



UNIVERSITY TRANSPORTATION CENTER RESEARCH BRIEF

PROJECT TITLE: Measuring Dispersal and Tracking of Anti-Icing and Deicing Chemicals using In-Situ Hyperspectral Data – Phase II: In-Situ Terrestrial Field Data Collection

PRINCIPAL INVESTIGATOR: Nathan Belz (UAF), Gabriel Fulton (UAF)

INSTITUTION: SINGLE-INSTITUTION PROJECT

ESTIMATED COMPLETION DATE: AUGUST 2020

SPONSORS: THE PACIFIC NORTHWEST TRANSPORTATION CONSORTIUM, AKDOT



Background

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. Obtaining robust measurements manually to quantify the rate of loss of deicing and anti-icing chemicals would be time prohibitive and make it difficult to obtain spatially representative samples over long time periods. To that end, we are validating our methodology by which spectroscopy can be used to measure field concentration measurements of anti-icing and deicing chemicals.



Research Project

The objectives of Phase II of this project are threefold. First, develop a robust in-field sampling plan to measure anti-icing and deicing chemical concentrations under varied environmental, geometric and volumetric conditions. Second, conduct the field data collection. Third, develop and conduct a robust sampling strategy to quantify the amount of anti-icing and deicing chemical loss due to imposed processes. Lastly, use these findings to inform and improve winter maintenance efforts and strategies.

The results and deliverables of this research will demonstrate broader applicability of hyperspectral sensing technologies in the field of transportation. The findings of this research serve to quantify the amount and nature of imposed loss of anti-icing and deicing chemicals and might provide information that can be used to better inform winter maintenance efforts and activities. This will improve the efforts of DOT's and other municipalities to effectively manage and mitigate the effects of winter precipitation events. In turn, this will directly improve winter mobility of our highway systems.