Vermont Transportation Resilience Planning Tool (TRPT)

Presented by Roger Branon Rodriguez roger@stone-env.com
Lauren Padilla lpadilla@stone-env.com
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Acknowledgements

VERMONT AGENCY OF TRANSPORTATION

Joe Segale

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

CONSULTANTS

Roy Schiff, Jessica Louisos, James MacBroom, Tony Ciriello, Brian Cote, Lauren Weston, and Doug Osborne
Milone & MacBroom

Evan Fitzgerald, Evelyn Boardman, Joe Bartlett
Fitzgerald Environmental Associates

Lucy Gibson, Chris Sargent
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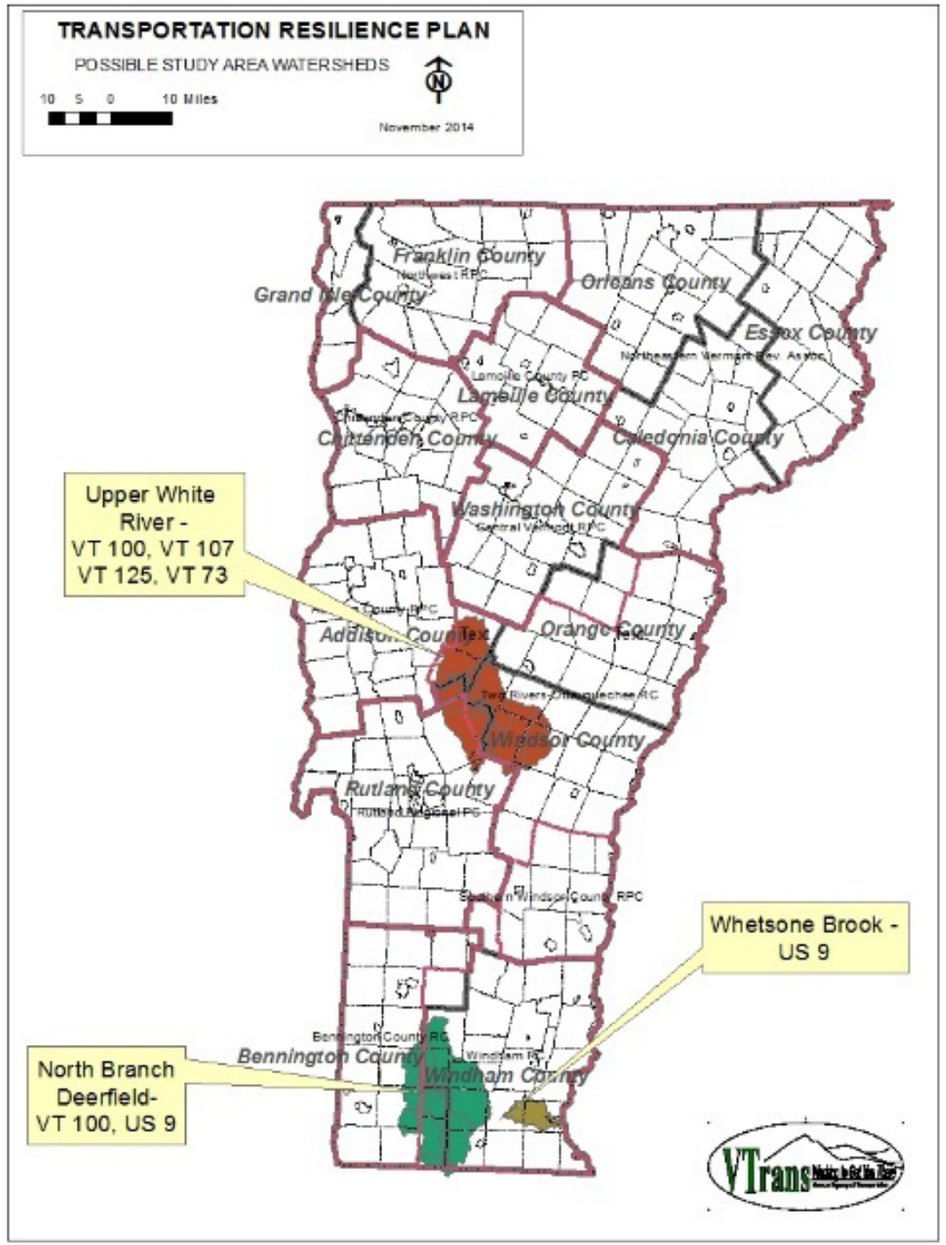
Norman Marshall
Smart Mobility

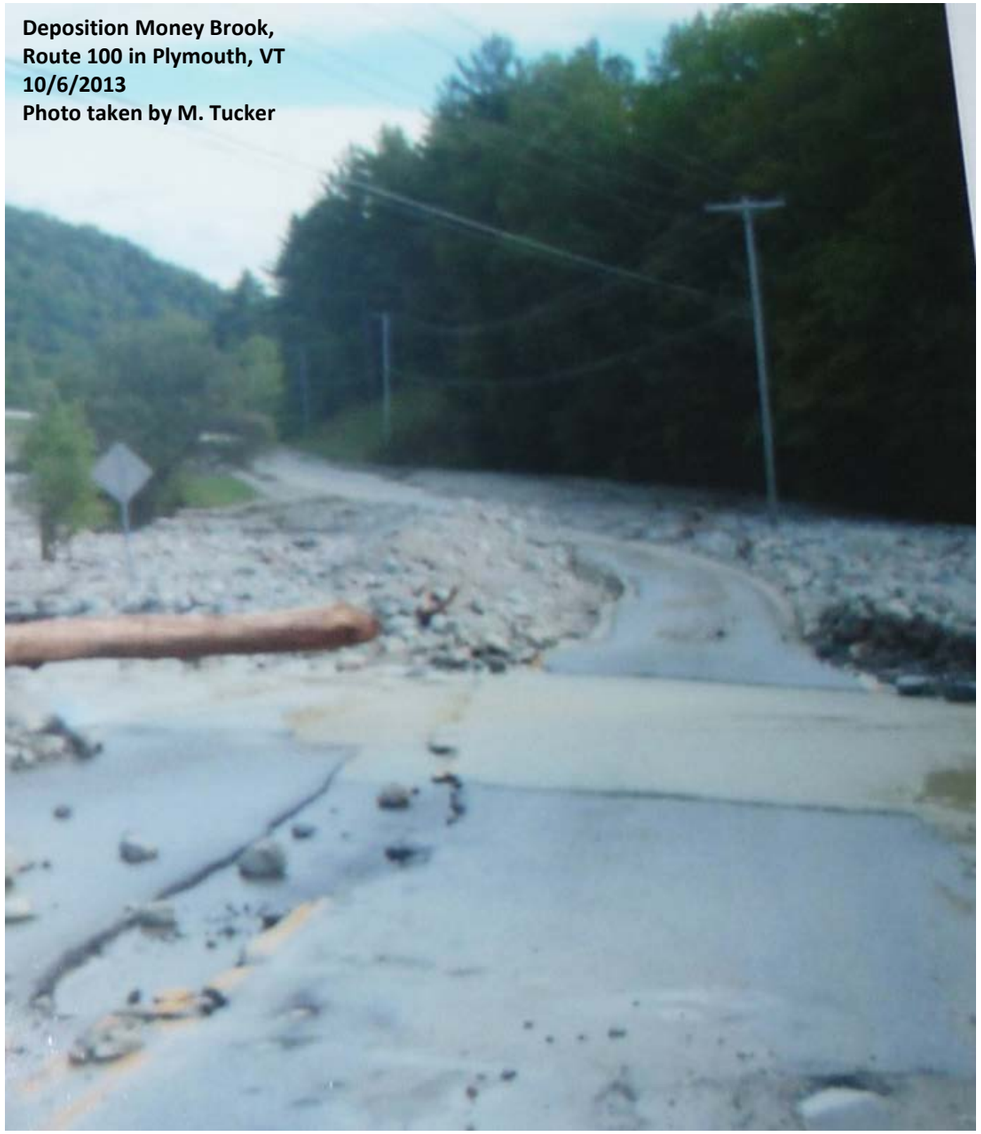
Lauren E. Padilla, Barb Patterson, David Healy, Roger Branon Rodriguez
Stone Environmental

Pilot Watersheds

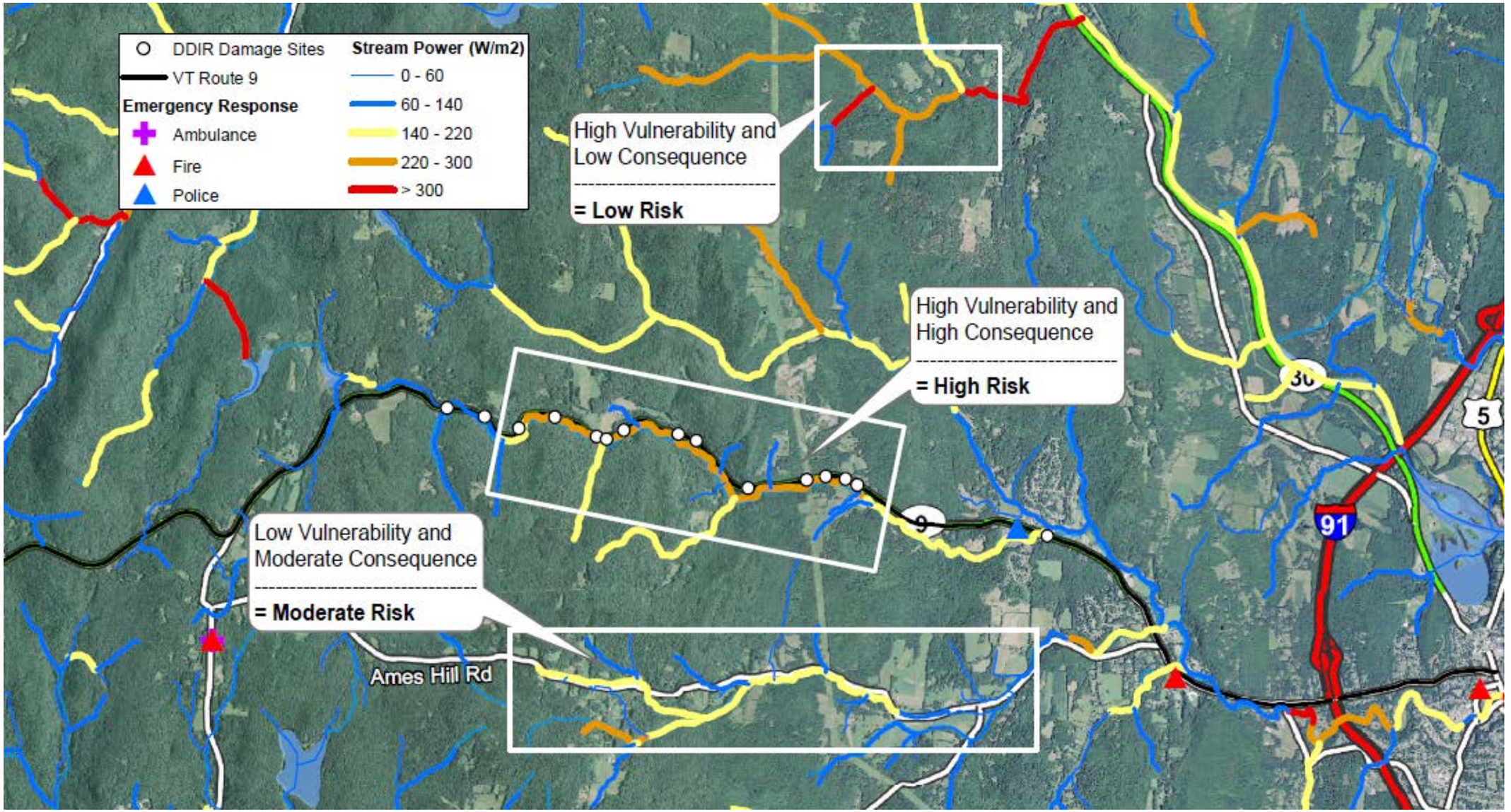
1. Upper White River
2. North Branch Deerfield
3. Whetstone Brook



Need for Transportation Resiliency



Goals

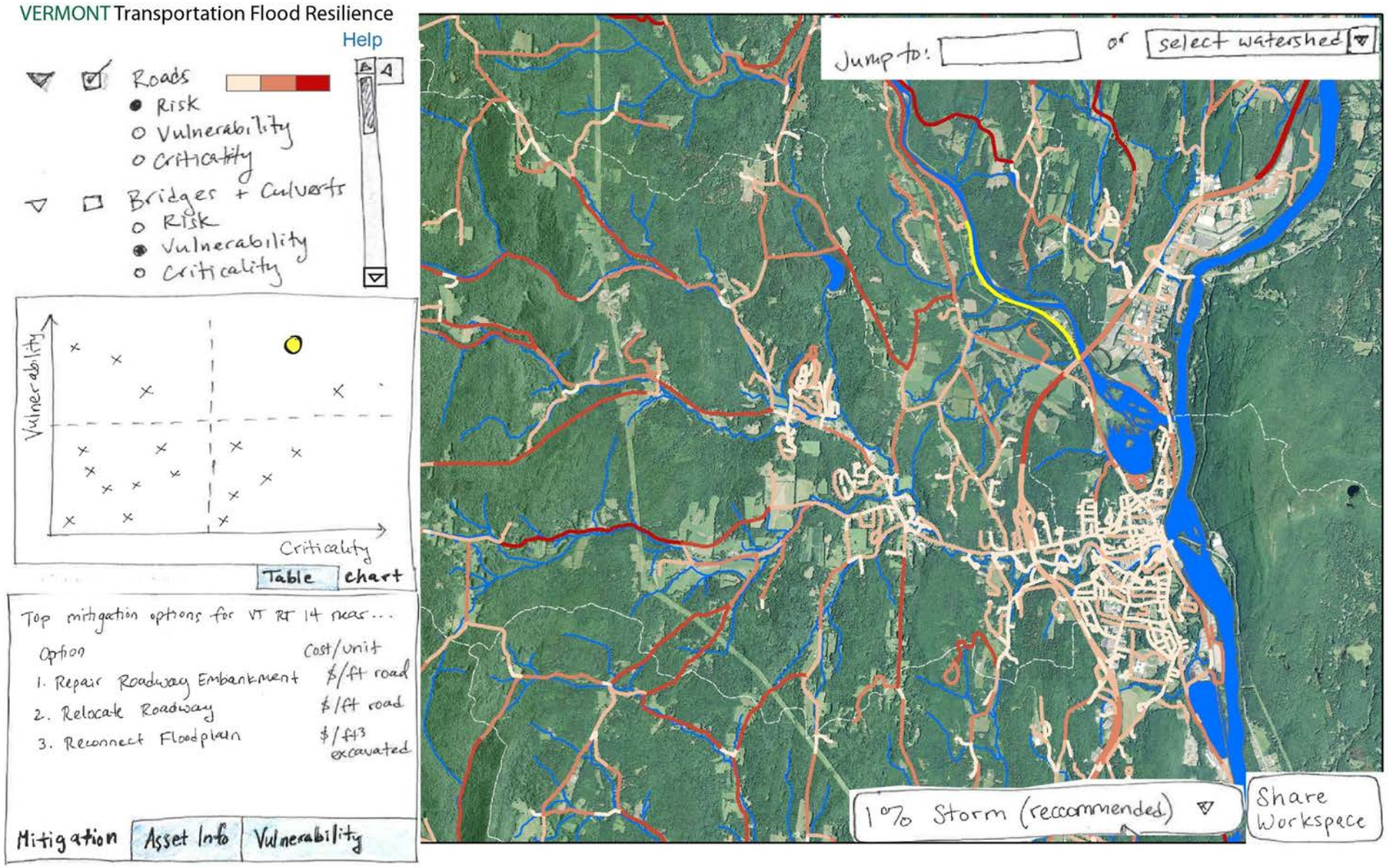

DDIR Damage Sites
VT Route 9
Emergency Response
Ambulance
Fire
Police
Stream Power (W/m2)
0 - 60
60 - 140
140 - 220
220 - 300
> 300
High Vulnerability and Low Consequence
= Low Risk
High Vulnerability and High Consequence
= High Risk
Low Vulnerability and Moderate Consequence
= Moderate Risk
Ames Hill Rd
9
91
5

Who are the intended users?

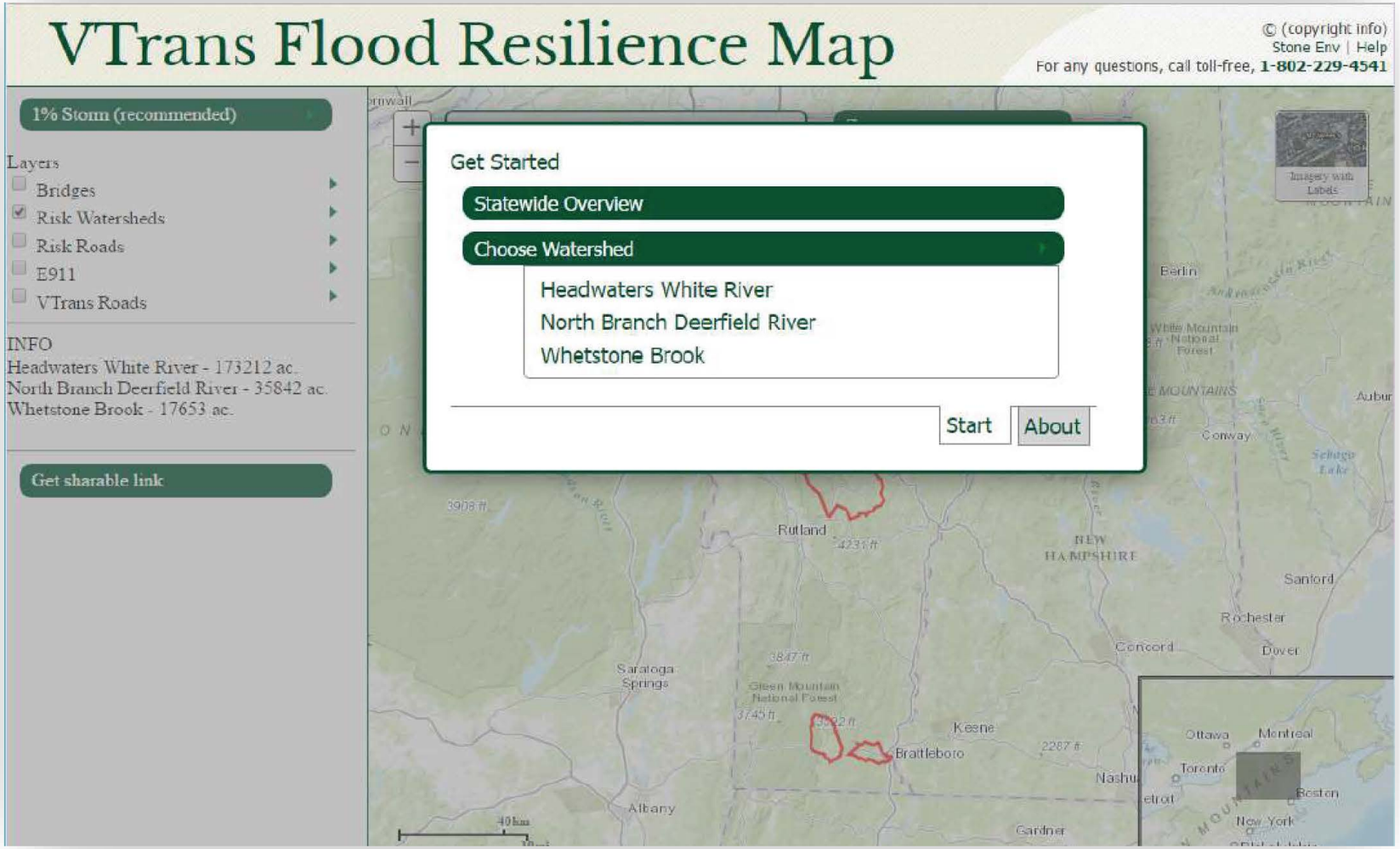
Primary Users

- 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

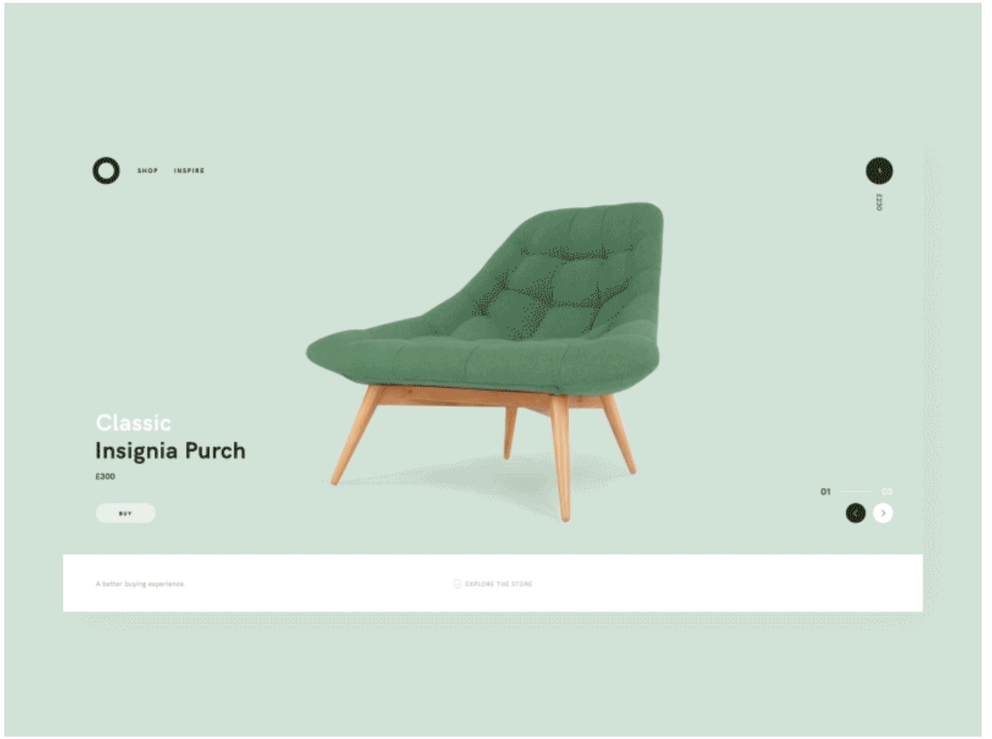


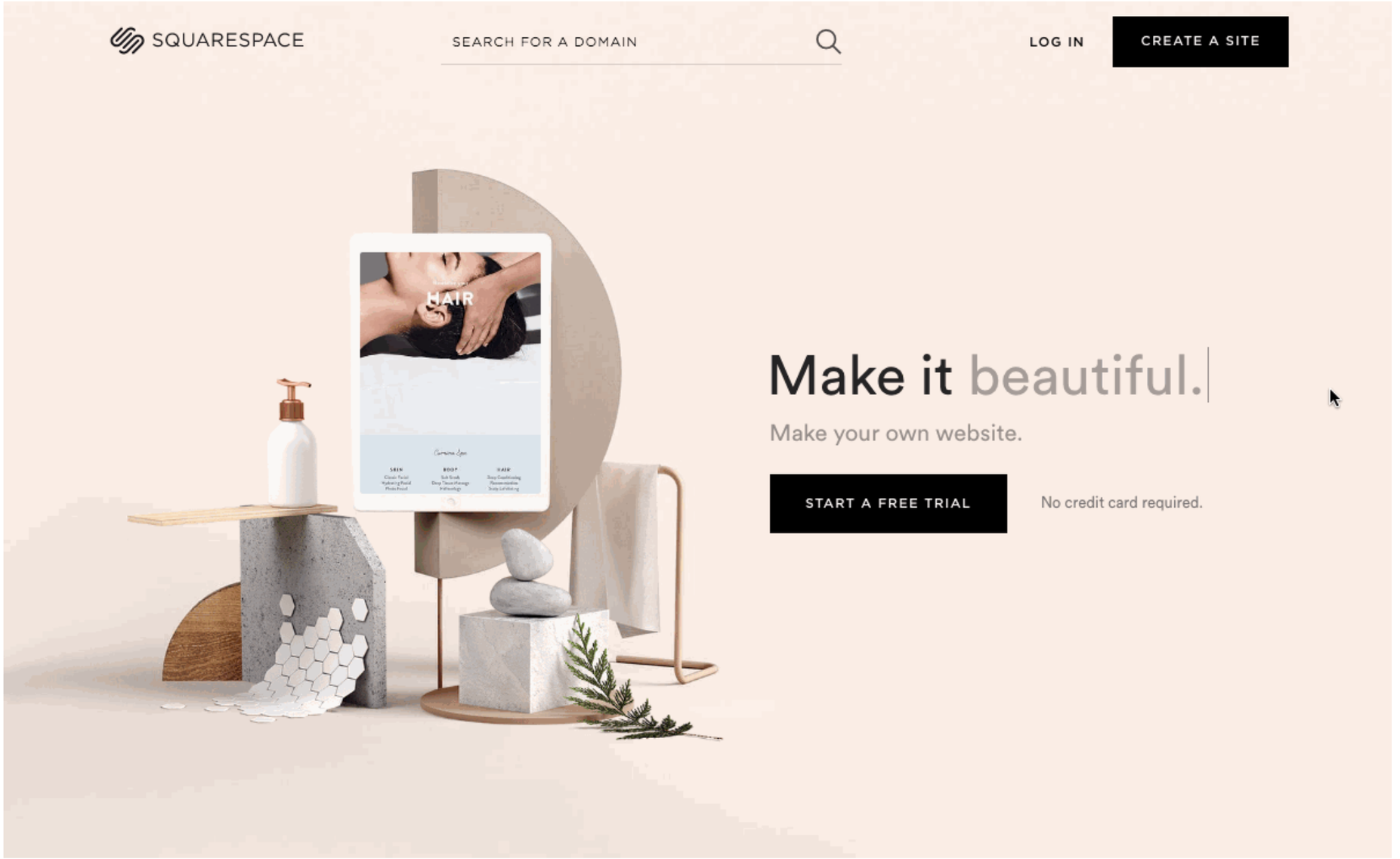
First Iteration



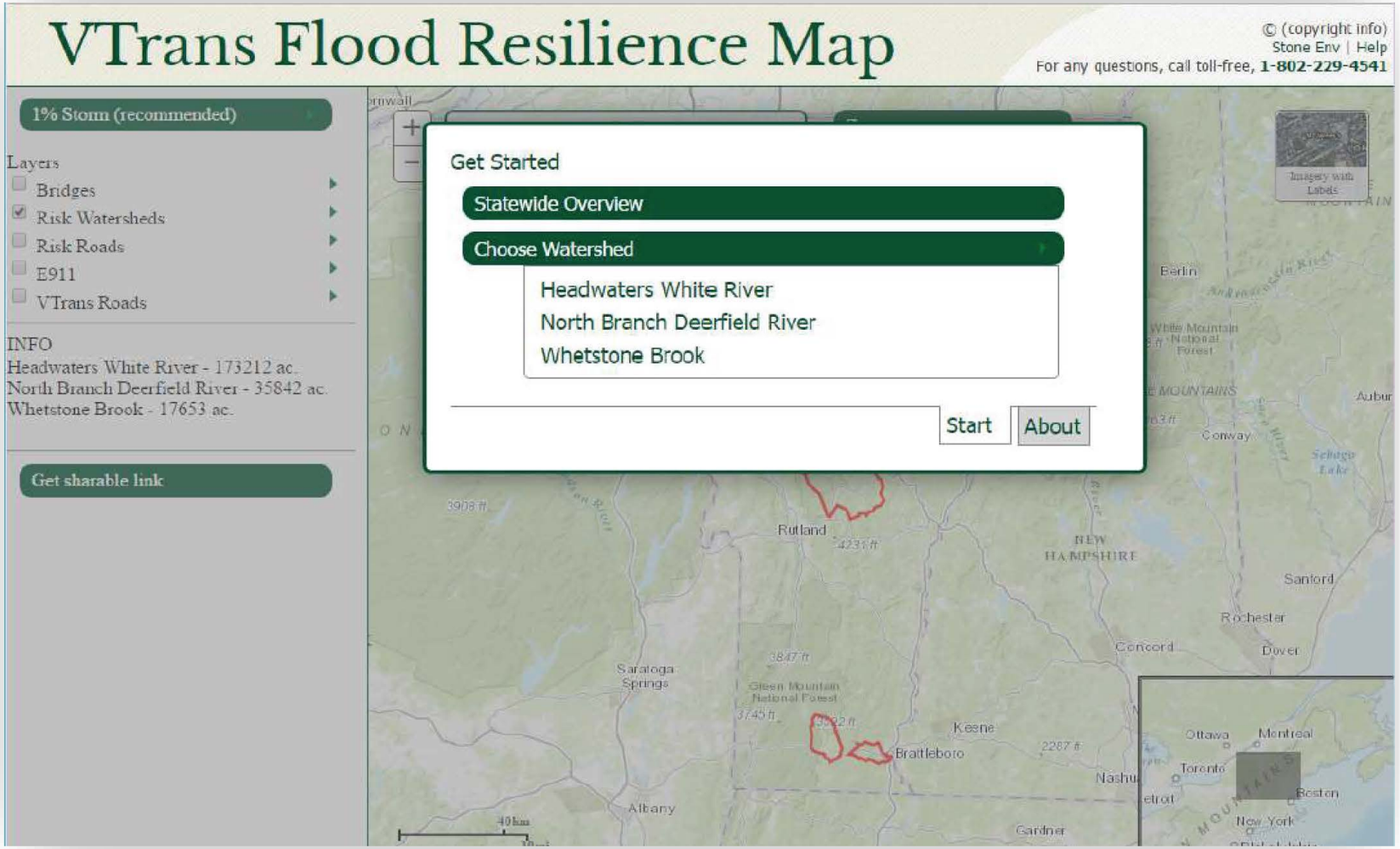
One of the key rules of user interface design is that users need to be in control.


gifbin.com


SHOP
INSPIRE
Classic
Insignia Purch
£300
BUY
01
A better buying experience.
EXPLORE THE STORE


SQUARESPACE
SEARCH FOR A DOMAIN
LOG IN
CREATE A SITE
HAIR
Make it beautiful.
Make your own website.
START A FREE TRIAL
No credit card required.

First Iteration



Current Iteration

http://vtrans.stone-env.net

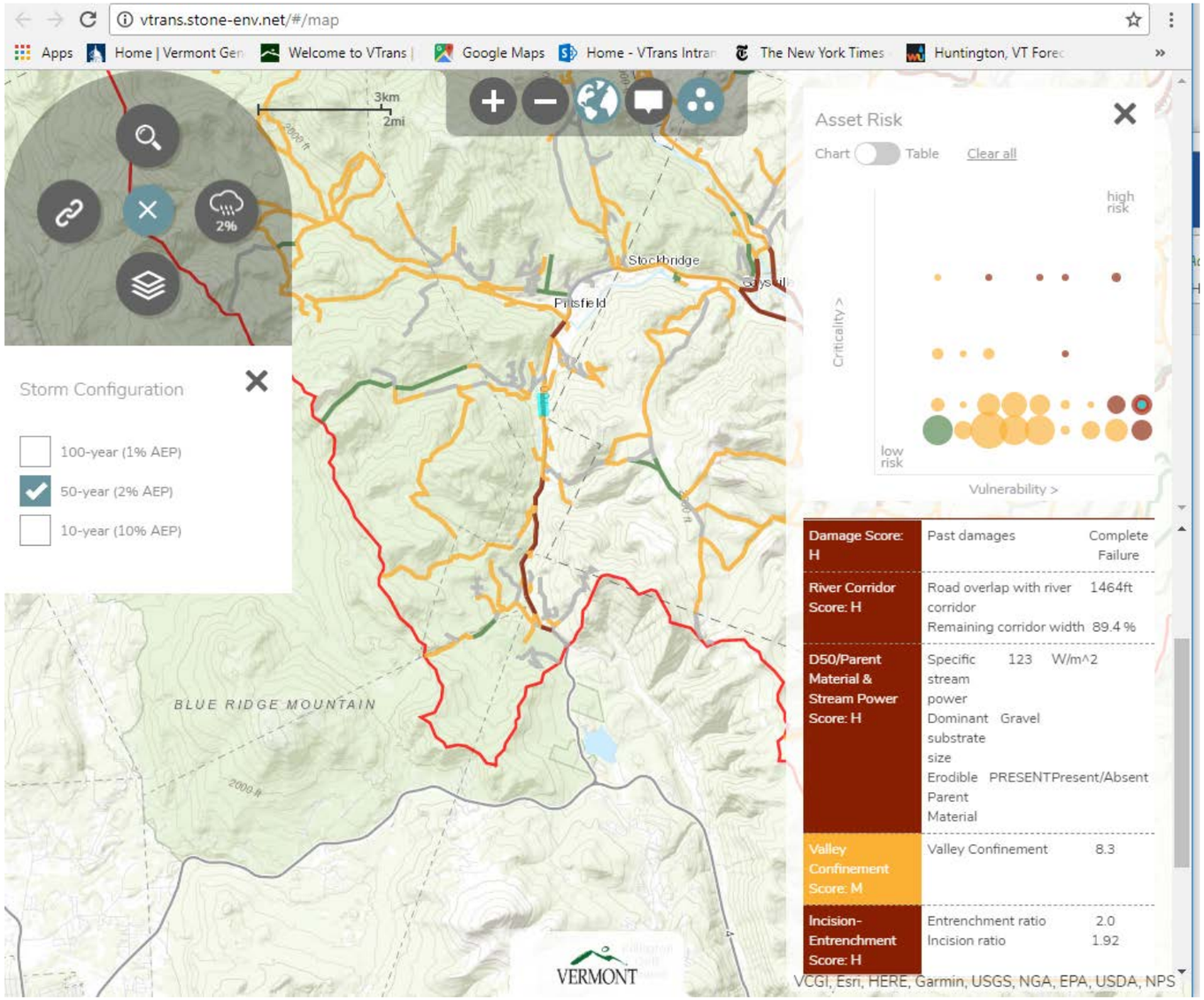
Case Study

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.

Stabilized bed on the Tweed River (looking downstream)
Killington, Vermont
Source: Fitzgerald Environmental, 2013

Thank you.

For more information / www.stone-env.com
Contact / roger@stone-env.com
lpadilla@stone-env.com