

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: October 1 to December 31, 2004	Multi Year Project Four Year	
Description of Work Performed and Progress: <div style="color: green; font-weight: bold;"> <p>Welcome to North Carolina and Maryland, the 19th and 20th state agencies participating in this study!!</p> </div> <p>The study participants met October 27th and 28th, 2004 to review progress on existing contracts, prepare problem statements prior to advertising and review the priorities. The existing priorities will remain the same as listed below. After reviewing the ProVAL software Version 2.5 with a bumpfinder and grinder simulation, it was agreed to extend the BETA testing to the end of December 2004 to provide adequate input to the consultant, The Transtec Group, Inc. There will be four ProVAL workshops scheduled during the first quarter of 2005 for the participating state agencies. Each agency will be allowed to send up to five participants, but travel expenses will need to be covered by the agencies. Locations and dates are:</p> <p>Florida: Gainesville – January 24th & 25th Kentucky: Frankfort – February 15th & 16th Connecticut: Rocky Hill – March 3rd (to be webcast) Colorado: Denver – March 21st & 22nd</p> <p>Instructors will be Steve Karamihas, Mike Swan and Dr. George Chang or Dr. Rob Rasmussen.</p> <p>Steve Karamihas reviewed the progress on Priority Two “Critical Profiler Accuracy Requirements”. The TAC agreed that the pending results from the 2004 Profiler Roundup would assist in preparation of the final report for priority two; therefore the due date was proposed to be extended. A draft report on priority two is expected prior to the completion of the Profiler Roundup analysis.</p> <p>Dave Huft from SDDOT and Abdenour Nazef from FLDOT presented a draft problem statement for Priority Five.</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 Profilors Unique Problems 9. Portable Validation Device Implementation 		

Note: 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>.

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:

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.

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.

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.

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.

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 to be completed by December 31, 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. The problem statement was reviewed and anticipated to be advertised after the first of the 2005 New Year.

Funding - There is currently \$948,400.00 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 \$1.43 Million has been committed to the project over the four year time frame from the participating SHA's.

Participating State Highway Departments: California, Colorado, Connecticut, Florida, Georgia, Illinois, Kansas, Kentucky, Maryland, Mississippi, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas and Wisconsin. Also assisting FHWA Federal Lands, FHWA LTPP, and FHWA Office of Pavement Technology.

STATUS AND COMPLETION DATE

Percentage of work completed to date for total project

Project is: 25 %

_____ on schedule X behind schedule, explain:

The Technical Advisory Committee has recommended a deadline extension on the critical accuracy requirements project until analysis and results of the FHWA Profiler Roundup are available. This was recommended in order to take full advantage of the synergistic benefits of the two related research projects.

Expected Completion Date: September 30, 2007

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Project Manager

TPF 5(063)

Tentative Timeline - 2005



