

2017 Research Symposium

Identifying Best Practices for Snowplow Route Optimization

& STIC Annual Meeting

RESEARCH PROJECT TITLE

Identifying Best Practices for Snowplow Route Optimization

STUDYTIMELINE

December 2015 – December 2016

PRINCIPAL INVESTIGATOR

Jonathan Dowds, UVM TRC, PI

VTRANS CONTACT(S)

Todd Law, State Maintenance Engineer

MORE INFORMATION

This project was funded by the Clear Roads research consortium. The final report for the project is available through the Clear Roads website at: http://clearroads.org/wp-content/uploads/dlm_uploads/FR_CR.14-07_Final.pdf

This fact sheet was prepared for the 2017 VTrans Research Symposium & STIC Annual Meeting held on **September 28, 2017** at National Life in Montpelier, VT. 8:00 am– 12:00 pm.

Fact sheets can be found for additional projects featured at the 2017 Symposium at <http://vtrans.vermont.gov/planning/research/2017symposium>

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 or What was the Problem?

Well-designed winter maintenance routes result in snow and ice control service that is both more effective, because roads are cleared more rapidly, and more cost-efficient, because deadheading, route overlap and other inefficiencies are reduced or eliminated. There are an increasing number of computerized tools to facilitate the routing process, but these tools are not yet widely used by winter maintenance practitioners. The purpose of this project was to provide practitioners with an overview of computerized route optimization processes and concrete recommendations about how to ensure that route improvement efforts produce actionable results

Methodology or What was done?

This project synthesized the methods used and lessons learned from nine recent and ongoing snowplow routing projects using a variety of computerized routing tools. The report includes project descriptions, based on interviews with project personnel, which focus on project goals, optimization software features used, and lessons learned.

Conclusion or What are the next steps?

These snowplow route optimization projects show that route optimization is a powerful tool for improving routing efficiency but that it does not replace the need for expert judgment in the route design process. Successful route optimization projects rely on close cooperation between experienced winter maintenance professionals and the individuals conducting the route optimization as well as a highly accurate, snowplow-routing specific representation of the road network. Successful projects also include time to review and revise new routes to identify potential problem spots prior to implementation. Automatic Vehicle Location/Global Position System (AVL/GPS) systems are highly complementary to route optimization and route review projects.

Agencies that do not have up-to-date information about the lengths of existing routes should consider collecting this information prior to undertaking route improvement projects. Collecting route length data is straight-forward with GPS/AVL systems or even with smartphones or driver reports.

What are potential impacts? What is the benefit to VTrans?

Multiple route optimization projects report route length reductions on the order of 5% to 10%, with reductions as high as 50% reported in one case. This project report provides guidance on how to conduct a successful snowplow route optimization project as well as metrics that may indicate the potential for optimization to provide significant savings such as widely varying route lengths among existing routes. In the event that VTrans opts to continue with computerized route optimization work, it will give the Agency additional tools to ensure that the project includes a successful implementation stage.