TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Date: ____1/31/2012_____

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)* SPR-2(208)	**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: Pavement Subgrade Performance Study	

Name of Project Manager(s):	**Phone Number:**	**E-Mail**
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Lead Agency Project ID: DTFH61-11-D-00009-T11004	**Other Project ID (i.e., contract #):**	**Project Start Date:** 1999
Original Project End Date: 09/30/2014	**Current Project End Date:** 11/30/2014	**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
$2,858,490.12	$2,497,738.34	97%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
$0 (0)	$0	

Project Description:

The objective of SPR-2(208) was to develop prediction models for permanent deformation in the subgrade soil that incorporate the effect of soil type and moisture content. The full-scale experimental phase of the study was conducted at the Cold Region Research Laboratory (CRREL) of the U.S. Army Corps of Engineers in Hanover, New Hampshire, between 1999 and 2007. Four flexible pavements with the same granular base layer and asphalt concrete surface layer were built inside the Frost Effects Research Facility and were subjected to accelerated pavement testing (APT). The pavements were built with a combination of four soil types and three moisture levels, which resulted in a total of 12 sets of pavement sections, named cells. Each of the four soil types were placed in the pits of the facility at three moisture contents. For each cell, between four and six pavement sections, named windows, were subjected to accelerated pavement testing. The MARK HVS IV was used as the loading device. Up to four wheel load magnitudes were used for the windows in the same cell. The test sections were instrumented with stress, strain, moisture and temperature sensors. Surface rutting was monitored with a laser profilometer. Falling Weight Deflectometer (FWD) tests were performed on each pavement section before the application of accelerated traffic. The testing phase of the project was completed and the final deliverables were received in February 2007 (Cortez et al., 2007).

The final deliverables from the testing phase included a comprehensive database containing APT testing data of the four different subgrade soils under various moistures and loading conditions, along with a series of reports. Preliminary data analysis showed that the database provides a wealthy amount of information for pavement engineers and researchers in the development of advanced subgrade performance models. However, because of its complexity due to the number of variables involved, its sheer size, and some incomplete/missing data, the potential use of the database couldn't be realized without a detail assessment of the database. The Technical Advisory Committee (TAC) of the TPF thus requested the FHWA to conduct an independent assessment of the database and to develop a work plan for future data analysis. The objectives of the database assessment were to 1) review the data variables, its completeness and to document them; 2) to obtain/assemble/input additional available laboratory test results and missing data and 3) with the assessment complete, to develop a detailed work plan for future data analysis and modeling. The data assessment task was completed in October 2010 and this resulted in a comprehensive report documenting the entire study effort to date, including detail documentation of APT and laboratory test data, and a Microsoft Access database with data for further analysis (Romanoschi, 2010).

The TAC met during the January 2011 Transportation Research Board Annual Meeting and recommended the final phase of this TPF to develop empirical models for permanent deformation in subgrade soils consistent and for use with the NCHRP 1-37A Mechanistic-Empirical Pavement Design Guide (MEPDG) and more fundamentally based mechanistic models for advancing the science of pavement design.

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

A Task Order Proposal (TOP) was received in response to a Task Order Proposal Request (TOPR) under an existing IDIQ contract issued to conduct the final phase of this study to:
1. Develop empirical models for permanent deformation in subgrade soils consistent and for use with the NCHRP 1-37A Mechanistic-Empirical Pavement Design Guide (MEPDG) and the associated model parameters for the subgrade soils tested in SPR-2(208) and validate them using the performance data collected.
2. Develop fundamentally based mechanistic models for the determination of permanent deformation in subgrade soils under repeated traffic loading and validate them through finite element modeling and the performance data collected for advancing the science of pavement design.

The Task Order Proposal was reviewed by the TAC members and a recommendation to award the Task Order based on technical and cost evaluation was made to the FHWA's Contracting Office. FHWA's Contracting Office has requested additional information from the contractor and will be awarding the Task Order upon satisfactory response.

Anticipated work next quarter:

It is anticipated that the new Task Order will be awarded in the next quarter and work will begin. The TAC will meet with the research team during 2012 TRB Annual Meeting to discuss the work plan for the new task order entitled "Development of empirical and mechanistic models for permanent deformation in subgrade soils" with the research team and to provide technical clarification.

Significant Results:

- The final phase of this research effort will be initiated next quarter.

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).

-Since last QPR, one month delay in awarding the final Task Order due to clarification required from the contractor. No further delay expected.

Potential Implementation:

1. Empirical models for permanent deformation in subgrade soils consistent and for use with the NCHRP 1-37A Mechanistic-Empirical Pavement Design Guide (MEPDG) and the associated model parameters for the subgrade soils tested in SPR-2(208).

2. Fundamentally based mechanistic models for the determination of permanent deformation in subgrade soils under repeated traffic loading for advancing the science of pavement design.

3. Fully documented APT performance and laboratory test data in a Microsoft Access database for future model validation and calibration.