

2019 Research Showcase

& STIC Annual Meeting

Snow and Ice Control Performance Measurement: Comparing “Grip,” Traffic Speeds and Safety During Winter Storms

PROJECT TITLE

Snow and Ice Control Performance Measurement: Comparing “Grip,” Traffic Speed Distributions and Safety Outcomes During Winter Storms

STUDY TIMELINE

October 2017 – September 2019

INVESTIGATORS

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VTRANS CONTACTS

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This fact sheet was prepared for the 2019 VTrans Research Showcase & STIC Annual Meeting held at the Dill Building in Berlin, VT, on September 11, 2019 from 8:30 am– 1:00 pm.

Fact sheets can be found for additional projects featured at the 2019 Symposium at

<http://vtrans.vermont.gov/planning/research/2019showcase>

Additional information about the VTrans Research Program can be found at

<http://vtrans.vermont.gov/planning/research>

Additional information about the VTrans STIC Program can be found at

<http://vtrans.vermont.gov/boards-councils/stic>

Introduction

Road surface conditions and vehicle speeds capture important factors that influence mobility and traveler safety during and after a winter storm event. Vaisala’s proprietary “Grip” measure provides an imputed measure of the condition of the road surface. The Average Distribution Deviation (ADD) measures changes in the distribution of vehicle speeds during and after winter weather events, capturing the traveling public’s response to their perception of road surface conditions. The objective of this project was to gain a better understanding of the relationship among Grip, speed and adverse safety outcomes.

Methodology

To identify high risk periods, the research team extracted events where the ADD was within the normal range and Grip was compromised. These cases indicate that speed distribution of the traffic stream did not differ from the typical speed distribution for clear days but that road conditions were degraded. High-risk days, corresponding to a day and a location when the ADD and the Grip readings were inconsistent with one another, were compared to crash and Vermont State Policy incident records.

Conclusions

High-risk days identified in this research, showed a strong co-occurrence with crashes and other snow and ice-related incidents, increasing the risk of one of these adverse outcomes by 3-4 times. However, this conclusion is based on a very limited set of data for the winters of 2016-2017 and 2017-2018, so more research is needed to support this conclusion as well as to determine whether a lower ADD threshold should be used to identify high-risk period.

Potential Impacts and VTrans Benefits

If the ADD-Grip discrepancies can be used to predict crashes, then this finding could be extremely useful for winter traffic safety in Vermont. For example, a programmable message board, linked to the real-time calculation of the ADD-Grip discrepancy, could communicate poor Grip situations with greater urgency added when the ADD indicates that current speeds are not safe.

