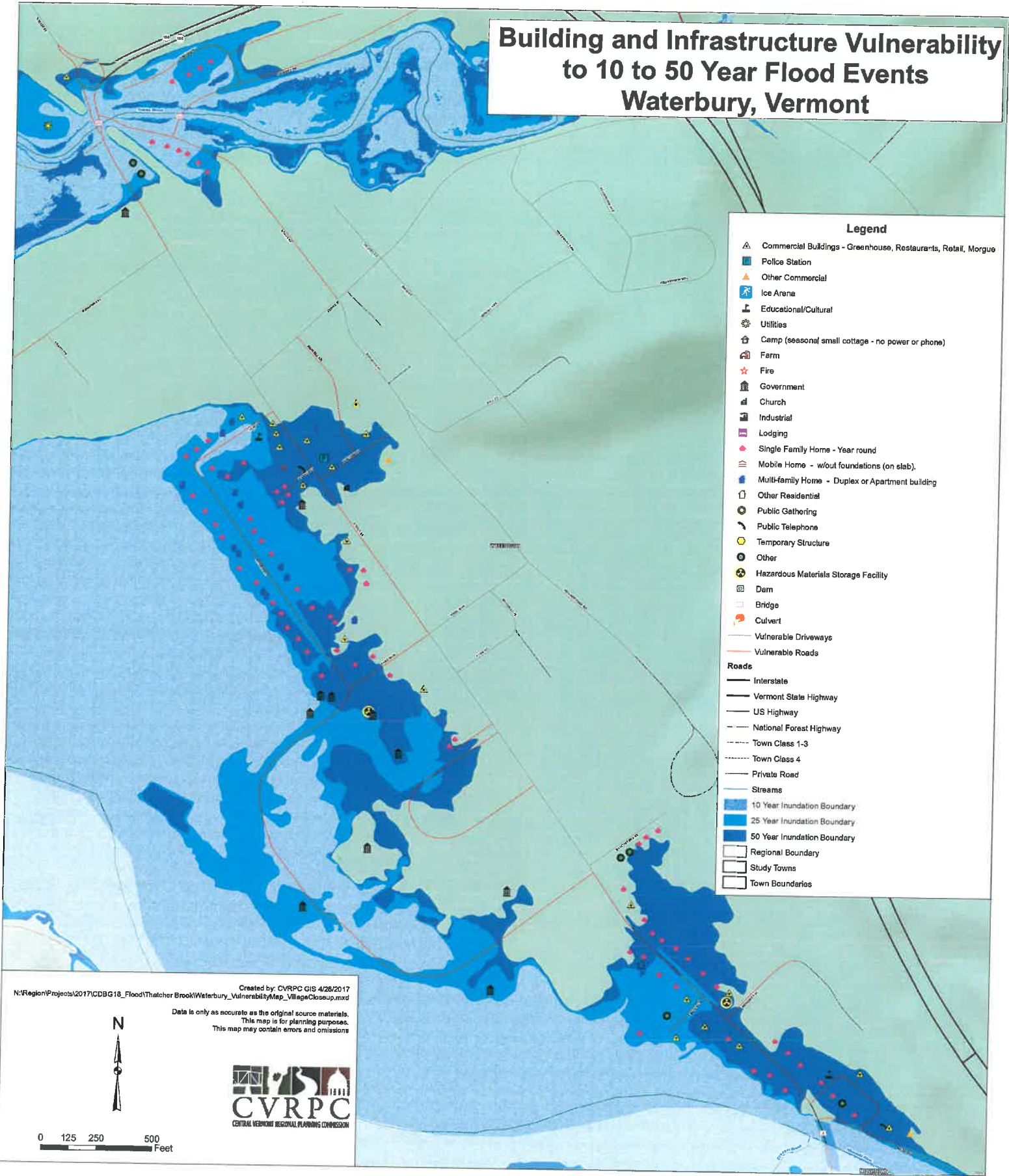


## **VIII. Appendix**

- 1. Building and Infrastructure Vulnerability to 10–50 Year Flood Events**
- 2. Map and Details of the Waterbury Hazard Mitigation Priorities**
- 3. Waterbury Transportation Network**
- 4. Hazardous Materials Studies**
  - a. 2016 Tier II Facilities in Waterbury with hazardous materials
  - b. Excerpts from the VT State Commodity Flow Study 2017
  - c. Excerpts from the LEPC #5 Hazardous Materials Rail Commodity Flow Study 2009
  - d. Rail Safety Training
- 5. Waterbury Dam**
  - a. Map - Waterbury Dam Inundation Area
  - b. Dam Safety Seminar
  - c. Recent Waterbury Dam article in the Waterbury Record
- 6. Waterbury Opinion Survey and Comments**
- 7. Central VT RPC Flood Study of Mad River and Thatcher Brook announcement**
- 8. Waterbury Floodplain Management Working Group 2016 Annual Report**
- 9. Winooski Street Bridge Restoration Study Project**
- 10. Excerpts - USGS Flood Maps for the Winooski River in Waterbury, VT 2014**
- 11. Resources for Implementing the Waterbury Hazard Mitigation Plan**
  - a. List of Disaster Recovery Funding Resources 2016
  - b. Alternative Funding for Disaster Recovery Witt-O'Brien's 2013

# Building and Infrastructure Vulnerability to 10 to 50 Year Flood Events Waterbury, Vermont



### Legend

- ▲ Commercial Buildings - Greenhouse, Restaurants, Retail, Morgue
- Police Station
- ▲ Other Commercial
- ⚡ Ice Arena
- 🎓 Educational/Cultural
- ⚙️ Utilities
- 🏠 Camp (seasonal small cottage - no power or phone)
- 🌾 Farm
- ★ Fire
- 🏛️ Government
- ⛪ Church
- 🏭 Industrial
- 🏠 Lodging
- 🏠 Single Family Home - Year round
- 🏠 Mobile Home - w/out foundations (on slab)
- 🏠 Multi-family Home - Duplex or Apartment building
- 🏠 Other Residential
- 👥 Public Gathering
- ☎️ Public Telephone
- 🏠 Temporary Structure
- ⚙️ Other
- ☢️ Hazardous Materials Storage Facility
- 🌳 Dam
- 🌉 Bridge
- 📉 Culvert
- 🚗 Vulnerable Driveways
- 🛣️ Vulnerable Roads

### Roads

- Interstate
- Vermont State Highway
- US Highway
- National Forest Highway
- Town Class 1-3
- Town Class 4
- Private Road
- Streams

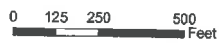
### Inundation Boundaries

- 10 Year Inundation Boundary
- 25 Year Inundation Boundary
- 50 Year Inundation Boundary

### Boundaries

- Regional Boundary
- Study Towns
- Town Boundaries

Created by: CVRPC GIS 4/28/2017  
 N:\Region\Projects\2017\CDBG18\_Flood\Thatcher Brook\Waterbury\_VulnerabilityMap\_VillageCloseup.mxd  
 Data is only as accurate as the original source materials.  
 This map is for planning purposes.  
 This map may contain errors and omissions





Potential Hazard Mitigation Projects identified in AHMP (up to 5)		Plan, Inventory or Assessment where Problem was Identified					
Map ID	Problem Area - location & key findings	Latitude	Longitude	ANR River Corridor Plan, Phase I or II	Inventories - Bridge, Culvert or Dam	Road Erosion Inventory (REI)	Other (Municipal Town Plan, for example)
1	Main St Reconstruction project - storm drain improvement. This project has been ongoing since the 1990s but stormwater updates are needed as part of the reconstruction project along Main Street. The stormwater system is 100 years old and underground stormwater pipes need updating as part of this project.	44.33842	-72.75702				Waterbury LHMP 2017 Draft, Mitigation Strategies Update
2	Winooski River floodplain reconnection project. The aim is to increase low-lying areas that can accommodate floodwaters and reduce flooding in developed areas. Specifically, lower the corn and hay fields behind the state office complex to increase flood storage.	44.334659 44.329605	-72.761764 -72.75353				Waterbury LHMP 2017 Draft, Mitigation Strategies Update; Waterbury Flood Study, Milone & MacBroom, 2013; Evaluating the Costs and Benefits of Floodplain Protection Activities..., Schiff, et al, 2015, LCBP Technical Report no. 78.
3	Colbyville stormwater drainage improvement along Rt. 100	44.34787	-72.74507				As part of Bike and Ped improvement
4	Lincoln St-Graves Brook culvert replacement: current structure is undersized and could cause flooding. Restore floodplain along northern bank Graves Brook downstream from Lincoln St crossing. Replace Stowe St bridge.	44.344891 44.344339	-72.743179 -72.74691	Mid Winooski River Corridor Plan, BCE, 2015.	Culvert Inventory CVRPC 2014		Mad River Area Flood Mitigation Sites, D&K, 2017.
5	Culvert and bridge replacement at Ripley, Shaw Mansion, and Guptil Rds. Structures are at least somewhat geomorphically incompatible and some have reduced aquatic organism passage.	44.363321 44.368631 44.373159 44.370151	-72.721289 -72.697179 -72.683572 -72.68541	Mid Winooski River Corridor Plan, BCE, 2015.	Culvert Inventory CVRPC 2014		

# 1. Project Objectives & Next Steps for Main St. Reconstruction Project and Culverts

Main St Reconstruction Project - Culvert Replacements	
<b>Project Type</b>	As part of a reconstruction project downtown, upgrades to the underground stormwater lines are needed to ensure effective stormwater management and flood resiliency.
<b>Purpose &amp; Need:</b>	This project is a high priority for Waterbury as many initiatives have been done already as part of the downtown reconstruction especially after Tropical Storm Irene. Proper stormwater management and erosion control techniques as well as updated stormwater lines are needed to complete this project.
<b>Town Priority (high or med)</b>	
<b>Effectiveness Questions* (Yes/No, provide details)</b>	
Supported by technical information demonstrating feasibility?	Yes
Effective project achieving project objective?	Yes
Is sufficient funding available for grant match?	Yes
climate adaptation in mind?	Yes by installing new stormwater lines and storm drains that are up to standard, flood resiliency will be improved for the community.
Mitigation Approach - Reduce Vulnerability/Harden or Avoidance/Move?	This project will help reduce vulnerability to stormwater infrastructure damage in the future.
<b>Impact Questions* (Yes/No, provide details)</b>	
Multiple past damages?	Yes during TSI especially, stormwater infrastructure was compromised.
Community priority which will result in significant increase in safety or reduction in risk to high cost/critical/high impact problem?	Yes this is a community priority to mitigate hazards and improve physical infrastructure the manage the village stormwater drainage.

Next Steps to Advance Project	
Request Hydraulic Report	Engineering nearly completed.
Collect Town Data needed for Grant Applications	Will not be seeking grant funds to complete.
Develop BCA ratio	NA
Seek funds to Develop Cost Estimates	NA
Develop Capital Budget Estimates	NA
Seek funds to Develop Plans	Completed
Seek Construction Funds	Already have funds as part of reconstruction project.
Develop RFP for Construction	NA
Estimated Construction Timeline	Within next 5 years
Any issues/constraints that might hinder project moving forward? (is yes, please identify)	None
Point of Contact	Barbara Farr, Director, Long Term Community Recovery Program and Community Liaison for Transportation Projects, Town of Waterbury; bfarr@waterburyvt.com; (802) 888-3810

# 1. Project Objectives & Next Steps for Main St. Reconstruction Project and Culverts

Increase available river corridor/floodplain acreage/storage and/or storage/headwater forest?	No
Enhance natural habitat?	No
Protect important cultural or historic features?	Yes, the are abundant cultural and historic resources in the downtown Waterbury area and improving infrastructure will help protect them.
Protect economic assets?	Yes by improving the stormwater system, the economic asset of the town's infrastructure will be improved and protected.
Improves water quality by reducing sediment and/or nutrients?	Yes, with proper drainage, erosion will be minimized and sediment runoff reduced.
<b>Proactivity Questions* (Yes/No, provide details)</b>	
Previous actions been taken to remedy, study or alleviate problem?	No
<b>Unique Circumstances* (Yes/No, provide details)</b>	
Special qualities in terms of importance to community?	The Main Street Reconstruction project has been a significant investment for the community and for the state and pipe replacement are an important piece of the project's success.
Create significant benefits above the minimum?	Yes, the reconstruction project is necessary especially after TSI and the community will reap the benefits for years to come.

**Information for Grant Applications - Main Street Reconstruction Project - Culvert Replacements**

		Grant Opportunities ("X" indicates data needed for grant application)										
		Yes	Yes (cat. D)	Yes	Maybe	Yes	No	Yes	Maybe	No	Maybe	
HMGP	Better Roads	ERP	Watershed Grant	Town Highway Structures	Town Highway Class 3 Roadway	Trans. Alternatives Program	LCBP - Pollution Prevention	LCBP - Env. Assistance Program				
<b>General wording of question found in grant(s)</b>												
<b>Data to be included in Grant Application(s):</b>												
<b>Problem Description</b>	Culvert and stormwater line upgrades to manage stormwater drainage are a mitigation action for infrastructure under the Waterbury's Updated Mitigation Strategies for 2017.	X	X	X	X	X	X	X	X	X	X	X
<b>Project Description / Proposed Scope of Work</b>	Replacing failing/undersized culverts and installing new culverts and stormwater lines for proper stormwater drainage.	X	X	X	X	X	X	X	X	X	X	X
<b>Project Objective/Type of work</b>	Culvert - upsize	X	X	X	X	X	X	X	X	X	X	X
<b>Existing Structure</b>	Many small culverts to be replaced/upsized; 100 year old stormwater lines to be replaced.	X	X	X	X	X	X	X	X	X	X	X
<b>Bylaws to address encroachments or reduce vulnerability?</b>	NA											
<b>Hazard Mitigation Plan? Date of approval</b>	Yes, 2013, 2017 draft	X										
<b>Muni. Compiled with 19V.S.A Section 309(d) regarding "complete streets"</b>	Yes						X			X		
<b>Muni. Adopted codes &amp; Standards that meet or exceed State approved template</b>	Yes						X			X		
<b>Muni. Has current Network Inventory (less than 3 yrs. Old)</b>	No, will be inventoried in 2018						X			X		
<b>Watershed/Waterbody</b>	Winooski River	X	X	X	X	X	X	X	X	X	X	X
<b>Watershed Coordinator</b>	Karen Bates, karen.bates@vermont.gov, 802-490-6144											
<b>Trans District Number &amp; Contact</b>	District 5; David Blackmore; 802-655-1560; david.blackmore@vermont.gov								X (prior contact is required)			
<b>Location (Lat/long); Town Highway # &amp; class; Structure#</b>	44.338421, -72.757021; TH-1; Class 1	X	X	X	X	X	X	X	X	X	X	X
<b>Map of Project Area</b>	See Town wide project map											
<b>Road Segment ID</b>	23090_N_Main_St_43387.1						X		X	X	X	X
<b>Hydrologically Connected?</b>	Yes											
<b>History of Damages/maintenance</b>	Some damaged during TSI	X	X	X	X	X	X	X	X	X	X	X
<b>How was it identified (inventory, capital budget, basin plan, etc.)</b>	This was identified in draft hazard mitigation plan 2017 strategies.											
<b>Analysis of Alternatives</b>	Not needed	X										
<b>Project Category</b>	Better Roads Category D						X		X	X	X	X
<b>Cost Benefit/Budget</b>	See Benefit-Cost-Analysis below	X	X	X	X	X	X	X	X	X	X	X

### Information for Grant Applications - Main Street Reconstruction Project - Culvert Replacements

Which grant(s) is the project eligible for? (Yes/No/Maybe)		Grant Opportunities ("X" indicates data needed for grant application)											
General wording of question found in grant(s) Within or near Designated Downtown, Village, Growth Center or New Town Center? Identified in Town (or Regional) Plan, Capital Program	Data to be included in Grant Application(s):  Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		Yes (cat. D)	Yes	Maybe	Yes	No	Yes	Maybe	No	Yes	Maybe	No	Maybe
		X	X	X	X	X	X	X	X	X	X	X	X

### Data for Benefit-Cost-Analysis or Budget

Most projects will use a BCA based upon the Damage-Frequency-Assessment model. To run the model, there needs to be at least 2 prior damage events. For each year that the road/culvert/bridge suffered provide the information noted in the right hand column.

BCA Ratio tips	YEAR
Prior Damage Event #1	
Prior Damage Event #2	
Prior Damage Event #3	
Estimated project cost (engineering + construction =)	
Estimated annual maintenance cost (e.g. culvert cleanup)	
Hydraulic Report Completed (yes/no)	
Permit Status (include where obtained)	
BCA ratio	

Links to supporting documents	
Waterbury Hazard Mitigation Plan 2013	<a href="https://www.waterburyvt.com/fileadmin/files/Ordinance_files/Plans/Local_Hazard_Mitigation_Plan_-_May_2012_-_Adopted_December_3_2012.pdf">https://www.waterburyvt.com/fileadmin/files/Ordinance_files/Plans/Local_Hazard_Mitigation_Plan_-_May_2012_-_Adopted_December_3_2012.pdf</a>



## 2. Project Objectives & Next Steps for Winooski River Floodplain Reconnection

<b>Project Type</b>	<u>Reconnection of Floodplain along Winooski River</u>
<b>Purpose &amp; Need:</b>	The purpose of this project is to increase flood storage to prevent and decrease the magnitude of flooding to the downtown Waterbury area, which was hit especially hard by 2011's Hurricane Irene.
<b>Town Priority (high or med)</b>	This is a high priority for the town. The completion of this project will protect the downtown area, which is prone to flooding due to its proximity to the Winooski River.
<b>Effectiveness Questions* (Yes/No, provide details)</b>	
<i>Supported by technical information demonstrating feasibility?</i>	Yes, Milone and MacBroom study (2013) showed that reconnection of the floodplain would theoretically increase hydrologic storage and alleviate flooding impacts in Waterbury. As part of what Waterbury called the "Choke Study" (Phase II), alternatives were explored. Their analysis proposed three floodplain restoration sites, but landowners at the site in Duxbury (most downstream site) do not want the use of their land to change and flooding would compromise its current use. Two floodplain reconnection sites are possible but further refinement of the modeling will be needed to account for the loss of flood storage at the Duxbury site.
<i>Effective project achieving project objective?</i>	Yes, by providing more flood storage, objective of flood resiliency and impact reduction is better achieved.
<i>Is sufficient funding available for grant match?</i>	Yes.
<i>climate adaptation in mind?</i>	Yes- our changing climate will bring storms like Irene much more frequently before, highlighting the urgent need for floodplain reconnection in order to decrease the risk to the town.
<i>Mitigation Approach - Reduce Vulnerability/Harden or Avoidance/Move?</i>	The mitigation approach of this project is to reduce the town's vulnerability to floods.
<b>Impact Questions* (Yes/No, provide details)</b>	

<b>Next Steps to Advance Project</b>	
<i>Request Hydraulic Report</i>	Completed
<i>Collect Town Data needed for Grant Applications</i>	Completed
<i>Develop BCA ratio</i>	Completed
<i>Seek funds to Develop Cost Estimates</i>	Work with engineer on cost of implementation.
<i>Develop Capital Budget Estimates</i>	Using the cost of implementation, estimate 20% match.
<i>Seek funds to Develop Plans</i>	Need to obtain funds for final engineering
<i>Seek Construction Funds</i>	Look to apply for HMGP or ERP/watershed grant 2018, and/or LCBP grant
<i>Develop RFP for Construction</i>	2019
<i>Estimated Construction Timeline</i>	Within the next 5 years--2022.
<i>Any issues/constraints that might hinder project moving forward? (is yes, please identify)</i>	Potential funding.

## 2. Project Objectives & Next Steps for Winooski River Floodplain Reconnection

Multiple past damages?	Yes, especially Tropical Storm Irene.
Community priority which will result in significant increase in safety or reduction in risk to high cost/critical/high impact problem?	Yes--this project will reduce flooding risk to numerous private businesses, public offices and infrastructure, and residences.
Increase available river corridor/floodplain acreage/storage and/or storage/headwater forest?	Yes--the purpose of this project is to reconnect the Winooski River floodplain and increase flood storage.
Enhance natural habitat?	Yes.
Protect important cultural or historic features?	Yes--this project will protect historic downtown buildings.
Protect economic assets?	Yes--this project will protect all of the assets of downtown, including homes, businesses, bridges, roads, and other infrastructure.
Improves water quality by reducing sediment and/or nutrients?	Yes-- increasing flood storage will decrease the amount of sediment and nutrients from roads that would end up in the river during a flood event.
<b>Proactivity Questions* (Yes/No, provide details)</b>	
Previous actions been taken to remedy, study or alleviate problem?	Yes, problem and solution has been extensively studied by Milone and MacBroom, 2013, and recommendations have been made that included this project.
<b>Unique Circumstances* (Yes/No, provide details)</b>	
Special qualities in terms of importance to community?	Yes, reducing flooding impacts for both this community and other communities is of significant importance.
Create significant benefits above the minimum?	Yes, minimal protection would be to eliminate development within area, but to reconnect the floodplain would help to reduce flooding impacts.

Point of Contact

Lauren Oates, State Hazard Mitigation Officer;  
lauren.oates@vermont.gov; (802) 241-5363

**Information for Grant Applications - Winooski River Floodplain Reconnection Project**

Grant Opportunities ("X" indicates data needed for grant application)																					
General wording of question found in grant(s)	Which grant(s) is the project eligible for? (Yes/No/Maybe)		Better Roads	ERP	Watershed Grant	Town Highway Structures	Town Highway Class 3 Roadway	Trans. Alternatives Program	LCBP - Pollution Prevention	LCBP - Env. Assistance Program											
	Yes	No									Yes	No	Yes	No	Yes	No	Yes	Yes			
<b>Problem Description</b>	X																				
<b>Project Description / Proposed Scope of Work</b>	X																				
<b>Project Objective/Type of work</b>	X																				
<b>Existing Structure</b>	X																				
<b>Bylaws to address encroachments or reduce vulnerability?</b>	X																				
<b>Hazard Mitigation Plan? Date of approval</b>	X																				
<b>Muni. Complied with 18V.S.A Section 309(d) regarding "complete streets"</b>																					
<b>Muni. Adopted codes &amp; Standards that meet or exceed State approved template</b>																					
<b>Muni. Has current Network Inventory (less than 3 yrs. Old)</b>																					
<b>Watershed/Waterbody</b>	X																				
<b>Watershed Coordinator</b>																					
<b>Vitrans District Number &amp; Contact</b>																					
<b>Location (Lat/long); Town Highway # &amp; class; Structure#</b>	X																				
<b>Map of Project Area</b>																					
<b>Road Segment ID</b>																					
<b>Hydrologically Connected?</b>																					
<b>History of Damages/maintenance How was it identified (inventory, capital budget, basin plan, etc.)</b>	X																				
<b>Analysis of Alternatives</b>	X																				
<b>Project Category</b>																					
<b>Cost Benefit/Budget</b>	X																				
<b>Within or near Designated Downtown, Village, Growth Center or New Town Center?</b>																					

## Information for Grant Applications - Winooski River Floodplain Reconnection Project

Grant Opportunities ("X" indicates data needed for grant application)									
HMGP	Better Roads	ERP	Watershed Grant	Town Highway Structures	Town Highway Class 3 Roadway	Trans. Alternatives Program	LCBP - Pollution Prevention	LCBP - Env. Assistance Program	
Yes	No	Yes	Yes	No	No	No	Yes	Yes	
X	X	X	X	X	X	X	X	X	
									X

Which grant(s) is the project eligible for? (Yes/No/Maybe)

General wording of question found in grant(s)  
 Data to be included in Grant Application(s):

Yes (Draft LHMP)

### Data for Benefit-Cost-Analysis or Budget

Most projects will use a BCA based upon the Damage-Frequency-Assessment model. To run the model, there needs to be at least 2 prior damage events. For each year that the road/culvert/bridge suffered provide the information noted in the right hand column.

BCA Ratio tips	YEAR
TOTAL COST INCURRED IN GIVEN YEAR DAMAGED: Cost of repair (municipal costs plus contractors - if location was previously fixed with PA funds via FEMA declared disaster, that data is best. If not, use estimates from Road Foreman ), how many hours was road closed? By which agency (local PD, local fire, VSP, etc.)	
Prior Damage Event #1	Tropical Storm Irene 2011 widespread flooding. Reconnecting floodplain would increase storage by 23.6 acres and reduce flooding.
Prior Damage Event #2	1027 flood. Extensive flooding.
Prior Damage Event #3	
Estimated project cost (engineering + Construction =)	
Estimated annual maintenance cost (e.g. culvert cleanout)	None
Hydraulic Report Completed (yes/no)	Yes
Permit Status (include where obtained)	Unknown
BCA ratio	2.71: Increase of 270%; existing conditions costs \$67,000 to live in floodplain; floodplain restoration = net benefit of \$166,000.

Links to supporting documents	
Evaluating the Costs and Benefits of Floodplain Protection Activities... Schiff, et al, 2015, LCBP Technical Report no. 78.	<a href="http://www.lcbp.org/wp-content/uploads/2013/03/78_CostsBenefitsFloodplains.pdf">http://www.lcbp.org/wp-content/uploads/2013/03/78_CostsBenefitsFloodplains.pdf</a>
Waterbury, Vermont Middle Winooski River Corridor Plan, BOE, 2015	<a href="http://centralvtplanning.org/wp-content/uploads/2012/03/MidWinooski_RCP_FINA_L_12_15_15_BCE_Report.pdf">http://centralvtplanning.org/wp-content/uploads/2012/03/MidWinooski_RCP_FINA_L_12_15_15_BCE_Report.pdf</a>

### 3. Project Objectives & Next Steps for Colbyville Stormwater Improvement

<b>Project Type</b>	Colbyville Stormwater Infrastructure Improvement
<b>Purpose &amp; Need:</b>	Due to high stormwater runoff volumes along the west side of Route 100 due to steep slopes in Colbyville, water quality in Thatcher Brook is compromised. Reducing the stormwater volume through implementation of best management practices would help to reduce infrastructure damage and streambank erosion in Thatcher Brook from stormwater runoff and improve water quality. High priority for the town to help meet water quality regulations.
<b>Town Priority (high or med)</b>	

<b>Effectiveness Questions* (Yes/No, provide details)</b>	
Supported by technical information demonstrating feasibility?	Yes stormwater inputs into Thatcher Brook identified in the Mid-Winooski River Corridor Plan, 2015.
Effective project achieving project objective?	Yes project will reduce stormwater runoff and improve water quality.
Is sufficient funding available for grant match?	Yes
climate adaptation in mind?	Yes, with increases in severe storms, volumes of storm runoff will only increase potentially causing more erosion and water quality degradation.
Mitigation Approach - Reduce Vulnerability/Harden or Avoidance/Move?	Reduce vulnerability of stream and infrastructure to damage from large stormwater flows.
<b>Impact Questions* (Yes/No, provide details)</b>	
Multiple past damages?	Stormwater runoff causing stream erosion observed during stream geomorphic assessment.

<b>Next Steps to Advance Project</b>	
Request Hydraulic Report	Completed Dubois and King, 2017
Collect Town Data needed for Grant Applications	Work with Road Foreman to determine cost of washout repair due to stormwater.
Develop BCA ratio	Work with engineer on cost-benefit of implementation.
Seek funds to Develop Cost Estimates	Work with engineer on cost of engineering and implementation.
Develop Capital Budget Estimates	Using the cost of implementation, estimate 20% match.
Seek funds to Develop Plans	Need to obtain funds for engineering
Seek Construction Funds	Look to apply for Transportation Alternatives, Better Roads, LCBP, or ERP 2018 or 2019
Develop RFP for Construction	2018-2020
Estimated Construction Timeline	Within the next 5 years--2022.
Any issues/constraints that might hinder project moving forward? (is yes, please identify)	Potential funding
Point of Contact	Bill Woodruff, Public Works Director; bwoodruff@waterburyvt.com; (802) 839-6199

### 3. Project Objectives & Next Steps for Colbyville Stormwater Improvement

Community priority which will result in significant increase in safety or reduction in risk to high cost/critical/high impact problem?	Yes, community priority to reduce costs to upgrades and fixes to culvert and road infrastructure.
Increase available river corridor/floodplain acreage/storage and/or storage/headwater forest?	Yes, reduction in stormwater will keep less runoff from entering the Winooski River via Thatcher Brook.
Enhance natural habitat?	Yes pollutant loading into Thatcher Brook will be reduced.
Protect important cultural or historic features?	No
Protect economic assets?	Yes, by decreasing runoff volume, receiving culverts will be more efficient in conveying storm flows.
Improves water quality by reducing sediment and/or nutrients?	Yes, reducing stormwater will reduce flows that cause streambank erosion and therefore nutrient loading.
<b>Proactivity Questions* (Yes/No, provide details)</b>	
Previous actions been taken to remedy, study or alleviate problem?	None
<b>Unique Circumstances* (Yes/No, provide details)</b>	
Special qualities in terms of importance to community?	
Create significant benefits above the minimum?	

### Information for Grant Applications - Colbyville Stormwater Improvement

General wording of question found in grant(s)		Grant Opportunities ("X" indicates data needed for grant application)									
		HMGP	Better Roads	ERP	Watershed Grant	Town Highway Structures	Town Highway Class 3 Roadway	Trans. Alternatives Program	LCBP - Pollution Prevention	LCBP - Env. Assistance Program	
Which grant(s) is the project eligible for? (Yes/No/Maybe)		No	Yes	Yes	No	No	No	Yes	Yes	Maybe	Maybe
<b>Data to be included in Grant Application(s):</b>											
Install best management practices to reduce stormwater runoff is a mitigation action for infrastructure under the Waterbury's Updated Mitigation Strategies for 2017.		X	X	X	X	X	X	X	X	X	X
Replacing failing/undersized culverts and installing new culverts for proper stormwater drainage.		X	X	X	X	X	X	X	X	X	X
Project Objective/Type of work		X	X	X	X	X	X	X	X	X	X
Existing Structure		X	X	X	X	X	X	X	X	X	X
Bylaws to address encroachments or reduce vulnerability?											
Hazard Mitigation Plan? Date											
Muni. Complied with 19V.S.A Section 309(d) regarding "complete streets"											
Standards that meet or exceed State approved template											
Muni. Has current Network inventory (less than 3 yrs. Old)											
Watershed/Waterbody		X	X	X	X	X	X	X	X	X	X
Watershed Coordinator											
Vtrans District Number & Contact											
Location (Lat/long); Town Highway # & class; Structure#		X	X	X	X	X	X	X	X	X	X
Map of Project Area											
Road Segment ID											
Hydrologically Connected?											
History of Damages/maintenance											
How was it identified (Inventory, capital budget, basin plan, etc.)											
Analysis of Alternatives											
Project Category											
Cost Benefit/Budget											

### Information for Grant Applications - Colbyville Stormwater Improvement

Grant Opportunities ("X" indicates data needed for grant application)									
HMGP	Better Roads	ERP	Watershed Grant	Town Highway Structures	Town Highway Class 3 Roadway	Trans. Alternatives Program	LCBP - Pollution Prevention	LCBP - Env. Assistance Program	
No	Yes	Yes	No	No	No	Yes	Maybe	Maybe	
X	X	X	X	X	X	X	X	X	
						X			
						X			

Which grant(s) is the project eligible for? (Yes/No/Maybe)
Data to be included in Grant Application(s):
No
No

### Data for Benefit-Cost-Analysis or Budget

Most projects will use a BCA based upon the Damage-Frequency-Assessment model. To run the model, there needs to be at least 2 prior damage events. For each year that the road/culvert/bridge suffered provide the information noted in the right hand column.

BCA Ratio tips	YEAR
<b>Prior Damage Event #1</b>	
<b>Prior Damage Event #2</b>	
<b>Prior Damage Event #3</b>	
Estimated project cost (engineering + construction =)	
Estimated annual maintenance cost (e.g. culvert cleanout)	
Hydraulic Report Completed (yes/no)	
Permit Status (include where obtained)	
BCA ratio	

Links to supporting documents	
waterbury, Vermont Middle Winooski River Corridor Plan, BCE, 2015	<a href="http://centralvtplanning.org/wp-content/uploads/2012/03/MidWinooski_RCP_FINA_L_12_15_15_BCE_Report.pdf">http://centralvtplanning.org/wp-content/uploads/2012/03/MidWinooski_RCP_FINA_L_12_15_15_BCE_Report.pdf</a>



#### 4. Project Objectives & Next Steps: Lincoln St Culvert/Floodplain Reconnection & Stowe St Bridge

<b>Project Type</b>	Lincoln St culvert/floodplain reconnection and Stowe St Bridge Replacement The purpose of this project is to replace a culvert at the Graves Brook/Lincoln St crossing and the Stowe St bridge over Thatcher Brook and to restore the floodplain along Graves Brook downstream of the Lincoln St culvert. These actions are necessary to reduce fluvial erosion and the risk of flooding. The Stowe St Bridge is functionally deficient for the travel and pedestrian volume that connect Route 100 and the State owned Park n' Ride. The bridge is adjacent to a large wetland and Thatcher Brook, which receive abundant runoff from the road.
<b>Purpose &amp; Need:</b>	This is high priority for the town to protect infrastructure and homes in the vicinity. The replacement of the Stowe St. Bridge is an infrastructure high priority for the town and is listed as high priority on the CVRPC TAC list. The current bridge replaced the bridge that was destroyed in the 1927 flood and is therefore 90 years old.
<b>Town Priority (high or med)</b>	

<b>Effectiveness Questions* (Yes/No, provide details)</b>	
Supported by technical information demonstrating feasibility?	Yes. Lincoln Street culvert replacement recommended in river corridor plan and flood analysis conducted by Dubois and King in 2017 (also recommended floodplain reconnection).
Effective project achieving project objective?	Enlarging culvert will provide more room for flood flows to head downstream to Thatcher Brook and not back up to homes along Graves Brook. Providing more storage along floodplain downstream of culvert will enhance flood storage capacity.
Is sufficient funding available for grant match?	Yes.
climate adaptation in mind?	Yes—climate change will bring bigger storms with a greater frequency, increasing the risk of floods. These actions will remediate the flooding risk to local infrastructure.
Mitigation Approach - Reduce Vulnerability/Harden or Avoidance/Move?	The mitigation approach of this project is to reduce the vulnerability of these areas to damage during a flood event.
<b>Impact Questions* (Yes/No, provide details)</b>	
Multiple past damages?	
Community priority which will result in significant increase in safety or reduction in risk to high cost/critical/high impact problem?	Yes—this project will reduce the risk of damage to public infrastructure and to private property.
Increase available river corridor/floodplain acreage/storage and/or storage/headwater forest?	Yes—part of this project involves floodplain restoration downstream of the Lincoln St culvert crossing, where the floodplain has become restricted.
Enhance natural habitat?	Yes.
Protect important cultural or historic features?	No.
Protect economic assets?	Yes—this project will protect the infrastructure around the problem sites.
Improves water quality by reducing sediment and/or nutrients?	Yes—by restoring the Graves Brook floodplain, the town will decrease the amount of fluvial erosion in the area, lessening the amount of sediment and nutrients that will make it into the Winooski River.
<b>Proactivity Questions* (Yes/No, provide details)</b>	
Previous actions been taken to remedy, study or alleviate problem?	

<b>Next Steps to Advance Project</b>	
Request Hydraulic Report	Completed Dubois and King, 2017
Collect Town Data needed for Grant Applications	Need to work with Road Foreman to obtain information on past structure damage
Develop BCA ratio	Need to complete once data from Road foreman collected
Seek funds to Develop Cost Estimates	Will need to work with engineer to develop cost estimates.
Develop Capital Budget Estimates	Once cost estimate established, determine match for grant.
Seek funds to Develop Plans	Look to apply for HMGP, ERP, Transportation Highway Structures, LCBP 2018
Seek Construction Funds	Look to apply for HMGP, ERP, Transportation Highway Structures, LCBP 2018
Develop RFP for Construction	Yes will need to do that once the town can obtain cost estimates.
Estimated Construction Timeline	Within the next 5 years--2022.
Any issues/constraints that might hinder project moving forward? (if yes, please identify)	Funding
Point of Contact	Bill Woodruff, Public Works Director, bwoodruff@waterburyvt.com; (802) 839-6199

4. Project Objectives & Next Steps: Lincoln St Culvert/Floodplain Reconnection & Stowe St Bridge

Unique Circumstances* (Yes/No, provide details) Special qualities in terms of importance to community? Create significant benefits above the minimum?	

\_\_\_\_\_

**Information for Grant Applications - Lincoln St Culvert/Floodplain Reconnection & Stowe St Bridge**

General wording of question found in grant(s)	Grant Opportunities ("X" indicates data needed for grant application)										
	HMGP	Better Roads	ERP	Watershed Grant	Town Highway Structures	Town Highway Class 3 Roadway	Trans. Alternatives Program	LCBP - Pollution Prevention	LCBP - Env. Assistance Program	Yes	Maybe
Which grant(s) is the project eligible for? (Yes/No/Maybe)											
Data to be included in Grant Application(s):											
Problem Description											
Project Description / Proposed Scope of Work											
Project Objective/Type of work											
Existing Structure											
Bylaws to address encroachments or reduce vulnerability?											
Hazard Mitigation Plan? Date of approval											
Muni. Complied with 19V.S.A Section 309(d) regarding "complete streets"											
Muni. Adopted codes & Standards that meet or exceed State approved template											
Muni. Has current Network inventory (less than 3 yrs. Old)											
Watershed/Waterbody											
Watershed Coordinator											
Vtrans District Number & Contact											
Location (Lat/long); Town Highway # & class; Structure#											
Map of Project Area											
Road Segment ID											
Hydrologically Connected?											
History of Damages/maintenance (inventory, capital budget, basin plan, etc.)											
Analysis of Alternatives											

**Information for Grant Applications - Lincoln St Culvert/Floodplain Reconnection & Stowe St Bridge**

Which grant(s) is the project eligible for? (Yes/No/Maybe)		Grant Opportunities ("X" indicates data needed for grant application)											
General wording of question found in grant(s)	HMGP	Better Roads	ERP	Watershed Grant	Town Highway Structures	Town Highway Class 3 Roadway	Trans. Alternatives Program	LCBP - Pollution Prevention	LCBP - Env. Assistance Program	Yes	No	Yes	Maybe
Project Category													
Cost Benefit/Budget	X	X	X	X	X	X	X	X	X	X	X	X	X
Within or near Designated Downtown, Village, Growth Center or New Town Center?													
Identified in Town (or Regional) Plan, Capital Program													

**Data for Benefit-Cost-Analysis or Budget**

Most projects will use a BCA based upon the Damage-Frequency-Assessment model. To run the model, there needs to be at least 2 prior damage events. For each year that the road/culvert/bridge suffered provide the information noted in the right hand column.

BCA Ratio tips	YEAR
<b>Prior Damage Event #1</b>	
<b>Prior Damage Event #2</b>	
<b>Prior Damage Event #3</b>	
Estimated project cost (engineering + construction =)	
Estimated annual maintenance cost (e.g. culvert cleanout)	
Hydraulic Report Completed (yes/no)	
Permit Status (include where obtained)	
BCA ratio	

Links to supporting documents	
Waterbury, Vermont Middle Winooksi River Corridor Plan, BCE, 2015	<a href="http://centralvtplanning.org/wp-content/uploads/2012/03/MidWinooksi_RCP_FINA_L_12_15_15_BCE_Report.pdf">http://centralvtplanning.org/wp-content/uploads/2012/03/MidWinooksi_RCP_FINA_L_12_15_15_BCE_Report.pdf</a>
Waterbury Hazard Mitigation Plan 2013	<a href="https://www.waterburyvt.com/fileadmin/files/Ordinance_files/Plans/Local_Hazard_Mitigation_Plan_-_May_2012_-_Adopted_December_3_2012.pdf">https://www.waterburyvt.com/fileadmin/files/Ordinance_files/Plans/Local_Hazard_Mitigation_Plan_-_May_2012_-_Adopted_December_3_2012.pdf</a>

## 5. Project Objectives & Next Steps for Ripley, Shaw Mansion & Guptil Rds Culverts / Bridge

<b>Project Type</b>	Culvert/Bridge Replacement at Ripley, Shaw Mansion, & Guptil Rds
<b>Purpose &amp; Need:</b>	The culverts are undersized, reducing aquatic organism passage and increasing flood risk. All structures are at least somewhat geomorphically incompatible, and the bridge is in poor condition and has low passage.
<b>Town Priority (high or med)</b>	This is a high priority. Bridges with low clearance can be prone to jamming by woody debris, increasing flood risk to the residential area. Undersized culverts cause erosion and can contribute to flooding, especially if jammed.

<b>Effectiveness Questions* (Yes/No, provide details)</b>	
<i>Supported by technical information demonstrating feasibility?</i>	Yes, obtain information from road foreman.
<i>Effective project achieving project objective?</i>	Yes, by upsizing culverts and reducing culvert drop, flood damages will be minimized, access to homes in a flood emergency will be improved as well as aquatic organism passage.
<i>Is sufficient funding available for grant match?</i>	Yes
<i>climate adaptation in mind?</i>	Yes; with climate change comes the increased frequency of larger storm events. Replacing the bridge and culverts will decrease the instances of flood damage due to structure blockages.
<i>Mitigation Approach - Reduce Vulnerability/Harden or Avoidance/Move?</i>	The mitigation approach is to reduce the vulnerability of the area around the structures to property and infrastructure damage.
<b>Impact Questions* (Yes/No, provide details)</b>	
<i>Multiple past damages?</i>	Yes

<b>Next Steps to Advance Project</b>	
<i>Request Hydraulic Report</i>	Yes, work with Engineer for Bridge design
<i>Collect Town Data needed for Grant Applications</i>	Work with Road Foreman to obtain information.
<i>Develop BCA ratio</i>	Work with Road Foreman & Engineer to obtain information.
<i>Seek funds to Develop Cost Estimates</i>	No
<i>Develop Capital Budget Estimates</i>	Yes, check with Road Foreman
<i>Seek funds to Develop Plans</i>	Yes for Bridge replacement
<i>Seek Construction Funds</i>	Apply for Better Roads Cat. D, HMGP, Town Highway Structures, and/or LCBP
<i>Develop RFP for Construction</i>	Unknown, may not be necessary if tonw does work.
<i>Estimated Construction Timeline</i>	Within the next 5 years-- 2022
<i>Any issues/constraints that might hinder project moving forward? (is yes, please identify)</i>	Funding
<i>Point of Contact</i>	Bill Woodruff, Public Works Director; bwoodruff@waterburyvt.com; (802) 839-6199

## 5. Project Objectives & Next Steps for Ripley, Shaw Mansion & Guptil Rds Culverts / Bridge

Community priority which will result in significant increase in safety or reduction in risk to high cost/critical/high impact problem?	Yes - Reduced road flooding will allow access to homes on the road for emergency vehicles and residents during most flooding conditions.
Increase available river corridor/floodplain acreage/storage and/or storage/headwater forest?	No.
Enhance natural habitat?	Yes- the completion of this project will increase aquatic organism passage through the structures.
Protect important cultural or historic features?	No.
Protect economic assets?	Yes- the completion of this project would protect the roads from damage.
Improves water quality by reducing sediment and/or nutrients?	Yes- erosion would be reduced by replacing all structures.
<b>Proactivity Questions* (Yes/No, provide details)</b>	
Previous actions been taken to remedy, study or alleviate problem?	Studied in Stream Geomorphic Assessment
<b>Unique Circumstances* (Yes/No, provide details)</b>	
Special qualities in terms of importance to community?	
Create significant benefits above the minimum?	

**Information for Grant Applications - Ripley, Shaw Mansion, and Guptil Rd culverts/bridge**

		Grant Opportunities ("X" indicates data needed for grant application)									
		HMGP	Better Roads	ERP	Watershed Grant	Town Highway Structures	Town Highway Class 3 Roadway	Trans. Alternatives Program	LCBP - Pollution Prevention	LCBP - Env. Assistance Program	
		Yes	Yes (cat. D)	Yes	Maybe	Yes	No	No	Maybe	Maybe	
<b>General wording of question found in grant(s)</b>		<b>Data to be included in Grant Application(s):</b>									
<b>Problem Description</b>	Culvert and bridge upsizing to improve flood resiliency, geomorphic compatibility and/or aquatic organism passage.	X	X	X	X	X	X	X	X	X	
<b>Project Description / Proposed Scope of Work</b>	Replacing failing/undersized bridges and culverts and installing new culverts.	X	X	X	X	X	X	X	X	X	
<b>Project Objective/Type of work</b>	Culvert/Bridge - upsize	X	X	X	X	X	X	X	X	X	
<b>Existing Structure</b>	Guptil Rd. Bridge 17' wide, Shaw Mansion Rd culvert 7' wide, Ripley Road culverts 54" and 80" wide from downstream to upstream	X	X	X	X	X	X	X	X	X	
<b>Bylaws to address encroachments or reduce vulnerability?</b>	NA										
<b>Hazard Mitigation Plan? Date of approval</b>	Yes, 2013, 2017 draft	X									
<b>Muni. Complied with 19V.S.A Section 309(d) regarding "complete streets"</b>	Yes					X					
<b>Muni. Adopted codes &amp; Standards that meet or exceed State approved template</b>	Yes					X					
<b>Muni. Has current Network inventory (less than 3 yrs. Old)</b>	No, will be inventoried in 2018					X					
<b>Watershed/Waterbody</b>	Unnamed Tributaries to Thatcher Brook	X	X	X	X						
<b>Watershed Coordinator</b>	Karen Bates, karen.bates@vermont.gov, 802-490-6144										
<b>Vtrans District Number &amp; Contact</b>	District 5; David Blackmore, 802-655-1580; david.blackmore@vermont.gov										
<b>Location (Lat/long); Town Highway # &amp; class; Structure#</b>	44.363321, -72.721289, TH-1, Class 2; 44.368631, -72.697179, TH-28, Class 3; 44.370151, -72.68541, TH-6, Class 3; 44.373159, -72.683572, TH-6, Class 3	X		X		X		X			
<b>Map of Project Area</b>	See Town wide project map									X (if within/near Designated area)	
<b>Road Segment ID</b>	23090_Guptil_Rd_25782.1; 23090_Shaw_Mansion_Rd_21; 23090_Ripley_Rd_18; 23090_Ripley_Rd_14			X		X					
<b>Hydrologically Connected?</b>	Yes	X	X								

### Information for Grant Applications - Ripley, Shaw Mansion, and Guptil Rd culverts/bridge

General wording of question found in grant(s) History of Damages/maintenance How was it identified (inventory, capital budget, basin plan, etc.) Analysis of Alternatives Project Category Cost Benefit/Budget Within or near Designated Downtown, Village, Growth Center or New Town Center? Identified in Town (or Regional) Plan, Capital Program	Grant Opportunities ("X" indicates data needed for grant application)											
	HMGP	Better Roads	ERP	Watershed Grant	Town Highway Structures	Town Highway Class 3 Roadway	Trans. Alternatives Program	LCBP - Pollution Prevention	LCBP - Env. Assistance Program	Yes (cat. D)	Yes	Maybe
	Yes	Yes	Yes	Maybe	Yes	No	No	Yes	Maybe	Yes	No	Maybe
Which grant(s) is the project eligible for? (Yes/No/Maybe)	X											
Data to be included in Grant Application(s): Shaw Mansion Road culvert bottom rusted, failing headwall and scour; Upstream Ripley Rd culvert rusted out bottom.	X	X			X	X						
This was identified in draft hazard mitigation plan 2017 strategies. May be needed for bridges	X											
Better Roads Category D			X									
See Benefit-Cost-Analysis below	X	X	X	X	X	X	X	X	X	X	X	X
No												
Yes (Draft LHMP), River Corridor Plan												

#### Data for Benefit-Cost-Analysis or Budget

Most projects will use a BCA based upon the Damage-Frequency-Assessment model. To run the model, there needs to be at least 2 prior damage events. For each year that the road/culvert/bridge suffered provide the information noted in the right hand column.

	YEAR
BCA Ratio tips	
Prior Damage Event #1	
Prior Damage Event #2	
Prior Damage Event #3	
Estimated project cost (engineering + Construction =)	

Links to supporting documents	
Waterbury Hazard Mitigation Plan 2013	<a href="https://www.waterburyvt.com/fileadmin/files/Ordinance_files/Plans/Local_Hazard_Mitigation_Plan_-_May_2012_-_Adopted_December_3_2012.pdf">https://www.waterburyvt.com/fileadmin/files/Ordinance_files/Plans/Local_Hazard_Mitigation_Plan_-_May_2012_-_Adopted_December_3_2012.pdf</a>
Waterbury, Vermont Middle Winooski River Corridor Plan, BCE, 2015	<a href="http://centralvtplanning.org/wp-content/uploads/2012/03/MidWinooski_RCP_FINA_L_12_15_15_BCE_Report.pdf">http://centralvtplanning.org/wp-content/uploads/2012/03/MidWinooski_RCP_FINA_L_12_15_15_BCE_Report.pdf</a>



**Information for Grant Applications - Riplay, Shaw Mansion, and Guptil Rd culverts/bridge**

Which grant(s) is the project eligible for? (Yes/No/Maybe)	
General wording of question found in grant(s)	Data to be included in Grant Application(s):
Estimated annual maintenance cost (e.g. culvert cleanout)	
Hydraulic Report Completed (yes/no)	
Permit Status (include where obtained)	
BCA ratio	

Grant Opportunities ("X" indicates data needed for grant application)

HMGP	Better Roads	ERP	Watershed Grant	Town Highway Structures	Town Highway Class 3 Roadway	Trans. Alternatives Program	LCBP - Pollution Prevention	LCBP - Env. Assistance Program
Yes	Yes (cat. D)	Yes	Maybe	Yes	No	No	Maybe	Maybe
X	X	X	X	X	X	X	X	X

Grant Possibilities

Grant Website	Description/Eligibility	Contacts	Notes
<p><u>DEMHS - Hazard Mitigation Grant Program</u></p>	<p>The HMGP program is funded through the Federal Emergency Management Agency (FEMA) and is administered by DEMHS on behalf of the state. Typical hazard mitigation projects include: mitigation of local roads and bridges, home acquisition (buyout), structural elevations or relocations, replacement of undersized culverts, mitigation outreach and education, etc. Project proposals do not need to be directly connected to damages incurred from the most recent declared disaster. <b>Must have the following to be eligible: 1) Approved and adopted Local Mitigation Plan; 2) Participate in National Flood Insurance Program; 3) Have a Local Emergency Operations Plan in place.</b></p>		<p>Federal funds are available to cover up to 75% of approved project costs; however, please note that there is a 25% local match (or lower depending on ERAF eligible actions) requirement that is the responsibility of the applicant town. <a href="http://floodready.vermont.gov/assessment/community_reports">http://floodready.vermont.gov/assessment/community_reports</a></p>
<p><u>Better Roads Grant Program</u></p>	<p>Funding to support projects on municipal roads that improve water quality and result in maintenance cost savings. The grant funds are provided by the VT Agency of Transportation. The Vermont Better Roads Program's goal is to promote the use of erosion control and maintenance techniques that save money while protecting and enhancing Vermont's lakes and streams. <b>Category A max. is \$8,000. Category B max is \$20,000. Category C or D max. is \$40,000; Minimum 20% local match is required.</b></p>	<p>Contact Jim Ryan with questions - <a href="mailto:Jim.Ryan@vermont.gov">Jim.Ryan@vermont.gov</a> or at (802) 490-6140.</p>	<p>Due 5 pm Friday, March 17, 2017</p>
<p><u>Ecosystem Restoration Grant Program</u></p>	<p>Grants to restore and protect rivers, streams, lakes, ponds, and wetlands from unregulated nonpoint source runoff and erosion containing nutrient (phosphorus and nitrogen) and sediment pollution. Ecosystem Restoration Grants are supported by State of Vermont capital construction funds and, new for 2016, the Clean Water Fund. The use of Clean Water Fund dollars is to maximize opportunities for the restoration and protection of Vermont's waterways by prioritizing and targeting resources, allowing DEC to fund projects that are not capital eligible. CWIP will use these funds for projects as necessary. Ecosystem Restoration and Protection Capital Funds <b>Max Grant Amount: \$10,000 (20% local match)</b></p>	<p>David Pasco - <a href="mailto:david.pasco@vermont.gov">david.pasco@vermont.gov</a> or 802-490-6112</p>	<p>Priority projects (unranked); Sources of water pollution in impaired waters; Significant sources of water pollution; Riparian buffer restoration; Compliance with road permit; Education, outreach; innovative technologies; land acquisition; municipal assist</p>
<p><u>Watershed Grant Program</u></p>	<p>A wide variety of watershed projects are eligible, including protection, restoration and enhancement of habitat, water quality, recreation, and/or cultural/historic resources, and monitoring and education. Max Grant Amount: \$10,000</p>	<p>Chris Saunders - <a href="mailto:chris.saunders@vermont.gov">chris.saunders@vermont.gov</a> or 802-343-5487</p>	<p>Grant funds are available for water-related projects that: ... <b>Reduce phosphorus loading and/or sedimentation as part of DEC's Clean Water Initiative objectives;</b> <i>not all project types are listed here (see webpage for complete list)</i></p>

Grant Possibilities

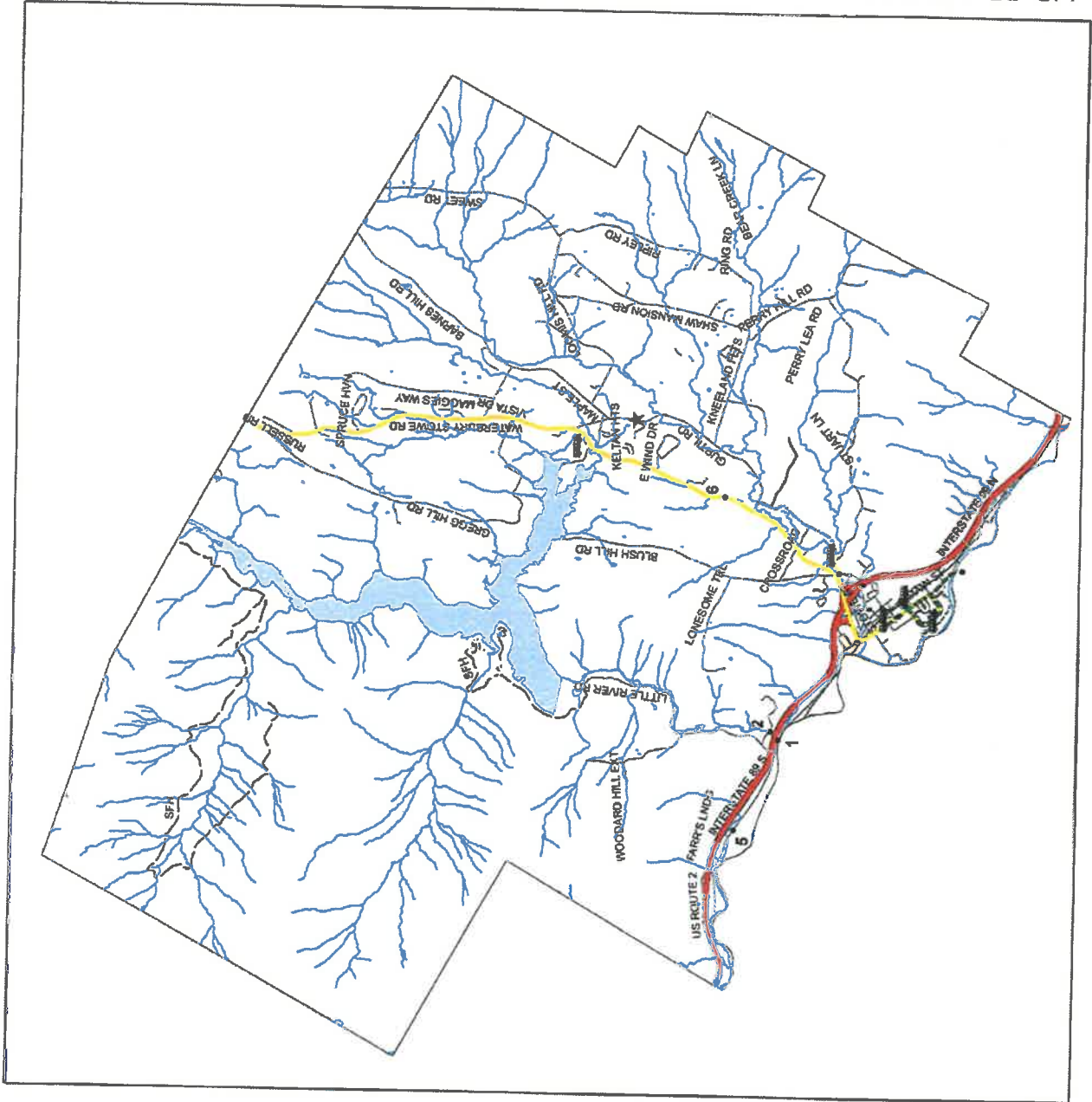
Grant Website	Description/Eligibility	Contacts	Notes
<p><u>Town Highway Structures - Section 5 of Orange Book</u></p>	<p>State grants for bridges, culverts (36 inch diameter or larger), and retaining walls that are part of the municipalities' highway (Class 1, 2, or 3) infrastructure are made by the Secretary of Transportation from annual appropriations for that purpose (19 V.S.A. § 306). State funds are required to be matched by at least: 1. 20 percent of total project cost with municipal funds, or 2. 10 percent of total project cost with municipal funds providing that municipalities have: • adopted town highway codes and standards that meet or exceed the minimum requirements of the VTrans January 23, 2013 template, and • conducted a highway infrastructure study (not less than three years old) which identifies all town culverts, bridges, and identified road problems. The inventory would include location, size, deficiency/condition, and estimated cost of repair – where the condition is less than acceptable. <b>State grant amounts are limited to \$175,000 for any one project. Projects are selected by the District Transportation Administrator (DTA) from applications submitted by municipalities on a once-per-year basis.</b></p>	<p><u>Vtrans District Office</u></p>	<p>Culvert replacement for culverts equal to or greater than 36 inches in diameter shall be part of the Town Highway Structures Program.</p>
<p><u>Town Highway Class 2 Roadway Program - Section 5 of Orange Book</u></p>	<p>State grants for the preservation of any Class 2 highways for resurfacing or reconstruction are made by the Secretary of Transportation or his/her designee from annual appropriations for that purpose (19 V.S.A. § 306). <b>State funds are required to be matched by at least:</b></p> <ol style="list-style-type: none"> <li>1. 30% of total project cost with municipal funds, or 2. 20% of total project cost with municipal funds providing that: <ul style="list-style-type: none"> <li>• town highway codes and standards that meet or exceed the minimum requirements of the VTrans January 23, 2013 template have been adopted, and</li> <li>• a highway infrastructure study has been conducted (not less than three years old) which identifies all town culverts, bridges, and identified road problems. The inventory would include location, size, deficiency/condition, and estimated cost of repair – where the condition is less than acceptable. <b>State grant amounts are limited to \$175,000 for any one project.</b></li> </ul> </li> </ol>	<p><u>Vtrans District Office</u></p>	<p>Culverts less than 36 inches in diameter are considered part of drainage work in the Town Highway Class 2 Roadway Program. Guardrail work is only considered eligible if it is an essential part of the roadway project. Curbing is an eligible item if it is an essential part of the roadway cross section (e.g., curbing in conjunction with a closed drainage system or associated with a raised median or other traffic control barrier). Sidewalks are not eligible under the Class 2 Roadway grants.</p>
<p><u>Transportation Alternatives Program</u></p>	<p>Eligible projects include: (E.ii.)Community improvement activities including vegetation management practices in transportation rights-of-way to improve roadway safety, prevent against invasive species, and provide erosion control and (F.i.) Any environmental mitigation activity, including pollution prevention and pollution abatement activities and mitigation to address stormwater management, control, and water pollution prevention or abatement related to highway construction or due to highway runoff. - <b>Eligible applicants may apply for project funding up to \$300,000 in federal dollars. Scoping studies are typically awarded in the range of \$20,000 to \$50,000 total.</b></p>	<p>Scott Robertson, 802-828-5712 scott.robertson@vermont.gov or</p>	<p>Project Match Requirements – For construction projects, a minimum of twenty percent (20%) of the total project cost must be provided by the Sponsor. For scoping studies, a minimum of fifty percent (50%) of the total project cost must be provided by the Sponsor. At least half of the match must be in cash expenditures.</p>

Grant Possibilities

Grant Website	Description/Eligibility	Contacts	Notes
<p>Lake Champlain Basin Program - Pollution Prevention &amp; Wildlife Habitat Conservation Grants</p>	<p>Projects may address any of the priorities identified in Opportunities for Action, but those that address reducing nonpoint source inputs of phosphorus, toxic substances from urban and/or agricultural areas, or projects that target improvement of wetland, riparian or aquatic habitat (e.g. riparian plantings or aquatic organism passage projects) to restore and maintain a healthy and diverse fish &amp; aquatic life community probably will rank higher in the review process. Projects that incorporate flood-resilient practices will be awarded up to five extra points in the selection criteria. ALL grant proposals submitted in response to this RFP with field-based components to their project MUST provide some assurance of invasive species spread prevention measures in their application. <b>Max Grant Amount in 2016: \$20,000</b></p>	<p>Meg Modley - mmodley@lcbp.org or 802-372-0215</p>	<p>Regardless of organization type, eligible applicants must either have or be able to acquire a DUNS number. Please see <a href="http://neiwppcc.org/contractors/contactor">http://neiwppcc.org/contractors/contactor</a>. docs/DUNSGuidefoContractors.pdf for more information about DUNS and how to acquire a DUNS number.</p>
<p>Lake Champlain Basin Program - Lake Champlain Watershed Environmental Assistance Program</p>	<p>The goal of the Lake Champlain Watershed Environmental Assistance Program is to provide assistance with planning, designing and implementation of large scale projects that protect and enhance water quality, water supply, ecosystem integrity and other water related issues within the watershed. It defines the Lake Champlain Watershed as the land areas within Addison, Bennington, Caledonia, Chittenden, Franklin, Grand Isle, Lamoille, Orange, Orleans, Rutland, and Washington Counties in the State of Vermont. Under this Invitation for Letters of Request, the USACE will assist successful applicants by facilitating restoration projects in the following categories:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> River Corridor Management</li> <li><input type="checkbox"/> Non-Point Source pollution prevention</li> <li><input type="checkbox"/> Invasive species prevention</li> <li><input type="checkbox"/> Land Use Mapping</li> <li><input type="checkbox"/> Other water quality initiatives detailed in Opportunities for Action, An Evolving Plan for the Future of the Lake Champlain Basin, 2003, and consistent with the Lake Champlain General Management Plan</li> </ul>	<p>Meg Modley - mmodley@lcbp.org or 802-372-0215</p>	<p>The USACE Planning Assistance to States grant program through the LCBP is going to be revived likely this spring. LCBP hopes to host a public meeting about this opportunity later in the year (2017). Letter of Request is for US Army Corps of Engineers assistance. Not a monetary award.</p>

# WATERBURY TRANSPORTATION: Town Map

Id	Project Type	Road	Description
1	Bridge	US 2	Over Little River
2	Bridge	Farr Rd	Relocate Farr Rd
5	Paving	US 2	Waterbury Village to Bolton
6	Paving	VT 100	Waterbury Village to Stowe



### Legend

- Cross Vermont Trail
- Community Path
- Waterbury Commuter
- Route 100 Commuter
- Commuter Stops
- Town Garage
- Transportation Projects
- Rail Road
- Waterbury Park and Ride
- Rivers, Lakes, and Ponds
- Streams
- Paved Public Roads
- Unpaved Public Roads
- State Forest Highway
- Paved Private Roads
- Unpaved Private Roads
- Interstate



Map 3-1



Source:  
 Cross Vermont Trail: CVTA 2010  
 Waterbury Community Path: CVRPC 2011  
 Commuter Routes: CVRPC, GMTA 2013  
 Commuter Stops: CVRPC, GMTA 2013  
 Rail Rds and Station: VCGI, VTrans.  
 Roads: VTrans 2012  
 Surface Water: VHD 2008

Map created 2013 by CVRPC  
 Path: N:\Town\Water\TownPlan\Transportation.mxd

Data is only as accurate as the original source materials.  
 This map is for planning purposes only.  
 This map may contain errors and omissions.



W.a

# WATERBURY TRANSPORTATION: Village Map

Id	Project Type	Road	Description
3	Bridge	Stowe ST	Reconstruction of BR 36
4	Bridge	I-89	Rehabilitate 846 North and South, and BR 46 A
7	Roadway Project	US 2	Reconstruct Main ST
8	Roadway Project	US 2 / VT 100	Construct Roundabout
9	Enhancement	Stowe ST	Install Sidewalk
10	Bike and Pedestrian Project	VT 100	Crosssett Brook School Area

### Legend

- Cross Vermont Trail
- Rivers, Lakes, and Ponds
- Community Path
- Streams
- Waterbury Commuter Roads
- Paved Public Roads
- Route 100 Commuter
- Unpaved Public Roads
- Commuter Stops
- State Forest Highway
- Rail Rd Station
- Paved Private Roads
- Senior Meal Site
- Unpaved Private Roads
- Transportation Projects
- Interstate
- Rail Road
- Waterbury Park and Ride



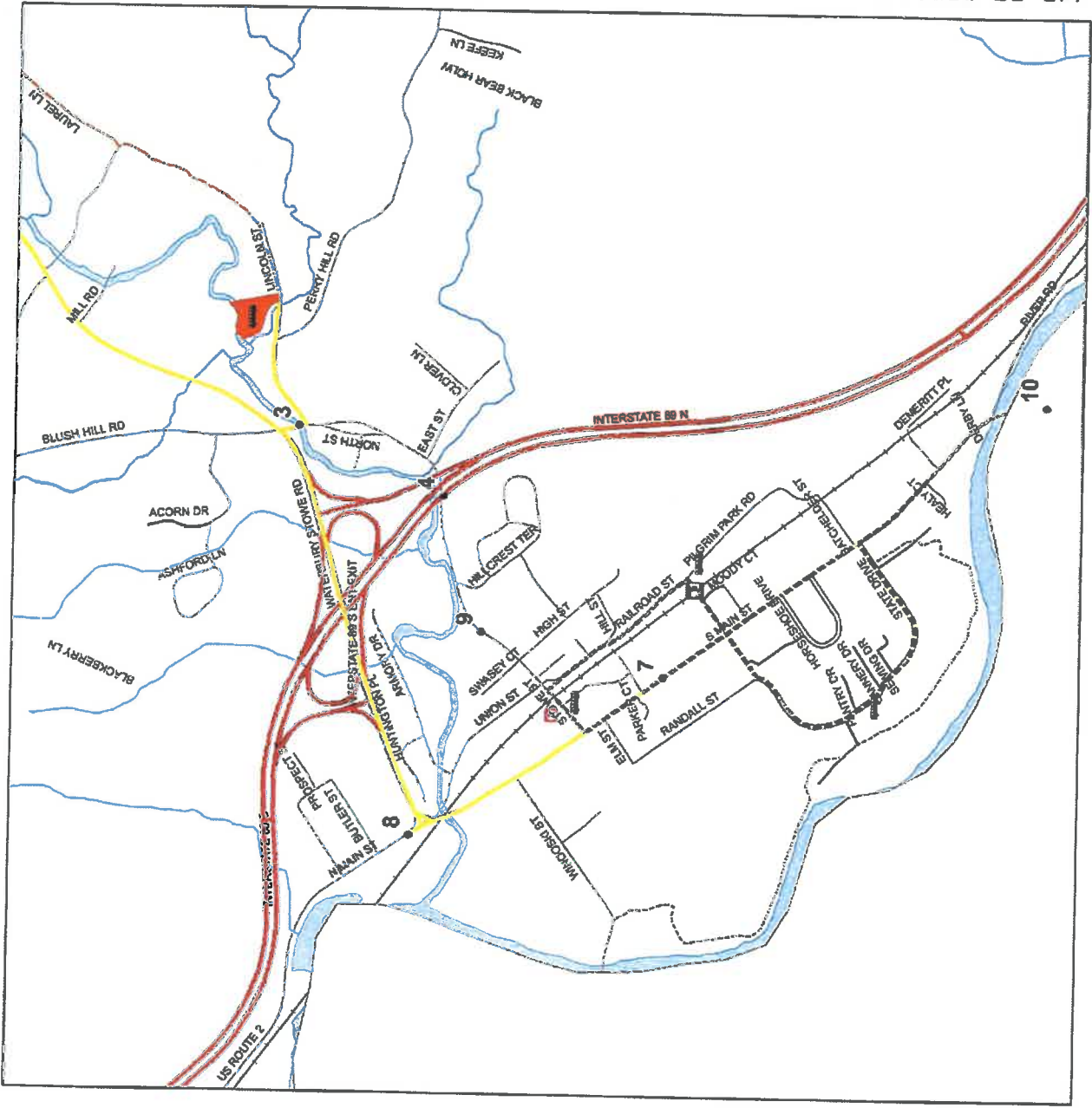
Map 3-2



3.6

Source:  
 Cross Vermont Trail: CVTA 2010  
 Waterbury Community Path: CVRPC 2011  
 Commuter Routes: CVRPC, GMTA 2013  
 Commuter Stops: CVRPC, GMTA 2013  
 Rail Rds and Station: VCGI, VTrans.  
 Roads: VTrans 2012  
 Surface Water: VHD 2008

Map created 2013 by CVRPC  
 Path: N:\Town\Water\Town\Plant\Transportation-village.mxd  
 Data is only as accurate as the original source materials.  
 This map is for planning purposes only.  
 This map may contain errors and omissions.



**Found Facilities**

*Tier 11 Reporting facilities 2016*

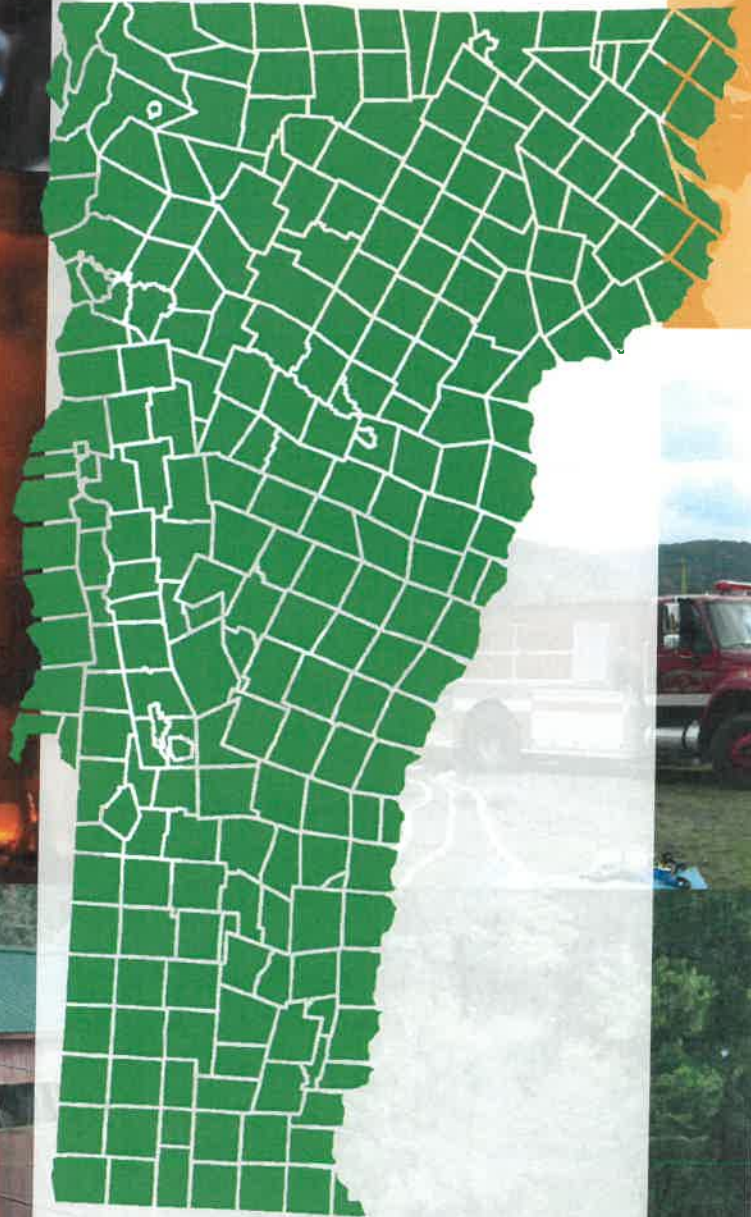
**Imported records**

Report Year	Facility Name	City	County	Address	State	Zip
2016	Amerigas dba Blue Flame Gas Waterbury	Waterbury	Washington	676 US Rt 2	VT	05676
2016	Ben & Jerry's Homemade Inc. Waterbury VT	Waterbury	Washington	1281 Waterbury Stowe Road	VT	05676
2016	Billings Mobil	Waterbury	Washington	758 Waterbury Stowe Road	VT	05676
2016	Bourne's Energy (Walker Construction-5950	Waterbury Center	Washington	5950 Waterbury-Stowe Rd	VT	05677
2016	Comcast of CT/GA/MA/NH/NY/NC/VA/VT. LLC	Waterbury	Washington	375 Lonesome Trail Rd. (Blush Hill)	VT	05676
2016	Crossroads Beverage	Waterbury	Washington	52 No Main Street	VT	05676
2016	Fairpoint WATERBURY DIAL OFC (FPT-	WATERBURY	Washington	3 SWASEY COURT	VT	05676
2016	GMP Little River hydroelectric plant #22	Waterbury	Washington	2246 Little River Rd.	VT	05671
2016	GMP Waterbury Center substation #47	Waterbury	Washington	2927 Waterbury-Stowe Road	VT	05676
2016	Iving Energy Customer - WSC LLC.	Waterbury	Washington	80 South Main Street	VT	05676
2016	Keurig Green Mountain INC - Waterbury	Waterbury Center	Washington	228 Suss Drive	VT	05677
2016	Keurig Green Mountain inc. - Waterbury	Waterbury	Washington	150 Pilgrim Park	VT	05676
2016	Moretown Landfill	Waterbury	Washington	19 Kaiser Drive	VT	05676
2016	RCC - WATERBURY - USID102989	WATERBURY	Washington	149 BLUSH HILL ROAD	VT	05676
2016	Shaw's #7649	WATERBURY	Washington	RT100 & RT 189 COLBYVILLE CENT	VT	05671
2016	Simon's Waterbury	Waterbury	Washington	27131 Waterbury-Stowe Road	VT	05676
2016	Verizon Wireless Waterbury (1258819)	Waterbury	Washington	Blush Hill Rd	VT	05676
2016	Vermont Army National Guard - Waterbury	Waterbury	Washington	86 Armory Drive	VT	05676
2016	Village of Waterbury - Earle P. Towne	Waterbury Center	Washington	556 Barnes Hill Road	VT	05677
2016	Village of Waterbury - Waste Water Treatment	Waterbury	Washington	187 Route 2	VT	05676
2016	VSECU Waterbury Branch	Waterbury	Washington	27 South Main Street	VT	05676
2016	VT Department of BGS	Waterbury	Washington	91 State Drive	VT	05676

*4.a*

# Vermont State <sup>4.6</sup> Commodity Flow Study

2017





# Border Crossing Data

An immense amount of data was obtained at the Highgate Springs and Derby international border crossings that span the entire 2016 year. Derby has 12,438 lines of data, while Highgate Springs has 18,535 lines of data. Both sets of data provided the placard number, date, and hour in which the hazardous material truck crossed from Canada into the U.S. Because the data files are so large, they are not included in this report. LEPC's interested in reviewing the data should please contact TRORC and it can be emailed to you.

With this wealth of data, a deeper analysis was able to be completed. Seasonal, monthly, daily, and hourly analysis was done.

## Seasonal Patterns

The number of hazardous trucks that crossed the border was broken up into seasons to see what time of year trucks are most likely to travel into the U.S. Seasons are defined as the following:

- Winter: January, February, December
- Spring: March, April, May
- Summer: June, July, August
- Fall: September, October, November.

For both Highgate and Derby, winter was the season that experienced the most hazardous trucks. This is mostly

likely caused by the increase of heating oil needed during the winter months. Fall was the second most populous season, due to the same reasons as homes and businesses are filling up on heating oil in preparation for winter.

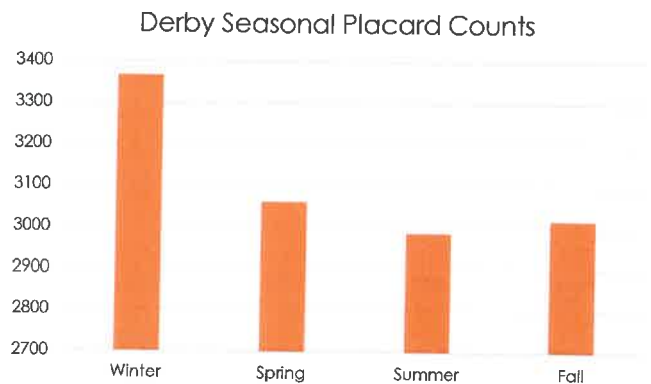


Figure 8: Derby Seasonal Placard Counts

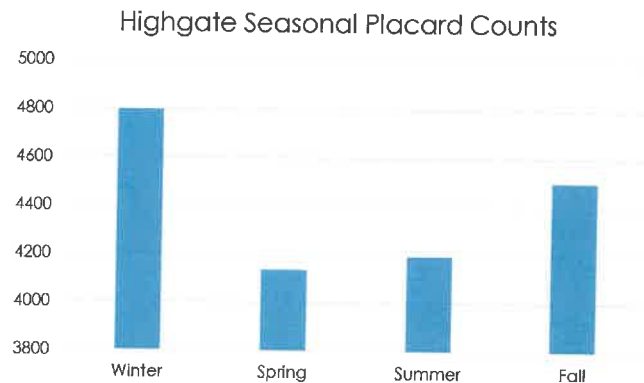


Figure 9: Highgate Seasonal Placard Counts

# Border Crossing Data

## Monthly Patterns

The seasonal data was further broken up into monthly categories. In Highgate, January experienced the heaviest hazardous truck occurrences. By looking at the rest of the months of the year, it appears that other months are very similar in hazardous truck volume.

In Derby, December experienced the heaviest truck volume. Similar to Highgate, the other months of the year had similar truck volumes crossing the border.

Highgate Monthly Placard Percentages

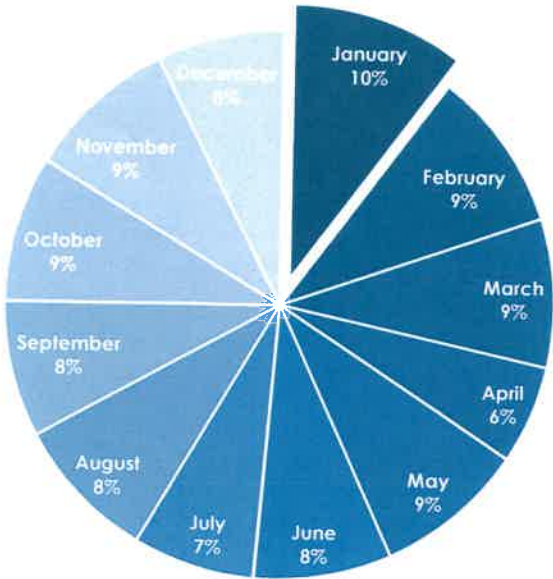


Figure 10: Highgate Monthly Placard Percentages

Derby Monthly Placard Percentages

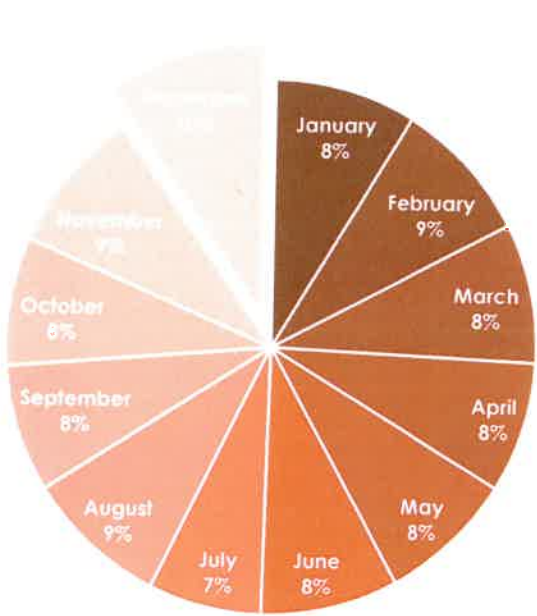
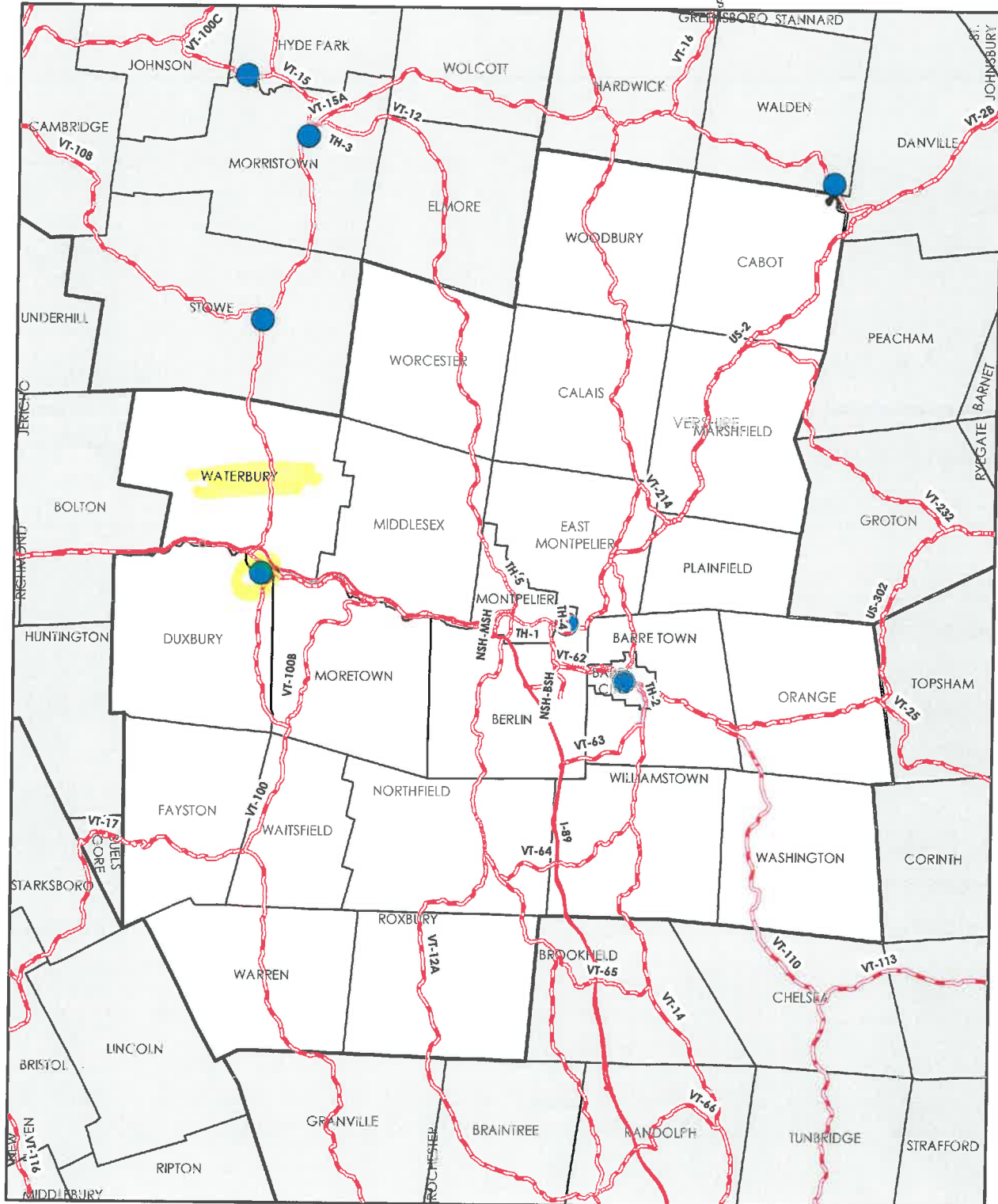
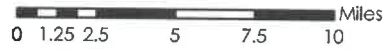


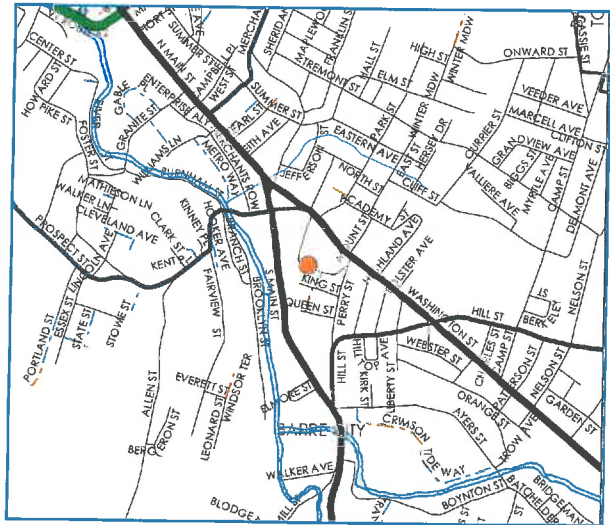
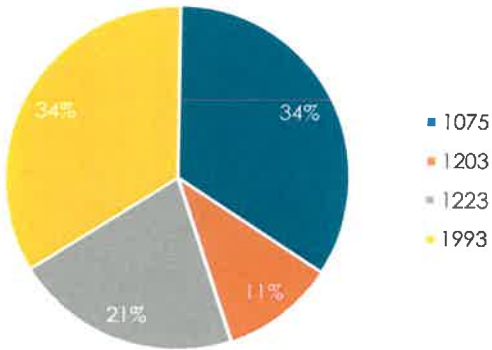
Figure 11: Derby Monthly Placard Percentages

## HMEP Locations

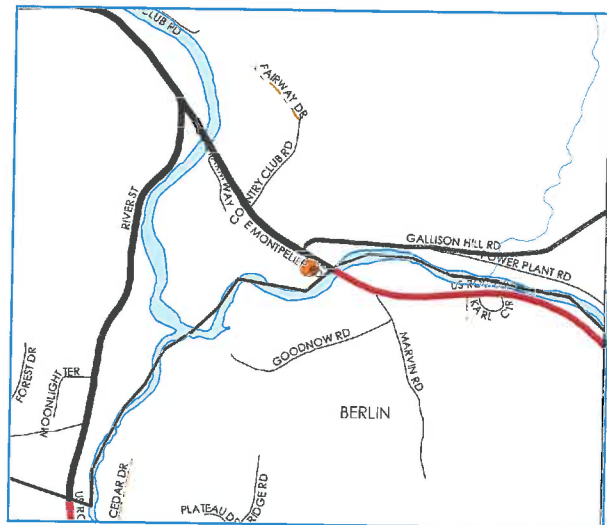
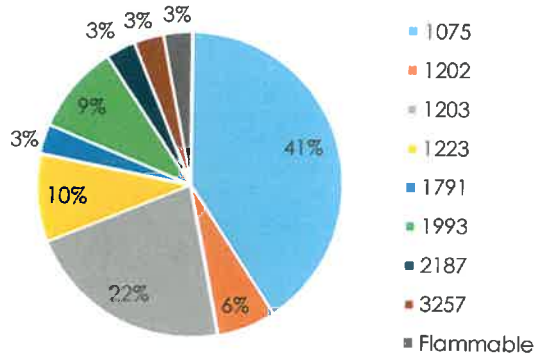
LEPC # 5 ● Study Areas



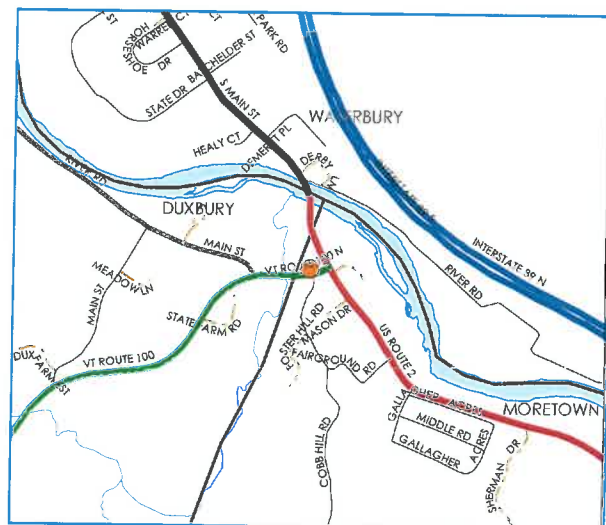
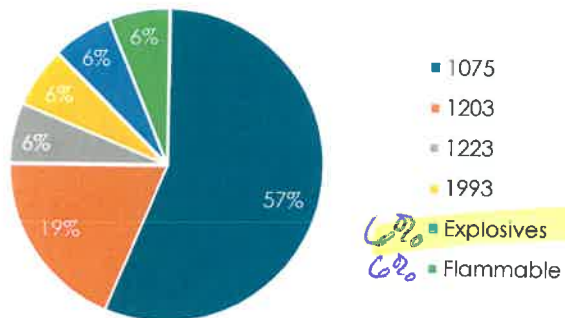
Barre - US 302  
East/West



Montpelier - US 2  
East/West



Waterbury - VT Route 100  
North/South



# Emergency Response Guidebook

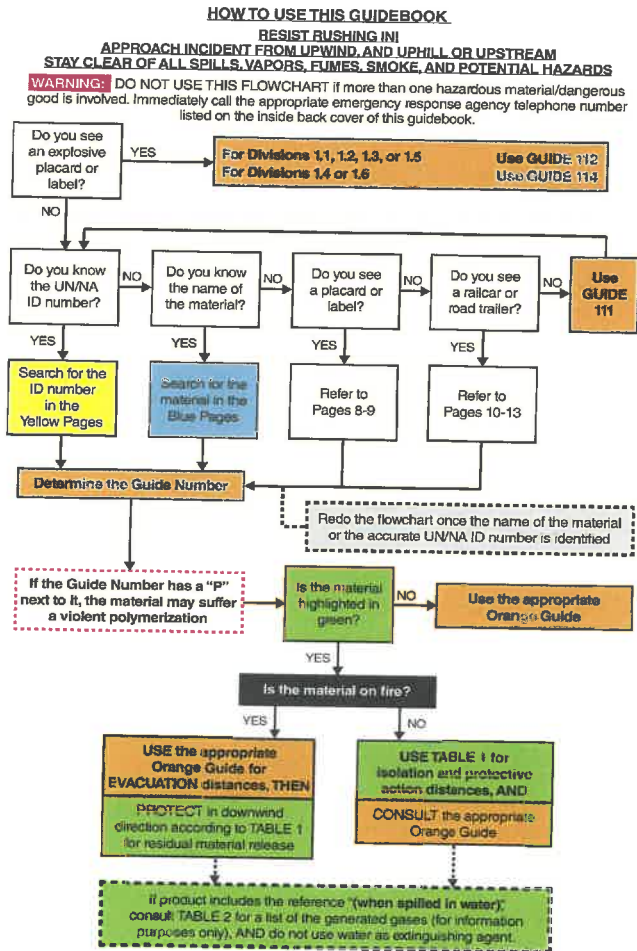
The ERG is a great tool to use for first responders. It is a free publication that you can get from your local fire department or LEPC. There is also a free phone application you can download so you have it at your fingertips 24/7.

The flow chart to the right is taken from the ERG (page 1) and explains how to properly use the book depending on what type of placard is involved in an incident.

Large trucks or other vehicles that do not have placards can pose a hazardous materials threat. Gasoline and diesel are a large fire threat and during spills can contaminate waterways. First responders should always approach situations like these upwind, uphill, or upstream, and **never handle these materials without first contacting the Vermont HAZMAT team.** Responder life safety is the priority in these situations.

It is always important to remember that the ERG is intended as a guide for the initial response to a HAZMAT situation. It should not be used for long term abatement.

The following pages (in order by guide number) show the accompanying guide pages with the placards recorded in this study. Some placards show additional directions on how to isolate the situation if a spill were to occur.



**BEFORE AN EMERGENCY - BECOME FAMILIAR WITH THIS GUIDEBOOK!**  
First responders must be trained in the use of this guidebook.

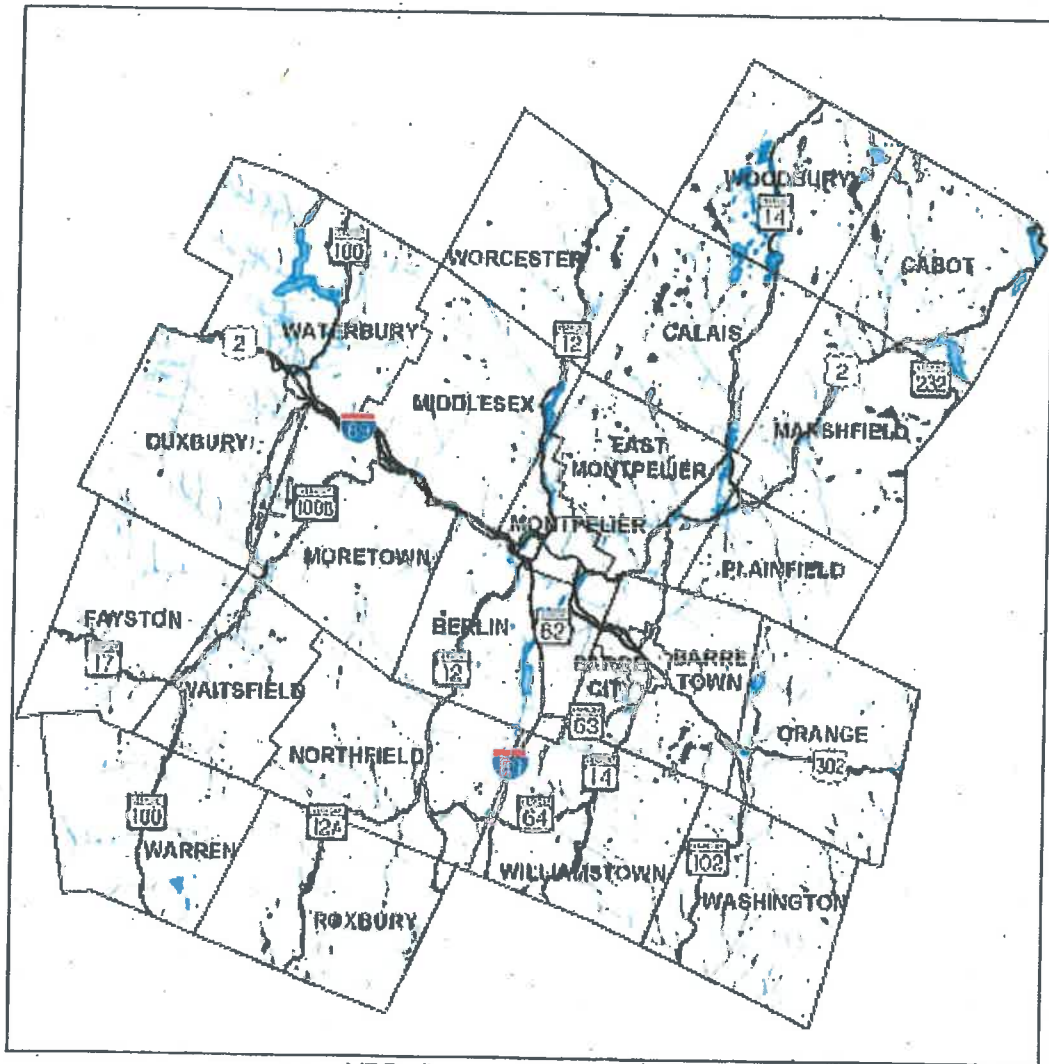
Page 1

Guide 111 should be used for placards that are marked "Dangerous" or for unknown loads if the manifest cannot be reached. **Call the VT HAZMAT Response Team at 1-800-641-5005 during emergencies.** It can also be very useful to write this number on the cover of your ERG so it can be located quickly.

You can download the 2016 Emergency Response Guidebook [here](#).

# 2009 Hazardous Materials Commodity Flow Study

## LEPC #5



HAZARDOUS MATERIAL EMERGENCY PREPAREDNESS  
LOCAL EMERGENCY PLANNING COMMITTEE  
(LEPC#5)

**Allan Ray Machell**  
Communications Specialist

# RAILROAD Commodities Flow Study - 2009

- 1: Index
- 2: Agency of Transportation
3. AMTRAK
- 4: HM & EHM CARRIED ON VT RAILROADS                   \*\*CONFIDENTIAL\*\*
- 5: New England Central Railroad HM SECURITY PLAN \*\*CONFIDENTIAL\*\*
- 6: Washington County Railroad
- 7: Federal Railroad Administration (FRA)
- 8: New England Central Railroad (NECR)  
    w/ New England Map  
    w/ VT map with all rail lines.  
    w/ LEPC#5 assorted maps.
- 9: Railroads that make up the VT RAIL SYSTEM (VRS)  
    w/maps of the nine RR within the VPS.  
    HM on the VRS during 2008  
    Rail Cars per Month / Year on VRS  
    Rail Car inventory records
- 10: Charts & Graph of total HM & EHM carried per line.  
    Total cars vs rail lines.  
    Pie chart, Shipments by Chemicals  
    Pie chart, Total Rail Cars on VT Rail Lines  
    Pie chart, Total Rail Cars of VT Rail Lines and their HM & EHM.
- 11: Sample Railcar inventory of Montpelier Junction
- 12: Descriptive material of typical HM railcar with photos
- 13: Photos of a 10 car shipment of PROPANE
- 14: Photos of a 10 car shipment within customer's facility.
- 15: FRA Hazardous Materials Guidance
- 16: Notes & Railroad Survey Results

**Note:** Items marked \*\*CONFIDENTIAL\*\* have been used for computation of final data in this section. In the final published report, verbatim data from the railroad will not be included.

## Railroad Commodity Flow Critique

Gathering Hazardous Materials (HM) or Extremely Hazardous Materials (EHM) flow within the boundaries of LEPC#5 via railroad posed completely different problems from the highway portion of this project:

There are no local railroad offices in the LEPC from which to obtain information. Thus the first person to contact was the "Rail Coordinator" at the Agency of Transportation. She was very helpful and provided several railroad contact persons both at the state and national level to contact. This information is included in the report to benefit other LEPCs within the state.

The first piece of vital information was that no Hazardous Materials (HM) or Extremely Hazardous Materials (EHM) is intermixed with passenger rail service. For this reason HM and EHM are transported when there are no passenger trains using the railroad. This time period proved to be mostly from 2am to 5am in the morning and on no set date. The usual message the customer received was "We have a delivery for you sometime next week." This made it practically impossible to know when to attempt to observe the train passing by. The second problem would be observing the passing train at 2am in the dark to gather some meaningful data as it went by at 30 to 50 miles per hour. For the above reasons I focused my attention on Montpelier Junction. This site normally has approximately one-half million gallons of Propane on their property. On several occasions I traveled to the junction and recorded the railcars with commodities and also the empty cars waiting to be returned. The data obtained is included as part of this report.

Talking to the personnel involved with HM on the railroads in Vermont and Region 1, most were willing to provide data on the HM and EHM they transported within the state. As these reports included customer names and products received the information was considered confidential and they asked that this information not be put out for public distribution..

None of the reports were broken down by county or LEPC's. As a result that data had to be extrapolated from the reports, the results, combined and averaged to obtain the figures of the materials used within LEPC#5 or traveling throughout LEPC#5.

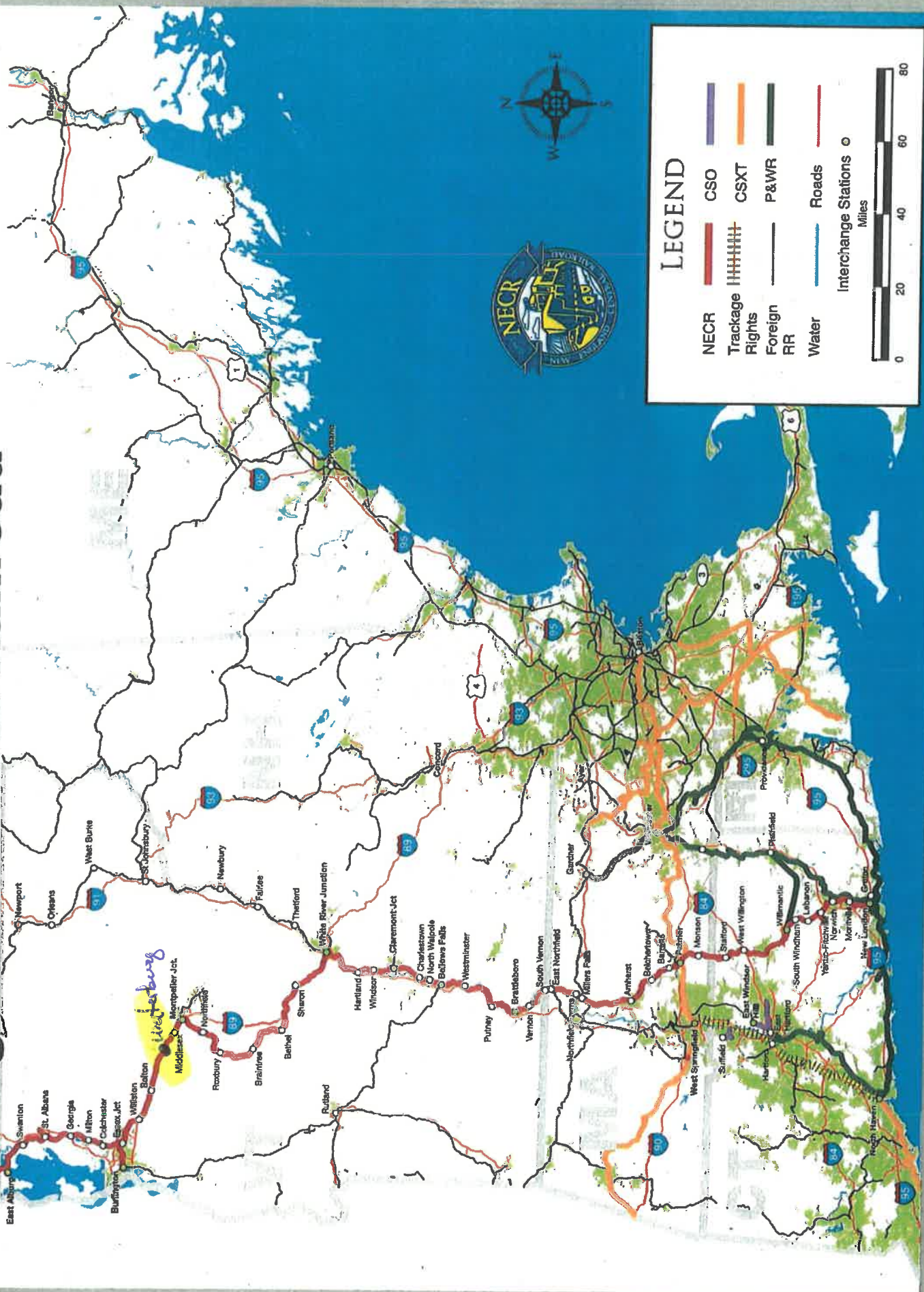
It appears from preliminary analysis the majority of HM and EHM traveling on the railroads of LEPC#5 by the two major railroads is:

Fuel Oil	58%
Gasoline	51%
Diesel Fuel	14%
Propane	13%

There are many other HM and EHM carried over the railroads, most average 2% or less of the total commodities carried, those are not listed here. A listing of these can be found in section five of this report.



# New England Central Railroad



### LEGEND

NECR	CSO	CSXT	Water
Trackage Rights	Foreign RR	P&WR	Roads
Interchange Stations			

Miles

0 20 40 60 80



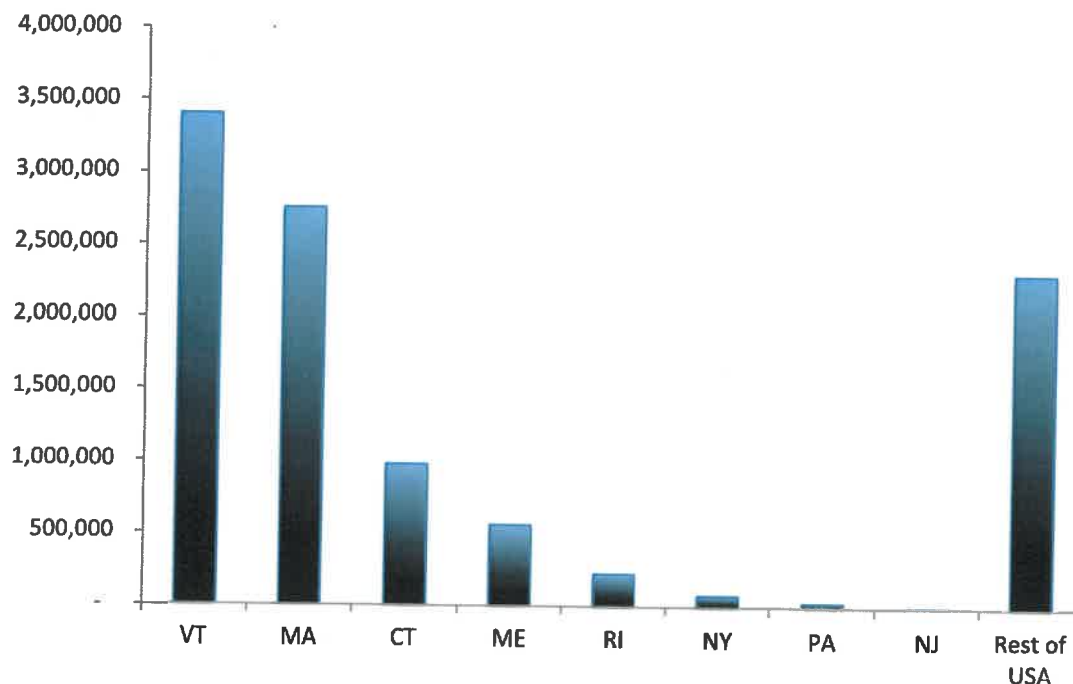
**Table 4.5 Cross-Border Flows by Direction of Travel**

Trade	Tons (Millions)	Dollars (Billions)
VT-Canada	1.28	\$ 1.77
US-Canada	2.13	\$ 1.17
<i>Northbound Sub-Total</i>	<u>3.41</u>	<u>\$ 2.94</u>
Canada-VT	-	\$ -
Canada-US	6.97	\$ 7.31
<i>Southbound Sub-Total</i>	<u>6.97</u>	<u>\$ 7.31</u>
<b>Total</b>	<b>10.38</b>	<b>\$ 10.25</b>

Source: TRANSEARCH, 2007.

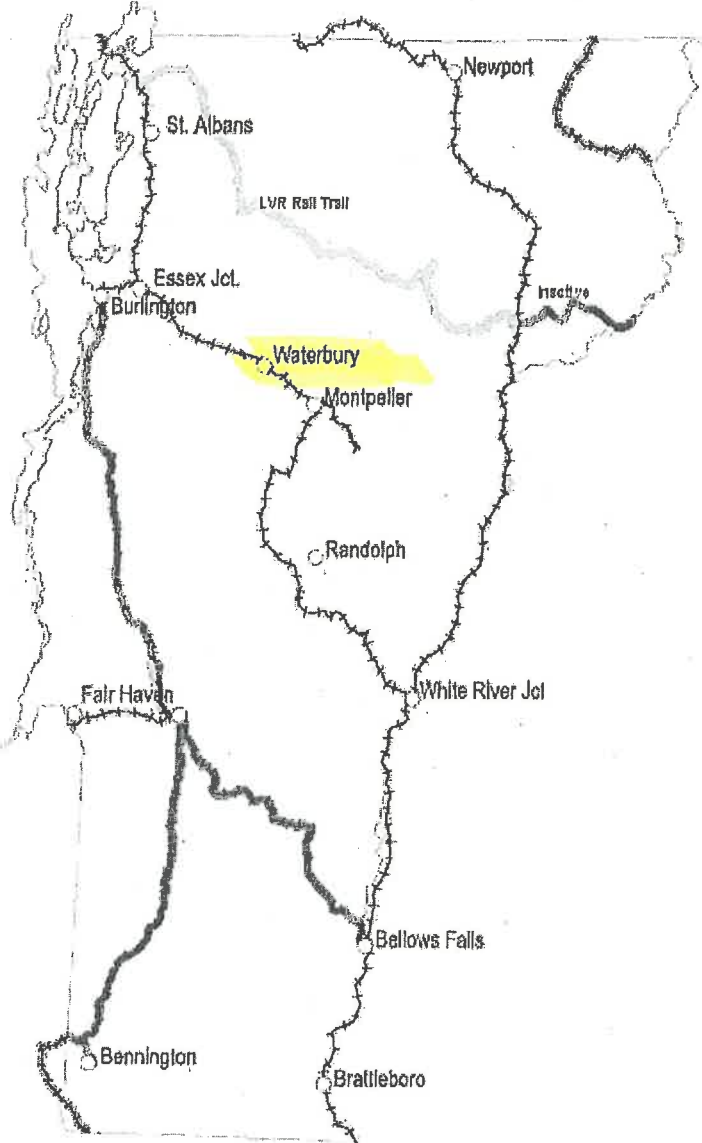
As with domestic trade, the majority of goods moving through Vermont's gateways to and from Canada originated or terminated in the Northeast region. Vermont, the rest of New England and New York account for over 77 percent of these shipments by weight, representing 8.0 million tons. The distributions are charted in Figure 4.11 and mapped in Figure 4.12.

**Figure 4.11 Top U.S. States Using Vermont's Border Crossings**  
*Annual Tons Shipped*



Source: TRANSEARCH, 2007.

Below is a map of Vermont's Rail network:



**HM MATERIALS MOVED ON THE NEW ENGLAND ENTRAL RAILROAD**

Hazardous Material	# of Cars	Percentage	Not Recorded
4912210 Fuel Oil	474	59%	
4905419 Liquefied Petroleum Gases	110	14%	
4905752 Petroleum Gases	77	10%	
4908175 Gasoline	62	8%	
4912299 Kerosene	20	2%	2% Or Less
4930228 Hydrochloric Acid	18	2%	2% Or Less
4918775 Hydrogen Peroxide	15	2%	2% Or Less
4914166 Diesel Fuel	12	1%	2% Or Less
4920523 Chlorine	10	1%	2% Or Less
4905704 Butadienes	9	1%	2% Or Less
4935240 Sodium Hydroxide	2	0%	2% Or Less
4905707 Petroleum Gases		0%	2% Or Less
4912082 Fuel Oil		0%	2% Or Less
4912271 Kerosene		0%	2% Or Less
	809	100%	

NECR HAZMAT SHIPMENTS\_Edited

HazMat on Vermont Rail System - Jan 1st to Dec 31, 2008

	Rutland to Bellows Falls	Rutland to Whitehall NY	Rutland to Burlington	Montpelier Jct to Barre	Total Carloads in LEPC#5	% of total used in LEPC#5
Ammonium Nitrate	4	4			0	0%
Fuel Oil	583	733	1628	58	1686	58%
Propane	5	25	44		44	2%
Styrene Nonomer	23	33			0	0%
Sulfuric Acid	20	21			0	0%
Diesel Fuel		517	517	3	520	18%
Gasoline		560	644		644	22%
Anhydrous Ammonia				5	5	0%
Sodiun Chlorate				33	33	1%
			1161	41	2932	100%

Carloads of HazMat moved in 2008	5460
Average Carloads per MONTH	455
Carloads of HazMat thru or in LEPC#5	2932



# AWR 147: Rail Car Incident Response

Berlin, VT / October 7, 2017

AWR 147: Rail Car Incident Response is an 8-hour, awareness level course developed to educate rural emergency responders on freight rail car incidents involving hazardous materials.

Because most freight rail traffic traverses rural areas, it is important that rural responders, especially those in resource-limited areas, understand the dangers and unique hazards these incidents present. Although safeguards are in place to prevent hazardous materials from causing harm under normal transportation, storage, handling and use, if any of these safeguards are circumvented, there is potential for great harm.

Upon completion of this DHS approved course, participants will be better prepared to respond to a freight rail car incident without endangering the health and safety of responders.

Key points covered in this course include:

- Identifying the design, construction, components and markings of rail tank cars;
- Recognizing the chemical being transported, and the manner in which the chemical must be considered in an emergency;
- Determining damage to the car and the potential hazard to people, property and the environment;
- Recognizing possible mitigation strategies for breached freight cars;
- Identifying characteristics and key resources in the rail/freight industry as well as federal, state, and private resources available to assist in a response effort

\*Please note all foreign nationals need to complete a DHS Foreign National Visitor Request Form by September 7, 2017 in order to attend this course. Contact John Kayser with any questions.



### Training sponsored by:

**Vermont Emergency Management**  
**Training site: Dill Building, Unit A**  
**2178 Airport Rd.**  
**Berlin, VT 05641**  
**Date: October 7, 2017**  
**Time: 8 a.m. to 5 p.m.**  
**Prerequisites: U.S. Citizenship.**

## Registration Deadline: September 23, 2017

Please complete the registration form fully and email it to:

**Brittany Marquette**

[brittany.marquette@vermont.gov](mailto:brittany.marquette@vermont.gov)

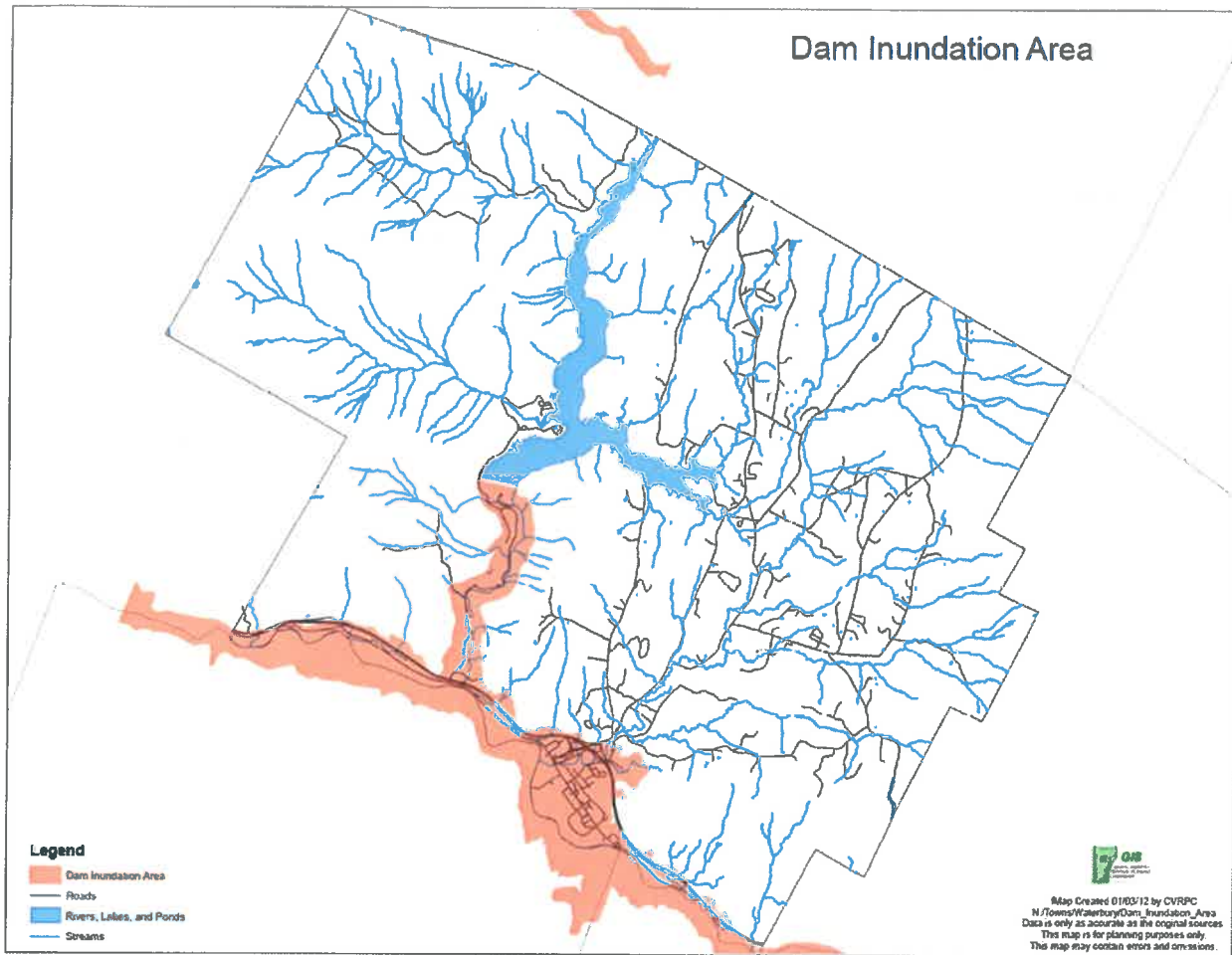
Office: 802-241-5414

<b>Name</b>			<b>FEMA SID #:</b>
			Register at: <a href="https://cdp.dhs.gov/femasid">https://cdp.dhs.gov/femasid</a>
<b>Course date &amp; location</b>	<b>October 7, 2017—Dill Building, Unit A</b>		
<b>Position</b>			
<b>Agency/ Company</b>			
<b>Address</b>			
<b>City/State</b>		<b>Zip</b>	
<b>Phone</b>		<b>Fax</b>	
<b>E-mail</b>			

For more information about this course please contact John Kayser at [Kayser@findlay.edu](mailto:Kayser@findlay.edu) or 419-434-5814.



2. Waterbury Dam Inundation Area





<http://dec.vermont.gov/facilities-engineering/dam-safety>

# SEPTEMBER 28 DAM SAFETY SEMINAR

## What you should know to protect your community.

Is dam safety a concern in your community? If so, this seminar is for you. Learn about dam safety, regulations, and emergency preparedness measures from experts in the field. Learn effective ways to communicate and collaborate with dam owners. Understand what an Emergency Action Plan (EAP) is and how you can get involved in its development. Understand what questions to ask of dam owners related to their evacuation and notification procedures in the event of a dam failure affecting your community.

“Dam safety is a shared responsibility.” (FEMA 12/2015)

We hope you will join us for this informative seminar.



Central Vermont Regional Planning Commission

### PRESENTERS:

Ben Green, PE  
ANR  
Dam Safety  
Program

and

John Greenan, PE  
Green Mountain  
Power

### Location:

Waterbury Municipal  
Office - Steele  
Community Room

28 North Main Street,  
Waterbury, VT

5:30 p.m. - 7:30 p.m.

Refreshments  
provided

Question and  
Answer period

### FOR MORE INFORMATION

#### CONTACT:

**LAURA RANKER**

[ranker@cvregion.com](mailto:ranker@cvregion.com)

802-229-0389

29 MAIN ST., SUITE 4

MONTPELIER, VT 05602



## Big dam will need a big fix

### Next up: \$45 million for spillway, gates

BY MADELINE HUGHES WATERBURY RECORD

Depending on the weather, you might have walked across the Waterbury Dam, swam near it, or even skied down it.

Towering over the 850-acre reservoir is the dam that holds back the water waiting to get to the Winooski River.

Metal railings and wide paths keep onlookers above the water. Chain-link fences keep trespassers away from the mechanics of the dam.

The dam was built in the 1930s by the Civilian Conservation Corps. It provides flood control; the reservoir has become a hugely popular recreation spot in central Vermont; and hydropower turbines in the dam produce electricity.

The dam, one of the five largest in Vermont, is classified as a high hazard dam — if it were to fail, people would die.

The dam has been through three major rehabilitation projects: in the 1950s, the 1980s and the early 2000s. Local people have still-fresh memories of the years that the reservoir was drained for work on the dam: without swimming and boating and beach-lounging, those summers seemed a lot longer than normal.

Each set of improvements was designed to make sure the dam holds up.

Next up, within the next decade, is a \$45 million project to replace the main spillway and dam gates. That project is still in the preliminary planning stages.

See 'Dam' on Page 19



PHOTOS BY MADELINE HUGHES  
Above, during the Friends of the Waterbury Reservoir dam tour, visitors were allowed onto the spillway bridge. They could peer down to the water on the left and the rocky spillway to the right.  
It right, Ben Green, an engineer with the Vermont Department of Environmental Conservation, explains to visitors that the principal spillway tainter gates remain open, except when the water in the Winooski River becomes too high and the gates must be closed.

## DAM

continued from Page 1

This winter, however, Green Mountain Power plans major repairs to the dam's powerhouse. To get new permits for its hydropower operation, it needs to exert better control over the river flow downstream from the dam. Now, the flow can vary from very low to very high, tougher rules under the federal Clean Water Act require that the river flow be far more consistent to protect aquatic life.

### What's in the dam?

Last week, the Friends of the Waterbury Reservoir partnered with the state Department of Environmental Conservation to usher people past the "Do Not Enter" signs outside the powerhouse and out onto the spillway bridge to celebrate Vermont's Clean Water Week.

"We decided to do a tour because lots of people had never been to the dam," said Laurie Smith, president emeritus and board member for Friends of the Waterbury Reservoir.

"They didn't know how it worked, or how the water worked."

"We have lived here a long time and are interested in what happens with the reservoir. We use it for recreation all the time," said Bob Kirch, a Stowe resident. The tour gave him and other residents look at the technical side of the dam.

First they went inside the gatehouse, down steep stairs. Ben Green, facilities engineering division dam safety engineer section chief, explained how the gates and pulleys all worked.

Then, outside, Green took visitors onto the spillway bridge, explaining that the principal spillway gates remain open unless the downstream water levels in the Winooski get too high, and water has to be held back for flood control.

Green and his small department monitor the river's water levels and can usually tell a few days in advance if they will have to close the floodgates. For the Waterbury Dam, the action level — where if the water in the Winooski hits the floodgates must be closed — is 417

feet above sea level and the flood level is 419 feet.

Things have become increasingly automated since the dam was built in the 1930s. Green and his department can track water levels from their computers and phones.

However, if things take a serious turn, Green and his crew will wind up out on the spillway bridge, turning knobs and pushing buttons to manually close the spillway gates.

More information: friends of waterburyres.org

5.c

**March 2017 - Public Opinion Survey for the  
Waterbury Town and Village Hazard Mitigation Plan  
Update 2017**

The results of this survey will help guide the planning process for the required 5-year update of the Waterbury Town and Village Hazard Mitigation Plan. This plan is important for the community as it helps identify potential hazards and provides guidance for mitigating against the hazards that are most likely to impact the residents, businesses and public infrastructure. It is also used as the basis to determine eligibility levels for several state and federal programs for funding pre- and post-disasters. Please take a few minutes to complete the survey to help provide input for the updated Hazard Mitigation Plan.

1. Had your home or business been impacted by Tropical Storm Irene in 2011?  
 Yes  No
  
2. Do you own property in a floodplain or flood hazard area?  Yes  No  Don't know
  
3. If yes, do you have insurance through the National Flood Insurance Program?  Yes  No  
 Don't know
  
4. What is the most effective way for you to receive information about how to make your household or business safer from disasters? (Check all that apply)  
 Newspapers  
 Television  
 Radio  
 Internet/Social media  
 Public meeting  
 Schools  
 Fact Sheet/Brochure  
 Insurance agent  
 Direct mailing
  
5. In your opinion, which of the following are most important to protect against potential hazards in Waterbury? Please rank with 1 being the most important and 10 being the least important.  
 Loss of life or injuries  
 Business closures or loss  
 Damage or loss of roads, railroad, bridges, utilities  
 Protection against dam breaches, hazardous material spills  
 Damage to schools, and other public properties  
 Damage or loss of cultural/historic properties  
 Loss or damage to farmlands, wetlands, waterways  
 Damage to public properties and services (parks, water, sewer, buildings, etc.)  
 Protection of vulnerable populations  
 Protection of wildlife

6. A number of activities can reduce impacts from disasters. I have made my family and property more disaster resilient by: (Check all that apply)
- Developing a Household Emergency Plan
  - Preparing a Disaster Supply Kit with food, water and emergency supplies
  - Creating a procedure for utility shutoffs in an emergency
  - Making sure my insurance is up-to-date and adequate for loss
  - Tying down my fuel tank(s) to prevent spills and contamination (interior and exterior)
  - Flood proofing my home/business, including basement
  - Installing underground utilities
  - Developing an evacuation plan and meeting place if separated
  - Installing working smoke alarms and CO2 detectors
  - Sharing emergency contact information
  - Being aware of hazards and risks
  - Installing a back-up generator
  - Constructing above the 100-year base flood elevation
  - Being certified in CPR and First Aid training
  - Becoming energy independent

7. The Town and Village of Waterbury are in the process of updating the Waterbury Hazard Mitigation Plan for FEMA during 2017. Can you please prioritize the items below with #1 being the highest importance and #9 being the lowest?

Priority	Hazard Mitigation Projects
	Improve infrastructure for Main Street Reconstruction, Stowe St. bridge, culverts, stormwater drainage, bike and pedestrian access/safety
	Implement floodplain reconnection strategies to increase low-lying areas that can accommodate floodwaters and reduce flooding in developed areas
	51 S. Main St. property (former municipal office offices) when redeveloped has adequate floodproofing measures
	Plan for long-term growth outside of the floodplain. Consider areas for future village development
	Participate and provide ongoing maintenance in FEMA's Community Rating System (CRS) effective October 2016 that reduces flood insurance premiums for properties in floodplains
	Support structural elevation of several pilot homes in the village area
	Adoption of the VTAlert notification system by municipal officials for instant emergency notifications of residents and businesses.
	Update Local Emergency Operations Plan annually to be eligible for FEMA Public and Individual Assistance in a declared disaster

8. A number of activities can reduce your community’s risk from natural and man-made disasters. Some are regulatory and others are non-regulatory. Please check the box that best represents your opinion about the following strategies to reduce the risk associated with disasters.

Action	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree
I support local and state permitting to reducing risk					
I support a mix of permitting and non-permitting approaches to reducing risk					
I support policies to prohibit development in areas that are considered high risk					
I support protecting critical infrastructure in high risk areas					
I support the use of tax dollars to compensate landowners for not developing in high risk areas					
I support protecting natural and cultural resources					
I am willing to make my home more disaster resilient					
I support the local economy following a disaster					
I support improving disaster preparedness in schools					
I support disclosure of hazardous risks during real estate transactions					

9. We would appreciate any information you are willing to share about you and your household. This information will remain confidential and is used for survey comparison only.

a) Age: \_\_\_ 18-30 \_\_\_ 31-50 \_\_\_ 51-65 \_\_\_ 65+

b) Gender: \_\_\_ M \_\_\_ F

c) Level of education:

\_\_\_ High School

\_\_\_ Some College

\_\_\_ College Degree

\_\_\_ Post Graduate degree

d) Household income:

\_\_\_ Less than \$25,000

\_\_\_ \$25,000-\$50,000

\_\_\_ \$50,000-\$75,000

\_\_\_ \$75,000-\$100,000

\_\_\_ \$100,000-\$150,000

\_\_\_ \$150,000+

e) How long have you lived in Waterbury? \_\_\_ Years

f) Do you rent or own your home? \_\_\_ Rent \_\_\_ Own

10. Please provide any additional comments or suggestions to help foster a more prepared and resilient community.

Comments:
-----------

Thank you for your time and effort in filling out this survey.

If you are interested in participating in a focus group or would like to be involved with the updating of the Waterbury Hazard Mitigation Plan or other hazard mitigation activities, please let us know your contact information.

Name:

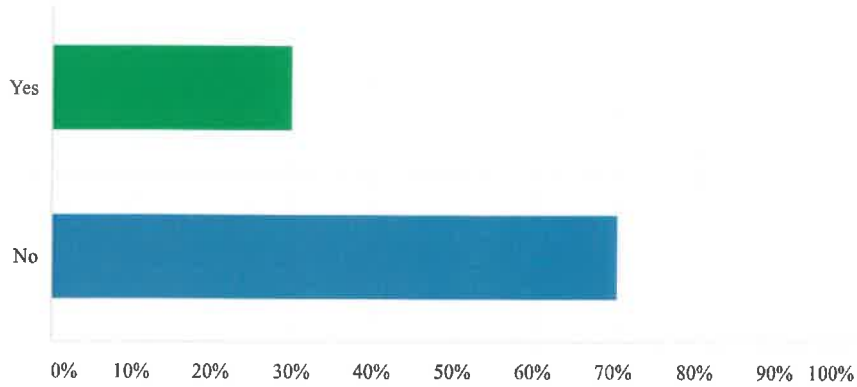
Email address:

Sincerely, Waterbury's Floodplain Management Working Group

Q1

# Had your home or business been impacted by Tropical Storm Irene in 2011?

Answered: 64 Skipped: 1



**ANSWER CHOICES**

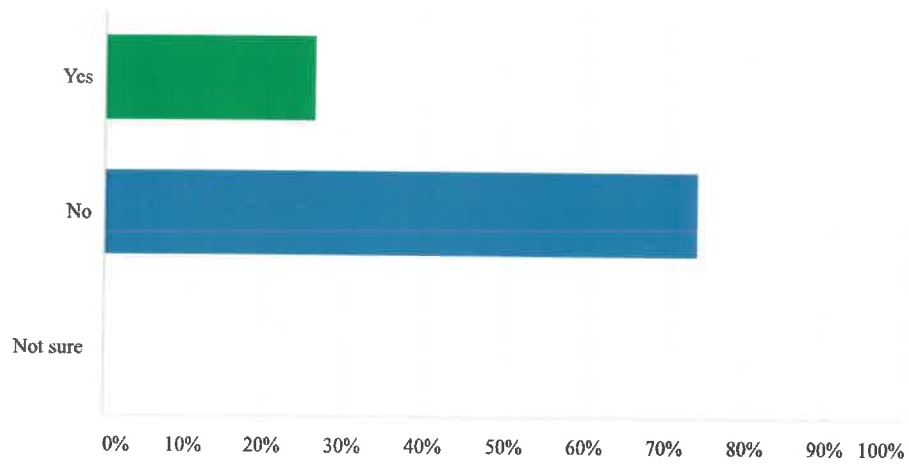
**RESPONSES**

- Yes	29.69%	19
- No	70.31%	45
TOTAL		64

Q2

# Do you own property in a floodplain of flood hazard area?

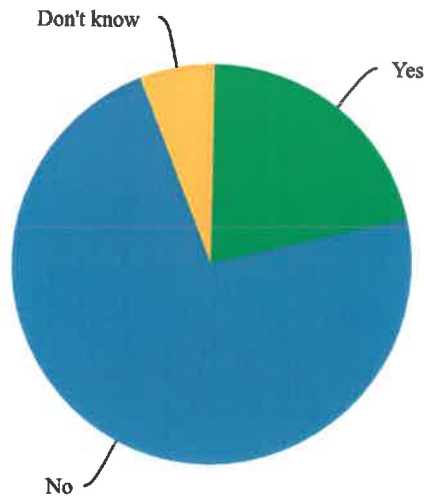
Answered: 65 Skipped: 0



ANSWER CHOICES	RESPONSES	
- Yes	26.15%	17
- No	73.85%	48
- Not sure	0.00%	0
TOTAL		65

# If yes, do you have insurance through the National Flood Insurance Program? Q3

Answered: 33 Skipped: 32



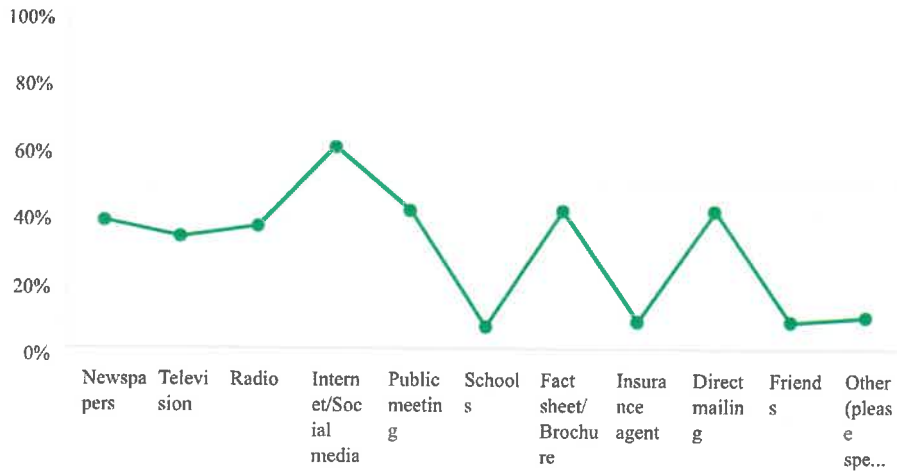
ANSWER CHOICES	RESPONSES	
- Yes	21.21%	7
- No	72.73%	24
- Don't know	6.06%	2
TOTAL		33



Q4

# What is the most effective way for you to receive information about how to make your household or business safer from disaster? (check all that apply)

Answered: 64 Skipped: 1



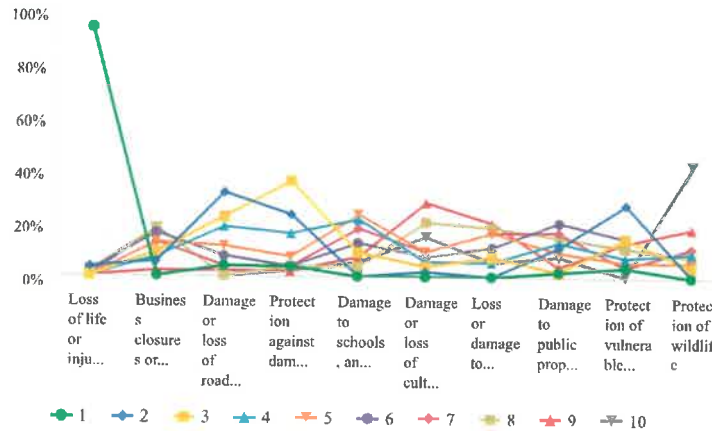
ANSWER CHOICES	RESPONSES	
- Newspapers	37.50%	24
- Television	32.81%	21
- Radio	35.94%	23
- Internet/Social media	59.38%	38
- Public meeting	40.63%	26
- Schools	6.25%	4
- Fact sheet/Brochure	40.63%	26
- Insurance agent	7.81%	5
- Direct mailing	40.63%	26
- Friends	7.81%	5
- Other (please specify)	9.38%	6

Total Respondents: 64



In your opinion, which of the following are most important to protect against potential hazards in Waterbury? Please rank with 1 being the most important and 10 being the least important.

Answered: 63 Skipped: 2



	1	2	3	4	5	6	7	8	9	10	TOTAL
Loss of life or injuries	93.33% 56	3.33% 2	0.00% 0	0.00% 0	0.00% 0	1.67% 1	0.00% 0	1.67% 1	0.00% 0	0.00% 0	€
Business closures or loss	0.00% 0	5.36% 3	8.93% 5	7.14% 4	12.50% 7	16.07% 9	12.50% 7	17.86% 10	1.79% 1	17.86% 10	€
Damage or loss of roads, railroad, bridges, utilities	3.70% 2	31.48% 17	22.22% 12	18.52% 10	11.11% 6	7.41% 4	3.70% 2	0.00% 0	1.85% 1	0.00% 0	€
Protection against dam breaches, hazardous material spills	3.57% 2	23.21% 13	35.71% 20	16.07% 9	7.14% 4	3.57% 2	3.57% 2	3.57% 2	1.79% 1	1.79% 1	€
Damage to schools, and other public properties	0.00% 0	0.00% 0	8.93% 5	21.43% 12	23.21% 13	12.50% 7	17.86% 10	3.57% 2	7.14% 4	5.36% 3	€
Damage or loss of cultural/historic properties	0.00% 0	1.85% 1	3.70% 2	5.56% 3	9.26% 5	7.41% 4	9.26% 5	20.37% 11	27.78% 15	14.81% 8	€
Loss or damage to farmlands, wetlands, waterways	0.00% 0	0.00% 0	7.27% 4	5.45% 3	16.36% 9	10.91% 6	16.36% 9	18.18% 10	20.00% 11	5.45% 3	€
Damage to public properties and services (parks, water, sewer, buildings, etc.)	1.85% 1	11.11% 6	1.85% 1	12.96% 7	9.26% 5	20.37% 11	16.67% 9	14.81% 8	3.70% 2	7.41% 4	€
Protection of vulnerable populations	3.64% 2	27.27% 15	14.55% 8	7.27% 4	5.45% 3	14.55% 8	3.64% 2	10.91% 6	12.73% 7	0.00% 0	€
Protection of wildlife	0.00% 0	0.00% 0	3.64% 2	9.09% 5	5.45% 3	3.64% 2	10.91% 6	7.27% 4	18.18% 10	41.82% 23	€

**Q5. In your opinion, what is most important to protect against potential hazards?**

By far, most important is Life. Least important Wildlife.

2nd most important is Loss of Infrastructure.

Business closures pretty evenly dispersed, middle of the road of importance, with slight trend toward less important.

**Rank**

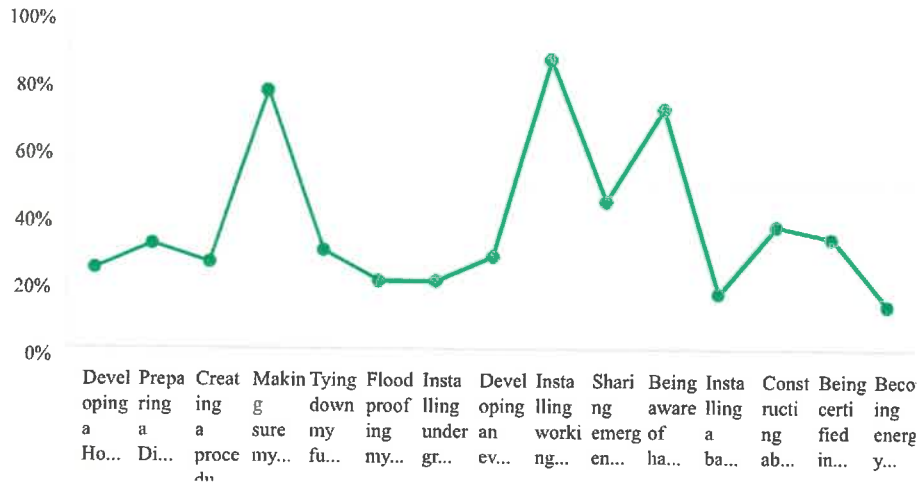
- 1** Loss of life / injury) (93% ranked top priority, 56 of 63 answered)
- 2\*** Damage to or loss of **Infrastructure**
- 3\*** **Dam** breaches or hazardous materials spill
- 4** Protection of vulnerable populations
- 5\*** Damage to schools / other **Public** properties
- 6\*** Damage to **Public** Properties & services (parks, water, sewer)
- 7** Business closures or loss
- 8** Loss or damage to farmlands/wetlands
- 9** Damage or loss fo cultural/historic properties
- 10** Protection of wildlife (42% ranked lowest priority, 22 of 62 answered)

**\* Infrastructure / Public properties score High**

Q6

# A number of activities can reduce impacts from disasters. I have made my family and property more disaster resilient by: (Check all that apply)

Answered: 55 Skipped: 10



## ANSWER CHOICES

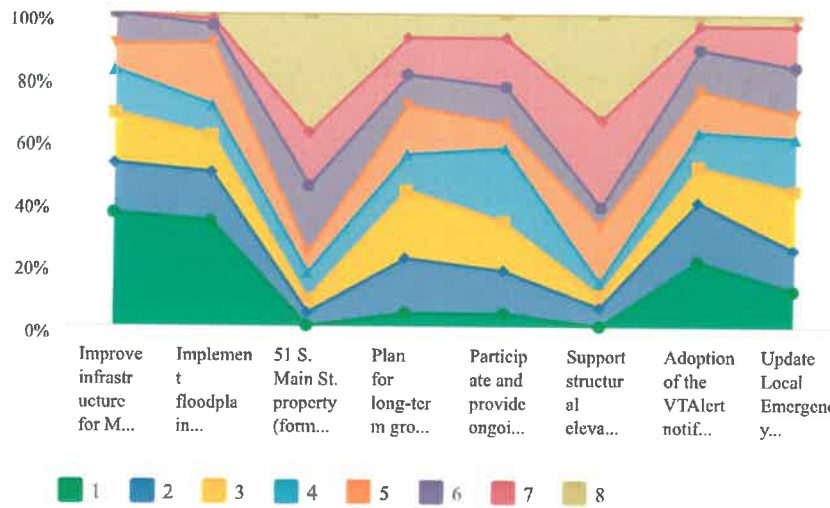
## RESPONSES

ANSWER CHOICES	PERCENTAGE	RESPONSES
- Developing a Household Emergency Plan	23.64%	13
- Preparing a Disaster Supply Kit with food, water and emergency supplies	30.91%	17
- Creating a procedure for utility shutoffs in an emergency	25.45%	14
- Making sure my insurance is up-to-date and adequate for loss	76.36%	42
- Tying down my fuel tank(s) to prevent spills and contamination (interior and exterior)	29.09%	16
- Flood proofing my home/business, including basement	20.00%	11
- Installing underground utilities	20.00%	11
- Developing an evacuation plan and meeting place if separated	27.27%	15
- Installing working smoke alarms and CO2 detectors	85.45%	47
- Sharing emergency contact information	43.64%	24
- Being aware of hazards and risks	70.91%	39
- Installing a back-up generator	16.36%	9
- Constructing above the 100-year base flood elevation	36.36%	20
- Being certified in CPR and First Aid training	32.73%	18
- Becoming energy independent	12.73%	7

Total Respondents: 55

The Town and Village of Waterbury are in the process of updating the Waterbury Hazard Mitigation Plan for FEMA during 2017. Can you please prioritize the items below with #1 being the highest importance and #8 being the lowest? Q7

Answered: 57 Skipped: 8

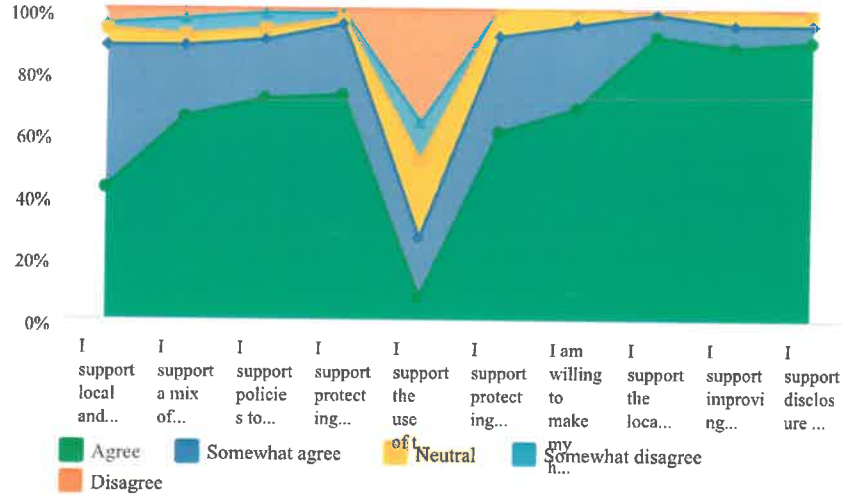


	1	2	3	4	5	6	7	8	TOTAL	SCORE
Improve infrastructure for Main Street Reconstruction, Stowe St. bridge, culverts, stormwater drainage, bike and pedestrian access/safety	36.00% 18	16.00% 8	16.00% 8	14.00% 7	8.00% 4	10.00% 5	0.00% 0	0.00% 0	50	6.28
Implement floodplain reconnection strategies to increase low-lying areas that can accommodate floodwaters and reduce flooding in developed areas	33.33% 17	15.69% 8	11.76% 6	9.80% 5	19.61% 10	5.88% 3	1.96% 1	1.96% 1	51	5.98
51 S. Main St. property (former municipal office offices) when redeveloped has adequate floodproofing measures	0.00% 0	4.26% 2	4.26% 2	8.51% 4	6.38% 3	21.28% 10	17.02% 8	38.30% 18	47	2.60
Plan for long-term growth outside of the floodplain. Consider areas for future village development	3.92% 2	17.65% 9	21.57% 11	11.76% 6	15.69% 8	9.80% 5	11.76% 6	7.84% 4	51	4.67

- Participate and provide ongoing maintenance in FEMA's Community Rating System (CRS) effective October 2016 that reduces flood insurance premiums for properties in floodplains	3.92% 2	13.73% 7	15.69% 8	23.53% 12	7.84% 4	11.76% 6	15.69% 8	7.84% 4	51	4.45
- Support structural elevation of several pilot homes in the village area	0.00% 0	6.00% 3	4.00% 2	4.00% 2	18.00% 9	6.00% 3	28.00% 14	34.00% 17	50	2.66
- Adoption of the VTAlert notification system by municipal officials for instant emergency notifications of residents and businesses.	20.75% 11	18.87% 10	11.32% 6	11.32% 6	13.21% 7	13.21% 7	7.55% 4	3.77% 2	53	5.34
- Update Local Emergency Operations Plan annually to be eligible for FEMA Public and Individual Assistance in a declared disaster	11.32% 6	13.21% 7	18.87% 10	16.98% 9	7.55% 4	15.09% 8	13.21% 7	3.77% 2	53	4.87

A number of activities can reduce your community's risk from natural and man-made disasters. Some are regulatory and others are non-regulatory. Please check the box that best represents your opinion about the following strategies to reduce the risk associated with disasters.

Answered: 58 Skipped: 7



	AGREE	SOMEWHAT AGREE	NEUTRAL	SOMEWHAT DISAGREE	DISAGREE	TOTAL	WEIGHTED AVERAGE
- I support local and state permitting to reducing risk	42.11% 24	45.61% 26	5.26% 3	1.75% 1	5.26% 3	57	1.82
- I support a mix of permitting and non-permitting approaches to reducing risk	64.91% 37	22.81% 13	3.51% 2	5.26% 3	3.51% 2	57	1.60
- I support policies to prohibit development in areas that are considered high risk	70.69% 41	18.97% 11	3.45% 2	5.17% 3	1.72% 1	58	1.48
- I support protecting critical infrastructure in high risk areas	71.93% 41	22.81% 13	1.75% 1	1.75% 1	1.75% 1	57	1.39

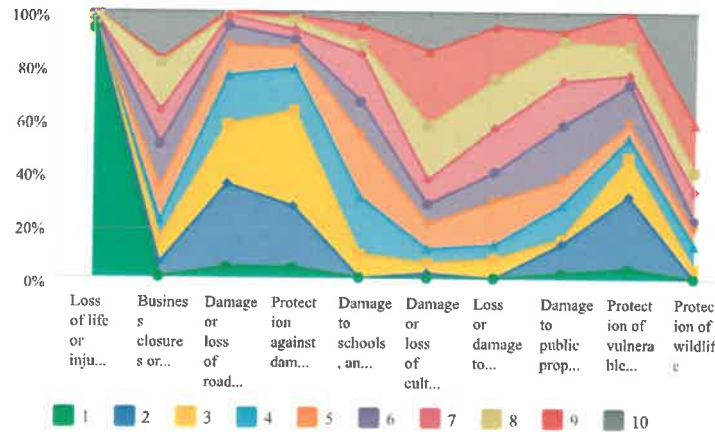
- I support the use of tax dollars to compensate landowners for not developing in high risk areas	7.02% 4	19.30% 11	24.56% 14	12.28% 7	36.84% 21	57	3.53
- I support protecting natural and cultural resources	60.00% 33	30.91% 17	9.09% 5	0.00% 0	0.00% 0	55	1.49
- I am willing to make my home more disaster resilient	67.86% 38	26.79% 15	5.36% 3	0.00% 0	0.00% 0	56	1.38
- I support the local economy following a disaster	91.07% 51	7.14% 4	0.00% 0	0.00% 0	1.79% 1	56	1.14
- I support improving disaster preparedness in schools	87.50% 49	7.14% 4	5.36% 3	0.00% 0	0.00% 0	56	1.18
- I support disclosure of hazardous risks during real estate transactions	89.29% 50	5.36% 3	3.57% 2	0.00% 0	1.79% 1	56	1.20



Q8

In your opinion, which of the following are most important to protect against potential hazards in Waterbury? Please rank with 1 being the most important and 10 being the least important.

Answered: 63 Skipped: 2



	1	2	3	4	5	6	7	8	9	10	TOTAL
Loss of life or injuries	93.33% 56	3.33% 2	0.00% 0	0.00% 0	0.00% 0	1.67% 1	0.00% 0	1.67% 1	0.00% 0	0.00% 0	6
Business closures or loss	0.00% 0	5.36% 3	8.93% 5	7.14% 4	12.50% 7	16.07% 9	12.50% 7	17.86% 10	1.79% 1	17.86% 10	5
Damage or loss of roads, railroad, bridges, utilities	3.70% 2	31.48% 17	22.22% 12	18.52% 10	11.11% 6	7.41% 4	3.70% 2	0.00% 0	1.85% 1	0.00% 0	5
Protection against dam breaches, hazardous material spills	3.57% 2	23.21% 13	35.71% 20	16.07% 9	7.14% 4	3.57% 2	3.57% 2	3.57% 2	1.79% 1	1.79% 1	5
Damage to schools, and other public properties	0.00% 0	0.00% 0	8.93% 5	21.43% 12	23.21% 13	12.50% 7	17.86% 10	3.57% 2	7.14% 4	5.36% 3	5
Damage or loss of cultural/historic properties	0.00% 0	1.85% 1	3.70% 2	5.56% 3	9.26% 5	7.41% 4	9.26% 5	20.37% 11	27.78% 15	14.81% 8	5
Loss or damage to farmlands, wetlands, waterways	0.00% 0	0.00% 0	7.27% 4	5.45% 3	16.36% 9	10.91% 6	16.36% 9	18.18% 10	20.00% 11	5.45% 3	5
Damage to public properties and services (parks, water, sewer, buildings, etc.)	1.85% 1	11.11% 6	1.85% 1	12.96% 7	9.26% 5	20.37% 11	16.67% 9	14.81% 8	3.70% 2	7.41% 4	5
Protection of vulnerable populations	3.64% 2	27.27% 15	14.55% 8	7.27% 4	5.45% 3	14.55% 8	3.64% 2	10.91% 6	12.73% 7	0.00% 0	5
Protection of wildlife	0.00% 0	0.00% 0	3.64% 2	9.09% 5	5.45% 3	3.64% 2	10.91% 6	7.27% 4	18.18% 10	41.82% 23	5

Thank you for your time and effort filling out this survey. If you are interested in participating in a focus group of would like to be involved with the updating of the Waterbury Hazard Mitigation Plan or other hazard mitigation activities, please let us know your contact information. Sincerely, Waterbury's Floodplain Management Working Group.

Answered: 13 Skipped: 52

ANSWER CHOICES	RESPONSES
Email address:	Responses 84.62% 11
Name:	Responses 100.00% 13

RESPONSES (13)

TEXT ANALYSIS

MY CATEGORIES

*See next page*

PAID FEATURE

Use text analysis to search and categorize responses; see frequently-used words and phrases. To use Text Analysis, upgrade to a paid plan .

UPGRADE

Learn more »

Categorize as...

Filter by Category

Search responses

s ?

Showing 13 responses

Tom Burrows

3/25/2017 8:38 AM

View respondent's answers

Anne M. Imhoff

3/24/2017 11:35 AM

View respondent's answers

Kathleen Daye

3/23/2017 12:35 PM

View respondent's answers

Hans von Briesen

3/23/2017 12:23 PM

View respondent's answers

Alix Klein

3/23/2017 12:19 PM

View respondent's answers

Designated meeting/shelter places throughout the town. Designated drop off and storage facilities throughout the town. Designated communication mechanisms by the town. All pre-designated and pre-communicated of any disaster event.

3/25/2017 8:38 AM

Our community needs a real-time source of emergency information besides WDEV. Recent heavy rains made me find rain gauge info on the NOAA site to monitor the river level. The town should have a Twitter account or some such internet based means to communicate to many people quickly.

3/23/2017 6:55 PM

Do not allow any future development in the flood zone. Consider rezoning current village property in the floodplain so it disallows development.

3/23/2017 12:33 PM

I don't support tax benefits to floodplain building. Also support regulation of floodplain building in high risk areas.

3/23/2017 12:23 PM

Who is our town emergency planner/responder?

3/23/2017 12:17 PM

people should be penalized for building in high risk areas.

3/19/2017 6:41 PM

As time passes since Tropical Storm Irene, we need to make sure our community does not become complacent regarding disaster preparedness. We need to keep addressing our vulnerabilities and vulnerable populations and stay prepared.

3/17/2017 11:47 AM

During a drought, forest fire is a major threat outside the village as more and more homes are built in forest areas. Outside burning must be strictly controlled during these periods.

3/15/2017 9:42 AM

Efforts must be town and region-wide and not only focus on Main Street/ Village area.

3/15/2017 9:32 AM

Questions #5 & #8 only permit ONE response, which is not clear from the instructions. Also, pale blue type and very small black type both very difficult to read on line.

3/14/2017 7:34 PM

Landowners who want to develop in high-risk areas are fools. We shouldn't have to bribe them; neither should they be rewarded when their buildings fail.



## Central Vermont Regional Planning Commission

November 22, 2016

Dear Landowner:

The Central Vermont Regional Planning Commission has received funding from the Vermont Community Development Program to conduct a flood study of the Mad River and Thatcher Brook. The study builds on the work of previous studies. Results from the study will help guide redevelopment and lead to mitigation actions to reduce risks to public safety and infrastructure in the future. CVRPC has contracted with DuBois and King, Inc. of Randolph, Vermont to perform work under this project.

The inundation data that is being gathered will help the communities in a variety of ways:

- Understand the extent of flood inundation from various storm events;
- Support flood risk analysis related to mitigation and planning;
- Explore “What if” scenarios in support of preparedness;
- Provide timely response based on real time gauge and forecast information;
- Support damage assessment related to recovery efforts; and
- Support Environmental and Ecological Assessments – wetlands identification and hazardous spill cleanup.

The study requires gathering field data at various locations along the main stem of the Mad River and Thatcher Brook as well as along the tributaries of Shepard Brook, Mill Brook, Freeman Brook, Folsom Brook, and Graves Brook in the towns Fayston, Moretown, Waitsfield, Warren, and Waterbury. Most of the assessment work is conducted in the stream channel. However, it may be necessary for their survey crew and river scientists to take measurements directly along the stream bank and this would require that they cross your property.

We ask that you please assist the survey crews and river scientists from DuBois and King, Inc. by allowing them access to the stream sections in the project study area that run through your property. The field survey is taking place now and will continue, weather permitting, through December. Unfinished field work will resume and be completed in the spring of 2017. The results of the survey will be available in the summer of 2017 with the issuance of a final report and maps.

Please return the enclosed post card to CVRPC or e-mail Laura Ranker at Ranker@cvregion.com if you do NOT wish to have our contractor access your property as part of this flood study project. A prompt response will help ensure your wishes are met. If you have questions, please feel free to contact me, Laura Ranker at [Ranker@cvregion.com](mailto:Ranker@cvregion.com) or (802) 229-0389. Thank you for your help.

Sincerely,

Laura Ranker, Planner

[www.centralvtplanning.com](http://www.centralvtplanning.com)

29 Main Street Suite 4 Montpelier Vermont 05602  
802-229-0389 E Mail: CVRPC@CVRegion.com

## 2016 Floodplain Management Working Group Annual Report

The former Long-Term Recovery Committee transitioned into the Floodplain Management Working Group (FMWG) two years ago to incorporate remaining recovery projects into longer term flood and river related planning and mitigation activities. Waterbury has successfully completed most of the 22 project goals identified in the Waterbury Long Term Recovery Plan in the 5 years following Tropical Storm Irene. This will be the final recovery report for Tropical Storm Irene projects although planning and mitigation efforts will continue to help protect Waterbury residents and properties from all future hazardous events.

Here is a list of the **visible** improvement projects that were completed through a variety of funding sources, both public and private.

- Neighborhood recovery including Main, Randall and Elm Streets and other streets
- The former mobile home park, now the Main Street Cottages by the roundabout with 11 houses elevated above the flood plain
- At least 3 private property elevations above the 100-year floodplain
- The State Office Complex – A restored and flood-proofed complex that was re-occupied by approximately 1,300 workers in 2016
- The new energy efficient Waterbury Municipal offices, Library and History Center next to municipal ballfields
- Ladd Hall on South Main Street – 27 units of affordable housing
- The new Hunger Mountain Children’s Center on South Main Street due to open shortly
- An Economic Development Director that works specifically to retain, recruit and expand local business opportunities.
- Public outreach and education on floodproofing, construction, zoning and planning in and around the floodplain have taken place. A flume/stream table has been utilized at public events to demonstrate variables that can change river dynamics

There are also many **invisible** projects that have been undertaken that are also critical to Waterbury’s recovery. They include:

- Countless hours of meetings with local officials, community members, state and federal governments to forge a recovery plan with 22 priority projects
- Grant writing and project management to secure funds for many of the recovery projects
- Approved Community Rating System – A program of the National Flood Insurance Program that helps reduce insurance premiums due to the rigorous community preparedness levels. This became effective in October 2016. Public outreach efforts will continue to educate the community through meetings, social media, newspaper articles, and local involvement on ways to mitigate and protect itself from future events
- New approved Flood Hazard Zoning Bylaws designed to protect public and private investments
- Several flood studies including river corridor planning to fully understand the dynamics of the Winooski River and its impact on the core of the village properties

- The Long-Term Community Recovery Committee met for two years following Irene to coordinate the flood recovery effort. A subset of that group, now the Floodplain Management Working Group, continues to meet monthly to oversee several flood related projects in an advisory role to the Planning Commission and Select Board. The Floodplain Management Working Group (FMWG) coordinates and makes recommendations for grant opportunities and is in the process of updating the Waterbury Hazard Mitigation Plan due to be completed in 2017
- Three years of AmeriCorps VISTA members to help plan, write grants and organize the projects listed above
- Emergency generators for the municipal water and sewer services and the Thatcher Brook Elementary School
- A new flood-proofed sewer pump station
- A full-time Recreation Director to maintain and enhance recreation facilities and opportunities for children and families
- A Downtown Master Plan and Branding Plan was completed thanks to recovery funding through the Vermont Downtown Program that Revitalizing Waterbury is carrying out. This plan will result in continued improvements and enhancements for the downtown businesses, especially when Main Street is reconstructed starting in 2018. The banners around the village are a visible outcome of this project  
[http://www.revitalizingwaterbury.org/uploads/files/pdf/WaterburyMarketReportFinalMay2013\\_000.pdf](http://www.revitalizingwaterbury.org/uploads/files/pdf/WaterburyMarketReportFinalMay2013_000.pdf)
- A Connector Trail Feasibility Study was completed to link the Village area with Little River State Park and the Cotton Brook trails that lead to Stowe  
[https://www.waterburyvt.com/fileadmin/files/Town\\_clerk\\_files/Waterbury\\_Connector\\_Trail\\_Final\\_Report\\_Complete\\_LR.pdf](https://www.waterburyvt.com/fileadmin/files/Town_clerk_files/Waterbury_Connector_Trail_Final_Report_Complete_LR.pdf)

### **What's Next?**

- The five-year update of the Waterbury Town and Village All Hazards Plan in 2017 including public outreach and education
- Implementation of improvements in the Downtown Master Plan
- Ongoing flood plain restoration planning and river corridor planning to protect investments in the village core
- 51 South Main Street (old municipal offices) – The Village Trustees are evaluating next steps.

Respectfully submitted by the Flood Plain Management Working Group

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# Winooski Street Bridge Restriction Study Project Waterbury, Vermont



Presented to:  
Vermont Department of Buildings  
and General Services

July 9, 2013



Presented by:  
Milone & MacBroom, Inc.  
Waterbury, Vermont

9.  
Cover only

Prepared in cooperation with the Federal Emergency Management Agency

# Flood Maps for the Winooski River in Waterbury, Vermont, 2014



Scientific Investigations Report 2015–5077



# Flood Maps for the Winooski River in Waterbury, Vermont, 2014

By Scott A. Olson

## Abstract

From August 28 to 29, 2011, Tropical Storm Irene delivered rainfall ranging from approximately 4 to more than 7 inches in the Winooski River Basin in Vermont. The rainfall resulted in severe flooding throughout the basin and significant damage along the Winooski River. In response to the flooding, the U.S. Geological Survey (USGS), in cooperation with the Federal Emergency Management Agency, conducted a new flood study to aid in flood recovery and restoration and to assist in flood forecasting. The study resulted in two sets of flood maps that depict the flooding for an 8.3-mile reach of the Winooski River from about 1,000 feet downstream of the Waterbury-Bolton, Vermont, town line upstream to about 2,000 feet upstream of the Waterbury-Middlesex, Vt., town line.

The first set of maps consists of flood-recovery maps depicting the boundaries of floodwaters at the 10-, 4-, 2-, 1-, and 0.2-percent annual exceedance probability (AEP) discharges, the boundaries of the floodway, and the boundaries of floodwaters from Tropical Storm Irene as estimated by a hydraulic model. The second set of maps consists of flood-inundation maps depicting the areal extent and depth of flooding corresponding to selected water levels (stages) at the USGS Winooski River above Crossett Bk at Waterbury, VT (04288040) streamgage. The maps correspond to streamgage water levels ranging from 417.0 to 431.0 feet in 2-foot increments. The availability of these flood-inundation maps along with current stage from the USGS streamgage obtained from a USGS Web site will provide emergency management personnel and residents with information that is critical for flood response activities such as evacuations and road closures, as well as for post-flood recovery efforts. These flood inundation maps can be accessed through the USGS Flood Inundation Mapping Science Web site ([http://water.usgs.gov/osw/flood\\_inundation/](http://water.usgs.gov/osw/flood_inundation/)).

To generate the maps, flood profiles for the Winooski River were developed. The U.S. Army Corps of Engineers one-dimensional step-backwater Hydrologic Engineering Center River Analysis System model (HEC-RAS), was used to compute the water-surface profiles along the study reach.

The simulated water-surface profiles were then combined with a geographic information system digital elevation model derived from light detection and ranging (lidar) data with a vertical accuracy that meets or exceeds vertical national map accuracy standards for 2-foot contour mapping to delineate the area flooded for each water-surface profile.

High-water marks from Tropical Storm Irene were available for seven locations along the study reach. The high-water marks were used to estimate water-surface profiles and discharges resulting from Tropical Storm Irene throughout the study reach. From a comparison of the estimated water-surface profile for Tropical Storm Irene with the water-surface profiles for the 1- and 0.2-percent annual exceedance probability (AEP) floods, it was determined that the high-water elevations resulting from Tropical Storm Irene exceeded the estimated 1-percent AEP flood throughout the Winooski River study reach but did not exceed the estimated 0.2-percent AEP flood at any location within the study reach.

## Introduction

During August 28–29, 2011, record-breaking rainfall from Tropical Storm Irene resulted in extensive flooding across much of Vermont. In the Winooski River valley, the flooding resulted in extensive property damage and destruction of transportation corridors. In response to the flooding, President Obama made a presidential declaration of a major disaster for the State of Vermont under the Stafford Act.<sup>1</sup> The Winooski River reach was selected because of the significant flood damage that occurred during Tropical Storm Irene and the availability of light detection and ranging (lidar) based digital elevation models. The study reach includes 8.3 miles (mi) of the Winooski River from approximately 1,000 feet (ft) downstream of the Waterbury-Bolton town line upstream to approximately 2,000 ft upstream of the Waterbury-Middlesex town line (fig. 1).

<sup>1</sup>Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93–288 (codified as amended at 42 U.S.C. §§5121–5207).

2 Flood Maps for the Winooski River in Waterbury, Vermont, 2014

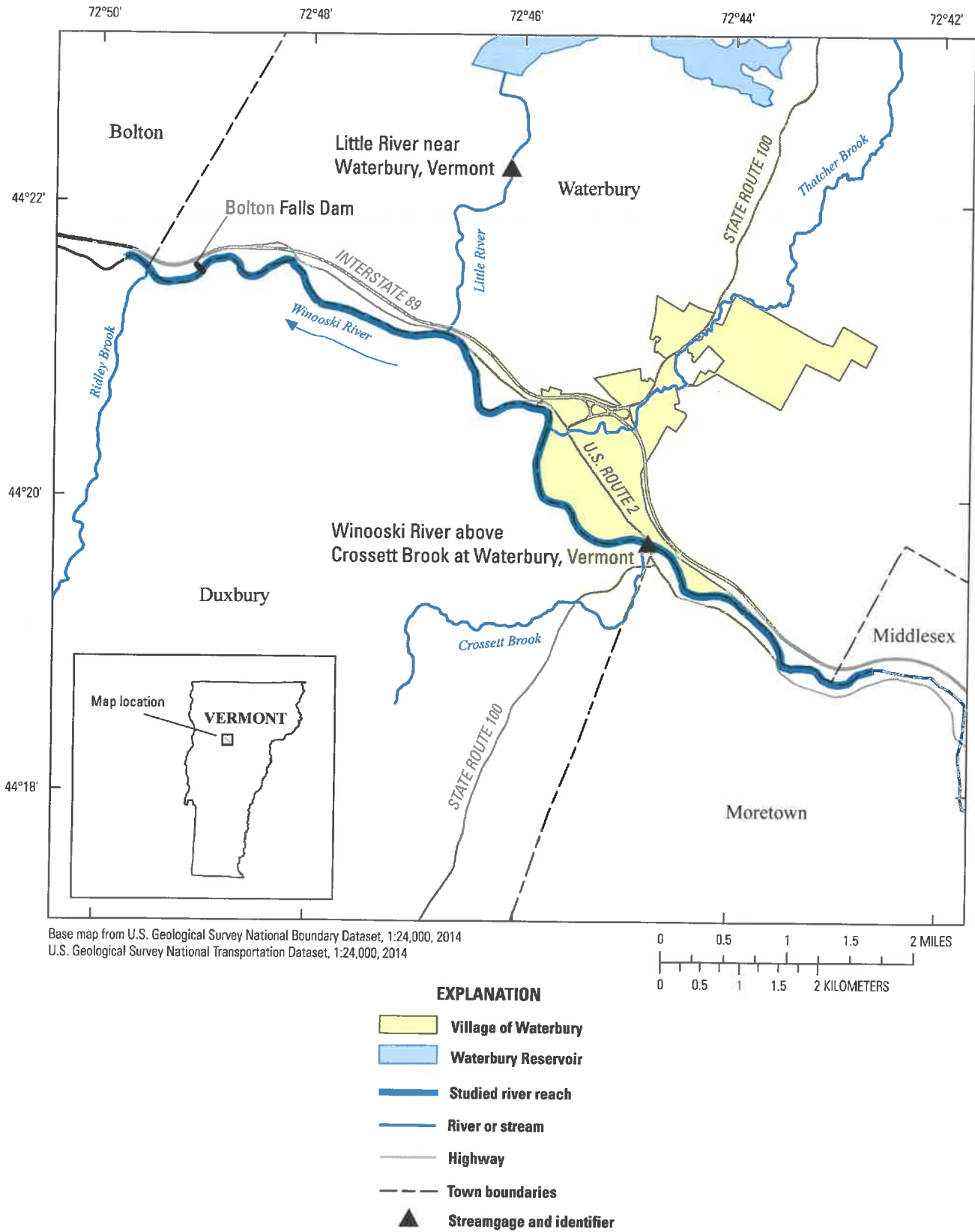


Figure 1. The Winooski River study reach in Waterbury, Vermont, and the locations of the Winooski River above Crossett Bk at Waterbury, VT (0428804) and Little River near Waterbury, VT (04289000) streamgages.

To address a component of the disaster declaration, the U.S. Geological Survey (USGS), in cooperation with the Federal Emergency Management Agency (FEMA), has produced a series of flood-recovery and flood-inundation maps. The flood-recovery maps show the extent of flooding from Tropical Storm Irene, as well as flood boundaries for discharge with a 10-, 4-, 2-, 1- and 0.2-percent annual exceedance probability (AEP) and the floodway. These flood-recovery maps are for advisory purposes and do not supersede the effective flood insurance rate maps (FIRMs; Federal Emergency Management Agency, 2013).

The flood-inundation maps depict the areal extent and depth of flooding corresponding to selected water levels (stages) at the USGS Winooski River above Crossett Bk at Waterbury, VT (04288040) streamgage. The streamgage water levels ranged from 417.0 to 431.0 ft in 2-ft increments (table 1). The 417.0-ft stage is approximately bankfull and is defined by the National Weather Service (NWS) as the flood action stage (National Weather Service, 2014) or that stage that, when reached by a rising stream, requires the NWS or a partner to take mitigation action in preparation for possible significant hydrologic activity. The 431.0-ft stage exceeds the stage that corresponds to the estimated 0.2-percent AEP flood. It should be noted that this streamgage is a stage-only streamgage, and discharge is not computed as part of its real-time record. The real-time stage reported for the Winooski River above Crossett Bk at Waterbury, VT streamgage can be translated into water-surface elevations, flood depths, and areal extent of flooding along the Winooski River in Waterbury, Vermont, by referring to the map that corresponds to the streamgage's stage. By referring to the appropriate map, emergency responders can discern the severity of flooding and identify flooded roads and areas that require evacuation upstream and downstream from the streamgage.

## Purpose and Scope

This report describes the development of a series of estimated flood-recovery and flood-inundation maps for the Winooski River in Waterbury and identifies the Web site where the maps are found. The flood-recovery maps show the extent of flooding from Tropical Storm Irene, as well as flood boundaries as a result of floods with a 10-, 4-, 2-, 1- or 0.2-percent AEP and the floodway in Waterbury. The purpose of the flood-recovery maps is to provide local government and citizens with accurate and up-to-date information on flood hazards to aid in the rebuilding process. The flood-inundation maps depict flooding corresponding to stages at the USGS Winooski River above Crossett Bk at Waterbury, VT (04288040) streamgage ranging from 417.0 to 431.0 ft in 2-ft increments (table 1). These flood-inundation maps along with current stage from the USGS streamgage obtained from a USGS Web site will provide emergency management personnel and residents with information that is critical for flood response activities such as evacuations and road closures, as well as for postflood recovery efforts.

## Study Area Description

Waterbury is a town in central Vermont with a population of 5,064 in 2010. Of those, 1,763 lived in Village of Waterbury, which is on the banks of the Winooski River on the southern side of the town (U.S. Census Bureau, 2014). The Winooski River flows east to west and forms the southern border of the Town of Waterbury. Duxbury, Vt., is across the river from Waterbury. Waterbury receives 42 inches of rain annually and has a mean annual high temperature of 55 degrees Fahrenheit (°F) and a mean annual low temperature of 32 °F (PRISM Group, 2012a–c).

**Table 1.** U.S. Geological Survey streamgage information for Winooski River at Waterbury, Vermont.

[Bk, Brook; VT, Vermont]

Characteristic	Parameter
Station name	Winooski River above Crossett Bk at Waterbury, VT
Station number	04288040
Drainage area, in square miles	672
Latitude	44°19'42.37"
Longitude	72°44'46.25"
Date of establishment	April 1991
Maximum stage since establishment, in feet above the North American Vertical Datum of 1988	*429.3

\*From a high-water mark 100 feet downstream of the streamgage.

The Winooski River study reach consists of the entire portion of the river abutting Waterbury and extends 1,000 ft downstream of the Waterbury-Bolton, Vt., town line and 2,000 ft upstream of the Waterbury-Middlesex, Vt., town line. The drainage basin of the river at the study reach is primarily forested, whereas the valleys often have agricultural and residential uses. The drainage area at the downstream end of study reach is 836 square miles (mi<sup>2</sup>). The elevation of the river at the downstream end of the study reach is approximately 340 ft above the North American Vertical Datum of 1988 (NAVD 88). The basin has relatively steep upland slopes at relatively high elevations—97.6 percent of the basin is at elevations above 1,200 ft. There are a few peaks in the basin whose elevations exceed 4,000 ft. Much of the Winooski River study reach has broad floodplains that serve agricultural purposes. A portion of the Village of Waterbury occupies the floodplain.

The length of the Winooski River study reach is 8.3 mi. The channel changes approximately 100 ft in elevation along the reach. Near the downstream end of the study reach is Bolton Falls Dam. This dam was built on a natural falls area and is used to generate electricity. The fall at the dam is approximately 50 ft. In addition to the dam, the study reach is traversed by two automobile bridges, a railroad bridge, and a snowmobile-trail suspension bridge.

About halfway through the study reach is the confluence of the Winooski River and the Little River. The Little River is a relatively large tributary and has a drainage area of 112 mi<sup>2</sup>; it has a flood control reservoir with usable storage of 2.81 billion cubic feet at a drainage area of 108 mi<sup>2</sup>. Additional flood control reservoirs in the Winooski River Basin upstream from the study reach combine for an additional 1.87 billion cubic feet of usable storage (Keirstead and others, 2004).

## Previous Studies

The flood insurance study (FIS) for Washington County, Vt. (Federal Emergency Management Agency, 2013), includes Waterbury and the Village of Waterbury, Vt. It is the effective FIS for Waterbury and was completed by ECJ-KCE Consultant Engineers in 1981, then updated by Green International Affiliates, Inc. in 1998.

New hydrologic estimates were made and new hydraulic models were developed for this investigation. The results of the study provided in this report and the recovery maps are for advisory purposes for the towns. The results and maps do not supersede the effective FISs or the FIRMs.

## Creation of Flood Maps

Tasks specific to development of the flood-recovery and flood-inundation maps for the Winooski River study reach in Waterbury were (1) estimation of flood discharges at the 10-, 4-, 2-, 1-, and 0.2-percent AEPs, (2) collection of topographic

and bathymetric data for cross sections and geometric data for structures and bridges along the study reach, (3) development of the hydraulic model for the study reach and computation of the water-surface profiles for the AEP flood discharges using the U.S. Army Corps of Engineers Hydrologic Engineering Center River Analysis System (HEC-RAS) computer program (U.S. Army Corps of Engineers, 2010), (4) development of hydraulic models with adjusted discharges corresponding to specific water-surface elevations at the Winooski River above Crossett Bk at Waterbury, VT, streamgage, and (5) production of estimated flood maps for the simulated water-surface profiles using the U.S. Army Corps of Engineers HEC-GeoRAS computer program (U.S. Army Corps of Engineers, 2010) and a geographic information system (GIS). The flood maps consist of flood-recovery maps at selected AEPs (appendix 1) and flood-inundation maps for selected stages at the streamgage (<http://wim.usgs.gov/FIMI/FloodInundationMapper.html>).

## Estimation of Flood Discharges

Flood discharges at the 10-, 4-, 2-, 1-, and 0.2-percent AEPs were estimated for the Winooski River study reach. There are two continuous recording Winooski River streamgages, the Winooski River near Essex Junction, VT<sup>2</sup> (04290500) streamgage with a drainage area of 1,040 mi<sup>2</sup> and the Winooski River at Montpelier, VT (04286000) streamgage with a drainage area of 395 mi<sup>2</sup>.

Reservoirs affect peak-discharge hydrology for the Winooski River. Useable storage for the reservoirs upstream from the Montpelier streamgage total 1.87 billion cubic feet, which is used for flood control. This results in 4.73 million cubic feet of storage per square mile of drainage area at the streamgage in Montpelier. At the Essex Junction streamgage the combined upstream storage is 4.48 billion cubic feet resulting in 4.31 million cubic feet of storage per square mile of drainage. According to Benson (1962), peak discharges are affected by less than 10 percent in New England when storage is 4.5 million cubic feet per square mile or less. Using this as criterion for defining peak discharges as regulated or unregulated, the peak discharges at the Montpelier and Essex Junction streamgages are best described as marginally regulated.

Because storage per square mile of drainage area above the Montpelier streamgage was greater than—but close to—Benson's criterion and storage per square mile of drainage area above the Essex Junction streamgage was slightly less than the criterion, the peak discharges for both streamgages were treated as unregulated in the frequency analysis. This allowed the frequency curves at each of the gages to be determined using the generalized skew reported in Olson (2014); it also allowed for the results to be weighted with the regression equations in Olson (2014) and the results between

<sup>2</sup>The Winooski River near Essex Junction, VT and the Winooski River at Montpelier, VT streamgages are outside the study area and not shown in figure 1 or listed in appendix 1.

the streamgages to be interpolated using techniques described in Olson (2014). The flood frequency analysis for the streamgages was conducted using the USGS PeakFQ software (U.S. Geological Survey, 2014a).

A few unique procedures were applied to the hydrologic analyses. Analysis of the peak-discharge data revealed evidence of a change in the magnitude of peak discharges since the construction of the detention reservoirs. Hence, peak discharges prior to the construction of the reservoirs were removed from the analysis to keep the analysis representative of current (2014) conditions. The exception was the 1927 peak. This peak, representing one of the greatest flooding events in Vermont’s history, was deemed too important to remove from the frequency analysis, although it could have been decreased by as much as 10 percent, according to the Benson criterion, had the reservoirs been constructed at that time. The estimated flood discharges are as shown in table 2.

The estimated flood discharges for Tropical Storm Irene on the Winooski River in Waterbury were based on high-water marks available for the Winooski River (Medalie and Olson, 2013). Initially, the discharge was estimated with the high-water marks at the Winooski Street Bridge<sup>3</sup> using indirect measurement techniques (Hulsing, 1967; Matthai, 1967). The resulting discharge was 51,900 cubic feet per second (ft<sup>3</sup>/s). Applying this discharge to the HEC–RAS model resulted in water-surface elevations that were above the other high-water marks available for the reach. Model calibration to the high-water marks at the Winooski Street bridge and the South Main Street (U.S. Route 2) bridge resulted in a discharge decrease to 49,000 ft<sup>3</sup>/s. This discharge value was used for the study reach from the upstream end to the confluence with the Little River.

The discharge of Winooski River downstream of the confluence with the Little River was estimated using a

drainage-area adjustment using the contributing drainage area from the Little River below the Waterbury flood reservoir (8 mi<sup>2</sup>) and adding 685 ft<sup>3</sup>/s, which is the discharge from the Waterbury flood reservoir at the time of the flood reported at the Little River near Waterbury, VT (04289000) streamgage. The resulting estimated peak discharge of the Winooski River downstream of the confluence of the Little River was 50,200 ft<sup>3</sup>/s. This discharge when input into the HEC–RAS model resulted in water-surface elevations that matched high-water marks at Bolton Falls Dam, within reason. The estimated discharges used to simulate the flooding from Tropical Storm Irene are shown in table 2.

In the flood-inundation mapping model, the discharges were implemented similar to the Tropical Storm Irene HEC–RAS model with the only change in discharge occurring at the confluence of the Little River. There are significant flood controls on the Little River; however, it is unknown what the contribution of discharge from the Little River would be in all flooding situations. This introduces some uncertainty in the flood-inundation maps of the Winooski River downstream of the Little River confluence. For the Winooski River flood-inundation model, an increase in discharge of 11.6 percent was applied at the confluence of the Little River. This percent increase was the average increase determined for the Winooski River at the Little River for the 10-, 4-, 2-, 1-, and 0.2-percent AEP discharge analysis.

Using the increase of 11.6 percent at the Little River confluence, the discharges input to the HEC–RAS model were adjusted to obtain the desired water levels at the Winooski River above Crossett Bk at Waterbury, VT streamgage location at the downstream side of the South Main Street (U.S. Route 2) bridge over the Winooski River. It should be noted that this streamgage is a stage-only streamgage and does not have a rating curve with corresponding discharges that could be used to calibrate the HEC–RAS model. The resulting estimated discharges are listed in table 3.

<sup>3</sup>The Winooski Street bridge and other features and locations not shown in figure 1 are listed in appendix 1.

**Table 2.** Estimated flood discharges for the Winooski River streamgages and the Winooski River study reach in Waterbury, Vermont.

[mi<sup>2</sup>, square miles; ft<sup>3</sup>/s, cubic feet per second; VT, Vermont]

Location on Winooski River	Drainage area (mi <sup>2</sup> )	Flood discharges (ft <sup>3</sup> /s) for indicated annual exceedance probabilities					Tropical Storm Irene discharge (ft <sup>3</sup> /s)
		10%	4%	2%	1%	0.2%	
At streamgage 04286000, Winooski River at Montpelier, VT	395	12,000	15,900	19,400	23,200	34,300	14,600
Upstream of Crossett Brook	672	24,600	31,100	36,500	42,200	57,900	49,000
Upstream of the Little River	704	25,400	32,000	37,500	43,400	59,500	49,000
Bolton Falls	821	28,400	35,600	41,800	48,300	66,100	50,200
At streamgage 04290500, Winooski River at Essex Junction, VT	1,040	32,000	39,800	46,400	53,500	73,000	35,000

# Listing of Disaster Recovery Funding Resources

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Resources described below contain a wide range of federal, private, and non-profit funding, program and technical assistance resources that may be available pre and/or post disaster. The list includes:

1. Federal disaster recovery funding opportunities, technical guidance, and program resources
2. National resources for SLTT
3. Other federal funding programs that have been made available to tribal and local governments through a congressional supplemental allocation
4. Federal technical assistance to tribal and local governments to better prepare them for future disaster recovery

This listing provides a starting point for the user and is not a comprehensive guide, nor does it indicate applicability or availability for any particular or general recovery need. Application period for grants are noted on the site or by contacting the funding source for additional information and future funding opportunities. The primary, most current, and comprehensive source of information on all federal assistance programs is through the Catalog of Federal Domestic Assistance (CFDA). [www.cfda.gov](http://www.cfda.gov) Resources are also available from States and a wide range of non-profit and foundation sources.

## Non-agency Specific Federal Grants, Assistance, and Guidance Websites

These websites have search capabilities to allow users to search available Federal grants and assistance based on specific keywords.

**Grants.gov** - [www.grants.gov](http://www.grants.gov)

**Benefits.gov** - [www.benefits.gov](http://www.benefits.gov)

**DisasterAssistance.gov** - [www.disasterassistance.gov](http://www.disasterassistance.gov)

**Catalog of Federal Domestic Assistance (CFDA)** - [www.cfda.gov](http://www.cfda.gov)

**U.S. Climate Resilience Toolkit** - <http://toolkit.climate.gov/>

**U.S. Government Open Data** - <http://www.data.gov/>

**Other Recovery Help** - <https://www.disasterassistance.gov/get-assistance/other-recovery-help>

**Community Recovery Management Toolkit** - <http://www.fema.gov/national-disaster-recovery-framework/community-recovery-management-toolkit>

## Federal Department/Agency Specific Resources

### Corporation for National and Community Service (AmeriCorps)

- **AmeriCorps State and National Grants** - <http://www.nationalservice.gov/ASNgrants>

### U.S. Department of Agriculture (USDA)

- **USDA Drought Programs and Assistance** - [http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=usda\\_drought\\_programs.html](http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=usda_drought_programs.html)
- **Disaster Assistance Program** - <https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/index>
- **The Extension Disaster Education Network EDEN: Reducing the Impacts of Disasters Through Education** - <http://eden.lsu.edu/Pages/default.aspx>
- **U. S. Forest Service National Urban and Community Forestry Program** - <http://www.fs.fed.us/ucf/nucfac.html>
- **NRCS Emergency Watershed Protection (EWP) Program** - <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/>
- **NRCS Emergency Watershed Protection Program - Floodplain Easement Option (EWP FPE)** - [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/tn/newsroom/?cid=nrcs143\\_008225](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/tn/newsroom/?cid=nrcs143_008225)
- **NRCS Farm and Ranch Lands Protection Program** - <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/farmranch/>
- **NRCS Resource Conservation and Development Program** - [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/la/people/partners/?cid=nrcs141p2\\_015725](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/la/people/partners/?cid=nrcs141p2_015725)
- **Natural Resources Conservation Services (NRCS) Technical Assistance** - <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/>
- **Rural Development – Emergency Community Water Assistance Grants Program** - <http://www.rd.usda.gov/programs-services/emergency-community-water-assistance-grants>
- **Rural Development – Community Facilities Direct Loan and Grant Program** – <http://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program>
- **Rural Development – Intermediary Relending Program** – <http://www.rd.usda.gov/programs-services/intermediary-relending-program>
- **Rural Development – Rural Community Development Initiative Grants** - [http://www.rurdev.usda.gov/HAD-RCDI\\_Grants.html](http://www.rurdev.usda.gov/HAD-RCDI_Grants.html)

- **Rural Development – Programs & Services for Communities & Nonprofits -** <http://www.rd.usda.gov/programs-services/programs-services-communities-nonprofits>
- **Rural Development – Rural Business Development Grants -** [http://www.rurdev.usda.gov/BCP\\_rbeg.html](http://www.rurdev.usda.gov/BCP_rbeg.html)
- **Rural Development – Rural Housing Service -** <http://www.rd.usda.gov/about-rd/agencies/rural-housing-service>
- **Rural Development – Water & Waste Disposal Loan & Grant Program -** <http://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program>
- **Rural Development – Water & Waste Disposal Loan Guarantees -** <http://www.rd.usda.gov/programs-services/water-waste-disposal-loan-guarantees>
- **NRCS Small Watershed Program -** [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/programs/?cid=nrcs144p2\\_064043assists](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/programs/?cid=nrcs144p2_064043assists)
- **NRCS Watershed Surveys and Planning -** <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wsp/>
- **Rural Development – Water & Waste Disposal Technical Assistance & Training Grants –** <http://www.rd.usda.gov/programs-services/water-waste-disposal-technical-assistance-training-grants>

## U.S. Department of Commerce

- **EDA Disaster Recovery/Post-Disaster Economic Recovery Resources -** <http://www.eda.gov/about/disaster-recovery.htm>
- **EDA Funding Opportunities -** <https://www.eda.gov/funding-opportunities/>
- **EDA Public Works and Economic Adjustment Assistance Programs -** <http://www.grants.gov/web/grants/view-opportunity.html?oppld=279842> and <https://www.cfda.gov/index?s=program&mode=form&tab=core&id=e5254fa16829ebe6a08dd1c79126ec8d>
- **EDA Planning Program and Local Technical Assistance Program -** <http://www.grants.gov/web/grants/view-opportunity.html?oppld=280447> and <https://www.cfda.gov/index?s=program&mode=form&tab=core&id=43b8ca979f221b452123a1c2938e2d77>
- **EDA Regional Innovation Strategies Program (RIS) -** <https://www.eda.gov/oie/ris/>
- **NOAA Coastal and Estuarine Land Conservation Program -** <http://coast.noaa.gov/czm/landconservation/>
- **NOAA - Digital Coast -** <http://coast.noaa.gov/digitalcoast/>
- **NOAA - Coastal & Waterfront Smart Growth -** <http://coastalsmartgrowth.noaa.gov/>
- **NOAA National Marine Fisheries Service - Habitat Conservation Funding Opportunities -** <http://www.habitat.noaa.gov/funding/index.html>
- **NOAA The National Coastal Zone Management Program -** <http://coast.noaa.gov/czm/>
- **NOAA – National Weather Service - Automated Flood Warning System -** <http://water.weather.gov/afws/>

## U.S. Army Corps of Engineers (USACE)



- **Direct Missions** - <http://www.nwo.usace.army.mil/Missions.aspx>
- **Beach Erosion Control Projects** - <https://www.cfda.gov/index?s=program&mode=form&tab=core&id=e55e7e0e7484f1f9e674a5ec50ea3211>
- **Brownfields - Urban Waters Program** - <http://www.usace.army.mil/Missions/Environmental/BrownfieldsUrbanWaters.aspx>
- **Coastal Program Guide: North Atlantic Coast Comprehensive Study** - <http://www.nad.usace.army.mil/CompStudy>
- **Dam Safety Program** - <http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram.aspx>
- **Emergency Drought Assistance** - <http://www.usace.army.mil/Missions/EmergencyOperations/Drought.aspx>
- **Emergency Operations Flood Response and Post-Flood Response** - <https://www.cfda.gov/index?s=program&mode=form&tab=core&id=b578e8145423be9ceec71d7a422b74e1> and <http://www.usace.army.mil/Missions/EmergencyOperations/Floods.aspx>
- **Emergency Rehabilitation of Flood Control Works or Federally Authorized Coastal Protection Works** - <https://www.cfda.gov/index?s=program&mode=form&tab=core&id=b4bea60966c27373d0e3bf86de3fd451>
- **Emergency Advance Measures for Flood Prevention** - <https://www.cfda.gov/index?s=program&mode=form&tab=core&id=c0a95aa1d0fafd65c881ab5d2d3385e2>
- **Public Law 84-99 Rehabilitation Program** - <http://www.iwr.usace.army.mil/Missions/FloodRiskManagement/FloodRiskManagementProgram/PartnersinSharedResponsibility/USACEStaff/PL8499RehabilitationProgram.aspx>
- **Silver Jackets**- <http://www.nfrmp.us/state/>
- **Invasive Species Management** - <http://www.usace.army.mil/Missions/Environmental/InvasiveSpeciesManagement.aspx>
- **Levee Safety Program** - <http://www.usace.army.mil/Missions/CivilWorks/LeveeSafetyProgram.aspx>
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## U.S. Department of Education

- **Readiness and Emergency Management for Schools** - <http://www2.ed.gov/programs/dvpeemergencyresponse/index.html>

## U.S. Department of Energy

- **Weatherization and Intergovernmental Programs Office** - <http://energy.gov/eere/wipo/weatherization-and-intergovernmental-programs-office>
- **Energy Efficiency and Conservation Block Grant Program** - <http://energy.gov/eere/wipo/energy-efficiency-and-conservation-block-grant-program>
- **Financing Solutions** - <http://energy.gov/eere/slsc/financing-solutions>
- **Strategic Energy Planning** - <http://energy.gov/eere/slsc/strategic-energy-planning>

- **Office of Indian Energy Policy and Programs - <http://apps1.eere.energy.gov/tribalenergy/>**
- **National Renewable Energy Laboratory - Technology Deployment, Disaster Resiliency and Recovery - [http://www.nrel.gov/tech\\_deployment/disaster\\_recovery.html](http://www.nrel.gov/tech_deployment/disaster_recovery.html)**

## U. S. Department of Health and Human Services

- **Administration for Children and Families – Health Profession Opportunity Grants - <http://hpogcommunity.acf.hhs.gov/Pages/default.aspx>**
- **Administration for Children and Families – Community Economic Development Program - <http://www.acf.hhs.gov/programs/ocs/programs/ced>**
- **Administration for Children and Families – Rural Community Development Program - <http://www.acf.hhs.gov/programs/ocs/programs/rcd>**
- **Administration for Children and Families – Social and Economic Development Strategies - <http://www.acf.hhs.gov/programs/ana/programs/seds>**
- **Administration for Community Living – Funding Opportunity Announcements - [http://acl.gov/Funding\\_Opportunities/Announcements/Index.aspx](http://acl.gov/Funding_Opportunities/Announcements/Index.aspx)**
- **Health Resources and Services Administration – Affordable Care Act Grants for School-Based Health Center Capital Expenditures - <https://www.cfda.gov/index?s=program&mode=form&tab=step1&id=4e561fd1f73dab04a9f6698ecff8705c>**
- **HRSA – Rural Community Programs - <http://www.hrsa.gov/ruralhealth/community/index.html>**
- **Health Resources and Services Administration – Small Rural Hospital Improvement Grant Program - <https://www.cfda.gov/index?s=program&mode=form&tab=step1&id=e6e74ae93844c1fa459ac7866c8832eb>**
- **Public Health Service - Recovery Resource Library - <http://www.phe.gov/about/oem/recovery/Pages/resources.aspx>**
- **Substance Abuse and Mental Health Services Administration (SAMHSA) – Comprehensive Community Mental Health Services for Children with Serious Emotional Disturbances - <https://www.cfda.gov/?s=program&mode=form&tab=step1&id=e68810bf55c9db6fc78a0815ef594525>**
- **Substance Abuse and Mental Health Services Administration (SAMHSA) – Disaster Relief Information - <http://www.disasterassistance.gov/disaster-assistance/forms-of-assistance/4506/1/6> and <http://www.samhsa.gov/find-help/disaster-distress-helpline>**
- **Administration for Children and Families - Community Services Block Grant - <http://www.acf.hhs.gov/programs/ocs/programs/csbg>**
- **Centers for Disease Control and Prevention (CDC) - <http://www.cdc.gov/>**
- **Centers for Disease Control and Prevention Funding and Guidance for State and Local Health Departments - <http://www.cdc.gov/phpr/coopagreement.htm>**
- **Public Health Service – Health Program for Toxic Substances and Disease Registry - <https://www.cfda.gov/index?s=program&mode=form&tab=core&id=20926d427710175ab14b078cb9ed9127>**
- **Substance Abuse and Mental Health Services Administration (SAMHSA) – Mental Health Disaster Assistance and Emergency Mental Health -**

<https://www.cfda.gov/index?s=program&mode=form&tab=core&id=80eb099ceb73ddcdd14eb85e327b5f4d>

- **Disaster Resources for Older Adults and People with Disabilities -**  
<https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4505/1/6> and  
<http://www.acl.gov/Programs/Index.aspx> and  
[http://www.acl.gov/Get\\_Help/Preparedness/Index.aspx](http://www.acl.gov/Get_Help/Preparedness/Index.aspx)
- **Low Income Home Energy Assistance Program (LIHEAP) -**  
<https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4468/1/6> and  
<http://www.acf.hhs.gov/programs/ocs/liheap-state-and-territory-contact-listing> and  
<http://www.acf.hhs.gov/programs/ocs/liheap-tribal-contact-listing>
- **Temporary Assistance for Needy Families (TANF) -** <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4467/1/6> and  
<http://www.acf.hhs.gov/programs/ofa/programs/tanf>

## U. S. Department of Homeland Security (non-FEMA)

- **U. S. Coast Guard – National Pollution Funds Center - The Oil Spill Liability Trust Fund -**  
[http://www.uscg.mil/npfc/About\\_NPFC/osltf.asp](http://www.uscg.mil/npfc/About_NPFC/osltf.asp)

## Federal Emergency Management Agency (FEMA)

- **Community Disaster Loan Program -** <https://www.fema.gov/community-disaster-loan-program>
- **Community Recovery Management Toolkit -** <http://www.fema.gov/national-disaster-recovery-framework/community-recovery-management-toolkit>
- **National Dam Safety Program Information -** <https://www.fema.gov/national-dam-safety-program-information>
- **Fire Management Assistance Grant Program -** <https://www.fema.gov/fire-management-assistance-grant-program>
- **Public Assistance (PA): Local, State, Tribal, and Non-Profit -** <https://www.fema.gov/public-assistance-local-state-tribal-and-non-profit>
- **Hazard Mitigation Assistance – Hazard Mitigation Grant Program (HMGP) -**  
<https://www.fema.gov/hazard-mitigation-grant-program>
- **Hazard Mitigation Assistance – Pre-Disaster Mitigation Grant Program (HMGP) -**  
<http://www.fema.gov/pre-disaster-mitigation-grant-program>
- **Hazard Mitigation Assistance - Flood Mitigation Assistance Grant Program -**  
<https://www.fema.gov/flood-mitigation-assistance-program>
- **Repetitive Flood Claims Grant Program -** <https://www.fema.gov/repetitive-flood-claims-grant-program-fact-sheet>
- **Severe Repetitive Loss (SRL) Grant Program -** <https://www.fema.gov/media-library/resources-documents/collections/14>
- **Transit Security Grant Program -** <https://www.fema.gov/transit-security-grant-program>

- **Unified Federal Environmental and Historic Preservation Review for Presidentially Declared Disasters** - <https://www.fema.gov/unified-federal-environmental-and-historic-preservation-review-presidentially-declared-disasters>
- **Disaster Recovery Center (DRC) / DRC Locator** - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4627/1/805> and <http://asd.fema.gov/inter/locator/home.htm>
- **FEMA Housing Portal** - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4630/1/805> and <https://asd.fema.gov/inter/hportal/home.htm>
- **Assistance to Individuals and Households** - <http://www.fema.gov/recovery-directorate/assistance-individuals-and-households>
- **Individuals and Households Program (IHP) - Housing Assistance** - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4471/1/805>
- **Individuals and Households Program (IHP) - Other Needs Assistance** - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4473/1/805>
- **Disaster Legal Services (DLS)** - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4464/1/805> and [http://www.fema.gov/media-library-data/1434639696302-5072dea58c180aeba87b0bf92bf1eb63/DLS\\_FactSheet\\_final508.pdf](http://www.fema.gov/media-library-data/1434639696302-5072dea58c180aeba87b0bf92bf1eb63/DLS_FactSheet_final508.pdf) and [http://www.americanbar.org/groups/committees/disaster/resources/disaster\\_legal\\_hotlines.html](http://www.americanbar.org/groups/committees/disaster/resources/disaster_legal_hotlines.html) and <http://www.disasterlegaid.org/>
- **National Flood Insurance Program (NFIP)** - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4465/1/805> and <https://www.floodsmart.gov/floodsmart/>
- **The National Emergency Family Registry and Locator System (NEFRLS)** - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4628/1/805> and <https://www.fema.gov/media-library/assets/documents/94763>
- **Emergency Management Performance Grant Program** - <https://www.fema.gov/emergency-management-performance-grant-program>
- **Fire Prevention & Safety Grants** - <https://www.fema.gov/fire-prevention-safety-grants>
- **Community Rating System** - <https://www.fema.gov/national-flood-insurance-program-2/community-rating-system>
- **Tribal Homeland Security Grant Program** - <https://www.fema.gov/fy-2014-tribal-homeland-security-grant-program-thsgp>

## **U. S. Department of Housing and Urban Development (HUD)**

- **Community Compass** - [http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/comm\\_planning/about/cpdata](http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/about/cpdata)
- **Community Development Block Grant Entitlement Program** - <https://www.hudexchange.info/cdbg-entitlement/>
- **State Community Development Block Grant Program** - <https://www.hudexchange.info/cdbg-state/>
- **Community Development Block Grant – Section 108 Loan Guarantee Program** - <https://www.hudexchange.info/section-108/>
- **Community Development Block Grant Disaster Recovery (CDBG-DR) Program** - <https://www.hudexchange.info/cdbg-dr/>
- **CDBG-DR Toolkits** - <https://www.hudexchange.info/resource/2853/cdbg-dr-toolkits>

- **Federal Housing Authority – Approved Nonprofits Program -**  
[http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/housing/sfh/np](http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/np)
- **Federal Housing Authority – Good Neighbor Next Door Sales Program -**  
[http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/housing/sfh/reo/goodn/gnndabot](http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/reo/goodn/gnndabot)
- **HOME Investment Partnerships Program -**  
[http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/comm\\_planning/affordablehousing/programs/home/](http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/affordablehousing/programs/home/)
- **Office of Public and Indian Housing – Indian Community Development Block Grant Program -**  
[http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/public\\_indian\\_housing/ih/grants/icdbg](http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/ih/grants/icdbg)
- **Office of Public and Indian Housing – Main Street Grants Program Hope VI -**  
<http://www.hud.gov/mainstreet>
- **Sustainable Communities Initiative Resource Library -**  
<https://www.hudexchange.info/programs/sci/resources>
- **Capacity Building for Community Development and Affordable Housing Grants -**  
<http://portal.hud.gov/hudportal/HUD?src=/hudprograms/capacitybuilding>
- **HUD, DOT, and EPA – Partnership for Sustainable Communities –**  
<http://www.sustainablecommunities.gov/>
- **PD&R Disaster Recovery Toolkit -** <https://www.huduser.gov/portal/sandy.html>
- **Mortgage Insurance for Disaster Victims 203(h) and 203(k) Rehabilitation Mortgage Insurance**  
<https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4703/1/7> and  
[http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/housing/sfh/ins/203h-dft](http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/ins/203h-dft) and  
[http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/housing/sfh/203k](http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/203k)
- **HUD Public Housing Program -** <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4474/1/7> and  
[http://portal.hud.gov/hudportal/HUD?src=/topics/rental\\_assistance/phprog](http://portal.hud.gov/hudportal/HUD?src=/topics/rental_assistance/phprog)
- **Housing Choice Voucher Program (Section 8) –** <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4469/1/7> and  
[http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/public\\_indian\\_housing/programs/hcv/about/fact\\_sheet](http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/programs/hcv/about/fact_sheet)

## U.S. Department of Justice

- **Community Relations Service -** <http://www.justice.gov/crs>

## U.S. Department of Labor

- **Employment and Training Administration - National Emergency Grants -**  
<http://www.doleta.gov/neg/Resources.cfm>
- **American Job Centers Network -** <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4723/1/1> and <http://www.careeronestop.org/ReEmployment/>

- **Disaster Unemployment Assistance** - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4466/1/1> and <http://workforcesecurity.doleta.gov/unemploy/disaster.asp>
- **Unemployment Insurance** - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4450/1/1> and <http://workforcesecurity.doleta.gov/unemploy/uifactsheet.asp>

## U.S. Department of the Interior

- **Bureau of Reclamation – Drought Response Program** - <http://www.usbr.gov/drought/>
- **Fish and Wildlife Service – Endangered Species/Grants** - <http://www.fws.gov/endangered/grants/index.html>
- **Fish and Wildlife Service - National Coastal Wetlands Conservation Grant Program** - <http://www.fws.gov/coastal/CoastalGrants/>
- **Fish and Wildlife Service – Environmental Contaminants Program/The Restoration Program** - <http://www.fws.gov/midwest/es/ec/ecFactSheet.html>
- **Fish and Wildlife Service – National Wildlife Refuge System/Comprehensive Conservation Plans** - <http://www.fws.gov/refuges/planning/ComprehensiveConservationPlans.html>
- **Fish and Wildlife Service – North American Wetlands Conservation Act** - <http://www.fws.gov/birds/grants/north-american-wetland-conservation-act.php>
- **Fish and Wildlife Service – Service Training and Technical Assistance** – <https://www.cfda.gov/?s=program&mode=form&tab=step1&id=1d274f2fba135d7269a4db113da8b409>
- **National Park Service – Civil War Battlefield Land Acquisition Grants** - <http://www.nps.gov/abpp/grants/CWBLAGgrants.htm>
- **National Park Service – Federal Lands to Parks Program** - <http://www.nps.gov/ncrc/programs/flp/index.htm>
- **National Park Service – Grants to Historically Black Colleges and Universities** - <http://www.nps.gov/preservation-grants/HBCU/index.html>
- **National Park Service – Land and Water Conservation Fund** - <http://www.nps.gov/lwcf/index.htm>
- **National Park Service - American Battlefield Protection Program** - <http://www.nps.gov/abpp/grants/planninggrants.htm>
- **National Park Service – National Center for Preservation Technology and Training** - <http://www.ncptt.nps.gov/>
- **National Park Service – National Heritage Area Federal Financial Assistance** - <https://www.cfda.gov/index?s=program&mode=form&tab=core&id=5ab150232c8e9560d3f4c6dde0a2c641>
- **National Park Service – National Register of Historic Places** - <http://www.nps.gov/nr/>
- **National Park Service – National Trails System** – <http://www.nps.gov/nts/>
- **National Park Service – Rivers, Trails, and Conservation Assistance Program** - <http://www.nps.gov/rtca>
- **National Park Service – Save America’s Treasures Grants** - <https://www.nps.gov/preservation-grants/sat/>
- **National Park Service – Land & Water Conservation Fund** – <http://www.nps.gov/ncrc/programs/lwcf/grants.html>

- **National Park Service – State, Tribal, and Local Plans and Grants -** <http://www.nps.gov/orgs/1623/index.htm>
- **National Park Service – Technical Preservation Services, Historic Surplus Property Program -** <http://www.nps.gov/tps/historic-surplus.htm>
- **National Park Service – Historic Preservation Fund Grants -** <https://www.nps.gov/preservation-grants/index.html>
- **National Park Service – Urban Park & Recreation Recovery -** <http://www.nps.gov/uparr/>
- **National Park Service – Youth Programs -** <http://www.nps.gov/gettinginvolved/youthprograms/index.htm>
- **USGS – National Geospatial Program: The National Map -** <http://www.nationalmap.gov/>
- **Bureau of Indian Affairs (BIA) Financial Assistance and Social Services -** <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4364/1/11>
- **Youth Conservation Corps -** <https://www.nps.gov/subjects/youthprograms/ycc.htm>
- **USGS – Earthquake Hazards Program -** <http://earthquake.usgs.gov/>
- **USGS – National Gap Analysis Program -** <http://gapanalysis.usgs.gov/>
- **USGS, FEMA, NIST and NSF – National Earthquake Hazards Reduction Program -** <http://www.nehrp.gov/>

## U.S. Department of Transportation

- **Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants -** <http://www.dot.gov/TIGER> (due: April 29, 2016)
- **Federal Highway Administration - Emergency Relief Program -** <http://www.fhwa.dot.gov/programadmin/erelief.cfm>
- **Federal Highway Administration – Recreational Trails Program -** [http://www.fhwa.dot.gov/environment/recreational\\_trails/](http://www.fhwa.dot.gov/environment/recreational_trails/)
- **Federal Transit Administration – Grant Programs -** <https://www.transit.dot.gov/grants/13070.html>
- **Federal Transit Administration – Enhanced Mobility of Seniors and Individuals with Disabilities** <https://www.transit.dot.gov/funding/grants/enhanced-mobility-seniors-individuals-disabilities-section-5310>
- **Federal Transit Administration – Formula Grants for Other than Urbanized Areas -** <https://www.transit.dot.gov/funding/grants/grant-programs/formula-grants-other-urbanized-areas-5311>
- **Federal Transit Administration - Public Transportation Emergency Relief Program -** <https://www.transit.dot.gov/funding/grant-programs/emergency-relief-program/emergency-relief-program>
- **Federal Highway Administration – MAP-21 - Moving Ahead for Progress in the 21st Century -** <http://www.fhwa.dot.gov/map21/factsheets/mp.cfm>
- **Federal Transit Administration – State of Good Repair & Asset Management -** <https://www.transit.dot.gov/regulations-and-guidance/asset-management/state-good-repair/state-good-repair-asset-management>
- **Recovery Resource Guide: A Transportation Stakeholder Guide to Recovery -** [https://cms.dot.gov/sites/dot.gov/files/docs/RECOVERY%20RESOURCE%20GUIDE\\_Final%20Version\\_08-27-2014.pdf](https://cms.dot.gov/sites/dot.gov/files/docs/RECOVERY%20RESOURCE%20GUIDE_Final%20Version_08-27-2014.pdf)

- **A Guide to Regional Transportation Planning for Disaster, Emergencies and Significant Events - [http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_777.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_777.pdf)**

## U.S. Department of Veterans Affairs

- **Direct Home Loans for Native Americans - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4364/1/11> and <http://benefits.va.gov/homeloans/nadl.asp>**
- **Inquiry Routing and Information System (IRIS) - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4509/1/11> and <https://iris.custhelp.com/>**
- **Loan Management - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/5933/1/11> and <http://www.benefits.va.gov/homeloans/>**
- **My HealthVet Website - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4700/1/11> and <https://www.myhealth.va.gov/index.html>**
- **Native American Veterans Housing Loan Program - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4707/1/11> and <http://www.benefits.va.gov/PERSONA/veteran-tribal.asp>**
- **Specially Adapted Housing Grant - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4733/1/11> and <http://www.benefits.va.gov/homeloans/adaptedhousing.asp> and <http://www.benefits.gov/benefits/benefit-details/587>**
- **VA - Burial Benefits - Headstones, Markers, and Medallions for Placement in Private Cemeteries - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4713/1/11> and <http://www.cem.va.gov/cem/hmm/index.asp>**
- **VA - Burial Benefits - Partial Reimbursement of Expenses - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4711/1/11> and <http://benefits.va.gov/benefits/>**
- **VA - Burial Benefits - Presidential Memorial Certificates - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4709/1/11> and <http://www.cem.va.gov/>**
- **VA - Burial Benefits - Veteran and Dependent Burial in VA National Cemeteries - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4715/1/11> and [http://www.cem.va.gov/cem/burial\\_benefits/](http://www.cem.va.gov/cem/burial_benefits/)**
- **VA Change of Address - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4698/1/11>**
- **VA-Guaranteed Home Loan Program - <https://www.disasterassistance.gov/get-assistance/forms-of-assistance/1507/1/11> and <http://www.benefits.va.gov/homeloans/>**

## Environmental Protection Agency (EPA)

- **Brownfields Area-Wide Planning Grants - [http://www.epa.gov/brownfields/areawide\\_grants.htm](http://www.epa.gov/brownfields/areawide_grants.htm)**
- **Drinking Water State Revolving Loan Fund - [http://water.epa.gov/grants\\_funding/dwsrf/](http://water.epa.gov/grants_funding/dwsrf/)**
- **Clean Water State Revolving Loan Fund - [http://water.epa.gov/grants\\_funding/cwsrf/cwsrf\\_index.cfm](http://water.epa.gov/grants_funding/cwsrf/cwsrf_index.cfm)**



- **Green Infrastructure Technical Assistance Program -** <http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm>
- **Superfund Program -** <https://www.epa.gov/superfund>
- **Underground Storage Tanks (UST) Program -** <http://www.epa.gov/oust/>
- **Smart Growth: Building Blocks for Sustainable Communities -** <https://www.epa.gov/smartgrowth/building-blocks-sustainable-communities>
- **Smart Growth Implementation Assistance Program -** <https://www.epa.gov/smartgrowth/smart-growth-implementation-assistance>
- **Urban Waters Small Grants -** <http://www2.epa.gov/urbanwaters/urban-waters-small-grants>
- **Water Pollution Control (Section 106) Grants -** [http://water.epa.gov/grants\\_funding/cwf/pollutioncontrol.cfm](http://water.epa.gov/grants_funding/cwf/pollutioncontrol.cfm)

## General Services Administration (GSA)

- **GSA Programs for State and Local Customers, including Disaster Purchasing Program -** <http://www.gsa.gov/portal/content/105300>

## National Aeronautics and Space Administration (NASA)

- **Science Mission Directorate – Earth Observing System Data and Information System (EOSDIS) -** <http://science.nasa.gov/earth-science/earth-science-data/>

## National Archives and Records Administration

- **Preservation General Information -** <http://www.archives.gov/preservation/disaster-response/general.html>

## National Endowment for the Humanities (NEH)

- **Preservation Assistance Grants for Smaller institutions -** <http://www.neh.gov/grants/preservation/preservation-assistance-grants-smaller-institutions>
- **NEH Grants -** <http://www.neh.gov/grants/grants.html>

## Small Business Administration (SBA)

- **Disaster Loan Information –** <https://www.sba.gov/loans-grants/see-what-sba-offers/sba-loan-programs/disaster-loans/apply-disaster-loan>
- **Types of Disaster Loans -** <https://www.sba.gov/loans-grants/see-what-sba-offers/sba-loan-programs/disaster-loans/types-disaster-loans>

- **Disaster Loan Factsheet** - <https://www.sba.gov/loans-grants/see-what-sba-offers/sba-loan-programs/disaster-loans/disaster-loan-fact-sheets>
- **Current Declared Disasters** - <https://disasterloan.sba.gov/ela/Declarations/Index>

## Selected Non-Federal Recovery Resources

- **Association of Bay Area Governments (ABAG) Recovery Toolkit for Local Governments** - <http://resilience.abag.ca.gov/resilience/toolkit>
- **American Planning Association: Planning for Post-Disaster Recovery: Next Generation** - <https://www.planning.org/research/postdisaster/> <http://blogs.planning.org/postdisaster/>
- **American Red Cross - Disaster Relief** - <http://www.redcross.org/what-we-do/disaster-relief>
- **Architects Foundation** - <http://architectsfoundation.org/>
- **Corporate Citizenship Center: Resources for Disaster Recovery** - <https://www.uschamberfoundation.org/corporate-citizenship-center/resources-disaster-recovery>
- **Council on Foundations - Disaster Philanthropy** - <http://www.cof.org/content/disaster-philanthropy>
- **International City/County Managers Association: ICMA Knowledge Network: Disaster Recovery** - [http://icma.org/en/icma/knowledge\\_network/blogs/blogpost/2512/Top\\_Resources\\_on\\_Disaster\\_Recovery](http://icma.org/en/icma/knowledge_network/blogs/blogpost/2512/Top_Resources_on_Disaster_Recovery)
- **International Economic Development Council - Restore Your Economy** - <http://restoreyoureconomy.org/>
- **National Association of Development Organizations (NADO) Disaster Resilience** - <http://www.nado.org/category/resources/disaster-recovery/>
- **National Trust for Historic Preservation - National Main Street Center** - <http://www.preservationnation.org/main-street/>
- **National Voluntary Organizations Active in Disasters Resources** - <http://www.nvoad.org/>
- **National Resource Network New Solutions for Cities** - [www.nationalresourcenetwork.org](http://www.nationalresourcenetwork.org)

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# **Alternate Funding for Disaster Recovery**

## **A Guide to Available Federal Programs and Funding Resources**

**FEBRUARY 2013**

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## **Purpose**

*Disaster needs are often unique, and the programs that may apply to them are complex and come with significant restrictions. For this reason, the purpose of program summaries in this publication is to provide a guide to potential sources of disaster assistance. More complete information about each program and funding source can be obtained from the contact noted at the end of each summary.*

The purpose of this guide is to provide basic information about programs of assistance available to individuals, businesses, and public entities after a disaster. These programs help individuals cope with their losses, and affected businesses and public entities restore their structures and operations. The information is intended to serve as a starting point for disaster workers and local, State, and Federal officials to locate sources of help as they seek more definitive information, such as eligibility criteria and application processes. Included are programs that make financial assistance available, as well as those that provide technical assistance and/or goods and other services.

## **Background**

The program summaries in this guide evolved from an initial compilation of programs obtained from the *Catalog of Federal Domestic Assistance* (CFDA), the compendium of financial and non-financial programs throughout the Federal Government that provides assistance or benefits to the American public. The summaries were reviewed to reflect programs that are specifically intended to apply to disaster recovery and regular agency programs that, in special circumstances, may support disaster recovery.

The CFDA includes a comprehensive list of Federal regional and local office addresses and telephone numbers that is also a useful reference for obtaining program information. The CFDA can be obtained in print or for automated use on CD-ROM, , or on line through the Federal Assistance Programs Retrieval System (<http://12.46.245.173/cfda/cfda.html>). Charges apply. Each automated edition is revised in June and December. For more information on electronic access, contact GSA/IRMS/ WKU, Reporters' Building, Room 101, 300 Seventh Street SW., Washington, DC 20407; or call (202) 708-5126; fax (202) 401-8233, attn: GSA Federal Domestic Assistance Staff.. To order the printed version of the CFDA, contact the Superintendent of Documents, Government Printing Office, Washington, DC 20402; or call (202) 512-1800 or Federal Information: (800) 688-9889.

This guide revises and supersedes *Disaster Assistance: A Guide to Recovery Programs* (FEMA 229(4)), first published by the Federal Emergency Management Agency (FEMA) in December 1995, with the latest revision having occurred in December 2005.

With transfer into Homeland Security (DHS), agencies, including FEMA, with pre-existing CFDA

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numbers, retired their CFDA numbers and new DHS CFDA numbers were assigned to their grant awards. Some grant awards remain active under old CFDA numbers.

***For more information, go to:***

<http://www.eda.gov/xp/EDAPublic/AboutEDA/Programs.xml>

[http://64.233.161.104/search?q=cache:EWWxTqHQ\\_BQJ:170.104.54.3/admin/accounting/publications/SEFA.pdf+cfda+10.416&hl=en](http://64.233.161.104/search?q=cache:EWWxTqHQ_BQJ:170.104.54.3/admin/accounting/publications/SEFA.pdf+cfda+10.416&hl=en)

[http://64.233.161.104/search?q=cache:ejOq31ZSSAQJ:www.dhs.gov/dhspublic/interweb/assets/library/OfB\\_CDFA\\_Crosswalk.pdf+fema+cfda+new&hl=en](http://64.233.161.104/search?q=cache:ejOq31ZSSAQJ:www.dhs.gov/dhspublic/interweb/assets/library/OfB_CDFA_Crosswalk.pdf+fema+cfda+new&hl=en)

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## **Organization and Use**

An objective of this guide is to reflect in, one document, recovery assistance and services available to disaster victims.

*Eligibility requirements may be more comprehensive or more restrictive than they appear to be in this guide. It is important, therefore, to obtain additional information about program eligibility from the program source.*

Program summaries are organized in two sections: (I) specific agency programs that exist for the express purpose of aiding disaster victims [disaster-specific programs] and (II) regular agency programs that may be applied to disaster recovery under special circumstances [disaster-applicable programs]. Section I program summaries include slightly more information than Section II programs, as reflected below. Inclusion of a program does not necessarily mean that assistance is available. Congress may authorize a program but may not appropriate funds for it in a given fiscal year. Current efforts of Congress and the Administration to streamline government also may result in the elimination of some of the programs or consolidation into larger block grants.

In Sections I and II, program summaries are organized alphabetically by title or subject where this is more helpful. *If needed, see Appendix Two for a crosswalk between program titles used in this publication and program titles in the CFDA.* As a further aid, summaries are indexed alphabetically as follows:

1. By the Federal or nonprofit agency that has primary responsibility for administration of the program
2. By assistance available, including Advisory and Counseling Services; Direct Payments; Donations; Education, Technical information, and Training; Formula Grants, Project and Other Grants; Loans; Sale of Goods or Property; Specialized Services; and Technical Assistance
3. By the category of recipient of assistance, as follows: Federal agencies, States, Localities, Nonprofit organizations (sometimes specified by category, such as universities or organizations that do the work of government), Businesses, and Individuals

Assistance to individuals may include funds for temporary housing for victims, individual and family grants to meet disaster-related expenses, and loans to individuals for repair or replacement of real and personal property. Funds may flow directly from the Federal Government to the individual, or from the Federal Government to the individual through a State or a subdivision of a State, or from a nonprofit organization to the individual.

Assistance to businesses (including farms and sole proprietorships) generally is made available when the ability to continue operations is terminated or impaired by a disaster. Such assistance may include loans or grants to replace livestock herds, restore damaged structures, or replace inventories.

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Assistance to public entities (States, localities, etc.) comprises measures such as repair or replacement of non-federally supported thoroughfares and water control facilities (e.g., dikes, irrigation works, levees, and drainage systems) and clearance of debris necessary to protect the public interest, it also includes repair or replacement of Federal buildings, State-supported schools, or public facilities in U.S. Trust Territories or on Native American lands. It includes loans to communities that have incurred substantial losses of tax and other revenue and the use of government-owned equipment, supplies, facilities, personnel, and other resources. Recipients of public assistance may include States, political subdivisions of States (counties or parishes), any type of organization under the aegis of a State agency, localities (municipalities, unincorporated towns, water control districts, etc.), U.S. Trust Territories or possessions, Indian tribes, universities, or other nonprofit organizations.