## RESEARCH PROBLEM STATEMENT

**DATE:** 08/12/2016  
**PROJECT AREA:** Maintenance

**TITLE:** Investigating adverse impacts of road deicers on pavement materials

**PROBLEM STATEMENT:**

In the United States, 15 million tons of deicing salt are used each year and more than $2 billion is spent on winter road maintenance. The annual average snowfall in the state of Arkansas ranges from 10.4 inches in the extreme northwest to 2.8 inches in the lowlands of the southeast. Multiple ice storms are also expected every year. There are a wide range of deicing agents, including abrasives such as sand, and salts such as sodium chloride, magnesium chloride, potassium acetate, calcium chloride, potassium chloride and calcium magnesium acetate (CMA). Although their effectiveness is comparable, salts and sands can contribute to corrosion of vehicles and infrastructure, contamination of water bodies, damage to roadside vegetation, and damage to the pavement materials. In this project, an investigation will be conducted on the adverse impact of road deicing agents on pavement materials. Previous research indicates the impact varies due to many factors such as length and type of road drainage systems, the amount of deicers applied, types of pavement materials and aggregates. This research aims to identify the deicer(s) that induces the least damage to pavement and develop protocols for application. In addition to the traditional deicing agents used above, alternative organic deicing agents will be evaluated as potential alternatives.

**OBJECTIVES:**

The research objectives of this project are to (1) identify the optimal deicing agent(s) by comparing the adverse impact on pavement materials, (2) develop application protocols of selected deicer(s), and (3) perform a cost analysis of the developed deicing protocols that AHTD could use for budgeting purposes.

**FORM OF RESEARCH IMPLEMENTATION:**

A guidance manual will be developed to assist AHTD with implementing the selected deicing protocol developed through this research project. Additionally, the project team will develop and deliver a short course to AHTD personnel, tailored to helping AHTD with implementation that will enhance current frozen precipitation guidelines.

**REVIEWER:** Davin Webb  
**Estimated Project Duration:** 24

**PREPARED BY:** Wen Zhang and Andrew Braham

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