

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(368)	Transportation Pooled Fund Program - Report Period: Quarter 1 (January 1 – March 31, 2018) Quarter 2 (April 1 – June 30, 2018) Quarter 3 (July 1 – September 30, 2018) <input checked="" type="checkbox"/> Quarter 4 (October 1 – December 31, 2018)	
Project Title: Performance Engineered Concrete Paving Mixtures		
Project Manager: Todd Hanson	Phone: 239-1471	E-mail: todd.hanson@dot.iowa.gov
Project Investigator: Peter Taylor	Phone: 515-294-9333	E-mail: ptaylor@iastate.edu
Lead Agency Project ID:	Other Project ID (i.e., contract #): Addendum 629	Project Start Date: 10/1/17
Original Project End Date: 12/31/2019	Current Project End Date:	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
\$1,345,000	\$472,103.55	15%

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
\$157,951.23		

Project Description:

Concrete for pavements has historically been specified and field controlled around acceptance criteria that do not relate well to durability (slump, air content, strength). Paving concrete specifications need to be built upon engineering properties that directly relate to good field performance. With the recent advancements in research knowledge on failure mechanisms, and the parallel development of better tests, this is possible.

A review of many current and new specifications has found that they are still largely based on strength, slump, and air, which provide limited correlation with the mechanisms of pavement failure currently observed. The need for change in the way we specify concrete, especially concrete for paving mixtures, is becoming increasingly apparent as mixtures become more complex with a growing range of chemical admixtures and supplementary cementitious materials. Traffic loadings continue to increase, more aggressive winter maintenance practices are implemented, and demand increases to build systems more quickly, cheaply, and with increased longevity.

Tasks include:

- Task 1: Implementing What We Know
- Task 2: Performance Monitoring and Specification Refinement
- Task 3: Measuring and Relating Early Age Concrete Properties to Performance

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

For Quarter ending December 31, 2018

- A PEM update was presented at the NRMCA Concrete Works meeting on October 1, 2018 in the Washington, D.C. area. The focus topics are those included in the upcoming publication “What Contractors (and Producers) Need to Know About PEM.
- Team members joined the South Dakota DOT, the SD Chapter-ACPA and Reede Construction Co. under the FHWA/PEM incentive program for shadow testing on an I-90 project in the western part of the state during the first week of October. A meeting was held on site with 11 state employees and the general contractor to discuss the side by side testing. With the CPTech trailer and testing equipment, we were able to highlight the initiative, discuss project specifics and demonstrate testing methods on site. The Department has collected SAM test data as well as performed Box tests and resistivity tests per the FHWA incentive program.
- We are working with Lisa McDaniel, IA Division FHWA, on a review of the PEM database and data collection process developed by Nichols Consulting Engineers. In addition, the State DOT data Entry Spreadsheet is being modified to simplify use by the states. This spreadsheet will be imported into the PEM database with shadow test data.
- In October, Tennessee DOT joined the TPF-5(368) pooled fund project, bringing the participation level to 17 states. Welcome TAC member Michael Mellons.
- On October 30, we participated with Tara Cavalline in a PEM presentation for the North Carolina Concrete Pavement Workshop in Greenville, NC. Estimate attendance: 150
- Throughout the fall construction season, the Pennsylvania Department of Transportation conducted FHWA/PEM shadow testing on a project near Pittsburgh, working closely with project contractor Golden Triangle Construction Co. This was an FHWA/PEM incentive project.
- It should be noted that several SHA's (MN, MI, WI, NY) have notified us that they are collecting PEM testing data on a number of projects. This information is being shared with PEM Team members.
- PEM Team members worked throughout the quarter, refining and responding to industry comments as they proceed through final approvals of the PP 84-19 submitted to the AASHTO COMP Technical Committee. Work has now begun on developing PP 84-20.

- Team members are also corresponding with an AASHTO Task Force that is reviewing other potential PEM tests developed by our researchers.
- A PEM technical session was presented at the ACPA Annual meeting in Ft. Lauderdale, FL on November 29, 2018. CP Tech staff, representatives of Cedar Valley Corporation (IA), Golden Triangle Construction Co. (PA), the Iowa Concrete Paving Association and Wisconsin Concrete Pavement Association shared their vision and experience with the PEM initiative. Nearly 80 ACPA members attended the session. The contractor interest expressed was encouraging.
- We presented the PEM initiative to the AGC of Missouri at the request of industry and MO DOT at Lake Ozark in early December. Attendance was approximated at 40 participants.
- PEM Team members continued to respond to numerous calls from states and contractors/producers who were seeking guidance about testing and response to field issues.
- We have begun the annual task of contacting TAC SHAs to determine their specific PEM interest, progress and needs. This information will be shared with Team and TAC and will serve as the guidance in our implementation strategy for 2019 and beyond. Contacts this quarter include IA/AR/OK/KS/OH/MN/MI/NY/IL.
- Concrete paving specifications have been gathered from each of the TAC SHAs. The Team is conducting a review process that will allow us to provide recommendations for individual SHA PEM implementation strategies.
- Conversations continue with state DOT participants to identify and respond to their needs, questions and plans for PEM shadow testing in 2019 or beyond.
- Currently, we are working with NC, CA and KS to explore PEM related Open House events concurrent with FHWA MCT visits in 2019.
- Refinements of the PEM Website are ongoing. Users will find valuable information about PEM, test method summaries, test procedures, videos, state dot data entry sheet, slideshows or You Tube links, a schedule of shadow projects and information pertinent to test data entry. The link is www.cptechcenter.org/pem.

Anticipated work next quarter:

- Additional PEM Team calls with state TAC members to assess progress.
- Specification reviews/recommendations and related conversation with SHA TAC members.
- Publish Tech Briefs: “What Contractor’s Need to Know About PEM” and “What State Agencies Need to Know About PEM”
- Pilot and subsequent presentations of a one day engineering level PEM Workshop for interested agencies and industry.
- A PEM Team meeting in early January to review progress and finalize implementation strategies for 2019 and beyond.
- A SHA TAC member call and Industry TAC member call will be scheduled in the first quarter, 2019 to provide updates on progress, discuss proposed implementation strategies. The time frame and location for the next face-to-face full TAC meeting will also be determined.
- Planning for PEM Workshops/Demos in conjunction with FHWA MCT visits in CA, KS, NC.
- General outreach and assistance to SHA and industry as requested.
- Encouragement of SHAs to consider additional shadow testing and FHWA incentive participation on upcoming projects.
- Work with SHAs to establish implementation strategies.
- Work with FHWA in urging SHAs or contractor’s to participate in FHWA’s PEM testing equipment loan program.

- Continued effort to expand participation in the study to other states.
- Ongoing review and update of PP 84-20.
- Work with FHWA to coordinate additional PEM activities that will be included in the new cooperative agreement, Advancing Concrete Pavement Technology Solutions.
- PEM presentations for Paving Workshops in SD, IA, WI, PA, OH, MO/KS, St. Louis and at the Spring meetings of NRMCA, PCA and ACPA.

Significant Results:

Considerable time has been spent throughout 2018 to inform agency and industry about the PEM initiative. We are seeing encouraging interest from states, local paving groups, the national associations and individual contractors who are stepping forward to participate in shadow testing projects. While three shadow tests were built in 2018, we are optimistic that we will see WI, IL, NY, NC, KS, MN conduct shadow testing in 2019. In addition to the reported accomplishments, we are introducing a plan to involve SHA and Industry TAC members in small task groups focused on training, implementation, QA/QC, and the development of a PEM related construction specification.

Circumstances 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 members

Ahlstrom, Gina / Federal Highway Administration
 Baer, Patricia / Pennsylvania Department of Transportation
 Covay, Jeff / Arkansas Department of Transportation
 Dennis, Dan / New York State Department of Transportation
 Hanson, Todd / Iowa Department of Transportation
 Hayes, Chad / Wisconsin Department of Transportation
 Hodges, Darin / South Dakota Department of Transportation
 Hunter, Brian / North Carolina Department of Transportation
 Krstulovich, James / Illinois Department of Transportation
 Lim, S. David / California Department of Transportation
 Masten, Maria / Minnesota Department of Transportation
 Meggers, Dave / Kansas Department of Transportation
 Mellons, Michael J./Tennessee Department of Transportation
 Miller, Dan / Ohio Department of Transportation
 Prieve, Eric / Colorado Department of Transportation
 Romero, Matt / Oklahoma Department of Transportation
 Staton, John / Michigan Department of Transportation
 Wielenga, Craig / Idaho Transportation Department