

# Pavement Smoothness Overview

Road Profiler Users Group  
Des Moines, Iowa  
September 20-23, 2006

Mark Swanlund

Office of Pavement Technology



# Presentation Outline

---

- FHWA performance goal
- Program strategies
- Current activities
- Future directions

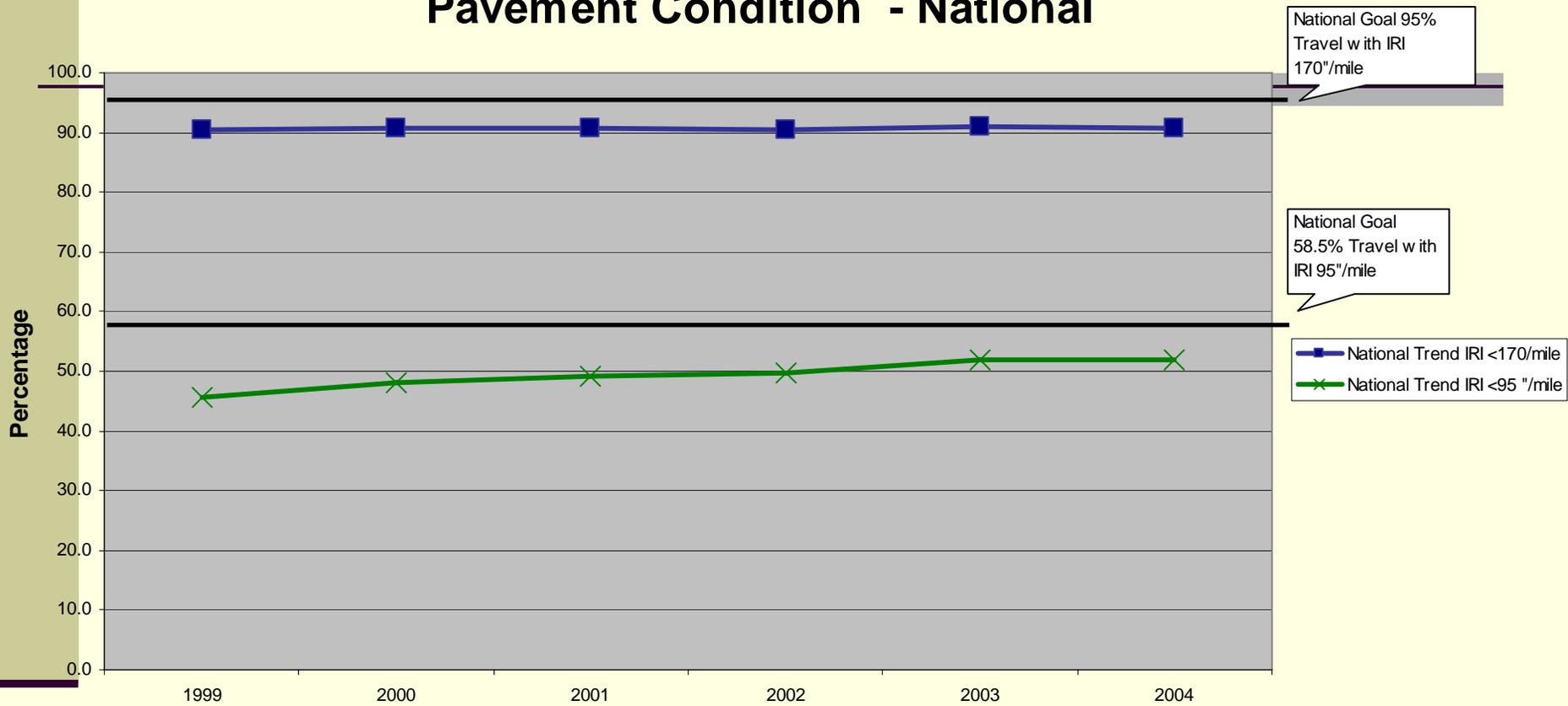
# National Performance Goal

---

58.5 % of the travel on the NHS will be on facilities with a reported IRI of 95"/mile or less

95% of the travel on the NHS will be on facilities with a reported IRI of 170"/mile or less

# Pavement Condition - National



# National Performance Goal 2005 preliminary results

---

- Significant improvement - 6
- Improvement – 11
- Static conditions – 27
- Decline – 6
- Significant decline -1

# Smoothness Program Strategies

---

- Development of innovative analysis tools
- Development of advanced measurement equipment
- Implementation of improved smoothness specifications

# ProVAL Software

---

- ProVAL 2.7 released September, 2006
- Features
  - Simplified Interface
  - User defined set-ups
  - Profile editor
  - Export facilities
  - Improved reports
- Technical support and software available at <http://www.roadprofile.com>

# ProVAL Workshops

---

- Implementation workshops available -14
- Focus:
  - Familiarize with current version
  - Fundamentals of profiling and analysis
  - Knowledge sharing
- Types
  - Essential ProVAL Workshop
  - Advanced ProVAL Workshop
- Contact: Bob Orthmeyer 708-283-3533

# Ultra-Light Inertial Profiler (ULIP)

---

- Inertial profiler mounted on Segway
- Testbed for advanced technology
- Sample interval of 0.5mm
- ULIP-G includes a gyro
- Federal Lands to use for testing
- Interest for sidewalk inventory



# Smoothness Specifications

## AASHTO Provisional Standards

---

- MP11 Equipment Specification
- PP49 Certification Program
- PP50 Profiler Operation
- PP51 Smoothness Specification
  - Development and revision through ETG
  - Implementation support
  - Conduct R&D to fill knowledge gaps

# Highlights: MP11 Profiler

---

- Minimum operation speed 10 mph for lightweights
- Performance criteria for high-pass filtering
- Identified pending technology wrt sampling
- More data parameters



# Highlights: PP49 Profiler Certification

---

- Vertical calibration now optional
- Reference profile sample interval 2.75”
- Cross-correlation and profile comparison acceptable methods for repeatability and accuracy



# Highlights: PP50 Profiler Operation

---

- Defers manufacturers requirements for vertical calibration
- Recommends continuous IRI reported in histogram
- Dropped data format requirements



# Highlights: PP51 Smoothness Spec

---

- Added localized roughness definition
- Added daily verification section check



# Implementation Support

---

- Developing profiler specs
- Setting up certification programs/sites
- Establishing profiler operation procedures
- Developing smoothness specifications
- Conducting reference testing for certification programs

Contact: Mark Swanlund 202 366 1323 or  
Bob Orthmeyer 708 283 3533



# Smoothness R&D activities

---

- Golden Footprint Study - Steve Karamihas
- Smoothness Criteria for Concrete Pavement
  - How smooth is smooth enough
  - Lower limit of perception
  - Value of smoothness
- Profiler Pooled Fund Study TPF-5(063)
  - Reference profiler
  - ProVal SAM
  - Single accelerometer study



# Future Directions

---

- Confluence of smoothness, texture, and friction
- Unified model to relate all texture-related parameters

---

Thank You

Mark Swanlund  
Office of Pavement Technology