



Integration of Mobile Road Weather Information Systems into Winter Maintenance Operations in Fairbanks, Alaska

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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. The Alaska Department of Transportation and Public Facilities (DOT&PF) must cover an incredibly large state with incredibly dynamic and varied weather and temperature conditions. Alaska DOT&PF develops robust and comprehensive plans for winter maintenance operations to maintain an acceptable level of mobility and safety for the traveling public while also operating within a very constrained budget. If applied in excess, anti-icing material may create significantly slippery and wet pavement surfaces. Conversely, if an insufficient amount of anti-icing material is applied it can fail to provide sufficient friction and be ineffective in preventing the bond between ice and pavement surface. It stands to reason that anti-icing and deicing compounds (e.g., salt and sand) are only effective at or above a certain concentration. That is to say, if the amount of salt in solution becomes too dilute, then it no longer retains the capacity to control the development of or melt ice on the roadway. The questions that remain are: 1) how long after applying an anti-icing or deicing chemical does the application remain at an effective concentration; and 2) when is reapplication of anti-icing chemical warranted?



Research Project

It is our supposition that mobile road weather information system (mRWIS) technologies can be used to provide critical information about road surface conditions and inform maintenance crews with regard to remnants of previous applications as well as the best course of action for retreatment. To that end, the primary goal of this project is to integrate mRWIS into Alaska DOT&PF maintenance operations (e.g., installed on maintenance and plow trucks) for real-time tracking of plow location, road condition, and estimated friction to improve decision making regarding anti-icing treatments. A more general objective of this project is to evaluate the efficacy and reliability of mobile road weather information systems (mRWIS) and their role in monitoring anti-icing applications, particularly the longevity of the application, and determine the extent to which mRWIS can be used as a decision making tool for anti-icing operations.

ABOUT THE AUTHORS

The research team consisted of Nathan Belz of the University of Alaska.

ABOUT THE FUNDERS

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EXPECTED DATE OF COMPLETION

August 2022

FOR MORE INFORMATION

<http://depts.washington.edu/pactrans/research/projects/integration-of-mobile-road-weather-information-systems-into-winter-maintenance-operations-in-fairbanks-alaska/>