UTC Project Information	
Project Title [MODIFIED]	Road Weather Information System Contributions to Road Safety: Assessment of Winter Crash Histories in Alaska
University	University of Alaska
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Funding Source(s) and Amounts Provided (by each agency or organization)	University of Washington PacTrans $70,000 University of Alaska $ 70,000
Total Project Cost	$140,000
Agency ID or Contract Number	69A3551747110
Start and End Dates	September 16, 2020-September 15, 2022
Brief Description of Research Project	Various transportation authorities have relied on the Road Weather Information System (RWIS) to make informed decisions about winter road maintenance in the past (WRM). The use of RWIS provides a variety of advantages in terms of improving road safety. A solid foundation of information on the development of the use of RWIS across states is provided in this article, as well as a traffic safety analysis of the use of RWIS as a road countermeasure to reduce the crash rate during the winter season. RWIS has been in use by the Alaska Department of Transportation since 2000, with just 26 of the 75 RWIS stations across the state being considered for this investigation. The impact of utilizing RWIS on the crash rate with and without RWIS was captured using the Empirical Bayes (EB) technique. It is proposed in this research that three safety performance metrics (SPFs) be created for winter crashes in Alaska. RWIS as a countermeasure is novel in this study, which is why a crash modification factor was established. In addition, the research results showed that RWIS implementation has the potential to reduce fatal and serious winter crashes by 36 percent with an expected cost to benefit ratio of approximately 1:27.

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	No adoption of research outcomes has occurred at this time.
Impacts/Benefits of Implementation (actual, or anticipated)	This study provides sufficient evidence to recommend that RWIS are effective in reducing crashes, especially in preventing fatal and serious injury crashes during the winter season. For crash frequency, the Empirical Bayes unbiased estimates for the reduction of crashes as a result of the implementation of RWIS are 15% and 34% for total crashes and fatal and severe injury crashes, respectively. The reduction in crash rates for total crashes is statistically significant ($\alpha < 0.1$). The reduction in crash rates for fatal and severe injury crashes is statistically significant ($\alpha < 0.05$). The two CMFs were significant: all crashes CMF value was 0.83 with $\alpha < 0.001$ and the fatal and serious injury crashes CMF value was 0.64 with $\alpha < 0.001$. The calculated cost-to-benefit ratio of implementing RWIS throughout the state's highway segments is approximately 1:27. This study provides sufficient evidence to recommend that RWIS are effective in reducing crashes, especially in preventing fatal and serious injury crashes during the winter season. This research is novel as it develops SPF and EB analysis that uses a realistic time frame (i.e., October through May) for the winter season spanning over the New Year. In addition, we incorporate weather data in the form of AWSSI into the SPF and EB models.
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