Need for a Bump Ride Panel – A Case Study

- Carl Bertrand, Spectral Measurements, LLC
- RPUG Meeting, October 27, 2008
- Austin, Texas

Sponsors

- Dr. Magdy Mikhail, Texas Department of Transportation
- Dr. Emmanuel Fernando (TTI) Interagency Contract, Subcontract

Information Sources

- TxDOT Item 585 “Ride Quality for Pavement Surfaces”, 2004
- TRB 1861, 2003 “Using a Ride Quality Index for Construction Quality Control and Acceptance Specifications” – Swan and Karamihas
- CDOT’s July3, 2008 revisions to “Standard Specifications for Road and Bridge Construction” for HMA pavement roadway smoothness using a high speed profiler.

Inertial Profile Data Used for Comparisons

- Dynatest Mark III – TxDOT Certified, SLS5000 small spot laser, 6 in. profile interval, 200 ft long wavelength cutoff, PaveTex (owner/operator)
- IH10 East – Lane R1 – approx. 20 mile project, Junction Area Office
- ACP
- Before & After Grind Profiles

Goal of Case Study

- Compare existing bump locators
- Use of ProVAL SAM
- Can existing ProVAL SAM be implemented within TxDOT immediately?

Existing Bump Locators

- TxDOT_Ride Quality - Localized Roughness
- ProVAL 2.73 (multiple processes available)

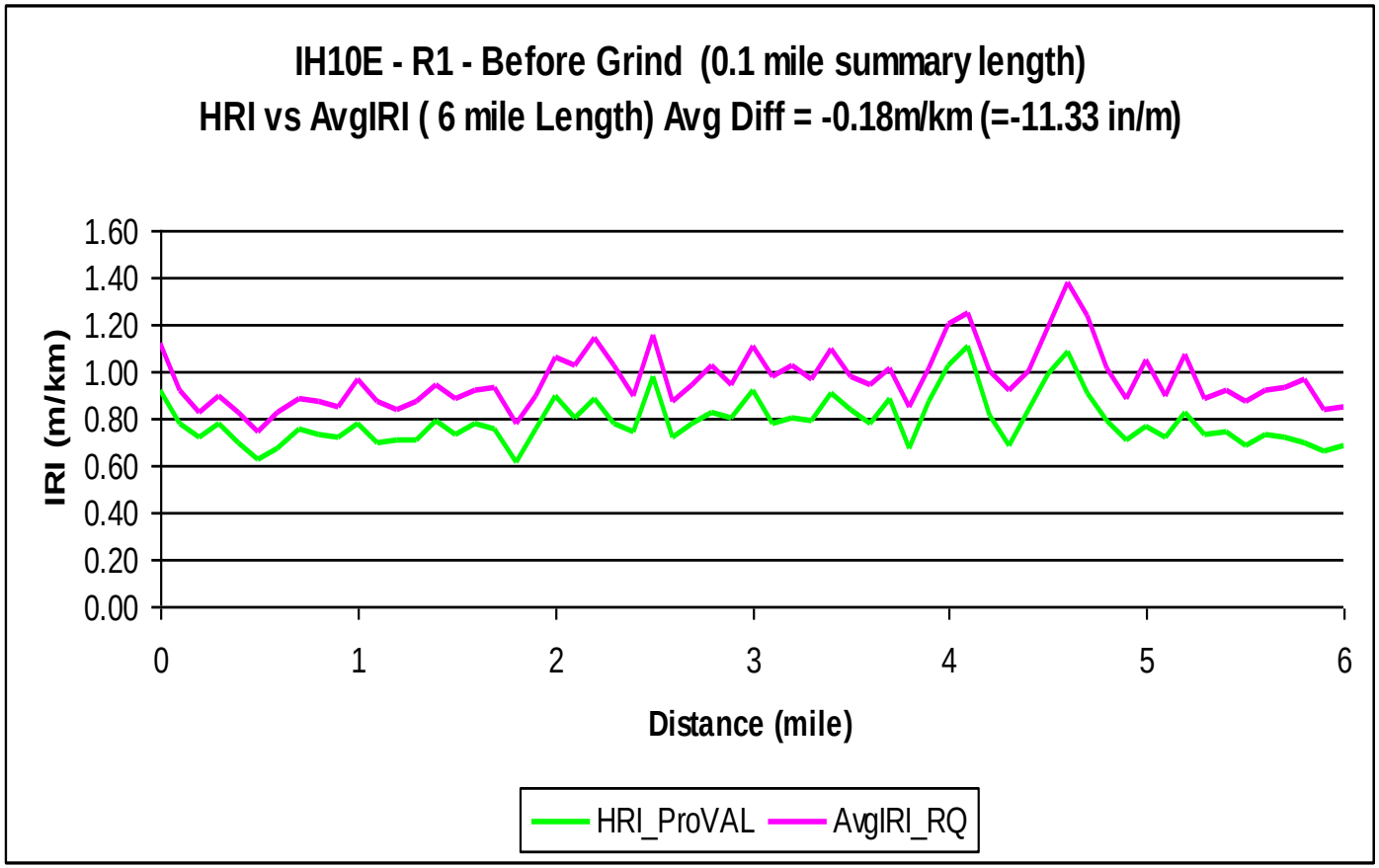
TxDOT_RQ Localized Roughness

- Average of L & R Wheel Paths
- 25 FT Moving Average through Avg. Profiles
- Deviations > +/- 0.15 inches (bumps and dips)

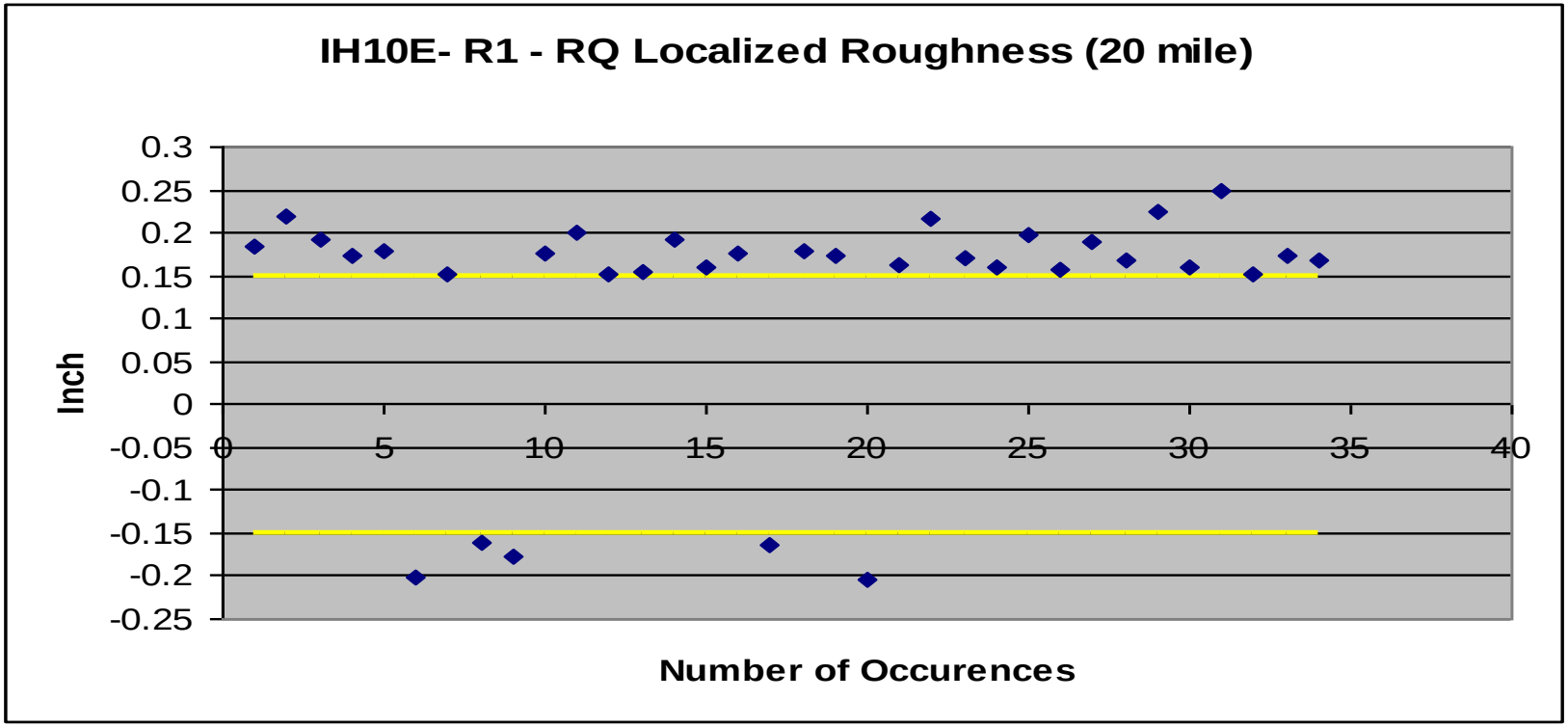
Are HRI and average IRI the same?

- Used ProVAL 2.73 to compute HRI
- Used TxDOT Ride Quality 2005.05.13 to compute average IRI

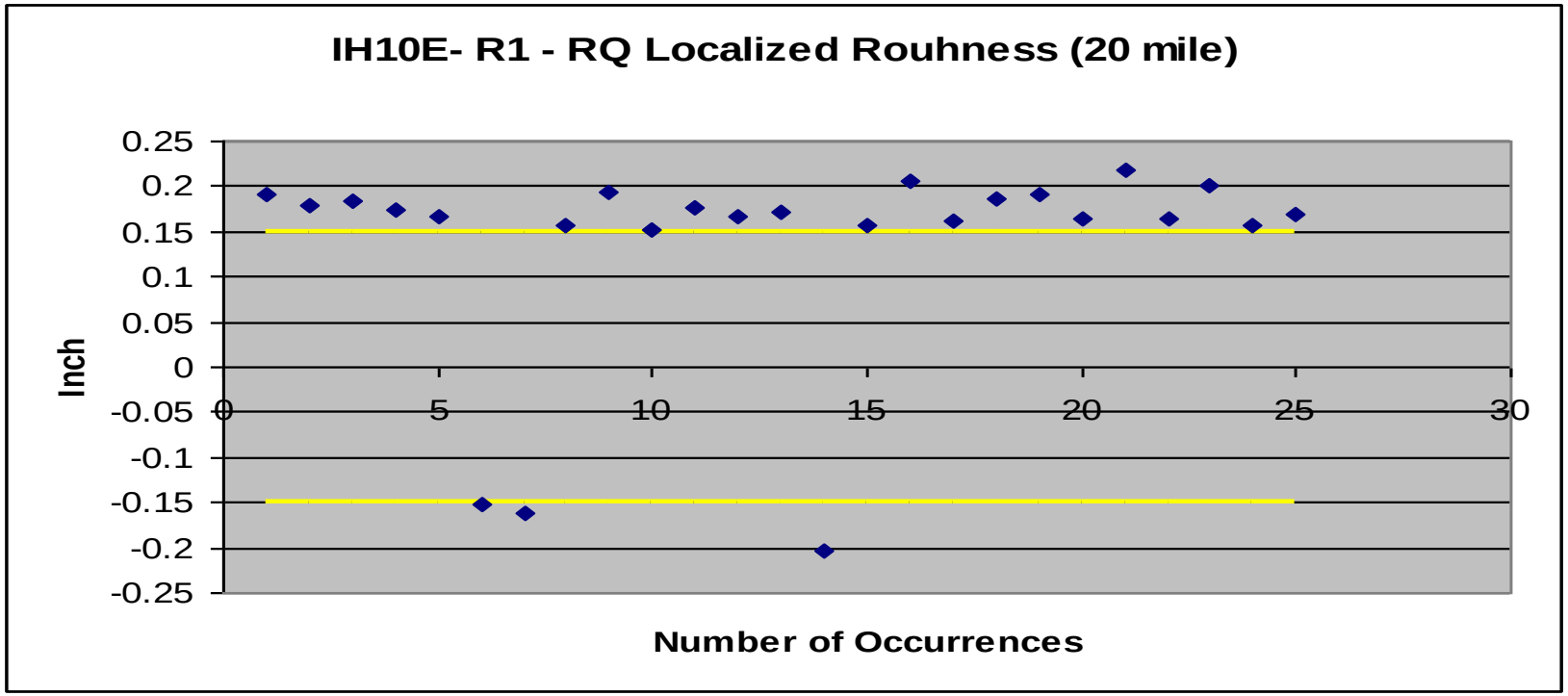
HRI vs. Avg. IRI
IH10E – R1 (6 m) Before Grind



TxDOT Localized Roughness from ProVAL - Before Grind



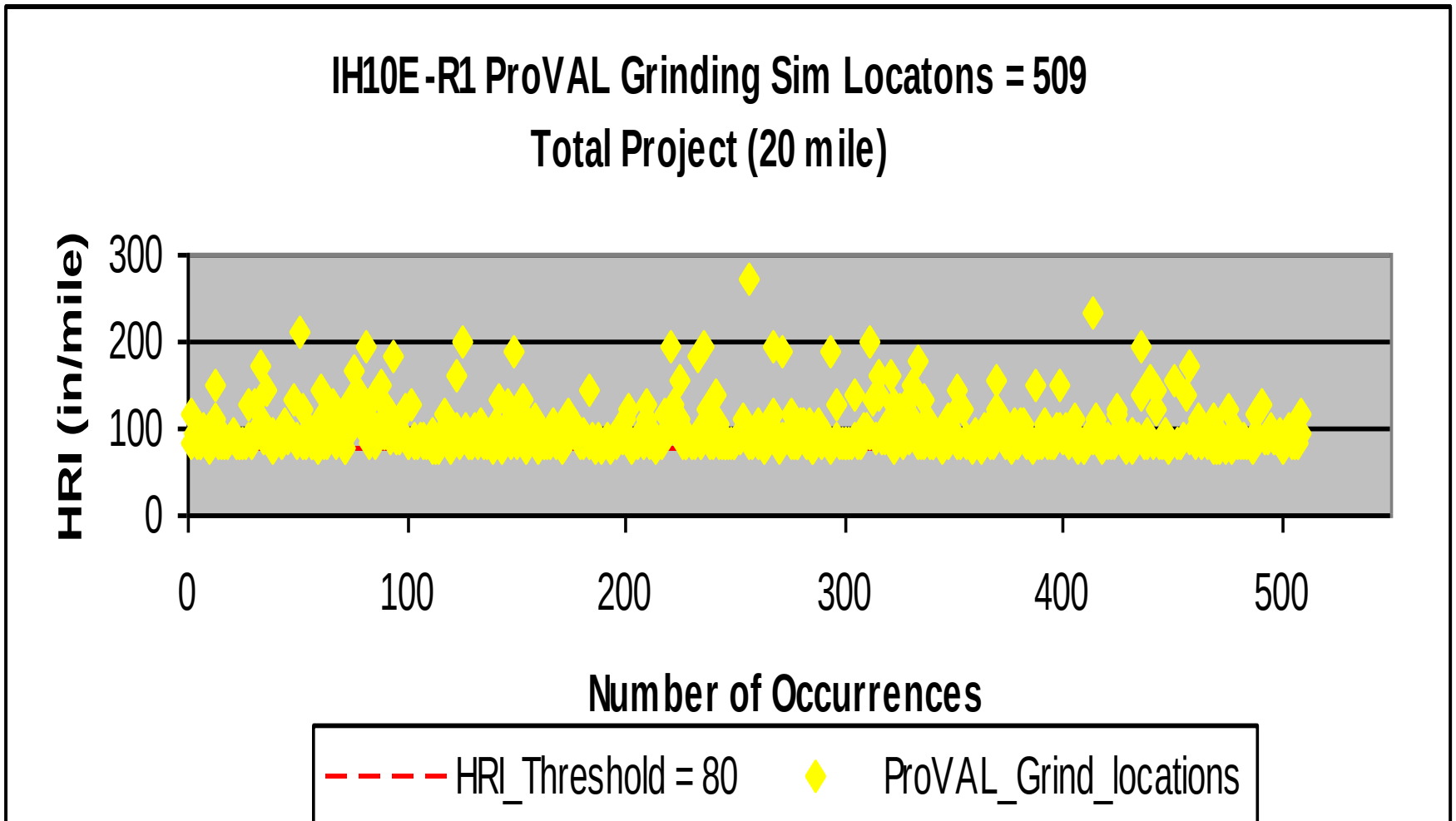
TxDOT Localized Roughness from ProVAL – After Grind



ProVAL Grind Parameters Used

- HRI Threshold = 80 in/mile (1.26 m/km)
- Continuous Reporting Short Interval = 25 ft
- Short Cutoff Wavelength = 0.82 ft
- 250 mm filter not applied to profile

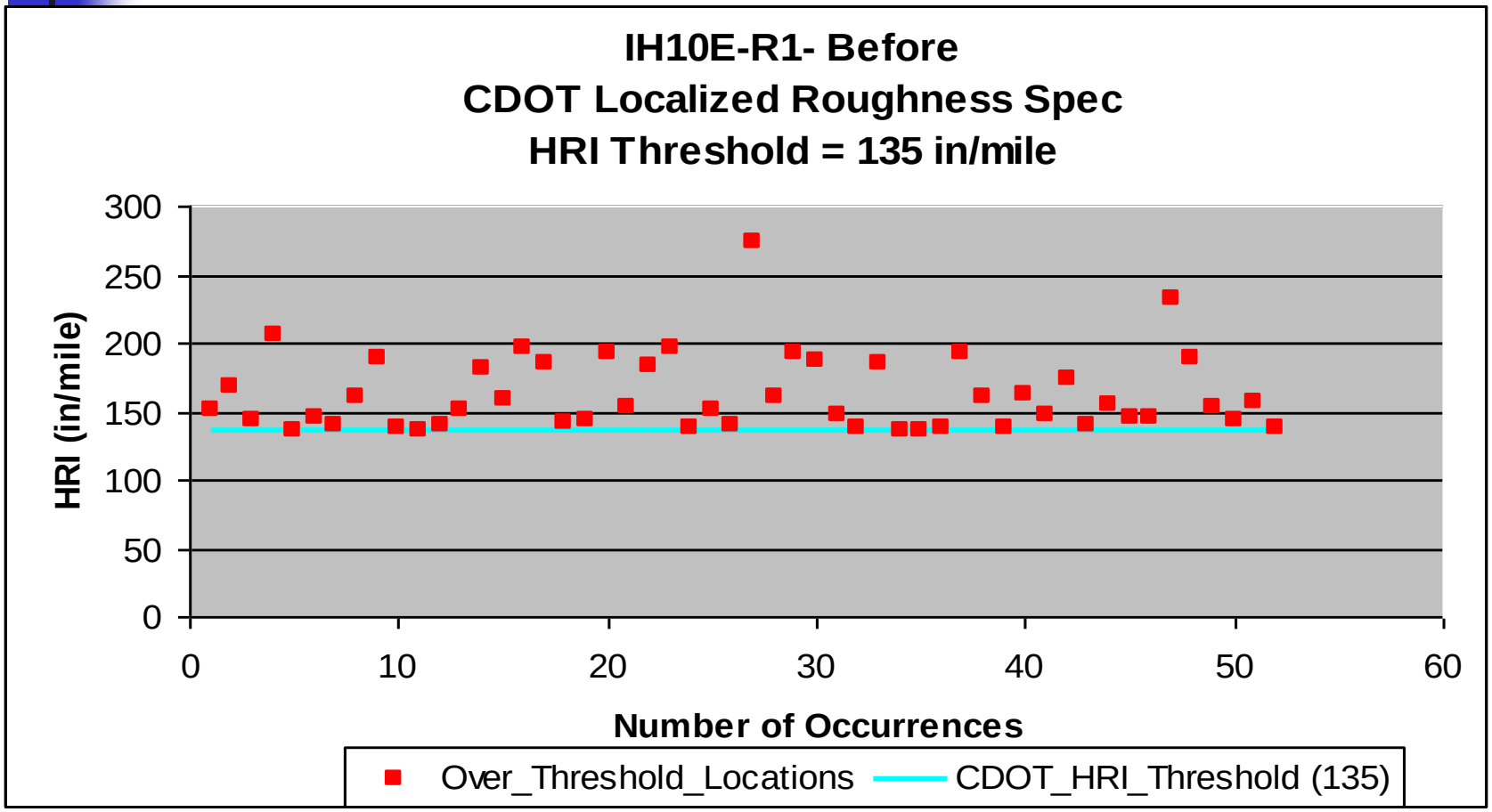
ProVAL Over Threshold – Bumps



Colorado ProVAL Parameters

- HRI Threshold = 135 in/mile (2.129 m/km)
- Continuous Short Interval = 25 ft
- 250 mm filter applied to profile

CDOT Localized Roughness Analysis

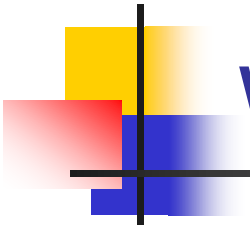


TxDOT Item 585 Schedule 1- Contractor Penalty- Before Grind

Process	Bump	Dip	($*1,000)
TxDOT_RQ	28	5	-$16,500
ProVAL_Grind	509	N/A	-$254,500
CDOT	53	N/A	-$26,500

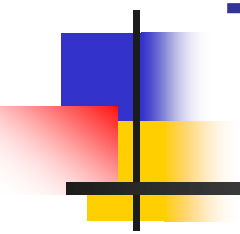
Localized Roughness - Conclusions

- Summary statistics are not the same (AvgIRI vs. HRI).
- Comparisons between TxDOT method & HRI based method are poor, resulting in large contractor pay differences.



What about user comfort?

- Threshold values need to be evaluated for implementation consistency.
- Threshold value determination should have the users perception as an input.



Thanks

Questions?