

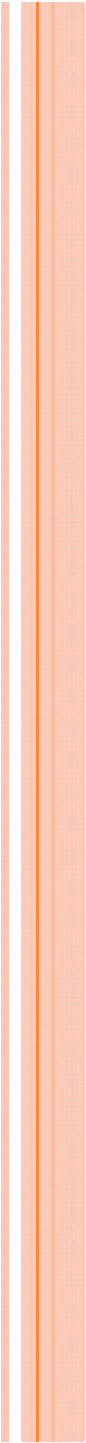
FRICTION TESTING BY IGGA

2013 RPUG

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IGGA





Presentation Outline

- Why Is Industry Friction Testing
- Development and Evaluation of Test Sections to Improve Surface Characteristics
- Basics on Diamond Ground Textures and Equipment
- Results of Various On-Going IGGA Research Efforts
- Testing of the LTPP SPS-2 Experiment



Why Is IGGA Conducting Friction Testing

- Evaluation of Existing CDG and NGCS Test Sections
 - Acoustic Longevity of CDG and NGCS Textures
 - Friction Longevity of CDG and NGCS Textures
- Evaluation of the Impact of Longitudinal Grooving on Friction Results
 - Better Awareness of the Safety Benefits of Grooving
 - Better Understanding of the Isotropic Behavior
 - Development of More Grooved vs Un-Grooved Test Sections
- Development of Improved CDG Textures
 - 110 Spacers
 - 120 Spacers
 - 130 Spacers



Friction Initiative

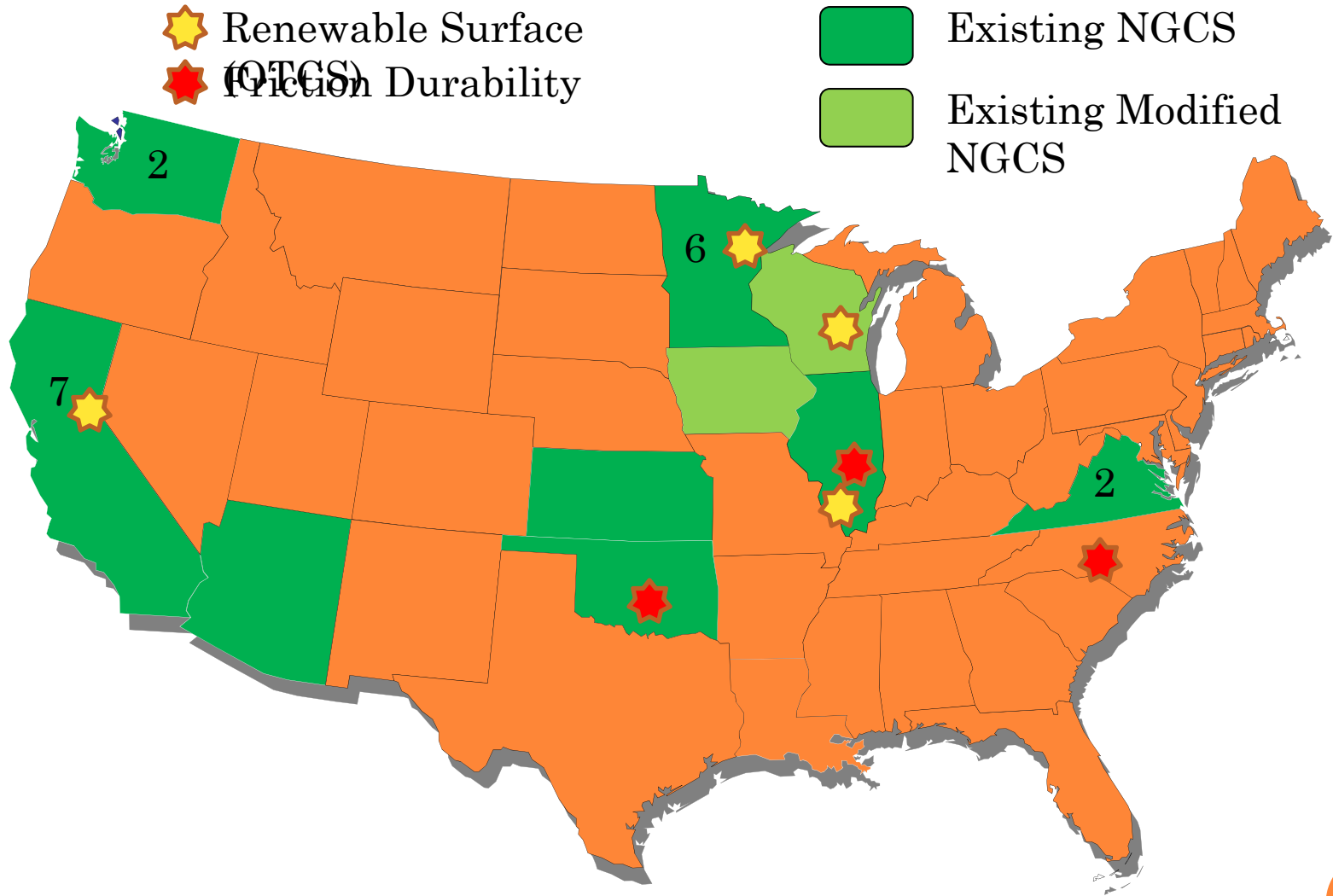
- Calibration and Verification of IGGA Equipment Functionality
- Evaluate the Impact of Spacer Width on Friction Levels (110, 120, 130)
- Compare Grooved and Ungrooved Surfaces
- Comparison of CDG to Other Concrete Surfaces & AC Quiet Pavement Surfaces
- Evaluate SPS-2 Test Sections



IGGA Friction Test Equipment



On Going Evaluation Sites



Concrete Textures Being Evaluated

Longitudinal Grooving



Conventional
Diamond Grinding



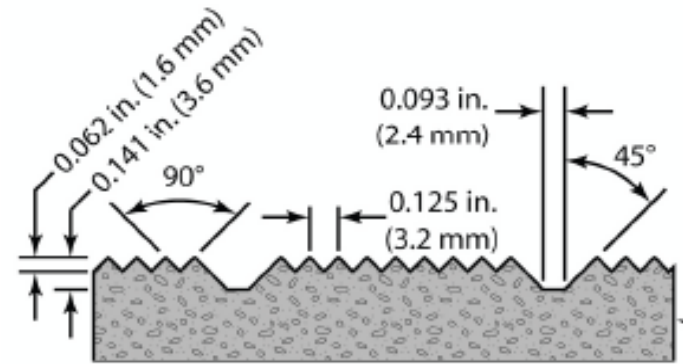
OTCS



Next Generation
Concrete Surface



Back to the Future Again



Style 15 Christensen Diamond Grooving Pattern

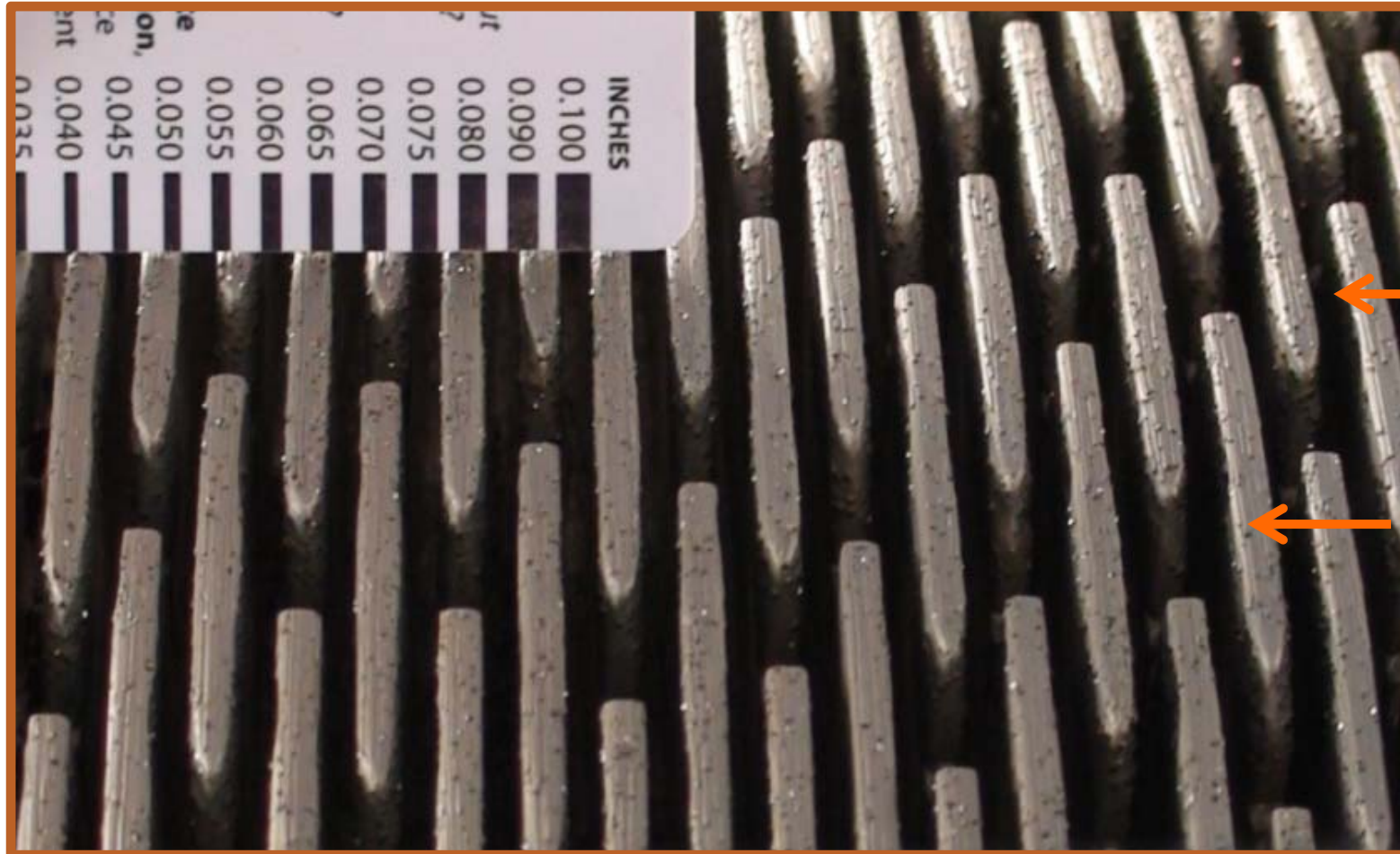
1960's
California
a
Texture



Diamond Grinding Equipment



Grinding Head



← Space
r

← Blade



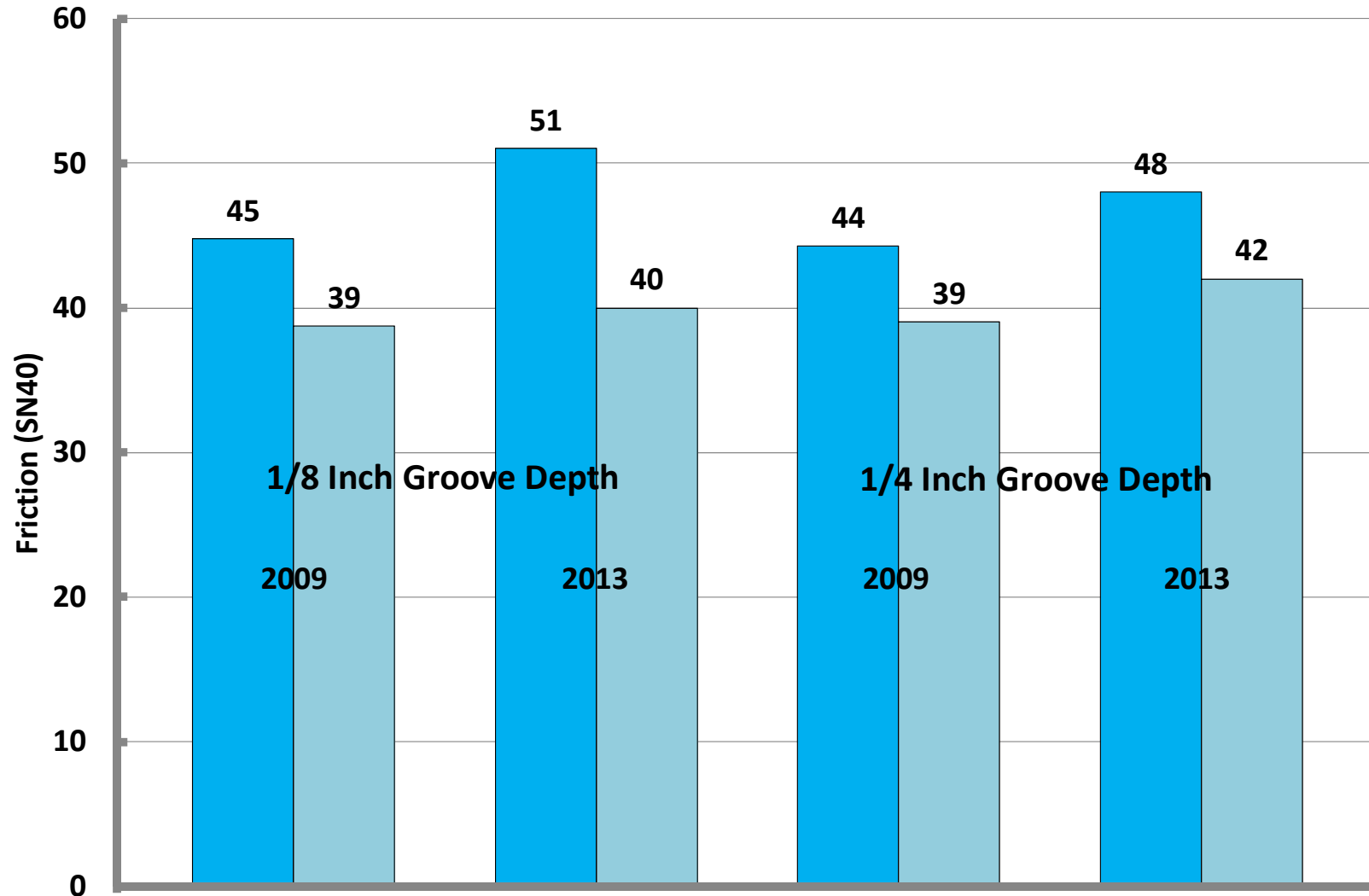
Results Section



Impact of Groove Depth on Friction (FN40)



Effect of Groove Depth

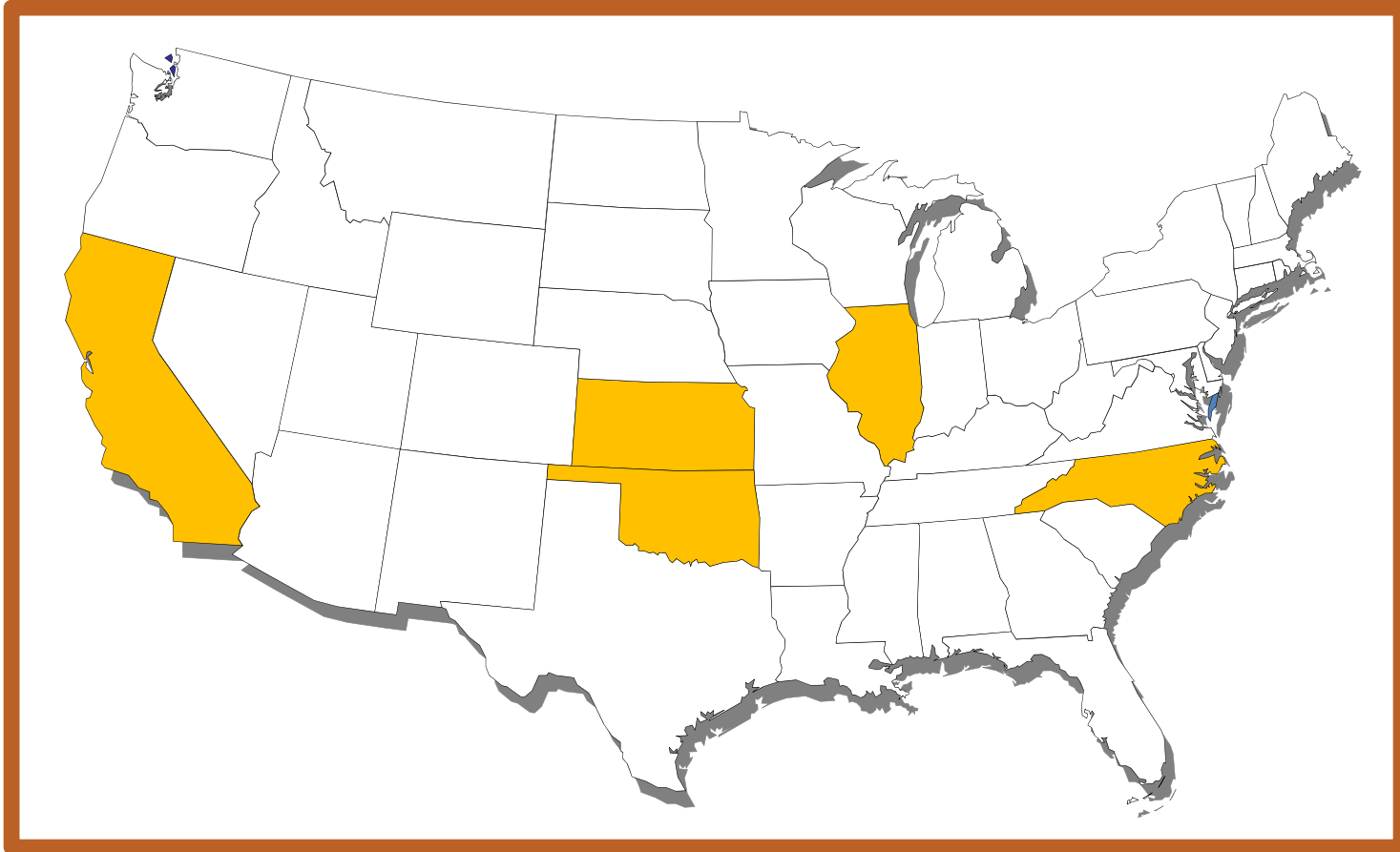


Summary Slide on Impact of Groove Depth

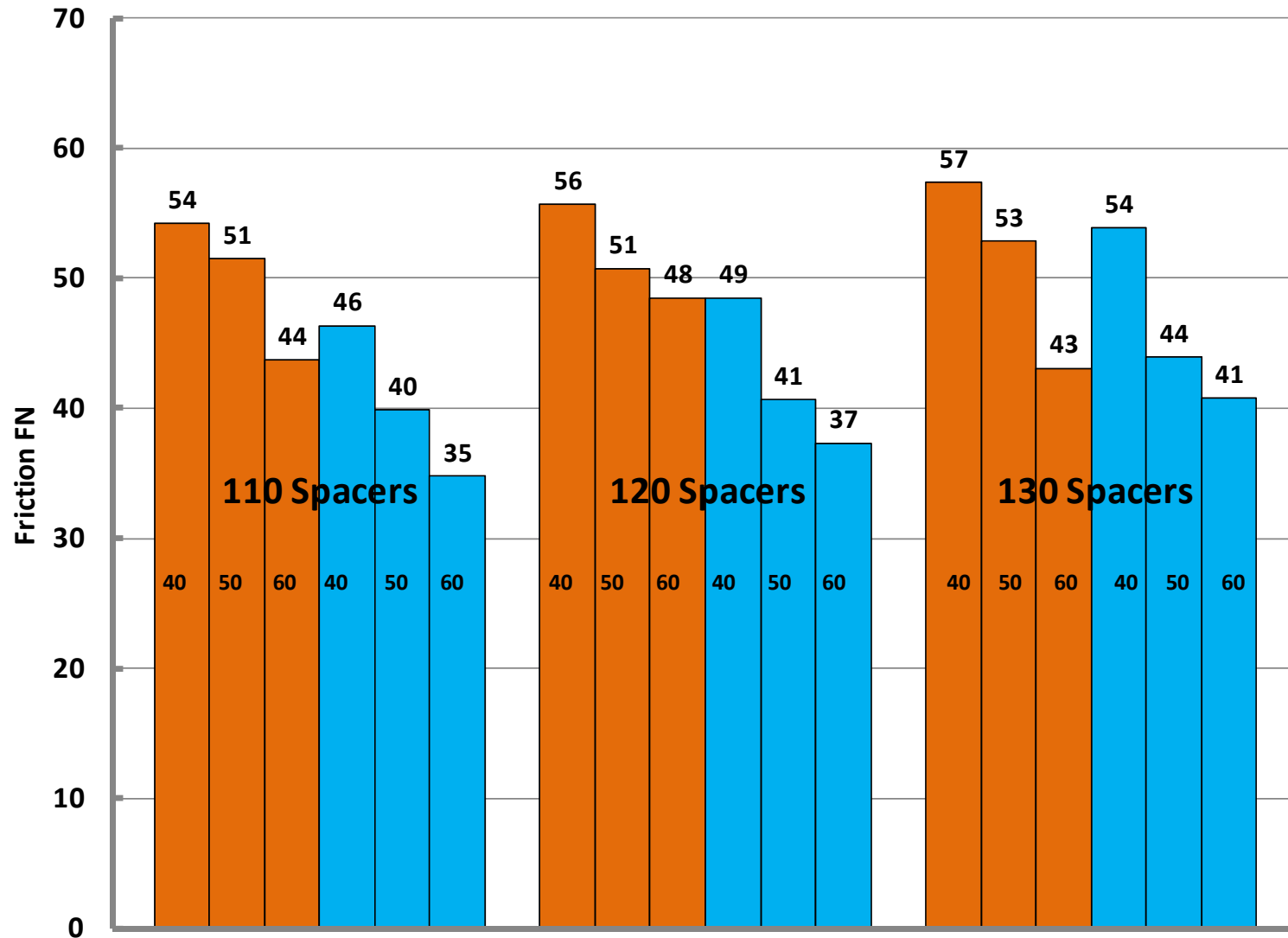
- No Apparent Difference



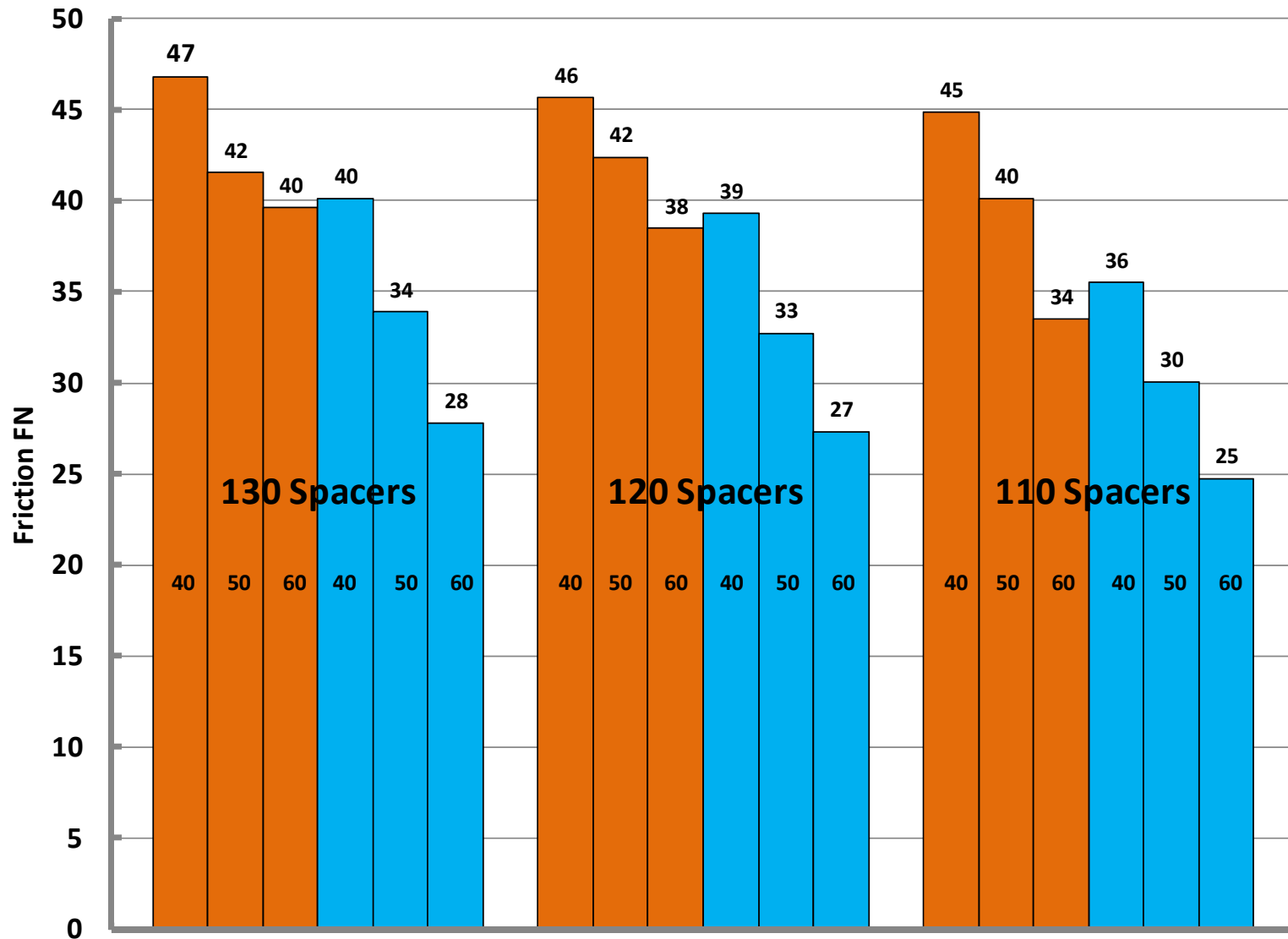
Spacer Width Experiment



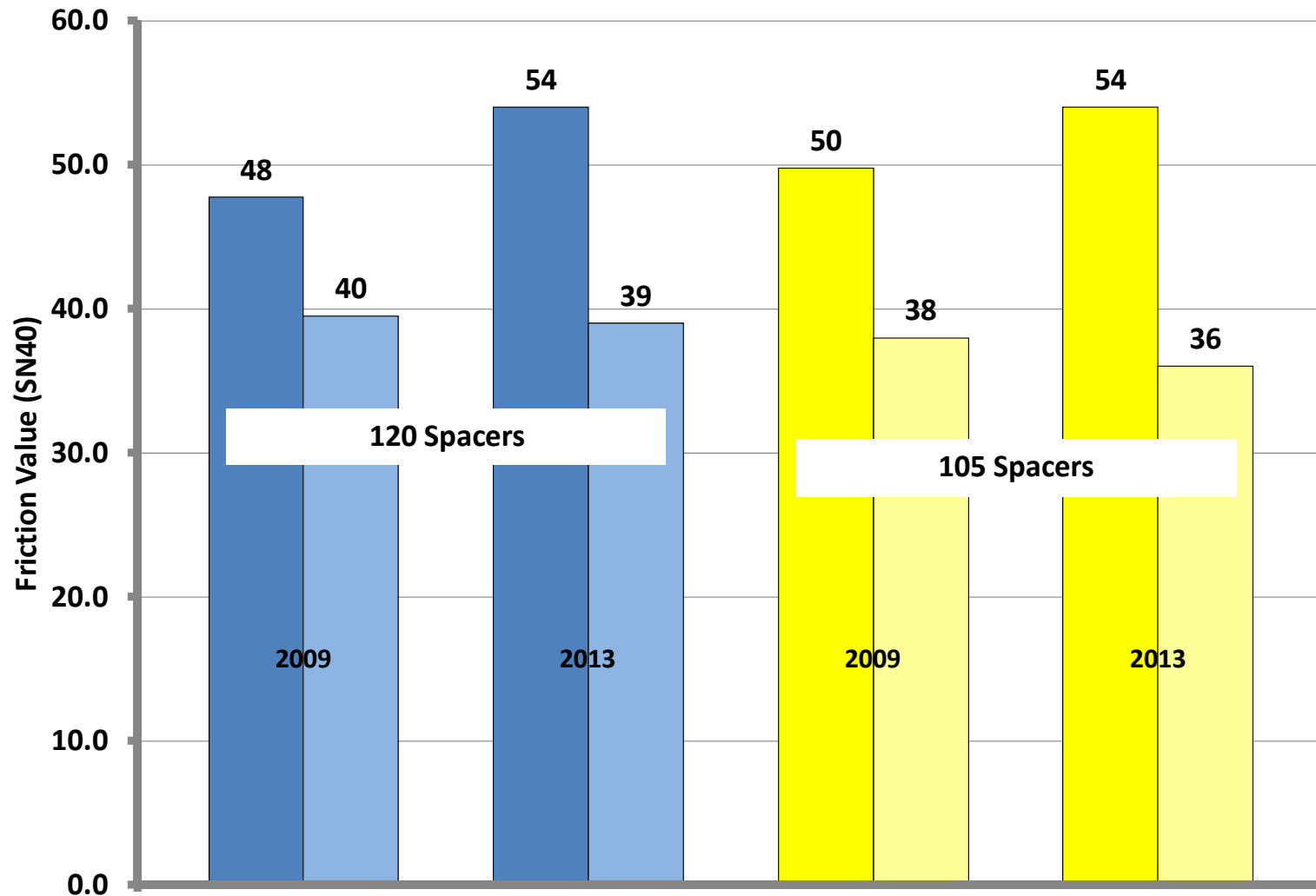
North Carolina Friction Sites < 1 yr of Traffic



Oklahoma Friction Site- < 1 Year



Effect of Spacers- 10 Years of Traffic



Summary Slide on Impact of Spacer Width on Friction (FN40)

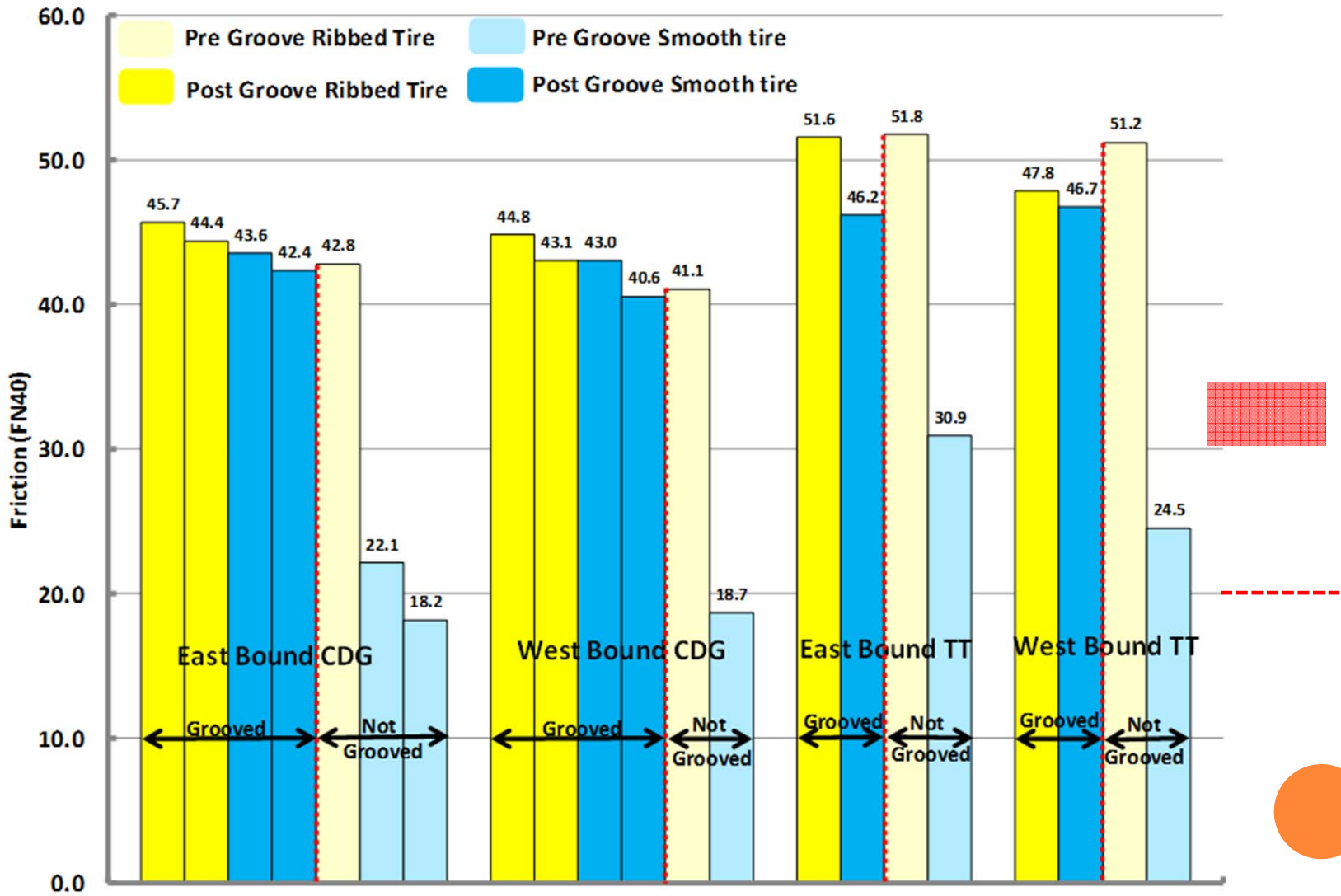
- Jury Still Out: Wider Spacers Probably Increase Friction but not by much



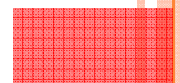
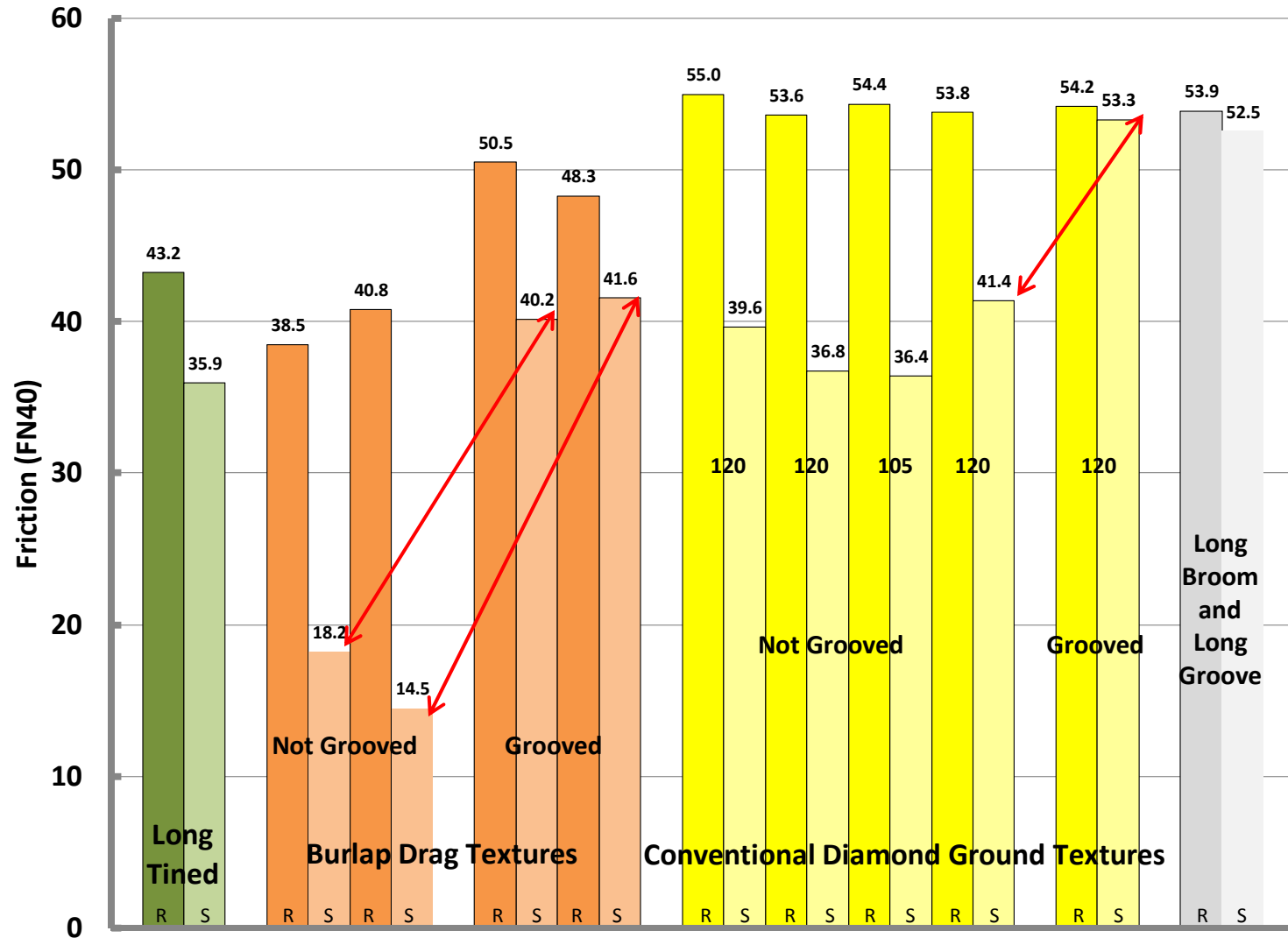
Effect of Grooving on Friction



Ohio - 1 Year Old



California - 10 Years Old

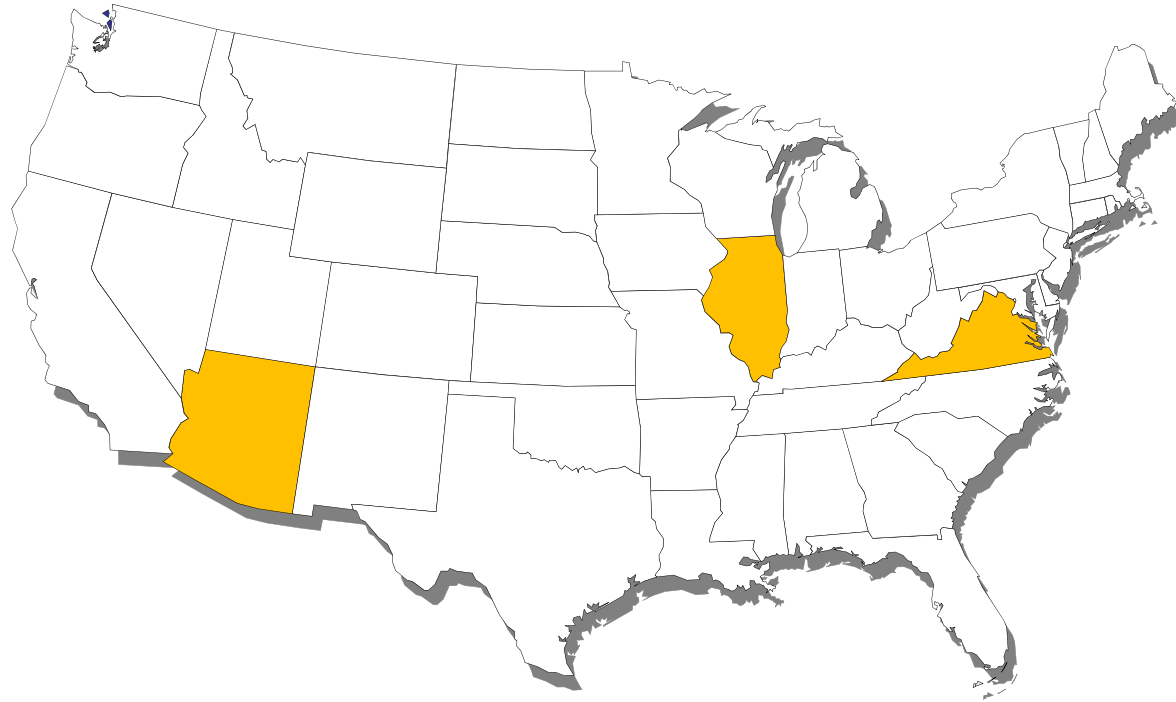


Summary Slide on Impact of Grooving

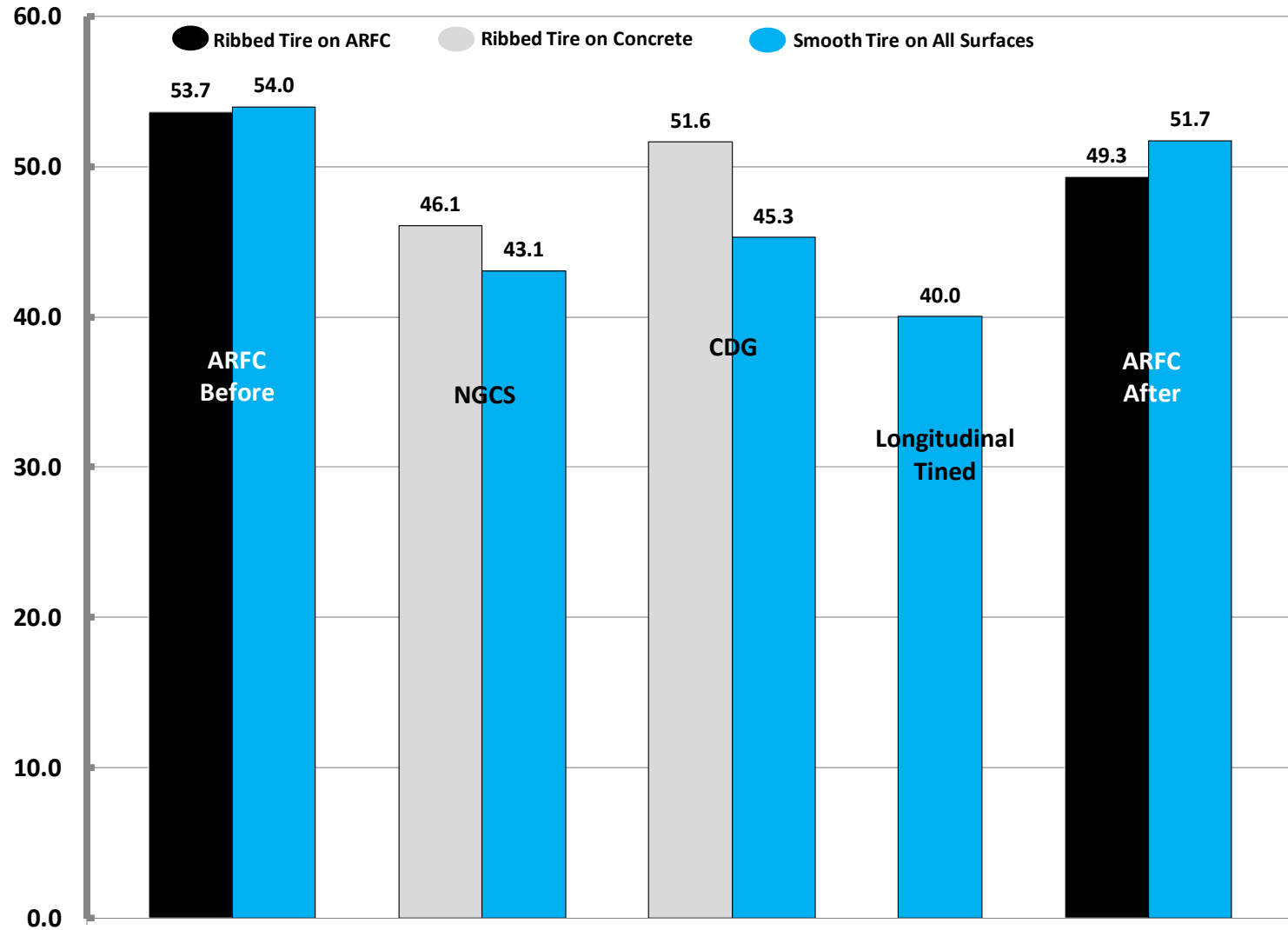
- Grooving has a dramatic effect on surfaces with low macrotexture



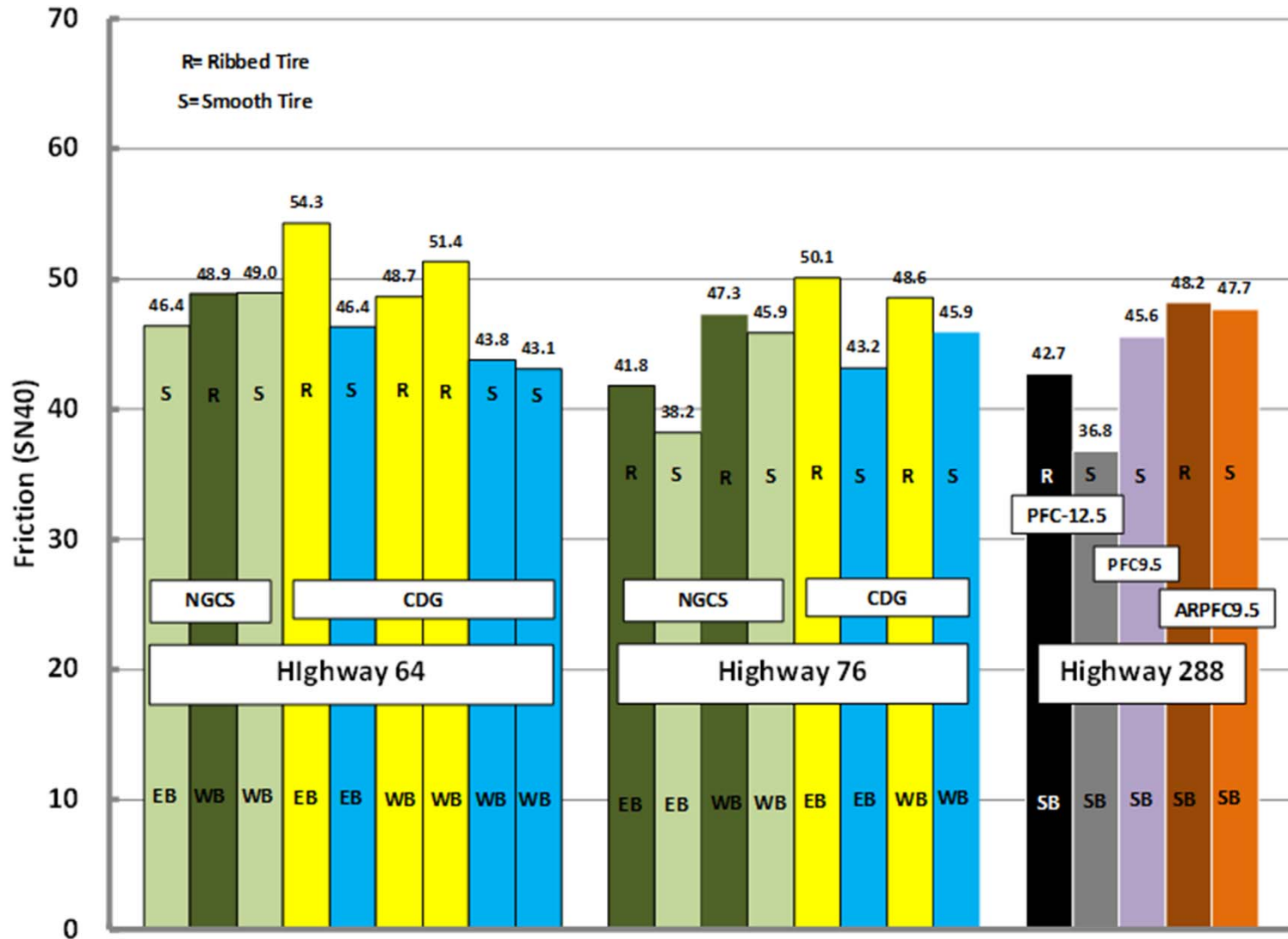
Comparison to Other QP Surfaces



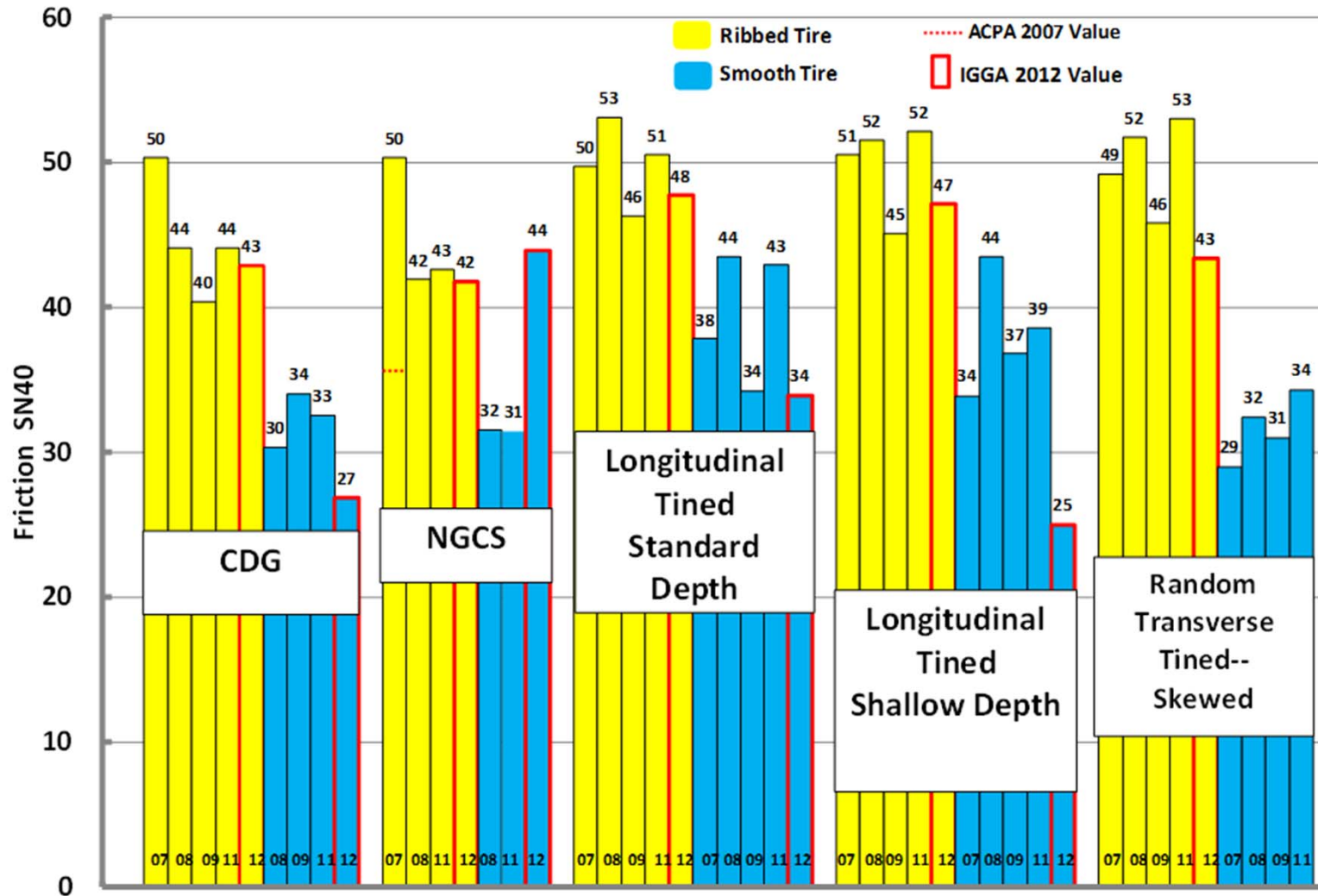
Arizona 1 – Year Old



Virginia QP Sites



Comparison to Other Concrete Surfaces

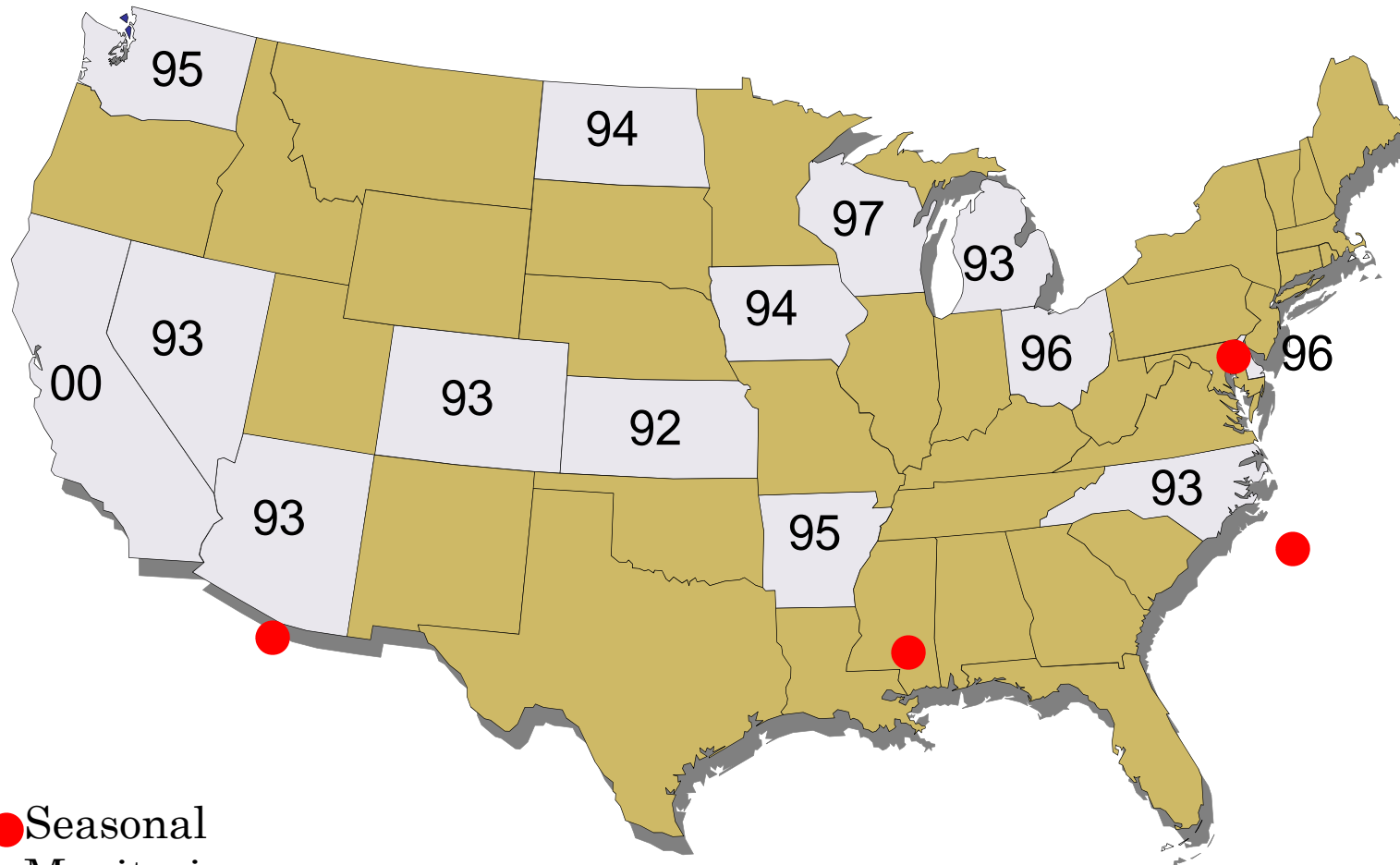


Summary Slide on Competitiveness of Diamond Ground Surfaces

- Diamond Ground Surfaces are Competitive with AC and other PCCP Surfaces— There is variability



LTPP SPS-2 National Research Project

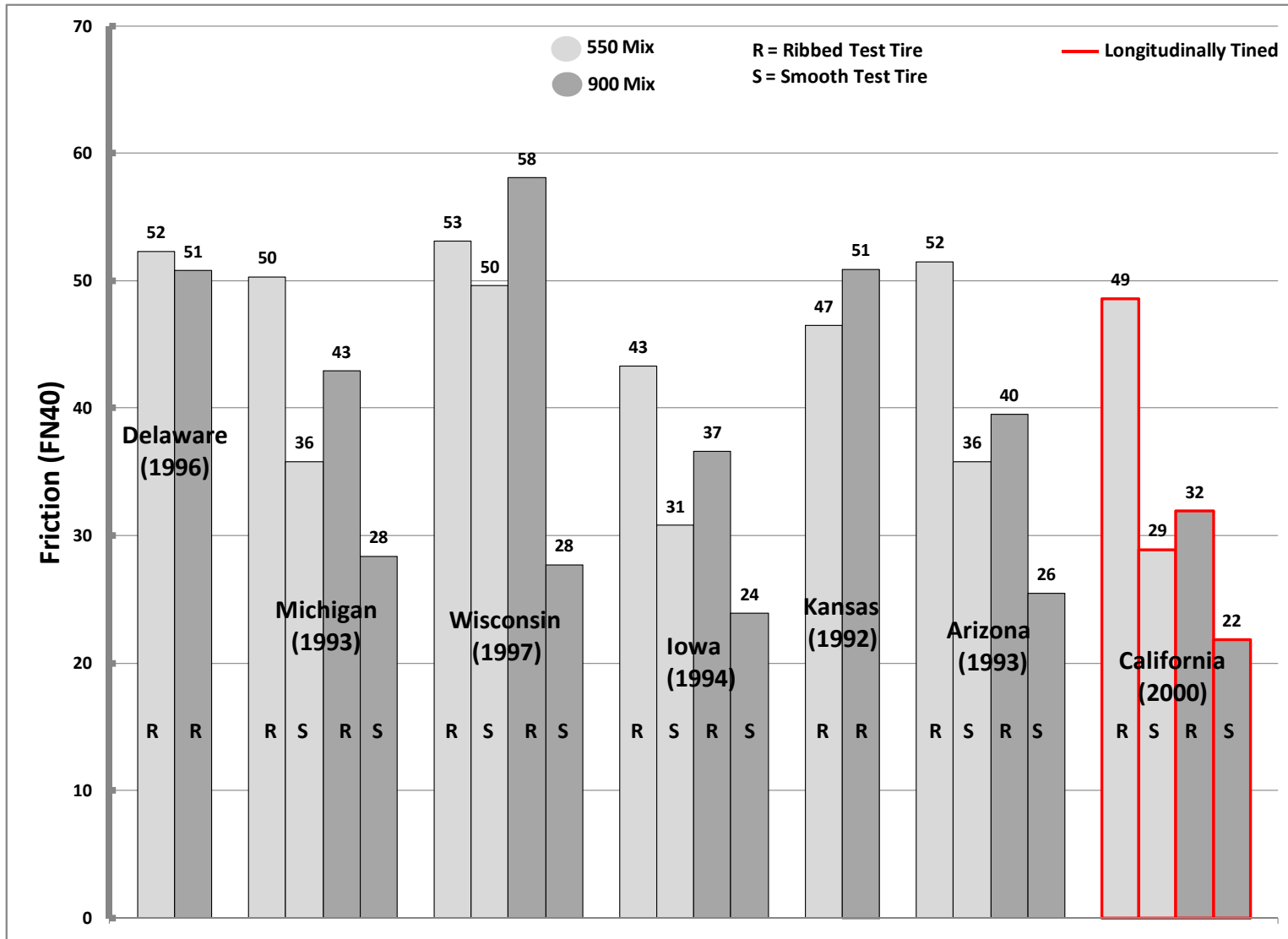


● Seasonal Monitoring Site



SPS-2 Friction Comparison

550 vs 900 psi Mixes



Summary of 550 vs 900 psi Mix Results

- 550 psi Mixes Always Exhibited Higher Smooth Tire FN40



The Road Ahead

- Work Will Continue with New Test Section Construction Planned for 2013

