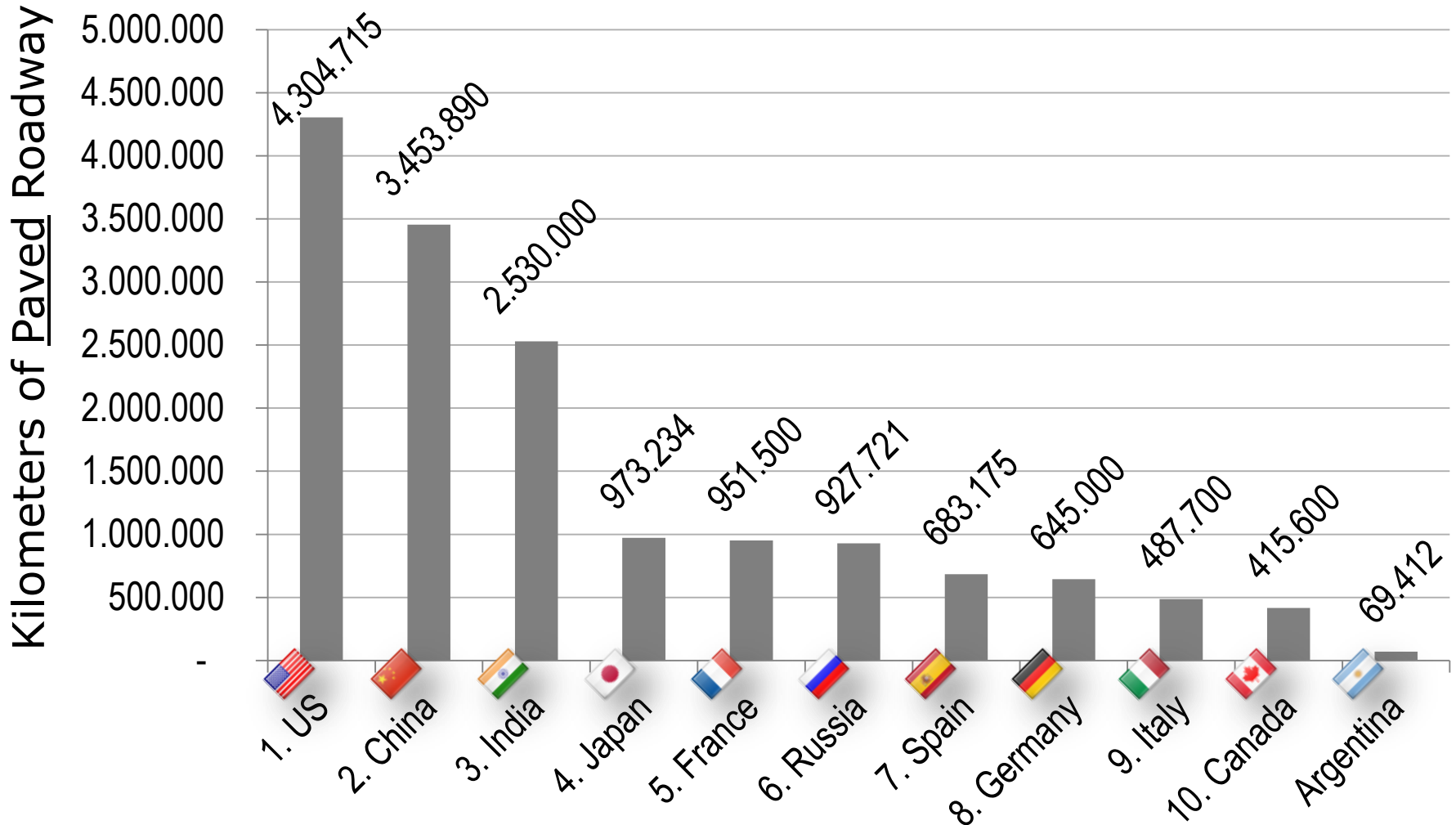


II SEMINARIO INTERNACIONAL DE PAVIMENTOS DE HORMIGÓN

www.congresodevialidad.org.ar



Why Are You Listening to Gringos?

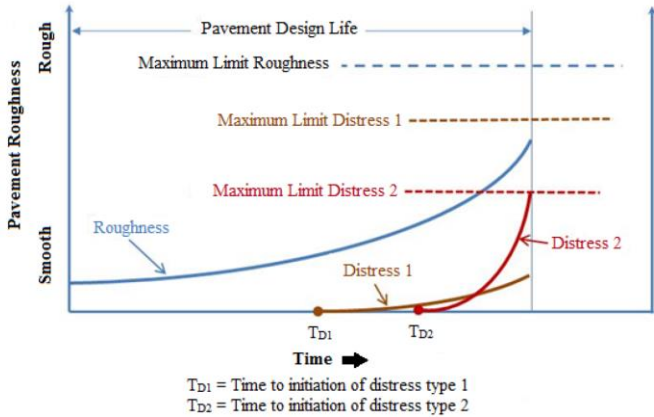


Source: CIA's World Factbook

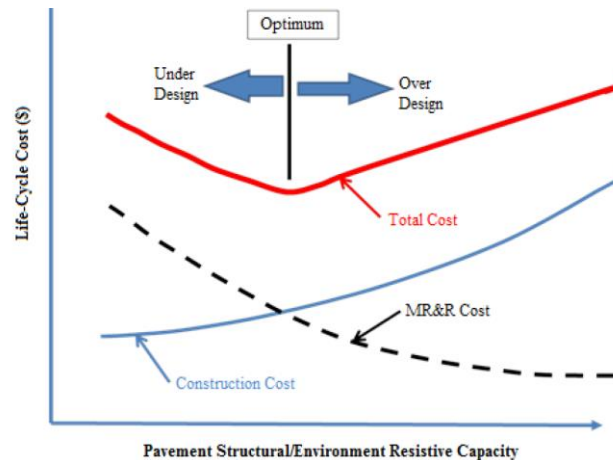
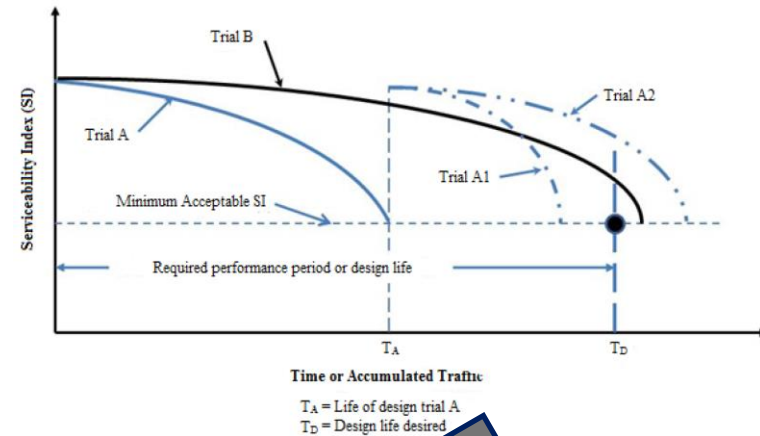


This Extends Beyond Construction

Field-Based Performance Models



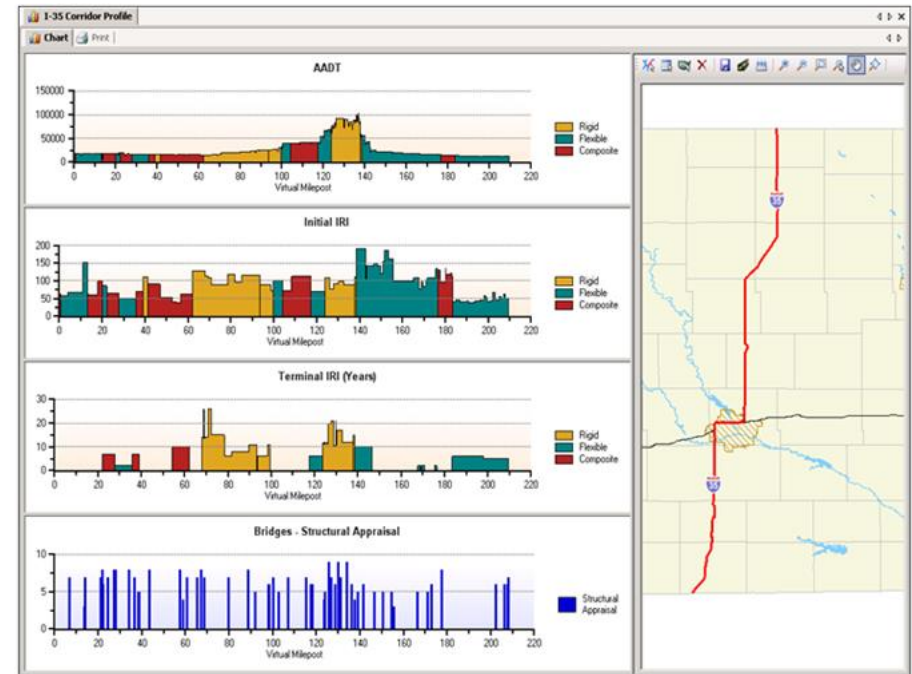
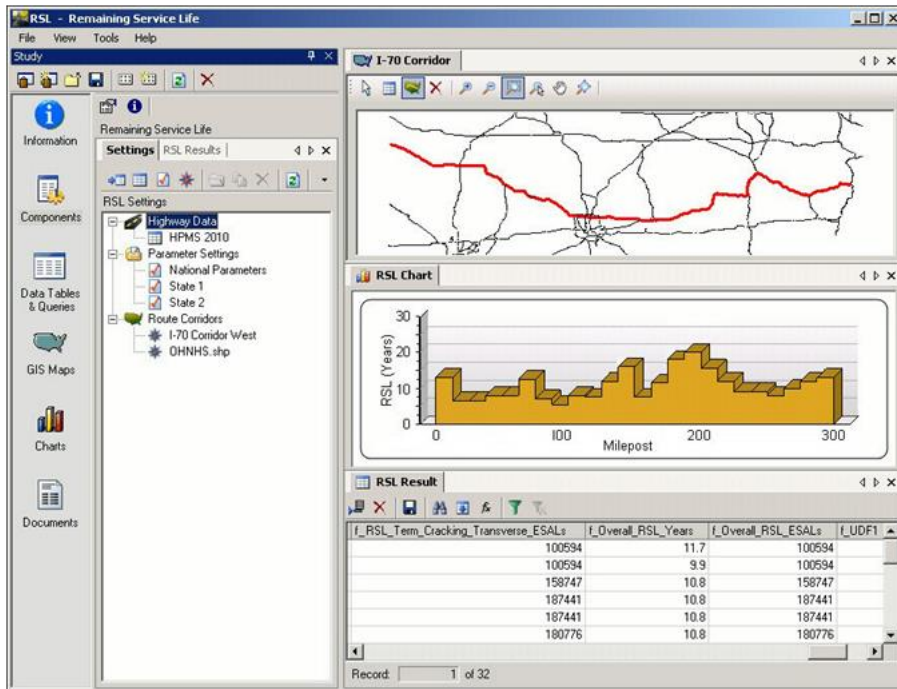
Performance Model-Based Design



Design-Driven, Life-Cycle Cost
Optimized Section Gets Constructed



FHWA's Pavement Health Track



FREE at: www.fhwa.dot.gov/pavement/healthtrack



CONSTRUCTING SMOOTH



Smoothness Easier with Slipform



versus





Trackline Support is Key!





Slipform Paver Advancements



**Zero
Clearance**



**Variable
Width**



Stringless Slipform Paving



versus



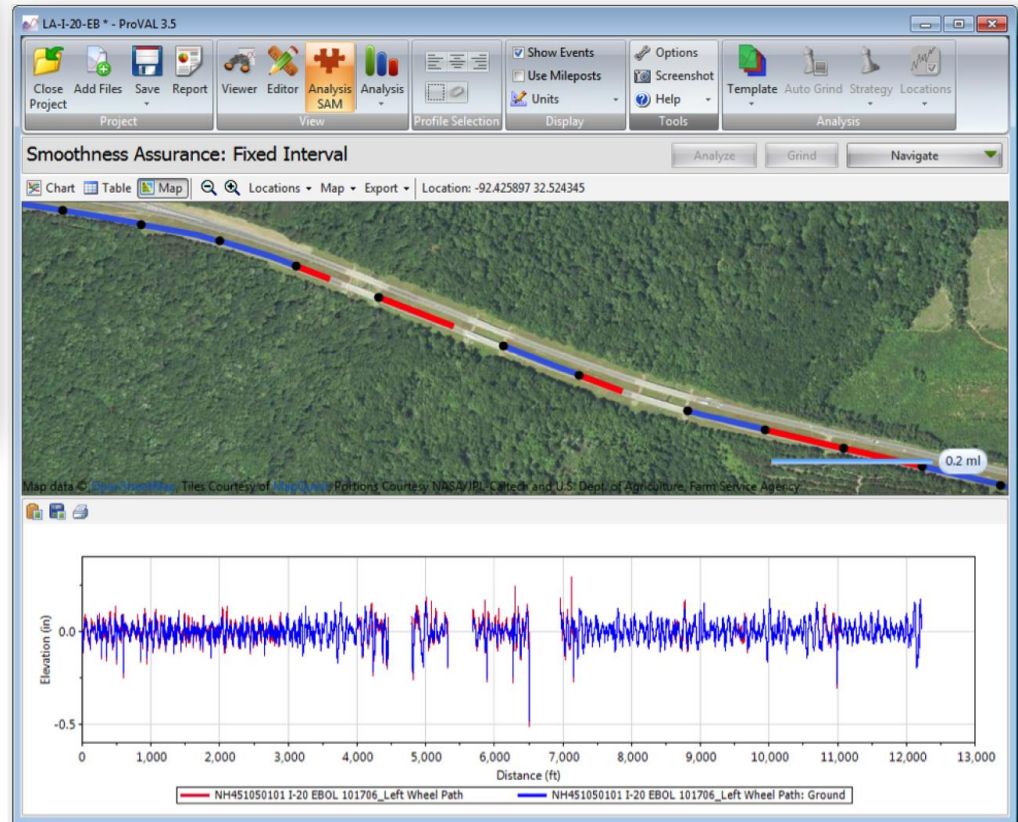
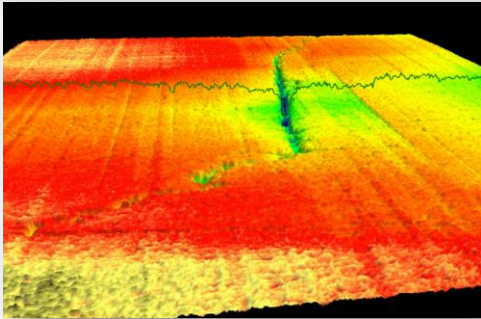


Can Measure During Construction...





...Validate After Construction...



PROVAL 3.5
Pavement Profile
Viewing & Analysis

FREE at: www.roadprofile.com

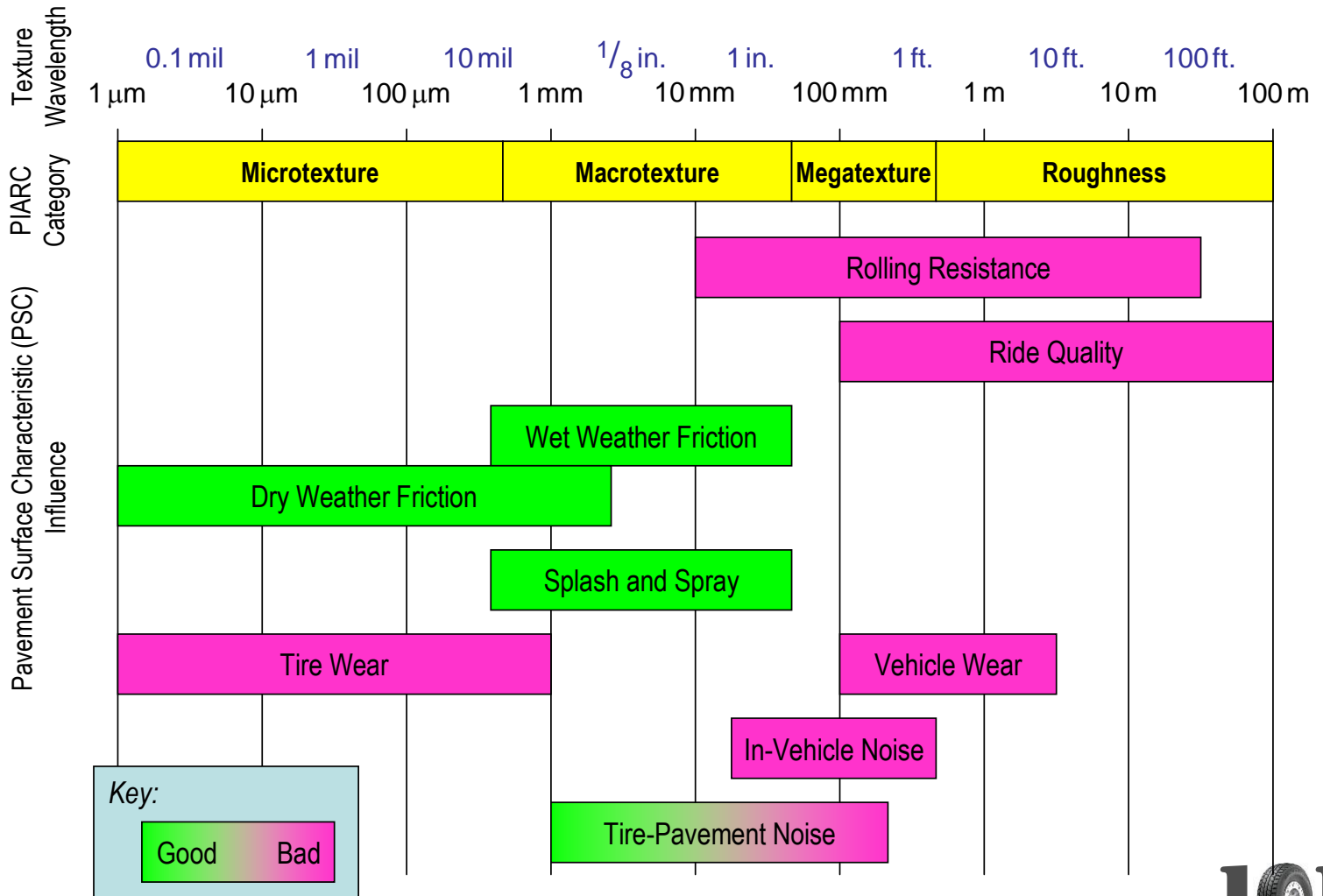


...and Correct if Not Smooth Enough





Texture is Critical to Smoothness



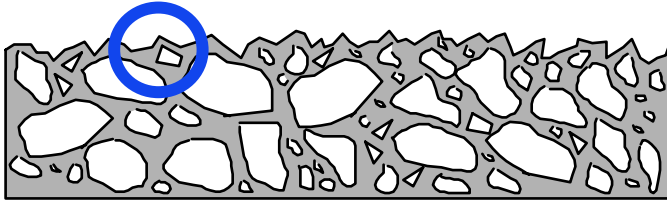
Source: Iowa State University





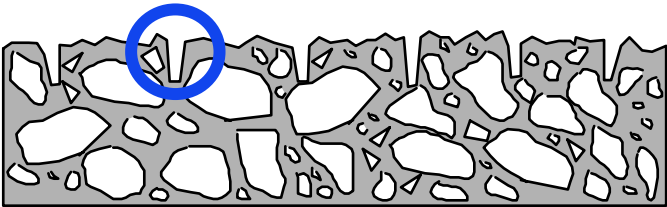
Concrete Pavement Textures

From Fine Aggregate Particles



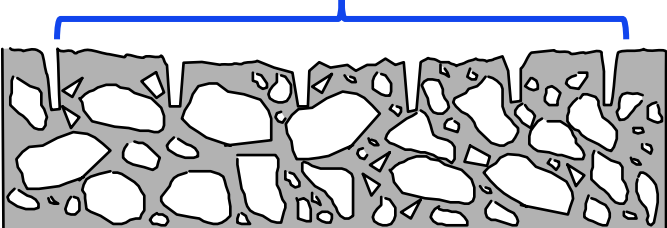
Microtexture

Formed into surface (Grooves)



Macrotexture

From 2 to 20 in. (50 to 510 mm)



Megatexture

COMING SOON!

- “Best Practices for Constructing Smooth Concrete Pavements”
 - Free on-demand webinar
 - Developed by ACPA
 - Sponsored by FHWA





The Ten Commandments of Smoothness

1. Develop a smoothness plan for the project
2. Develop an accurate field survey for stringline/stringless controls
3. Properly prepare the grade, providing a stable form or track line
4. Set up appropriate forms properly for fixed-formed paving
5. Use a consistent concrete mixture appropriate for the paving method
6. Deliver and place concrete consistently
7. Set-up and operate the paver steadily
8. Fasten dowels/reinforcing securely and use "bump-free" construction joints (headers)
9. Use only necessary and appropriate finishing techniques
10. Apply texturing and curing with care





A Synthesis of Knowledge of Potential Durability of Concrete

Long-Life Concrete: How Long Will My Concrete Last?

Peter C. Taylor, PhD
October 2013



Sponsored through

Technology Transfer Concrete Consortium (TTCC) Pooled Fund Study
TPF-5(159) with funding from Colorado, Illinois, Iowa, Kansas, Michigan,
Minnesota, Ohio, Oklahoma, and Pennsylvania

IOWA STATE UNIVERSITY
Institute for Transportation

National Concrete Pavement
Technology Center



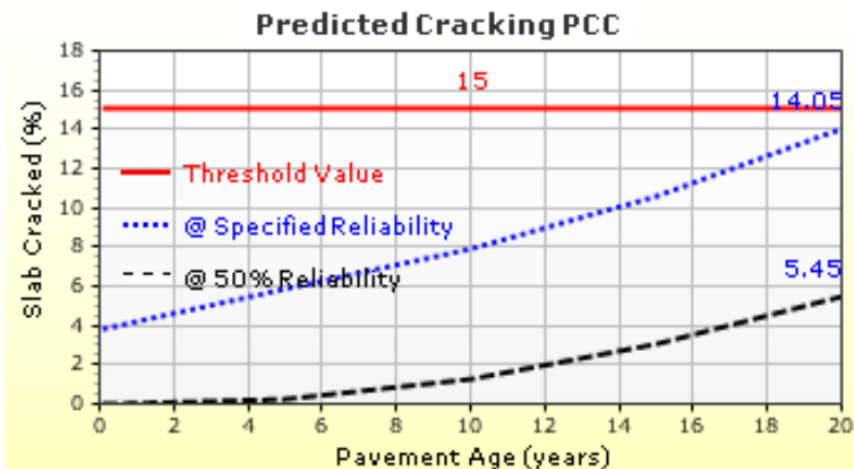
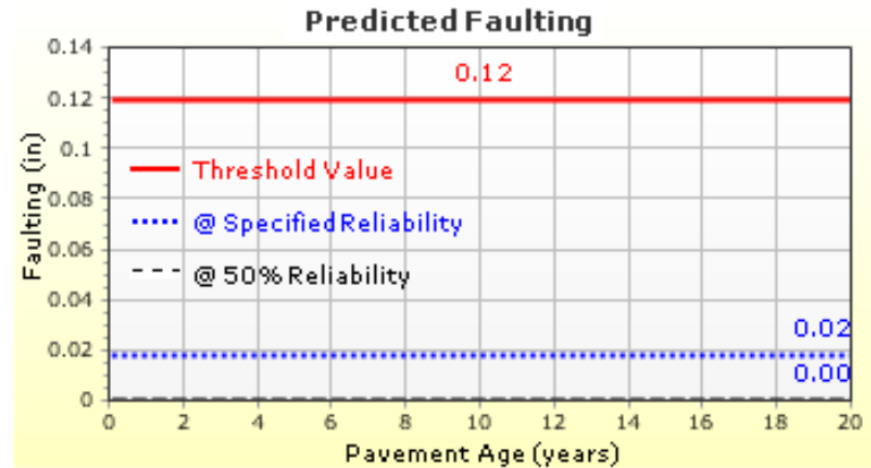
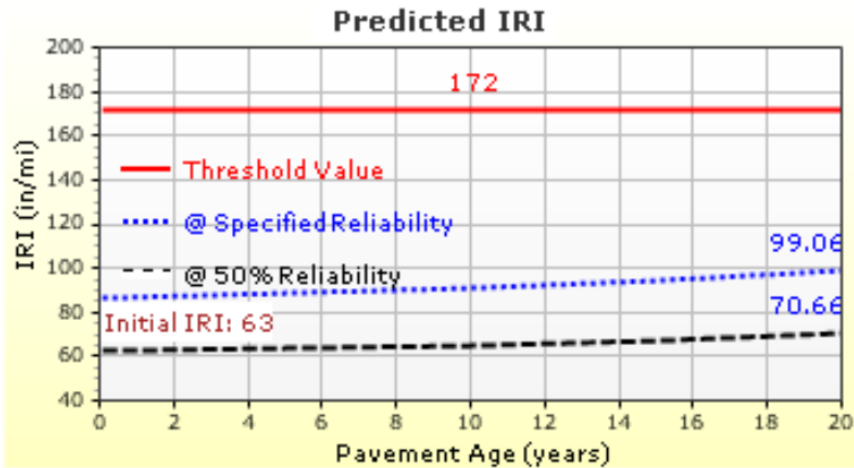
CONSTRUCTING DURABLE



Accurate Performance Predictions



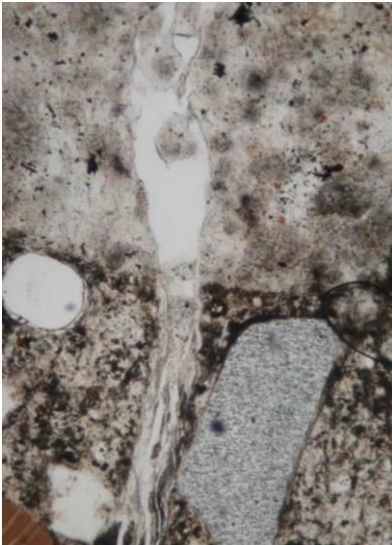
Distress Charts



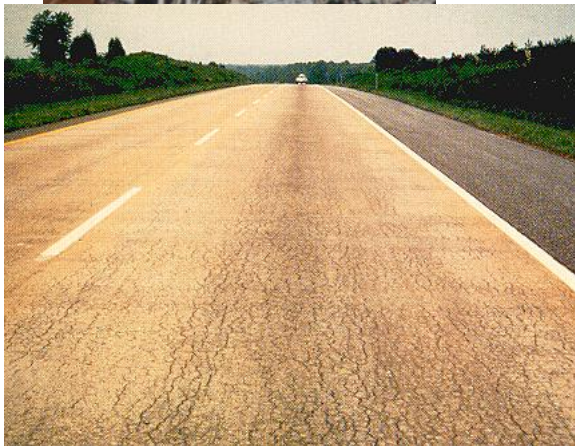
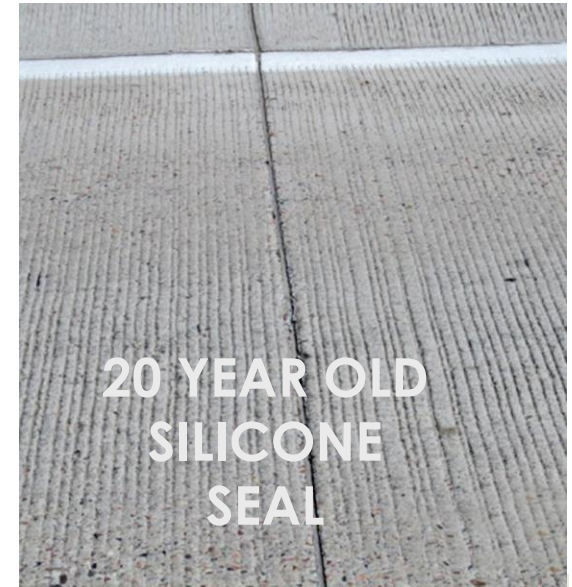
Design focuses on these three distresses but spalling and other distresses inherent in the curve development



Appropriate Material Selection



**Specifications
Designed
to Screen
Against
Material-
Related
Distresses**



**Materials used
Must be Capable
of Meeting the
Performance
or Design Life**





Quality Construction

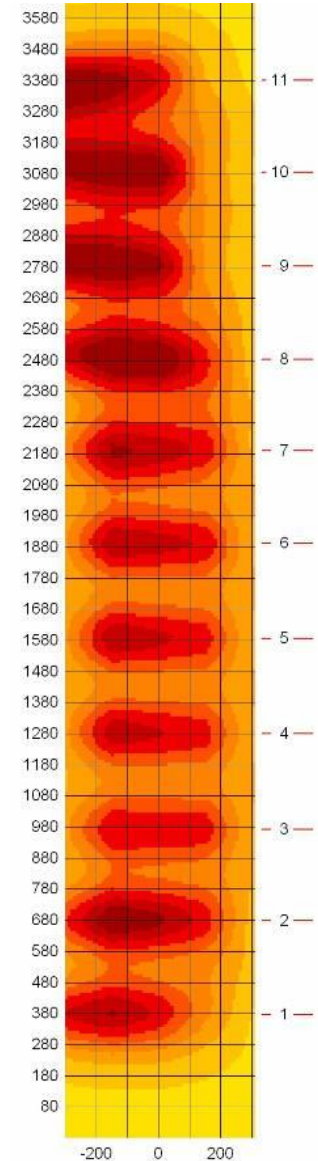
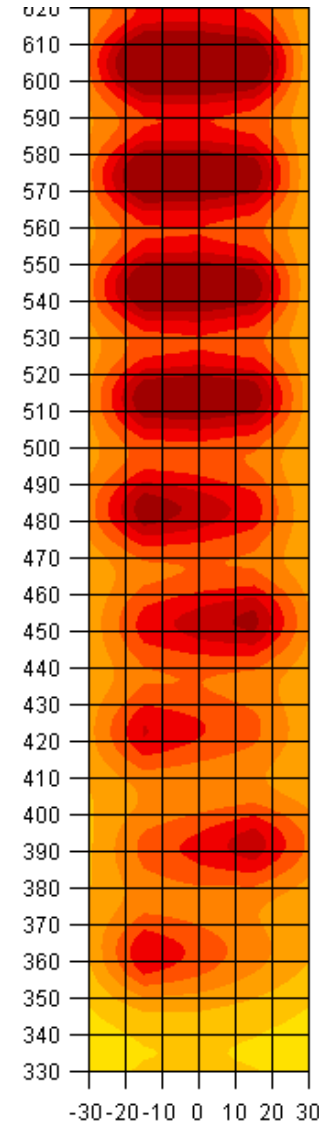
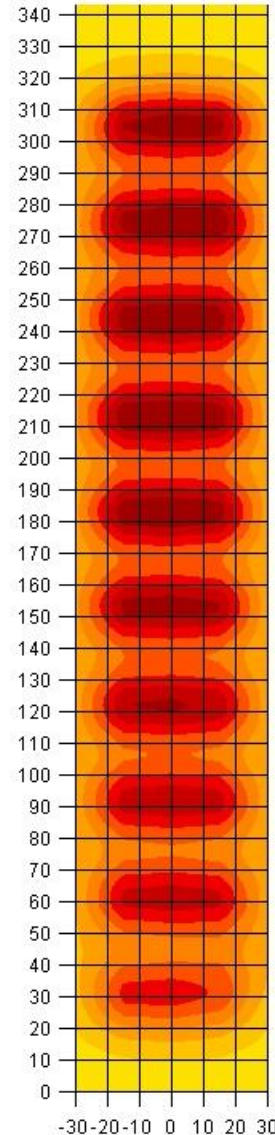
**Quality Control (QC) &
Quality Assurance (QA)
Should Ensure that
Durability is Achievable!**





Validation of the As-Built Pavement

Post-Construction Testing Should Ensure that the As-Built Pavement Meets the Design

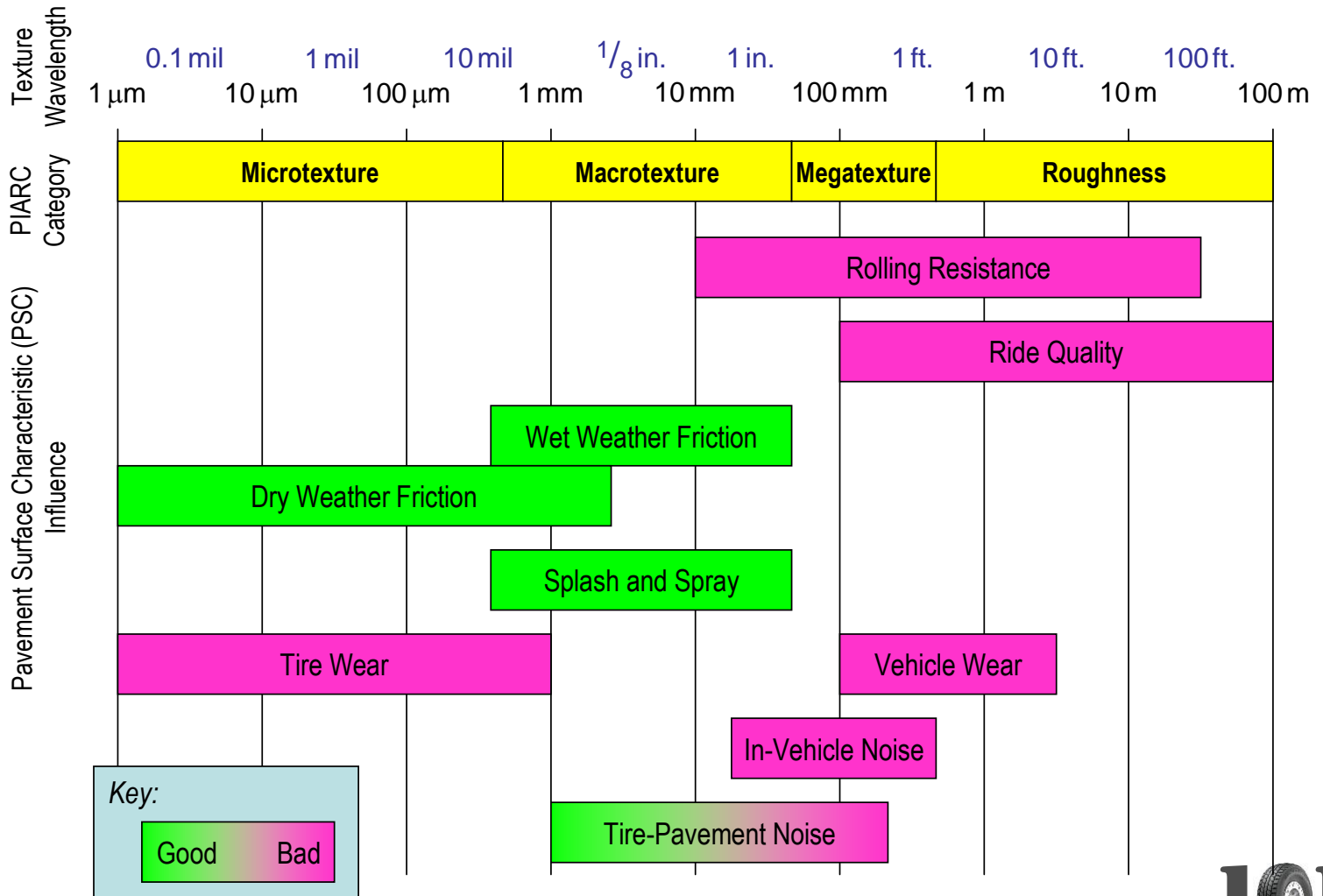




CONSTRUCTING QUIET



Texture is Critical to Noise

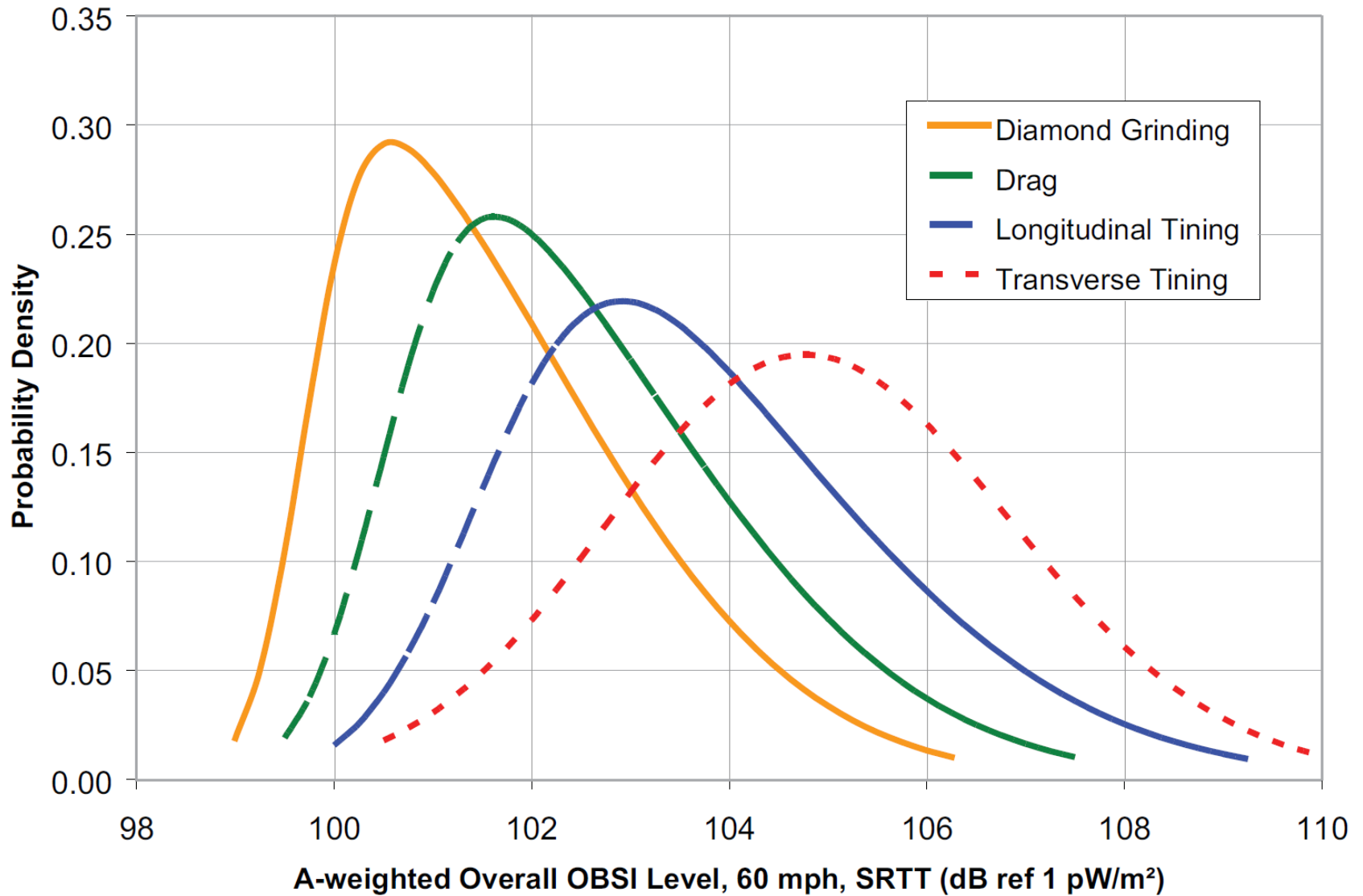


Source: Iowa State University





Can Build Quit Texture, or...





Quiet can be Engineered





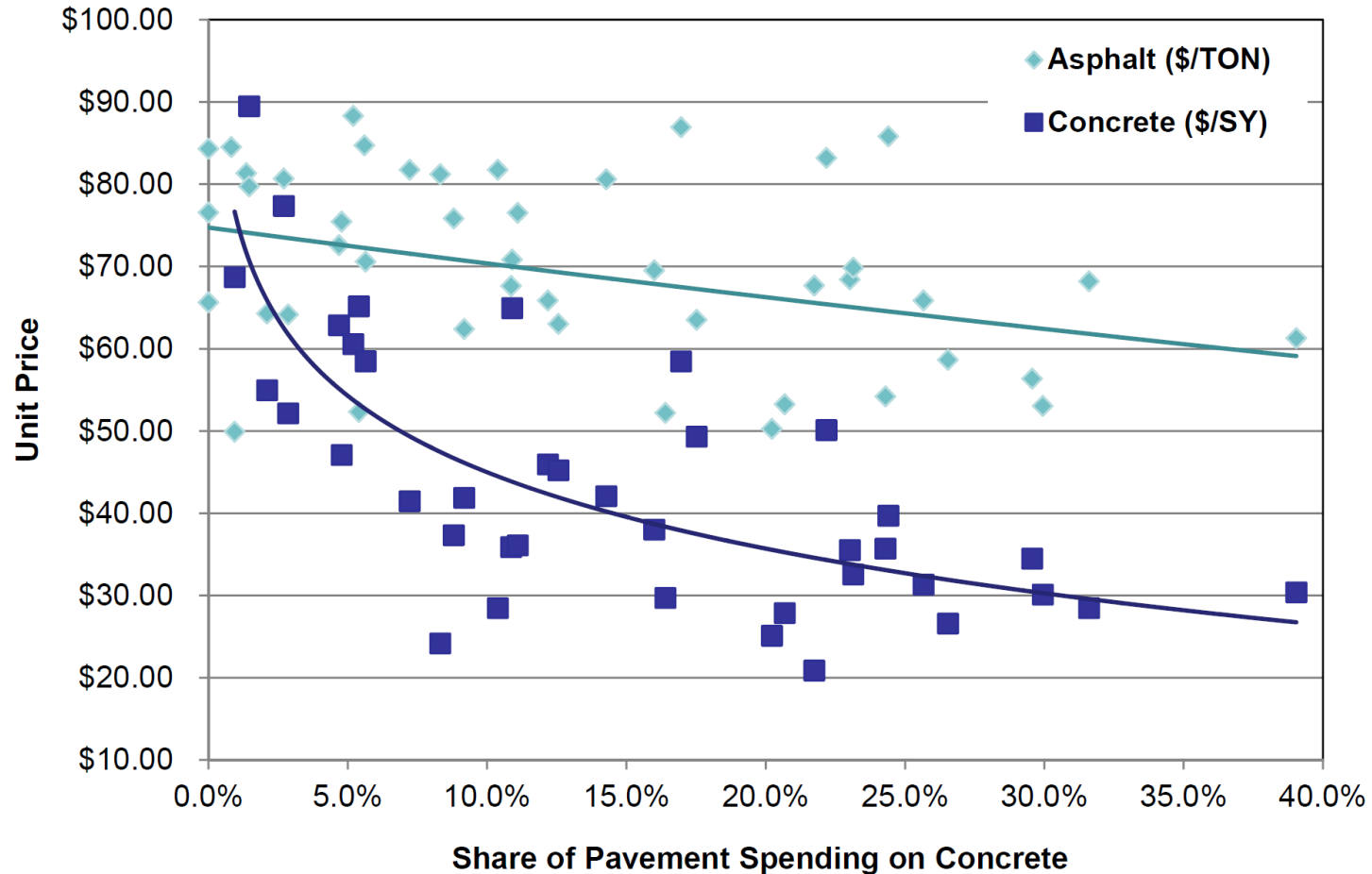
DRIVING INNOVATION



Innovation & Competition

“Competition between companies is a key driver of innovation and technological change.”

- U.S. Dept. of Justice, *Promoting Innovation through Competition*



- Specifications & standards can be leveraged to encourage adoption of existing material, testing, equipment, etc. advancements



LOOKING AHEAD



Competition Will Drive Innovation

**CAD Automated
Joint Layout**

**Out-of-the-Box
Design Approaches**



**GPS-Guided
Saws**

**Non-Destructive
Fresh, In-Place
Air Void Analyzer**





Thank You! Questions?

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American Concrete Pavement Association

www.robertrodgen.com



Main Website | acpa.org

Concrete Wiki | wiki.acpa.org

App Library | apps.acpa.org

Desktop Software | software.acpa.org

Resources | resources.acpa.org

On-Demand Training | ondemand.acpa.org

Live Online Training | webinars.acpa.org

Your Local Contact | local.acpa.org