Arkansas State Highway and Transportation Department
Transportation Research Committee

RESEARCH PROBLEM STATEMENT

DATE: 08/27/2010

PROJECT AREA: Pavements

TITLE: Damage Assessment Tool for Low Volume Roads

PROBLEM STATEMENT:

Oil and gas exploration in the Fayetteville shale has created a significant maintenance problem for the State and those counties located in the play area or on the routes to the play area. State and local officials need an easy-to-use tool that requires only simple inputs to assess, with reasonable accuracy, the damage caused by increased heavy truck traffic on low volume roads. Such a tool should consider the major failure modes of cracking and rutting and should be based on simple inputs for soil properties, environmental conditions and traffic. A limited tool was previously developed to predict damage based solely on rutting, which is not the complete picture. This project would include a mechanistic cracking model based on material properties, pavement geometry and drainage that would be empirically modified by observed performance. This project would also expand the current database of soil types where a relationship between mechanical properties and index properties has been established. The tool for damage assessment would be a user friendly computer program that would require simple inputs and give reasonable predictions of damage or remaining life of low volume flexible pavements. This tool could be used when the sophisticated inputs required to realistically evaluate flexible pavements using the MEPDG are not available.

OBJECTIVES:

Create a simple damage assessment model that would be suitable for use by AHTD as well as local agencies.
Incorporate the model in a user friendly computer program.
Expand the database and refine the relationships between mechanical and index properties of soils in the play area.
Observe damage as a function of traffic and relate it empirically to pavement and subgrade properties.
Develop a complete protocol for rapid damage or remaining life assessment.

Form of Research Implementation:

A user friendly Visual Basic program to predict damage based on user defined rutting and cracking criteria.
Training for users on how to use the program and obtain the inputs required for the program.

Total Estimated Cost and Project Duration: **$** 140,000 **and** 24 **months.**

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