



## 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 through a growing use of a 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, but with intent for 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.):

- The final report was submitted to the TAC for review shortly after that, comments received were incorporated and the ~~draft-final~~ report was submitted to IA DOT on December 30, 2022
- ~~We are expecting to complete all deliverables by March 31, 2023.~~

## Anticipated work next quarter:

- ~~An extension to March 31, 2022 was requested in order to make final revisions and post the final report on the website.~~

## Significant Results:

Through the PEM pooled fund, the project team learned the following:

- Each state agency is unique in the way it specifies concrete pavements; Table 2 in AASHTO R 101 gives agencies choices in the PEM properties and standard test methods to use.
- The success of the PEM shadow projects was the result of coordination and communication between state agencies and industry.
- New test methods require training and practice in following standard methods for the tests to achieve the desired results.
- Contractors involved in the shadow projects were supportive and continue to use the tools provided through the PEM pooled fund project.
- Concrete pavement sustainability is improved when PEM approaches are used.
- Additional technology transfer activities are needed to further expose agencies and industry to PEM and its benefits.
- The goals of the pooled fund project were achieved, including the implementation of PEM in practice, the delivery of education and training on the PEM approach and tests for PEM properties, adjustment of the specification values used in concrete paving, and the continued development of tools to relate early-age concrete properties to performance.

**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**

Praul, Mike & Bob Conway / Federal Highway Administration  
Baer, Patricia / Pennsylvania Department of Transportation  
Richard Bradbury / Maine Department of Transportation  
Covay, Jeff / Arkansas Department of Transportation  
Dennis, Dan / New York State Department of Transportation  
Dietz, Dana / Idaho Transportation Department  
Hanson, Todd/ Iowa 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  
Wadley, Dan / Kansas Department of Transportation  
Mellons, Jason/Tennessee Department of Transportation  
Miller, Dan / Ohio Department of Transportation  
Parry, Jim / Wisconsin Department of Transportation  
Prieve, Eric / Colorado Department of Transportation  
Johnson, Daryl / Oklahoma Department of Transportation  
Bahmer, Thomas / Michigan Department of Transportation  
Waters, Jason / Georgia Department of Transportation