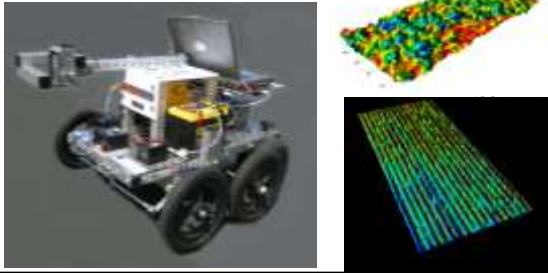


Texture: RoboTex

- 3-D texture measurement built around line laser sensor
- Laser height sensor, inertial referencing
- GPS, DMI encoder, video log



Friction



ASTM E 274



ASTM E 1911

Noise: Wayside

- Statistical Isolated Pass-by (SIP) – AASHTO TP 98
- Continuous-Flow Traffic Time Integrated Method (CTIM) – AASHTO TP 99
- Controlled Pass-by (CPB)



Source: LM Sandberg

Noise: On-Board Sound Intensity (OBSI)



AASHTO TP 76

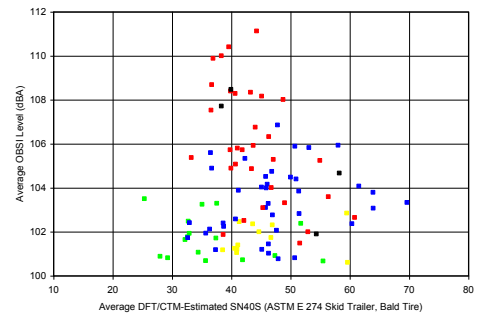
Rolling Resistance



COOEE / MnROAD / MIRIAM

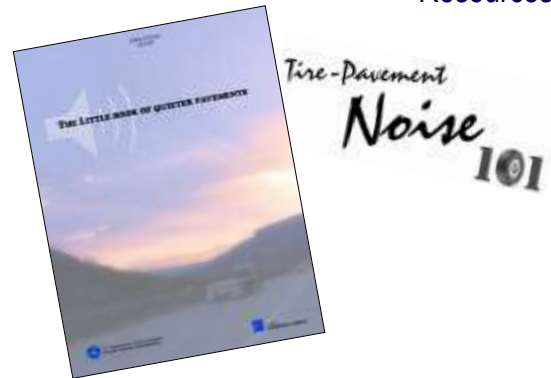
Friction vs. Noise

Do Friction and Noise Relate?

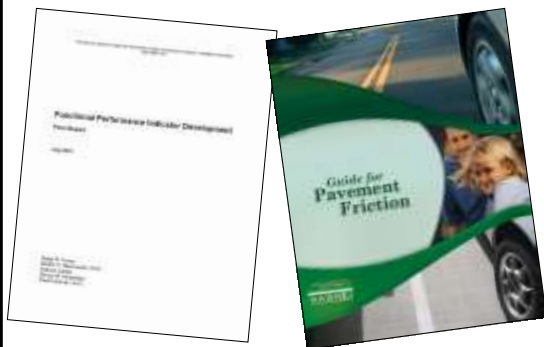


Resources

Resources



Resources



Variability

Test Sections

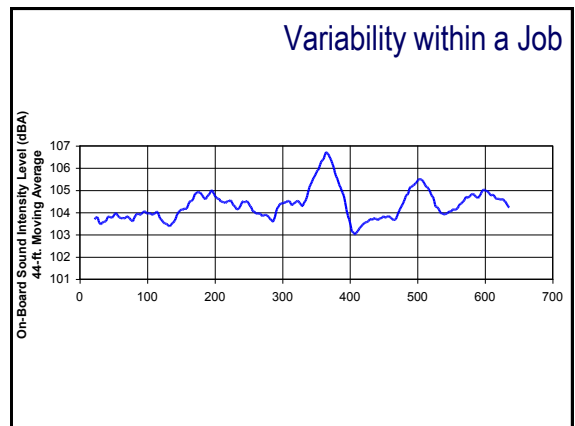
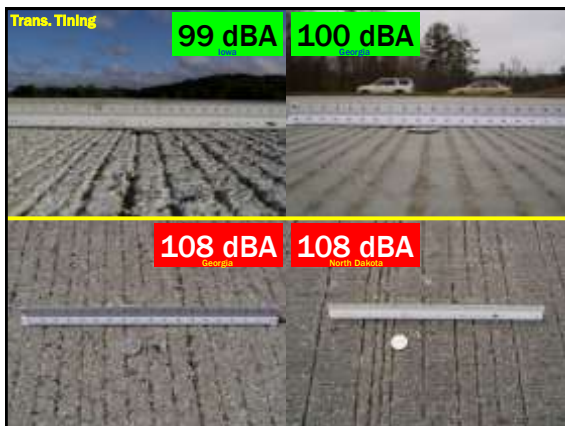
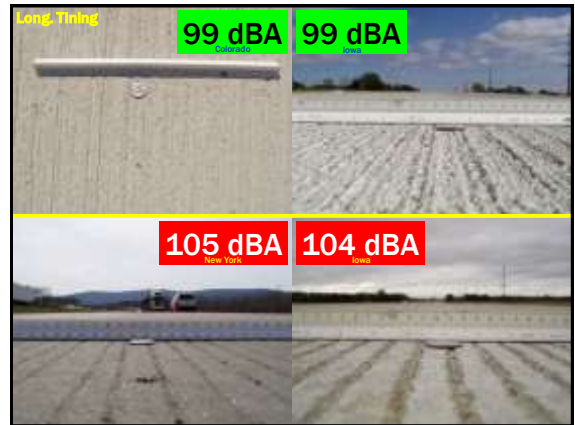
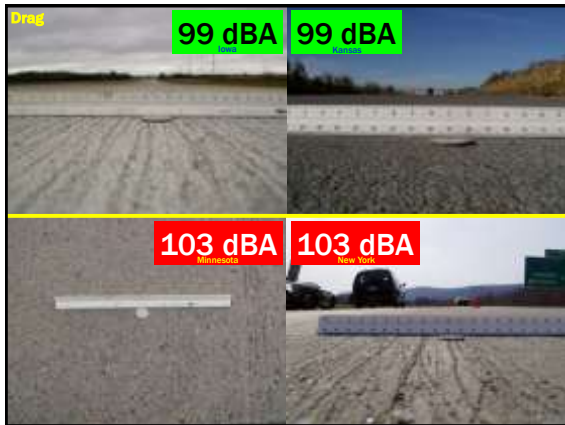
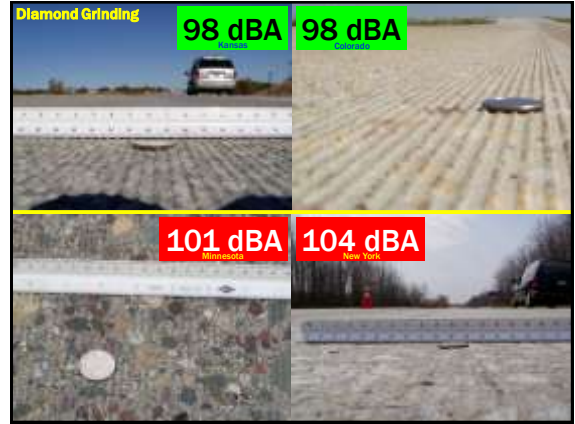
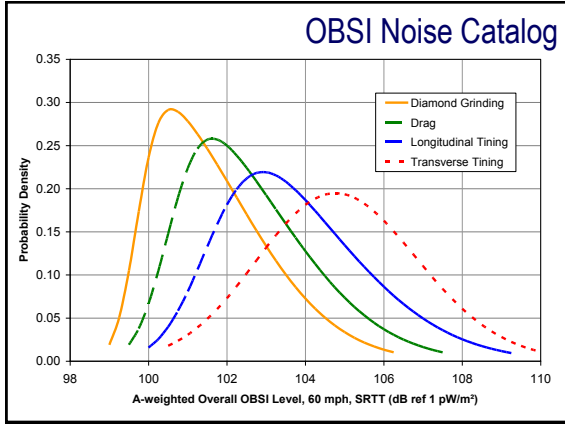
- In 8 years, 2000 unique textures have been tested
 - Transverse Tining (incl. skewed and cross-tined)
 - Longitudinal Tining (incl. sinusoidal)
 - Diamond Ground
 - Grooved (longitudinal, transverse)
 - Drag (Burlap, Turf, Broom, Belt, Carpet)
 - Shot Peened
 - Exposed Aggregate
 - Porous (Pervious) Concrete
 - Milled
 - HMA and Surface Treatments
- Hundreds of miles in 20 States and 7 Countries

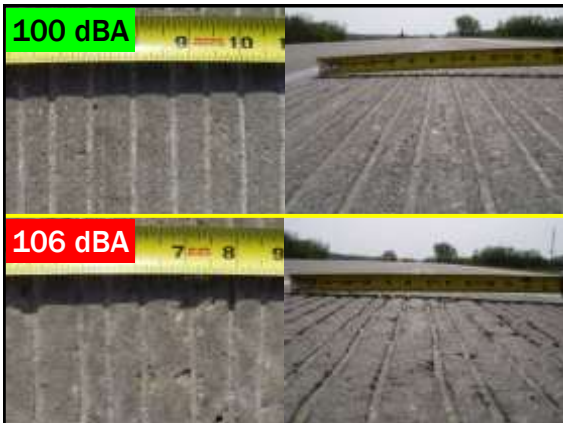
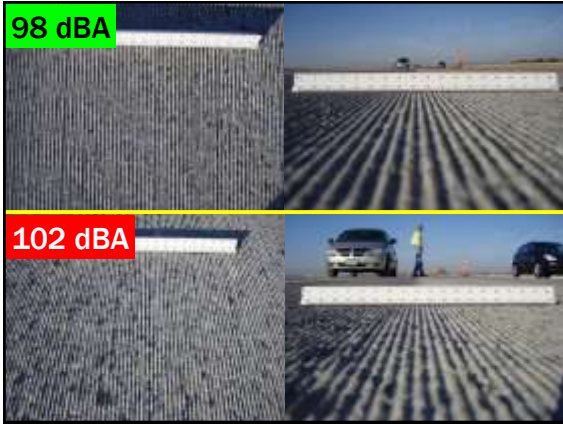
Lesson Learned

There is a lot of:

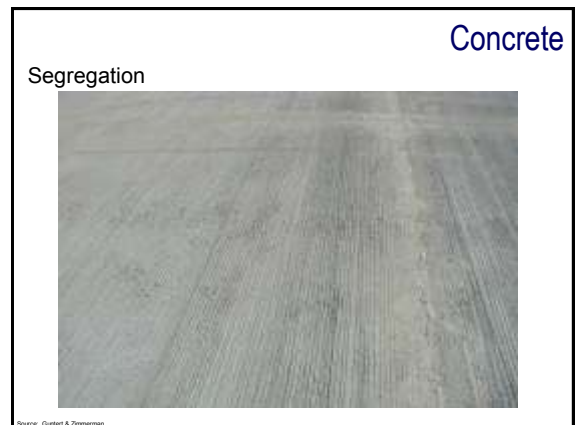
VARIABILITY

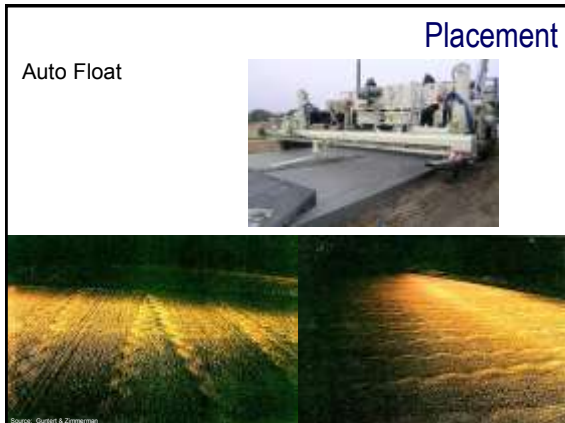
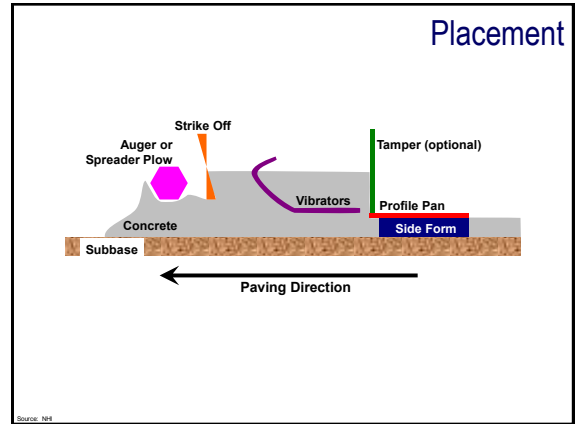
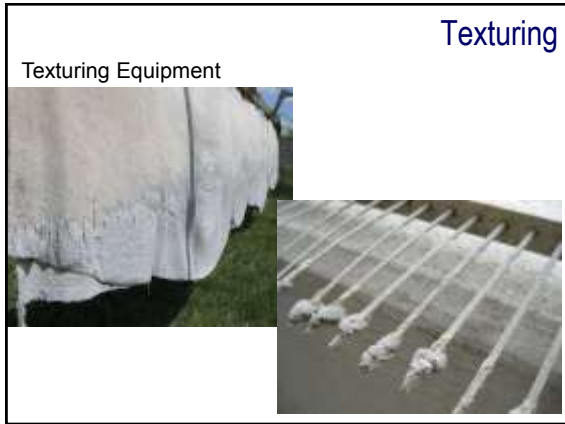
Variability from project to project, and
variability within a given project.





Better Practices





Design and Construction Guidelines

- A "how to" guide for designing and constructing quieter concrete pavements
- Addresses all conventional concrete pavement texture types
- Simple and practical guidance

www.CPTechCenter.org

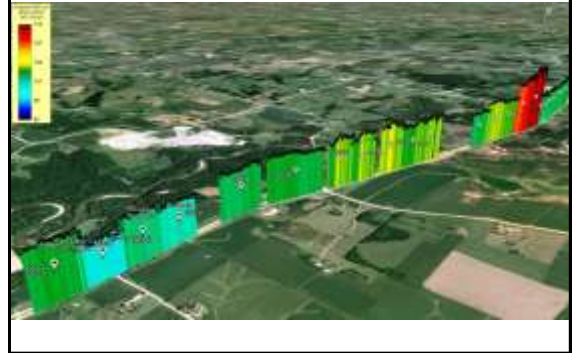
Real-Time Monitoring



■ SHRP 2 R06(E)
Real-Time
Smoothness for
Concrete Paving



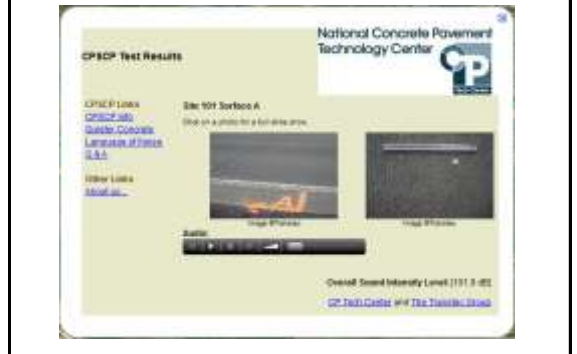
Visualization



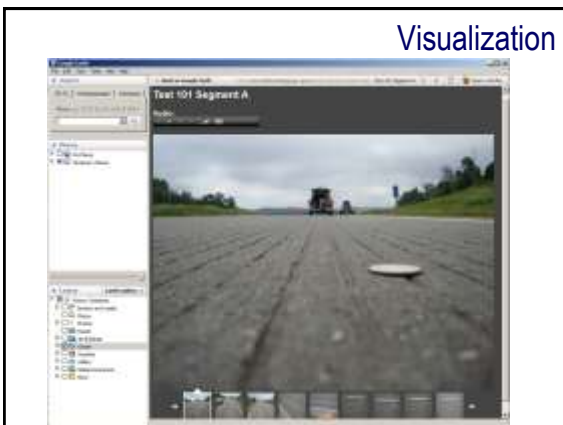
Visualization



Visualization



Visualization



Visualization



