Arkansas State Highway and Transportation Department
Transportation Research Committee

RESEARCH PROBLEM STATEMENT

DATE: 08/26/2010 **PROJECT AREA:** Maintenance

TITLE: Design, Construction and Monitoring of Roller Compacted Concrete Pavement in the FSP

PROBLEM STATEMENT:

More than 1,000 miles of roadways in Arkansas have been adversely affected by the increased traffic loadings in the Fayetteville Shale Play (FSP), leading to a sharp acceleration of pavement distress. Thus, efficient rehabilitation strategies should be examined that will provide at least 20 years of service for this traffic level.

Roller-compacted concrete pavement (RCCP) is one such potential alternative. RCCP is a low-paste, zero-slump concrete mixture that is compacted with rollers and requires no forms, reinforcing, dowels, jointing, or finishing. The reduced cement content and ease of construction result in substantial cost savings. Also, traffic can be returned to the roadway in as little as 24 hours. RCCP is very strong and well-suited for heavy traffic loadings, but the success of any pavement depends upon the quality of its foundation. Thus, base/subbase reconstruction should also be considered in this project. Full-depth reclamation (FDR) is a sustainable alternative to traditional remove and replace (R&R) methods. FDR involves pulverizing the existing deteriorated pavement structure, mixing with cement and water, and compacting in place, providing a stable base for a pavement surface in a single pass, allowing traffic to be immediately returned to the roadway or paving to begin. FDR and RCCP should be considered as a fast, cost-effective alternative for maintenance.

OBJECTIVES:

1. Review literature on FDR and RCCP, including design/testing procedures, and state experiences.
2. Design and construct a number of test sections (structure + materials) to be considered for use in the FSP. Possible sections are 1) RCCP w/diamond grinding & FDR, 2) RCCP w/HMA surface & FDR with shoulder widening, 3) HMA/FDR, 4) PCCP/FDR, 5) HMA/R&R. Several locations and contractors (and AHTD maintenance) should be included to increase knowledge base and speed learning curve for use of new materials.
3. Monitor sections and provide recommendations for construction, pvmt. performance, traffic issues, & cost.

Form of Research Implementation:

In many ways, much of this project will be implementation. The PI will work extensively with AHTD, as AHTD personnel will play a key role in all phases of the project, including design, bidding contracting, and construction oversight. Extensive evaluation of test sections will generate recommendations.

Total Estimated Cost and Project Duration: **$** 185,000 **and** 33 **months.**

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ADVISORY COUNCIL RANKING	TRC RANKING	Statement Combined with Statement Number(s)
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