

Transportation Pooled Fund Program

Project Title: “Improving the Quality of Pavement Profiler Measurement”		
Project Manager and Phone Number: Robert L. Orthmeyer, P.E. (708) 283-3533 Robert.orthmeyer@fhwa.dot.gov	Project No: TPF 5(063)	Project is: <input type="checkbox"/> PLANNING <input checked="" type="checkbox"/> R&D
Reporting Period: July 1 to September 30, 2004	Multi Year Project Four Year	
Description of Work Performed and Progress:		
<p style="color: green; margin: 0;">Welcome to North Carolina DOT, the 19th state agency joining this study!!</p> <p>The following list of priorities remains the same:</p> <ol style="list-style-type: none"> 1. Reference Profile Device (development of) 2. Critical Profile Accuracy Requirements (definition) 3. Construction Acceptance and Correction Software (acquisition of existing) 4. Certification / Validation Sites 5. Evaluating Upper Limits of Single Accelerometer and Single Height Sensor 6. Emerging Technology That Enhances Profile Measurement 7. Portable Validation Device Feasibility 8. Lightweight Profilers Unique Problems 9. Portable Validation Device Implementation <p>A web site has been developed to manage all of the pooled fund study proposals, solicitations and projects. The TPF-5(063) Profile Quality study can be found at: http://www.pooledfund.org/projectdetails.asp?id=280&status=4.</p> <p>Priority Two: It was agreed by the Technical Advisory Committee (TAC) to pursue this priority before asking for a reference device to be constructed. The “Defining of Critical Profile Accuracy Requirements” project was issued to the University of Michigan Transportation Research Institute (UMTRI) with the Principal Investigators to be Tom Gillespie and Chris Winkler with Steve Karamihas as the primary analyst. The contractor is working on the following tasks:</p> <p>Task 1: Define the goal of the reference device. It is anticipated that the device must accurately measure a roadway profile and be able to study the distribution of roughness within a profile. From an accurate profile, the common profile-based indexes can be calculated. The IRI, RN, PI, truck dynamic loading, and ride quality over a range of speeds are of paramount interest.</p> <p>Task 2: Define the relevant waveband of interest. In this task, the Contractor will define the long and short wavelength boundaries that are needed to capture the performance qualities listed above.</p> <p>Task 3: Define the needed accuracy and precision of the device within the wavelengths of interest addressing phase shift and amplitude. Requirements will be set for the accuracy and precision of profile measurements. Note that this will not be done through direct evaluation of individual elevations. This is because the required accuracy for estimation of vehicle response is sensitive to wavelength.</p>		

Task 4: Define the sampling and footprint requirements. The Contractor will define sampling requirements that ensure proper measurement of the wavelength range defined in Task 2. Requirements will also be set for the footprint of the device to represent the envelopment of short-wavelength features by vehicle tires and bridging over short, narrow dips.

Task 5: Establish a method of benchmarking the repeatability and accuracy of the device. Objective performance qualities will be set for candidate reference devices based on the results of Tasks 3 and 4. In addition, The Contractor will suggest a method of verifying the overall performance of a device. As a minimum, a procedure for verifying the repeatability will be defined. Provide an interim report addressing Tasks 1-5, no later than six months after acceptance of the contract.

Task 6: Provide a review of "candidate" reference methods to assess the potential of currently available and emerging technology to provide a reference profile.

An interim report will be provided at the next meeting, October 26th and 27th, which tailgates onto RPUG.

Priority Three Part 1: A contract for bump finder software (DTFH61-04-C-00010) was signed April 22, 2004. The study selected Steve M. Karamihas to supply the software that includes grinder simulation capabilities. The first task for this contract is to provide a demonstration of the software to the participating agencies. This was accomplished through a web-casting process that the FHWA has available through the National Highway Institute on Wednesday May 5. The web cast was recorded and can be viewed at: http://www306.placeware.com/cc/elearn_nhi/view?id=bump-1&pw=683607. To view just type in your name.

The first task was completed June 28. Software code was delivered to the FHWA and to The Transtec Group, Inc. by July 9. This is being incorporated into ProVAL.

Priority Three Part 2: The contract to provide ProVAL Support was signed with The Transtec Group, Inc. from Austin, TX. This includes tasks to incorporate the Karamihas bumpfinder into ProVAL. BETA testing was initiated the last week of September 2004 with the final version completed by November 12, 2004.

Priority One – Reference Device(s): It is anticipated that a Request for Proposals will be finalized by the end of final delivery of Priority Two.

Priority Five - Evaluating Upper Limits of Single Accelerometer and Single Height Sensor: A research statement is being developed by the participating agency technical representatives for South Dakota and Florida. This will be delivered at the next meeting in Nevada.

There is currently \$774,200.00 of obligated funds from the participating STD's in the pooled fund study account. Of this \$98,000 has been awarded to UMTRI for Priority Two. Priority three has \$292,450 set aside for funding from the pooled fund study. (Funding from the FHWA HIPT is being used to allow the acquisition of the Bumpfinder software and ProVAL support to proceed.) A total of \$1.34 Million has been committed to the project over the four year time frame from the participating SHA's.

The date for the next scheduled meeting of the participating agencies is scheduled for Wednesday October 26th beginning at 1:00 pm and all day Thursday October 27th and will tailgate onto the RPUG annual meeting at State Line, NV.

STATUS AND COMPLETION DATE

Percentage of work completed to date for total project
Project is: 25 %

X on schedule _____ behind schedule, explain:

Expected Completion Date: September 30, 2007

Robert L. Orthmeyer, P.E.
Project Manager