TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): FHWA Office of Technical Services Resource Center P&M TST

INSTRUCTIONS:
Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

Transportation Pooled Fund Program Project # *(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* TPF 5(063)	**Transportation Pooled Fund Program - Report Period:** ☑ Quarter 1 (January 1 – March 31) ☐ Quarter 2 (April 1 – June 30) ☐ Quarter 3 (July 1 – September 30) ☐ Quarter 4 (October 1 – December 31)	
Project Title: "Improving the Quality of Pavement Profiler Measurement"		
Name of Project Manager(s): Robert L Orthmeyer	**Phone Number:** (708) 283-3533	**E-Mail** robert.orthmeyer@dot.gov
Lead Agency Project ID: FHWA OTS RC P&M TST	**Other Project ID (i.e., contract #):** DTFH61-10-D-00013	**Project Start Date:** May 2003
Original Project End Date: September 2008	**Current Project End Date:** September 2014	**Number of Extensions:** Two

Project schedule status:

☐ On schedule ☑ On revised schedule ☐ Ahead of schedule ☐ Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date
$2,832,000	$1,587,300	75%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
NA	NA	75

Project Description:

Participating Agencies: California, Colorado, Connecticut, Florida, Georgia, Illinois, Kansas, Kentucky, Louisiana, Maryland, Mississippi, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas and Wisconsin. FHWA offices include: Federal Lands, LTPP, the Office of Technical Services Resource Center and the Office of Pavement Technology (HIPT).

1. Guiding Principles

The goal of the IPQ Pooled-Fund Study (IPQ Study) is to assemble states and the Federal Highway Administration (FHWA) to (1) identify data integrity and quality issues with inertial profilers; (2) suggest approaches to addressing identified problems; (3) initiate and monitor projects intended to address identified problems; (4) disseminate results; and (5) assist in solution deployment.

2. Scope

The IPQ Pooled-Fund Study is intended to serve as a forum for the participants to identify and address operational issues that are common among various inertial profilers. The Study will focus on quality of data issues that arise from the use and operation of inertial profilers. Within these broad topic areas, the following are offered as examples issues that might be addressed within the intended scope:

• Implementation of American Association of State and Highway Transportation Officials (AASHTO) Provision Protocols for Inertial Profilers.
• Inertial profiler certification procedures.
• Establishing a reference profile.
• Certification course(s).
• Operator procedures and training i.e. NHI Course 131100 “Pavement Smoothness: Factors Affecting Inertial Profiler Measurements Used For Construction Quality Control”.

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

A statement of work (SOW) was developed for Priority Six - Validity of IRI at various speeds and was submitted to NCHRP process for part of the effort. The SOW has made it through the initial round of balloting by the SHAs and is in front of the Board of Directors for final approval.

Priority One – Reference Device(s): A SOW has been developed and delivered to contracting office to conduct another round of evaluations of potential reference devices.

Priority Three: Another set of enhancements has been proposed for the software that includes improvements sought by MS and TX. The SOW has been developed and in front of the contractor for response. ProVAL software version 3.3 is available at the www.roadprofile.com website. The full new version of ProVAL 3.3 is available!! Transtec has the included the Optimum Weigh-in-motion Locator (OWL) module into ProVAL version 3.2 along with Automated Faulting Module (AFM) assisted by Florida DOT and Mississippi DOT.

Priority Five - Evaluating Upper Limits of Single Accelerometer and Single Height Sensor: The project has begun with Dr.’s Nicolas Gagarine and James Mekemson of Starodub, Inc. providing the research and report. The phase I report has been provided to FHWA. The second phase will quantify the aspects identified in the first phase report, provide a recommended alternative for uniform data collection at all times and was completed by October 30, 2011. The panel would like to see a Tech Brief developed for the study, a sensitivity analysis page and an upgrade to the software to allow the initial and final IRI calculation to be displayed.

Anticipated work next quarter:

Priority One: Finalize work on SOW for another round of evaluations for potential reference devices.

Priority Four: Regional Calibration/Verification Centers: A subcommittee was formed within the Technical Advisory Committee (TAC) to provide guidance on how to proceed with this effort. A webinar will be held to develop process and direction for the group.

Priority Five: Release of final report and study on the Limitations of a Single Axis Accelerometer.

Priority Six: Review of NCHRP Problem statement and update on status.

A webinar meeting to finalize funding priorities.

Significant Results:

Accomplishments to Date:
Priority One: Benchmark testing tool to evaluate potential profiler reference devices; Evaluations have been completed and report cards are available. Final report is available on the web site. Although only one device is closest to qualifying as a reference device - the ICC SurPRO 3500.
Priority Two: Critical Profile Accuracy Requirements study and report (see website for CPAR report);
Priority Three: ProVAL software and support (www.roadprofile.com) that includes grinding simulation. New version 3.3 was released on December 30th.
Priority Five: First phase of understanding the limitations of a single accelerometer. Second phase final report is to be completed by October 30, 2011.
Priority Six: Automated Faulting Module was completed by December 15, 2010 and included in ProVAL software.
Priority Six B & C: Currently a Statement of Work is being developed related to urban IRI for TAC review in September.

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

Several delays have been encountered within FHWA processes involving contract awards.

States have delayed their commitment of funds to the study. This might be due to the new processes and forms that are involved and communication with their funding resources.

Potential Implementation:

1. Provide a pavement profiler reference device that assists Agencies with profiler certification and validation that all inertial profilers are collecting correct pavement profiles that can be used for ride quality indices.

2. Provide assistance with regional calibration/validation centers that would provide uniform quality data collection by inertial profilers. This would enhance confidence in nation wide reporting of ride quality for programs such as pavement management systems and FHWA Highway Performance Monitoring System (HPMS).

3. Providing a standardized engineering tool - the Profile Viewer and Analysis (ProVAL) software - that removes the "black box" concept of understanding pavement profiles collected by inertial profilers. Users can import profiles from various file formats and save them in the Pavement Profile standard file type. Entire analysis projects can be saved, which preserves user information and analysis inputs. After analyses have been performed, the user can print a report of the original profiles and the results of any analyses performed. ProVAL has been adapted by many agencies around the world.
Types of analyses that ProVAL can perform:
Profile Editing (to manipulate profile data in many aspects including cropping and filtering);
Standard Ride Statistics, such as International Roughness Index (IRI), Half-car Roughness Index (HRI), Mean Roughness Index (MRI), and Ride Number (RN);
Fixed-Interval Ride Statistics (to report roughness indexes at a fixed interval);