TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Date: ____04/30/2016_____

Lead Agency (FHWA or State DOT): ___FHWA_____

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(282)	**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:
Demonstration of Network Level Pavement Structural Evaluation with Traffic Speed Deflectometer

Name of Project Manager(s):	**Phone Number:**	**E-Mail**
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Lead Agency Project ID: DTFH61-11-D-00009-T13008	**Other Project ID (i.e., contract #):**	**Project Start Date:** 09/20/2013
Original Project End Date: 07/19/2016	**Current Project End Date:** 07/19/2016	**Number of Extensions:**

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
$822,446	$680,028 (as of 3/31/2016)	83%

Quarterly Project Statistics:

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

Project Description:

Background

Current State Highway Agencies' (SHA) Pavement Management Systems are primarily based on surface condition data, and surface cracking is mainly used as an indicator of the pavement structural condition. However, with effective pavement preservation activities that intervene early to preserve and extend the life of pavements and increasingly thicker long-life pavements, the surface cracks can no longer be relied on as a reliable indicator of structural condition or "health" of the pavement structure. This is because most preservation treatments correct surface cracks but do not correct bottom-up fatigue cracking, instead concealing them, while the bottom-initiated cracks continue to develop. In addition, the prevalence of top-down cracking in thicker pavements also makes it difficult to distinguish them from bottom-up fatigue cracking, which is the common indicator of structural deterioration. The true pavement structural condition and rate of deterioration are needed not only to plan optimal structural rehabilitation activities and future budget needs but also for assessing meaningful progress under a performance based Federal-Aid program. With an aging pavement network on our most trafficked highways, the fear is not when the next preservation treatment is needed but when that will no longer be effective, resulting in the need for major rehabilitation / reconstruction. The SHAs state-of-the-practice pavement condition data collection is inadequate to meet this increasingly critical need and some SHAs have investigated the network level use of the Falling Weight Deflectometer (FWD). While FWDs are the preferred device for project level structural evaluation, they are inefficient at the network level. FWD measurements are made at discrete points along the pavement sections and the equipment should remain stationary on the road during each testing point (typically 1-4 minutes, depending on the protocol). Since the equipment has to be stationary during measurements, this requires traffic control and lane closures that disrupt traffic. This limits the productivity and the number of discrete points where measurements can be obtained.

High speed continuous deflection devices were developed as a practical alternative to the FWD for network level pavement structural evaluation. A number of recent studies have investigated the state-of-the-technology and use of high speed continuous deflection devices (1, 2, 3). A more recent effort under SHRP2-R06(F) project titled "Assessment of Continuous Pavement Deflection Measuring Technologies" reviewed all such devices under Phase I of two phase effort and concluded that, for network level applications, there are two potential devices currently on the market – the Traffic Speed Deflectometer (TSD) and the Rolling Wheel Deflectometer (RWD) (1). TSD is manufactured in Denmark and to date is being used in Denmark, UK, Poland and Italy. In addition, several thousand miles of major roads in Australia were tested in 2010 and South Africa has recently purchased a device. The manufacturers of TSD have reported of their plans to make available their latest version of TSD for demonstration testing in the US at their own transportation expense in 2013. Federal Highway Administration's has initiated a new research project to assess, field evaluate and validate on instrumented and other test pavement sections the capability of RWD and TSD for pavement structural evaluation at the network level for use in pavement management application and decision making (4). Following the field evaluation, validation and identification of technically capable device(s), the research project will also develop analysis methodologies for enabling the use of information obtained from those technically capable device(s) in pavement management

Objectives

The objective of the proposed pooled-fund project is to assess the feasibility of and demonstrate the use of Traffic Speed Deflectometer (TSD) for network level pavement structural evaluation for use in the participating state agencies' pavement management application and decision making. FHWA research project under Contract Number DTFH61-12-C-00031 will compliment this proposed pooled fund study.

Scope of Work

This project will include the following tasks:

1. Coordination and collection of TSD data on agency designated pavement sections for one day of testing at traffic speed, including calibration. Testing length of 30 – 50 miles.
2. Post-processing of all collected data. The agency will be provided with all collected raw and process data in an Excel workbook. Please see comments section for the type of data collected with TSD.
3. Exploratory analysis in the use of pavement structural condition information derived from TSD for use in the participating SHA's pavement management system and applications.

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

- The 4th TAC meeting was held on January 14th in conjunction the 95th TRB Annual Meeting that was held January 10–14, 2016, at the Walter E. Washington Convention Center, in Washington, D.C. An update on the second round of testing and analysis was provided and data analysis and final report details were discussed with SHAs staff and feedback solicited. In addition, taking advantage of attendees to the TRB, related efforts internationally (Australia, UK, Denmark) were presented and discussed.
- The research team requested condition and other structure data from participating SHA PMSs for pavement segments where TSD data were collected. Continuing the data analysis, incorporating additional related data received from SHAs, and developing draft reports for the SHAs.

Anticipated work next quarter:

The following work will be carried out over the next quarterly period:

- Individual web meetings will be scheduled and held with each participating SHAs to have focused discussion of specific findings, to provide technical help on the TSD data and software use and received feedback from SHAs on the analysis findings.
- Further develop report documenting the data collection, analysis and recommendation for the incorporation of TSD data in SHAs PMS process for each participating SHA.

Significant Results:

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).

Potential Implementation:

The objective of the pooled-fund project is to assess the feasibility of and demonstrate the use of Traffic Speed Deflectometer (TSD) for network level pavement structural evaluation for use in the participating agencies pavement management application and decision making. The use of pavement structural condition in addition to functional and pavement surface distress information will provide for planning optimal structural rehabilitation activities and future budget needs as well as for assessing progress under a performance based Federal-Aid program.