



U.S. Department of Transportation  
**Federal Highway Administration**

*IMPROVED*  
**CONSTRUCTION**  
 new strategies to enhance the quality  
**AND**  
**MAINTENANCE**  
 performance of highway operations  
*OPERATIONS*

# Optimizing Highway Performance:

## Enhancing Pavement Smoothness

### ADVANCED PROFILING EQUIPMENT IMPROVES CONSTRUCTION QUALITY CONTROL AND ACCELERATES ACCEPTANCE TESTING

A recent National Quality Initiative (NQI) survey indicated that pavement smoothness is the most significant measure motorists use to judge the quality of our Nation's roads. Pavement smoothness directly relates to driver comfort as well as pavement life expectancy. New lightweight equipment for measuring pavement smoothness can help contractors save significant time and money on road construction and resurfacing projects. Lightweight profiling equipment automates the process of data collection and analysis, providing instantaneous test results. These lightweight profilers can be used within hours after paving, enabling contractors to take immediate corrective action. Fast and accurate, an advanced lightweight profiler can pay for itself on its first project, helping contractors to spot quality control issues more promptly and cost-effectively.

### PARTNERSHIPS PROMOTE NEW TECHNOLOGY, COMMON STANDARDS

In partnership with the Road Profilers Users Group (RPUG), American Association of State Highway and Transportation Officials (AASHTO), American Concrete Pavement Association (ACPA), National Asphalt Pavement Association (NAPA), and equipment manufacturers, the Federal Highway Administration (FHWA) is helping to accelerate the use of advanced profiling equipment as well as the development and implementation of common standards for pavement smoothness.

FHWA has partnered with six State highway agencies to field-test, evaluate, and document the effectiveness of select lightweight profiling equipment in comparison with the States' existing practices. In addition, FHWA will facilitate the development of a technical guide that would include information on:

- The costs and benefits of constructing smoother pavements
- The most appropriate methods of measuring pavement smoothness
- Guidelines for smoothness specifications for both contract quality control and agency acceptance testing



**Obtain fast, accurate, and repeatable measurements**

The measurements obtained by advanced lightweight profiling equipment are highly accurate, repeatable, and unaffected by variations in vehicle weight or speed, temperature, sunlight, wind, or pavement color or texture.

**LIGHTWEIGHT PROFILERS PROVIDE IMPROVED SMOOTHNESS CONTROL**

A typical lightweight profiler features state-of-the-art measuring equipment mounted on an all-terrain vehicle. A non-contact sensor collects data as the profiler travels the pavement surface. The raw data is stored in an on-board computer for processing. Profile data can be analyzed under various roughness indices, including the International Roughness Index (IRI), Profile Index (PI), and Ride Number (RN), and the results can be viewed on-screen or output to a printer.

Advanced lightweight profiling equipment is faster and more accurate than traditional methods of measuring initial pavement smoothness and can help contractors improve construction quality control, accelerate acceptance testing, and reduce related costs.

**NEW FHWA PROGRAM TARGETS IMPROVED CONSTRUCTION AND MAINTENANCE OPERATIONS**

FHWA's pavement smoothness initiatives are part of an evolving program, called "Optimizing Highway Performance: Meeting the Customer's Needs," which is designed to identify and promote new ways of addressing our Nation's highway infrastructure needs, while at the same time minimizing delays to the traveling public. The program evaluates techniques, methods, and devices that increase efficiency, accelerate operations, reduce delay and disruption, and enhance safety. Specific areas of focus include:

- New construction materials and technologies for improved quality control and quality assurance
- State-of-the-practice contract administration techniques
- Innovative methodologies that allow optimum scheduling for specific projects
- State-of-the-art preventive maintenance techniques

To learn more about advanced profiling equipment, contact:

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