Statement No. 19

Arkansas Department of Transportation

Transportation Research Committee

RESEARCH PROBLEM STATEMENT

DATE: 09/10/2017 | **PROJECT AREA:** Maintenance

TITLE: Development of Metals Corrosion Maps of Arkansas and Maintenance of Cross-drains

PROBLEM STATEMENT:

Metal culverts or pipes used along or across the Arkansas highway system can corrode over time. The rate of metal corrosion varies around the ArDOT districts and it depends on various material properties and environmental conditions, which include soil type, ground water table, rainfall, acidity level of soils, etc. Catastrophic incidents such as a complete wash out of metal culverts along with roadway can be prevented if proper metals can be selected during the construction project. A use-friendly corrosion map help to reduce such catastrophic damage and save human life and properties. Also, selecting less expensive metals in less corrosive areas can be cost effective to the ArDOT. Further, the ArDOT districts that have more ice and snow would be more susceptible to metal pipe corrosion because of the amount of salt used in the winter. Since different metals corrode at different rates even under the same environmental conditions, this could lead to us picking more appropriate materials for a longer life expectancy. Louisiana has done similar work and completed banned metal pipes in District 2 (New Orleans). The objective of this study is to develop a user friendly corrosion map for all AHTD districts by analyzing relevant historical soil, materials and environmental data. Required mathematical models followed by user-friendly maps will be developed to accomplish the goals of this study. This study will also look into the maintenance prospective of crossdrians to help prevent future damage to roadway. Crossdrains are considered one of ArDOT's most valuable assets. Findings of this study could save the department on costly repairs.

OBJECTIVES:

1. Analyze soils, materials and environmental data from historical and new construction projects.
2. Develop a user friendly corrosion map for Arkansas
3. Suggest cost-effective maintenance options of cross-drains to lengthen their service lives.

FORM OF RESEARCH IMPLEMENTATION:

1. Report containing technical findings and user-friendly corrosion maps and maintenance options
2. Train users how to use the corrosion map and adopt proper maintenance of cross-drains.

Estimated Project Duration: 24 **months**

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Standing Subcommittee Ranking	Advisory Council Ranking	Statement Combined with Statement Number(s)
4 / 9	19 / 44	