

RESEARCH PROBLEM STATEMENT

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| DATE: 09/05/2019 | PROJECT AREA: Pavements |
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TITLE: Effect of Flooding Event on Damage and Performance Characteristics of Roadway Pavements

PROBLEM STATEMENT:

During the last few decades, flooding has become one of the most prevalent severe weather event for areas in flood plains in Arkansas. Flooding can cause significant damage to roadway infrastructure system that affects the subsequent performance and remaining life. However, its effects have been underestimated and have not been thoroughly investigated. Pavement system loses its structural capacity when it is saturated by flooding event. As the flood waters recede from the pavement surface, it is expected that the roadway needs to be opened to traffic immediately. In practice, during this early drying period, pavement structure could be still in the weakened condition that causes increased rate of deterioration and premature failures with less traffic load applications as compared to non-flooded condition. Therefore, there is a need to better understand and to evaluate the effect of flooding event on change in damage and performance characteristics of pavement system. Also, this study will include the development of rational decision support criteria or guideline for opening roadways to traffic that help minimize the premature damage and failure after flooding event.

OBJECTIVES:

The primary objectives of this study are summarized as follows:

- (1) Evaluate the effect of flooding on change in damage and performance characteristics, and remaining life of roadway pavement system.
- (2) Develop the rational and implementable decision support criteria or guideline for opening roadways back to service after flooding event.

FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:

The form of research output will include the development of rational decision support criteria or guideline that will help minimize the risk for premature damage and failures, and loss of pavement life due to flooding event. This will be of significant benefit to reduce potential costs due to flooding event and to better maintain the pavement management system in the State of Arkansas. According to Arkansas Highway Commission, the estimate to cover flood-related damage of roadway infrastructure system is approximately \$30 million in 2019.

Estimated Project Duration: 24 Months

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Standing Subcommittee
Ranking

Advisory Council
Ranking

Statement Combined with
Statement Number(s)