

2018 Research Symposium

Methods and Tools for Transportation Resilience Planning

& STIC Annual Meeting

RESEARCH PROJECT TITLE

Methods and Tools for Transportation Resilience Planning: Identifying and Reducing Flood And Erosion Risks On Vermont Roads

STUDY TIMELINE

Month Year – Month Year

INVESTIGATORS

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VTRANS CONTACTS

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This fact sheet was prepared for the 2018 VTrans Research and Innovation Symposium & STIC Annual Meeting held at the State House in Montpelier, VT, on **September 12, 2018** from 8:00 am– 1:00 pm.

Fact sheets can be found for additional projects featured at the 2018 Symposium at <http://vtrans.vermont.gov/planning/research/2018symposium>

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

The goal of the project is to create a method to systematically identify road segments, bridges, and culverts that are vulnerable to flood and erosion damages; to pinpoint the most critical locations and mitigation options on the transportation network; and a web-based application to display risk information.

Methodology

Vulnerability was predicted on three pilot watersheds: the Upper White River, the North Branch Deerfield River, and Whetstone Brook. A novel vulnerability scoring system was created and linked to different levels of transportation failures (i.e., partial closure, full closure, partial failure, and complete failure).

Updates to the Vermont State travel model to include local roads in the study watersheds allowed simulations to identify the links in the transportation network prone to delays from flooding failure.

The vulnerability and criticality scores were combined to develop a risk score. High risk locations are vulnerable to damages and important for efficient travel, and thus are locations where greater investment is warranted. Mitigation recommendations were established based on the characteristics that contribute to vulnerability and criticality for each location in the pilot watersheds. Mitigation options included vegetative practices in low risk and hard armor stabilization in high risk locations. Floodplain reconnection and river corridor conservation were also considered to reduce vulnerability to transportation infrastructure.

Conclusions and Next Steps

The Vermont Transportation Resilience Planning Tool is now up and running to display risk results and improve transportation planning in the pilot watersheds, VTrans.stone-env.net.

Potential Impacts and VTrans Benefits

The results of this innovative, multi-discipline project may be used for project identification and planning, project prioritization, budgeting, resource and asset management, initial site assessment, starting the design alternatives analysis, emergency planning, recovery planning, conservation planning, and planning for continuity of business and future housing. The methods and tools developed in the three pilot watersheds are intended to be expanded across Vermont in the future. Other states in the region are looking to adopt these and related methods to improve the resiliency of the regional transportation network.

