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

Pavement Evaluation 2014
Blacksburg, VA
“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
   iii. Next round of evaluations: 2015

2. Critical Requirements (completed): UMTRI;
   final report on pooled fund study website – “Critical Profile Accuracy Requirements”
   - 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 Version 3.5 to include mapping
Export files to Google Earth
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)
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
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.
• “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
Robert Orthmeyer
FHWA Resource Center
Robert.Orthmeyer@dot.gov
(708) 283-3533