

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): IOWA DOT

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 # TPF-5(300)	Transportation Pooled Fund Program - Report Period: <input checked="" type="checkbox"/> Quarter 1 (January 1 – March 31, 2016) <input type="checkbox"/> Quarter 2 (April 1 – June 30, 2016) <input type="checkbox"/> Quarter 3 (July 1 – September 30, 2016) <input type="checkbox"/> Quarter 4 (October 1 – December 31, 2016)	
Project Title: Performance and Load Response of Rigid Pavement Systems		
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Project Investigator: Peter Taylor	Phone: 515-294-9333	E-mail: ptaylor@iastate.edu
Lead Agency Project ID:	Other Project ID (i.e., contract #): Addendum 504	Project Start Date: 5/29/14
Original Project End Date: 5/31/2017	Current Project End Date: 5/31/2019	Number of Extensions: PFS

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	Total Percentage of Work Completed
\$1,520,000.00	\$359,517.70	35%

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
\$62,547.02	\$45,258.55	8%

Project Description:

The modern approach to highway design is embodied in the Mechanistic-Empirical Pavement Design Guide (MEPDG), which incorporates models embedded in dedicated software, such as AASHTOWare Pavement ME Design, to predict pavement performance in greater detail than before. Full implementation of the MEPDG by state departments of transportation requires customizing or calibrating the software to state and local conditions, which in turn requires collecting data on climate, material properties, load response, and pavement performance.

The MEPDG software uses these data inputs to more accurately simulate the load response of pavements and long-term pavement performance. Local calibration of the software involves comparing long-term performance simulation results to actual performance data at local sites if possible or from matching pavements in the LTPP database. New York is one of the states that have previously instrumented test pavement sections to acquire local data to improve calibration of the MEPDG software. The installed sensors are still functioning to an extent that permits collection of additional useful data. This project has these objectives:

- Collecting load response and performance data and environmental monitoring at selected test pavements in New York for four years.
- Installing new instrumented sections as needed for a better understanding of rigid pavement response, including monitoring for the duration of the project.
- Determining the impact of a base on long-term performance of rigid pavement utilizing the data acquired in fulfilling the first two objectives and other nationally available data on the topic.

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

NYS DOT priority task list:

- Task 1. Develop relationships between PCC slab thickness and pavement performance
- Task 2. FWD Analysis Procedures

Work for the NYSDOT is progressing on several points.

1. The draft interim report for Task 2 has just been completed and will be forwarded to ISU for delivery to New York.
2. The draft report for Task 1 is being finalized and will be sent when it is complete.
3. Additional data and tables for the MEPDG catalog are being generated in response to the comments provided by the liaison. Tables are being constructed for the various parameters, including: PCC pavement thickness, Truck ESALs, IRI, faulting, and cracking.
4. NY DOT expressed interest in pursuing further investigation of the overlay procedure using AASHTOWare Pavement-ME, this is will be added to the NYSDOT priority task list.
5. A tentative schedule for site visits was proposed to NY State DOT, this includes
 - a. Site visit to the RT9A project site to finish pulling sensor wires into the pull box in early May, followed by a one week trip to the I86 project site in Early June and a one week trip at the end of June to cover the I90 and I490 projects. During those site visits FWD data will be collected in addition to the sensor data and distress surveys. If possible, dynamic truck runs will be conducted on the I 90 project.

TAC meeting was held March 1.

Performance and Load Response of Rigid Pavement Systems, TPF-5(300)

TAC Conference Call

March 1, 2016

Participating:

Wes Yang, New York DOT

Shad Sargent, Ohio University

Andrew Russ, Ohio University

Sam Curry, Ohio University

Brian Worrel, Iowa DOT

Peter Taylor, CP Tech Center

Tom Cackler, CP Tech Center

Shad Sargent presented an overview of the proposed additional scope of work, *Development of a Concrete Overlay Design Procedure*.

The goal of this additional SOW is to develop an overlay design procedure and software for concrete pavements. Existing models will be located, analyzed, validated, and if needed, modified, or new models developed.

A design approach for composite overlays was developed for the Ohio DOT and this design approach and its local modifications are being used in this research. For example, Ohio DOT is not using a rigid base, but using crushed stone as a base. New York has been using a rigid base, but has used crushed stone for an I90 project and it is being monitored. So far, crushed stone is doing just as good a job, if not better, and was cheaper.

In New York, 3 test sections (rubblized, unbonded, traditional) have been rehabbed with concrete overlays. These will be monitored for performance and cost effectiveness.

New task:

The NYSDOT will provide a list of flexible and composite pavements where the department had collected FWD measurements prior to the PCC overlay. The research team will supplement this data, as needed, with data from nearby states and the FHWA LTPP database, where required data are available. The research team, in cooperation with NYSDOT, will identify projects for the study.

I-70 and I-90 have unbonded overlays that are showing premature cracks and distresses. The research team is looking at causes - environmental, moisture, and temperature.

The research team is looking at the performance of unbonded overlays in New York. AASHTO has software to design unbonded overlays; team will modify this software to use in New York for the short term.

This research will not overlap with the research on overlays that was done at the University of Pittsburg, but will look to complement it. New York will share their research results with the Pittsburg team and collaborate with them.

Discussion:

Wes Yang indicated that New York is satisfied with the research that has taken place and are pleased with the schedule for the new tasks.

The proposal for additional tasks has been reviewed by the New York DOT and Iowa DOT and is ready to be implemented. An expert pavement design panel will be assembled to review, comment, and advise the research team. The intent is to work with the research team to ensure products and research findings build upon existing expertise in the design community and result in useful and cost effective tools for the sponsoring agencies. It is envisioned that the panel will consist of 3 to 5 national experts that will regularly collaborate with the research team throughout the project.

Next steps.

Finalize the budget for the proposal and submit it to the Iowa DOT for a contract amendment.

Anticipated work next quarter:

- Continue creating design tables for NYSDOT regions per Item 3 above.
- Site visits to the various test sections to continue data collection efforts per Item 5a.
- Discussions are continuing on selection of a site for instrumented pre-cast slabs.

Significant Results:

Circumstance affecting project or budget (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).

The newest version of the AASHTO Pavement-ME software, Version 2.2, has been received and installed. The earlier results generated with Version 2.1 of the software need to be validated using the new version as the calibration coefficients have been changed.