3.2.2 Establishing Roadway Priority in Statewide Roadway Snow and Ice Control Operations

Presenter
James L Sullivan
Research Analyst
UVM Tran. Research Center
james.sullivan@uvm.edu

Co-Presenter

Deriving optimal routes for statewide roadway snow and ice control (RSIC) operations involves a complex balancing of solutions to service-territory-clustering, truck-allocation, and truck-routing problems. Larger service territories require more trucks if overall travel is to be minimized, but dedicating more trucks to one service area sacrifices the time it takes to complete RSIC operations in another garage since the number of trucks available to each garage is proportional to the time it takes to clear all of its roads. RSIC operations are often guided by principles of priority: certain groups of roadways are frequently considered to have a higher priority than others. The current RSIC Operations Plan for the Vermont Agency of Transportation establishes three levels of service for three categories of roadway links. These principles of priority typically guide the way service territories and vehicles are allocated to each garage, so that the efficient routes developed for each garage also address the most critical links in the network first. Researchers at the UVM Transportation Research Center incorporated a continuous measure of priority, the Network Robustness Index (NRI), on the state-maintained links, not a hierarchical measure as had been used by others. To avoid incorporating the priority measure into the routing solution, the measure was used earlier on in the truck-allocation process to come up with an optimized allocation.
Then, in the routing process, a performance metric based on this priority measure was used to compare the effectiveness of various routing procedures in providing RSIC operations.