Vermont Transportation Resilience Planning Tool (TRPT)

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Pilot Watersheds

1. Upper White River
2. North Branch Deerfield
3. Whetstone Brook
Need for Transportation Resiliency

Deposition Money Brook, Route 100 in Plymouth, VT 10/6/2013
Photo taken by M. Tucker

Photos taken by L. Grange and Mansfield Heliflight, 2011

Erosion along Route 4 in Mendon

Inundation along Route 2 in Waterbury
Goals
Who are the intended users?

**Primary Users**
- VTrans (Planner, Engineer, Asset Manager)
- Vermont Department of Environmental Conservation (Engineer, Floodplain Manager, Scientist)
- Regional Planning Commissions (Regional Planner, Transportation Planner, Other Staff)
- Vermont Emergency Management (Planner, Project Coordinator, Emergency Operation Center Watchstander)
Initial Design
First Iteration
One of the key rules of user interface design is that users need to be in control.
Make it beautiful.

Make your own website.

START A FREE TRIAL

No credit card required.
First Iteration

VTrans Flood Resilience Map

Get Started
- Statewide Overview
- Choose Watershed
- Headwaters White River
- North Branch Deerfield River
- Whetstone Brook

Start | About
Current Iteration

http://vtrans.stone-env.net
Case Study

The Tweed River valley in Killington and Pittsfield is mostly narrow due to the mountainous setting and additional confinement by the road embankment. In many cases, the small natural floodplains in the narrow valley have been disconnected from the river channel as the river has cut down (i.e., incised) due to erosion. The Tweed River along Vermont Route 100 is very erosive as it has a lot of (stream) power to move sediment and is overly confined.

During Tropical Storm Irene, the erosive nature of the Tweed led to loss of several sections of the Vermont Route 100 road embankment. High velocity flows that could not spread into a floodplain gouged holes in the road embankment to make new. Small culverts and bridges were washed out.
Case Study

The TRPT shows high and moderate risk sections of Vermont Route 100 along the Tweed River. The vulnerability due to erosion is high (10 out of 10). Stream power is moderate (123 Watts per square meter) and a long portion of the road segment is in the river corridor (1,464 feet). More than 10% of the floodplain is filled by the road embankment that is leading to high vulnerability. Road sections near Stage Road and Hadley Lane are the most constricted (V = 9 out of 10), lead to severe transportation consequences if damaged (C = 7 out of 10), and thus have the highest risk in the area (R = 8 out of 10).
Case Study

With the understanding of the driving processes behind the vulnerability a mitigation project was designed to both protect the road and reduce erosion. Bed armoring was installed to elevate the channel to pre-flood levels and reconnect floodplain. The over-steepened bank armoring that spilled into the river channel was pulled back to restore the bankfull channel width. The bank armoring was re-installed at a shallower slope and the lower portion was seeded to restore riparian vegetation. Proper sediment and erosion controls were used during installation of this aggressive alternative to minimize construction impacts. The practice has been installed for nearly four years and is stable. The reconnected floodplain has been accessed several times. SUCCESS.
Thank you.

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