

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, 2016) X Quarter 2 (April 1 – June 30, 2016) Quarter 3 (July 1 – September 30, 2016) Quarter 4 (October 1 – December 31, 2016)	
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
\$224.		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 a graduate (PhD) students' research on spatial analysis of the field measurements obtained from the project sites and the manual of practice.

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). This evaluation focused on geostatistical modeling of the spatial variability using semivariograms and studying spatial anisotropy in situ. The anisotropy aspect provided information regarding how measurements varied in the longitudinal direction (direction of travel and roller compaction) versus in the transverse direction. These aspects are important to understand as it provides information for use in the Manual of Practice as to what to expect as typical values of variability in situ when performing the different QA test measurements that are being recommended in the manual.

Anticipated work next quarter:

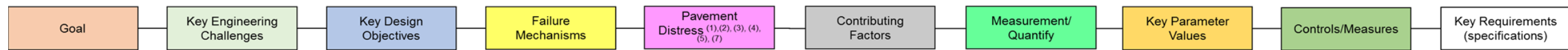
- Manual of practice

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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(1) Miller, J., and Bellinger, W. (2003). Distress Identification manual for Long-Term Pavement Performance Program, FHWA-RD-03-031, June 2003.
 (2) Md/DOT Distress Identification Manual, February 2003.
 (3) Smith, K., Harrington, D., Pierce, L., Ram, P., and Smith, K. (2014). Concrete Pavement Preservation Guide, 2nd Edition, FHWA DTFH61-12-H-00010, September 2014.
 (4) AASHTO R36, Standard Practice for Evaluating Faulting of Concrete Pavements
 (5) AASHTO PP68, Standard Practice for Collecting Images of Pavement Surfaces for Distress Detection
 (6) Guide for Mechanistic-Empirical Design of New and Rehabilitated Pavement Structures. Appendix JJ: Transverse Joint Faulting Model
 (7) Appendix A NCHRPw_35
 (8) Geotechnical Aspects of Pavements, FHAW NHI-05-037

