VERMONT
AGENCY OF TRANSPORTATION

FACT SHEET

Using the Relationship between Winter Severity and Snow and Ice Control Costs to Create a Cost Forecasting Tool

Introduction

Planning for snow and ice control (SIC) activities is a persistent challenge for VTrans due to variability in winter severity and a limited understanding of the relationship between severity and SIC cost. The purpose of this project was to develop a forecasting tool suitable for estimating the cost of achieving the Agency's SIC performance targets across a range of weather conditions.

Methodology

Utilizing a decade of SIC cost data from VTrans MATS database and weather data from the National Oceanic and Atmospheric Administration (NOAA), the investigators explored the relationship between SIC costs and winter severity, finding that this relationship defines 3 distinct "snow regions" in Vermont:
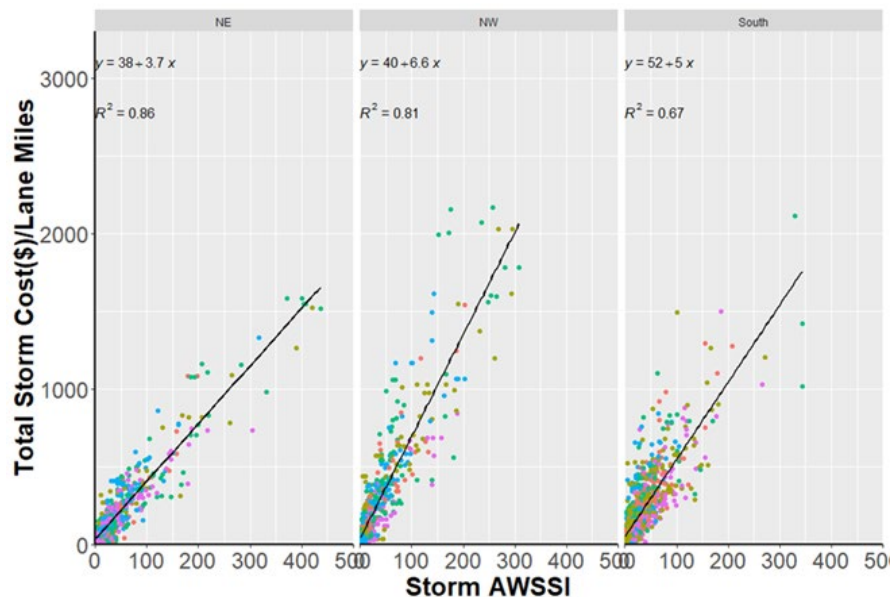
Surface friction data collected at Road Weather Information System (RWIS) stations in Vermont were used in conjunction with the NOAA data to create a new SIC performance measure - weighted Grip loss.

Conclusions and Next Steps

The research team created a cost forecasting tool, scripted in the VBA module of MS Excel, for estimating SIC costs from winter-severity forecasts. The tool can be used to estimate SIC costs statewide, by maintenance district, or by individual VTrans garage, in $ per lane-mile or total $. he tool simulates 10,000 randomly-generated winter seasons matching the user's specification to estimate costs. The research team is currently working on an extension of this project, exploring the contribution of pavement quality (roughness and rut depth) to SIC costs.

Potential Impacts and VTrans Benefits

This tool will enable VTrans to make data-driven decisions about appropriate levels of investment in SIC for a given winter forecast and potentially improve SIC performance management by comparing actual SIC performance outcomes and cost-effectiveness to those seen in the historical data.

More information about the VTrans Research Program, including additional Fact Sheets, can be found at:
http://vtrans.vermont.gov/planning/research