Automated Pavement Faulting Method
Presentation Outline:

- Faulting (AASHTO R-36)
- Manual and Automated Methods
- Automated Faulting Program
- Accuracy and Precision
- Conclusion
Faulting is ...

• Difference in elevation across a joint

• Important indicator of pavement performance

• Major impact on pavement life-cycle cost
Manual Faulting Measurement

- Slow, tedious and labor intensive
- Exposure to potentially hazardous conditions
- Requires traffic control
Automated Faulting Measurement

• Faster and Safer
• More efficient
• More cost-effective
• No lane closure
Automated Faulting Program (AFP)

- Uses longitudinal roadway profiles
- Locates transverse joints/cracks
- Calculates faulting automatically
High-Speed Inertial Profiler (HSIP)

- Distance Measuring Instrument (DMI)
- Data Acquisition System
- Auto-triggering System
Automated Faulting – Principle
Automated Faulting Program (AFP)

- User inputs typical slab length
- Removes exclusions from profile analysis
- Sets value for sensitivity factor (SF)
- Calculates grade between profile points
- Identifies joints
- Calculates faulting per AASHTO R-36 (04)
Automated Faulting Program (AFP)

- Adjusts sensitivity factor (SF)
- Recalculates joint location and faulting for SF with yields the best results
- Saves results in Excel
Automated Faulting Accuracy and Precision

- How accurate, repeatable and reproducible?
Field Validation

• Two 1,000 ft test sections (SR 5 and SR 24)
• 20 ft slabs
• Three replicate faultmeter measurements per joint
• Five repeat passes by five HSIP @ 40 mph
Automated (HSIP) vs Manual (Faultmeter)
Automated Faulting Method Precision (ASTM C 670)

- Bias: 0.2 mm (0.01 in.) to 0.7 mm (0.03 in.)
- Repeatability: 0.6 mm (0.02 in.)
- Reproducibility: 0.9 mm (0.04 in.)
Benefits of Automated Pavement Faulting Method

• Efficient and cost-effective for identifying joints and for estimating faulting

• Implementable for construction, maintenance and forensic investigations

• Network and project level
Thank You!