TPF 5(063)
"Improving the Quality of Pavement Profile Measurement" Update

Pavement Evaluation 2014

Blacksburg, VA

U.S. Department of Transportation
Federal Highway Administration

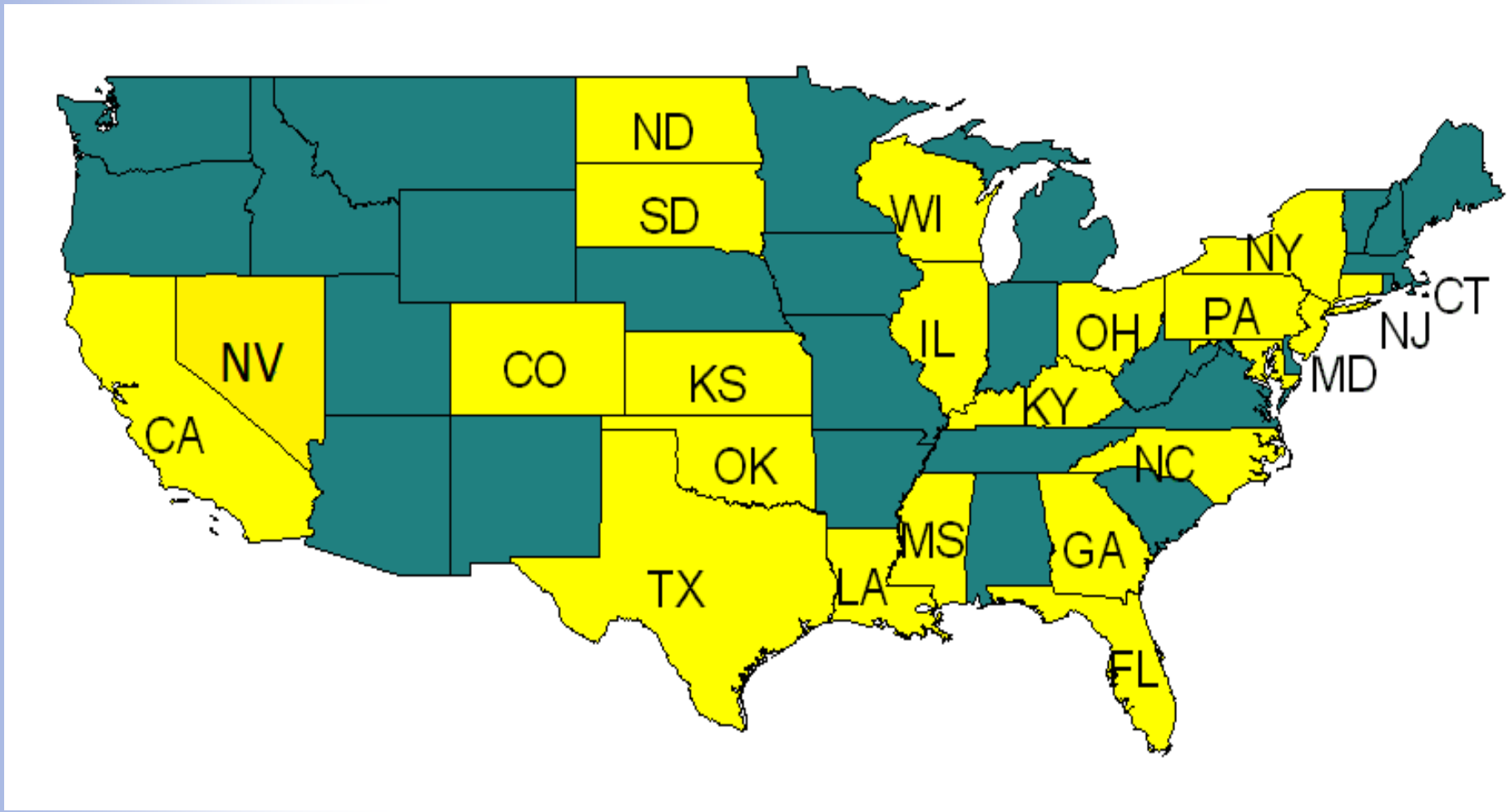
Overview TPF 5(063)

- “Improving the Quality of Pavement Profiler Measurement”
- FHWA is lead agency with 22 participating State Highway Agencies (SHA’s) includes:
  - FHWA Office of Technical Services / Resource Center
  - FHWA Long Term Pavement Performance (LTPP)
  - FHWA Federal Lands

Participating State Agencies (22)

- Ohio
- Louisiana
- Kentucky
- California
- Colorado
- Florida
- Georgia
- Kansas
- Mississippi
- New Jersey
- Nevada
- New York
- North Dakota
- South Dakota
- Illinois
- North Carolina
- Maryland
- Oklahoma
- Connecticut
- Texas
- Wisconsin
- Pennsylvania

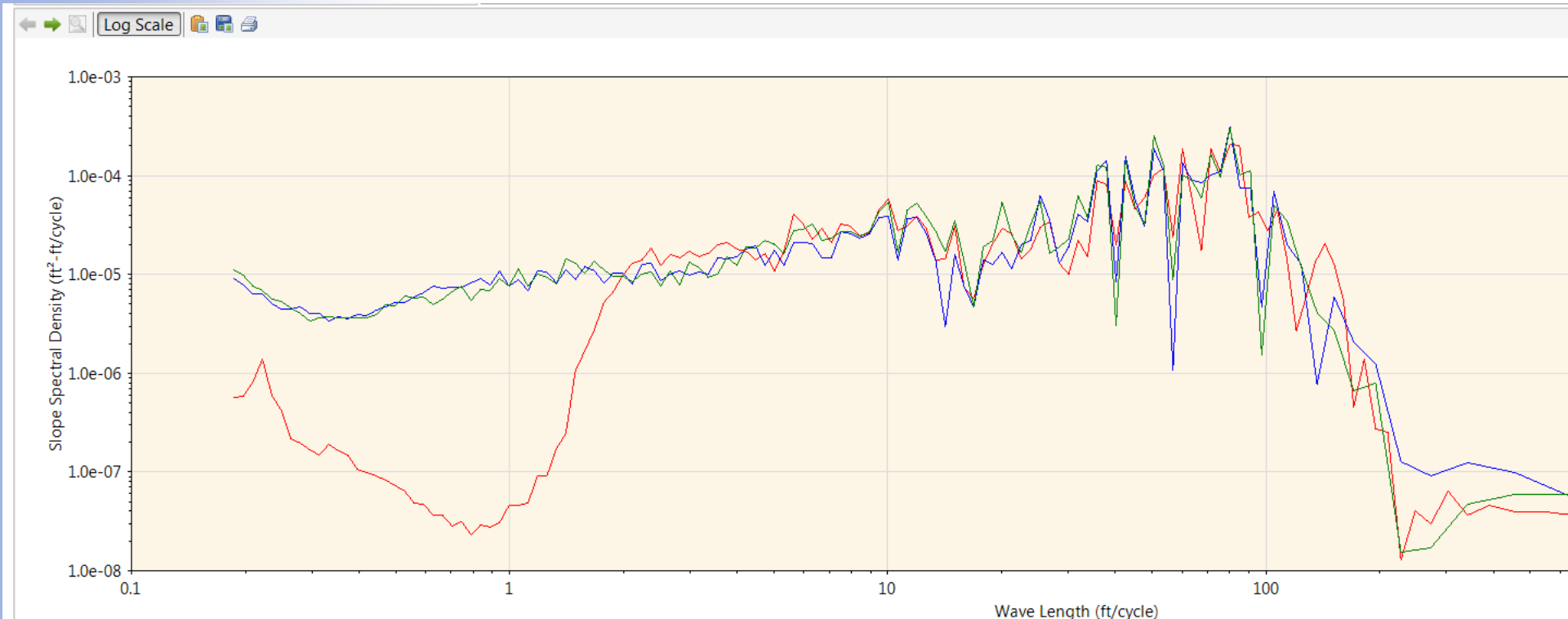
Participating State Agencies



Inertial Profilers Vary!!!

Inertial Profilers vary - continued

- All three devices from same manufacturer and all three are supposed to be **not** using a low pass filter. Is there a low pass filter being applied to one of the devices???



TPF 5(063) Priorities

1. Build Reference Profile Device
2. Critical Requirements
3. Bumpfinder Software
4. Certification/Validation Sites
5. Evaluating Upper Limits of Single Accelerometer
6. Emerging Technology that Enhances Profile Measurement

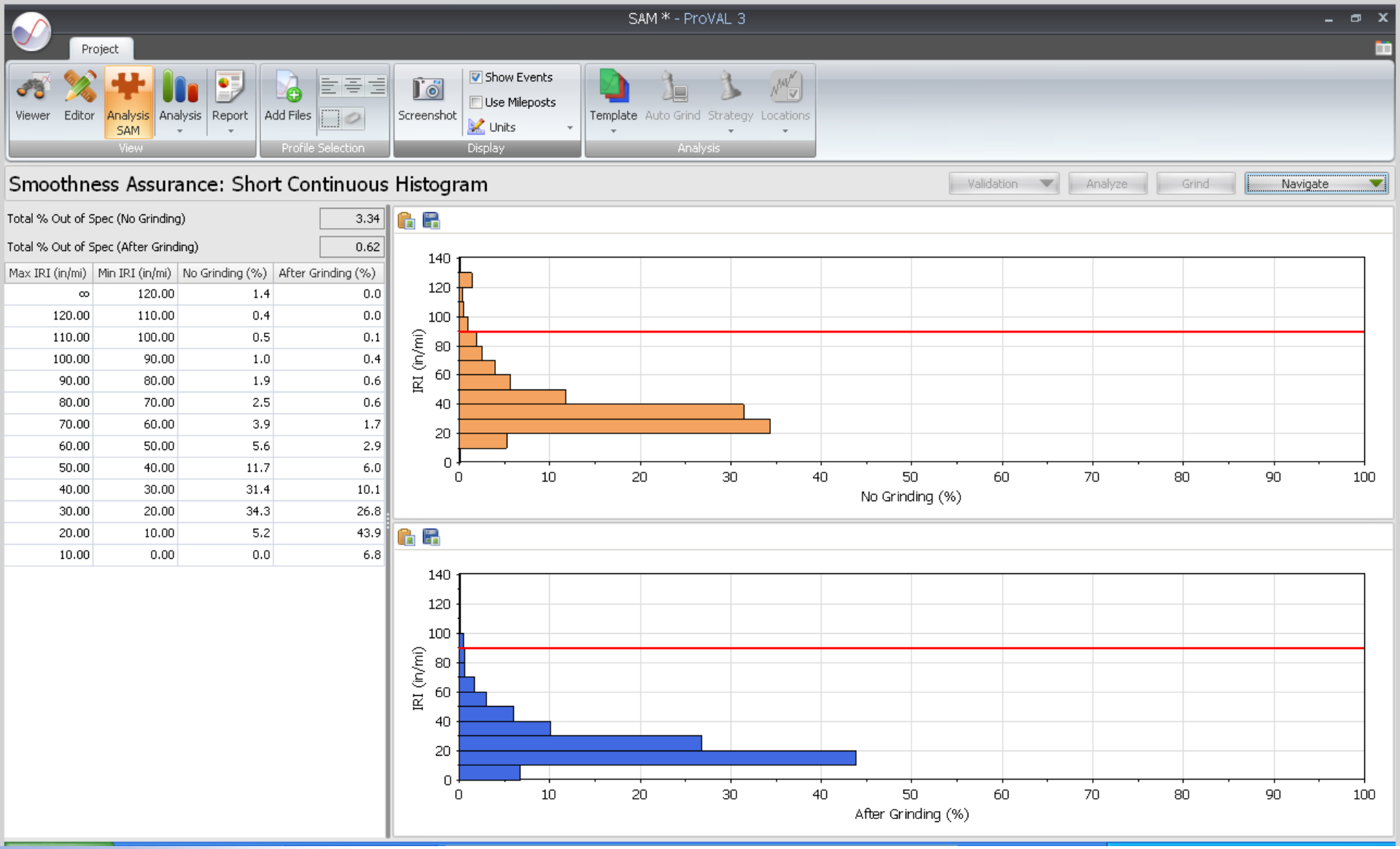
Progress on TPF 5(063) Priorities

1. Build a Reference Profile Device (ongoing): Two parts –
   i. Benchmark Testing – UMTRI
   ii. Reference Devices – Last round of evaluations Oct. 2012
   iii. Next round of evaluations: 2015
2. Critical Requirements (completed): UMTRI; final report on pooled fund study website – “Critical Profile Accuracy Requirements”

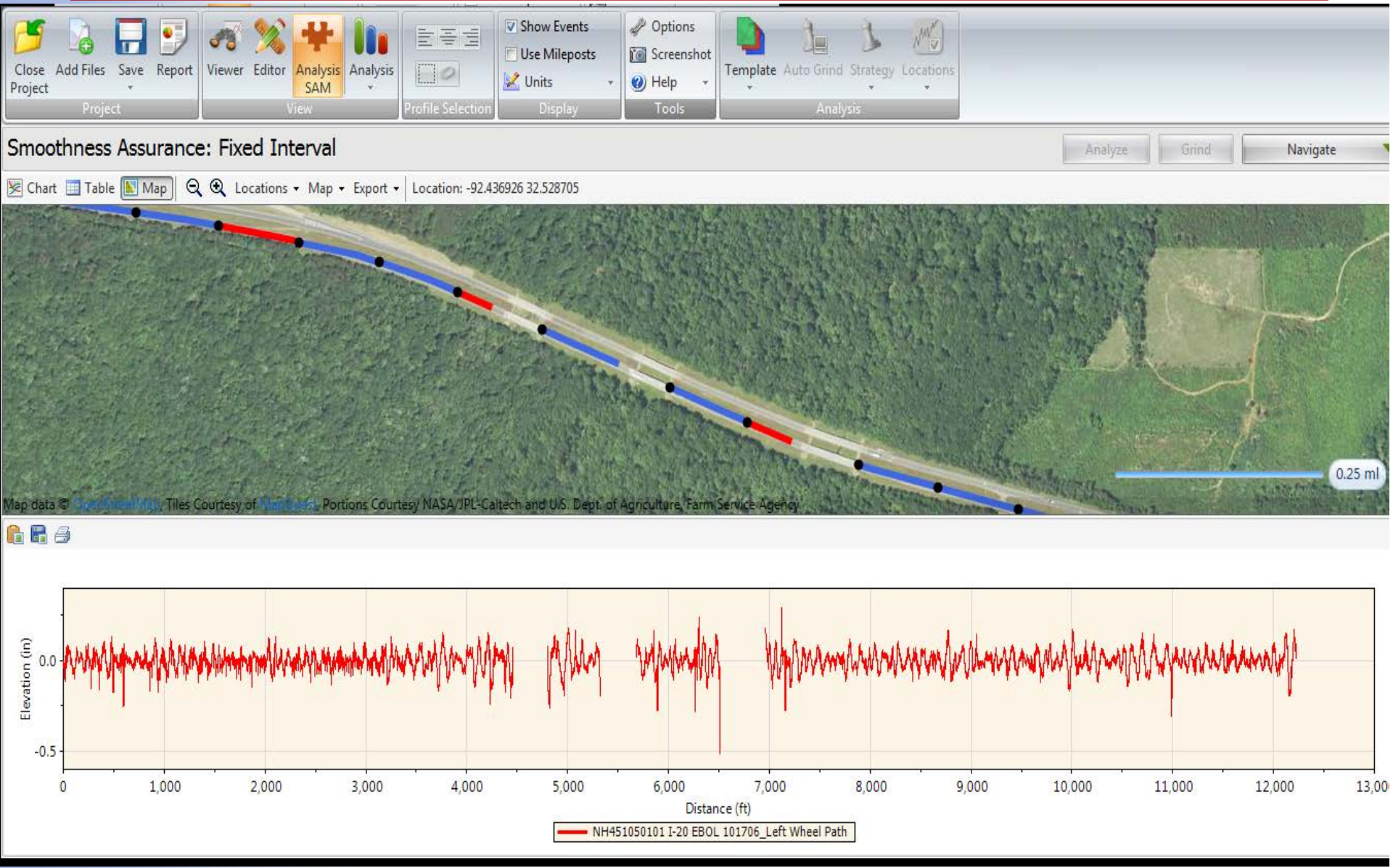
TPF 5(063) Priorities - continued

3. ProVAL Software: The Transtec Group, Inc. – www.roadprofile.com
   - ProVAL 3.3 released in December 2011
     - Includes Automated Faulting Module (AFM)
   - ProVAL 3.4 released Dec. 2012
   - ProVAL 3.5 released Sept. 2014
   - Multiple workshops – 10 annually
     - Scheduling completed for FY14

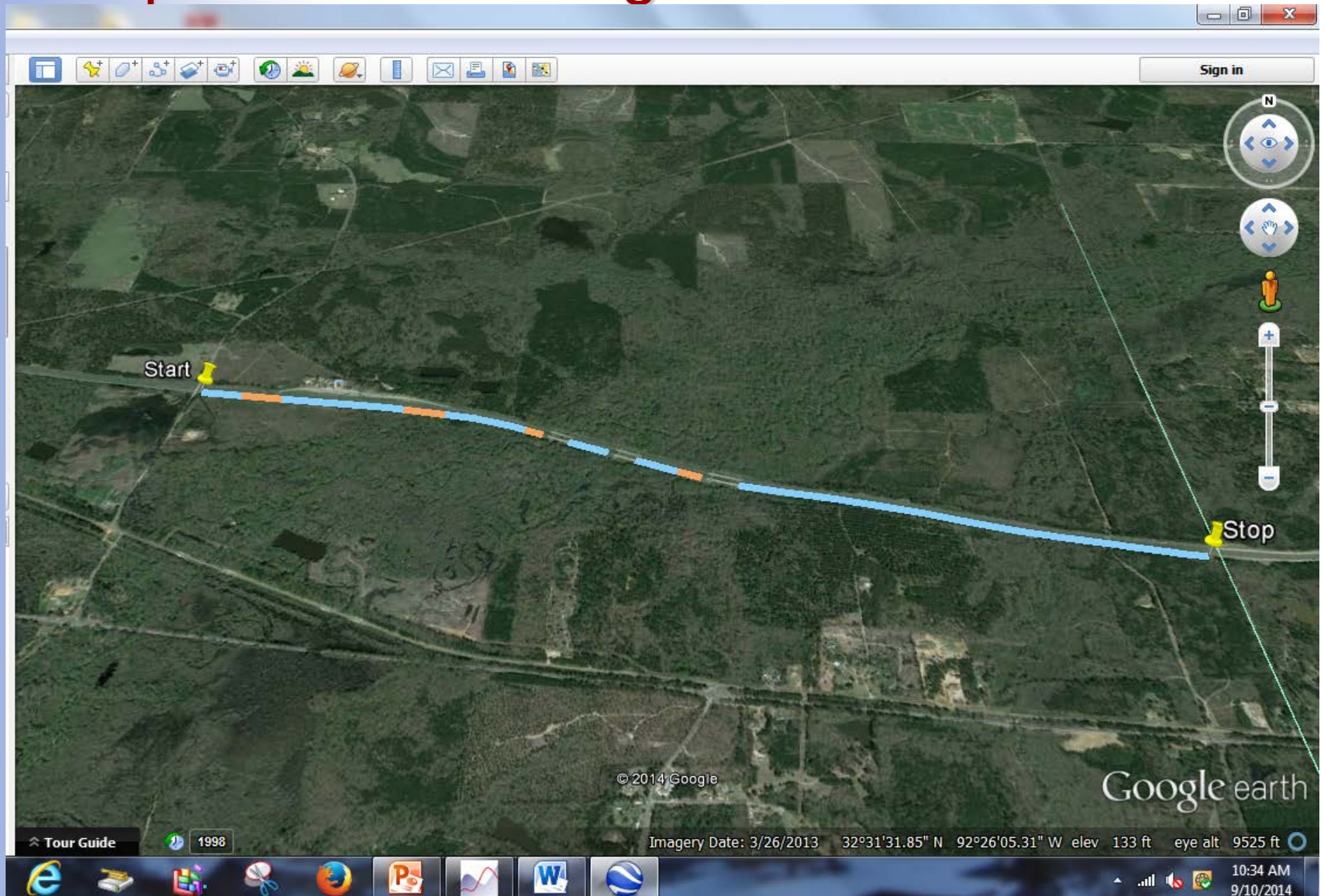
ProVAL 3.4 software & workshops



ProVAL Version 3.5 to include mapping



Export files to Google Earth



TPF 5(063) Priorities continued

4. Certification/Validation Site
   i. FHWA Study completed Sept. 2014 by SME, Inc. (Perera)
5. Evaluating Upper Limits of Single Accelerometer
   i. Phase I: Starodub, Inc. – complete
   ii. Phase II: Completed Dec. 2011
6. Emerging Technology that Enhances Profile Measurement
   i. Urban IRI measurement - NCHRP
   ii. Urban and low speed profile indices

TPF 5(063) Priority Number 1

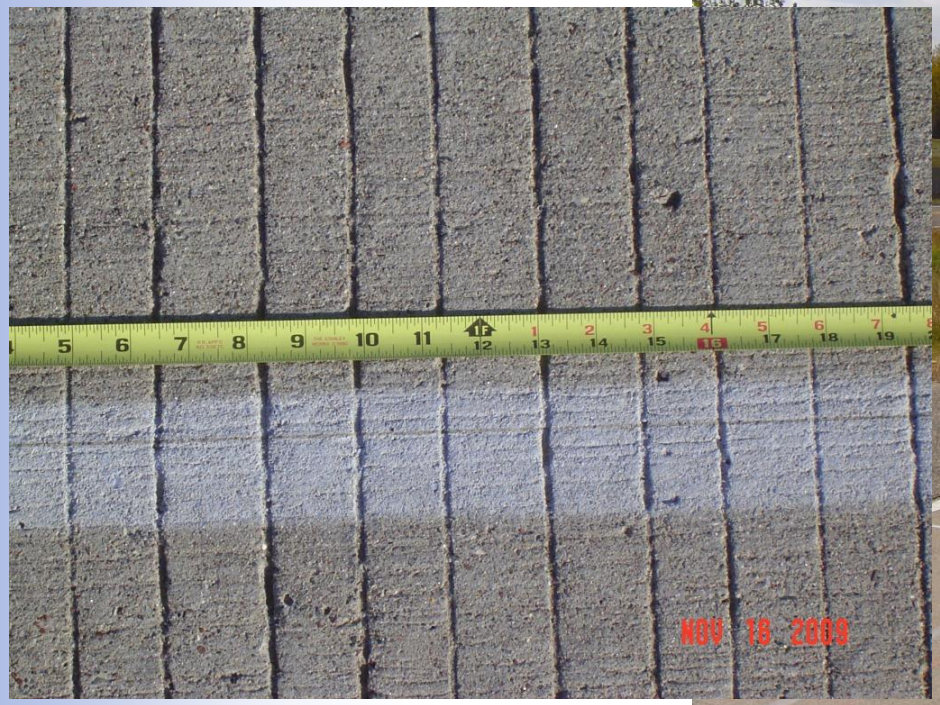
- Build a reference device
  - Need a Ground Truth – Built a Benchmark Cart (UMTRI)

TPF 5(063) Priority Number 1

- First round of evaluations in 2009/2010.
- Second round in October 2012.
- Next round of evaluations in 2015.
  - Need Six Pavement Surfaces:
    - Transverse Tined Concrete
    - Conventionally Ground Concrete
    - Dense Graded Asphalt
    - Negative Texture i.e. Open Graded OR Porous Pavement
    - Coarse Chip Seal
    - Longitudinal Tined Concrete

TPF 5(063) Priority Number 1

- Need Six Surfaces
  - Transverse Tined PCC

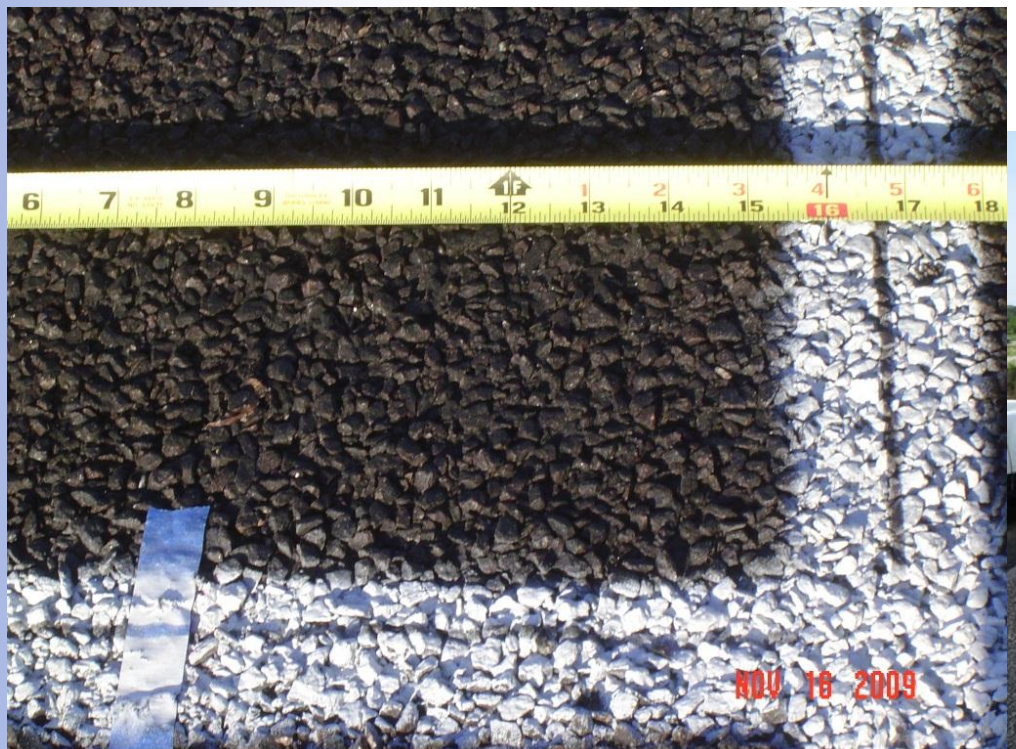


TPF 5(063) Priority Number 1

- Need Six Surfaces
  - Dense Graded AC

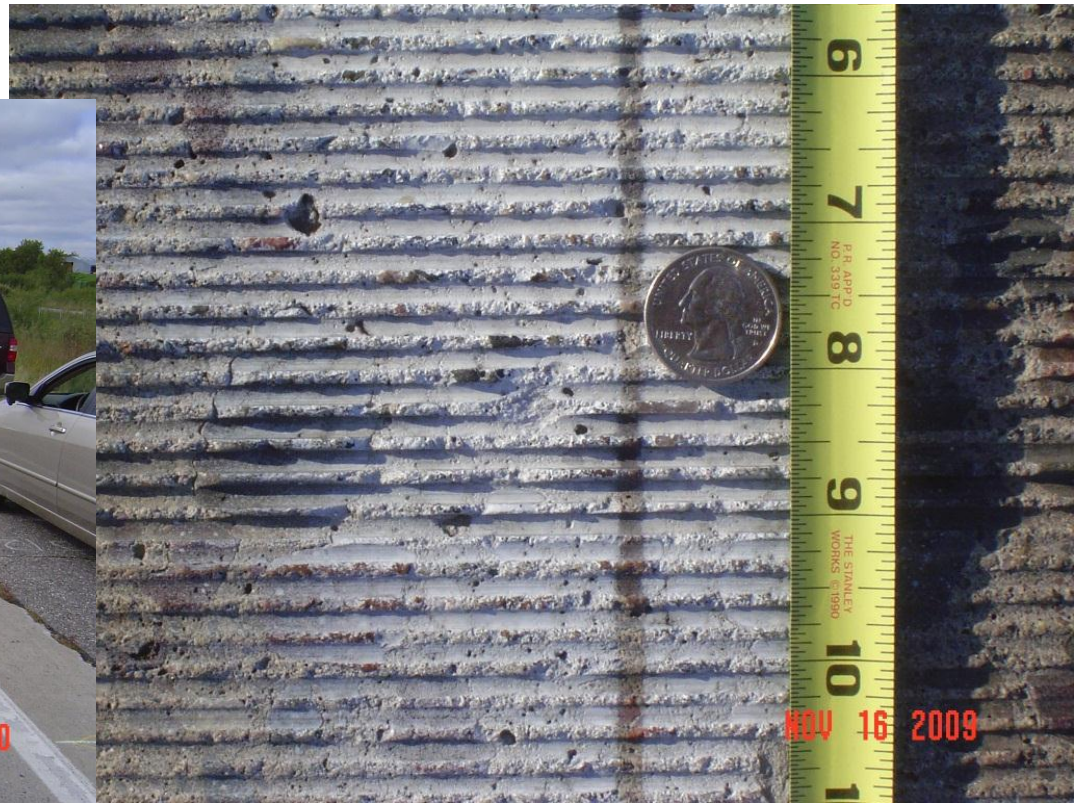
TPF 5(063) Priority Number 1

- Need Six Surfaces
  - Coarse Chip Seal (positive texture)



TPF 5(063) Priority Number 1

- Need Six Surfaces
  - Conventional Grind on PCC



TPF 5(063) Priority Number 1

- Need Six Surfaces
  - Negative Texture – Porous AC

TPF 5(063) Priority Number 1

- Need Six Surfaces (2009/10)
  - Longitudinal Tined PCC - Wisconsin

TPF 5(063) Priority Number 1

- Need Six Surfaces - 2012
  - Longitudinal Tined PCC now at MnROAD

TPF 5(063) Priority Number 1

- Build a reference device – VERY CLOSE
  - Next round of evaluations – 2015

TPF 5(063) Priority Six

- Current studies underway:
  - Federal Lands is lead agency:
  - "**Improving the Quality of Pavement Profile Measurement in Urban and Low-Speed Settings**
  - $350K effort with University of Michigan Transportation Research Institute (UMTRI)
  - Completion Date September 30, 2015
  - Includes field evaluations of potential measurement equipment

- NCHRP 10-93 – similar topic: see Dr. Amir Hanna

TPF 5(063) Priority Six cont.

- Current FHWA task order just initiated: Conduct inertial profiler “Type Test”
  - A type test is used in industry (government) to conduct an independent evaluation of components and equipment being supplied by manufacturers and/or technology integrators.

TPF 5(063) Priority Six cont.

- “Type Test” Objective:
  - To provide an unbiased report of the equipment and it is essential that both manufacturers and owner/agencies can rely on the test reports from a fully independent testing operation.
  - Details to follow shortly – most likely conducted fall 2015.

FHWA Toolkit - Smoothness

Smoothness

- ProVAL software (www.roadprofile.com)
- ASTM E2560-07: Standard Specification for Data Format for Pavement Profile
- NHI 131100 “Pavement Smoothness”
- Task Order contractor to assist with the implementation of AASHTO ride standards
- AASHTO Ride Quality Standards
  - M328 Equipment Specification
  - R54 Accepting Ride Quality using an inertial profiler
  - R56 Certification of Inertial Profilers
  - R57 Operation of Inertial Profilers

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