

2017 Research Symposium

& STIC Annual Meeting

Examining the Potential Impacts of Maintenance Investment and Capital Reinvestment in Vermont's Roadway Infrastructure Network

RESEARCH PROJECT TITLE

Examining the Potential Impacts of Maintenance Investment and Capital Reinvestment in Vermont's Roadway Infrastructure Network

STUDY TIMELINE

September 2015 – November 2016

RESEARCH TEAM

David Novak, UVM, PI
James Sullivan
Jon Dowds
Karen Sentoff

VTRANS CONTACT(S)

Joe Segale – Director of Policy, Planning & Research Bureau

MORE INFORMATION

[Research will add link to the final report and other materials on VTrans website](#)

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>

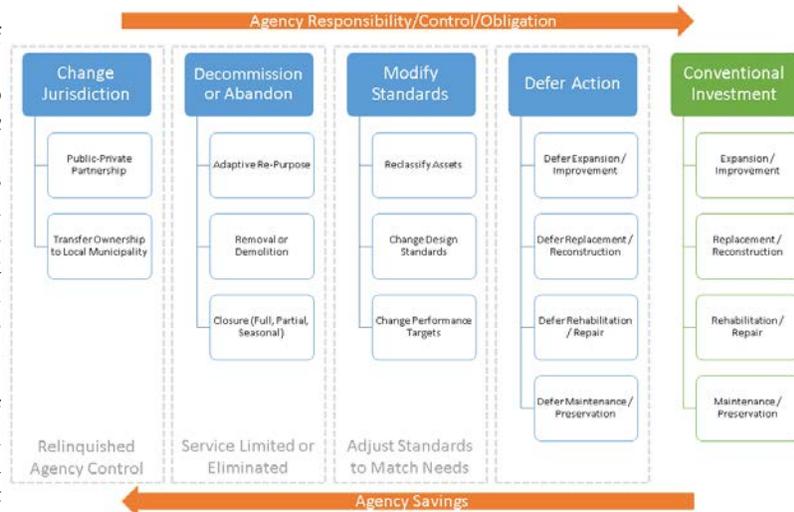
Additional information about the **VTrans STIC Program** can be found at <http://vtrans.vermont.gov/boards-councils/stic>

Introduction

Throughout the US, organizations responsible for building and maintaining transportation infrastructure are facing growing fiscal constraints. In response, transportation investment strategies have shifted away from capacity-expansion-based approaches to more innovative approaches focused on the most important or “critical” assets. Intentionally reallocating funds and resources from low priority assets or programs to the most critical assets or programs has been broadly defined as strategic disinvestment. Prioritizing assets based on network criticality and access to emergency services is one basis for making strategic disinvestment decisions. As states like Vermont consider implementing disinvestment strategies, the possible social and economic consequences associated with those decisions should also be considered; particularly in the context of whether disinvestment decisions may disproportionately impact populations that are classified as “vulnerable”.

Methodology

- Reviewed the current state of practice in disinvestment
- Developed a framework to help guide strategic disinvestment for VAOT
- Identified candidate corridors for disinvestment based on network performance metrics for criticality (Network Robustness Index, NRI) and access to emergency services (Critical Closeness Accessibility, CCA)
- Assessed the impact of potential disinvestment on vulnerable populations with a new metric, the Vermont Vulnerability Index (VVI)



Conclusions

Based on the metrics of criticality (NRI) and accessibility (CCA), 35 miles of state, US, or interstate highway and 180 miles of town highway were identified as candidates for four different disinvestment scenarios. By evaluating the most common originating and terminating locations for trips that utilize the candidate disinvestment corridors, populations were identified that would be most affected by the disinvestment. Of the candidate corridors, disinvestments would disproportionately impact vulnerable populations for 40% of the state-owned asset disinvestments and 60% of the town-owned asset disinvestments according to the new VVI.

Impacts & Benefits

The tools (NRI, CCA, and VVI) presented here are designed to assist the VAOT in making the most effective disinvestment and reinvestment decisions in line with overarching Agency goals and within a network-based, strategic decision-making framework. The thresholds of network criticality and service accessibility used in the disinvestment scenarios can be adjusted to represent a particular strategy, providing a set of tools for the Agency to use alongside its project prioritization and budget allocation processes. Furthermore, the vulnerability metrics developed at the town level could be used to assess the social impacts of transportation funding decisions, among other potential applications. The tools may also aid the VAOT beyond this application, where consideration of transportation network criticality, emergency service accessibility, and/or population vulnerability may be crucial to decision-making.