Objective
The majority of the jointed plain concrete pavements constructed in Pennsylvania perform with little maintenance throughout the intended design life; however, there are some pavements that have exhibited early distress in the first five to ten years after construction. The maintenance/repairs generated by this early deterioration can generate substantial costs for a pavement type that is typically considered to be maintenance free. The objectives of this research are to help identify the cause of this premature deterioration so that it can be prevented in future projects and also provide guidance on how to address this deterioration once it has developed.

Problem Statement
Early-age deterioration can be caused by three primary factors; construction practices, construction materials and/or design deficiencies. Many times early-deterioration is the result of a combination of these three factors. Deterioration related primarily to the use of a non-durable concrete will still typically take ten to fifteen years to manifest. The deterioration being observed is occurring within the first five to ten years so the focus of this research effort will be to look at the three facets of concrete pavements (construction practices, construction materials, pavement design) critical to performance so that the cause(s) of this premature deterioration can be identified.

Tasks to be completed
The tasks required to complete this research effort are as follows:
1. Gather project information and develop a database regarding the exact type of failures that are occurring.
2. Data analysis, site selection and development of field data and laboratory work plan.
3. Execute field data collection work plan once the project locations and field data collection work plan has been approved.
4. Execute Laboratory Study. Three tools will be used to evaluate the potential of early age deterioration in the slab; Mechanistic-Empirical Pavement Design Guide, the High Performance Pavement software and a finite element program.
5. Identify cause of deterioration and provide guidance on potential repair techniques and draft final report.

Results...