

Problem Statements

- **Development of a Concrete Durability Specification** AFN30
- **Joint Deterioration Monitoring for Selection of Proper Preservation Type and Timing** AFN30/AFH50
- **Characterizing Slab/Base Friction for Improved Concrete Pavement Designs** AASHTO Joint Committee
- **Reliable Prediction of Service Life Model of HPC Bridge Decks** AFN10

Development of a Concrete Durability Specification

- The main objective of the research is to develop a durability-based specification for concrete construction that integrates with modern design methods and provides: i) a scientific basis for material selection that maximizes durability, ii) best practices for construction, and iii) specifications for construction QC/QA to ensure durability.
- Total research funding would likely be in the 2-4 million dollar range.
- Research period: 10-15 years.

Joint Deterioration Monitoring for Selection of Proper Preservation Type and Timing

- A paradigm shift from the incessant need for rehabilitation and repair to keep a road in service to an approach that achieves extended pavement life in a more sustainable manner through preservation. This should be accomplished through improved pavement joint deterioration monitoring for more effective preservation types, timing, and activities.
- The study will result in a report including specifications for preserving pavement joints with information on monitoring, preservation techniques and timing as well as QC/QA of preservation activities.

Characterizing Slab/Base Friction for Improved Concrete Pavement Designs

- The objective of this research is to develop guidelines for the selection of the interface friction parameters in the MEPDG for a variety of designs and locations. This project would identify and quantify the effect of all design features affecting the current model based on actual performance in the field, in addition to determine the most suitable loss of friction age based on project conditions. The research should also investigate whether or not a more robust friction model should be developed to account for an intermediate level of friction that would better model the slab fatigue damage and hence slab cracking.
- The estimated funding for the project is \$450,000. The estimated time to conduct the research is 24 months.

Reliable Prediction of Service Life Model of HPC Bridge Decks

- This research will indicate the road map to formulation of accurate service life model of HPC bridge decks with respect to chloride ingress in harsh chloride environments. Evaluation of the propagation period would allow comparison of the effect of several HPC mixture designs on overall durability performance of the concrete structures.
- Long term electrical resistivity testing is needed for HPC mixtures to obtain time dependent variation of resistivity and its effect on the corrosion propagation rate of reinforcing steel. The research effort is anticipated to cost \$200,000 over 2 years (\$100,000 each year).