# Vermont Transportation Resilience Planning Tool: A Web Tool for Assessing Infrastructure Risk

STONE ENVIRONMENTAL

**Awards**
Grand Award, 2018
American Council of Engineering Companies of Vermont (ACEC/VT)

GIS & Data Science Project of the Year
Vermont Center for Geographic Information, 2018

**Services / Expertise**
Geospatial & Data Solutions
Web Application Development
Spatial Analysis
Database Design
User Experience
JavaScript API
ArcGIS Server
MS SQL Server
Google Charts
AngularJS

**Markets**
State Government
Regional Planners
Risk Assessment
Climate Resilience
Infrastructure Planning

**Project Location**
Montpelier, Vermont

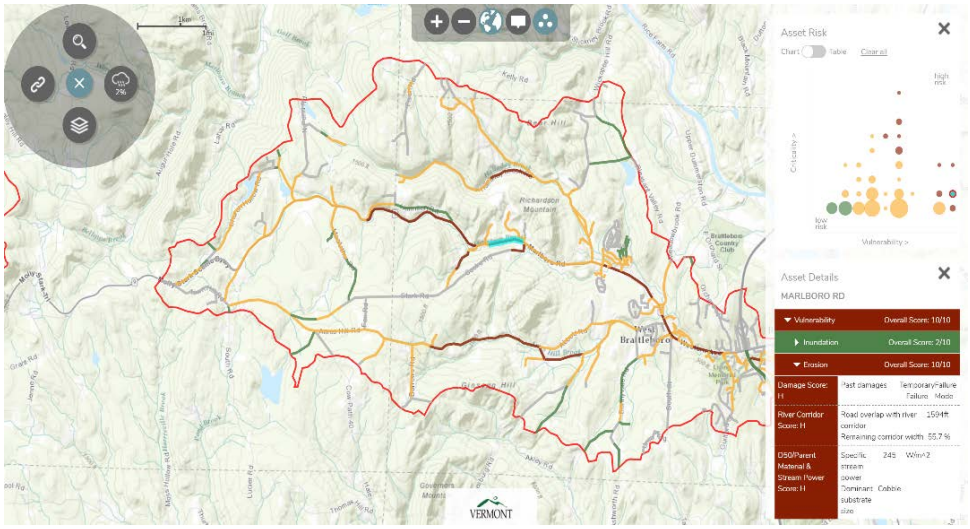
**Date Completed**
2015-present

**Project Owner**
Vermont Agency of Transportation, Operations Division

**Project Partners**
Vermont Agency of Natural Resources
Vermont Emergency Management
Vermont Agency of Commerce and Community Development
Two Rivers-Ottauquechee Regional Commission
Windham Regional Commission
White River Partnership
Municipal Road Foreman

**Project ID#**
15-131

**Project Manager**
Lauren Padilla, Ph.D.




*The TRPT allows users to view infrastructure vulnerabilities, risk, and mitigation options through interactive mapping, graphing, and tabular summaries.*

**STONE** worked with the Vermont Agency of Transportation (VTrans), a multi-disciplinary team of consultants, and a variety of local, regional, and state agency partners to develop the Vermont Transportation Resilience Planning Tool (TRPT), a web-based application designed to help integrate climate risk and transportation resiliency into VTrans' planning process and ultimately create a more resilient transportation network in Vermont. The TRPT, advanced through the *Methods and Tools for Transportation Resilience Planning Project*, combines river science, hydraulics and transportation planning methods to help VTrans and project partners understand the vulnerability of their transportation systems to the impacts of climate change and extreme weather and identify and prioritize mitigation strategies to avoid or minimize the impacts of future damages in the most critical, highest risk locations. The app identifies bridges, culverts and road embankments within a watershed that are vulnerable to damage from floods; estimates risk based on the vulnerability and criticality of roadway segments; and identifies potential mitigation measures based on the factors driving the vulnerability and criticality.

The TRPT, which is applied at the watershed level, was developed and tested in three pilot watersheds. The app displays the results of vulnerability, criticality/transportation modeling, risk, and mitigation strategies assessments in these watersheds, and allows users to review these data for three flood sizes (10-year, 50-year, and 100-year; or 10%, 2%, and 1% chance annual recurrence interval) and three processes (inundation, erosion, and deposition). Key features include a map service for viewing spatial datasets, graphical data for summary analyses, and tabular display of mitigation alternatives for at-risk transportation assets.

The app is available for use by anyone connected to the internet and is compatible with multiple internet browsers and devices. It provides a centralized repository and display for all users without requiring any specialized desktop software or internet browser plug-ins. This tool is for planning purposes only and findings must be confirmed in the field prior to seeking funding and initiating design.