

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(183)	Transportation Pooled Fund Program - Report Period: Quarter 1 (January 1 – March 31, 2017) Quarter 2 (April 1 – June 30, 2017) X Quarter 3 (July 1 – September 30, 2017) Quarter 4 (October 1 – December 31, 2017)	
Project Title: Improving the Foundation Layers for Concrete Pavement		
Project Manager: Brian Worrel	Phone: 239-1471	E-mail: brian.worrel@dot.iowa.gov
Project Investigator: Peter Taylor (David White)	Phone: 294-3781	E-mail: ptaylor@iastate.edu
Lead Agency Project ID: RT 0314	Other Project ID (i.e., contract #): Addendum 352	Project Start Date: 3/16/09
Original Project End Date: 3/15/14	Current Project End Date: 12/31/2017	Number of Extensions: On-going pooled fund project

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
\$875,000	\$867,718	98

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
\$0		1

Project Description:

The objective of this research is to improve the construction methods, economic analysis and selection of materials, in-situ testing and evaluation, and development of performance-related specifications for the pavement foundation layers. The outcome of this study will be conclusive findings that make pavement foundations more durable, uniform, constructible, and economical. Although the focus of this research will be PCC concrete pavement foundations, the results will likely have applicability to ACC pavement foundations and, potentially, unpaved roads. All aspects of the foundation layers will be investigated including thickness, material properties, permeability, modulus/stiffness, strength, volumetric stability and durability. Forensic and in-situ testing plans will be conceived to incorporate measurements using existing and emerging technologies (e.g. intelligent compaction) to evaluate performance related parameters as opposed to just index or indirectly related parameter values. Field investigations will be conducted in each participating state. The results of the study will be compatible with each state's pavement design methodology and capable for use with the Mechanistic-Empirical Pavement Design Guide (MEPDG). Evaluating pavement foundation design input parameters at each site will provide a link between what is actually constructed and what is assumed during design. There are many inputs to the pavement design related to foundation layers and this project will provide improved guidelines for each of these. The study will benefit greatly from maximizing the wide range of field conditions possible within the framework of a pooled fund study.

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

This quarters main progress is completion of a PhD students' dissertation focusing on physical and mechanistic parameter variability both in univariate and spatial aspects, and the manual of practice.

As summarized in the last QPR, the graduate students' work focused on studying the spatial analysis aspect in detail to understand if there are similarities in how the different engineering parameter values (modulus, CBR, dry density, and moisture content) spatially vary in situ and how they are linked to the different materials (base [virgin vs. recycled] and subgrade). The geostatistical analysis revealed interesting aspects related to spatial anisotropy that exists in situ and how they relate to the construction process. These aspects are important to understand as it relates to construction QC/QA specifications particularly with regard to non-uniformity. The information from the students' dissertation work is extensive and a separate project report has been drafted. The final draft will be submitted to InTrans Pubs early next quarter for publication and submission to the TAC.

Anticipated work next quarter:

- Spatial Uniformity Report
- Manual of practice

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).

TAC committee:

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