UNIVERSITY TRANSPORTATION CENTER

RESEARCH BRIEF

PROJECT TITLE: **Measuring Dispersal and Tracking of Anti-Icing and Deicing Chemicals using In-Situ Hyperspectral Data**

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INSTITUTION: UNIVERSITY OF ALASKA, FAIRBANKS

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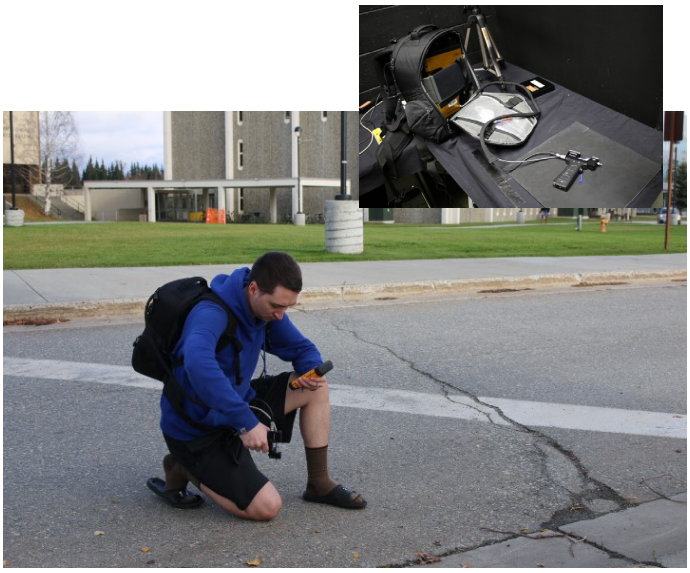
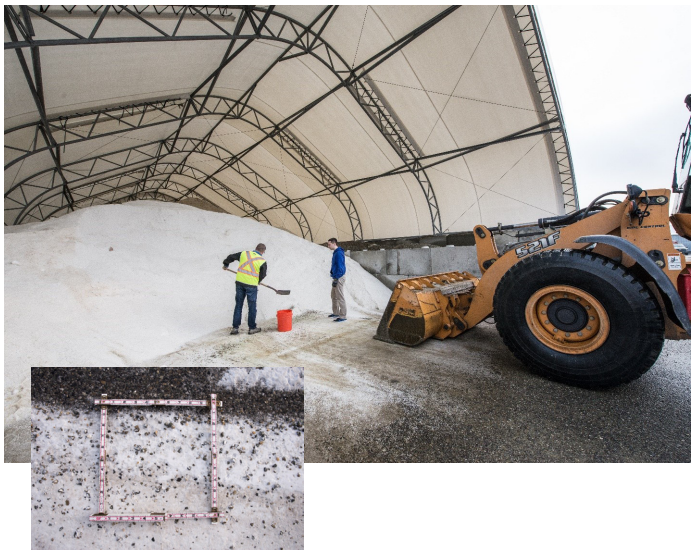
Research Project

The use and application of salt, sand and related mixtures, and derivatives have proven to be highly effective for controlling or removing the development of ice on the roadway surface. Ample research exists indicating the way in which application method, application rate and efficacy of mix contents can vary depending on temperature and surface conditions. There is also substantial research on the environmental impacts of anti-icing and deicing applications on factors such as soil and groundwater as well as the corrosive properties of different types of chlorides. However, there is little if any research to suggest the longevity and dispersal of anti-icing and deicing compounds after they have been applied to the roadway surface (i.e., how long does it stay in place and where does it go post-application?). To that end, the objectives of this project are fourfold:





1. Create a framework and develop methods for generating an anti-icing and deicing chemical spectral library to be used for in-situ imaging and concentration quantification;
2. Conduct preliminary field imagery acquisition and processing for proof of concept;
3. Develop and conduct a robust sampling strategy to quantify the amount of anti-icing and deicing chemical loss due to imposed processes; and
4. Integrate findings into practice to inform and improve winter maintenance efforts and strategies.

The goal of this project will be to determine to what extent a winter roadway surfaces can be analyzed using spectrometry to record the percentage reflectance at each wavelength. In this process a catalog of the prime constituents used in anti-icing and deicing materials n-members will be recorded. These recordings will then be used to estimate varying spatial and temporal compositions of anti-icing and deicing material.