

November 2013



State of Vermont

Hazard Mitigation Plan

State of Vermont HAZARD MITIGATION PLAN

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EXECUTIVE SUMMARY

The increasing threat of natural and technological hazards requires that all governments consider mitigation activities to decrease their vulnerabilities. The State of Vermont has undertaken the process to make its citizens and infrastructure more resilient to disasters by updating the 2010 State of Vermont Hazard Mitigation Plan (HMP). The State of Vermont HMP identifies and ranks hazards faced in the state, vulnerabilities to these hazards at the state and local level, and mitigation strategies that will harden the state against disaster. In addition, the plan fulfills the requirements of the Federal Disaster Mitigation Act as administered by the Federal Emergency Management Agency (FEMA).

The development of this plan was guided by three overarching priorities. First, the State of Vermont HMP should be a source of information and guidance for local jurisdictions in completing their own HMPs. The State of Vermont Hazard Mitigation Committee consisted of representatives from Vermont Regional Planning Commissions (RPC) to advise the Committee on the needs and concerns of local jurisdictions. Additionally, the Committee placed an emphasis on providing detailed information, including tables and figures, which local jurisdictions could utilize when developing their own plans.

Second, the impacts of climate change will affect the severity and frequency of natural hazards and the State of Vermont must be prepared for these impacts. The State of Vermont Hazard Mitigation Committee included members of the University of Vermont who specialize in the impacts of climate change and assisted with ensuring that the proper information on climate change was included throughout the plan. Additionally, the mitigation strategies were developed to ensure that the State of Vermont was hardening itself against the increasing effects of climate change.

The third priority incorporated into the overall development of the plan was to ensure a partnership with private and public sector agencies. The State of Vermont understands that a great portion of the critical infrastructure in the state is operated and owned by private sector organizations, and to ensure a consistent approach to hazard mitigation, these partners must be involved in the planning process. Therefore, representatives from various private sector partners were asked for their input and information to use in the Risk and Vulnerability Assessment (Section 5) as well as the State of Vermont Mitigation Strategy (Section 6). For example, representatives from the Vermont Yankee Nuclear Power Plant reviewed the information provided in the Nuclear Power Plant Failure hazard profile to ensure its accuracy, and representatives from the Vermont Electric Power Company (VELCO) provided input on the mitigation strategies and Severe Winter Storms hazard profile.

Overall, the State of Vermont and its local jurisdictions understand the benefits of developing and implementing mitigation plans and strategies. Elected officials, public safety organizations, planners, and many others have worked together to update this HMP, proving that they have the vision to implement mitigation practices and reduce the loss of life and property in their communities.

Updates from the 2010 State of Vermont Hazard Mitigation Plan

The 2010 State of Vermont HMP has undergone extensive revisions to reflect the situation in the State of Vermont as of 2013. The major differences between the 2010 HMP and the 2013 HMP are listed below:

- The format of the State of Vermont HMP has been altered to allow for a streamlined presentation.
- Section 3: Profile of the State of Vermont has been added. This section includes information on the history, governmental organization, demographics, transportation infrastructure, and a capability assessment of the State of Vermont.
- The State of Vermont Hazard Mitigation Committee changed the names of the following hazards:

2010 State of Vermont HMP	2013 State of Vermont HMP
Flooding	Flooding and Fluvial Erosion
Winter Snow and Ice Storms	Severe Winter Storms
Hurricanes	Hurricanes/Tropical Storms
Extreme Heat	Extreme Temperatures
Terrorism and Civil Hazards	Terrorism
Epidemics and other Health Threats	Infectious Disease Outbreak
Infestations/Invasive Species	Invasive Species

- The State of Vermont Hazard Mitigation Committee elected to remove the following hazards:
 - Structural Fires
 - Shortages
- The State of Vermont Hazard Mitigation Committee elected to add the following hazards:
 - Rock Cuts
 - Nuclear Power Plant Failure
 - Severe Thunderstorms
 - Tornadoes
- The State of Vermont Hazard Mitigation Committee reviewed and revised the mitigation goals listed in the 2010 HMP. The seven goals have been reduced to five goals and are listed in Section 6: State of Vermont Mitigation Strategy.

- All updates to previous mitigation strategies are listed in Table 5-2: Mitigation Strategies, Objectives, and Action Items in Section 5 of this plan, State of Vermont Mitigation Strategy. Many new mitigation strategies have been added following outreach to multiple State agencies and private sector partners and these strategies have been labeled as “New in 2013”.

Section 1 INTRODUCTION

The impact of expected yet unpredictable natural and human-caused events can be reduced through more effective community planning and by adopting cost effective, preventive mitigation efforts for state infrastructure. The goal of this plan is to provide an all-hazards mitigation plan (HMP) to make Vermont communities more disaster-resilient. While the primary emphasis of this HMP is on natural hazards, several human-caused hazards are also addressed.

Hazard mitigation is any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. Based on the results of previous efforts, FEMA and state agencies have come to recognize that it is less expensive to prevent disasters than to repeatedly repair damage after a disaster has struck. This plan recognizes that communities have opportunities to identify mitigation strategies and measures during all phases of emergency management: preparedness, mitigation, response, and recovery. Hazards cannot be eliminated, but it is possible to determine what the hazards are, identify where the hazards are most severe, and identify local actions that can be taken to reduce the severity of the hazard.

Hazard mitigation lessens the impact of the hazard by eliminating or reducing the frequency of occurrence, averts the hazard by redirecting the impact by means of a structure or land treatment, adapts to the hazard by modifying structures or standards, or avoids the hazard by stopping, limiting, or relocating development. The State of Vermont HMO presents the hazards most likely to impact the state and a mitigation strategy to mitigate those hazards.

1.1 Authority and Scope

Section 409 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act Title 44 Code of Federal Regulations (CFR) as amended by Section 102 of the Disaster Mitigation Act of 2000 gives state and local governments the framework to evaluate and mitigate all hazards as a condition of receiving federal disaster funds. Under Section 409, a state was required to update its HMP following every Presidential emergency declaration.

The Disaster Mitigation Act of 2000 (Public Law 106-390 with Interim Final Rules 44 CFR Part 201 and 206) eliminated the update requirement following Presidential declarations. Since November 1, 2004, the Disaster Mitigation Act of 2000 requires that states review and update their plan, with FEMA approval, every three years. These regulations also provide specific requirements for the contents of the plan, which the state must have to obtain FEMA approval. There are two levels of criteria contained within these regulations: standard and enhanced. The State of Vermont has developed a standard State HMP.

1.2 Purpose

The purpose of the State of Vermont HMP is to help local governments identify all hazards facing their community and establish strategies to begin reducing risks from identified hazards.

Section 1

The plan is also intended to better integrate and consolidate efforts of state agencies with those of regional and local government as well as efforts of quasi-governmental organizations such as Regional Planning Commissions (RPCs).

1.3 Adoption by the State of Vermont

The State of Vermont HMP will be adopted under the provisions of Vermont Title 3, Chapter 67, Section 4020(b) (State agency planning and coordination). Appendix O provides an approved signed copy of the adoption letter. This paragraph provides for two public hearings to be noticed at least 30 days prior to the public hearings. Specific notice is required to be given to:

- Executive director of each Regional Planning Commission
- Agency of Administration
- Agency of Commerce and Community Development (ACCD)
- Vermont Agency of Natural Resources (ANR)
- Vermont Agency of Transportation (VTrans)
- Business, conservation, low-income, advocacy, and other community or interest groups or organizations that have requested notice prior to the date the hearing is warned.

Any of the aforementioned bodies or their representatives may submit comments on the plan, and may appear and be heard in any proceeding with respect to the content of the plan.

Prior to submission for approval and subsequent updates, the state will ensure that all aspects of the State of Vermont HMP are in accordance with federal statutes and regulations regarding grant funding, in compliance with 44 CFR Section 13.11 (c) and Section 13.11 (d).

The director of the Vermont Division of Emergency Management and Homeland Security (DEMHS) and those partner agencies with primary implementation responsibilities will endorse the State of Vermont HMP. The Governor's Authorized Representative (GAR) will adopt the plan on behalf of the State of Vermont. Immediately following the State of Vermont adoption, the State of Vermont HMP will be submitted to FEMA for formal approval.

2.1 Overview of Planning Process

The Vermont Division of Emergency Management and Homeland Security (DEMHS) led the effort to update the current State of Vermont Hazard Mitigation Plan (HMP) for 2013. The overall process involved multiple planning meetings; reviewing and compiling information from jurisdiction hazard mitigations plans; reviewing and updating selected hazards, including the update of hazard maps and figures; and determining the status of previous mitigation action items and creating new mitigation action items in accordance with new or developing threats.

This approach follows the Federal Emergency Management Agency (FEMA) Hazard Mitigation Protocol:

- Gather initial available data.
- Gather additional relevant data.
- Analyze interview information and all pertinent data gathered according to FEMA Hazard Analysis Protocol.
- Produce draft HMP with recommendations and supporting data.
- Obtain feedback from State of Vermont Hazard Mitigation Committee members.
- Prepare the final HMP.
- Submit draft to FEMA for initial review.
- Obtain comments and suggestions from nongovernmental organizations (NGOs), environmental, business, and civic groups.
- Incorporate FEMA comments and recommendations.
- Incorporate comments from NGOs and environmental, business, and civic groups, if input is provided in an appropriate forum.
- Adopt the plan.
- Obtain FEMA approval.

During the development of the plan, Vermont followed these six steps in the Risk and Vulnerability Analysis:

1. Determine past hazards.
2. Determine possible future hazards.
3. Determine likely hazards.
4. Determine community vulnerability (human and economic) for each hazard. Each identified hazard was analyzed with respect to the following criteria:

Section 2

- a. Probability of occurrence
 - b. Effect of the potential disaster on people and property
 - c. Predictability of the hazard
 - d. Frequency of occurrence
 - e. Speed of onset of the potential disaster
 - f. Duration of the disaster
 - g. Scope and intensity of the potential disaster
 - h. Controllability of the incident
 - i. Protective action options
5. Determine any in-place or planned hazard reduction or mitigation efforts.
 6. Make recommendations.

2.1.1 State of Vermont Hazard Mitigation Committee

The State of Vermont Hazard Mitigation Planning Committee was tasked with the development and completion of the HMP as required per federal guidelines. The goal of the Committee was to provide a comprehensive review of the previous HMP and work together to update all pertinent information. Representatives from the State of Vermont Hazard Mitigation Committee are listed below and represent a number of State of Vermont departments and agencies, local representation, and private sector partners. Each member of the Committee was tasked to provide updated information for parts of the plan that pertained to their department or agency's purpose. For example, representatives of the Vermont Agency of Transportation (were tasked to develop mitigation action items that would mitigate the impact of flooding on roadways. Members of the Agency of Natural Resources (ANR) were asked to summarize the impact of Tropical Storm Irene on the state's river corridors or to determine the impact an earthquake would have on the State's capabilities.

Table 2-1
State of Vermont Hazard Mitigation Committee Members

Committee Members	Agency
Alec Portalupi	Agency of Transportation
Daniel Baker	University of Vermont
Josh Hanford	Agency of Commerce and Community Development
Karen Horn	Vermont League of Cities and Towns
Kari Dolan	Agency of Natural Resources - Department of Environmental Conservation
Kate Hammond	Vermont Division of Emergency Management and Homeland Security

Committee Members	Agency
Kelly Hamshaw	University of Vermont
Kevin Geiger	Representative of Regional Planning Commissions
Laurence Becker	Agency of Natural Resources - Department of Environmental Conservation- State Geologist
Lesley-Ann Dupigny-Giroux	University of Vermont - State Climatologist
Michael Clasen	Agency of Administration
Mike Batcher	Representative of Regional Planning Commissions
Mike Kline	Agency of Natural Resources - Department of Environmental Conservation
Milly Archer	Vermont League of Cities and Towns
Misha Bailey	Vermont Division of Emergency Management and Homeland Security
Ray Doherty	Vermont Division of Emergency Management and Homeland Security
Rob Evans	Agency of Natural Resources - Department of Environmental Conservation
Steve Hamshaw	University of Vermont
Tim Bouton	Representative of Regional Planning Commissions

The State of Vermont Hazard Mitigation Committee also provided the time line to which the HMP would be updated.

**Table 2-2
State of Vermont Hazard Mitigation Plan Update Time Line**

Task	Date
Conduct kickoff meeting	June 12, 2012
Review of current FEMA-approved State of Vermont Hazard Mitigation Plan (HMP)	July 6, 2012
Update and develop base list of hazards	July 27, 2012
Conduct risk assessment	July 27, 2012
Conduct two working group sessions with key state agencies	Week of July 30, 2012
Conduct public meeting (if scheduled the same week as the working group sessions)	Week of July 30, 2012
Update risk assessment	August 13, 2012
Conduct risk assessment review meeting	August 22, 2012
Conduct 2nd public meeting (if scheduled at same time as mitigation strategies review meeting)	Week of September 17, 2012
Conduct mitigation strategies review meeting	Week of September 17, 2012

Section 2

Task	Date
Conduct working group meeting for mitigation strategies and goals	December 13, 2012
Conduct draft updated State of Vermont HMP meeting and review additional information needs	January 10, 2013
Conduct meeting with VT Department of Environmental Conservation (DEC) to collect additional mitigation strategies	March 8, 2013
Upload draft updated State of Vermont HMP to SharePoint site	March 13, 2013
Conduct review session with project team to review draft updated State of Vermont HMP	March 21, 2013
Receive all comments on first draft updated State of Vermont HMP	March 27, 2013
Deliver second draft updated State of Vermont HMP	April 26, 2013
Final Draft Updated State of Vermont HMP for FEMA submittal	May 17, 2013
Revise final draft updated State of Vermont HMP	August 2013
Final Plan	November 1, 2013

2.2 Coordination among Agencies

The State of Vermont Hazard Mitigation Committee made every effort to incorporate State, NGO, private sector, and local jurisdiction partners into the planning process. This was done by inviting individuals to be on the State of Vermont Hazard Mitigation Committee, sending the draft plan directly to certain agencies, and posting the plan online for public comment. More details for the coordination of information retrieval and dissemination may be found in the subsections below.

2.2.1 State Agency Coordination

The main agency for coordination of the mitigation planning process is the Vermont Division of Emergency Management and Homeland Security (DEMHS). DEMHS is responsible for all aspects of mitigation planning, including the State of Vermont Hazard Mitigation Committee. Other state agencies are responsible for certain aspects of mitigation planning and are therefore invited to sit on the State of Vermont Hazard Mitigation Committee. Each agency's responsibilities for mitigation planning:

- **The Agency of Administration** shall provide administrative support through the office of the Governor's Authorized Representative (GAR). The agency will appoint a member to the State of Vermont Hazard Mitigation Committee, who may also serve as a member of the Hazard Mitigation Grant Review Subcommittee (HMGRS).
- **The Agency of Natural Resources (ANR), DEC, Rivers Management Program** shall provide guidance and technical assistance relating to flood plain management programs and projects governed by rules from the National Flood Insurance Program through the state office of the National Flood Insurance Program Coordinator. The Program's River Management Engineers will provide technical assistance for the Hazard Mitigation Grant

Program, Flood Mitigation Assistance, and Pre-Disaster Mitigation-Competitive projects. In addition, ANR will support mitigation through the expertise of the State Geologist, River Scientists, and the River Management Alteration Engineers with technical assistance on structural mitigation projects and on river corridor protection, management, and restoration projects as needed. ANR provides financial and technical support and state funding through Ecosystem Restoration Program capital appropriations. This funding has been used to leverage federal funding through FEMA, US Department of Agriculture (USDA) and the Environmental Protection Agency (EPA) to finance fluvial geomorphic assessments, fluvial erosion hazard (FEH) area mapping, development of river corridor protection plans, and implementation of river corridor protection and restoration projects. ANR administers a FEH program that works with and encourages communities to enhance the level of river corridor and floodplain protection to mitigate flood and FEH. ANR is building a statewide river corridor lands conservation infrastructure in partnership with the VT Housing & Conservation Board, the VT Land Trust, the VT Rivers Conservancy, and other local and regional organizations. DEC and the State Geologist provide detailed technical studies and develop protocols regarding earthquake and landslide hazard areas. The VT DEC River Management Engineers serve a critical mitigation role in post-flood recovery operations by serving in the field working with local governments, state agencies and landowners to ensure that pre-flood hazard conditions are not re-established or exacerbated, but are reduced or eliminated. Major impediments to this effort are the very limited resources available to address all existing needs. Even when floods affect a limited regional area impacting a small number of towns, available river engineering resources are stretched to the limit. The expertise available to support a comprehensive mitigation response and role in flood recovery operations after a major statewide flood or after a flood involving several counties is very constrained and limited due to insufficient resources.

- ANR will appoint at least one member to the State of Vermont Hazard Mitigation Committee, who may also serve as a member of the Grant Selection subcommittee.
- Support is being provided by ANR for landslide, drought, earthquake, and hurricane risk assessments. The HAZUS-MH program is being utilized to run forecasts for hurricane and flood damage projections in select areas of the state.
- **The Vermont Agency of Transportation (VTTrans)** shall provide engineering and design support for projects that involve the transportation systems of the state. The agency will appoint at least one member to the State of Vermont Hazard Mitigation Committee, who may also serve as a member of the HMGRS.
- **The Agency of Agriculture** shall provide guidance and impact information for projects that involve the agricultural industry of the State. The agency will appoint at least one member to the State of Vermont Hazard Mitigation Committee.
- **The Agency of Human Services (AHS)** shall provide guidance and programmatic advice for projects that involve mitigation activities affected individual properties. The agency will appoint at least one member to the State of Vermont Hazard Mitigation Committee.
- **The Vermont Department of Health (VDH)** shall provide guidance for mitigation measures, which may affect public health and prevent the spread of disease. The agency will appoint at least one member to the State of Vermont Hazard Mitigation Committee.

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- **The Department of Banking, Insurance, Securities & Health Care (BISHCA)** shall provide guidance and expertise concerning insurance issues relating to disaster-impacted communities, individuals and businesses. The agency will appoint at least one member to the State of Vermont Hazard Mitigation Committee.
- **Agency of Commerce and Community Development (ACCD)** will coordinate, support, and where appropriate, provide funding for Hazard Mitigation and Disaster Recovery projects. The Agency will work in partnership and coordinate with the regulatory agencies on projects that change land use or support new growth and development. ACCD's long-standing priority to encourage smart growth and development in existing village and town centers, supports many of the statewide strategies for avoiding future hazards and protecting existing infrastructure. The Agency will also participate in future resilience planning and climate change policy. The agency may appoint at least one member to the State of Vermont Hazard Mitigation Committee, who may also serve as a member of the HMGRS. This agency's role was previously held by the Department of Economics, Housing & Community Affairs (DHCA).
- **The Department of Buildings and General Services (BGS)** shall provide technical assistance in matters concerning state-owned buildings. The agency will appoint at least one member to the State of Vermont Hazard Mitigation Committee, who may also serve as a member of the HMGRS.
- **The Vermont League of Cities & Towns (VLCT)** represents the interests of communities statewide and is a new member of the Hazard Mitigation Committee.

Personnel will be provided as required from the participating State Agencies as follows:

- **The GAR** will be the Secretary of Administration or Deputy Secretary of Administration unless otherwise specified. The GAR shall have the overall responsibility for compliance with the provisions of Federal Disaster Assistance, including participation in grants under Section 404.
- **The State Hazard Mitigation Officer** shall be the person selected to implement state hazard mitigation policy. The State Hazard Mitigation Officer will be responsible for coordinating all hazard mitigation activities under Sections 404 and 409 of PL 100-707. This position is located at The Vermont DEMHS.
- **State of Vermont Hazard Mitigation Committee (State of Vermont Hazard Mitigation Committee)** members shall be invited from participating state, local, and private agencies willing and able to provide expertise to mitigating disaster damages.
- **HMGRS** members shall be appointed by appropriate state agencies to assist in the review and evaluation of Pre-Disaster Mitigation-Competitive (PDM-C), Flood Mitigation Assistance (FMA) and Hazard Mitigation Grant Program (HMGP) project applications.

2.2.2 Nongovernmental Agency Coordination

A wide variety of nonprofit, environmental, business and civic organizations were contacted to provide input and comments on the original State Plan draft. These organizations were invited to provide comments during the Public Review phase for the original Plan. Organizations contacted

include: VLCT, White River Partnership, Lake Champlain Committee, Vermont Natural Resources Council, Nature Conservancy of Vermont, Vermont Local Roads Program, VELCO, and others. These organizations were invited to review and comment on the State Plan draft by sending it to them directly. Their remarks were taken into account for the final draft, especially in those sections involving policy recommendations and environmental impact of mitigation measures.

Parties were provided a copy of the current plan and were given an opportunity to submit written comments. Written comments and suggestions were reviewed by the State Hazard Mitigation Officer and members and were given due consideration in the overall update process.

2.2.3 Improvements in Coordination Since 2010

Interagency coordination pertaining to mitigation has improved significantly in the period covering the years 2010 through 2013. After the spring flooding events in 2011 and Tropical Storm Irene, even closer cooperation was established between DEMHS and state and local partners. The VLCT and the Vermont Housing and Conservation Board (VHCB) played a more active role in the activities of the State of Vermont Hazard Mitigation Committee. In 2012, VLCT and VHCB efforts were directed at assisting with proposed home acquisitions to be funded under the HMGP program.

Every effort is made to include comments and feedback from other State agencies for various mitigation initiatives. DEMHS's State Hazard Mitigation Officer has assumed a more proactive protean role and endeavors to assist local communities with mitigation projects as much as possible. More frequent meetings have taken place among state and regional partners as well as between DEMHS and local Vermont communities in high hazard areas. The State Hazard Mitigation Officer conducts annual workshop training sessions for prospective mitigation grant applicants and also assists in training of new town officials.

In January 2012, the proposed changes in incentives for the Emergency Relief and Assistance Fund (ERAF) were submitted for consideration to the state legislature. From October 2006 through February 2007, numerous State and regional agencies were allowed to submit written comments and suggestions for updates to the incentives list in the ERAF rule, located in Appendix B: ERAF Revised Incentives List. The ERAF incentives are related to the State providing increased cost share funding to local communities for Public Assistance projects; communities would receive greater than the usual 12.5 percent cost share if they achieved certain mitigation requirements. The incentives list is provided to each community prior to any disaster; towns are encouraged to attain various checklist items such as National Flood Insurance Program (NFIP) membership, having an approved local mitigation plan, membership in the NFIP Community Rating System, meeting State road and bridge standards, having a Rapid Response Plan, adopting a highway access (curb cut) policy, and having a local Emergency Operations Plan. DEMHS's State Hazard Mitigation Officer coordinated the overall effort pertaining to ERAF incentives updates. Various comments and proposals were taken into consideration by DEMHS staff and management before a final list of draft recommendations was forwarded to the Vermont Agency of Transportation (VTrans) and the Secretary of Administration in April 2007. In October 2012, the ERAF incentives were adopted and approved by the state legislature. From 2010 through 2013, FEMA Region 1 continued its support for Vermont's mitigation efforts by having a staff member attend regular meetings of the State of Vermont Hazard Mitigation

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Committee and project selection meetings for HMGP and PDM-C grant applications. FEMA has also deployed Region 1 staff to Vermont periodically to deal with specific mitigation issues and challenges.

Two additional DEMHS mitigation staff members were hired in the fall of 2012 to assist the State Hazard Mitigation Officer. The additional mitigation staff will allow DEMHS to significantly improve outreach and technical assistance to towns, state agencies, and regional planning commissioners (RPC).

DEMHS also works more closely with other state agencies and RPC's in larger statewide efforts. For example, there were coordinated efforts in 2006, 2008, and 2009 to submit a PDM-C Planning grant proposal to aid Vermont communities in completing local and multijurisdictional mitigation plans. These proposals also facilitate the ongoing fluvial (riverine) erosion hazard studies and recommendations, which were initiated by the ANR in 2004. These PDM-C state planning proposals were selected for funding in 2007, 2008 and 2009 by the FEMA National Review panel.

In 2011 and 2012, DEMHS also established firmer working relationships with the U.S. Army Corps of Engineers (USACE) through the silver jackets initiative. This resulted in funding of flood studies in the Ottauquechee River corridor, as well as funding for incident action plans for Vermont towns with high hazard dams. Also in 2011-2012, DEMHS established links with the University of Vermont (UVM) for climate change and global warming studies, to forecast future impacts on natural disasters. UVM staff also helped determine mobile home park vulnerabilities in known flood zones. In the period covering 2010-2013, DEMHS, DEC coordinated response and warning efforts regarding the landslide events in Cambridge near Smugglers' Notch. In January and February of 2007, DEMHS's State Hazard Mitigation Officer and DEMHS's Director helped coordinate the statewide effort to monitor dangerous ice jams along the Winooski River in Montpelier. In January 2010, DEMHS's State Hazard Mitigation Officer closely monitored an inchoate ice jam along the Winooski River in Montpelier, which dissipated after a few hours. DEMHS also worked closely with the City of Montpelier and a private engineering firm in preparing an HMGP grant application to mitigate recurring ice jams in the capital city; the grant was subsequently awarded. Partners participating in this collaborative effort included DEMHS, ANR, VT Agency of Administration, USACE, USACE Cold Weather Research Laboratory, VT National Guard, FEMA Region 1, Montpelier's Public Works Department, and the City of Montpelier Police Department. DEMHS intends to replicate this proactive multi-agency approach in dealing with future natural hazards in Vermont. FEMA also indicated that it would publicize Vermont's response to the ice jam threat as part of its "best practices" on the FEMA website.

2.3 Program Integration

2.3.1 FEMA Programs

Planning and project requirements for state HMGP, PDM-C, FMA, and local plans) are consolidated. For example, a common criterion has been established for judging the potential eligibility of mitigation applications before the State of Vermont Hazard Mitigation Committee. Applications are ranked according to how well the following issues are addressed: type of

infrastructure, benefit-cost ratio, practical engineering solution, effectiveness of mitigation strategy, severity of repeated loss and its effect on the local community, history of repetitive loss, economic impact on local towns, etc. The state's mitigation selection criteria was revised and updated by DEMHS in 2008, 2009, 2011, and 2012 to better reflect the state's priorities, strategies, goals, and objectives. The state's HMGP application was also revised in 2012 to better reflect current mitigation strategies, goals, and objectives in emphasizing prevention.

The DEMHS was notified on April 7, 2010, that Vermont is compliant with the 64 listed criteria for the Emergency Management Accreditation Program (EMAP). Many sections of State of Vermont HMP were deemed exemplary by the EMAP national review team, reflecting best practices for mitigation.

2.3.2 National Flood Insurance Program

The NFIP is the only practicable source of flood insurance for property in Vermont. Currently, 87 percent of Vermont municipalities participate in the NFIP. Most of the non-participating communities are in very low population areas with limited social capital or limited areas mapped as Special Flood Hazard Areas.

Rob Evans with the DEC Rivers Program is the NFIP coordinator for Vermont. The Vermont NFIP works with sister state agencies including DEMHS and the Department of Financial Regulation, as well as with the RPCs, participating municipalities, and the FEMA Region 1 Floodplain Management and Insurance Branch in Boston.

Based on current best available data in Vermont, around 8,000 structures are already exposed to flooding with a 1 percent annual chance or greater. Of these structures, two-thirds do not have flood insurance.

Since the previous plan in November 2010, six communities have joined the NFIP (Baltimore, Essex Junction Village, Granby, Halifax, Isle la Motte, and Peacham). Subsequent to the 2011 Disaster Declarations, FEMA directed Joint Field Office staff to contact non-participating communities and be sure they were aware of the opportunity. Thirty-six communities do not participate at this time. Three are currently working to adopt flood hazard bylaws and prepare applications.

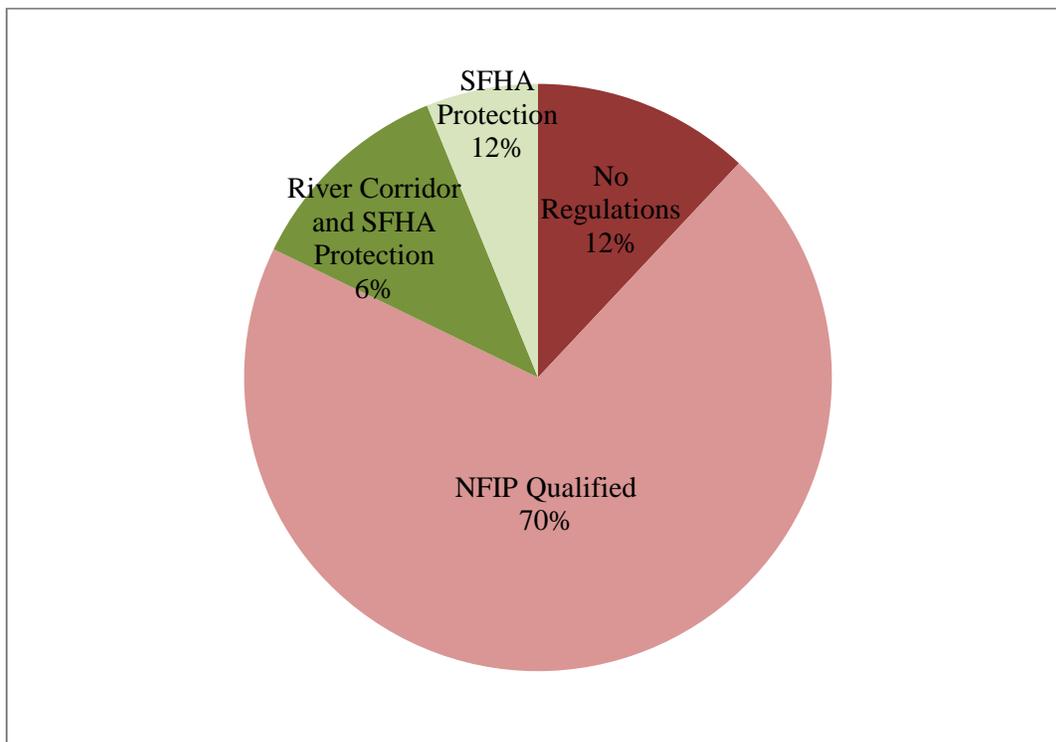
Currently, an average flood insurance premium in Vermont is \$1,400 a year to insure \$170,000 in value. In 2008, the NFIP was \$20 billion dollars in deficit after insurance claims punctuated by Hurricanes Katrina, Rita, and Ike. Since that time, additional costs were incurred by Hurricanes Irene and Sandy. With the Biggert-Waters NFIP Reform Act of 2012, Congress enacted changes to the NFIP to eliminate subsidies built into the program, pay off accumulated debt, and build a catastrophic reserve fund. An analysis by a private insurance industry group Property Casualty Insurance Association of America estimates private market actuarial rates for flood insurance to be over \$3,000 for \$170,000 value. This will change the cost of insurance from roughly one and half mortgage payments per year to roughly three. This may reduce the insurance take up rates and the willingness of owners and renters to maintain flood insurance policies in the next few years.

To better protect public safety, historic structures, and investments in flood hazard areas a number of communities have adopted non-encroachment standards in their flood hazard and river corridor areas. At this time, 17 percent have some form of these avoidance-based bylaws.

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In 2012, the Vermont Legislature adopted Act 138 establishing the Flood Resilient Communities Program and establishing incentives for municipalities to join the NFIP, adopt an HMP, and avoid new encroachments into river corridors.

Figure 2-1: Municipal Hazard Area Regulations in Vermont (4/2013)



So far, hazard area bylaw updates have mostly occurred in tandem with updated Flood Insurance Rate Maps (FIRM). While addressing flood hazard area regulation is important, it is seldom perceived as an inviting or urgent priority at the municipal level. When new FEMA FIRMs become official/effective, all communities that participate in the NFIP must update their flood hazard area bylaws ahead of that date. The FIRM update process has been a key driver of bylaw updates. After the Bennington County Digital FIRM becomes effective in 2013, the pace of municipal action will likely slow greatly. In the next few years, the impetus to change municipal regulations are likely to be primarily influenced by the extent that the incentives associated with the Flood Resilient Communities Program are known and meaningful to municipal officials.

2.3.3 Program Integration with Local Jurisdictions

The State Hazard Mitigation Officer and DEMHS Planning Division representatives work closely with RPCs, providing technical support in the design phases of regional and local mitigation planning. In coordination with other state agencies, DEMHS also assists the RPCs in identifying potential problem locations such as roads, bridges, culverts, designated flood zones, landslide areas, etc., to identify and prioritize pre-disaster mitigation efforts. DEMHS will recommend changes to update regional and local mitigation planning efforts when necessary. Every two or three weeks, the State Hazard Mitigation Officer spends at least one day in the field, meeting with town officials, highway department managers, emergency management

officials, and/or RPC personnel, soliciting input, and gathering information to better coordinate and integrate pre-disaster mitigation efforts. These regular field trips also help identify goals and priorities common with other State mitigation efforts. Once information has been gathered and analyzed DEMHS makes recommendations to local towns concerning the appropriate mitigation solution, which may include an application for the PDM-C or FMA programs. After field visits, DEMHS may make recommendations to towns and RPCs concerning potential problem areas and possible remedial action, and may propose amendments to regional and local mitigation plans.

Beginning in 2010-2011, there was greater input provided by the VLCT pertaining to mitigation proposals and state initiatives. VLCT has been a valuable partner in providing a bridge between the state and local communities, particularly regarding new policy changes and statutes involving mitigation incentives, such as the ERAF.

2.3.4 Mitigation Program Integration with DEMHS Resource Database

DEMHS's Planning Division has developed the Vermont Emergency Planning and Resource Database (VEPARDS) to better coordinate and integrate emergency response, recovery, and mitigation efforts statewide. This database is currently operational in the emergency operations center (EOC) at DEMHS. The VEPARDS database was updated in 2009-2010 to help track critical facilities and other vulnerable areas. This comprehensive database lists key persons, resources, equipment, facilities, and locations throughout the state. The database is linked to towns, Local Emergency Planning Committees, emergency managers, police and fire departments, regional planners, and state officials, and provides real-time tracking of resources during a disaster. In the aftermath of a disaster, the database will be useful in identifying those areas most in need of post-disaster assistance and follow-up mitigation efforts. In addition, the Emergency Resource Database is available to better integrate pre- and post-disaster mitigation efforts by DEMHS, ANR, other state agencies, towns, and NGOs such as the Red Cross, Vermont Center for Geographic Information, et al. Some challenges to program integration include personnel changes and reassignments in various state and local agencies.

Beginning in 2007, completed mitigation projects were included as a cross reference in the VEPARDS database. This is designed to permit easy access to mitigation information during EOC activations and state response efforts pertaining to local disasters. In 2010, VEPARDS was updated to include the most recent mitigation projects as well as critical facilities such as schools, hospitals, power utilities, etc. In 2009-2010, DEMHS received assistance from the Vermont Center for Geographic Information (VCGI) to help coordinate the database update endeavor. We anticipate that this database update effort will continue in the 2013-2016 timeframe and beyond.

In 2012, many local mitigation plans were linked to DEMHS' DisasterLan portal, allowing easy access for town officials to plans during emergencies and afterwards.

Ideally, the end result of these integrated mitigation efforts will be projects that are better able to withstand the often-harsh climatic conditions prevailing throughout the state.

2.3.5 Other Program Integration Initiatives

The State of Vermont HMP has been integrated with planning initiatives in many state agencies, including DEMHS, Department of Public Safety (DPS), ANR, ACCD, VTrans, BGS, AHS, and several state boards and commissions. These planning initiatives include basin planning, river corridor planning, emergency services, land use, and transportation planning. While coordination has been established in many cases, this plan will serve to recommend potential areas of further integration to state agencies within Vermont as well as RPCs and other appropriate parties such as FEMA. These initiatives are designed to create a comprehensive, all-inclusive approach to reducing losses from natural and human-caused disasters throughout the state.

From 2010 through 2013, the State Hazard Mitigation Officer coordinated interagency meetings to address localized hazard events to mitigate future damages. Within the past several years, DEMHS, ANR, VTrans, and other partners have met in response to landslides in Hardwick and Montpelier in 2005, rockslides near Smugglers' Notch in 2006, and ice jams in Montpelier in 2010 and 2012. DEMHS, ANR, VTrans, and local partners have also met to address the chronic flooding/fluvial erosion situation in the towns of Brattleboro, Bennington, Ripton, and Waitsfield. The VT DEC Rivers Program Rivers Program team has taken the lead in formulating strategy for effective flood mitigation plans in these three towns and elsewhere, coordinating efforts with local community and regional partners. A PDM-C FY 09 planning grant has allowed the VT DEC/Vermont Geological Survey to develop a landslide protocol that can be used to identify areas sensitive to landslide hazards in Vermont. The report can be viewed at: <http://www.anr.state.vt.us/dec/geo/hazinx.htm> and in Appendix C: Protocol for Identification of Areas Sensitive to Landslides in Vermont.

Routinely, mitigation projects involving road, bridge, and culvert upgrades are coordinated with efforts of VTrans and DEC River Management Engineers. VTrans has a particular expertise and proven track record concerning these types of infrastructure projects; therefore, VTrans' advice is often solicited in the final mitigation design and implementation phase of select projects, particularly those involving federal highway/transportation funds. DEC provides a critical supporting role in the design and implementation of transportation infrastructure, flood recovery, and mitigation projects that must interface with fluvial dynamics to help ensure that public investments are made effectively and wisely.

Section 3

PROFILE OF THE STATE OF VERMONT

3.1 History

Vermont was an independent republic before joining the Union¹. Between 1777, when Vermont established its independence, and 1791, when Vermont joined the Union as the 14th state, Vermont was truly independent - with its own coins and its own postal service. French explorer Samuel de Champlain came to Vermont in 1609 guided by Algonquin Indians from Canada. He claimed northern Vermont for France. The French built the first fort in Vermont at Isle LaMotte and established other smaller settlements. When the British won the French and Indian War in 1763, the territory became part of what is now New England.

The first British settlement was at Fort Dummer (near Brattleboro), built as a defense against the French and their Indian allies. After the French and Indian War, the English began to settle the territory, which became known as the New Hampshire Grants but was also claimed by New York.

Since both New York and New Hampshire claimed Vermont, many settlers who received land from the New Hampshire government found that other settlers were given the same land from the New York government. In 1775, the Green Mountain Boys formed to defend the New Hampshire land grants against the New Yorkers. Ethan Allen, one of Vermont's founders, led this army until the British captured him.

The Green Mountain Boys became famous for their role in the American Revolution at the battles of Hubbardton and Bennington in 1777. After these battles, the Green Mountain Boys returned home and declared Vermont an independent republic. In 1790, New York consented to the admission of Vermont into the Union (for a payment of \$30,000) and stated the New York-Vermont boundary should be the mid-channel of Lake Champlain.

In 1791, 14 years after declaring independence, Vermont became the 14th state and the first state to join the Union after the original 13 colonies.

3.2 Demographics

Currently, Vermont is the sixth smallest state and the second least populated state. The population of Vermont at the 2010 census was 625,741. The estimate for 2012 shows a small decrease to a population of 625,011. This small population accounts for approximately 67 people per square mile. The median household income for the state sits just above the average for the United States at \$53,422.

¹ State of Vermont Secretary of State, "History," <http://www.sec.state.vt.us/kids/history.html>

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The following statistical data from the U.S. Census Bureau represents the demographics of the State of Vermont.

**Table 3-1
Demographics²**

Category	Vermont	United States
People QuickFacts		
Population, 2012 estimate	626,011	313,914,040
Population, 2011 estimate	626,592	311,587,816
Population, 2010 (April 1) estimates base	625,741	308,747,508
Population, percent change, April 1, 2010 to July 1, 2012	Z	1.7%
Population, percent change, April 1, 2010 to July 1, 2011	0.1%	0.9%
Population, 2010	625,741	308,745,538
Persons under 5 years, percent, 2011	5.0%	6.5%
Persons under 18 years, percent, 2011	20.1%	23.7%
Persons 65 years and over, percent, 2011	15.0%	13.3%
Female persons, percent, 2011	50.7%	50.8%
White persons, percent, 2011 (a)	95.5%	78.1%
Black persons, percent, 2011 (a)	1.1%	13.1%
American Indian and Alaska Native persons, percent, 2011 (a)	0.4%	1.2%
Asian persons, percent, 2011 (a)	1.4%	5.0%
Native Hawaiian and Other Pacific Islander persons, percent, 2011 (a)	Z	0.2%
Hispanic or Latino Origin persons, percent, 2011 (b)	1.6%	16.7%

² U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, American Community Survey, Census of Population and Housing, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report

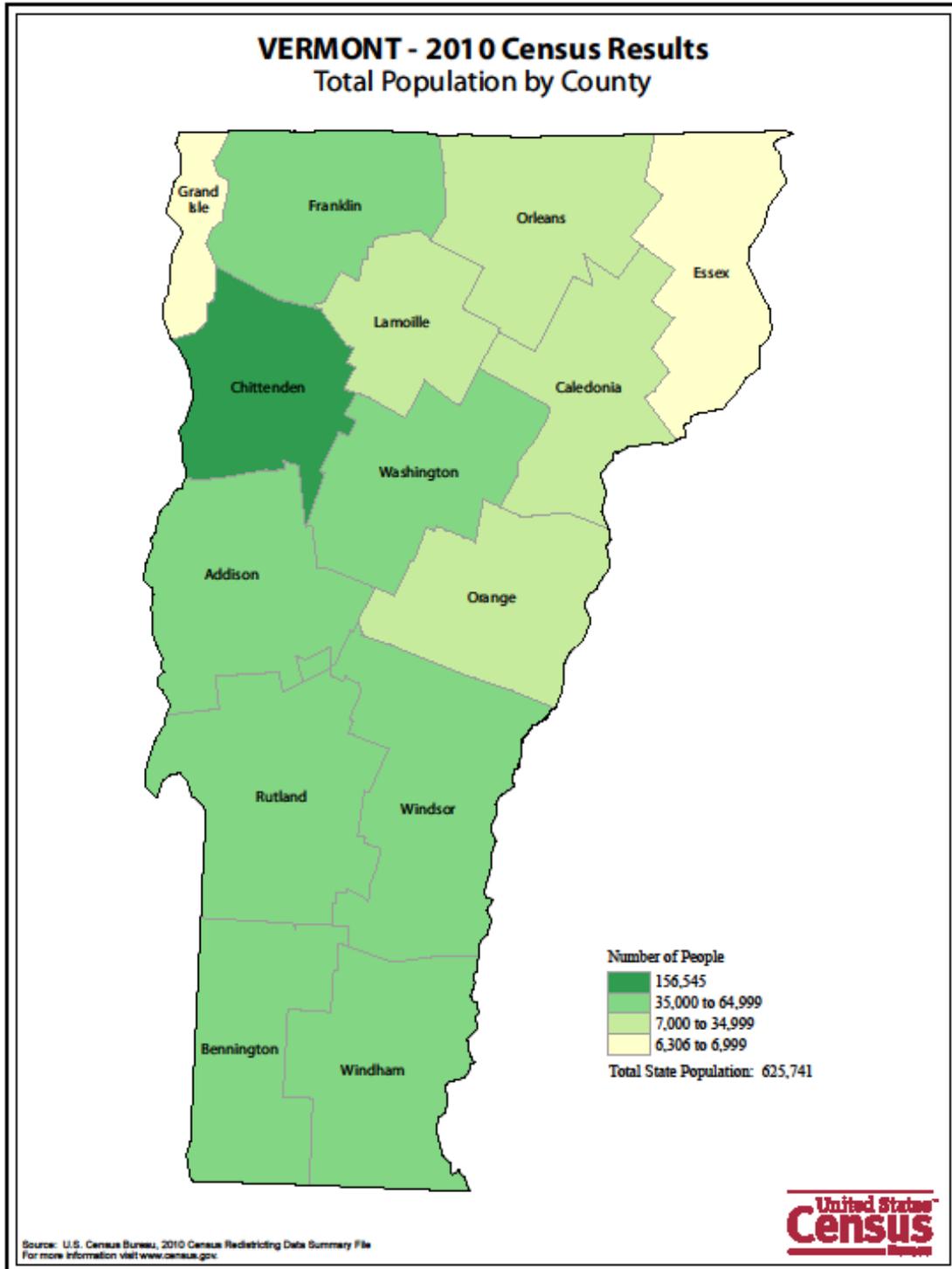
PROFILE OF THE STATE OF VERMONT

Category	Vermont	United States
White persons not Hispanic, percent, 2011	94.2%	63.4%
Persons reporting two or more races, percent, 2011	1.7%	2.3%
Living in same house 1 year & over, percent, 2007-2011	86.2%	84.6%
Foreign born persons, percent, 2007-2011	3.9%	12.8%
Language other than English spoken at home, percent age 5+, 2007-2011	5.2%	20.3%
High school graduate or higher, percent of persons age 25+, 2007-2011	91.0%	85.4%
Bachelor's degree or higher, percent of persons age 25+, 2007-2011	33.8%	28.2%
Veterans, 2007-2011	51,981	22,215,303
Mean travel time to work (minutes), workers age 16+, 2007-2011	21.7	25.4
Housing units, 2011	324,389	132,312,404
Homeownership rate, 2007-2011	71.4%	66.1%
Housing units in multi-unit structures, percent, 2007-2011	23.0%	25.9%
Median value of owner-occupied housing units, 2007-2011	\$213,000	\$186,200
Households, 2007-2011	256,711	114,761,359
Persons per household, 2007-2011	2.34	2.6
Per capita money income in the past 12 months (2011 dollars), 2007-2011	\$28,376	\$27,915
Median household income, 2007-2011	\$53,422	\$52,762
Persons below poverty level, percent, 2007-2011	11.3%	14.3%
Business QuickFacts		
Private nonfarm establishments, 2010	21,451	7,396,628
Private nonfarm employment, 2010	264,099	111,970,095
Private nonfarm employment, percent change, 2000-2010	4.2	-1.8
Nonemployer establishments, 2010	59,945	22,110,628
Total number of firms, 2007	78,729	27,092,908

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Category	Vermont	United States
Black-owned firms, percent, 2007	S	7.1%
American Indian- and Alaska Native-owned firms, percent, 2007	0.5%	0.9%
Asian-owned firms, percent, 2007	0.8%	5.7%
Native Hawaiian and Other Pacific Islander-owned firms, percent, 2007	S	0.1%
Hispanic-owned firms, percent, 2007	0.6%	8.3%
Women-owned firms, percent, 2007	26.0%	28.8%
Manufacturers shipments, 2007 (\$1000)	10,751,461	5,338,306,501
Merchant wholesaler sales, 2007 (\$1000)	5,121,694	4,174,286,516
Retail sales, 2007 (\$1000)	9,310,119	3,917,663,456
Retail sales per capita, 2007	\$15,005	\$12,990
Accommodation and food services sales, 2007 (\$1000)	1,367,630	613,795,732
Building permits, 2011	1,299	624,061
Geography QuickFacts		
Land area in square miles, 2010	9,216.66	3,531,905.43
Persons per square mile, 2010	67.9	87.4

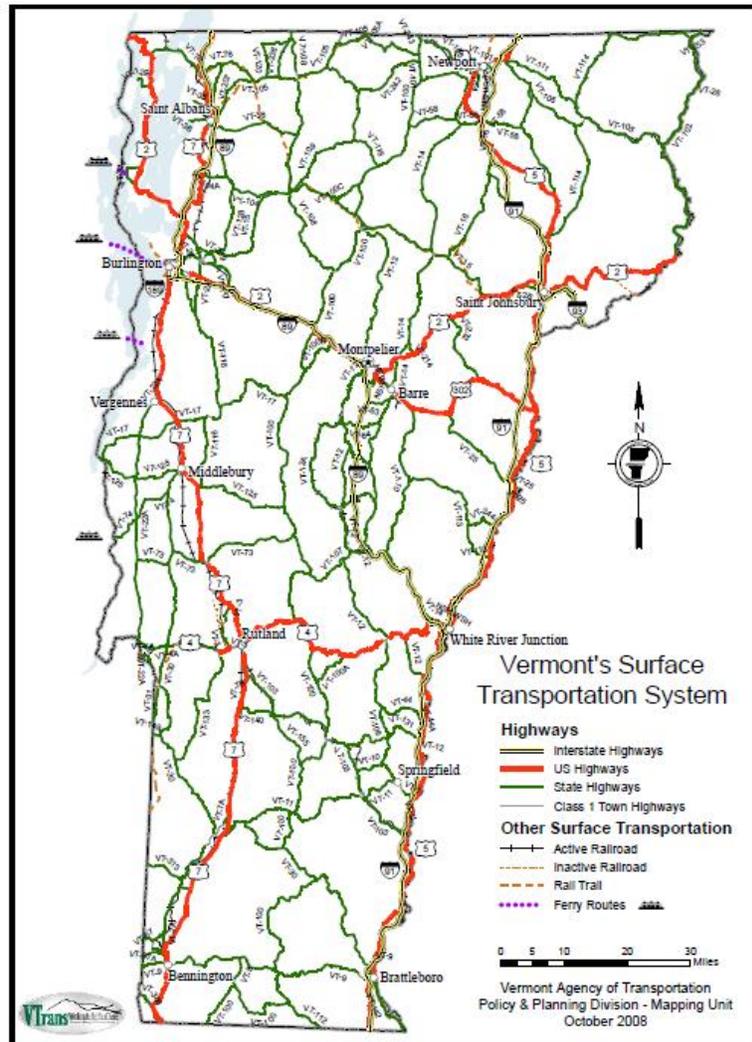
Figure 3-1
Total Population by County



3.3 Transportation

The Vermont Agency of Transportation (VTrans) manages a variety of transportation resources from airports, buses, ferries, rail services, and commuter options.

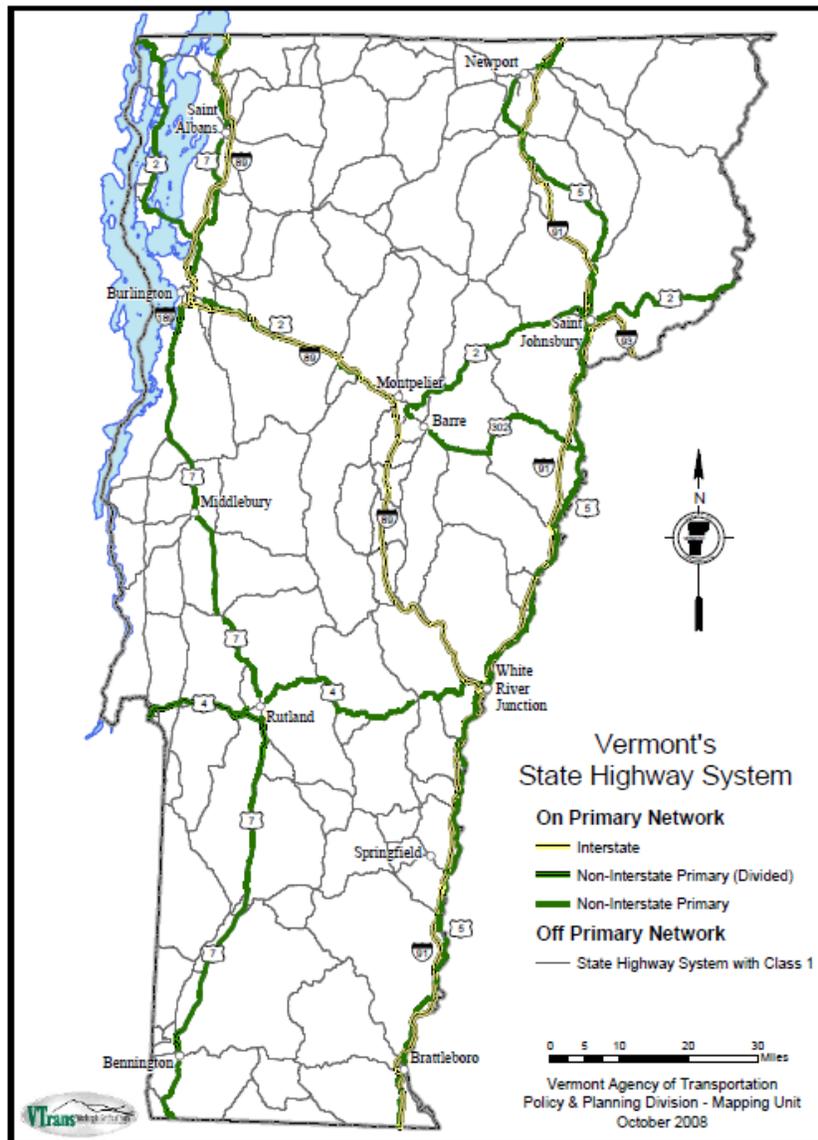
**Figure 3-2
Vermont's Surface Transportation System**



Vermont owns approximately 2,840 miles of highway, which is the third smallest quantity among the 50 states. North-south routes within the state are Interstate 89 (runs northwestward from White River Junction to serve both Montpelier and Burlington en route to the Canadian border), Interstate 91 (runs northward from the Massachusetts border to the Canadian border, connecting Brattleboro, White River Junction, St. Johnsbury, and Newport), Interstate 93 (has its northern terminus at I-91 in St. Johnsbury and connects the northern part of the state with New Hampshire and points south), US Route 5 (travels south to north along the eastern border of the state, parallel to I-91 for its entire length in the state), US Route 7 (runs south to north along the

western border of the state connecting Burlington, Middlebury, Rutland, and Bennington) and Vermont Route 100 (runs south to north almost directly through the center of the state, providing a route along the full length of the Green Mountains). East-west routes include US Route 2 (crosses northern Vermont from west to east and connects the population centers of Burlington, Montpelier, and St. Johnsbury), US Route 4 (crosses south-central Vermont from west to east and connects with the New York border in the Town of Fair Haven, with the City of Rutland and continues running through Killington and White River Junction), US Route 302 (travels eastward from Montpelier and Barre, into New Hampshire and Maine), Vermont Route 9 (runs across the southern part of the state that connects Bennington to Brattleboro), and Vermont Route 105 (crosses the northernmost parts of Vermont and connects the cities of St. Albans and Newport).

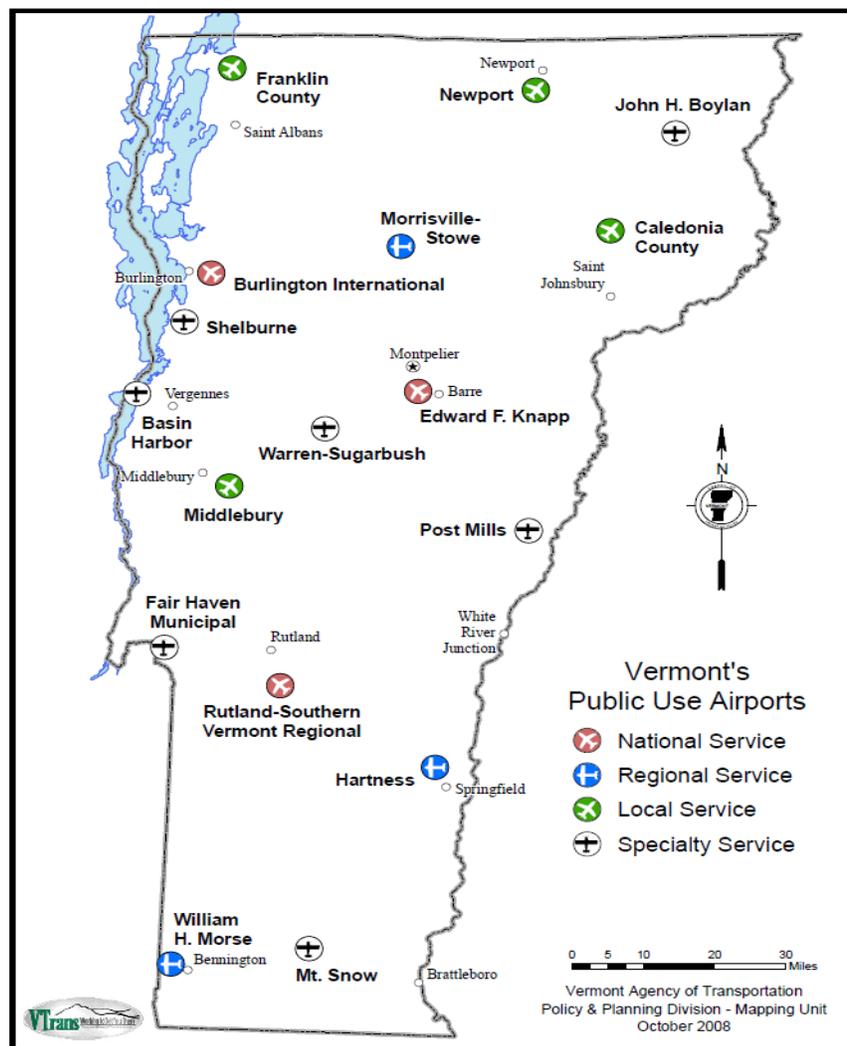
Figure 3-3
Vermont's State Highway Systems Public Use Airports



Section 3

The State of Vermont is served by 2 commercial airports and 14 private/state airport facilities. Of the two commercial airports, the Burlington International Airport (BTV) is the largest in the state.

**Figure 3-4
Vermont Public Use Airports**



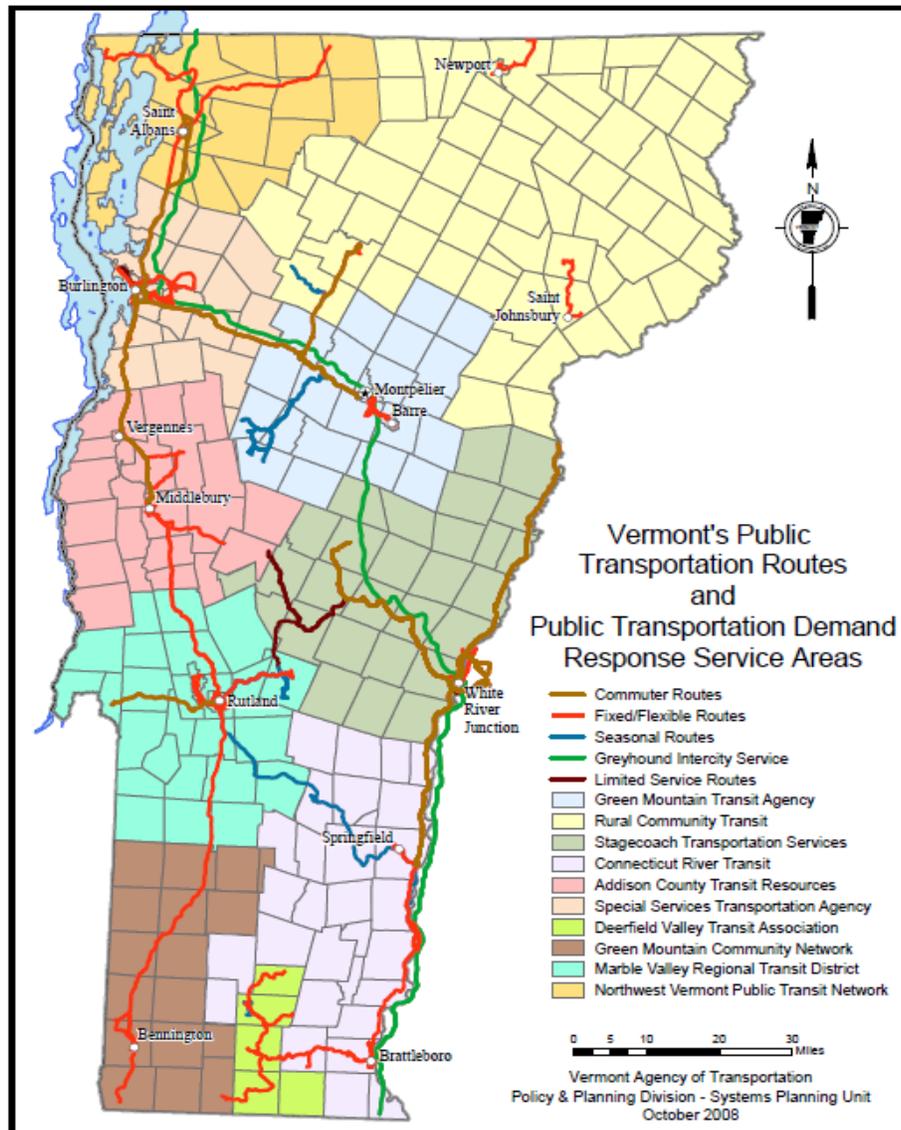
Vermont has 10 different bus companies, 2 ferry companies and 3 rail service lines throughout the state. The State of Vermont also has a program called Go Vermont, which is a resource for travelers who want to reduce the cost and environmental impact of driving. It provides information on bus routes, biking, or walking and features a free carpool/vanpool matching service and ridesharing tips.

Local Community Public and Private Transportation

Greyhound Lines stops at Bellows Falls, Brattleboro, Burlington, Montpelier, and White River Junction. Other transportation includes:

- Addison County, including the college town of Middlebury, Bristol, and Vergennes, is served by Addison County Transit Resources (ACTR).
- Bennington County is served by the Green Mountain Community Network out of Bennington and Yankee Trails Transportation Company out of Rensselaer, New York.
- Brattleboro in Windham County is served by the BeeLine (Brattleboro Town Bus). Windham is served out of West Dover by the MOOver (Deerfield Valley Transit Association or DVTA).
- Burlington is served by Chittenden County Transportation Authority (CCTA) and University of Vermont Campus Area Transportation System (CATS).
- Colchester in Chittenden County is served by the Special Services Transportation Agency (SSTA).
- Rutland County is served by Marble Valley Regional Transit District (MVRTD) out of Rutland.
- Windsor County:
 - Ludlow (in Windsor County) is served by the Ludlow Municipal Transit System (LMTS).
 - Windsor is also served by Advanced Transit (AT) out of Wilder.
 - The Connecticut River Transit (CRT) out of Springfield, Vermont, serves parts of Windham County.
 - Parts of Windsor County, including Norwich and Hartford as well as in White River Junction and in parts of New Hampshire, have access to AT, a free public transportation service. AT has routes and many different lines all throughout the Upper Valley region.
- Stowe in Lamoille County is served by Stowe Trolley System, Village Mountain Shuttle, and Morrisville Shuttle.
- Stagecoach Transportation Services out of Randolph in Orange County also serves parts of Windsor County.
- In Washington County, the Green Mountain Transit Authority (GMTA) runs out of the capital city, Montpelier.
- The Network (Northwest Vermont Public Transit Network [NVPT]) running out of Saint Albans serves Franklin and Grand Isle counties.
- Rural Community Transportation (RCT) runs out of Saint Johnsbury and services Caledonia, Essex, Lamoille, and Orleans Counties. There is a shuttle bus linking the various local networks.
- There is ferry service to New York State from Burlington, Charlotte, Grand Isle, and Shoreham. All but the Shoreham ferry are operated by the Lake Champlain Transportation Company (LCTC).

Figure 3-5
Vermont Public Transportation Routes and Public Transportation Demand Response Services Area



Rail

- Amtrak station is in White River Junction.
- The state is served by Amtrak's Vermonter and Ethan Allen Express, the New England Central Railroad, the Vermont Railway, and the Green Mountain Railroad.
- The Ethan Allen Express serves Rutland and Castleton, while the Vermonter serves Saint Albans, Essex Junction, Waterbury, Montpelier, Randolph, White River Junction, Windsor, Bellows Falls, and Brattleboro.

Figure 3-6
Vermont Rail Systems

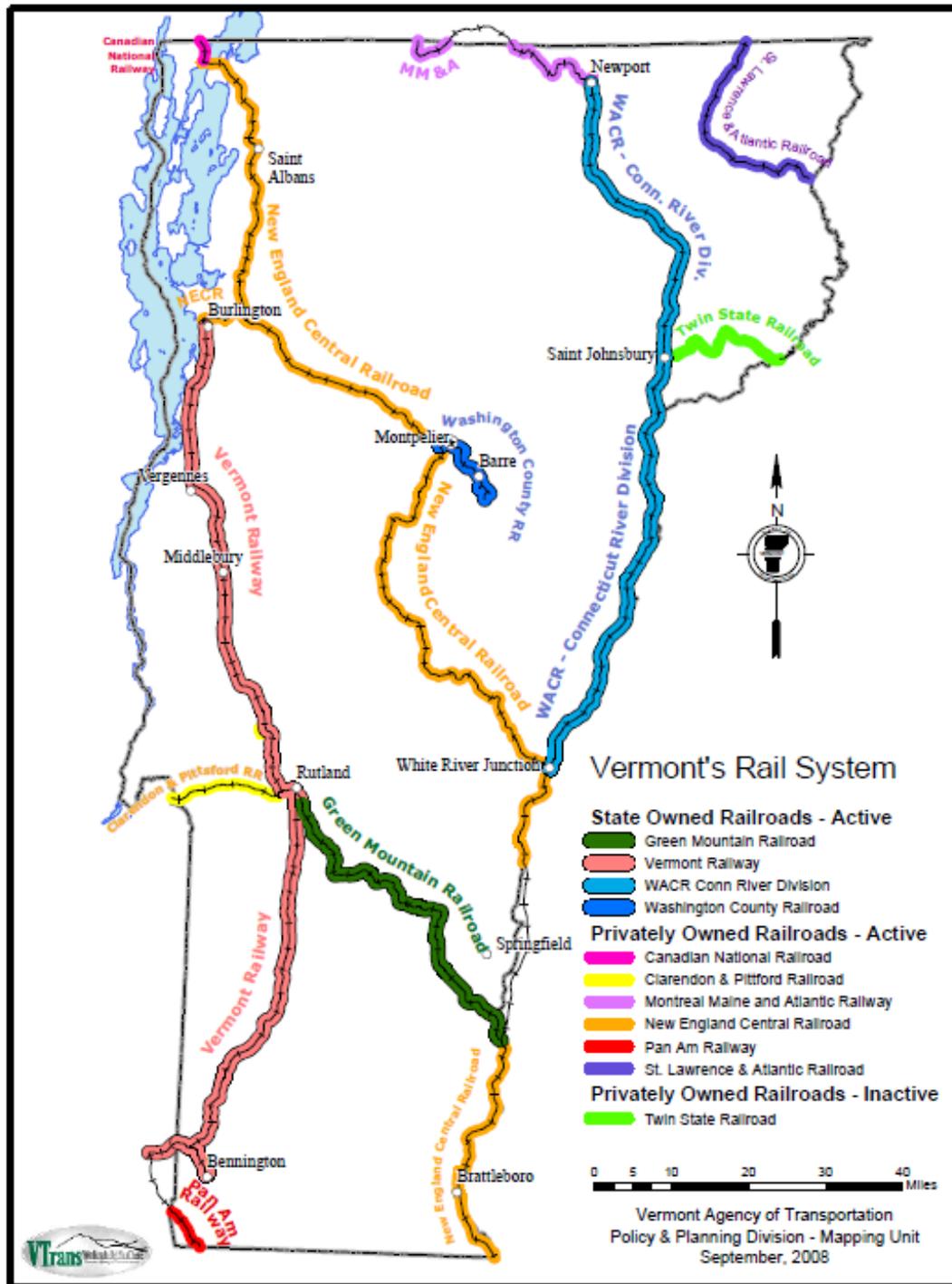
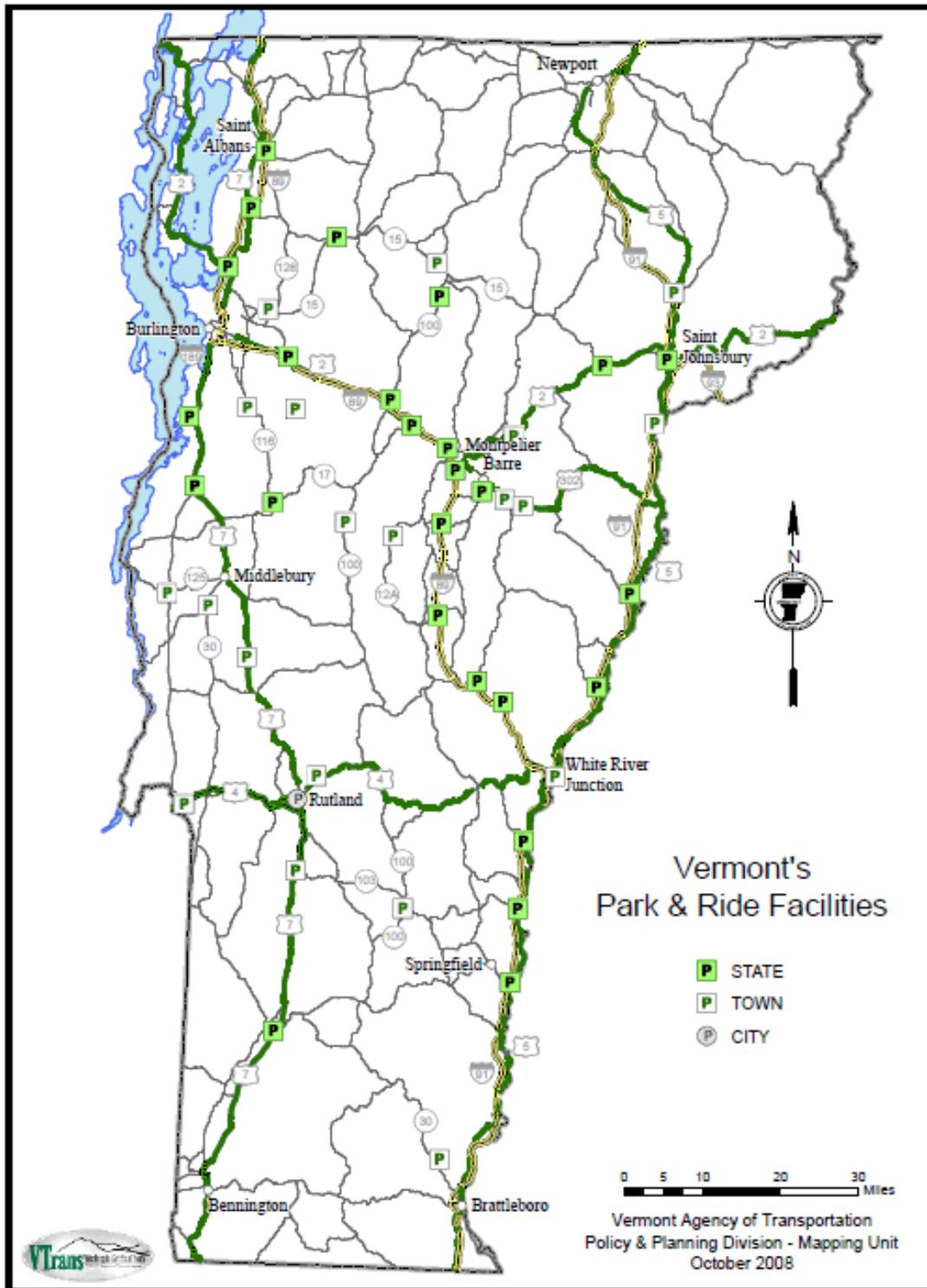


Figure 3-7
Vermont Park & Ride Facilities



3.4 State Capability Assessment

The Vermont Division of Emergency Management and Homeland Security (DEMHS) coordinates the state’s interagency effort in dealing with natural and human-caused disasters. One of the primary goals is to marshal existing state and federal resources to mitigate the effects of natural and human-caused hazards, and to establish priorities for hazard mitigation programs at all levels in the state. To further this goal, the State of Vermont Hazard Mitigation Committee is composed of a diverse cross-section of state and regional agencies. Quarterly meetings of the State of Vermont Hazard Mitigation Committee are held to ensure that problem areas are properly addressed throughout the state. Active agency participation in the Hazard Mitigation review process is critically important in effectively evaluating and implementing mitigation proposals.

Utilizing State of Vermont Hazard Mitigation Committee feedback, a review of the capabilities identified in the 2010 State of Vermont Hazard Mitigation Plan was conducted. It was discovered that in addition to the capabilities identified below, three capabilities previously identified as activities or actions in the mitigation strategy are more accurately defined as capabilities. The reasoning for this is that the activities are more or less ongoing or conducted on a continuous basis. These activities have been updated in Section 5.1: Updates on 2010 State of Vermont Hazard Mitigation Actions. Previously identified actions that may now be considered capabilities include:

- Create a state process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan.
- Bolster State ability to support development of nationally competitive PDM & FMA applications and fundable HMGP project applications
- Provide training and education to State, regional and local officials about hazard retrofit/upgrade strategies, including but not limited to: road and bridge standards, flood proofing, building elevation, fluvial conflict resolution, and dam maintenance or removal.

The State of Vermont Hazard Mitigation Plan (HMP) has identified those regulations, policies, and programs that can have a positive influence on hazard mitigation planning. For example, flooding and fluvial erosion remains one of the most recurring and devastating hazards in Vermont. As a result, it is apparent in Section 3.4.1: State Regulatory Mitigation Capabilities that the majority of the state policies aimed at improving mitigation are centered on flooding and fluvial erosion.

In the 2010-2013 timeframe, DEMHS’s administration of the Hazard Mitigation Grant Program (HMGP) and the State Hazard Mitigation Project Selection Committee underwent changes to improve its pre- and post-disaster capabilities for all hazards. This included expansion of DEMHS’s use of the HMGP to apply for landslide properties, also known as “cliffhangers”. Additional changes to HMGP are discussed in detail in Section 5.5.1: Changes in HMGP Regulation Since 2010. Even before 2010, the Project Selection Committee took actions to address natural hazards proactively. For example, the State of Vermont Hazard Mitigation Committee approved fluvial geomorphic assessments designed to address the ongoing problem

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of stream instability and fluvial erosion. In addition, repetitive loss properties and flood-prone locales were given a high priority.

Close cooperation among state agencies and regional mitigation planning partners in Vermont is a hallmark of our state. The DEMHS, the Agency of Natural Resources (ANR), the Agency of Commerce and Community Development, and other state agencies attend regular meetings of the state's Regional Planning Commissions (RPC). This close partnership is further exemplified by the planning process utilized for the 2013 update to the State of Vermont Hazard Mitigation Plan, which is described in Section 2: Planning Process. For detailed information on how each state agency contributes to Vermont's overall mitigation capabilities, refer to Section 2.2.1: State Agency Coordination, which discusses the role each agency has in statewide mitigation planning, the State of Vermont Hazard Mitigation Committee, and the State of Vermont Hazard Mitigation Plan (HMP) update process. This close cooperation and coordination has a synergistic effect, which improves mitigation planning in Vermont and makes it easier to identify areas in greatest need of mitigation projects and planning efforts.

A 2013 DEMHS and State of Vermont Hazard Mitigation Committee review of state management capabilities underscores the importance of effective interagency and federal partnerships for hazard mitigation projects and planning. A close cooperation between state agencies and Federal Emergency Management Agency (FEMA), U.S. Army Corps of Engineers (USACE), National Weather Service (NWS), U.S. Geological Survey (USGS), and others was evident in the 2004-2007 timeframe. This cooperation was further increased in 2010-2013, particularly due to the flooding events of Tropical Storm Irene in 2011, which bolstered collaboration between FEMA, NWS, USACE, and DEMHS. Vermont's rural geography and small size limits our post-disaster technical assistance capabilities, which highlights the need for strong partnerships and close collaboration even more. For example, the state post-disaster flood recovery technical assistance capabilities of the Agency of Natural Resources (ANR) River Management Engineers would be inadequate in any flood of a geographic extent greater than three to four counties.

Below is a summarization of state programmatic mitigation capabilities.

Table 3-2
Summarization of State Capabilities

Mitigation Programs	Description of Loss Reduction	Areas for Improvement
Pre-Disaster Mitigation-Competitive (PDM-C)	Proactively deals with potential vulnerability areas	Need to better inform towns concerning PDM-C application procedures and requirements; additional outreach needs to be done to encourage the submission of grant applications under PDM-C
Hazard Mitigation Grant Program (HMGP)	Deals with post-disaster damages to minimize recurrence	Need to conduct additional post-disaster outreach to underserved communities
Flood Mitigation Assistance (FMA)	Deals with repetitive loss areas to minimize future risk	Need to better identify potential projects in areas on FEMA's NFIP list; more communities need to take advantage of FMA funds for buy-outs
FEMA Public Assistance	Deals with emergency protective measures and post-flood rebuilding	FEMA needs to build relationships with the State and potential recipients to better promote the mitigation outcomes available through in this program
Map Modernization/Risk Map (FEMA, ANR)	Limited hydrologic and hydraulic restudy and digitization of existing	Work in Bennington is starting in 2010 and provides a great opportunity to integrate fluvial erosion hazard

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Mitigation Programs	Description of Loss Reduction	Areas for Improvement
	data to facilitate floodplain regulation, flood insurance rating, land use planning, and project planning	(FEH) data as part of RiskMAP. Windham and Windsor Counties need to be revisited since they only received restudy of the Connecticut River. Beyond Bennington County, there is no indication that FEMA will fund additional mapping without cash match from the State. The sole source that is offered for match, at this time, is LIDAR collected in Franklin County
VT Agency of Natural Resources- Rivers Program	Informs municipalities of FEHs and develops river corridor plans which outline potential mitigation solutions	Need to provide additional tangible municipal incentives to achieve greater community buy-in of river corridor protection and flood hazard avoidance
VT Emergency Relief & Assistance Fund (ERAF)	Provides incentives to communities to enact pre-disaster mitigation measures	Need to perform detailed and timely follow-up with towns on a regular basis; additional work needs to be done to encourage towns to adopt mitigation measures
USDA Emergency Watershed Protection (EWP) Program	Provides technical and financial assistance for relief from imminent hazard in small watersheds	Program needs additional federal funding and less restrictions on which land and types of restoration work that would be eligible for this program
USDA Natural Resource Conservation Service (NRCS)	Provides Conservation Partnership Initiative Grants and Farm/Ranch Land Protection Funds	Need to better coordinate state and federal efforts regarding actual needs at the local micro-enterprise level
USDA Rural Development Disaster Assistance	Provides financial assistance to help minimize agricultural losses due to natural disasters; grants, and loans	USDA needs a better outreach program to inform potentially eligible farmers suffering losses after floods, hailstorms, and other natural disasters
USDA Emergency Conservation Program	Shares with agriculture producers the cost of rehabilitating eligible farmlands damaged by natural disasters	Not always well funded; also needs to perform more efficient outreach efforts to potential applicants
Farm Service Agency's Emergency Loan Program	Provides emergency loans to help producers recover from production and physical losses due to drought, flooding and other natural disasters	Not especially attractive to those in need; most farmers look for grant programs, as opposed to loan programs
U.S. Army Corps of Engineers/ Cold Region Research and Engineering Laboratory (CRREL) & Silver Jackets Initiative (USACE)	Large-scale infrastructure and watershed projects	The State would prefer more regular collaboration by USACE in mitigation projects
Disaster Mitigation Planning & Technical Assistance (DOC)	Planning grants for capacity building and mitigation activities to provide disaster resistant jobs/workplace	U.S. Department of Commerce needs to build relationships with potential grant recipients to better promote this program
Town Officers Education Conferences (TOECS)	Bi-annual seminars to inform town officials about mitigation efforts/programs	Need to better inform town officials concerning the benefits of mitigation projects and planning
Municipal Officers Management Seminars (MOMS)	Bi-annual seminars to inform town officials about mitigation efforts/programs	Need to better inform town officials concerning the benefits of mitigation projects and planning
Individual Meetings with Town Officials by State Hazard Mitigation Officer (pre and post-	Informs town officials of mitigation programs and identifies possible projects	Need to better inform and motivate town officials to submit PDM-C, FMA and HMGP applications

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Mitigation Programs	Description of Loss Reduction	Areas for Improvement
disaster)		
Public Assistance (PA) Applicant Briefings (post-disaster)	Informs town officials in affected areas of PA funds for rebuilding; also, informs officials of available mitigation programs	Need to better coordinate real mitigation needs with FEMA Public Assistance field staff in the immediate post-disaster timeframe; this pertains mainly to 406 mitigation efforts

3.4.1 State Regulatory Mitigation Capabilities

This section describes the key statutory and regulatory capabilities the state utilizes when minimizing the creation of future vulnerabilities, and reducing existing vulnerabilities. These capabilities assist with guiding development throughout the state by requiring municipal consideration of vulnerabilities and risks through various mechanisms and, in some instances, requiring permits and project review by state technical experts.

State policy on mitigation is comprehensive and multifaceted, encompassing a diverse range of issues and programs, including water quality, soil erosion, watershed planning, storm water runoff, transportation infrastructure construction and maintenance, agricultural practices, flood plain management, river corridor protection, restoration and growth management, and current and proposed land use.

3.4.1.1 Title 10: Conservation and Development

Title 10 provides the legal guidance for conservation and development of land in the State of Vermont. Although Title 10 covers a variety of important topics, there are several chapters that specifically impact mitigation. The following chapters relate to mitigation by defining key terms or establishing the baseline for mitigation activities.

To view Title 10 and the chapters described below visit:
<http://www.leg.state.vt.us/statutes/chapters.cfm?Title=10>

Title 10 Chapter 32: Flood Hazard Areas

This state statute is the backbone law that provides a legal basis for the state, municipal, and federal governments to work together to address flood hazard issues. Specifically, this law defines what a flood hazard area is and how to map it, and establishes that the state will provide assistance to local governments to help manage flood-prone lands; coordinate federal, state, and local management activities; and encourage local governments to manage flood hazard areas and flood-prone lands, 10 V.S.A §751. Furthermore, it provides that Vermont will “maintain the agricultural use of flood-prone lands” and “carry out a comprehensive statewide flood hazard area management program for the state in order to ensure eligibility for flood insurance,” 10 V.S.A §751.

Title 10 Chapter 37: Wetlands Protection and Water Resources Management

This statute provides the water resources management policy, establishes the Department of Environmental Conservation (DEC), and defines the classification of wetlands.

Title 10 Chapter 39: Watershed Protection and Flood Prevention

This statute empowers Vermont's Governor to take any necessary actions to mitigate flood damage, authorizes the DEC to utilize state funds to operate and maintain flood prevention structures, and provides eminent domain authority.

Title 10 Chapter 41: Regulation of Stream Flow

This statute prohibits the alteration of the streams course, current or cross-section of watercourses unless authorization is given by the Secretary of ANR and specifically the River Management Program within DEC. All new and replacement stream crossings must meet the criteria described in §1023 of this statute in order for ANR to authorize the action. The stream alteration must be applied for through an Individual Permit or as a "reported activity" under the state Stream Alteration General Permit. See 10 V.S.A. §1023.

In the spring of 2013, ANR released a new Stream Alteration General Permit, which allows for certain activities to be automatically authorized by ANR because they are pre-determined to satisfy the statutory criteria. A narrative description of the new Stream Alteration General Permit can be found in Appendix N of this 2013 update to the State of Vermont HMP.

For the most current DEC adopted version of the Stream Alteration General Permit, visit: http://www.vtwaterquality.org/rivers/htm/rv_management.htm

Title 10 Chapter 43: Dams

This statute provides authority for the construction or reconstruction of any dam, pond, or impoundment capable of impounding more than 500,000 cubic feet of water in Vermont. The chapter also provides guidance for the surveying of existing dams, removal of obstructions, and defines the state's policy related to flood control developments.

Title 10 Chapter 151: State Land Use and Development Plans, "Act 250"

This significant statute is known throughout Vermont as "Act 250". Act 250 regulates land use permitting decisions for development applications of a certain size. Projects that fall within Act 250's jurisdiction are: 1) those that occur in towns with no zoning and are over one acre; 2) those that occur in towns with permanent zoning and bylaw enforcement and are commercial projects greater than 10 acres; and 3) those that occur in towns with permanent zoning and bylaw enforcement and are residential projects larger than 10 units.

The relevant section of Act 250 that mitigates natural hazard risk is §6086, which requires ANR to review Act 250 permit applications for flood inundation and erosion impacts. ANR and specifically the floodplain managers within the Rivers Management Program make case-by-case determinations on whether a permit application is for a project within a "floodway" or "floodway fringe". Their comments are directed toward the District Environmental Commissions, which make the final permit decision.

It is important to note that in 2003 the Vermont Supreme Court established that in Vermont the designation of "floodway" within Act 250 is much broader than the FEMA minimum standard,

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and can include fluvial erosion analyses in addition to the FEMA-mapped floodway.³ As a result, new developments requiring an Act 250 permit are not typically allowed within the FEH corridor as determined and mapped by ANR.

Nine District Environmental Commissions review Act 250 permit applications and issue decisions and land use permits. District commissions are located in five regional offices around the state: Rutland, Springfield, Essex Junction, Barre, and St. Johnsbury. All appeals from commission decisions are heard by the Environmental Court.

- a. The relevant section for flood hazard mitigation is Title 10 §6086(a)(1)(D).
- b. For general information on Act 250 and a link to the Act 250 database showing each permit, visit: <http://www.anr.state.vt.us/site/cfm/act250/index.cfm>
- c. For more detailed Act 250 information, particularly geared toward permit applicants, and including the list of “1 and 10 acre towns”, visit: <http://www.nrb.state.vt.us/lup/>
- d. For ANR’s procedure on making floodway and floodway fringe determinations for Act 250 visit: http://www.anr.state.vt.us/dec/waterq/rivers/docs/Educational%20Resources/rv_ProcedureonANRFloodwayDeterminationsinAct250Proceedings.pdf

Title 10 Chapter 161: Disposal of Low-Level Radioactive Waste

This statute provides the responsibilities, authority, and standards required for disposing of radioactive waste.

Title 10 Chapter 162: Texas Low-Level Radioactive Waste Disposal Compact

This statute provides that Vermont is a member of this Compact, and outlines its responsibilities.

Title 10 Chapter 165: General Permit Authority

This statute requires that all development in Vermont be permitted and outlines the process of obtaining a permit

3.4.1.2 Title 24: Municipal and County Government

To view Title 24 and the chapters described below visit:
<http://www.leg.state.vt.us/statutes/chapters.cfm?Title=24>

Title 24 Chapter 83: Building Inspectors and Regulation of Building

This statute requires that when any municipality adopts a building code, it shall impose requirements consistent with the current Vermont Fire Prevention & Building Code, as adopted by the Commissioner of Public Safety.

³ *In re Woodford Packers, Inc.*, 175 Vt. 579, 830 A.2d 100 (2003).

Title 24 Chapter 117: Municipal and Regional Planning and Development

Known as Chapter 117, this state statute enables municipal planning and land use regulation. The general purpose of Chapter 117 is to encourage the appropriate development of land in a manner that “will promote the public health, safety against fire, floods, explosions, and other dangers.” 24 V.S.A. §4302(a).

One of the most significant sections of Chapter 117 regarding mitigating flood and fluvial erosion risk is §4424, which allows municipalities to adopt freestanding bylaws to regulate development and use along shorelines and in flood or other hazard areas. This means that, for the most part, towns develop their own rules for development and land use along flood and erosion hazard areas and issue permits according to their municipal bylaws. However, §4424 does require municipalities to provide the ANR with a copy of all permit applications for development in flood and other hazard areas *before* issuing their own permit so that ANR can review and provide technical comments. In this way, the ANR provides guidance to local governments, reviewing the permit application to ensure it conforms to the municipalities’ own bylaws and NFIP requirements. See 24 V.S.A. §4424.

- a. For a multitude of planning and zoning resources that are designed for the local land use planner, visit: <http://www.vpic.info/PlanningZoning.html>
- b. For a planning and zoning operator’s manual designed for Vermont’s volunteer municipal officials, visit this document from 2007:
<http://www.vpic.info/Publications/Reports/Essentials/EssentialsBlackWhite.pdf>

3.4.1.3 Act 110, “An act relating to establishment of an Agency of Natural Resources’ river corridor management program”

Act 110 became law in May 2010, and amended Title 10 Chapter 49, and Title 24 Chapter 117, to direct the Secretary of ANR to establish a river corridor management program and shoreland management program, effective February 2011, that will produce the following: 1) River Corridor Protection Procedures with a priority schedule for providing river corridor and buffer maps; 2) Best Management Practices for river corridors and buffers; and 3) Municipal Incentives (for the adoption of river corridor and buffer protection bylaws) and Minimum Standards for Municipal Eligibility. Additionally, beginning January 15, 2011 and biennially thereafter, Act 110 requires ANR’s river corridor management program to report to the House Committee on Fish, Wildlife and Water Resources and the Senate Committee on Natural Resources and Energy regarding the status of river corridor, shoreland, and buffer zoning within Vermont.

One of the significant amendments Act 110 made was to 10 V.S.A. §1421, which established that it is the official policy of the State of Vermont to make rules that will reduce FEHs.

In response to Act 110, the Rivers Program of DEC reorganized, effective November 2010, to create a River Corridor and Floodplain Management Program (RCFMP). This new program integrates floodplain management under the FEMA NFIP with FEH avoidance, river corridor and buffer protection, and river science. The Rivers Program now more effectively and efficiently provides technical assistance to municipalities, landowners, and the regulated communities, with enhanced alignment of efforts to minimize flood hazards, improve water quality, reduce risks to public safety, and promote ecological integrity of rivers statewide.

- a. For Act 110 visit: http://intranet.anr.state.vt.us/wqpubtest/waterq/rivers/docs/rv_act110.pdf

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b. For a summary of Act 110 visit:

http://intranet.anr.state.vt.us/wqpubtest/waterq/rivers/docs/rv_act110_rcmp_%20summary.pdf

3.4.1.4 Act 138, The Rivers Bill

Act 138, also known as the Rivers Bill, became law in 2012 and amended numerous state statutes, some of which are described above. A description of Act 138's key components can be found in Section 5.5.2: Summary of Rivers Bill Components of Act 138.

The significant amendments that Act 138 created that relate to state mitigation capabilities are listed below:

Amendments to Title 10 Chapter 32

Act 138 amended this by creating the authority for ANR to develop flood hazard area rules and general permits for any development exempt from municipal regulation and allows for these rules to exceed NFIP minimum requirements. The flood hazard area rules will be in effect by July 1, 2014. See 10 V.S.A. §754.

Amendments to Title 10 Chapter 41

Act 138 amended this by adding Emergency Stream Alteration Requirements, which define when people are allowed to conduct emergency protective measures in rivers and river corridors. Emergency protective measures must be limited to the amount necessary to remove imminent threats to life or property; have prior approval from the municipality; be reported to the Secretary of ANR within 72 hours; and be consistent with the Stream Alteration General Permit during emergencies. Act 138 also amended this statute to state that berms are prohibited in flood hazard areas or river corridors, unless constructed as an emergency protective measure. See 10 V.S.A. §1021 and §1027.

Amendments to Title 10 Chapter 49, "Protection of Navigable Waters and Shorelands"

Act 138 amended this by adding requirements to ANR's river corridor mapping and sensitivity analysis program, and requiring the state to create a flood resilient communities incentive program. See 10 V.S.A. §1427 and §1428.

Amendments to Title 24 Chapter 117

Act 138 amended this to allow ANR to delegate municipal flood hazard permit review to municipalities and RPCs that meet ANR qualification requirements. See 24 V.S.A. §4424.

3.4.1.5 Act 16, "An act relating to municipal and regional planning and flood resilience"

Act 16 became law in the spring of 2013, and amended multiple sections within Title 24 Chapter 117, described above. Most significantly, it established that after July 1, 2014, municipal and regional plans must include a flood resilience element. Municipal plans must include 12 mandatory elements (land use, transportation, etc.), now to include a flood resilience element as well. Municipal land use regulations (including hazard area regulations and zoning) must be in conformance with the municipal plan and the purposes set in 24 V.S.A. §4302, which now

includes the purpose of encouraging “flood resilient communities.” 24V.S.A. §4302(c)(14). Plans are valid for up to five years. See 24 V.S.A. §4382 and §4302.

1. For Act 16 visit: <http://www.leg.state.vt.us/docs/2014/Acts/ACT016.pdf>
2. For a summary of Act 16 visit: <https://outside.vermont.gov/agency/ANR/FloodResilience/Flood%20Resilience%20Documents/Act%2016%20Summary%202013.pdf>
3. For a multitude of resources that will aid municipalities in meeting the new flood resiliency planning requirements visit: <https://outside.vermont.gov/agency/ANR/FloodResilience/Pages/default.aspx>

3.4.1.6 The 2012 Rule for the Emergency Relief and Assistance Fund

The Emergency Relief and Assistance Fund (ERAF) is authorized by Title 20 Chapter 1 §45, Emergency Relief and Assistance. This section states that when the Governor declares a state of emergency, “the Secretary of Administration may expend from the Emergency Relief and Assistance Fund such funds necessary to meet match requirements for federal grants.” The ERAF provides the state portion of the required 25% non-federal match for FEMA Public Assistance (PA) grants to Vermont cities and towns to repair damaged infrastructure after a presidentially declared disaster.

A new rule created by the ERAF went into effect in October 2012. This new rule is provided in Appendix B of this 2013 update to the State of Vermont HMP. Under the new ERAF rule municipalities have 24 months to adopt additional flood hazard mitigation measures to maintain the traditional amount of state cost share for FEMA PA grants, which was half of the 25% non-federal match. Municipalities that adopt higher standards can achieve a higher percentage of state funding for post-disaster repair projects (from 12.5% to 17%). Municipalities that adopt the standard set of hazard mitigation measures will continue to receive state funds to cover half of the required non-federal match or 12.5%. Municipalities that have not adopted the basic set of measures will see a decrease in the state match (from 12.5% to 7.5%). Thus, the state contribution toward the local match requirement will vary from 7.5 % to 17% of the total project costs, depending upon the level of adoption of recommended mitigation measures.

To see the requirements of the new ERAF rule, see Appendix B of this 2013 State of Vermont HMP.

- a. For a narrative summary of the new ERAF rule visit: <http://www.vlct.org/events-news-blogs/current-news/emergency-relief-and-assistance-fund/>

3.4.2 Improvements in Vermont’s Pre-Disaster and Post-Disaster Capabilities Since 2010

3.4.2.1 DEMHS’s Recovery and Mitigation Section

During 2013, Vermont Emergency Management transitioned to become the Division of Emergency Management and Homeland Security. This entailed a division-wide reorganization, which included the creation of the new Recovery and Mitigation Section. See Appendix P for a 2013 organization chart of the DEMHS.

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The Recovery and Mitigation Section Chief oversees the Hazard Mitigation Team, which administers the HMGP, and the Recovery Team, which administers the State Public Assistance (PA) Program. Prior to this reorganization, in 2012, the State Hazard Mitigation Officer had received two new hazard mitigation planner positions, which greatly expanded the Hazard Mitigation Team's ability to leverage HMGP opportunities after Tropical Storm Irene, and increases the scope of mitigation efforts across the state. The creation of the new Recovery and Mitigation Section also led to changes in the administration of the State's PA program, which used to reside within VTrans. These changes resulted in three new positions being created: a PA Officer position and two PA Coordinator positions.

By combining the hazard mitigation and recovery functions within one section under DEMHS, and adding the new positions, the State's ability to serve in these capacities has been greatly streamlined and expanded. Tropical Storm Irene showed Vermont that our recovery and mitigation programs needed to grow and work closely together in order to implement many of the lessons learned from Irene. The creation of this new section builds the foundation upon which these programs can evolve and even more effectively provide pre and post-disaster mitigation assistance.

Changes to the State's Public Assistance Program

Significant changes have been made to the State of Vermont's administration of the FEMA Public Assistance (PA) program since Tropical Storm Irene. Irene highlighted for the State that PA can fund mitigation on a project-by-project basis, but only if it is correctly identified in the immediate recovery phase when project worksheets (PW) are being written. The State misses these opportunities when this is not done.

When a federally declared disaster causes structural damage, there are more federal funding opportunities available for mitigation than when there is no open disaster. Section 406 of the Stafford Act allows for hazard mitigation measures to improve damaged elements of a facility for which there is a repair PW under the FEMA PA program. To determine if a 406 hazard mitigation measure is eligible it must meet one of the following tests of cost effectiveness:

- 1) Cost no more than 15% of the total eligible cost of eligible repair work for the damaged facility,
- 2) Cost no more than 100% of the total eligible cost of eligible repair work and on the list of FEMA-approved mitigation measures, or
- 3) Have a benefit-cost ratio of equal to or greater than 1.0 using the FEMA benefit-cost methodology.

For further information look to the FEMA publication: FEMA 323, "Public Assistance Applicant Handbook," March 2010, Appendix C, page C-1.

The greatest change the State of Vermont has made with its PA program is that VTrans has transferred PA program management over to DEMHS. This is explained in the document titled "State of Vermont Memorandum of Understanding Regarding Federal Emergency Management Agency (FEMA) Public Assistance (PA) Program". Under the MOU, VTrans personnel will continue to be mobilized as project specialists for federal disaster declarations.

Positive developments in Vermont's PA program since Irene in 2011 include:

- FEMA Headquarters' response to a second PA appeal on March 22, 2013 for the town of Townshend's Dam Road Culvert (PW#01803) clarified that upgrading from a pipe culvert to a box culvert can be eligible as 406 hazard mitigation.
- The State of Vermont is committed to fielding project specialists with knowledge of 406 hazard mitigation opportunities to attend site visits and participate in PW development for future disasters.

The following are areas for future improvement of Vermont's PA program:

- Strengthen the base of knowledge among Regional Planning Commission, municipality, and VTrans district personnel regarding how to maximize 406 hazard mitigation opportunities.
- Explore and request consideration of 406 hazard mitigation opportunities at every juncture. Work closely with FEMA to identify eligible 406 hazard mitigation opportunities.

3.4.2.2 Agency of Natural Resources Rivers Management Program

Since the 2010 State of Vermont HMP update, the ANR has added three River Management Engineers (RMEs). Two of the positions were added in response to Act 138, passed in 2012, to provide additional capacity to implement the new emergency stream alteration rule and stream alteration permit, and conduct river management engineering training to multiple stakeholders. Having additional staff will maximize flood and fluvial erosion mitigation opportunities for in channel stream work conducted both pre- and post-flood. The section currently has six full-time RMEs. Five engineers provide technical and regulatory assistance to private and public entities and serve out of the five ANR regional offices. Appendix Q provides a 2013 organization chart of the ANR Rivers Program. The sixth engineer provides technical assistance and training programs to the State Agency of Transportation (VTrans) operations staff

In response to Act 110, passed in 2010, DEC's Rivers Program reorganized in November of 2010, to create a RCFMP. The new program integrates floodplain management under the FEMA National Flood Insurance Program (NFIP), FEH avoidance, river corridor and buffer protection, and river science. This reorganization has enabled the Rivers Program to more effectively and efficiently provide technical assistance to municipalities, landowners, and the regulated community to help minimize flood hazards, improve water quality, reduce risks to public safety, and promote ecological integrity of rivers statewide. The program is supervised by the state floodplain manager and currently staffs three regional floodplain managers, three regional river scientists, a flood hazard mapping coordinator, and two temporary positions. Two of the floodplain manager positions were added in the fall of 2012 to support the creation and implementation of the Act 138 Flood Hazard Area rule and support municipal and Act 250 floodplain permit reviews. Having additional floodplain management staff allows the program to meet the statewide need for floodplain management technical support to communities and state agencies both pre and post-disaster.

3.4.2.3 Agency of Commerce and Community Development

In the wake of Tropical Storm Irene, the ACCD created a webpage with resources for municipalities to use when conducting flood resiliency planning. This includes reports, example action plans, program information, and links to useful resources.

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To access this website, entitled “Plan Today for Tomorrow’s Flood”, visit: http://accd.vermont.gov/strong_communities/opportunities/planning/resiliency.

3.4.3 Impact of Tropical Storm Irene on Waterbury State Office Complex, and Pre and Post-Disaster Capabilities

As a result of Tropical Storm Irene, the Waterbury State Office Complex (WSOC) was flooded and many agencies were required to move their operations. A summarization of some of the impacts on State capabilities as a result of the relocation may be found below, and a full summary of statewide impacts from Tropical Storm Irene may be found in Section 4.1.2.6: Hurricanes/Tropical Storms.

- Department of Emergency Management and Homeland Security (DEMHS)
 - DEMHS was temporarily relocated as a result of flooding.
 - The State of Vermont Emergency Operations Center, which is located with DEMHS at the WSOC, was also temporarily relocated to the Joint Field Office in Burlington, Vermont and a backup EOC was established at the Vermont National Guard’s Camp Johnson in Colchester, Vermont.
 - Communications issues arose due to DisasterLan being unavailable for a brief period of time because of the relocation.
- Agency of Natural Resources (ANR), Department of Environmental Conservation (DEC)
 - Temporary offices were established in Winooski, Vermont, and ANR employees were relocated here for one year.
 - The result of the relocation was a temporary absence of the institutional framework that assists ANR in supporting municipal wastewater and potable water infrastructure, stream alterations, hazardous materials response, and NFIP management.
 - Permanent relocation occurred when ANR was settled in the National Life Building in Montpelier, Vermont.
- Vermont Department of Transportation (VTrans)
 - VTRANS was permanently relocated to the National Life Building in Montpelier, Vermont.
- Agency for Commerce and Community Development (ACCD)

ACCD was already located at the National Life Building before Irene, however due to ANR’s relocation to the National Life Building ACCD had to share part of its floor with ANR, thereby reducing ACCD’s total office space.

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RISK AND VULNERABILITY ASSESSMENT

A risk assessment measures the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards by assessing the vulnerability of people, buildings, and infrastructure to natural and technological disasters. Several methods were used to identify risks to the community. These methods included evaluating historical data from scientific and news media sources, soliciting opinions and experiences from participating jurisdictions, and eliciting feedback from State of Vermont Agencies of State Government.

Following the risk assessment, a vulnerability assessment was conducted. The vulnerability assessment predicts the extent of damage that may result from a hazard event of a given intensity in a given area on the existing and future built environment. Determining the community’s vulnerability involved identifying the threats posed to people, property, and the environment. This also included identifying state facilities that could be affected by each hazard.

The following natural and technological hazards were identified and have been ranked according to vulnerability by the State of Vermont Hazard Mitigation Plan (HMP) Committee.

**Table 4-1
Hazards, by Ranking, Included in the Risk and Vulnerability Assessment**

Hazard	Justification for Inclusion
Flooding and Fluvial Erosion	Frequency, previous incidents
Terrorism	Potential adverse impact
Earthquakes	Potential adverse impact
Infectious Disease Outbreak	Previous incidents
Hurricanes/Tropical Storms	Previous incidents
Tornadoes	Frequency, previous incidents
Nuclear Power Plant Failure	Potential adverse impact
Landslides/Rockslides	Previous incidents
Severe Thunderstorms	Frequency, previous incidents
Wildfires	Frequency, potential adverse impact
Dam Failure	Potential adverse impact
Severe Winter Storms	Frequency, previous incidents
Hail	Frequency, potential adverse impact
Ice Jams	Previous impacts, potential adverse impact

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Hazard	Justification for Inclusion
Drought	Previous incidents, potential adverse impact
Rock Cuts	Frequency, previous incidents
Invasive Species	Potential adverse impact
Extreme Temperatures	Frequency

The following hazards were not profiled due to geographic location, low occurrence, or low potential for damage.

Table 4-2
Hazards Not Included in the Risk and Vulnerability Assessment

Hazard	Justification for Omission
Civil Disturbance	Low occurrence, low vulnerability
Coastal Erosion	Geographic proximity
Expansive Soils	Low vulnerability
Karst Topography	Low occurrence
Sinkholes	Low vulnerability
Tsunami	Geographic proximity
Volcano	Geographic proximity

The following information was included in each hazard profile:

- **Hazard Definition.** The hazard definition will include a description of the hazard and the general threats it poses. All hazards were identified using statistical data and records from a variety of sources, including Presidential disaster declarations, maps, and hazardous materials response data. The lists of hazards are based on frequency, severity, probability, potential loss, vulnerability, and large-scale effects on the State of Vermont.
- **Hazard Profile.** Each hazard will be profiled to explain how it will affect or has affected the state, including previous incidents that have affected Vermont. The State of Vermont HMP Committee utilized the Special Hazards Event List Database for the United States (SHELDUS) to determine the occurrence of specific hazards as well as the economic losses. Refer to Appendix D: Explanation of SHELDUS Data for more information on this data set.

4.1 Natural Hazards

Natural hazards such as flooding and fluvial erosion, tornadoes, winter storms, and the like are an enduring condition around the human environment. Natural hazards become disasters when they intersect with the human environment. In Vermont, natural disasters have had devastating effects on human lives, property, the economy, and the community.

4.1.1 Impact of Climate Change on Natural Hazards in Vermont

4.1.1.1 Introduction

Over the past three decades, there has been a marked increase in the frequency and severity of weather-related disasters, both globally and nationally⁴. The emergency management community recognizes that this trend is being driven in part by changing global and regional climate conditions. It is critical that this recognition be incorporated into any planning process for preparing for and responding to weather-related emergencies and disasters. This section reviews the documented changes in our global and regional climate and discusses the forecasted conditions under several emissions scenarios. The following sections of the Risk Analysis identify the natural hazards that Vermonters can expect to face through the end of this century, and the State of Vermont Mitigation Strategies section reviews the actions underway or planned to address these hazards and risks. Most of the natural hazards and several of the technological hazards identified in the Risk Analysis are likely to be exacerbated by changes in our regional climate. Finally, to the extent that extreme weather becomes more frequent, the risk to critical infrastructure such as transportation arteries and energy and communication transmission systems will also increase.

4.1.1.2 Global Trends

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as "... a change in the state of the climate that can be identified by changes in the mean and/or variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity." In its series of assessment reports, the IPCC has documented the overall warming of the globe and tied that trend to increasing concentrations of greenhouse gases in the atmosphere. The overall warming of the planet, and particularly warming in the Arctic, has resulted in a number of other effects, including dramatic decreases in the extent of sea ice, sea level rise due to both melting land ice (glaciers) and volumetric expansion of the ocean, changes in weather patterns, and an increase in the frequency and/or duration of extreme weather (either precipitation or drought).

Historical patterns of development, both globally and in our region, located communities and infrastructure in valleys and near water bodies (either the ocean or lakes and rivers). This development pattern implicitly assumes that climate conditions will remain relatively static; for example, that coastlines will not shift and rivers will remain in their current courses. With a change in the climate regime, many communities and their associated infrastructure find themselves at increased risk from climate change driven disasters, such as flooding.

4.1.1.3 Regional/State Forecasts

In addition to the work being undertaken at the global level, there have been a number of efforts made regionally to attempt to describe the changes in climate that the area has already

⁴ Munich R.E., "Severe Weather in North America," October 2012.

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experienced and to develop forecasts of what changes can be expected under several potential future global greenhouse gas emissions scenarios.

Texas Tech “Past and Future Changes in Climate and Hydrological Indicators in the U.S. Northeast”

A team led by Katherine Hayhoe of Texas Tech University published a study of nine atmosphere-ocean global climate models in 2006⁵. This study reports an increase in regional temperatures of +0.08°C/decade over the last century, and a +0.25°C /decade rise since 1970 and a number of other statistics indicating an overall warming. Projected temperatures across the Northeast region would increase through the end of the century, up to +5C relative to 1961-1990, with a larger increase in summer temperature as compared to winter. Changes in precipitation are more difficult to model, but this study projected increases in winter precipitation and no change to a decrease in summer precipitation.

TNC “Climate Change in the Champlain Basin”/Climate Wizard

In May of 2010, the Nature Conservancy published “Climate Change in the Champlain Basin”. This study assessed the patterns of and the ecological consequences of recent and future climate change in the Lake Champlain Watershed. Although the focus of this report was on the effects of climate change on aquatic ecosystems and species, the findings regarding the change in regional climate are relevant to this plan. Among those findings were:

- Between 1976 and 2005, mean annual air temperatures in the study area increased by 2.1°F, with the most significant seasonal warming during the summer months.
- In the same time period, total annual precipitation was approximately three inches greater than it was during the preceding eight decades.
- Freeze-up of the lake is occurring two weeks later than in the early 1800s, and the number of winters where the lake does not freeze over is increasing.
- By the end of this century, the range of anticipated additional warming is from +1° to +6°F under a moderate emissions scenario, and from +6° to +11°F under a high emissions scenario.
- The basin could receive as much as 10-15 percent more precipitation in an average year, with an increase frequency of heavy or extreme precipitation events.
- A larger fraction of winter precipitation is likely to fall as rain rather than snow.

UMass Amherst Regional Climate Model Study

Researchers from the University of Massachusetts Amherst Climate System Research Center recently published a study entitled, “Assessment of Regional Climate Model Simulation Estimates over the Northeast United States.”⁶ This paper “describes the sign, magnitude, and quantitative significance of precipitation and temperature changes across the Northeast United

⁵ Hayhoe, K., et al., “Past and Future Changes in Climate and Hydrological Indicators in the US Northeast,” 2006.

⁶ Rawlins, M. A., R. S. Bradley, and H. F. Diaz, “Assessment of Regional Climate Model Simulation Estimates over the Northeast United States,” 2012.

States between the periods 2041–2070 and 1971–2000” by looking at results of four global and six regional climate models. For air temperature, they modeled changes of +2° to +3°C, with winter temperatures rising the most in the northern parts of the region and summer temperatures rising most in the south. Precipitation changes were not modeled to change much outside their naturally variable range.

National Oceanic and Atmospheric Administration (NOAA) Technical Report, “Regional Climate Trends and scenarios for the U.S. National Climate Assessment: Part 1. Climate of the Northeast U.S.”

The 2013 NOAA Technical Report NESDIS 142-1 is “one of a series of climate descriptions” of eight regions in the United States. Each report provides a description of the historical climate conditions in the region and a description of “the climate conditions associated with two future pathways of greenhouse gas emissions.” Model simulations discussed in the report indicate precipitation increases of 6-9 percent across Vermont for the second emission scenario in the 2070-2099 time frame. Model simulations for earlier periods in the 21st century are not statistically significantly different from normal year-to-year variability.

4.1.1.4 Specific Impacts of Climate Change

Flooding

The effects climate change may have on precipitation patterns in Vermont and the Northeast will cause alterations to hydrology and water availability. Increases in the frequency and severity of flood inundation, fluvial erosion, and subsequent landslide hazards will result in impacts to ecological and geomorphic (or physical) integrity of river/floodplain systems, and to the built environment. Vermont’s historic settlement pattern, in association with the widespread channelization of rivers and loss of functioning flood plains due to encroachments, make Vermont particularly vulnerable to climate change-related increases in flood frequency and magnitude. Moreover, increases in frequency of periodic drought will lead to greater demand for new and more reliable water supplies.

River ice jams can result in flood events, causing major social, economic, and ecological impacts. Ice jams are a function of stream flow, the thickness of the ice cover, and stream morphology. Although there is limited research into how climate change may influence the frequency and magnitude of ice jams specifically, more frequent rainfall events during the winter months could lead to more frequent ice jamming occurrences (Beltaos, 1997; 1999). However, changes in ice conditions due to climate change contribute to the difficulty in predicting flooding caused by ice jams.

Water Quality

In addition to an increase in the frequency and severity of natural hazards, the greater amount of precipitation that climate change is projected to bring to the Northeast may detrimentally affect water quality. Higher water inflows into lakes and streams increase phosphorus levels, leading to eutrophication, which is the cause of toxic cyanobacterial blooms (blue-green algae). Cyanobacterial blooms are harmful to the environment, and toxic to animals and people. While human-caused nutrient over-enrichment is the primary driver in the occurrence of cyanobacterial blooms, warmer temperatures alter physical and chemical conditions, contributing further to their

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frequency. Researchers at the University of Vermont are currently considering how significantly this will impact Vermont's Lake Champlain.⁷

Infectious Diseases

The Vermont Department of Health has stated that there is speculation about possible connections between climate change and a number of emerging infectious diseases (e.g., eastern equine encephalitis, anaplasmosis, and babesiosis) and disease vectors. However, the occurrence of these diseases or the presence of their vectors in Vermont has not been conclusively linked to climate change. Flooding due to the more frequent intense rainfall events projected for the Northeast may also increase mold problems and other water-borne disease outbreaks in homes and businesses.

Air Quality

Some regions will see higher temperatures due to climate change, and this can cause increased air pollution and human health impacts. The below paragraph from the Draft National Climate Assessment describes the relationship between increased temperatures, air pollution (in particular ozone), and human health:

Climate change alone is projected to increase summertime ozone concentrations by 1 to 10 parts per billion this century. Ground-level ozone is associated with diminished lung function, increased hospital admissions and emergency room visits, and increases in premature mortality. Current estimates suggest that 1,000 premature deaths per 1.8°F rise in temperature could occur each year related to worsened ozone and particle pollution. Other studies project 4,300 additional premature deaths per year by 2050. Health-related costs of climate change's current effects on ozone air pollution have been estimated at \$6.5 billion nationwide⁸.

For more information on the human health impacts predicted to occur from increased temperatures due to climate change, look to the following resources:

- North East Climate Impact Assessment, Pg. 97 and 100:
<http://www.northeastclimateimpacts.org/pdf/confronting-climate-change-in-the-u-s-Northeast.pdf>.
- Climate Change: A Human Health Perspective, Pg. 14-15:
http://www.niehs.nih.gov/health/materials/a_human_health_perspective_on_climate_change_full_report_508.pdf.
- CDC website: http://www.cdc.gov/climateandhealth/effects/airway_diseases.htm.

⁷ Zia, Asim, "Adaptive Management of Critical Transitions in the Lake Champlain Basin," Research on Adaptation to Climate Change project's Climate Change Modeling Workshop, November 13, 2012.

⁸ Draft National Climate Assessment, Health Impacts section, p.2,
<http://ncadac.globalchange.gov/download/NCAJan11-2013-publicreviewdraft-chap9-health.pdf>

4.1.2 Atmospheric Hazards

Atmospheric hazards include weather-generated incidents. Each atmospheric hazard has its own natural characteristics, geographic location and/or aerial extent, seasonality, severity, and associated risks. Though these characteristics allow identification of each individual hazard, many of these hazards are interrelated. For example, tornadoes can be a byproduct of severe thunderstorms, tropical storms, or hurricanes, and snow or ice can be a byproduct of nor'easters. These hazards may also be directly linked to other categories of natural hazards (for example, excessive rain can cause the geologic hazard of sinkholes and landslides). In addition, atmospheric hazards can be interlinked with technological hazards (for example, excessive rains can cause dam/levee failure, which can lead to flooding). These linkages make it difficult to attribute damage to a specific hazard or to assess the risk a specific hazard has on the planning area, but mitigation strategies quite often have beneficial effects on several types of hazards.

4.1.2.1 Flooding and Fluvial Erosion

Hazard Definition

Flooding is the most common recurring hazard event in the State of Vermont. In recent years, flood intensity and severity appear to be increasing. It is highly likely that flooding will continue in both the short-term and long-term. There are three main types of flooding that occur in Vermont: flooding from rain or snowmelt, flash flooding, and urban flooding. Flooding has also been known to occur as a result of ice jams in rivers adjoining developed towns and cities. Flood damages are associated with inundation and fluvial erosion hazards (FEH). Data indicate that greater than 75 percent of flood damages in Vermont, measured in dollars, are associated with fluvial erosion. These events may result in widespread damage in major rivers' floodplains or localized flash flooding caused by unusually large rainstorms over a small area. The effects of all types of events can be worsened by ice or debris dams and the failure of infrastructure (especially culverts), private dams, and beaver dams.

Flooding has a high level of vulnerabilities that can cause a wide range of disruption to the community. Flooding can affect drinking water and cause washouts and steep slopes, wastewater and septic systems to wash out, and contamination. After Tropical Storm Irene, Vermont experienced the following incidents:

- Public drinking water facilities:
 - Were in 100 year floodplain (FPs), & GW sources/intakes in 100 year FP and in tributaries became inundated
 - Had individuals working to protect public water infrastructure during large flood events are at risk
 - Had Rochester and Warren experiencing issues due to systems having to cross the streams either via bridges or underneath the streambed.
- Steep slopes during Tropical Storm Irene experienced subsidence and fast-moving water, causing impacts to water storage tanks (scouring).
- Potable/small water systems experienced damage.

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- Some septic systems had complete wipeouts due to sewage collection lines that were exposed on the down slopes and where they ran the lines through the streambeds.
- Aboveground storage tanks (ASTs) were disconnected and float downriver.
- Issues with hazardous household waste when people were cleaning up their residential areas and there was not a program in place to deal with this type of contamination.
- Gravel pits in the floodplain sometimes fail during floods, and are not being given enough attention.

Hazard Profile

One of the worst flood disasters affecting Vermont occurred on November 3, 1927. This event was caused by nearly 10 inches of heavy rain from the remnants of a tropical storm that fell on frozen ground. The flood claimed 84 lives, more than 1,000 bridges, and hundreds of miles railroads and roads. Over 600 farms and businesses were destroyed. Flooding in the White River valley was particularly violent, with the river flowing at an estimated 120,000 cubic feet per second on the morning of the November 4, 1927.

A prime example of historical flood damage in Vermont occurred in the hamlet of Gaysville, which had a large mill, church, stores, and many residences destroyed during the flood. The worst widespread spring flooding occurred on March 13–19, 1936, when slow-moving storms with warm air combined to drop around 8 inches of rain on a late winter snow pack that had a water equivalent of 10 inches.

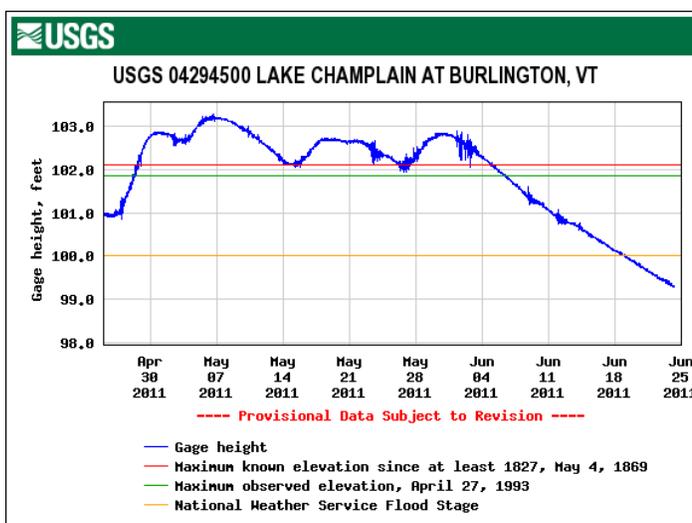
One of the relatively recent widespread floods occurred on June 28-30 in 1973, when up to six inches of rain fell. A Presidential disaster was declared for the entire state and damage was estimated at \$64 million (in 1973 dollars).

Within the last several years, several floods have affected limited areas of the state. They were usually the result of intense summer thunderstorms. An example was the summer flood of 1998, when torrential rain deluged the Warren, Randolph, and Bradford areas. The result was the Presidential disaster designation (FEMA-DR-1228-VT) covering June 17–August 17, 1998. A record amount of precipitation fell in Vermont in the summer of 1998, with Burlington setting a new annual rainfall record of 50.42 inches. July 1998 ranks as the fourth wettest month and June 1998 as the fifth wettest on record for Burlington. Rain in Vermont is accumulated either by the many low-pressure systems that track through the state or by fast-moving and destructive summer thunderstorms.

In May 2006, Burlington received a record amount of rainfall, almost an inch more than the previous record, set in 1983. Flooding caused extensive damage to the small town of Athens, Vermont, in late June 2006. This flooding was caused by persistent rainfall for the entire month of June, exacerbated by excessive rain caused by one storm system passing through. The damage was mostly suffered in roadways because of flash flooding, which turned a normally placid body of water, Bull Creek, into a raging flow. There were reports of a mudslide in Dummerston, which also caused damage to roadways. This was the most serious occurrence of localized flood damage in Vermont in 2006 and involved a state emergency operations center (EOC) activation.

Research done at the University of Massachusetts Boston indicates that the strength of storms between 1954 and 2005 has been fairly consistent. However, when you examine the flooding pattern to 2008, extreme rainfall amounts appear to be increasing. Moreover, the rate of increase appears to have grown between 1970 and 2010. Long-term flood records appear to support an increase in flooding events in northern New England. 75 years' worth of data from the U.S. Geological Survey (USGS) stream flow gages were reviewed, and data results point to an increase in the number of flooding events. The data indicates a "stepwise" increase in the frequency of above-average flooding, beginning around 1970. In some cases, severity is above the long-term average. By way of contrast, floods before 1970 fell below the long-term average for intensity.

The year 2011 was a record year for flooding in the State of Vermont. A total of four disaster declarations were issued by President Obama in Vermont just in the year 2011, all attributed to flooding and fluvial erosion. The first floods occurred over a two-week period in April and May of 2011 (DR 1995, 4043). These floods impacted the northern half of the state, including the counties of Addison, Chittenden, Essex, Franklin, Grand Isle, Lamoille, Orleans, Washington, and Windham. The damage totaled over \$1.8 million in FEMA assistance. In the spring, heavy rains in late March/early April on top of a deep late season snowpack resulted in riverine flooding and sent Lake Champlain well over the 500-year flood elevation breaking the 140-year-old peak stage elevation. Additional spring runoff events resulted in Lake Champlain being above base flood elevation for more than a month. High lake levels coupled with wind driven waves in excess of 3 feet resulted in major flood damages for shoreline communities



A second declaration (DR-4001) was made following flooding from a severe storm on May 26, 2011. Although not as severe as floods that occurred earlier in the month, multiple counties were included in the declaration, including Caledonia, Essex, Orange, and Washington counties.

Additionally, flooding and fluvial erosion caused by Tropical Storm Irene was catastrophic, destroying property and taking lives, and again eliciting a disaster declaration (DR-4022). The details and impacts of Tropical Storm Irene are provided in the Hurricanes/Tropical Storms section of this risk assessment. However, it is important to underscore that the majority of damages resulting from Tropical Storm Irene were due to flooding and fluvial erosion.

There was also a major disaster declaration issued by the president in 2012 (DR-4066). Severe storms, tornadoes, and flooding occurred on May 29, 2012, impacting Addison, Lamoille, and Orleans counties. The cost of this flooding has not yet been totaled.

Mobile home parks are an area of particular concern with regard to flooding. An assessment completed in 2012 by researchers at the University of Vermont found that one-fifth of Vermont's 247 mobile home parks have at least one lot that is located within a flood hazard area and nearly 12 percent of all mobile home park lots are located in flood hazards areas. Two of the major

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flooding events in 2011 affected 19 mobile home parks across central and southern regions of the state, destroying over 150 mobile homes. Tropical Storm Irene also flooded two parks that are not in mapped flood hazard areas: Barber’s Pond Mobile Home Park in Pownal and Tenney’s Mobile Home Park in Athens. Both of these parks were located just outside the limit of the mapped flood hazard area. A table of the flood vulnerable mobile home parks can be found in Appendix E: Flood Vulnerable Mobile Home Parks in Vermont.

In addition to the flooding and fluvial erosion dangers along major riverways and lakes in Vermont, there are significant flash flood dangers near small streams and in alluvial fans. These areas are not captured in FEMA’s Flood Insurance Rate Maps (FIRM). However, the VT DEC Rivers Program plans to provide statewide coverage of fluvial erosion hazard (FEH) areas, even along smaller streams. They are accomplishing this by delineating river corridors for larger streams and rivers, and standard setbacks for smaller, upland streams. The setbacks will be determined by factoring in the same stable stream slope requirements as used when delineating a river corridor using a meander centerline setback. This is important because the dangers along these areas are real. One example was during Tropical Storm Irene, when US 4 experienced extensive damage in Killington. More information on FEH area’s can be found in Appendix F: Frequently Asked Questions about Fluvial Erosion Hazards or Appendix G: River Corridors, FEH Areas, Setbacks, and Buffers.

The table below lists all of the floods, arranged according to cost, that have impacted Vermont in just the last 10 years.

**Table 4-3
Significant Floods Events in Vermont in the Last 10 Years**

Property Damage (Adjusted for Inflation)	Crop Damage (Adjusted for Inflation)	Begin Date	End Date	County	Injuries	Fatalities	Remarks
\$2,032,183.91	\$ -	8/28/2004	8/28/2004	Addison	0	0	Flash Flood
\$1,642,105.26	\$ -	7/11/2007	7/11/2007	Washington	0	0	Flash Flood
\$956,321.84	\$ -	7/12/2004	7/12/2004	Lamoille	0	0	
\$821,052.63	\$ -	7/11/2007	7/11/2007	Windsor	0	0	Flash Flood
\$821,052.63	\$ -	7/11/2007	7/11/2007	Orange	0	0	Flash Flood
\$787,878.79	\$ -	8/26/2008	8/26/2008	Addison	0	0	Flash Flood
\$787,878.79	\$ -	6/14/2008	6/15/2008	Rutland	0	0	Flash Flood
\$525,252.53	\$ -	6/14/2008	6/15/2008	Addison	0	0	Flash Flood
\$520,000.00	\$ -	10/1/2010	10/1/2010	Addison	0	0	
\$371,428.57	\$ -	8/21/2009	8/21/2009	Orange	0	0	Flash Flood
\$358,620.69	\$ -	7/12/2004	7/12/2004	Essex	0	0	

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Property Damage (Adjusted for Inflation)	Crop Damage (Adjusted for Inflation)	Begin Date	End Date	County	Injuries	Fatalities	Remarks
\$315,151.52	\$ -	8/2/2008	8/2/2008	Washington	0	0	Flash Flood
\$309,523.81	\$ -	8/3/2003	8/3/2003	Windham	0	0	
\$273,684.21	\$ -	7/11/2007	7/11/2007	Caledonia	0	0	Flash Flood
\$273,684.21	\$ -	7/11/2007	7/11/2007	Windsor	0	0	Flash Flood
\$218,947.37	\$ -	7/11/2007	7/11/2007	Washington	0	0	Flash Flood
\$210,101.01	\$ -	3/8/2008	3/9/2008	Caledonia	0	0	Flash Flood
\$210,101.01	\$ -	8/1/2008	8/2/2008	Washington	0	0	Flash Flood
\$109,473.68	\$27,368.42	7/11/2007	7/11/2007	Orleans	0	0	Flash Flood
\$109,473.68	\$ -	7/11/2007	7/11/2007	Lamoille	0	0	Flash Flood
\$109,473.68	\$ -	7/11/2007	7/11/2007	Orleans	0	0	Flash Flood
\$105,050.51	\$ -	7/24/2008	7/24/2008	Lamoille	0	0	Flood
\$105,050.51	\$ -	8/6/2008	8/6/2008	Rutland	0	0	Flash Flood
\$105,050.51	\$ -	8/6/2008	8/6/2008	Windsor	0	0	Flood
\$105,050.51	\$ -	8/7/2008	8/7/2008	Washington	0	0	Flash Flood
\$105,050.51	\$ -	6/28/2008	6/28/2008	Rutland	0	0	Flash Flood
\$105,050.51	\$ -	6/17/2008	6/17/2008	Franklin	0	0	Flash Flood
\$104,000.00	\$ -	7/21/2010	7/21/2010	Orange	0	0	
\$104,000.00	\$ -	10/1/2010	10/1/2010	Caledonia	0	0	
\$104,000.00	\$ -	10/1/2010	10/1/2010	Washington	0	0	
\$84,782.61	\$ -	5/19/2006	5/20/2006	Franklin	0	0	Flash Flood
\$79,591.84	\$ -	7/29/2009	7/29/2009	Rutland	0	0	Flash Flood
\$62,173.91	\$ -	1/18/2006	1/18/2006	Rutland	0	0	Flood
\$61,904.76	\$ -	8/3/2003	8/3/2003	Windham	0	0	
\$61,904.76	\$ -	8/3/2003	8/3/2003	Windham	0	0	
\$62,650.60	\$ -	4/13/2002	4/14/2002	Windsor	0	0	
\$57,777.78	\$ -	6/10/2005	6/10/2005	Orleans	0	0	Flash Flood

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Property Damage (Adjusted for Inflation)	Crop Damage (Adjusted for Inflation)	Begin Date	End Date	County	Injuries	Fatalities	Remarks
\$57,777.78	\$ -	8/29/2005	8/29/2005	Windsor	0	0	Flash Flood
\$56,521.74	\$ -	5/19/2006	5/20/2006	Washington	0	0	Flood
\$56,521.74	\$ -	5/19/2006	5/20/2006	Franklin	0	0	Flood
\$56,521.74	\$ -	5/19/2006	5/20/2006	Chittenden	0	0	Flood
\$56,521.74	\$ -	5/19/2006	5/20/2006	Lamoille	0	0	Flood
\$54,736.84	\$ -	3/15/2007	3/15/2007	Orange	0	0	Flood
\$52,525.25	\$ -	8/2/2008	8/2/2008	Lamoille	0	0	Flash Flood
\$52,525.25	\$ -	8/6/2008	8/6/2008	Caledonia	0	0	Flash Flood
\$52,525.25	\$ -	8/6/2008	8/6/2008	Windsor	0	0	Flash Flood
\$52,525.25	\$ -	8/7/2008	8/7/2008	Orange	0	0	Flash Flood
\$52,000.00	\$ -	10/15/2010	10/15/2010	Windsor	0	0	
\$52,000.00	\$ -	8/4/2010	8/4/2010	Lamoille	0	0	
\$52,000.00	\$ -	10/1/2010	10/1/2010	Addison	0	0	
\$52,000.00	\$ -	10/1/2010	10/1/2010	Orange	0	0	
\$52,000.00	\$ -	10/1/2010	10/1/2010	Washington	0	0	
\$50,120.48	\$ -	4/14/2002	4/14/2002	Orange	0	0	
\$47,816.09	\$ -	8/12/2004	8/12/2004	Franklin	0	0	Flood
\$45,217.39	\$ -	1/18/2006	1/18/2006	Chittenden	0	0	Flood
\$41,600.00	\$ -	10/1/2010	10/1/2010	Rutland	0	0	
\$41,839.08	\$ -	8/30/2004	8/30/2004	Franklin	0	0	Flood
\$41,839.08	\$ -	8/30/2004	8/30/2004	Lamoille	0	0	Flood
\$39,565.22	\$ -	5/19/2006	5/20/2006	Orleans	0	0	Flood
\$38,315.79	\$ -	5/16/2007	5/16/2007	Orleans	0	0	Flood
\$37,142.86	\$ -	4/13/2003	4/14/2003	Rutland	0	0	
\$35,862.07	\$ -	8/12/2004	8/12/2004	Rutland	0	0	Flood
\$30,952.38	\$ -	7/24/2003	7/24/2003	Addison	0	0	

RISK AND VULNERABILITY ASSESSMENT

Property Damage (Adjusted for Inflation)	Crop Damage (Adjusted for Inflation)	Begin Date	End Date	County	Injuries	Fatalities	Remarks
\$31,325.30	\$ -	6/5/2002	6/6/2002	Franklin	0	0	
\$30,952.38	\$ -	7/24/2003	7/24/2003	Rutland	0	0	
\$29,885.06	\$ -	8/30/2004	8/30/2004	Chittenden	0	0	Flood
\$29,885.06	\$ -	8/30/2004	8/30/2004	Orleans	0	0	Flood
\$28,888.89	\$ -	6/29/2005	6/29/2005	Chittenden	0	0	Flash Flood
\$28,260.87	\$ -	1/18/2006	1/18/2006	Addison	0	0	Flood
\$28,260.87	\$ -	1/18/2006	1/19/2006	Caledonia	0	0	Flood
\$28,260.87	\$ -	5/14/2006	5/15/2006	Windsor	0	0	Flood
\$28,260.87	\$ -	5/19/2006	5/20/2006	Addison	0	0	Flood
\$27,368.42	\$ -	5/16/2007	5/16/2007	Essex	0	0	Flood
\$26,262.63	\$ -	4/29/2008	4/30/2008	Caledonia	0	0	Flood
\$26,262.63	\$ -	7/24/2008	7/24/2008	Orleans	0	0	Flood
\$26,262.63	\$ -	8/2/2008	8/2/2008	Washington	0	0	Flash Flood
\$26,262.63	\$ -	8/7/2008	8/7/2008	Addison	0	0	Flash Flood
\$26,262.63	\$ -	8/7/2008	8/7/2008	Orange	0	0	Flash Flood
\$26,262.63	\$ -	8/7/2008	8/7/2008	Windsor	0	0	Flash Flood
\$26,530.61	\$ -	6/15/2009	6/15/2009	Addison	0	0	Flood
\$26,000.00	\$ -	1/25/2010	1/25/2010	Windsor	0	0	
\$26,000.00	\$ -	8/3/2010	8/4/2010	Orleans	0	0	
\$29,759.04	\$ -	6/12/2002	6/13/2002	Caledonia	0	0	
\$29,759.04	\$ -	6/12/2002	6/13/2002	Franklin	0	0	
\$29,759.04	\$ -	6/12/2002	6/13/2002	Lamoille	0	0	
\$29,759.04	\$ -	6/12/2002	6/13/2002	Orleans	0	0	
\$25,060.24	\$ -	4/13/2002	4/14/2002	Addison	0	0	
\$25,060.24	\$ -	4/13/2002	4/14/2002	Caledonia	0	0	
\$23,908.05	\$ -	7/23/2004	7/23/2004	Chittenden	0	0	
\$25,060.24	\$ -	4/14/2002	4/14/2002	Essex	0	0	

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Property Damage (Adjusted for Inflation)	Crop Damage (Adjusted for Inflation)	Begin Date	End Date	County	Injuries	Fatalities	Remarks
\$24,761.90	\$ -	8/13/2003	8/13/2003	Orleans	0	0	
\$23,908.05	\$ -	8/12/2004	8/12/2004	Washington	0	0	Flash Flood
\$23,908.05	\$ -	8/30/2004	8/31/2004	Orleans	0	0	Flood
\$23,111.11	\$ -	6/9/2005	6/9/2005	Washington	0	0	Flash Flood
\$23,111.11	\$ -	10/19/2005	10/19/2005	Windsor	0	0	Flood
\$22,608.70	\$ -	5/18/2006	5/19/2006	Washington	0	0	Flash Flood
\$22,608.70	\$ -	6/26/2006	6/26/2006	Washington	0	0	Flood
\$22,608.70	\$ -	6/29/2006	6/29/2006	Franklin	0	0	Flash Flood
\$21,894.74	\$ -	5/16/2007	5/16/2007	Caledonia	0	0	Flood
\$21,894.74	\$ -	6/12/2007	6/12/2007	Rutland	0	0	Flash Flood
\$21,894.74	\$ -	6/12/2007	6/12/2007	Rutland	0	0	Flash Flood
\$21,010.10	\$ -	8/3/2008	8/3/2008	Orleans	0	0	Flash Flood
\$16,956.52	\$ -	1/18/2006	1/18/2006	Washington	0	0	Flood
\$16,956.52	\$ -	6/26/2006	6/26/2006	Addison	0	0	Flood
\$12,380.95	\$ -	10/29/2003	10/29/2003	Chittenden	0	0	
\$12,530.12	\$ -	6/12/2002	6/12/2002	Essex	0	0	
\$12,380.95	\$ -	8/8/2003	8/8/2003	Lamoille	0	0	
\$12,530.12	\$ -	4/14/2002	4/14/2002	Orleans	0	0	
\$11,954.02	\$ -	5/24/2004	5/24/2004	Rutland	0	0	
\$12,380.95	\$ -	8/3/2003	8/3/2003	Washington	0	0	
\$12,530.12	\$ -	4/14/2002	4/14/2002	Washington	0	0	
\$12,380.95	\$ -	7/24/2003	7/24/2003	Windsor	0	0	
\$12,380.95	\$ -	8/12/2003	8/12/2003	Windsor	0	0	
\$11,954.02	\$ -	8/12/2004	8/12/2004	Lamoille	0	0	Flood
\$11,954.02	\$ -	8/12/2004	8/12/2004	Washington	0	0	Flood
\$11,555.56	\$ -	4/3/2005	4/4/2005	Rutland	0	0	Flood

RISK AND VULNERABILITY ASSESSMENT

Property Damage (Adjusted for Inflation)	Crop Damage (Adjusted for Inflation)	Begin Date	End Date	County	Injuries	Fatalities	Remarks
\$11,304.35	\$ -	1/18/2006	1/19/2006	Franklin	0	0	Flood
\$10,505.05	\$ -	7/24/2008	7/24/2008	Washington	0	0	Flood
\$10,505.05	\$ -	7/24/2008	7/24/2008	Caledonia	0	0	Flood
\$10,505.05	\$ -	8/7/2008	8/7/2008	Windsor	0	0	Flash Flood
\$10,400.00	\$ -	1/25/2010	1/26/2010	Orange	0	0	
\$10,400.00	\$ -	1/25/2010	1/25/2010	Washington	0	0	
\$10,400.00	\$ -	10/1/2010	10/1/2010	Chittenden	0	0	
\$6,190.48	\$ -	10/27/2003	10/28/2003	Caledonia	0	0	
\$6,265.06	\$ -	6/12/2002	6/12/2002	Chittenden	0	0	
\$6,190.48	\$ -	8/13/2003	8/13/2003	Essex	0	0	
\$5,977.01	\$ -	3/7/2004	3/7/2004	Lamoille	0	0	
\$6,190.48	\$ -	8/8/2003	8/8/2003	Orleans	0	0	
\$5,977.01	\$ -	7/31/2004	7/31/2004	Rutland	0	0	
\$6,190.48	\$ -	10/29/2003	10/29/2003	Washington	0	0	
\$5,777.78	\$ -	3/28/2005	3/28/2005	Windsor	0	0	Flood
\$5,777.78	\$ -	4/3/2005	4/3/2005	Caledonia	0	0	Flood
\$5,777.78	\$ -	4/3/2005	4/4/2005	Lamoille	0	0	Flood
\$5,777.78	\$ -	6/17/2005	6/17/2005	Addison	0	0	Flood
\$5,777.78	\$ -	10/16/2005	10/17/2005	Orleans	0	0	Flood
\$5,652.17	\$ -	8/3/2006	8/3/2006	Orleans	0	0	Flood
\$5,652.17	\$ -	12/1/2006	12/2/2006	Washington	0	0	Flood
\$5,473.68	\$ -	4/20/2007	4/30/2007	Addison	0	0	Lakeshore Flood
\$5,473.68	\$ -	4/20/2007	4/30/2007	Chittenden	0	0	Lakeshore Flood
\$5,473.68	\$ -	4/20/2007	4/30/2007	Franklin	0	0	Lakeshore Flood
\$5,473.68	\$ -	4/20/2007	4/30/2007	Grand Isle	0	0	Lakeshore Flood
\$5,473.68	\$ -	3/15/2007	3/15/2007	Washington	0	0	Flood
\$5,252.53	\$ -	7/24/2008	7/24/2008	Washington	0	0	Flood

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Property Damage (Adjusted for Inflation)	Crop Damage (Adjusted for Inflation)	Begin Date	End Date	County	Injuries	Fatalities	Remarks
\$4,622.22	\$ -	10/17/2005	10/18/2005	Franklin	0	0	Flood
\$3,759.04	\$ -	5/28/2002	5/28/2002	Bennington	0	0	
\$3,391.30	\$ -	1/18/2006	1/18/2006	Windsor	0	0	Flood
\$2,476.19	\$ -	10/29/2003	10/29/2003	Addison	0	0	
\$2,476.19	\$ -	10/29/2003	10/29/2003	Rutland	0	0	
\$2,390.80	\$ -	4/2/2004	4/2/2004	Rutland	0	0	
\$2,260.87	\$ -	1/18/2006	1/18/2006	Orleans	0	0	Flood
\$2,260.87	\$ -	1/18/2006	1/19/2006	Lamoille	0	0	Flood
\$2,260.87	\$ -	1/18/2006	1/19/2006	Orange	0	0	Flood
\$2,080.00	\$ -	3/23/2010	3/23/2010	Caledonia	0	0	
\$2,080.00	\$ -	3/23/2010	3/23/2010	Orleans	0	0	
\$2,080.00	\$ -	3/23/2010	3/24/2010	Chittenden	0	0	
\$2,080.00	\$ -	3/23/2010	3/23/2010	Washington	0	0	
\$2,080.00	\$ -	3/23/2010	3/24/2010	Rutland	0	0	
\$2,080.00	\$ -	8/4/2010	8/4/2010	Orleans	0	0	
\$1,857.14	\$ -	12/25/2003	12/26/2003	Addison	0	0	
\$1,857.14	\$ -	12/25/2003	12/26/2003	Rutland	0	0	
\$1,195.40	\$ -	7/31/2004	7/31/2004	Addison	0	0	
\$1,238.10	\$ -	10/29/2003	10/29/2003	Franklin	0	0	
\$1,238.10	\$ -	11/20/2003	11/20/2003	Lamoille	0	0	
\$1,238.10	\$ -	10/29/2003	10/29/2003	Orleans	0	0	
\$1,238.10	\$ -	11/20/2003	11/20/2003	Washington	0	0	
\$1,238.10	\$ -	3/22/2003	3/22/2003	Washington	0	0	
\$1,238.10	\$ -	10/29/2003	10/29/2003	Windsor	0	0	
\$1,155.56	\$ -	3/31/2005	3/31/2005	Franklin	0	0	Flood
\$1,155.56	\$ -	3/31/2005	3/31/2005	Franklin	0	0	Flood
\$1,155.56	\$ -	4/1/2005	4/1/2005	Franklin	0	0	Flood

RISK AND VULNERABILITY ASSESSMENT

Property Damage (Adjusted for Inflation)	Crop Damage (Adjusted for Inflation)	Begin Date	End Date	County	Injuries	Fatalities	Remarks
\$1,155.56	\$ -	4/1/2005	4/1/2005	Franklin	0	0	Flood
\$1,050.51	\$ -	8/7/2008	8/7/2008	Windham	0	0	Flash Flood
\$123.81	\$ -	11/20/2003	11/20/2003	Orleans	0	0	

FEH Assessment

While inundation-related flood loss is a significant component of flood disasters, the predominant mode of damage in Vermont is associated with the dynamic and oftentimes catastrophic physical adjustment of stream channel dimensions and location during storm events due to bed and bank erosion, debris and ice jams, structural failures, flow diversion, or flow modification by manmade structures. Channel adjustments with devastating consequences have frequently been documented wherein such adjustments are linked to historic channel management activities, floodplain encroachments, adjacent land use practices, and/or changes in watershed hydrology associated with conversion of land cover and drainage activities.

Vermont's landscape has historically contributed greatly to the widespread practice of the channelization of rivers and streams to maximize agricultural land uses and facilitate the development of transportation infrastructure. Channelization, in combination with widespread floodplain encroachment, has contributed significantly to the disconnection of as much as 70 percent of Vermont's streams from their floodplains. In this unsustainable condition and when energized by flood events, catastrophic adjustments of the channel frequently occur, usually with consequent fluvial erosion damage to adjacent or nearby human investments.

All areas of the state suffer equally from FEHs. Some areas have suffered more than others simply because of the location of storm tracks. Transportation infrastructure and agricultural property are the most frequently endangered types of human investment affected by fluvial erosion hazards. Residential, commercial, utility infrastructure and municipal properties are also frequently endangered.

Changes in watershed hydrology that significantly influence fluvial stability are commonly associated with urbanization or with silvicultural practices. However, watershed scale hydrologic changes have been observed in Vermont as a localized phenomenon either in small, highly urbanized watersheds such as Moon Brook in Rutland, Stevens Brook in St. Albans City, Morehouse Brook in Winooski, and Centennial Brook and Bartlett Brook in South Burlington; or in small, rural subwatersheds where clear cutting of a large percentage of the watershed land area has recently occurred.

Stream geomorphic assessments and a fluvial geomorphic database maintained by the Agency of Natural Resources (ANR) have identified main stem rivers often channelized from 60-95 percent of their lengths. When human investments and land use expectations include all the land in the valley up to the river banks, there results extreme public interest in maintaining this unsustainable morphological condition despite its great cost and resultant hazard to public safety. Some of the most channelized rivers with which extensive flood damages have been associated include the White River, West Branch of the Little River, Mad River, Huntington River, Great Brook, Williams River, and North Branch of the Deerfield River.

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The Vermont Agency of Transportation maintains a list of “scour-critical” stream crossing structures endangered by streambed scour. At present, 293 structures statewide out of a total of 2,668 structures inventoried are considered scour-critical. A spreadsheet database is maintained by VTrans and continually updated by the Bridge Inspection Program. No specific data analysis has been done to ascertain any geographic sensitivity of scour critical structures.

Many other bridges and culverts are endangered by outflanking or debris jams or channel adjustment processes not associated with the structures themselves. Again, there is no specific geographic pattern of distribution. These problems exist uniformly throughout the state.

Analysis of stream geomorphic assessment data collected over the last 10 years is providing important insights regarding the condition of Vermont’s streams and rivers. Of the nearly 1,700 assessed river miles in Vermont, nearly three-quarters (74 percent) have become confined to deeper, straighter channels and no longer have access to historic floodplains. In response, the Vermont ANR has adopted an avoidance strategy to restore and protect the natural stability of rivers and minimize flood damage. River corridor protection has become the primary tool in the Agency’s avoidance tool box.

The Vermont Rivers Program has developed a work plan to create a statewide river corridor digital map layer that will allow the state to further identify potential conflicts between human investments and river dynamics. A statewide river corridor layer will facilitate mitigation and river corridor protection planning and prioritization.

The status of geomorphic assessments and FEH mapping is the table below:

**Table 4-4
Number of Towns with Completed Geomorphic Assessments and FEH Maps**

Description	# of Towns
FEH language, map, or equivalent adopted as an ordinance	20
FEH map incorporated into current or draft Pre-Disaster Mitigation Plan	37
FEH language, map, or equivalent incorporated into Town Plan	9
Draft FEH maps completed	88
River Corridor Plan underway or completed	117
Phase 2 stream geomorphic assessment underway or completed (prerequisite for FEH map development)	140
Phase 1 stream geomorphic assessment underway or completed (prerequisite for Phase 2 SGA)	194
Conducted preliminary outreach	153
No action yet	53

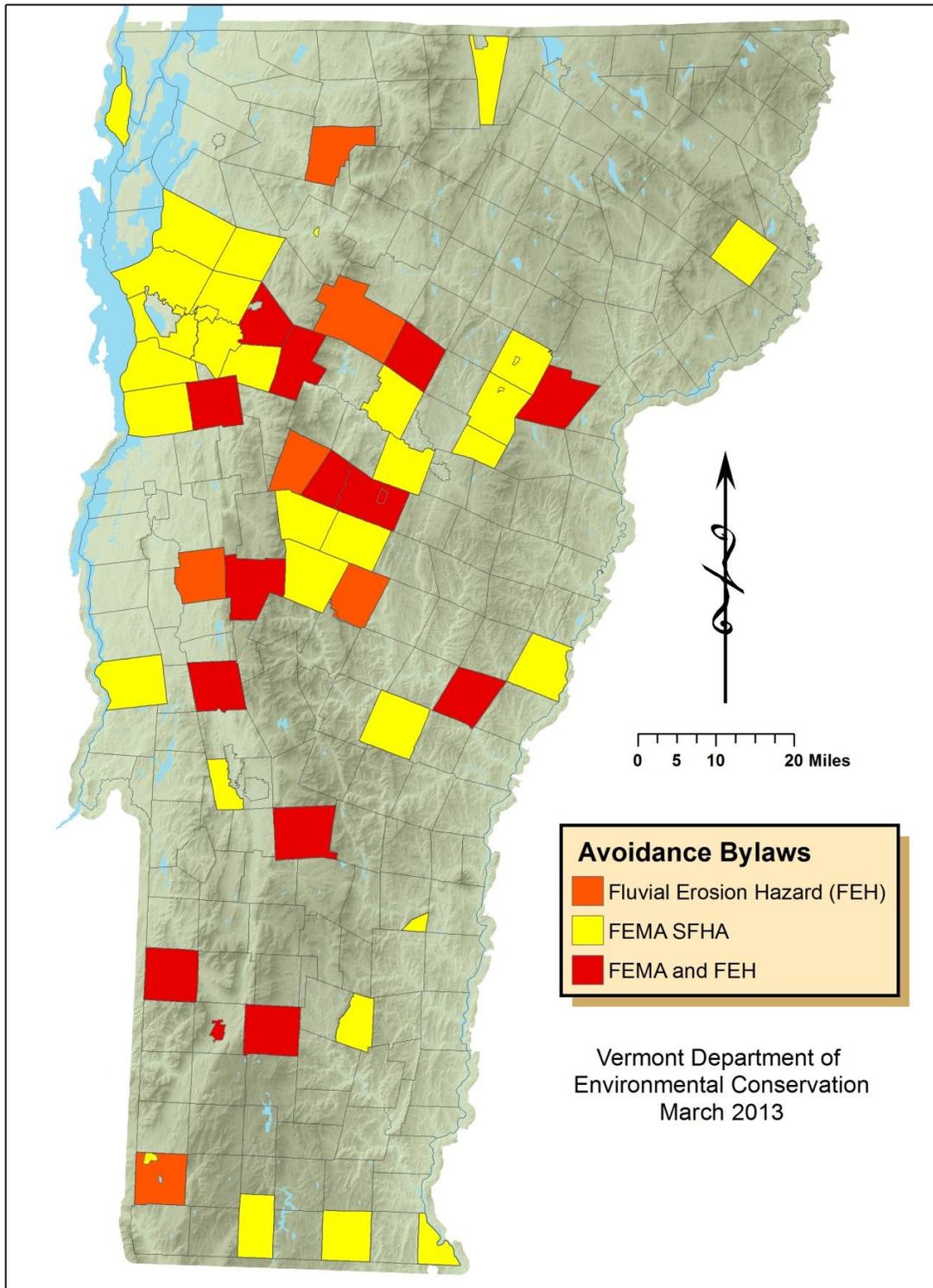
National Flood Insurance Program and Inundation Hazard Assessment

The National Flood Insurance Program (NFIP) has historically been the standard for floodplain management in Vermont. Unfortunately, the NFIP minimum standards adopted by most towns

allow continued encroachment in floodplains and further degradation of the natural and beneficial floodplain functions.

In 2008, the NFIP Coordinator's Office developed a suite of model flood hazard bylaws that goes well beyond federal minimum standards. The model bylaws include an automatic adoption provision and allows for the adoption of digital data. Three of the model bylaws integrate the FEH Overlay District language and other enhancements from the standalone document entitled Flood Plain & River Corridor Protection – Land Use and Regulatory Enhancement Options. Two of the models are strict avoidance bylaws that prohibit construction of new structures and fill in the entire Special Flood Hazard Area. The intent behind the development of multiple model bylaws is to provide options to a community given the nature of their flood hazards, their capacity to administer adopted regulations, and their desire to manage their flood hazards over and above the NFIP minimum criteria. As of early 2013, 57 communities have adopted avoidance-based flood hazard bylaws.

Figure 4-1
Vermont Towns with Avoidance Bylaws in Place



FEMA identifies and maps flood inundation risks in support of the NFIP. The Flood Insurance Studies and Flood Insurance Rate Maps (FIRMs) are the basis for floodplain regulation and flood insurance requirements. The quality of this information in Vermont is highly variable. There are some communities that do not have any mapped flood hazards. There many communities that have mapping that is very old and/or not based on detailed studies.

FEMA began updating Flood Insurance Studies and providing digital FIRMs (DFIRMS) in 2005 through its Map Modernization and Risk Map programs. Six of Vermont’s 14 counties have, or will soon have, updated DFIRMs. DFIRM data exists for Windham, Windsor, Rutland, Chittenden, Washington, and Bennington Counties. The preliminary maps for Bennington County include the ANR FEH corridor as an informational layer.

Additional Flood Insurance Study and DFIRM updates beyond Bennington County are very uncertain given reductions in FEMA’s mapping budget coupled with overall federal budget uncertainty. VT DEC is very interested in a new Flood Insurance Study/DFIRM effort in the Missisquoi watershed in Franklin County. The State has acquired high-resolution topography to FEMA mapping specifications for this watershed and remains hopeful that we will be able to secure FEMA funding for this endeavor.

DFIRM data are readily available through the ANR Natural Resources Atlas web mapping application (<http://anrmaps.vermont.gov/websites/anra/>).

Table 4-5 provides the municipalities with the greatest vulnerability measured in terms of total number of insurance policies in effect.

**Table 4-5
Municipality Vulnerability Rankings**

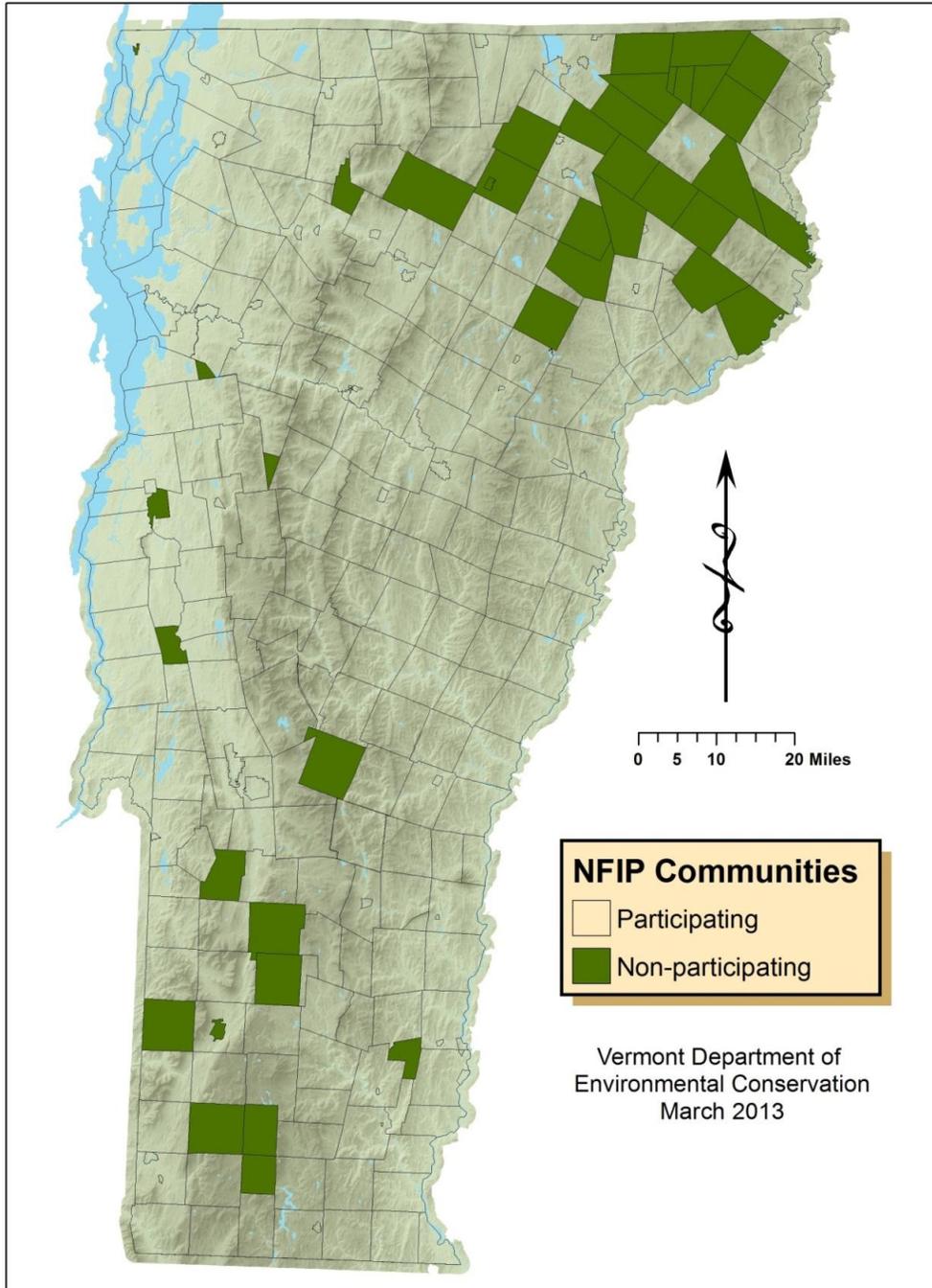
Name	Municipality	Rank
Montpelier	City	1
Barre	City	2
Bennington	Town	3
Rutland	City and Town	4
Ludlow	Town and Village	5
Waterbury	Town and Village	6
Windsor	Town	7
Woodstock	Town and Village	8
Lyndonville/Lyndon	Town	9
Brattleboro	Town	10
Jamaica	Town	11

There are 239 communities participating in the NFIP in Vermont as listed in FEMA’s Community Status Book as of March 2013 (<http://www.fema.gov/cis/VT.pdf>). There are 257

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communities actually *covered* by the NFIP due to many villages being regulated under the Town Community Identification Number.

Figure 4-2
NFIP Status of Vermont Towns



**Table 4-6
Vermont Communities Participating in the NFIP**

CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Tribal
500163#	ADDISON, TOWN OF	ADDISON COUNTY	11/22/1974	9/18/1986	9/18/1986	9/18/1986	No
500221#	ALBURGH, TOWN OF	GRAND ISLE COUNTY	11/8/1974	3/16/1981	3/16/1981(M)	3/16/1981	No
	Village of Alburgh (CID 500222) has merged with the Town of Alburgh.						
500291#	ANDOVER, TOWN OF	WINDSOR COUNTY	12/20/1974	8/5/1985	9/28/2007(M)	8/5/1985	No
500012#	ARLINGTON, TOWN OF	BENNINGTON COUNTY	08/2/1974	7/17/1986	7/17/1986	7/17/1986	No
500216	BAKERSFIELD, TOWN OF	FRANKLIN COUNTY	02/7/1975	9/27/1985	9/27/1985(M)	9/27/1985	No
500298#	BALTIMORE, TOWN OF	WINDSOR COUNTY		9/28/2007	(NSFHA)	2/29/2012	No
500292#	BARNARD, TOWN OF	WINDSOR COUNTY	09/6/1974	9/18/1985	9/28/2007(M)	9/18/1985	No
500024#	BARNET, TOWN OF	CALEDONIA COUNTY	2/22/1974	5/17/1988	5/17/1988	5/17/1988	No
500105#	BARRE, CITY OF	WASHINGTON COUNTY	7/26/1974	1/17/1985	1/17/1985	1/17/1985	No
500273#	BARRE, TOWN OF	WASHINGTON COUNTY	8/30/1974	6/15/1978	6/15/1978	6/15/1978	No
500081#	BARTON, TOWN OF	ORLEANS COUNTY	11/15/1974	4/3/1978	2/2/1994	4/3/1978	No
500082#	BARTON, VILLAGE OF	ORLEANS COUNTY	11/8/1974	4/3/1978	2/2/1994	4/3/1978	No
500125#	BELLOWS FALLS, VILLAGE OF	WINDHAM COUNTY	8/16/1974	7/16/1979	9/28/2007	7/16/1979	No
500227#	BELVIDERE, TOWN OF	LAMOILLE COUNTY	12/6/1974	10/15/1980	10/15/1980	08/7/2001	No
500013#	BENNINGTON, TOWN OF	BENNINGTON COUNTY	9/13/1974	6/17/1986	6/17/1986	6/17/1986	No
500259#	BENSON, TOWN OF	RUTLAND COUNTY	12/13/1974	9/27/1985	8/28/2008(M)	9/27/1985	No

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CID	Community Name	County	Initial FHB Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Tribal
500049#	BERKSHIRE, TOWN OF	FRANKLIN COUNTY	5/31/1974	6/1/1983	6/1/1983	6/1/1983	No
500106#	BERLIN, TOWN OF	WASHINGTON COUNTY	2/15/1974	8/15/1984	8/15/1984	8/15/1984	No
500143#	BETHEL, TOWN OF	WINDSOR COUNTY	02/8/1974	8/5/1991	9/28/2007	8/5/1991	No
500045#	BLOOMFIELD, TOWN OF	ESSEX COUNTY	09/6/1974	6/3/1991	6/3/1991	6/3/1991	No
500308#	BOLTON, TOWN OF	CHITTENDEN COUNTY	2/21/1975	4/1/1981	7/18/2011	4/1/1981	No
500069#	BRADFORD, TOWN OF	ORANGE COUNTY	1/31/1975	6/3/1991	6/3/1991	6/3/1991	No
500234#	BRADFORD, VILLAGE OF	ORANGE COUNTY	10/25/1974	6/3/1991	6/22/1998	6/3/1991	No
	Village has merged with Town of Bradford.						
500235#	BRAINTREE, TOWN OF	ORANGE COUNTY	12/13/1974	9/27/1985	9/27/1985(M)	9/27/1985	No
500090#	BRANDON, TOWN OF	RUTLAND COUNTY	09/6/1974	5/15/1978	8/28/2008	5/15/1978	No
500126#	BRATTLEBORO, TOWN OF	WINDHAM COUNTY	02/8/1974	12/4/1985	9/28/2007	12/4/1985	No
500144#	BRIDGEWATER, TOWN OF	WINDSOR COUNTY	8/16/1974	7/2/1980	9/28/2007	7/2/1980	No
500164#	BRIDPORT, TOWN OF	ADDISON COUNTY	11/22/1974	2/15/1979	8/15/1979	8/15/1979	No
500205#	BRIGHTON, TOWN OF	ESSEX COUNTY	9/20/1974	5/4/1989	3/5/1990	5/4/1989	No
500001#	BRISTOL, TOWN OF	ADDISON COUNTY	08/9/1974	8/5/1986	8/5/1986	8/5/1986	No
500165#	BRISTOL, VILLAGE OF	ADDISON COUNTY	12/13/1974	8/19/1986	8/19/1986	8/19/1986	No
500236#	BROOKFIELD, TOWN OF	ORANGE COUNTY	12/13/1974	9/29/1978	9/29/1978	9/9/2008	No
500280#	BROOKLINE, TOWN OF	WINDHAM COUNTY	12/6/1974	9/4/1985	9/28/2007(M)	9/4/1985	No

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CID	Community Name	County	Initial FHB Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Tribal
500206#	BRUNSWICK, TOWN OF	ESSEX COUNTY	10/12/1979	6/17/1991	6/17/1991	6/17/1991	No
500025#	BURKE, TOWN OF	CALEDONIA COUNTY	6/7/1974	6/4/1980	6/4/1980	6/4/1980	No
	Includes the Village of West Burke (CID 500208).						
500032#	BURLINGTON, CITY OF	CHITTENDEN COUNTY	7/19/1974	11/15/1978	7/18/2011	11/15/1978	No
500108	CABOT, TOWN OF	WASHINGTON COUNTY	4/16/1976	9/18/1985	9/18/1985(M)	9/18/1985	No
	As of 1/1/2011, the Village of Cabot merged into the Town of Cabot. See General Assembly of the State of Vermont H.794						
500109	CALAIS, TOWN OF	WASHINGTON COUNTY	6/28/1974	9/4/1985	9/4/1985(M)	9/4/1985	No
500061#	CAMBRIDGE, TOWN OF	LAMOILLE COUNTY	6/28/1974	6/15/1983	6/15/1983	6/15/1983	No
500228#	CAMBRIDGE, VILLAGE OF	LAMOILLE COUNTY	8/9/1974	6/1/1983	6/1/1983	6/1/1983	No
500046#	CANAAN, TOWN OF	ESSEX COUNTY	5/31/1974	9/30/1980	9/30/1980	9/30/1980	No
500091#	CASTLETON, TOWN OF	RUTLAND COUNTY	8/30/1974	7/16/1984	8/28/2008	7/16/1984	No
500145#	CAVENDISH, TOWN OF	WINDSOR COUNTY	2/8/1974	10/15/1981	9/28/2007	10/15/1981	No
	INCLUDES THE VILLAGE OF PROCTORSVILLE						
500309#	CHARLOTTE, TOWN OF	CHITTENDEN COUNTY	01/3/1975	9/3/1980	7/18/2011	9/3/1980	No
500070#	CHELSEA, TOWN OF	ORANGE COUNTY	6/28/1974	8/15/1980	8/15/1980	8/15/1980	No
500146#	CHESTER, TOWN OF	WINDSOR COUNTY	6/28/1974	3/4/1980	9/28/2007	3/4/1980	No
500092#	CHITTENDEN, TOWN OF	RUTLAND COUNTY	4/1/1977	9/18/1985	8/28/2008(M)	9/18/1985	No
500093#	CLARENDON, TOWN OF	RUTLAND COUNTY	5/31/1974	11/19/1980	8/28/2008	11/19/1980	No
500033#	COLCHESTER, TOWN OF	CHITTENDEN COUNTY	8/23/1974	3/1/1982	7/18/2011	3/1/1982	No

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500207#	CONCORD, TOWN OF	ESSEX COUNTY	9/20/1974	9/27/1985	9/30/1992	9/27/1985	No
500071#	CORINTH, TOWN OF	ORANGE COUNTY	6/28/1974	6/30/1976	9/27/1991	6/30/1976	No
500317	CORNWALL, TOWN OF	ADDISON COUNTY	3/21/1975	9/27/1985	9/27/1985(M)	9/27/1985	No
500246	COVENTRY, TOWN OF	ORLEANS COUNTY	2/21/1975	9/27/1985	9/27/1985	9/27/1985	No
500247	CRAFTSBURY, TOWN OF	ORLEANS COUNTY	9/13/1974	9/27/1985	9/27/1985(M)	9/27/1985	No
500312#	DANBY, TOWN OF	RUTLAND COUNTY	1/17/1975	8/1/1980	8/28/2008	8/1/1980	No
500185	DANVILLE, TOWN OF	CALEDONIA COUNTY	1/17/1975		1/17/1975	06/7/04(E)	No
500248	DERBY, TOWN OF	ORLEANS COUNTY	12/13/1975	9/27/1985	9/27/1985(M)	9/27/1985	No
	The Town of Derby includes the jurisdictions of the Village of Derby Center (CID 500249) and the Village of Derby Line (CID 505519).						
500014	DORSET, TOWN OF	BENNINGTON COUNTY	7/26/1974	8/1/1986	8/1/1986(L)	8/1/1986	No
500127#	DOVER, TOWN OF	WINDHAM COUNTY	8/2/1974	7/1/1991	9/28/2007	7/1/1991	No
500128#	DUMMERSTON, TOWN OF	WINDHAM COUNTY	8/30/1974	6/17/1991	9/28/2007	6/17/1991	No
500110#	DUXBURY, TOWN OF	WASHINGTON COUNTY	6/28/1974	3/15/1982	11/19/1997	3/15/1982	No
500111#	EAST MONTPELIER, TOWN OF	WASHINGTON COUNTY	6/14/1974	5/2/1983	5/2/1983	5/2/1983	No
500318	ELMORE, TOWN OF	LAMOILLE COUNTY	4/11/1975		4/11/1975	11/14/2001(E)	No
500050#	ENOSBURG FALLS, VILLAGE OF	FRANKLIN COUNTY	4/5/1974	1/2/1981	1/2/1981	1/2/1981	No
500051#	ENOSBURG, TOWN OF	FRANKLIN COUNTY	8/9/1974	1/2/1981	1/2/1981	6/19/1996	No
500035#	ESSEX JCT., VILLAGE OF	CHITTENDEN COUNTY	6/28/1974	1/2/1981	7/18/2011	4/12/2012	No

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500034#	ESSEX, TOWN OF	CHITTENDEN COUNTY	9/20/1974	1/16/1981	7/18/2011	1/16/1981	No
500094#	FAIR HAVEN, TOWN OF	RUTLAND COUNTY	7/19/1974	10/16/1984	8/28/2008	10/16/1984	No
500052#	FAIRFAX, TOWN OF	FRANKLIN COUNTY	5/17/1974	1/20/1982	1/20/1982	1/20/1982	No
500053	FAIRFIELD, TOWN OF	FRANKLIN COUNTY	1/10/1975	9/27/1985	9/27/1985(M)	9/27/1985	No
500072#	FAIRLEE, TOWN OF	ORANGE COUNTY	12/17/1976	6/3/1991	6/3/1991	6/3/1991	No
500326#	FAYSTON, TOWN OF	WASHINGTON COUNTY		9/30/1980	9/30/1980	9/30/1980	No
500002#	FERRISBURG, TOWN OF	ADDISON COUNTY	9/6/1974	9/18/1986	9/18/1986	9/18/1986	No
500054#	FLETCHER, TOWN OF	FRANKLIN COUNTY	11/8/1974	12/1/1981	12/1/1981	12/1/1981	No
500310	FRANKLIN, TOWN OF	FRANKLIN COUNTY	11/15/1974	9/18/1985	9/18/1985(M)	9/18/1985	No
500217#	GEORGIA, TOWN OF	FRANKLIN COUNTY	2/7/1975	9/16/1981	9/16/1981	9/16/1981	No
500251#	GLOVER, TOWN OF	ORLEANS COUNTY	12/20/1974	8/5/1991	8/5/1991	8/5/1991	No
500004#	GOSHEN, TOWN OF	ADDISON COUNTY	12/20/1977	9/1/1986	9/1/1986(L)	9/1/1986	No
500129#	GRAFTON, TOWN OF	WINDHAM COUNTY	4/2/1976	8/4/1987	9/28/2007	8/4/1987	No
500223#	GRAND ISLE, TOWN OF	GRAND ISLE COUNTY	10/18/1974	6/3/1988	6/3/1988	6/3/1988	No
500003#	GRANVILLE, TOWN OF	ADDISON COUNTY	1/24/1975	8/19/1991	8/19/1991	8/19/1991	No
500085	GREENSBORO, TOWN OF	ORLEANS COUNTY	7/19/1974	9/27/1985	9/27/1985(M)	9/27/1985	No
500026#	GROTON, TOWN OF	CALEDONIA COUNTY	8/9/1974	9/27/1991	9/27/1991	9/27/1991	No
500047#	GUILDHALL, TOWN OF	ESSEX COUNTY	8/16/1974	6/17/1991	6/17/1991	6/17/1991	No
500130#	GUILFORD, TOWN OF	WINDHAM COUNTY	7/19/1974	6/3/1986	9/28/07(M)	6/3/1986	No

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500005#	HANCOCK, TOWN OF	ADDISON COUNTY	9/20/1974	9/27/1985	8/19/1991	9/27/1985	No
500027#	HARDWICK, TOWN AND VILLAGE OF	CALEDONIA COUNTY	6/28/1974	6/15/1984	7/17/2002	6/15/1984	No
	INCLUDES THE VILLAGE OF HARDWICK						
500148#	HARTFORD, TOWN OF	WINDSOR COUNTY	11/22/1974	7/2/1979	9/28/2007	7/2/1979	No
500149#	HARTLAND, TOWN OF	WINDSOR COUNTY	12/24/1976	6/15/1988	9/28/2007	6/3/1993	No
500055#	HIGHGATE, TOWN OF	FRANKLIN COUNTY	5/31/1974	4/4/1983	4/4/1983	4/4/1983	No
500322#	HINESBURG, TOWN OF	CHITTENDEN COUNTY	1/31/1975	9/27/1985	7/18/2011	9/27/1985	No
500313#	HUBBARDTON, TOWN OF	RUTLAND COUNTY	12/13/1974	12/1/1990	8/28/2008(M)	12/1/1990	No
500036#	HUNTINGTON, TOWN OF	CHITTENDEN COUNTY	7/26/1974	7/17/1978	7/18/2011	7/17/1978	No
500230#	HYDE PARK, TOWN OF	LAMOILLE COUNTY	12/6/1974	11/4/1981	11/4/1981	11/4/1981	No
500231#	HYDE PARK, VILLAGE OF	LAMOILLE COUNTY	8/30/1974	12/15/1981	12/15/1981	12/15/1981	No
500260#	IRA, TOWN OF	RUTLAND COUNTY	12/6/1974	9/18/1985	8/28/2008(M)	9/18/1985	No
500131#	JAMAICA, TOWN OF	WINDHAM COUNTY	6/28/1974	5/5/1981	9/28/2007	5/5/1981	No
500253#	JAY, TOWN OF	ORLEANS COUNTY	9/13/1974	8/23/2000	8/23/2000	8/23/2000	No
500062#	JEFFERSONVILLE, VILLAGE OF	LAMOILLE COUNTY	8/9/1974	6/15/1983	6/15/1983	6/15/1983	No
500037#	JERICO, TOWN OF	CHITTENDEN COUNTY	6/14/1974	6/1/1981	7/18/2011	6/1/1981	No
500063#	JOHNSON, TOWN OF	LAMOILLE COUNTY	6/21/1974	2/1/1979	4/17/1987	2/1/1979	No
500232#	JOHNSON, VILLAGE OF	LAMOILLE COUNTY	4/5/1974	2/1/1979	4/3/1987	2/1/1979	No

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500178	LANDGROVE, TOWN OF	BENNINGTON COUNTY	1/3/1975	9/18/1985	9/18/1985(M)	9/18/1985	No
500006	LEICESTER, TOWN OF	ADDISON COUNTY	6/28/1974	11/1/1985	11/1/1985(M)	11/1/1985	No
500212#	LEMINGTON, TOWN OF	ESSEX COUNTY	12/13/1973	6/3/1991	6/3/1991	6/3/1991	No
500007#	LINCOLN, TOWN OF	ADDISON COUNTY	8/2/1974	8/19/1986	8/19/1986	8/19/1986	No
500132#	LONDONDERRY, TOWN OF	WINDHAM COUNTY	6/28/1974	4/1/1992	9/28/2007	4/1/1992	No
500254	LOWELL, TOWN OF	ORLEANS COUNTY	9/20/1974	12/4/1985	12/4/1985(M)	12/4/1985	No
500150#	LUDLOW, TOWN OF	WINDSOR COUNTY	3/11/1977	9/1/1978	9/28/2007	9/1/1978	No
500294#	LUDLOW, VILLAGE OF	WINDSOR COUNTY	11/15/1974	9/1/1978	9/28/2007	9/1/1978	No
500028#	LYNDON, TOWN OF	CALEDONIA COUNTY		6/18/1980	5/17/1988	6/18/1980	No
	INCLUDES THE VILLAGE OF LYNDONVILLE						
500015#	MANCHESTER, TOWN OF	BENNINGTON COUNTY	8/2/1974	4/3/1978	7/3/1985	4/3/1978	No
500283#	MARLBORO, TOWN OF	WINDHAM COUNTY	12/27/1974	9/18/1985	9/28/2007(M)	9/18/1985	No
500323#	MARSHFIELD, TOWN OF	WASHINGTON COUNTY	9/20/1974	7/16/1984	3/5/1996	7/16/1984	No
500113#	MARSHFIELD, VILLAGE OF	WASHINGTON COUNTY	9/20/1974	7/16/1984	7/16/1984	7/16/1984	No
500095#	MENDON, TOWN OF	RUTLAND COUNTY	8/16/1974	9/18/1985	8/28/2008(M)	9/18/1985	No
500008#	MIDDLEBURY, TOWN OF	ADDISON COUNTY		1/3/1985	1/3/1985	1/3/1985	No
500114#	MIDDLESEX, TOWN OF	WASHINGTON COUNTY	6/28/1974	5/3/1982	5/3/1982	5/3/1982	No
500261#	MIDDLETOWN SPRINGS, TOWN OF	RUTLAND COUNTY	12/6/1974	9/18/1985	8/28/2008(M)	9/18/1985	No
500038#	MILTON, TOWN OF	CHITTENDEN COUNTY	7/26/1974	1/6/1982	7/18/2011	1/6/1982	No

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	INCLUDES THE VILLAGE OF MILTON						
500167#	MONKTON, TOWN OF	ADDISON COUNTY	1/24/1975	11/1/1985	11/1/1985(M)	11/1/1985	No
500056#	MONTGOMERY, TOWN OF	FRANKLIN COUNTY	6/21/1974	12/2/1980	7/5/2001	12/2/1980	No
505518#	MONTPELIER, CITY OF	WASHINGTON COUNTY		6/22/1973	2/17/1982	6/22/1973	No
500116#	MORETOWN, TOWN OF	WASHINGTON COUNTY	5/31/1974	9/29/1978	3/1/1984	9/29/1978	No
500064#	MORRISTOWN, TOWN OF	LAMOILLE COUNTY	5/31/1974	1/3/1979	7/2/1987	1/3/1979	No
500065#	MORRISVILLE, VILLAGE OF	LAMOILLE COUNTY	2/1/1974	5/15/1978	7/2/1987	5/15/1978	No
500096#	MT. HOLLY, TOWN OF	RUTLAND COUNTY	6/28/1974	9/18/1985	8/28/2008(M)	9/18/1985	No
500009#	NEW HAVEN, TOWN OF	ADDISON COUNTY	10/25/1974	4/3/1978	9/4/1986	4/3/1978	No
500237#	NEWBURY, TOWN OF	ORANGE COUNTY	10/25/1974	5/17/1990	7/21/1999	5/17/1990	No
	INCLUDE THE VILLAGES OF NEWBURY (CID 500238) and WELLS RIVER						
500133#	NEWFANE, TOWN AND VILLAGE OF	WINDHAM COUNTY	6/28/1974	6/5/1989	9/28/2007	6/5/1989	No
500086#	NEWPORT, CITY OF	ORLEANS COUNTY	12/13/1977	6/18/1980	6/18/1980	8/19/1981	No
500256#	NEWPORT, TOWN OF	ORLEANS COUNTY	11/1/1974	9/18/1985	9/18/1985(M)	9/18/1985	No
500180	NORTH BENNINGTON, VILLAGE OF	BENNINGTON COUNTY	2/21/1975		2/21/1975	7/7/2011(E)	No
500225#	NORTH HERO, TOWN OF	GRAND ISLE COUNTY	1/10/1975	8/15/1980	8/15/1980	8/15/1980	No
500087#	NORTH TROY, VILLAGE OF	ORLEANS COUNTY	8/2/1974	7/16/1980	7/16/1980	7/16/1980	No
500118#	NORTHFIELD, TOWN OF	WASHINGTON COUNTY	5/31/1974	5/15/1978	5/15/1978	5/15/1978	No

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500117#	NORTHFIELD, VILLAGE OF	WASHINGTON COUNTY	6/21/1974	5/15/1978	5/15/1978	5/15/1978	No
500295#	NORWICH, TOWN OF	WINDSOR COUNTY	10/18/1974	6/15/1988	9/28/2007	6/15/1988	No
500239	ORANGE, TOWN OF	ORANGE COUNTY	1/31/1975	9/18/1985	9/18/1985(M)	9/18/1985	No
500088#	ORLEANS, VILLAGE OF	ORLEANS COUNTY	8/9/1974	3/15/1978	8/19/1985	3/15/1978	No
500168	ORWELL, TOWN OF	ADDISON COUNTY	11/15/1974	9/18/1985	9/18/1985(M)	9/18/1985	No
500169#	PANTON, TOWN OF	ADDISON COUNTY	1/17/1975	9/18/1986	9/18/1986	9/18/1986	No
500097#	PAWLET, TOWN OF	RUTLAND COUNTY	6/28/1974	9/1/1978	8/28/2008	9/1/1978	No
505524	PEACHAM, TOWN OF	CALEDONIA COUNTY				11/23/11(E)	No
500181	PERU, TOWN OF	BENNINGTON COUNTY	1/10/75		10/25/1977	8/12/2013 (E)	No
500263#	PITTSFIELD, TOWN OF	RUTLAND COUNTY	12/13/1974	9/4/1991	8/28/2008	9/4/1990	No
500098#	PITTSFORD, TOWN OF	RUTLAND COUNTY	6/14/1974	7/4/1988	8/28/2008	7/4/1988	No
500275#	PLAINFIELD, TOWN OF	WASHINGTON COUNTY	8/9/1974	8/1/1983	7/16/1996	8/1/1983	No
500151#	PLYMOUTH, TOWN OF	WINDSOR COUNTY	1/10/1975	6/19/1989	9/28/2007	6/19/1989	No
500297#	POMFRET, TOWN OF	WINDSOR COUNTY	11/1/1974	9/18/1985	9/28/2007	9/18/1985	No
500099#	POULTNEY, TOWN OF	RUTLAND COUNTY	6/28/1974	7/2/1980	8/28/2008	7/2/1980	No
500266#	POULTNEY, VILLAGE OF	RUTLAND COUNTY	12/6/1974	7/2/1980	8/28/2008	7/2/1980	No
500016#	POWNA, TOWN OF	BENNINGTON COUNTY	8/16/1974	4/1/1980	4/1/1980	4/1/1980	No
500265#	PROCTOR, TOWN OF	RUTLAND COUNTY	5/31/1974	12/1/1978	8/28/2008	12/1/1978	No
500134#	PUTNEY, TOWN OF	WINDHAM COUNTY	6/21/1974	9/18/1985	9/28/2007	9/18/1985	No

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500073#	RANDOLPH, TOWN OF	ORANGE COUNTY	6/28/1974	7/16/1991	7/16/1991	7/16/1991	No
	INCLUDES THE VILLAGE OF RANDOLPH						
500152#	READING, TOWN OF	WINDSOR COUNTY	9/13/1974	5/4/1989	9/28/2007	5/4/1989	No
500017	READSBORO, TOWN OF	BENNINGTON COUNTY	5/31/1974	9/27/1985	9/27/1985(M)	9/27/1985	No
	Includes the Village of Readsboro (CID 500182)						
500218#	RICHFORD, TOWN OF	FRANKLIN COUNTY	8/2/1974	10/15/1980	10/15/1980	10/15/1980	No
500057#	RICHFORD, VILLAGE OF	FRANKLIN COUNTY	3/15/1974	9/3/1980	9/3/1980	9/3/1980	No
500040#	RICHMOND, TOWN OF	CHITTENDEN COUNTY	3/22/1974	7/2/1982	7/5/1982	7/5/1982	No
	INCLUDES THE VILLAGE OF RICHMOND						
500010	RIPTON, TOWN OF	ADDISON COUNTY	1/17/1975	9/18/1985	9/18/1985(M)	9/18/1985	No
500299#	ROCHESTER, TOWN OF	WINDSOR COUNTY	12/20/1974	8/5/1991	9/28/2007	8/5/1991	No
500135#	ROCKINGHAM, TOWN OF	WINDHAM COUNTY	6/21/1974	5/15/1980	9/28/2007	5/15/1980	No
	INCLUDES THE VILLAGE CORPORATION OF SAXTON'S RIVER						
500276#	ROXBURY, TOWN OF	WASHINGTON COUNTY	12/13/1974	1/17/1986	1/17/1986(M)	1/17/1986	No
500153#	ROYALTON, TOWN OF	WINDSOR COUNTY	7/19/1974	1/16/1981	9/28/2007	1/16/1981	No
500018	RUPERT, TOWN OF	BENNINGTON COUNTY	8/9/1974	9/18/1985	9/18/1985(M)	9/18/1985	No
500101#	RUTLAND, CITY OF	RUTLAND COUNTY	3/15/1974	4/17/1978	8/28/2008	4/17/1978	No
500267#	RUTLAND, TOWN OF	RUTLAND COUNTY	2/7/1975	9/29/1978	8/28/2008(M)	9/29/1978	No

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500030#	RYEGATE, TOWN OF	CALEDONIA COUNTY	8/2/1975	6/17/1991	6/17/1991	6/17/1991	No
500170#	SALISBURY, TOWN OF	ADDISON COUNTY	12/20/1974	11/1/1985	11/1/1985(M)	11/1/1985	No
500183	Sandgate, TOWN OF	BENNINGTON COUNTY	1/31/1975		11/29/1977	6/05/2013 (E)	No
500019	SHAFTSBURY, TOWN OF	BENNINGTON COUNTY	6/28/1974	9/18/1985	9/18/1985(M)	9/18/1985	No
500300#	SHARON, TOWN OF	WINDSOR COUNTY	2/4/1977	9/28/2007	9/28/2007(M)	9/28/2007	No
500193#	SHELBURNE, TOWN OF	CHITTENDEN COUNTY	12/13/1974	12/16/1980	7/18/2011	12/16/1980	No
500059#	SHELDON, TOWN OF	FRANKLIN COUNTY	4/12/1974	4/1/1981	4/1/1981	4/1/1981	No
500171#	SHOREHAM, TOWN OF	ADDISON COUNTY	2/7/1975	8/1/1979	7/25/1980	8/1/1979	No
500102#	SHREWSBURY, TOWN OF	RUTLAND COUNTY	6/28/1974	9/1/1978	8/28/2008	9/1/1978	No
500195#	SOUTH BURLINGTON, CITY OF	CHITTENDEN COUNTY	11/1/1974	3/16/1981	7/18/2011	3/16/1981	No
500226#	SOUTH HERO, TOWN OF	GRAND ISLE COUNTY	10/18/1974	6/15/1978	6/15/1978	6/15/1978	No
500154#	SPRINGFIELD, TOWN OF	WINDSOR COUNTY	2/22/1974	12/4/1979	9/28/2007	12/4/1979	No
500219#	ST ALBANS, TOWN OF	FRANKLIN COUNTY	1/10/1975	6/15/1988	6/15/1988	6/15/1988	No
500058#	ST. ALBANS, CITY OF	FRANKLIN COUNTY	5/17/1974	6/15/1978	6/15/1978	6/15/1978	No
500031#	ST. JOHNSBURY, TOWN OF	CALEDONIA COUNTY	8/2/1974	7/3/1986	7/3/1986	7/3/1986	No
500020#	STAMFORD, TOWN OF	BENNINGTON COUNTY	5/31/1974	7/3/1978	7/3/1978	7/3/1978	No
500197	STANNARD, TOWN OF	CALEDONIA COUNTY			(NSFHA)	2/8/1985	No
500172	STARKSBORO, TOWN OF	ADDISON COUNTY	1/31/1975	12/4/1985	12/4/1985(M)	12/4/1985	No
500155#	STOCKBRIDGE, TOWN OF	WINDSOR COUNTY	11/1/1974	9/4/1986	9/28/2007	9/4/1986	No

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500066#	STOWE, TOWN OF	LAMOILLE COUNTY	7/21/1974	7/2/1980	08/4/2005	7/2/1980	No
500240#	STRAFFORD, TOWN OF	ORANGE COUNTY	3/28/1975	9/27/1985	2/3/1993	9/27/1985	No
500321#	STRATTON, TOWN OF	WINDHAM COUNTY	1/31/1975	9/28/2007	9/28/2007	8/21/2008	No
500269#	SUDBURY, TOWN OF	RUTLAND COUNTY	1/24/1975	8/28/2008	8/28/2008(M)	9/28/2010	No
500021#	SUNDERLAND, TOWN OF	BENNINGTON COUNTY	2/1/1974	11/1/1985	11/1/1985(M)	11/1/1985	No
500220#	SWANTON, TOWN OF	FRANKLIN COUNTY	2/28/1975	4/18/1983	4/18/1983	4/18/1983	No
500060#	SWANTON, VILLAGE OF	FRANKLIN COUNTY	3/22/1974	3/16/1983	3/16/1983	3/16/1983	No
500075#	THETFORD, TOWN OF	ORANGE COUNTY	8/16/1974	6/3/1991	12/20/1999	6/3/991	No
500241#	TOPSHAM, TOWN OF	ORANGE COUNTY	10/29/1976	9/18/1985	9/27/1991	9/18/1985	No
500136#	TOWNSHEND, TOWN OF	WINDHAM COUNTY	8/2/1974	9/18/1985	9/28/2007(M)	9/18/1985	No
	INCLUDES THE VILLAGE OF TOWNSHEND						
500089#	TROY, TOWN OF	ORLEANS COUNTY	7/26/1974	12/2/1980	12/2/1980	12/2/1980	No
500076	TUNBRIDGE, TOWN OF	ORANGE COUNTY	5/31/1974	9/18/1985	9/18/1985(M)	9/18/1985	No
500042#	UNDERHILL, TOWN OF	CHITTENDEN COUNTY	5/31/1974	6/15/1988	7/18/2011	6/15/1988	No
500011#	VERGENNES, CITY OF	ADDISON COUNTY	6/28/1974	9/18/1986	9/18/1986	9/18/1986	No
500137#	VERNON, TOWN OF	WINDHAM COUNTY	6/28/1974	9/27/1991	9/28/2007	9/27/1991	No
500242	VERSHIRE, TOWN OF	ORANGE COUNTY	1/17/1975	04/1/2012	04/1/2012(L)	8/23/2010(E)	No
500120#	WAITSFIELD, TOWN OF	WASHINGTON COUNTY	6/28/1974	6/1/1978	9/5/1984	6/1/1978	No

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500103#	WALLINGFORD, TOWN OF	RUTLAND COUNTY	5/31/1974	1/16/1981	8/28/2008	1/16/1981	No
500138#	WARDSBORO, TOWN OF	WINDHAM COUNTY	12/27/1974	7/16/1980	9/28/2007	7/16/1980	No
500121#	WARREN, TOWN OF	WASHINGTON COUNTY	6/28/1974	9/1/1977	9/1/1977	9/1/1977	No
500077	WASHINGTON, TOWN OF	ORANGE COUNTY	6/28/1974		2/20/1976	8/28/1998(E)	No
500123#	WATERBURY, TOWN OF	WASHINGTON COUNTY	6/28/1974	4/15/1982	4/6/1998	4/15/1982	No
500122#	WATERBURY, VILLAGE OF	WASHINGTON COUNTY	5/10/1974	4/15/1982	4/6/1998	4/15/1982	No
500200	WATERFORD, TOWN OF	CALEDONIA COUNTY	7/26/1974	11/15/1985	11/15/1985(M)	11/15/1985	No
500156#	WEATHERSFIELD, TOWN OF	WINDSOR COUNTY	6/14/1974	9/18/1985	9/28/2007	9/18/1985	No
500271#	WELLS, TOWN OF	RUTLAND COUNTY	1/10/1975	6/15/1988	8/28/2008	6/15/1988	No
500079#	WEST FAIRLEE, TOWN OF	ORANGE COUNTY	2/28/1975	11/15/1985	12/2/1992	11/15/1985	No
500272#	WEST HAVEN, TOWN OF	RUTLAND COUNTY	1/3/1975	8/28/2008	8/28/2008(M)	5/22/2009	No
500104#	WEST RUTLAND, TOWN OF	RUTLAND COUNTY	7/26/1974	9/1/1989	8/28/2008	9/1/1989	No
500301#	WEST WINDSOR, TOWN OF	WINDSOR COUNTY	2/28/1975	6/17/1991	9/28/2007	6/17/1991	No
500257	WESTFIELD, TOWN OF	ORLEANS COUNTY	12/24/1976	4/1/1998	4/1/1998(L)	4/1/1998	No
500203#	WESTFORD, TOWN OF	CHITTENDEN COUNTY	1/3/1975	7/18/2011	7/18/2011	01/1/2010	No
500139#	WESTMINSTER, TOWN OF	WINDHAM COUNTY	8/16/1974	1/3/1985	9/28/2007	1/3/1985	No
	INCLUDES THE VILLAGE OF WESTMINISTER						
500157#	WESTON, TOWN OF	WINDSOR COUNTY	12/20/1974	4/1/1992	9/28/2007	4/1/1992	No
500174#	WEYBRIDGE, TOWN OF	ADDISON COUNTY	1/17/1975	9/29/1986	9/29/1986	9/29/1986	No

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CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Tribal
500141#	WHITINGHAM, TOWN OF	WINDHAM COUNTY	8/9/1974	9/18/1985	9/28/2007(M)	9/18/1985	No
	INCLUDES THE VILLAGE OF JACKSONVILLE						
500080#	WILLIAMSTOWN, TOWN OF	ORANGE COUNTY	6/28/1974	7/17/1978	7/17/1978	7/17/1978	No
500043#	WILLISTON, TOWN OF	CHITTENDEN COUNTY	3/15/1974	3/2/1981	7/18/2011	3/2/1981	No
500142#	WILMINGTON, TOWN OF	WINDHAM COUNTY	5/31/1974	5/1/1978	9/28/2007	5/1/1978	No
500290#	WINDHAM, TOWN OF	WINDHAM COUNTY	9/6/1977	9/28/2007	9/28/2007(M)	10/14/2009	No
500159#	WINDSOR, TOWN OF	WINDSOR COUNTY	8/16/1974	9/28/1979	9/28/2007	9/28/1979	No
500022#	WINHALL, TOWN OF	BENNINGTON COUNTY	9/20/1974	6/19/1989	6/19/1989	6/19/1989	No
500044#	WINOOSKI, CITY OF	CHITTENDEN COUNTY	2/1/1974	8/1/1978	7/18/2011	8/1/1978	No
500068#	WOLCOTT, TOWN OF	LAMOILLE COUNTY	6/28/1974	8/2/1982	06/6/2000	8/2/1982	No
500314	WOODBURY, TOWN OF	WASHINGTON COUNTY	1/17/1975	11/1/1985	11/1/1985(M)	11/1/1985	No
500023	WOODFORD, TOWN OF	BENNINGTON COUNTY	11/15/1974	9/18/1985	9/18/1985(M)	9/18/1985	No
500160#	WOODSTOCK, TOWN OF	WINDSOR COUNTY	8/9/1974	12/15/1978	9/28/2007	12/15/1978	No
500161#	WOODSTOCK, VILLAGE OF	WINDSOR COUNTY	9/13/1974	2/15/1979	9/28/2007	2/15/1979	No
500278#	WORCESTER, TOWN OF	WASHINGTON COUNTY	1/31/1975	4/3/1978	4/3/1978	4/3/1978	No
Summary:							
Total in Flood Program			233				
Total in Emergency Program			6				

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CID	Community Name	County	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Tribal
Total in Regular Program			227				
Total in Regular Program with no Special Flood Hazard Areas			2				
Total in Regular Program but Minimally Flood-Prone			51				

State of Vermont Repetitive Loss Information

Repetitive loss structures are a serious concern from a mitigation standpoint. An NFIP-insured structure that has had at least two paid flood losses of more than \$1,000 each in any 10-year period since 1978 is considered a repetitive loss structure. The time between damages must be at least 10 days apart. A property is considered a severe repetitive loss property when there are at least four flood insurance claims (each exceeding \$5,000), or when there are two or more losses where the building payments exceed the property value.

Tropical Storm Irene greatly increased the number of repetitive loss properties in the State of Vermont. According to the 2010 State of Vermont HMP, there were 65 non-mitigated multiple loss properties in the State of Vermont in 33 towns. Currently, there are 139 non-mitigated multiple loss properties in 45 communities. The list of properties can be found in Appendix H: Repetitive Loss Properties in Vermont.

There are also areas within the State of Vermont that present significant losses but do not fall under the FEMA definition of a repetitive loss property. For example, Clover Street in Rutland City is repeatedly flooded by Moon Brook after major rainstorms. It is speculated that the major cause of this flooding is an insufficiently sized culvert under the adjacent railroad bed to the west. The culvert does not meet the cost-benefit ratio to qualify for FEMA Hazard Mitigation Grant Program (HMGP) funding, but is a significant threat to the community.

An analysis of digital FIRM data in three counties indicates that 82 percent of stream miles do not have a mapped Special Flood Hazard Areas. There is no mandatory flood insurance requirement as a result, yet flood losses are experienced along these flooding sources. Unfortunately, these losses are not documented by way of a flood insurance claim due to lack of coverage.

Another example is in Addison County. There are multiple areas, including Lincoln Village, Ripton Village, River Road in New Haven, Route 125 in Addison, and the Brookside mobile home park in Starksboro that are vulnerable to flooding. Some of these areas are flooded regularly with little damage while others are flooded occasionally with little damage. Most of these homes are not on the FEMA repetitive loss property list because the residents do not have flood insurance or make a claim on their insurance.

The State of Vermont is committed to ensuring that all repetitive loss properties, whether they meet the FEMA definition or not, are monitored and mitigated to prevent future financial loss and loss of life.

4.1.2.2 Severe Thunderstorms

Hazard Definition

Severe thunderstorms are capable of producing high winds (including downdrafts), large hail, lightning, flooding, rains, and tornadoes. Thunderstorm winds are generally short in duration, involving straight-line winds and/or gusts in excess of 50 mph. Thunderstorm winds tend to affect areas of Vermont with significant tree stands as well as areas with exposed property and infrastructure and aboveground utilities. Thunderstorm winds can cause power outages,

transportation and economic disruptions, and significant property damage, and pose a high risk of injuries and loss of life.

Microbursts and macrobursts are downdrafts that move outward from the base of a thunderstorm and can reach speeds in excess of 80 mph. Microbursts (the smaller of the two in terms of area affected) pose an extreme threat to aircraft. The downward wind can exceed the lift component of an aircraft, making it impossible to maintain altitude, which for low flying aircraft (especially during takeoff and landing) is extremely dangerous.

Thunderstorms range in size and type. An ordinary cell thunderstorm consists of one cell with an updraft and downdraft and produce strong winds, rain, lightning, and even hailstones. Multicell cluster thunderstorms consist of several ordinary cell thunderstorms in the vicinity of each other. Multicell cluster thunderstorms are extremely prone to causing flash flooding. Squall line thunderstorms move in a line or front that can exceed 100 miles in length, with the strongest rains and winds at the front of the storm. Supercell thunderstorms are the largest, longest lasting, and most devastating thunderstorms. Nearly all tornadoes are formed from supercell thunderstorms. Supercell thunderstorms can also form hailstones larger than golf balls. These supercell storms have clockwise rotating winds that exacerbate the storm. Lightning, hail, flash flooding, and tornadoes are all associated with this type of thunderstorm.

High Winds

Although not delineated as a separate hazard for the purposes of this HMP, high winds pose a threat to the safety of Vermont's citizens and property. The National Weather Service (NWS) issues a wind advisory when winds are sustained at 31 to 39 mph for at least one hour or any gusts 46 to 57 mph. Winds of 58 mph or higher cause the NWS to issue a High Wind Warning. Additionally, the NWS also has classifications for Tropical Storm Wind Warning and Hurricane Wind Warning when high winds in inland areas are associated with a tropical cyclone.

In Vermont, high winds are most often seen accompanying severe thunderstorms. In fact, straight-line winds are often responsible for most of the wind damage associated with a thunderstorm. These winds are often confused with tornadoes because of similar damage and wind speeds; however, they are not rotating like the winds of a tornado. Other than severe thunderstorms, tropical storms, hurricanes, nor'easters, and winter storms can cause high winds in Vermont.

High winds pose a serious concern for all electric and telecommunication utilities in Vermont due to the customer outages and damage to infrastructure they cause. However, while the electric distribution utilities frequently receive damage from high winds, the VELCO transmission high-voltage assets are less susceptible to high wind due to larger and more robust construction and much larger right-of-ways.

One example of a high wind event in Vermont was the Nor'easter of April 2007 that resulted in a federal disaster declaration: DR 1698. High winds during this April storm resulted in many trees down and damage to some private homes and public infrastructure, primarily in southern Vermont.

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Hazard Profile

While short-term thunderstorm probability can be predicted through convective outlooks, thunderstorms are still the most prevalent natural hazard event occurring in Vermont. Severe summer thunderstorm winds occur more frequently than any other natural hazard incident within Vermont. Supercell thunderstorms that produce tornadoes can be the most destructive and cause widespread damage to land, crops, and property. In addition to being hazardous to human life, lightning can damage infrastructure, plants, and property, and can start forest fires. Lightning is the most unpredictable weather-related event. According to the NWS, lightning is the first thunderstorm hazard to arrive and the last to leave. Lightning can strike up to 50 miles away from a thunderstorm, can carry up to 100 million volts of electricity, and can reach temperatures upward of 50,000 degrees Fahrenheit.

Flash floods are likely to occur after a severe thunderstorm that produces a large amount of precipitation over a short amount of time. Mountainous areas such as Vermont are particularly prone to flash flooding due to the steep terrain. Damage from flooding includes land erosion, property damage, loss of crops, and even human life. Floods are responsible for more deaths each year than any other hazard in the United States, with the majority being vehicle-related. The power of moving water is usually underestimated. Six inches of water can knock a person off their feet and as little as two feet of moving water can carry a large vehicle. Sudden rises in river levels leave little time to prepare for the effects of a flash flood. Fortunately, in a flash flood, the water will recede but it can still cause damage to properties and structures.

Severe thunderstorms can produce hail. Hail is damaging to crops, structures, and vehicles. Hail can damage and kill plants and even destroy entire fields of crops. Hail can break windows and cause widespread damage to buildings and vehicles. Hailstone size can range from the size of a BB pellet to the size of a softball.

Thunderstorms and associated hazards can occur anywhere in Vermont at any time of the year; however, spring and summer are the most common times for severe thunderstorms.

Table 4-7
Thunderstorms Causing More than \$200,000 in Damage in Last 10 Years

Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Jurisdiction Impacted	Fatalities	Injuries
\$656,842.11	\$-	8/25/2007	8/25/2007	Rutland	0	0
\$437,894.74	\$-	8/25/2007	8/25/2007	Rutland	0	0
\$364,000.00	\$104,000.00	7/21/2010	7/21/2010	Orange	0	0
\$273,684.21	\$-	8/16/2007	8/16/2007	Grand Isle	0	0
\$164,210.53	\$-	8/16/2007	8/16/2007	Franklin	0	0
\$164,210.53	\$-	8/16/2007	8/16/2007	Rutland	0	0
\$157,575.76	\$-	7/18/2008	7/18/2008	Lamoille	0	0

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Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Jurisdiction Impacted	Fatalities	Injuries
\$156,000.00	\$26,000.00	7/21/2010	7/21/2010	Orange	0	0
\$123,809.52	\$-	7/21/2003	7/21/2003	Windsor	1	0
\$115,555.56	\$-	7/5/2005	7/5/2005	Franklin	0	0
\$115,555.56	\$-	8/1/2005	8/1/2005	Chittenden	0	0
\$109,473.68	\$-	8/16/2007	8/16/2007	Rutland	0	0
\$109,473.68	\$-	8/25/2007	8/25/2007	Orange	0	0
\$109,473.68	\$-	8/25/2007	8/25/2007	Rutland	0	0
\$109,473.68	\$-	8/25/2007	8/25/2007	Washington	0	0
\$106,122.45	\$-	8/21/2009	8/21/2009	Rutland	0	0
\$105,050.51	\$-	7/18/2008	7/18/2008	Grand Isle	0	0
\$105,050.51	\$-	6/10/2008	6/10/2008	Grand Isle	0	0
\$104,000.00	\$-	7/21/2010	7/21/2010	Chittenden	0	0
\$104,000.00	\$-	5/26/2010	5/26/2010	Rutland	0	0
\$104,000.00	\$-	5/26/2010	5/26/2010	Chittenden	0	0
\$98,222.22	\$-	6/6/2005	6/6/2005	Addison	0	0
\$82,105.26	\$-	8/16/2007	8/16/2007	Chittenden	0	0
\$82,105.26	\$-	8/16/2007	8/16/2007	Chittenden	0	0
\$82,105.26	\$-	8/16/2007	8/16/2007	Rutland	0	0
\$82,105.26	\$-	8/16/2007	8/16/2007	Rutland	0	0
\$82,105.26	\$-	8/25/2007	8/25/2007	Windsor	0	0
\$78,787.88	\$-	7/18/2008	7/18/2008	Franklin	0	0
\$78,787.88	\$-	6/8/2008	6/8/2008	Orange	0	0
\$78,000.00	\$26,000.00	7/21/2010	7/21/2010	Orange	0	0
\$78,000.00	\$10,400.00	7/21/2010	7/21/2010	Lamoille	0	0
\$78,000.00	\$-	7/21/2010	7/21/2010	Orange	0	0
\$62,650.60	\$-	6/26/2002	6/26/2002	Lamoille	0	0
\$61,904.76	\$-	7/24/2003	7/24/2003	Addison	0	0

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Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Jurisdiction Impacted	Fatalities	Injuries
\$59,770.11	\$-	8/29/2004	8/29/2004	Franklin	0	0
\$57,777.78	\$-	6/8/2005	6/8/2005	Rutland	0	0
\$57,777.78	\$-	7/5/2005	7/5/2005	Franklin	0	0
\$57,777.78	\$-	8/1/2005	8/1/2005	Orange	0	0
\$57,777.78	\$-	8/30/2005	8/31/2005	Chittenden	0	0
\$56,521.74	\$-	8/7/2006	8/7/2006	Grand Isle	0	0
\$54,736.84	\$-	8/16/2007	8/16/2007	Franklin	0	0
\$54,736.84	\$-	8/16/2007	8/16/2007	Caledonia	0	0
\$54,736.84	\$-	8/16/2007	8/16/2007	Washington	0	0
\$54,736.84	\$-	8/16/2007	8/16/2007	Rutland	0	0
\$54,736.84	\$-	8/25/2007	8/25/2007	Rutland	0	0
\$54,736.84	\$-	8/25/2007	8/25/2007	Windsor	0	0
\$54,736.84	\$-	8/25/2007	8/25/2007	Caledonia	0	0
\$54,736.84	\$-	8/25/2007	8/25/2007	Caledonia	0	0
\$54,736.84	\$-	7/10/2007	7/10/2007	Orleans	0	0
\$52,525.25	\$-	7/18/2008	7/18/2008	Grand Isle	0	0
\$52,525.25	\$-	7/18/2008	7/18/2008	Franklin	0	0
\$52,525.25	\$-	7/18/2008	7/18/2008	Franklin	0	0
\$52,525.25	\$-	6/10/2008	6/10/2008	Chittenden	0	0
\$52,000.00	\$52,000.00	7/21/2010	7/21/2010	Orange	0	0
\$52,000.00	\$-	7/21/2010	7/21/2010	Chittenden	0	0
\$52,000.00	\$-	7/21/2010	7/21/2010	Chittenden	0	0
\$52,000.00	\$-	7/21/2010	7/21/2010	Rutland	0	0

4.1.2.3 Severe Winter Storms

Hazard Definition

Severe winter storms bring the threat of heavy accumulations of snow, cold/wind chills, strong winds, and power outages that result in high rates of damage and even higher rates of expenditures.

A heavy accumulation of snow, especially when accompanied by high winds, causes drifting snow and very low visibility. Sidewalks, streets, and highways can become extremely hazardous to pedestrians and motorists. Severe winter storms develop through the combination of multiple meteorological factors. In Vermont and the northeastern United States, these factors include the moisture content of the air, direction of airflow, collision of warm air masses coming up from the Gulf Coast, and cold air moving southward from the Arctic.

Severe winter storms alerts are communicated using terminology listed in the table below.

**Table 4-8
Winter Storm and Blizzard Alert Terminology**

Term	Definition
Winter Storm Watch	Snowstorm conditions are possible in the specified area, usually within 36 hours.
Winter Storm Warning	Snowstorm conditions are expected in the specified area, usually within 24 hours.
Blizzard Warning	Sustained winds or gusts of 35 mph occurring in combination with considerable falling/blowing snow for a period of at least three hours are expected.
Heavy Snow Warning	Snow accumulations are expected to approach or exceed 6 inches in 12 hours.

Terminology related to snowfall and other frozen precipitation is provided in the subsequent table below.

**Table 4-9
Snowfall and Other Frozen Precipitation Terminology**

Term	Definition
Snowstorm	A storm with heavy snow
Blizzard	A severe snowstorm with cold temperatures, winds at or above 35 mph, and low visibility (less than ¼ mile)
Heavy Snow	Seven inches or more of snow falling within a 24-hour period
Winter Storm	Heavy snow with sleet and/or freezing rain
Blowing Snow	Wind driven snow that reduces visibility to six miles or less causing significant drifting
Drifting Snow	Uneven distribution of snowfall caused by strong surface winds
Flurries	Light snow falling for short durations
Freeze	Occurs when the surface air temperature is expected to be 32°F or below over a widespread area for a significant period of time

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Term	Definition
Snow Showers	Snow falling at varying intensities for brief periods of time

The NWS uses the Northeast Snowfall Impact Scale (NESIS) to categorize the severity of a snowstorm based on the amount of snowfall and the population at risk. The NESIS provides a numerical measurement of the snowstorm’s potential socioeconomic impact compared with past storms and assigns each large storm into one of the five categories.

Table 4-10
NESIS Definition of Snowstorms

Category	NESIS Value	Description
1	1–2.499	Notable
2	2.5–3.99	Significant
3	4–5.99	Major
4	6–9.99	Crippling
5	10.0+	Extreme

Hazard Profile

A severe winter storm with a blizzard occurred on February 15–17, 1958. This storm dumped more than 30 inches of snow and resulted in 26 deaths in New England. On December 26–27, 1969, another blizzard caused 18–36 inches of snow in northwestern Vermont and 45 inches in Waitsfield. Governor Dean Davis declared a state disaster. Drifts of snow from that storm piled up to 30 feet in places. A string of storms hit Vermont in March 2001, beginning with 15–30 inches on March 5–6 (later declared a federal disaster), 10–30 inches on March 22, and 10–20 inches on March 30.

The worst winter storm to hit the state recently was not a snowstorm, but an ice storm. In January of 1998, an unusual combination of precipitation and temperature led to the accumulation of more than three inches of ice in many locations, causing closed roads, downed power lines, and damage to thousands of trees. This storm was estimated as a 200–500 year event. Power was out up to 10 days in some areas and 700,000 acres of forest were damaged in Vermont. Vermont suffered no fatalities, unlike Quebec where 3 million people lost power and 28 were killed. Temperatures rose after the storm, causing the ice to melt and permitting crews to reopen roads, which kept many residents from freezing in their unheated homes.

Beginning on February 14, 2007, Vermont experienced the second heaviest snowfall ever recorded in the month of February. Some areas of Vermont received from 28–36 inches of snow in a 24–48 hour period. Heavy snow loads on roofs led to the collapse of at least 10 barns, causing the death of some cows and other livestock.

In late 2008, winter storms and high winds resulted in extensive power outages, primarily in southern Vermont counties. Upward of 40,000 homes were without power for several days during this period.

The great ice storm of 1998 (DR-1201) resulted in just under \$6 million in damage and affected six counties. The assigned frequency of this event is approximately a 100-year event. Damages were not uniformly distributed throughout the six counties due to the varying intensity of the conditions geographically. Based on the losses associated with the incident, an estimate of \$1 million dollars of potential loss per County and \$14 million for a statewide incident for a 100-year ice storm is reasonable.

Despite the fact that DR-1358 (2001) is officially listed as a winter storm, and DR-1101 (1996) occurred in January, damages in both cases were primarily flood-related, particularly for DR-1101, which was flooding associated with rain and a mid-winter thaw that melted a 30-inch snow pack in two and a half days. From a practical standpoint, there is no history of federal disaster declarations for a non-flood-related or non-ice storm-related winter storm event and, therefore, no data is available.

The winter of 2011 was the third snowiest on record for Vermont, with a total of 124.3 inches of snow. Approximately 25 inches of that record is owed to a March blizzard in the Burlington area, which brought 17.5 inches of snow in a single day and set the record for one-day snowfall. The storm closed schools for days, and many people were without power. Driving was hazardous due to a 1-inch layer of ice beneath several inches of snow.

State facilities and individual towns are generally well prepared to deal with winter storms. VTrans' winter maintenance road crews are experienced and well equipped to keep highways open. Municipal road crews are also generally well prepared. Most critical state facilities have emergency backup generators in case of loss of power due to icing. There is no specific region of Vermont that is more vulnerable to ice storms than others are.

Electricity and telecommunication companies in Vermont, particularly VELCO, which has high-voltage transmission assets, state that severe ice storms are their largest threat; however, severe snow loading during winter storms is also a threat. The Vermont Joint Utilities and State Agencies Emergency Preparation program has identified the below thresholds for which weather events with a potential adverse impact on electrical and telecommunication systems can be identified. Severe winter storms would trigger the majority of the thresholds; however, tornadoes, thunderstorms, and hurricanes/tropical storms are also indicated. This program is made up of the Vermont electric utilities, telecommunication providers, state agencies (DEMHS and others), natural gas suppliers, and a weather consultant. For weather events, the thresholds listed below trigger statewide coordination calls to coordinate sharing of information and facilitate mutual assistance.

- High winds (40 mph or more)
- Average and drier than average snowfalls capable of causing power outages or wet snowfalls with high water content of four inches or greater or any combination to cause tree limbs to snow load
- Wet snowfalls with "leaf out" occurring in the fall or spring
- Freezing rain or sleet resulting in accumulations of ¼ inch or more
- Special consideration will be given for the time of year with foliage on trees where less than ¼ inch may be cause for concern

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- Ice accretion from freezing rain greater than about 1/3 inch approaches levels to begin to weigh down trees and trigger outages
- NWS criteria is for an accretion of greater than ¼ of an inch
- Special weather events will be given priority with at least three days lead time, including:
 - Major Nor'easters
 - Any organized wind storms
 - Major tropical cyclones or their counterparts
 - Tornadoes
 - Thunderstorms of more than just isolated coverage

Table 4-11
Winter Storm Events⁹¹⁰

Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Jurisdiction Impacted	Fatalities	Injuries
\$1,040,000.00	\$-	2/23/2010	2/24/2010	Windsor	0	0
\$260,000.00	\$-	2/23/2010	2/25/2010	Orange	0	0
\$260,000.00	\$-	2/23/2010	2/25/2010	Washington	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Addison	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Caledonia	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Chittenden	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Essex	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Franklin	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Grand Isle	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Lamoille	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Orange	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Orleans	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Rutland	0	0

⁹ Spatial Hazard Events and Losses Database for the United States, http://webra.cas.sc.edu/hvriapps/sheldus_setup/sheldus_results.aspx

¹⁰ Explanation of Storm Data can be found in appendix A

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Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Jurisdiction Impacted	Fatalities	Injuries
\$237,192.99	\$-	2/14/2007	2/14/2007	Washington	0	0
\$237,192.99	\$-	2/14/2007	2/14/2007	Windsor	0	0
\$208,000.00	\$-	2/23/2010	2/24/2010	Rutland	0	0
\$130,000.00	\$-	1/2/2010	1/3/2010	Chittenden	0	0
\$115,555.56	\$-	10/25/2005	10/26/2005	Lamoille	0	0
\$115,555.56	\$-	10/25/2005	10/26/2005	Orleans	0	0
\$115,555.56	\$-	10/25/2005	10/26/2005	Rutland	0	0
\$115,555.56	\$-	10/25/2005	10/26/2005	Addison	0	0
\$115,555.56	\$-	10/25/2005	10/26/2005	Chittenden	0	0
\$115,555.56	\$-	10/25/2005	10/26/2005	Franklin	0	0
\$115,555.56	\$-	10/25/2005	10/26/2005	Washington	0	0
\$104,000.00	\$-	2/23/2010	2/24/2010	Rutland	0	0
\$104,000.00	\$-	2/23/2010	2/24/2010	Addison	0	0
\$104,000.00	\$-	2/23/2010	2/25/2010	Lamoille	0	0
\$74,285.71	\$-	4/3/2003	4/4/2003	Chittenden	0	0
\$61,904.76	\$-	12/15/2003	12/15/2003	Addison	0	0
\$61,904.76	\$-	12/15/2003	12/15/2003	Chittenden	0	0
\$57,777.78	\$-	10/25/2005	10/26/2005	Caledonia	0	0
\$57,777.78	\$-	10/25/2005	10/26/2005	Essex	0	0
\$52,000.00	\$-	2/23/2010	2/24/2010	Chittenden	0	0
\$52,000.00	\$-	2/23/2010	2/24/2010	Chittenden	0	0
\$52,000.00	\$-	2/23/2010	2/25/2010	Caledonia	0	0
\$49,523.81	\$-	12/6/2003	12/7/2003	Addison	0	0
\$49,523.81	\$-	1/4/2003	1/4/2003	Addison	0	0
\$49,523.81	\$-	1/4/2003	1/4/2003	Chittenden	1	0
\$49,523.81	\$-	1/4/2003	1/4/2003	Lamoille	0	0
\$49,523.81	\$-	4/4/2003	4/5/2003	Rutland	0	0

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Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Jurisdiction Impacted	Fatalities	Injuries
\$49,523.81	\$-	1/4/2003	1/4/2003	Washington	0	0
\$49,523.81	\$-	4/4/2003	4/5/2003	Windsor	0	0
\$46,222.22	\$-	2/10/2005	2/10/2005	Grand Isle	0	0
\$46,222.22	\$-	2/10/2005	2/10/2005	Franklin	0	0
\$46,222.22	\$-	2/10/2005	2/10/2005	Chittenden	0	0
\$46,222.22	\$-	2/10/2005	2/10/2005	Addison	0	0
\$46,222.22	\$-	12/9/2005	12/9/2005	Windsor	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Addison	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Caledonia	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Chittenden	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Essex	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Franklin	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Grand Isle	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Lamoille	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Orange	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Orleans	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Rutland	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Washington	0	0
\$45,084.18	\$-	12/11/2008	12/12/2008	Windsor	0	0
\$37,142.86	\$-	12/6/2003	12/7/2003	Chittenden	0	0
\$37,142.86	\$-	12/6/2003	12/7/2003	Franklin	0	0
\$37,142.86	\$-	12/15/2003	12/15/2003	Franklin	0	0
\$37,142.86	\$-	12/6/2003	12/7/2003	Grand Isle	0	0
\$37,142.86	\$-	12/15/2003	12/15/2003	Grand Isle	0	0
\$37,142.86	\$-	12/14/2003	12/15/2003	Lamoille	0	0
\$37,142.86	\$-	12/15/2003	12/15/2003	Orange	0	0
\$37,142.86	\$-	12/6/2003	12/7/2003	Rutland	0	0

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Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Jurisdiction Impacted	Fatalities	Injuries
\$37,142.86	\$-	12/15/2003	12/15/2003	Rutland	0	0
\$37,142.86	\$-	12/15/2003	12/15/2003	Washington	0	0
\$34,666.67	\$-	11/24/2005	11/24/2005	Lamoille	0	0
\$34,666.67	\$-	11/24/2005	11/24/2005	Orleans	0	0
\$34,666.67	\$-	11/24/2005	11/24/2005	Washington	0	0
\$34,666.67	\$-	12/9/2005	12/9/2005	Rutland	0	0
\$32,355.56	\$-	1/2/2005	1/2/2005	Grand Isle	0	0
\$32,355.56	\$-	1/2/2005	1/2/2005	Franklin	0	0
\$32,355.56	\$-	1/2/2005	1/2/2005	Chittenden	0	0
\$32,355.56	\$-	1/2/2005	1/2/2005	Addison	0	0
\$32,355.56	\$-	1/2/2005	1/2/2005	Rutland	0	0
\$31,325.30	\$-	1/7/2002	1/7/2002	Rutland	0	0
\$31,325.30	\$-	1/7/2002	1/7/2002	Windsor	0	0
\$30,814.81	\$-	2/10/2005	2/10/2005	Rutland	0	0
\$30,814.81	\$-	2/10/2005	2/10/2005	Windsor	0	0
\$30,814.81	\$-	2/10/2005	2/10/2005	Orange	0	0
\$28,888.89	\$-	10/25/2005	10/26/2005	Orange	0	0
\$28,260.87	\$-	2/25/2006	2/25/2006	Addison	0	0
\$28,260.87	\$-	2/25/2006	2/25/2006	Rutland	0	0
\$27,892.72	\$-	12/31/2004	12/31/2004	Washington	0	0
\$27,892.72	\$-	12/31/2004	12/31/2004	Chittenden	0	0
\$27,892.72	\$-	12/31/2004	12/31/2004	Franklin	0	0
\$26,000.00	\$-	1/2/2010	1/3/2010	Chittenden	0	0
\$26,000.00	\$-	1/2/2010	1/3/2010	Lamoille	0	0
\$26,000.00	\$-	2/23/2010	2/24/2010	Addison	0	0
\$26,000.00	\$-	4/27/2010	4/28/2010	Washington	0	0
\$26,000.00	\$-	1/26/2005	1/26/2005	Rutland	0	0

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Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Jurisdiction Impacted	Fatalities	Injuries
\$26,000.00	\$-	1/26/2005	1/26/2005	Windsor	0	0
\$25,422.22	\$-	2/10/2005	2/10/2005	Orleans	0	0
\$25,422.22	\$-	2/10/2005	2/10/2005	Essex	0	0
\$25,422.22	\$-	2/10/2005	2/10/2005	Lamoille	0	0
\$25,422.22	\$-	2/10/2005	2/10/2005	Caledonia	0	0
\$25,422.22	\$-	2/10/2005	2/10/2005	Washington	0	0
\$25,060.24	\$-	3/26/2002	3/27/2002	Orange	0	0
\$ -	\$208,000.00	5/11/2010	5/13/2010	Chittenden	0	0
\$ -	\$104,000.00	5/11/2010	5/13/2010	Addison	0	0
\$ -	\$104,000.00	5/11/2010	5/13/2010	Rutland	0	0
\$ -	\$52,000.00	5/11/2010	5/13/2010	Grand Isle	0	0
\$ -	\$52,000.00	5/11/2010	5/13/2010	Franklin	0	0
\$ -	\$52,000.00	5/11/2010	5/13/2010	Windsor	0	0

There are no standard loss estimation models or methodologies for the winter storm hazards. Potential losses from winter storms are, in most cases, indirect and therefore difficult to quantify.¹¹ The table below illustrates the impact of winter storms occurring between January 1, 2006 and September 31, 2012.

Table 4-12
Impact of Winter Storms Occurring Between January 1, 2006 and September 31, 2012

Type	Total Events	Deaths	Injuries	Property Damage	Crop Damage
Heavy Snow	57	-	-	\$2.650 million	
Cold/Wind Chill	31	-	-		
Strong Wind	184	-	-	\$2.092 million	
Winter Storm	505	-	-	\$7.545 million	\$145,000
Winter Weather	573	-	-	\$2.467 million	

¹¹ http://www.nyc.gov/html/oem/downloads/pdf/hazard_mitigation/section_31_winter_weather_hazard_analysis.pdf

4.1.2.4 Ice Jams

Hazard Definition

The Northeast States Emergency Consortium states that ice jams occur when warm temperatures and heavy rain cause snow to melt rapidly. Snowmelt combined with heavy rains can cause frozen rivers to swell, which breaks the ice layer on top of the river. The ice layer often breaks into large chunks, which float downstream and often pile up near narrow passages or other obstructions, such as bridges and dams.

Ice jams include those that form in the early winter as ice formation begins (freeze-up jams); those that form as a result of the breakup of ice covers (breakup jams); and those that contain elements of both (combination jams). Ice events can include ice jams, ice jams that are not formally identified as such, the formation of an ice cover that raises water levels upstream or decreases water levels downstream, or any other result of ice formation, ice cover formation and progression, or ice cover breakup.

Hazard Profile



Ice jams have been identified as an increasingly dangerous hazard in Vermont, as these can lead to sudden and catastrophic flooding in many locations. The Winooski River and Dog River in Montpelier have been identified as particular areas of interest, given the history of ice jams and flooding in these locations. More than a dozen serious ice jams events have occurred in Montpelier since 1900. In 1992, an ice jam in Montpelier led to flood inundation in the downtown area, causing more than \$5 million in damage to buildings, homes, roads, culverts, and other infrastructure facilities. Ice jams in this location have been identified as far back as the 1700s. It is likely that ice jams will continue to pose a threat to Vermont for the foreseeable future, particularly in the months of January and February.

From February through March 2007, December 2008, and again in January 2010, the City of Montpelier and state agencies carefully monitored a large frazil ice jam on the Winooski River at Cemetery Bend and ice jams in other locations, which threatened to flood downtown Montpelier. The VT DEC Stream Alteration Engineers provided critical assistance in implementing monitoring and mitigation strategies. Strategically placed gages along the river allowed authorities to monitor the height of the river and rate of rise; alarm systems are in place to warn citizens of impending flooding. In addition, the U.S. Army Corps of Engineers (USACE) Cold Region Research and Engineering Laboratory (CRREL) have established a website with monitoring equipment and gages indicating level of rise, depth of water, and river temperature.

The state capital in Montpelier is particularly vulnerable to ice jams on the Winooski River. *Image courtesy of Jim Chamberlin, Montpelier, Vermont.*

This can be accessed by emergency management officials so that sufficient warning can be given if flooding appears to be imminent. In early 2010, ice jams were also reported on the Lamoille River in Johnson and on the Seymour branch in

Cambridge.

The Montpelier City ice jam event of 1992 (DR-938) approximated a 100-year event. It resulted in nearly \$5 million (nominal dollars) in damages to local roads, buildings, private businesses,

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and homes. This disaster effectively shut down many functions of state government and the state legislature for several days, resulting in indirect losses for which no existing data has been generated. The inundation associated with this jam was of very short duration (less than 12 hours); otherwise, disruption of services could have represented a much more serious economic loss. Montpelier experienced a significant ice jam event in February–March 2007, resulting in extensive planning and preparations for possible flooding. In early 2007, ice jams also caused problems in the towns of Woodstock and Chelsea, including localized road flooding in some locations. In January 2010, ice jams were reported in Montpelier, Middlesex, Johnson, and Cambridge, accompanied by minor localized flooding in some locations.

While other jurisdictions have a history of more frequent ice jam flooding, such as Hardwick, Richford, and Richmond, Montpelier’s vulnerability to ice jams may represent the most extreme in the state based on the magnitude of the historic and potential economic loss.

There are no known state buildings or facilities (other than roadway infrastructure) immediately endangered by ice jams outside the Berlin, Montpelier, and Waterbury State Office Complexes, although no specific inventory or assessment has been performed.

An ice jam in 2011 on the Mad River caused damage to roads and threatened flooding to the area near Morehead.

The USACE CRREL in Hanover, New Hampshire, has compiled ice jam information on a regional and national basis. When necessary, DEMHS and other state mitigation partners contact the nearby USACE office for additional data regarding ice jams. Vermont has a tremendous record of ice jams. During the years 1867–1999, there have been 753 ice jams on 74 rivers and in 127 towns. The Winnooski, Lamoille, and Missisquoi Rivers each have nearly 10 percent of the total ice jams. These ice jams occur most in March (44 percent), January (24 percent) and February (18 percent) followed by December (7 percent) and April (6 percent). In addition, 753 documented ice jamming events have occurred in 132 years. That calculates to a flat average of 5.7 ice jams per year. There are many meteorologic and hydrologic characteristics that allow for variance of severity within the data, though it is clear that these will occur each year. These events are becoming more and more frequently noted as humans change the landscape, upgrade data collection techniques, and seek to live closer to hazard-prone areas.



Table 4-13
Vermont Ice Jams Since 1993

Date	River	Location
January 5, 1993	Black River	Orleans
March 31, 1993	West River, Passumpsic, Black River, Otter Creek	Rutland
April 1, 1993	Passumpsic River, Black River, Otter Creek	Caledonia, Orleans, Rutland

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Date	River	Location
January 15, 1995	Black River	Orleans
January 20, 1996	Connecticut River (affected VT tributaries)	Windsor
January 24, 1999	Browns River	Chittenden
January 24, 1999	Williams River	Windsor
January 24, 1999	Battenkill, Waloomsac River	Bennington
February 28, 2000	Lamoille River, Missisquoi River	Franklin
February 28, 2000	Browns River, Winooski River	Chittenden
April 12, 2001	Missisquoi River	Franklin
April 13, 2001	Otter Creek	Rutland
March 22, 2003	Mad River	Washington
March 7, 2004	Lamoille River	Lamoille
March 28, 2005	Black River	Windsor
March 31, 2005	Lamoille River	Franklin
March 31, 2005	Missisquoi River	Franklin
April 1, 2005	Lamoille River	Franklin
February 2007	Winooski River, Dog River	Washington
January 2008	Winooski River	Washington
January 2010	Winooski River, Lamoille River	Washington, Lamoille
January 2010	Missisquoi River	Franklin

Vermont's northern latitude means a high likelihood of temperatures dropping sufficiently in the winter to allow freezing of most rivers. During thaws, the surface ice breaks off and blocks the river as an ice jam. It is important to monitor the fluctuations on the state's rivers and potential for these events to occur with the thaws. Human settlement, development, and the associated infrastructure co-exist in proximity to rivers. Vermont's cultural history and socioeconomic factors need to be considered in relation to the most appropriate use of floodplains. Residences, buildings, or other infrastructure built within the floodplain will be susceptible to all flood types, including ice jams.

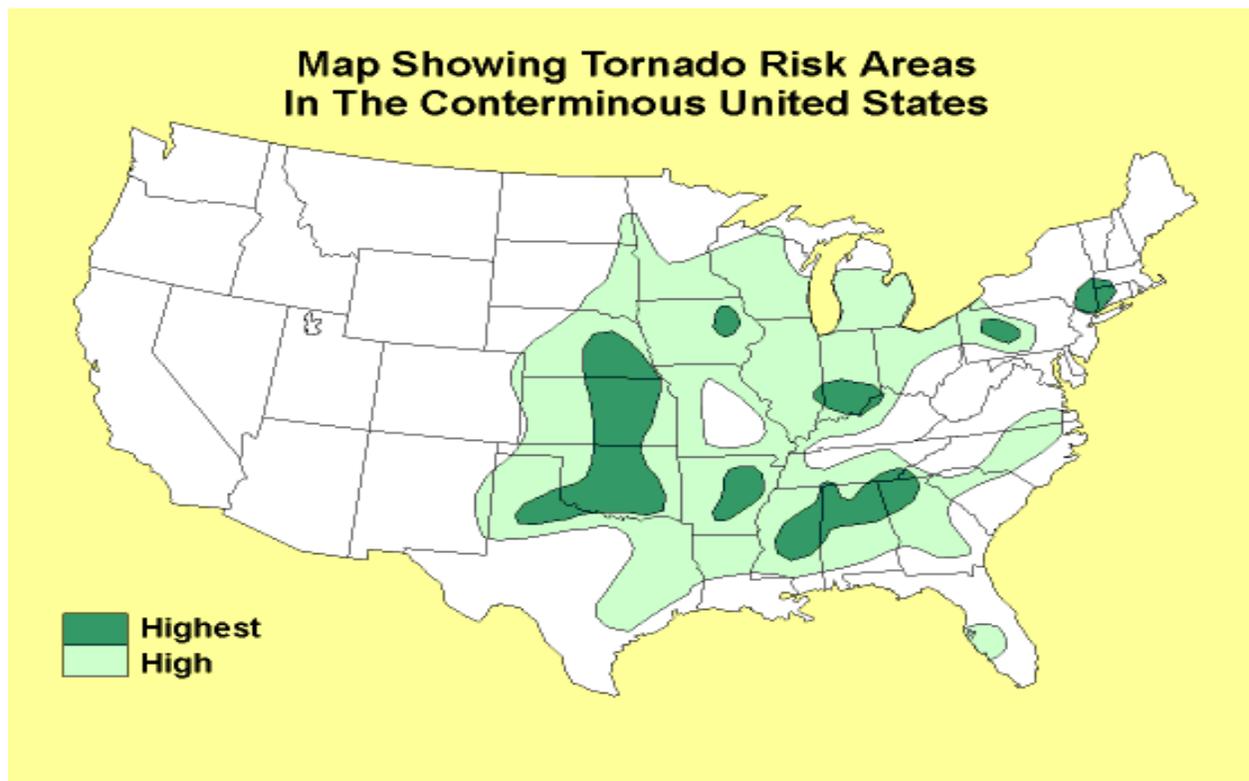
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4.1.2.5 Tornadoes

Hazard Definition

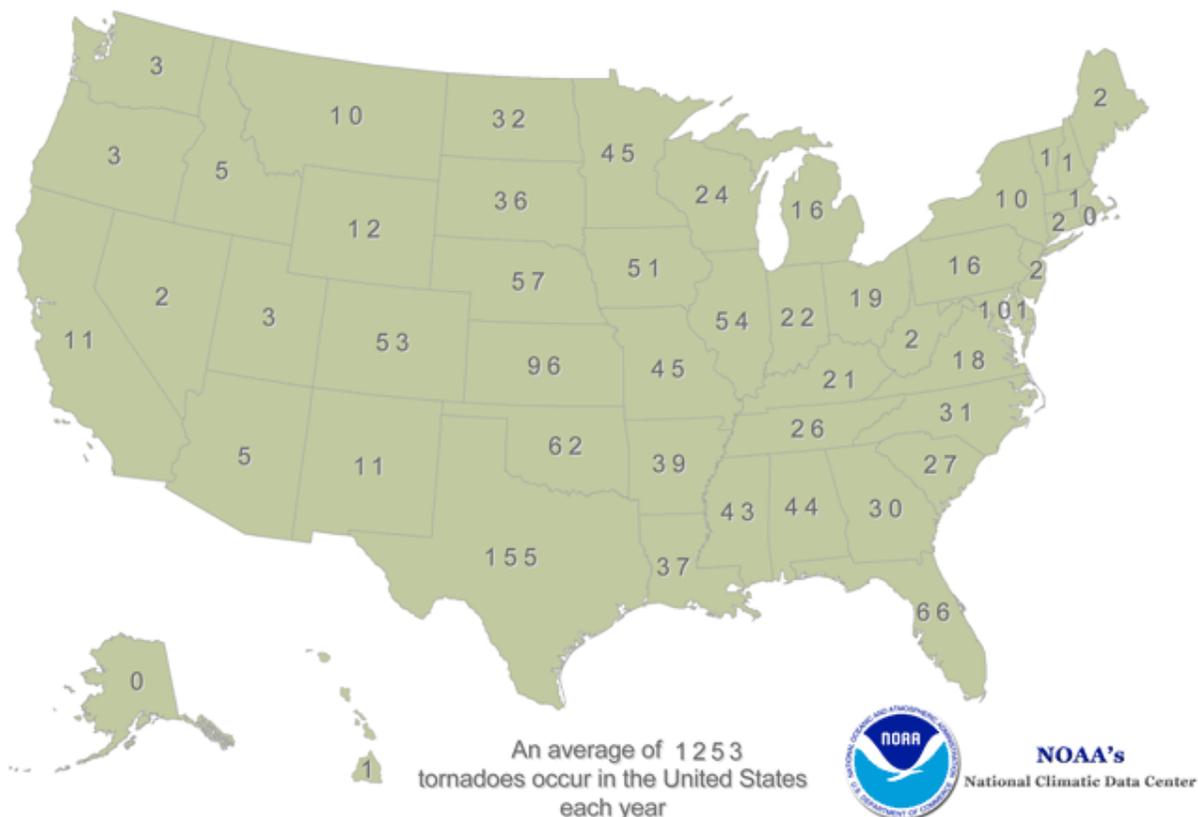
A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of 1 mile wide and 50 miles long. Tornado season in Vermont runs ordinarily from March through August; however, tornadoes can strike at any time of the year if the essential conditions are present.¹

Figure 4-3
Tornado Risk Areas in the Conterminous United States



¹ Source: National Weather Service, <http://www.nws.noaa.gov>

Figure 4-4
Average Annual Number of Tornadoes
Averaging Period: 1991–2010



Hazard Profile

Since 1953, Vermont has experienced more than 40 tornadoes, 14 of magnitude F2 (significant) and 16 of magnitude F1 (moderate) on the Fujita Scale. F2 tornadoes have maximum wind speeds of 113–157 miles per hour (mph), while F1 tornadoes range from 73–112 mph. Damage from tornadoes has ranged from a few downed trees to seven injuries during a 1970 tornado in Franklin County. These injuries occurred when a waterspout, a tornado that originates over water instead of land, moved from Lake Champlain to the south part of Swanton, where it struck a cabin. Property damage has totaled over \$8.4 million overall in the State of Vermont due to tornado damage. There have been no deaths as a result of a tornado in Vermont since 1950.

The last day of May 1998 brought severe weather to southern Vermont. The hardest hit area was Bennington County, where a tornado damaged homes and property in North Bennington. This tornado originated near Round Lake, New York, and moved rapidly eastward into Vermont, producing damage in North Bennington before dissipating in Shaftsbury. Funnel clouds were also reported that day in the Brattleboro area, but no tornadoes were confirmed to have touched down. Strong straight-line winds also damaged areas of Bennington and Windham Counties.

On June 5, 2002, thunderstorms spawned two tornadoes: one in Woodford Hollow in Bennington County and the other one near Wilmington in Windham County. The first touchdown produced a

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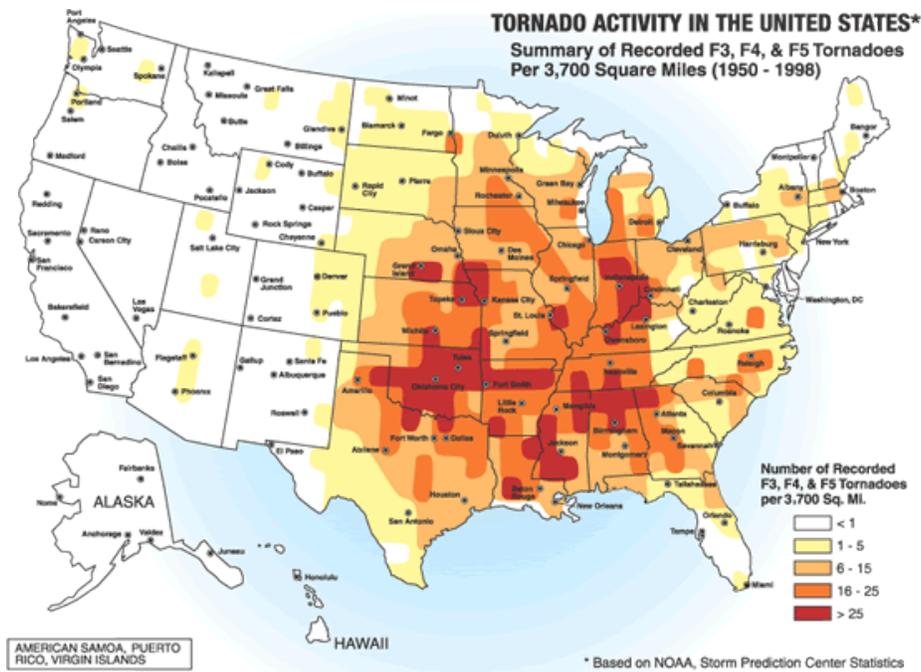
swath 150 yards wide and a path length of one-half mile. Many trees as large as a foot in diameter were either knocked over or ripped apart. Trees also fell on three automobiles. The second tornado, four miles Northeast of Wilmington, was even stronger despite a narrower swath of 50 yards. There was a significant windstorm event accompanying the Nor'easter of April 2007. This resulted in many downed trees and damage in Rutland city and nearby towns in south-central Vermont, and also resulted in a Presidential disaster declaration (DR-1698).

A tornado was reported in Bakersfield in July 2008, causing localized damages. A tornado with winds reaching 100 mph ripped an apartment house's roof off, snapped large trees, and destroyed a barn in the small town of Washington, Vermont in May 2009. The NWS stated that the tornado had an EF1 intensity on the Enhanced Fujita (EF) Scale. These tornadoes are considered rare in Vermont; on average, one is reported every two years.

The most recent tornado to strike Vermont occurred on May 29, 2012 when severe storms rolled through the Northeast portion of the state. The tornado, rated as an EF0 by NOAA, had wind speeds that peaked at 70 mph, tearing 45 trees out of the ground and pelting area house with marble-sized hail. This storm also resulted in a Presidential disaster declaration (DR-4066).

Overall, Vermont has averaged less than one tornado per year since 1950. This ranks the state as 47th out of the 50 states for tornado frequency. This includes no deaths, with the state ranking 44th for injuries and 45th for cost of damages. When we compare these statistics to other states by the frequency per square mile, Vermont ranks as follows: number 38 for the frequency of tornadoes, 0 for fatalities, 39 for injuries per area, and number 41 for costs per area. On FEMA's map entitled "Tornado Activity in the United States," most of Vermont shows recorded activity of less than one tornado per 1,000 square miles. A small portion of southern Vermont has seen 1–5 tornadoes per 1,000 square miles.

Figure 4-5
Tornado Activity in the United States



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**Table 4-14
Vermont Tornadoes by County 1950-2010**

Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Injuries	Fatalities	Remarks
\$873,600.00	\$-	5/31/1998	5/31/1998	Bennington	0	0
\$565,217.39	\$565,217.39	8/8/1983	8/8/1983	Addison	0	0
\$565,217.39	\$565,217.39	8/8/1983	8/8/1983	Chittenden	0	0
\$185,714.29	\$-	7/21/2003	7/21/2003	Bennington	0	0
\$132,653.06	\$-	5/9/2009	5/9/2009	Orange	0	0
\$105,050.51	\$-	7/18/2008	7/18/2008	Lamoille	0	0
\$96,296.30	\$9,629.63	7/14/1988	7/14/1988	Windham	0	0
\$93,975.90	\$-	6/5/2002	6/5/2002	Windham	0	0
\$53,061.22	\$26,530.61	7/16/2009	7/16/2009	Orange	0	0
\$52,525.25	\$-	7/18/2008	7/18/2008	Lamoille	0	0
\$39,393.94	\$3,939.39	9/3/1993	9/3/1993	Essex	0	0
\$39,393.94	\$3,939.39	9/3/1993	9/3/1993	Orleans	0	0
\$37,142.86	\$3,714.29	6/13/1961	6/13/1961	Franklin	0	0
\$37,142.86	\$-	6/24/1960	6/24/1960	Lamoille	0	0
\$37,142.86	\$-	6/9/1965	6/9/1965	Addison	1	0
\$37,142.86	\$-	7/9/1962	7/9/1962	Windsor	0	0
\$34,666.67	\$-	8/11/1966	8/11/1966	Windsor	0	0
\$33,831.33	\$-	6/5/2002	6/5/2002	Bennington	0	0
\$30,588.24	\$-	5/29/1969	5/29/1969	Bennington	1	0
\$28,888.89	\$288.89	8/3/1970	8/3/1970	Franklin	7	0
\$27,368.42	\$2,736.84	7/19/1972	7/19/1972	Franklin	0	0
\$27,368.42	\$-	8/9/1972	8/9/1972	Orange	0	0
\$26,000.00	\$-	6/5/2010	6/5/2010	Orleans	0	0
\$26,000.00	\$-	8/3/2010	8/3/2010	Caledonia	0	0
\$18,571.43	\$-	5/20/1962	5/20/1962	Franklin	0	0
\$18,571.43	\$-	5/20/1962	5/20/1962	Orleans	0	0

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Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Injuries	Fatalities	Remarks
\$12,380.95	\$-	7/21/2003	7/21/2003	Windham	0	0
\$3,714.29	\$3,714.29	6/24/1960	6/24/1960	Bennington	0	0
\$3,714.29	\$371.43	7/18/1961	7/18/1961	Franklin	0	0
\$3,714.29	\$371.43	7/21/1961	7/21/1961	Rutland	0	0
\$3,714.29	\$-	7/4/1963	7/4/1963	Franklin	0	0

4.1.2.6 Hurricanes/Tropical Storms

Hazard Definition

A hurricane is a tropical cyclone with sustained winds that have reached speed of 74 mph or higher. A storm reaches hurricane status only after strengthening over a period of days or even weeks. A tropical storm has a maximum sustained one-minute wind speed of 39–73 mph. The National Hurricane Center through the NWS names a tropical cyclone once it reaches tropical storm status. As a hurricane moves toward the coast, it loses wind speed and may be downgraded to a tropical storm. This is the case in many of the tropical storms that have reached Vermont.

Hurricanes and tropical storms are compound hazards, including precipitation, high winds, flooding, and fluvial erosion. The topography and landscape in Vermont contribute to the risk associated with these three hazards associated with hurricanes and tropical storms. Many of Vermont's villages, towns, and cities are located in or proximate to the floodplains of rivers, and many roads in Vermont run parallel to rivers. Due to the cultural and natural landscapes in Vermont, the compounded hazards that occur during hurricanes and tropical storms are high risks to public safety and human investments.

The Saffir-Simpson Hurricane Wind Scale is a rating system between 1 and 5 for sustained wind speed of hurricanes. This scale serves as an estimate of potential property damage during hurricanes. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and property damage. Category 1 and 2 storms are still dangerous, however, and require mitigation. The Saffir-Simpson Hurricane Wind Scale serves as a good measure for sustained wind speed; however, hurricanes and tropical cyclones are compound hazards, and wind is not the only mechanism of injury or property damage.

Table 4-15
Saffir-Simpson Hurricane Wind Scale (National Hurricane Center)

Category	Wind Speed	Types of Damage Due to Hurricane Winds
1	74-95 mph 64-82 kt 119-153 km/h	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to

Category	Wind Speed	Types of Damage Due to Hurricane Winds
		several days.
2	96-110 mph 83-95 kt 154-177 km/h	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (Major)	111-129 mph 96-112 kt 178-208 km/h	Devastating damage will occur: Well-built frame homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (Major)	130-156 mph 113-136 kt 209-251 km/h	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (Major)	157 mph or higher 137 kt or higher 252 km/h or higher	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Hazard Profile

Hurricanes rarely reach as far inland as Vermont, more often reaching Vermont as tropical storms or depressions. The worst non-winter storm to hit Vermont was the disastrous hurricane of 1938. On September 21, 1938, a very fast-moving hurricane (known as the “Long Island Express”) hit Vermont in the early evening causing wind damage. There was also severe flooding as a result of more than four inches of rain that accompanied the storm. Buildings were lost, power lines downed, and many trees felled.

More recently, Tropical Storm Floyd in September 1999 caused flooding and wind damage in parts of Vermont. Tropical Storm Floyd caused one fatality and resulted in a federal disaster declaration. In general, severe hurricanes are not considered likely nor do they pose a recurring threat for Vermont.

However brutal past tropical storm events have been, none have wreaked the havoc of the flooding from Tropical Storm Irene. In August 2011, Tropical Storm Irene moved up the Eastern Seaboard of the United States, gradually turning into a tropical storm as it made landfall in New York and Connecticut. The tropical storm moved into Vermont, dropping as much as 11 inches of rain on the state, causing nearly every river and stream to flood and experience catastrophic fluvial erosion. Extensive transportation damage was reported; nearly every state highway was affected and many local roads were washed away. Three people died and many were injured from the floods. The State of Vermont worked quickly to restore road access, but flood recovery efforts are still underway as of the update of this HMP.

Most of Vermont received at least 100 mm (4 inches) of rain from Tropical Storm Irene and large areas received in excess of 125 mm (5 inches). The heaviest rain fell in the mountains in the central and southern portions of the state, with extensive areas of greater than 150 mm (5.9

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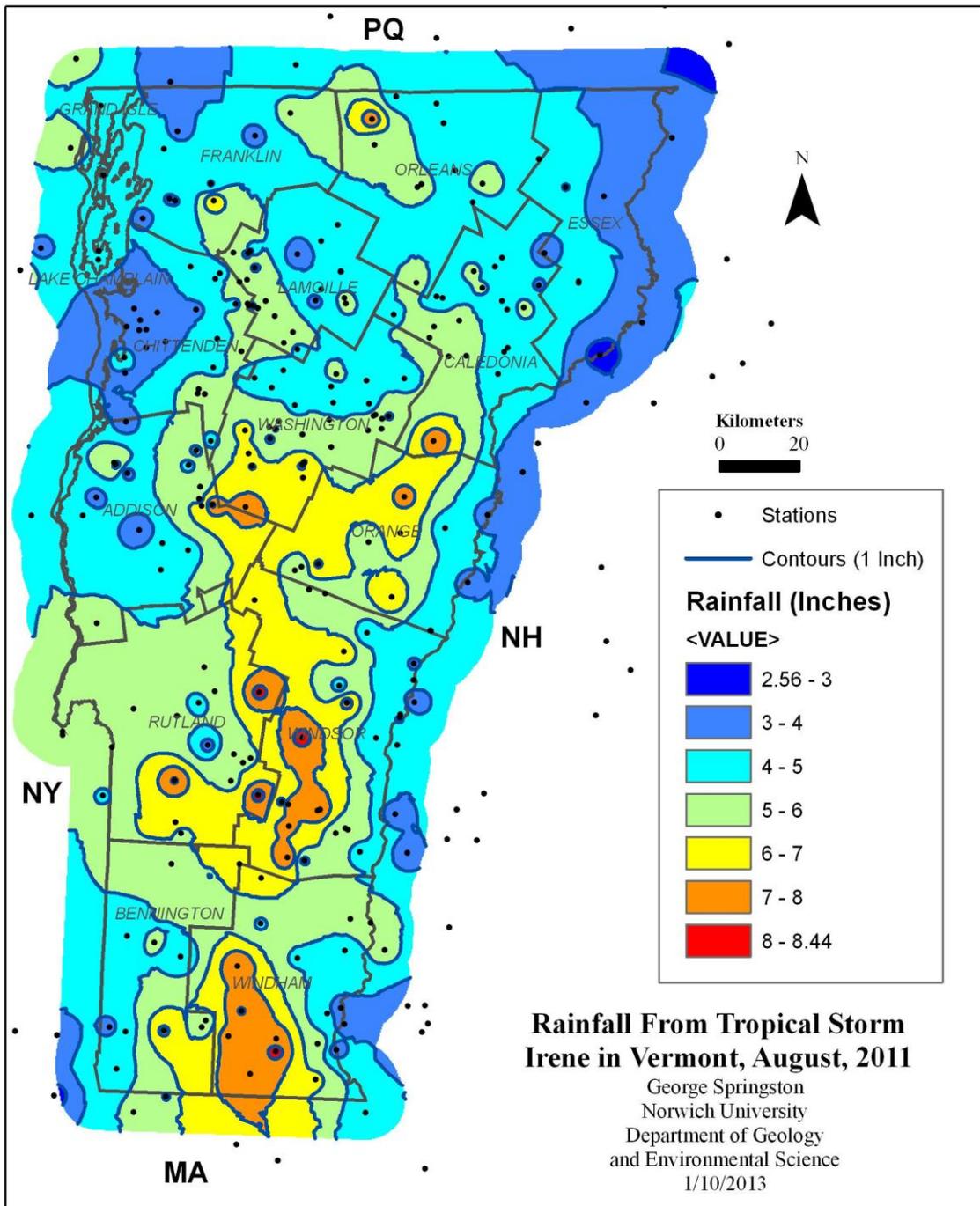
inches). The figure below was produced by combining data from the NWS (2011) with data from the MesoWest network of automated weather stations, the National Climatic Data Center, the CoCoRaHS network of observers (<http://www.cocorahs.org>), colleges, sewage treatment plant operators, and other municipal officials, and private citizens. The 186 observations in the original NWS compilation were thus expanded to 333, of which 238 are in Vermont.

During Tropical Storm Irene, flooding originated in headwater streams draining the flanks of the Green Mountains, where rainfall totals were greatest. As these high-gradient headwater streams filled quickly the water rushed down the hillsides and inundated the narrow valleys. These high-gradient streams with minimal floodplain attenuation rose and peaked rapidly in a matter of a few hours, and then receded nearly as quickly. By contrast, larger rivers of lower gradient with wide floodplains and contiguous wetlands were able to attenuate the storm flows; these rivers peaked later and receded more slowly.

U.S. Geological Survey's (USGS) National Water Information System includes 116 real-time streamflow gaging stations in Vermont and New Hampshire. Runoff values in central Vermont were among the greatest recorded by USGS in New England. Flows and stage at nine USGS streamflow gages in Vermont with 30+ years of flow and stage data were the greatest recorded; seven of these gages had 40+ years of flow and stage data.

USGS attempted to make discharge measurements at gages during the flooding. These discharge measurements are critical for establishing the upper ends of rating curves (stage to discharge relations). If a stream gage experienced the peak flow of record and a discharge measurement could not be made, then indirect measurements were made following the flooding. The indirect methods consist of identifying the highest stages of the river during the flooding with high water marks. These high water marks were used to survey in the extent of channel inundation at the peak flows. Hydraulic modeling is then used to estimate the peak flows.

Figure 4-6
Rainfall from Tropical Storm Irene in Vermont



Rainfall from Tropical Storm Irene in Vermont and vicinity. The original rainfall data from the NWS compilation of September 2011 has been supplemented by data from the MesoWest network, the National Climatic Data Center, the CoCoRaHS network of observers, and additional data from sewage treatment plant operators and private citizens.

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The following is a brief look at some of the effects of Tropical Storm Irene, according to the State of Vermont ANR:

Transportation

- State highway system: >500 miles of road and ~200 bridges damaged; costs to rebuild: \$175 million–250 million (lowered from initial estimates of \$620 million).
- Municipal Roads: Estimated >2000 road segments damaged, >280 bridges and ~960 culverts damaged.
- Railroad: >200 miles of rail and 6 bridges in the state-owned rail system damaged, costing the state an estimated \$21.5 million. New England Central Railroad also reported damage to private railways, with repairs required at 66 locations.
- Bus: Green Mountain Transit Authority offices in Berlin sustained flood damages, including 13 vehicles.

Emergency Response

- Main offices for both DEMHS and Vermont ANR were flooded in Waterbury; disaster response headquarters had to be relocated.
- Extensive road damage meant some areas were initially hard to access; 13 communities were without any passable roads leading in or out of town.

Buildings and Infrastructure

- Power outages for ~158,800 customers, with 55 percent restored within 24 hours. All Vermont customers restored in approximately 709 hours, or 29 days after Tropical Storm Irene.
- VELCO experienced an outage of one 115kV line due to river erosion, and loss of 1,800 feet of right-of-way. New right-of-way was secured, five new structures erected in new right-of-way, and the line was restored to service on September 10, 2011.
- VELCO also lost a main backbone fiber optic cable that was unearthed due to river erosion. Temporary fiber optic connectivity was established the following day, and new fiber optic cable was installed that now avoids the riverbed crossing.
- 7,215 individuals and families registered for FEMA assistance (by 11/15/11); >\$45.9 million in grants and low interest loans for Vermont residents, businesses, and nonprofit organizations have been approved by FEMA and the U.S. Small Business Administration; also, nearly \$15 million loaned to businesses and farms by Vermont Economic Development Authority.
- FEMA completed over 4,954 property inspections to document damage; ~1,500 residences had significant damage (433 of these residences were mobile homes) and at least 1,405 households were temporarily or permanently displaced.



- Municipal infrastructure (including transportation) costs are projected to be >\$1 million for at least 12 of the 45 southern and central Vermont towns with severe impacts; an estimated \$140 million in FEMA reimbursements will likely be needed by Vermont towns, with \$2 million in PA dollars obligated for Tropical Storm Irene as of 12/6/11.
- Waterbury State Office Complex, R.A LaRosa Agriculture and Environmental Laboratory, and Vermont State Hospital severely damaged in flooding; ~1,500 employees displaced, and costs to rebuild/upgrade estimated at \$50 million to \$85.4 million.
- Significant damage to White River National fish hatchery in Bethel; ~10 percent of hatchery fish were killed, and thousands of other reared fish may be contaminated.
- State Roxbury Fish Hatchery damages estimated at \$500,000.

Public Health and Safety

- American Red Cross set up 13 emergency shelters and distributed ~16,000 meals, plus “thousands and thousands” of water bottles.
- Food safety advisory for any food touched by floodwaters.
- Increased allergen exposure from mold growth in flooded buildings and possessions.

Water Supply

- Drinking water advisory issued for wells submerged by floodwaters—possibility of harmful chemicals or pathogens.
- About 30 public water systems issued Boil Water Notices as a result of Tropical Storm Irene; in many cases, broken pipes lowered a system’s water pressure, which increased the likelihood of harmful contaminants mixing with treated drinking water.
- An estimated 16,590 people in Vermont were affected by Tropical Storm Irene-related Boil Water Notices; 6,215 of these people use the large public water systems affected in Wilmington, Bethel, Woodstock, and Cavendish.



Hazardous Waste and Fuel Spills

- Potentially hazardous waste (such as household chemicals or spilled fuels) mobilized along rivers, contaminating floodwaters and sediment and soil deposits.
- In the first week after Tropical Storm Irene, hazardous spills reported to state officials increased over routine levels by a factor of 14; many spills were related to home fuel tank connections breaking as floodwaters moved tanks.
- Both U.S. Environmental Protection Agency (EPA) and Vermont Department of Environmental Conservation (DEC) investigated and assessed hundreds of Irene-related spills; oil-water separators were used to process roughly 300,000 gallons of contaminated waters near the Waterbury state complex.
- An estimated \$1.75 million in total costs have been incurred to the state (and hopefully will be covered by FEMA) to clean up aboveground storage tank oil spills.

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Wastewater Treatment

- Seventeen municipal wastewater treatment facilities (WWTFs) reported compromised operations, with issues ranging from pump station overflows to incomplete processing of sewage (no structural damages, but damages relating to mechanical, electrical, and debris accumulation problems). Most problems were resolved within 24 hours and the vast majority within one week of Tropical Storm Irene; estimated discharge of partially unprocessed or raw sewage is 10 million gallons during this period (all 91 WWTFs in Vermont successfully process roughly 44 million gallons of sewage each day on average). Several facilities implemented work-around solutions that prevented further sewage discharge.
- On-site septic systems around the state were also damaged by high groundwater levels and river or stream erosion. In the two months following Tropical Storm Irene, state officials tallied 17 septic system failures due specifically to Tropical Storm Irene. Additional systems may have failures attributable to Tropical Storm Irene, but displaced homeowners may not yet have discovered failures because they have not been back to use them.

Solid Waste Disposal

- Vermont landfills received an estimated 32,000–42,000 tons of Tropical Storm Irene-related waste during the months that followed.
- Household hazardous waste collections around the state amassed an estimated 4,385 gallons and 8,464 units* of waste, with ~\$82,000 cost incurred (*units refer to disposed items and range from small bottles to five-gallon buckets of material).

Forests

- High flows and saturated ground conditions undermined tree roots, and floating debris injured tree stems. Brief duration of standing water at most locations prevented further near-term tree damage; however, great amounts of accumulated sediment and debris in some streamside forests or establishment of invasive plants may inhibit tree growth over time.
- Aerial surveys found 9,213 acres with trees exhibiting flood damage symptoms from both spring and Tropical Storm Irene-related flooding.
- Green Mountain National Forest: Multiple trails, recreation sites, and roads closed (as of 11/18/11, 20 trail closures, 5 recreation site closures, and 20 roads closed).

Agriculture

- Farm fields and barns were washed out or covered with flood sediments and debris; more than 450 farms filed Farm Loss claims with the U.S. Department of Agriculture (USDA), and roughly 20,000 acres of farmland were affected.
- Food advisories forced farmers to throw away food crops that may have been contaminated by floodwaters.
- Estimated value of crop losses and cropland damage: >\$10 million dollars statewide.
- Producers reported more than 1,000 acres of sugar bush damaged by winds.
- Farm product deliveries were impeded by road closures.

- Shortages in hay and forage this winter may continue to stress farms; the potential remains for further damage to silage from mold or poor fermentation.

Water Resources

- Intense flooding occurred in at least 10 of Vermont's 17 major river basins.
- Major rivers in Vermont demonstrated record or near record flood crest levels.
- Otter Creek gage in Center Rutland showed the highest flood crest since the gage began operating 83 years ago—9.21' above flood stage.
- Mad River gage in Moretown and White River gage in West Hartford both showed second highest flood crests on record (only 1927 was higher)—12.1' and 10.4' above flood stage, respectively.
- Nine stream gaging stations in Vermont recorded peak flows estimated to have a 1 percent or less chance of occurring or being exceeded in any given year.
- Some river locations appeared relatively unscathed, while others underwent catastrophic channel enlargement, deposition, and relocation; pre-Tropical Storm Irene geomorphic studies of many Vermont rivers probably flagged some of these damaged areas as being susceptible to channel adjustment (further investigation of this question will be needed as mapping of Irene-damaged areas is completed).
- In-stream channel work and gravel removal occurred in multiple locations during Tropical Storm Irene recovery period (largely in the 2-3 months after the flood); in some cases, work occurred without official authorization.

Aquatic Life and Habitat

- In many locations, daily turbidity of waters (related to in-stream work) and habitat disruption may stress fish and macroinvertebrates (insects, snails, mussels, crayfish, etc.); extreme scour from powerful floodwaters likely reduced total numbers of fish and macroinvertebrates in some rivers, and species composition of fish and macroinvertebrates may shift to species that more readily withstand these stresses.
- For example, state fish biologists studied wild trout populations in the Mad and Dog River watersheds both before and after major Tropical Storm Irene-related flooding. After the flood, wild trout populations in studied streams were reduced to 33–58 percent of pre-flood levels.
- Fish and macroinvertebrate populations have a long history of surviving floods when quality stream habitat is available, and reduced numbers are usually temporary, but an increase in flood return rate due to changing climate may have long-term impacts. In addition, where habitat is compromised (due to historic channelization practices, encroachment, or post-Tropical Storm Irene channel remediation efforts such as streambed excavation and fallen tree removal), fish populations may be affected over a longer term, depending on how quickly natural stream processes can re-establish habitat features.
- Increased algae growth with ongoing influx of river silts (elevating available nutrient levels).

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- Mussel populations (including some rare, threatened, or endangered species) likely harmed as sand and silt deposition and bank collapse buried and suffocated individuals.
- Chemical contaminants distributed along river ways may enter food chains or otherwise harm sensitive plants and animals.
- Japanese knotweed, an invasive plant that spreads by sprouting from broken plant rhizomes, has been spread with flood debris, threatening riparian forests, future bank stability, and agricultural fields.

Mobile Home Parks

- Mobile homes suffered disproportionately in Tropical Storm Irene; mobile homes comprise 15 percent of the total residences damaged while only accounting for 7 percent of Vermont's total housing stock.
- 17 mobile home park communities experienced some level of flooding during Tropical Storm Irene, with 14 of those parks having at least 1 home destroyed by floodwaters.
- More than 130 mobile homes were completely destroyed.

The table below lists all of the mobile home parks impacted by Tropical Storm Irene.

**Table 4-16
Mobile Home Parks Impacted by Tropical Storm Irene**

Mobile Home Park Name	County	Town Name	Park Floodplain Status	Floodplain Data Source	Total Homes in Park	Homes Flooded	Homes Destroyed
Green Mountain Mobile Home Park	Bennington	Pownal	100 Year Flood Plain	Draft DFIRM	42	1	1
Northeast Kingdom Mobile Home Park	Caledonia	Lyndonville	Floodway	Paper FIRM	60	19	3
Forest Dale Mobile Home Park	Rutland	Brandon	Floodway	DFIRM	5	5	3
Fort Warren Mobile Home Park	Rutland	Castleton	Floodway	DFIRM	46	n/a	0
Weston's Mobile Home Park, LLC	Washington	Berlin	Floodway	Draft DFIRM	83	70	50
Patterson's Mobile Home Park	Washington	Duxbury	100 Year Flood Plain	Draft DFIRM	19	19	19
Tucker Mobile Home Park	Washington	Northfield	Floodway	Draft DFIRM	32	1	1
Whalley Trailer Park	Washington	Waterbury	Floodway	Draft DFIRM	11	11	11
Mountain Home Park	Windham	Brattleboro	Floodway	DFIRM	276	15	6
Glen Park	Windham	Brattleboro	Floodway	DFIRM	33	16	11
Benson's Park	Windham	Rockingham	Floodway	DFIRM	8	1	1
Richards Mobile Home Park	Windsor	Bethel	100 Year Flood Plain	DFIRM	21	11	9
Black River Mobile Court	Windsor	Ludlow	Floodway	DFIRM	15	10	8
Green's Trailer Park	Windsor	Sharon	100 Year Flood Plain	DFIRM	6	5	5
Riverside Mobile Home Park	Windsor	Woodstock	Floodway	DFIRM	40	34	9
Barber's Pond Mobile Home Park	Bennington	Pownal	No flood hazard status	Draft DFIRM	8	0	0
Tenney's Mobile Home Park	Windham	Athens	No flood hazard status	DFIRM	5	n/a	n/a
Total Homes					710	218	137

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Mobile home parks are uniquely vulnerable to flooding resulting from hurricanes and tropical storms. This increased risk is related to siting of park communities in flood hazard areas, socioeconomic characteristics of park residents, and limitations of the structures themselves. An assessment completed in 2012 by researchers at the University of Vermont found that one-fifth of Vermont's 247 mobile home parks have at least one lot that is located within a flood hazard area and nearly 12 percent of all mobile home park lots are located in flood hazards areas.

Most recently, Hurricane Sandy came to the Northeast on October 29, 2012; however, the storm did not significantly affect Vermont and did not result in a disaster declaration for Vermont. Nevertheless, Vermont did experience high winds from Hurricane Sandy, especially in the southern part of the state. All of Vermont's 14 counties experienced electric utility impacts from Hurricane Sandy, and approximately 64,600 customers lost power. All customers had their power restored in approximately 56 hours.

4.1.2.7 Hail

Hazard Definition

Hail is a form of precipitation composed of spherical lumps of ice. Known as hailstones, these ice balls typically range from 5–50 mm in diameter on average, with much larger hailstones forming in severe thunderstorms. The size of hailstones is a direct function of the severity and size of the thunderstorm that produces it. Hail causes \$1 billion dollars in damage to crops and property in the United States each year. An example of the economic destruction a hailstorm can cause is one that struck the Kansas City area in 2001 caused an estimated \$1.5 billion dollars in damage. No matter the size, hail can damage property, young and tender plants, and cause bodily harm to those unfortunate enough to be caught outside.

Hazard Profile

Hailstorms usually occur in Vermont during the summer months and generally accompany passing thunderstorms. While local in nature, these storms are especially significant to area farmers, who can lose entire fields of crops in a single hailstorm. Large hail is also capable of property damage. There have been 282 recorded hail events in Vermont spanning the 50 years between 1955 and 2005. Most of these events had hail measuring .75 inches, but many had hail at least 1.5 inches in size. The largest hail during the period was 3-inch hail that fell in Chittenden County in 1968 (National Center for Climate Data). Tennis ball-sized hail was reported in the Town of Chittenden during a storm in the summer of 2001. In 2006 in Barnet, a sudden summer windstorm caused extensive localized damage and injuries at a local Buddhist center in this small Northeast Kingdom village. Hail is considered a relatively infrequent occurrence in Vermont. Those hail events that do occur tend to be highly localized and limited to a relatively small area.

Figure 4-7
Hail Reports by Month (NWS)

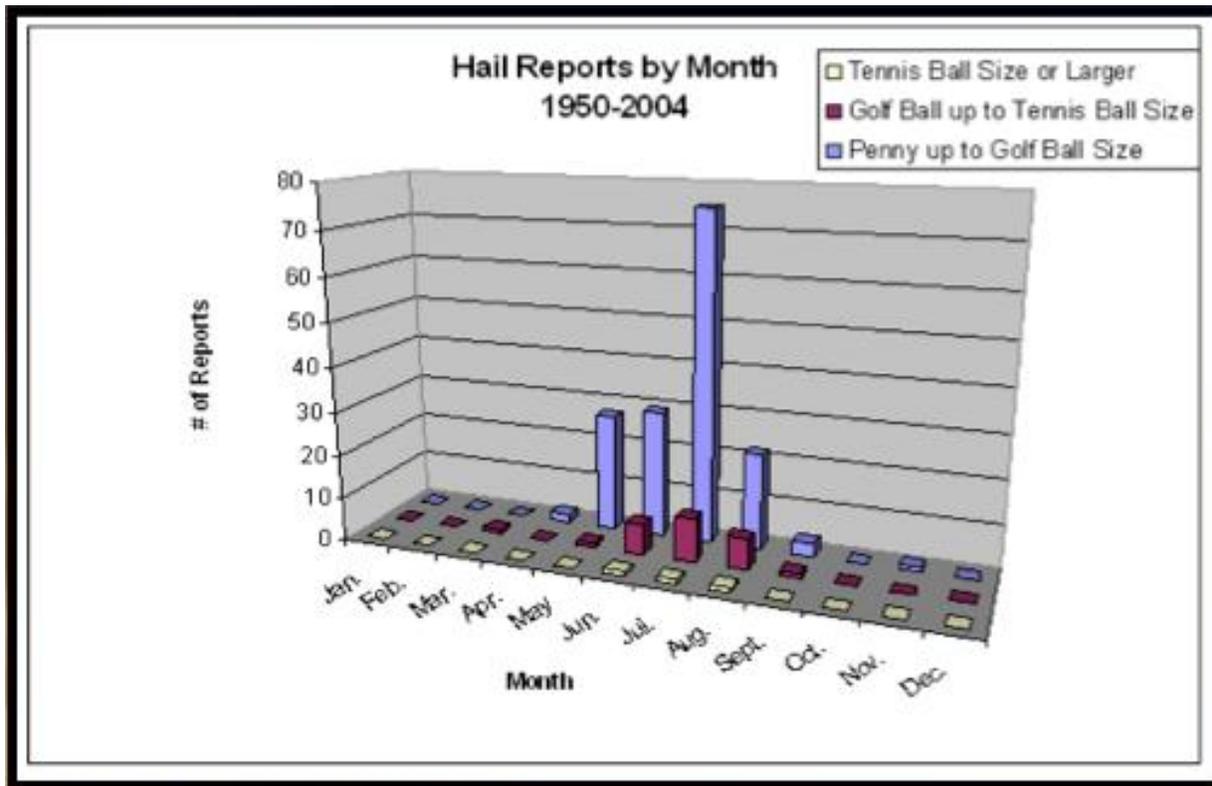


Table 4-17
Hail Events in Vermont since 2002

Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Injuries	Fatalities	Remarks
\$53,061.22	\$53,061.22	7/16/2009	7/16/2009	Chittenden	0	0
\$27,368.42	\$-	7/10/2007	7/10/2007	Orleans	0	0
\$26,000.00	\$-	7/21/2010	7/21/2010	Lamoille	0	0
\$26,000.00	\$-	7/21/2010	7/21/2010	Orange	0	0
\$21,894.74	\$-	7/9/2007	7/9/2007	Washington	0	0
\$21,224.49	\$-	7/16/2009	7/16/2009	Chittenden	0	0
\$20,800.00	\$-	7/21/2010	7/21/2010	Washington	0	0
\$15,600.00	\$-	6/5/2010	6/5/2010	Caledonia	0	0
\$10,612.24	\$21,224.49	7/16/2009	7/16/2009	Chittenden	0	0

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Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Injuries	Fatalities	Remarks
\$10,612.24	\$-	7/16/2009	7/16/2009	Chittenden	0	0
\$5,252.53	\$-	8/7/2008	8/7/2008	Orange	0	0
\$5,200.00	\$-	6/5/2010	6/5/2010	Caledonia	0	0
\$1,195.40	\$-	5/18/2004	5/18/2004	Rutland	0	0
\$1,155.56	\$-	5/1/2005	5/1/2005	Franklin	0	0
\$1,155.56	\$-	5/3/2005	5/3/2005	Orleans	0	0
\$1,155.56	\$-	5/29/2005	5/29/2005	Caledonia	0	0
\$1,155.56	\$-	5/30/2005	5/30/2005	Addison	0	0
\$1,155.56	\$-	5/30/2005	5/30/2005	Caledonia	0	0
\$1,155.56	\$-	6/8/2005	6/8/2005	Windsor	0	0
\$1,155.56	\$-	6/8/2005	6/8/2005	Windsor	0	0
\$1,130.43	\$-	7/1/2006	7/1/2006	Chittenden	0	0
\$-	\$52,000.00	7/21/2010	7/21/2010	Chittenden	0	0
\$-	\$26,000.00	7/21/2010	7/21/2010	Grand Isle	0	0
\$-	\$26,000.00	7/21/2010	7/21/2010	Chittenden	0	0
\$-	\$21,224.49	7/16/2009	7/16/2009	Franklin	0	0
\$-	\$20,800.00	7/21/2010	7/21/2010	Chittenden	0	0
\$-	\$20,800.00	7/21/2010	7/21/2010	Orange	0	0
\$-	\$20,800.00	7/21/2010	7/21/2010	Orange	0	0
\$-	\$10,400.00	7/21/2010	7/21/2010	Caledonia	0	0

Although hailstorms occur relatively infrequently, they are still very important to take into account because of Vermont's high vulnerability. Most of Vermont's economy is agrarian. The more farms there are, the higher the risk for damage, and the more vulnerable the area exposed to hailstorms. There is little in the way of protecting these lands before the storms hit; therefore, most of the focus in mitigating this type of hazard is aimed at response and recovery. Knowing how much land is at risk when these storms occur is important for estimating the amount of money needed to recover and rebuild the areas that are most heavily affected.

While hail can directly damage crops, other aspects of Vermont's economy may be indirectly affected. There have been reports of hailstorms completely destroying entire hay fields and cornfields. These crops are usually used to feed animals, so dairy farms and other farms that

breed livestock can be affected. This can cause a "domino effect," increasing prices of feed for livestock, which in turn increases the price of milk and other dairy products. This shows that these storms can still have a substantial impact on many different aspects of Vermont's economy.

4.1.2.8 Extreme Temperatures

Hazard Definition

Extreme temperatures include both cold and hot events, which can have a significant effect on human health and commercial/agricultural businesses, and primary and secondary effects on infrastructure (for example, burst pipes and power failure). What constitutes “extreme cold” or “extreme heat” can vary across different areas of the country based on what the population is accustomed to in their respective climates. The table below summarizes important elements of both hot and cold extremes.

Table 4-18
Elements of Temperature Extremes

Heat wave	Prolonged period (at least 3 days) of excessive heat, often combined with excessive humidity.
Heat index	Apparent temperature of how hot it feels when relative humidity is combined with the observed air temperature. Exposure to full sunshine can increase the heat index by 15 degrees.
Excessive Heat Watch	Conditions are favorable for an excessive heat event to meet or exceed local Excessive Heat Warning criteria in the next 24 to 72 hours.
Excessive Heat Warning	Heat Index values are forecast to meet or exceed locally defined warning criteria for at least 2 days (daytime highs = 105–110° Fahrenheit).
Heat Advisory	Heat Index values are forecast to meet locally defined advisory criteria for 1 to 2 days (daytime highs = 100–105° Fahrenheit).
Frost/Freeze Warning	Below freezing temperatures are expected.
Wind Chill	The wind chill temperature is how cold people and animals feel when outside. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature. Therefore, the wind makes it FEEL much colder. If the temperature is 0 degrees Fahrenheit and the wind is blowing at 15 mph, the wind chill is -19 degrees Fahrenheit. At this wind chill temperature, exposed skin can freeze in 30 minutes.

Hazard Profile

One of the noteworthy characteristics of Vermont’s climate is the tendency to stray above or below expected temperature values, a statement that was as true in 1922 as it is today. Extremes in temperature and the seasonality of these extremes are important to both individuals as well as economic activities. During the summer, both extreme cold and extreme heat can be observed. The former is associated with frost, which can be detrimental during the growing season. Extremely high temperatures can occur when a high-pressure system (under which air is descending toward the Earth’s surface) develops and intensifies over the state. Under such conditions, the potential for a heat wave exists. A heat wave is a period of three or more consecutive days during which the diurnal maximum temperature meets or exceeds 90°F. In

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Burlington, the average number of days per year with above 90°F temperatures is six. In 1999, a drought year, this figure climbed to 19. Extreme maximum temperatures are often observed during drought years, and in many cases, the records that are broken were long-standing and set during previous droughts. It should be noted that a heat wave could be either a boon or a bane depending upon the time of year and the antecedent conditions. For example, the hot conditions of August 1996 followed a cool, wet summer, thereby providing an extra boost for plants.

Extreme heat can create an emergency if it continues for several days. Prolonged high temperatures can overload power and cooling systems, buckle rail lines, wither crops, and threaten people with heat stroke, heat cramps, heat fainting, heat exhaustion, asthma attacks, heart attack, stroke, and death. In addition, heat-related events are often associated with changes in air pollution, including ozone, which causes respiratory injury and damage to plant foliage. Climate change is expected to bring increasing temperatures for the Northeast, including specifically the Lake Champlain Watershed (see Section 5.1.1: The Impact of Climate Change on Hazards in Vermont), and experts are projecting that for some regions these increased temperatures will cause an increase in air pollution and affect human health. For a more detailed discussion, see Section 5.1.1.

Luckily, Vermont has a climate where *extreme* heat is unlikely. However, heat-related events do occur. In July of 1911, Northfield had a 12-day average of 90.75°F. The summer of 1949 was also very hot, with 25 days above 90°F. While certainly uncomfortable, extreme temperatures usually create only minor emergencies, although they usually affect at least one region of the state. Temperatures may reach the mid to upper 90s during the summer, but these are usually short-lived and relatively unusual events. Some climatologists predict a greater likelihood of anomalous high temperature weather events, which are caused by global climate change.

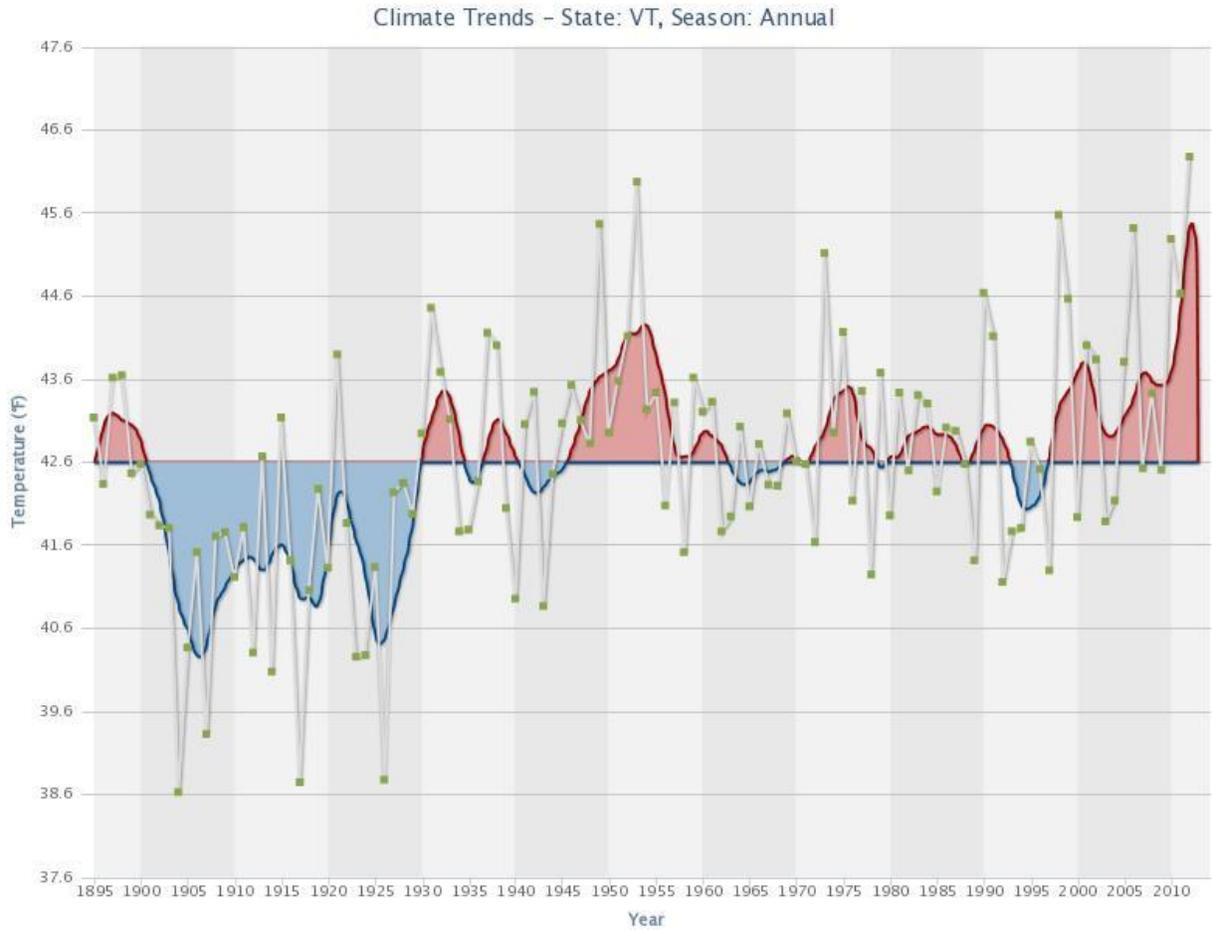
The table below highlights the role of climate variability in the long stretch of above-average temperatures from April 2011 to August 2012.

Table 4-19
Monthly Average Temperature in Burlington

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1981-2010	18.7	21.5	31.0	44.8	56.3	65.8	70.6	68.8	60.5	48.1	38.2	25.8
2011	18.2	21.1	29.8	45.4	59.2	66.1	72.8	70.4	64.1	50.1	43.3	30.6
2012	24.5	28.4	43.2	46.0	61.6	67.8	73.0	72.0	61.9	52.9		

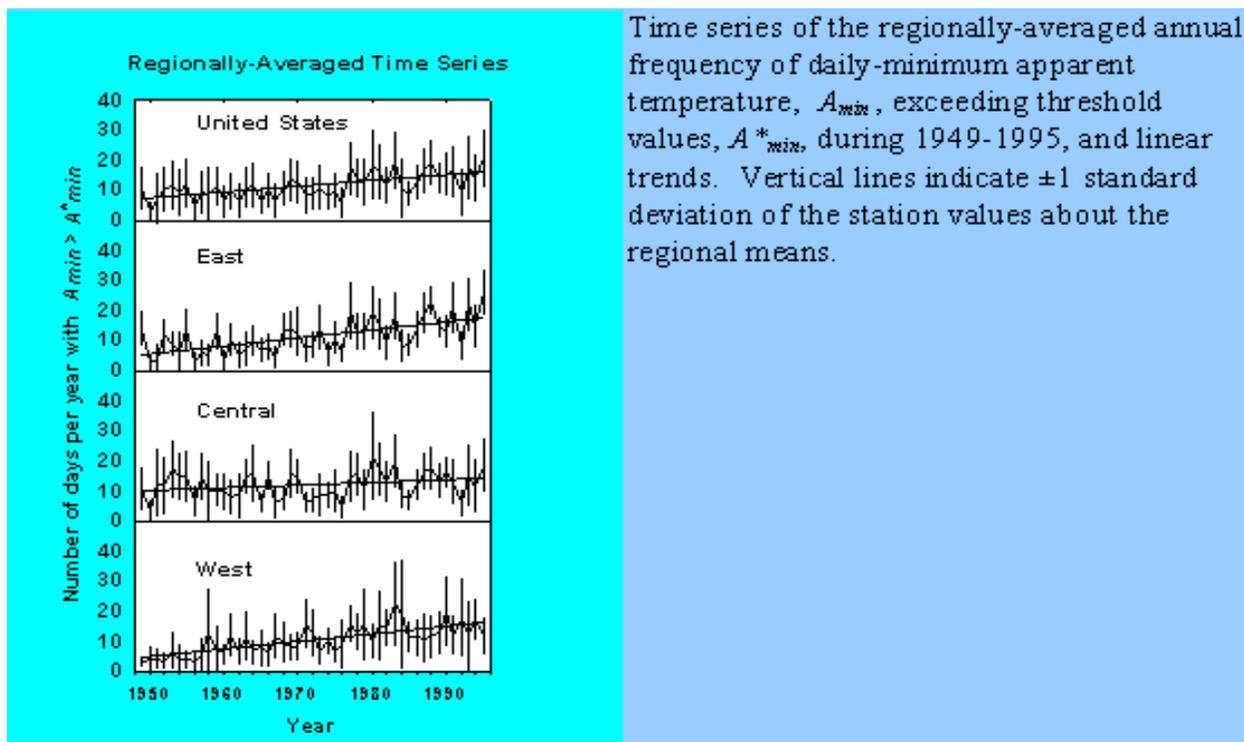
The Historical Climate Trends graph below provides a comparative analysis of Vermont’s annual average temperatures. Long-term average annual temperature is the horizontal line in the middle of the chart and the 5-year moving averages are the red and blue curves. A red curve indicates a warmer period than the historical average, while a blue curve is a period that is cooler than the historical average. As our average annual temperatures climb, extreme heat becomes ever more important.

Figure 4-8
Vermont Annual Climate Trends



Some climatologists predict a greater likelihood of anomalous high temperature weather events being caused by global warming. Currently, the National Climate Data Center (NCDC) updates a U.S. heat stress index. The largest increase in temperature threshold values have been found in eastern and western regions of the United States, the temperature information is being collected from the NWS stations. As shown in the graph below, extreme heat is ever more important where we are located as our average daily temperatures climb. Graph retrieved from NCDC (Wuertz, 2012).

Figure 4-9
National Climate Data Center Heat Graph



In the fall, both abrupt cold snaps and record warmth can be observed, where the latter tends to be associated with southerly flow. Similarly in winter, both extreme cold and record warm conditions occur. The winter of 1933–1934 was particularly cold, and the lowest temperature ever recorded for the state (50°F) occurred at Bloomfield on December 30, 1933. Prior to this, extreme cold temperatures were widespread on January 4 and December 18, 1835, with -40°F at Montpelier and White River, -38°F at Bradford, -30°F at Rutland and -26°F at Burlington. Following the winter of 1933–1934, more than 20 percent of the apple trees in Vermont were eliminated, although this figure was less than 2 percent for the Macintosh variety. Temperature is a very important variable in promoting apple growth. The dwarf trees introduced in the 1860s lacked the winter hardiness needed to be truly viable in Vermont. The severe winter of 1917–1918 destroyed almost all of the Baldwin and other strains. Only the Macintosh variety survived, and it remains the dominant strain grown today. In 2001, temperature fluctuations in the spring produced a different loss. Daily maxima of at least 90°F followed by minima on the order of 20°F accelerated the flowering of the apple blossoms, which were then killed by the low nighttime temperatures.

One of the most prolonged cold episodes lasted from January 18 to February 3, 1969. Diurnal maxima were below 0°F . Water mains and other connections froze and burst in record numbers across the state. Since then, extreme cold has been recorded in February 1993 and again on January 19, 1997. In both cases, cold dense air moving out from an Arctic high-pressure system caused temperatures to plummet. Daytime highs in 1993 were 10°F , while the minima were -5°F .

Long-range forecast models are predicting an increase of 4°F in temperature in Vermont by 2100, and a precipitation increase by 30 percent in winter. With warmer temperatures, there is

likely to be a heightened consideration for water supplies as many individuals in Vermont use private wells for water supplies. There are other global warming projections that look at crop and vegetation, which could drop by nearly 40 percent in some areas, causing great disruptions on the agricultural sector in Vermont. Forests and ecosystems are also in danger due to warming trends and changes in climate.

4.1.2.9 Drought

Hazard Definition

Drought is defined as a water shortage with reference to a specified need for water in a conceptual supply and demand relationship. It is a complex phenomenon that is difficult to monitor and assess because it develops slowly and covers extensive areas, as opposed to other disasters that have rapid onsets and obvious destruction. Also unlike most disasters, the effects of drought can linger long after the drought has ended. It is an inherent, cyclical component of natural climatic variability and can occur at any place at any time. It is difficult to determine the onset, duration, intensity, and severity of a drought, all of which affect the consequences and mitigation techniques. High winds, low humidity, and extreme temperatures can all amplify the severity of the drought.

There are four types of drought: meteorological, agricultural, hydrological, and socioeconomic.

Meteorological drought is defined as a reduction in rainfall from a normal precipitation pattern in regard to the amount, intensity, or timing of the event as well changes in the temperature, humidity, and wind patterns. The strict threshold differs for every nation; the United States defines meteorological drought as receiving less than 2.5 mm of rainfall in 48 hours. Meteorological drought is the first drought stage detected.

Agricultural drought is defined by deficient moisture conditions that cause a lasting effect on crops and non-natural vegetation. It is dependent on rainfall, temperature, topography, evapotranspiration, permeability, and porosity of soils, precipitation effectiveness, and vegetative demand. Agricultural drought begins when the available soil moisture supports the actual evapotranspiration rate at only a fraction of the potential evapotranspiration rate.

Hydrological drought is related to the effects of decreased precipitation on surface or subsurface water supply. It is the last stage of drought and is lagged behind meteorological and agricultural drought because water infiltrates down to the groundwater during the latter portion of the hydrological cycle. Subsurface water supply is the last drought component to return to normal when meteorological conditions and aquifer recharge return.

Socioeconomic drought is what happens when the consequences of the drought start to affect the socioeconomic sector. It occurs when the demand for an economic good is greater than the available supply due to weather-related drought. Examples of such goods include water, hydroelectric power, food grains, meat, dairy, and much more. Socioeconomic drought affects the associated population both individually and collectively.

The severity of a drought depends on the duration, intensity, and geographic extent of the water shortage as well as the demands on the area's water supply. The USDA rates droughts from D0–D4, depending on the severity of the drought, the amount of time it will take for vegetation to return to normal levels, and the possible effects of the drought on vegetation and water supply. See figure below.

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Drought differs from other natural hazards in multiple ways. First, drought is not as obvious as other hazards; it does not have the property destruction of a tornado or hurricane. Second, there is a lack of an exact and universally accepted definition of drought. Finally, the beginning and end of a drought is difficult to determine. In addition, droughts are often spread over a larger geographic area than other natural hazards. These things considered, the economic effects of a drought can be just as devastating as any other natural hazards.

**Figure 4-10
Drought**

Drought Severity	Return Period (years)	Description of Possible Impacts	Drought Monitoring Indices		
			Standardized Precipitation Index (SPI)	NDMC* Drought Category	Palmer Drought Index
Minor Drought	3 to 4	Going into drought; short-term dryness slowing growth of crops or pastures; fire risk above average. Coming out of drought; some lingering water deficits; pastures or crops not fully recovered.	-0.5 to -0.7	D0	-1.0 to -1.9
Moderate Drought	5 to 9	Some damage to crops or pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested.	-0.8 to -1.2	D1	-2.0 to -2.9
Severe Drought	10 to 17	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-1.3 to -1.5	D2	-3.0 to -3.9
Extreme Drought	18 to 43	Major crop and pasture losses; extreme fire danger; widespread water shortages or restrictions.	-1.6 to -1.9	D3	-4.0 to -4.9
Exceptional Drought	44+	Exceptional and widespread crop and pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells creating water emergencies.	less than -2	D4	-5.0 or less

*NDMC - National Drought Mitigation Center

Hazard Profile

Even though the state usually has adequate rainfall, droughts occasionally occur. Several severe droughts have been recorded during the last century, while moderate and mild droughts are much more common. These localized deficiencies of water leave wells dry, cause damage to crops, and cause restrictions on water usages. According to the NCDC, there was a protracted drought rated severe in 1964 and worsening to extreme in 1965 and 1966. Droughts cause the loss of potable water when wells run dry and can have severe effects on crops and livestock. Drought also makes conditions ripe for wildfires. In 1966, there were 14 Class C wildfires in Vermont ranging from 10 to 100 acres, much larger than the average forest fire in Vermont of 2.5 acres. In the summer of 2003, Vermont experienced drought conditions with many communities reporting the season to be the driest on record. In general, severe droughts are not frequent occurrences in Vermont.

There were two declared statewide droughts in June and July 1995. These droughts were due to a lack in rainfall, which required officials to put restrictions on water usage. Lack of rain combined with some of the hottest temperatures led to the loss of crops in some areas. The drought persisted through the summer of 1995, and a third, more severe drought affected Southern Vermont in August of that year. This loss of crops can be seen in the low yields of corn and hay for that year.

Vermont has a highly variable, unpredictable climate. Droughts, while low frequency hazards, are of serious concern to the population of Vermont. It is often difficult to recognize the onset of a drought during its preliminary stages, and this plus Vermont's variable climate can lead to the disregard for the seriousness of an oncoming drought.

In the summer of 2003, Vermont experienced drought conditions with many communities reporting the season to be the driest on record. In response to this event, in 2002, the ANR developed the Vermont Agency of Natural Resources Drought Plan in consultation with DEMHS (then VEM) to guide its activities in response to droughts and extended periods of dry weather (full plan available at http://intranet.anr.state.vt.us/anrstaff/ppgr/vtanr_drought_plan.pdf). The plan is a set of operating procedures that outline the responsibilities of various programs, lines of communication to be used, and the general sequence of actions to be followed based on the severity of the situation. Additionally, the plan provides a set of qualitative and quantitative Vermont-specific drought severity indices and recommended actions based on drought level.

In late summer/early autumn of 2007, ground water shortages were evident in several areas of Vermont. This was particularly apparent near shallow wells. The State Geologist and Vermont Geological Survey developed groundwater resource maps for towns and conducted ongoing statewide assessments because groundwater provides natural storage of water during periods of agricultural or hydrologic drought. The resources this program provides are intended for community planning purposes, so future water supplies can be sited. Communities with groundwater wells that have adequate yields in times of drought have a degree of protection, where low yield areas may be more vulnerable. For more information on the Vermont Geological Survey's groundwater program and links to statewide assessments and County and town groundwater maps, see: <http://www.anr.state.vt.us/dec/geo/grndwaterinx.htm>

Currently, the State Geologist has been communicating with the State Climatologist about groundwater as a safeguard against drought, and the State Climatologist is pursuing a NOAA grant to include VT groundwater information in a NOAA drought web site. It is important to conduct regional and municipal level education on the groundwater resource in times of drought. Planning for the use of groundwater is a way to develop a safeguard for water supply during drought periods.

Though Vermont encompasses a small geographic area, the state has distinct regions that can experience significantly different weather patterns and react differently to the amount of precipitation they receive. As the below image and graphs indicate, the NCDC separates Vermont into three regions: northeastern, western, and southeastern.

Drought information is most easily displayed using graphs rather than maps, since droughts are caused by trends that develop over time. The graphs below provide a comparative analysis of the annual average rainfalls for the three regions of Vermont: Northeastern, Western and Southeastern. Long-term average annual rainfall is the horizontal line in the middle of the chart and the 5-year moving averages are the green and brown curves. A green curve indicates a

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period that is wetter than the historical average, while a brown curve is drier than the historical average.

Figure 4-11
Vermont Climate Division

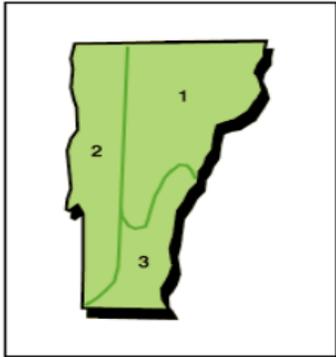


Figure 1: Climate divisions for northern New England, including the northeastern (1), western (2) and southeastern (3) in Vermont (courtesy National Climatic Data Center).

Figure 4-12
Northeastern Vermont Climate Trend

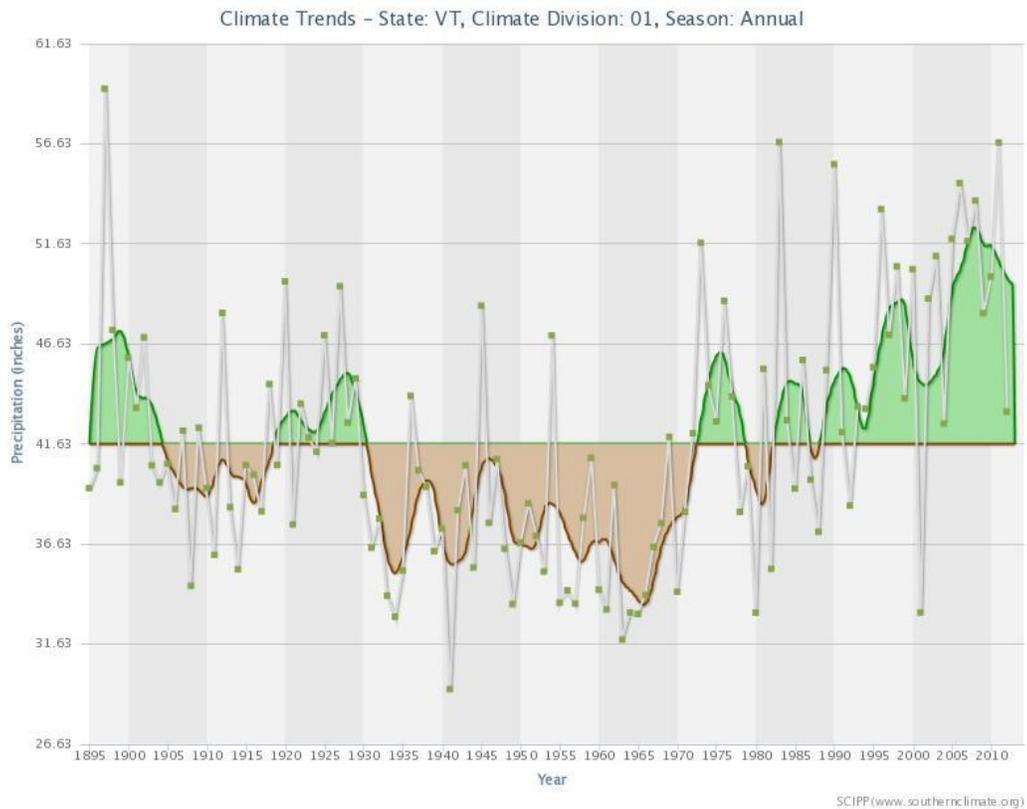


Figure 4-13
Western Vermont Climate Trends

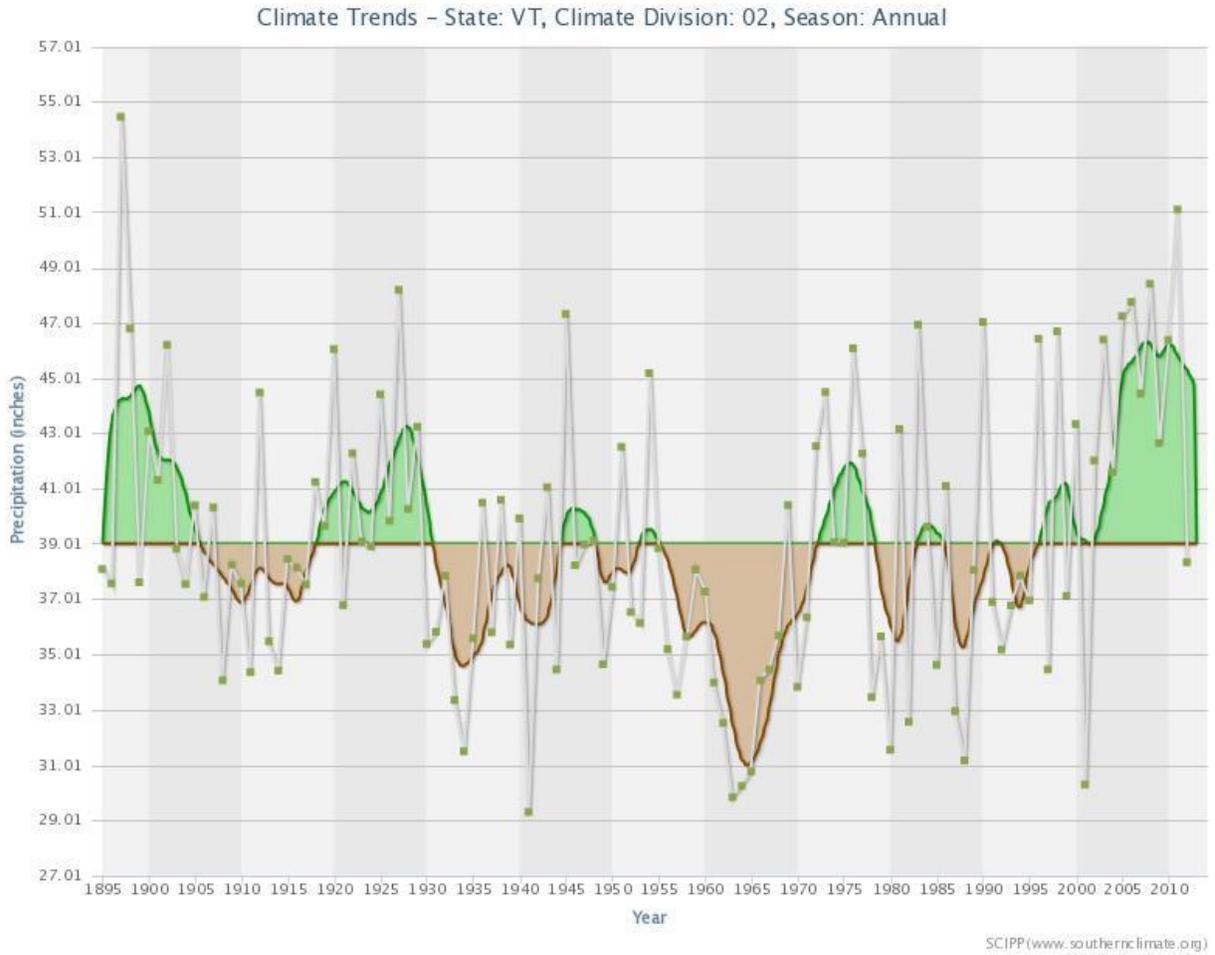
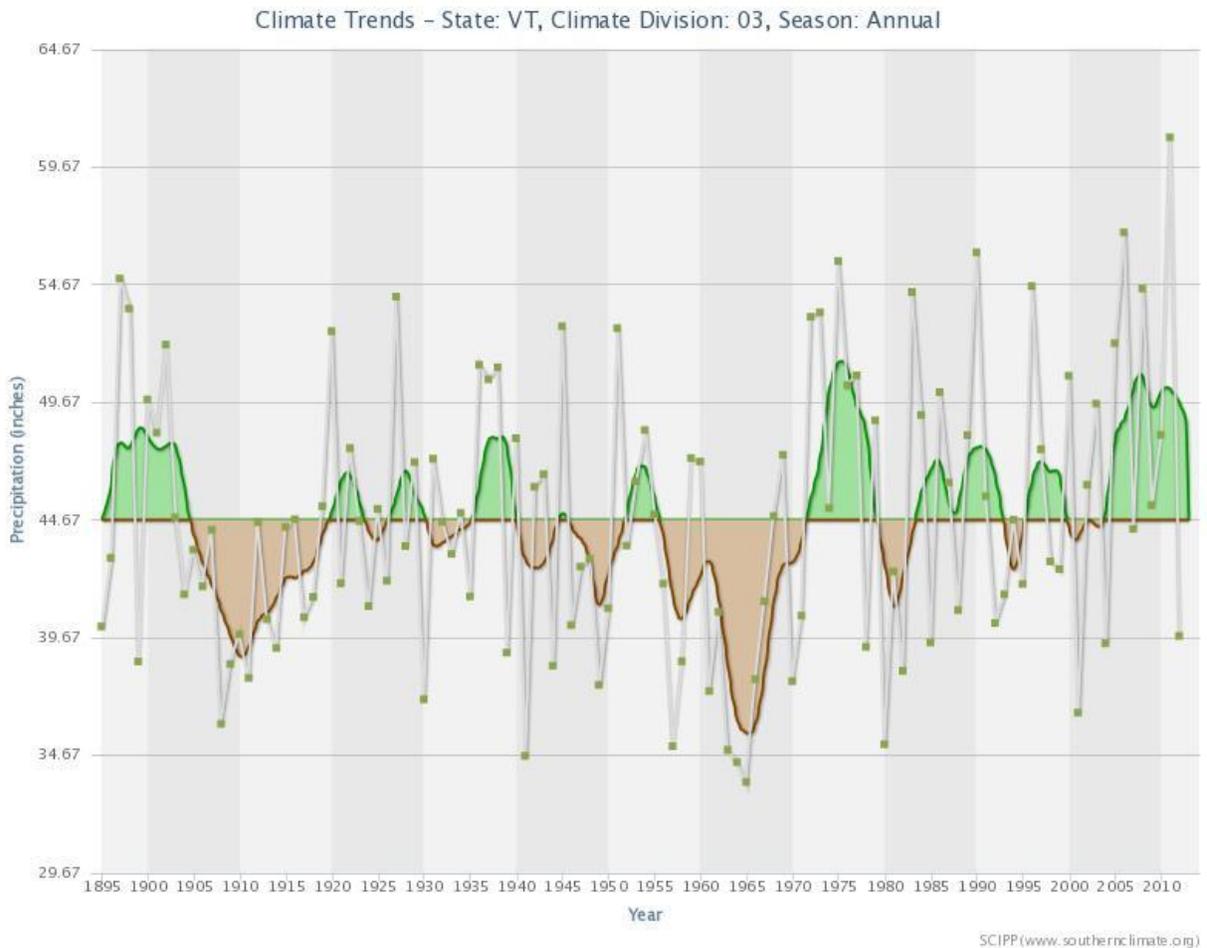


Figure 4-14
Southeastern Vermont Climate Trends



Dollar losses from droughts are not estimated to date, but certain losses could be investigated, such as the reduction in agricultural production during droughts, the cost to bring water to struggling farms, the construction of new community water supplies with better storage capability such as groundwater supplies that tap water in natural storage, the replacement of surface supplies and springs with drilled wells during the drought period, and drilled wells that have been deepened to capture additional yields when sustainable yield drops during the drought period.

Drought risk is not considered of such significant potential to endanger known state buildings, facilities, or governmental functions. Relative to other regions of the country, severe droughts are not frequent occurrences in Vermont.

The following table shows the droughts experienced in Vermont since the early 1900s

Table 4-20
Drought Events in Vermont¹²

Drought Period	Duration	Lowest PDSI
9/1964–1/1966	17 months	-5.11 in 6/1965
9/1964–10/1965	14 months	-5.47 in 5/1965
1/1965–8/1965	8 months	-4.44 in 5/1965
9/1941–2/1942	6 months	-3.40 in 9/1941
8/1934–12/1934	5 months	-3.83 in 11/1934
8/1934–12/1934	5 months	-3.73 in 11/1934
10/2001–1/2002	4 months	-4.64 in 12/2001
4/1966–7/1966	4 months	-3.35 in 4/1966
10/1949–12/1949	3 months	-3.40 in 11/1949
10/1963–12/1963	3 months	-3.66 in 12/1963
5/1980–7/1980	3 months	-3.60 in 6/1980
7/1995–9/1995	3 months	-3.40 in 9/1995
1/1989–2/1989	2 months	-3.24 in 2/1989
10/1957–11/1957	2 months	-3.20 in 10/1957
11/1908–12/1908	2 months	-3.83 in 12/1908
11/1908–12/1908	2 months	-3.33 in 12/1908
11/1953–12/1953	2 months	-3.32 in 11/1953
11/1953–12/1953	2 months	-3.71 in 11/1953
4/1935–5/1935	2 months	-3.19 in 5/1935
4/1957–5/1957	2 months	-3.34 in 4/1957
4/1985–5/1985	2 months	-3.10 in 5/1985
5/1941–6/1941	2 months	-3.11 in 5/1941
6/1964–7/1964	2 months	-3.44 in 7/1964
6/1964–7/1964	2 months	-3.15 in 7/1964

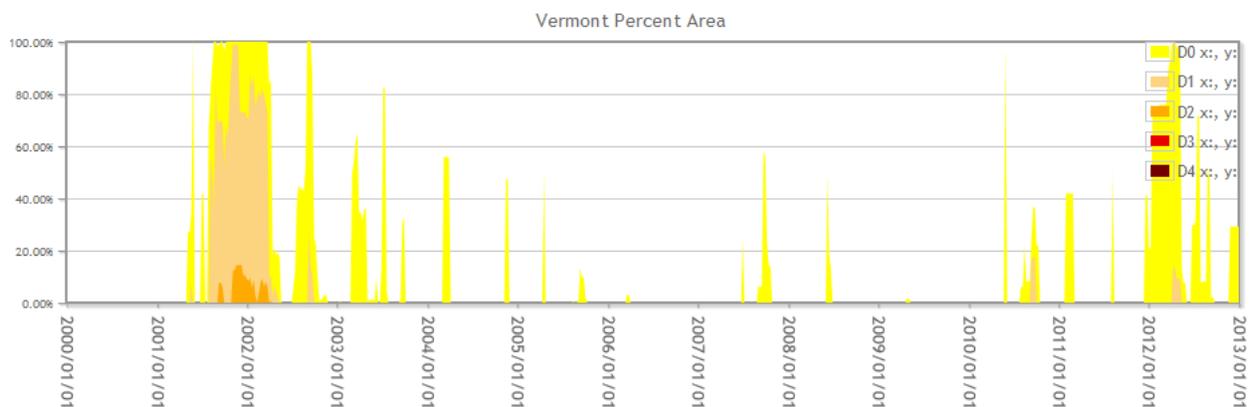
¹² http://www.nrcc.cornell.edu/drought/VT_drought_periods.html

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Drought Period	Duration	Lowest PDSI
7/1999–8/1999	2 months	-3.61 in 8/1999
8/1959–9/1959	2 months	-3.85 in 9/1959

To supplement the above information, this final graph shows the percentage of Vermont that was under different severities of drought from 4 January 2000 until 19 March 2013. As Figure 5 above indicates: DO is abnormally dry; D1 is moderate drought; D2 is severe drought; D3 is extreme drought; and D4 is exceptional drought.

Figure 4-15
Severity of Drought in Vermont since January 4, 2000



4.1.2.10 Wildfires

Hazard Definition

A wildfire is the uncontrolled burning of woodlands, brush, or grasslands. According to FEMA, there are four categories of wildfires that can occur throughout the United States:

- **Wildfires:** Fueled by natural vegetation; typically occur in national forests and parks, where federal agencies are responsible for fire management and suppression
- **Interface or Intermix Fires:** Urban wildfires in which vegetation and the built environment provide fuel
- **Firestorms:** Events of such an extreme intensity that effective suppression is virtually impossible; occur during extreme weather and generally burn until conditions change or the available fuel is exhausted
- **Prescribed Fires and Prescribed Natural Fires:** Fires that are intentionally set or selected natural fires that are allowed to burn for beneficial purposes

Wildfires can be a result of naturally occurring influences such as lightning, extreme drought and heat, and human influences such as a discarded cigarette butt, improperly extinguished campfire, or a stray spark from nearby railroad tracks. The potential for threat of wildfires is dependent upon topography and slope, surface fuel characteristics, recent climate conditions, current

meteorological conditions, and fire behavior. Once a wildfire threatens a community, it is often too late to protect nearby structures, and populations have to be evacuated for their own safety. These fires have damaged structures and utilities as well as hundreds of acres of woodlands.

Hazard Profile

Although wildfires are uncommon in Vermont, the state has acknowledged that extended periods of warming due to climate change have increased the occurrence of wildfire events. In the State of Vermont's 2010 Forest Resources Plan, different areas across the state were highlighted as priority areas at risk of wildfire damage. These are mainly rural and rural residential areas, which together account for 98.4 percent of Vermont's total land area. One particular zone that is at the most risk is the Forested Rural Residential Landscape Zone (FRRLZ). It has the highest risk of wildfire due to the density of structures in close proximity to forest cover.

The wildfire threat in Vermont is relatively rare. Wildfire conditions in Vermont are typically at their worst either in spring when dead grass and fallen leaves from the previous year are dry and new leaves and grass have not come out yet, or in late summer and early fall when that year's growth is dry. In drought conditions, this risk is obviously higher, and the risk of wildfire due to drought was severe enough to warrant a statewide ban on open burning in 1966. That was the last such statewide ban until one was issued in 1999 due to drought. However, due to a very dry April 2000, the state once again had to declare a temporary burning ban, and at the end of 2001, the State remained in a drought. There was a statewide ban on open burning that occurred in October 2005 and was rescinded in April 2005. Most recently, there was a threat of explosive fire growth potential in March 2012. This was due to low humidity, warm temperatures, and strong winds. In addition, dry grass was a wildfire threat during the spring of 2012 due to a mild winter leaving grass exposed through the winter months. In general, wildfire risk is considered statewide, excluding the built up urban areas of Burlington, South Burlington, Montpelier, Rutland, St. Albans, and Brattleboro.

The vulnerability to wildfires is constantly changing. Predictive models for fire potential are often generated each month or season. These models incorporate the state of fuels across various areas based on the latest precipitation and soil moisture anomalies, drought, and snow depth data. While giving an overall prediction for each season, models cannot incorporate the daily weather changes that affect fire risks. The Wildland Fire Assessment System is available on the Internet from the U.S. Forest Service at <http://www.wfas.net/>. This system provides national fire danger ratings that are updated daily. The maps take into account current and antecedent weather, fuel types, and both live and dead fuel moisture.

A number of RPC's have assisted local communities with preparing Community Wildfire Protection Plans (CWPP), which are aimed at lessening the impacts of interface wildfire. These CWPP's are authorized and defined in Title I of the Healthy Forests Restoration Act (HFRA, PL 108-148, 2003), which does not prescribe the exact form of a CWPP, but states that they should address local forest and range conditions, values-at-risk, and priorities for action. As of the writing of the 2013 update to this plan, CWPP's have been or will be done for Bridgewater, Plymouth, Hyde Park, Johnson, Stockbridge, Pittsfield, Newbury, Rochester, Glastenbury, Shaftsbury, Arlington, Sandgate, and Sunderland

There has not been a major wildfire in Vermont in the last 50 years. Vermont has a reliable system of local fire suppression infrastructure coordinated at the state-level. Vermont's climate,

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vegetation type, and landscape discourage major wildfire. There is no specific geographic area of the state particularly more vulnerable.

4.1.2.11 Landslides/Rockslides

Hazard Definition

The term "landslide" describes a wide variety of processes that result in the downward and outward movement of slope-forming materials including rock, soil, artificial fill, or a combination of these. The materials may move by falling, toppling, sliding, spreading, or flowing. For a general introduction to landslides, Highland and Bobrowsky (2008) provide a good introduction to classification, causes, and associated hazards. Turner and Schuster (1996) and Sidle and Ochiai (2006) provide comprehensive overviews of landslide analysis, including detailed summaries of landslide types, field investigation methods, and strength and stability analysis. The table below shows a classification of slope movement types with the common landslide types in Vermont emphasized.

Table 4-21
Simplified Classification of Slope Movement Types*

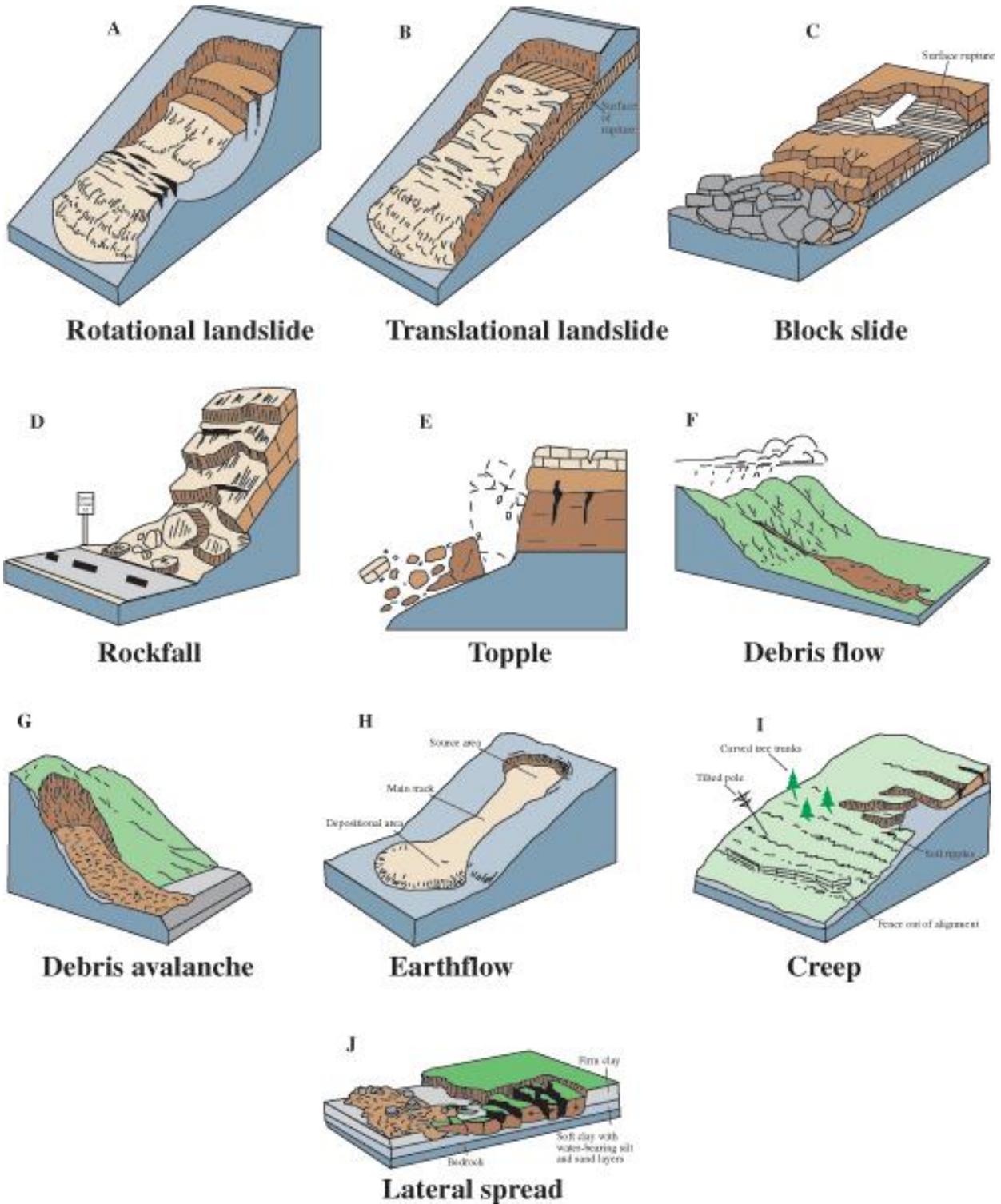
Type of Movement	Type of Material		
	Bedrock	Engineering Soils	
		Predominantly Coarse	Predominantly Fine
Falls	Rock fall	Debris fall	Earth fall
Topples	Rock topple	Debris topple	Earth topple
Slides*	Rock slide	Debris slide	Earth slide or slump
Spreads	Rock spread	Debris spread	Earth spread
Flows		Debris flow	Earth flow
Complex	Combinations of two or more types of movement		
Creep	Several types		

* Modified from Varnes (1978). Types common in Vermont are in bold.

*Slides may be subdivided into rotational and translational types. Rotational slides in relatively homogeneous materials are commonly called “slumps”. The term “rotational slump”, although somewhat redundant, will be used here to emphasize the distinction from translational slides.

The figure below shows the most common types of rock, soil, and debris failure.

Figure 4-16
Rock, Soil, and Debris Failure Types



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Landslides with this overall form are common on clayey to sandy lacustrine deposits throughout Vermont. In many cases, the displaced material has been at least partially eroded away by stream flow. From Cruden and Varnes (1996, Figure 3-3).

Although landslides are primarily associated with mountainous regions, they can also occur in areas of generally low relief. In low relief areas, landslides occur as cut-and-fill failures (roadway and building excavations), river bluff failures, lateral spreading landslides, collapse of mine-waste piles (especially coal), and a wide variety of slope failures associated with quarries and open-pit mines.

A protocol for identifying potentially unstable slopes has been developed and tested at six site areas in Chittenden County. The analysis on the tested site areas utilized ESRI's ArcGIS Standard with the Spatial Analyst extension. While other Geographic Information Systems (GIS) software could be used, the protocol outlined below assumes the analysis uses ESRI ArcGIS software. The protocol is divided into five phases, which is described below:

Phase 1 – This phase involves selection of the site area of interest, creation of the project in ArcGIS, initial data collection, creation of a landslide database for the site area, photo interpretation, field reconnaissance, and resolution of the landslide polygons.

Phase 2 – This phase involves conducting terrain analysis on the best DEM available for the site area to produce layers, which will be used for frequency analysis later in the process. Our trials indicate that an accurate bare-Earth LIDAR DEM is probably an essential prerequisite for successful terrain analysis using the frequency ratio method. That does not mean that hazard mapping cannot be undertaken without LIDAR terrain data. In many parts of Vermont, no LIDAR data is currently available. In these areas, the best available DEM may be the USGS 10 m DEM. In such areas, the procedures outlined in this phase can be attempted, and if field review indicates that it is inadequate, then the areas of high hazard potential will need to be identified by careful stereoscopic photointerpretation and field work. However, the work will proceed far more efficiently if an accurate bare-Earth LIDAR DEM is available.

Phase 3 – Frequency ratio analysis will be conducted during this phase. Frequency ratio is basically a comparison of the landslide pixels in the site area to the total number of pixels in the site area for each parameter. The following steps will explain how to calculate and understand frequency ratio.

Phase 4 – Calibration of the maps and construction of the hazard potential maps.

Phase 5 – Preparation of maps showing potentially unstable areas. Final maps will show the moderate/high hazard zones and the areas designated as sensitive to landslide effects. The scale of presentation is optional, but this protocol is intended to produce maps that can be used for planning purposes at scales of about 1:10,000 or smaller (that is, less detailed). Additional buffering of the sensitive areas may be undertaken based on planning considerations.

Hazard Profile

Vermont actually has a relatively high incidence of landslides, though this type of disaster rarely occurs. Landslides usually result from human-caused or natural changes to groundwater flow that cause pore pressure changes in bank materials or removal of vegetation and human-caused or natural undercutting of steep banks.

Landslides can be triggered by one or a combination of factors, including fluvial erosion, soil saturation, natural geologic weathering processes such as the freezing and thawing of soils, human modification of the bank, increases in loading on top of the slope, surface or near surface drainage patterns, and loss of vegetation. Fluvial erosion, causing bed and bank erosion or associated with water flowing along the toe of the slope, removes bank material to over-steepen and potentially under-cut the slope.

Fluvial erosion is considered the most important contributing factor to landslides. In the past, unless the area is identified as hazardous through a fluvial geomorphic assessment and a river corridor plan, these landslide vulnerable areas have not been identified as hazardous because these areas are located well above the elevation that would be designated as hazardous under FEMA flood hazard area maps. The landslide mapping protocol is intended to address this shortcoming.



Minimal data exists on damages associated with landslides. The Jeffersonville slide on the Brewster River in April 1999 cost nearly \$300,000 in channel and floodplain restoration and buyout of one residence.

In April of 2004, a soil slope failure occurred in Hardwick, resulting in the Vermont Agency of Transportation doing significant construction and engineering, the buyout of one residence, and ongoing maintenance, totaling \$1.4 million in

costs. Additionally, in December of 2005, a significant rockslide occurred in the City of Montpelier, affecting Elm and Cliff Streets. The Governor issued an emergency proclamation and FHWA approved a \$2,000,000 project to stabilize the remaining slope and to make repairs to damaged utilities and roadways under the FHWA Emergency Relief (ER) program.

Significant landslides were observed in Smugglers Notch in the summer of 2006 and in subsequent years. In 2009, a detailed assessment of slope stability issues in Smugglers Notch was completed (Springston, *Smugglers Notch Slope Instability Report*, June 2009). This report highlighted that rock falls, rock slides, and debris flows have occurred in Smugglers Notch for thousands of years, and can be expected to continue into the future. In fact, road damage information from VTrans included in this report shows that landslides are nearly annual events. Rock falls in this area can involve large individual blocks, the largest block to fall on record was the 11,500 ton piece that fell off the west face north of Easy Gully in July 1983. Debris flows are the other main type of landslide that occurs in the Notch, and can be expected to range from a few cubic meters of mud, pebbles, cobbles, and boulders, up to many thousands of cubic meters. The largest recorded debris flow occurred on the east side in May 1986 and was about 327,000 cubic yards of material. This blocked Vt. Route 108 and the West Branch at the site of the pull-off near the Cambridge-Stowe line. Future debris flows can also be expected to sweep down to and across Vt. Rt. 108. Even though the largest debris flow occurred

Completed slope stabilization project in Hardwick
Source: Vermont Department of Transportation



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on the east side of the Notch, activity appears to be more frequent on the west side. According to recorded landslide history in the Notch, all slides occurred between May and December, with the peak being in July.

Extensive landslide activity occurred as a result of the heavy rains of 2011. In central Vermont, landslides occurred due to high water conditions resulting from the melting of the thick snowpack and the heavy spring rains as well as from flash flood event in late May. Widespread landsliding occurred throughout much of central and southern Vermont as a result of Tropical Storm Irene. Assessments are still underway, but it appears that many of these landslides occurred on the sites of earlier slides that were reactivated by the heavy rains and powerful floodwaters.

As a result of the landslides associated with Tropical Storm Irene, the May 2011 period of heavy precipitation, and previous landslide occurrences, the following properties were subject to continued risk warranting purchase through the Hazard Mitigation Grant Program. While fluvial erosion and stream toe erosion of steep slopes are major contributing factors to landslides in Vermont, the *Protocol for Identification of Areas Sensitive to Landslide Hazards in Vermont* (discussed below) indicates that landslide mechanisms are at work in banks higher than 3 meters. Thus, homes destroyed by fluvial erosion would fall into the “Landslide” category only if they sat on a bank higher than 3 meters. The landslide properties listed below have been selected based on the following criteria:

- 1) They were awarded an HMGP grant using FEMA’s Landslide Methodology and/or
- 2) The damaged house sat on a bank higher than 3 meters.

Table 4-22
Purchased “Cliff Hanger” Properties

Name/Town	Town	County	Date of Occurrence	Cost of Buyout
40 School Street	Readsboro	Bennington	8/28/2011	\$ 142,212
42 School Street	Readsboro	Bennington	8/28/2011	\$155,668
62 School Street	Readsboro	Bennington	8/28/2011	\$191,998
3013 Danby-Pawlet Road	Danby	Rutland		\$76,859
15 Hilltop Avenue	Barre City	Washington	5/29/2011	\$227,976
21 Hilltop Avenue	Barre City	Washington	5/29/2011	\$152,732
86 Waterman Hill Road	Hartford	Windsor		\$238,219.5
104 Waterman Hill Road	Hartford	Windsor		\$235,778.5
36 Town Garage Road	Westminster	Windham	8/28/2011	\$58,090 (Pending Approval)

In 2007, VTrans completed a study that identified rock cut exposures along State, Interstate, and U.S. highways, evaluating them for rockfall potential and identifying appropriate mitigative measures for potentially dangerous slopes (Eliassen and Springston, *Rockfall Hazard Rating of*

Rock Cuts on U.S. and State Highways in Vermont, 2007). This is discussed in more detail Section 5.2.4: Rock Cuts, because it focuses mainly on rockfalls from human-caused rock cuts. However, the report notes that four of the locations with the highest potential for hazardous rockfalls are natural rock outcrops that were not cut for roadways. Because of natural resource issues and budgetary considerations, (potential remediation at these locations is expected to be in the order of \$10s of million dollars in cost each), additional investigation would be necessary to allow mitigation planning.

In 2009, a PDM-C grant award allowed the Vermont Geological Survey to further study landslide-prone areas and develop a useful protocol to assess future risks. The document entitled *Protocol for Identification of Areas Sensitive to Landslide Hazards in Vermont* can be viewed at <http://www.anr.state.vt.us/dec/geo/hazinx.htm>. The report notes that accurate LIDAR data provides the best starting point for landslide analysis in Vermont; therefore, VGS selected seven site areas to attempt to represent conditions in various parts of the state. Since LIDAR coverage is limited in the state, six of these study sites were in Chittenden County and one in Lamoille County. The protocol was found to work best for translational landslides. The report states that, “the most important parameters for identifying translational landslides are slope angle and roughness, although soil type and topographic wetness index are also important at some site areas.” The report concludes that, in most parts of Vermont, areas of 25 to 50 sq. km. will probably yield enough landslides for a robust analysis. Alternatively, if the site of interest is smaller, the best results occurred when the following criteria were met.

- There is a minimum of one landslide per square kilometer in the site area.
- The average size of the landslides is at least 400 square meters.
- At least 30 percent of the landslides are greater than 400 square meters.

The table below lists significant landslides that have impacted the State of Vermont outside of Tropical Storm Irene.

**Table 4-23
Significant Landslides in Vermont**

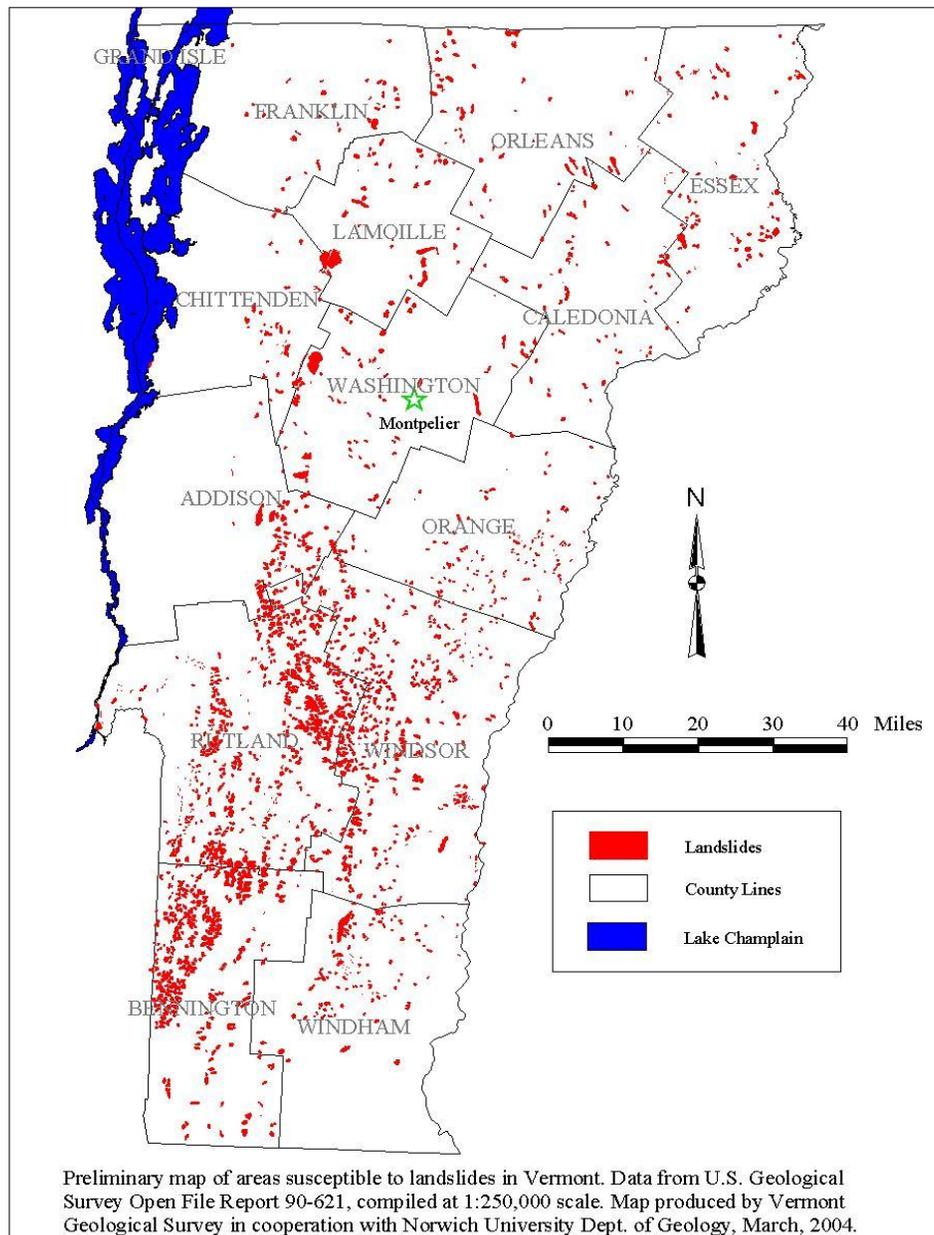
Property Damage (Adjusted for inflation)	Crop Damage (Adjusted for inflation)	Begin Date	End Date	Location	Fatalities	Remarks
\$1,433,424.88	-	04/18/2004	4/18/2004	Hardwick	0	0
\$2,000,000.00	-	12/26/2005	12/26/2005	Montpelier	0	0
\$360,000.00	\$-	Spring, 2002	Spring, 2002	Lake Willoughby		
\$300,000.00	-	4/1999	7/4/1999	Jeffersonville	0	0
\$104,000.00	\$-	5/23/1986	5/23/1986	Lamoille	0	0
\$91,228.07	\$-	5/11/1989	5/11/1989	Bennington	0	0
\$11,304.35	\$-	5/2/1983	5/2/1983	Rutland	0	0

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In addition to the above information, over the past five years (State FY 2008-2012) VTrans has spent approximately \$5.76 million on soil slope mitigation projects. Some of the projects have resulted from soil slope failures, causing emergency repair to be required. VTrans is currently beginning a soil slope mitigation project on RT 102 in Maidstone, VT that is due to bank erosion and is estimated to cost \$840,000, however this price may go up.

At the end of this document, please look for Appendix C: *Protocol for Identification of Areas Sensitive to Landslide Hazards in Vermont*. To find the full report and protocol, go to: <http://www.anr.state.vt.us/dec/geo/hazinx.htm>.

Figure 4-17
Areas Susceptible to Landslides in Vermont



4.1.2.12 Earthquakes

Hazard Definition

According to the USGS, an earthquake occurs when two blocks of the Earth suddenly slip past one another. The surface where they slip is called the fault or fault plane. The location below the Earth's surface where the earthquake starts is called the hypocenter, and the location directly above it on the surface of the Earth is called the epicenter.

Earthquakes in the northeastern United States generally have deep foci (> 10 km) and are considered to be intraplate. The deep faults along which these earthquakes occur are not expressed on the ground surface. Although there are numerous faults exposed at the ground surface in the northeastern United States, there is no evidence for significant motion along these faults (e.g., Jacob, 1991; Ebel and Kafka, 1991).

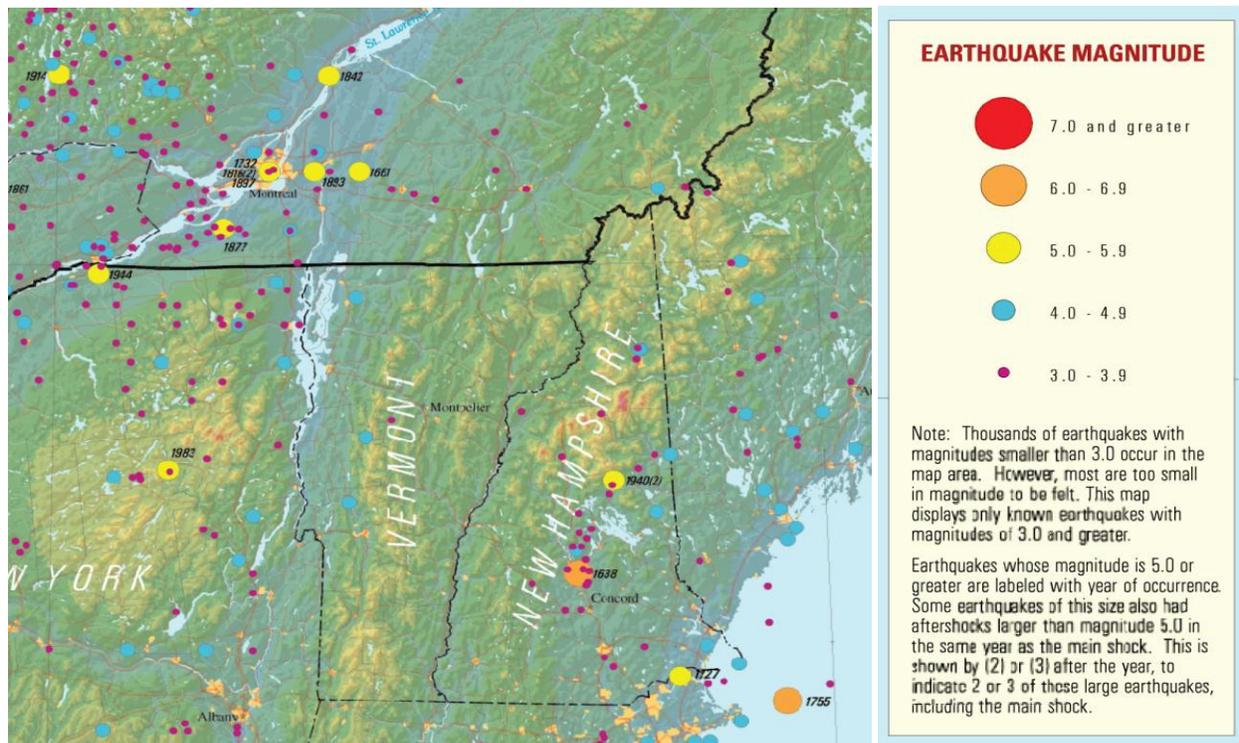
Hazard Profile

Vermont is classified as an area with low to moderate seismic activity. Sixty-three known or possible earthquakes have been centered in Vermont since 1843 (Ebel, et. al. 1995). The two strongest recorded earthquakes measured in Vermont were of a magnitude 4.1 on the Richter scale. One was centered in Swanton and occurred on July 6, 1943, and the second occurred in 1962 at Middlebury. The 1962 earthquake was felt throughout New England and resulted in broken windows and cracked plaster, while the Swanton earthquake caused little damage. It is likely that small earthquakes will continue to occur in the coming years.

In addition, earthquakes centered outside the state have been felt in Vermont. Twin earthquakes of 5.5 occurred in New Hampshire in 1940. In 1988, an earthquake with a magnitude 6.2 on the Richter scale took place in Saguenay, Quebec and caused shaking in the northern two-thirds of Vermont (Ebel, et. al. 1995). On April 20, 2002, a 5.1 magnitude event in Plattsburgh caused shaking in Vermont with damage near the epicenter in New York. In the last three years, the following events were felt widely or in parts of Vermont: 10/16/12 Hollis Center/Waterboro, Maine, magnitude 4.0; 10/10/12 ENE of Montreal, Quebec, magnitude 3.9; 10/22/2011 Mineral Springs, Virginia, magnitude 5.8; and 6/23/2010 NNE of Ottawa, Ontario, magnitude 4.9.

A computer earthquake damage simulation (HAZUS program) conducted by the Vermont State Geologist's Office suggests that there is little earthquake risk in Vermont at 100-year and 250-year recurrence intervals; however, there is a potential risk at the 500-year recurrence level. A Report on The Seismic Vulnerability of the State of Vermont (Ebel, et al., 1995) postulated six 500-year "strong" earthquake epicenters in the Northeast that could be expected to cause damage in Vermont are located at Middlebury (5.7 magnitude), Swanton (5.7 magnitude), Montreal, Quebec (6.8 magnitude), Goodnow, New York (6.6 magnitude), and Tamsworth, New Hampshire (6.2 magnitude), and Charlevoix, Quebec, Canada (6.6 magnitude). Using these epicenters and magnitudes, further HAZUS runs confirmed that five of these earthquakes (minus Charlevoix) could cause ground shaking in certain parts of Vermont sufficient to result in millions of dollars in damage. (See HAZUS-MH damage projections in Appendix I: HAZUS-MH Documentation.

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As previously summarized, 5 of these 6 possible 500-year earthquakes have moment magnitudes and epicenters close enough to Vermont to cause significant damage, these five earthquakes have predicted peak ground accelerations greater than 0.1 g and would cause widespread damage resulting in tens to hundreds of millions of dollars in structural and economic losses and undetermined casualties. The Swanton and Middlebury earthquakes were estimated to have PGAs of 0.4 g and total losses exceeding \$300 million dollars each (HAZUS-MH projections). In addition to the 5 postulated 500-year earthquakes that would affect Vermont, the recent occurrence of a 5.1 magnitude earthquake near Plattsburgh (Ausable Forks), New York, indicates that this epicenter also be considered.

Middlebury Scenario:

- **Building Damage:** HAZUS-MH estimates that over 3,600 buildings will receive at least moderate damage. Of these, 38 buildings will be completely destroyed. This is over 2 percent of the total number of buildings in the State. For essential facilities, HAZUS-MH also estimates that on the day of the earthquake, 98 percent of hospital beds will be available and by 30 days, 100 percent will be operational. One school will receive moderate damage. It is predicted that over 262 families will be displaced from their homes and 62 will need temporary shelter.
- **Transportation and Utility Systems:** HAZUS-MH estimates minimal disruption of the transportation and utility systems. However, over 2,000 households are expected to be without electrical power for up to 3 days.
- **Casualties:** The model predicts 69 casualties requiring medical attention, 12 needing hospitalization, and 2 killed by the earthquake.

- **Economic Loss:** Direct building losses are estimated at greater than \$308 million; 10 percent of these losses are due to business interruption. HAZUS-MH estimates that damage to transportation systems will be \$34 million. Approximately \$0.21 million would be needed to repair damaged communication systems.
- **Government Buildings:** 14 structures are predicted to receive slight damage, 6 will receive moderate damage, and 1 will be extensive.

Montreal Scenario:

- **Building Damage:** HAZUS-MH estimates that over 3,400 buildings will receive at least moderate damage. This is over 2 percent of the total buildings in the state. Of these, 23 buildings will be completely destroyed. For essential facilities, HAZUS-MH also estimates that on the day of the earthquake, 95 percent of hospital beds will be available and by 30 days, 100 percent will be operational. It is predicted that over 229 families will be displaced from their homes and 56 will need temporary shelter.
- **Transportation and Utility Systems:** HAZUS-MH estimates no disruption of the transportation and utility systems and no households are expected to be without electrical power.
- **Casualties:** The model predicts up to 70 casualties requiring medical attention, 12 needing hospitalization, and 2 killed by the earthquake.
- **Economic Loss:** Direct building losses are estimated at greater than \$198 million; 17 percent of these losses are due to business interruption. HAZUS-MH estimates that damage to transportation systems will be \$18 million. Approximately \$0.03 million would be needed to repair damaged communication systems.
- **Government Buildings:** 15 structures are predicted to receive slight damage, 7 moderate damage, and 1 extensive.

4.1.2.13 Infectious Disease Outbreak

Hazard Definition

Infectious diseases are caused by organisms, typically bacteria, protozoan, fungi, or viruses that enter the body and grow there. Many of these diseases require continuous monitoring, as they present seasonal threats to the general population. An epidemic emerges when an infectious disease occurs suddenly in numbers that are in excess of normal expectancy. Infectious disease outbreaks put a strain on the healthcare system, may cause continuity issues for local businesses, and can affect the economy when worker absences decrease overall production. These outbreak incidents are a danger to emergency responders, healthcare providers, schools, and the public. This can include influenza (e.g., H1N1), pertussis, West Nile virus, and many other diseases.

Hazard Profile

The great influenza epidemic of 1918 killed millions worldwide and would likely cause hundreds to thousands of deaths in Vermont should a similar outbreak occur. In fact, it is anticipated that a more serious strain of the usual flu will occur some year and that vaccines might not be ready in time. H1N1 influenza was not a serious threat in Vermont in 2009, although a very small number of people were affected.

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Other diseases such as HIV/AIDS, SARS, cholera, malaria, and resistant tuberculosis are already major disasters in some parts of the world, but are not prevalent here. An incident that caused water supplies to become contaminated or resulted in people eating spoiled food could also have health implications. Rabid animals could be a local threat. The potential for large-scale infection of Vermont's commercial animal population with foot and mouth disease, so-called mad cow disease, or any number of poultry viruses, while unlikely, could cause widespread economic problems. A health threat might also result from a bio-terrorist act covered above.

There is speculation about possible connections between climate change and a number of emerging infectious diseases (e.g., eastern equine encephalitis, anaplasmosis, and babesiosis) and disease vectors. This would be of concern due to changes in vector and zoonotic biology. However, the occurrence of these diseases or the presence of their vectors in Vermont has not been conclusively linked to climate change. Worth noting, the number of confirmed Lyme Disease Cases in Vermont has increased from 3 in 2001 to 393 in 2011.

DEMHS is currently preparing for the avian and pandemic flu as potential threats to the Vermont population in the coming years. In July 2006, a two-week exercise was conducted to prepare DEMHS for this hazard. Additional avian flu preparation efforts are ongoing in 2010 with support and participation of the Department of Health, DEMHS, and other state agencies. DEMHS also has a detailed response protocol to deal with H1N1 outbreaks.

Figure 4-18 below shows the status of reportable diseases for the State of Vermont in 2012.

Figure 4-18
Reportable Diseases for Vermont in 2012

	Campylobacter	Cryptosporidium §	E. coli*	Giardia	Group A Strep Inv	Hepatitis A**	Hepatitis B - Acute	Hepatitis B - Chronic	Hepatitis C - Acute	Hepatitis C - Chronic	Legionellosis	Listeriosis**	Lyme §	Meningococcal Inf.**	Pertussis	Salmonella	Shigella	Tuberculosis**	Varicella §	
Age																				
<5	17	15	5	15	1	0	0	0	0	0	0	0	12	2	101	9	0	0	47	
5-14	12	24	5	26	0	0	0	1	0	0	0	0	67	0	397	8	0	0	77	
15-24	28	14	2	29	2	2	0	1	4	85	0	0	39	0	79	7	1	1	12	
25-39	41	17	2	29	1	0	1	11	2	240	0	0	57	0	29	11	1	0	4	
40-64	43	8	3	57	8	0	1	15	0	325	8	1	238	0	36	34	3	3	4	
65+	28	7	1	26	6	0	0	0	0	22	4	0	99	0	3	19	0	0	1	
Unknown	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total (YTD)	169	85	18	183	18	2	2	28	6	672	12	1	512	2	645	88	5	4	145	
5-yr Median (YTD)	169	70	22	206	19	2	2	†	2	†	9	1	398	2	18	85	5	5	130	
County of Residence																				
Addison	13	25	0	15	0		1	2	2	29	0		29		114	7	1		3	
Bennington	6	2	1	4	3		0	0	0	21	0		124		27	7	0		6	
Caledonia	9	5	2	3	0		0	0	1	36	0		5		56	2	0		6	
Chittenden	33	7	2	70	7		1	19	0	235	2		65		118	21	2		27	
Essex	1	0	0	1	0		0	0	0	11	0		0		5	0	0		0	
Franklin	17	0	3	8	0		0	0	1	44	3		13		27	5	1		9	
Grand Isle	0	2	0	1	0		0	0	0	2	0		5		9	0	0		1	
Lamoille	5	3	1	9	0		0	0	0	16	0		3		45	8	0		4	
Orange	5	8	0	9	0		0	0	0	35	0		19		12	0	0		4	
Orleans	9	3	1	7	0		0	0	0	27	0		2		24	4	0		10	
Rutland	21	9	2	8	2		0	2	0	48	1		96		131	12	0		16	
Washington	17	14	5	22	3		0	0	2	35	1		12		41	6	1		13	
Windham	20	2	0	12	1		0	3	0	64	1		69		7	9	0		39	
Windsor	13	5	1	14	2		0	2	0	69	4		70		29	7	0		7	
Unknown	0	0	0	0	0		0	0	0	0	0		0		0	0	0		0	
Total (YTD)	169	85	18	183	18	2	2	28	6	672	12	1	512	2	645	88	5	4	145	
(802)863-7240	1(800)640-4374 (VT)										FAX: (802)865-7701									

*Shiga toxin-producing Escherichia coli (STEC)

**This column partially obscured to protect patient confidentiality

§ Includes both confirmed & probable cases

†Data captured differently in previous years; no 5-year median available

4.2 Technological Hazards

Technological hazards are distinct from natural hazards primarily in that they originate from human activity. In contrast, while the risks presented by natural hazards may be increased or decreased as a result of human activity, they are not inherently human-caused. The term “technological hazards” refers to the origins of incidents that can arise from human activities, such as the manufacturing, transportation, storage, and use of hazardous materials.

4.2.1 Dam Failure

Hazard Definition

A dam failure may occur for multiple reasons, such as an overtopping caused by floods that exceed the capacity of the dam, deliberate acts of sabotage, structural failure, movement of the foundation supporting the dam, soil erosion in embankment dams, and inadequate maintenance and upkeep.

DEMHS classifies dams according to a dam’s potential for causing loss of life and property damage in the area downstream of the dam if it were to fail. The following Downstream Hazard Classification system is used by the Department. It is same as the U.S. Army Corps of Engineers system given in Recommended Guidelines for Safety Inspection of Dams (ER 1110-2-106, 25 Sept. 79, 24 Mar 80 Chg 1).

**Table 4-24
Downstream Hazard Classification of Dams**

Class	Hazard Category	Potential Loss of Life	Potential Economic Loss
3	Low	None expected (No permanent structures for human habitation)	Minimal (Undeveloped to occasional structure or agriculture)
2	Significant	Few (No urban developments and no more than a small number of inhabitable structures)	Appreciable (Notable agriculture, industry, or structures)
1	High	More than few	Excessive (Extensive community, industry, agriculture)

Hazard Profile

DEMHS is coordinating efforts with towns to complete incident action plans (IAP) for all high hazard dams. This process is still being developed and further progress is expected in the 2010-2013 timeframe. In 2007, a newly hired DEMHS planner was tasked with assisting towns in developing IAPs for high hazard dams throughout the state. Due to technical, staff, and resource limitations, the state has not yet fully developed a working model, which would accurately predict dam failure in high hazard areas. This may change in the future if state agencies and the Governor’s Office place this in a higher level of prioritization.

The ANR Dam Safety Program maintains an inventory of 1240 dams (including 90 ANR-owned dams) with 540 having impoundments greater than 500,000 cubic feet. These dams are inspected on a rotating basis and have a hazard rating assigned. There are 61 high hazard dams on the dam inventory; 40 of these are under the jurisdiction of the ANR Dam Safety Program. None of the high hazard dams under the jurisdiction of the ANR Dam Safety Program are considered to be in

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imminent danger of failure; however, Star Lake Dam in Mt. Holly has been identified as needing major repair or replacement and the town has started the planning for this. A compilation of all the high hazard dams, significant hazard dams, their locations, and a few other parameters are included in the table below.

Table 4-25
Dams in Vermont

Dam Name	State/ FERC ID #	Hydro?	Location	Owner	Hazard Level	Inundation Map Exists	EAP Exists	EAP Last Update
Class 1 Dams (High Hazard)								
Ball Mountain Dam	850	N	Jamaica	USACE	H	☐	Y	1994
Chestnut Hill Reservoir	27.08	N	Brattleboro	Town of Brattleboro	H		N	
Chittenden Reservoir	49.01	Y	Chittenden	CVPS	H	☐	Y	2007
Clark Falls	128.01/2205	Y		CVPS	H	☐	Y	2009
Comerford	12.13/ 2077	Y	Barnet	TransCanada	H	☐	Y	2007
East Barre	14.02	N	Barre Town	State of Vermont - DEC	H	Y	Y	2012
East Long Pond	252.02	Y	Woodbury	Hardwick Electric Department	H	Y	Y	1993
Elizabeth Mine TP-1	200.10		Strafford	Ted Zagaeski	H		N	
Green River Dam	101.01/ 2629	Y	Hyde Park	Village of Morrisville	H	☐	Y	2006
Harriman	243.01/ 2323	Y	Whitingham	TransCanada	H	☐	Y	2007
Indian Brook Dam	69.01	Y	Essex	Town of Essex	H	Y	Y	2011
Institute Pond	119.01	N	Lyndon	Lyndon Institute	H	Y	Y	2011
Jacksonville Pond	243.06	N	Whitingham	Town of Whitingham	H	Y	Y	2011
Jewell Brook Site No. 1	117.07	N	Ludlow	Town of Ludlow	H	Y	Y	2009
Jewell Brook Site No. 2	117.06	N	Ludlow	Town of Ludlow	H	Y	Y	2009
Jewell Brook Site No. 3	117.04	N	Ludlow	Town of Ludlow	H	Y	Y	2009

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Dam Name	State/ FERC ID #	Hydro?	Location	Owner	Hazard Level	Inundation Map Exists	EAP Exists	EAP Last Update
Jewell Brook Site No. 5	117.05	N	Ludlow	Town of Ludlow	H	Y	Y	2009
Johnson State Lower	108.06	N	Johnson	State of Vermont - JSC	H	Y	Y	2013
Keyser	47.02	N	Chelsea	F. Ray Keyser, Jr.	H		N	
Lake Clara	243.02	N	Whitingham	Mary E. Proctor	H		N	
Lake Mansfield	199.01	N	Stowe	Lake Mansfield Trout Club	H		N	
Lake Paran	17.01	N	Bennington	State of Vermont - AOT	H	Y	Y	2011
Lake Sadawga	243.03	N	Whitingham	State of Vermont - DFW	H	Y	Y	2010
Lake Sadawga West Dike	243.11	N	Whitingham	State of Vermont - DFW	H	Y	Y	2010
Mackville Pond	93.02	Y	Hardwick	Hardwick Electric Department	H	Y	Y	1993
Mahoney Pond	249.06	N	Winhall	Stratton Corporation	H			
Marshfield No. 6	39.02	Y	Cabot	Green Mountain Power Corp	H		Y	1994
Middlesex No. 2	126.02	Y		Green Mountain Power Corp	H		Y	
Moore Dam	2077	Y	Littleton, NH	TransCanada	H		Y	2007
Murphy Dam	NH 194.12	N	Pittsburg, NH	State of New Hampshire	H		Y	2003
Newport No. 1	59.01/ 2306	Y	Newport	Great Bay Hydro Corp.	H		Y	2008
Nichols Pond	252.01	Y	Woodbury	Hardwick Electric Department	H	Y	Y	1993
North Hartland Dam	95.01/ 2816	Y	Hartland	USACE	H		Y	1999
North Springfield Dam	12870	N	N. Springfield	USACE	H		Y	1994
Okemo Snow Pond	117.13	N	Ludlow	Okemo Mountain Inc	H		Y	2006

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Dam Name	State/ FERC ID #	Hydro?	Location	Owner	Hazard Level	Inundation Map Exists	EAP Exists	EAP Last Update
Peterson	128.02/ 2205	Y	Milton	CVPS	H	☐	Y	2009
Pleasant Valley Reservoir	27.01	N	Brattleboro	Town of Brattleboro	H	Y	Y	2011
Rutland City Reservoir	174.04	N	Rutland Town	City of Rutland	H	☐	N	
Sherman	2323.00	N	Monroe	TransCanada	H	☐	Y	2007
Silver Lake	11.01	Y	Barnard	State of Vermont - DEC	H	Y	Y	2009
Snow Lake	61.01	N	Dover	Mt. Snow Ltd	H		Y	2008
Somerset	191.01/ 2323	Y	Somerset	TransCanada	H	☐	Y	2007
St. Albans North Reservoir	70.01	N	Fairfax	City of St. Albans	H			
St Albans South Reservoir	70.02	N	Fairfax	City of St. Albans	H	Y	Y	2011
Star Lake	135.02	N	Mount Holly	Town of Mount Holly	H	Y	Y	2012
Stiles Pond	227.01	N	Waterford	Town of St. Johnsbury	H		N	
Stowe Upper Golf Course	199.16	N	Stowe	Mt. Mansfield Co., Inc.	H		Y	2006
Sugar Hill	82.01/ 11478	Y	Goshen	CVPS	H			
Sugarbush Tank	223.05	N	Warren	Summit Ventures N.E. LLC	H		Y	2007
Thurman W. Dix Reservoir	147.01	N	Orange	City of Barre	H	Y	Y	2009
Townshend Dam	18410	Y	Townshend	USACE	H	☐	Y	1994
Union Village Dam	18830	Y		USACE	H	☐	Y	1994
Wantastiquet Lake	237.01	N	Weston	Wantastiquet Trout Club	H	☐	Y	2002
Warren (Blueberry) Lake	223.02	N	Warren	Town of Warren	H	Y	Y	2005

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Dam Name	State/ FERC ID #	Hydro?	Location	Owner	Hazard Level	Inundation Map Exists	EAP Exists	EAP Last Update
West Charleston	45.01/ 2306	Y	West Charleston		H	☐	Y	2008
Wilder Dam	1892.00	Y	Hartford	TransCanada	H	☐	Y	2007
Windsor Upper	248.02	N	Windsor	Town of Windsor	H	Y	N	2010
Wolcott	251.04	Y	Wolcott	Hardwick Electric Department	H		Y	1993
Woodward Reservoir	156.01	N	Plymouth	Farm and Wilderness Foundation	H			
Wrightsville	126.01	Y	Middlesex/Montpelier	State of Vermont - DEC	H	Y	Y	2003
Class 2 Dams (Significant Hazard)								
Bradford Dam	24.01/ 2488	Y	Bradford	CVPS	S		Y	2009
Crystal Lake	15.05	N	Barton	State of Vermont - DEC	S	Y	Y	2011
Essex 19 Dam	69.05/ 2513	Y	Essex Junction	Green Mountain Power Corp	S		Y	2009
Highgate Falls	2547	Y	Swanton	Village of Swanton	S	☐	Y	2005
Waterbury	226.01	Y	Waterbury	State of Vermont - DEC	S	Y	Y	2006

4.2.2 Terrorism

Hazard Definition

Terrorism is defined in the Code of Federal Regulations (CFR) 25.2 as, "The unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." Many people associate terrorism with large events like the Oklahoma City Federal Building bombing of 1995 or the September 11, 2001 attacks on the World Trade Center in New York City. However, terrorism can come in the form of a school shooting, a car bomb, or tainting the agricultural supply system.

Cyber-terrorism is a large threat to the United States and its local communities. The Center for Strategic and International Studies (CSIS) has defined it as the "use of computer network tools to shut down critical national infrastructures or to coerce or intimidate a government or civilian population." The threat of cyber terror is that it can be utilized in any community, no matter the size, because of our reliance on computer programming for our most critical assets, such as energy and government operations.

An additional threat is agricultural terrorism. An attack on food supply can occur at any point between the farm and the table. Toxins can be introduced to domestic food-processing plants. Crops or livestock raised on American soil can also be targeted. Restaurants can be targeted at the end of the food distribution system. The effects of agricultural terrorism include illness and death, panic in the community, undermining the economy, and possibly eroding confidence in the government.

Hazard Profile

DEMHS and Vermont State Police conducted a risk/threat assessment of potential weapons of mass destruction (WMD) attacks in 2000 that ranked potential targets by State Police district. At that time, no known or suspected terrorists have been identified as operating in Vermont. However, some in the U.S. intelligence community believe that radical extremist organizations may have small cells in parts of Canada not far from the U.S. border. In this regard, Vermont is considered a potential transit point for terrorist organizations operating out of Canada who may travel through the state to reach points to the south. However, it is not likely that a major or even a small-scale terrorist attack will occur in Vermont due to its lack of high profile national targets.

Nonetheless, additional analysis of the potential threat from terrorism is ongoing, due to the actual use of hijacked aircraft as flying bombs and biological weapons (anthrax in letters) in September and October 2001. A vulnerability analysis was completed by the Vermont DEC Dam Safety Section (11/1/01) on the potential of an intentional breach of dams that normally hold back at least 1,000 acre-feet of water. This study identified 15 sites where security could be focused. Vulnerability studies have resulted in security upgrades to Vermont Yankee, the State Buildings Department, and Burlington International Airport. Vermont has a Terrorism Task Force and Department of Homeland Security (DHS) Office that have outlined immediate needs of the State (Conceptual Synopsis, 11/6/01) to better anticipate and respond to terrorism, and is

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in charge of conducting a broader needs assessment, which is being updated for 2010 and future years.

Although the overall terrorist threat is fairly low in Vermont, the most probable form of terrorism is expected to be in the form of a conventional bombing, hijacking, kidnapping, or shooting incident. A WMD attack in Vermont is considered a low probability; however, it is recognized as having the potential for catastrophic consequences. Many state agencies and departments have created internal protocols outlining their actions in a terrorism incident, and the Governor has established the State of Vermont Terrorism Task Force to create the statewide plan to deal with terrorism.

4.2.3 Invasive Species

Hazard Definition

The National Invasive Species Council defines an invasive species as one that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive species can overwhelm native species and their habitats, forcing the native species out. Invasive plants in Vermont, such as Japanese knotweed, phragmites, and purple loosestrife, can change soil composition, change water tables, and disrupt insect cycles. They often lack food value that wildlife depends upon. Some invasive animals prey heavily upon native species while others such as the alewife and zebra mussel out-compete native species for food and nutrients with significant impacts reverberating up and down food chains.

Each year, the United States loses 1.7 million acres to the spread of invasive species and estimates the total costs of invasive species to be more than \$130 billion annually. About 42 percent of the species on the federal threatened or endangered species lists are at risk primarily because of non-native species. The United States Forest Service issued a national strategy to address invasive species in 2004, and it encompasses four elements: prevention, early detection and rapid response, control and management, and rehabilitation and restoration.

Hazard Profile

The State of Vermont maintains three different lists of invasive species. The first is a watch list of non-native plants that have some potential to become invasive in Vermont based on their behavior in northeastern states. One-third of the plant species found in Vermont are not native to the state, but only about 8 percent have the potential to create environmental and economic harm due to their ability to grow rapidly, profusely, and widely. These are the plant species monitored on the watch list. The watch list is intended for public information and as a way to enlist volunteers to monitor potentially harmful plants in Vermont, although it has no regulatory force.

To be added to the watch list, a plant must meet both 1 and 2 and either 3 or 4 in the list of criteria below:

1. The taxon is nonindigenous to northeastern North America.
2. The taxon may negatively affect native species or natural communities.

3. In Vermont, the taxon has the potential, based on its biology and its colonization history in the Northeast or elsewhere, for rapid and widespread dispersal and establishment over spatial gaps away from the site of introduction.
4. The taxon is acknowledged to be invasive in northeastern North America but its Vermont status is unknown or unclear. This may result from lack of field experience with the taxon or from difficulty in taxonomic determination.

Table 4-26
Invasive Species Watch List in Vermont

Scientific Name	Common Name
<i>Acer ginnala</i> Maxim.	Amur maple
<i>Acer platanoides</i> L.	Norway maple
<i>Alnus glutinosa</i> (L.) Gaertner	European black alder
<i>Amorpha fruticosa</i> L.	False indigo
<i>Ampelopsis brevipedunculata</i> (Maxim.) Trautv.	Porcelainberry
<i>Anthriscus sylvestris</i> (L.) Hoffm.	Wild chervil
<i>Berberis thunbergii</i> DC.	Japanese barberry
<i>Berberis vulgaris</i> L.	Common barberry
<i>Callitriche stagnalis</i> Scop.	Pond water-starwort
<i>Cardamine impatiens</i> L.	Narrowleaf bittercress
<i>Centaurea maculosa</i> L.	Spotted knapweed
<i>Elaeagnus angustifolia</i> L.	Russian olive
<i>Elaeagnus umbellata</i> Thunb.	Autumn olive
<i>Euonymus alata</i> (Thunb.) Sieb.	Winged euonymus
<i>Euphorbia cyparissias</i> L.	Cypress spurge
<i>Glyceria maxima</i> (Hartman) Holmberg	Reed mannagrass
<i>Hesperis matronalis</i> L.	Dame's rocket
<i>Iris pseudacorus</i> L.	Yellow iris
<i>Ligustrum obtusifolium</i> Sieb. & Zucc.	Border privet
<i>Lonicera xylosteum</i> L.	Dwarf honeysuckle
<i>Lysimachia vulgaris</i> L.	Garden Loosestrife
<i>Marsilea quadrifolia</i> L.	European waterclover

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Scientific Name	Common Name
<i>Microstegium vimineum</i> (Trin.) A. Camus	Japanese stilt grass
<i>Najas minor</i> Allioni	Brittle waternymph
<i>Paulownia tomentosa</i> (Thunb.) Sieb & Zucc. Ex Ste.	Princess tree
<i>Phalaris arundinacea</i> L.	Reed canary grass
<i>Polygonum perfoliatum</i> L.	Mile-a-minute vine
<i>Polygonum sachalinense</i> F. Schmidt ex Maxim.	Giant knotweed
<i>Populus alba</i> L.	White poplar
<i>Robinia pseudoacacia</i> L.	Black locust
<i>Rorripa nasturtium-aquaticum</i> (L.) Hayek	Watercress
<i>Rosa multiflora</i> Thunb. ex Murr.	Multiflora rose

The second list is composed of invasive species that are currently in the state and is divided into categories depending on the species' impact on the environment.

- **Category One:** Non-native aquatic or wetland species with a demonstrated ability to be highly invasive on a localized or widespread scale. These species are currently having economic and/or ecological impacts in Vermont.
- **Category Two:** Non-native aquatic or wetland species considered to have the potential to be invasive on a localized or widespread scale.
- **Category Three:** Non-native aquatic or wetlands species not known to be present in Vermont, but with the potential to become invasive if/when they arrive. Known regional location follows scientific name.

Table 4-27
Invasive Species Currently in the State of Vermont

Category One
flowering rush (<i>Butomus umbellatus</i>)
yellow flag iris (<i>Iris pseudacorus</i>)
Japanese knotweed (<i>Fallopia japonica</i>) ✓
purple loosestrife (<i>Lythrum salicaria</i>)
Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)
common reed (<i>Phragmites australis</i>)
water chestnut (<i>Trapa natans</i>)

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Category One

zebra mussel (*Dreissena polymorpha*)

Category Two

European frogbit (*Hydrocharis morsus-ranae*)

slender-leaved naiad (*Najas minor*)

yellow floating heart (*Nymphoides peltata*)

curly leaf pondweed (*Potamogeton crispus*)

great water cress (*Rorippa amphibia*)

alewife (*Alosa pseudoharengus*)

faucet snail (*Bithynia tentaculata*)

Chinese mystery snail (*Cipangopaludina chinensis*)

mute swan (*Cygnus olor*)

common carp (*Cyprinus carpio*)

gizzard shad (*Dorosoma cepedianum*)

white perch (*Morone americana*)

rusty crayfish (*Orconectes rusticus*)

European rudd (*Scardinius erythrophthalmus*)

Category Three

fanwort (*Cabomba caroliniana*) **CT, MA, NH, NJ, NY, PA, R**

Brazilian elodea (*Egeria densa*) **CT, MA, NH, NJ, NY, PA**

East Indian hygrophila (*Hygrophila polysperma*) **FL**

hydrilla (*Hydrilla verticillata*) **CT, MA, ME, NJ, PA**

giant salvinia (*Salvinia molesta*, *auriculata*, *biloba* or *herzogii*) **NC**

parrot's feather (*Myriophyllum aquaticum*) **CT, NJ, NY, MA, PA**

variable-leaved watermilfoil (*Myriophyllum heterophyllum*) **CT, MA, ME, NH, NY, RI**

spiny water flea (*Bythotrephes cederstroemi*) **NY**

asiatic clam (*Corbicula fluminea*) **NY, MA**

quagga mussel (*Dreissena bugensis*) **NY, Quebec**

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Category Three
Eurasian ruffe (<i>Gymnocephalus cernuus</i>) Lakes Superior & Huron
round goby (<i>Neogobius melanostomus</i>) NY
tubenose goby (<i>Proterothinus marmoratus</i>) NY
tench (<i>Tinca tinca</i>) NY

The third and final list is the Quarantine #3 Noxious Weeds list. The quarantine was created to regulate the importation, movement, sale, possession, cultivation, and/or distribution of certain invasive plants. These plants either pose a threat to the Vermont environment or are already negatively impacting waterways and natural areas in the state. Many of these plants are becoming such a problem that there is no alternative prevention method. The quarantine prevents plants not yet found in Vermont from being introduced and will protect the state from the many environmental, agricultural, recreational, and/or economical problems associated with their presence.

Table 4-28
Quarantine #3 Noxious Weeds in Vermont

Designated Noxious Weeds	
(A) Class A Noxious Weeds	(B) Class B Noxious Weeds
(1) All weeds listed in 7 CFR 360.200 as amended, which is hereby incorporated by reference including subsequent amendments and editions. 46	(1) <i>Aegopodium podagraria</i> L. (goutweed)
(2) <i>Cabomba caroliniana</i> (fanwort)	(2) <i>Ailanthus altissima</i> (tree-of-heaven)
(3) <i>Egeria densa</i> (Brazilian elodea)	(3) <i>Alliaria petiolata</i> (<i>A. officinalis</i>) (garlic mustard)
(4) <i>Hydrilla verticillata</i> (hydrilla)	(4) <i>Butomus umbellatus</i> (flowering rush)
(5) <i>Hygrophila polysperma</i> (Roxb.) T. Anderson (<i>E. Indian hygrophila</i>) 52	(5) <i>Celastrus orbiculatus</i> Thunb. (Oriental bittersweet)
(6) <i>Myriophyllum aquaticum</i> (Vell.) Verdc. (Parrot feather)	(6) <i>Fallopia japonica</i> (<i>Polygonum cuspidatum</i>) (Japanese knotweed)
(7) <i>Myriophyllum heterophyllum</i> (variable-leavedmilfoil) 56	(7) <i>Hydrocharis morsus-ranae</i> L. (frogbit)
(8) <i>Salvinia auriculata</i> (giant salvinia)	(8) <i>Lonicera x bella</i> (Bell honeysuckle)
(9) <i>Salvinia biloba</i> (giant salvinia)	(9) <i>Lonicera japonica</i> (Japanese honeysuckle)
(10) <i>Salvinia herzogii</i> (giant salvinia)	(10) <i>Lonicera maackii</i> (Amur honeysuckle)
(11) <i>Salvinia molesta</i> (giant salvinia)	(11) <i>Lonicera morrowii</i> (Morrow honeysuckle)
(12) <i>Vincetoxicum hirundinaria</i> Medikus. (pale swallow-wort)	(12) <i>Lonicera tatarica</i> (Tartarian honeysuckle)
	(13) <i>Lythrum salicaria</i> (purple loosestrife)

Designated Noxious Weeds	
	(14) <i>Myriophyllum spicatum</i> (Eurasian watermilfoil)
	(15) <i>Nymphoides peltata</i> (Gmel.) (yellow floating heart)
	(16) <i>Phragmites australis</i> (common reed)
	(17) <i>Potamogeton crispus</i> L. (curly leaf pondweed)
	(18) <i>Rhamnus cathartica</i> (common buckthorn)
	(19) <i>Rhamnus frangula</i> (glossy buckthorn)
	(20) <i>Trapa natans</i> L. (water chestnut)
	(21) <i>Vincetoxicum nigrum</i> L. (black swallow-wort)

4.2.4 Rock Cuts

Hazard Definition

Vermont’s highways required the construction of significant rock cuts to traverse its often topographically challenging terrain. Many of these cuts were constructed using uncontrolled blasting techniques resulting in slopes that are uneven and contain numerous weak areas. Even slopes cut utilizing newer pre-split blasting techniques deteriorate over time as a consequence of Vermont’s harsh northern climate. Areas of high risk for rockfalls develop during the numerous freeze-thaw cycles that characterize Vermont’s winters.

Rock slopes along Vermont’s highways were designed and constructed by the Agency of transportation (VTrans) and, just like bridges, pavements, and other transportation infrastructure, these cuts require maintenance to allow them to perform as designed. Deferred maintenance on these particular assets along VTrans right-of-ways can result in rockfalls, creating hazardous conditions.



Rockfall on VT Route 5A in Westmore, VT
Source: 2007 Rockfall Hazard Rating System

Hazard Profile

In 2007 VTrans completed a study that identified rock cut exposures along State, Interstate, and U.S. highways, evaluating them for rockfall potential and identifying appropriate mitigation measures for potentially dangerous slopes (Eliassen and Springston, *Rockfall Hazard Rating of Rock Cuts on U.S. and State Highways in Vermont*, 2007). This report allows the State to prioritize slopes and allocate limited funds in a responsible manner. It was re-evaluated and

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updated in 2011, and was in the final stages of review at the time of drafting the 2013 update to the State of Vermont HMP.

The 2007 VTrans study first surveyed rock cuts above 10 feet in height on all Vermont and U.S. highways, assigning them to one of three categories (A, B and C):

- “A” ranked cuts present a high potential for rockfall to occur and for that rock to reach the roadway,
- “B” ranked cuts indicate cuts that have less of a chance of impacting the roadway, and
- “C” ranked cuts do not appear to represent a potential hazard.

150 “A” cuts, 687 “B” cuts and 2,799 “C” ranked cuts were found on all State and U.S. highways in Vermont.

All “A” ranked cuts then went through a detailed information collection process, and were assigned a score that represents their associated hazard potential. The bulk of the scores were between the 200 to 600 range. Of the 33 cuts within the 500 to 700 score range, conservative estimates for mitigation of these cuts approach \$10 to \$14 million dollars depending upon which mitigation option is chosen.

The following tables show the costs associated with remediation projects due to rockfalls at rock cut sites and mitigative remediation projects at rock cut sites. Currently, VTrans is addressing a rock cut mitigation project on I-89 in Richmond.

Table 4-29
Mitigation Projects at Rock Cut Sites due to Rockfall Events

Township	Date	Location	Remediation Method Used	Total Project Cost
Barnet	2002	US-5 4.21 SB RIGHT	Major rockfall in November. Hand scaled and installed rock dowels.	\$163,987
Lyndon	2003	I-91 136.68 NB OUTSIDE	Rockfall in September. Hand scaled and installed rock dowels.	\$18,333
Thetford	2006	US-5 6.59 SB RIGHT	Major rockfall in 2003 that covered roadway. Machine scaled in 2003 and again in 2006.	
Berlin	2007	US-2 1.3 EB RIGHT	Machine scaled. Due to rockfall.	
Putney	2008	I-91 20.36 SB RIGHT	Rockfall in March created overhang. Trim blasted to remove overhang.	
Putney	2008	I-91 19.86 SB RIGHT	Rockfall in March that covered roadway. Placed a permanent jersey barrier at the base of this cut and trim blasted.	
Woodford	2010	VT-9 3.59 WB RIGHT	Rockfall in July of 2008. High scaled, installed rock dowels, and applied tecco netting and shotcrete.	

**Table 4-30
Rock Slope Remediation Activities Performed by VTrans***

Township	Date	Location	Remediation Method Used	Total Project Cost
Fairlee	2009	I-91 95.87 NB MEDIAN	Machine and hand scaled and installed rock dowels.	\$2,861,531 Cost of all twelve Hartford-Newbury rock cuts totaled \$2,861,531
Fairlee	2009	I-91 95.87 SB RIGHT	Machine and hand scaled and installed rock dowels.	
Thetford	2009	I-91 86.68 SB RIGHT	Cut slope back on 1:1 slope.	
Norwich	2010	I-91 77.29 SB RIGHT	Machine and hand scaled and installed rock dowels.	
Fairlee	2010	I-91 89.52 SB RIGHT	Machine and hand scaled and installed hybrid rockfall fence.	
Fairlee	2010	I-91 89.78 SB RIGHT	Machine and hand scaled and installed rock dowels.	
Fairlee	2010	I-91 95.73 NB RIGHT	Machine scaled.	
Hartford	2010	I-91 71.26 SB RIGHT	Machine and hand scaled and installed rock dowels.	
Hartford	2010	I-91 71.59 NB MEDIAN	Machine scaled.	
Hartford	2010	I-91 71.61 NB RIGHT	Machine and hand scaled and installed rock dowels.	
Hartford	2010	I-91 71.63 SB RIGHT	Machine scaled.	
Hartford	2010	I-91 SB INT. 11 RAMP B RIGHT	Machine scaled.	
Chester	2010	VT-103 8.33 NB RIGHT	Machine and hand scaled, installed rock dowels, drain holes and applied shotcrete.	\$1,074,051
Rockingham	2010	I-91 34.94 NB RIGHT	Machine and hand scaled, installed rock dowels, and drain holes.	\$830,785
Berlin	2012	I-89 46.72 NB RIGHT	High scaled and installed of rock dowels.	\$226,910
Stockbridge	2012	VT-107 2.04 EB RIGHT	Machine and hand scaled, installed rock dowels, and secured netting with rock dowels.	\$1,017,386

* For which costs were known at the time of writing the 2013 State of Vermont HMP update

VTrans' rock and soil slope program addresses the rock and soil slope problem areas identified in the 2007 *Rockfall Hazard Rating of Rock Cuts on U.S. and State Highways in Vermont* report, and areas identified by the Maintenance districts. This program has received between \$1.6 and \$3.0 million each State Fiscal Year for the past five years (State FYs 2008-2012). For State FY 2013 VTrans has \$3.0 million in the As Passed budget. Over the past five years, VTrans has spent approximately \$2.56 million of this program's funds on rock cut mitigation projects. The \$2.56 million is in addition to funds spent from regular Maintenance District budgets.

4.2.5 Nuclear Power Plant Failure

Hazard Definition

Nuclear power plant incidents refer to the release of radioactive material at a commercial power plant or nuclear facility in sufficient quantity to constitute a threat to the health and safety of the off-site population. Examples of nuclear power plant incidents include Three-Mile Island, Pennsylvania in 1979, and Chernobyl, Ukraine in 1988. There is one commercial nuclear power plant in Vermont, located 5 miles south of Brattleboro.

In response to the March 1979 accident at the Three-Mile Island Nuclear Reactor, there was an increased Federal oversight of commercial nuclear power plants. The Nuclear Regulatory Commission (NRC) continued to regulate the plants but FEMA was tasked with evaluating and assisting state and local agencies in their efforts to respond in the event of an accident at a plant in their vicinity.

Hazard Profile

The Vermont Yankee Nuclear Power Station located in Vernon, VT and owned by Entergy Corporation is a single-unit boiling water reactor. In this type of power plant, uranium atoms fission (split), producing heat. This heat causes the water in the reactor vessel to boil and turn to steam. The steam turns a turbine, which powers a generator to produce electricity just like a coal or oil-fired plant. A transformer converts the electricity into a high-voltage current that is then sent to the power grid via high-tension wires. The steam is converted into water in condensers and pumped back to the reactor vessel so that it can be boiled again. Vermont Yankee generates 650 megawatts of electricity, which meets approximately 35 percent of the overall energy requirements of the State of Vermont.

The Radiological Emergency Response Plan (RERP) Program is the section of DEMHS responsible for planning, training, and response to an incident at the Vermont Yankee Nuclear Power Station. The RERP Program employs seven full-time and two part time staff. The RERP Program is federally mandated ([44 CFR §350](#)) to provide reasonable assurance that the public health and safety of the citizens living around the Vermont Yankee Nuclear Power Station are adequately protected in the event of a nuclear power station incident.

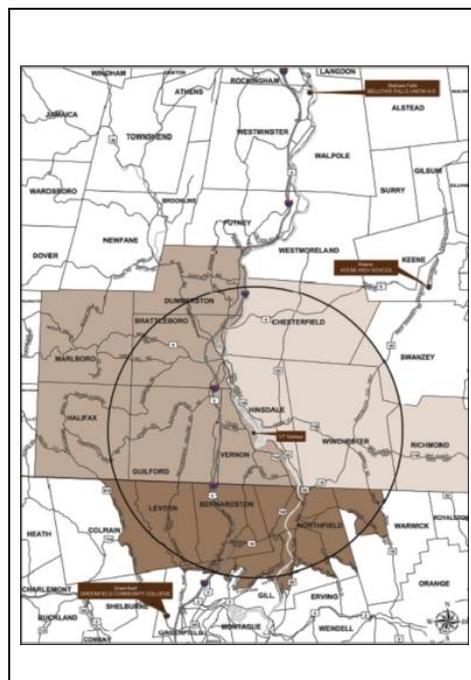
The RERP established Emergency Planning Zones (EPZs), which are approximately 10 miles around Vermont Yankee, and plans have been created to ensure prompt and effective action is taken in these areas in the event of an incident. There are two types of EPZs: Plume Exposure Pathway Zone and Ingestion Exposure Pathway Zone.

The State of Vermont and the RERP Program plans for the entire community, not just the portion lying within 10 miles of Vermont Yankee Nuclear Power Station. Communities in the Emergency Planning Zone are:

Massachusetts Bernardston
 Colrain
 Gill
 Greenfield
 Leyden
 Northfield
 Warwick

New Hampshire Chesterfield
 Hinsdale
 Richmond
 Swanzey
 Winchester

Vermont Brattleboro
 Dummerston
 Guiford
 Halifax
 Marlboro
 Vernon



The probability of an emergency at Vermont Yankee with a release of radioactive material to the environment that requires public protective actions is considered extremely low due to redundant safety systems and the design and structural specifications required and enforced by the Nuclear Regulatory Commission. However, to be prepared if an emergency was to occur, appropriate plans and procedures have been developed and utility, state, local, and federal response personnel are available to support the response efforts.

The Health Department enforces the state’s Radiological Health Rule, which limits the amount of ionizing radiation that any member of the public could be exposed to if standing at the site boundary of the station. The Radiological Health Rule also limits the amount of gaseous, liquid, radioiodine and radioactive particulate effluents that any member of the public could possibly be exposed to as a result of operations at Vermont Yankee.

The Radiological Health Rule specifically limits the annual direct gamma radiation from Vermont Yankee to a measured exposure value of 20 milliroentgen above background radiation at the site boundary on land. This measured exposure value represents a 5 millirem effective dose equivalent to any member of the general public. The Radiological Health Rule also limits specific emissions or discharges from Vermont Yankee to an effective dose of no more than 5 millirem from each pathway to any member of the general public.

The Vermont Department of Health has been monitoring and reporting on radiation emissions and radiological effluents (discharges) from the Vermont Yankee Nuclear Power Station since 1971. The purpose of this environmental surveillance is to protect the public’s health from excess amounts of radiation.

In 2011, measurements of wells at Vermont Yankee confirm no dose in excess of any limit established by the Vermont Department of Health’s Radiological Health Rule. The numerous

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samples and measurements of the environment on-site and around Vermont Yankee in 2011 show no instances of non-compliance with the Radiological Health Rule, from either operations at Vermont Yankee or the tritium-contaminated plume of groundwater first detected in January 2010. Further results may be found in the 2011 Public Health Monitoring Report published by the Vermont Department of Health, and available at http://healthvermont.gov/enviro/rad/yankee/documents/2011_VY_surveillance_report.pdf.

4.3 Secondary Effects of Hazards

Each of the above hazards has been identified as primary hazards and their primary impacts have been detailed. However, each of the primary hazards identified also has the potential to produce secondary effects. For example, a severe thunderstorm may produce hail, flooding, or tornadoes. A drought's main impact is on the environment but it also increases the likelihood of a secondary wildfire. A hurricane or tropical storm has multiple secondary effects as well, including disease outbreak, tornadoes, or utility outage. The table below is provided as an update to the 2010 State of Vermont HMP and provides a matrix to better understand the secondary effects of the primary hazards listed above.

Table 4-31
Secondary Effects of Primary Hazards

Primary Hazards	Structural Damage	Utility Outage	Chemical Release/Spill	Commodity Shortages	Emergency Comms.	Erosion	Structural Fire	Mold	CO Poisoning	Disease	Flooding	Landslide	Dam Failure	Tornado	Wildfire
Dam/Levee Failure	x	x	x			x		x		x	x	x	x		
Drought				x											x
Earthquake	x	x	x	x	x		x		x		x	x			
Extreme Temperatures		x								x					x
Flooding	x	x	x		x		x		x		x	x	x		
Hailstorms	x	x													
Hurricane/Tropical Storm	x	x	x	x	x	x	x	x	x	x	x			x	
Ice Jams	x										x		x		
Infectious Disease Outbreaks				x						x					
Invasive Species				x											
Landslides/Rockslides	x					x						x			
Nuclear Power Plant Failure		x	x												
Severe Thunderstorms	x	x					x				x			x	x
Severe Winter Storms	x	x		x		x	x				x				
Terrorism	x	x	x	x	x		x			x			x		
Tornadoes	x	x	x		x		x							x	
Wildfires	x	x					x								x

4.4 Overview of Federal Disaster Declarations in Vermont

Between 1963 and 2012, Vermont experienced 34 federal disaster declarations. This ranks Vermont at 33 out of 59 U.S. states and territories. Since 1989, there has been at least one federally declared disaster every year in Vermont except for 1991, 1994, 2005, and 2010. All of the disasters in recent years have been declared as a result of extreme weather conditions. Historically, flooding and flash flooding have caused the most disaster-related damage in Vermont. Most of the declared disasters were the result of suffering caused by flood damage. Federal disaster declarations (DR 1698 and DR 1715) occurred in April and July 2007 as a result of a severe Nor'easter and accompanying rainstorms. Flooding and severe storms in the summer of 2008 resulted in three new disaster declarations: DR 1778, DR 1784, and DR 1790. Declared counties in these latest disasters received aid for PA for infrastructure repair. In January 2009, a disaster declaration (DR 1816) was received for the ice storm that affected southern Vermont counties in December 2008.

There were several disaster declarations from 2010 through 2012. Severe storms and flooding brought a total amount of public assistance from FEMA of nearly \$17.5 million. Over \$129 million was awarded to Vermont in public assistance for the recovery from Tropical Storm Irene, making it the costliest disaster in the state's history. A tornado, severe storms, and flooding affected three Vermont counties in May 2012, eliciting \$500,000 in assistance.

**Table 4-32
Federal Disaster Declarations in Vermont**

Year	DR	Type	Declaration Date	Public Assistance Only (unless County shown in bold)	Total Damage Cost	Funds Awarded for Public Assistance
2012	4066	Severe Storm, Tornado, and Flooding	6/22	Addison, Lamoille, Orleans		\$524,576
2011	4043	Severe Storms and Flooding	11/08	Caledonia County added for public assistance and Washington County for individual assistance		\$969,195
2011	4022	Tropical Storm Irene	9/1/11	Addison, Bennington, Caledonia, Chittenden, Essex, Franklin, Lamoille, Orange, Orleans, Rutland, Washington, Windham, Windsor for PA Chittenden, Rutland, Washington, Windsor for IA		\$129,121,407
2011	4001	Severe Storms and Flooding	7/8/11	Essex, Orange, Caledonia, Washington for PA Washington for IA		\$8,695,126
2011	1995	Severe Storms and Flooding	6/15/11	Addison, Chittenden, Essex, Franklin, Grand Isle, Lamoille, Orleans, Washington for PA Addison, Chittenden, Essex, Franklin, Grand Isle, Lamoille, Orleans for IA		\$9,829,398

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Year	DR	Type	Declaration Date	Public Assistance Only (unless County shown in bold)	Total Damage Cost	Funds Awarded for Public Assistance
2010	1951	Severe Storm/ Wind	12/22/10	Chittenden, Franklin, Lamoille	\$1.6 million	\$1,520,000
2009	1816	Severe winter storm/ice storm	1/14/09	Windham, Bennington	\$1 million +	\$1,336,228
2008	1790	Severe storms and flooding	9/15/08	Addison, Caledonia, Essex, Lamoille, Orange, Washington, Windsor	\$6.5 million	\$4,560,634
2008	1784	Severe storms, tornado and flooding	8/15/08	Caledonia, Grand Isle, Lamoille	\$500,000	\$449,861
2008	1778	Severe storms, flooding	7/15/08	Addison, Franklin	\$1.1 million	\$1,085,383
2007	1715	Severe storms, flooding	8/3/07	Orange, Washington, Windsor, Caledonia, Orleans	\$4 million	\$4,193,393
2007	1698	Severe Storms, High Winds, Flooding	5/4/07	Bennington, Caledonia, Essex, Orange, Rutland, Windham, Windsor, and Lamoille (added)	\$4.8 million	\$3,462,633
2004	1559	Severe Storms and Flooding	9/23/04	Windham, Addison, Chittenden, Lamoille, Caledonia, Orleans, Franklin	\$1,833,470	\$2,314,619
2003	1488	Severe Storms; Flooding	9/12/03	Bennington, Orange, Windham, Windsor	\$1.1 million	\$1,162,522
2002	1428	Severe Storm; Flooding	7/12/02	Caledonia, Franklin, Lamoille, Orleans, Essex	\$1.6 million	\$1,500,390
2001	1358	Winter Storm, Flood	1/18/01	Bennington, Rutland	\$1 million	\$915,715
2000	1336	Flooding; Severe Storm	7/27/00	Addison, Bennington, Orange, Rutland, Windham, Windsor	\$3.5 million	\$3,307,916
1999	1307	Tropical Storm Floyd	11/12/99	Bennington, Caledonia, Essex, Lamoille, Orange, Orleans, Rutland, Washington, Windham, Windsor	\$1.4 million	\$1,328,709
1998	1228	Severe Storms	7/1/1998	Addison, Caledonia, Chittenden, Essex, Franklin, Lamoille, Orange, Orleans, Rutland, Washington, Windsor	\$11,849,541	\$4,403,698
1998	1201	Ice Storms	1/16/1998	Addison, Chittenden, Franklin, Grand Isle, Orange, Windsor	\$6.5 million	\$5,899,183
1997	1184	Excessive Rainfall; High Winds; Flooding	4/25/1997	Caledonia, Franklin, Lamoille, Orleans, Washington	\$8 million	\$7,256,842
1996	1124	Flooding	6/27/1996	Windham	\$1.5 million	\$1,332,028

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Year	DR	Type	Declaration Date	Public Assistance Only (unless County shown in bold)	Total Damage Cost	Funds Awarded for Public Assistance
1996	1101	Major Storms; Flooding	2/13/1996	Addison, Bennington, Chittenden, Franklin, Lamoille, Orange, Orleans, Rutland, Washington, Windham, Windsor	\$3.8 million	\$3,364,711
1995	1063	Heavy Rains; Flooding	8/16/1995	Caledonia, Chittenden, Essex, Lamoille, Orleans, Washington	\$4.9 million	\$4,255,398
1993	990	Flooding	5/12/1993	Addison, Chittenden, Franklin, Grand Isle	\$1.5 million	\$1,348,800
1992	938	Ice Jams; Flooding	3/18/1992	Caledonia, Orange, Washington, Windsor	\$4.2 million	\$3,920,746
1990	875	Flooding	7/25/1990	Caledonia, Chittenden, Franklin, Lamoille, Washington	\$4.1 million	\$3,927,063

Table 4-33
Declarations by Type of Disaster

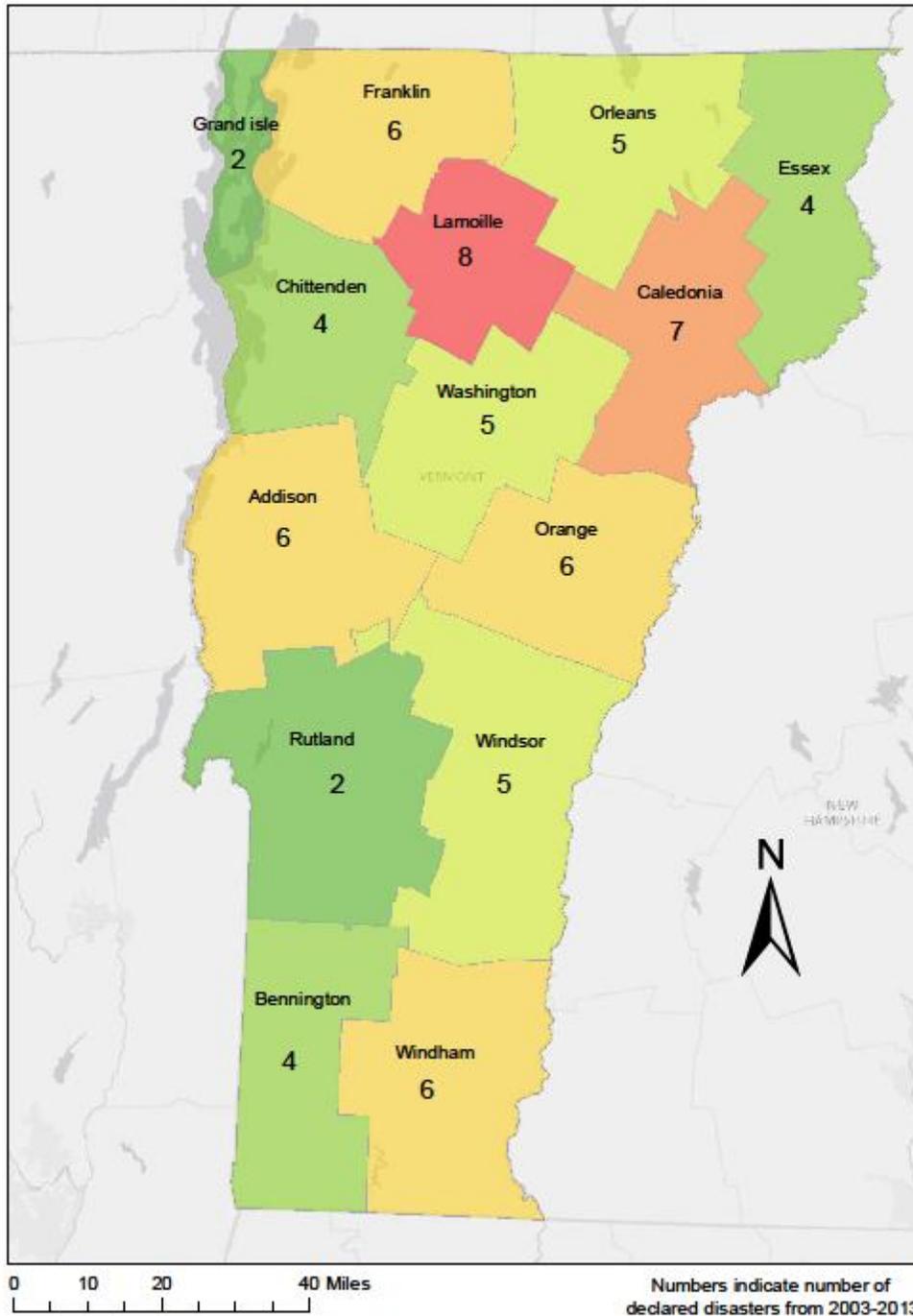
Type of Disaster	Date of Declaration	DR	Declared Areas	Federal Disbursement	Total Disbursement
Excessive Rainfall; High Winds; Flooding	4/25/1997	1184	Caledonia, Franklin, Lamoille, Orleans, Washington	\$8 million	\$7.2 million
Flooding	6/27/1996	1124	Windham	\$1.5 million	\$1.3 million
Flooding	5/12/1993	990	Addison, Chittenden, Franklin, Grand Isle	\$1.5 million	\$1.3 million
Flooding	7/25/1990	875	Caledonia, Chittenden, Franklin, Lamoille, Washington	\$4.1 million	\$3.9 million
Flooding; Severe Storm	7/27/00	1336	Addison, Bennington, Orange, Rutland, Windham, Windsor	\$3.5 million	\$3.3 million
Heavy Rains; Flooding	8/16/1995	1063	Caledonia, Chittenden, Essex, Lamoille, Orleans, Washington	\$4.9 million	\$4.3 million
Ice Jams; Flooding	3/18/1992	938	Caledonia, Orange, Washington, Windsor	\$4.2 million	\$3.9 million
Ice Storms	1/16/1998	1201	Addison, Chittenden, Franklin, Grand Isle, Orange, Windsor	\$6.5 million	\$5.9 million
Major Storms; Flooding	2/13/1996	1101	Addison, Bennington, Chittenden, Franklin, Lamoille, Orange, Orleans, Rutland, Washington, Windham, Windsor	\$3.8 million	\$3.3 million
Severe Storm/Wind	12/22/10	1951	Chittenden, Franklin, Lamoille	\$1.6 million	\$1.52 million
Severe Storm; Flooding	7/12/02	1428	Caledonia, Franklin, Lamoille, Orleans, Essex	\$1.6 million	\$1.5 million
Severe Storms	7/1/1998	1228	Addison, Caledonia, Chittenden, Essex, Franklin, Lamoille, Orange, Orleans, Rutland, Washington, Windsor	\$11.8 million	\$4.4 million
Severe Storms and Flooding	11/08	4043	Caledonia County added for PA and Washington County for IA		
Severe Storms and Flooding	7/8/11	4001	Essex, Orange, Caledonia, Washington for PA Washington for IA		

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Type of Disaster	Date of Declaration	DR	Declared Areas	Federal Disbursement	Total Disbursement
Severe Storms and Flooding	6/15/11	1995	Addison, Chittenden, Essex, Franklin, Grand Isle, Lamoille, Orleans, Washington for PA Addison, Chittenden, Essex, Franklin, Grand Isle, Lamoille, Orleans for IA		
Severe storms and flooding	9/15/08	1790	Addison, Caledonia, Essex, Lamoille, Orange, Washington, Windsor	\$6.5 million	\$4.5 million
Severe Storms and Flooding	9/23/04	1559	Windham, Addison, Chittenden, Lamoille, Caledonia, Orleans, Franklin	\$1.8 million	\$2.3 million
Severe storms, flooding	7/15/08	1778	Addison, Franklin	\$1.1 million	\$1 million
Severe storms, flooding	8/3/07	1715	Orange, Washington, Windsor, Caledonia, Orleans	\$4 million	\$4.1 million
Severe Storms, High Winds, Flooding	5/4/07	1698	Bennington, Caledonia, Essex, Orange, Rutland, Windham, Windsor, and Lamoille (added)	\$4.8 million	\$3.4 million
Severe storms, tornado and flooding	8/15/08	1784	Caledonia, Grand Isle, Lamoille	\$500,000	\$449,861
Severe Storms; Flooding	9/12/03	1488	Bennington, Orange, Windham, Windsor	\$1.1 million	\$1.1 million
Severe winter storm/ice storm	1/14/09	1816	Windham, Bennington	\$1 million +	\$1.3 million
Tropical Storm Floyd	11/12/99	1307	Bennington, Caledonia, Essex, Lamoille, Orange, Orleans, Rutland, Washington, Windham, Windsor	\$1.4 million	\$1.3 million
Tropical Storm Irene	9/1/11	4022	Addison, Bennington, Caledonia, Chittenden, Essex, Franklin, Lamoille, Orange, Orleans, Rutland, Washington, Windham, Windsor for PA Chittenden, Rutland, Washington, Windsor for IA		
Winter Storm, Flood	1/18/01	1358	Bennington, Rutland	\$1 million	\$915,715

Figure 4-19
Federal Disaster Declarations in Vermont by County

Declared Disasters by County 2003-2013



4.5 Overview of Vermont's Potential Vulnerability

A careful examination of natural hazards was undertaken by reviewing the files of DEMHS, ANR, FEMA, and other publicly available sources regarding hazard risk methodology. This examination involved an extensive review of natural disasters in Vermont, both declared and undeclared, over the past 15 years. Hazard data from regional/local mitigation plans was also used during the course of this assessment. The Hazard Inventory and Risk Assessment (HIRA) criteria and standardized methodology was adopted for the sake of this review. The frequency and severity of each natural disaster was noted and ranked by probability of recurrence, as listed in the tables below.

Vermont occupies a geographical location astride the Green Mountains, the center of three ranges of the Appalachians at this latitude. With the Adirondacks to the west and the White Mountains to the east, Vermont is partially shielded from many severe ocean weather systems that adversely affect much of the northeastern United States.

While Vermont's geography usually offers a degree of protection from ocean storms, the geographical isolation allows severe storms to strike without warning. The topography funnels and concentrates large volumes of water into small streams and river valleys with a suddenness that causes severe damage on a localized basis. One town can be completely devastated, while its neighboring town on the opposite side of the mountain has no damage whatsoever. In addition, homes and offices located far above designated floodplains can be severely flooded by this concentrated volume of water.

The mountainous areas in Vermont vulnerable to these phenomena are numerous. Because of the steep mountain topography, damage from frequently occurring extreme weather events in any specific location may occur often or only once in a lifetime. In Vermont, it is not impossible to hear the following sentiment expressed, "We've had two 100-year floods already this year." This comment reflects a fundamental misunderstanding regarding flood probability; consequently, DEMHS avoids using the term "100-year or 500-year flood" because this could potentially lead to confusion.

Vermont's vulnerability to each hazard was summarized based on a common set of definitions and classifications. The figure below identifies classifications of vulnerability. Each profile was analyzed on the criteria for frequency of occurrence, the amount of warning time prior to the hazard occurring, the amount of area potentially affected by the hazard, and the severity of impact should the hazard occur.

**Figure 4-20
Hazard Classifications**

Frequency of Occurrence: Probability	
1 = Unlikely	<1% probability of occurrence per year
2 = Occasionally	1–10% probability of occurrence per year, or at least one chance in next 100 years
3 = Likely	>10% but <100% probability per year, at least 1 chance in next 10 years
4 = Highly Likely	100% probability in a year
Warning Time: Amount of time generally given to alert people to hazard	
1 = More than 12 hours	
2 = 6–12 hours	
3 = 3–6 hours	
4 = None–Minimal	
Geographic Extent: How large an area would likely be affected?	
1 = Community-wide	
2 = State-wide	
3 = Region-wide	
Potential Impact: Severity and extent of damage and disruption	
1 = Negligible	Isolated occurrences of minor property damage, minor disruption of critical facilities and infrastructure, and potential for minor injuries
2 = Minor	Isolated occurrences of moderate to severe property damage, brief disruption of critical facilities and infrastructure, and potential for injuries
3 = Moderate	Severe property damage on a neighborhood scale, temporary shutdown of critical facilities, and/or injuries or fatalities
4 = Major	Severe property damage on a metropolitan or regional scale, shutdown of critical facilities, and/or multiple injuries or fatalities

The State of Vermont HMP Committee used this information to assign vulnerability to each hazard. Each hazard was assigned a score for each of the criteria listed above. The score of each criterion was then totaled to give the hazard an overall score, thus determining vulnerability. The hazards were ranked according to this scored vulnerability. See table 4-34 for these assignments.

**Table 4-34
Vermont Hazard Rankings**

Hazard	Frequency of Occurrence	Warning Time	Geographic Extent	Potential Impact	Hazard Score
Flooding and Fluvial Erosion	Highly Likely	None - Minimal	Region-wide	Major	14
Terrorism	Unlikely	None- Minimal	Statewide	Major	12
Earthquakes	Likely	None - Minimal	Statewide	Minor	12
Infectious Disease Outbreak	Likely	More than 12 hours	Statewide	Major	11
Hurricanes/Tropical Storms	Likely	More than 12 hours	Statewide	Major	11
Tornadoes	Occasionally	None- Minimal	Community-wide	Major	11
Nuclear Power Plant Incidents	Unlikely	None- Minimal	Region-wide	Major	11
Landslides/ Rockslides	Likely	None - Minimal	Community-wide	Moderate	11
Severe Thunderstorms	Highly Likely	6-12 hours	Region-wide	Moderate	11
Wildfires	Occasionally	6-12 hours	Statewide	Moderate	10
Dam Failure	Unlikely	3-6 hours	Community-wide	Major	9
Severe Winter Storms	Highly Likely	More than 12 hours	Region-wide	Minor	9
Hail	Likely	6-12 hours	Region-wide	Minor	9
Ice Jams	Highly Likely	More than 12 hours	Community-wide	Minor	8
Drought	Occasionally	More than 12 hours	Statewide	Minor	8
Rockcuts	Occasionally	None - Minimal	Community-wide	Minor	8
Invasive Species	Likely	More than 12 hours	Statewide	Negligible	8
Extreme Temperatures	Likely	More than 12 hours	Region-Wide	Negligible	7

4.6 Assessing Vulnerability by Jurisdiction

The design of the State of Vermont Risk and Vulnerability Assessment as laid out in this section focuses on impact of probable hazards on the state as a whole. In addition to understanding the impacts of these hazards on the state, it is essential to understand which areas of the state are most vulnerable to these hazards. The tables below illustrate the vulnerabilities faced by certain jurisdictions.

**Table 4-35
Risks by Jurisdiction as of 2013**

Regional Planning Commission	High Risk	Moderate Risk
Addison County RPC	Flooding and Fluvial Erosion; Winter Storms; High Winds; Earthquakes	Ice Storms, Landslides
Bennington County RPC	Flooding and Fluvial Erosion; Winter Storms; High winds; Severe Thunderstorms	Radiological Accident Risk; Hazardous Materials Spills
Central Vermont RPC	Flooding and Fluvial Erosion; Winter Storms	High Winds, Ice Jams
Chittenden County RPC	Severe Winter Storms; Flooding and Fluvial Erosion; High Wind Storms; Lightning	Hazmat Spill Risk
Lamoille County RPC	Flooding and Fluvial Erosion; Winter Storms	Structure Fire, Winter Storms, Landslides, Rock Slides
Northeastern Vermont Development Association	Flooding and Fluvial Erosion	Ice Storms
Northwest RPC	Flooding and Fluvial Erosion	Ice Storms, Landslides
Rutland RPC	Flooding and Fluvial Erosion; Ice Storms	Winter Storms, Ice Storms, High Wind Events
Southern Windsor County RPC	Flooding and Fluvial Erosion	Winter Storms
Two Rivers Ottauquechee RPC	Flooding and Fluvial Erosion; Structural Fire	Winter Storms, Technological Hazards, Hazmat Spills
Windham Regional Commission	Flooding and Fluvial Erosion; Severe Winter Storms	Structural Fire; Wind Storms, Radiological Accident Risk

**Table 4-36
Specific Vulnerabilities per Jurisdiction**

Windham, Windsor, Orange, Caledonia, and Lamoille counties have the highest number of reported flood-related events and FEMA disaster declarations.
Washington County has the greatest number of high hazard dams (8), followed by Windsor County (7), Windham County (6) and Orange County (5).
Significant ice jams have occurred on the Winooski River in Montpelier, the Lamoille river in Johnson and on the Deerfield river north branch in Wilmington. Montpelier's ice jams in the downtown area have been the most problematic in recent years.
The entire state is vulnerable to flash flooding and localized flooding events, dependent upon the track or course of the storm event. Many storm events impact the state from southwest to the Northeast.
As Vermont has no coastal or ocean front areas, coastal flooding is not an issue. However, lake front areas on Lake Champlain in Shelburne, Charlotte and Ferrisburgh may be impacted from erosion and storm water runoff and related pollution.
Snow accumulation is highest at the upper elevations of the Green Mountains, including Mt Mansfield, Killington, Mt Ellen,

Camel's Hump, Mt Abraham, Lincoln Peak, Pico Peak, Jay Peak, Bromley, and Stratton mountain.
Extreme cold temperatures are more prevalent at higher elevations and in the Northeast quadrant of Vermont (Northeast Kingdom area).
The following communities have the highest number of repetitive flood losses, according to FEMA's NFIP listing: Barre, Lyndon/Lyndonville, Derby, Hardwick, Montpelier, St. Albans, St. Johnsbury, Berkshire, Berlin, and Colchester.
Bennington has been impacted by severe FEHs on the Roaring Branch river, which has led to chronic localized flooding in recent years.

4.6.1 Development and Growth by Jurisdiction

Vermont has a total population of 621,760 according to the most recent U.S. Census taken in 2009. The state encompasses an area of 9,249.56 square miles. Most of the state's citizens live in small rural communities with a population of several hundred to several thousand people. The largest city is Burlington, with a population of 38,358 persons.

This section will examine population trends in Vermont (increase and decrease) to better understand population density and exposure to potential hazards. Since 2000, Vermont has witnessed a slight increase in population (2.1 percent).

**Table 4-37
Demographics Information by County**

Counties	2011 Population	2011 Housing Units	Percentage Change 2000-2011	Estimated Population 2020
Addison	36,742	16,760	2.2%	37,569
Bennington	36,970	20,922	-1.6%	35,828
Caledonia	31,116	15,942	1.9%	30,827
Chittenden	157,491	65,722	3.9%	158,253
Essex	6,291	5,019	-1.0%	6,330
Franklin	48,113	21,588	6.1%	51,121
Grand Isle	6,931	5,048	9.5%	8,278
Lamoille	24,701	12,969	11.8%	29,021
Orange	29,006	14,845	2.4%	26,518
Orleans	27,173	16,162	3.9%	28,366
Rutland	61,289	33,768	-0.6%	62,636
Washington	59,626	29,443	1.1%	59,342
Windham	44,266	28,479	-1.7%	42,732

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Counties	2011 Population	2011 Housing Units	Percentage Change 2000-2011	Estimated Population 2020
Windsor	56,666	33,524	-1.5%	55,704
Total	626,431	314,246	2.1%	634,817

Population change by County, per US Census statistics

The following chart indicates the number of housing units in 2000 and 2011 and the net increase in housing within this time frame. The net increase in housing from 2000 through 2011 represents an 8.7 percent gain in total housing in Vermont. Housing values appreciated an average of 3.2 percent per year during this time with minor variations depending upon location, according to data provided by Vermont realtor associations.

Table 4-38
Housing Information by County

Counties	2000 Housing Units	2009 Housing Units	Net Increase
Addison	15,312	16,760	1,448
Bennington	19,403	20,922	1,519
Caledonia	14,504	15,942	1,438
Chittenden	58,864	65,722	6,858
Essex	4,762	5,019	257
Franklin	19,191	21,588	2,397
Grand Isle	4,663	5,048	385
Lamoille	11,009	12,969	1,960
Orange	13,386	14,845	1,459
Orleans	14,673	16,162	1,489
Rutland	32,311	33,768	1,457
Washington	27,644	29,443	2,297
Windham	27,039	28,479	2,696
Windsor	31,621	33,524	2,497
Total Statewide	294,382	314,246	28,157

Source: US Census and University of Vermont Indicators

As the above charts indicates, for the most part there were relatively minor changes in population statewide, with a slight gain in some counties and minor population decreases in other counties. In the 2000-2011 timeframe, there were no significant large-scale increases in either commercial or residential development in Vermont. There was a total net increase of 28,157 housing units

statewide during this time frame. Limited affordable housing complexes were completed in Burlington and Shelburne, and a commercial redevelopment project was completed at the old mill complex in Winooski. Local mitigation plans covering jurisdictions affected by new development have noted these minor changes and the potential impact on areas of vulnerability.

For a detailed discussion of the Vermont regulations and policies designed to ensure that development within the state minimizes the creation of future vulnerabilities, or requires mitigating existing vulnerabilities, see Section 3.4: State Capability Assessment.

DEMHS and members of the State of Vermont Hazard Mitigation Committee also analyzed the vulnerability of various jurisdictions by reviewing local and regional Multihazard Mitigation Plans. As part of the comprehensive State of Vermont HMP update process, changes in development, population growth and decreases, and other trends were noted. It is important for the State of Vermont Hazard Mitigation Committee to note these trends to prioritize mitigation projects, planning initiatives and outreach efforts.

Conclusions reached from this review indicate that it is unlikely that natural hazard risk and vulnerability will be increased dramatically. Nonetheless, for those areas experiencing moderate growth, minor increases in risk can be expected.

**Table 4-39
Development and Growth by Jurisdiction**

Jurisdictions	Local Assessments of Development and Growth
Addison County	At the 2011 census, there were 36,742 people, 14,084 households, and 9,340 families residing in the county. The population density was 48 per square mile. There were 16,760 housing units at an average density of 20 per square mile. The main shire town is Middlebury. There has been a 2.2 percent increase in population since the previous census. Overall growth has been minor, primarily in the Middlebury area in support of the local university.
Bennington County	As of 2011, the population was 36,970. It has the unusual distinction of having two shire towns, sometimes called County seats. Bennington is known as the south shire and Manchester is the north shire. The largest town is Bennington. Since 2000, the population has decreased 1.6 percent. Other than some minor redevelopment in downtown Bennington, there has not been a significant increase in either commercial or residential construction.
Central Vermont/ Washington County	As of 2011, the population was 59,534. Its shire town is Montpelier, the state capital. The center of population of Vermont is located in Washington County, in the Town of Warren. The population has increased approximately 1.1 percent since the 2000 census. The county has a total area of 695 square miles, of which 689 square miles is land and 6 square miles (0.90 percent) is water. Washington County is one of only two counties in Vermont that does not border a neighboring state or Canada; the other is Lamoille County to the north. Since 2005, there has been modest growth concentrated around the ski resorts of Sugar Bush and Mad River Glen.
Chittenden County	As of 2000, the population was estimated at 156,545. The main town and focus of commercial activity is Burlington. Chittenden is by far the most populous County in the state, with more than twice as many residents as Vermont's second-most populous County, Rutland. The county has a total area of 620 square miles, of which 539 square miles is land and 81 square miles (13.01 percent) is water. There has been a 3.9 percent increase in population over the past 10 years. A modest degree of commercial development has taken place around Burlington, South Burlington, and Shelburne within the past 10 years, with some increase in flood risk and storm water runoff into Lake Champlain.
Lamoille County	In 2011, its population was 24,475. Its main town is Hyde Park. The county has a total area of 464 square miles, of which 461 square miles is composed of land and 3 square miles (0.60 percent) is water. The county has grown at a rate of 11.8 percent over the previous census. Lamoille County's growth since 2000 is due in part to its relatively affordable housing stock and its proximity to

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Jurisdictions	Local Assessments of Development and Growth
	Burlington and Stowe for commuters who hold jobs in the larger towns. The Town of Morrisville has experienced a minor degree of commercial redevelopment in the downtown business areas.
Northeastern Vermont "Northeast Kingdom"	The Northeast Kingdom (NEK) is a term used to describe the Northeast corner of Vermont, comprising Essex, Orleans and Caledonia counties. The 2000 census count indicated a total population of 64,630. The population has increased 4.8 percent over the past 11 years. Caledonia County has a total area of 658 square miles of which 651 square miles is land and 7 square miles (1.06 percent) is water. St Johnsbury is the main town in this area, which has undergone a small amount of commercial redevelopment and renovation in the downtown area in the past 10 years. See Section 4.6.1.1 below for detailed information on the large development projects underway in this region. These projects are mostly commercial; however, there will be some increase in residential units as well.
Northwestern Vermont	This area is composed of rural Franklin and Grand Isle counties. The 2011 census count indicates a population of 55,044 for both counties, representing a 15.6 percent increase over the past nine years. The main town here is St. Albans. This area has witnessed a modest increase in residential and commercial construction to support a growing population. Much of the increase in this location is due to relatively affordable housing stock for commuters to Burlington, as well as an increase in vacation home purchases in Grand Isle (North and South Hero islands). As a result of development in downtown St. Albans, there has been an increased flood risk primarily due to unwise encroachments in the flood plain. In addition, storm water runoff into Lake Champlain has been increased, which has been a source of pollution.
Rutland County	The county has a total area of 945 square miles, of which 933 square miles is land and 12 square miles (1.30 percent) is water. The primary stream of the county is Otter Creek, which runs through the county from the south to the north. The main town is Rutland. As of the 2010 census, there were 61,642 people, 25,984 households, and 16,018 families residing in the county. The population density is approximately 66 people per square mile with 33,768 housing units at an average density of 34 per square mile. There has been a -0.6 percent population decrease within the past 11 years. There has been a modest degree of commercial development in downtown Rutland, including a large public parking garage and a retail shopping center. Due to poor drainage, there has been a noticeable increase in flood risk as a result of development in the downtown Rutland area.
Southern Windsor County	Largest county (total area) in the state. As of 2010, the population was 56,666. Its main shire town is Woodstock. The 2009 census indicated a total population of 56,552 persons, a -1.5 percent decrease, but in actuality, the population has increased 1.5 percent. The county has a total area of 976 square miles, of which 971 square miles is land and 5 square miles (0.49 percent) is water. There has not been any significant commercial or residential development in this location within the past 10 years.
Two Rivers-Ottawaquechee Southeastern Vermont	This area comprises Orange County and a section of Windsor County. As of 2010, the population was 29,006, a 2.4 percent increase since 2000. Orange County has a total area of 692 square miles, of which 689 square miles is land and 3 square miles (0.46 percent) is water. This area is primarily rural, with agricultural and recreation being its primary economic focus. There has not been any significant degree of development in this area within the past 10 years. Overall hazard risk from flooding and winter storms has remained unchanged.
Windham County	As of 2010, the population was 44,266. Its main towns are Brattleboro and Newfane. The county has a total area of 798 square miles, with 789 square miles being land and 9 square miles (1.18 percent) composed of water. Some sections of Brattleboro have witnessed chronic flooding due to extreme fluvial erosion of the Roaring Branch river. Flood risk has increased also for residents of two mobile home parks located adjacent to active rivers prone to repeated flooding. The heightened flood risk in this area is not due to new development, but rather represents the cumulative consequences of unwise development practices over the past 60 years.

Source: US Census for 2010. Also, multijurisdictional and regional Multihazard Mitigation Plans.

4.6.1.1 Development Plans for the Northeast Kingdom

Development projects must pass through numerous laws at the state and federal level, the state permit processes, and municipal ordinances in order to determine the codes, standards, and requirements that must be met. The Northeast Kingdom, located in the northeastern section of Vermont, is currently undergoing multiple large development projects. These projects are largely commercial; however, some do include building additional residential units. New vulnerabilities introduced by these projects will largely result from the higher rates of tourism in both the summer and winter months and the correlated increases in traffic and seasonal population booms. The increase in jobs may also result in a slight increase in the region's overall population. The following offers a detailed outline of development proposals for the Northeast Kingdom, as of August 2013.

Proposals for development that are part of the **NEK Economic Development Initiative** are noted with the acronym NEKEDI. These projects are funded by investments through the Vermont E-B5 Regional Center immigrant investment visa program.

NEKEDI: Jay Peak - Town of Jay - \$170 million investment

- West Bowl Hotel complex
- West Bowl Skier services facilities
- New lifts and trails
- 84-unit hotel at the Stateside Base area of the resort. An Act 250 permit has been approved allowing construction for removal of the existing Stateside Chalet and ski patrol buildings; new sewer service connection to Troy/Jay municipal wastewater treatment facility and new water service to the Jay Peak water system; parking expansion; and a new comprehensive on-site storm water system.
- Another Jay Peak Act 250 permit has been issued for Phase II of the "Lodge & Townhouses Project" consisting of 18 residential buildings (88 units) including sewer connections, storm water and wastewater treatment, and new road alignment. This project, located in undeveloped areas of the resort, required a hearing earlier in the year. It was noted that the project will not affect forestry in the area.
- The Vermont ANR approved Jay Peak's erosion control plans. The protection of stream buffer areas is required.
- The District 7 Environmental Commission estimated that the Master Plan for the new expansion at Jay Peak Resort would have a positive net impact on the town of Jay of \$1 million in tax revenue after paying toward costs of infrastructure to serve the resort's new facilities. The resort would pay \$7.4 million in education tax revenue annually to the state of Vermont.
- Medical Center (based on analysis of communities and certificate of need) housing 2.5 health care providers serving communities of Jay, Troy, North Troy, Westfield, Lowell, Montgomery, and Montgomery Center. The Medical Center will also be a resource for Jay Peak Resort guests and staff.

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NEKEDI: AnC BIO Vermont - Newport City

A 40-acre research campus overlooking Lake Memphremagog in Newport City. Manufacturing and distribution from the 90,000 sq ft facility is scheduled for spring 2013. A 75,000 sq ft Research Tower is scheduled to be built on campus in the fall 2013. The Tower will be an FDA-approved facility designed to develop and manufacture artificial organs using patented hybrid bio-digital technology. This project will offer 2,000 direct and indirect jobs.

NEKEDI: Newport Marina Hotel & Conference Center - Newport City

This 150-unit hotel will be located at the Waterfront Plaza with restaurants, retail & conference facilities, marina, and boardwalk. The Conference Center will be able to accommodate events with up to 600 guests.

Plans for the first two floors of the Hotel and Convention Center will include commercial businesses open to the public. A bowling alley, cinema, drug store, and grocery store are planned. The Marina Hotel on the waterfront will enlarge the city's tourist capacity and feature restaurants offering local agricultural products. The businesses currently located at the Waterfront Plaza have either been invited to stay or encouraged to relocate in Newport. Developer Bill Stenger has said the hotel, slated to begin construction in 2015, will be the final project in the NEK Economic Development Initiative.

NEKEDI: The Newport Renaissance Block - Newport City

The city block currently known as the Spates Block adjacent to the Orleans County Courthouse will be acquired and a new building will be constructed in that space.

With construction of the Newport Marina Hotel and the Renaissance Block, an attractive pedestrian experience will open up from the Eastside Restaurant along the waterfront to the Gateway Building and up to Main Street. Both facilities will create 3,500 direct and indirect jobs.

The Renaissance Block, between Second and Central Streets in Newport, will include four levels of commercial and residential space. Demolition is planned for March, and the target completion date for the major revitalization project is summer 2015.

NEKEDI: Newport Airport – Town of Coventry - \$20 million budget

- Expand the pilot and passenger terminal.
- Expand hanger space for regional passenger service aircraft.
- Construct a bonded warehouse and Free Trade Zone facility.
- Expand flight school offerings for winter flight and jet training.

The District Environmental Commission #7 issued a Land Use Permit in August authorizing construction of a 950-foot runway extension, eight aircraft hangar buildings, stormwater treatment system, gravel access road, and related infrastructure at the Newport Airport in Coventry. The extension plan is an essential part of the proposed growth in and around the airport. The next step is for the FAA to agree to fund a significant portion of the actual extension. This announcement is pending.

On July 11, 2013, Jay Peak owners and Governor Shumlin announced Q Aviation's plans to bring a light plane assembly and distribution center and flight school to the Newport Airport in Coventry.

- **Flight Design** is a German light aircraft manufacturer that has built light-sport aircraft for over 25 years and delivered more than 1,800 airplanes to customers around the world. The Newport, Vermont facility will be the company's fifth distribution center in the US and will serve New England and Canada. *Flight Design USA* manufactures seven models. The CTLS model, popular for flight training and long distance travel, is certified for commercial flight training and rental use. The company is poised to take advantage of the area's designated Foreign Trade Zone status and will add 25 jobs to the region. Construction will begin in the spring of 2014 and operations, including a flight school, will begin in the summer of 2014. The project is part of a planned \$20 million expansion in a public-private partnership.
- **Parker Pie** the popular pizza restaurant located in West Glover, VT has opened a second location at the Newport State Airport. The new restaurant space was formerly a hangar and maintenance shed.

NEKEDI: **Burke Mountain** – Town of Burke - \$108 million investment/2,100 direct and indirect jobs

- Acquired by partners Ariel Quiros and Bill Stenger - May 2012.
- \$1 million invested in snowmaking upgrades for upcoming season.
- Four mountain lodge facilities to be constructed over the next three years. Two will be built just below the mid-Burke detachable quad. A third at the site of the current Mid-Burke Lodge, and the last at the base near the Tamarack Grill. Construction is scheduled for 2013 and 2014.

Q Burke Mountain Resort received Act 250 approval in August to begin construction of the five-story 116-unit hotel below the existing Mid-Burke Lodge. The project now has a Land Use Permit issued by the state, plus wastewater and potable water supply, and storm water discharge permits. Groundbreaking will begin in September and completion is expected in December 2014.

Bear Path Investment Group, LLC has also been given approval by the town's Development Review Board for a new condominium building to be added to the eight townhouses the firm built in 2007.

Louis Garneau USA – Town of Derby

Louis Garneau USA announced the expansion and relocation of its manufacturing plant to Route 5, east of Interstate 91 in Derby. Groundbreaking ceremonies took place on July 8, and the new 60,000 square foot building is expected to open in 2014. The international company based in Canada has outgrown leased space in Newport City. Ninety people are now employed at the East Main Street location where cycling apparel and accessories, cross country ski apparel, and snowshoes are produced. The company expects to grow to 120 workers.

The Highlands Project – Newport City

Newport's *The Highlands* Housing Project calls for the renovation and construction of 82 residential units at 338 Highland Avenue. REM Development Company, LLC has obtained approval from the City of Newport for the high-end apartment complex. Developer Bob Miller

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announced that groundbreaking could begin in the fall of 2013. An Act 250 permit was issued on April 25, 2013.

Walmart – Town of Derby

A new Wal-mart facility is proposed for Route 5 in Derby.

Planning Studies Underway to Provide Analysis of Development Impacts

NEK Transportation Infrastructure Study

The Northeastern Vermont Development Association (NVDA), which is the Regional Planning Commission for the Northeast Kingdom, has been studying the potential impact of various development proposals that are either part of the EB-5 related developments or those developments unrelated to EB-5 (i.e. Walmart) but are located within a relevant corridor. A consultant, RSG from White River Junction, has been hired to perform a review of several existing transportation studies that look at the Jay area, Newport City/Derby, and Lyndon/Burke areas. A steering committee was formed and two meetings were held where the scope and schedules were refined and existing conditions were reviewed. Public Meetings were held in Newport and Lyndonville on August 22 and 28, 2013.

Existing studies and corridors to be reviewed:

- Jay Area Transportation Study (2006)
- US Rte 5 Newport City/Derby Corridor Study (2006-07)
- Burke Mountain Area Transportation Infrastructure Study (2007)
- US Rte 5/105/5A Intersection Study (2007)
- Lyndon Corridor Management Plan (2008)
- Newport City Railroad Square Intersection Study (2008)
- City Thoroughfare Study (2010)
- VT Rte 100 Pedestrian Safety Study for Lowell & Westfield (2012)

These Transportation Studies are available online at www.nvda.net/studies-reports.php

Grant Awarded To Study Housing Demand

The Town of Burke has received a planning grant from the Vermont Community Development Program in the amount of \$30,000 to address growth and related impacts that will result from recently announced developments that extend from the Jay/Newport area to Burke. The grantee will work with NVDA to conduct a comprehensive regional study on housing demand and strategy on public facilities. While activities will be centered in Burke, Newport, and Jay, the study will yield data and findings that can support planning efforts in all impacted communities. Work and outreach is expected to begin later this summer.

Final Report: NEK Today and Tomorrow Summit Conference

This report documents deliberations by individual work groups involved in the June 15 Summit at Lake Region Union High School. Action priorities and next steps were identified to address issues connected to the future of the economy, land, and towns in the region. NVDA, the

Vermont Council on Rural Development, and stakeholder organizations held follow-up meetings to evaluate each of the key issues and priorities. Careful consideration was given to what is now being done, who is leading, and what may be needed next. This information was built into the Final Report.

Several priorities seemed to aggregate around the need to convene leadership to support the NEK working lands enterprises and the infrastructure needed for the next phase of their development. This area was identified as crucial for further collaboration, strategic planning, and development. NVDA and VCRD will work together on the next stage to advance this process.

4.6.2 Jurisdictional Flood Vulnerability

In 2010, DEMHS mitigation staff reviewed the number of structures located in the designated Special Flood Hazard Area (SFHA) as well as NFIP losses greater than \$100,000. In addition, there was a review of community bylaws enacted to avoid encroachment (i.e., development) in known flood hazard areas. Data for the extreme Northeast quadrant of Vermont is currently unavailable but may be included in a future State of Vermont HMP update.

The results of this review are illustrated in the charts and maps below:

Table 4-40
SFHA Communities

Communities With More than 90 Structures In SFHA	# of Structures	NFIP Losses over \$100,000	Losses in Dollars
Barre City	348	Montpelier	\$1,584,916
Bennington	341	Lyndon	\$ 873,284
Montpelier	300	Barre City	\$ 519,586
St. Albans Town	288	St. Johnsbury	\$ 270,856
Windsor	247	Rutland City	\$ 266,645
Brattleboro	241	Montgomery	\$ 257,852
Ludlow	165	St. Albans Town	\$ 200,815
Washington	165	Moretown	\$ 158,726
Berlin	163	Granville	\$ 157,327
Colchester	163	Hardwick	\$ 155,893
North Hero	153	New Haven	\$ 151,204
Richmond	142	North Hero	\$ 147,110
Ferrisburg	133	Johnson Village	\$ 146,928
Swanton	132	Warren	\$ 112,190
Dover	128	Berlin	\$ 104,547

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Communities With More than 90 Structures In SFHA	# of Structures	NFIP Losses over \$100,000	Losses in Dollars
Rutland City	124	Derby	\$ 97,338
Jamaica	121		
Johnson	117		
Woodstock	115		
Northfield	107		
Manchester	106		
Pownal	102		
Wilmington	102		
Londonderry	93		

Source: VT ANR/NFIP records

FEMA's National Flood Insurance Program Repetitive Loss (RL) data provides a useful overview of areas of the state that are vulnerable to repeated flood loss and damages. All RL properties and their losses have been listed as a table in Appendix H: Repetitive Loss Properties in Vermont. A similar vulnerability assessment for FEHs will be possible in future state, regional, and local HMPs with the completion of a statewide river corridor data layer and tracking erosion-related damages.

4.7 Assessing Vulnerability of State Facilities

The State of Vermont has assessed vulnerability of state facilities utilizing VEPARDS, DisasterLan, HAZUS-MH and the E-911 database. Only Rutland County and the cities of Montpelier, Berlin, Waterbury, and Burlington have identified those facilities within the 100-year flood zone.

The Agency of Buildings and General Services (BGS) is the lead agency for the ongoing flood study of state-owned buildings. One of the 2013 HMGP applications submitted to FEMA by DEMHS includes funding to expand this study to a statewide assessment of state-owned buildings in the floodplain. As of the writing of the 2013 State Hazard Mitigation Plan update, this application has not yet been reviewed or approved. Berlin and Waterbury are considered vulnerable due to increasing state infrastructure investments within flood-prone areas.

The chart below indicates state critical facilities (both public and private), their locations, and the potential hazard risk. More detailed assessments of other critical facilities are included in approved regional and local mitigation plans. Potential loss estimates are based on losses that may be incurred due to severe flooding, winter storms, ice storms, earthquakes, or other natural hazards and includes projected revenue losses.

State of Vermont's Definition of Critical Infrastructure

The State of Vermont HMP defines critical infrastructure as systems and assets, whether physical or virtual, that are vital to Vermont's ability to carry out its essential functions. An item is

deemed critical infrastructure if it is so vital to Vermont that its loss would have a substantial impact on security, economic viability, or public health or safety. The State of Vermont used this definition to determine whether or not a state facility is critical to Vermont’s everyday operations.

**Table 4-41
Potential Losses of Critical Facilities**

Critical Facility	Location	Hazard	Potential Losses (estimate)
Arbors Nursing Home	687 Harbor Road, Shelburne	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms/Earthquake	\$200,000
BGS Montpelier Maintenance Facility	120 State Street, Montpelier	Flooding and Fluvial Erosion	\$250,000
BGS N.E. District Office	100 Main Street, Newport	Winter Storms	\$165,000
BGS NW District Office	108 Cherry Street, Burlington	Flooding and Fluvial Erosion/Winter Storms	\$225,000
BGS SE District Office	570 State Farm Road, Windsor	Winter Storms	\$130,000
BGS SW District Office	Rutland	Winter Storms Wind Storms	\$180,000
BGS Waterbury Maintenance Facility	103 South Main Street, Waterbury	Flooding and Fluvial Erosion/Winter Storms	\$250,000
Barre City Fire Department	8 South Main Street, Barre	Winter Storms/Flooding and Fluvial Erosion	\$450,000
Barre Town Fire Department	Websterville/Barre	Winter Storms/Flooding and Fluvial Erosion	\$350,000
Barre City Police Department	15 Fourth Street., Barre	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$400,000
Barre Town Police Department	149 Websterville Road., PO Box 116, Websterville	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$200,000
Bel-Aire Quality Center Nursing Home	35 Bel-Aire Drive, Newport	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$300,000
Bennington Fire Department	130 River Street., Bennington	Flooding and Fluvial Erosion/Tornadoes and High Wind	\$500,000
Bennington Health and Rehab Center	2 Blackberry Lane, Bennington	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$500,000
Bennington Police Department	118 South Street, Bennington	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$400,000

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Critical Facility	Location	Hazard	Potential Losses (estimate)
Berlin Edward Knapp Airport	Barre-Berlin	Winter Storms/Flooding and Fluvial Erosion	\$1.3 million
Berlin Fire Department	338 Paine Turnpike North, Berlin	Flooding and Fluvial Erosion	\$350,000
Berlin Health and Rehab Center	98 Hospitality Dr, Berlin	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$600,000
Berlin Police Department	108 Shed Road, Berlin	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$200,000
Brattleboro Fire Department	103 Elliot Street, Brattleboro	Flooding and Fluvial Erosion	\$800,000
Brattleboro Memorial Hospital	17 Belmont Avenue, Brattleboro	Flooding and Fluvial Erosion	\$1.7 million
Brattleboro Police Department	200 Main Street, Brattleboro	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$500,000
Brattleboro Retreat	Anna Marsh Lane, Brattleboro	Flooding and Fluvial Erosion	\$600,000
Brookside Health and Rehabilitation	1200 Christian Street, White River Jct.	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$400,000
Burlington Fire Department	136 S Winooski Avenue., Burlington	Winter Storms	\$500,000
Burlington Health and Rehabilitation Center	300 Pearl Street, Burlington	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms/Earthquakes	\$500,000
Burlington Int'l Airport	South Burlington	Winter Storms	\$2.5 million
Burlington Police Department	1 North Avenue, Burlington	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms/Earthquakes	\$600,000
Cedar Hill Health Care Center Nursing Home	49 Cedar Hill Drive, Windsor	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$300,000
Centers for Living and Rehab	160 Hospital Drive, Bennington	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$600,000
Central VT Medical Center	130 Fisher Road, Berlin	Flooding and Fluvial Erosion/Winter Storms	\$2.7 million

RISK AND VULNERABILITY ASSESSMENT

Critical Facility	Location	Hazard	Potential Losses (estimate)
Chittenden Regional Correctional Facility	7 Farrell Street, South Burlington	Flooding and Fluvial Erosion/Winter Storms/Earthquakes	\$1 million
Copley Hospital	Washington Highway, Morrisville	Winter Storms	\$1.5 million
Crescent Manor Care Center Nursing Home	312 Crescent Boulevard, PO Box 170, Bennington	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$500,000
Department of Public Safety (DPS) Radio Shop	Route 2, Middlesex	Flood and Fluvial Erosion/Winter Storms	\$200,000
Derby Green Nursing Home	2853 US Route 5., PO Box 24, Derby	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$105,000
DisasterLan Emergency Planning and Response Database System	103 South Main Street, Waterbury	Flood and Fluvial Erosion	\$1 million
Electrical Transmission Infrastructure	Statewide	Flooding and Fluvial Erosion/Winter Storms/Tornadoes and High Wind	\$1 billion
Fletcher Allen Health Care Medical Center Campus	111 Colchester Avenue, Burlington	Winter Storms/Earthquake/Hurricanes and Tropical Storms	\$3.1 million
Fletcher Allen Health Care Fanny Allen Campus	Colchester	Winter Storms/Earthquake/Hurricane and Tropical Storms	\$2.0 million
Franklin County Rehabilitation Center	110 Fairfax Road, St. Albans	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$400,000
Gifford Medical Center	Randolph	Winter Storms	\$1 million
Gill Odd Fellows Nursing Home	8 Gill Terrace, Ludlow	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$300,000
Grace Cottage Hospital	Rt. 35, Townshend	Winter Storms	\$1 million
Green Mountain Nursing and Rehabilitation	475 Ethan Allen Avenue, Colchester	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms/Earthquakes	\$300,000
Greensboro Nursing Home	47 Maggie's Pond Road, Greensboro	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$200,000
Helen Porter Nursing Home	30 Porter Street, Middlebury	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and	\$400,000

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Critical Facility	Location	Hazard	Potential Losses (estimate)
		Tropical Storms	
IBM Facility	Robinson Parkway, Essex Junction	Winter Storms	\$1.75 million
Interstate Highways	Statewide	Flooding and Fluvial Erosion/Winter Storms/Tornadoes and High Wind	\$5 billion
Joseph C. McNeil Electrical Power Generating Station	Burlington	Flood and Fluvial Erosion/Tornadoes and High Wind	\$250 million
Kindred Transitional Care & Rehabilitation – Birchwood Terrace	43 Starr Farm Road, Burlington	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms/Earthquakes	\$600,000
Linden Lodge Nursing Home	75 Linden Street., Brattleboro	Flooding and Fluvial Erosion	\$400,000
Mt. Ascutney Hospital and Health Center	289 County Road, Windsor	Winter Storms	\$1 million
Maple Lane Nursing Home	60 Maple Lane, PO Box 500, Barton	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$300,000
Marble Valley Regional Correctional Facility	167 State Street, Rutland	Flooding and Fluvial Erosion/Winter Storms	\$1 million
Mayo Healthcare, Inc. Nursing Home	70 Richardson Street, Northfield	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$200,000
Menig Extended Care Nursing Home	44 South Main Street, Randolph	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$200,000
Merten's House Nursing Home	73 River Street, Woodstock	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$100,000
Montpelier Fire Department	61 Main Street, Montpelier	Flooding and Fluvial Erosion/Ice Jams	\$650,000
Montpelier Police Department	1 Pitkin Court, Montpelier	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms/Ice Jams	\$500,000
Mountain View Center Nursing Home	9 Haywood Avenue, Rutland	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$600,000
NOAA National Weather Service Office and Radar	1200 Airport Drive, South Burlington and 789 Vermont National Guard Road, Colchester	Winter Storms/Earthquakes/Tornado/Flooding and Fluvial	\$8 million

RISK AND VULNERABILITY ASSESSMENT

Critical Facility	Location	Hazard	Potential Losses (estimate)
		Erosion/Hurricanes and Tropical Storms	
National Guard, Camp Johnson, Building Green Mountain Armory	789 Vermont National Guard Road, Colchester	Winter Storms	\$15.9 million
National Guard, Camp Johnson, Building RTI	789 Vermont National Guard Road	Winter Storms	\$12.4 million
National Guard, Camp Johnson, Building 86 th IBCT QH/JRC	789 Vermont National Guard Road	Winter Storms	\$9.9 million
National Guard, Camp Johnson, Building Billeting Argonne	789 Vermont National Guard Road	Winter Storms	\$2 million
National Guard, Camp Johnson, Building Billeting Munda	789 Vermont National Guard Road	Winter Storms	\$2 million
National Guard, Camp Johnson, Building Billeting Wilderness	789 Vermont National Guard Road	Winter Storms	\$1.8 million
National Guard, Camp Johnson, Building Billeting Gettysburg	789 Vermont National Guard Road	Winter Storms	\$1.8 million
National Guard, Camp Johnson, Building Billeting Hubbardton	789 Vermont National Guard Road	Winter Storms	\$1.8 million
National Guard, Camp Johnson, Building Billeting Hubbardton	789 Vermont National Guard Road	Winter Storms	\$1.8 million
National Guard, Camp Johnson, Building Billeting Dinning	789 Vermont National Guard Road	Winter Storms	\$2.9 million
National Guard, Camp Johnson, Building 1	789 Vermont National Guard Road	Winter Storms	\$2.1 million
National Guard, Camp Johnson, Building USPFO	789 Vermont National Guard Road	Winter Storms	\$3.9 million
National Guard, Camp Johnson, Building 5	789 Vermont National Guard Road	Winter Storms	\$2.8 million
National Guard, Camp Johnson, Building 15	789 Vermont National Guard Road	Winter Storms	\$10.5 million
National Guard, Camp Johnson, Building RRTC	789 Vermont National Guard Road	Winter Storms	\$16.8 million
Newport Health Care Center Nursing Home	148 Prouty Drive, Newport	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$300,000
North Country Hospital and Health Center	189 Prouty Drive, Newport	Winter Storms	\$1.1 million
Northeast Correctional Complex	1266 and 1270 Route 5, St. Johnsbury	Flooding and Fluvial Erosion/Winter Storms	\$1 million
Northeastern Vermont Regional Hospital	St. Johnsbury	Winter Storms	\$1.8 million
Northwestern Medical Center	St. Albans	Flooding and Fluvial Erosion/Winter Storms	\$2.1 million
Northern State Correctional Facility	2559 Glen Road, Newport	Flooding and Fluvial Erosion/Winter Storms	\$1 million
Northwest State Correctional Facility	3649 Lower Newton Road, Swanton	Flooding and Fluvial Erosion/Winter Storms	\$1 million
Pine Heights at Brattleboro Center for Nursing and Rehabilitation	187 Oak Grove Avenue, Brattleboro	Flooding and Fluvial Erosion/Winter	\$400,000

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Critical Facility	Location	Hazard	Potential Losses (estimate)
		Storms/Hurricanes and Tropical Storms	
Pines Rehab and Health Center	601 Red Village Road, Lyndonville	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$300,000
Porter Medical Center	116 Porter Drive, Middlebury	Flooding and Fluvial Erosion/Winter Storms	\$2.2 million
Redstone Villa, LLC, Nursing Home	7 Forest Hill Drive, St. Albans	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$200,000
Rowan Court Health and Rehab	378 Prospect Street, Barre	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$400,000
Rutland Airport	Rutland	Flooding and Fluvial Erosion/Winter Storms	\$1 million
Rutland City Fire Department	104 Center Street, Rutland	Winter Storms, Wind Storms	\$550,000
Rutland City Police Department	Rutland	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$300,000
Rutland Healthcare and Rehab Center	46 Nichols Street., Rutland	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$600,000
Rutland Regional Medical Center	160 Allen Street, Rutland	Winter Storms	\$2.0 million
Southeast State Correctional Facility	546 State Farm Road, Windsor	Flooding and Fluvial Erosion/Winter Storms	\$1 million
Southern State Correctional Facility	700 Charleston Road, Springfield	Flooding and Fluvial Erosion/Winter Storms	\$1 million
Southwestern Vermont Health CareCenter for Living and Rehabilitation	160 Hospital Drive, Bennington	Winter Storms	\$1 million
Southwestern Vermont Medical Center	100 Hospital Drive, Bennington	Winter Storms	\$1 million
Springfield Health and Rehab Center	105 Chester Road, Springfield	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$500,000
Springfield Hospital	25 Ridgewood Road, Springfield	Winter Storms	\$1 million
St. Albans Fire Department	Walnut Street, St. Albans, and 6 th Avenue, St. Albans	Flooding and Fluvial Erosion/Tornadoes and High Wind	\$250,000
St. Albans Healthcare and Rehab Center	596 Sheldon Road, St. Albans	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and	\$500,000

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Critical Facility	Location	Hazard	Potential Losses (estimate)
		Tropical Storms	
St. Johnsbury Fire Department	1187 Main Street, St. Johnsbury	Winter Storms	\$850,000
St. Johnsbury Health and Rehab Center	1248 Hospital Drive, St. Johnsbury	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$500,000
St. Johnsbury Police Department	1187 Main Street, Suite 1, St. Johnsbury	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$500,000
Starr Farm Nursing Home Center	98 Starr Farm Road., Burlington	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms/Earthquakes	\$600,000
State of Vermont Wireless Communication Infrastructure	Statewide	Tornadoes and High Wind/Winter Storms	\$200 million
Stratton House Nursing Home	Townshend	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$95,000
Stowe-Morrisville Airport	Route 100, Morrisville	Winter Storms	\$200,000
Telecommunication Network	Statewide	Flooding and Fluvial Erosion/Winter Storms/Tornadoes and High Wind	\$600 million
The Pines at Rutland Center for Nursing and Rehabilitation	99 Allen Street, Rutland	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$500,000
The Manor Nursing Home	577 Washington Highway, Morrisville	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$300,000
Thompson House Nursing Home	80 Maple Street, Brattleboro	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$200,000
Union House Nursing Home	3086 Glover Street, Glover	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$200,000
VTALERT.gov Mass Notification System	State of New York		\$100,000
VT State Police (VSP) Headquarters	103 South Main Street, Waterbury	Flooding and Fluvial Erosion	\$850,000
VSP Fleet Services	Ft. Ethan Allen, Colchester	Flooding and Fluvial Erosion/Winter Storms	\$300,000

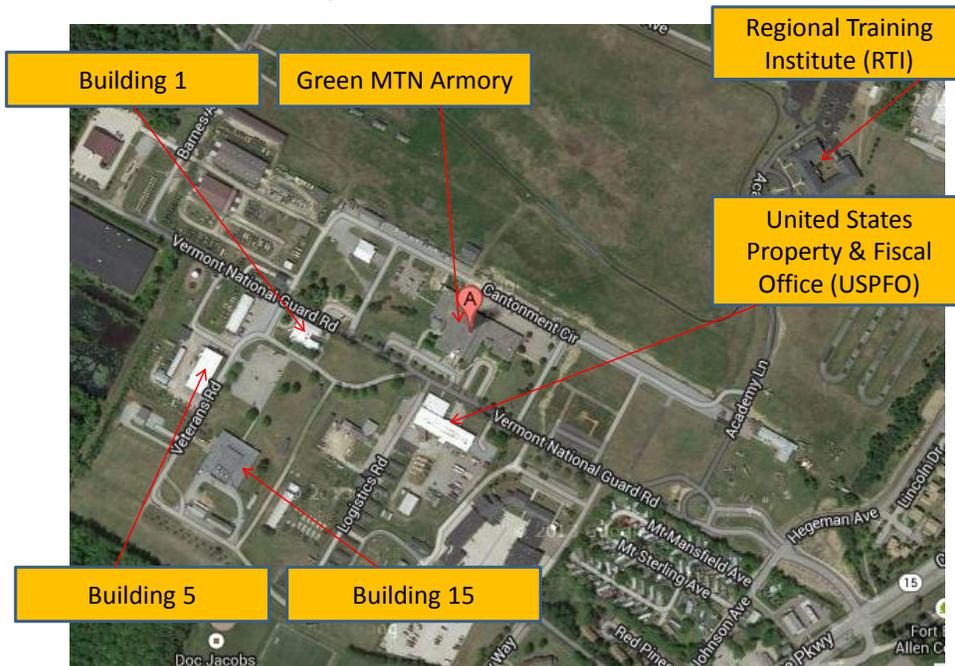
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Critical Facility	Location	Hazard	Potential Losses (estimate)
VSP Training Academy	317 Academy Road, Pittsford	Winter Storms	\$250,000
VSP Field Office- Royalton	2011 VT Route 107, Bethel	Winter Storms	\$300,000
VSP Field Office- Bradford	1594 Waits River Road, Bradford	Winter Storms	\$300,000
VSP Field Office- Brattleboro	464 Marlboro Road, Brattleboro	Flooding and Fluvial Erosion/Winter Storms	\$300,000
VSP Field Office- Derby	35 Crawford Road, Derby	Winter Storms	\$300,000
VSP Field Office- New Haven	New Haven	Winter Storms	\$300,000
VPS Field Office- Middlesex	1080 Route 2, Middlesex	Flooding and Fluvial Erosion	\$300,000
VSP Field Office- Rockingham	1987 Rockingham Road, Chester	Flooding and Fluvial Erosion	\$300,000
VSP Field Office- Rutland	124 State Place, Rutland	Flooding and Fluvial Erosion/Winter Storms	\$300,000
VSP Field Office – St. Albans	St. Albans	Flooding and Fluvial Erosion/Winter Storms	\$300,000
VSP Field Office- St. Johnsbury	1068 Route 5, St. Johnsbury	Winter Storms	\$300,000
VSP Field Office- Shaftsbury	Shaftsbury	Winter Storms	\$300,000
VSP Field Office- Williston	2777 Street George Road, Williston	Flooding and Fluvial Erosion	\$300,000
VT Emergency Operations Center	103 South Main Street, Waterbury	Flooding and Fluvial Erosion	\$1 million
VT Rail System	Statewide	Flooding and Fluvial Erosion/Winter Storms	\$100 million
Vermont Information and Analysis Center	Williston	Flooding and Fluvial Erosion/Hurricane and Tropical Storm/Earthquake	\$125,000
Vermont Natural Gas Pipeline	Statewide	Earthquake/Flooding and Fluvial Erosion	\$300 million
Vermont State Offices at National Life	1 National Life Drive, Montpelier, VT 05604	Winter Storms	\$5 million
Vermont Veterans' Home	325 North Street, Bennington	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$700,000
Vermont Yankee	Vernon	Radiological Risk/Earthquake	\$3.1 billion
Vernon Green Nursing Home	61 Greenway Drive, Vernon	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$300,000
Veterans Administration Medical Center	215 North Main Street, White River Junction	Winter Storms	\$1.8 million
Wake Robin-Linden Nursing Center	200 Wake Robin Drive, Shelburne	Flooding and Fluvial Erosion/Winter	\$400,000

RISK AND VULNERABILITY ASSESSMENT

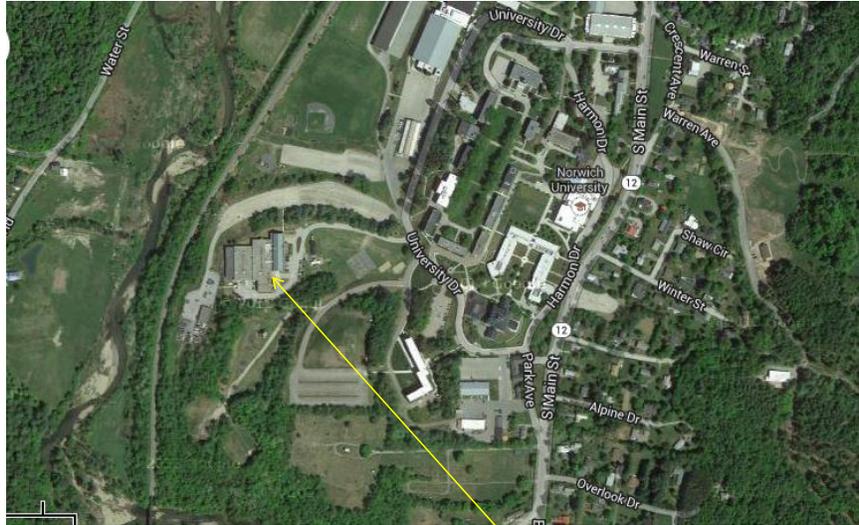
Critical Facility	Location	Hazard	Potential Losses (estimate)
		Storms/Hurricanes and Tropical Storms/Earthquakes	
Waterbury Fire Department	Main Street, Waterbury	Flooding and Fluvial Erosion	\$425,000
Waterbury Police Department	46 South Main Street, Waterbury	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$300,000
Woodridge Nursing Home	142 Woodridge Road., Berlin	Flooding and Fluvial Erosion/Winter Storms/Hurricanes and Tropical Storms	\$600,000

Camp Johnson (Colchester, VT)



VTNG Mitigation Product 1

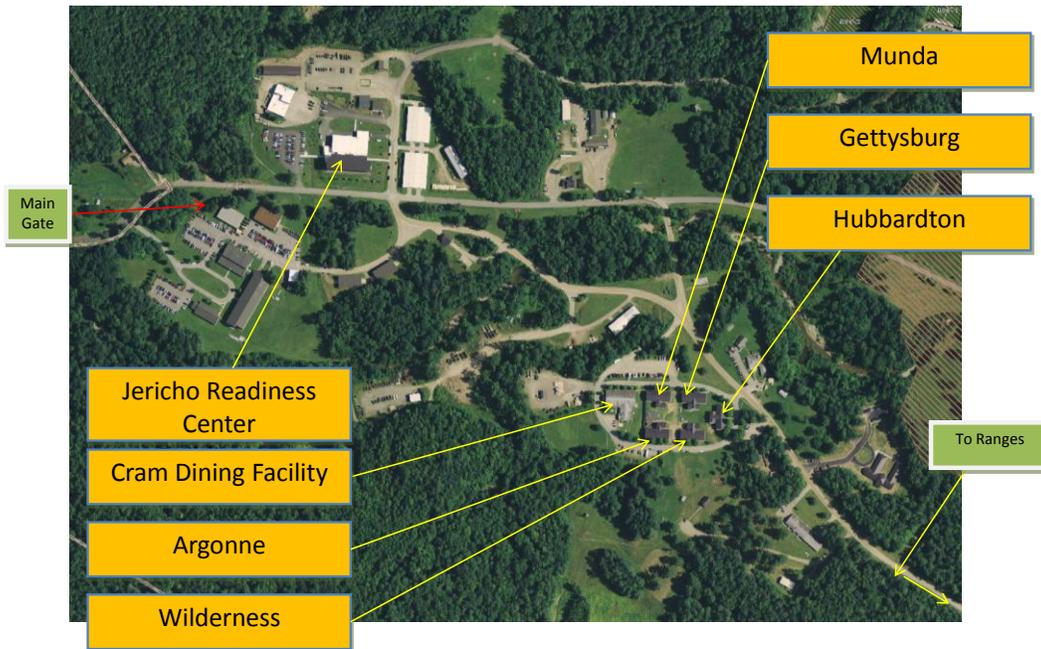
Regional Readiness and Technology Center (RRTC)
Campus of Norwich University, Northfield, VT



RRTC

VTNG Mitigation Product 3

Camp Ethan Allen Firing Training Site (CEATS), Jericho, VT



VTNG Mitigation Product 2

Nonessential Facilities

The facilities listed in table 4-41 are essential as defined by the State of Vermont’s critical infrastructure definition. However, there are many state-owned facilities that are not included in that list, although they potentially face and are vulnerable to a variety of hazards. Although employees who carry out essential functions may work in these facilities, the facilities themselves are not critical to ensuring continuity of business in the event of a disaster.

The University of Vermont is an example of state-owned facilities that are not included in table 4-41. Although the University of Vermont provides vital educational and research resources to the citizens of the State of Vermont, its facilities are not necessary to keep the State of Vermont functional, therefore it was not included in table 4-41.

A full list of the State-owned facilities may be found in Appendix R.

Potential Flood Losses Involving State Facilities

A flood-proofing study for state-owned buildings was completed for the Agency of Administration by Dubois and King in 1983. This study was updated in an abbreviated project completed by the Division of State Buildings in July 2006. The flood study concentrated on state buildings in Montpelier, Berlin, and Waterbury. We believe that the overall findings remain valid for purposes of identifying potential vulnerable areas, yet this study needs to be updated. . One of the 2013 HMGP applications submitted to FEMA by DEMHS includes funding to expand this study to a statewide assessment of state-owned buildings in the floodplain, led by the Department of Building and General Services. The results of the study would be incorporated in the 2016 update to the State of Vermont HMP. A portion of the 2006 study’s findings are listed in the tables below. Damage potentials are listed in 1983 dollars and need to be adjusted for inflation. Potential loss data for FY 2010-2013 may be included in future versions of this State of Vermont HMP along with data obtained from BGS, which will be included in DEMHS emergency planning and response database. BGS leadership will need to fully support this endeavor to continue the flood study for state buildings. Even though the flood study has been completed, some backup emergency generators for state buildings in Waterbury have been installed in identified flood zones. If additional flood mitigation measures are not implemented, and the vulnerabilities of other state-owned facilities across the state are not identified, it is anticipated that flood-related losses to state buildings could increase significantly in the coming years.

**Table 4-42
Flood-Proofing of State-Owned Buildings
Montpelier, Vermont State Complex**

Address	\$Damage Potential	Dry Flood – Proofing	Reducing Flood Damages	Priority
111 State Street	\$12,000	Yes	Partial	3
120 State Street	\$440,000	Yes	Partial	2
133 State Street	\$450,000	Yes	Minimal	1
6 Baldwin Street	\$7,000	Yes	No	4

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Address	\$Damage Potential	Dry Flood – Proofing	Reducing Flood Damages	Priority
116 State Street	\$61,000	Yes	Partial	2
122 State Street	\$1,000,000	Yes	Minimal	1
110 State Street	\$15,000	Yes	Minimal	3
109 State Street	\$250,000	Yes	Minimal	1
128 State Street	\$5,000	No	Partial	5
126 State Street	\$6,000	No	Minimal	5
132 State Street	\$7,500	No	Minimal	5
118 State Street	\$3,000	No	Partial	5
4 Western Avenue	None	N/A	N/A	N/A
10 Taylor Street	None	N/A	N/A	N/A
136 State Street	\$6,000	No	Minimal	5
134 State Street	\$3,000	Yes	Yes	4
5 Green Mountain Drive	\$125,000	Partial	Minimal	3
15 Green Mountain Drive	\$6,000	Yes	Partial	4
13 Green Mountain Drive	None	N/A	N/A	N/A
20 Dog River Road	None	N/A	N/A	N/A

Table 4-43
Berlin, Vermont State Complex

Building Materials	\$Damage Potential	Dry Flood – Proofing	Reducing Flood Damages	Priority
Testing Lab	\$20,000	No	Partial	4
Main Garage	\$35,000	Partial	Minimal	3
Traffic Shop	\$8,000	Partial	Partial	3

Table 4-44
Waterbury, Vermont State Complex

Building	\$Damage Potential	Dry Flood – Proofing	Reducing Flood Damages	Priority
Osgood Building	\$12,000	Partial	Partial	4
1,2,and3 North	\$70,000	Yes	Minimal	2

RISK AND VULNERABILITY ASSESSMENT

Building	\$Damage Potential	Dry Flood – Proofing	Reducing Flood Damages	Priority
N. Connector Bldg	\$2,500	No	Yes	3
4 North	\$1,000	No	Yes	5
5 North	\$11,000	Partial	Partial	4
6 and 7 North	\$5,500	No	Partial	3
8 and 9 North	\$2,000	No	Partial	4
10 North	\$1,000	No	Yes	5
1, 2, and 3 South	\$7,000	No	Partial	3
South Corridor	\$500	No	No	5
4 South	\$1,000	No	Partial	5
5 South	\$3,000	No	Partial	5
6 and 7 South	\$6,000	No	Partial	4
8 and 9 South	Minimal	---	---	5
10 South	\$5,000	No	Partial	3
Dale Building	\$12,500	No	Partial	3
A Building	\$76,000	Yes	Partial	2
Weeks Building	\$76,300	Partial	Minimal	2
Annex-Ladd Hall	---	---	---	---
Ladd Hall	\$30,000	No	Partial	3
Stanley Hall	\$24,000	No	No	5
Wasson Hall	\$12,000	No	No	5
Hanks Building	\$1,000	No	No	5
Center Building	\$70,000	Yes	Partial	2
Kitchen/Dining Room	\$16,000	No	Partial	3
Sewing Building	\$6,000	No	Partial	4*
43 Randall Street	\$6,000	Yes	Partial	3
Boiler House	\$700,000	Yes	Minimal	1
Power House	\$30,000	No	Partial	3

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Building	\$Damage Potential	Dry Flood – Proofing	Reducing Flood Damages	Priority
5 Park Row	\$10,000	No	Minimal	3
Cottage	\$1,500	Yes	Partial	4
83 S Main Street	\$5,000	Yes	No	4
123 S Main Street	\$2,600	Yes	Yes	4
121 S Main Street	\$4,200	Yes	Yes	3
B Building	\$12,000	No	No	3
Medical Building	\$65,000	Yes	No	2
Laundry	\$1,000	No	Minimal	4
Carpenter Shop	\$2,000	No	No	5
Garage Storage	Minimal	---	---	5
Green House	Minimal	---	---	5
Lumber Storage	Minimal	---	---	5
Repair Shop	\$1,000	No	No	5
Buildings and Grounds	Minimal	---	---	5
Logue Cottage	\$2,000	Yes	No	4*

* Contains living quarters below flood elevation

There are currently only three state-owned facilities in Brattleboro, Vermont:

- State of Vermont office
- District Court
- Air pollution monitoring trailer

Both the state office (232 Main) and the district court (30 Putney Road) are in the town proper and are not in a flood zone. The air pollution monitoring trailer is further out of town along the river, and also not in any flood hazard area. The state office and district court are not especially vulnerable to any particular hazard. The air pollution monitoring trailer is a mobile trailer that can be moved from site to site as necessary. However, as is common with mobile homes, the trailer is more vulnerable to almost all hazards than the other two facilities due to its design and construction. The estimated losses for these buildings may be found with all state-owned facilities in Appendix R.

4.8 Estimating Potential Losses by Jurisdiction

The table listed below represents a cumulative summary of recorded and estimated losses to residential property, commercial property, and public infrastructure by County. These estimates were derived from a review of regional plans and FEMA PA expenditures from 2000-2010 from federally declared disasters within this 10-year period. Additional losses may have been incurred from non-declared disasters. Most of the losses resulted from flooding and severe winter storm events.

Some of the state’s infrastructure losses incurred during this timeframe were not covered under FEMA’s PA program, as these losses occurred in non-declared counties; these losses may be included in future State of Vermont HMP updates. As much as possible, the losses were determined by procedures outlined in FEMA’s Understanding Your Risks: Identifying Hazards and Estimating Losses.

**Table 4-45
Estimated Potential Losses by County**

County	Estimated Residential Losses	Estimated Commercial Losses	Estimated Losses to Public Infrastructure	FEMA PA Funds Expended
Addison	\$900,000	\$700,000	\$2.4 million	\$2 million
Chittenden	\$950,000	\$1.4 million	\$1.2 million	\$450,000 +
Washington	\$750,000	\$650,000	\$1.65 million	\$1.73 million
Rutland	\$825,000	\$650,000	\$1.56 million	\$1.85 million
Windham	\$950,000	\$1.1 million	\$2.35 million	\$2.72 million
Windsor	\$1.3 million	\$1.3 million	\$2 million	\$3.38 million
Bennington	\$850,000	\$750,000	\$1.4 million	\$2.82 million
Franklin	\$725,000	\$380,000	\$1.15 million	\$1.36 million
Lamoille	\$1.2 million +	\$1.0 million	\$2.6 million	\$2.6 million
Grand Isle	\$560,000	\$300,000	\$950,000	\$1.01 million
Orleans	\$75,000	\$550,000	\$900,000	\$1.56 million
Essex	\$110,000	\$600,000	\$750,000	\$2.04 million
Caledonia	\$325,000	\$800,000	\$1.1 million	\$3.08 million
Orange	\$750,000	\$825,000	\$1.75 million	\$3.38 million

Source: FEMA PA expenditures from 2000-2010 and local town and VTrans records

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STATE OF VERMONT MITIGATION STRATEGY

The purpose of this document is to provide a strategy the State of Vermont can use to mitigate the effects of hazards. The Hazard Mitigation Strategy is presented through a series of goals, objectives, and action steps necessary to implement a comprehensive hazard mitigation program. The goals, objectives, and action steps are based on the natural and technological hazards identified in the Risk and Vulnerability Analysis, as well as the mitigation needs identified following Tropical Storm Irene.

The State of Vermont intends to create an efficient, effective, and consistent Hazard Mitigation Strategy that will focus efforts and priorities; enhance mitigation capabilities; and integrate state, regional, and local planning and risk assessment efforts in the short-term and long-term. The goals and objectives stated herein are meant to serve as practical policy guidance for State of Vermont decision makers in allocating resources for the Pre-Disaster Mitigation (PDM) Program, Hazard Mitigation Grant Program (HMGP), and Flood Mitigation Assistance (FMA) Program, among others.

5.1 Update on 2010 State of Vermont HMP Mitigation Goals

During the past three years, the Vermont Division of Emergency Management & Homeland Security (DEMHS) and state partners have been remarkably successful in implementing previously identified goals and strategies outlined in the 2010 State of Vermont Hazard Mitigation Plan (HMP). The following is a summary of progress achieved in attaining mitigation goals and objectives:

Goal 1: Ensure that current and proposed legislation and regulatory policies require effective hazard mitigation practices throughout the state.

The state legislature passed the Emergency Relief & Assistance Fund (ERAF) rule in 2012, providing incentives to local communities to enact mitigation measures. Act 138, also passed in 2012, added Emergency Stream Alteration Requirements, requires the state to create a flood resilient communities incentive program, and gave ANR the ability develop flood hazard area rules and general permits for development exempt from municipal regulation. Act 16, passed in 2013, makes it mandatory for towns to include flood resiliency measures in local municipal plans. Additional actions designed to encourage proactive mitigation are under consideration by the Vermont state legislature.

A new Stream Alteration General Permit was finalized in 2013, with new culvert and bridge standards. This is being incorporated into the next VTrans Hydraulics Manual for state and local personnel, and incorporates the latest data on hydrologic and sediment impacts on upstream and downstream communities.

Goal 2: Ensure that grant-related funding processes allow for expedient and effective mitigation actions to take place at the municipal and state-level.

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The state's mitigation project selection criteria (scoring sheet) for recommending mitigation projects for FEMA funding was revised to reflect the state's emphasis on flood avoidance, particularly for the most vulnerable locations. Risk and vulnerability data was used to develop and support projects that more closely reflected the state's most urgent mitigation needs, especially those related to flood-related efforts. Projects addressing repetitive loss locations, river corridor projects, and fluvial erosion mitigation initiatives received extra attention. Projects that involved a multiplicity of agencies and organizations and which involved long-term solutions were prioritized, e.g., projects involving DEMHS, FEMA, the Army Corps of Engineers and Regional Planning Commissions. Overall, the state was able to maximize federal grant opportunities to achieve its mitigation goals and objectives.

The Flood Resilient Communities Program was enacted, which will lead to increased funding for towns that adopt strict river corridor and floodplain ordinances and bylaws. Financial incentives are being provided to encourage greater participation at the local level.

State agencies (ANR) are providing assistance to towns in assessing risks to drinking water and waste water systems. A revolving loan and grant fund is being provided to encourage communities to identify appropriate resiliency measures for these systems.

Goal 3: Provide timely and accurate technical assistance that supports hazard mitigation activities to regional and local jurisdictions as well as private sector partners.

A climate change working group was established between DEMHS and the University of Vermont (UVM). Projections on climate change impacts will allow the state and communities to better prepare for catastrophic weather events. As a result, increased emphasis is being placed on implementing PDM efforts designed to improve resiliency. Increased educational outreach efforts are being implemented by UVM and the Champlain Valley Office of Economic Opportunity to improve mitigation of vulnerable mobile home parks and other flood-prone locations.

DEC is providing technical assistance to towns to implement river corridor protection mechanisms and to reduce fluvial erosion hazards (FEH). Significant progress has been achieved in nine Vermont towns, which have implemented stricter bylaws regulating development in known flood risk areas.

DEMHS and state mitigation partners have successfully encouraged towns to include proposed mitigation projects and initiatives in their local mitigation plans. Reminders to towns to include future projects are forwarded during state reviews of draft mitigation plans.

Workshops and webinars have been developed to assist towns in grant application development, benefit-cost analysis, and post-disaster recovery activities. As needed, individualized consultations are also provided by DEMHS mitigation staff to assist towns and agencies in developing mitigation concepts and projects.

A rapid response joint field force has been established involving river engineers, mitigation specialists, and restoration staff to assist towns in the immediate aftermath of a disaster. These teams can provide technical, regulatory, and administrative assistance for in-stream reconstruction projects to ensure that these include mitigation and resiliency measures.

Goal 4: Identify state-level risks and vulnerabilities and protect or harden state infrastructure against hazards.

DEMHS, VTrans, and other mitigation partners have identified the most vulnerable public infrastructure locations and have prioritized these for mitigation measures. Particular emphasis is being placed on mitigation of roads, bridges, and culverts to minimize or reduce future flood risk.

Over the past three years, nine Vermont towns have actively taken steps to avoid new encroachments in identified river corridors and/or floodplains. These nine towns have enacted flood bylaws restricting new development in the known flood zones.

The state has integrated fluvial geomorphic assessments into transportation infrastructure planning, design and construction. Additionally, rock cuts and rockslide locations have been identified and prioritized for mitigation, particularly those impacting major roads and public transportation sectors.

Goal 5: Conduct hazard assessments, mapping, and data collection projects to increase knowledge about both the hazards facing Vermont and the most effective mitigation actions for minimizing public exposure to hazards.

DEMHS is working with UVM and the State Climatologist to establish a predictive model for impacts from climate change and global warming.

Emergency action plans are being formulated for towns with previously identified high hazard dams.

Significant progress has been made by DEC and Regional Planning Commissions in statewide mapping of vulnerable river corridors and fluvial erosion risk areas. Applied technologies in these endeavors include Vermont's Stream Geomorphic Assessment Protocol, LIDAR, HAZUS-MH and other VCGI mapping data. Additional fluvial erosion and flood risk mapping will continue.

Considerable progress has been achieved in developing a landslide protocol, which can now be used by regional and municipal partners to identify their landslide vulnerabilities. Recent DEC studies are also developing protocols for mitigating earthquake impacts to critical facilities.

A review of the progress achieved on mitigation actions in the 2010 State of Vermont Hazard Mitigation Plan may be found in the table below.

**Table 5-1
Progress in Hazard Mitigation Activities - 2010–2013**

2010 Activity #	Activity Description	Lead Agency	Current Status	Current Status Description	Priority Level	Carry Over ?	2013 Activity
5.3.1.6	Provide training to state, regional and local officials for hazard avoidance strategies, including but not limited to: open space preservation, property acquisition, creation of special assessment districts, tax increment financing, repetitive loss properties, assessment, mapping and implementation of local river corridor protection mechanisms, wetlands protection, zoning tools, landslide risk assessment, subdivision planning and development review, and implementing pro-active, preventative mitigation projects for key infrastructure locations.	DEMHS, ANR/DEC, VLCT	Partially Completed (35%) In Progress	From 2010 through 2013, training pertaining to river corridor protection and fluvial erosion risk assessment was conducted by DEC through individual meetings with select officials, towns and agencies. The SHMO also met with individual towns in high risk areas to provide recommendations for mitigation proposals, including structural buyouts, elevations, road and bridge upgrades, zoning to prohibit future development in risk areas, and river corridor protection. In 2013, DEMHS, VTrans and VLCT began to provide training for the Emergency Relief & Assistance Fund (ERAF) incentives changes, which encourages towns to proactively implement pre-disaster mitigation measures.	High	Yes	Training and Workshops Will Continue Through 2016
5.1.7 5.3	Conduct technical assessments guided by the data outputs of the fluvial geomorphic and landslides assessment and mapping process.	DEC	Completed	From 2010 through 2013, DEC, the Chittenden Regional Planning Commission and Two Rivers RPC conducted technical assessments and educational outreach for fluvial hazard risk areas. DEC technical assessments were also performed, resulting in the development of a unique landslide protocol and mapping tool to assist towns in mitigating existing landslide risk.	Medium	No	N/A
5.2.	Use risk and vulnerability data as the basis for developing action plans (utilizing avoidance strategies when possible) and establishment of funding priorities and incorporate into project	DEMHS, RPCs	Partially Completed (30%) In Progress	DEMHS and RPCs worked with towns most at risk for flooding and helped incorporate pre-disaster mitigation strategies into local mitigation plans. This included VT towns in central and southern VT most impacted by catastrophic flooding from tropical storm Irene.	Medium	Yes	Activity Continues for Local Plan Development through 2016

STATE OF VERMONT MITIGATION STRATEGY

2010 Activity #	Activity Description	Lead Agency	Current Status	Current Status Description	Priority Level	Carry Over ?	2013 Activity
	selection criteria and use weighted ranking for PDM, HMGP, and FMA applications.			DEMHS revised the project selection criteria scoring sheet for federal grant applications, giving additional credit to towns that are proactive in implementing mitigation measures and strategies in their local mitigation/municipal plans.			
5.2.1.4 5.2.1.6	Create criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include a section on the coordination of local mitigation planning that includes the following: consideration for communities with the highest risks, repetitive loss properties, most intense development pressures, and strongest commitment to address these hazards expressed in their respective regional and local mitigation plans. Further, that for non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs.	DEMHS, State Mitigation Committee	Mostly Completed (75%) Additional Minor Refinements to be Made in Project Selection Criteria	From 2010 through 2013, DEMHS and members of the hazard mitigation committee revised the mitigation project selection criteria/scoring sheet for submitted grant proposals. Additional credit was given to towns experiencing the highest repetitive loss and flood risk; extra credit was also given to towns which list specific mitigation proposals in their local mitigation plans. The revised project selection criteria also provides additional credit for projects with a high benefit-cost ratio. These changes in the project selection criteria have provided a meaningful incentive for towns to implement pre-disaster mitigation strategies and projects to help minimize or eliminate future risk.	Medium to High	Yes	SHMC Members May Recommend Additional Project Selection Criteria Revisions in 2013- 2016
5.2.1.7	Create a state process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan.	DEMHS, RPCs	Partially Completed (50%) Additional State-Local Mitigation Plan	The SHMO and DEMHS mitigation staff conducted preliminary reviews of draft local mitigation plans to ensure these are commensurate with the strategies, goals and objectives outlined in the larger State Mitigation Plan. Suggestions for revisions are forwarded to towns/RPCs before the final draft is submitted	Medium	Yes	DEMHS Mitigation Staff Will Review Plans to Ensure Compatibility with State

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2010 Activity #	Activity Description	Lead Agency	Current Status	Current Status Description	Priority Level	Carry Over ?	2013 Activity
			Coordination and Collaboration Ongoing	to FEMA R1 for review.			Mitigation Plan Strategies in 2013-2016 Timeframe
5.1.15	Re-evaluate and update Rock Fall Hazard Rating of Rock Cuts on U.S. and State Highways in Vermont.	VTrans	Partially Accomplished (35%)	Begun in earnest in 2011 and undergoing review for additional activities; phased approach will continue.	Medium	Yes	Rock Fall Monitoring and Mitigation Will Continue through 2016
5.1.2	Enact new legislation and/or strengthen existing regulations to ensure that all future development is consistent with the most recent fluvial and mapping assessments.	DEMHS, ANR	Mostly Completed (80%) - Additional Legislative Refinements are Being Considered	The VT state legislature passed Act 16 (H.401) in 2013, pertaining to municipal and regional planning and flood resilience. This law requires that all local and regional plans adopted after July 2014 address flood resilience	High	Yes	Additional Legislative Initiatives May Be Developed in 2014-2016
5.1.2.1	To the extent possible, create grant and loan priority incentives to ensure that all new construction takes place outside of designated flood plain, fluvial erosion hazard, and repetitive loss areas.	ANR/DEC , State Mitigation Committee	State Funding Incentives Approved; Outreach & Education Are Ongoing	For submitted HMGP grant applications, the hazard mitigation project selection committee gave priority to towns which proactively implement mitigation measures in the pre-disaster timeframe. In particular, extra credit is given to towns which identify fluvial erosion hazard zones and prohibit development in these locations. These priorities are reflected in the newly revised project selection criteria/scoring sheet for submitted grant applications.	Medium to High	Yes	ERAF Outreach and Training Will Continue through 2016
5.1.3.2	Ensure that proposed environmental and development legislation initiatives are in accordance with the State Mitigation Plan.	DEMHS, State Mitigation Committee	Completed	The newly enacted legislation of Act 16, flood resiliency requirements and ERAF incentives are fully commensurate with the overall strategies, goals and objectives described in the State Mitigation Plan.	High	No	N/A

STATE OF VERMONT MITIGATION STRATEGY

2010 Activity #	Activity Description	Lead Agency	Current Status	Current Status Description	Priority Level	Carry Over ?	2013 Activity
5.2.2.3	Fund local or regional flood hazard mitigation planning activities, adoption of river corridor protection mechanisms and/or management strategies through state or federal grant programs.	DEMHS, ANR	Partially Completed (50%) - Work in Progress	Several regional planning commissions and towns received PDM or HMGP grants to fund local plan updates, river corridor protection initiatives, and flood mitigation outreach and education. This includes the Chittenden and Two Rivers Ottauquechee RPCs.	High	Yes	Towns and RPCs Will Continue Activities With Grant Funding Through 2016
5.2.2	Allow the state's HMGP and PDM grant funds to be used to develop state and/or local HMPs to meet the planning criteria outlined in 44 CFR Part 201.	DEMHS, RPCs, participating towns	Ongoing	DEMHS was successful in securing PDM and HMGP funding for local mitigation plan development	Medium	Yes	Local Mitigation Plan Updates Will Continue through 2016
5.2.1.7	Include requirements from federal and state required hazard mitigation grant project criteria for PDM, FMA & HMGP projects.	DEMHS	Completed	The state project selection committee provided additional credit for submitted PDM, FMA & HMGP grant applications that included proactive pre-disaster mitigation measures. Towns which enacted stronger flood zoning standards and which identified fluvial risk zones were given priority for project selection by the state mitigation committee.	Medium to High	No	Completed
5.2.1.4 5.3.2.3	Incorporate plan integration into project selection criteria and use weighted ranking to evaluate and prioritize PDM, FMA and HMGP applications which demonstrate clear relationships to other state, local, and regional planning efforts.	DEMHS	Mostly Accomplished (65%)	Submitted HMGP applications were ranked and prioritized based on how well the proposals were integrated into state and regional mitigation priorities, including resiliency, flood avoidance activities, restoring natural flood plains, mapping of identified flood risk areas, etc.	Medium	Yes	Submitted PDM, FMA and HMGP Applications Will Be Ranked to Reflect State Mitigation Priorities & Integration with Other Efforts

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2010 Activity #	Activity Description	Lead Agency	Current Status	Current Status Description	Priority Level	Carry Over ?	2013 Activity
5.2.2.1	Bolster State ability to support development of nationally competitive PDM applications and fundable HMGP project applications.	DEMHS	Mostly Accomplished (75%)	From 2011 through 2013, DEMHS conducted BCA training and application development workshops and training sessions for RPCs and towns. A grant application webinar was also conducted in 2013. Individualized assistance was also provided to RPCs by DEMHS staff in support of PDM & HMGP applications in 2012-2013.	Medium to High	Yes	Workshops/ Training Sessions Are Planned Through 2016
5.2.1.5 5.2.1.7	Incorporate environmentally sustainable, ecological processes into project selection criteria and use weighted ranking to evaluate and prioritize PDM, FMA and HMGP applications.	DEMHS, ANR	Mostly Accomplished (80%)	The state project selection committee and the SHMO vet each submitted grant application to ensure that it meets Vermont's strict environmental and sustainability standards. Only those which meet the state's standards are recommended for FEMA funding.	Medium	Yes	Additional Refinements May Be Made to the State Project Selection Criteria through 2016
5.2.1.4	Prioritize HMGP, PDM and FMA applications based upon the involvement of multiple political jurisdictions (watersheds, regions or multi-town collaborations) and areas impacted by repetitive flood loss.	DEMHS, State Mitigation Committee	Mostly Accomplished (75%)	The state hazard mitigation project selection committee gives priority for projects involving multiple jurisdictions and towns, particularly in RL areas. This approach is reflected in the mitigation project selection criteria (scoring sheet) which was revised in the 2010-2013 timeframe.	Medium	Yes	Additional Refinements May Be Made to the State Project Selection Criteria through 2016
5.2.1.5	Incorporate implementation mechanisms/technical support from multiple sources into project selection criteria and use weighted ranking for PDM, FMA and HMGP applications.	DEMHS, State Mitigation Committee	Mostly Accomplished (80%)	The state mitigation project selection committee gives priority for projects which include well documented engineering designs, including diagrams and schematics and other technical data. These priorities are reflected in the mitigation project selection criteria (scoring sheet) which was revised in the 2010-2013 timeframe.	Medium	Yes	Additional Refinements May Be Made to the State Project Selection Criteria through 2016

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2010 Activity #	Activity Description	Lead Agency	Current Status	Current Status Description	Priority Level	Carry Over ?	2013 Activity
5.3.1.6 5.3.1.8	Provide training and education to state, regional and local officials about hazard retrofit/upgrade strategies, including but not limited to: road and bridge standards, flood proofing, building elevation, fluvial conflict resolution, and dam maintenance or removal.	VTrans, ANR	Partially Completed (60%)	From 2011 through 2013, VTrans and ANR have conducted extensive training and workshops for the new road and bridge standards, culvert standards, fluvial erosion risk assessment and mapping. NFIP and CRS standards were also covered in individual one-on-one meetings and training sessions.	Medium to High	Yes	Additional Technical Training at Local Level Is Scheduled through 2016
5.3	DEMHS will refine its organizational strategic plan with significant public input from its State partners and local communities to improve level of service and organizational efficiency in support of its many programs.	DEMHS	Mostly Accomplished (80%)	In the 2010-2013 timeframe, DEMHS included additional agencies and other organizations as active participants in the state mitigation committee. VLCT, UVM and BGS now have greater participation in the mitigation committee and provide valuable input on policy and planning initiatives.	Medium	Yes	DEMHS Will Seek Additional Involvement From Local, Regional and State Agencies in SHMC Activity
5.3.1.3	Accelerate current mapping and risk assessment initiatives utilizing the latest technologies, e.g. fluvial hazard risk assessment, HAZUS MH	ANR, DEC	Partially Completed (55%)	A significant amount of new mapping has been accomplished in the period covering 2010-2013. This includes ANR's fluvial erosion risk mapping and DEC's landslide protocol mapping of known vulnerable areas.	High	Yes	Fluvial Risk Assessments & Mapping Will Continue Through 2016, Partially Dependent Upon Available Funding

5.2 Strategy Development

This strategy was developed by the State of Vermont Hazard Mitigation Committee following a review of existing policies, findings of the State of Vermont, and local hazard risk assessments and programs being implemented statewide. The Vermont DEMHS, the Vermont Agency of Natural Resources (ANR), and the Agency of Commerce and Community Development (ACCD) were responsible for developing the mitigation strategy, in coordination with other State of Vermont Hazard Mitigation Committee members. The strategy was designed to fully utilize existing programs to achieve the State of Vermont’s hazard mitigation goals, in accordance with the requirements of 44 CFR §201.4(c)(3) related to the State of Vermont Hazard Mitigation Plan (HMP) guidelines.

Ensuring Cost Effectiveness

A central goal in determining effective mitigation strategies was to ensure the projects would be cost effective. A project is cost effective if its benefits outweigh its costs. There are many ways to measure benefit. The goal of mitigation is to reduce the loss of life and injuries that occur during a disaster as well as reducing property destruction. The benefits that are seen by eliminating casualties are immeasurable. Another method to determine benefits is to estimate the amount of money that would be spent due to incurred damages from not implementing the mitigation action. The estimated cost of this future damage is the “benefit”. If the estimated cost of the mitigation action is less than the estimated benefit, then the project is determined to be cost effective.

Each of the below project cost estimates were based on agency expertise by those submitting mitigation actions as well as previous project costs. Vermont derived the benefit-cost per project based on a study conducted by the Multihazard Mitigation Council (MMC)¹³. The key findings of the report included that \$1.00 dollar spent on mitigation saves society an average of \$4.00, with positive benefit-cost ratios for all hazard types studied. Therefore, to reflect the benefits of Vermont’s current and future mitigation projects each estimated project was multiplied by 4 to represent the benefit of each mitigation strategy listed in table 5-3.

Vermont agency representatives and the State of Vermont Hazard Mitigation Planning Committee reviewed the provided mitigation goals, objectives, and action items and determined that they are technically feasible if funding is available. A great emphasis was placed on ensuring that mitigation activities consider their impact on the environment. This is evidenced by the many climate change-related and environmental conservation mitigation projects provided below.

Mitigation Strategy Ranking

The State of Vermont Hazard Mitigation Planning Committee prioritized certain mitigation actions above others using a two-step process. First, the Committee reviewed the State of

¹³ Multihazard Mitigation Council. “Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities”, December 2005, http://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/MMC/hms_vol2_ch1-7.pdf (accessed August 28, 2013).

Vermont HMP from 2010 to assess their progress on previously identified goals. Tropical Storm Irene spotlighted Vermont’s strengths and weaknesses, particularly regarding resiliency to natural hazards. With this knowledge and a review of the previous mitigation goals, the Committee agreed on five new goals that refined the state’s approach toward addressing unaccomplished actions from the previous plan and newly identified areas for improvement. These goals are listed in Section 5.3.

Second, the State of Vermont Hazard Mitigation Planning Committee determined that all mitigation actions would be ranked within these goals. State agencies were asked to assign a priority classification to each action, stating whether it was a high, medium, or low priority. The State of Vermont will utilize these rankings in determining where mitigation funds are spent as well as identifying which projects will be completed first. The following definitions of the classifications were used.

**Table 5-2
Priority Classifications**

High Priority	The mitigation action requires immediate implementation to ensure the safety and security of Vermont citizens. Actions may include structural updates and changes to infrastructure, legislation that enhances mitigation requirements, or conducting research required to implement another action.
Medium Priority	The mitigation action is important but does not require immediate implementation to ensure the safety and security of Vermont citizens. Actions may include mitigation planning, changes to the HMGP application process, providing public information to Vermont citizens, or providing technical assistance.
Low Priority	The mitigation action will benefit Vermont citizens but is not vital to the safety and security of Vermont citizens at this time. Actions may include researching the environmental impacts of pollution on the State of Vermont or understanding how climate change will affect future hazards.

5.3 State Hazard Mitigation Goals

1. Ensure that current and proposed legislation and regulatory policies require effective hazard mitigation practices throughout the state.
2. Ensure that grant-related funding processes allow for expedient and effective mitigation actions to take place at the municipal and state-level.
3. Provide timely and accurate technical assistance that supports hazard mitigation activities to regional and local jurisdictions as well as private sector partners.
4. Identify state-level risks and vulnerabilities and protect or harden state infrastructure against hazards.
5. Conduct hazard assessments, mapping, and data collection projects to increase knowledge about both the hazards facing Vermont and the most effective mitigation actions for minimizing public exposure to hazards.

5.4 State of Vermont Hazard Mitigation Goals, Objectives, and Action Items

Table 5-3
State of Vermont Mitigation Goals Objectives and Action items

Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
Goal 1: Ensure that current and proposed legislation and regulatory policies require effective hazard mitigation practices throughout the state.									
1.1 Ensure legislative and administrative policies are consistent with the most current hazard assessments.	1.1.1	Consider fluvial erosion hazards (FEH) during the environmental review process for municipal water and wastewater facility improvements and encourage design consultants to use tools offered by the Environmental Protection Agency's (EPA) climate ready water utilities initiative.	Vermont Agency of Natural Resources (ANR) – Department of Environmental Conservation (DEC)	2013-2016	Existing state/federal sources	Medium to high	New in 2013	\$50,000.00	\$200,000.00
	1.1.2	Propose new legislation and/or strengthen existing regulations to ensure that all future development and infrastructure investments avoid, to the greatest extent possible, those areas most recently assessed as landslide, fluvial erosion, and flood hazard areas.	Vermont Agency of Administration ANR Vermont Department of Transportation (VTrans) Vermont Division of Emergency Management and Homeland Security (DEMHS) Vermont Agency of	2013-2016	Current state/federal funds and programs	Medium	New in 2013	\$50,000.00	\$200,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
			Commerce and Community Development (ACCD)						
	1.1.3	Develop amendments to the aboveground storage tank rules to modify the acceptable standards for aboveground storage tanks in flood-prone areas and for aboveground storage tanks that are below or partially below maximum flood stage.	ANR – DEC	2013-2014	Existing state sources	Medium	New in 2013	\$25,000.00	\$100,000.00
	1.1.4	Revise <i>Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont</i> to incorporate mechanisms for better water quality protection and flood mitigation. ¹⁴	ANR – Department of Forest, Parks, and Recreation	2011-2014	State general funds	Low to medium	New in 2013	\$25,000.00	\$100,000.00
1.2 Ensure funding priorities are consistent with legislative and administrative	1.2.1	Create grant and loan priority incentives to ensure that all new construction takes place outside the designated floodplain, FEH, and repetitive loss areas.	Agency of Administration, ANR, ACCD, state hazard mitigation committee	2013-2016	Existing state/federal sources	High	ERAF, updated every 2 years ACT 138, passed in 2012 and ongoing updates	\$50,000.00	\$200,000.00

¹⁴ The regulations entitled *Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont* became effective on August 15, 1987. These regulations were promulgated under the authority of Chapter 47 of Title 10 of the Vermont Statutes Annotated, Water Pollution Control. The acceptable management practices are intended and designed to prevent discharges of mud, petroleum products, and woody debris (logging slash) from entering streams and other bodies of water during logging and to otherwise minimize the risks to water quality. They are also meant to control soil erosion and maintain stream temperature. See the current *Acceptable Management Practices* at: <http://www.vtfrp.org/watershed/documents/Amp2009pdf.pdf>.

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
policies.							Flood Resilient Communities Program Flood Resiliency Act from ANR, ongoing		
	1.2.2	Develop and implement new rules for floodplain land uses that are not regulated by municipalities, including: 1) agriculture, 2) transportation, 3) silviculture, 4) utilities, and 5) schools. Negotiate MOUs with other agencies that may be delegated regulatory authority in their areas of jurisdiction. ANR will provide technical assistance to delegated agencies.	ANR – DEC Rivers Program	2013-2016	State general funds	High	Act 138 update: ANR has initiated stakeholder outreach.	\$500,000.00	\$2,000,000.00
	1.2.3	Implement the new state rule that increases or decreases the level of state funding municipalities can receive from the Emergency Relief and Assistance Fund based on actions that reduce their flood hazards. Conduct outreach to municipalities about the new incentives.	DEMHS, ANR, AOT	2012-2018	Existing state/federal sources	High	ERAF rule, adopted in 2012 and ongoing	\$20,000.00 legislative staff costs; \$250,000.00 state matching fund cost per FEMA declared disaster	\$80,000.00
1.3 Ensure that legislative changes are taken into consideration	1.3.1	Incorporate the new statewide bridge and culvert standards from the revised Vermont Stream Alteration Regulations (Act 138) into the next VTrans	VTrans	2013-2014	VTrans	High	New in 2013	\$50,000.00	\$200,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
for mitigation planning.		Hydraulics Manual update.							
	1.3.2	Ensure that proposed environmental and development legislation initiatives proposed by the administration are consistent with the State HMP.	DEMHS, ANR, VHCB, ACCD, B&GS, VTrans	2013-2018	Existing state/federal sources	Medium	Ongoing	\$25,000.00	\$100,000.00
	1.3.3	Develop new management guidelines for riparian areas on state-owned lands, and incorporate appropriate flood resiliency considerations into the guidelines. Use these guidelines in the development and implementation of long-range management plans for agency lands, and develop a riparian buffer management policy for agency lands.	ANR – Department of Forest, Parks, and Recreation; Department of Environmental Conservation; and Department of Fish & Wildlife	2013-2016	State general funds	Medium	New in 2013	\$250,000.00	\$1,000,000.00
1.4 Ensure new and updated regulatory standards require appropriate sizing of structures and incorporate best available data.	1.4.1	Incorporate design requirements for stream crossings that require the use of site-specific hydrologic and sediment regime data to achieve stream equilibrium and connectivity performance standards into the Stream Alteration Rules and general permit.	ANR – DEC Rivers Program	2012-2013	Existing state sources	High	New in 2013	\$75,000.00	\$300,000.00
	1.4.2	Adopt or update technical stormwater standards via rule-making or general permit to incorporate the best available precipitation data.	ANR – DEC Stormwater Program	2013-2014	Existing state sources	Medium to high	New in 2013	\$25,000.00	\$100,000.00
1.5 Secure sustainable	1.5.1	Actively participate in the regional and national	VTrans	Ongoing	Existing state/federal	High	New in 2013	\$50,000.00	\$200,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
funding and finance sources.		coalitions engaged in dialogue and policy development regarding federal programs and legislation affecting state, regional, and national transportation policy, programs, authorization and funding.			sources				
Goal 2: Ensure that grant-related funding processes allow for expedient and effective mitigation actions to take place at the municipal and state-level.									
2.1 Create criteria for prioritizing mitigation projects that receive planning and project grants under available funding programs.	2.1.1	Use risk and vulnerability data as the basis for developing action plans (utilizing avoidance strategies whenever possible) and establishing funding priorities. Incorporate these into project selection criteria and use weighted ranking for PDM-C, FMA, and HMGP applications.	State Project Selection Committee, DEMHS, ANR, Agency of Administration	2013-2018	Existing state/federal funds, U.S. Army Corps of Engineers (ACE)	High	Ongoing and incorporated into the selection of HMGP applications after Tropical Storm Irene	\$30,000.00	\$120,000.00
	2.1.2	Develop and launch a new Flood Resilient Communities Program that will increase the state and federal funding available for municipalities that conduct river corridor planning and adopt enhanced floodplain and river corridor protection bylaws and ordinances. Package financial incentives from a range of programs with a scoring system.	ANR, VTrans, ACCD, DEMHS	2013-2018	FEMA mitigation grants, state general funds	High	New in 2013 Required per Act 138	\$400,000.00	\$1,600,00.00
	2.1.3	Provide assistance to municipalities to assess the flood and erosion risks facing their drinking water and waste	ANR – DEC Drinking Water and Groundwater	2013-2016	State funds	High	New in 2013	\$75,000.00	\$300,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
		water systems. Work with them to identify potential resilience improvements to those systems that could be funded under the state drinking water revolving loan & grant fund, the state clean water revolving loan and grant fund, and various federal hazard mitigation grant programs.	Protection Division						
	2.1.4	Prioritize PDM-C, FMA, and HMGP applications based on the involvement of multiple political jurisdictions (for example, watersheds, regions, or multi-town collaborations), multiple funding sources, and multi-agency sponsorship or partnerships.	DEMHS, ANR, state Project Selection Committee	2013-2018	FEMA mitigation grants	Medium to high	New in 2013 and incorporated into the selection of HMGP applications after Tropical Storm Irene	\$30,000.00	\$120,000.00
	2.1.5	Prioritize PDM-C, FMA, and HMGP project funding based on evidence of supporting scientific/engineering documentation and support from a broad base of peer reviewers (for example, federal, state, regional, and local) to ensure the technical validity of a proposed project solution.	DEMHS, ANR, VTrans, state Project Selection Committee	2013-2018	EMPG, state funds	Medium	New in 2013 and incorporated into the selection of HMGP applications after Tropical Storm Irene	\$25,000.00	\$100,000.00
	2.1.6	Prioritize mitigation efforts affecting repetitive loss areas and development of a priority list and map of community-identified properties that have	DEMHS, ANR, state hazard mitigation committee	2013-2018	HMGP and GMA grants, locally raised funding for 25 percent match	Medium	New in 2013	\$40,000.00	\$160,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
		been damaged repetitively but are not on the FEMA RL or Severe Repetitive Loss (SRL) list.			share				
	2.1.7	<p>Require that each PDM-C, FMA, and HMGP state, local, or regional project meet the following criteria:</p> <ul style="list-style-type: none"> • Comply with federal regulations as stated under 44 CFR Part 201, 44 CFR Part 9 (Floodplain Management & Protection of Wetlands), and 44 CFR Part 10 (Environmental Considerations). • Fall in line with priority mitigation strategies as identified in the State of Vermont HMP. • Meet standards for cost effectiveness and substantially reduce the risk of future damage, hardship, loss or suffering. • Provide a long-term solution to the problem it is intended to address. 	State Project Selection Committee, DEMHS	2013-2018	Federal EMPG, HMGP, PDM-C, and FMA, and existing state general fund sources	Medium	New in 2013	\$55,000.00	\$220,000.00
2.2 Provide state, local, and regional mitigation funding.	2.2.1	Schedule practical workshop sessions to help applicants prepare competitive grant applications, including sessions on application development, e-Grants,	DEMHS, FEMA Region 1, FEMA contractors	2013-2018	Existing state sources, EMPG	Medium to high	New in 2013	\$50,000.00	\$200,000.00

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		benefit-cost analysis, engineering design, environmental permitting, etc.							
	2.2.2	Allow the state's HMGP and PDM-C grant funds to be used to develop state and/or local HMPs to meet the planning criteria outlined in 44 CFR Part 201.	State Project Selection Committee, DEMHS	2013-2018	Federal EMPG, existing general fund sources	Medium	Completed in 2011	\$35,000.00	\$140,000.00
	2.2.3	Fund state, local, or regional flood hazard mitigation planning activities, adoption of river corridor protection mechanisms, and/or management strategies through state and federal grant programs.	DEMHS, ANR, Agricultural Administration, VTrans, ACCD, RPCs	2013-2018	Municipal planning grants, Vermont watershed grants, HMGP, PDM grants, transportation planning initiative	Medium	New in 2013	\$60,000.00	\$240,000.00
2.3 Preserve, maintain and operate the Vermont Transportation system in the most cost effective and efficient manner.	2.3.1	Ensure operations have sufficient funding and staffing to meet the needs of winter operations and summer safety work.	VTrans	Ongoing	Existing state/federal sources	High	New in 2013	\$240,000.00	\$1,000,000.00
	2.3.2	Give funding priority for maintenance and preservation of transportation infrastructure.	VTrans	Ongoing	Existing state/federal sources	High	New in 2013	\$50,000.00	\$200,000.00
2.4 Ensure federal disaster recovery funding is coordinated for maximum mitigation impact.	2.4.1	Work closely with the applicable federal agencies and local officials before and after a major disaster to ensure that appropriate mitigation features are incorporated into public assistance projects.	DEMHS, ANR, VTrans, affected applicants	2013-2018	Federal Public Assistance funds, federal mitigation funds, state emergency funds	High	ACT 138, 2012 update Vermont town, road and bridge, and State Stream Alteration standards, updated in	\$75,000.00	\$300,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
							2013		
	2.4.2	Ensure key state program staff who are responsible for federal disaster recovery programs participate in the HMGP selection committee and coordinate with the state recovery office.	ACCD, ANR, VTrans, DEMHS, Agency of Administration, Agency of Agriculture	during major disaster recovery phase	CDBG-DR, EPA watershed restoration, EDA and USDA disaster aid	Medium to high	New in 2013	\$22,000.00	\$88,000.00
2.5 Secure sustainable funding and finance sources.	2.5.1	Continue to explore the potential for VTrans to use impact fees to pay for future transportation improvements and encourage increased use of impact fees at the local level.	VTrans	Ongoing	State impact fees	Medium	New in 2013	\$5,000.00	\$20,00
	2.5.2	Continue to evaluate existing partnerships with other states that hold potential for developing projects or initiatives of sufficient financial scale that may attract public-private partnerships to Vermont and northern New England, New York, and Canada.	VTrans	Ongoing	Existing state/federal sources	Medium	New in 2013	\$5,000.00	\$20,00
2.6 Ensure mitigation projects are incorporated into state funding proposals for federal funds.	2.6.1	Integrate hazard mitigation objectives into EPA 319 water quality protection project proposals where restoration of fluvial equilibrium and floodplain access accomplishes significant protection of public safety and water quality and aquatic and riparian habitat benefits.	DEC Watershed Management Division	2013-2018	PDM, HMGP, and state general funds	Medium	New in 2013	\$20,000.00	\$80,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
Goal 3: Provide timely and accurate technical assistance that supports hazard mitigation activities to regional and local jurisdictions as well as private sector partners.									
3.1 Provide data and materials to local and regional municipalities to assist with mitigation planning and activities.	3.1.1	Use current scientific information and projections on how climate change will affect natural disasters in Vermont and utilize the data to encourage local jurisdictions to implement resilient capabilities in advance of climate change-related frequency and severity increases.	DEMHS, state hazard mitigation committee, ANR	2013-2018	PDM-C, HMGP, EPA	High	New in 2013	\$35,000.00	\$140,000.00
	3.1.2	Provide education and outreach to LEPCs, park residents, and park owners on strategies to improve the resiliency of mobile homes, including park scale planning.	ACCD, UVM – Department of Community Development and Applied Economics, and Champlain Valley Office of Economic Opportunity – Mobile Home Program	2014-2016	USDA, NIFA, Disaster Resilience for Rural Communities Program	High	2013-2018	\$40,000.00	\$160,000.00
	3.1.3	Develop and implement the new river corridor protection procedures to combine model protocols for mapping and assessing river segments, and model best management practices and ordinances.	ANR – DEC Rivers Program	2013-2014	Existing sources	High	Act 138	\$50,000.00	\$200,000.00
	3.1.4	Enhance operational systems to utilize the 2013 standard river management procedures and Stream Alteration Rules	ANR – DEC Rivers Program	2013-2016	State funds	High	New permit and technical procedures approved in	\$180,000.00	\$720,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
		for general permit for technically assisting, planning, and authorizing proposed projects in rivers and streams. These operational systems will be used for interagency coordination and tracking progress with in-stream mitigation measures.					2013		
	3.1.5	Encourage local jurisdictions to annually review local mitigation plans to revalidate possible recovery projects that may be implemented to mitigate future disasters, and include this reminder in immediate pre-flood outreach.	VDEMHS, RPCs	2013-2018	State sources	High	New in 2013	\$35,000.00	\$140,000.00
	3.1.6	Develop a training program to educate local jurisdictions on post-disaster recovery processes.	VDEMHS, RPCs	2013-2018	State sources	High	New in 2013	\$20,000.00	\$80,000.00
	3.1.7	Develop and prioritize flood resilience projects and policies in five Mad River Valley towns as a demonstration on incorporating resilience with other land use goals. Develop guidance documents to help Vermont municipalities integrate river corridor assessments and plans into existing planning processes.	ACCD, ANR	Report, August 2013	EPA smart growth implementation assistance; with in-kind resources from ACCD, ANR, Friends of the Mad River, Mad River planning district, Central Vermont Regional Planning Commission	Medium to high	New in 2013	\$10,000.00	\$40,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
	3.1.8	Serve as a resource to municipalities for state- and FEMA-generated educational materials on hazards mitigation, including flood management and planning, as well as climate change and associated adaptation strategies.	DEMHS, ANR, ACCD, VTrans, RPCs	2013-2018	EMPG, HMGP, community assistance program, cooperating technical partners	Medium	New in 2013	\$25,000.00	\$100,000.00
	3.1.9	Provide data to critical facilities on the impact of seismic shaking and landslides on their facilities.	ANR, DEC – VGS	2013-2018	EHRSA, PDM, HMGP	Medium	New in 2013	TBD	TBD
	3.1.10	Provide the public with access to EnviroFlash (a partnership between Vermont and the EPA) at http://www.enviroflash.info/?home=1 to get up-to-date e-mail notifications regarding air quality that affects public health.	ANR – DEC Air Division	2013-2016	EPA	Medium	New in 2013	\$5,000.00	\$20,000.00
3.2 Provide mitigation planning assistance to RPCs and local jurisdictions.	3.2.1	Identify properties where hazard mitigation would be improved through a relocation of the existing uses (that is, buildings or other facilities) and by protection of the property from construction of new structures.	VHCB, ACCD, Army Corps, RPC, local governments	2014-2017	Federal, state, and local funding	High	RPCs and local Hazard Mitigation Plan updates will reflect properties identified through the planning process.	\$200,000.00	\$800,000.00
	3.2.2	Assist RPCs and local emergency management directors with utilizing the Protocol for Identification of Areas Sensitive to Landslide	ANR, DEC – Vermont Geological Survey	2013-2016	HMGP, PDM, EMPG	Medium to high	New in 2013	\$25,000.00	\$100,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
		Hazards in Vermont in assessing landslide hazards. ¹⁵							
	3.2.3	Integrate state and local mitigation planning by coordinating DEMHS and RPC planning efforts.	DEMHS	2013-2018	EMPG, PDM, HMGP	Medium	New in 2013	\$25,000.00	\$100,000.00
	3.2.4	Develop a focus on floods website with a comprehensive and interactive set of web resources (that is, maps of flood hazard areas, planning tools, and other information) that communities, regional planning associations, watershed groups, community-based organizations, businesses, and others can use to assess their vulnerability to flooding and plan actions to reduce their risk and increase local resilience.	ANR – DEC	2013-2016	HMGP	Medium	New in 2013	\$30,000.00	\$120,000.00
	3.2.5	Utilize RPCs and the natural resource conservation districts to assist in coordinating flood hazard and FEH mitigation efforts and adoption of river corridor protection mechanisms.	ANR; RPCs; VACD; Vermont Land Trust; Agency of Agriculture, Food, and Markets	2013-2016	Municipal planning grants, Vermont watershed grants, HMGP, PDM	Medium	New in 2013	\$10,000.00	\$40,000.00

¹⁵ See Appendix C for a summary of the Protocol for Identification of Areas Sensitive to Landslide Hazards in Vermont and information on where to find the complete document.

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
	3.2.6	Utilize the Conservation Reserve Enhancement Program to reach out to farmers impacted by Tropical Storm Irene, and negotiate contracts that provide payments for farmers who plant riparian buffers and flood chute grassed waterways to reduce future flood damage to their fields and attenuate flood-borne sediment and debris, thus reducing downstream flooding.	Agency of Agriculture, USDA Farm Service Agency, Natural Resources Conservation Service	Ongoing	USDA Farm Service Agency, state funds	Medium	New in 2013. Conservation Reserve Enhancement Program is ongoing since 2002, yet use of riparian buffers and grassed flood chutes was not standard prior to Tropical Storm Irene.	\$500,000	\$2,000,000
	3.2.7	Assist towns affected by severe flood losses with mitigation projects and pre-disaster planning.	DEMHS, ANR	2013-2018	PDM-C, HMGP, EMPG grants	Medium	Assisted towns after Tropical Storm Irene in 2011-2012	\$35,000.00	\$140,000.00
3.3 Ensure the process of providing technical assistance to local and regional jurisdictions is effective and efficient.	3.3.1	Develop a rapid response joint field task force of river engineers, scientists, and restoration specialists to deploy along with transportation engineers and Regional Planning Commission staff in the immediate aftermath of a flood disaster to provide regulatory, technical and administrative assistance for in-stream reconstruction projects to ensure they are incorporating mitigation measures and increasing	ANR, VTrans, RPC's, DEMHS	2013-2016	State sources	High	New in 2013	\$60,000.00	\$240,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
		flood resilience. Plans for sufficient contract and EMAC resources for large-scale events will be maintained.							
	3.3.2	Develop more effective mechanisms for coordination and cooperation between state, municipal, nonprofit, and other private organizations.	DEMHS, Vermont State Police, state and local emergency response commissions, VDH, Vermont National Guard	2013-2018	PDM-C, HSU	Medium to high	New in 2013	\$25,000.00	\$100,000.00
	3.3.3	Develop greater capacity for providing technical assistance and financial incentives to local governments for the adoption and implementation of river corridor protection bylaws, river corridor easements, and floodplain and river corridor restoration projects.	ANR, DEMHS	2013-2016	State general funds	Medium to high	Act 138 update: 2 new floodplain management positions were created in the ANR Rivers Program.	\$480,000.00	\$1,900,000.00
3.4 Provide for a safe and resilient transportation system.	3.4.1	Create and maintain a three-tiered "rivers and roads" training program, including introductory, intermediate, and advanced training for state and municipal transportation professionals to reduce risks and vulnerabilities from post-flood river work.	ANR, VTrans	2013-2016	HMGP, VTrans training center, ANR	High	New in 2013	\$300,000.00	\$1,200,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
	3.4.2	Provide safety training to agency personnel who work in the field for employee safety as well as identification of infrastructure safety issues.	VTrans	Ongoing	Existing state/federal sources	Medium	New in 2013	\$4,575,000	\$20,000,000
3.5 Support and reinforce Vermont's historic settlement pattern of compact village and urban centers separated by rural countryside.	3.5.1	Work with other government agencies to support the siting of government facilities, services, and large employers in downtowns and village centers.	ACCD, BGS	2014-2015	Existing state/federal sources	Medium	New in 2013	\$5,000.00	\$20,000.00
Goal 4: Identify state-level risks and vulnerabilities and protect or harden state infrastructure against hazards.									
4.1 Provide for a safe and resilient transportation system.	4.1.1.	Evaluate and implement design standards and strategies necessary to accommodate extreme weather conditions and determine vulnerabilities and adaptation priorities for transportation.	VTrans	Ongoing	Existing state/federal sources	High	New in 2013	\$10,000,000.00	\$40,000,000.00
	4.1.2	Plan and invest in a transportation system that is resilient to potential future conditions resulting from climate change (that is, flood events).	VTrans	Ongoing	Existing state/federal sources	High	New in 2013	\$10,000,000.00	\$40,000,000.00
	4.1.3	Mitigate rock cut and rockslide hazards identified by VTrans maintenance districts and in the <i>Rockfall Hazard Rating of</i>	VTrans	Ongoing	STIP	Medium to high	Rockfall Hazard Rating, re-evaluated and updated in	\$4,500,000.00	\$20,000,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
		<i>Rock Cuts on U.S. and State Highways in Vermont.</i>					2011		
	4.1.4	Integrate fluvial geomorphic considerations and landslide assessments into transportation infrastructure planning, design, construction, and maintenance activities.	VTrans, ANR	Ongoing	PDM, HMGP	Medium	New in 2013	\$1,500,000.00	\$6,000,000.00
	4.1.5	Develop a program to selectively thin or clear trees that could potentially fall across state-maintained highways during a high wind or wet/heavy snow event.	VTrans	Ongoing	State transportation fund	Medium	New in 2013	\$900,000.00	\$3,600,000.00
4.2 Coordinate with private sector organizations to ensure utility infrastructure is protected and prepared for disasters.	4.2.1	Conduct inventory of state-owned facilities in SFHA and FEH zones.	DEMHS, BGS	2013-2015	FEMA PDM or HMGP grant	High	New in 2013	\$20,000.00.00	\$80,000.00.00
	4.2.2	Utilize the Vermont Joint Utilities and State Agencies Emergency Preparation Program to prepare for and respond to natural disasters, and get utility customers restored promptly.	Electric, telecommunication, and gas utilities throughout the state, DEMHS, Public Service Department, weather consultant	2013-2016	Utility company budgets, Federal emergency management program funds, state funds	High	New in 2013	\$30,000.00	\$120,000.00
	4.2.3	Design transmission power structures to prevent a physical cascading failure of multiple structures during natural hazard events, especially extreme ice and tornadoes.	Electric utilities throughout the state	2013-2016	Utility company budgets	High	New in 2013. Design changes implemented after 1998 ice storm	\$35,000.00	\$140,000.00

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	4.2.4	Develop, train, and implement the incident command process model to manage emergency work during natural hazard events, and mitigate associated damage.	Certain electric utilities in the state	2013-2015	Utility company budgets	High	Adopted after Tropical Storm Irene and implemented during Tropical Storm Sandy	\$25,000.00	\$100,000.00
	4.2.5	Conduct inventory of power poles and other electric and telecommunications infrastructure to manage and prepare for natural disasters.	Utilities throughout the state	2013-2016	Utility company budgets	Low to medium	New in 2013	\$10,000.00	\$40,000.00
4.3 Work with federal partners to evaluate statewide hazards and complete mitigation activities.	4.3.1	When feasible, encourage project participation by the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, and others.	ANR – DEC, U.S. Army Corps of Engineers, Natural Resources Conservation Service	2013-2016	Staff	Medium	New in 2013	\$10,000.00	\$40,000.00
4.4 Develop systems to track hazards on a statewide basis.	4.4.1	Adapt the stream bank assessment from the ANR Stream Geomorphic Assessment Protocols to analyze stream bank stability and provide risk analysis in flood-prone areas along transmission system.	Electric utilities throughout the state, ANR – DEC Rivers Program	2011-2012	Utility company budgets	Medium	Developed after Tropical Storm Irene due to the damage caused from stream bank erosion	\$25,000.00	\$100,000.00
4.5 Ensure new buried and suspended water lines at river crossings are designed to withstand flood scouring	4.5.1	Review current design standards to ensure they are adequate and revise or develop new standards if necessary.	ANR	2014-2015	Existing staff, Vermont technical advisory committee	Medium	New in 2013	\$75,000.00	\$300,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
and ice damage.									
4.6 Identify sewage treatment and water supply systems or components that are susceptible to flooding, and implement priority improvements.	4.6.1	Survey municipalities to determine where susceptible systems and components exist, collate responses, and prioritize improvements. Develop and implement a plan to work with municipalities to ensure improvements are made.	ANR – DEC	2013-2015	Annual DW and CW IUPs and DW and CW planning loan funds to queue up projects to access HMGP funds	Medium	New in 2013	\$50,000.00	\$200,000.00
4.7 Ensure Vermont utilities are hardened against flood and FEHs.	4.7.1	Assist Vermont Gas in evaluating the flood vulnerability of Vermont’s natural gas pipeline network through the Integrity Management Program, and identify actions to mitigate this risk.	Public Service Department, Vermont Gas	2013-2016	State General Funds, Vermont Gas, USDOT	Medium	New 2013	\$25,000.00	\$100,000.00
	4.7.2	Utilities revising their Integrated Resource Plans are encouraged to identify critical assets located on floodplains and develop plans for reducing future vulnerability, or if needed relocating those assets as they need rebuilding.	Public Service Department	Ongoing	State General Funds	Medium	New in 2013	\$25,000.00	\$100,000.00
4.8 Implementation of sound river	4.8.1	Adopt the performance standards and design requirements for Bridges and Culverts, Sediment and	ANR - DEC	2013	Existing state funds	High	New in 2013. The Stream Alteration General Permit	\$30,000.00	\$120,000.00

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management.		Debris Removal, and Emergency Measures outlined by the Stream Alteration General Permit and ANR Stream Alteration Regulations (Act 138). ¹⁶					was finalized in 2013.		
Goal 5: Conduct hazard assessments, mapping, and data collection projects to increase knowledge about both the hazards facing Vermont and the most effective mitigation actions for minimizing public exposure to hazards.									
Assess and map hazards, and provide data for mitigation planning and activities.	5.1.1	Facilitate and support the establishment of predictive modeling to understand the impact of climate change on infrastructure. Adopt appropriate codes and standards to mitigate the impacts of climate change.	UVM, VTrans	Ongoing	Existing sources	High	New in 2013	\$30,000.00	\$120,000.00
	5.1.2	Complete emergency action plans for all high and significant hazard dams.	ANR – DEC	2013-2-16	FEMA Dam Safety Grants	High	New in 2013	\$2,000,000.00	\$8,000,000.00
	5.1.3	Complete statewide mapping of river corridors and FEH zones.	ANR – DEC Rivers Program	2013-2014	PDM, DEC, HMGP	High	New in 2013	\$200,000.00	\$800,000.00
	5.1.4	Accelerate current mapping and risk assessment initiatives utilizing the latest technologies (for example, the Vermont Stream Geomorphic Assessment Protocol, the river corridor protection procedures, the Protocol for Identification of Areas Sensitive to Landslide	ANR, DEMHS	2013-2016	PDM-C, FMA, EPA, EMPG grants	High	New in 2013	\$200,000.00	\$800,000.00

¹⁶ See Appendix N for a summary of the Stream Alteration General Permit and information on where to find the complete document.

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
		Hazards in Vermont, LIDAR, VCGI, and HAZUS-MH).							
	5.1.5	Plan for health consequences of climate change and climate variability by developing public health adaptation strategies. See Section 5.4 of the 2013 State HMP for a detailed description.	VDH, UVM	2013-2016	CDC	Medium to high	CDC grant approved for VDH in 2013	\$1,000,000.00	\$4,000,000.00
	5.1.6	Identify where key economic assets (for example, major employers, agriculture, historic centers, and tourism sites) and their associated infrastructure intersect with areas of risk and vulnerability. Select five areas to further analyze and develop strategies to remove, mitigate, or decrease risk to areas of economic activity.	Vermont Economic Resiliency Planning Program, ACCD in partnership with Vermont Association of Planning & Development Agencies (VAPDA), ANR, and AOT	May 2015	EDA grant submitted, matching funds from partner organizations	Medium to high	New in 2013	\$500,000.00	\$2,000,000.00
	5.1.7	Utilize the Protocol for Identification of Areas Sensitive to Landslide Hazards in Vermont, the Vermont Stream Geomorphic Assessment Protocol, and mapping protocols to identify hazards.	ANR – Vermont Geologic Survey and DEC Rivers Program in partnership with RPCs and municipalities	2013-2016	State funds, PDM grants	Medium to high	New in 2013	\$50,000.00	\$200,000.00
	5.1.8	Study and document the hazard vulnerabilities of mobile home parks and their	ACCD, UVM – Department of Community	2010-2013	USDA, NIFA, Disaster Resilience for	Medium to high	New in 2013	\$379,000.00	\$1,200,000.00

STATE OF VERMONT MITIGATION STRATEGY

Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
		residents.	Development and Applied Economics, and Champlain Valley Office of Economic Opportunity – Mobile Home Program		Rural Communities Program				
	5.1.9	Include FEH risk assessment and mapping as an integral element of FEMA map modernization/risk map activities.	ANR – DEC Rivers Program		FEMA CTP, risk map funds	Medium to high	New in 2013	\$15,000.00.00	\$60,000.00.00
	5.1.10	Develop groundwater resource maps for towns, and conduct ongoing statewide assessments to support community planning and identification of future water supplies, particularly for times of drought.	ANR – DEC Vermont Geological Survey	2013-2016	State general funds	Medium	New in 2013	\$65,000.00	\$260,000.00
	5.1.11	Identify the potential for enhanced seismic shaking on soft soil, and make outreach to critical facilities in these areas.	Ongoing	2013-2016	PDM, HMGP	Medium	New in 2013	\$50,000.00	\$200,000.00
	5.1.12	Send a questionnaire to each town requesting the location of any private or public dam not included on the national and state dam inventory list. Emphasize preparedness around high hazard dams.	DEMHS, ANR – DEC Facilities Engineering Division	2013-2014	PDM-C, EMPG grants	Medium	New in 2013	\$8,000.00	\$32,000.00
	5.1.13	Develop a seismic vulnerability ranking system	VTrans, UVM	2012-2015	VTrans research advisory council,	Medium	New in 2013	\$50,000.00	\$200,000.00

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Objective	Action Item Number	Action	Responsible Agency	Projected Time Line	Resources	Priority Status	2013 Update or Revision	Estimated Cost	Benefits of Costs
		for Vermont bridges and slopes associated with bridges, and assign the rankings by conducting thorough seismic analyses of select bridge sites.			FHWA				
	5.1.14	Monitor and participate in, as appropriate, research on climate change and extreme weather events.	VTrans	Ongoing	Existing state/federal sources	Medium	New in 2013	\$30,000.00	\$120,000.00
	5.1.15	Re-evaluate and update Rockfall Hazard Rating of Rock Cuts on U.S. and State Highways in Vermont from 2007.	VTrans	2011-2013	State transportation funds	Low	Completed in 2011 and currently undergoing review	\$15,000.00	\$60,000.00
	5.1.16	Monitor, collect data, and conduct studies on air pollutant levels in Vermont, and their correlation to increased temperatures, specifically ozone, nitrogen oxides, carbon monoxide, particulate matter, sulfur dioxide and toxic elements. Utilize the monitoring stations in Underhill, Burlington, Rutland, and Bennington.	ANR – DEC Air Division	2013-2016	EPA	Low	New in 2013	\$250,000.00	\$1,000,000.00
	5.1.17	Use the Environmental Public Health Tracking Program to collect and publish annual statistics for heat-related emergency department visits, hospitalizations, and deaths on Vermont's tracking portal: http://healthvermont.gov/tracking .	VDH	Ongoing	State funds	Low	New in 2013	TBD	TBD

5.5 State Mitigation and Resiliency Initiatives

The State of Vermont responded to Tropical Storm Irene with a resounding effort to absorb as many lessons as possible, and build the state back significantly more resilient than it was before. This has been done through numerous reports, projects, and initiatives that have all aimed to do one or both of the following: collect Irene-specific lessons, and provide state-level suggestions for mitigation and resiliency. This section intends to catalogue and briefly describe the reports and projects that DEMHS was aware of at the time of drafting the 2013 update to the State of Vermont HMP. All of the below projects and reports are related to improving resiliency in Vermont; however, not all are a direct result of Tropical Storm Irene. At the end of this subsection is a summary of the mitigation projects taking place at the Waterbury State Office Complex at the time of the 2013 update to the State HMP.

- The Vermont Department of Health’s four-year grant project to reduce the health consequences of climate change and climate variability by developing public health adaptation strategies
 - Beginning in 2013, this project will accomplish the following:
 1. Prepare a climate and health profile that identifies and prioritizes five anticipated health impacts and key risk factors associated with climate change in Vermont (by August 2013).
 2. Complete a vulnerability assessment to identify populations and geographic areas that are more likely to suffer health impacts as a result of climate change (by August 2014).
 3. Project the disease burden and assess suitable public health interventions for the high priority climate impacts identified in the climate and health profile (by August 2015).
 4. Develop an evidence-based adaptation plan to prepare the state to address climate-related public health impacts (by August 2016).
 - More information is available at http://www.cdc.gov/climateandhealth/climate_ready.htm.
 - This project is funded by the Center for Disease Control’s Climate Ready City and States Program.
- Vermont State Agency Policy Memo: Smart Growth Implementation Assistance Project—Disaster Recovery and Long-Term Resilience Planning in Vermont
 - This document was written by Gavin Smith, Dylan Sandler, and Mikey Goralnik at the Department of Homeland Security Coastal Hazards Center of Excellence, University of North Carolina at Chapel Hill.
 - This document provides a set of policy recommendations for key state agencies that reflect existing strengths as well as areas in need of improvement. Its recommendations are intended to initiate an ongoing dialogue among state agencies and the number of

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stakeholders that have a role to play in both pre-event planning and post-disaster actions that advance the complimentary aims of smart growth and flood resilience.

- As of the writing of the State of Vermont HMP, this document was still in draft form. It is expected to be completed mid-2013.
- Adapting Vermont’s Transportation Infrastructure to the Future Impacts of Climate Change
 - This document was prepared by Ian Johnson of the VTrans Policy, Planning, and Intermodal Development Division on August 13, 2012.
 - This white paper provides an overview of climate-related adaptation and resilience-oriented efforts underway at VTrans and makes recommendations that will increase the effectiveness of long-term decision-making under any future climate scenario. Its ultimate recommendation is that the agency should focus on minimizing vulnerability to current weather norms while developing holistic analytical tools to enable planners, designers, and decision makers to better adapt to future climate conditions.
 - More information is available at http://vtransplanning.vermont.gov/sites/aot_policy/files/documents/planning/Climate%20Change%20Adaptation%20White%20Paper.pdf.
- Economic Development Administration’s Vermont DR-4022, Economic Impact Assessment
 - This report compiles the qualitative and quantitative data available to describe the consequences of Tropical Storm Irene. It focuses in on the nine most impacted counties and recommends strategies for economic recovery.
 - More information is available at http://vtstrong.vermont.gov/Portals/0/Documents/Vermont_Econ_Impact_Final%20-%2042312.pdf.
- Flood Resilience in the Lake Champlain Basin and Upper Richelieu River
 - This report was written by the Lake Champlain Basin Program, and released on April 2013.
 - This new report provides a comprehensive review of the 2011 flooding impacts of Lake Champlain and the Richelieu River Valley, discussing the impacts to humans, community infrastructure, and the Lake Champlain ecosystem. The report also outlines policy recommendations for the three impacted jurisdictions (Vermont, New York, and Quebec) to consider for increasing our resilience to future flood events in the region. Finally, the document also presents the results of a LCBP flood conference held in 2012 at the request of Vermont Governor Shumlin and Quebec’s former Premier Charest, following the spring 2011 flooding. Find the report at http://www.lcbp.org/wp-content/uploads/2013/04/FloodReport2013_en.pdf
- Community Recovery Partnership Report
 - This report was written by the Vermont Department of Economic, Housing, and Community Development, within the Agency of Commerce and Community Development, and released in October 2012.

- The Community Recovery Partnership (CRP) was created by Governor Shumlin after Tropical Storm Irene in 2011 in order to identify the major needs and capacities of the communities most impacted by Irene, support local leaders, track recovery progress, and enhance coordination and communication among local, regional and state agencies and organizations involved in recovery. The CRP accomplished these tasks through 12 meetings covering the 45 hardest hit Vermont towns.
- This report describes the outreach conducted through the CRP, as well as the outcomes and findings of the partnership. It includes a final section that lists ongoing recovery needs, and the then-current activities taking place aimed at addressing each need.
- Find the report at http://vtstrong.vermont.gov/Portals/0/Documents/CRP_Report10_2012_F.pdf
- Climate Change Adaptation White Paper Series
 - The Climate Change Team within the Agency of Natural Resources (ANR) produced this series of white papers, which provide a brief overview of the challenges facing the different sectors of Vermont, what programs are already in place to address those challenges, and what steps need to be taken next to continue adapting to the impacts of climate change.
 - The paper topics include 1) an overview of climate change in Vermont, 2) agriculture, 3) water resources, 4) recreation, 5) forestry, 6) public health, 7) public safety, 8) fish and wildlife, and 9) transportation.
 - Find the series at <http://www.anr.state.vt.us/anr/climatechange/Adaptation.html>
- Resilient Vermont Project: Stronger Communities, Ecosystems, and Economies
 - Beginning in June 2012, the Institute for Sustainable Communities (ISC) and the State of Vermont, working closely with a range of key stakeholders, will collaborate on an 18-month partnership called the Resilient Vermont Project.
 - The overarching goal of this project is to bolster the state's resilience by producing the following deliverables by fall of 2013:
 1. *Inventory and Gap Analysis*. ISC will inventory and map the existing resilience-building programs and activities already underway in Vermont in the community, economic, and ecosystem resilience arenas, as well as gaps.
 2. *Resilience Workshops*. ISC will design and deliver three workshops, engaging leaders and practitioners from state agencies and statewide stakeholder groups, local communities, business leaders, hazard mitigation officials, and the regional planning and economic development organizations. These working sessions will 1) develop a common lens and integrated strategy for a resilient Vermont, and 2) build the capacity of the participating groups and institutions to work effectively together to develop and implement that strategy.
 3. *Resilience Roadmap*. ISC will also produce a menu of practical recommendations for action. This roadmap will include both low- and no-cost action steps as well as larger, long-term investments, and it will be organized to reflect a range of

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implementation roles and responsibilities, including state and local governments, regional organizations and the private and nonprofit sectors.

- More information available at http://www.iscvt.org/where_we_work/usa/article/resilient-vermont/
- Recovery and Resilience the Vermont Way
 - At the request of Governor Shumlin, in January 2012, the Governor’s Institute on Community Design (GICD) produced this report.
 - This report was written after the GICD visited Vermont in December 2011 to support Irene recovery efforts. It provides recommendations to advance the goals of rebuilding more disaster-resistance communities and a more resilient economy. It also includes models and successful examples from other state recovery efforts.
 - Find the report at http://www.vtstrong.vermont.gov/Portals/0/Documents/GICD_Report_032812.pdf
- Irene Recovery Status Reports
 - The Irene Recovery Office produced a series of recovery reports to document the progress made and lessons learned from Irene. These reports “offer a snapshot showing how far we’ve come, the work underway, and what we see ahead.”
 - Find the earlier recovery reports at <http://www.vtstrong.vt.gov/RESOURCES/RecoveryReports.aspx>
 - Find the most recent recovery report, from April 2013, at <http://vtstrong.vermont.gov/Portals/0/Report%20April%202013.pdf>
 - Additionally, the Irene Recovery Office held a summit in January 2013, to capture highlights from Vermont’s recovery experience a year after Irene. The Summit Summary, “Irene & Beyond: Continuing Vermont’s Recovery, Shaping Our Future Resilience”, can be found at http://vtstrong.vermont.gov/Portals/0/Irene%20and%20Beyond%20Summit%202013_Executive%20Summary.pdf
- Research on Adaptation to Climate Change
 - The Vermont Experimental Program to Stimulate Competitive Research (EPSCoR), funded by the National Science Foundation, selected the Research on Adaptation to Climate Change project, which brings together academics and the private sector to investigate the below question:
 1. How will the interaction of climate change and land use alter hydrological processes and nutrient transport from the landscape, internal processing and eutrophic state within Lake Champlain, and what are the implications for adaptive management strategies?
 2. More information available at <http://www.uvm.edu/~epscor/new02/?q=node/30>
- Disaster Recovery and Long-Term Resilience Planning in Vermont
 - This report is the result of technical assistance provided by the U.S. Environmental Protection Agency’s (EPA’s) Smart Growth Implementation Assistance (SGIA)

program and the Federal Emergency Management Agency (FEMA) to the State of Vermont in the wake of Tropical Storm Irene.

- EPA's SGIA program reviewed state and local policies in Vermont that affect flood resilience. This review included local development regulations, community plans, and HMPs in two Mad River Valley communities that experienced damage from Irene—Moretown and Waitsfield. They also reviewed state agency policies and initiatives that influenced the state's ability to recover from and plan for long-term resilience after Irene. The project's methodology, described in the report, can serve as a prototype for other communities interested in assessing and strengthening their flood resilience policies.
- The report describes specific steps that communities can take to enhance their flood resilience, and provides a checklist that can assist communities with accomplishing some of the tasks. The report also provides numerous examples of projects and policies being implemented across Vermont and throughout the country to improve flood resilience.
- As of the writing of the 2013 State HMP update this report was in draft form. The final report will be available at http://accd.vermont.gov/strong_communities/opportunities/planning/resiliency/sgia
- Vermont's ACCD has adapted the EPA SGIA report for a statewide audience, with the same title, and this can be found at <http://accd.vermont.gov/sites/accd/files/Documents/strongcommunities/cpr/Vermont%20SGIA%20Guidance%20Document%20FINAL.pdf>

Hazard Mitigation and the Waterbury State Office Complex

As of the writing of this document, demolition has begun as a step toward reconstruction of the Waterbury State Office Complex (WSOC) on South Main St. in Waterbury from the devastating flooding caused by Tropical Storm Irene. Section 404 of the Stafford Act allows for standalone cost effective mitigation projects through the Hazard Mitigation Grant Program (HMGP), and Section 406 of the Stafford Act allows for hazard mitigation measures to improve damaged elements of a facility for which there is a repair Project Worksheet (PW) under the FEMA Public Assistance (PA) program.

For the WSOC both 404 and 406 hazard mitigation opportunities were identified. The final WSOC PWs include \$35 million of 406 hazard mitigation for a consolidated improved project, under the provisions of the Sandy Recovery and Improvement Act, passed by the U.S. Congress in 2013. In addition, \$631,000 in 404 hazard mitigation was identified for the demolition of four structures in the Special Flood Hazard Area.

5.5.1 Changes in HMGP Regulation Since 2010

The State-administered process for applying for and reviewing FEMA Hazard Mitigation Grant Program (HMGP) projects has changed dramatically in Vermont since the 2010 State of Vermont HMP. Many of these changes are reflective of lessons learned following Tropical Storm Irene and these changes are listed below.

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- DEMHS revised the HMGP application document by simplifying the information requested, making it more user friendly, and creating two different versions – one with a calculator built into the budget to further assist applicants, and one without.
- DEMHS increased the level of outreach conducted for announcing the HMGP funding opportunity, and educating about eligibility and application requirements.
 - Conducted statewide webinar for municipalities, RPCs, and eligible nonprofits.
 - Increased publicity by working with state partners such as Vermont League of Cities and Towns (VLCT), Better Back Roads, and RPCs to announce the various HMGP application rounds.
 - Conducted conference calls with RPCs to discuss eligible projects in their regions, including a focus on properties in the NFIP repetitive loss list.
- Participation and interest at the State Mitigation Project Selection Committee meetings greatly increased: active participation on behalf of the Agency of Administration, DEC, ACCD, RPCs, and Vermont Housing and Conservation Board (VHCB) became regular.
 - Some State Mitigation Project Selection Committee operating procedures changed, such as we began utilizing the newly renovated EOC's increased technological capabilities for increased efficiency of application review.
- DEMHS increased the level of scrutiny applied to eligibility criteria on HMGP applications prior to the project selection meeting.
- DEMHS now requires subapplicants to complete numerous FEMA-required forms prior to forwarding the applications to FEMA, whereas the forms were previously sent to FEMA post-award.
- The State Mitigation Project Selection Committee accepted a variety of applications that it did not previously accept:
 - DEMHS broadened the scope of eligible 5% Initiative projects by allowing projects such as generators for critical facilities to apply.
 - DEMHS accepted HMGP applications from secondary homes and commercial properties, which was previously not allowed.
- Increased training opportunities to support the HMGP application process to include Benefit-Cost Analysis training and Local Mitigation Plan training are now available to local jurisdiction representatives.
- DEMHS actively uses LHMPs as a tool to identify eligible HMGP projects.
- Standard Operating Procedures were created for HMGP projects, including the Acquisition Closing and Demolition phases of buyout projects, as well as for Infrastructure Projects.
- A tracking tool was developed for use in tracking by towns of In-Kind costs associated with Labor, Equipment, and Mileage to meet both 25% Match and 2% Administrative Costs.
- DEMHS and ACCD worked closely together to best utilize the Community Development Block Grant as a 25% match for HMGP projects.

- DEMHS partnered with the State NFIP Coordinator to ensure program compliance was leveraged when HMGP applications were received.
- DEMHS has partnered with Leidos to streamline the HMGP application process and reporting tools for future events.
- Increased outreach has occurred through VLCT to advertise HMGP Application Deadlines, changes to the ERAF, and changes to the NFIP.

5.5.2 Summary of “Rivers Bill” Components of Act 138

Act 138 was passed to increase mitigation measures as related to river and lakes management. The act, known as the Rivers and Lakes Bill (S.202) promotes natural floodplain function, decreasing the reliance on expensive and increasingly vulnerable manmade structures to protect the community from flood hazards; identifying river management practices to minimize environmental impacts and river erosion hazard, especially in response to the imminent public safety and infrastructure threats addressed after a major flood like Irene; and promoting natural stream and river stability by helping towns identify and protect highly sensitive river corridors. Although certain components of Act 138 are incorporated into the above mitigation strategies, the following summary of the act’s objectives provides the components as they relate to river management, according to Vermont’s ANR – DEC Rivers Program from the Watershed Management Division.

Objective: Comply with the NFIP, and protect floodplains in partnership with Vermont communities.

- Increases support for towns seeking technical reviews of floodplain development proposals. ANR has been given the authority to delegate authority to trained RPC and municipal staff to review development proposals requiring municipal permits under the NFIP. By creating a greater network of professionals to assist towns with floodplain regulation, Vermont will substantially increase municipal participation, awareness, and protection of their floodplain assets.
- Requires state regulation of floodplain encroachments currently exempt from municipal regulation (for example, agriculture, silviculture, transportation, utilities, and schools). Importantly, this action will help bring Vermont into compliance with the NFIP. States that are not in compliance risk suspension from the NFIP and loss of access to the federally subsidized insurance, which paid out 49 million to Vermont policy holders after Irene. The rules must be in effect by July 1, 2014.
- Allows for state floodplain regulations that are more protective than those required by the NFIP. ANR would be required to work with FEMA, sister agencies, and other interested parties to adopt floodplain rules. The regulation of certain floodplain activities may be delegated by the ANR to other state agencies of jurisdiction (for example, floodplain developments sought by farmers would be regulated by the Agency of Agriculture).
- Allows the agency to regulate floodplain developments through a general permit, which would create an opportunity to spend limited state resources on those floodplain activities that have the greatest potential to impact floodplain functions.

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- Requires the ANR to promote floodplain protections through an outreach program that would include helping towns adopt model floodplain protection bylaws and ordinances that would exceed the minimum criteria of the NFIP in terms of hazard mitigation.

Objective: Reduce the vulnerability of private and public property and river ecosystems after floods.

- Allows the state to adopt Stream Alteration Rules. Rule-making authority provides the opportunity for the state to engage interested parties in codifying the management criteria necessary to meet statutory intent.
- Requires the state to adopt rules for conducting emergency protective measures after a flood. Starting March 1, 2013, municipalities were required to notify ANR within 24 hours (instead of 72 hours) of taking an emergency protective measure in a river. New rules and associated technical procedures will assist town officials in identifying imminent threats and the emergency measures that will reduce the vulnerability of town citizens and their property in future floods. The new emergency river management rules, in effect by March 1, 2013, will:
 - Require an activity to be permitted either through an individual permit or under the coverage of a general permit
 - Prohibit the construction of berms unless deemed by the agency to be a necessary emergency protective measure
 - Provide activity specific criteria such that emergency protective measures are conducted in a manner consistent with the statutory criteria for stream alterations:
 1. Will not adversely affect the public safety by increasing flood or FEHs
 2. Will not significantly damage fish life or wildlife
 3. Will not significantly damage the rights of riparian owners
 4. In case of any waters designated by the board as outstanding resource waters, will not adversely affect the values sought to be protected by designation
 - Address the management of large woody debris in-stream channels after floods
- Specifies that the state regulates the movement, fill, and excavation of 10 cy or more of in-stream material, which includes all gradations of sediment, ledge rock, and large woody debris.
- Requires the ANR to establish and maintain a river management training program to help VTrans, municipalities, consulting engineers, RPCs, and ANR staff identify river instability and design river restoration and protection measures that will both protect river ecosystems and minimize river erosion hazards.

Objective: Increase incentives for river corridor planning and protection.

- Allows for the adoption of rules and requires the adoption of procedures to delineate and protect river corridors and reduce FEHs. The rules would promote the public interest by encouraging municipal shore land and river corridor protection area zoning bylaws. A river corridor protection area is an area within a river corridor subject to fluvial erosion and may occur as a river establishes and maintains the dimension, pattern, and profile associated with

dynamic equilibrium condition and would represent a hazard to life, property, and infrastructure placed within the area.

- Establishes the River Corridor and Floodplain Management Program. This change acknowledges the importance of combining the state policy, planning, and regulation of the landforms critical to the management of inundation and FEHs. For instance, the legislation requires the agency to develop recommended best practices for management of river corridors, floodplains, and buffers.
- Requires ANR to conduct stream geomorphic assessments and provide river corridor plans, maps, and model protection bylaws to municipalities. Statutory changes require that river corridors be delineated and mapped based on river sensitivity where a river poses a probable risk of harm to life, property, and infrastructure. River sensitivity means the potential of the river, given its inherent characteristics and present geomorphic conditions, to be subject to a high rate of fluvial erosion and other river channel adjustments, including erosion, deposits of sediment, and flooding. This statutory definition creates an important link between the vertical stability of a river (equilibrium conditions) and the public's interest in safety and property protection, which are primary objectives in regulating stream alterations.
- Requires the ANR, RPCs, and municipality to post completed river corridor maps of public websites. The maps will include and recommend best practices for management of river corridor protection areas, flood hazard areas (that is, NFIP floodplains), and buffers. In addition to providing maps, the state will provide municipalities with alternative river corridor protection area bylaws and ordinances.
- Requires the Secretary of Administration to establish a Flood Resilient Communities Program. Through this program, the state would provide increasing financial incentives to those municipalities that have taken greater and greater steps to protect river corridors and floodplains and mitigate other flood and FEHs.
- Provides authority for municipalities to regulate development within river corridor protection areas. Towns may now adopt freestanding bylaws to protect river corridor protection areas.

Act 138 also contains provisions for:

Stormwater: Provides the ANR with the authority to adopt rules regulating stormwater discharges during an emergency; requires the ANR to report the use of voluntary credits for stormwater discharges from renewable energy projects located at an elevation above 1,500 feet (that is, wind energy projects) to the legislature by January 15, 2014.

ANR Water Quality Remediation, Implementation, and Funding Report: Required the Secretary to report recommendations on how to remediate or improve the water quality of the state's surface waters, how to implement remediation or improvement of water quality, and how to fund the remediation or improvement of water quality to the legislative committees on or before December 15, 2012. The report included a description of how the state should regulate development in shorelands of lakes, including whether the state should enact statewide regulation for activities within shorelands of lakes and whether any regulation of activities within shorelands should be based on-site-specific criteria.

Transfer of Rule-making from the Water Resources Panel to the ANR: Grants the authority to establish mixing zones, adopt water quality standards, and make declaratory rulings;

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establishes water quality classifications; establishes rules to regulate the use of the public waters, rules to govern the surface levels of lakes, ponds, and reservoirs that are public waters of the state, and rules for considering the size and flow of the navigable waters.

Vermont Housing and Conservation Trust Fund: Adds “the protection of lands for multiple conservation purposes, including the protection of surface waters and associated natural resources” to the list of eligible land conservation activities supported by the Conservation Trust Fund.

Lake Champlain TMDL Implementation Plan: Establishes that within 12 months after the EPA issues a phosphorus total maximum daily load plan for Lake Champlain, the ANR should issue a revised Vermont-specific implementation plan for the area; establishes that the plan should be updated every 4 years thereafter.

5.5.3 Summary of Five Percent Initiative Project Applications Submitted for Funding (DR-4022)

The catastrophic effects of Tropical Storm Irene have opened up a tremendous opportunity for mitigation funding under the HMGP 5 percent initiative. The following projects were submitted to FEMA for consideration under the 5 percent initiative, and display the innovative approach DEMHS’s state, regional, and municipal partners take in seeking more effective means of accomplishing the state’s mitigation goals.

Statewide Education and Outreach for Flood Resiliency: Incorporate standard river management procedures and flood response programs for state agencies and municipalities for restoring infrastructure and rivers in the aftermath and large floods; provide fluvial geomorphic assessments, river corridor planning, and FEH risk mapping; develop *focus of floods*, a public education, awareness, and engagement initiative to be incorporated into the State of Vermont HMP. This initiative was approved by FEMA on July 19, 2012.

- Applicant: ANR – DEC
- Project cost:\$592,582
- Federal share:\$444,437
- Local share:\$148,145

Agricultural Hazard Mitigation Initiative: Identify priority watersheds/floodplains for agricultural hazard mitigation; correlate floodplains with farms; identify flood hazards on farms; educate farmers about the importance of hazard mitigation; and develop projects and proposals to mitigate the identified flood hazards in cooperation with the Vermont Agency of Agriculture, Food, and Markets and the ANR – DEC. This application was submitted to FEMA on November 9, 2012.

- Applicant: Vermont Association of Conservation Districts
- Project cost:\$267,000
- Federal share:\$200,250
- Local share:\$66,750

Assessing and Mitigating Vulnerability and Risk from Flooding on Transportation Infrastructure: Develop and apply methods that integrate river corridor planning and geomorphic assessments with transportation planning and decision-making to assess and mitigate risks from flooding on the transportation system; develop, apply, and test the methods in up to three watersheds resulting in a new implementation process and modifications to the VTrans project prioritization process. This application was submitted to FEMA on November 9, 2012.

- Applicant: VTrans
- Project cost:\$878,284
- Federal share:\$658,713
- Local share:\$219,571

Bennington County Natural Hazard and Vulnerability Assessment: Develop a natural hazard assessment to create hazard maps for flood, winter storm, wildfire, and landslide hazards within the county for better planning for hazards that cross town lines. This application was submitted to FEMA on February 26, 2013.

- Applicant: Bennington County Regional Commission
- Project cost:\$76,875
- Federal Share:\$57,656
- Local share:\$19,218

Municipal Emergency Response, Recovery, and Mitigation Toolkit: Develop an emergency response, recovery, and mitigation guidebook by compiling guides, fact sheets, and other materials into a single user-friendly manual to be accompanied by a train-the-trainer workshop for Vermont's RPCs; train RPCs to train municipal staff. This application was submitted to FEMA on February 26, 2013.

- Applicant: Lamoille County Planning Commission
- Project cost:\$47,940
- Federal share:\$35,955
- Local share:\$11,985

Home and Business Owner Hazard Mitigation Outreach: Develop flood mitigation outreach brochures with structural mitigation techniques used in Lamoille County; a multimedia flood mitigation outreach video project with examples of flood-proofing projects in Lamoille County; and three types of mitigation and resiliency workshops tailored specifically to homeowners, business owners, and contractors. This application was submitted to FEMA on February 26, 2013.

- Applicant: Lamoille County Planning Commission
- Project cost:\$49,693
- Federal share:\$37,269
- Local share: 12,423

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Country Club Pump Station Generator: Retrofit an emergency generator to support the country club pump station. This application was submitted to FEMA on February 26, 2013.

- Applicant: Rutland City
- Project cost:\$11,500
- Federal share:\$8,625
- Local share:\$2,875

College Pump Station Generator: Retrofit an emergency generator to support the college pump station. This application was submitted to FEMA on February 26, 2013.

- Applicant: Rutland City
- Project cost:\$54,000
- Federal share:\$40,500
- Local share:\$13,500

Erosion Hazard Risk Assessment: Conduct an erosion hazard risk assessment to develop a targeted work plan for the Mill Brook Watershed. This application was submitted to FEMA on February 26, 2013.

- Applicant: Southern Windsor County RPC
- Project cost:\$76, 850
- Federal share:\$57,637
- Local share:\$19,212

Flooding Mitigation & Outreach: Develop a series of black and white print advertisements to replace those no longer available from FEMA, video clips featuring sites destroyed by Tropical Storm Irene, and briefing packets and radio advertisements to be used to educate people about flood risks and to create public momentum to avoid and mitigate flood damage. This application was submitted to FEMA on February 26, 2013.

- Applicant: Two Rivers-Ottawquechee RPC
- Project cost:\$30,000
- Federal share:\$22,500
- Local share:\$7,500

Education and Training for Municipal Officials on Changes to the Emergency Relief and Assistance Fund (ERAF): Educate local officials about incentives for adopting specific hazard mitigation measures and about individual town technical assistance in adopting those measures articulated in the new ERAF rule. This application was submitted to FEMA on February 26, 2013.

- Applicant: Vermont League of Cities and Towns
- Project cost:\$88,041
- Federal share:\$66,031

- Local share:\$22,010

The total amount of FEMA funds requested under DR-4022-VT for 5 percent initiative projects is\$1,629,573.

5.6 Funding Sources

5.6.1 Federal Funding Sources

The table below is a summary of federal funding sources that primarily support hazard mitigation projects and planning in the State of Vermont. Many of the identified funding sources below have been available to Vermont in the 2010-2013 timeframe as a result of Tropical Storm Irene. FEMA’s Community Rating System, HMGP, Individual and Household Program, National Flood Insurance Program, and Public Assistance funding programs assisted Vermont citizens in recovering from the disaster. These funds were utilized to replace and repair damaged homes and provide financial assistance to families and individuals for basic needs. The U.S. Department of Housing and Urban Development provided CDBG Disaster Recovery funds for long-term housing and economic recovery following the storm. Additionally, the Small Business Administration provided direct loans to home and business owners needing additional funding to repair or rebuild uninsured disaster damage. The U.S. Economic Development Association provided three grants for a total of \$515,000 to assist in the economic recovery following Tropical Storm Irene. All funding sources provided are essential to Vermont remaining as resilient as possible.

**Table 5-4
Federal Funding Sources**

Funding Agency	Program	Type of Assistance	Availability	Managing Agency
FEMA	Community Assistance Program	Pre-disaster funding for States to provide technical assistance to communities in the NFIP and to evaluate community performance in implementing NFIP floodplain management activities	Pre-disaster	DEMHS
FEMA	Community Rating System	Flood insurance discounts	Pre- and post- disaster	ANR
FEMA	Disaster Preparedness Improvement Grants	Pre-disaster cost share grants for plan improvement and updates, as well as for implementing identified mitigation projects	Annual, pre-disaster	DEMHS
FEMA	FMA Program	Pre-disaster cost share grants for projects and planning	Annual, pre-disaster	DEMHS
FEMA	HMGP	Post-disaster cost share grants	Post-disaster only	DEMHS
FEMA	Individual and Household Program	Post-disaster grants	Post-disaster	DEMHS
FEMA	National Flood Insurance Program	Pre-disaster flood insurance	Pre- and post- disaster	ANR
FEMA	PDM Program	Grants provided on competitive basis to state and local jurisdictions for	Annual, pre-disaster	DEMHS

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Funding Agency	Program	Type of Assistance	Availability	Managing Agency
		projects and planning		
FEMA	Public Assistance	Post-disaster aid to state and local jurisdictions	Post-disaster	DEMHS
U.S. Department of Agriculture, National Resources Conservation Services	Emergency Watershed Protection Program	Provides financial and technical assistance to remove debris from stream channels, road culverts, and bridges; reshape and protect eroded banks; correct damaged drainage facilities; establish cover on critically eroding lands; repair levees and structures; and repair conservation practices	Post-Disaster	ANR
U.S. Department of Housing and Urban Development	CDBG Disaster Recovery	Post-disaster aid to state and local jurisdictions for long-term housing and economic and community recovery	Post-disaster	ACCD
Small Business Administration	Disaster Assistance Programs	Direct loans to businesses to repair or replace uninsured disaster damage	Post-disaster	DEMHS
U.S. Army Corps of Engineers	Various programs, including the Silver Jackets Initiative	Large-scale infrastructure and watershed projects	Pre- and post-disaster	DEMHS, ANR
Economic Development Administration		Direct funding to RPCs	Annual, Post-disaster	RPCs

In the 2010-2013 timeframe, the state drew mainly upon existing mitigation funding streams. While no new funding streams were utilized during this period, there was an increased emphasis on utilizing a collaborative, interagency approach to mitigation funding. The state makes every effort to draw on a wide range of funding streams for mitigation projects. FEMA’s HMGP, PDM-C Program, and FMA Program may provide up to 75 percent of funding for both project and planning grants. Local communities typically contribute the 25 percent local share of federally funded projects. CDBG Disaster Recovery funding may be available to provide the 25 percent match for approved HMGP-funded acquisitions and may also fund other post-disaster projects such as relocation payments due to disaster displacement, debris removal not covered by FEMA, rehabilitation of homes and buildings, and public services. Up to 90 percent of projects costs may be covered by FEMA in PDM-C for approved projects in designated “small and impoverished” communities. As FEMA funds for mitigation are reduced, it is increasingly important to explore multiple funding sources for future mitigation projects.

5.6.2 State Funding Sources

Beginning in 2011, additional funds have been provided by HUD’s Community Development Block Grant Program, which is administered by ACCD. Following Tropical Storm Irene, the Vermont Housing and Conservation Board has also provided funding for the personal match required for certain property acquisitions in identified flood zones.

State Funding Sources:

- State transportation fund

- VTrans research advisory council – funded both by state and federal funds
- Vermont Strong
- ERAF – state cost share of the non-federal match required for Public Assistance grants
- U.S. Department of Housing and Urban Development’s Community Development Block Grant program, administered by ACCD
- Vermont Housing and Conservation Board
- Better Back Roads – grants provided by both VTrans and ANR
- State Drinking Water Revolving Loan and Grant Fund – administered by ANR
- State Clean Water Revolving Loan and Grant Fund – administered by ANR

5.6.3 Other Funding Sources

Other funding sources include the electric, natural gas, and telecommunication utility companies throughout Vermont; the Municipal and Regional Planning Fund; the Stratton Foundation; the Vermont Disaster Relief Fund; and the New Hampshire Charitable Foundation.

Many of these funding sources were available following Tropical Storm Irene. For example, the Vermont Disaster Relief Fund is a nonprofit that was established to coordinate resources and raise funds for Vermont recovery. Additionally, the State of Vermont is fortunate to have the Stratton Foundation, a private foundation that invests in its local community. The Stratton Foundation provided matching funds to households following Tropical Storm Irene so that there would be less of a burden on homeowners looking to have their property acquired via the FEMA HMGP program. The New Hampshire Charitable Foundation awarded four grants to the Vermont Land Trust to support land conservation projects along the Connecticut River, including \$70,000 to support a permanent conservation easement in Newbury, Vermont, protecting 1,660 feet of river frontage.

Municipal and Regional Planning Fund

The Municipal and Regional Planning Fund can help fund mitigation activities through two means. The Municipal Planning Grant Program receives appropriations from this fund to support Vermont towns in their municipal planning efforts. The program funds technical assistance for town planning, implementation of plans and ordinances, encouragement of citizen participation and education, and innovative demonstration planning projects. Funded planning grants have included updating town plans and land use regulations, revising zoning bylaws, assessing water resources and town growth and development, and developing storm water retention plans.

This program was created more than 20 years ago as part of Act 200 in 1988. Approximately \$700,000 may be available in any given fiscal year, statewide, through a competitive application process; this amount may vary depending upon legislative priorities. Municipalities may apply for any amount up to \$15,000 for single applications or up to \$25,000 for consortia applications. Eligible applicants must coordinate efforts with municipalities that have been confirmed by their local RPC. This includes a requirement that their RPC formally approve the town’s adopted plan. Grant activities must be completed within 18 months of the award.

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Secondly, the Municipal and Regional Planning Fund can be used to achieve mitigation activities through the RPCs. RPC base funding is derived from this funding source, and RPCs typically use these non-federal dollars to match assistance to towns, which are funded under EMPG, HMGP or PDM grants, which require 50 percent and 25 percent matches, respectively. The annual amount of the Municipal and Regional Planning Fund that helps support these efforts is in excess of \$100,000.

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In March 2002, the Governor's Authorized Representative designated and the Federal Emergency Management Agency (FEMA) approved the State's 11 Regional Planning Commissions (RPCs) as eligible communities to receive assistance under Disaster Mitigation Act of 2000. The RPCs are created by statute and are nonprofit political subdivisions of the state with boards of directors appointed by their member communities. In practice, they provide a variety of tasks at the regional level and in assistance to towns, often acting in certain capacities in lieu of County government. There is no County government in Vermont. The figure below shows the boundaries of all the towns and RPCs in the State of Vermont.

Figure 6-1
Vermont Regional Planning Commission Boundaries

Vermont Regional Planning Commission Boundaries



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Vermont's strategy is to work with each of the RPCs and their constituent local governments to establish mitigation plans that would cover each community. In the recent past, local governments within the Regional Planning Commission areas developed local annexes with town-specific policy recommendations and mitigation capital improvements to joint regional mitigation plans, relying on regional vulnerability assessment and plan coordination. Utilizing Pre-Disaster Mitigation-Competitive (PDM-C) funds, Vermont Division of Emergency Management and Homeland Security (DEMHS) has provided assistance in plan development to communities under the aegis of the established RPC structure. This model was lauded and recognized by FEMA, with DEMHS receiving a Project Impact Model State award from FEMA Region I in 2000. This was largely funded using PDM-C funds matched with state planning dollars. In addition, the DEMHS has provided assistance in plan development to RPCs through emergency management program grants that the RPCs match with state planning funds and local in-kind.

Currently, 11 RPCs coordinate regional and local mitigation planning and strategy. These include Addison County RPC, Bennington County Regional Commission, Central Vermont RPC, Chittenden County RPC, Lamoille County Planning Commission, Northeastern Vermont Development Association, Northwest RPC, Rutland RPC, Southern Windsor County RPC, Two Rivers-Ottawaquechee Regional Commission, and the Windham Regional Commission.

RPCs are now mainly approaching local mitigation plans as standalone documents, due to the issue of plan expiration being based on the first town that is approved in a regional effort. RPCs are now receiving funding for mitigation plan development and plan updates through FEMA's PDM-C grant program as well as HMGP, DEMHS and the local towns. Additional PDM-C Planning grants were approved in 2012 for two RPCs to fund local plan development.

6.1 Local Capability Assessment

At the local level, the RPCs work closely with communities in formulating mitigation projects and planning efforts. Local mitigation policies, planning, and potential project sites are determined by the towns through meetings facilitated by the local RPCs. that include local legislative bodies, administrators, public works departments, emergency services, and highway crews. The RPCs provide much of the preliminary hazard identification and mapping that is needed for these discussions using their Geographic Information Systems (GIS) skills and then customize it based on local conditions. Through regular RPC meetings with DEMHS and other state agencies, these local mitigation needs are communicated and coordinated with other state efforts.

In 2010, a comprehensive DEMHS and State of Vermont Hazard Mitigation Committee review of regional/local mitigation capability revealed an increased awareness and staff commitment by many RPCs for mitigation projects and planning. In one sense, the regional capability was present, but needed additional support and encouragement by DEMHS and state partners as well as additional funding resources through FEMA PDM-C Planning grants. With the newly approved PDM-C Planning grants, the RPCs will devote more time and effort in assisting local communities in developing local mitigation plans. Ongoing funding sources will be needed to continue to update or revise plans. In addition, plan requirements necessitate much more work

COORDINATION OF LOCAL MITIGATION PLANNING

than in the initial plans, and plans that may have been done for a few thousand dollars are now several thousand dollars for smaller towns and tens of thousands of dollars for larger towns.

The RPCs and local communities are in the best position to determine their own mitigation needs; therefore, the state relies on these entities to provide information to advance mitigation goals and priorities. Through a collaborative arrangement, DEMHS, RPCs, and towns identify and prioritize local mitigation needs. These issues are discussed during regularly scheduled meetings between RPCs, DEMHS, and other members of the Hazard Mitigation Committee. When requested by the RPC/town, the State Hazard Mitigation Officer will schedule site visits to potential hazard areas to ascertain the most appropriate solution to remediate a specific hazard.

Once the town and RPC identify a specific, critical mitigation area, the State Hazard Mitigation Officer works with the RPC, local officials and relevant state agencies on preliminary project design and will recommend a particular grant program to address the mitigation need. These recommendations are also shared with the Hazard Mitigation Committee members during the project review process.

The local RPCs help towns determine the most appropriate mitigation policy and planning. For example, RPCs have worked with local town officials to draft the necessary floodplain ordinances and complete paperwork required for NFIP membership in towns that had not participated. In another example, RPCs provide direct grant writing and administration assistance to local town officials to help implement HMGP mitigation projects and resolve remaining obstacles to project completion. Such efforts include a HMGP erosion control project in Cavendish, as well as a variety of projects in several towns, primarily aimed at mitigating flood damage.

Beginning in 2010 and continuing to the present time, the VT League of Cities & Towns (VLCT) has been instrumental in informing towns regarding newer state policies and mitigation initiatives. VLCT is conducting outreach to towns in connection with the new ERAF incentives, which promote a more proactive approach by participating towns for implementation of pre-disaster mitigation projects and initiatives.

As much as possible, DEMHS strives toward a proactive approach to assist in the development of local mitigation planning and response. The addition of two mitigation planners at DEMHS in 2012 will help improve technical assistance and outreach for mitigation project development. Small and impoverished communities are actively encouraged to work with their respective RPC and DEMHS in identifying current and potential hazard sites. If a specific technical requirement needs to be satisfied, the RPCs or DEMHS act as a conduit for coordinating assistance from the relevant federal, state or local agency. This may involve obtaining the necessary floodplain data, environmental assessment, mapping information, engineering support, et al. Most recently, this has been done for the towns of Troy, Lyndonville, and Grafton, in connection with the PDM-C and FMA programs. In the case of a recent landslide in Hardwick, DEMHS was instrumental in coordinating a speedy multi-agency response with the town manager of Hardwick, local RPC, the Agency of Natural Resources (ANR), VTrans, Department of Environmental Conservation (DEC), Natural Resource Conservation Service, and the Army Corps of Engineers. It has been our experience that this collaborative multi-agency approach is often the most effective way to respond to mitigation needs throughout the state. We further believe that this synergistic approach is both practical and efficient, and effectively helps to combine federal, state, and local resources in meeting specific local needs.

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Local mitigation policies will be reviewed on a yearly basis by DEMHS and the RPCs to help evaluate their overall effectiveness. The local plans will also be reviewed by the State Hazard Mitigation Officer and/or state mitigation staff to ensure that these reflect state and regional priorities. When necessary, changes deemed will be recommended for inclusion into the updated local mitigation plan, to be done at five-year intervals or more frequently.

Local Plan Updates

The State of Vermont has maintained data to capture statistics, statues and information regarding plan updates. Below are several tables that reflect the findings.

6.2 Existing Local Policies

Local municipalities have the greatest authority to implement comprehensive hazard mitigation programs for their community. Title 24 Chapter 117 makes it clear that the right to determine which ordinances and bylaws will be adopted, what is included in those local regulations, and what is included in municipal plans rests largely with the local community. State agencies can suggest that certain provisions be incorporated into local regulations, and Act 250 and the NFIP provide some state and federal influence as well. However, for the most part towns develop their own rules for development and land use, including along flood and erosion hazard areas. They are also the entities that issue municipal permits, reviewing them for compliance with their own municipal bylaws. As can be seen in the below table, some municipalities in Vermont still choose to have no zoning. All Vermont communities have the option to develop and adopt different kinds of plans, including comprehensive plans, capital improvement plans, economic development plans, emergency operations/response plans, continuity of operations plans, and hazard mitigation plans (HMP). Vermont municipalities have the power to levy taxes/assessments for special purposes. Finally, Vermont municipalities also have the authority to create planning, emergency management, health, public works, economic development and other agencies as needed. All of these authorities have, or potentially could have, an impact on local hazard mitigation.

In 2012, the VLCT published a document titled the 2012 Vermont Municipal Land Use Regulation Practices and Fees, which provides local governments with statewide land use regulation information from various municipalities¹⁷. The information was collected as part of the 2012 Municipal Census Survey that was sent to all member municipalities in the spring of 2012. The survey, which included a variety of municipal questions, received 170 responses, or 65% out of Vermont's 260 municipalities. The report reveals municipality mitigation policies, programs, and capabilities such as adopted zoning boards, acts, codes, regulations, and bylaws, which ultimately enhance local hazard mitigation.

¹⁷Vermont League of Cities and Towns. "Vermont Municipal Land Use Regulation Practices and Fees", 2012, <<http://www.vlct.org/assets/MAC/2012%20VLCT%20Land%20Use%20Regs%20Report.pdf>> (accessed August 22, 2013).

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**Table 6-1
Zoning Regulation Provisions**

Name of Municipality	Design Control Districts per 24 V.S.A. § 4414(1)(E)	Historic District per 24 V.S.A. § 4414(1)(F)	Traffic Overlay Districts per 24 V.S.A. § 4414(2)	Aquifer (Water Resource) Protection Overlay Districts per 24 V.S.A. § 4414(2)	Viewshed / Scenic Overlay per 24 V.S.A. § 4414(2)	Other
Barre City	✓	✓				
Berkshire Town						✓
Brattleboro Town		✓				
Brighton Town						✓
Cabot Town				✓		
Calais Town		✓		✓		
Chelsea Town		✓				
Dorset Town	✓	✓		✓		
East Montpelier Town				✓		✓
Enosburg Falls Village	✓			✓		
Fair Haven Town	✓	✓				
Georgia Town	✓			✓	✓	
Glover Town						✓
Hyde Park Town				✓	✓	
Lincoln Town				✓	✓	
Ludlow Village	✓	✓	✓	✓	✓	
Moretown Town		✓		✓		
Morristown Town				✓		✓
North Bennington Village		✓				
Northfield Town		✓		✓		
Norwich Town		✓		✓		
Peacham Town				✓		
Readsboro Town				✓		

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Name of Municipality	Design Control Districts per 24 V.S.A. § 4414(1)(E)	Historic District per 24 V.S.A. § 4414(1)(F)	Traffic Overlay Districts per 24 V.S.A. § 4414(2)	Aquifer (Water Resource) Protection Overlay Districts per 24 V.S.A. § 4414(2)	Viewshed / Scenic Overlay per 24 V.S.A. § 4414(2)	Other
Rockingham Town	✓	✓		✓		
Shelburne Town	✓	✓		✓	✓	✓
Shrewsbury Town	✓	✓				✓
Springfield Town	✓	✓	✓	✓		✓
St. Albans City	✓	✓				
St. Johnsbury Town	✓					
Stowe Town	✓	✓			✓	
Warren Town		✓				
Waterbury Town	✓					
Waterbury Village	✓					
Wilmington Town	✓	✓				
Windham Town	✓	✓	✓	✓	✓	
Windsor Town	✓	✓				
Winooski City	✓					✓

**Table 6-2
Local Planning and Land Use Tools**

Name of Municipality	Has Municipal Plan	Municipal Plan is Current	Municipality has an Official Map as per 24 V.S.A. § 4421	Municipality has Adopted Subdivision Regulations/Bylaws
Alburgh Town	✓	✓	✓	
Andover Town	✓	✓	✓	✓
Barnard Town	✓	✓		✓
Barnet Town	✓	✓		✓
Barre City	✓	✓		✓
Barre Town	✓	✓		✓
Barton Town	✓	✓	✓	✓

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Name of Municipality	Has Municipal Plan	Municipal Plan is Current	Municipality has an Official Map as per 24 V.S.A. § 4421	Municipality has Adopted Subdivision Regulations/Bylaws
Bellows Falls Village			✓	
Benson Town	✓	✓		✓
Berkshire Town	✓	✓	✓	✓
Brattleboro Town	✓	✓	✓	✓
Bridgewater Town	✓	✓	✓	
Bridport Town	✓	✓	✓	✓
Brighton Town	✓	✓	✓	
Brunswick Town	✓	✓	✓	
Cabot Town	✓			✓
Calais Town	✓	✓		✓
Cambridge Town	✓	✓		✓
Canaan Town	✓	✓	✓	✓
Chelsea Town	✓	✓		
Colchester Town	✓	✓	✓	✓
Cornwall Town	✓	✓		✓
Derby Town	✓	✓	✓	✓
Dorset Town	✓	✓	✓	✓
East Montpelier Town	✓	✓		✓
Elmore Town	✓		✓	
Enosburg Falls Village	✓	✓	✓	✓
Essex Town	✓	✓	✓	✓
Fair Haven Town	✓	✓	✓	✓
Fairlee Town	✓	✓	✓	✓
Fayston Town	✓	✓		✓
Ferrisburgh Town	✓		✓	✓
Fletcher Town	✓		✓	✓
Franklin Town	✓	✓	✓	✓

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Name of Municipality	Has Municipal Plan	Municipal Plan is Current	Municipality has an Official Map as per 24 V.S.A. § 4421	Municipality has Adopted Subdivision Regulations/Bylaws
Georgia Town	✓	✓	✓	✓
Glover Town	✓	✓		
Greensboro Town	✓	✓	✓	
Groton Town	✓			
Guilford Town	✓	✓	✓	
Halifax Town	✓	✓		
Hartland Town	✓	✓	✓	
Holland Town	✓	✓		
Huntington Town	✓	✓		✓
Hyde Park Town	✓	✓		✓
Jamaica Town	✓			
Jay Town				✓
Kirby Town	✓			
Leicester Town	✓		✓	✓
Lincoln Town	✓	✓	✓	✓
Ludlow Village	✓	✓	✓	✓
Lyndon Town	✓	✓	✓	✓
Lyndonville Village	✓	✓	✓	✓
Maidstone Town	✓	✓	✓	✓
Marlboro Town	✓			✓
Mendon Town	✓	✓	✓	✓
Milton Town	✓	✓		✓
Montgomery Town	✓			
Moretown Town	✓	✓	✓	
Morristown Town	✓	✓	✓	✓
Newark Town	✓	✓		
Newport City	✓	✓		✓

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Name of Municipality	Has Municipal Plan	Municipal Plan is Current	Municipality has an Official Map as per 24 V.S.A. § 4421	Municipality has Adopted Subdivision Regulations/Bylaws
North Bennington Village	✓	✓	✓	✓
North Hero Town	✓	✓		✓
Northfield Town	✓	✓	✓	✓
Norton Town	✓	✓		✓
Norwich Town	✓	✓	✓	✓
Orange Town	✓		✓	
Panton Town	✓	✓	✓	✓
Peacham Town	✓	✓	✓	✓
Pittsfield Town	✓	✓		
Pittsford Town	✓	✓		✓
Proctor Town				✓
Readsboro Town	✓	✓		✓
Richmond Town	✓	✓	✓	✓
Rochester Town	✓	✓		✓
Rockingham Town	✓	✓	✓	✓
Roxbury Town	✓	✓		
Rutland Town	✓	✓		✓
Shelburne Town	✓	✓	✓	✓
Shoreham Town	✓	✓		
Shrewsbury Town	✓	✓	✓	✓
South Hero Town	✓	✓	✓	✓
Springfield Town	✓	✓	✓	✓
St. Albans City	✓	✓	✓	✓
St. Albans Town	✓	✓	✓	✓
St. Johnsbury Town	✓	✓		✓
Starksboro Town	✓	✓	✓	✓
Stockbridge Town	✓	✓		✓

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Name of Municipality	Has Municipal Plan	Municipal Plan is Current	Municipality has an Official Map as per 24 V.S.A. § 4421	Municipality has Adopted Subdivision Regulations/Bylaws
Stowe Town	✓	✓		✓
Stratton Town	✓	✓	✓	✓
Sutton Town	✓	✓		
Swanton Town	✓	✓	✓	✓
Topsham Town	✓	✓		
Townshend Town	✓	✓	✓	
Troy Town	✓	✓	✓	✓
Wallingford Town	✓			✓
Wardsboro Town	✓	✓		
Warren Town	✓	✓	✓	✓
Waterbury Town	✓	✓		
Waterbury Village	✓	✓		
Waterford Town	✓	✓	✓	✓
Waterville Town			✓	
Wells Town	✓	✓	✓	
West Fairlee Town	✓	✓	✓	
West Haven Town	✓	✓	✓	
West Windsor Town	✓	✓		✓
Westford Town	✓	✓		✓
Westmore Town	✓			
Weston Town	✓	✓	✓	✓
Wheelock Town	✓	✓		
Williamstown Town	✓	✓		
Wilmington Town	✓	✓	✓	✓
Windham	✓	✓	✓	
Windsor Town	✓	✓		✓
Winhall Town	✓	✓	✓	✓

COORDINATION OF LOCAL MITIGATION PLANNING

Name of Municipality	Has Municipal Plan	Municipal Plan is Current	Municipality has an Official Map as per 24 V.S.A. § 4421	Municipality has Adopted Subdivision Regulations/Bylaws
Winooski City	✓	✓		✓
Wolcott Town	✓	✓	✓	✓
Woodbury Town	✓			
Woodstock Town	✓	✓	✓	

**Table 6-3
Bylaws Adopted to Address the Municipalities Hazards**

Name of Municipality	Wetlands	Riparian Zones	Floodplains	Steep Slopes	High Elevation Areas / Forested Hillides	Stormwater Management	Erosion Prevention / Sediment Control	Downtowns	Growth Centers
Andover Town	✓	✓	✓	✓	✓	✓			
Barnard Town	✓		✓						
Barre City			✓					✓	
Barre Town	✓		✓						
Barton Town	✓	✓	✓	✓	✓			✓	✓
Brattleboro Town		✓	✓					✓	
Bridport Town							✓		
Brighton Town		✓		✓	✓			✓	
Cabot Town			✓					✓	
Calais Town	✓	✓	✓		✓			✓	✓
Canaan Town	✓		✓						
Colchester Town	✓	✓	✓	✓	✓	✓	✓		✓
Derby Town									
Dorset Town	✓	✓	✓	✓	✓		✓		
East Montpelier Town	✓	✓	✓						
Elmore Town	✓		✓	✓	✓	✓	✓		
Enosburg Falls Village	✓	✓	✓		✓	✓	✓	✓	

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Name of Municipality	Wetlands	Riparian Zones	Floodplains	Steep Slopes	High Elevation Areas / Forested Hillides	Stormwater Management	Erosion Prevention / Sediment Control	Downtowns	Growth Centers
Fair Haven Town	✓		✓					✓	
Fairlee Town			✓						
Fayston Town	✓	✓	✓	✓	✓	✓	✓		
Fletcher Town	✓			✓	✓	✓	✓		
Franklin Town	✓					✓	✓		
Georgia Town	✓	✓	✓	✓	✓	✓	✓		
Greensboro Town			✓						
Guilford Town			✓						
Huntington Town	✓	✓	✓		✓		✓		
Hyde Park Town			✓		✓	✓			
Kirby Town	✓		✓	✓	✓		✓		
Lincoln Town	✓	✓	✓		✓	✓	✓		✓
Ludlow Village	✓		✓		✓	✓	✓	✓	✓
Lyndon Town			✓						
Lyndonville Village			✓						
Maidstone Town	✓		✓			✓	✓		
Marlboro Town	✓	✓		✓	✓				
Mendon Town			✓	✓	✓				
Milton Town			✓						
Moretown Town	✓		✓	✓	✓	✓	✓		
Morristown Town			✓		✓	✓	✓	✓	
Newport City	✓		✓					✓	
North Bennington Village	✓		✓			✓		✓	

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Name of Municipality	Wetlands	Riparian Zones	Floodplains	Steep Slopes	High Elevation Areas / Forested Hillsides	Stormwater Management	Erosion Prevention / Sediment Control	Downtowns	Growth Centers
North Hero Town	✓		✓				✓		
Northfield Town	✓	✓	✓			✓	✓	✓	
Norton Town	✓								
Norwich Town	✓		✓	✓		✓	✓		
Panton Town	✓	✓	✓			✓	✓		
Peacham Town	✓		✓			✓	✓	✓	
Pittsford Town	✓	✓	✓						
Proctor Town	✓		✓						
Readsboro Town			✓					✓	
Richmond Town	✓	✓	✓	✓		✓	✓		
Rockingham Town			✓					✓	
Shelburne Town	✓	✓	✓	✓					
Shrewsbury Town	✓	✓	✓	✓	✓	✓	✓		
South Hero Town	✓		✓						
Springfield Town	✓	✓	✓			✓	✓	✓	✓
St. Albans City						✓		✓	
St. Albans Town	✓		✓			✓			✓
St. Johnsbury Town	✓		✓					✓	
Stowe Town		✓	✓	✓	✓	✓	✓	✓	
Stratton Town	✓	✓	✓	✓	✓	✓			✓
Swanton Town	✓	✓	✓	✓			✓	✓	✓
Wardsboro Town			✓						
Warren Town	✓	✓	✓	✓	✓		✓	✓	✓

Section 6

Name of Municipality	Wetlands	Riparian Zones	Floodplains	Steep Slopes	High Elevation Areas / Forested Hillides	Stormwater Management	Erosion Prevention / Sediment Control	Downtowns	Growth Centers
Waterbury Town			✓	✓	✓			✓	
West Windsor Town	✓		✓	✓			✓		
Westmore Town				✓					
Weston Town						✓		✓	
Wilmington Town	✓		✓	✓		✓			
Windham Town	✓		✓		✓				
Windsor Town			✓					✓	
Winhall Town	✓	✓	✓	✓	✓	✓	✓		
Winooski City		✓	✓					✓	✓
Wolcott Town	✓		✓			✓		✓	✓
Woodbury Town	✓								

**Table 6-4
Local Land Use Boards**

Name of Municipality	Planning Commission (PC)	Zoning Board of Adjustment (ZBA)	Development Review Board (DRB)	Conservation Commission or Board (CC)	Design Review Commission/Historic Commission (DRC/HC)
Albany Town	✓				
Allburgh Village	✓				
Andover Town		✓			
Arlington Town	✓				
Barnard Town	✓		✓	✓	
Barnet Town	✓	✓			
Barre City	✓		✓		
Barre Town	✓		✓		
Barton Town	✓	✓			

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Name of Municipality	Planning Commission (PC)	Zoning Board of Adjustment (ZBA)	Development Review Board (DRB)	Conservation Commission or Board (CC)	Design Review Commission/Historic Commission (DRC/HC)
Benson Town	✓		✓		
Berkshire Town			✓		
Braintree Town	✓				
Brattleboro Town	✓		✓	✓	
Bridgewater Town	✓				
Bridport Town	✓	✓			
Brighton Town	✓		✓		
Brunswick Town		✓			
Burlington City	✓				
Cabot Town	✓	✓			
Calais Town	✓		✓	✓	✓
Cambridge Town	✓		✓	✓	
Canaan Town	✓	✓			
Charlotte Town	✓				
Chelsea Town			✓		
Clarendon Town	✓				
Colchester Town			✓	✓	✓
Corinth Town	✓				
Cornwall Town		✓		✓	
Derby Line Village	✓				
Derby Town	✓	✓			
Dorset Town		✓		✓	✓
East Haven Town	✓				
East Montpelier Town			✓		
Eden Town	✓				
Elmore Town			✓	✓	
Enosburg Falls Village	✓				

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Name of Municipality	Planning Commission (PC)	Zoning Board of Adjustment (ZBA)	Development Review Board (DRB)	Conservation Commission or Board (CC)	Design Review Commission/Historic Commission (DRC/HC)
Essex Town	✓	✓		✓	
Fair Haven Town	✓	✓			
Fairlee Town	✓		✓		
Fayston Town	✓		✓		
Ferrisburgh Town	✓	✓		✓	
Fletcher Town	✓		✓		
Franklin Town	✓	✓			
Georgia Town	✓	✓		✓	
Glover Town		✓			
Goshen Town	✓				
Greensboro Town	✓	✓		✓	
Groton Town	✓	✓			
Guilford Town	✓			✓	
Halifax Town		✓			
Hartford Town	✓				
Hartland Town	✓			✓	
Huntington Town	✓	✓			
Hyde Park Town	✓		✓		
Isle La Motte Town	✓				
Jamaica Town	✓				
Jay Town		✓			
Jericho Village	✓	✓			
Kirby Town	✓	✓			
Leicester Town	✓	✓			
Lincoln Town				✓	
Londonderry Town	✓				

COORDINATION OF LOCAL MITIGATION PLANNING

Name of Municipality	Planning Commission (PC)	Zoning Board of Adjustment (ZBA)	Development Review Board (DRB)	Conservation Commission or Board (CC)	Design Review Commission/Historic Commission (DRC/HC)
Ludlow Village		✓	✓		
Lunenburg Town	✓				
Lyndon Town	✓		✓		
Lyndonville Village	✓				
Maidstone Town	✓	✓			
Marlboro Town	✓		✓	✓	
Mendon Town		✓			
Middlebury Town	✓				
Milton Town	✓		✓	✓	
Montgomery Town			✓	✓	
Montpelier City	✓				
Moretown Town	✓		✓		✓
Morristown Town	✓		✓	✓	
Newark Town	✓				
Newport City	✓		✓		✓
North Bennington Village	✓	✓	✓		✓
North Hero Town			✓		
North Troy Village	✓				
Northfield Town	✓	✓	✓		
Norton Town	✓	✓			
Norwich Town	✓		✓	✓	
Orwell Town	✓				
Panton Town	✓		✓		
Peacham Town			✓	✓	
Peru Town	✓				
Pittsfield Town	✓	✓			

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Name of Municipality	Planning Commission (PC)	Zoning Board of Adjustment (ZBA)	Development Review Board (DRB)	Conservation Commission or Board (CC)	Design Review Commission/Historic Commission (DRC/HC)
Pittsford Town		✓			
Pomfret Town	✓				
Proctor Town	✓	✓			
Readsboro Town	✓		✓		
Richmond Town	✓		✓	✓	
Rochester Town	✓	✓			
Rockingham Town	✓	✓		✓	✓
Rutland Town	✓				
Searsburg Town	✓				
Shelburne Town	✓		✓		✓
Shoreham Town	✓	✓			
Shrewsbury Town			✓	✓	
South Burlington City	✓				
South Hero Town	✓	✓			
Springfield Town	✓	✓	✓		
St. Albans City	✓		✓		
St. Albans Town	✓		✓		
St. Johnsbury Town	✓		✓		
Starksboro Town	✓		✓	✓	
Stockbridge Town	✓	✓			
Stowe Town			✓	✓	✓
Strafford Town	✓				
Stratton Town	✓	✓			
Sutton Town	✓	✓			
Swanton Town			✓		
Swanton Village	✓				

COORDINATION OF LOCAL MITIGATION PLANNING

Name of Municipality	Planning Commission (PC)	Zoning Board of Adjustment (ZBA)	Development Review Board (DRB)	Conservation Commission or Board (CC)	Design Review Commission/Historic Commission (DRC/HC)
Topsham Town	✓				
Townshend Town	✓				
Troy Town		✓			
Tunbridge Town	✓				
Underhill Town	✓		✓	✓	
Unified Towns/Gores of Essex County			✓		
Walden Town	✓				
Wallingford Town	✓		✓	✓	
Wardsboro Town	✓	✓			
Warren Town			✓	✓	✓
Washington Town	✓				
Waterbury Town			✓	✓	
Waterbury Village	✓				
Waterford Town	✓		✓		
Waterville Town	✓				
Wells Town	✓				
West Fairlee Town	✓			✓	
West Haven Town		✓			
West Rutland Town	✓				
West Windsor Town	✓		✓	✓	
Westford Town	✓		✓	✓	
Westmore Town	✓	✓			
Weston Town	✓	✓		✓	
Wheelock Town	✓				
Williston Town	✓				
Wilmington Town	✓		✓		

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Name of Municipality	Planning Commission (PC)	Zoning Board of Adjustment (ZBA)	Development Review Board (DRB)	Conservation Commission or Board (CC)	Design Review Commission/Historic Commission (DRC/HC)
Windham Town	✓	✓		✓	
Windsor Town	✓		✓		✓
Winhall Town	✓	✓			
Winooski City	✓		✓		
Wolcott Town	✓		✓		
Woodbury Town	✓	✓		✓	
Woodstock Town			✓	✓	✓

**Table 6-5
Zoning Regulation Provisions**

Name of Municipality	Municipality adopted the Municipal Administrative Procedures Act (MAPA) as outlined in 24 V.S.A. Chapter 36	Municipality has a Building Code as Outlined in 24 V.S.A. Chapter 83	Municipality has Fees Associated with a Building Code Outlined in 24 V.S.A. Chapter 83	Municipality Adopted on the Record Review as per 24 V.S.A. § 4471 (b)	Municipality has Adopted Local Act 250 Review per 24 V.S.A. § 4420(b)(1)
Athens Town					✓
Barre City		✓	✓		
Brattleboro Town	✓			✓	✓
Colchester Town		✓	✓	✓	✓
Dorset Town					✓
Essex Town		✓	✓		
Fair Haven Town		✓	✓		
Fairlee Town					✓
Guilford Town	✓				
Hartland Town					✓
Ludlow Village	✓	✓	✓	✓	✓
Lyndon Town					✓
Maidstone Town					✓

COORDINATION OF LOCAL MITIGATION PLANNING

Name of Municipality	Municipality adopted the Municipal Administrative Procedures Act (MAPA) as outlined in 24 V.S.A. Chapter 36	Municipality has a Building Code as Outlined in 24 V.S.A. Chapter 83	Municipality has Fees Associated with a Building Code Outlined in 24 V.S.A. Chapter 83	Municipality Adopted on the Record Review as per 24 V.S.A. § 4471 (b)	Municipality has Adopted Local Act 250 Review per 24 V.S.A. § 4420(b)(1)
Morristown Town					✓
Newport City					✓
North Bennington Village	✓	✓			✓
Northfield Town	✓				
Norton Town	✓	✓	✓	✓	✓
Norwich Town	✓			✓	
Panton Town	✓				
Peacham Town					✓
Shelburne Town	✓			✓	
St. Albans City		✓	✓		
Stowe Town	✓			✓	
Troy Town		✓	✓		
Warren Town		✓	✓		✓
Wells Town	✓			✓	✓
Weston Town					✓
Wilmington Town		✓	✓		
Winhall Town	✓	✓	✓		✓
Winooski City		✓	✓		

**Table 6-6
Municipal Zoning Districts Within Ordinances**

Name of Municipality	Shoreland District or Lakeshore District	Conservation District	Forestry District	Flood Hazard District	Other
Barnard Town	✓			✓	
Barnet Town	✓				Village Districts
Barre City		✓		✓	

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Name of Municipality	Shoreland District or Lakeshore District	Conservation District	Forestry District	Flood Hazard District	Other
Barre Town		✓			
Barton Town	✓				
Benson Town	✓				
Brattleboro Town	✓			✓	Urban Center District
Bridport Town	✓				
Brighton Town	✓			✓	
Brunswick Town	✓	✓	✓	✓	
Cabot Town	✓				
Calais Town	✓				
Canaan Town	✓				
Cornwall Town		✓			
Dorset Town			✓		
East Montpelier Town		✓		✓	
Eden Town					
Elmore Town	✓		✓	✓	
Enosburg Falls Village		✓		✓	
Fairlee Town	✓				
Fayston Town				✓	
Ferrisburgh Town	✓	✓			
Fletcher Town	✓	✓	✓	✓	
Franklin Town	✓	✓			
Georgia Town	✓				
Glover Town				✓	
Greensboro Town	✓	✓			
Halifax Town		✓			
Huntington Town		✓	✓	✓	
Hyde Park Town	✓	✓			

COORDINATION OF LOCAL MITIGATION PLANNING

Name of Municipality	Shoreland District or Lakeshore District	Conservation District	Forestry District	Flood Hazard District	Other
Isle La Motte Town				✓	
Jamaica Town				✓	
Jay Town					Village Center
Leicester Town		✓			
Ludlow Village		✓		✓	
Lyndon Town				✓	
Lyndonville Village				✓	
Maidstone Town	✓		✓		Agricultural Zone covers flood plain
Marlboro Town		✓			
Mendon Town			✓	✓	
Milton Town	✓	✓	✓	✓	
Montgomery Town		✓		✓	
Moretown Town		✓		✓	
Morristown Town				✓	
Newport City	✓	✓			
North Hero Town	✓				
Northfield Town				✓	
Norton Town	✓		✓		
Norwich Town				✓	
Peacham Town	✓			✓	
Pittsford Town		✓		✓	
Readsboro Town		✓	✓		
Shelburne Town	✓	✓	✓		
Shrewsbury Town				✓	Overlays
South Hero Town	✓	✓			
Springfield Town	✓			✓	
St. Albans Town	✓	✓		✓	

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Name of Municipality	Shoreland District or Lakeshore District	Conservation District	Forestry District	Flood Hazard District	Other
Starksboro Town		✓	✓	✓	
Stockbridge Town		✓			
Stowe Town				✓	Fluvial Erosion District
Stratton Town		✓		✓	
Swanton Town	✓	✓		✓	
Wardsboro Town		✓		✓	
Waterbury Town				✓	
Waterville Town				✓	
West Haven Town		✓			
West Windsor Town		✓			
Weston Town	✓	✓		✓	
Windham Town			✓		
Windsor Town				✓	
Winhall Town	✓		✓	✓	
Winooski City				✓	
Wolcott Town	✓				

COORDINATION OF LOCAL MITIGATION PLANNING

**Table 6-7
Village Data**

Jurisdiction	RPC	County	PSD	LEPC#	Vtrans District #	CERT # or County	Town/City Population Estimate (July 2007)	NIMS Compliant (Y/N)	RRP or Basic Emergency Operations Plan (EOP) Sent Electronically to VEM	Local Hazard Mitigation Plan (Y/N)	FEMA Approval Date for Local HMP	NFIP Membership (Y/N) CSB 6-18-08
Buel's Gore	CCRPC	Chittenden	A	1	5	1	12		12/27/06	Y	06/08/05	N
Cabot Village	CVRPC	Washington	A	5	6	5	246			Y		Y
Marshfield Village	CVRPC	Washington	A	5	6	5	266			Y		Y
Northfield Village	CVRPC	Washington	A	5	6	5	3,120			Y	01/05/06	Y
Waterbury Village	CVRPC	Washington	A	5	6	5	1,766	N	04/26/06	N		Y
Cambridge Village	LCPC	Lamoille	A	11	8	11	225					
Hyde Park Village	LCPC	Lamoille	A	11	8	11	499					
Jeffersonville Village	LCPC	Lamoille	A	11	8	11	557					
Johnson Village	LCPC	Lamoille	A	11	8	11	1,388					
Morrisville	LCPC	Lamoille	A	11	6	11	2,033	Y		Y	09/08/06	Y
Alburg Village	NRPC	Grand Isle	A	13	8	13	505		06/30/08	N		Y
Swanton Village	NRPC	Franklin	A	4	8	4	2,537	Y	05/29/07	N	06/01/99	Y
Albany Village	NVDA	Orleans	B	10	9	10	160					
Averill	NVDA	Essex	B	10	9	10	18	Y				N
Averys Gore	NVDA	Essex	B	10	9	10	1	Y				N
Barton Village	NVDA	Orleans	B	10	9	10	728			Y	12/23/05	Y
Derby Center Village	NVDA	Orleans	B	10	9	10	673					

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Jurisdiction	RPC	County	PSD	LEPC#	Vtrans District #	CERT # or County	Town/City Population Estimate (July 2007)	NIMS Compliance (Y/N)	RRP or Basic Emergency Operations Plan (EOP) Sent Electronically to VEM	Local Hazard Mitigation Plan (Y/N)	FEMA Approval Date for Local HMP	NFIP Membership (Y/N) CSB 6-18-08
Ferdinand	NVDA	Essex	B	10	9	10	33	Y		N		N
Lewis	NVDA	Essex	B	10	9	10	1	Y		Y	10/21/05	Y
Lyndonville	NVDA	Caledonia	B	9	7	9	1,227			Y	05/27/05	N
North Troy Village	NVDA	Orleans	B	10	9	10	612			Y	12/23/05	N
Orleans Village	NVDA	Orleans	B	10	9	10	813			Y	12/23/05	N
Warner's Grant	NVDA	Essex	B	10	9	10	-	Y	02/11/05	N		N
Warren Gore	NVDA	Essex	B	10	9	10	10	Y	02/11/05	Y	10/21/05	Y
West Burke Village	NVDA	Caledonia	B	9	7	9	370					
Newbury Village	TRORC	Orange	B	12	7	12	431					
UTGS	NVDA		B				UNLISTED IN CENSUS		02/11/05	Y		N
Wells River	TRORC	Orange	B	12	4	12	340					
Bennington Village (Old)	BCRC	Bennington	C	7	1		241					
Manchester Village	BCRC	Bennington	C	7	1		701					
Poultney Village	RRPC	Rutland	C	2	3	2	1,539					
Ludlow Village	SWCRPC	Windsor	D	3	3	3	1,034			Y	07/21/06	Y
Woodstock Village	TRORC	Windsor	D	12	4	12	932	Y	N/A	N		N
Newfane Village	WRC	Windham	D	6	2	6	111					
North Westmin	WRC	Windham	D	6	2	6	257					

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Jurisdiction	RPC	County	PSD	LEPC#	Vtrans District #	CERT # or County	Town/City Population Estimate (July 2007)	NIMS Compliant (Y/N)	RRP or Basic Emergency Operations Plan (EOP) Sent Electronically to VEM	Local Hazard Mitigation Plan (Y/N)	FEMA Approval Date for Local HMP	NFIP Membership (Y/N) CSB 6-18-08
ster Village												
Saxton's River Village	WRC	Windham	D	6	2	6	482		09/23/08	N		Y
Westminster Village	WRC	Windham	D	6	2	6	264					
JURISDICTION COUNT:	37						24,132					

**Table 6-8
Town Data**

Jurisdiction	RPC	County	PSD	LEPC#	Vtrans District #	CERT # or County	Town/City Population Estimate (July 2007)	NIMS Compliant (Y/N)	RRP or Basic Emergency Operations Plan (EOP) Sent Electronically to VEM	Local Hazard Mitigation Plan (Y/N)	FEMA Approval Date for Local HazMit Plan	NFIP Membership (Y/N) CSB 6-18-08
Bolton	CCRPC	Chittenden	A	1	5	1	1,006	N	04/18/07	Y	06/08/05	Y
Burlington	CCRPC	Chittenden	A	1	5	1	38,531	Y	04/06/07	Y	06/08/05	Y
Charlotte	CCRPC	Chittenden	A	1	5	1	3,754	N	12/16/09	Y	06/08/05	Y
Colchester	CCRPC	Chittenden	A	1	5	1	17,207	Y	04/09/07	Y	06/08/05	Y
Essex Junction	CCRPC	Chittenden	A	1	5	1	9,000	N	12/19/07	Y	06/08/05	N
Essex Town	CCRPC	Chittenden	A	1	5	1	19,465	Y	12/19/07	Y	06/08/05	Y
Hinesburg	CCRPC	Chittenden	A	1	5	1	4,619	Y	12/18/06	Y	06/08/05	Y
Huntington	CCRPC	Chittenden	A	1	5	1	1,956	N	12/18/06	Y	06/08/05	Y
Jericho	CCRPC	Chittenden	A	1	5	1	5,170	N	10/09/09	Y	06/08/05	Y
Milton	CCRPC	Chittenden	A	1	5	1	10,539	Y	07/16/09	Y	06/08/05	Y
Richmond	CCRPC	Chittenden	A	1	5	1	4,171	N	08/14/07	Y	06/08/05	Y

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Jurisdiction	RPC	County	PS D	LEP C#	Vtrans District #	CERT # or County	Town/City Population Estimate (July 2007)	NIMS Compliant (Y/N)	RRP or Basic Emergency Operations Plan (EOP) Sent Electronically to VEM	Local Hazard Mitigation Plan (Y/N)	FEMA Approval Date for Local HazMit Plan	NFIP Membership (Y/N) CSB 6-18-08
Shelburne	CCRPC	Chittenden	A	1	5	1	7,143	N	05/04/07	Y	06/08/05	Y
South Burlington	CCRPC	Chittenden	A	1	5	1	17,445	Y	04/06/07	Y	06/08/05	Y
St. George	CCRPC	Chittenden	A	1	5	1	690	N	01/16/07	Y	06/08/05	N
Underhill	CCRPC	Chittenden	A	1	5	1	3,080	N	12/01/06	Y	06/08/05	Y
Westford	CCRPC	Chittenden	A	1	8	1	2,205	Y	11/03/06	Y	09/26/05	Y
Williston	CCRPC	Chittenden	A	1	5	1	8,371	Y	11/03/06	Y	06/08/05	Y
Winooski	CCRPC	Chittenden	A	1	7	1	6,462	Y	12/27/06	Y	06/08/05	Y
Barre City	CVRPC	Washington	A	5	6	5	8,905	Y	04/08/08	Y	09/30/08	Y
Barre Town	CVRPC	Washington	A	5	6	5	7,989	N	07/18/07	Y	12/10/07	Y
Berlin	CVRPC	Washington	A	5	6	5	2,822	Y	08/24/09	Y	09/07/07	Y
Cabot	CVRPC	Washington	A	5	6	5	1,322	N	04/04/07	Y	09/07/07	Y
Calais	CVRPC	Washington	A	5	6	5	1,538	N	04/04/07	Y	09/07/07	Y
Duxbury	CVRPC	Washington	A	5	6	5	1,315	N	04/26/06	Y	09/07/07	Y
East Montpelier	CVRPC	Washington	A	5	6	5	2,701	N	04/26/06	N		Y
Fayston	CVRPC	Washington	A	5	6	5	1,245	N	04/26/06	N		Y
Marshfield	CVRPC	Washington	A	5	6	5	1,607	N	04/19/07	Y	02/24/06	Y
Middlesex	CVRPC	Washington	A	5	6	5	1,867	N	05/01/07	Y	09/10/09	Y
Montpelier	CVRPC	Washington	A	5	6	5	7,806	Y	05/02/06	Y	01/22/08	Y
Moretown	CVRPC	Washington	A	5	6	5	1,724	N	04/26/06	Y	12/10/07	Y
Northfield Town	CVRPC	Washington	A	5	6	5	5,748	N	03/26/09	Y	09/07/07	Y
Orange	CVRPC	Orange	A	5	6	5	965	N	06/16/09	Y	09/30/08	Y
Plainfield	CVRPC	Washington	A	5	6	5	1,349	N	04/26/06	Y	04/04/06	Y

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Jurisdiction	RPC	County	PSD	LEPC#	Vtrans District #	CERT # or County	Town/City Population Estimate (July 2007)	NIMS Compliant (Y/N)	RRP or Basic Emergency Operations Plan (EOP) Sent Electronically to VEM	Local Hazard Mitigation Plan (Y/N)	FEMA Approval Date for Local HazMit Plan	NFIP Membership (Y/N) CSB 6-18-08
Roxbury	CVRPC	Washington	A	5	6	5	555	N	04/20/07	N		Y
Waitsfield	CVRPC	Washington	A	5	6	5	1,678	Y	04/26/06	Y	09/07/07	Y
Warren	CVRPC	Washington	A	5	6	5	1,731	N	10/20/09	Y		Y
Washington	CVRPC	Orange	A	5	6	5	1,099	N	04/26/06	N		Y
Waterbury Town	CVRPC	Washington	A	5	6	5	5,348	N		N		Y
Williamstown	CVRPC	Orange	A	5	6	5	3,227	N	05/02/06	Y	11/04/09	Y
Woodbury	CVRPC	Washington	A	5	6	5	810	N	06/08/09	Y	09/07/07	Y
Worcester	CVRPC	Washington	A	5	6	5	866	N	04/02/07	Y	09/07/07	Y
Belvidere	LCPC	Lamoille	A	11	8	11	287	Y	01/29/09	Y	09/08/06	Y
Cambridge	LCPC	Lamoille	A	11	8	11	3,088	Y	09/10/09	Y	09/08/06	Y
Eden	LCPC	Lamoille	A	11	8	11	1,120	Y		Y	09/08/06	N
Elmore	LCPC	Lamoille	A	11	6	11	961	Y		Y	09/08/06	Y
Hyde Park	LCPC	Lamoille	A	11	8	11	3,232	Y	03/05/09	Y	09/08/06	Y
Johnson	LCPC	Lamoille	A	11	8	11	3,200	Y	01/29/09	Y	09/08/06	Y
Morristown	LCPC	Lamoille	A	11	6	11	5,524			Y	09/08/06	Y
Stowe	LCPC	Lamoille	A	11	6	11	4,886	Y	12/15/09	Y	09/08/06	Y
Waterville	LCPC	Lamoille	A	11	8	11	680	Y	01/29/09	Y	09/08/06	N
Wolcott	LCPC	Lamoille	A	11	6	11	1,698	Y	07/14/08	Y	09/08/06	Y
Alburg Town	NRPC	Grand Isle	A	13	8	13	2,023	N	06/30/08	N		Y
Bakersfield	NRPC	Franklin	A	4	8	4	1,393	N	11/30/09	N		Y
Berkshire	NRPC	Franklin	A	4	8	4	1,601	N	07/11/07	N		Y
Enosburgh	NRPC	Franklin	A	4	8	4	2,716	N	10/14/08	Y	04/21/08	Y

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Enosburgh Falls	NRPC	Franklin	A	4	8	4	1,443		10/14/08	Y	04/21/08	Y
Fairfax	NRPC	Franklin	A	4	8	4	4,142	N	08/24/08	Y	10/20/08	Y
Fairfield	NRPC	Franklin	A	4	8	4	1,894	N	12/15/09	N		Y
Fletcher	NRPC	Franklin	A	4	8	4	1,292	N	11/06/07	N		Y
Franklin	NRPC	Franklin	A	4	8	4	1,310	N	04/13/07	N		Y
Georgia	NRPC	Franklin	A	4	8	4	4,506	N	07/15/09	Y		Y
Grand Isle	NRPC	Grand Isle	A	13	8	13	2,306	N	05/19/09	N		Y
Highgate	NRPC	Franklin	A	4	8	4	3,674	Y	04/13/07	Y	06/01/99	Y
Isle La Motte	NRPC	Grand Isle	A	13	8	13	505	N	04/13/07	N		N
Montgomery	NRPC	Franklin	A	4	8	4	1,056	N	12/09/08	Y	02/14/08	Y
North Hero	NRPC	Grand Isle	A	13	8	13	905	N	04/10/07	N		Y
Richford	NRPC	Franklin	A	4	8	4	2,312	Y	07/11/07	N		Y
Sheldon	NRPC	Franklin	A	4	8	4	2,293	Y	06/07/07	N		Y
South Hero	NRPC	Grand Isle	A	13	8	13	1,862	N	05/11/09	N		Y
St. Albans City	NRPC	Franklin	A	4	8	4	7,305	Y	08/27/09	N		Y
St. Albans Town	NRPC	Franklin	A	4	8	4	6,009	Y	07/11/07	N		Y
Swanton Town	NRPC	Franklin	A	4	8	4	6,431	N	05/31/07	N	06/01/99	Y
Albany	NVDA	Orleans	B	10	9	10	817	Y	05/19/09	Y		N
Barnet	NVDA	Caledonia	B	9	7	9	1,779	N	08/26/09	Y	10/21/05	Y
Barton Town	NVDA	Orleans	B	10	9	10	2,820	Y	07/14/09	Y	12/23/05	Y
Bloomfield	NVDA	Essex	B	10	9	10	266	Y	07/30/09	Y		Y
Brighton	NVDA	Essex	B	10	9	10	1,314	Y	07/14/09	Y	12/23/05	Y

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Brownington	NVDA	Orleans	B	10	9	10	864	Y	02/11/05	Y		N
Brunswick	NVDA	Essex	B	10	9	10	104	Y	12/17/05	Y		Y
Burke	NVDA	Caledonia	B	9	7	9	1,716	Y	07/30/09	Y	05/27/05	N
Canaan	NVDA	Essex	B	10	9	10	1,075	Y	07/27/09	Y	12/23/05	Y
Charleston	NVDA	Orleans	B	10	9	10	871	Y	02/13/05	Y		N
Concord	NVDA	Essex	B	9	7	9	1,203	Y	07/27/09	Y	10/21/05	Y
Coventry	NVDA	Orleans	B	10	9	10	992	Y	07/30/09	Y	12/23/05	Y
Craftsbury	NVDA	Orleans	B	10	9	10	1,107	N	11/13/09	Y	12/23/05	Y
Danville	NVDA	Caledonia	B	9	7	9	2,336	Y	06/18/07	Y		Y
Derby	NVDA	Orleans	B	10	9	10	4,823	Y	05/21/09	Y	10/21/05	Y
Derby Line	NVDA	Orleans	B	10	9	10	778			Y		Y
East Haven	NVDA	Essex	B	9	7	9	298	N	02/11/05	Y		N
Glover	NVDA	Orleans	B	10	9	10	939	Y	04/20/09	Y	05/17/05	Y
Granby	NVDA	Essex	B	9	7	9	84	Y	02/11/05	Y		N
Greensboro	NVDA	Orleans	B	10	9	10	777	Y	05/13/09	Y	05/17/05	Y
Groton	NVDA	Caledonia	B	9	7	9	966	Y	07/24/09	Y	05/17/05	Y
Guildhall	NVDA	Essex	B	9	7	9	268	N	07/30/09	Y	05/17/05	Y
Hardwick	NVDA	Caledonia	B	9	7	9	3,226	Y	06/18/07	Y	10/21/05	Y
Holland	NVDA	Orleans	B	10	9	10	574	Y	07/09/07	Y		N
Irasburg	NVDA	Orleans	B	10	9	10	1,049	Y	03/25/05	Y		N
Jay	NVDA	Orleans	B	10	9	10	531	Y	03/04/09	Y		Y
Kirby	NVDA	Caledonia	B	9	7	9	522	N	07/11/09	Y		N
Lemington	NVDA	Essex	B	10	9	10	111	Y		Y		Y

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Lowell	NVDA	Orleans	B	10	9	10	719	Y	08/07/09	Y	10/21/05	N
Lunenburg	NVDA	Essex	B	9	7	9	1,288	N	07/30/09	Y	05/27/05	Y
Lyndon	NVDA	Caledonia	B	9	7	9	5,713	Y	02/13/05	Y	05/27/05	Y
Maidstone	NVDA	Essex	B	10	7	10	106	Y	02/11/05	Y		N
Morgan	NVDA	Orleans	B	10	9	10	739	N	03/25/05	Y		N
Newark	NVDA	Caledonia	B	10	7	10	461	N	02/13/05	Y		N
Newport City	NVDA	Orleans	B	10	9	10	5,185	Y	10/09/09	Y		Y
Newport Town	NVDA	Orleans	B	10	9	10	1,955	Y	12/17/05	Y	12/23/05	Y
Norton	NVDA	Essex	B	10	9	10	228	Y	07/23/09	Y	12/23/05	
Peacham	NVDA	Caledonia	B	9	7	9	678	Y	12/17/04	Y		Y
Ryegate	NVDA	Caledonia	B	9	7	9	1,217	N	07/29/09	Y		N
Sheffield	NVDA	Caledonia	B	9	7	9	715	Y	08/21/09	Y		Y
St. Johnsbury	NVDA	Caledonia	B	9	7	9	7,468	N	12/16/08	Y		Y
Stannard	NVDA	Caledonia	B	9	7	9	197	N	11/26/04	Y		N
Sutton	NVDA	Caledonia	B	9	7	9	1,062	Y	02/13/05	Y	12/23/05	Y
Troy	NVDA	Orleans	B	10	9	10	1,705	Y	02/13/05		12/23/05	
Victory	NVDA	Essex	B	9	7	9	96	N	02/11/05	Y	10/12/05	N
Walden	NVDA	Caledonia	B	9	7	9	765	N	07/17/09		10/12/05	N
Waterford	NVDA	Caledonia	B	9	7	9	1,225	N	07/16/09	Y	10/21/05	Y
Westfield	NVDA	Orleans	B	10	9	10	522	Y	07/24/09	Y	12/23/05	N
Westmore	NVDA	Orleans	B	10	9	10	313	Y	06/24/09	Y		N
Wheelock	NVDA	Caledonia	B	9	7	9	609	Y	08/21/09	Y	11/23/04	Y
Bradford	TRORC	Orang	B	12	7	12	2,667	Y	10/15/08	N		Y

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		Orange										
Corinth	TRORC	Orange	B	12	7	12	1,458	N	05/19/08	Y	05/28/09	Y
Fairlee	TRORC	Orange	B	12	4	12	1,008	N	08/07/08	Y	05/28/09	Y
Newbury	TRORC	Orange	B	12	7	12	2,158	N	10/10/08	N		Y
Thetford	TRORC	Orange	B	12	4	12	2,779	N	02/06/09	N		Y
Topsham	TRORC	Orange	B	12	7	12	1,139	N	07/30/09	N		Y
Vershire	TRORC	Orange	B	12	4	12	628	N	02/04/09	N		Y
West Fairlee	TRORC	Orange	B	12	4	12	726	N	01/23/09	N		Y
Addison	ACRPC	Addison	C	8	5	8	1,431	N	10/24/08	N		Y
Bridport	ACRPC	Addison	C	8	5	8	1,248	N	10/24/08	N		Y
Bristol	ACRPC	Addison	C	8	5	8	3,770	N	10/24/08	N		Y
Comwall	ACRPC	Addison	C	8	5	8	1,226	Y	10/24/08	N		Y
Ferrisburgh	ACRPC	Addison	C	8	5	8	2,692	N	10/24/08	N		Y
Goshen	ACRPC	Addison	C	8	3	8	218	Y	04/14/09	Y		Y
Leicester	ACRPC	Addison	C	8	5	8	1,010	N	10/24/08	N		Y
Lincoln	ACRPC	Addison	C	8	5	8	1,270	N	01/16/09	Y	04/27/05	Y
Middlebury	ACRPC	Addison	C	8	5	8	8,205	Y	09/24/08	N		Y
Monkton	ACRPC	Addison	C	8	5	8	1,981	Y	10/24/08	N		Y
New Haven	ACRPC	Addison	C	8	5	8	1,820	Y	10/24/08	Y	11/23/04	Y
Orwell	ACRPC	Addison	C	8	3	8	1,222	Y	10/24/08	N		N
Panton	ACRPC	Addison	C	8	5	8	687	N	10/24/08	N		Y
Ripton	ACRPC	Addison	C	8	5	8	588	N	10/24/08	Y	12/10/08	Y
Salisbury	ACRPC	Addison	C	8	5	8	1,105	N	10/24/08	N		Y

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		n										
Shoreham	ACRPC	Addison	C	8	5	8	1,295	Y	10/24/08	N		Y
Starksboro	ACRPC	Addison	C	8	5	8	1,924	N	10/24/08	N		Y
Vergennes	ACRPC	Addison	C	8	5	8	2,696	N	09/11/08	Y		Y
Waltham	ACRPC	Addison	C	8	5	8	485	Y	10/24/08	N		N
Weybridge	ACRPC	Addison	C	8	5	8	829	N	10/24/08	N		Y
Whiting	ACRPC	Addison	C	8	3	8	408	N	10/24/08	N		N
Arlington	BCRC	Bennington	C	7	1		2,426	Y	07/27/09	Y	08/26/05	Y
Bennington	BCRC	Bennington	C	7	1		14,309	N	06/16/09	Y	08/26/05	Y
Dorset	BCRC	Bennington	C	7	1		2,103	N	07/16/09	Y		Y
Glastenbury	BCRC	Bennington	C	7	1		15	N		N		N
Manchester Town	BCRC	Bennington	C	7	1		4,108	Y	02/02/09	Y	11/02/05	Y
North Bennington	BCRC	Bennington	C	7	1		1,334	N	11/16/07	Y	08/26/05	Y
Pownal	BCRC	Bennington	C	7	1		3,454	Y	01/28/09	Y	08/26/05	Y
Rupert	BCRC	Bennington	C	7	1		705	N	11/16/07	Y	05/23/05	Y
Sandgate	BCRC	Bennington	C	7	1		351	N	05/22/07	Y	08/26/05	N
Shaftsbury	BCRC	Bennington	C	7	1		3,693	N	02/22/07	Y	04/06/07	Y
Sunderland	BCRC	Bennington	C	7	1		886	N	11/16/07	N		Y
Woodford	BCRC	Bennington	C	7	1		388	N		N		Y
Benson	RRPC	Rutland	C	2	3	2	1,024	N	12/30/08	Y	11/23/04	Y
Brandon	RRPC	Rutland	C	2	3	2	3,886	Y	12/30/08	Y	11/23/04	Y
Castleton	RRPC	Rutland	C	2	3	2	4,372	N	12/30/08	Y	11/23/04	Y

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Chittenden	RRPC	Rutland	C	2	3	2	1,264	N	06/20/07	Y	11/23/04	Y
Clarendon	RRPC	Rutland	C	2	3	2	2,895	N	06/20/07	Y	11/23/04	Y
Danby	RRPC	Rutland	C	2	1	2	1,277	N	12/30/08	Y	11/23/04	Y
Fair Haven	RRPC	Rutland	C	2	3	2	2,929	N	12/30/08	Y	11/23/04	Y
Hubbardton	RRPC	Rutland	C	2	3	2	775	N	12/30/08	Y	11/23/04	Y
Ira	RRPC	Rutland	C	2	3	2	451	N	12/30/08	Y	11/23/04	N
Killington	RRPC	Rutland	C	2	3	2	1,138	N	12/30/08	Y	11/23/04	Y
Mendon	RRPC	Rutland	C	2	3	2	1,083	N	12/30/08	Y	11/23/04	Y
Middletown Springs	RRPC	Rutland	C	2	3	2	810	Y	12/30/08	Y	11/23/04	Y
Mt. Holly	RRPC	Rutland	C	2	3	2	1,221	N	12/30/08	Y	11/23/04	N
Mt. Tabor	RRPC	Rutland	C	2	1	2	199	N	12/30/08	Y	11/23/04	Y
Pawlet	RRPC	Rutland	C	2	1	2	1,435	N	06/20/07	Y	11/23/04	Y
Pittsford	RRPC	Rutland	C	2	3	2	3,206	N	06/27/08	Y	11/23/04	Y
Poultney	RRPC	Rutland	C	2	3	2	3,544	N	01/12/09	Y	11/23/04	Y
Proctor	RRPC	Rutland	C	2	3	2	1,820	Y	08/07/08	Y	11/23/04	Y
Rutland City	RRPC	Rutland	C	2	3	2	16,826	Y	06/20/07	Y	11/23/04	Y
Rutland Town	RRPC	Rutland	C	2	3	2	4,092	N	06/20/07	Y	11/23/04	Y
Shrewsbury	RRPC	Rutland	C	2	3	2	1,128	Y	12/30/08	Y	11/23/04	N
Sudbury	RRPC	Rutland	C	2	3	2	606	N	12/30/08	Y	11/23/04	N
Tinmouth	RRPC	Rutland	C	2	3	2	627	N	06/20/07	Y	11/23/04	Y
Wallingford	RRPC	Rutland	C	2	3	2	2,324	Y	12/30/08	Y	11/23/04	Y
Wells	RRPC	Rutland	C	2	3	2	1,097	Y	04/02/08	Y	11/23/04	Y

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West Haven	RRPC	Rutland	C	2	3	2	309	N	12/30/08	Y	11/23/04	Y
West Rutland	RRPC	Rutland	C	2	3	2	2,522	N	06/20/07	Y	07/21/06	Y
Granville	TRORC	Addison	C	8	5	8	287	N	08/21/09	Y	05/28/09	Y
Hancock	TRORC	Addison	C	8	5	8	363	N	09/08/08	Y	02/20/09	Y
Pittsfield	TRORC	Rutland	C	12	3	12	419	N	05/22/09	N		Y
Readsboro	WRC	Bennington	C	7	1		769	N	11/16/09	N		Y
Searsburg	WRC	Bennington	C	7	1		90	N	09/23/08	N		N
Winhall	WRC	Bennington	C	7	1		777	Y	11/19/08	N		Y
Landgrove	BCRC	Bennington	D	7	1		138	N		Y		Y
Peru	BCRC	Bennington	D	7	1		426	N		N		N
Stamford	BCRC	Bennington	D	7	1		794	Y	11/16/07	N		Y
Andover	SWCRPC	Windsor	D	3	2	3	548	N	11/03/08	Y	07/21/06	Y
Baltimore	SWCRPC	Windsor	D	3	2	3	260	N	06/12/07	Y	07/21/06	N
Cavendish	SWCRPC	Windsor	D	3	2	3	1,391	N	01/10/08	Y	07/21/06	Y
Chester	SWCRPC	Windsor	D	3	2	3	3,031	N	05/08/07	Y	07/21/06	Y
Ludlow	SWCRPC	Windsor	D	3	3	3	2,654	Y	04/08/09	Y	07/21/06	Y
Reading	SWCRPC	Windsor	D	3	4	3	712	Y	04/28/08	Y	07/21/06	Y
Springfield	SWCRPC	Windsor	D	3	2	3	8,666	Y	03/24/08	Y	07/21/06	Y
Weathersfield	SWCRPC	Windsor	D	3	2	3	2,842	N	04/28/08	Y	07/21/06	Y
West Windsor	SWCRPC	Windsor	D	3	4	3	1,099	Y	05/13/09	Y	07/21/06	Y
Windsor	SWCRPC	Windsor	D	3	4	3	3,633	N	04/12/07	Y	07/21/06	Y
Barnard	TRORC	Windsor	D	12	4	12	961	N	12/09/08	Y	02/20/09	Y

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Bethel	TRORC	Windsor	D	12	4	12	1,940	Y	05/23/08	Y	02/20/09	Y
Braintree	TRORC	Orange	D	12	4	12	1,235	N	08/07/08	Y	05/28/09	Y
Bridgewater	TRORC	Windsor	D	12	4	12	926	Y	05/21/09	Y	02/20/09	N
Brookfield	TRORC	Orange	D	12	6	12	1,245	Y	05/19/08	N		Y
Chelsea	TRORC	Orange	D	12	4	12	1,234	N	06/16/09	Y	02/20/09	Y
Hartford	TRORC	Windsor	D	12	4	3	10,700	N	12/08/09	Y	02/20/09	Y
Hartland	TRORC	Windsor	D	3	4	3	3,059	N	05/12/09	N		N
Norwich	TRORC	Windsor	D	12	4	3	3,508	Y	11/25/08	N	11/23/04	Y
Plymouth	TRORC	Windsor	D	12	3	12	572	Y	10/02/08	Y	05/28/09	Y
Pomfret	TRORC	Windsor	D	12	4	12	965	N	11/25/08	Y	02/20/09	Y
Randolph	TRORC	Orange	D	12	4	12	5,045	Y	12/17/09	Y	02/20/09	Y
Rochester	TRORC	Windsor	D	12	4	12	1,135	N	05/21/09	Y	05/28/09	Y
Royalton	TRORC	Windsor	D	12	4	12	2,465	Y	12/22/08	N		Y
Sharon	TRORC	Windsor	D	12	4	12	1,346	N	05/23/08	Y	02/20/09	Y
Stockbridge	TRORC	Windsor	D	12	4	12	689	N	06/09/09	Y	02/20/09	Y
Strafford	TRORC	Orange	D	12	4	12	1,084	Y	06/17/09	Y	05/28/09	Y
Tunbridge	TRORC	Orange	D	12	4	12	1,305	Y	05/09/08	N		N
Woodstock Town	TRORC	Windsor	D	12	4	12	3,143	Y	05/09/08	N		Y
Athens	WRC	Windham	D	6	2	6	326	N	09/23/08	N		Y
Bellows Falls	WRC	Windham	D	6	2	6	2,934		09/23/08	N		Y
Brattleboro	WRC	Windham	D	6	2	6	11,590	Y	09/23/08	N		Y
Brookline	WRC	Windham	D	6	2	6	447	Y	01/28/09	N		Y

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Jurisdiction	RPC	County	PS D	LEP C#	Vtrans District #	CERT # or County	Town/City Population Estimate (July 2007)	NIMS Compliant (Y/N)	RRP or Basic Emergency Operations Plan (EOP) Sent Electronically to VEM	Local Hazard Mitigation Plan (Y/N)	FEMA Approval Date for Local HazMit Plan	NFIP Membership (Y/N) CSB 6-18-08
Dover	WRC	Windham	D	6	1	6	1,437	Y	09/23/08	N		Y
Dummerston	WRC	Windham	D	6	2	6	1,942	Y	09/23/08	Y		Y
Grafton	WRC	Windham	D	6	2	6	619	Y	01/29/09	Y	03/03/09	Y
Guilford	WRC	Windham	D	6	2	6	1,960	Y	11/19/09	N		Y
Halifax	WRC	Windham	D	6	2	6	817	N	09/23/08	N		N
Jacksonville	WRC	Windham	D	6	2	6	221		09/23/08	N		Y
Jamaica	WRC	Windham	D	6	2	6	907	N	11/25/09	N		Y
Londonderry	WRC	Windham	D	6	2	6	1,779	N	09/23/08	Y		Y
Marlboro	WRC	Windham	D	6	2	6	978	Y	09/23/08	Y	03/03/09	Y
Newfane	WRC	Windham	D	6	2	6	1,720	N	09/23/08	Y	03/03/09	Y
Putney	WRC	Windham	D	6	2	6	2,606	Y	12/19/08	N		Y
Rockingham	WRC	Windham	D	6	2	6	5,003	N	04/28/09	N		Y
Somerset	WRC	Windham	D	6	1	6	5	N		N		N
Stratton	WRC	Windham	D	6	1	6	167	N	09/23/08	N		Y
Townshend	WRC	Windham	D	6	2	6	1,066	N	09/23/08	N		Y
Vernon	WRC	Windham	D	6	2	6	2,055	N	12/01/08	N		Y
Wardsboro	WRC	Windham	D	6	2	6	902	N	11/24/08	N		Y
Westminster	WRC	Windham	D	6	2	6	3,211	N	09/23/08	Y		Y
Weston	WRC	Windsor	D	6	2	6	634	N	09/23/08	N		Y
Whitingham	WRC	Windham	D	6	1	6	1,214	Y	09/23/08	N		Y
Wilmington	WRC	Windham	D	6	1	6	2,355	N	09/23/08	Y		Y
Windham	WRC	Windham	D	6	2	6	344	Y	09/23/08	Y		N

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Jurisdiction	RPC	County	PSD	LEPC#	Vtrans District #	CERT # or County	Town/City Population Estimate (July 2007)	NIMS Compliant (Y/N)	RRP or Basic Emergency Operations Plan (EOP) Sent Electronically to VEM	Local Hazard Mitigation Plan (Y/N)	FEMA Approval Date for Local HazMit Plan	NFIP Membership (Y/N) CSB 6-18-08
JURISDICTION COUNT:	254						635,861					

6.3 Local Funding and Technical Assistance

The Vermont Division of Emergency Management and Homeland Security actively assists local RPCs in developing their local mitigation plans. DEMHS assists RPCs in the local planning process by coordinating HAZUS-MH damage assessments with the ANR’ Department of Environmental Conservation (DEC) and the Vermont Center for Geographic Information (VCGI), and DEMHS works closely with individual RPCs in their plan development and review. Typically, the RPC will initially work with individual communities in developing a local hazard mitigation draft plan, which is then forwarded to the State Hazard Mitigation Officer or mitigation staff DEMHS for review and comment. The comments and suggestions for changes in local plans are then incorporated into the plan prior to the plan’s submittal to FEMA Region 1. A significant part of the DEMHS review process is to coordinate and link local mitigation plans to the overall state mitigation strategy as outlined in the State of Vermont HMP. Following the events of Tropical Storm Irene, this local plan review process was more finely tuned and better coordinated among DEMHS, RPCs, and the local communities.

The State Hazard Mitigation Officer and DEMHS mitigation staff also provide technical assistance as needed in support of individual mitigation project development and project implementation. This was most recently demonstrated for projects in Hardwick, Wilmington, Barre City, Brattleboro, Chester, Granville, Readsboro and other locations. Assistance was also provided to the Northwest and Two Rivers RPCs for PDM-C Planning grant proposals, which were subsequently approved. County Technical assistance is also provided by VT DEC to local governments and RPCs on planning and projects associated with flood-related and fluvial erosion hazards (FEH). The DEC’s Rivers Program has provided considerable funding to match PDM and HMGP grants in the past and their staff assists in the assessment of this hazard and subsequent regulatory efforts that implement river corridor protection as a hazard mitigation or avoidance strategy. During the community implementation phase, DEC will continue to provide technical support to towns and RPCs to address fluvial hazards through the Rivers Program.

GIS data for plan preparation may be provided by the VCGI, which coordinates all GIS data in Vermont, and assists DEMHS with planning efforts. The ANR’ own mapping resources may provide additional GIS mapping data. RPCs are designated regional GIS service centers in Vermont and have developed an enormous amount of local data. We are presently utilizing the HAZUS-MH software to better identify potential hazard areas, run damage projections in likely hazard areas, and to more accurately plot flood plains in selected areas. HAZUS-MH is also being utilized to plot projections of damages caused by wind and flooding. Statewide flood plain mapping is contingent upon completion of FEMA’s digital mapping update, which is currently not slated to digitally convert the Flood Insurance Rate Maps for several has updated select

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Vermont counties only. Addison, Essex, Franklin, Grand Isle, Orange and Orleans are lacking new DFIRMS. It is imperative that digital conversion continue, as well as map revisions take a higher priority to allow the entire state to have an accurate, up-to-date system for identifying active flood zones.

Local Plan Review Process

The review process (including time lines) for Regional/Local Plans is as follows:

- Receipt and review of regional/local plans by the State Hazard Mitigation Officer or DEMHS Policy/Planning chief (1-2 weeks): this includes review, coordination, and linkage of regional/local plans to the State of Vermont HMP with emphasis on and comparison of identified strategies, priorities, mitigation objectives, hazards assessed and estimated potential losses. This begins the formal State review process. Input will be solicited from other members of the State of Vermont Hazard Mitigation Committee, as needed or if appropriate.
- Consolidation of comments and return to towns or RPCs (2 weeks): The plan review tool document will be returned to the appropriate town or RPC. A coordination meeting will be scheduled, as needed, to prepare for final submission through the state to FEMA for approval (per CFR 44, the regional review will be completed within 45 days after receipt from the state, whenever possible).
- Submission of regional or local plans to FEMA for approval after initial state review and local revision. This step should only take 60 days, but has taken several months in the past. This time lag is not conducive to making further revisions or local adoption and leaves towns without plans.
- Upon receipt of FEMA comments, DEMHS will work with the appropriate RPC and associated town to make needed revisions.
- Following resubmittal and conditional approval by FEMA, towns will adopt the plan and submit it to the State Hazard Mitigation Office. The State Hazard Mitigation Officer will verify that the necessary revisions have been made and will forward the plan to FEMA for final approval. However, multijurisdictional plans may not include all participating jurisdictions.

6.4 Local Plan Coordination and Integration

Through the State of Vermont Hazard Mitigation Committee and careful oversight by the State Hazard Mitigation Officer, local and state mitigation efforts are closely coordinated and integrated for project and planning purposes. Being a small state works to Vermont's advantage when bringing together the various regions, as they often share common vulnerabilities and challenges pertaining to hazard mitigation.

As previously described, local RPCs develop mitigation plans specifically tailored to address local needs. Through close cooperation with DEMHS and other members of the Hazard Mitigation Committee, these local plans are closely coordinated and linked with the State of Vermont HMP as much as possible. For example, the Addison County Regional Mitigation Plan has carefully identified preparedness, response, and recovery elements that have been

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incorporated into the overall State of Vermont HMP. To a large extent, the Addison County Regional Mitigation Plan served as a model for other regional plans throughout the state. The Addison County Regional Mitigation Plan is a comprehensive and multifaceted document, which addresses Hazard Inventory and Risk Assessment, mitigation initiatives, plan approval and maintenance procedures, community hazard mitigation project applications, individual town plans, et al. To ensure up-to-date standards, policies, and procedures, DEMHS may initiate a comprehensive project review on an annual basis and/or after every significant natural disaster.

It should be noted that State of Vermont HMP linkages to local mitigation plans involve a progressive and evolving process. We fully anticipate that state and regional mitigation ties will be strengthened in the future through cooperative efforts of DEMHS, RPCs, other state agencies, and town officials. The following actions have been taken to better integrate local planning efforts into state mitigation planning:

- An increase in DEMHS outreach and training efforts directed toward local towns and RPCs; the added DEMHS mitigation staff will ensure a more robust outreach effort
- More frequent meetings and consultations on current and proposed mitigation efforts
- Increased proactive efforts by the State Hazard Mitigation Officer and other DEMHS staff, as well as staff from VTrans and VT DEC to promote preventive mitigation efforts at the regional and local levels, particularly in the most vulnerable communities
- More interagency collaborative efforts to better integrate mitigation projects and planning with existing statutes and environmental regulations, and other similar progressive initiatives

Recognizing that climate change is likely to increase the frequency and severity of a number of Vermont's hazards, DEMHS strongly encourages local mitigation planning processes begin considering climate change impacts and strategies. This can be done in the format most applicable to their region. DEMHS specifically included the Impacts of Climate Change on Natural Hazards in Vermont, Section 4.1.1, in the 2013 update to the State Plan because it recognizes that climate change is a critical factor to consider when assessing future hazards and developing mitigation and resiliency strategies, and we would like to see this mirrored in local mitigation plans.

Additionally, in recent months increased attention is being given in Vermont to the opportunities and options for integrating local hazard mitigation planning and other municipal planning processes. FEMA's review of local HMPs includes a component addressing how the mitigation plan will be integrated into other municipal planning efforts. Coordination of municipal development plans and local HMPs is also encouraged through 24 V.S.A. 117, the Vermont Planning and Development Act, which states that municipalities should develop municipal plans "in a manner which will promote the public health, safety against fire, floods, explosions and other dangers..." Further, §4382(a)(2) calls for municipal plans to include a land use plan that identifies areas for "open spaces reserved for flood plain".

How a community elects to integrate hazard mitigation goals and strategies into its municipal plan can be accomplished through a variety of means. Each municipal development plan is uniquely structured but all plans generally contain a discussion of land use, natural resources, municipal services, and historic resources. Land use districts may propose areas of limited development or limited land uses that would encapsulate the disaster prone areas. Natural

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resource policies can be directed toward open space, ecosystem restoration, or riparian buffers. In inventorying a municipality's emergency responders, it may discover gaps in services. The Village of Jeffersonville's revised village plan uses language in the historic resources chapter that encourages wet flood-proofing measures to preserve buildings in its historic Designated Village Center, located in a Special Flood Hazard Area. This is in addition to supporting regulations for open space to be set aside for flood storage. Its HMP, to be completed by 2014, will integrate the village plan policy to support buy-outs of frequently flooded historic properties and will identify potential sources of grant funding (i.e., HMGP).

Communities can also integrate hazard mitigation planning into their municipal plans by regulatory means, for example, exploring joining the National Flood Insurance Program or encouraging residents in the flood hazard area to purchase flood insurance. Local HMPs offer the option of suggesting the community explore FEHs, stricter flood hazard regulations, or implementing a flood district overlay. A municipality could also use its plan as the impetus to discussing stormwater management, planned unit developments, or utilizing other programs that may provide mitigation activities through regulatory and non-regulatory means.

The table below illustrates a review of risks according to RPC plans that were considered and integrated in the risk analysis of the State of Vermont HMP.

**Table 6-9
Risks by RPC**

RPC	High Risk	Moderate Risk
Addison County	Flooding and Fluvial Erosion; Winter storms; High Winds;	Earthquakes
Bennington County	Flooding and Fluvial Erosion; Flash flooding; Winter storms; High winds	Radiological Risk
Central Vermont	Fluvial Erosion, Flash Flooding; Winter Storms	High Winds, Ice Storms; Ice Jams
Chittenden County	Severe Winter Storms; Flooding and Fluvial Erosion; High winds; Lightning/Electrical Storms	Ice Storms; Stream Bank Erosion
Lamoille County	Flooding and Fluvial Erosion	Ice Storms, Landslides
Northeastern Development Association	Flooding and Fluvial Erosion	Ice storms, snow loads
Northwest RPC	Flooding and Fluvial Erosion, Ice Storms	Flooding
Rutland RPC	Flooding and Fluvial Erosion, Ice Storms, Wind Storms	Winter Storms, Ice Storms
Southern Windsor County	Flooding and Fluvial Erosion	Ice Storms
Two Rivers-Ottawaquechee	Flooding and Fluvial Erosion, Structural Fire	Winter Storms
Windham RPC	Flooding and Fluvial Erosion, Severe Winter Storms	Structural Fire; Windstorms, Radiological Risk

Several regions set forth new goals and mitigation strategies. These strategies were also considered during the development of state mitigation priorities. The following example comes from the Chittenden County Multijurisdictional All-Hazards Mitigation Plan Act. Municipalities

and individual organizations could potentially engage in the following general regional mitigation strategies:

1. Work with and assist municipalities in completing fluvial geomorphology assessment and landslides hazard assessment.
2. Encourage coordination and cooperation between municipal, nonprofit, and private emergency services providers.
3. Develop multi-partner research projects to address data gaps in all hazards mitigation planning.
4. Develop multi-partner public communications, outreach and education projects to improve the capacity of the general public and the private sector to mitigate the effects of, and endure hazard events.

Other mitigation strategies provided in the regional plans often included:

- Building Design/Codes/Use Regulations
- Community Preparedness Activities
- Financial & Tax Incentives
- Hazard Control & Protective Works
- Insurance Programs
- Land Use Planning/Management
- Science & Technology
- Mitigation Committee
- Protection/Retrofit of Infrastructure & Essential Facilities
- Public Awareness/Training & Education
- Public Health/Emergency Medical Care/Education
- Public Protection
- Laws/Ordinances/Inspections

Consideration of Mobile Home Parks in Local Hazard Mitigation Plans

A review of 58 local HMPs for towns with mobile home parks was conducted. Upon completion, it was discovered that 87 percent of towns do not specifically consider the potential risks of natural and technological hazards to mobile home parks. Very few plans identify mitigation strategies for these communities. In cases where mobile home parks are mentioned, there is a varying level of detail related to the town's park or parks. Key highlights from this study include:

- 17 percent of the available plans discuss at least one potential hazard related to current mobile home parks within the town.
- The majority of the risks identified include flooding, tropical storms, hurricanes, structural fires, and high winds.

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- Two communities noted parks that are on public water systems (Weathersfield and Fair Haven).
- Very few plans identified potential mitigation strategies related to their parks; four towns (Berlin, Braintree, Springfield, and Washing) discussed strategies such as tie downs to minimizing wind damage, creating new emergency access points, and water systems.

6.5 Prioritizing Community Planning and Projects

This section includes criteria for prioritizing communities and local jurisdictions projects that receive grants under available funding programs. These projects should include:

- Consideration for communities with the highest risk conditions
- Communities which have demonstrated the strongest commitment toward implementation of pre-disaster mitigation measures, such as local river corridor protection programs
- Repetitive loss properties, in accordance with FEMA definitions and state records
- Communities demonstrating a critical or urgent mitigation need
- Small and impoverished rural areas which rarely benefit from federal or state assistance programs
- Existence of a River Corridor Plan

For non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a formal cost-benefit review of proposed projects and their associated costs.

The State of Vermont Hazard Mitigation Committee by means of the Hazard Mitigation Grant Review Subcommittee (HMGRS) typically selects priority areas for mitigation grants based upon the following criteria:

- Repetitive loss areas as indicated by past history and documented prior losses
- Areas chronically affected by severe flooding, ice jams, FEHs, landslides and other natural disasters
- Areas within which river corridor protection strategies will most effectively mitigate future flood loss in comparison with other alternatives
- Strong benefit-cost ratio, i.e., between 1.0 and 5 in accordance with FEMA Benefit-Cost Analysis (BCA) guidelines
- Areas where the following are important issues: water quality, stream bank erosion, watershed maintenance, storm water runoff, chronic flooding, ice jams
- Towns impacted by strong development pressures or otherwise demonstrating a critical or urgent mitigation need
- Communities traditionally underserved by state and federal grant programs, e.g., small and impoverished communities

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- Measures that are commensurate with preserving the natural features of rivers, streams, mountain ranges, forests, open spaces and other aspects of the natural landscape
- Areas indicating a high probability of recurrence of hazards (based on local and state assessments, past history at site, etc.)
- Projected effects of potential natural disasters on people and property, utilizing HAZUS-MH assessments and computer projections
- Frequency of hazard occurrence in designated area
- Length or duration of natural disaster
- Scope or intensity of previous disasters in applicant locations
- Local efforts to be proactive

All project grant applications, a copy of which can be found in Appendix J: State of Vermont Mitigation Grant Application, are subject to strict BCA, following the guidelines and format as set by FEMA. Planning grant applications are reviewed and vetted according to how well the proposals address long-term mitigation needs. In a recent example, the Fluvial Geomorphic Assessment Planning Grant addresses a critical problem facing a large number of Vermont towns and communities; namely, problems caused by fluvial erosion damages due to stream instability resulting from natural processes and anthropogenic influences. As it is widely applicable, this practical fluvial erosion assessment is often used in reviewing hazard mitigation grant applications for potential eligibility. Additional eligibility requirements are listed in Appendix K: State of Vermont Mitigation Project Review Criteria. The HMGP Subgrant Agreement may be found in Appendix L: State of Vermont HMGP Subgrant Agreement.

State Established Incentives

In addition to the priorities set forth in 44 CFR, Section 206.435(b) the State of Vermont Hazard Mitigation Committee has established further incentives within the selection criteria as follows:

- Adoption of local road and bridge standards recommended by VTrans
- Adoption of river corridor protection ordinances consistent with the state model
- Achieving a Community Rating System (CRS) rating of #1 through 9 in connection with NFIP
- Traditionally do not benefit from State or Federal grant programs, e.g. small and impoverished communities

A revised incentives list pertaining to the state's Emergency Relief and Assistance Fund (ERAF) has been approved.

Additional Considerations

The selection process shall consider how well the proposed project is designed and organized, as well as the degree to which the applicant demonstrates technical ability to successfully implement the project.

7.1 Monitoring, Evaluating, and Updating the State of Vermont Hazard Mitigation Plan

The State of Vermont Hazard Mitigation Plan (HMP) is a dynamic document; it is not immutable nor set in stone. To ensure that the HMP remains current and relevant to actual mitigation needs, it is important that it be updated periodically. It is the Vermont Division of Emergency Management and Homeland Security's (DEMHS) policy that the State of Vermont HMP will be updated at least once a year or after a declared disaster (and not less than every 3 years). The responsibility for the maintenance and updating of the plan lies with DEMHS' State Hazard Mitigation Officer.

7.1.1 Analysis of Previous Plan Maintenance Procedures

The 2010 State of Vermont HMP provided a foundation upon which the State could implement identified mitigation projects as well as carry out an extensive Hazard Mitigation Grant Program (HMGP) process following Tropical Storm Irene. Progress made on previously identified mitigation goals is summarized in Section 5, including those impacted by Tropical Storm Irene.

The State of Vermont's various agencies have always been invested in mitigation activities, as identified in previous Vermont HMPs. However, the events following Tropical Storm Irene magnified the need for coordination and a comprehensive approach to mitigation and resiliency planning statewide. As evidenced throughout the plan, the results of this have been multi-agency coordination efforts to build a stronger, more resilient Vermont. This important lesson learned has certainly impacted the planning process as well as the approach to plan maintenance in regard to the HMP. Multiple State agencies provided key representatives to the State of Vermont Hazard Mitigation Planning Committee and participated heavily in providing information and analyzing their mitigation goals from an agency perspective. The previous plan provided the guidance and foundation upon which to build the planning committee, update this plan, and gave insight to the State of Vermont's new approach to mitigation.

Additionally, Tropical Storm Irene shed light on the need for education of HMGP funding and the application process. Following this disaster and other flood events in 2011, the State of Vermont spent significant resources to ensure that local jurisdictions were knowledgeable about mitigation projects and available funding. This not only included education about funding eligibility, but also provided recommendations for monitoring and reporting of current projects underway. A detailed process for HMGP applications and review was included in the previous plan; nevertheless, this renewed focus on educating local officials and providing technical assistance for HMGP is a great improvement from the previous State of Vermont HMP's Maintenance Section.

7.1.2 Plan Review and Update Procedures

The following procedures should be followed for updating the plan:

1. The State of Vermont Hazard Mitigation Committee will discuss the process to determine if the evaluation criteria are still appropriate or if modifications or additions are needed due to changing conditions since the last update occurred. Data needs will be reviewed, data sources will be identified and responsibility for collecting information will be assigned to members.
2. DEMHS's State Hazard Mitigation Officer and State mitigation partners will review each section of the HMP to determine actual progress achieved in reaching mitigation goals and objectives. The following will be determined:
 - a. The status report concerning how well DEMHS and State partners are achieving goals and objectives
 - b. Whether goals and objectives still address current conditions
 - c. Any obstacles in achieving mitigation goals and objectives
 - d. Whether or not revisions to strategies, goals, and objectives are warranted
3. A draft report will be prepared based on these evaluation criteria:
 - a. Changes in community and governmental processes, which are hazard-related and have occurred since the last review
 - b. Progress in implementation of plan initiatives and projects
 - c. Effectiveness of previously implemented initiatives and projects
 - d. Evaluation of unanticipated challenges or opportunities that may have occurred between the date of adoption and the date of the report
 - e. Evaluation of hazard-related public policies, initiatives and projects
 - f. Review and discussion of the effectiveness of public and private sector coordination and cooperation
4. The State of Vermont Hazard Mitigation Committee will convene a second meeting of the review/update subcommittee to review the draft report. Consensus will be reached on changes to the draft.
5. The State Hazard Mitigation Officer will incorporate changes and schedules public hearings (if deemed necessary) in accordance with Vermont Title 3, Chapter 67, Paragraph 4020b.
6. The State Hazard Mitigation Officer will provide a 30-day advance notice of the public hearing (if deemed necessary) with specific notice to:
 - a. Executive director of each Regional Planning Commission (RPC)
 - b. Department of Housing and Community Affairs
 - c. Agency of Natural Resources (ANR)
 - d. Agency of Transportation
 - e. The council of Regional Commissions

- f. Business, conservation, environmental, low-income advisory and other community groups or organizations that have requested notice prior to the date the hearing is announced.
7. The State Hazard Mitigation Officer will accommodate input received at the public hearing (if deemed necessary) and will provide proposed changes to the HMP to members of the State of Vermont Hazard Mitigation Committee.
8. The State Hazard Mitigation Officer will schedule a second public hearing per subparagraphs 5 and 6 above, if deemed necessary.
9. The State Hazard Mitigation Officer finalizes the plan and provides it to the State of Vermont Hazard Mitigation Committee for final concurrence.
10. Upon full State of Vermont Hazard Mitigation Committee concurrence, the State Hazard Mitigation Officer will forward the updated plan to the Governor's Authorized Representative (GAR) for approval and submission to DHS/ FEMA Region 1.

Post-Disaster Review Procedures

In the aftermath of a declared disaster, if deemed necessary, a special review may occur in accordance with the following procedures:

- Within six months of a declared emergency event or when feasible, DEMHS may initiate a post-disaster review and assessment. Members of the State of Vermont Hazard Mitigation Committee will be notified that the assessment process has commenced.
- This post-disaster review and assessment will document the facts of the event and assess whether existing HMPs (state and regional) effectively addresses the hazard.
- A draft after action report of the review and assessment will be distributed to the Review/Update Committee.
- A meeting of the Committee will be convened by the State Hazard Mitigation Officer to make a determination whether the plan needs to be amended. If the Committee determines that no modification of the plan is needed, then the report is distributed to local communities.
- If the Committee should determine that modification of the plan is needed, the State Hazard Mitigation Officer will draft an amended plan that will reflect the recommendations of the Committee.

7.1.3 Monitoring Progress on Mitigation Activities

The State Hazard Mitigation Officer, in cooperation with members of the State of Vermont Hazard Mitigation Committee, will periodically undertake a review of progress and efficacy of the State's mitigation strategies in reaching our stated goals and objectives. It is DEMHS's aim to perform this comprehensive review on an annual basis or every 18 months at the latest. This review will be concomitant and coterminous with the three-year State of Vermont HMP update cycle. To improve monitoring and track progress of mitigation activities, it has been decided to hold more frequent meetings of the State of Vermont Hazard Mitigation Committee and hold more regular informal exchanges of information among state, regional, and local partners. When

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feasible, a post-disaster analysis of the mitigation project will be conducted by DEMHS mitigation staff.

In the 2010-2013 timeframe, it was deemed necessary to revise the Project Selection Review Criteria used to rank project applications for funding. A revised HMGP grant application was also produced which better reflected current state priorities. It was also decided to place a greater emphasis on implementing preventive mitigation measures, particularly those involving fluvial erosion hazards (FEH), riverine corridor protection studies, and concentrating on communities severely impacted by chronic flooding and ice jams. In addition, a greater emphasis was placed on assisting local towns in developing feasible local HMPs, with the assistance of RPCs and DEMHS mitigation staff.

Status Report on 2010-2013 State of Vermont Hazard Mitigation Plan

This comprehensive mitigation review revealed that many grant and loan incentives and priorities have not yet been implemented. However, some progress was made on implementing State of Vermont HMP goals in V.S.A. Title 20 change, yet much more can still be done in this area. On a positive note, improved DEMHS- RPC coordination has been achieved, mainly with local hazard mitigation planning.

Other positive developments are as follows:

- ANR completed essential fluvial geomorphic assessments in many areas; work in continuing satisfactorily in other locations as of July 2010.
- Funding has continued for local flood mitigation studies and other planning activities through a large PDM-C State of Vermont HMP Grant, a coordinated by DEMHS, ANR and the RPCs.
- River corridor planning projects are in progress, funded through the Vermont Ecosystem Restoration Program. However, river corridor protection mechanisms still need to be implemented.
- ANR has produced Municipal and Technical Guides and Procedures for FEH mitigation and river corridor protection.
- ANR has adopted a Stream Alteration Rules and a General Permit, which sets standards for in-stream work including emergency protective measures and stream crossings.
- Timely risk assessments were performed in Lincoln on the New Haven River.
- Mitigation Project Selection Criteria checklist has been revised and updated by DEMHS to better reflect current state priorities.
- More frequent meetings of the State of Vermont Hazard Mitigation Committee and Project Selection Subcommittee have occurred with improved information flow between and among Committee members.
- DEMHS has increased its outreach assistance and workshop training to towns to develop more competitive PDM-C grant applications.
- DEMHS has developed more collaborative working relationships with the U.S. Army Corps of Engineers and with the Vermont League of Cities & Towns for mitigation projects and outreach initiatives.

The following objectives still need to be more fully implemented and represent areas for improvement:

- VT Agency of Agriculture and RPC flood mitigation efforts and river corridor protection mechanisms.
- Legislative action is recommended to ensure that future development takes place outside FEH areas and designated floodways.
- Changes to V.S.A. Chapter 117 measures were encouraging, but additional progress still needs to be made on the state legislative side.
- As related to flood mapping and risk assessments, some progress has been made on flood map modernization in select counties, but much more still needs to be done. Flood plains and flood zones need to be delineated more accurately on new digitalized FEMA flood maps (FIRMS).
- More attention needs to be focused at the state and local levels on pre-disaster flood mitigation and ice jam mitigation projects and planning.
- More communities still need to implement proactive mitigation measures pursuant to an avoidance strategy, and not simply repair or retrofit existing infrastructure facilities.
- There needs to be greater local and state legislative support for important mitigation priorities, including: risk avoidance, remediation of repetitive flood loss areas, river corridor protection and attention to areas impacted by chronic fluvial erosion and severe flooding.
- A more tightly focused future State of Vermont HMP could potentially include interim benchmarks for measuring progress at the local and state levels. This may extend beyond the required three-year cycle of State of Vermont HMP updates.
- More focus on developing a climate change strategy that identifies adaptation techniques, policies and activities that enhance resilience at the local and state-level from climate change impacts. The strategy may very well build on progress the state has made thus far in promoting local initiatives to conduct fluvial geomorphic assessments, develop FEH risk mapping and river corridor planning, and adopt FEH and enhanced floodplain protection ordinances.

Nonetheless, the following elements remain valid for the 2010-2013 timeframe:

The State of Vermont HMP maintenance process should include:

- A system for monitoring implementation of mitigation measures, quarterly reports, and project closeouts.
- A system for reviewing progress on achieving goals as well as activities and projects in the Mitigation Strategy.

The State Hazard Mitigation Officer or other DEMHS representative will continue to monitor progress of each mitigation project by periodic on-site inspections of the work in progress. This will be in addition to the submission of quarterly progress reports. This monitoring will ensure that the project conforms to the original scope of work, project design, and project cost. After project completion, a final site inspection will take place, which will include taking digital photos of the site, and review of project invoices and other documentation to ensure that all

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project closeout procedures are met in accordance with the guidelines (please refer to Closeout Section below).

To review progress on achieving mitigation goals, when feasible a full Post-Project Completion report may be presented to the Hazard Mitigation Committee, which meets semi-annually to monitor progress on the State of Vermont HMP. (Please see Appendix M for State of Vermont Mitigation Project Post-Completion Report). Due to DEMHS staffing limitations and time constraints, the post-project analyses may be done for select projects only. When feasible, the State Hazard Mitigation Officer will submit these post-completion reports to the Mitigation Subcommittee at an annual State of Vermont Hazard Mitigation Committee Review meeting. These detailed reports may indicate:

- Actual cost savings (cost avoidance) resulting from the mitigation project
- How well the project contributes to overall State mitigation strategy
- How many homes and/or individuals were safeguarded as a result of the mitigation project
- If emphasis should be shifted to other state mitigation priorities

At DEMHS's discretion, the State Hazard Mitigation Officer and Hazard Mitigation Subcommittee will carefully review the Post-Project Completion reports and make recommendations for amendments or changes for future project selection.

DEMHS plans to further implement a Mitigation Project Geo-Location program. This will locate mitigation projects on a state map and will be linked to DEMHS's VEPARDS database. The mitigation data would also be accessible in DEMHS's DisasterLan program for the state emergency operations center (EOC). Mitigation data will be analyzed to help judge the effectiveness of the completed mitigation project. The methodology for determining project efficacy will be developed with assistance from the ANR and from other state partners.

7.2 Project Implementation and Closeout

Implementation and Monitoring

The State of Vermont Hazard Mitigation Committee will review and monitor each mitigation project during its implementation and after its completion. The State Hazard Mitigation Officer or other DEMHS representative will initiate this review. In the period following project completion, a comprehensive review will be performed to address the following:

- Is the project cost effective (per benefit-cost analysis)?
- Amount of funds saved a result of this project?
- Did the project meet State hazard mitigation goals and objectives?
- Is the project in accordance with prior approved scope of work?
- Is the project in accordance with State/federal environmental laws and regulations?
- Can lessons be applied to improve the selection, design, and implementation of future mitigation projects?

The State Hazard Mitigation Officer will gather this information utilizing the Post-Project Completion form. When feasible, an on-site inspection will be scheduled, along with an interview of the project manager in the town. The post-project review will include a benefit-cost analysis and environmental checklist. The State Hazard Mitigation Officer will present his aggregate findings in a report to the State of Vermont Hazard Mitigation Committee, which will meet on a semi-annual basis.

Closeout Procedures

- The subapplicant shall forward final bills and the closeout form to the Department of Public Safety (DPS) Finance Administrator, who will review, copy and forward this to DPS Finance for final payment. DPS Finance will then forward all final payments and admin fees to the subapplicant.
- The State Hazard Mitigation Officer will conduct final site inspections and ensure that all work has been completed according to the scope of work. The State Hazard Mitigation Officer will carefully examine project related invoices to verify expenditures are reasonable, authorized, and commensurate with pre-approved budgets. Any financial irregularity or questionable expense will be reported to DEMHS/DPS Finance and FEMA. Digital photographs of completed projects will be a part of the closeout package sent to FEMA.
- Upon project closeout, a letter to the FEMA Mitigation Division will be forwarded requesting that FEMA close the project. This letter will include:
 - Project name
 - Federal project number
 - Final total project cost
 - Final mitigation grant funding amount
 - Photographs of the completed project
 - Assurance that all eligible funds have been paid to the Subgrantee, all costs were the result of eligible work, all work was completed in accordance with the project conditions, no bills are outstanding, and no further request for funding will be made for the project
- *Public Assistance Closeout Procedures:* The FEMA Public Assistance (PA) closeout process includes some elements that were not in place before Tropical Storm Irene:
 - One example is that the “Conditions Information” section of the Project Worksheets, which includes a list of the permits required for the project, are truly required at closeout now. This protects both the town and the State.
 - The State also provides a closeout checklist with information on expenditures for towns to fill out. This checklist and other useful documents for PA applicants are available on the DEMHS website: <http://vem.vermont.gov/publicassistance>.

Program Closeout

For all federally declared disasters, the designated DEMHS mitigation staff will request the closeout procedure with the DEMHS/DPS Finance departments.

Although the plan should be reviewed in its entirety every three years as described above, each town may review and update their programs, initiatives, and projects more often directly with the State Hazard Mitigation Officer based upon changing local needs and priorities.

7.2.1 Mitigation Project Maintenance

The State Hazard Mitigation Officer, working in coordination with members of the State of Vermont Hazard Mitigation Committee, monitors the administration and implementation of mitigation projects. The State Hazard Mitigation Officer is also responsible for ensuring that project closeout criteria and documentation is complete.

The State of Vermont Hazard Mitigation Committee and the State Hazard Mitigation Officer is responsible for monitoring and tracking progress of mitigation measures. By conducting periodic site visits, collecting relevant data and issuing reports, and attending local meetings, the State Hazard Mitigation Officer or other DEMHS staff member verifies compliance with scope of work criteria for mitigation projects. During on-site inspections of projects in progress as well as completed mitigation projects, the State Hazard Mitigation Officer will collect information for a report on measurable outcomes. Measurable post-project outcomes will include:

- Progress on achieving local mitigation goals
- Actual long-term savings to the local community and the state, once a feasible system has been implemented to calculate savings
- Actual infrastructure maintenance savings to roads, bridges, culverts
- Conformance with existing environmental laws and regulations
- How well the project contributes to achieving broader goals as outlined in the State of Vermont HMP

During site visits, the State Hazard Mitigation Officer will take digital photographs of the area and will conduct interviews with town officials and state agency representatives to help determine the post-completion efficacy of the mitigation project. Annual maintenance cost figures will be gathered and compared with projected savings. Utilizing the Benefit-Cost Analysis (BCA) matrix, the actual savings can be determined for inclusion into a final post-completion project report. The project will also be assessed for adherence to existing environmental regulations.

7.3 Review and Update of the State of Vermont HMP

Beginning in 2007 and continuing into the present time, the State of Vermont HMP was reviewed by DEMHS in its entirety on an annual basis or after every major declared disaster. If time constraints preclude this, the review will be performed no later than 18 months after each revised plan has been finalized. This will allow DEMHS to better monitor progress in achieving mitigation goals and objectives, and will provide an opportunity to make recommendations for changes in future State of Vermont HMPs.

Ideally, updates should be undertaken sooner than the mandatory three-year interval as much as possible. The HMP review will take into account changes in local, state and federal statutes, and

will deal with changes in mitigation priorities within the state. Changes in mitigation priorities will be accomplished through a comprehensive review of past mitigation projects and planning grants. The State of Vermont HMP review/update phase will incorporate information obtained by the post-project review process as described in other sections of this Plan.

A comprehensive review of the State of Vermont HMP will examine:

- The overall efficacy of the State of Vermont HMP in addressing real mitigation needs
- Actual savings realized by implementing cost effective projects
- How mitigation efforts support environmental protection regulations
- Areas for organizational and programmatic improvement
- How to more efficiently combine federal, state, and local resources to implement the most cost effective hazard mitigation projects and planning
- How to better coordinate and implement state, regional and local mitigation efforts

The State of Vermont and the DEMHS strive toward a synergistic, inclusive and collaborative approach to hazard mitigation in the state. Ideally, this strategy incorporates input from a wide variety of state, local, and regional agencies, including the Agency of Natural Resources, Department of Housing and Community Affairs, Vermont Agency of Transportation, the Vermont Center for Geographic Information, and the 11 RPCs. The mitigation strategy also includes advice and suggestions from the nonprofit, environmental, and NGO community. By involving a diverse range of agencies and organizations, we believe this strategy can better address mitigation needs and implement more effective and useful strategies throughout the State of Vermont.

Appendix A

ACRONYMS, DEFINITIONS, AND GLOSSARY

Acronyms:

A:

AAP	Acceptable Agricultural Practices
AFB	Air Force Base
AMP	Acceptable Management Practices
AMS	Aerial Measuring System
ANR	Agency of Natural Resources
ANSIR	Awareness of National Security Issues and Response Program
ARAC	Atmospheric Release Advisory Capability
ARC	American Red Cross
ARES	Amateur Radio Emergency Services
ARG	Accident Response Group
ARS	Agriculture/Research Service
ARRL	American Radio Relay League
ATC	Air Traffic Control
ATSD (CS)	Assistant to the Secretary of Defense for Civil Support

B:

BDC	Bomb Data Center
BIA	Bureau of Indian Affairs
BMP	Best Management Practices

C:

CBIAC	Chemical and Biological Defense Information and Analysis Center
CBRNE	Chemical, Biological, Radiological, Nuclear Material, or High- Yield Explosive
CDBG	Community Development Block Grant

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CDC	Centers for Disease Control, U.S. Public Health Service
CDC	Centers for Disease Control and Prevention
CDRG	Catastrophic Disaster Response Group
CDRG	Catastrophic Disaster Response Group
CEPPO	Chemical Emergency Preparedness and Prevention Office
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHEMTREC	Chemical Transportation Emergency Center
CHPPM	Center for Health Promotion and Preventive Medicine
CIRG	Crisis Incident Response Group
CJCS	Chairman of the Joint Chiefs of Staff
CM	Consequence Management
CMU	Crisis Management Unit (CIRG)
CRU	Crisis Response Unit
CSREES	Cooperative State Research, Education and Extension Service
CST	Civil Support Teams
CW/CBD	Chemical Warfare/Contraband Detection

D:

DAE	Disaster Assistance Employee (FEMA temporary employee)
DOC	Department of Commerce
DEC	Department of Environmental Conservation
DEMHS	Vermont Division of Emergency Management and Homeland Security
DEST	Domestic Emergency Support Team
DHCA	Department of Housing and Community Affairs
DHS	Department of Homeland Security
DFO	Disaster Field Office
DMAT	Disaster Medical Assistance Team

ACRONYMS, DEFINITIONS, AND GLOSSARY

DMCR	Disaster Management Central Resource
DMORT	Disaster Mortuary Operational Response Team
DOD	Department of Defense
DOE	Department of Energy
DOE	Department of Education
DOI	Department of the Interior
DOJ	Department of Justice
DOL	Department of Labor
DOS	Department of State
DOT	Department of Transportation
DPP	Domestic Preparedness Program
DTCTPS	Domestic Terrorism/Counter Terrorism Planning Section (FBI HQ)
DTIC	Defense Technical Information Center

E:

EM	Emergency Management
EMI	Emergency Management Institute
EMS	Emergency Medical Services
ERP	Emergency Watershed Protection
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ERAF	Emergency Relief & Assistance Fund
ERT	Emergency Response Team (FBI)
ERT-A	Emergency Response Team – Advance Element
ERTU	Evidence Response Team Unit
ESF	Emergency Support Function

Appendix A

EST Emergency Support Team

EU Explosives Unit

F:

FAA Federal Aviation Administration

FBI Federal Bureau of Investigation

FCC Federal Communications Commission

FEMA Federal Emergency Management Agency

FEST Foreign Emergency Support Team

FHA Federal Highway Administration

FMA Flood Mitigation Assistance Program

FNS Food and Nutrition Service

FRERP Federal Radiological Emergency Response Plan

FRMAC Federal Radiological Monitoring and Assessment Center

FRP Federal Response Plan

FS Forest Service

G:

GAR Governor's Authorized Representative

GSA General Services Administration

H:

HazMat Hazardous Materials

HHS Department of Health and Human Services

HMGP Hazard Mitigation Grant Program

HMRU Hazardous Materials Response Unit

HQ Headquarters

HRT Hostage Rescue Team (CIRG)

HTIS Hazardous Technical Information Services (DoD)

ACRONYMS, DEFINITIONS, AND GLOSSARY

HUD Department of Housing and Urban Development

I:

IC Incident Commander
ICC Interstate Commerce Commission
ICS Incident Command System
IND Improvised Nuclear Device

J:

JIC Joint Information Center
JOC Joint Operations Center
JTF-CS Joint Task Force for Civil Support

K:

L:

LEPC Local Emergency Planning Committee
LFA Lead Federal Agency
LLNL Lawrence Livermore National Laboratory

M:

MEDCOM Medical Command
MMRS Metropolitan Medical Response System
MOA Memorandum of Agreement
MOU Memorandum of Understanding
MSCA Military Support to Civil Authorities

N:

NAP Nuclear Assessment Program
NBC Nuclear, Biological, and Chemical
NCP National Oil and Hazardous Substances Pollution Contingency Plan

Appendix A

NDMS	National Disaster Medical System
NDPO	National Domestic Preparedness Office
NEST	Nuclear Emergency Search Team
NETC	National Emergency Training Center
NFA	National Fire Academy
NGO	Nongovernmental Organization
NMRT	National Medical Response Team
NRC	Nuclear Regulatory Commission
NRT	National Response Team
NSC	National Security Council
NTIS	National Technical Information Service
NWS	National Weather Service
O:	
OEP	Office of Emergency Preparedness
OFCM	Office of the Federal Coordinator for Meteorology
OIG	Office of the Inspector General (USDA)
OSC	On-Scene Commander
OSHA	Occupational Safety and Health Administration
OSLDPS	Office for State and Local Domestic Preparedness Support
P:	
PA	Public Affairs or Public Assistance
PAO	Public Affairs Officer
PDA	Preliminary Damage Assessment
PDD	Presidential Decision Directive
PDM-C	Pre-Disaster Mitigation-Competitive Program
PHS	U.S. Public Health Service, Department of Health and Human Services

ACRONYMS, DEFINITIONS, AND GLOSSARY

POC	Point of Contact
PT	Preparedness, Training, and Exercises Directorate (FEMA)
PUD	Planned Unit Development

Q:

R:

R&D	Research and Development
RACES	Radio Amateur Civil Emergency Services
RAP	Radiological Assistance Program
RCRA	Research Conservation and Recovery Act
RDD	Radiological Dispersal Device
REAC/TS	Radiation Emergency Assistance Center/Training Site
RMP	River Management Program
ROC	Regional Operations Center
RRIS	Rapid Response Information System (FEMA)
RRT	Regional Response Team

S:

SAC	Special Agent in Charge (FBI)
SARA	Superfund Amendments and Reauthorization Act
SBCCOM	Soldier and Biological Chemical Command (U.S. Army)
SCBA	Self-Contained Breathing Apparatus
SEB	State Emergency Board
SERC	State Emergency Response Commission
SHMC	State Hazard Mitigation Committee
SHMO	State Hazard Mitigation Officer
SHPO	State Historical Preservation Officer
SIOC	Strategic Information and Operations Center (FBI HQ)

Appendix A

SLG State and Local Guide
SOP Standard Operating Procedure

T:

TERC Tribal Emergency Response Commission
TIA Terrorist Incident Appendix
TRIS Toxic Release Inventory System

U:

UC Unified Command
UCS Unified Command System
USC U.S. Code
USDA United States Department of Agriculture
USFA U.S. Fire Administration
USGS United States Geological Survey
USPHS United States Public Health Service
USPS United States Postal Service

V:

VA Department of Veterans Affairs
VEPARDS Vermont Emergency Planning & Response Database System

W:

WMD Weapons of Mass Destruction
WMD-CST WMD Civil Support Team

Definitions

The following definitions were agreed upon for the purpose of clarity in planning process documentation:

Alternate Governor’s Authorized Representative (Alternate GAR): The individual selected for this position is the Deputy Secretary of Administration, who performs the duties of the GAR when so designated or assigned.

Application: The initial request for funding under Section 404, Public Law 100-707, which is to be submitted to FEMA by the State of Vermont as provided in Section 206.436 of the Federal regulations within 12 months of a declaration of a major disaster.

Grant: An award of financial assistance. The total grant the estimated total eligible Federal share of all approved projects under Section 406, PL100-707, shall determine award.

Grantee: The State of Vermont. It is the State of Vermont to which a disaster assistance grant is awarded and which is accountable for the use of funds provided. The State of Vermont will be the grantee for all Federal Disaster Assistance funds. Local governments, State Agencies, and eligible private nonprofit institutions can be designated as subgrantees.

Governor’s Authorized Representative (GAR): The individual selected to represent the Governor in all activities related to implementing the provisions of PL 100-707. In Vermont, the GAR has been designated as the Secretary of Administration. The GAR also serves as chairperson for the State Hazard Mitigation Committee.

The State Hazard Mitigation Officer (SHMO) shall be the person selected to coordinate and implement state hazard mitigation policy. The SHMO will be responsible for coordinating all hazard mitigation activities under the Sections 404 and 409 of PL-100-707. This position is located at Vermont Emergency Management.

Hazard Mitigation Grant Program (HMGP) Application: As part of the initial application process, the Vermont application that is completed for consideration for funding under the HMGP by the Hazard Mitigation Selection Committee.

Hazard Mitigation Grant Review Subcommittee (HMGRS): A subcommittee of the State Hazard Mitigation Committee, formed to assist in the review and evaluation of mitigation project applications. The HMGRS shall be composed of personnel from the following agencies: Agency of Administration, Agency of Natural Resources (ANR), Agency of Transportation, Agency of Human Services, Department of Buildings and General Services, Department of Housing and Community Affairs, Vermont Association of Planning & Development Agencies (VAPDA) and Vermont Emergency Management. Composition shall include, but not be limited to, the aforementioned agencies. The Alternate GAR is designated as the chair of this subcommittee.

Project: Any mitigation action, measure, or proposal offered to reduce the risk of future damage, hardship, or losses from emergencies or disasters.

Section 404 Projects: Projects proposed by eligible applicants through the HMGP funded following a Presidential disaster declaration.

State Hazard Mitigation Committee (SHMC): A state committee, operating throughout the year, that provides mitigation policy and planning guidance for all aspects of the hazard mitigation program in Vermont. The SHMC will provide technical and programmatic assistance

to the SHMO in the development and maintenance of the State of Vermont Hazard Mitigation Plan (HMP). The SHMC shall be composed of personnel from the following agencies: Agency of Administration, Agency of Agriculture, ANR, Agency of Transportation, Agency of Human Services, Department of Buildings and General Services, Department of Education, Department of Housing and Community Affairs, Department of Banking, Insurance, Securities & Health Care, Department of Labor & Industry and Vermont Emergency Management. Additionally, the VAPDA, the Federal Emergency Management Agency (FEMA) and the National Resource Conservation Service (NRCS) shall be represented. Composition shall include, but not be limited to, the aforementioned agencies. The Agency of Administration will designate the chair of this committee.

State of Vermont HMP: The current State of Vermont HMP (pre-DMA2000) was developed as a condition to receiving Federal Disaster Assistance under Section 409 of Public Law 100-707. The plan is to be updated within 180 days following a declared disaster and is one of the basic policy guides for identification of projects to be funded under Section 404. This revision will integrate the requirements of the Disaster Mitigation Act 2000 (DMA 2000).

State Hazard Mitigation Program: An ongoing state program to promote sound mitigation practices to reduce the threat to people and property from natural disasters. The program involves a coordinated effort of State agencies and local governments striving to create communities more resistant to the effects and impact of all-hazards.

Subgrant: An award of financial assistance to an eligible sub grantee under a grant to a grantee.

Subgrantee: The legal entity to which a subgrant is awarded. Local governments, state agencies, and eligible private nonprofit institutions are potential subgrantees for funding under Section 404.

Glossary

Acceleration: The rate of change of velocity with respect to time. Acceleration due to gravity at the Earth's surface is 9.8 meters per second squared. That means that every second that something falls toward the surface of Earth, its velocity increases by 9.8 meters per second.

Acquisition of hazard-prone structures: Local governments can acquire lands in high hazard areas through conservation easements, purchase of development rights, or outright purchase of property.

Asset: Any manmade or natural feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.

Base Flood: Flood that has a 1 percent probability of being equaled or exceeded in any given year. Also known as the 100-year flood.

Base Flood Elevation (BFE): Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The BFE is used as a standard for the National Flood Insurance Program (NFIP).

Bedrock: The solid rock that underlies loose material, such as soil, sand, clay, or gravel.

Benefit: Net project outcomes, usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of conducting a benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable risk reduction factors, including a reduction in expected property losses (building, contents, and function) and protection of human life.

Benefit-Cost Analysis (BCA): A systematic, quantitative method of comparing the projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Biological agents: Biological agents are organisms or toxins that have illness-producing effects on people, livestock and crops.

Blizzard Warning: A Blizzard Warning is declared when considerable falling and/or blowing snow with sustained wind speeds of at least 35 mph will affect an area.

Building: A structure that is walled and roofed, principally aboveground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheel and axles carry no weight.

Capability assessment: An assessment that provides a description and analysis of a community or state's current capacity to address the threats associated with hazards. The capability assessment attempts to identify and evaluate existing policies, regulations, programs, and practices that positively or negatively affect the community's or state's vulnerability to hazards or specific threats.

Chemical agents: Chemical agents are poisonous gases, liquids or solids that have toxic effects on people, animals or plants.

Coastal zone: The area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas with direct drainage to the ocean.

Community Emergency Response Team (CERT): CERT is the mechanism to establish, train and maintain a local cadre of residents to act as first responders in the event of an emergency. A CERT team is especially critical in the first three days following a disaster when conditions may prevent access by emergency response personnel.

Community Rating System (CRS): CRS is a program that provides incentives for NFIP communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of these policyholders in communities are reduced.

Computer-Aided Design and Drafting (CADD): A computerized system enabling quick and accurate electronic 2-D and 3-D drawings, topographic mapping, site plans, and profile/cross-section drawings.

Cost Effectiveness: Cost effectiveness is a key evaluation criterion for federal grant programs. Cost-effectiveness has several possible definitions, although for grant-making purposes FEMA defines a cost effective project as one whose long-term benefits exceed its costs. That is, a project should prevent more expected damages than it costs initially to fund the effort. This is done to ensure that limited public funds are used in the most efficient manner possible. Benefit-cost analysis is one way to illustrate that a project is cost effective.

Contour: A line of equal ground elevation located on a topographic (contour) map.

Critical facilities: Facilities vital to the health, safety, and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.

Dam Hazard Class: The hazard class is determined by the downstream risk to life and property in the event of failure. Category 1 is assigned to high hazard dams that pose substantial life safety risk. Category 2 (significant hazard dams) poses less life safety risk. Category 3 dams are low hazard and pose little risk to life or property.

Dam Height: The height, measured in feet, is the vertical distance from the lowest point on the crest of the dam to the lowest point in the original streambed.

Debris: The scattered remains of assets broken or destroyed in a hazard event. Debris caused by a wind or water hazard event can cause additional damage to other assets.

Disaster Mitigation Act of 2000 (DMA 2000): DMA 2000 (Public Law 106-390) is the latest legislation to improve the planning process. Signed into law on October 30, 2000, this new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.

Digitize: To convert electronically points, lines, and area boundaries shown on maps into x, y coordinates (e.g., latitude and longitude, universal transverse mercator (UTM), or table coordinates) for use in computer applications.

Duration: The average time (in days), which the building's occupants typically must operate from a temporary location while repairs are made to the original building due to damages resulting from a hazard event. How long a hazard event lasts.

Earthquake: A sudden motion or trembling caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates.

Excessive Heat Warning: The Albany NWS Forecast Office will issue an excessive heat warning when the heat index is expected to exceed 115 degrees for any length of time during the day or the heat index will be equal to or exceed 105 degrees for more than 3 hours in a day for at least 2 consecutive days.

Excessive Heat Watch: The Albany NWS Forecast Office will issue an excessive heat watch when it is possible for the heat index to exceed 115 degrees for any length of time during the day or the heat index will be equal to or exceed 105 degrees for more than 3 hours in a day for at least 2 consecutive days.

Elevation of Structures: Raising structures above the BFE to protect structures located in areas prone to flooding.

Emergency response services: The actions of first responders such as firefighters, police, and other emergency services personnel at the scene of a hazard event. The first responders take appropriate action to contain the hazard, protect property, conduct search and rescue operations, provide mass care, and ensure public safety.

Epicenter: The epicenter of an earthquake is the point on the Earth's surface directly above the focus.

Erosion: Wearing away of the land surface by detachment and movement of soil and rock fragments, during a flood or storm or over a period of years, through the action of wind, water, or other geologic processes.

Erosion Hazard Area: Area anticipated to be lost to shoreline retreat over a given period of time. The projected inland extent of the area is measured by multiplying the average annual long-term recession rate by the number of years desired.

Essential Facility: Elements that are important to ensure a full recovery of a community or state following a hazard event. These would include government functions, major employers, banks, schools, and certain commercial establishments, such as grocery stores, hardware stores, and gas stations.

Extent: The size of an area affected by a hazard or hazard event.

Extratropical Cyclone: Cyclonic storm events like Nor'easters and severe winter low-pressure systems. Both West and East coasts can experience these non-tropical storms that produce gale-force winds and precipitation in the form of heavy rain or snow. These cyclonic storms, commonly called Nor'easters on the East Coast because of the direction of the storm winds, can last for several days and can be very large – 1,000-mile wide storms are not uncommon.

Fault: A fault is a fracture in the Earth's crust along which two blocks of the crust have slipped with respect to each other.

Focus: The focus of an earthquake is the point underneath the Earth's surface where an earthquake originates.

Federal Emergency Management Agency (FEMA): Agency created in 1979 to provide a single point of accountability for all federal activities related to disaster mitigation and emergency preparedness, response, and recovery. FEMA is now part of the Department of Homeland Security.

Fire Potential Index (FPI): Developed by USGS and USFS to assess and map fire hazard potential over broad areas. Based on such geographic information, national policy makers and on-the-ground fire managers established priorities for prevention activities in the defined area to reduce the risk of managed and wildfire ignition and spread. Prediction of fire hazard shortens the time between fire ignition and initial attack by enabling fire managers to pre-allocate and stage suppression forces to high fire risk areas.

Flash Flood: A flood event occurring with little or no warning where water levels rise at an extremely fast rate.

Flood: A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.

Flood Depth: Height of the floodwater surface above the ground surface.

Flood Elevation: Elevation of the water surface above an established datum, e.g. National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or Mean Sea Level.

Flood Hazard Area: The area on a map shown to be inundated by a flood of a given magnitude.

Flood Insurance Rate Map (FIRM): Map of a community, prepared by FEMA, which shows both the Special Flood Hazard Areas and the risk premium zones applicable to the community under the NFIP.

Flood Mitigation Assistance (FMA) Program: A program created as part of the National Flood Insurance Reform Act of 1994. FMA provides funding to assist communities and states in implementing actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other NFIP insurable structures, with a focus on repetitive loss properties.

Flood Insurance Study (FIS): A study that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.

Floodplain: Any land area, including watercourse, susceptible to partial or complete inundation by water from any source.

Flood-proofing: Actions that prevent or minimize future flood damage. Making the areas below the anticipated flood level watertight or intentionally allowing floodwaters to enter the interior to equalize flood pressures are examples of flood-proofing.

Flood Zone: A geographical area shown on a FIRM that reflects the severity or type of flooding in the area.

Frequency: A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent

typically occurs, on average. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average, and would have a 1 percent chance – its probability – of happening in any given year. The reliability of this information varies depending on the kind of hazard being considered.

Fujita Scale of Tornado Intensity: Rates tornadoes with numeric values from F0 to F5 based on tornado wind speed and damage sustained. An F0 indicates minimal damage such as broken tree limbs or signs, while an F5 indicates severe damage sustained.

Functional Downtime: The average time (in days) during which a function (business or service) is unable to provide its services due to a hazard event.

Geographic Area Impacted: The physical area in which the effects of the hazard are experienced.

Geographic Information Systems (GIS): A computer software application that relates physical features on the Earth to a database to be used for mapping and analysis.

Goals: General guidelines that explain what you want to achieve. They are usually broad policy-type statements, long-term in nature, and represent global visions.

Ground Motion: The vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter, but soft soils can further amplify ground motions.

Hazard: A source of potential danger or adverse condition.

Hazard Event: A specific occurrence of a particular type of hazard.

Hazard Identification: The process of identifying hazards that threaten an area.

Hazard information center: Information booths, publication kiosks, exhibits, etc. that display information to educate the public about hazards that affect the jurisdiction and hazard mitigation activities people can undertake.

Hazard Mitigation: Sustained actions taken to reduce or eliminate long-term risk from hazards and their effects.

Hazard Mitigation Grant Program (HMGP): Authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation activities to be implemented as a community recovers from a disaster.

Hazard profile: A description of the physical characteristics of hazards and a determination of various descriptors, including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

HAZUS, HAZUS-MH: A GIS-based, nationally standardized, loss estimation tool developed by FEMA. HAZUS-MH is the new multihazard version that includes earthquake, wind, hurricane, and flood loss estimate components.

Heat Advisory: The Albany NWS Forecast Office will issue a heat advisory when the heat index is expected to exceed 105 degrees, but be less than 115 degrees and less than 3 hours in a day and/or when nighttime lows are forecast to remain above 80 degrees for 2 consecutive days.

Heat Index: This is what the temperature feels like to the human body based on both the air temperature and humidity.

Hurricane: An intense tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center or “eye.” Hurricanes develop over the North Atlantic Ocean, Northeast Pacific Ocean, or the South Pacific Ocean east of 160°E longitude. Hurricane circulation is counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

Hydrology: The science of dealing with the waters of the Earth. A flood discharge is developed by a hydrologic study.

Infrastructure: Refers to the public services of a community that have a direct impact on the quality of life. Infrastructure includes communication technology, such as phone lines or Internet access; vital services, such as public water supplies and sewer treatment facilities; and an area’s transportation system: airports, heliports, highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, dry-docks, piers, and regional dams.

Intensity: A measure of the effects of a hazard event at a particular place.

Landslide: Downward movement of a slope and materials under the force of gravity.

Lateral Spreads: Develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies in a seismic event.

Liquefaction: The phenomenon that occurs when ground shaking causes loose soils to lose strength and act like viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength.

Loss of Bearing Strength: Results when the soil supporting structures liquefies. This can cause structures to tip and topple.

Loss estimation: Forecasts of human and economic impacts and property damage from future hazard events, based on current scientific and engineering knowledge.

Lowest Floor: Under the NFIP, the lowest floor of the lowest enclosed area (including basement) of a structure.

Magnitude: A measure of the strength of a hazard event. The magnitude (also referred to as severity) of a given hazard event is usually determined using technical measures specific to the hazard.

Maximum Storage: This volume, also measured in acre-feet, is the maximum amount of liquid impounded behind the dam when the water level is at its maximum.

Memorandum of Agreement (MOA): A non-binding statement that defines the duties, responsibilities, and commitment of the different parties or individuals; provides a clear statement of values, principles, and goals; and establishes an organizational structure to assist in measuring and evaluating progress.

Mitigate: To cause something to become less harsh or hostile, to make less severe or painful.

Mitigation actions: Activities or projects that help achieve the goals and objectives of a mitigation plan.

Mitigation plan: The document that articulates results from the systematic process of identifying hazards and evaluating vulnerability, identifying goals, objectives and actions to reduce or eliminate the effects of identified hazards, and an implementation plan for carrying out the actions.

National Flood Insurance Program (NFIP): Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations in 44 CFR §60.3.

National Geodetic Vertical Datum of 1929 (NGVD): Datum established in 1929 and used in the NFIP as a basis for measuring flood, ground, and structural elevations, previously referred to as Sea Level Datum or Mean Sea Level. The BFEs shown on most of the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency are referenced to NGVD.

National Weather Service (NWS): Prepares and issues flood, severe weather, and coastal storm warnings and can provide technical assistance to Federal and state entities in preparing weather and flood warning plans.

Nor'easter: An extratropical cyclone producing gale-force winds and precipitation in the form of heavy snow or rain.

Normal Storage: This is the total volume of water and sediment that is stored behind the dam when it is at its normal level. This volume is measured in acre-feet, which is a foot of water covering one acre. It is the equivalent of 43,560 cubic feet or 325,829 gallons.

Objectives: Objectives define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable.

Open space preservation: Preserving undeveloped areas from development through any number of methods, including low-density zoning, open space zoning, easements, or public or private acquisition. Open space preservation is a technique that can be used to prevent flood damage in flood-prone areas, land failures on steep slopes or liquefaction-prone soils, and can enhance the natural and beneficial functions of floodplains.

Ordinance: A term for a law or regulation adopted by a local government.

Outflow: Follows water inundation creating strong currents that rip at structures and pound them with debris, and erode beaches and coastal structures.

Overtopping: Water flowing over the parts of the dam or the abutments that should not be overflowed and causes a failure by erosion, structural collapse, piping or some other cause or causes. Usually occurs because of inadequate or blocked spillways during flood events.

Planimetric: Describes maps that indicate only manmade features like buildings.

Planning: The act or process of making or carrying out plans; the establishment of goals, policies, and procedures for a social or economic unit.

Piping: Progressive internal erosion of a soil mass, such as a dam embankment, foundation or abutment, by uncontrolled seepage that eventually erodes a channel or “pipe” through the dam

and results in a rapid release of the contents of the reservoir. Piping is a major cause of Earth dam failures and other dams with Earth foundations or abutments.

Policy: A course of action or specific rule of conduct to be followed in achieving goals and objectives.

Post-disaster mitigation: Mitigation actions taken after a disaster has occurred, usually during recovery and reconstruction.

Post-disaster recovery ordinance: An ordinance authorizing certain governmental actions to be taken during the immediate aftermath of a hazard event to expedite implementation of recovery and reconstruction actions identified in a pre-event plan.

Post-disaster recovery planning: The process of planning those steps the jurisdiction will take to implement long-term reconstruction with a primary goal of mitigating its exposure to future hazards. The post-disaster recovery planning process can also involve coordination with other types of plans and agencies, but it is distinct from planning for emergency operations.

Preparedness: Actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Probability: A statistical measure of the likelihood that a hazard event will occur.

Public education and outreach programs: Any campaign to make the public more aware of hazard mitigation and mitigation programs, including hazard information centers, mailings, public meetings, etc.

Recovery: The actions taken by an individual or community after a catastrophic event to restore order and lifelines in a community.

Recurrence Interval: The time between hazard events of similar size in a given location. It is based on the probability that the given event will be equaled or exceeded in any given year.

Regulation: Most states have granted local jurisdictions broad regulatory powers to enable the enactment and enforcement of ordinances that deal with public health, safety, and welfare. These include building codes, building inspections, zoning, floodplain and subdivision ordinances, and growth management initiatives.

Regulatory power: Local jurisdictions have the authority to regulate certain activities in their jurisdiction. With respect to mitigation planning, the focus is on such things as regulating land use development and construction through zoning, building codes, subdivision regulations, design standards, and floodplain regulations.

Relocation out of hazard areas: A mitigation technique that features the process of demolishing or moving a building to a new location outside the hazard area.

Repetitive Loss Property: A property that is currently insured for which two or more NFIP losses (occurring more than ten days apart) of at least \$1000 each have been paid within any 10-year period since 1978.

Replacement Value: The cost of rebuilding a structure. This is usually expressed in terms of cost per square foot, and reflects the present-day cost of labor and materials to construct a building of a particular size, type and quality.

Resources: Resources include the people, materials, technologies, money, etc., required to implement strategies or processes. The costs of these resources are often included in a budget.

Response: The actions taken during and immediately an event to address immediate life and safety needs and to minimize further damage to properties.

Resolutions: Expressions of a governing body's opinion, will, or intention that can be executive or administrative in nature. Most planning documents must undergo a council resolution, which must be supported in an official vote by a majority of representatives to be adopted. Other methods of making a statement or announcement about a particular issue or topic include proclamations and declarations.

Richter Scale: A numerical scale of earthquake magnitude devised by seismologist C.F. Richter in 1935.

Risk: The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Riverine: Of or produced by a river.

Scale: A proportion used in determining a dimensional relationship; the ratio of the distance between two points on a map and the actual distance between the two points on the Earth's surface.

Scarp: A steep slope.

Scour: Removal of soil or fill material by the flow of floodwaters. The term is frequently used to describe storm-induced, localized conical erosion around pilings and other foundation supports where the obstruction of flow increases turbulence.

Seismicity: Describes the likelihood of an area being subject to earthquakes.

Special Flood Hazard Area (SFHA): An area within a floodplain having a 1 percent or greater chance of flood occurrence in any given year (100-year floodplain); represented on Flood Insurance Rate Maps by darkly shaded areas with zone designations that include the letter A or V.

Stafford Act: The Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-107 was signed into law November 23, 1988 and amended the Disaster Relief Act of 1974, PL 93-288. The Stafford Act is the statutory authority for most federal disaster response activities, especially as they pertain to FEMA and its programs.

Stakeholder: Stakeholders are individuals or groups that will be affected in any way by an action or policy, including businesses, private organizations, and citizens, that will be affected in any way by an action or policy.

State Hazard Mitigation Officer (SHMO): The state government representative who is the primary point of contact with FEMA, other state and federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.

Storm Surge: Rise in the water surface above normal water level on the open coast due to the action of wind stress and atmospheric pressure on the water surface.

Structure: Something constructed. (See also Building)

Structural retrofitting: Modifying existing buildings and infrastructure to protect them from hazards.

Subdivision: The division of a tract of land into two or more lots for sale or development.

Subdivision and development regulations: Regulations and standards governing the division of land for development or sale. Subdivision regulations can control the configuration of parcels, set standards for developer-built infrastructure, and set standards for minimizing runoff, impervious surfaces, and sediment during development. They can be used to minimize exposure of buildings and infrastructure to hazards.

Substantial Damage: Damage of any origin sustained by a structure in a Special Flood Hazard Area whereby the cost of restoring the structure to its before-damaged condition would equal or exceeds 50 percent of the market value of the structure before the damage.

Surface Faulting: The differential movement of two sides of a fracture – in other words, the location where the ground breaks apart. The length, width, and displacement of the ground characterize surface faults.

Tectonic Plate: Torsionally rigid, thin segments of the Earth’s lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that cause seismic activity.

Topographic: Characterizes maps that show natural features and indicate the physical shape of the land using contour lines. These maps may also include manmade features.

Tornado: A violently rotating column of air extending from a thunderstorm to the ground.

Tornado Warning: A tornado warning is declared when a tornado has been sighted or indicated by weather radar in an area. Affected people should be prepared to move to a pre-designated place of safety.

Tornado Watch: A tornado watch is declared when tornadoes are possible in an area. Affected people should remain alert for approaching storms.

Town plan: A document, also known as a “general plan,” covering the entire geographic area of a community and expressing community goals and objectives. The plan lays out the vision, policies, and strategies for the future of the community, including all of the physical elements that will determine the community’s future development. This plan can discuss the community’s desired physical development, desired rate and quantity of growth, community character, transportation services, location of growth, and siting of public facilities and transportation. In most states, the comprehensive plan has no authority in and of itself, but serves as a guide for community decision-making.

Tropical Cyclone: A generic term for a cyclonic, low-pressure system over tropical or subtropical waters.

Tropical Depression: A tropical cyclone with maximum sustained winds of less than 39 mph.

Tropical Storm: A tropical cyclone having maximum sustained winds greater than 39 mph and less than 74 mph.

Vulnerability: Describes how exposed or susceptible an asset is to damage. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power—if an electric substation is flooded, it not only affects the substation but a number of businesses as well. Often, indirect effects can be much more widespread and damaging than direct ones.

Vulnerability assessment: The extent of injury and damage that may result from a hazard event of a given intensity in a given area. The vulnerability assessment should address the effects of hazard events on the existing and future built environment.

Water Displacement: When a large mass of Earth on the ocean bottom sinks or uplifts, the column of water directly above it is displaced, forming the tsunami wave. The rate of displacement, motion of the ocean floor at the epicenter, the amount of displacement of the rupture zone, and the depth of water above the rupture zone all contribute to the intensity of the tsunami.

Wave Runup: The height that the wave extends up to on steep shorelines, measured above a reference level (the normal height of the sea, corrected to the state of the tide at the time of wave arrival).

Weapons of Mass Destruction (WMD):

Winter Storm Warning: A Winter Storm Warning is declared when severe winter weather conditions will affect an area.

Winter Storm Watch: A Winter Storm Watch is declared when severe winter weather conditions may affect an area.

Wildfire: An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

Zone: A geographical area shown on a FIRM that reflects the severity or type of flooding in the area.

Zoning: The division of land within a local jurisdiction by local legislative regulation into zones of allowable types and intensities of land uses.

Zoning Bylaw: Designation of allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

Appendix B

EMERGENCY RELIEF AND ASSISTANCE FUND REVISED INCENTIVES LIST

State of Vermont

Emergency Relief and Assistance Fund (ERAF)

State Share- Match Incentives

Changes & Updates

The current State funding default rate for FEMA Public Assistance-eligible projects is 50% of the local match requirement, or 12.5% of the total project cost. Twenty-four months after adoption of this Rule, the State funding default rate shall drop to 30% of the local match requirement, or 7.5% of total project costs.

Twenty-four months after adoption of this Rule, in order to qualify for State match funding to the 50% level of the non-Federal cost share, or 12.5% of total project cost, a municipality must provide verification to the Department of Public Safety (DPS) that it has adopted or will adopt within 30 days of a federal disaster declaration, or is actively implementing the following programs or standards:

1. Town road and bridge standards consistent with or exceeding those listed under the most current version of Town Road & Bridge Standards, *Handbook for Local Officials*, published by the Vermont Agency of Transportation;
2. A flood hazard bylaw, or an adopted interim flood hazard bylaw as an intermediary step (24 V.S.A. §4415), to secure enrollment and participation in the National Flood Insurance Program (NFIP), if applicable;
3. A local Hazard Mitigation Plan that meets the provisions of 44 CFR Part 201.6 that has been approved by the local community, and is approved or in the process of securing final approval by FEMA. The local mitigation plan may be part of a larger multijurisdictional or regional mitigation plan; and,
4. Adoption of a local Emergency Operations Plan (EOP) in accordance with State standards.

Twenty-four months after adoption of this Rule, in order to qualify for increased State match funding to the 70% level of the non-Federal cost share, or 17.5% of total project cost, a municipality must provide verification to the DPS that it has adopted and is actively administering either item (a) or (b) from the following list:

1. Maintenance of an active rate classification (class #1 through 9) under FEMA's Community Rating System (CRS) that includes activities that prohibit new structures in mapped flood hazard zones.

or

2. Adoption of a Fluvial Erosion Hazard (FEH) or other river corridor or floodplain protection by-law that meets or exceeds the Vermont Agency of Natural Resources (ANR) FEH model regulations and scoping guidelines.

For the 24 month period following adoption of this Rule, the provisions within the current Rule will determine the rate of state financial participation with the municipality.

II. Other ERAF Rule Recommendations:

1. ERAF funding is currently applicable to presidentially declared (Federal) disasters only. State funds should also be provided for repair or replacement of damaged public infrastructure to communities in the event of a State disaster declaration as authorized by the Governor, in accordance with the original legislative intent. However, in the event of a State declared disaster, funding formulas do not apply as Federal funds would not be available. After a State declaration, reimbursements for infrastructure repair may be made on a case-by-case basis by VTrans and the Secretary of Administration in coordination with the executive branch.
2. ERAF funds not utilized should be carried over to the next fiscal year and should be added to the annual ERAF funding allocation.
3. VEM, ANR, and VTrans will provide technical assistance in their respective areas of expertise to interested communities in order to enhance their eligibility for increased ERAF funding. Vigorous outreach to communities is an essential part of implementing the new ERAF incentives and avoiding future losses.
4. FEMA normally provides 75% of total project costs in the aftermath of a federally declared disaster; the local community is expected to contribute the 25% match amount for each project. The default State funding level through ERAF will remain at 50% of the non-Federal cost share (i.e. 12.5% of total project costs) up to eighteen months after changes have been adopted. Eighteen months after incentives changes have been adopted, the State funding default level will drop to 30% of the local match amount, or 7.5% of total project costs.
5. Eighteen months after ERAF incentives changes have been adopted, additional State funding levels to 50% or 70% of the local match share is subject to fulfillment by individual communities of the provisions as outlined in amended Appendix A. For purposes of clarification, the 30% State funding level toward the local match amount corresponds to 7.5% of total project costs; the 50% State funding level toward the local match amount corresponds to 12.5% of total project costs; and the 70% State funding level corresponds to 17.5% of total project costs.
6. Consistent annual funding by the State executive branch is of key importance for the success of ERAF and broader hazard mitigation efforts throughout Vermont.
7. ERAF procedures should be adopted to determine how funds would be made available and how these would be disbursed to communities.

Appendix C

PROTOCOL FOR IDENTIFICATION OF AREAS SENSITIVE TO LANDSLIDE HAZARDS IN VERMONT

Executive Summary

The purpose of this project is to advance the state of landslide mapping and landslide hazard assessment in Vermont by developing and testing a protocol to map potential hazard areas. The results of this project will be incorporated into the State of Vermont Hazard Mitigation Plan (HMP), which will be updated in 2013.

This project was divided into three phases. Phase 1 involved set up of the project, creation of a landslide database, and selection of test sites. Phase 2 involved development of the protocol. Phase 3 involved preparing the protocol for incorporation in the State of Vermont HMP.

Seven site areas were selected in an attempt to represent conditions throughout the state because the protocol will be applied throughout the state. The outcome was that all but one site area are in Chittenden County, because of the LIDAR coverage there. The bare-Earth LIDAR 3.2m DEM is the best elevation data in the state, however it is only available in some parts of Vermont at this time. The USGS 10m DEM is available throughout the state and can be used with the protocol if LIDAR is unavailable, but the results would not be expected to be as accurate as the results with LIDAR. Other considerations in site area selection included map coverage, geology, elevation, types of terrain, urban disturbance, and types of landslides expected. The site areas range in size from 1.28 to 12.58 km² for a total of 41.3 km². Site areas include parts of Alder Brook in Essex, Bartlett Brook in South Burlington, Clay Point in Colchester, Indian Brook in Colchester, Joiner Brook in Bolton, La Platte River in Shelburne, and Smugglers Notch in Cambridge.

Data collection included a literature review, photo interpretation, and field reconnaissance. Landslide characteristics were collected using a field data sheet developed as part of this project. Data were input into an ArcGIS project for each site area.

Thirteen potential parameters were considered as to their effect on landslide hazard. These included location with respect to the marine limit of the Champlain Sea, aspect, distance to stream, elevation, hydrologic group, NDVI, profile curvature, roughness, slope angle, slope height, soil type, stream power index, surficial geology, and topographic wetness index.

A frequency ratio model was used to analyze the site areas and the landslides identified there. At most site areas, the most important parameters were determined to be slope angle and roughness, although soil type and topographic wetness index are also important at some site areas. Slope and distance to stream/lake were found to be the most important parameters along Lake Champlain shoreline. The important parameters were then combined to produce a landslide susceptibility map. These results were verified with field checking.

A heuristic method was used to complete the delineation of areas sensitive to landslide hazard. This included consideration of the frequency ratio maps, surficial geology, slope angle, profile

Appendix C

curvature, topographic contours, outcrops, and mass failure sites identified by the DEC Rivers Management Program during their stream geomorphic assessments.

A protocol was written for how to analyze landslide hazards at other sites using this method. This process was found to work best for translational landslides. Based on the results of the frequency ratio analysis, the most important parameters for identifying translational landslides are slope angle and roughness, although soil type and topographic wetness index are also important at some site areas. Slope and distance to stream/lake were found to be the most important parameters along Lake Champlain shoreline.

Low-angle rotational landslides were found to be difficult to identify using this protocol. Frequency ratio analysis indicated that the most important parameters for the low-angle rotational slides were soil type and topographic wetness index, although surficial geology will likely prove to be important too. The biggest problem is that there are not many of these types of slides available to study. Debris flows were also not conducive to this type of analysis.

Based on the results of this study, it is suggested that in most parts of Vermont, areas of 25 to 50 sq. km. will probably yield enough landslides for a robust analysis. Alternatively, if the site of interest is smaller, the best results occurred when the following criteria were met.

- There is a minimum of one landslide per square kilometer in the site area.
- The average size of the landslides is at least 400 square meters.
- At least 30% of the landslides are greater than 400 square meters.

However, if the landslides are small in area, then it becomes critical that the GPS locations are done using a mapping-grade GPS with at least submeter accuracy after post-processing.

Appendix D

EXPLANATION OF SHELDUS DATA

The information below was selected from the Special Hazards Event List Data Base for the United States (SHELDUS) Frequently Asked Questions as provided by the University of North Carolina. The complete list of questions and answers can be found at <http://webra.cas.sc.edu/hvri/products/sheldusfaq.aspx>.

Why do I have a different number of counties from decade to decade?

This is caused by changes in county boundaries. The changes are documented in the metadata and are the following.

1960: There were 3,068 counties, 30 independent cities in Virginia, and the independent cities of Baltimore and St. Louis for a total of 3,100 enumeration units.

1970: There were 3,067 counties (Princess Ann County, VA was absorbed by Virginia Beach city in 1963; Menominee County, WI was carved out of Shawano County, WI in 1961), 38 independent cities in Virginia (Salem/51775 became independent of Roanoke/51161 in 1968; Bedford City/51515 became independent of Bedford County/51019 in 1968; Emporia became independent of Greensville County/51081 in 1967; Lexington/51678 became independent of Rockbridge County/51153 in 1965; Fairfax/51600 became independent of Fairfax County/51059 in 1961; Arlington was a county in 1960 but changed status to an independent city in 1970), and the independent cities of Baltimore, St. Louis, and Carson City (Ormsby, NV was consolidated with Carson City/32510 in 1969).

1980: There were 3,065 counties (Washabaugh, SD/46131 merged with Jackson, SD/46071 in 1979; City of Nansemond, VA became Nansemond County in 1972, then merged with the City of Suffolk, VA in 1974). 41 independent cities in Virginia (Poquoson/51735 became independent of York County/51199 in 1976), and the independent cities of Baltimore, St. Louis, and Carson City.

1990: There were 3,067 counties (La Paz, AZ/04012 was formed from part of Yuma County, AZ in 1982; Cibola, NM/35006 was formed from part of the western portion of Valencia County, NM in 1981), 41 independent cities of Virginia, and the independent cities of Baltimore, St. Louis, and Carson City.

What data sources have been used to compile the database?

The main data sources were "Storm Data and Unusual Weather Phenomena" by the National Climatic Data Center, information from the National Geophysical Data Center, and the Storm Prediction Center. Please see the metadata section for more detailed information.

What do the different columns of my downloaded .txt file represent?

The columns represent information on hazard events (beginning and ending), hazard type(s), spatial information (FIPS code, county, state, and sometimes additional local remarks), and damage information (crop and property damage, fatalities, injuries). Please see the metadata section for more detailed information.

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Example: If you are searching for drought events in South Carolina between August 1, 1990 and August 1, 1995, the database will return an event that will be visualized on our website as following:

Begin Date	Hazard Type	State	County	Injuries	Fatalities	Property Damage	Crop Damage
05/01/1995	DROUGHT	SC	Abbeville	0.00	0.00	0.00	434782.61
TOTAL	--	--		0	0	0	20000000

What Does a Record Represent?

Each record from 1990 through 1995 refers to a hazard event affecting a county and generating total losses higher than \$50,000 of either property or crop damage. For instance, a thunderstorm event affecting Richland and Lexington County in South Carolina and causing property damages of \$50,000 will be entered in the database as an event affecting Richland County with \$25,000 and Lexington County with \$25,000 worth of damage. However, a thunderstorm event causing \$5,000 in Richland County alone will not be included as the damage does not exceed the threshold value of \$50,000.

Note, from 1960 to 1989 and 1995 on, every event listed in NCDC's Storm Data set that had exact damage figures assigned was entered into the database. This methodology modification was necessary as NCDC changed its reporting procedure in the course of 1995. Originally, NCDC had classified damages into logarithmic categories such as \$0-50, \$50-500, \$500-5000, \$50,000-500,000, \$5,000,000-50,000,000. In addition, the spatial resolution of the reports was low, i.e. most frequently damages were documented for larger regions instead of singular counties. In the course of 1995, NCDC started reporting exact dollar figures such as \$126,000 and the resolution increased as well, meaning damages were immediately assigned to a specific county if possible. Thus, many counties missed the \$50,000 threshold from 1995 through 2000. Major damages in a state would be lost had we maintained the threshold, hence the decision to adjust the methodology.

Why are There Injuries and Fatalities with Decimal Places?

Often casualties and damage information are listed without sufficient spatial reference. For instance, the damage caused by a singular natural hazard could be listed as:

Delaware (statewide) - January 20, 1988 - Snow Storm - 1 fatalities - 6 injuries - \$100,000 property damage

In order to assign the damage amount to a specific county, the fatalities, injuries and dollar losses need to be divided by the number of counties affected from this event. In the snowstorm example provided above, the losses would be split between Delaware's three counties as the hazard had affected the whole state. Thus, the event would enter the database as:

Kent - January 20, 1988 - Snow Storm - 0.33 fatality - 2 injuries - \$33,333.33 property damage

New Castle - January 20, 1988 - Snow Storm - 0.33 fatality - 2 injuries - \$33,333.33 property damage

Sussex - January 20, 1988 - Snow Storm - 0.33 fatality - 2 injuries - \$33,333.33 property damage

There are numerous cases where the damage figures are far less than \$50,000. Is this only due to the fact that damages have been divided based on the geography or have more specific sources been used?

The National Climate Data Center (NCDC) has changed its reporting procedures in 1995. During this year, both categorical as well as exact dollar losses have been reported by NCDC. Thus, the majority of the records from 1995 onwards are exact damage figures that have been reported as such by NCDC and that have not undergone any processing by us (exemption: events affecting multiple counties).

In addition, NCDC has also improved its spatial reporting system. Instead of reporting affected regions and an associated damage figure that we would have distributed across the affected counties, NCDC has moved on to reporting every single county and its associated damage separately.

Thus from 1960-1989, we have included EVERY event that caused property or crop damages. This change in our methodology was necessary due to NCDC's change in reporting. Consequently, you will find many small damage figures like \$500, \$1000, etc. in these events.

Hence, from 1990 - 1995 we have only selected events with property or crop damage higher than \$50,000 (equals NCDC's logarithmic category 5=\$50,000 to \$500,000), whereas from 1995 onwards we have included all property or crop damage-causing events reported in NCDC's Storm Data publications.

Appendix E

FLOOD VULNERABLE MOBILE HOME PARKS IN VERMONT



Appendix F

FREQUENTLY ASKED QUESTIONS ABOUT FLUVIAL EROSION HAZARD AREAS

Q1. What are Fluvial (or River-Related) Erosion Hazards (FEH)?

A1. FEH refer to major streambed and streambank erosion associated with the often catastrophic physical adjustment of stream channel dimensions (width and depth) and location that can occur during flooding.

Q2. Why Should My Community be Concerned with Fluvial Erosion?

A2. Of all the natural hazards experienced in Vermont, flooding is the most frequent, damaging, and costly, averaging \$14 million a year in damages. While some flood losses are caused by inundation (i.e. waters rise, fill, and damage low-lying structures), most flood losses in Vermont are caused by fluvial erosion.

Q3. What is a FEH Area?

A3. An FEH area includes the stream and the land adjacent to the stream. It identifies the area where stream processes can occur to enable the river to re-establish and maintain stable conditions over time. The area boundaries also attempts to capture the lands most vulnerable to fluvial erosion by indicating the magnitude or frequency that fluvial adjustments can be anticipated during flood events. The area can be mapped, and is based on quality-assured fluvial geomorphic (or physical) assessment data.

Q4. How is a FEH Map Used?

A4. An FEH map can be used to support flood mitigation opportunities. Since avoidance is the most cost effective approach to mitigating fluvial erosion hazards, an FEH Overlay District is an important way to limit encroachment along rivers. Other uses include identifying stream and floodplain restoration projects, bridge and culvert replacement priorities, river corridor protection opportunities, and reviewing Act 250 proposals.

Q5. Why Should a Community Adopt a FEH Zone?

A5. Communities are considering FEH mapping and zoning as a cost effective strategy to reduce flood damages over time. Keeping development out of the fluvial erosion hazard (FEH) zone – the area most vulnerable to flood-related erosion hazards – will serve to protect public safety, reduce damages to private property and public infrastructure, and minimize the recovery costs and misery associated with those damages. Moreover, adopting an FEH Overlay District provides important water quality and ecological benefits that come from allowing a river to achieve a physically stable condition over time. The FEH zone enables the stream to re-establish floodplain function that will serve to attenuate floodwaters, store sediment, and reduce nutrient pollution during times of flooding.

Q6. What is a Stable Stream?

A6. A stable stream, one that experiences minimal erosion, maintains storage of floodwaters, sediments, organic material and nutrients in floodplains, and provide aquatic and riparian habitat diversity. It is referred to as a stream that has evolved to a most probable form in balance with its watershed inputs – water, sediment, and woody debris.

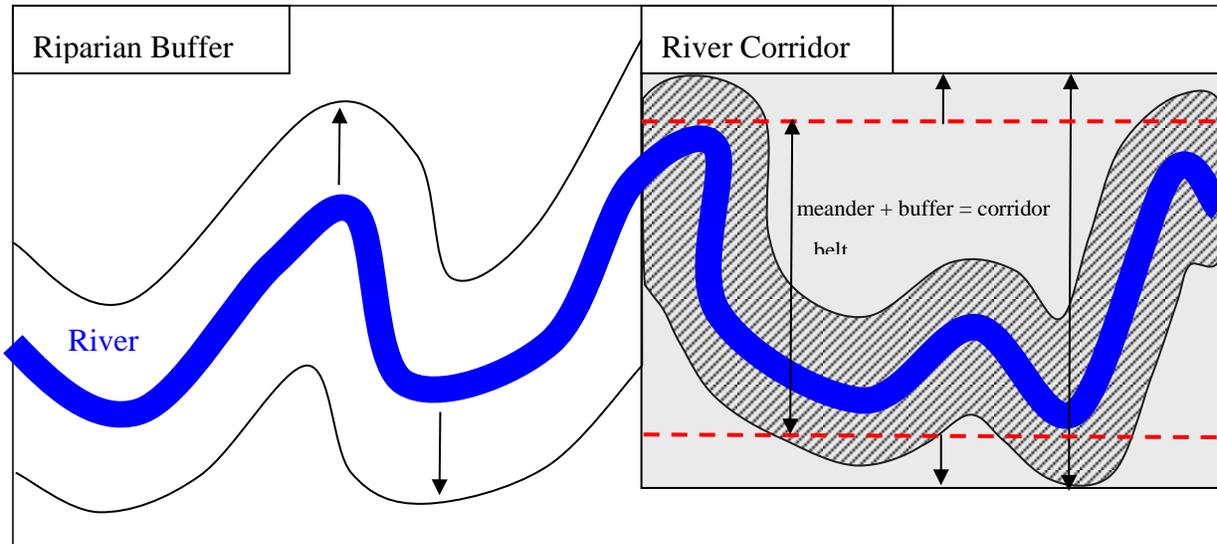
Q7. FEH Areas the Same as Buffers?

A7. Not quite. Refer to figure below. FEH areas and buffers both refer to land adjacent to streams. They differ in that FEH areas are specified structural setbacks necessary to accommodate the width and depth dimensions, meander pattern, and slope profile of a stream in its most stable, least erosive condition. The width of the FEH area is minimally based on the stream meander belt, which is derived from fluvial geomorphic (or physical) assessments, and extends to a width necessary to capture the outside bends of the naturally stable river.

A buffer is a specified, vegetated setback from the top of a stream bank or top of a slope. A buffer typically assumes that the river is a static, unchanging system, unless it is allowed to “float” (or move) with the river. It can contribute to stream bank stability, depending on its size and vegetation. However, its principal benefits include providing water quality, habitat function, and shade for keeping water temperatures cool. (The term, “setback” is a specified distance from the top of a riverbank or shoreline, measured perpendicular from the waterway.)

Ideally, the FEH area incorporates the entire river corridor, which includes both the meander belt and a buffer, providing space for both the channel in its most probable, stable form and sufficient woody vegetation to naturally stabilize the banks. A healthy stream requires both attributes: (i) a river corridor to improve stream stability, enhance public safety, reduce flood losses, and provide long-term water quality benefits and, ii) a vegetated buffer to provide bank stability additional water quality and habitat function.¹⁸

¹⁸ Refer to *Appendix G: River Corridors, FEH Areas, Setbacks, and Buffers* in this document and the Vermont Agency of Natural Resource 2008 Guide to River Corridor Protection for more information.



Comparing a buffer setback to a river corridor. Adapted from Ohio DNR, Rainwater and Land Development Manual, 2006 Ed., Ch 2. Post Construction Stormwater Management Practices, p. 21.

Q8. Is the National Flood Insurance Program (NFIP) Adequate for Protecting Communities from Flooding?

A8. The NFIP is an insurance program, managed by the Federal Emergency Management Agency (FEMA) that is available to property owners in a town enrolled in the program. The program provides property owners with flood insurance in order to receive financial assistance after a flood. Unfortunately, the NFIP maps delineate inundation hazards only. The maps do not consider the dynamic nature of river systems, and thus, provide little guidance to a town or landowners assessing fluvial erosion-related flood risks. In fact, the NFIP minimum standards allow for new development into mapped flood hazard areas without regard for the erosion hazard potential, which exacerbates flood loss, further worsens water quality, degrades river conditions, and increases costs associated with flood recovery.

Q9. What Flood-Related Costs Does an FEH Zone Mitigate?

A9. There are direct and indirect costs associated with flooding. A town with a designated FEH zone or overlay district minimizes these costs. Direct costs include rescue and relief support, emergency preparedness, cleanup, restoring public utilities and facilities, rebuilding public infrastructure, rebuilding homes and businesses that are not insured or are underinsured, and providing temporary shelter for flood victims. Indirect costs include interruption of business functions, loss of wages and sales, operation and maintenance of flood control facilities, cost of loans for repairing or replacing damaged investments, and subsidies for flood insurance.

Q10. Does an FEH Zone Affect Property Taxes?

A10. An FEH zone should not have any impact on property taxes. The value and associated property tax base of a property adjacent to a river are already tempered by how susceptible it is to flood damages and whether the property owner is required to carry flood insurance.

Q11. Will the FEH Zone Affect Flood Insurance Rates?

A11. The FEH zone can overlay onto the FEMA National Flood Insurance Rate Maps (FIRM), but it does not affect the FEMA flood maps. Therefore, it will not affect flood insurance rates.

Q12. How Will the FEH Zone Affect Existing Development that is Within the FEH Area?

A12. The model FEH Area Overlay District should have little if any effect on existing structures. The FEH overlay district has been written in such a way as to recognize that individuals and communities have already made encroachments into river corridors. If a person is interested in modifying an existing structure or adding an accessory structure, the proposed modification should be designed so as to not create or increase the level of the erosion hazard by encroaching further toward the stream.

Q13. How Will an FEH Zone Affect New Development Being Proposed Within the FEH Area?

A.13. The fundamental goal of the FEH zone is to keep people, their investments, and taxpayer-supported public investments out of harm's way. Thus, the FEH zone discourages unwise development within the boundaries of the FEH map. Avoiding the placement of public and private infrastructure within the FEH area, based on the boundaries of the FEH map, will accomplish four objectives: (1) to protect public safety; (2) to reduce flood losses; (3) minimize public and private expenditures for flood recovery, and, (4) to minimize fluvial erosion hazards by affording the stream the space and time it needs to adjust toward and maintain a more stable, equilibrium condition.

Q14. Where Can I Go for More Information About the Vermont FEH Program and How my Community can Participate?

A14. To find information about the FEH Program and find a copy of the [Municipal Guide to Fluvial Erosion Hazard Mitigation](#), including a Model FEH Area Overlay District, visit the VT River Management Website: : www.vtwaterquality.org/rivers.htm.

Appendix G

RIVER CORRIDORS, FLUVIAL EROSION HAZARD AREAS, SETBACKS, AND BUFFERS

Riparian (or riverside) buffers, setbacks, fluvial erosion hazard (FEH) areas, and river corridors are important land use planning tools for communities to work with in maintaining a wide variety of river and floodplain functions. Towns that take steps to integrate these tools into local zoning ordinances, over the long-term term, will realize the economic, societal, and ecological benefits that healthy, stable river systems can provide.

Although river corridors, FEH areas, setbacks, and buffers are used to achieve different objectives, those objectives are complementary. In fact, river corridors integrate the river meander belt (the basis for FEH areas) and vegetated buffers, and represent an ideal avoidance tool for towns zoning and site-specific river conservation and management planning. River corridor protection¹⁹ will help to achieve the multiple objectives and minimize the limitations cited below.

FEH Areas:

Definition: Specified structural setbacks necessary to accommodate the width and depth dimensions, meander pattern, and slope profile of a stream in its most stable, least erosive condition. Allowing for naturally stable stream geometry is essential for protecting water quality, providing habitat, and mitigating flooded-related hazards. The width of the FEH area is minimally based on the stream meander belt, which is derived from fluvial geomorphic (or physical) assessments, and extends to a width necessary to capture the outside bends of the naturally stable river. Ideally, the FEH area incorporates the entire river corridor, which includes both the meander belt and a buffer, providing space for both the channel in its most probable, stable form and sufficient woody vegetation to naturally stabilize the banks.

Benefits: As stated above in Appendix B, FEH areas discourages unwise development within the boundaries of the zone which will: (1) protect public safety; (2) reduce flood losses; (3) minimize public and private expenditures for flood recovery, and, (4) minimize fluvial erosion hazards by affording the stream the space and time it needs to adjust toward and maintain a more stable, equilibrium condition.

Limitations: FEH areas, based solely on the meander belt requirements of the stream, may not be wide enough to provide a sufficient vegetated buffer, particularly where the stream is running near the boundary of the FEH area.

¹⁹ A detailed description of river corridor delineation and small stream setbacks and their use in FEH area determinations are found in the Vermont Agency of Natural Resources 2008 Guide to River Corridor Protection.

Setbacks:

Definition: Specified distances from a waterway, measured perpendicular from the waterway. Rules, standards, or zoning requirements determine conditions or acceptable land uses allowed within the setback.

Benefits: Objectives are to provide water quality, habitat, and aesthetic benefits. The extent of protection is a function of the width of the setback. Setbacks can range from restricting development in the floodplain to a fixed setback width, such as 100 feet from the stream. Easy to administer. Ideally suited for steeper, stable tributaries that have a low probability of lateral adjustment over time.

Limitations: The distance of the setback may or may not be based on geomorphic assessment. Additionally, standard setbacks assume that the river is static. Rivers are not and will never be static in the landscape. Rivers adjust both laterally and vertically, in part due to natural processes, but largely due to generations of watershed, floodplain, and channel alterations. Assuming that rivers are static will invariably lead to more human conflict with river systems and subsequently greater public and private costs to address those conflicts.

Buffers:

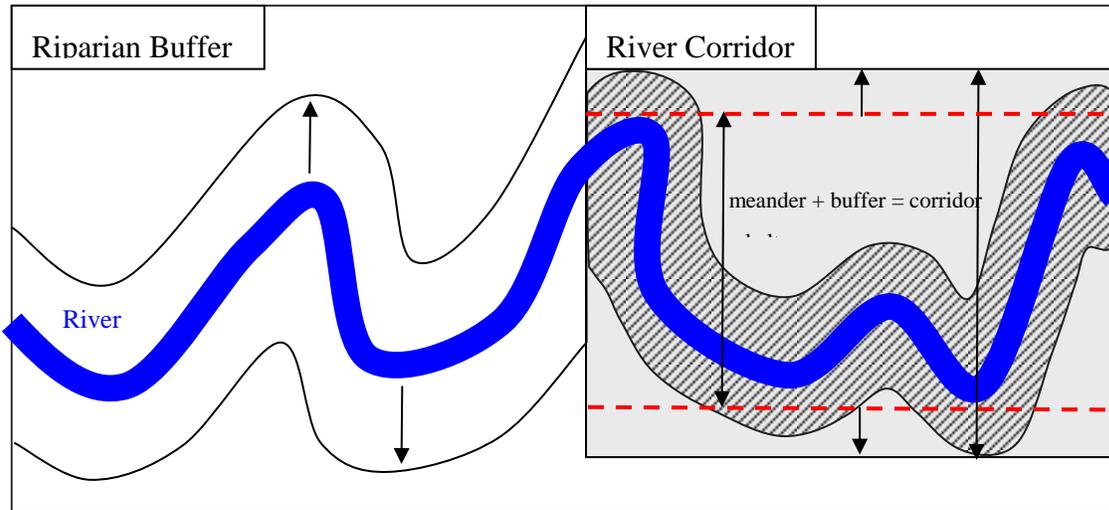
Definition: Specified permanently vegetated, undisturbed setbacks as measured from the top off bank/top of slope, which contribute to stream bank stability, while providing other water quality, habitat, and aesthetic functions. Buffers are also established at a fixed distance and measured perpendicular to that waterway.

Benefits: As described in the League of Cities and Towns' *Technical Paper #2: Creating an Effective Riparian Buffer Ordinance*, vegetated buffers protect water quality from filtering surface runoff and provide shade. Buffers also provide habitat, and their vegetative root depth and density contribute to streambank stability. For smaller, steeper streams, a standard vegetated buffer zone of a specified size would be adequate for stream corridor protection (including FEH mitigation).

Limitations: As with standard setbacks, the buffer width may or may not be based on geomorphic assessment. (The Act 250 buffer guidance, for example, recommends larger buffers on unstable streams and smaller buffers on stable.) Moreover, establishing buffers on low gradient sensitive streams, in the absence of protected river corridors, may make it virtually impossible to re-establish or maintain healthy, stable riverine conditions. As soon as development encroaches within the corridor, albeit outside the buffer, the stream no longer has access to its meander belt, the lateral extent of room and floodplain access it needs to maintain stable conditions and attenuate floods. Similar to standard setbacks, buffers typically assume that rivers are static. (Buffers that "float" with the stream are an exception.) Buffers could then become another investment to protect using channelization practices such as berms and rock riprap.

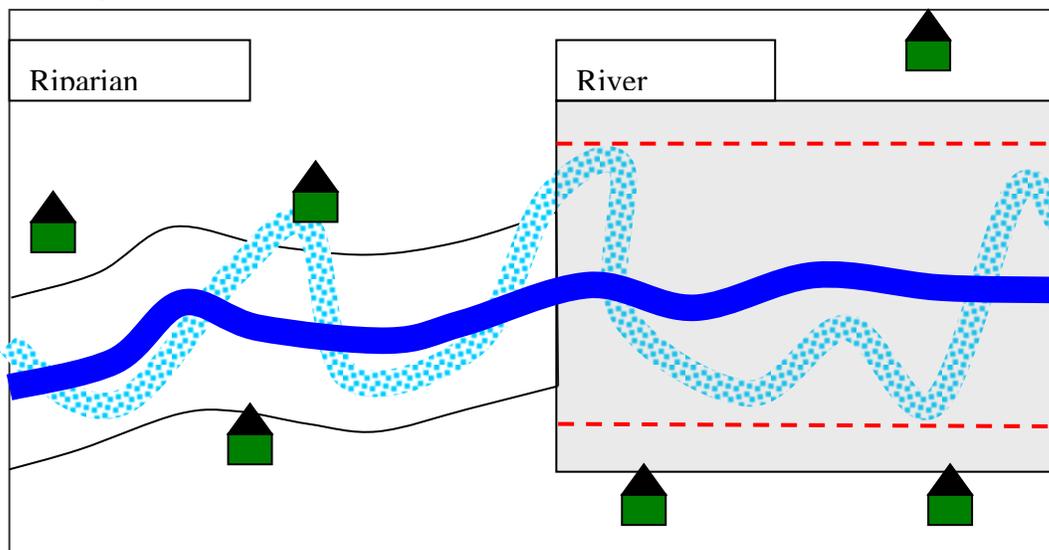
RIVER CORRIDORS, FEH AREAS, SETBACKS, AND BUFFERS

The illustrations below explain the difference between a riparian buffers, meander belts, and river corridor. In the first figure, the left portion of the diagram shows only a buffer setback adjacent to a meandering stream, while the right portion shows a river corridor on the same stream. The “Buffer Only” section assumes that the river will remain static. The “River Corridor” section allows for channel adjustment within the corridor.



Comparing a buffer setback to a river corridor. Adapted from Ohio DNR, Rainwater and Land Development Manual, 2006 Ed., Ch 2. Post Construction Stormwater Management Practices, p. 21.

The next figure shows a stream that has been straightened with development legally built up to the buffer on the left and the river corridor on the right. The straightened stream is unstable, characterized with a steepened slope and loss of flood plain access. The houses along the “Buffer Only” section are vulnerable to catastrophic channel adjustment that can occur during flooding. The “River Corridor Section accommodates channel adjustment and minimizes property damage from flooding.



A straightened river shadowed by the equilibrium meander geometry to which the stream will likely evolve. This figure illustrates the expected degree of conflict with encroachments (green houses) and future loss of vegetated buffer as the channel evolves with only a buffer setback (left) and with a protected corridor (right).

Appendix H

REPETITIVE LOSS PROPERTIES IN VERMONT

Community Name	Comm Nbr	Prop Locatr	Mitigated?	Insured?	Tot Building Payment	Tot Contents Payment	Losses	Total Paid	Average Pay
BARNET, TOWN OF	500024	0118373	NO	NO	26,513.85	6,322.43	2	32,836.28	16,418.14
BARRE, CITY OF	500105	0173420	NO	YES	92,536.24	0.00	3	92,536.24	30,845.41
BARRE, CITY OF	500105	0173062	NO	YES	29,180.74	0.00	3	29,180.74	9,726.91
BARRE, CITY OF	500105	0173518	NO	YES	122,204.15	128,952.04	3	251,156.19	83,718.73
BARRE, CITY OF	500105	0198961	NO	YES	33,924.71	0.00	2	33,924.71	16,962.36
BARRE, CITY OF	500105	0199217	NO	YES	16,896.32	0.00	2	16,896.32	8,448.16
BARRE, CITY OF	500105	0204703	NO	YES	12,300.45	0.00	2	12,300.45	6,150.23
BARRE, CITY OF	500105	0020893	NO	YES	75,769.12	4,942.86	4	80,711.98	20,178.00
BARRE, CITY OF	500105	0199498	NO	YES	18,942.69	0.00	2	18,942.69	9,471.35
BARRE, CITY OF	500105	0199497	NO	YES	9,981.11	0.00	2	9,981.11	4,990.56
BARRE, CITY OF	500105	0199496	NO	YES	9,610.18	0.00	2	9,610.18	4,805.09
BARRE, CITY OF	500105	0041234	NO	NO	0.00	2,688.47	2	2,688.47	1,344.24
BARRE, CITY OF	500105	0173083	NO	YES	567,728.68	573,610.66	3	1,141,339.34	380,446.45
BARRE, CITY OF	500105	0208303	NO	YES	58,362.94	0.00	2	58,362.94	29,181.47
BARRE, CITY OF	500105	0199002	NO	YES	60,343.72	0.00	2	60,343.72	30,171.86
BARRE, CITY OF	500105	0210523	NO	YES	13,894.73	0.00	2	13,894.73	6,947.37

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Community Name	Comm Nbr	Prop Locatr	Mitigated?	Insured?	Tot Building Payment	Tot Contents Payment	Losses	Total Paid	Average Pay
BARRE, CITY OF	500105	0173227	NO	YES	15,962.98	0.00	3	15,962.98	5,320.99
BARRE, CITY OF	500105	0172708	NO	YES	28,269.52	0.00	3	28,269.52	9,423.17
BARRE, CITY OF	500105	0198982	NO	NO	48,722.71	0.00	2	48,722.71	24,361.36
BARTON, TOWN OF	500081	0139247	NO	NO	6,337.18	0.00	2	6,337.18	3,168.59
BARTON, VILLAGE OF	500082	0104016	NO	YES	22,605.80	4,550.82	3	27,156.62	9,052.21
BENNINGTON, TOWN OF	500013	0199729	NO	YES	5,329.21	0.00	2	5,329.21	2,664.61
BERKSHIRE, TOWN OF	500049	0043629	NO	YES	4,078.91	2,880.53	2	6,959.44	3,479.72
BERLIN, TOWN OF	500106	0030877	NO	NO	19,382.84	55,154.99	5	74,537.83	14,907.57
BERLIN, TOWN OF	500106	0211849	NO	YES	195,672.92	89,812.87	2	285,485.79	142,742.90
BERLIN, TOWN OF	500106	0201278	NO	YES	14,464.55	0.00	2	14,464.55	7,232.28
BRATTLEBORO, TOWN OF	500126	0210208	NO	YES	17,733.41	0.00	2	17,733.41	8,866.71
BRATTLEBORO, TOWN OF	500126	0207530	NO	YES	74,446.58	0.00	2	74,446.58	37,223.29
CHELSEA, TOWN OF	500070	0201935	NO	YES	54,265.19	0.00	2	54,265.19	27,132.60
CHESTER, TOWN OF	500146	0203633	NO	YES	5,405.93	0.00	2	5,405.93	2,702.97
CHESTER, TOWN OF	500146	0203642	NO	YES	60,334.34	1,501.49	2	61,835.83	30,917.92
CHESTER, TOWN OF	500146	0164657	NO	YES	139,563.69	0.00	3	139,563.69	46,521.23
COLCHESTER, TOWN OF	500033	0085867	NO	NO	19,189.20	0.00	2	19,189.20	9,594.60
COLCHESTER, TOWN OF	500033	0201105	NO	YES	95,581.89	0.00	2	95,581.89	47,790.95
DERBY, TOWN OF	500248	0095438	NO	NO	14,829.81	0.00	2	14,829.81	7,414.91

REPETITIVE LOSS PROPERTIES IN VERMONT

Community Name	Comm Nbr	Prop Locatr	Mitigated?	Insured?	Tot Building Payment	Tot Contents Payment	Losses	Total Paid	Average Pay
DERBY, TOWN OF	500248	0093993	NO	YES	5,886.36	0.00	2	5,886.36	2,943.18
DERBY, TOWN OF	500248	0198627	NO	YES	32,300.84	0.00	2	32,300.84	16,150.42
DOVER, TOWN OF	500127	0194990	NO	NO	15,838.80	0.00	2	15,838.80	7,919.40
ENOSBURG FALLS, VILLAGE OF	500050	0090049	NO	NO	12,114.78	0.00	3	12,114.78	4,038.26
GRANVILLE, TOWN OF	500003	0184207	NO	SDF	252,554.00	17,596.71	5	270,150.71	54,030.14
GRANVILLE, TOWN OF	500003	0169360	NO	NO	130,085.15	0.00	4	130,085.15	32,521.29
GROTON, TOWN OF	500026	0208280	NO	YES	15,431.18	0.00	2	15,431.18	7,715.59
HANCOCK, TOWN OF	500005	0200789	NO	YES	24,160.43	0.00	2	24,160.43	12,080.22
HARDWICK, TOWN AND VILLAGE OF	500027	0210521	NO	YES	10,857.23	0.00	2	10,857.23	5,428.62
HARDWICK, TOWN AND VILLAGE OF	500027	0069257	NO	NO	7,971.87	347.00	3	8,318.87	2,772.96
JOHNSON, TOWN OF	500063	0089608	NO	NO	32,309.16	2,524.25	3	34,833.41	11,611.14
JOHNSON, TOWN OF	500063	0198454	NO	YES	48,202.80	7,245.48	2	55,448.28	27,724.14
JOHNSON, VILLAGE OF	500232	0201327	NO	YES	18,655.61	5,000.00	2	23,655.61	11,827.81
JOHNSON, VILLAGE OF	500232	0109000	NO	NO	33,235.73	0.00	2	33,235.73	16,617.87
LYNDON, TOWN OF	500028	0118136	NO	NO	31,807.14	7,100.00	2	38,907.14	19,453.57
LYNDON, TOWN OF	500028	0208786	NO	YES	15,267.04	0.00	2	15,267.04	7,633.52
LYNDON, TOWN OF	500028	0118543	NO	YES	0.00	181,648.10	3	181,648.10	60,549.37
LYNDON, TOWN OF	500028	0205068	NO	YES	0.00	45,949.12	2	45,949.12	22,974.56
LYNDON, TOWN OF	500028	0197922	NO	YES	154,369.43	2,555.88	3	156,925.31	52,308.44

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Community Name	Comm Nbr	Prop Locatr	Mitigated?	Insured?	Tot Building Payment	Tot Contents Payment	Losses	Total Paid	Average Pay
LYNDON, TOWN OF	500028	0210540	NO	YES	10,954.63	0.00	2	10,954.63	5,477.32
LYNDON, TOWN OF	500028	0205069	NO	YES	20,245.76	0.00	2	20,245.76	10,122.88
LYNDON, TOWN OF	500028	0118360	NO	NO	5,130.92	0.00	2	5,130.92	2,565.46
LYNDON, TOWN OF	500028	0207121	NO	YES	11,000.00	6,633.28	2	17,633.28	8,816.64
LYNDON, TOWN OF	500028	0208651	NO	YES	49,529.47	8,870.74	2	58,400.21	29,200.11
LYNDON, TOWN OF	500028	0118555	NO	NO	9,978.17	0.00	2	9,978.17	4,989.09
LYNDON, TOWN OF	500028	0122831	NO	YES	17,325.27	0.00	4	17,325.27	4,331.32
LYNDON, TOWN OF	500028	0081295	NO	NO	5,102.66	0.00	2	5,102.66	2,551.33
LYNDON, TOWN OF	500028	0092318	NO	NO	358,128.88	30,000.00	5	388,128.88	77,625.78
LYNDON, TOWN OF	500028	0208649	NO	YES	22,136.84	0.00	2	22,136.84	11,068.42
MIDDLESEX, TOWN OF	500114	0069263	NO	YES	17,464.03	3,241.00	3	20,705.03	6,901.68
MIDDLESEX, TOWN OF	500114	0076330	NO	YES	72,509.67	0.00	4	72,509.67	18,127.42
MIDDLESEX, TOWN OF	500114	0207519	NO	YES	19,100.86	0.00	2	19,100.86	9,550.43
MILTON, TOWN OF	500038	0198422	NO	YES	40,172.60	0.00	2	40,172.60	20,086.30
MILTON, TOWN OF	500038	0044980	NO	YES	52,568.23	0.00	4	52,568.23	13,142.06
MONTPELIER, CITY OF	505518	0210886	NO	YES	14,160.40	0.00	2	14,160.40	7,080.20
MONTPELIER, CITY OF	505518	0203632	NO	YES	10,341.34	0.00	2	10,341.34	5,170.67
MONTPELIER, CITY OF	505518	0198576	NO	YES	42,040.89	0.00	3	42,040.89	14,013.63
MONTPELIER, CITY OF	505518	0199465	NO	YES	61,215.99	0.00	3	61,215.99	20,405.33

REPETITIVE LOSS PROPERTIES IN VERMONT

Community Name	Comm Nbr	Prop Locatr	Mitigated?	Insured?	Tot Building Payment	Tot Contents Payment	Losses	Total Paid	Average Pay
MONTPELIER, CITY OF	505518	0208690	NO	YES	24,951.45	0.00	2	24,951.45	12,475.73
MONTPELIER, CITY OF	505518	0199040	NO	YES	35,571.76	0.00	3	35,571.76	11,857.25
MONTPELIER, CITY OF	505518	0199042	NO	YES	20,824.40	0.00	3	20,824.40	6,941.47
MONTPELIER, CITY OF	505518	0199041	NO	YES	56,635.09	0.00	3	56,635.09	18,878.36
MONTPELIER, CITY OF	505518	0111553	NO	YES	28,172.22	0.00	3	28,172.22	9,390.74
MONTPELIER, CITY OF	505518	0036139	NO	NO	9,624.04	9,100.37	3	18,724.41	6,241.47
MONTPELIER, CITY OF	505518	0208685	NO	YES	7,121.22	0.00	2	7,121.22	3,560.61
MONTPELIER, CITY OF	505518	0208688	NO	YES	46,366.27	0.00	2	46,366.27	23,183.14
MONTPELIER, CITY OF	505518	0199464	NO	YES	25,051.43	0.00	3	25,051.43	8,350.48
MONTPELIER, CITY OF	505518	0210887	NO	YES	15,034.90	0.00	2	15,034.90	7,517.45
MONTPELIER, CITY OF	505518	0208682	NO	YES	20,658.67	0.00	2	20,658.67	10,329.34
MONTPELIER, CITY OF	505518	0208689	NO	YES	27,389.00	0.00	2	27,389.00	13,694.50
MONTPELIER, CITY OF	505518	0208686	NO	YES	12,819.61	0.00	2	12,819.61	6,409.81
MONTPELIER, CITY OF	505518	0199485	NO	YES	84,605.95	5,300.00	3	89,905.95	29,968.65
MONTPELIER, CITY OF	505518	0199462	NO	YES	71,543.55	11,898.16	3	83,441.71	27,813.90
MONTPELIER, CITY OF	505518	0198575	NO	NO	70,323.60	0.00	3	70,323.60	23,441.20
MONTPELIER, CITY OF	505518	0201849	NO	YES	5,019.21	0.00	2	5,019.21	2,509.61
MONTPELIER, CITY OF	505518	0085541	NO	YES	13,337.47	0.00	4	13,337.47	3,334.37
MONTPELIER, CITY OF	505518	0199463	NO	YES	39,272.85	0.00	3	39,272.85	13,090.95
MONTPELIER, CITY OF	505518	0069264	NO	YES	1,851.82	6,475.82	2	8,327.64	4,163.82

Appendix H

Community Name	Comm Nbr	Prop Locatr	Mitigated?	Insured?	Tot Building Payment	Tot Contents Payment	Losses	Total Paid	Average Pay
MONTPELIER, CITY OF	505518	0208683	NO	YES	56,430.83	0.00	2	56,430.83	28,215.42
MONTPELIER, CITY OF	505518	0203184	NO	YES	14,560.03	0.00	2	14,560.03	7,280.02
MONTPELIER, CITY OF	505518	0208687	NO	YES	52,366.20	0.00	2	52,366.20	26,183.10
MONTPELIER, CITY OF	505518	0208684	NO	YES	20,553.47	0.00	2	20,553.47	10,276.74
MONTPELIER, CITY OF	505518	0199461	NO	YES	41,717.06	4,531.10	3	46,248.16	15,416.05
MONTPELIER, CITY OF	505518	0199660	NO	YES	36,364.83	0.00	3	36,364.83	12,121.61
MORRISVILLE, VILLAGE OF	500065	0076374	NO	NO	24,447.47	1,215.00	2	25,662.47	12,831.24
NEW HAVEN, TOWN OF	500009	0212172	NO	YES	82,176.68	0.00	2	82,176.68	41,088.34
NEWPORT, CITY OF	500086	0052125	NO	YES	44,550.92	0.00	4	44,550.92	11,137.73
NORTH TROY, VILLAGE OF	500087	0212171	NO	YES	26,437.11	0.00	2	26,437.11	13,218.56
NORTH TROY, VILLAGE OF	500087	0118897	NO	NO	34,895.30	0.00	2	34,895.30	17,447.65
NORTHFIELD, TOWN OF	500118	0204841	NO	YES	52,280.01	0.00	2	52,280.01	26,140.01
NORTHFIELD, VILLAGE OF	500117	0205064	NO	YES	59,592.25	0.00	2	59,592.25	29,796.13
NORTHFIELD, VILLAGE OF	500117	0205099	NO	YES	179,245.37	0.00	2	179,245.37	89,622.69
PLYMOUTH, TOWN OF	500151	0196591	NO	NO	36,140.56	348.91	3	36,489.47	12,163.16
RICHMOND, TOWN OF	500040	0069261	NO	NO	5,559.49	4,343.88	2	9,903.37	4,951.69
ROYALTON, TOWN OF	500153	0204446	NO	YES	12,931.37	0.00	2	12,931.37	6,465.69
ROYALTON, TOWN OF	500153	0118102	NO	NO	5,467.99	4,588.00	2	10,055.99	5,028.00
RUTLAND, CITY OF	500101	0207192	NO	YES	30,208.08	0.00	2	30,208.08	15,104.04

REPETITIVE LOSS PROPERTIES IN VERMONT

Community Name	Comm Nbr	Prop Locatr	Mitigated?	Insured?	Tot Building Payment	Tot Contents Payment	Losses	Total Paid	Average Pay
RUTLAND, CITY OF	500101	0188959	NO	YES	95,435.29	0.00	4	95,435.29	23,858.82
RUTLAND, CITY OF	500101	0175878	NO	YES	25,844.70	0.00	3	25,844.70	8,614.90
RUTLAND, CITY OF	500101	0187486	NO	YES	43,267.24	0.00	4	43,267.24	10,816.81
RUTLAND, CITY OF	500101	0176328	NO	YES	74,074.27	0.00	3	74,074.27	24,691.42
RUTLAND, CITY OF	500101	0187484	NO	YES	60,749.51	0.00	3	60,749.51	20,249.84
RUTLAND, CITY OF	500101	0202003	NO	YES	67,317.85	7,163.75	2	74,481.60	37,240.80
RUTLAND, TOWN OF	500267	0047928	NO	NO	0.00	77,275.36	2	77,275.36	38,637.68
RYEGATE, TOWN OF	500030	0205492	NO	YES	21,157.74	0.00	2	21,157.74	10,578.87
ST ALBANS, TOWN OF	500219	0106814	NO	YES	29,254.97	0.00	2	29,254.97	14,627.49
ST ALBANS, TOWN OF	500219	0071655	NO	YES	46,558.41	10,351.39	5	56,909.80	11,381.96
ST ALBANS, TOWN OF	500219	0069259	NO	YES	23,082.41	450.00	5	23,532.41	4,706.48
ST. JOHNSBURY, TOWN OF	500031	0030797	NO	NO	25,264.87	12,835.88	2	38,100.75	19,050.38
ST. JOHNSBURY, TOWN OF	500031	0162264	NO	NO	140,336.19	125,663.64	3	265,999.83	88,666.61
ST. JOHNSBURY, TOWN OF	500031	0208284	NO	YES	76,570.47	34,382.26	2	110,952.73	55,476.37
ST. JOHNSBURY, TOWN OF	500031	0162833	NO	YES	35,644.67	0.00	3	35,644.67	11,881.56
STOCKBRIDGE, TOWN OF	500155	0169359	NO	YES	78,285.59	9,800.00	3	88,085.59	29,361.86
STOWE, TOWN OF	500066	0084176	NO	YES	12,345.75	0.00	2	12,345.75	6,172.88
STOWE, TOWN OF	500066	0207520	NO	YES	10,583.70	0.00	2	10,583.70	5,291.85
TOPSHAM, TOWN OF	500241	0195037	NO	YES	62,174.65	12,433.76	3	74,608.41	24,869.47
WARREN, TOWN OF	500121	0208908	NO	YES	19,638.43	0.00	2	19,638.43	9,819.22

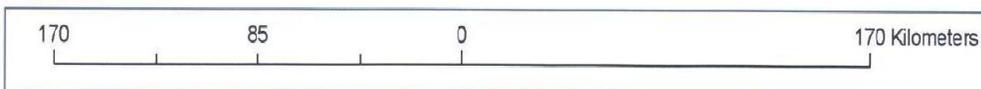
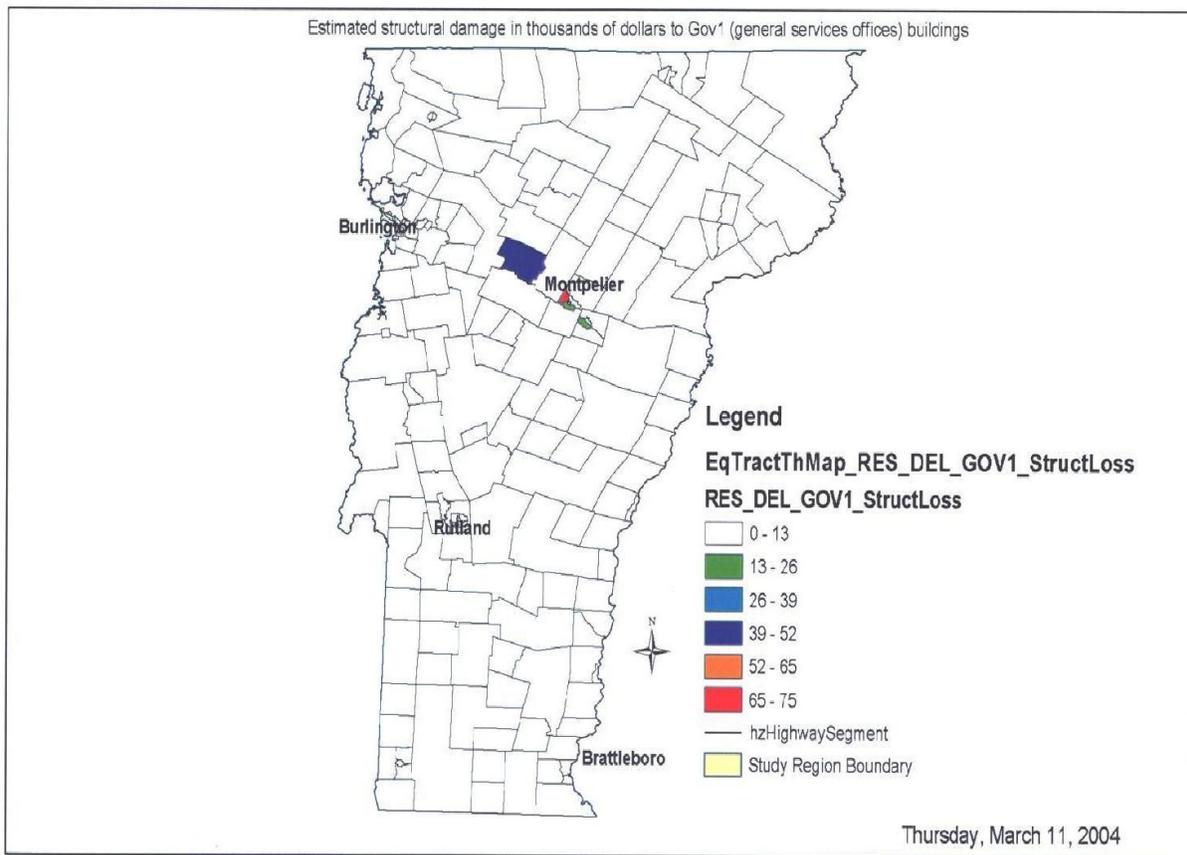
Appendix H

Community Name	Comm Nbr	Prop Locatr	Mitigated?	Insured?	Tot Building Payment	Tot Contents Payment	Losses	Total Paid	Average Pay
WILLIAMSTOWN, TOWN OF	500080	0198860	NO	YES	32,961.93	0.00	2	32,961.93	16,480.97
WILMINGTON, TOWN OF	500142	0205070	NO	YES	60,716.09	0.00	2	60,716.09	30,358.05
WILMINGTON, TOWN OF	500142	0030921	NO	YES	36,463.87	37,701.69	6	74,165.56	12,360.93
WINDSOR, TOWN OF	500159	0187463	NO	YES	14,996.85	0.00	2	14,996.85	7,498.43
BERKSHIRE, TOWN OF	500049	0031163	YES	NO	1,982.18	681.36	2	2,663.54	1,331.77
BRADFORD, TOWN OF	500069	0013537	YES	NO	945.00	9,190.55	2	10,135.55	5,067.78
COLCHESTER, TOWN OF	500033	0045583	YES	NO	14,113.00	1,165.00	2	15,278.00	7,639.00
DERBY, TOWN OF	500248	0094298	YES	NO	27,798.57	2,221.35	2	30,019.92	15,009.96
HARDWICK, TOWN AND VILLAGE OF	500027	0030966	YES	NO	7,590.85	0.00	2	7,590.85	3,795.43
HARDWICK, TOWN AND VILLAGE OF	500027	0090292	YES	NO	54,810.05	0.00	2	54,810.05	27,405.03
LYNDON, TOWN OF	500028	0118101	YES	NO	11,439.78	0.00	2	11,439.78	5,719.89
POWNALE, TOWN OF	500016	0040339	YES	NO	8,308.11	0.00	2	8,308.11	4,154.06
RICHMOND, TOWN OF	500040	0043584	YES	NO	5,468.28	2,601.17	2	8,069.45	4,034.73
RICHMOND, VILLAGE OF	500041	0069265	YES	NO	2,046.53	1,575.35	2	3,621.88	1,810.94
SWANTON, TOWN OF	500220	0031062	YES	NO	14,019.59	311.90	2	14,331.49	7,165.75

Appendix I HAZUS-MH DOCUMENTATION

Earthquake

Study Region : State of Vermont
Hazard Scenario : Middlebury, Vt 500 Year 5.7 magnitude earthquake

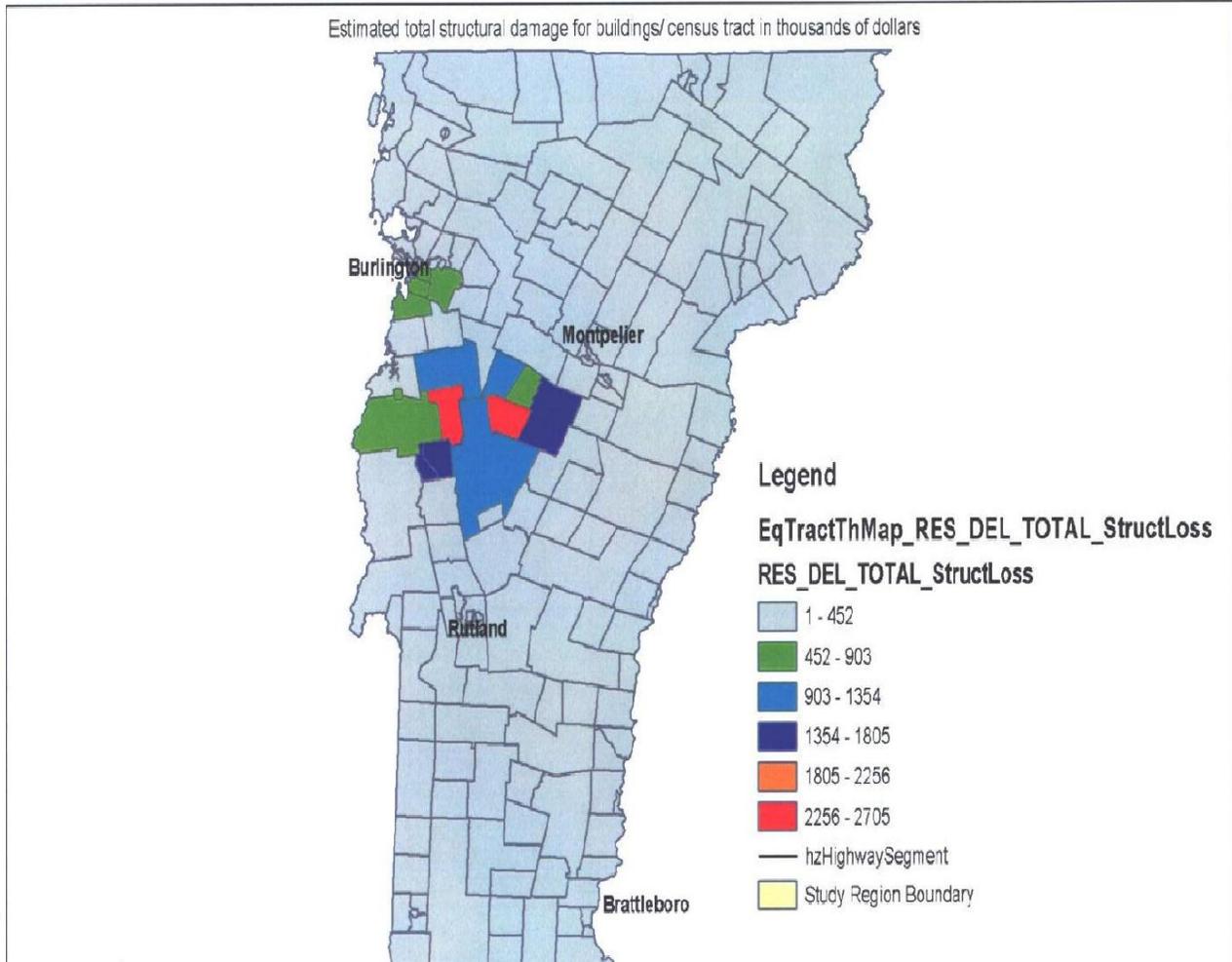


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Appendix I

Study Region : State of Vermont

Hazard Scenario : Middlebury, Vt 500 year 5.7 magnitude earthquake



Flood Damage Projections

100-Year Flood Analysis for Lyndon, Vermont

100-year flood analysis was performed for Lyndon, Vermont. FEMA's HAZUS-MH software was used to determine the location of the 100-year flood zone boundary. The Vermont Mapping Program's digital elevation model was used to derive the hydrologic network. VGIS layer Emergency E911 E-Site was used to determine facility locations.

State Government and Critical Facilities

The following 5 state government and critical facilities were determined to exist within the 100-year flood zone:

Address	City	Facility Type
433 E BURKE RD	LYNDON	P1-GOVERNMENT
126 WATER RD	LYNDON	P1-GOVERNMENT
119 PARK AV	LYNDON	P1-GOVERNMENT
670 CENTER ST	LYNDON	P1-GOVERNMENT
217 ROSE LN	LYNDON	P1-GOVERNMENT

Commercial Facilities

The following 29 commercial facilities were determined to exist within the 100-year zone:

Address	City	Facility Type
148 CALENDAR BROOK RD	LYNDON	C1-COMMERCIAL
2104 E BURKE RD	LYNDON	C1-COMMERCIAL
933 E BURKE RD	LYNDON	C1-COMMERCIAL
891 E BURKE RD	LYNDON	C1-COMMERCIAL
232 E BURKE RD	LYNDON	C1-COMMERCIAL
774 MAIN ST	LYNDON	C1-COMMERCIAL
636 MAIN ST	LYNDON	C1-COMMERCIAL
590 MAIN ST	LYNDON	C1-COMMERCIAL
564 MAIN ST	LYNDON	C1-COMMERCIAL
673 BROAD ST	LYNDON	C1-COMMERCIAL
663 BROAD ST	LYNDON	C1-COMMERCIAL
511 BROAD ST	LYNDON	C1-COMMERCIAL

Appendix I

Address	City	Facility Type
467 BROAD ST	LYNDON	C1-COMMERCIAL
411 BROAD ST	LYNDON	C1-COMMERCIAL
385 BROAD ST	LYNDON	C1-COMMERCIAL
6585 MEMORIAL DR	LYNDON	C1-COMMERCIAL
6601 MEMORIAL DR	LYNDON	C1-COMMERCIAL
92 BACK CENTER RD	LYNDON	C1-COMMERCIAL
64 BACK CENTER RD	LYNDON	C1-COMMERCIAL
66 BACK CENTER RD	LYNDON	C1-COMMERCIAL
231 RED VILLAGE RD	LYNDON	C1-COMMERCIAL
34 CALKINS DR	LYNDON	C1-COMMERCIAL
790 MAIN ST	LYNDON	C1-COMMERCIAL
200 E BURKE RD	LYNDON	C1-COMMERCIAL
469 BROAD ST	LYNDON	C1-COMMERCIAL
226 CALENDAR BROOK RD	LYNDON	C1-COMMERCIAL
1501 S WHEELOCK RD	LYNDON	C9-OTHER COMMERCIAL
791 MAIN ST	LYNDON	CL-LODGING
28 BACK CENTER RD	LYNDON	CL-LODGING

Residential Facilities

The following 135 residential facilities were determined to exist within the 100-year flood zone:

Address	City	Facility Type
66 CALENDAR BROOK RD	LYNDON	R1-SINGLE FAMILY
3740 GILMAN RD	LYNDON	R1-SINGLE FAMILY
341 MATHEWSON HILL RD	LYNDON	R1-SINGLE FAMILY
2963 E BURKE RD	LYNDON	R1-SINGLE FAMILY
2759 E BURKE RD	LYNDON	R1-SINGLE FAMILY
859 E BURKE RD	LYNDON	R1-SINGLE FAMILY
481 E BURKE RD	LYNDON	R1-SINGLE FAMILY

Address	City	Facility Type
2818 LILY POND RD	LYNDON	R1-SINGLE FAMILY
15 GRANITE LN	LYNDON	R1-SINGLE FAMILY
633 MAIN ST	LYNDON	R1-SINGLE FAMILY
623 MAIN ST	LYNDON	R1-SINGLE FAMILY
600 MAIN ST	LYNDON	R1-SINGLE FAMILY
201 PARK AV	LYNDON	R1-SINGLE FAMILY
173 PARK AV	LYNDON	R1-SINGLE FAMILY
165 PARK AV	LYNDON	R1-SINGLE FAMILY
105 PARK AV	LYNDON	R1-SINGLE FAMILY
546 CENTER ST	LYNDON	R1-SINGLE FAMILY
548 CENTER ST	LYNDON	R1-SINGLE FAMILY
574 CENTER ST	LYNDON	R1-SINGLE FAMILY
697 CENTER ST	LYNDON	R1-SINGLE FAMILY
1582 S WHEELOCK RD	LYNDON	R1-SINGLE FAMILY
344 BACK CENTER RD	LYNDON	R1-SINGLE FAMILY
311 BACK CENTER RD	LYNDON	R1-SINGLE FAMILY
310 BACK CENTER RD	LYNDON	R1-SINGLE FAMILY
77 FAIRWAY LN	LYNDON	R1-SINGLE FAMILY
288 BACK CENTER RD	LYNDON	R1-SINGLE FAMILY
58 FAIRWAY LN	LYNDON	R1-SINGLE FAMILY
11 FAIRWAY LN	LYNDON	R1-SINGLE FAMILY
57 RIVERSIDE CT	LYNDON	R1-SINGLE FAMILY
15 RIVERSIDE CT	LYNDON	R1-SINGLE FAMILY
39 RIVERSIDE CT	LYNDON	R1-SINGLE FAMILY
62 RIVERSIDE CT	LYNDON	R1-SINGLE FAMILY
34 RIVERSIDE CT	LYNDON	R1-SINGLE FAMILY
704 S WHEELOCK RD	LYNDON	R1-SINGLE FAMILY
693 S WHEELOCK RD	LYNDON	R1-SINGLE FAMILY

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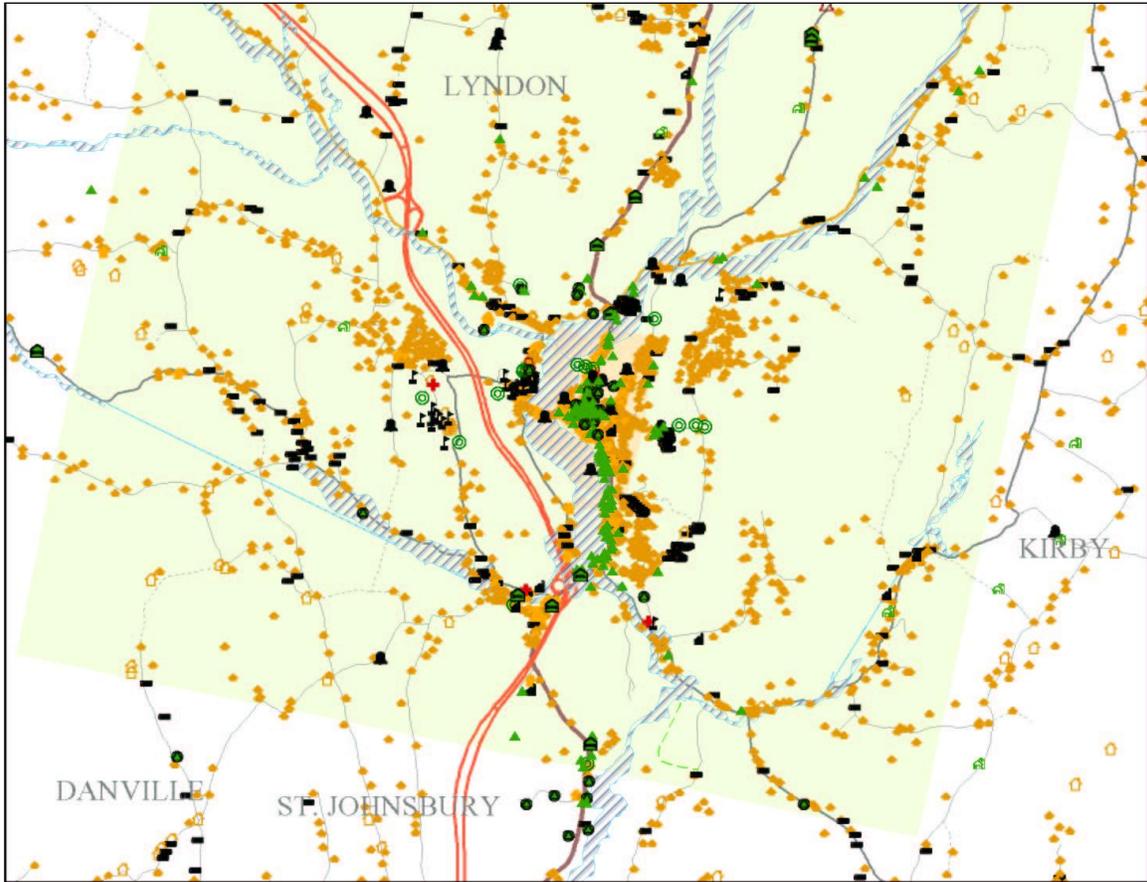
Address	City	Facility Type
620 S WHEELOCK RD	LYNDON	R1-SINGLE FAMILY
6554 MEMORIAL DR	LYNDON	R1-SINGLE FAMILY
16 BROOKSIDE LN	LYNDON	R1-SINGLE FAMILY
104 CALKINS DR	LYNDON	R1-SINGLE FAMILY
56 CHAMBERLAIN BRG	LYNDON	R1-SINGLE FAMILY
40 MILL ST	LYNDON	R1-SINGLE FAMILY
52 MILL ST	LYNDON	R1-SINGLE FAMILY
580 RED VILLAGE RD	LYNDON	R1-SINGLE FAMILY
10 LIGHT PLANT DR	LYNDON	R1-SINGLE FAMILY
737 RED VILLAGE RD	LYNDON	R1-SINGLE FAMILY
49 LIGHT PLANT DR	LYNDON	R1-SINGLE FAMILY
93 LIGHT PLANT DR	LYNDON	R1-SINGLE FAMILY
2164 RED VILLAGE RD	LYNDON	R1-SINGLE FAMILY
2024 RED VILLAGE RD	LYNDON	R1-SINGLE FAMILY
1641 RED VILLAGE RD	LYNDON	R1-SINGLE FAMILY
1738 RED VILLAGE RD	LYNDON	R1-SINGLE FAMILY
1632 RED VILLAGE RD	LYNDON	R1-SINGLE FAMILY
569 MAIN ST	LYNDON	R1-SINGLE FAMILY
96 ACORN LN	LYNDON	R1-SINGLE FAMILY
1582 RED VILLAGE RD	LYNDON	R1-SINGLE FAMILY
19 FERRET RUN	LYNDON	R1-SINGLE FAMILY
1769 S WHEELOCK RD	LYNDON	R1-SINGLE FAMILY
51 COLD HILL RD	LYNDON	R1-SINGLE FAMILY
615 MAIN ST	LYNDON	R2-MULTI FAMILY
599 MAIN ST	LYNDON	R2-MULTI FAMILY
580 CENTER ST	LYNDON	R2-MULTI FAMILY
590 CENTER ST	LYNDON	R2-MULTI FAMILY

Address	City	Facility Type
196 BACK CENTER RD	LYNDON	R2-MULTI FAMILY
24 CHAMBERLAIN BRG	LYNDON	R2-MULTI FAMILY
117 PARK AV	LYNDON	R2-MULTI FAMILY
446 CALENDAR BROOK RD	LYNDON	R3-MOBILE HOME
390 CALENDAR BROOK RD	LYNDON	R3-MOBILE HOME
2899 E BURKE RD	LYNDON	R3-MOBILE HOME
17 SLATE LN	LYNDON	R3-MOBILE HOME
27 SLATE LN	LYNDON	R3-MOBILE HOME
18 SLATE LN	LYNDON	R3-MOBILE HOME
39 SLATE LN	LYNDON	R3-MOBILE HOME
49 SLATE LN	LYNDON	R3-MOBILE HOME
28 SLATE LN	LYNDON	R3-MOBILE HOME
34 SLATE LN	LYNDON	R3-MOBILE HOME
55 SLATE LN	LYNDON	R3-MOBILE HOME
50 SLATE LN	LYNDON	R3-MOBILE HOME
67 SLATE LN	LYNDON	R3-MOBILE HOME
54 SLATE LN	LYNDON	R3-MOBILE HOME
77 SLATE LN	LYNDON	R3-MOBILE HOME
62 SLATE LN	LYNDON	R3-MOBILE HOME
85 SLATE LN	LYNDON	R3-MOBILE HOME
27 GRANITE LN	LYNDON	R3-MOBILE HOME
68 SLATE LN	LYNDON	R3-MOBILE HOME
12 GRANITE LN	LYNDON	R3-MOBILE HOME
93 SLATE LN	LYNDON	R3-MOBILE HOME
76 SLATE LN	LYNDON	R3-MOBILE HOME
33 GRANITE LN	LYNDON	R3-MOBILE HOME
82 SLATE LN	LYNDON	R3-MOBILE HOME
20 GRANITE LN	LYNDON	R3-MOBILE HOME

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Address	City	Facility Type
39 GRANITE LN	LYNDON	R3-MOBILE HOME
86 SLATE LN	LYNDON	R3-MOBILE HOME
47 GRANITE LN	LYNDON	R3-MOBILE HOME
30 GRANITE LN	LYNDON	R3-MOBILE HOME
94 SLATE LN	LYNDON	R3-MOBILE HOME
36 GRANITE LN	LYNDON	R3-MOBILE HOME
53 GRANITE LN	LYNDON	R3-MOBILE HOME
61 GRANITE LN	LYNDON	R3-MOBILE HOME
46 GRANITE LN	LYNDON	R3-MOBILE HOME
105 SLATE LN	LYNDON	R3-MOBILE HOME
67 GRANITE LN	LYNDON	R3-MOBILE HOME
73 GRANITE LN	LYNDON	R3-MOBILE HOME
54 GRANITE LN	LYNDON	R3-MOBILE HOME
81 GRANITE LN	LYNDON	R3-MOBILE HOME
62 GRANITE LN	LYNDON	R3-MOBILE HOME
87 GRANITE LN	LYNDON	R3-MOBILE HOME
68 GRANITE LN	LYNDON	R3-MOBILE HOME
95 GRANITE LN	LYNDON	R3-MOBILE HOME
80 GRANITE LN	LYNDON	R3-MOBILE HOME
90 GRANITE LN	LYNDON	R3-MOBILE HOME
115 GRANITE LN	LYNDON	R3-MOBILE HOME
31 MARBLE LN	LYNDON	R3-MOBILE HOME
100 GRANITE LN	LYNDON	R3-MOBILE HOME
37 MARBLE LN	LYNDON	R3-MOBILE HOME
125 GRANITE LN	LYNDON	R3-MOBILE HOME
106 GRANITE LN	LYNDON	R3-MOBILE HOME
118 GRANITE LN	LYNDON	R3-MOBILE HOME

Address	City	Facility Type
47 MARBLE LN	LYNDON	R3-MOBILE HOME
128 GRANITE LN	LYNDON	R3-MOBILE HOME
73 MARBLE LN	LYNDON	R3-MOBILE HOME
81 MARBLE LN	LYNDON	R3-MOBILE HOME
89 MARBLE LN	LYNDON	R3-MOBILE HOME
99 MARBLE LN	LYNDON	R3-MOBILE HOME
107 MARBLE LN	LYNDON	R3-MOBILE HOME
115 MARBLE LN	LYNDON	R3-MOBILE HOME
77 BROOKSIDE LN	LYNDON	R3-MOBILE HOME
64 BROOKSIDE LN	LYNDON	R3-MOBILE HOME
563 S WHEELLOCK RD	LYNDON	R3-MOBILE HOME
398 BACK CENTER RD	LYNDON	R3-MOBILE HOME
268 BACK CENTER RD	LYNDON	R3-MOBILE HOME
331 BACK CENTER RD	LYNDON	R3-MOBILE HOME
3699 E BURKE RD	LYNDON	R3-MOBILE HOME
19 MARBLE LN	LYNDON	R3-MOBILE HOME
67 MARBLE LN	LYNDON	R3-MOBILE HOME
40 SLATE LN	LYNDON	R3-MOBILE HOME



100-Year Flood Zone Analysis for Grafton, Vermont

Floodplain analysis was performed for Grafton, Vermont using FEMA's HAZUS-MH software. The Vermont Mapping Programs Digital Elevation Model was used to generate the hydrological network. VGIS data layers Emergency_E-SITE and VTrans_MAINTFAC (maintenance facilities) were used to determine facility locations.

State Government and Critical Facilities

The following state government/critical facility are within the 100-year flood zone:

Address	City	Facility Description
853 HOUGHTONVILLE RD	GRAFTON	P8-PUBLIC GATHERING

Commercial Facilities

The following 4 commercial facilities were determined to exist within the 100-year flood zone:

Address	City	Facility Description
778 ROUTE 121 E	GRAFTON	C1-COMMERCIAL
533 TOWNSHEND RD	GRAFTON	C1-COMMERCIAL
21 ROUTE 121 E	GRAFTON	C1-COMMERCIAL
3992 ROUTE 121 E	GRAFTON	C1-COMMERCIAL

Residential Facilities

The following 51 residential facilities were determined to exist within the 100-year flood zone:

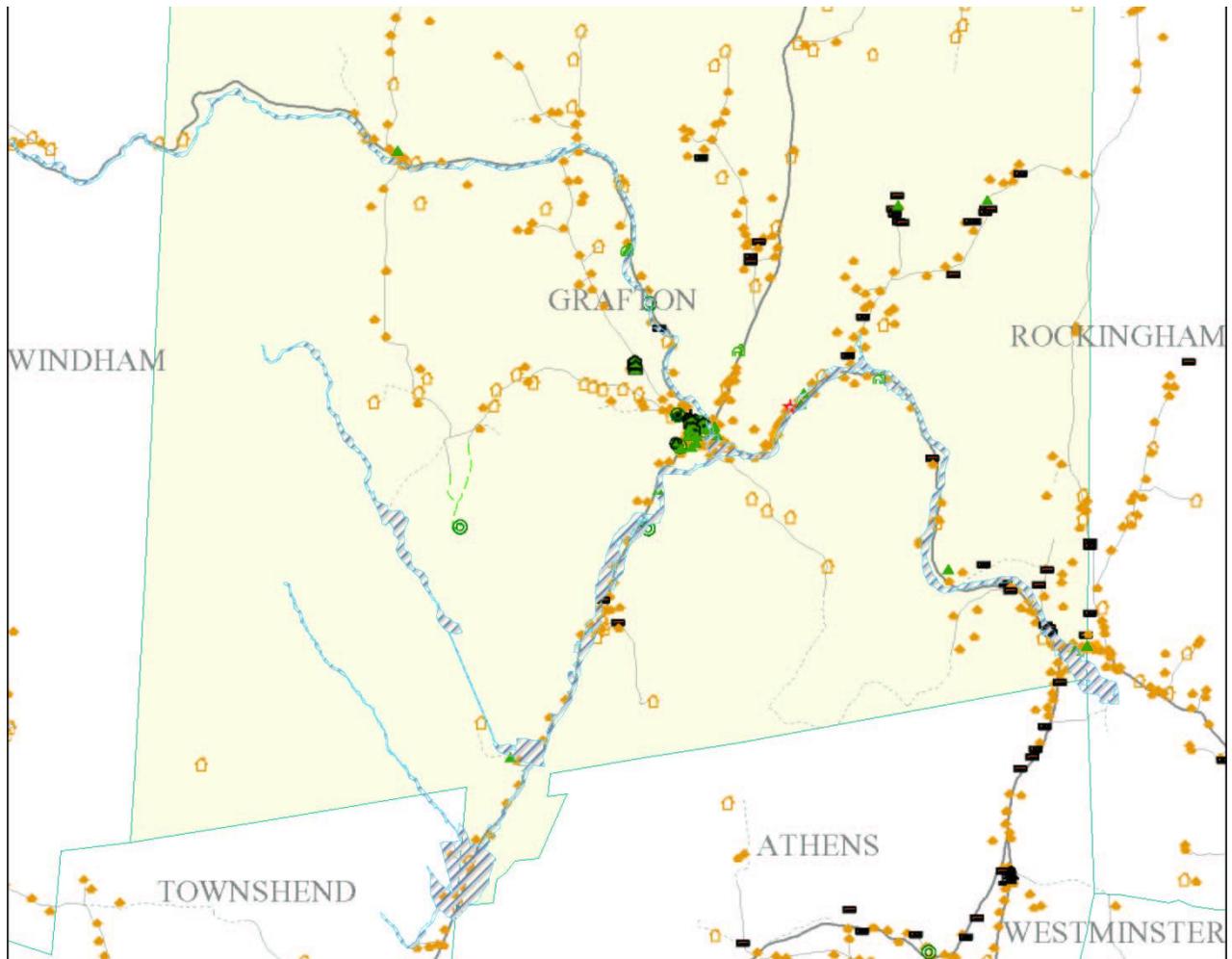
Address	City	Facility Description
38 RICHARDS RD	GRAFTON	R1-SINGLE FAMILY
90 ILLINGSWORTH RD	GRAFTON	R1-SINGLE FAMILY
1915 EASTMAN RD	GRAFTON	R1-SINGLE FAMILY
138 ELLSWORTH RD	GRAFTON	R1-SINGLE FAMILY
3241 HOUGHTONVILLE RD	GRAFTON	R1-SINGLE FAMILY
793 HOUGHTONVILLE RD	GRAFTON	R1-SINGLE FAMILY
882 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
783 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
47 CHESTER RD	GRAFTON	R1-SINGLE FAMILY
516 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY

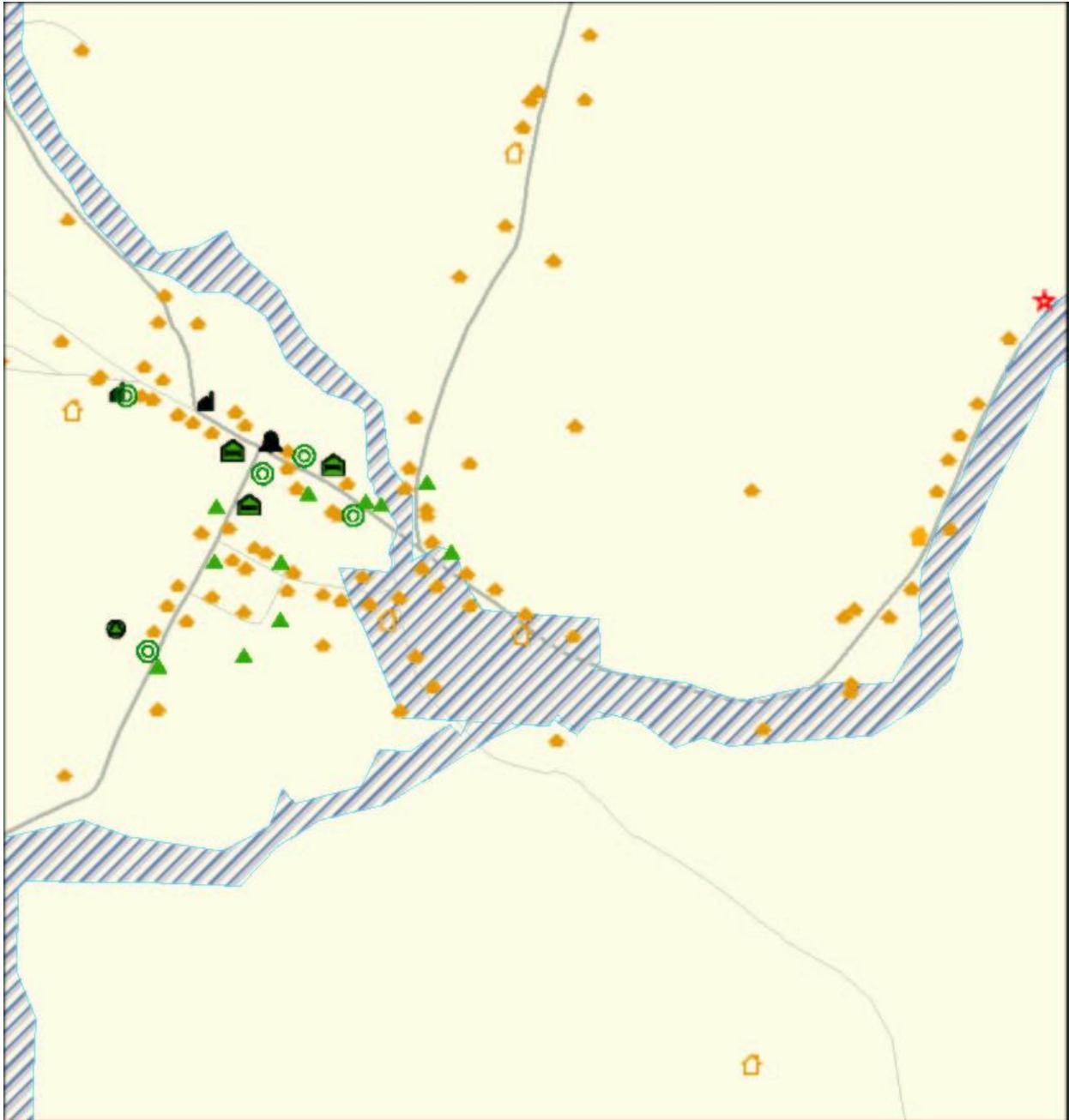
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Address	City	Facility Description
12 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
123 PLEASANT ST	GRAFTON	R1-SINGLE FAMILY
30 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
55 KIDDER HILL RD	GRAFTON	R1-SINGLE FAMILY
130 PLEASANT ST	GRAFTON	R1-SINGLE FAMILY
58 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
145 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
105 KIDDER HILL RD	GRAFTON	R1-SINGLE FAMILY
135 KIDDER HILL RD	GRAFTON	R1-SINGLE FAMILY
136 KIDDER HILL RD	GRAFTON	R1-SINGLE FAMILY
2490 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
916 TOWNSHEND RD	GRAFTON	R1-SINGLE FAMILY
1348 TOWNSHEND RD	GRAFTON	R1-SINGLE FAMILY
1528 TOWNSHEND RD	GRAFTON	R1-SINGLE FAMILY
1537 TOWNSHEND RD	GRAFTON	R1-SINGLE FAMILY
16 PARKER HILL RD	GRAFTON	R1-SINGLE FAMILY
3848 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
3924 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
41 ATHENS RD	GRAFTON	R1-SINGLE FAMILY
104 WYMAN HILL RD	GRAFTON	R1-SINGLE FAMILY
94 WYMAN HILL RD	GRAFTON	R1-SINGLE FAMILY
3367 TOWNSHEND RD	GRAFTON	R1-SINGLE FAMILY
3494 TOWNSHEND RD	GRAFTON	R1-SINGLE FAMILY
370 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
3581 HOUGHTONVILLE RD	GRAFTON	R1-SINGLE FAMILY
3525 HOUGHTONVILLE RD	GRAFTON	R1-SINGLE FAMILY
3275 HOUGHTONVILLE RD	GRAFTON	R1-SINGLE FAMILY

Address	City	Facility Description
3101 TOWNSHEND RD	GRAFTON	R1-SINGLE FAMILY
300 ROUTE 121 E	GRAFTON	R1-SINGLE FAMILY
124 ILLINGSWORTH RD	GRAFTON	R3-MOBILE HOME
2011 EASTMAN RD	GRAFTON	R3-MOBILE HOME
685 HOUGHTONVILLE RD	GRAFTON	R3-MOBILE HOME
175 PARKER HILL RD	GRAFTON	R3-MOBILE HOME
153 PARKER HILL RD	GRAFTON	R3-MOBILE HOME
121 PARKER HILL RD	GRAFTON	R3-MOBILE HOME
4125 CHESTER RD	GRAFTON	R5-CAMP/BUNGALOW
999 ROUTE 121 E	GRAFTON	R5-CAMP/BUNGALOW
72 KIDDER HILL RD	GRAFTON	R5-CAMP/BUNGALOW
108 ROUTE 121 E	GRAFTON	R5-CAMP/BUNGALOW
3330 TOWNSHEND RD	GRAFTON	R5-CAMP/BUNGALOW
3627 TOWNSHEND RD	GRAFTON	R5-CAMP/BUNGALOW

Appendix I





Appendix I

100-Year Flood Zone Analysis for Montpelier, Vermont

Floodplain analysis was performed for Montpelier, VT using FEMA's HAZUS-MH software. The Vermont Mapping Programs Digital Elevation Model was used to generate the hydrological network. VGIS data layers Emergency E-SITE and VTrans MAINTFAC (maintenance facilities) were used to determine facility locations.

State Government and Critical Facilities

The following 31 state government/critical facility are within the 100-year flood zone:

Address	City	Facility Type
149 STATE ST	MONTPELIER	P1-GOVERNMENT
144 STATE ST	MONTPELIER	P1-GOVERNMENT
133 STATE ST	MONTPELIER	P1-GOVERNMENT
136 STATE ST	MONTPELIER	P1-GOVERNMENT
134 STATE ST	MONTPELIER	P1-GOVERNMENT
132 STATE ST	MONTPELIER	P1-GOVERNMENT
128 STATE ST	MONTPELIER	P1-GOVERNMENT
111 STATE ST	MONTPELIER	P1-GOVERNMENT
116 STATE ST	MONTPELIER	P1-GOVERNMENT
120 STATE ST	MONTPELIER	P1-GOVERNMENT
89 STATE ST	MONTPELIER	P1-GOVERNMENT
87 STATE ST	MONTPELIER	P1-GOVERNMENT
10 TAYLOR ST	MONTPELIER	P1-GOVERNMENT
25 SCHOOL ST	MONTPELIER	P1-GOVERNMENT
58 STATE ST	MONTPELIER	P1-GOVERNMENT
11 E STATE ST	MONTPELIER	P1-GOVERNMENT
15 E STATE ST	MONTPELIER	P1-GOVERNMENT
39 MAIN ST	MONTPELIER	P1-GOVERNMENT
118 STATE ST	MONTPELIER	P1-GOVERNMENT
144 ELM ST	MONTPELIER	P3-CHURCH
156 MAIN ST	MONTPELIER	P3-CHURCH

Address	City	Facility Type
137 MAIN ST	MONTPELIER	P3-CHURCH
115 MAIN ST	MONTPELIER	P3-CHURCH
64 STATE ST	MONTPELIER	P3-CHURCH
34 SCHOOL ST	MONTPELIER	P3-CHURCH
130 MAIN ST	MONTPELIER	P3-CHURCH
135 MAIN ST	MONTPELIER	P5-CULTURAL
109 STATE ST	MONTPELIER	P5-CULTURAL
10 ELM ST	MONTPELIER	P6-POLICE
61 MAIN ST	MONTPELIER	P7-FIRE
1 BALLFIELD RD	MONTPELIER	P8-PUBLIC GATHERING

Commercial Facilities

The following 86 commercial facilities were determined to exist within the 100-year flood zone:

Address	City	Facility Type
30 FRANKLIN ST	MONTPELIER	C9-OTHER COMMERCIAL
156 ELM ST	MONTPELIER	C9-OTHER COMMERCIAL
2 SPRING ST	MONTPELIER	C9-OTHER COMMERCIAL
148 MAIN ST	MONTPELIER	C9-OTHER COMMERCIAL
148 STATE ST	MONTPELIER	C9-OTHER COMMERCIAL
144 MAIN ST	MONTPELIER	C9-OTHER COMMERCIAL
4 CUMMINGS ST	MONTPELIER	C1-COMMERCIAL
284 ELM ST	MONTPELIER	C1-COMMERCIAL
279 ELM ST	MONTPELIER	C1-COMMERCIAL
214 ELM ST	MONTPELIER	C1-COMMERCIAL
174 ELM ST	MONTPELIER	C1-COMMERCIAL
162 ELM ST	MONTPELIER	C1-COMMERCIAL
4 SPRING ST	MONTPELIER	C1-COMMERCIAL
155 ELM ST	MONTPELIER	C1-COMMERCIAL

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Address	City	Facility Type
153 ELM ST	MONTPELIER	C1-COMMERCIAL
137 ELM ST	MONTPELIER	C1-COMMERCIAL
154 MAIN ST	MONTPELIER	C1-COMMERCIAL
152 MAIN ST	MONTPELIER	C1-COMMERCIAL
147 STATE ST	MONTPELIER	C1-COMMERCIAL
146 MAIN ST	MONTPELIER	C1-COMMERCIAL
152 STATE ST	MONTPELIER	C1-COMMERCIAL
146 STATE ST	MONTPELIER	C1-COMMERCIAL
140 MAIN ST	MONTPELIER	C1-COMMERCIAL
141 MAIN ST	MONTPELIER	C1-COMMERCIAL
57 ELM ST	MONTPELIER	C1-COMMERCIAL
54 ELM ST	MONTPELIER	C1-COMMERCIAL
139 MAIN ST	MONTPELIER	C1-COMMERCIAL
3 SCHOOL ST	MONTPELIER	C1-COMMERCIAL
38 ELM ST	MONTPELIER	C1-COMMERCIAL
41 ELM ST	MONTPELIER	C1-COMMERCIAL
22 ELM ST	MONTPELIER	C1-COMMERCIAL
37 ELM ST	MONTPELIER	C1-COMMERCIAL
105 STATE ST	MONTPELIER	C1-COMMERCIAL
118 MAIN ST	MONTPELIER	C1-COMMERCIAL
93 STATE ST	MONTPELIER	C1-COMMERCIAL
8 LANGDON ST	MONTPELIER	C1-COMMERCIAL
116 MAIN ST	MONTPELIER	C1-COMMERCIAL
26 SCHOOL ST	MONTPELIER	C1-COMMERCIAL
7 LANGDON ST	MONTPELIER	C1-COMMERCIAL
23 SCHOOL ST	MONTPELIER	C1-COMMERCIAL
100 MAIN ST	MONTPELIER	C1-COMMERCIAL

Address	City	Facility Type
27 LANGDON ST	MONTPELIER	C1-COMMERCIAL
30 SCHOOL ST	MONTPELIER	C1-COMMERCIAL
58 STATE ST	MONTPELIER	C1-COMMERCIAL
27 STATE ST	MONTPELIER	C1-COMMERCIAL
17 STATE ST	MONTPELIER	C1-COMMERCIAL
50 STATE ST	MONTPELIER	C1-COMMERCIAL
89 MAIN ST	MONTPELIER	C1-COMMERCIAL
90 MAIN ST	MONTPELIER	C1-COMMERCIAL
5 STATE ST	MONTPELIER	C1-COMMERCIAL
13 STATE ST	MONTPELIER	C1-COMMERCIAL
40 STATE ST	MONTPELIER	C1-COMMERCIAL
34 STATE ST	MONTPELIER	C1-COMMERCIAL
38 STATE ST	MONTPELIER	C1-COMMERCIAL
30 STATE ST	MONTPELIER	C1-COMMERCIAL
24 STATE ST	MONTPELIER	C1-COMMERCIAL
20 STATE ST	MONTPELIER	C1-COMMERCIAL
18 STATE ST	MONTPELIER	C1-COMMERCIAL
8 STATE ST	MONTPELIER	C1-COMMERCIAL
6 STATE ST	MONTPELIER	C1-COMMERCIAL
2 STATE ST	MONTPELIER	C1-COMMERCIAL
68 MAIN ST	MONTPELIER	C1-COMMERCIAL
83 MAIN ST	MONTPELIER	C1-COMMERCIAL
66 MAIN ST	MONTPELIER	C1-COMMERCIAL
64 MAIN ST	MONTPELIER	C1-COMMERCIAL
73 MAIN ST	MONTPELIER	C1-COMMERCIAL
54 MAIN ST	MONTPELIER	C1-COMMERCIAL
44 MAIN ST	MONTPELIER	C1-COMMERCIAL
10 MAIN ST	MONTPELIER	C1-COMMERCIAL

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Address	City	Facility Type
27 MAIN ST	MONTPELIER	C1-COMMERCIAL
5 MEMORIAL DR	MONTPELIER	C1-COMMERCIAL
4 MAIN ST	MONTPELIER	C1-COMMERCIAL
623 STONE CUTTERS WAY	MONTPELIER	C1-COMMERCIAL
707 STONE CUTTERS WAY	MONTPELIER	C1-COMMERCIAL
707 STONE CUTTERS WAY	MONTPELIER	C1-COMMERCIAL
707 STONE CUTTERS WAY	MONTPELIER	C1-COMMERCIAL
62 RIVER ST	MONTPELIER	C1-COMMERCIAL
1 GRANITE ST	MONTPELIER	C1-COMMERCIAL
121 GRANITE SHED LN	MONTPELIER	C1-COMMERCIAL
9 SCHOOL ST	MONTPELIER	C1-COMMERCIAL
138 MAIN ST	MONTPELIER	C1-COMMERCIAL
136 MAIN ST	MONTPELIER	C1-COMMERCIAL
134 MAIN ST	MONTPELIER	C1-COMMERCIAL
132 MAIN ST	MONTPELIER	C1-COMMERCIAL
16 VINE ST	MONTPELIER	CL-LODGING
147 MAIN ST	MONTPELIER	CL-LODGING

Residential Facilities

The following 154 residential facilities were determined to exist within the 100-year flood zone:

Address	City	Facility Type
118 MILL RD	MONTPELIER	R1-SINGLE FAMILY
123 MILL RD	MONTPELIER	R1-SINGLE FAMILY
49 HAGGETT RD	MONTPELIER	R1-SINGLE FAMILY
3238 ELM ST	MONTPELIER	R1-SINGLE FAMILY
2900 ELM ST	MONTPELIER	R1-SINGLE FAMILY
2868 ELM ST	MONTPELIER	R1-SINGLE FAMILY
2696 ELM ST	MONTPELIER	R1-SINGLE FAMILY

Address	City	Facility Type
2047 ELM ST	MONTPELIER	R1-SINGLE FAMILY
493 ELM ST	MONTPELIER	R1-SINGLE FAMILY
489 ELM ST	MONTPELIER	R1-SINGLE FAMILY
3 CUMMINGS ST	MONTPELIER	R1-SINGLE FAMILY
427 ELM ST	MONTPELIER	R1-SINGLE FAMILY
423 ELM ST	MONTPELIER	R1-SINGLE FAMILY
417 ELM ST	MONTPELIER	R1-SINGLE FAMILY
409 ELM ST	MONTPELIER	R1-SINGLE FAMILY
403 ELM ST	MONTPELIER	R1-SINGLE FAMILY
397 ELM ST	MONTPELIER	R1-SINGLE FAMILY
391 ELM ST	MONTPELIER	R1-SINGLE FAMILY
385 ELM ST	MONTPELIER	R1-SINGLE FAMILY
379 ELM ST	MONTPELIER	R1-SINGLE FAMILY
375 ELM ST	MONTPELIER	R1-SINGLE FAMILY
371 ELM ST	MONTPELIER	R1-SINGLE FAMILY
396 ELM ST	MONTPELIER	R1-SINGLE FAMILY
367 ELM ST	MONTPELIER	R1-SINGLE FAMILY
32 PEARL ST	MONTPELIER	R1-SINGLE FAMILY
333 ELM ST	MONTPELIER	R1-SINGLE FAMILY
720 ELM ST	MONTPELIER	R1-SINGLE FAMILY
31 PEARL ST	MONTPELIER	R1-SINGLE FAMILY
346 ELM ST	MONTPELIER	R1-SINGLE FAMILY
27 PEARL ST	MONTPELIER	R1-SINGLE FAMILY
19 PEARL ST	MONTPELIER	R1-SINGLE FAMILY
325 ELM ST	MONTPELIER	R1-SINGLE FAMILY
323 ELM ST	MONTPELIER	R1-SINGLE FAMILY
313 ELM ST	MONTPELIER	R1-SINGLE FAMILY
311 ELM ST	MONTPELIER	R1-SINGLE FAMILY

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Address	City	Facility Type
15 VINE ST	MONTPELIER	R1-SINGLE FAMILY
30 SUMMER ST	MONTPELIER	R1-SINGLE FAMILY
28 SUMMER ST	MONTPELIER	R1-SINGLE FAMILY
286 ELM ST	MONTPELIER	R1-SINGLE FAMILY
13 VINE ST	MONTPELIER	R1-SINGLE FAMILY
14 VINE ST	MONTPELIER	R1-SINGLE FAMILY
11 VINE ST	MONTPELIER	R1-SINGLE FAMILY
25 SUMMER ST	MONTPELIER	R1-SINGLE FAMILY
285 ELM ST	MONTPELIER	R1-SINGLE FAMILY
9 VINE ST	MONTPELIER	R1-SINGLE FAMILY
24 SUMMER ST	MONTPELIER	R1-SINGLE FAMILY
7 VINE ST	MONTPELIER	R1-SINGLE FAMILY
23 SUMMER ST	MONTPELIER	R1-SINGLE FAMILY
5 VINE ST	MONTPELIER	R1-SINGLE FAMILY
10 WINTER ST	MONTPELIER	R1-SINGLE FAMILY
15 SUMMER ST	MONTPELIER	R1-SINGLE FAMILY
9 WINTER ST	MONTPELIER	R1-SINGLE FAMILY
6 WINTER ST	MONTPELIER	R1-SINGLE FAMILY
13 SUMMER ST	MONTPELIER	R1-SINGLE FAMILY
11 SUMMER ST	MONTPELIER	R1-SINGLE FAMILY
8 WINTER ST	MONTPELIER	R1-SINGLE FAMILY
9 SUMMER ST	MONTPELIER	R1-SINGLE FAMILY
222 ELM ST	MONTPELIER	R1-SINGLE FAMILY
5 SUMMER ST	MONTPELIER	R1-SINGLE FAMILY
221 ELM ST	MONTPELIER	R1-SINGLE FAMILY
208 ELM ST	MONTPELIER	R1-SINGLE FAMILY
200 ELM ST	MONTPELIER	R1-SINGLE FAMILY

Address	City	Facility Type
362 ELM ST	MONTPELIER	R1-SINGLE FAMILY
188 ELM ST	MONTPELIER	R1-SINGLE FAMILY
15 SPRING ST	MONTPELIER	R1-SINGLE FAMILY
184 ELM ST	MONTPELIER	R1-SINGLE FAMILY
12 SPRING ST	MONTPELIER	R1-SINGLE FAMILY
7 SPRING ST	MONTPELIER	R1-SINGLE FAMILY
29 FRANKLIN ST	MONTPELIER	R1-SINGLE FAMILY
27 FRANKLIN ST	MONTPELIER	R1-SINGLE FAMILY
127 ELM ST	MONTPELIER	R1-SINGLE FAMILY
117 ELM ST	MONTPELIER	R1-SINGLE FAMILY
150 MAIN ST	MONTPELIER	R1-SINGLE FAMILY
145 MAIN ST	MONTPELIER	R1-SINGLE FAMILY
143 MAIN ST	MONTPELIER	R1-SINGLE FAMILY
30 ST PAUL ST	MONTPELIER	R1-SINGLE FAMILY
26 ST PAUL ST	MONTPELIER	R1-SINGLE FAMILY
22 ST PAUL ST	MONTPELIER	R1-SINGLE FAMILY
126 STATE ST	MONTPELIER	R1-SINGLE FAMILY
11 ST PAUL ST	MONTPELIER	R1-SINGLE FAMILY
6 ST PAUL ST	MONTPELIER	R1-SINGLE FAMILY
4 ST PAUL ST	MONTPELIER	R1-SINGLE FAMILY
8 ST PAUL ST	MONTPELIER	R1-SINGLE FAMILY
5 ST PAUL ST	MONTPELIER	R1-SINGLE FAMILY
189 STATE ST	MONTPELIER	R1-SINGLE FAMILY
201 STATE ST	MONTPELIER	R1-SINGLE FAMILY
387 BARRE ST	MONTPELIER	R1-SINGLE FAMILY
415 ELM ST	MONTPELIER	R1-SINGLE FAMILY
465 ELM ST	MONTPELIER	R1-SINGLE FAMILY
158 MAIN ST	MONTPELIER	R1-SINGLE FAMILY

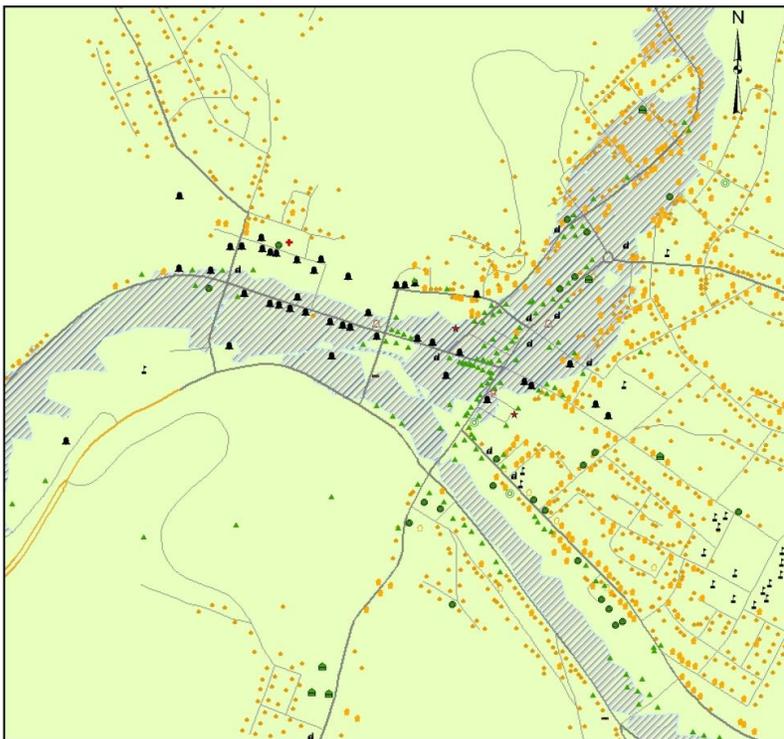
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Address	City	Facility Type
2481 ELM ST	MONTPELIER	R1-SINGLE FAMILY
24 ST PAUL ST	MONTPELIER	R1-SINGLE FAMILY
180 GLEN GANNON WY	MONTPELIER	R1-SINGLE FAMILY
26 PEARL ST	MONTPELIER	R2-MULTI FAMILY
22 PEARL ST	MONTPELIER	R2-MULTI FAMILY
319 ELM ST	MONTPELIER	R2-MULTI FAMILY
300 ELM ST	MONTPELIER	R2-MULTI FAMILY
294 ELM ST	MONTPELIER	R2-MULTI FAMILY
0 SUMMER ST	MONTPELIER	R2-MULTI FAMILY
287 ELM ST	MONTPELIER	R2-MULTI FAMILY
8 VINE ST	MONTPELIER	R2-MULTI FAMILY
269 ELM ST	MONTPELIER	R2-MULTI FAMILY
260 ELM ST	MONTPELIER	R2-MULTI FAMILY
11 WINTER ST	MONTPELIER	R2-MULTI FAMILY
12 WINTER ST	MONTPELIER	R2-MULTI FAMILY
3 VINE ST	MONTPELIER	R2-MULTI FAMILY
254 ELM ST	MONTPELIER	R2-MULTI FAMILY
7 WINTER ST	MONTPELIER	R2-MULTI FAMILY
248 ELM ST	MONTPELIER	R2-MULTI FAMILY
242 ELM ST	MONTPELIER	R2-MULTI FAMILY
249 ELM ST	MONTPELIER	R2-MULTI FAMILY
5 WINTER ST	MONTPELIER	R2-MULTI FAMILY
2 MECHANIC ST	MONTPELIER	R2-MULTI FAMILY
3 WINTER ST	MONTPELIER	R2-MULTI FAMILY
241 ELM ST	MONTPELIER	R2-MULTI FAMILY
228 ELM ST	MONTPELIER	R2-MULTI FAMILY
7 SUMMER ST	MONTPELIER	R2-MULTI FAMILY

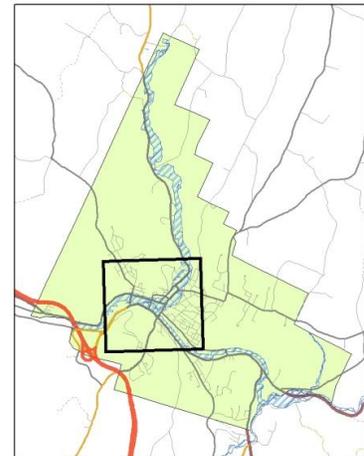
Address	City	Facility Type
235 ELM ST	MONTPELIER	R2-MULTI FAMILY
231 ELM ST	MONTPELIER	R2-MULTI FAMILY
223 ELM ST	MONTPELIER	R2-MULTI FAMILY
213 ELM ST	MONTPELIER	R2-MULTI FAMILY
8 SPRING ST	MONTPELIER	R2-MULTI FAMILY
187 ELM ST	MONTPELIER	R2-MULTI FAMILY
166 ELM ST	MONTPELIER	R2-MULTI FAMILY
26 FRANKLIN ST	MONTPELIER	R2-MULTI FAMILY
5 SPRING ST	MONTPELIER	R2-MULTI FAMILY
19 FRANKLIN ST	MONTPELIER	R2-MULTI FAMILY
14 FRANKLIN ST	MONTPELIER	R2-MULTI FAMILY
150 ELM ST	MONTPELIER	R2-MULTI FAMILY
1 SPRING ST	MONTPELIER	R2-MULTI FAMILY
131 ELM ST	MONTPELIER	R2-MULTI FAMILY
162 MAIN ST	MONTPELIER	R2-MULTI FAMILY
160 MAIN ST	MONTPELIER	R2-MULTI FAMILY
155 MAIN ST	MONTPELIER	R2-MULTI FAMILY
89 ELM ST	MONTPELIER	R2-MULTI FAMILY
142 MAIN ST	MONTPELIER	R2-MULTI FAMILY
10 BROWN ST	MONTPELIER	R2-MULTI FAMILY
2 BAIRD ST	MONTPELIER	R2-MULTI FAMILY
7 BAIRD ST	MONTPELIER	R2-MULTI FAMILY
34 ELM ST	MONTPELIER	R2-MULTI FAMILY
23 ST PAUL ST	MONTPELIER	R2-MULTI FAMILY
13 ST PAUL ST	MONTPELIER	R2-MULTI FAMILY
12 ST PAUL ST	MONTPELIER	R2-MULTI FAMILY
124 MAIN ST	MONTPELIER	R2-MULTI FAMILY
32 SCHOOL ST	MONTPELIER	R2-MULTI FAMILY

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Address	City	Facility Type
27 SCHOOL ST	MONTPELIER	R2-MULTI FAMILY
14 CUMMINGS ST	MONTPELIER	R2-MULTI FAMILY
435 ELM ST	MONTPELIER	R2-MULTI FAMILY
87 ELM ST	MONTPELIER	R2-MULTI FAMILY
1 MECHANIC ST	MONTPELIER	R2-MULTI FAMILY
6 CUMMINGS ST	MONTPELIER	R3-MOBILE HOME
1 TAYLOR ST	MONTPELIER	R3-MOBILE HOME
149 MAIN ST	MONTPELIER	R4-OTHER RESIDENTIAL
7 ST PAUL ST	MONTPELIER	R4-OTHER RESIDENTIAL



100 Year Flood Boundary and Intersecting Facilities, Montpelier Vermont



Inset: Detail Area

- Legend**
- ▲ Government
 - ⛔ Hospital
 - ⛔ Church
 - ⛔ School
 - ⛔ Cultural
 - ★ Police
 - ★ Fire
 - ⊕ Gathering
 - ⊕ Ambulance house
 - ⊕ Cemetery
 - ⊕ Health/Care Institutional
 - ▲ Commercial
 - ⊕ Farm
 - ⊕ Lodging
 - ⊕ Commercial/Other
 - ⊕ Industrial
 - ⊕ Utility
 - Single Family Home
 - Multi-family Home
 - Mobile Home
 - Other Residential
 - Bungalow
 - Seasonal Home
 - ▨ 100 Year Flood Boundary

Appendix J

STATE OF VERMONT MITIGATION GRANT APPLICATION

State of Vermont Hazard Mitigation Grant Program Project Application			
	FEMA-DR-	VT	Date Submitted:
Part 1:	Applicant Information		
Applicant Name: <i>(Eligible Applicant i.e. local government, state agency, nonprofit)</i>			
County:			
Project Title:			
Name of Local Hazard Mitigation Plan: <i>(Regional, County or Town)</i>			
Date of FEMA approval of Local Plan:			
Is Project Listed in Local Mitigation Plan?			
Primary Contact Information			
Name:			
Title:			
Organization:			
Mailing Address:			
Work Phone Number:		Alternate Phone Number:	
Fax Number		E-mail:	
Secondary Contact Information			
Name:			
Title:			
Organization:			
Mailing Address:			
Work Phone Number:		Alternate Phone Number:	
Fax Number		E-mail:	
Part 2:	Problem Description		
Problem Statement:			

Appendix J

<i>(What is happening?)</i>					
Location of Project:		Latitude:		Longitude:	<i>(in decimals)</i>
Required Maps: <i>(Attach)</i>	<input type="checkbox"/>	Local General Highway Map			
	<input type="checkbox"/>	Flood Insurance Rate Map with panel number			
	<input type="checkbox"/>	Topographic Map			
Identify adjacent roads:					
Identify adjacent bodies of water:					
Statement of Damages					
Date	Event	Description of Direct Damages	Description of Indirect Damages		Cost of Damage
Total Damage					
Part 3:		Project Objective			
Project Objective					
Part 4:		Analysis of Alternative Solutions			
Alternative Solutions					
Alternative Solution	Brief Title		Description of Alternative		
1					
2					
3	No Action		No Action		
Supporting Documentation: <i>(Attach)</i>	<input type="checkbox"/> Yes	Did any of the alternatives have significant impacts or limitations?			
	<input type="checkbox"/>	If Yes, provide additional information concerning these impacts Is the information attached?			
	<input type="checkbox"/>	Hydrology/ hydraulics reports, if applicable			
	<input type="checkbox"/>	Supporting documentation for alternatives			
Preferred Alternative					
Chosen Alternative:					
Justification:					
Part 5:		Project Description (for the Preferred Alternative)			

STATE OF VERMONT MITIGATION GRANT APPLICATION

Project Description				
Expected Life of Project				
Supporting Documentation: <i>(Attach)</i>	<input type="checkbox"/>	Digital Photos		
	<input type="checkbox"/>	Engineering Studies		
	<input type="checkbox"/>	Site Diagrams		
Project Costs for Preferred Alternative				
Item	Unit Qty.	Unit Measurement	Unit Cost	Cost Estimate
			Total Project Cost Estimate	
Summary of Project Costs				
A		Total Project Costs		
B		FEMA Share (75% of Line A)		
C		Local Share (25% of Line A) The sum of lines 1-3 must equal Line C		
		1. Cash		
		2. In-Kind Service		
		3. Other		
Identify source of local non-federal match:				
Part 6:	Benefit/Cost Analysis (for the Preferred Alternative)			
Total Project Costs = Summary of Project Costs (Line A)			Total Project Cost	
Future Maintenance (i.e. mowing, culvert maintenance, etc.)			Future Maintenance costs for life of project	
Total Cost = Project Cost + Future Maintenance			Total Cost	
Benefit/Cost Ratio = Anticipated Loss or Benefit /Total Cost			Benefit/Cost Ratio	
Only those projects with a benefit-cost ratio (BCR) of 1.0 or greater will be considered. Please attach a detailed benefit-cost analysis (BCA). Planning applications do not require a BCA.				
Part 7:	Scope of Work (for the Preferred Alternative)			

Appendix J

Task Description		Weeks to Complete		
		Award +		Weeks
		Award +		Weeks
		Award +		Weeks
		Award +		Weeks
		Award +		Weeks
		Award +		Weeks
		Award +		Weeks
		Award +		Weeks
Total Time Planned for Completion of Project		Award +		Total Weeks
Part 8:	Technical Confirmation			
Supporting Documentation: <i>(Attach)</i>	<input type="checkbox"/>	Has the hydrology/hydraulics/structural design of this project been endorsed by the local VTrans District Engineer, ANR Stream Alteration Engineer, consulting engineer or other technical expert?		
		Letter(s) of Support		
<input type="checkbox"/>				
Part 9:	Authorized Signature			
I certify that I am the authorized agent for the applicant and have responsibility for the development and completion of this application and all the information contained herein is true and accurate.				
<i>Authorized Agent's Signature / Title</i>			<i>Date</i>	
Required Forms: <i>(Attach)</i>	<input type="checkbox"/>	Application for Federal Assistance (SF424)		
	<input type="checkbox"/>	Summary Sheet for Assurances and Certifications (Summary Sheet and Form 20-16 A or B)		
	<input type="checkbox"/>	25% Match Commitment Letter		
Please submit a copy of the application in both hard copy (color preferred) and a scanned version in Adobe PDF to: Ray Doherty, State Hazard Mitigation Officer Vermont Division of Emergency Management & Homeland Security 103 South Main Street Waterbury, VT 05671 ray.doherty@state.vt.us				

Appendix K

STATE OF VERMONT MITIGATION PROJECT REVIEW CRITERIA

State Mitigation Project Review Criteria

Project Applications

PDM-C, FMA, & HMGP Programs

Name of Reviewer:

SubApplicant Name/ Community/ Agency:

Priority: *(zero low to 25 points high)*

Does the project address a critical facility or important community resource?

(Critical = 5; Important But Not Critical = 3; Minimal Importance = 0)

What is the severity of past losses?

(Critical = 5; Severe = 3; Serious = 2; Minimal = 0)

Has the community been proactive in mitigating hazards, e.g. adopting a fluvial erosion hazard overlay district, adopting flood plain development regulatory restrictions that exceed FEMA's minimum standards, or actively supporting substantial flood mitigation, riparian corridor land conservation, shore land protection, landslide or earthquake mitigation measures or similar activities?

(Yes = 15; Some Steps Taken = 5; Not at all = 0)

Engineering Solution: *(zero low to 10 points high)*

Is the project proposal complete and clearly defined from a technical perspective including submittal of adequate engineering technical data and/or analysis?

(Yes = 7, Partially Defined = 3, Not Well Defined = 0)

Does the application contain a recommendation from a qualified professional?

(Yes = 3, No = 0)

Effectiveness of Mitigation Strategy: *(zero low to 45 points high)*

Appendix K

Is the project identified in an approved Local/Regional Hazard Mitigation Plan, State Mitigation Plan, ANR River Corridor Plan and/or the Municipal Plan?

(In Approved Plan = 5; In Draft Plan = 3; Not in Plan = 0)

Does the project primarily address issues unavoidably related to recent federal or state declared disasters, and not damages due to deferred maintenance or inappropriate land use investments in hazardous areas?

(Yes= 5; No = 0)

Will the proposed solution correct the problem without having a negative impact on surrounding communities or will it substantially reduce the risk of future damage, hardship or loss resulting from a natural or manmade disaster?

(Full Solution = 10; Partial Solution = 5; Not an Appropriate Solution = 0)

Is the project primarily proactive or is it reactive; i.e. is hazard avoidance a primary element And/or the outcome of the project?

(Primarily Proactive = 10; Partially Proactive = 5; Primarily Reactive = 0)

Would completion of the project lead to risk avoidance, e.g. address a repetitive loss or chronic flooding location or mitigate areas affected by flooding, landslides, fluvial (riverine) erosion, ice jams or other hazards?

(Yes = 15; Partial Mitigation = 5; Little or No Mitigation = 0)

Benefit: *(zero low to 20 points high)*

Does the hazard pose a threat to human life and property or, if not addressed, would it severely impact the local community?

(Definite Significant Hazard = 5; Partial Hazard = 3; No Hazard = 0)

Is the community impacted by repetitive loss events, e.g. subject to repeated flooding, riverine erosion, landslides or other risks to public health and safety?

(Yes = 5, No = 0)

Does the project meet multiple program objectives (e.g. mitigation and environmental conservation) or are there additional potential benefits associated with this project e.g. flood control, property protection, eliminating potential isolation, water quality or riverine stabilization?

(Multiple Objectives Addressed= 10; Some Objectives Addressed = 5; No Objectives Addressed = 0)

TOTAL PROJECT SCORE (out of possible 100 points):

Appendix L

**STATE OF VERMONT HAZARD MITIGATION GRANT
PROGRAM SUBGRANT AGREEMENT**

Parties: This is a Subgrant Agreement between the State of Vermont, **Department of Public Safety (DPS)** (hereinafter called “State”), and _____ (hereinafter called “Subrecipient”). Subrecipient is/ is not required by law to have a Business Account Number from the Vermont Department of Taxes. The Account Number is # _____ .

Subrecipient Federal Tax Identification Number:

Subrecipient DUNS Number:

Subrecipient Addresses:

Mailing

Physical*

*As provided in the System for Award Management (SAM)

PO Box not acceptable

Appendix L

Subject Matter: The subject matter of this Subgrant Agreement is _____.

Detailed services to be provided by the Subrecipient are described in Attachment A.

Subgrant Term: The period of performance (effective dates) of this subgrant shall begin on the later of _____ or the date the DPS authorized representative(s) signs this agreement; and the period of Subrecipient's performance shall end on _____. *State will not reimburse any expenses incurred prior to the execution date of this agreement. The execution date is defined as the date the DPS representative(s) signs this agreement.*

Maximum Amount: In consideration of the services to be performed by Subrecipient, the State agrees to pay Subrecipient, in accordance with the payment provisions specified in Attachment B, a sum not to exceed \$ _____.

Source of Funds:

Federal Funds % Other Funds %

Match required: Yes No If Yes %, \$ If maximum reimbursement is sought.

CFDA Title:

CFDA Number:

Award Name:

Award Number:

Award Year:

Federal Granting Agency

Research and Development Grant? Yes No

Amendment: No changes, modifications, or amendments in the terms and conditions of this Subgrant Agreement shall be effective unless reduced to writing, numbered, and signed by the duly authorized representative of the State and Subrecipient.

Cancellation: This Subgrant Agreement may be suspended or cancelled by either party by giving written notice at least 30 days in advance.

Contact persons: The Subrecipient's contact person for this award is:

Telephone Number: E-mail address:

**STATE OF VERMONT HAZARD MITIGATION GRANT PROGRAM
SUBGRANT AGREEMENT**

Fiscal Year: The Subrecipient's fiscal year starts (month) and ends (month)

Public Safety Subgrant Contacts:

Project Workcenter

Name:

Phone:

E-Mail:

Grants Management Unit

Name:

Phone:

E-Mail:

We, the undersigned parties, agree to be bound by this Subgrant Agreement, its provisions, attachments and conditions contained herein.

Attachments: This Subgrant Agreement consists of 498 pages including the following attachments that are incorporated herein:

Please initial that you have read and understand each Attachment

_____ Attachment A - Scope of Work to be Performed

_____ Attachment B - Payment Provisions

_____ Attachment C - Customary State Subgrant Provisions

_____ Attachment D - Other Provisions

_____ Attachment E – Funding Source Special Conditions

STATE OF VERMONT

Department of Public Safety

SUBRECIPIENT

Authorized Representative

By:

Commissioner/ Deputy Commissioner

By:

Title: _____

Date: _____ Date: _____

Your signature on this agreement attests to the acceptance of all provisions, attachments and conditions contained herein.

**STATE OF VERMONT HAZARD MITIGATION GRANT PROGRAM
SUBGRANT AGREEMENT**

ATTACHMENT A

SCOPE OF WORK TO BE PERFORMED

Objective:

Activity to be Performed:

Performance Measures:

ATTACHMENT B

PAYMENT PROVISIONS

The State agrees to compensate the Subrecipient up to \$ _____ for services performed within the maximum amounts stated below provided such services are within the scope of the subgrant and are authorized as provided for under the terms and conditions of this subgrant. In the case of the Subrecipient completing this project for less than the budgeted amount, the State agrees to compensate the Subrecipient 75% of the total allowable, documented cost of the project.

IDENTIFIED PROJECT BUDGET: \$ _____

Provide detailed project budget information here:

Salaries and Benefits	\$ _____
Other Personal Service	\$ _____
Contractual	\$ _____
Supplies	\$ _____
Travel & Mileage	\$ _____
Equipment	\$ _____
Other Operating Expenses	\$ _____
Indirect Cost	\$ _____

During the performance of this subgrant, any of the cost categories may be increased or decreased by up to 10% with the approval of the DPS Grant Management Unit contact shown on page 3 provided the Total Award Amount is not exceeded.

PROGRAMMATIC REPORTING REQUIREMENTS:

The Subrecipient must submit programmatic reports using either the DPS Subgrant Progress Report Form or another format that includes all information required on the DPS form.

The Subrecipient must submit a Subgrant Closeout Report to the Vermont DPS no later than 30 days after the end date of the subgrant. In the event complying with this provision becomes impossible, contact the DPS Program Workcenter contact shown on page 3.

STATE OF VERMONT HAZARD MITIGATION GRANT PROGRAM SUBGRANT AGREEMENT

FINANCIAL REPORTING REQUIREMENTS /PAYMENT REQUESTS:

The State, at its discretion, will reimburse the Subrecipient by one of the following options depending on the needs of the Subrecipient and their standing with the State at the time they request such reimbursement:

Reimbursement in arrears of expenditures with attached documentation. Subgrantees must submit the DPS Financial Report form with detailed documentation of incurred expenses paid to receive payment.

Limited cash advance. Subgrantees must submit the DPS Financial Report form with detailed documentation of incurred expenses marked “Received not paid” to receive payment.

Requests for reimbursement or payment must be requested using a Vermont DPS Financial Report Form. Requests for reimbursement must be submitted to the Vermont DPS, Grants Management Unit no later than the end of the month following the month in which the expenses were incurred.

DPS will not make any payments on this subgrant unless the Subrecipient meets all provisions of the subgrant.

Subrecipients will submit their reimbursement requests with any required documentation attached to the form at the time of submission to their respective Grants Management Unit subgrant manager(s) at:

Name:

Vermont DPS/GMU

Address

103 South Main Street

Waterbury, VT 05671-2101

ATTACHMENT C

STANDARD STATE PROVISIONS For Contracts and Grants

1. **Entire Agreement:** This Agreement, whether in the form of a Contract, State Funded Grant, or Federally Funded Grant, represents the entire agreement between the parties on the subject matter. All prior agreements, representations, statements, negotiations, and understandings shall have no effect.
2. **Applicable Law:** This Agreement will be governed by the laws of the State of Vermont.
3. **Definitions:** For purposes of this Attachment, “Party” shall mean the Contractor, Grantee or Subrecipient, with whom the State of Vermont is executing this Agreement and consistent with the form of the Agreement.
4. **Appropriations:** If this Agreement extends into more than one fiscal year of the State (July 1 to June 30), and if appropriations are insufficient to support this Agreement, the State may cancel at the end of the fiscal year, or otherwise upon the expiration of existing appropriation authority. In the case that this Agreement is a Grant that is funded in whole or in part by federal funds, and in the event federal funds become unavailable or reduced, the State may suspend or cancel this Grant immediately, and the State shall have no obligation to pay Subrecipient from State revenues.
5. **No Employee Benefits For Party:** The Party understands that the State will not provide any individual retirement benefits, group life insurance, group health and dental insurance, vacation or sick leave, workers compensation or other benefits or services available to State employees, nor will the state withhold any State or Federal taxes except as required under applicable tax laws, which shall be determined in advance of execution of the Agreement. The Party understands that all tax returns required by the Internal Revenue Code and the State of Vermont, including but not limited to income, withholding, sales and use, and rooms and meals, must be filed by the Party, and information as to Agreement income will be provided by the State of Vermont to the Internal Revenue Service and the Vermont Department of Taxes.
6. **Independence, Liability:** The Party will act in an independent capacity and not as officers or employees of the State.

The Party shall defend the State and its officers and employees against all claims or suits arising in whole or in part from any act or omission of the Party or of any agent of the Party. The State shall notify the Party in the event of any such claim or suit, and the Party shall immediately retain counsel and otherwise provide a complete defense against the entire claim or suit.

After a final judgment or settlement, the Party may request recoupment of specific defense costs and may file suit in Washington Superior Court requesting recoupment. The Party shall be entitled to recoup costs only upon a showing that such costs were entirely unrelated to the defense of any claim arising from an act or omission of the Party.

STATE OF VERMONT HAZARD MITIGATION GRANT PROGRAM SUBGRANT AGREEMENT

The Party shall indemnify the State and its officers and employees in the event that the State, its officers or employees become legally obligated to pay any damages or losses arising from any act or omission of the Party.

7. **Insurance:** Before commencing work on this Agreement the Party must provide certificates of insurance to show that the following minimum coverages are in effect. It is the responsibility of the Party to maintain current certificates of insurance on file with the state through the term of the Agreement. No warranty is made that the coverages and limits listed herein are adequate to cover and protect the interests of the Party for the Party's operations. These are solely minimums that have been established to protect the interests of the State.

Workers Compensation: With respect to all operations performed, the Party shall carry workers' compensation insurance in accordance with the laws of the State of Vermont.

General Liability and Property Damage: With respect to all operations performed under the contract, the Party shall carry general liability insurance having all major divisions of coverage including, but not limited to:

Premises - Operations

Products and Completed Operations

Personal Injury Liability

Contractual Liability

The policy shall be on an occurrence form and limits shall not be less than:

\$1,000,000 Per Occurrence

\$1,000,000 General Aggregate

\$1,000,000 Products/Completed Operations Aggregate

\$ 50,000 Fire/ Legal/Liability

Party shall name the State of Vermont and its officers and employees as additional insureds for liability arising out of this Agreement.

Automotive Liability: The Party shall carry automotive liability insurance covering all motor vehicles, including hired and non-owned coverage, used in connection with the Agreement. Limits of coverage shall not be less than: \$1,000,000 combined single limit.

Party shall name the State of Vermont and its officers and employees as additional insureds for liability arising out of this Agreement.

8. **Reliance by the State on Representations:** All payments by the State under this Agreement will be made in reliance upon the accuracy of all prior representations by the Party, including but not limited to bills, invoices, progress reports and other proofs of work.
9. **Requirement to Have a Single Audit:** In the case that this Agreement is a Grant that is funded in whole or in part by federal funds, the Subrecipient will complete the Subrecipient

Annual Report annually within 45 days after its fiscal year end, informing the State of Vermont whether or not a single audit is required for the prior fiscal year. If a single audit is required, the Subrecipient will submit a copy of the audit report to the granting Party within 9 months. If a single audit is not required, only the Subrecipient Annual Report is required.

A single audit is required if the Subrecipient expends \$500,000 or more in federal assistance during its fiscal year and must be conducted in accordance with OMB Circular A-133. The Subrecipient Annual Report is required to be submitted within 45 days, whether or not a single audit is required.

10. **Records Available for Audit:** The Party will maintain all books, documents, payroll papers, accounting records and other evidence pertaining to costs incurred under this agreement and make them available at reasonable times during the period of the Agreement and for three years thereafter for inspection by any authorized representatives of the State or Federal Government. If any litigation, claim, or audit is started before the expiration of the three-year period, the records shall be retained until all litigation, claims or audit findings involving the records have been resolved. The State, by any authorized representative, shall have the right at all reasonable times to inspect or otherwise evaluate the work performed or being performed under this Agreement.
11. **Fair Employment Practices and Americans with Disabilities Act:** Party agrees to comply with the requirement of Title 21V.S.A. Chapter 5, Subchapter 6, relating to fair employment practices, to the full extent applicable. Party shall also ensure, to the full extent required by the Americans with Disabilities Act of 1990 that qualified individuals with disabilities receive equitable access to the services, programs, and activities provided by the Party under this Agreement. Party further agrees to include this provision in all subcontracts.
12. **Set Off:** The State may set off any sums, which the Party owes the State against any sums due the Party under this Agreement; provided, however, that any set off of amounts due the State of Vermont as taxes shall be in accordance with the procedures more specifically provided hereinafter.
13. **Taxes Due to the State:**
 - a. Party understands and acknowledges responsibility, if applicable, for compliance with State tax laws, including income tax withholding for employees performing services within the State, payment of use tax on property used within the State, corporate and/or personal income tax on income earned within the State.
 - b. Party certifies under the pains and penalties of perjury that, as of the date the Agreement is signed, the Party is in good standing with respect to, or in full compliance with, a plan to pay any and all taxes due the State of Vermont.
 - c. Party understands that final payment under this Agreement may be withheld if the Commissioner of Taxes determines that the Party is not in good standing with respect to or in full compliance with a plan to pay any and all taxes due to the State of Vermont.
 - d. Party also understands the State may set off taxes (and related penalties, interest and fees) due to the State of Vermont, but only if the Party has failed to make an appeal within the

STATE OF VERMONT HAZARD MITIGATION GRANT PROGRAM SUBGRANT AGREEMENT

time allowed by law, or an appeal has been taken and finally determined and the Party has no further legal recourse to contest the amounts due.

14. **Child Support:** (Applicable if the Party is a natural person, not a corporation or partnership.) Party states that, as of the date the Agreement is signed, he/she:
- a. is not under any obligation to pay child support; or
 - b. is under such an obligation and is in good standing with respect to that obligation; or
 - c. has agreed to a payment plan with the Vermont Office of Child Support Services and is in full compliance with that plan.

Party makes this statement with regard to support owed to any and all children residing in Vermont. In addition, if the Party is a resident of Vermont, Party makes this statement with regard to support owed to any and all children residing in any other state or territory of the United States.

15. **SubAgreements:** Party shall not assign, subcontract or subgrant the performance of his Agreement or any portion thereof to any other Party without the prior written approval of the State. Party also agrees to include all subcontract or subgrant agreements and a tax certification in accordance with paragraph 13 above.
16. **No Gifts or Gratuities:** Party shall not give title or possession of anything of substantial value (including property, currency, travel and/or education programs) to any officer or employee of the State during the term of this Agreement.
17. **Copies:** All written reports prepared under this Agreement will be printed using both sides of the paper.
18. **Certification Regarding Debarment:** Party certifies under pains and penalties of perjury that, as of the date that this Agreement is signed, neither Party nor Party's principals (officers, directors, owners, or partners) are presently debarred, suspended, proposed for debarment, declared ineligible or excluded from participation in federal programs or programs supported in whole or in part by federal funds.

Party further certifies under pains and penalties of perjury that, as of the date that this Agreement is signed, Party is not presently debarred, suspended, nor named on the State's debarment list at: <http://bgs.vermont.gov/purchasing/debarment>

19. **Certification Regarding Use of State Funds:** In the case that Party is an employer and this Agreement is a State Funded Grant in excess of \$1,001, Party certifies that none of these State funds will be used to interfere with or restrain the exercise of Party's employee's rights with respect to unionization.

(End of Standard Provisions)

ATTACHMENT D

OTHER GRANT AGREEMENT PROVISIONS

**CERTIFICATIONS REGARDING LOBBYING; DEBARMENT, SUSPENSION AND
OTHER RESPONSIBILITY MATTERS; AND DRUG-FREE WORKPLACE
REQUIREMENTS**

Applicants should refer to the regulations cited below to determine the certification to which they are required to attest. Applicants should also review the instructions for certification included in the regulations before completing this form. Signature of this agreement provides for compliance with certification requirements under 10 CFR Part 601 "New Restrictions on Lobbying," and 10 CFR Part 1036 "Government wide Debarment and Suspension (Nonprocurement) and Government wide Requirements for Drug-Free Workplace (Grants)." The certifications shall be treated as a material representation of fact upon which reliance will be placed when the DPS determines to award the covered transaction, grant, or other agreement.

1. LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

STATE OF VERMONT HAZARD MITIGATION GRANT PROGRAM SUBGRANT AGREEMENT

2. DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

(3) Applicable CFR's and Federal Executive Orders 12549 and 12689 prohibit non-federal entities from contracting with or making subawards under covered transactions to parties that are suspended or debarred or whose principals are suspended or debarred. Covered transactions include procurement contracts for goods or services equal to or in excess of \$25,000 and nonprocurement transactions such as grants or cooperative agreements. By signing this subgrant, the subgrantee agrees it will verify the status of potential vendors prior to any federal funds being obligated to prevent any debarred or suspended agencies or vendors from receiving federal funds. The Subrecipient can confirm the status of potential vendors by conducting a search on the SAM website (<https://www.sam.gov/portal/public/SAM/>). At this time, DPS does not require subrecipients to submit proof of verification with any reimbursement request; however, the subrecipient must maintain this information, in the form of a screen print, with other grant documentation. This documentation shall be available for review per Attachment C, paragraph 10.

3. DRUG-FREE WORKPLACE

This certification is required by the Drug-Free Workplace Act of 1988 (Pub.L. 100-690, Title V, Subtitle D) and is implemented through additions to the Debarment and Suspension regulations, published in the Federal Register on January 31, 1989, and May 25, 1990.

ALTERNATE I (GRANTEES OTHER THAN INDIVIDUALS)

(1) The grantee certifies that it will or will continue to provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's

Appendix L

workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing an ongoing drug-free awareness program to inform employees about:

- (1) The dangers of drug abuse in the workplace;
- (2) The grantee's policy of maintaining a drug-free workplace;
- (3) Any available drug counseling, rehabilitation, and employee assistance programs; and
- (4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will:

- (1) Abide by the terms of the statement; and
- (2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace not later than five calendar days after such conviction;

(e) Notifying the agency, in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted:

- (1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
- (2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a),(b),(c),(d),(e), and (f).

(2) The grantee may insert in the space provided below the site(s) for the performance of work done in connection with the specific grant:

Place of Performance: The Place of Performance is the address provided on the Standard Grant Agreement.

___ Check if there are workplaces on file that are not identified here.

ALTERNATE II (GRANTEES WHO ARE INDIVIDUALS)

STATE OF VERMONT HAZARD MITIGATION GRANT PROGRAM SUBGRANT AGREEMENT

(1) The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant.

(2) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to every grant officer or other designee, unless the Federal agency designates a central point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.

4. ORGANIZATIONAL AND FINANCIAL REQUIREMENTS

1. All subrecipients are required to establish and maintain accounting systems and financial records to accurately account for funds awarded to them. Determining allowability of costs claimed will be consistent with the requirements of the grant award and its applicable regulations.
 - a. Subrecipients have the responsibility to employ the organizational and management techniques necessary to assure proper administration and cost allocation, including accounting, budgeting, reporting, auditing and other review controls.
 - b. All subrecipients will accept responsibility for expending and accounting for funds in a manner consistent with an approved project, plan and or program as evidenced by their acceptance of a subgrant award by the DPS; Policies, procedures, reporting requirements or other special conditions established by the appropriate Federal agency, if applicable, and the DPS.
2. Subrecipients must have an adequate system of internal controls which:
 - a. Presents, classifies and retains all detailed financial records related to the subgrant award. Financial records must be retained by the Subrecipient and be available for review for a period of three (3) years after the expiration of the grant period except that records must be retained until completion or resolution of all issues arising from audit, litigation or claims started before the expiration of the three-year period, whichever is later.
 - b. Provides information for planning, control and evaluation of direct and indirect costs.
 - c. Provides cost and property control to ensure optimal use of the grant funds.
 - d. Controls funds and other resources to ensure that the expenditure of grant funds and use of any property acquired under the grant are in conformance with established guidelines and policies.
3. Notification of Organizational Changes Required:
 - a. The recipient shall provide DPS written notification within 30 days should any of the following events occur:
 - i. having new or substantially changed systems
 - ii. having new compliance personnel
 - iii. loss of license or accreditation to operate program

- iv. organizational restructuring.

5. SUPPLEMENTING NOT SUPPLANTING:

Federal funds must be used to supplement and not replace (or supplant) local or state funds which have been appropriated for the same purpose. If there is a potential presence of supplanting, the applicant or grantee will be required to supply documentation demonstrating that the reduction in non-federal resources occurred for reasons other than the receipt or expected receipt of federal funds.

6. FOLLOWING SUBRECIPIENT PROCEDURES:

The undersigned certifies that the Subrecipient organization has in place standard policies and procedures that govern the Subrecipient's payroll, purchasing, contracting and inventory control in accordance with 2 CFR 225, Appendix A, Section C 1.e. The undersigned further certifies that the Subrecipient organization will use those policies and procedures for any approved expenditure under this subgrant and for any equipment purchased with subgrant funds. The undersigned also agrees to make the policies and procedures available for examination by any authorized representatives of the State or Federal Government. This does not relieve the Subrecipient from requirements of federal financial management, requirements in:

- Circular A-133 Audits of States, Local Governments and Nonprofit Organizations,

- 2 CFR 215 (formerly A-110) Uniform Administrative Requirements for Grants and Other Agreements with Institutions of Higher Education, Hospitals and Other Nonprofit Organizations,

- 2 CFR 225 (formerly A-87) Cost Principles for State, Local and Indian Tribal Governments,

- 2 CFR 230 (formerly A-122) Cost Principles for Nonprofit Organizations,

or other applicable Circulars, CFRs and requirements in the various federal departments' grant management documentation nor does this imply that local policies and procedures supersede federal directives.

STATE OF VERMONT HAZARD MITIGATION GRANT PROGRAM SUBGRANT AGREEMENT

ATTACHMENT E

FUNDING SOURCE SPECIAL CONDITIONS

This subgrant is subject to the requirements of all federal laws, policies and bulletins. Most notably

- 2 CFR 180 OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)
- 2 CFR 215 (formerly A-110) Uniform Administrative Requirements for Grants and Other Agreements with Institutions of Higher Education, Hospitals and Other Nonprofit Organizations,
- 2 CFR 220 (formerly A-21) Cost Principles for Education Institutions,
- 2 CFR 225 (formerly A-87) Cost Principles for State, Local and Indian Tribal Governments,
- 2 CFR 230 (formerly A-122) Cost Principles for Nonprofit Organizations, and
- A-133 Audits of States, Local Governments and Nonprofit Organizations.

These referenced documents can be found at:

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=%2Findex.tpl>

This subgrant is also subject to the requirements of the State of Vermont grant and audit policies. The most pertinent bulletins and addendums are:

[Bulletin 5, Single Audit Policy For Subgrants](#)

[Addendum 5.0](#) - issued 12/5/08

[Addendum 5.0](#) - issued 4/21/2009

[Bulletin 5.5, State Grant Monitoring Policy](#)

[Bulletin 5.5 Supplement, State Grants Plan Guidelines](#)

[Addendum 5.5](#) - issued 12/5/08

The following references are for Federal Agency specific requirements which subgrants of the agency's funds must comply. Grants managers should delete those references that do not apply to the funding source for the subgrant.

This subgrant is subject to the requirements for the federal agency providing the funds. The link below will connect to the appropriate CFR:

FR 28 – Justice:

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=979af7e262cbe8d2d1f85e2c1d3b0d0c&rgn=div5&view=text&node=28:1.0.1.1.32&idno=28>

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<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=979af7e262cbe8d2d1f85e2c1d3b0d0c&rgn=div5&view=text&node=28:1.0.1.1.34&idno=28>

CFR 29 – Labor:

http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=3dbd326e38ff7bacf4d60d581f8c24ef&tpl=/ecfrbrowse/Title29/29cfr97_main_02.tpl

CFR 44 – Emergency Management Assistance:

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=1c469db093c5f86e3e7cf10c768b92d3;rgn=div5;view=text;node=44%3A1.0.1.1.13;idno=44;cc=ecfr>

CFR 49 – Transportation:

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=24f8e3f1b31d28b37764b06a0ee6a6f3&rgn=div5&view=text&node=49:1.0.1.1.12&idno=49>

Appendix M

**STATE OF VERMONT MITIGATION PROJECT POST-
COMPLETION EVALUATION FORM**

Mitigation Project Post-Completion Evaluation

Description of Project:

Town:

Local Contact Person:

Cost of Project:

Date Project Completed:

Projected Amount of Savings From Benefit-Cost Analysis (attached):

Number of Homes, Individuals Affected:

Describe How Project Conforms With State Hazard Mitigation Strategy and Objectives:

Have all Project Closeout procedures been performed?

Yes

No

If no, list outstanding issues to be resolved:

Environmental checklist:

Does project conform to all state & federal environmental regulations? Yes No

Does project have concurrence of the Agency of Natural Resources? Yes No

Storm water permits requirements met, if needed? Yes No

Hydrology/hydraulics study performed, if needed? Yes No

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VT Fish & Wildlife concurrence: any species adversely affected? ___ Yes ___ No

State archeological/SHPO concurrence: any historic issues? ___ Yes ___ No

Project/ cost/ environmental issues needing resolution:

Evaluation Completed By:

Name:

Agency:

Date:

Attachments: (Benefit-Cost analysis, digital photos of project, copies of project invoices, environmental permits, affidavit/ statement of town manager)

Appendix N

STREAM ALTERATION GENERAL PERMIT

The 2013 updated State of Vermont Hazard Mitigation Plan (HMP) incorporates the most current DEC adopted version of the Stream Alteration General Permit posted by the State at: http://www.vtwaterquality.org/rivers/htm/rv_management.htm

Vermont Bridge and Culvert Regulatory Standards and Design Requirements

This Annex to the State of Vermont HMP provides a roadmap of Vermont’s regulatory standards for new and replacement bridges and culverts (i.e., stream crossings) and begins with the requirements set forth in statute: 10 V.S.A. §1023(a). A State authorization shall be granted for a stream alteration, subject to such conditions determined to be warranted by the Secretary of the Agency of Natural Resources, if it appears that the change:

1. Will not adversely affect the public safety by increasing flood or fluvial erosion hazards;
2. Will not significantly damage fish life or wildlife;
3. Will not significantly damage the rights of riparian owners; and
4. In the case of any waters designated as Outstanding Resource Waters under 10 V.S.A. §1424a, will not adversely affect the values sought to be protected by the designation.

Standards promulgated from these statutory requirements, including those for bridge and culvert projects, shall protect both the built and natural environments, as well as public safety. Vermont law also gives the Secretary the authority to adopt Stream Alteration Rules to implement the statutory requirements. The Rules (adopted in 2013) establish performance standards that must be met by all regulated stream alterations except those called for in emergency situations.

The Vermont stream alteration performance standards are clearly stated as requirements for Individual Permits and for all categories of General Permit authorizations. All new and replacement stream crossings must be authorized with an Individual Permit or as a “reported activity” under the General Permit. Performance standards (specified by Rule) shall be met by stream crossings using design requirements specified in ANR permits.

ANR River Engineers, VTrans Bridge and Hydraulics Engineers, and ANR Fisheries Biologists conduct stream crossing reviews and coordinate design recommendations for state and municipal structures based on procedures adopted and published by the agencies, including the:

1. ANR Standard River Management Practices
2. VTrans Hydraulics Manual
3. ANR Guidelines for the Design of Stream/Road Crossings for the Passage of Aquatic Organisms in VT

The ANR River Management Program, as the Secretary’s regulatory designee, pursuant to 10 V.S.A. Chapter 41, codifies the design recommendations in an individual permit or general permit authorization as meeting the State Stream Alteration Rules.

FEMA is authorized to expend funds under the Stafford Act where the repair or replacement of a facility conforms with applicable codes, standards and specifications. FEMA has assisted the State of Vermont, as part of a Hazard Mitigation Planning Grant made in August 2012, to develop standard river management practices. This work has resulted in updates to the ANR Stream Alteration General Permit, which is hereby annexed to the 2013 State of Vermont HMP. The GP specifies the engineering design requirements and measurable performance standards required for new and replacement stream crossings in Vermont. These requirements are consistent with federal environmental and engineering design standards for stream crossings and are reasonable, replacable, and uniformly applied.

The State may also recommend structure types in its report to a municipality on the basis of constructability and as the least-cost means of complying with the Federal Section 404 and State Stream Alteration standards. A Structure type is a means of fulfilling the standard and does not constitute a standard itself.

Vermont Bridge and Culvert Regulatory Standards and Design Requirements

Town Road and Bridge Standards (From the Culverts and Bridges Section - State recommended, 2013)

“Bridges and culverts must be designed in accordance with the VTrans Hydraulics Manual and, in the perennial streams, conform to the statewide Stream Alteration Standards.”

Statewide Stream Alteration Standards (applicable to all stream crossings on perennial streams)

Performance Standards set within the *State Stream Alteration Rules* shall be met when the State issues individual stream alteration permits and general permit authorizations.

- **Equilibrium** – a structure shall maintain channel dimensions, general pattern, and slope such that no unnatural aggrading (raising) or degrading (lowering) of the channel bed elevation occurs along the longitudinal stream bed profile as a result of the structure.
- **Connectivity** – a structure shall not alter local channel hydraulics, streambank stability, or floodplain connectivity resulting in a discontinuity within the horizontal streambank alignment or vertical profile of the streambed. Stream crossings shall not create a physical obstruction or velocity barrier to the movement of aquatic organisms.

Stream Alteration Rules also establish that individual permit and general permit authorizations shall include design requirements or conditions, set forth in the general permit or by ANR procedure, such that the activity (e.g., stream crossing) will meet the performance standards.

Design Requirements to achieve Performance Standards for new and replacement bridges and culverts

STREAM ALTERATION GENERAL PERMIT

Stream Alteration General Permit – all stream crossings authorized under the GP will be done so as reported activities and shall meet the Performance Standards by meeting design requirements, set forth in the GP, for:

Structure Specification	Basis of Design	Design Guidance
Span Length	Based on a multiple of channel width as indicated by site-specific fluvial processes and geomorphic conditions	<i>Standard River Management Practices</i>
Opening Height	Based on a multiple of channel mean depth as indicated by watershed size and design flow (hydraulics) requirements	<i>Standard River Management Practices and State Hydraulics Manual</i>
Substrate depth, composition, and bed forms (for closed bottom structures)	Structure embeddedness based on channel slope and immobile particle sizes; sediment sizes and bed forms to achieve flow depths, velocities, and turbulence based on stream simulation	<i>Standard River Management Practices and AOP Guidelines</i>
Alignment	Based on the vertical channel profile to achieve a smooth longitudinal transition at the structure inlet and outlet	<i>Standard River Management Practices and AOP Guidelines</i>

Individual Stream Alteration Permits –stream crossings shall meet design requirements set forth in an individual permit for a structure span length, opening height, substrates, embeddedness, and alignment to achieve the Performance Standards in the *Stream Alteration Rules*.

Appendix O

STATE OF VERMONT HAZARD MITIGATION PLAN

ADOPTION LETTER



State of Vermont
Agency of Administration
Office of the Secretary
Pavilion Office Building
109 State Street
Montpelier, VT 05609-0201
www.aoa.vermont.gov

[phone] 802-828-3322
[fax] 802-828-3320

Jeb Spaulding, Secretary

November 15, 2013

Mr. Paul Ford, Acting Regional Director
Department of Homeland Security/ FEMA Region 1
99 High Street, Sixth Floor
Boston, MA 02110-2132

Dear Mr. Ford:

I am pleased to submit the newly updated State Hazard Mitigation Plan (HMP) on behalf of the State of Vermont. This HMP has been developed in accordance with 44 Code of Federal Regulations (CFR) Section 13.11 (c) and 44 CFR Section 13.11 (d) as a condition of receiving Stafford Act assistance. Director Joe Flynn of the Vermont Division of Emergency Management & Homeland Security (DEMHS) and the partner agencies of the State Mitigation Committee have endorsed the HMP submitted to FEMA. This letter constitutes formal adoption of the Standard HMP by the State of Vermont. We understand that given formal approval of the State Plan by FEMA, the State of Vermont will be considered eligible for the 15% level of Hazard Mitigation Grant Program (HMGP) funding in the aftermath of a federally declared disaster. With State adoption of our Mitigation Plan, it is also our understanding that Vermont would be eligible for grant funds through the Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SRL) grant programs.

The State of Vermont will strictly comply with all applicable Federal laws, regulations and statutes regarding hazard mitigation grant funding requirements, as outlined in 44 CFR § 201.4 (c) 7 and § 201.5, in compliance with § 13.11 (c). The State will also comply with all provisions of § 201.4 (c) 7 in accordance with all applicable Federal laws, statutes and regulations in effect with respect to periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). The State will also amend the Hazard Mitigation Plan whenever necessary to reflect changes in State and Federal statutes as required in accordance with 44 CFR § 13.11 (d).

The State of Vermont HMP has been approved for release by the office of Secretary of Administration, based upon the endorsement of the Vermont Division of Emergency Management & Homeland Security director and member agencies of the State Mitigation Committee. As the Governor's Authorized Representative (GAR), I am authorized to adopt the plan on behalf of the State of Vermont. With my signature below, I am approving the State Hazard Mitigation Plan for purposes of this plan's adoption.

Sincerely,

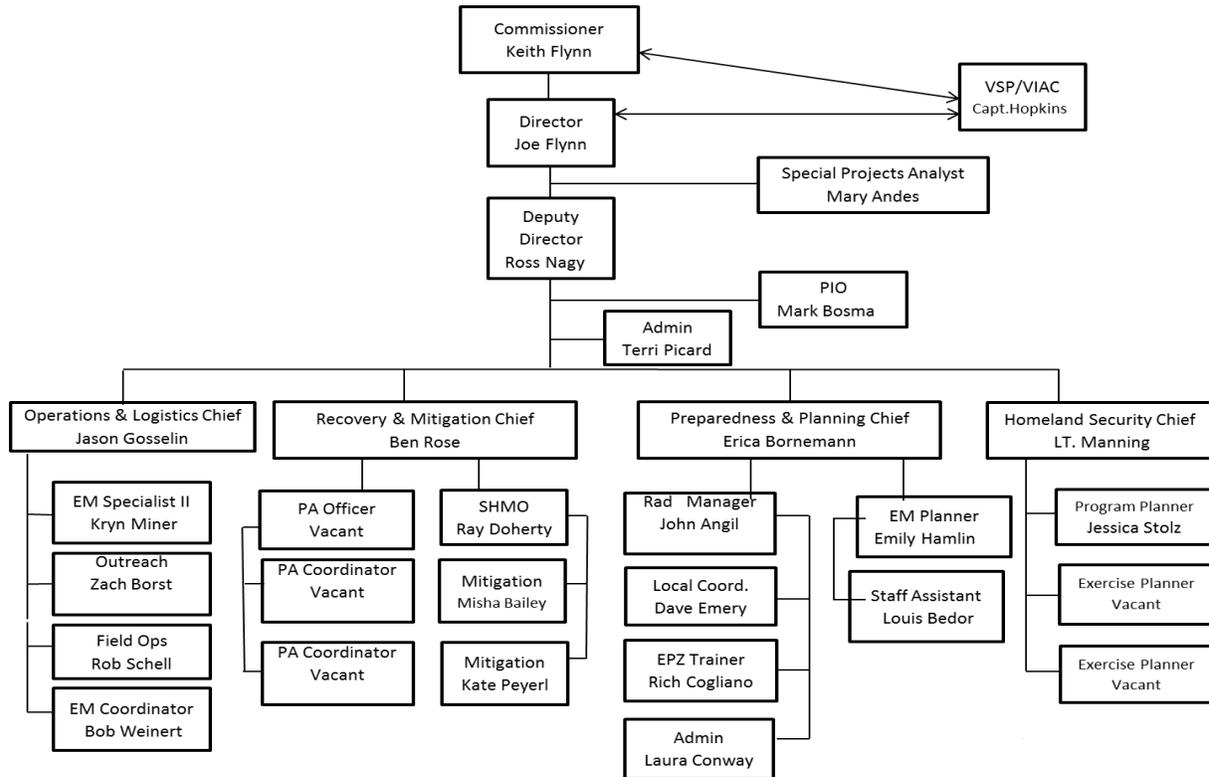
A handwritten signature in blue ink that reads "Jeb".

Jeb Spaulding, Secretary of Administration
Vermont Agency of Administration



Appendix P

DIVISION OF EMERGENCY MANAGEMENT AND HOMELAND SECURITY ORGANIZATION CHART

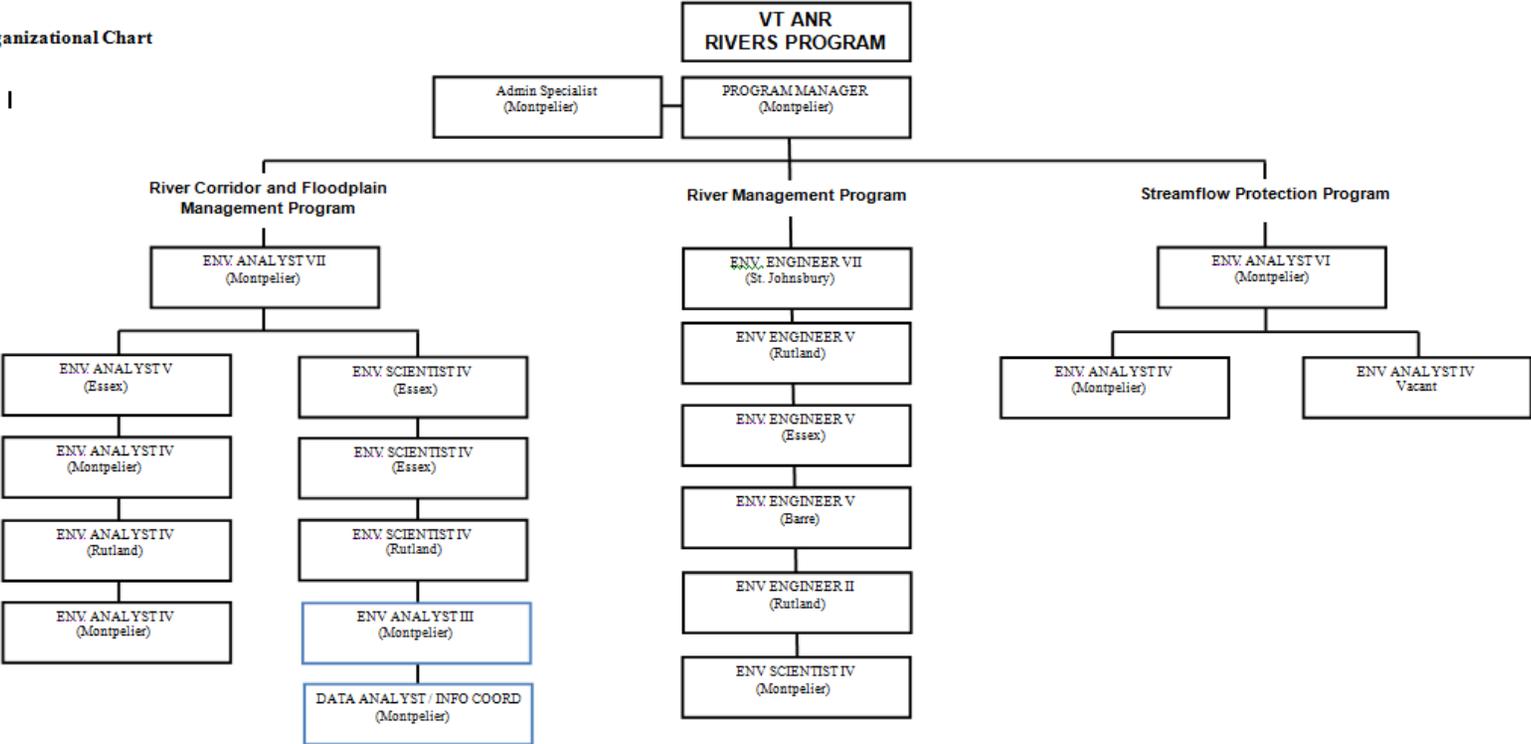


Appendix Q

AGENCY OF NATURAL RESOURCES

RIVERS PROGRAM ORGANIZATION CHART

Organizational Chart



Appendix R

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
1193 NORTH AVENUE	Buildings & General Services	\$ 5,929,993	1193 NORTH AVENUE	BURLINGTON	CHITTENDEN	VT	05401
HEALTH LAB	Buildings & General Services	\$ 6,231,894	195 COLCHESTER AVENUE	BURLINGTON	CHITTENDEN	VT	05401
COSTELLO COURT HOUSE	Buildings & General Services	\$ 26,544,054	32 CHERRY STREET	BURLINGTON	CHITTENDEN	VT	05401
ZAMPIERI OFFICE BUILDING	Buildings & General Services	\$ 30,338,704	108 CHERRY STREET	BURLINGTON	CHITTENDEN	VT	05401
50 CHERRY STREET (FORMER FORMAC)	Buildings & General Services	\$ 3,571,043	50 CHERRY STREET	BURLINGTON	CHITTENDEN	VT	05401
WOODSIDE JUVENILE FACILITY	Buildings & General Services	\$ 3,779,283	26 WOODSIDE DRIVE EAST	ESSEX TOWN	CHITTENDEN	VT	05451
GYM	Buildings & General Services	\$ 567,968	26 WOODSIDE DRIVE EAST	ESSEX TOWN	CHITTENDEN	VT	05451
BUILDING 617 (FORMER IBM BLDG)	Buildings & General Services	\$ 5,314,523	30 ALLEN MARTIN DRIVE	ESSEX JUNCTION	CHITTENDEN	VT	05452
MAHADY COURTHOUSE	Buildings & General Services	\$ 8,828,900	7 MAHADY COURT STREET	MIDDLEBURY	ADDISON	VT	05753
CHITTENDEN REG. CORRECTIONAL FAC	Buildings & General Services	\$ 14,098,996	7 FARRELL STREET	S. BURLINGTON	CHITTENDEN	VT	05855
LIFT STATION	Buildings & General Services	\$ 267,173	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF CORRECTIONS	Buildings & General Services	\$ 18,761,604	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF WOOD SHOP	Buildings & General Services	\$ 786,195	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF HOUSE	Buildings & General Services	\$ 252,914	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF BARN	Buildings & General Services	\$ 133,130	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF SEWAGE BUILDING	Buildings & General Services	\$ 113,264	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
NWSCF FUTURES STORAGE SHED	Buildings & General Services	\$ 120,759	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF PRINT SHOP	Buildings & General Services	\$ 710,279	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF 50 BED SATELITE UNIT	Buildings & General Services	\$ 4,279,711	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF AUTO SHOP	Buildings & General Services	\$ 319,044	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF PROGRAM BUILDING	Buildings & General Services	\$ 585,313	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF GENERATOR BUILDING	Buildings & General Services	\$ 291,986	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
NWSCF GREEN HOUSES (2)	Buildings & General Services	\$ 128,648	3649 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05488
DISTRICT COURTHOUSE	Buildings & General Services	\$ 6,067,371	36 LAKE STREET	ST. ALBANS	FRANKLIN	VT	05478
STATE OFFICE BUILDING	Buildings & General Services	\$ 7,324,897	20 HOUGHTON STREET	ST. ALBANS	FRANKLIN	VT	05478
RECYCLING BUILDING	Buildings & General Services	\$ 14,832	20 HOUGHTON STREET	ST. ALBANS TOWN	FRANKLIN	VT	05488
01 - ADMINISTRATION BUILDING	Buildings & General Services	\$ 1,671,875	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
02 - ACADEMIC VOCATIONAL	Buildings & General Services	\$ 3,025,585	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
03 - ASSEMBLY HALL (CHAPEL)	Buildings & General Services	\$ 1,941,591	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
04 - GYMNASIUM	Buildings & General Services	\$ 2,295,875	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
05 - FOOD SERVICE BUILDING	Buildings & General Services	\$ 2,130,572	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
06 - MAINTENANCE/GARAGE	Buildings & General Services	\$ 331,800	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
07 - LOGISTICS/WAREHOUSE	Buildings & General Services	\$ 368,302	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
08 - MEDICAL/DENTAL (INFIRMARY)	Buildings & General Services	\$ 616,017	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
ARSENAL (VACANT)	Buildings & General Services	\$ 1,722,281	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
10 - URBAN FORESTRY	Buildings & General Services	\$ 527,772	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
11 - AUTO MECHANICS (NEW)	Buildings & General Services	\$ 1,108,998	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
13 - BATHHOUSE/FILTERHOUSE	Buildings & General Services	\$ 226,615	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
34 - VOCATIONAL STORAGE	Buildings & General Services	\$ 208,147	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
15 - MAINTENANCE/STORAGE	Buildings & General Services	\$ 81,545	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
FAIRBANKS (VACANT)	Buildings & General Services	\$ 951,835	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
17 - WOMEN'S DORMITORY (GRAHAM)	Buildings & General Services	\$ 1,584,796	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
18 - WOMEN'S DORMITORY (INGALLS)	Buildings & General Services	\$ 1,751,078	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
19 - WOMEN'S DORMITORY (MCDONOUGH)	Buildings & General Services	\$ 1,363,545	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
20 - MEN'S DORMITORY (PHELPS)	Buildings & General Services	\$ 1,470,392	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
21 - MEN'S DORMITORY (PROCTOR)	Buildings & General Services	\$ 1,817,372	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
22 - MEN'S DORMITORY (TURRELL)	Buildings & General Services	\$ 1,177,078	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
23 - MEN'S DORMITORY	Buildings & General Services	\$ 1,003,956	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
24 - MEN'S DORMITORY	Buildings & General Services	\$ 1,588,213	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
25 - WOMEN'S HONOR DORMITORY	Buildings & General Services	\$ 1,235,489	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
32 - VOCATIONAL EDUCATION	Buildings & General Services	\$ 868,738	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
33 - STORAGE	Buildings & General Services	\$ 254,017	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
48 - RECREATION STORAGE	Buildings & General Services	\$ 78,117	100 MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
40 - VACANT (OLD CARRIAGE BLDG)	Buildings & General Services	\$ 12,338	WEEKS SCHOOL - MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
45 - STORAGE	Buildings & General Services	\$ 6,172	WEEKS SCHOOL - MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
44 - STORAGE	Buildings & General Services	\$ 6,654	WEEKS SCHOOL - MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
39 - FLAMMABLE STORAGE	Buildings & General Services	\$ 12,338	WEEKS SCHOOL - MACDONOUGH DRIVE	VERGENNES	ADDISON	VT	05491
STORAGE BUILDING (POLE SHED)	Buildings & General Services	\$ 66,480	565 ST. GEORGE AVENUE	WILLISTON	CHITTENDEN	VT	05495
STATE OFFICE BUILDING	Buildings & General Services	\$ 2,763,718	565 ST. GEORGE AVENUE	WILLISTON	CHITTENDEN	VT	05495
5 GREEN MOUNTAIN DRIVE	Employment & Training	\$ 8,556,378	5 GREEN MOUNTAIN DRIVE	MONTPELIER	WASHINGTON	VT	05633
2 GOVERNOR AIKEN AVE	Buildings & General Services	\$ 1,797,179	2 GOVERNOR AIKEN AVE	MONTPELIER	WASHINGTON	VT	05633
4 GOVERNOR AIKEN AVE	Buildings & General Services	\$ 966,597	4 GOVERNOR AIKEN AVE	MONTPELIER	WASHINGTON	VT	05633
1 BALDWIN STREET	Buildings & General Services	\$ 1,310,561	1 BALDWIN ST	MONTPELIER	WASHINGTON	VT	05633
6 BALDWIN STREET	Buildings & General Services	\$ 5,168,807	6 BALDWIN ST	MONTPELIER	WASHINGTON	VT	05633
9 BALDWIN STREET	Buildings & General Services	\$ 560,891	9 BALDWIN ST	MONTPELIER	WASHINGTON	VT	05633
10 BALDWIN STREET	Buildings & General Services	\$ 926,498	10 BALDWIN ST	MONTPELIER	WASHINGTON	VT	05633
12 BALDWIN STREET	Buildings & General Services	\$ 583,137	12 BALDWIN ST	MONTPELIER	WASHINGTON	VT	05633
13 BALDWIN STREET	Buildings & General Services	\$ 630,167	13 BALDWIN ST	MONTPELIER	WASHINGTON	VT	05633
14-16 BALDWIN STREET	Buildings & General Services	\$ 1,174,163	14-16 BALDWIN ST	MONTPELIER	WASHINGTON	VT	05633
112 STATE STREET	Buildings & General Services	\$ 8,475,890	112 STATE ST	MONTPELIER	WASHINGTON	VT	05633
26 TERRACE STREET	Buildings & General Services	\$ 2,033,404	26 TERRACE ST	MONTPELIER	WASHINGTON	VT	05633
10 TAYLOR (SHOP & STORAGE)	Buildings & General Services	\$ 462,354	10 TAYLOR ST	MONTPELIER	WASHINGTON	VT	05633
109 STATE STREET-INCLUDING CONNECTOR	Buildings & General Services	\$ 34,387,191	109 STATE ST	MONTPELIER	WASHINGTON	VT	05633
110 STATE STREET	Buildings & General Services	\$ 2,535,921	110 STATE ST	MONTPELIER	WASHINGTON	VT	05633
111 STATE STREET	Buildings & General Services	\$ 15,616,864	111 STATE STREET	MONTPELIER	WASHINGTON	VT	05633

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
115 STATE STREET-ANNEX	Buildings & General Services	\$ 45,031,588	115 STATE STREET	MONTPELIER	WASHINGTON	VT	05633
116 STATE STREET	Buildings & General Services	\$ 4,395,055	116 STATE ST	MONTPELIER	WASHINGTON	VT	05633
120 STATE STREET	Buildings & General Services	\$ 19,006,870	120 STATE ST	MONTPELIER	WASHINGTON	VT	05633
122 STATE STREET (BOILER PLANT)	Buildings & General Services	\$ 1,871,065	122 STATE ST	MONTPELIER	WASHINGTON	VT	05633
126 STATE STREET	Buildings & General Services	\$ 1,172,751	126 STATE ST	MONTPELIER	WASHINGTON	VT	05633
128 STATE STREET	Buildings & General Services	\$ 1,839,403	128 STATE ST	MONTPELIER	WASHINGTON	VT	05633
132 STATE STREET	Buildings & General Services	\$ 817,788	132 STATE ST	MONTPELIER	WASHINGTON	VT	05633
133 STATE STREET	Buildings & General Services	\$ 39,348,209	133 STATE ST	MONTPELIER	WASHINGTON	VT	05633
134 STATE STREET	Buildings & General Services	\$ 669,414	134 STATE ST	MONTPELIER	WASHINGTON	VT	05633
136 STATE STREET	Buildings & General Services	\$ 1,080,123	136 STATE ST	MONTPELIER	WASHINGTON	VT	05633
13 GREEN MOUNTAIN DRIVE	Buildings & General Services	\$ 2,923,738	13 GREEN MOUNTAIN DRIVE	MONTPELIER	WASHINGTON	VT	05633
15 GREEN MOUNTAIN DRIVE	Buildings & General Services	\$ 1,253,710	15 GREEN MOUNTAIN DRIVE	MONTPELIER	WASHINGTON	VT	05633
118 STATE STREET	Buildings & General Services	\$ 851,214	118 STATE ST	MONTPELIER	WASHINGTON	VT	05633
144 STATE STREET	Buildings & General Services	\$ 857,740	144 STATE ST	MONTPELIER	WASHINGTON	VT	05633
132 STATE STREET (SHOP & STOR)	Buildings & General Services	\$ 76,084	132 R STATE STREET	MONTPELIER	WASHINGTON	VT	05633
DISTRICT COURT & OFFICEBUILDING	Buildings & General Services	\$ 10,116,648	255 NORTH MAIN STREET	BARRE	WASHINGTON	VT	05641
MCFARLAND HOUSE	Buildings & General Services	\$ 12,706,011	5 PERRY ROAD	BARRE	WASHINGTON	VT	05641
REGIONAL LIBRARY	Buildings & General Services	\$ 1,480,194	578 PAYNE TURNPIKE	BERLIN	WASHINGTON	VT	05602
CENTRAL SERVICES	Buildings & General Services	\$ 5,968,265	1078 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	05602

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
TROOP HEADQUARTERS	Buildings & General Services	\$ 730,932	1078 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	05602
GARAGE	Buildings & General Services	\$ 56,986	1078 US RT. 2	MIDDLESEX	WASHINGTON	VT	05602
DAY CARE	Buildings & General Services	\$ 558,462	140 THREE-MILE BRIDGE ROAD	MIDDLESEX	WASHINGTON	VT	05602
VETERAN'S CEMETERY CHAPEL	Military	\$ 529,249	FURNACE ROAD	RANDOLPH	ORANGE	VT	05060
RADIO & COMM. SHOP	Buildings & General Services	\$ 393,897	400 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	05602
RADIO & COMM. SHOP	Buildings & General Services	\$ 99,877	409 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	05602
TROOP HEADQUARTERS	Buildings & General Services	\$ 457,981	1594 WAITS RIVER ROAD	BRADFORD	ORANGE	VT	05033
STATE OFFICE BUILDING	Buildings & General Services	\$ 18,901,868	100 MAIN STREET	NEWPORT	ORLEANS	VT	05855
DIST. COURT & OFFICE BLDG	Buildings & General Services	\$ 6,065,416	217 MAIN STREET	NEWPORT	ORLEANS	VT	05855
NSCF (A-1 ADMIN)	Buildings & General Services	\$ 1,618,585	2559 GLEN ROAD	NEWPORT	ORLEANS	VT	05855
NSCF (A-2 ADMIN/SEG/DINING)	Buildings & General Services	\$ 7,781,604	2559 GLEN ROAD	NEWPORT	ORLEANS	VT	05855
NSCF (B-BUILDING-GYM)	Buildings & General Services	\$ 4,934,290	2559 GLEN ROAD	NEWPORT	ORLEANS	VT	05855
NSCF (LIVING UNIT C)	Buildings & General Services	\$ 6,026,798	2559 GLEN ROAD	NEWPORT	ORLEANS	VT	05855
NSCF (LIVING UNIT D)	Buildings & General Services	\$ 6,026,798	2559 GLEN ROAD	NEWPORT	ORLEANS	VT	05855
NSCF VCI BUILDING 1	Buildings & General Services	\$ 2,889,784	2559 GLEN ROAD	NEWPORT	ORLEANS	VT	05855
NSCF (LIVING UNIT E)	Buildings & General Services	\$ 5,437,491	2559 GLEN ROAD	NEWPORT	ORLEANS	VT	05855
NSCF VCI 2	Buildings & General Services	\$ 2,644,002	2559 GLEN ROAD	NEWPORT	ORLEANS	VT	05855
NSCF GRINDER BUILDING	Buildings & General Services	\$ 71,944	2559 GLEN ROAD	NEWPORT	ORLEANS	VT	05855
NSCF (GARAGE)	Buildings & General Services	\$ 213,148	2559 GLEN ROAD	NEWPORT	ORLEANS	VT	05855
CALEDONIA COURTHOUSE	Buildings & General Services	\$ 12,905,425	27 MAIN STREET	ST. JOHNSBURY	CALEDONIA	VT	05819

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
REGIONAL LIBRARY	Buildings & General Services	\$ 910,658	23 TILTON ROAD	ST. JOHNSBURY	CALEDONIA	VT	05819
NESCF MAIN BUILDING	Buildings & General Services	\$ 13,353,688	1207 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
NESCF_PROGRAM BUILDING	Buildings & General Services	\$ 442,352	1207 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
NESCF WOOD SHED 1	Buildings & General Services	\$ 530	1270 US RT. 5	ST. JOHNSBURY	CALEDONIA	VT	05819
NESCF STORAGE BUILDING	Buildings & General Services	\$ 62,793	1270 US RT. 5	ST. JOHNSBURY	CALEDONIA	VT	05819
NESCF PUMP STATION BLDG	Buildings & General Services	\$ 11,125	1270 US RT. 5	ST. JOHNSBURY	CALEDONIA	VT	05819
NESCF WOOD SHED 2	Buildings & General Services	\$ 11,125	1270 US RT. 5	ST. JOHNSBURY	CALEDONIA	VT	05819
NESCF WOOD SHED 3	Buildings & General Services	\$ 11,125	1270 US RT. 5	ST. JOHNSBURY	CALEDONIA	VT	05819
NESCF WOOD SHED 4	Buildings & General Services	\$ 11,125	1270 US RT. 5	ST. JOHNSBURY	CALEDONIA	VT	05819
NESCF GREENHOUSE	Buildings & General Services	\$ 8,651	1270 US RT. 5	ST. JOHNSBURY	CALEDONIA	VT	05819
CCWC WOOD SHED 3	Buildings & General Services	\$ 546	1266 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
CCWC MAIN ADMIN. BLDG	Buildings & General Services	\$ 1,544,846	1266 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
CCWC WOOD SHED 2	Buildings & General Services	\$ 546	1266 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
CCWC DORMITORY	Buildings & General Services	\$ 2,379,675	1266 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
CCWC MAINTENANCE	Buildings & General Services	\$ 350,177	1266 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
CCWC WOOD SHED 1	Buildings & General Services	\$ 546	1266 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
OSGOOD BUILDING	Buildings & General Services	\$ 5,624,777	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
1,2 & 3 NORTH	Buildings & General Services	\$ 2,926,208	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
NORTH CONNECTOR	Buildings & General Services	\$ 1,159,843	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
4 NORTH	Buildings & General Services	\$ 1,293,851	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
5 NORTH	Buildings & General Services	\$ 1,309,806	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
6 & 7 NORTH	Buildings & General Services	\$ 1,885,645	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
8 & 9 NORTH BUILDING	Buildings & General Services	\$ 1,618,596	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
10 NORTH - OFFICES	Buildings & General Services	\$ 2,141,428	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
1,2,3 SOUTH	Buildings & General Services	\$ 3,490,186	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
SOUTH CORRIDOR	Buildings & General Services	\$ 979,739	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
5 SOUTH	Buildings & General Services	\$ 1,355,303	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
6 & 7 SOUTH	Buildings & General Services	\$ 1,508,745	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
8 & 9 SOUTH	Buildings & General Services	\$ 1,639,910	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
10 SOUTH - STORAGE	Buildings & General Services	\$ 2,743,456	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
DALE BUILDING	Buildings & General Services	\$ 7,742,444	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
"A" BUILDING	Buildings & General Services	\$ 3,832,860	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
WEEKS BUILDING	Buildings & General Services	\$ 5,478,444	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
LADD HALL	Buildings & General Services	\$ 3,524,941	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
STANLEY HALL	Buildings & General Services	\$ 4,207,579	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
WASSON HALL - CCV	Buildings & General Services	\$ 1,772,408	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
HANKS BUILDING	Buildings & General Services	\$ 907,118	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
CENTER BUILDING	Buildings & General Services	\$ 2,053,255	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
WEST OFFICE (CENTER CORE)	Buildings & General Services	\$ 8,943,111	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
SEWING BUILDING	Buildings & General Services	\$ 972,443	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
43.5 RANDALL (BARN)	Buildings & General Services	\$ 105,254	43 S RANDALL	WATERBURY	WASHINGTON	VT	05676
43 RANDALL	Buildings & General Services	\$ 543,904	43 RANDALL ST	WATERBURY	WASHINGTON	VT	05676
BOILER HOUSE	Buildings & General Services	\$ 3,083,606	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
5 PARK ROW	Buildings & General Services	\$ 161,099	5 PARK ROW	WATERBURY	WASHINGTON	VT	05676
123 SOUTH MAIN STREET	Buildings & General Services	\$ 564,563	123 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
121 SOUTH MAIN STREET	Buildings & General Services	\$ 532,684	121 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
"B" BUILDING	Buildings & General Services	\$ 4,318,677	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
DPS BUILDING	Buildings & General Services	\$ 6,114,388	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
OLD LAUNDRY	Buildings & General Services	\$ 1,215,245	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
RECYCLING (OLD CARPENTER SHOP)	Buildings & General Services	\$ 859,184	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
DISPOSAL PLANT - STORAGE	Buildings & General Services	\$ 61,099	103 S. MAIN STREET	WATERBURY	WASHINGTON	VT	05676
GARAGE - NEAR LUMBER STORAGE	Buildings & General Services	\$ 66,884	103 S. MAIN STREET	WATERBURY	WASHINGTON	VT	05676
OLD GREEN HOUSE - EQUIPMENT STORAGE	Buildings & General Services	\$ 56,239	103 S. MAIN STREET	WATERBURY	WASHINGTON	VT	05676
LUMBER STORAGE	Buildings & General Services	\$ 80,137	103 S. MAIN STREET	WATERBURY	WASHINGTON	VT	05676
REPAIR & MAINTENANCE	Buildings & General Services	\$ 849,235	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
OLD STOREHOUSE (B BLDG ANNEX)	Buildings & General Services	\$ 1,032,981	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
LOGUE COTTAGE	Buildings & General Services	\$ 234,664	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
AG./ENV LAB	Buildings & General Services	\$ 4,010,934	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
4 SOUTH	Buildings & General Services	\$ 825,953	103 S MAIN ST	WATERBURY	WASHINGTON	VT	05676
DPS NEW FORENSICS LAB	Buildings & General Services	\$ 14,071,189	103 S MAIN STREET	WATERBURY	WASHINGTON	VT	05676
GARAGE BEHIND 123 SO. MAIN ST	Buildings & General Services	\$ 16,918	103 S. MAIN STREET	WATERBURY	WASHINGTON	VT	05676
SEWAGE PUMP STATION	Buildings & General Services	\$ 12,084	103 S. MAIN STREET	WATERBURY	WASHINGTON	VT	05676
GARAGE AT LOGUE COTTAGE	Buildings & General Services	\$ 10,876	103 S. MAIN STREET	WATERBURY	WASHINGTON	VT	05676
252 MAIN STREET (KENGAR)	Buildings & General Services	\$ 1,061,024	252 MAIN STREET	HYDE PARK	LAMOILLE	VT	05655
RESIDENCE	Buildings & General Services	\$ 261,223	6102 VT RT 100	DUXBURY	WASHINGTON	VT	05676
DAIRY FARM	Buildings & General Services	\$ 177,090	6102 VT RT 100	DUXBURY	WASHINGTON	VT	05676
POLE SHED	Buildings & General Services	\$ 58,741	6102 VT RT. 100	DUXBURY	WASHINGTON	VT	05676
FUTURES SHED	Buildings & General Services	\$ 19,817	6102 VT RT. 100	DUXBURY	WASHINGTON	VT	05676
GARAGE	Buildings & General Services	\$ 117,405	6102 VT RT 100	DUXBURY	WASHINGTON	VT	05676
ROOT CELLAR	Buildings & General Services	\$ 126,463	6102 VT RT 100	DUXBURY	WASHINGTON	VT	05676
MACHINE SHOP	Buildings & General Services	\$ 18,126	6102 VT RT 100	DUXBURY	WASHINGTON	VT	05676
NEW KITCHEN	Buildings & General Services	\$ 107,800	HART ROAD	DUXBURY	WASHINGTON	VT	05676
OLD KITCHEN	Buildings & General Services	\$ 69,856	HART ROAD	DUXBURY	WASHINGTON	VT	05676
MAINTENANCE SHED	Buildings & General Services	\$ 6,041	HART ROAD	DUXBURY	WASHINGTON	VT	05676
RECREATION HALL	Buildings & General Services	\$ 128,552	HART ROAD	DUXBURY	WASHINGTON	VT	05676
MEN'S DORM	Buildings & General Services	\$ 75,703	HART ROAD	DUXBURY	WASHINGTON	VT	05676
WOMEN'S DORM	Buildings & General Services	\$ 75,703	HART ROAD	DUXBURY	WASHINGTON	VT	05676
DISTRICT COURT & OFFICE BUILDING	Buildings & General Services	\$ 13,057,499	1 VETERANS MEMORIAL DRIVE	BENNINGTON	BENNINGTON	VT	05201

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
FECTEAU MODULAR UNITS	Buildings & General Services	\$ 949,891	200 VETERANS MEMORIAL DRIVE	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON DOWNTOWN OFFICE BUILDING	Buildings & General Services	\$ 4,496,652	324 MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
TROOP HEADQUARTERS	Buildings & General Services	\$ 2,054,105	2011 RT 107	ROYALTON	WINDSOR	VT	05032
GARAGE BUILDING	Buildings & General Services	\$ 192,496	2011 RT 107	ROYALTON	WINDSOR	VT	05032
STATE OFFICE BUILDING	Buildings & General Services	\$ 3,948,961	232 MAIN STREET	BRATTLEBORO	WINDHAM	VT	05301
TROOP HEADQUARTERS	Buildings & General Services	\$ 607,521	464 MARLBORO ROAD/ROUTE 9	WEST BRATTLEBORO	WINDHAM	VT	05301
DISTRICT COURT	Buildings & General Services	\$ 5,084,924	30 PUTNEY ROAD	BRATTLEBORO	WINDHAM	VT	05301
DOCTORS HOUSE	Buildings & General Services	\$ 390,251	197 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
EAST COTTAGE	Buildings & General Services	\$ 1,554,096	317 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
FIREHOUSE	Buildings & General Services	\$ 827,896	92 DORFNER ROAD	PITTSFORD	RUTLAND	VT	05763
SCENARIO BUILDING (NEXT TO BGS)	Buildings & General Services	\$ 262,601	438 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
MAIN BUILDING	Buildings & General Services	\$ 6,563,949	317 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
GREEN STORAGE BUILDING	Buildings & General Services	\$ 84,779	347 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
TRAINING BUILDING & GYM	Buildings & General Services	\$ 2,046,399	317 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
WEST COTTAGE	Buildings & General Services	\$ 1,434,991	317 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
MAINTENANCE BUILDING	Buildings & General Services	\$ 323,189	405 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
SMOKE & BURN BUILDING	Buildings & General Services	\$ 125,069	59 DAVISON DRIVE	PITTSFORD	RUTLAND	VT	05763
COLD STORAGE (POLE BARN)	Buildings & General Services	\$ 253,549	62 DORFNER ROAD	PITTSFORD	RUTLAND	VT	05763
OUTDOOR FIRING RANGE	Buildings & General Services	\$ 1,006,767	47 DORFNER ROAD	PITTSFORD	RUTLAND	VT	05763

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
WAREHOUSE (BEHIND FIREHOUSE)	Buildings & General Services	\$ 176,862	82 DORFNER ROAD	PITTSFORD	RUTLAND	VT	05763
RED BARN	Buildings & General Services	\$ 23,201	442 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
RED STORAGE BUILDING	Buildings & General Services	\$ 24,676	448 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
OLD GENERATOR BUILDING	Buildings & General Services	\$ 4,735	317 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
ADMINISTRATION BUILDING	Buildings & General Services	\$ 1,719,188	93 DAVISON DRIVE	PITTSFORD	RUTLAND	VT	05763
DOG KENNEL	Buildings & General Services	\$ 61,817	361 ACADEMY ROAD	PITTSFORD	RUTLAND	VT	05763
MOBIL FIRING RANGE	Buildings & General Services	\$ 513,030	32 DORFNER ROAD	PITTSFORD	RUTLAND	VT	05763
TROOP HEADQUARTERS	Buildings & General Services	\$ 996,248	1987 ROCKINGHAM ROAD	ROCKINGHAM	WINDHAM	VT	05101
GARAGE	Buildings & General Services	\$ 86,573	1987 ROCKINGHAM ROAD	ROCKINGHAM	WINDHAM	VT	05101
MVRCF STORAGE	Buildings & General Services	\$ 34,072	167 STATE STREET	RUTLAND	RUTLAND	VT	05701
MODULAR BUILDING	Buildings & General Services	\$ 199,492	167 STATE STREET	RUTLAND	RUTLAND	VT	05701
MVRCF MAIN BUILDING	Buildings & General Services	\$ 11,253,577	167 STATE STREET	RUTLAND	RUTLAND	VT	05701
62 PIERPOINT AVE (FORMER AMORY)	Buildings & General Services	\$ 224,438	62 PIERPOINT	RUTLAND	RUTLAND	VT	05701
MVRCF EDUCATION	Buildings & General Services	\$ 247,600	167 STATE STREET	RUTLAND	RUTLAND	VT	05701
STORAGE BUILDING	Buildings & General Services	\$ 213,475	MCKINLEY AVENUE	RUTLAND	RUTLAND	VT	05701
MOTOR VEHICLES	Buildings & General Services	\$ 481,147	MCKINLEY AVENUE	RUTLAND	RUTLAND	VT	05701
HEAD QUARTERS	Buildings & General Services	\$ 927,683	MCKINLEY AVENUE	RUTLAND	RUTLAND	VT	05701
TRANSPORTATION	Buildings & General Services	\$ 438,840	MCKINLEY AVENUE	RUTLAND	RUTLAND	VT	05701
RADIO SHOP	Buildings & General Services	\$ 34,034	MCKINLEY AVENUE	RUTLAND	RUTLAND	VT	05702
REGIONAL CONST. OFFICE	Agency of Transportation	\$ 67,723	122 STATE PLACE	RUTLAND	RUTLAND	VT	05701

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
RUTLAND DISTRICT GARAGE	Agency of Transportation	\$ 746,876	122 STATE PLACE	RUTLAND	RUTLAND	VT	05701
RUTLAND SALT SHED	Agency of Transportation	\$ 147,390	122 STATE PLACE	RUTLAND	RUTLAND	VT	05701
RUTLAND WOOD SHED	Agency of Transportation	\$ 7,578	122 STATE PLACE	RUTLAND	RUTLAND	VT	05701
RUTLAND WELDING SHOP	Agency of Transportation	\$ 102,305	122 STATE PLACE	RUTLAND	RUTLAND	VT	05701
RUTLAND STORAGE SHED	Agency of Transportation	\$ 6,368	122 STATE PLACE	RUTLAND	RUTLAND	VT	05701
COURTHOUSE	Buildings & General Services	\$ 12,064,637	9 MERCHANTS ROW	RUTLAND	RUTLAND	VT	05701
RUTLAND STATE OFFICE BUILDING	Buildings & General Services	\$ 2,465,057	92 STATE STREET	RUTLAND	RUTLAND	VT	05701
STORAGE BUILDING	Buildings & General Services	\$ 37,316	92 STATE STREET	RUTLAND	RUTLAND	VT	05701
ASA BLOOMER BUILDING	Buildings & General Services	\$ 15,492,236	88 MERCHANTS ROW	RUTLAND	RUTLAND	VT	05701
RUTLAND MULTI-MODAL TRANSIT CENTER	Buildings & General Services	\$ 14,477,895	85 WEST STREET	RUTLAND	RUTLAND	VT	05701
STATE OFFICE BUILDING	Buildings & General Services	\$ 7,765,042	100 MINERAL STREET	SPRINGFIELD	WINDSOR	VT	05156
GARAGE	Buildings & General Services	\$ 72,915	100 MINERAL STREET	SPRINGFIELD	WINDSOR	VT	05156
DISTRICT COURT	Buildings & General Services	\$ 5,899,205	82 RAILROAD ROW	WHITE RIVER JUNCTION	WINDSOR	VT	05001
MAINTENANCE STORAGE	Buildings & General Services	\$ 124,039	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
MAINTENANCE SHOP	Buildings & General Services	\$ 90,439	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
BOILER HOUSE	Buildings & General Services	\$ 230,324	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
SIGN & PLATE SHOP STORAGE	Buildings & General Services	\$ 39,788	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
SERVICE BUILDING	Buildings & General Services	\$ 572,298	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
EDUCATION BUILDING	Buildings & General Services	\$ 703,416	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
GARAGE	Buildings & General Services	\$ 119,904	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
DORM & DINING	Buildings & General Services	\$ 3,512,743	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
LUMBER DRYING SHED	Buildings & General Services	\$ 87,710	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
NORTH COUNTRY DORM (ECHO)	Buildings & General Services	\$ 544,904	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
SAW MILL	Buildings & General Services	\$ 225,274	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
ADMIN BUILDING	Buildings & General Services	\$ 402,425	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
HAY BARN	Buildings & General Services	\$ 53,136	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
SIGN / MACHINE SHOP	Buildings & General Services	\$ 274,480	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
PLATE SHOP	Buildings & General Services	\$ 538,314	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
OIL SHED	Buildings & General Services	\$ 17,627	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
BGS MAINT. OFFICE (OLD HOUSE)	Buildings & General Services	\$ 314,488	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
CREOSOTE BUILDING	Buildings & General Services	\$ 171,159	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
HEIFER BARN	Buildings & General Services	\$ 272,374	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
COW BARN	Buildings & General Services	\$ 627,657	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
WIND SESCOF MILK HOUSE	Buildings & General Services	\$ 124,368	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
GATE HOUSE	Buildings & General Services	\$ 96,204	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
GREEN HOUSE (TEMP STRUCTURE)	Buildings & General Services	\$ 13,027	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
WOOD STOR. SHED 1 (OUTSIDE FENCE)	Buildings & General Services	\$ 1,302	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
WOOD STOR. SHED 2 (OUTSIDE FENCE)	Buildings & General Services	\$ 1,302	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
WOOD STOR. SHED 3 (OUTSIDE FENCE)	Buildings & General Services	\$ 1,302	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
BGS GARAGE (OUTSIDE FENCE)	Buildings & General Services	\$ 137,918	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
PUMP HOUSE	Buildings & General Services	\$ 13,027	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
DOMESTIC WATER BUILDING	Buildings & General Services	\$ 13,027	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
BGS SHED	Buildings & General Services	\$ 1,302	546 STATE FARM ROAD	WINDSOR	WINDSOR	VT	05089
EASTERN STATES EXPOSITION BUILDING	Buildings & General Services	\$ 2,149,214	1305 MEMORIAL AVENUE	W. SPRINGFIELD		MA	01089
SSCF CORE BUILDING (A)	Buildings & General Services	\$ 11,610,828	700 CHARLESTOWN ROAD	SPRINGFIELD	WINDSOR	VT	05156
SSCF BUILDING (GHI)	Buildings & General Services	\$ 6,434,947	700 CHARLESTOWN ROAD	SPRINGFIELD	WINDSOR	VT	05156
SSCF BUILDING BC-SEG	Buildings & General Services	\$ 5,000,047	700 CHARLESTOWN ROAD	SPRINGFIELD	WINDSOR	VT	05156
SSCF BUILDING (DEF)	Buildings & General Services	\$ 7,691,202	700 CHARLESTOWN ROAD	SPRINGFIELD	WINDSOR	VT	05156
SSCF MAINTENANCE	Buildings & General Services	\$ 752,029	700 CHARLESTOWN ROAD	SPRINGFIELD	WINDSOR	VT	05156
SSCF ENERGY BUILDING	Buildings & General Services	\$ 644,174	700 CHARLESTOWN ROAD	SPRINGFIELD	WINDSOR	VT	05156
FORMER VCET BLDG	Buildings & General Services	\$ 3,144,828	245 SOUTH PARK DRIVE	COLCHESTER	CHITTENDEN	VT	05446
BENNINGTON SAND SHED	Agency of Transportation	\$ 193,373	359 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON SALT SHED	Agency of Transportation	\$ 246,366	359 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON STATE GARAGE/OFFICE	Agency of Transportation	\$ 1,893,287	359 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON STORAGE SHED A	Agency of Transportation	\$ 77,175	359 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON STORAGE SHED B	Agency of Transportation	\$ 3,992	359 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON BRIDGE SHOP	Agency of Transportation	\$ 265,013	360 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON STORAGE SHED C	Agency of Transportation	\$ 40,016	359 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
BENNINGTON STORAGE SHED D	Agency of Transportation	\$ 40,016	359 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON STORAGE SHED E	Agency of Transportation	\$ 1,331	359 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON STORAGE SHED F	Agency of Transportation	\$ 66,461	360 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON STORAGE SHED G	Agency of Transportation	\$ 66,461	361 BOWEN ROAD	BENNINGTON	BENNINGTON	VT	05201
EAST DORSET SHED D	Agency of Transportation	\$ 2,744	18 VILLAGE STREET	DORSET	BENNINGTON	VT	05253
EAST DORSET SAND SHED 3	Agency of Transportation	\$ 208,661	18 VILLAGE STREET	DORSET	BENNINGTON	VT	05253
STORAGE SHED A	Agency of Transportation	\$ 79,734	18 VILLAGE STREET	DORSET	BENNINGTON	VT	05253
STORAGE SHED 2	Agency of Transportation	\$ 79,734	18 VILLAGE STREET	DORSET	BENNINGTON	VT	05253
EAST DORSET GARAGE	Agency of Transportation	\$ 601,928	18 VILLAGE STREET	DORSET	BENNINGTON	VT	05253
EAST DORSET SALT SHED	Agency of Transportation	\$ 154,689	18 VILLAGE STREET	DORSET	BENNINGTON	VT	05253
EAST DORSET SAND SHED	Agency of Transportation	\$ 208,661	18 VILLAGE STREET	DORSET	BENNINGTON	VT	05253
EAST DORSET SALT SHED	Agency of Transportation	\$ 154,689	18 VILLAGE STREET	DORSET	BENNINGTON	VT	05253
DORSET STORAGE SHED C	Agency of Transportation	\$ 79,734	18 VILLAGE STREET	DORSET	BENNINGTON	VT	05253
READSBORO GARAGE	Agency of Transportation	\$ 568,446	1136 VT RT. 100	READSBORO	BENNINGTON	VT	05350
READSBORO SALT SHED	Agency of Transportation	\$ 210,691	1136 VT RT. 100	READSBORO	BENNINGTON	VT	05350
READSBORO SAND SHED	Agency of Transportation	\$ 206,076	1136 VT RT. 100	READSBORO	BENNINGTON	VT	05350
READSBORO STORAGE SHED	Agency of Transportation	\$ 82,026	1136 VT RT. 100	READSBORO	BENNINGTON	VT	05350
STAMFORD SALT & TRACTOR SHED	Agency of Transportation	\$ 107,236	3508 MAIN ROAD	STAMFORD	BENNINGTON	VT	05352
STAMFORD GARAGE	Agency of Transportation	\$ 91,455	3508 MAIN ROAD	STAMFORD	BENNINGTON	VT	05352
WILMINGTON STORAGE SHED B	Agency of Transportation	\$ 6,368	23 HAYSTACK ROAD	WILMINGTON	WINDHAM	VT	05363

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
WILMINGTON GARAGE W/SHED	Agency of Transportation	\$ 388,329	23 HAYSTACK ROAD	WILMINGTON	WINDHAM	VT	05363
WILMINGTON SAND SHED	Agency of Transportation	\$ 161,069	23 HAYSTACK ROAD	WILMINGTON	WINDHAM	VT	05363
WILMINGTON SAND SHED 2	Agency of Transportation	\$ 198,083	23 HAYSTACK ROAD	WILMINGTON	WINDHAM	VT	5363
WILMINGTON COLD STORAGE SHED	Agency of Transportation	\$ 55,443	23 HAYSTACK ROAD	WILMINGTON	WINDHAM	VT	05363
BENNINGTON HANGAR AND TERMINAL	Agency of Transportation	\$ 1,023,939	1563 WALLOOMSAC ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON HANGAR 1	Agency of Transportation	\$ 120,999	1563 WALLOOMSAC ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON AIRPORT HEATED STORAGE	Agency of Transportation	\$ 101,243	1863 WALLOOMSAC ROAD	BENNINGTON	BENNINGTON	VT	05201
WILLARD HANGAR	Agency of Transportation	\$ 170,677	1563 WALLOOMSAC ROAD	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON RAIL SEC. HOUSE 1	Agency of Transportation	\$ 24,519	HOUGHTON STREET	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON RAIL SEC. HOUSE 2	Agency of Transportation	\$ 24,519	HOUGHTON STREET	BENNINGTON	BENNINGTON	VT	05201
SALT SHED	Agency of Transportation	\$ 149,824	638 VT RT. 131	WEATHERSFIELD	WINDSOR	VT	05030
ASCUTNEY GARAGE	Agency of Transportation	\$ 462,396	638 VT RT. 131	WEATHERSFIELD	WINDSOR	VT	05030
ASCUTNEY WOOD SHED	Agency of Transportation	\$ 4,544	VT ROUTE 131	WEATHERSFIELD	WINDSOR	VT	05030
SALT SHED	Agency of Transportation	\$ 178,674	VT ROUTE 131	WEATHERSFIELD	WINDSOR	VT	05030
CHESTER GARAGE/OFFICE	Agency of Transportation	\$ 218,919	165 ELM STREET	CHESTER	WINDSOR	VT	05143
CHESTER STORAGE SHED C	Agency of Transportation	\$ 1,921	165 ELM STREET	CHESTER	WINDSOR	VT	05143
CHESTER SALT SHED	Agency of Transportation	\$ 106,524	165 ELM STREET	CHESTER	WINDSOR	VT	05143
CHESTER STORAGE SHED A	Agency of Transportation	\$ 222,342	165 ELM STREET	CHESTER	WINDSOR	VT	05143
DUMMERSTON DISTRICT OFFICE	Agency of Transportation	\$ 1,241,954	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
DUMMERSTON GARAGE	Agency of Transportation	\$ 1,059,040	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301
DUMMERSTON STORAGE SHED A	Agency of Transportation	\$ 65,212	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301
DUMMERSTON STORAGE SHED B	Agency of Transportation	\$ 65,212	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301
DUMMERSTON STORAGE SHED C	Agency of Transportation	\$ 106,001	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301
DUMMERSTON SAND SHED 4A	Agency of Transportation	\$ 102,072	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301
DUMMERSTON SAND SHED 4B	Agency of Transportation	\$ 102,072	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301
DUMMERSTON SAND SHED 4C	Agency of Transportation	\$ 102,072	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301
DUMMERSTON SAND SHED 4D	Agency of Transportation	\$ 102,072	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301
DUMMERSTON STORAGE SHED D	Agency of Transportation	\$ 6,368	870 US RT 5	DUMMERSTON	WINDHAM	VT	05301
DUMMERSTON SALT SHED 1	Agency of Transportation	\$ 164,849	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301
DUMMERSTON SALT SHED 2	Agency of Transportation	\$ 164,849	870 US RT. 5	DUMMERSTON	WINDHAM	VT	05301
JAMAICA WOOD SHED	Agency of Transportation	\$ 35,273	232 VT RT. 30	JAMAICA	WINDHAM	VT	05343
JAMAICA SALT SHED	Agency of Transportation	\$ 148,312	232 VT RT. 30	JAMAICA	WINDHAM	VT	05343
JAMAICA GARAGE	Agency of Transportation	\$ 428,107	232 VT RT. 30	JAMAICA	WINDHAM	VT	05343
LONDONDERRY GARAGE	Agency of Transportation	\$ 678,853	158 DERRY WOODS ROAD	LONDONDERRY	WINDHAM	VT	05148
LONDONDERRY SAND SHED	Agency of Transportation	\$ 220,404	158 DERRY WOODS ROAD	LONDONDERRY	WINDHAM	VT	05148
LONDONDERRY SALT SHED	Agency of Transportation	\$ 164,020	158 DERRY WOODS ROAD	LONDONDERRY	WINDHAM	VT	05148
LONDONDERRY COLD STORAGE	Agency of Transportation	\$ 57,943	158 DERRY WOODS ROAD	LONDONDERRY	WINDHAM	VT	05148
MARLBORO GARAGE	Agency of Transportation	\$ 586,068	4952 VT RT. 9	MARLBORO	WINDHAM	VT	05344
MARLBORO SALT SHED	Agency of Transportation	\$ 254,300	4952 VT RT. 9	MARLBORO	WINDHAM	VT	05344

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
ROCKINGHAM GARAGE	Agency of Transportation	\$ 477,513	991 ROCKINGHAM ROAD	ROCKINGHAM	WINDHAM	VT	05101
ROCKINGHAM SALT SHED 10	Agency of Transportation	\$ 169,294	991 ROCKINGHAM ROAD	ROCKINGHAM	WINDHAM	VT	05101
ROCKINGHAM SALT SHED 1	Agency of Transportation	\$ 169,294	991 ROCKINGHAM ROAD	ROCKINGHAM	WINDHAM	VT	05101
ROCKINGHAM STORAGE SHED 2	Agency of Transportation	\$ 64,842	991 ROCKINGHAM ROAD	ROCKINGHAM	WINDHAM	VT	05101
ROCKINGHAM STORAGE SHED	Agency of Transportation	\$ 61,722	991 ROCKINGHAM ROAD	ROCKINGHAM	WINDHAM	VT	05101
SPRINGFIELD SALT SHED	Agency of Transportation	\$ 169,294	12 MISSING LINK ROAD	SPRINGFIELD	WINDSOR	VT	05156
SPRINGFIELD GARAGE	Agency of Transportation	\$ 260,721	12 MISSING LINK ROAD	SPRINGFIELD	WINDSOR	VT	05156
WESTMINSTER SALT SHED	Agency of Transportation	\$ 70,696	67 TOWN GARAGE ROAD	WESTMINSTER	WINDHAM	VT	05158
SPRINGFIELD TERMINAL	Agency of Transportation	\$ 280,345	15 AIRPORT ROAD	SPRINGFIELD	WINDSOR	VT	05150
SPRINGFIELD HANGAR NO. 1	Agency of Transportation	\$ 261,487	15 AIRPORT ROAD	SPRINGFIELD	WINDSOR	VT	05150
SPRINGFIELD HANGAR NO. 2	Agency of Transportation	\$ 510,046	15 AIRPORT ROAD	SPRINGFIELD	WINDSOR	VT	05150
SPRINGFIELD HANGAR NO. 3	Agency of Transportation	\$ 496,233	15 AIRPORT ROAD	SPRINGFIELD	WINDSOR	VT	05150
SPRINGFIELD T-HANGAR/GARAGE	Agency of Transportation	\$ 391,482	15 AIRPORT ROAD	SPRINGFIELD	WINDSOR	VT	05150
SPRINGFIELD T-HANGAR-NEW	Agency of Transportation	\$ 323,302	16 AIRPORT ROAD	SPRINGFIELD	WINDSOR	VT	5150
SPRINGFIELD AIRPORT ELECTRICAL	Agency of Transportation	\$ 19,075	15 AIRPORT ROAD	SPRINGFIELD	WINDSOR	VT	05150
ANR STORAGE BUILDING	Forests, Parks, & Recreation	\$ 214,684	15 AIRPORT ROAD	SPRINGFIELD	WINDSOR	VT	05150
CHESTER RAILROAD STATION	Agency of Transportation	\$ 388,517	563 DEPOT STREET	CHESTER	WINDSOR	VT	05143
VENDOR BUILDING	Agency of Transportation	\$ 38,414	I-91 N	GUILFORD	WINDHAM	VT	05354
SHED	Agency of Transportation	\$ 4,831	I-91 N NEAR STATE LINE OF VT	GUILFORD	WINDHAM	VT	05354

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
PUTNEY WEIGH STATION SB	Agency of Transportation	\$ 133,890	I-91 S	PUTNEY	WINDHAM	VT	05346
SOUTHEAST WELCOME CENTER	Agency of Transportation	\$ 2,200,607	I-91 NB	GUILFORD	WINDHAM	VT	05301
MAINTENANCE BARN	Agency of Transportation	\$ 181,622	I-91 NB	GUILFORD	WINDHAM	VT	05301
STORAGE--INFO KIOSK	Agency of Transportation	\$ 6,041	I-91 NB	GUILFORD	WINDHAM	VT	05301
STORAGE--DUMP	Agency of Transportation	\$ 6,041	I-91 NB	GUILFORD	WINDHAM	VT	05301
STORAGE--PICNIC	Agency of Transportation	\$ 18,126	I-91 NB	GUILFORD	WINDHAM	VT	05301
BRANDON-4 BAY GARAGE	Agency of Transportation	\$ 493,812	47 ROBERT WOOD DRIVE	BRANDON	RUTLAND	VT	05733
BRANDON SALT SHED 1	Agency of Transportation	\$ 168,647	47 ROBERT WOOD DRIVE	BRANDON	RUTLAND	VT	05733
BRANDON SAND SHED 2	Agency of Transportation	\$ 168,647	47 ROBERT WOOD DRIVE	BRANDON	RUTLAND	VT	05733
BRANDON STORAGE SHED	Agency of Transportation	\$ 73,176	47 ROBERT WOOD DRIVE	BRANDON	RUTLAND	VT	05733
CASTLETON SALT SHED	Agency of Transportation	\$ 184,529	143 VT RT. 30 S	CASTLETON	RUTLAND	VT	05735
CASTLETON SAND SHED	Agency of Transportation	\$ 184,529	143 VT RT. 30 S	CASTLETON	RUTLAND	VT	05735
CASTLETON STORAGE SHED	Agency of Transportation	\$ 78,483	143 VT RT. 30 S	CASTLETON	RUTLAND	VT	05735
CASTLETON CORNER GARAGE	Agency of Transportation	\$ 664,401	143 VT RT. 30 S	CASTLETON	RUTLAND	VT	05735
CASTLETON CORNERS WOOD SHED	Agency of Transportation	\$ 9,016	143 VT RT. 30 S	CASTLETON	RUTLAND	VT	05735
CASTLETON BRIDGE BUILDING	Agency of Transportation	\$ 252,735	143 VT RT. 30 S	CASTLETON	RUTLAND	VT	05735
CLARENDON SALT SHED	Agency of Transportation	\$ 184,529	1628 VT RT. 7B	CLARENDON	RUTLAND	VT	05759
CLARENDON SAND SHED	Agency of Transportation	\$ 184,529	1628 VT RT. 7B	CLARENDON	RUTLAND	VT	05759
CLARENDON GARAGE	Agency of Transportation	\$ 642,869	1628 VT RT. 7B	CLARENDON	RUTLAND	VT	05759
STORAGE SHED 1	Agency of Transportation	\$ 80,923	1628 VT RT. 7B	CLARENDON	RUTLAND	VT	05759

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
STORAGE SHED 2	Agency of Transportation	\$ 80,923	1628 VT RT. 7B	CLARENDON	RUTLAND	VT	05759
LUDLOW 5-BAY GARAGE	Agency of Transportation	\$ 565,477	91 VT RT. 100 N	LUDLOW	WINDSOR	VT	05149
LUDLOW SALT SHED 1	Agency of Transportation	\$ 181,108	91 VT RT. 100 N	LUDLOW	WINDSOR	VT	05149
LUDLOW SALT SHED 2	Agency of Transportation	\$ 181,108	91 VT RT. 100 N	LUDLOW	WINDSOR	VT	05149
LUDLOW STORAGE SHED A	Agency of Transportation	\$ 82,672	91 VT RT. 100 N	LUDLOW	WINDSOR	VT	05149
LUDLOW STORAGE SHED B	Agency of Transportation	\$ 82,672	91 VT RT. 100 N	LUDLOW	WINDSOR	VT	05149
MENDON SAND SHED 3	Agency of Transportation	\$ 205,570	84 US RT. 4	MENDON	RUTLAND	VT	05701
MENDON BRIDGE STORAGE A	Agency of Transportation	\$ 502,490	84 US RT. 4	MENDON	RUTLAND	VT	05701
MENDON BRIDGE STORAGE B	Agency of Transportation	\$ 341,920	84 US RT. 4	MENDON	RUTLAND	VT	05701
MENDON SALT SHED 1	Agency of Transportation	\$ 191,211	84 US RT. 4	MENDON	RUTLAND	VT	05701
MENDON SAND SHED 2	Agency of Transportation	\$ 191,211	84 US RT. 4	MENDON	RUTLAND	VT	05701
MENDON EQUIPMENT SHED	Agency of Transportation	\$ 174,091	84 US RT. 4	MENDON	RUTLAND	VT	05701
MENDON GARAGE-TRAFFIC SHOP	Agency of Transportation	\$ 214,767	84 US RT. 4	MENDON	RUTLAND	VT	05701
SUDBURY GARAGE	Agency of Transportation	\$ 373,064	3290 VT RT. 30	SUDBURY	RUTLAND	VT	05733
SUDBURY SALT SHED	Agency of Transportation	\$ 168,647	3290 VT RT. 30	SUDBURY	RUTLAND	VT	05733
SUDBURY SAND SHED	Agency of Transportation	\$ 168,647	3290 VT RT. 30	SUDBURY	RUTLAND	VT	05733
SUDBURY STORAGE SHED	Agency of Transportation	\$ 72,276	3290 VT RT. 30	SUDBURY	RUTLAND	VT	05733
RUTLAND-CLARENDON HANGAR	Agency of Transportation	\$ 713,428	1002 AIRPORT ROAD	CLARENDON	RUTLAND	VT	05759
CFR/MAINTENANCE BUILDING	Agency of Transportation	\$ 259,707	1002 AIRPORT ROAD	CLARENDON	RUTLAND	VT	05759

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
FUEL SHED	Agency of Transportation	\$ 45,291	1002 AIRPORT ROAD	CLARENDON	RUTLAND	VT	05759
RUTLAND TERMINAL BUILDING	Agency of Transportation	\$ 1,183,871	1002 AIRPORT ROAD	CLARENDON	RUTLAND	VT	05759
RUTLAND AIRPORT HEATED STORAGE	Agency of Transportation	\$ 795,423	1628 VT RT. 7B	CLARENDON	RUTLAND	VT	5759
BRANDON FREIGHT HOUSE	Agency of Transportation	\$ 187,375	43 CHURCH STREET	BRANDON	RUTLAND	VT	05733
LUDLOW RAILROAD STATION	Agency of Transportation	\$ 181,034	BRIDGE STREET	LUDLOW	WINDSOR	VT	05149
STORAGE SHED	Agency of Transportation	\$ 72,733	120 BILL FOX ROAD	WALLINGFORD	RUTLAND	VT	05773
SECTION HOUSE	Agency of Transportation	\$ 24,768	120 BILL FOX ROAD	WALLINGFORD	RUTLAND	VT	05773
FAIR HAVEN WELCOME CENTER	Agency of Transportation	\$ 569,891	US RT. 4EB	FAIR HAVEN	RUTLAND	VT	05743
FAIR HAVEN WEIGH STATION	Agency of Transportation	\$ 26,584	US RT. 4EB	FAIR HAVEN	RUTLAND	VT	5743
SHED 12	Agency of Transportation	\$ 98,841	W. FAIRLEE CENTER ROAD	WEST FAIRLEE	ORANGE	VT	05083
SHED 2	Agency of Transportation	\$ 199,446	100 BETTIS ROAD	RANDOLPH	ORANGE	VT	05060
SHED 1	Agency of Transportation	\$ 199,446	100 BETTIS ROAD	RANDOLPH	ORANGE	VT	05060
RANDOLPH STORAGE SHED	Agency of Transportation	\$ 27,170	100 BETTIS ROAD	RANDOLPH	ORANGE	VT	05060
RANDOLPH GARAGE	Agency of Transportation	\$ 447,611	100 BETTIS ROAD	RANDOLPH	ORANGE	VT	05060
READING STORAGE SHED	Agency of Transportation	\$ 6,654	1961 VT RT. 106	READING	WINDSOR	VT	05062
READING GARAGE	Agency of Transportation	\$ 252,097	1961 VT RT. 106	READING	WINDSOR	VT	05062
READING SALT SHED	Agency of Transportation	\$ 89,930	1961 VT RT. 106	READING	WINDSOR	VT	05062
SHED 5	Agency of Transportation	\$ 219,606	135 STATE GARAGE ROAD	ROCHESTER	WINDSOR	VT	05767
SHED 4	Agency of Transportation	\$ 219,606	135 STATE GARAGE ROAD	ROCHESTER	WINDSOR	VT	05767
ROCHESTER GARAGE	Agency of Transportation	\$ 343,127	135 STATE GARAGE ROAD	ROCHESTER	WINDSOR	VT	05767

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
ROCHESTER STORAGE SHED	Agency of Transportation	\$ 81,671	135 STATE GARAGE ROAD	ROCHESTER	WINDSOR	VT	05767
ROCHESTER WOOD SHED	Agency of Transportation	\$ 4,739	135 STATE GARAGE ROAD	ROCHESTER	WINDSOR	VT	05767
SHED 7	Agency of Transportation	\$ 219,606	1953 VT RT. 107	ROYALTON	WINDSOR	VT	05068
SHED 8	Agency of Transportation	\$ 219,606	1953 VT RT. 107	ROYALTON	WINDSOR	VT	05068
BRIDGE SHOP	Agency of Transportation	\$ 118,690	1953 VT RT. 107	ROYALTON	WINDSOR	VT	05068
ROYALTON STORAGE SHED A	Agency of Transportation	\$ 71,792	1953 VT RT. 107	ROYALTON	WINDSOR	VT	05068
ROYALTON STORAGE SHED NO. 2	Agency of Transportation	\$ 4,257	1953 VT RT. 107	ROYALTON	WINDSOR	VT	05068
ROYALTON GARAGE	Agency of Transportation	\$ 764,539	1953 VT RT. 107	ROYALTON	WINDSOR	VT	05068
SHED 6	Agency of Transportation	\$ 219,606	1953 VT RT. 107	ROYALTON	WINDSOR	VT	05068
ROYALTON WOOD SHED	Agency of Transportation	\$ 58,632	1953 VT RT. 107	ROYALTON	WINDSOR	VT	05068
SHARON SALT SHED	Agency of Transportation	\$ 168,974	VT RT. 14	SHARON	WINDSOR	VT	05065
THETFORD STORAGE SHED B	Agency of Transportation	\$ 82,040	1333 VT RT. 113	THETFORD	ORANGE	VT	05075
THETFORD SHED 10	Agency of Transportation	\$ 216,536	1333 VT RT. 113	THETFORD	ORANGE	VT	05075
THETFORD SHED 11	Agency of Transportation	\$ 216,536	1333 VT RT. 113	THETFORD	ORANGE	VT	05075
THETFORD STORAGE SHED A	Agency of Transportation	\$ 97,348	1333 VT RT. 113	THETFORD	ORANGE	VT	05075
THETFORD GARAGE	Agency of Transportation	\$ 517,778	1333 VT RT. 113	THETFORD	ORANGE	VT	05075
TUNBRIDGE SALT SHED	Agency of Transportation	\$ 245,106	754 VT RT. 110	TUNBRIDGE	ORANGE	VT	05077
TUNBRIDGE GARAGE	Agency of Transportation	\$ 320,594	754 VT RT. 110	TUNBRIDGE	ORANGE	VT	05077
REGIONAL CONSTRUCTION OFFICE	Agency of Transportation	\$ 64,212	226 BESWICK DRIVE	WHITE RIVER JUNCTION	WINDSOR	VT	05001

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
WHITE RIVER DISTRICT OFFICE	Agency of Transportation	\$ 488,476	226 BESWICK DRIVE	WHITE RIVER JUNCTION	WINDSOR	VT	05001
WHITE RIVER TOOLS STORAGE SHED	Agency of Transportation	\$ 169,037	226 BESWICK DRIVE	WHITE RIVER JUNCTION	WINDSOR	VT	05001
WHITE RIVER WOOD SHEDS (2 ATTA	Agency of Transportation	\$ 5,681	226 BESWICK DRIVE	WHITE RIVER JUNCTION	WINDSOR	VT	05001
WHITE RIVER STORAGE SHED	Agency of Transportation	\$ 7,848	226 BESWICK DRIVE	WHITE RIVER JUNCTION	WINDSOR	VT	05001
WHITE RIVER GARAGE	Agency of Transportation	\$ 517,466	226 BESWICK DRIVE	WHITE RIVER JUNCTION	WINDSOR	VT	05001
SHED 14	Agency of Transportation	\$ 203,758	226 BESWICK DRIVE	WHITE RIVER JUNCTION	WINDSOR	VT	05001
SHED 13	Agency of Transportation	\$ 203,758	226 BESWICK DRIVE	WHITE RIVER JUNCTION	WINDSOR	VT	05001
WINDSOR BARN STORAGE	Agency of Transportation	\$ 67,719	1640 US RT. 5 N	WINDSOR	WINDSOR	VT	05089
WINDSOR GARAGE	Agency of Transportation	\$ 423,152	1640 US RT. 5 N	WINDSOR	WINDSOR	VT	05089
WINDSOR SALT SHED 1	Agency of Transportation	\$ 81,725	1640 US RT. 5 N	WINDSOR	WINDSOR	VT	05089
SHED 15	Agency of Transportation	\$ 169,805	1640 US RT. 5 N	WINDSOR	WINDSOR	VT	05089
WINDSOR WOOD SHED	Agency of Transportation	\$ 44,369	1640 US RT. 5 N	WINDSOR	WINDSOR	VT	05089
WINDSOR STORAGE SHED B	Agency of Transportation	\$ 62,725	1640 US RT. 5 N	WINDSOR	WINDSOR	VT	05089
SHED 17	Agency of Transportation	\$ 121,412	511 WOOD STOCK ROAD	WOODSTOCK	WINDSOR	VT	05091
WOODSTOCK GARAGE	Agency of Transportation	\$ 287,303	511 WOOD STOCK ROAD	WOODSTOCK	WINDSOR	VT	05091
WOODSTOCK WOOD SHED	Agency of Transportation	\$ 3,408	511 WOOD STOCK ROAD	WOODSTOCK	WINDSOR	VT	05091
RANDOLPH S VENDING	Blind & Visually Impaired	\$ 35,255	I-89 S	RANDOLPH	ORANGE	VT	05060
RANDOLPH REST AREA SB	Agency of Transportation	\$ 268,492	I-89 S	RANDOLPH	ORANGE	VT	05060
SHARON REST AREA	Agency of Transportation	\$ 3,487,584	MILE MARKER 9 RT 89N	SHARON	WINDSOR	VT	05065
GARAGE	Agency of Transportation	\$ 204,752	MILE MARKER 9 RT 89N	SHARON	WINDSOR	VT	05065

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
CHIMNEY CORNERS SALT/SAND 1	Agency of Transportation	\$ 203,590	400 US RT. 7	COLCHESTER	CHITTENDEN	VT	05446
CHIMNEY CORNERS SALT/SAND 2	Agency of Transportation	\$ 203,590	400 US RT. 7	COLCHESTER	CHITTENDEN	VT	05446
CHIMNEY CORNERS SALT/SAND 3	Agency of Transportation	\$ 203,590	400 US RT. 7	COLCHESTER	CHITTENDEN	VT	05446
CHIMNEY CORNERS SALT/SAND 4	Agency of Transportation	\$ 203,590	400 US RT. 7	COLCHESTER	CHITTENDEN	VT	05446
CHIMNEY CORNERS COLD STORAGE A	Agency of Transportation	\$ 77,236	400 US RT. 7	COLCHESTER	CHITTENDEN	VT	05446
CHIMNEY CORNERS COLD STORAGE B	Agency of Transportation	\$ 77,236	400 US RT. 7	COLCHESTER	CHITTENDEN	VT	05446
CHIMNEY CORNERS COLD STORAGE C	Agency of Transportation	\$ 77,236	400 US RT. 7	COLCHESTER	CHITTENDEN	VT	05446
CHIMNEY CORNERS 12 BAY GARAGE	Agency of Transportation	\$ 1,606,343	400 US RT. 7	COLCHESTER	CHITTENDEN	VT	05446
FT. ETHAN ALLEN GARAGE (T-2000)	Agency of Transportation	\$ 953,941	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
FT. ETHAN ALLEN T-2001 BOILER	Agency of Transportation	\$ 60,270	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
FT ETHAN ALLEN T-2002 SHED	Agency of Transportation	\$ 1,353	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
FT. ETHAN ALLEN T-2021 CARPENTER	Agency of Transportation	\$ 111,145	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
FT. ETHAN ALLEN T-2029 TIRE SHED	Agency of Transportation	\$ 146,835	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
FT. ETHAN ALLEN PAINT SHOP	Agency of Transportation	\$ 317,412	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
FT. ETHAN ALLEN SALT SHED 1	Agency of Transportation	\$ 102,725	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
FT. ETHAN ALLEN SALT SHED 2	Agency of Transportation	\$ 102,725	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
FT. ETHAN ALLEN SALT SHED 3	Agency of Transportation	\$ 102,725	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
FT. ETHAN ALLEN SALT SHED 4	Agency of Transportation	\$ 102,725	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
FT. ETHAN ALLEN SALT SHED 5	Agency of Transportation	\$ 102,725	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
FT. ETHAN ALLEN DISTRICT OFFICE & GARAGE	Agency of Transportation	\$ 3,097,889	5 BARNES AVENUE	COLCHESTER	CHITTENDEN	VT	05446
SINGLE FAMILY RESIDENCE	Agency of Transportation	\$ 213,378	87 TOWERS ROAD	ESSEX JUNCTION	CHITTENDEN	VT	05452
GARAGE/SHOP	Agency of Transportation	\$ 53,714	87 TOWERS ROAD	ESSEX JUNCTION	CHITTENDEN	VT	05452
HORSE BARN FOUR STALL	Agency of Transportation	\$ 72,921	87 TOWERS ROAD	ESSEX JUNCTION	CHITTENDEN	VT	05452
MIDDLEBURY SALT SHED 1	Agency of Transportation	\$ 198,816	341 CREEK ROAD	MIDDLEBURY	ADDISON	VT	05753
MIDDLEBURY SALT SHED 2	Agency of Transportation	\$ 198,816	341 CREEK ROAD	MIDDLEBURY	ADDISON	VT	05753
COLD STORAGE	Agency of Transportation	\$ 214,679	341 CREEK ROAD	MIDDLEBURY	ADDISON	VT	05753
MIDDLEBURY STORAGE A	Agency of Transportation	\$ 63,430	341 CREEK ROAD	MIDDLEBURY	ADDISON	VT	05753
MIDDLEBURY STORAGE C	Agency of Transportation	\$ 118,312	341 CREEK ROAD	MIDDLEBURY	ADDISON	VT	05753
MIDDLEBURY STATE GARAGE	Agency of Transportation	\$ 620,105	341 CREEK ROAD	MIDDLEBURY	ADDISON	VT	05753
NEW HAVEN SALT SHED	Agency of Transportation	\$ 214,894	490 MAIN STREET	NEW HAVEN	ADDISON	VT	05472
NEW HAVEN GARAGE	Agency of Transportation	\$ 620,105	490 MAIN STREET	NEW HAVEN	ADDISON	VT	05472
NEW HAVEN STORAGE SHED B	Agency of Transportation	\$ 40,341	490 MAIN STREET	NEW HAVEN	ADDISON	VT	05472
NEW HAVEN SAND SHED NO. 2	Agency of Transportation	\$ 198,816	490 MAIN STREET	NEW HAVEN	ADDISON	VT	05472
NEW HAVEN STORAGE SHED A	Agency of Transportation	\$ 60,419	490 MAIN STREET	NEW HAVEN	ADDISON	VT	05472
MIDDLEBURY AIRPORT HANGAR	Agency of Transportation	\$ 171,211	467 AIRPORT ROAD	MIDDLEBURY	ADDISON	VT	05753
MIDDLEBURY TERMINAL/HANGAR	Agency of Transportation	\$ 590,648	467 AIRPORT ROAD	MIDDLEBURY	ADDISON	VT	05753
MIDDLEBURY AIRPORT SRE BUILDING	Agency of Transportation	\$ 260,400	467 AIRPORT ROAD	MIDDLEBURY	ADDISON	VT	05753
BURLINGTON ENGINE HOUSE	Agency of Transportation	\$ 1,622,059	1 RAILWAY LANE	BURLINGTON	CHITTENDEN	VT	05401
VT RAILWAY OFFICE BLDG-WATER FACILITY	Agency of Transportation	\$ 702,283	1 RAILWAY LANE	BURLINGTON	CHITTENDEN	VT	05401

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
STORAGE BUILDING	Agency of Transportation	\$ 143,712	1 RAILWAY LANE	BURLINGTON	CHITTENDEN	VT	05401
SHELBURNE COMMUTER RAIL STATION	Agency of Transportation	\$ 166,327	71 HARBOR ROAD	SHELBURNE	CHITTENDEN	VT	05482
CHARLOTTE RAILROAD STATION	Agency of Transportation	\$ 180,788	818 FERRY ROAD	CHARLOTTE	CHITTENDEN	VT	05445
VERGENNES RAILROAD STATION	Agency of Transportation	\$ 277,720	2 RAILWAY LANE	VERGENNES	ADDISON	VT	05491
WILLISTON INFORMATION CENTER N	Agency of Transportation	\$ 1,342,966	2524 I 89 N	WILLISTON	CHITTENDEN	VT	05495
WILLISTON INFORMATION CENTER S	Agency of Transportation	\$ 1,342,966	3052 I 89 S	WILLISTON	CHITTENDEN	VT	05495
SO. BURLINGTON TEMPORARY RAIL	Agency of Transportation	\$ 37,312	5 BARTLETT BAY ROAD	S. BURLINGTON	CHITTENDEN	VT	05401
STORAGE SHED P	Agency of Transportation	\$ 624,444	1756 RT 302	BERLIN	WASHINGTON	VT	05602
MATERIALS RESOURCE BUILDING	Agency of Transportation	\$ 1,995,484	1756 RT 302	BERLIN	WASHINGTON	VT	05602
AGGREGATE TESTING LAB	Agency of Transportation	\$ 519,532	1756 RT 302	BERLIN	WASHINGTON	VT	05602
BUILDING H CENTRAL GARAGE	Agency of Transportation	\$ 2,800,795	1756 RT 302	BERLIN	WASHINGTON	VT	05602
BUILDING I - HAZMAT	Agency of Transportation	\$ 6,654	1757 RT 302	BERLIN	WASHINGTON	VT	05602
EQUIPMENT SHED	Agency of Transportation	\$ 199,889	1756 RT 302	BERLIN	WASHINGTON	VT	05602
STORAGE SHED	Agency of Transportation	\$ 177,161	1756 RT 302	BERLIN	WASHINGTON	VT	05602
TRAFFIC SHOP	Agency of Transportation	\$ 877,839	1756 RT 302	BERLIN	WASHINGTON	VT	05602
MIDDLESEX STORAGE SHED	Agency of Transportation	\$ 165,238	1170 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	05602
MIDDLESEX STORAGE SHED A	TBD	\$ 7,251	1170 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	
MIDDLESEX GARAGE	Agency of Transportation	\$ 560,142	1170 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	05602
MIDDLESEX SALT SHED	Agency of Transportation	\$ 174,536	1170 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	05602

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
MIDDLESEX SALT SHED	Agency of Transportation	\$ 192,734	1170 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	05602
MIDDLESEX SALT SHED	Agency of Transportation	\$ 214,706	1170 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	05602
MIDDLESEX SALT SHED	Agency of Transportation	\$ 174,536	1170 US ROUTE 2	MIDDLESEX	WASHINGTON	VT	05602
MIDDLESEX STORAGE SHED B	Agency of Transportation	\$ 52,938	1170 US RT. 2	MIDDLESEX	WASHINGTON	VT	05602
GARAGE	Agency of Transportation	\$ 840,414	1876 RT 214	E. MONTPELIER	WASHINGTON	VT	05666
STORAGE SHED	Agency of Transportation	\$ 198,714	1876 RT 214	E. MONTPELIER	WASHINGTON	VT	05666
SAND SHED	Agency of Transportation	\$ 117,352	1876 RT 214	E. MONTPELIER	WASHINGTON	VT	05666
SALT SHED	Agency of Transportation	\$ 109,400	1876 RT 214	E. MONTPELIER	WASHINGTON	VT	05666
MORRISVILLE GARAGE	Agency of Transportation	\$ 437,295	643 BROOKLYN STREET	MORRISVILLE	LAMOILLE	VT	05661
MORRISVILLE WOOD SHED	Agency of Transportation	\$ 30,174	643 BROOKLYN STREET	MORRISVILLE	LAMOILLE	VT	05661
MORRISVILLE SALT/SAND SHED 1	Agency of Transportation	\$ 174,536	643 BROOKLYN STREET	MORRISVILLE	LAMOILLE	VT	05661
MORRISVILLE SALT/SAND SHED 2	Agency of Transportation	\$ 174,536	643 BROOKLYN STREET	MORRISVILLE	LAMOILLE	VT	05661
MORRISVILLE STORAGE SHED	Agency of Transportation	\$ 65,123	643 BROOKLYN STREET	MORRISVILLE	LAMOILLE	VT	05661
ORANGE SALT SHED	Agency of Transportation	\$ 245,106	30 RESERVOIR ROAD	ORANGE	ORANGE	VT	05641
ORANGE GARAGE	Agency of Transportation	\$ 471,047	30 RESERVOIR ROAD	ORANGE	ORANGE	VT	05641
WAITSFIELD GARAGE	Agency of Transportation	\$ 285,935	6909 MAIN ST	WAITSFIELD	WASHINGTON	VT	05673
SALT SHED 1	Agency of Transportation	\$ 173,303	6909 MAIN ST	WAITSFIELD	WASHINGTON	VT	05673
SALT SHED 2	Agency of Transportation	\$ 174,536	6909 MAIN ST	WAITSFIELD	WASHINGTON	VT	05673
SALT SHED 3	Agency of Transportation	\$ 174,536	6909 MAIN ST	WAITSFIELD	WASHINGTON	VT	05673
WAITSFIELD STORAGE SHED	Agency of Transportation	\$ 65,123	6909 MAIN STREET	WAITSFIELD	WASHINGTON	VT	05673

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
WILLIAMSTOWN SALT SHED 2	Agency of Transportation	\$ 219,606	3976 VT RT. 64	WILLIAMSTOWN	ORANGE	VT	05679
WILLIAMSTOWN SALT SHED 3	Agency of Transportation	\$ 219,606	3976 VT RT. 64	WILLIAMSTOWN	ORANGE	VT	05679
WILLIAMSTOWN WOOD SHED	Agency of Transportation	\$ 48,469	3976 VT RT. 64	WILLIAMSTOWN	ORANGE	VT	05679
WILLIAMSTOWN GARAGE	Agency of Transportation	\$ 697,314	3976 VT RT. 64	WILLIAMSTOWN	ORANGE	VT	05679
WILLIAMSTOWN SALT SHED 1	Agency of Transportation	\$ 159,176	3976 VT RT. 64	WILLIAMSTOWN	ORANGE	VT	05679
WILLIAMSTOWN STORAGE SHED B	Agency of Transportation	\$ 81,885	3976 VT RT. 64	WILLIAMSTOWN	ORANGE	VT	05679
ADMINISTRATION BUILDING	Agency of Transportation	\$ 1,049,660	1979 AIRPORT ROAD	BERLIN	WASHINGTON	VT	05641
AOT HQ MAINTENANCE	Agency of Transportation	\$ 95,067	1979 AIRPORT ROAD	BERLIN	WASHINGTON	VT	05641
ROBERTI HANGER	Agency of Transportation	\$ 499,520	1979 AIRPORT ROAD	BERLIN	WASHINGTON	VT	05641
AOT DISTRICT 6 OFFICE	Agency of Transportation	\$ 1,005,208	186 INDUSTRIAL LANE	BERLIN	WASHINGTON	VT	05641
MORRISVILLE AIRPORT TERMINAL	Agency of Transportation	\$ 170,208	2305 LAPORTE ROAD	MORRISVILLE	LAMOILLE	VT	05661
MORRISVILLE ELECTRIC CONTROL	Agency of Transportation	\$ 23,702	2305 LAPORTE ROAD	MORRISVILLE	LAMOILLE	VT	05661
RADIO SHED	Agency of Transportation	\$ 4,277	2305 LAPORTE ROAD	MORRISVILLE	LAMOILLE	VT	05661
MORRISVILLE AIRPORT HEATED SHED	Agency of Transportation	\$ 115,942	2305 LAPORTE ROAD	MORRISVILLE	LAMOILLE	VT	05661
MORRISVILLE FBO HANGAR	Agency of Transportation	\$ 361,676	2305 LAPORTE ROAD	MORRISVILLE	LAMOILLE	VT	05661
BARRE FUEL TRANSFER FACILITY	Agency of Transportation	\$ 325,156	1 WILLIAMS LANE	BARRE	WASHINGTON	VT	05641
OFFICE/STORAGE BUILDING	Agency of Transportation	\$ 727,715	453 STONECUTTERS WAY	MONTPELIER	WASHINGTON	VT	05602
MORRISVILLE ENGINE HOUSE&OFFICE	Agency of Transportation	\$ 1,570,030	191 STAFFORD AVENUE	MORRISVILLE	LAMOILLE	VT	05661
STORAGE GARAGE	Agency of Transportation	\$ 190,637	100 MACDONOUGH DRIVE	BERLIN	WASHINGTON	VT	05602

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
GMTA GARAGE/OFFICE	Agency of Transportation	\$ 2,080,521	100 MACDONOUGH DRIVE	BERLIN	WASHINGTON	VT	05602
BOLTONVILLE GARAGE	Agency of Transportation	\$ 482,940	1992 US RT. 302	NEWBURY	ORANGE	VT	05051
BOLTONVILLE STORAGE SHED	Agency of Transportation	\$ 134,487	1992 US RT. 302	NEWBURY	ORANGE	VT	05051
BOLTONVILLE WOOD SHED	Agency of Transportation	\$ 24,908	1992 US RT. 302	NEWBURY	ORANGE	VT	05051
BRADFORD GARAGE/OFFICE	Agency of Transportation	\$ 801,310	57 FAIRGROUND ROAD	BRADFORD	ORANGE	VT	05033
BRADFORD STORAGE SHED A	Agency of Transportation	\$ 141,682	57 FAIRGROUND ROAD	BRADFORD	ORANGE	VT	05033
BRADFORD STORAGE SHED B	Agency of Transportation	\$ 86,179	57 FAIRGROUND ROAD	BRADFORD	ORANGE	VT	05033
BRADFORD SALT SHED	Agency of Transportation	\$ 131,586	57 FAIRGROUND ROAD	BRADFORD	ORANGE	VT	05033
BRADFORD STORAGE SHED C	Agency of Transportation	\$ 63,599	57 FAIRGROUND ROAD	BRADFORD	ORANGE	VT	05033
BRADFORD WOOD SHED	Agency of Transportation	\$ 2,287	57 FAIRGROUND ROAD	BRADFORD	ORANGE	VT	05033
SAND SHED	Agency of Transportation	\$ 184,026	1846 US RT 2W	DANVILLE	CALEDONIA	VT	05828
DANVILLE SALT SHED	Agency of Transportation	\$ 74,026	1846 US RT. 2 W	DANVILLE	CALEDONIA	VT	05828
GARAGE	Agency of Transportation	\$ 238,527	1846 US RT 2W	DANVILLE	CALEDONIA	VT	05828
WEST DANVILLE WOOD SHED	Agency of Transportation	\$ 1,714	1846 US RT 2W	DANVILLE	CALEDONIA	VT	05828
LUNENBURG STORAGE SHED	Agency of Transportation	\$ 58,894	31 KIMBALL ROAD	LUNENBURG	ESSEX	VT	05906
LUNENBURG HOUSE	Agency of Transportation	\$ 134,839	27 KIMBALL RD	LUNENBURG	ESSEX	VT	05906
LUNENBURG WOOD SHED	Agency of Transportation	\$ 4,878	31 KIMBALL RD	LUNENBURG	ESSEX	VT	05906
LUNENBURG GARAGE	Agency of Transportation	\$ 193,678	31 KIMBALL RD	LUNENBURG	ESSEX	VT	05906
LUNENBURG SALT SHED	Agency of Transportation	\$ 126,804	31 KIMBALL RD	LUNENBURG	ESSEX	VT	05906
LUNENBURG SAND SHED	Agency of Transportation	\$ 215,222	31 KIMBALL RD	LUNENBURG	ESSEX	VT	05906

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
LUNENBURG HOUSE SHED 1	Agency of Transportation	\$ 6,368	31 KIMBALL RD	LUNENBURG	ESSEX	VT	05906
LUNENBURG HOUSE SHED 2	Agency of Transportation	\$ 6,368	31 KIMBALL RD	LUNENBURG	ESSEX	VT	05906
SALT SHED 1	Agency of Transportation	\$ 209,568	1630 GILMAN ROAD	LYNDON	CALEDONIA	VT	05851
SALT SHED 3	Agency of Transportation	\$ 168,922	1630 GILMAN ROAD	LYNDON	CALEDONIA	VT	05851
NEW SALT SHED 2	Agency of Transportation	\$ 168,922	1630 GILMAN ROAD	LYNDON	CALEDONIA	VT	05851
STORAGE BUILDING	Agency of Transportation	\$ 59,150	1630 GILMAN ROAD	LYNDON	CALEDONIA	VT	05851
GARAGE	Agency of Transportation	\$ 621,672	1630 GILMAN ROAD	LYNDON	CALEDONIA	VT	05851
LYNDONVILLE WOOD SHED	Agency of Transportation	\$ 3,811	1630 GILMAN ROAD	LYNDON	CALEDONIA	VT	05851
STORAGE SHED A	Agency of Transportation	\$ 54,122	1630 GILMAN ROAD	LYNDON	CALEDONIA	VT	05851
OLD SALT SHED 2	Agency of Transportation	\$ 215,277	1630 GILMAN ROAD	LYNDON	CALEDONIA	VT	05851
STORAGE GARAGE	Agency of Transportation	\$ 60,507	1630 GILMAN ROAD	LYNDON	CALEDONIA	VT	05851
NEWBURY SALT SHED	Agency of Transportation	\$ 221,984	249 INDUSTRIAL PARK ROAD	NEWBURY	ORANGE	VT	05051
NEWBURY SAND SHED	Agency of Transportation	\$ 221,984	249 INDUSTRIAL PARK ROAD	NEWBURY	ORANGE	VT	05051
NEWBURY STORAGE SHED	Agency of Transportation	\$ 59,789	249 INDUSTRIAL PARK ROAD	NEWBURY	ORANGE	VT	05051
STATE OFFICE BUILDING	Buildings & General Services	\$ 1,733,450	1068 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
SALT SHED 2	Agency of Transportation	\$ 166,790	1068 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
SALT SHED 3	Agency of Transportation	\$ 166,790	1068 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
GARAGE	Agency of Transportation	\$ 633,123	1068 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
SALT SHED 1	Agency of Transportation	\$ 208,990	1068 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
ST. JOHNSBURY WOOD SHED	Agency of Transportation	\$ 3,807	1068 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
TOOL AND STORAGE SHED	Agency of Transportation	\$ 76,317	1068 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
LUMBER STORAGE SHED	Agency of Transportation	\$ 69,293	1068 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
CARPENTER SHOP	Agency of Transportation	\$ 281,745	1068 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
ANR STORAGE BUILDING	Natural Resources	\$ 236,077	1068 US RT 5	ST. JOHNSBURY	CALEDONIA	VT	05819
AIRPORT TERMINAL AND HANGAR	Agency of Transportation	\$ 632,194	2107 PUDDING HILL ROAD	LYNDON	CALEDONIA	VT	05851
LYNDONVILLE SCHOOLHOUSE BUILDING	Agency of Transportation	\$ -	2165 PUDDING HILL ROAD	LYNDON	CALEDONIA	VT	05851
NEW CAP BUILDING	Agency of Transportation	\$ 309,445	2165 PUDDING HILL ROAD	LYNDON	CALEDONIA	VT	05851
BRADFORD REST AREA NB	Agency of Transportation	\$ 431,730	I-91 N	BRADFORD	ORANGE	VT	05033
LYNDONVILLE VENDING	Blind & Visually Impaired	\$ 23,302	I-91 S	LYNDON	CALEDONIA	VT	05851
WELCOME CENTER	Agency of Transportation	\$ 247,832	I-91 S	LYNDON	CALEDONIA	VT	05851
WATERFORD VENDING	Blind & Visually Impaired	\$ 30,894	1270 I-93 NB	WATERFORD	CALEDONIA	VT	05848
WELCOME CENTER	Agency of Transportation	\$ 320,502	1270 RT 93 N	WATERFORD	CALEDONIA	VT	05848
WATERFORD STORAGE SHED	Agency of Transportation	\$ 12,826	1270 RT 93 N	WATERFORD	CALEDONIA	VT	05848
CAMBRIDGE SAND SHED	Agency of Transportation	\$ 168,922	8409 VT RT. 15	CAMBRIDGE	LAMOILLE	VT	05444
CAMBRIDGE GARAGE	Agency of Transportation	\$ 362,541	8409 VT RT. 15	CAMBRIDGE	LAMOILLE	VT	05444
CAMBRIDGE SALT SHED	Agency of Transportation	\$ 179,498	8409 VT RT. 15	CAMBRIDGE	LAMOILLE	VT	05444
CAMBRIDGE STORAGE SHED	Agency of Transportation	\$ 65,123	8409 VT RT. 15	CAMBRIDGE	LAMOILLE	VT	05444
EDEN WOOD STORAGE SHED	Agency of Transportation	\$ 68,072	756 BELVIDERE ROAD	EDEN	LAMOILLE	VT	05652
EDEN SALT SHED	Agency of Transportation	\$ 194,218	756 BELVIDERE ROAD	EDEN	LAMOILLE	VT	05652

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
EDEN GARAGE	Agency of Transportation	\$ 365,448	756 BELVIDERE ROAD	EDEN	LAMOILLE	VT	05652
ENOSBURG SAND/SALT SHED 1	Agency of Transportation	\$ 166,278	275 ELM STREET	ENOSBURG	FRANKLIN	VT	05450
ENOSBURG STORAGE SHED B	Agency of Transportation	\$ 65,123	275 ELM STREET	ENOSBURG	FRANKLIN	VT	05450
ENOSBURG STORAGE SHED A	Agency of Transportation	\$ 65,123	275 ELM STREET	ENOSBURG	FRANKLIN	VT	05450
ENOSBURG GARAGE	Agency of Transportation	\$ 362,677	275 ELM STREET	ENOSBURG	FRANKLIN	VT	05450
ENOSBURG SAND/SALT SHED 2	Agency of Transportation	\$ 166,278	275 ELM STREET	ENOSBURG	FRANKLIN	VT	05450
GEORGIA GARAGE	Agency of Transportation	\$ 245,091	380 BALLARD ROAD	GEORGIA	FRANKLIN	VT	05468
GEORGIA STORAGE SHED	Agency of Transportation	\$ 100,057	380 BALLARD ROAD	GEORGIA	FRANKLIN	VT	05468
GEORGIA SALT/SAND SHED	Agency of Transportation	\$ 262,128	380 BALLARD ROAD	GEORGIA	FRANKLIN	VT	05468
NORTH HERO GARAGE	Agency of Transportation	\$ 590,998	185 STATION ROAD	NORTH HERO	GRAND ISLE	VT	05474
NORTH HERO WOOD SHED	Agency of Transportation	\$ 5,081	185 STATION ROAD	NORTH HERO	GRAND ISLE	VT	05474
NORTH HERO SALT SHED	Agency of Transportation	\$ 209,257	185 STATION ROAD	NORTH HERO	GRAND ISLE	VT	05474
NORTH HERO STORAGE SHED	Agency of Transportation	\$ 63,693	185 STATION ROAD	NORTH HERO	GRAND ISLE	VT	05474
HIGHGATE GARAGE & OFFICE	Agency of Transportation	\$ 1,089,112	444 AIRPORT ROAD	HIGHGATE	FRANKLIN	VT	05459
HIGHGATE SALT SHED 1	Agency of Transportation	\$ 150,680	444 AIRPORT ROAD	HIGHGATE	FRANKLIN	VT	05459
HIGHGATE SAND SHED 2	Agency of Transportation	\$ 150,680	444 AIRPORT ROAD	HIGHGATE	FRANKLIN	VT	05459
HIGHGATE STORAGE SHED A	Agency of Transportation	\$ 81,912	444 AIRPORT ROAD	HIGHGATE	FRANKLIN	VT	05459
HIGHGATE STORAGE SHED B	Agency of Transportation	\$ 128,986	444 AIRPORT ROAD	HIGHGATE	FRANKLIN	VT	05459
MONTGOMERY GARAGE	Agency of Transportation	\$ 284,809	706 N. MAIN STREET	MONTGOMERY	FRANKLIN	VT	05470

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
SALT/SAND SHED	Agency of Transportation	\$ 197,173	706 N. MAIN STREET	MONTGOMERY	FRANKLIN	VT	05470
STORAGE SHED	Agency of Transportation	\$ 6,368	680 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS GARAGE/OFFICE	Agency of Transportation	\$ 654,678	680 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS STORAGE SHED/SHOP	Agency of Transportation	\$ 195,673	680 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS DISTRICT OFFICE	Agency of Transportation	\$ 467,275	680 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS STORAGE SHED	Agency of Transportation	\$ 193,428	680 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS STORAGE SHED	Agency of Transportation	\$ 9,423	680 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS STORAGE SHED	Agency of Transportation	\$ 104,448	680 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS SALT SHED 1	Agency of Transportation	\$ 154,699	680 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS SALT SHED 8	Agency of Transportation	\$ 146,003	680 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS SALT SHED 53	Agency of Transportation	\$ 154,699	680 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
FRANKLIN COUNTY AIRPORT TERMINAL	Agency of Transportation	\$ 887,594	629 AIRPORT ROAD	HIGHGATE	FRANKLIN	VT	05488
RENTAL HANGER BUILDING	Agency of Transportation	\$ 957,896	891 AIRPORT ROAD	HIGHGATE	FRANKLIN	VT	05488
WELCOME CENTER	Agency of Transportation	\$ 316,081	70 N. MAIN STREET	ALBURG	GRAND ISLE	VT	05440
GEORGIA/FAIRFAX N VENDING	Blind & Visually Impaired	\$ 35,255	I-89	GEORGIA	FRANKLIN	VT	05478
GEORGIA/FAIRFAX S VENDING	Blind & Visually Impaired	\$ 35,255	I-89	GEORGIA	FRANKLIN	VT	05478
GEORGIA/FAIRFAX REST AREA NB	Agency of Transportation	\$ 229,450	I-89	GEORGIA	FRANKLIN	VT	05478
GEORGIA/FAIRFAX REST AREA SB	Agency of Transportation	\$ 229,450	I-89	GEORGIA	FRANKLIN	VT	05478
BARTON GARAGE	Agency of Transportation	\$ 500,855	1067 GLOVER ROAD	BARTON	ORLEANS	VT	05822
BARTON SALT SHED	Agency of Transportation	\$ 202,189	1067 GLOVER ROAD	BARTON	ORLEANS	VT	05822

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
BARTON STORAGE SHED	Agency of Transportation	\$ 100,877	1067 GLOVER ROAD	BARTON	ORLEANS	VT	05822
BLOOMFIELD GARAGE	Agency of Transportation	\$ 257,472	2902 VT RT 102	BLOOMFIELD	ESSEX	VT	05905
BLOOMFIELD SALT/SAND SHED	Agency of Transportation	\$ 206,287	2903 VT RT 102	BLOOMFIELD	ESSEX	VT	5905
CANAAN SALT SHED	Agency of Transportation	\$ 168,922	143 VT RT 141	CANAAN	ESSEX	VT	05903
CANAAN SAND SHED	Agency of Transportation	\$ 144,883	143 VT RT 141	CANAAN	ESSEX	VT	05903
CANAAN GARAGE/FURNACE ROOM	Agency of Transportation	\$ 211,566	143 VT RT 141	CANAAN	ESSEX	VT	05903
CANAAN WOOD SHED	Agency of Transportation	\$ 7,419	143 VT RT 141	CANAAN	ESSEX	VT	05903
CANAAN STORAGE SHED	Agency of Transportation	\$ 84,941	143 VT RT. 141	CANAAN	ESSEX	VT	05903
MAIN BUILDING	Buildings & General Services	\$ 3,181,397	35 CRAWFORD ROAD	DERBY	ORLEANS	VT	05829
GARAGE	Buildings & General Services	\$ 100,696	35 CRAWFORD ROAD	DERBY	ORLEANS	VT	05829
DERBY STORAGE SHED	Agency of Transportation	\$ 52,219	4611 US RT. 5	DERBY	ORLEANS	VT	05855
DERBY OFFICE/GARAGE	Agency of Transportation	\$ 552,689	4611 US RT. 5	DERBY	ORLEANS	VT	05855
DERBY STORAGE GARAGE NO. 1	Agency of Transportation	\$ 225,560	4611 US RT. 5	DERBY	ORLEANS	VT	05855
CARPENTER SHOP	Agency of Transportation	\$ 655,817	4611 US RT. 5	DERBY	ORLEANS	VT	05855
DERBY STORAGE GARAGE NO. 2	Agency of Transportation	\$ 195,604	4611 US RT. 5	DERBY	ORLEANS	VT	05855
DERBY STORAGE SHED C (WOOD)	Agency of Transportation	\$ 24,169	4611 US RT. 5	DERBY	ORLEANS	VT	05855
DERBY STORAGE & WOOD SHED	Agency of Transportation	\$ 56,799	4611 US RT. 5	DERBY	ORLEANS	VT	05855
SALT/SAND SHED	Agency of Transportation	\$ 440,295	4611 US RT. 5	DERBY	ORLEANS	VT	05855
DERBY STORAGE SHED B	Agency of Transportation	\$ 136,827	4611 US RT 5	DERBY	ORLEANS	VT	05855

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
IRASBURG GARAGE	Agency of Transportation	\$ 306,218	1122 VT RT. 14	IRASBURG	ORLEANS	VT	05845
IRASBURG STORAGE SHED A	Agency of Transportation	\$ 83,865	1122 VT RT. 14	IRASBURG	ORLEANS	VT	05845
IRASBURG SALT SHED 2	Agency of Transportation	\$ 96,143	1122 VT RT. 14	IRASBURG	ORLEANS	VT	05845
IRASBURG STORAGE SHED B	Agency of Transportation	\$ 95,692	1122 VT RT. 14	IRASBURG	ORLEANS	VT	05845
IRASBURG SALT SHED 1	Agency of Transportation	\$ 96,143	1122 VT RT. 14	IRASBURG	ORLEANS	VT	05845
ISLAND POND STORAGE SHED	Agency of Transportation	\$ 65,123	603 RAILROAD STREET	BRIGHTON	ESSEX	VT	05846
ISLAND POND SALT SHED	Agency of Transportation	\$ 179,498	603 RAILROAD ST	BRIGHTON	ESSEX	VT	05846
ISLAND POND SALT & WOOD SHED	Agency of Transportation	\$ 85,032	603 RAILROAD STREET	BRIGHTON	ESSEX	VT	05846
ISLAND POND SALT SHED	Agency of Transportation	\$ 221,944	603 RAILROAD ST	BRIGHTON	ESSEX	VT	05846
ISLAND POND GARAGE	Agency of Transportation	\$ 372,505	603 RAILROAD ST	BRIGHTON	ESSEX	VT	05846
ISLAND POND WOOD SHED	Agency of Transportation	\$ 7,611	603 RAILROAD ST	BRIGHTON	ESSEX	VT	05846
WESTFIELD GARAGE	Agency of Transportation	\$ 456,462	266 LOOP ROAD	WESTFIELD	ORLEANS	VT	05874
WESTFIELD SALT SHED #1	Agency of Transportation	\$ 107,946	266 LOOP ROAD	WESTFIELD	ORLEANS	VT	05874
WESTMORE STORAGE SHED	Agency of Transportation	\$ 125,290	5712 WILLOUGHBY LAKE ROAD	WESTMORE	ORLEANS	VT	05860
WESTMORE GARAGE	Agency of Transportation	\$ 197,291	5712 WILLOUGHBY LAKE ROAD	WESTMORE	ORLEANS	VT	05860
WESTMORE SALT SHED	Agency of Transportation	\$ 44,355	5712 WILLOUGHBY LAKE ROAD	WESTMORE	ORLEANS	VT	05860
ISLAND POND RESIDENCE	Agency of Transportation	\$ 166,278	3529 VT RT 105	BRIGHTON	ESSEX	VT	05846
NEWPORT AIRPORT MAINTENANCE BLDG	Agency of Transportation	\$ 98,910	2628 AIRPORT ROAD	COVENTRY	ORLEANS	VT	05855
NEWPORT MAINTENANCE HANGAR #1	Agency of Transportation	\$ 265,575	2628 AIRPORT ROAD	COVENTRY	ORLEANS	VT	05855
NEWPORT FUTURES STORAGE HANGAR	Agency of Transportation	\$ 264,651	2628 AIRPORT ROAD	COVENTRY	ORLEANS	VT	05855

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
NEWPORT TERMINAL BUILDING	Agency of Transportation	\$ 127,604	2628 AIRPORT ROAD	COVENTRY	ORLEANS	VT	05855
DERBY LINE REST AREA 5B	Agency of Transportation	\$ 195,795	I-91 S	DERBY	ORLEANS	VT	05829
PICNIC SHELTER	Forests, Parks, & Recreation	\$ 278,762	6750 VT RT 17W	ADDISON	ADDISON	VT	05734
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 225,220	6750 VT RT 17W	ADDISON	ADDISON	VT	05734
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 91,666	6750 VT RT 17W	ADDISON	ADDISON	VT	05734
GARAGE	Forests, Parks, & Recreation	\$ 40,876	6750 VT RT 17W	ADDISON	ADDISON	VT	05734
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 85,535	6750 VT RT 17W	ADDISON	ADDISON	VT	05734
WOODSHED	Forests, Parks, & Recreation	\$ 29,975	6750 VT RT 17W	ADDISON	ADDISON	VT	05734
TOILET #3	Forests, Parks, & Recreation	\$ 2,663	6750 VT RT 17W	ADDISON	ADDISON	VT	05734
SUPERVISOR RESIDENCE	Forests, Parks, & Recreation	\$ 362,001	1477 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
CCC BUILDING #1	Forests, Parks, & Recreation	\$ 10,646	1477 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
WORKSHOP	Forests, Parks, & Recreation	\$ 254,369	1477 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
GARAGE	Forests, Parks, & Recreation	\$ 7,987	1477 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 107,926	5 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 200,656	5 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 100,171	5 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
RANGER'S RESIDENCE W/GARAGE	Forests, Parks, & Recreation	\$ 165,224	5 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
LEANTO STORAGE SHED	Forests, Parks, & Recreation	\$ 3,992	1477 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
STORAGE BARN #3	Forests, Parks, & Recreation	\$ 58,847	1477 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
WELCHER NATURE CENTER	Forests, Parks, & Recreation	\$ 319,961	5 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
LUMBER STORAGE BUILDING	Forests, Parks, & Recreation	\$ 73,459	1477 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
STORAGE BARN #2	Forests, Parks, & Recreation	\$ 54,758	1477 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
PARK SHELTER	Forests, Parks, & Recreation	\$ 143,737	5 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
WOODSHED	Forests, Parks, & Recreation	\$ 26,592	5 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
POOL PUMP HOUSE	Forests, Parks, & Recreation	\$ 24,912	5 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
STORAGE BARN #4	Forests, Parks, & Recreation	\$ 66,459	1477 BUTTON BAY ROAD	FERRISBURG	ADDISON	VT	05456
WHITE HOUSE	Forests, Parks, & Recreation	\$ 254,624	787 KINGSLAND BAY SP ROAD	FERRISBURG	ADDISON	VT	05456
THEATER	Forests, Parks, & Recreation	\$ 218,947	787 KINGSLAND BAY SP ROAD	FERRISBURG	ADDISON	VT	05456
RECREATION HALL	Forests, Parks, & Recreation	\$ 222,901	787 KINGSLAND BAY SP ROAD	FERRISBURG	ADDISON	VT	05456
DINING HALL	Forests, Parks, & Recreation	\$ 551,923	787 KINGSLAND BAY SP ROAD	FERRISBURG	ADDISON	VT	05456
HAWLEY HOUSE	Forests, Parks, & Recreation	\$ -	787 KINGSLAND BAY SP ROAD	FERRISBURG	ADDISON	VT	05456
BARN	Forests, Parks, & Recreation	\$ 331,344	787 KINGSLAND BAY SP ROAD	FERRISBURG	ADDISON	VT	05456
CONTACT STATION	Forests, Parks, & Recreation	\$ 7,987	787 KINGSLAND BAY SP ROAD	FERRISBURG	ADDISON	VT	05456
RED HOUSE	Forests, Parks, & Recreation	\$ 146,763	787 KINGSLAND BAY SP ROAD	FERRISBURG	ADDISON	VT	05456
FARMHOUSE	Forests, Parks, & Recreation	\$ 390,065	787 KINGSLAND BAY SP ROAD	FERRISBURG	ADDISON	VT	05456
TOILET BUILDING	Forests, Parks, & Recreation	\$ 177,154	787 KINGSLAND BAY SP ROAD	FERRISBURG	ADDISON	VT	05456
BATHHOUSE	Forests, Parks, & Recreation	\$ 701,324	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
NATURE CENTER	Forests, Parks, & Recreation	\$ 96,823	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
GARAGE	Forests, Parks, & Recreation	\$ 42,171	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 99,299	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 76,171	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
RANGER'S QUARTERS	Forests, Parks, & Recreation	\$ 190,032	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
TOILET BUILDING #4	Forests, Parks, & Recreation	\$ 51,936	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
ASSISTANT RANGER'S QUARTERS	Forests, Parks, & Recreation	\$ 72,898	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
CONTACT STATION	Forests, Parks, & Recreation	\$ 7,987	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
WOODSHED	Forests, Parks, & Recreation	\$ 28,959	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
PARMALEE CAMP	Forests, Parks, & Recreation	\$ 124,921	3570 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
RESTROOM/CONCESSION	Forests, Parks, & Recreation	\$ 209,504	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
RANGER'S RESIDENCE #1	Forests, Parks, & Recreation	\$ 243,535	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
HELPER'S QUARTERS/NATURE CENTER	Forests, Parks, & Recreation	\$ 143,893	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
GARAGE	Forests, Parks, & Recreation	\$ 56,288	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
RANGER'S RESIDENCE #2	Forests, Parks, & Recreation	\$ 283,967	374 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
BARN/SHOP	Forests, Parks, & Recreation	\$ 186,934	374 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
WOODSHED	Forests, Parks, & Recreation	\$ 36,736	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 123,598	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
TOILET BUILDING #4	Forests, Parks, & Recreation	\$ 59,057	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
TOILET BUILDING #5	Forests, Parks, & Recreation	\$ 131,819	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
TOILET BUILDING #6	Forests, Parks, & Recreation	\$ 59,057	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
TOILET BUILDING #7	Forests, Parks, & Recreation	\$ 77,718	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
CONTACT STATION	Forests, Parks, & Recreation	\$ 7,987	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
SHOWER BUILDING A	Forests, Parks, & Recreation	\$ 61,982	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
SHOWER BUILDING B	Forests, Parks, & Recreation	\$ 61,982	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
PICNIC SHELTER	Forests, Parks, & Recreation	\$ 41,930	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
COMPOSTING TOILET	Forests, Parks, & Recreation	\$ 15,512	65 EMERALD LAKE LANE	DORSET	BENNINGTON	VT	05253
GREY/FORRESTER STAFF QUARTERS	Forests, Parks, & Recreation	\$ 286,436	478 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
WHISPERING PINES HELPER QUARTERS	Forests, Parks, & Recreation	\$ 84,192	478 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
GILBERT HOUSE	Forests, Parks, & Recreation	\$ 212,754	262 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
GILBERT HOUSE GARAGE	Forests, Parks, & Recreation	\$ 24,012	262 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
BATHHOUSE	Forests, Parks, & Recreation	\$ 229,691	478 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
TOILET BUILDING	Forests, Parks, & Recreation	\$ 61,065	478 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
PICNIC SHELTER	Forests, Parks, & Recreation	\$ 48,659	478 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
GARAGE	Forests, Parks, & Recreation	\$ 65,195	478 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
CONCESSION BUILDING	Forests, Parks, & Recreation	\$ 89,738	478 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
CONTACT STATION	Forests, Parks, & Recreation	\$ 16,297	478 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
WOODSHED	Forests, Parks, & Recreation	\$ 5,324	478 SHAFTSBURY SP ROAD	SHAFTSBURY	BENNINGTON	VT	05262
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 100,176	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 133,951	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
GARAGE	Forests, Parks, & Recreation	\$ 37,544	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
SEWER PUMP BUILDING	Forests, Parks, & Recreation	\$ 3,992	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
STAFF RESIDENCE (DUPLEX)	Forests, Parks, & Recreation	\$ 151,894	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
WOODSHED	Forests, Parks, & Recreation	\$ 21,938	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 85,600	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 85,600	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
CABIN-LADY SLIPPER	Forests, Parks, & Recreation	\$ 19,335	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
CABIN-JACK-IN-THE-PULPET	Forests, Parks, & Recreation	\$ 19,335	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
CABIN-GENTIAN	Forests, Parks, & Recreation	\$ 19,335	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
CABIN-TRILLIUM	Forests, Parks, & Recreation	\$ 19,335	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
VAULT TOILET	Forests, Parks, & Recreation	\$ 15,512	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
PUMP HOUSE	Forests, Parks, & Recreation	\$ 7,990	142 STATE PARK ROAD	WOODFORD	BENNINGTON	VT	05201
LOOKOUT TOWER - BURKE MTN	Forests, Parks, & Recreation	\$ 90,025	TOLL ROAD	BURKE	CALEDONIA	VT	05832
PARK SHELTER	Forests, Parks, & Recreation	\$ 64,024	TOLL ROAD	BURKE	CALEDONIA	VT	05832
TOILET BUILDING #4	Forests, Parks, & Recreation	\$ 19,722	TOLL ROAD	BURKE	CALEDONIA	VT	05832
BLACKSMITH SHOP	Forests, Parks, & Recreation	\$ 95,476	TOLL ROAD	BURKE	CALEDONIA	VT	05832
SUGAR HOUSE	Forests, Parks, & Recreation	\$ 37,312	TOLL ROAD	BURKE	CALEDONIA	VT	05832
CCC TOILET BUILDING	Forests, Parks, & Recreation	\$ 26,119	TOLL ROAD	BURKE	CALEDONIA	VT	05832
CCC TOILET BUILDING - MTN. TOP	Forests, Parks, & Recreation	\$ 26,119	TOLL ROAD	BURKE	CALEDONIA	VT	05832
SPRUCE LOOKOUT TOWER	Forests, Parks, & Recreation	\$ 90,025	1636 VT RT. 232	PLAINFIELD	WASHINGTON	VT	05046

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
RANGER RESIDENCE NEW DISCOVERY	Forests, Parks, & Recreation	\$ 205,972	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
TOILET BUILDING #1-ND	Forests, Parks, & Recreation	\$ 19,722	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
TOILET BUILDING #2 ND	Forests, Parks, & Recreation	\$ 59,166	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
MAINTENANCE/STORAGE BARN-ND	Forests, Parks, & Recreation	\$ 214,514	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
SHELTER AT OSMORE	Forests, Parks, & Recreation	\$ 158,047	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
SHELTER AT OWLS HEAD	Forests, Parks, & Recreation	\$ 40,515	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
RANGER'S RESIDENCE-ST	Forests, Parks, & Recreation	\$ 29,411	126 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
PARK SHELTER-ST	Forests, Parks, & Recreation	\$ 67,896	126 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
TOILET BUILDING #1 AT STILLWATER	Forests, Parks, & Recreation	\$ 33,900	126 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
TOILET BUILDING #2 AT STILLWATER	Forests, Parks, & Recreation	\$ 59,166	126 BOULDER BEACH RD	GROTON	CALEDONIA	VT	05046
SHELTER & TOILET #2-RP	Forests, Parks, & Recreation	\$ 86,566	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	05046
RANGER RESIDENCE AT RICKER POND	Forests, Parks, & Recreation	\$ 103,989	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	05046
GARAGE-RP	Forests, Parks, & Recreation	\$ 73,117	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	05046
TOILET BUILDING #1-RP	Forests, Parks, & Recreation	\$ 26,119	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	05046
TOILET BUILDING #3 RICKER POND	Forests, Parks, & Recreation	\$ 33,900	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	05046
TOILET BUILDING #2 BOULDER BEACH	Forests, Parks, & Recreation	\$ 59,166	440 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
CONCESSION AT BOULDER BEACH	Forests, Parks, & Recreation	\$ 56,383	440 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
RANGER RESIDENCE AT BIG DEER	Forests, Parks, & Recreation	\$ 183,820	303 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
TOILET BUILDING #5 AT BIG DEER	Forests, Parks, & Recreation	\$ 37,312	303 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
TOILET BUILDING #1-BB	Forests, Parks, & Recreation	\$ 17,270	440 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
STAFF RESIDENCE #1 AT BIG DEER	Forests, Parks, & Recreation	\$ 66,533	303 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
STAFF RESIDENCE #2 AT BIG DEER	Forests, Parks, & Recreation	\$ 66,533	303 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
NATURE CENTER AT BOULDER BEACH	Forests, Parks, & Recreation	\$ 142,860	329 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
TOILET BUILDING #3-ST	Forests, Parks, & Recreation	\$ 33,900	126 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
CONTACT STATION-ST	Forests, Parks, & Recreation	\$ 56,383	126 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
CARPENTRY SHOP	Forests, Parks, & Recreation	\$ 213,724	1636 VT RT 232	PEACHAM	CALEDONIA	VT	05046
REGIONAL SHOP OFFICE	Forests, Parks, & Recreation	\$ 74,084	1636 VT RT. 232	PEACHAM	CALEDONIA	VT	05046
GARAGE-ND	Forests, Parks, & Recreation	\$ 36,724	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
WOODSHED-ND	Forests, Parks, & Recreation	\$ 18,456	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
CONTACT STATION - RICKER	Forests, Parks, & Recreation	\$ 10,927	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	05046
BLACKSMITH SHED	Forests, Parks, & Recreation	\$ 38,287	1636 VT RT. 232	PEACHAM	CALEDONIA	VT	05046
STORAGE SHED - RICKER	Forests, Parks, & Recreation	\$ 4,792	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	05046
STORAGE SHED-ST	Forests, Parks, & Recreation	\$ 13,326	126 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
WOODSHED-RP	Forests, Parks, & Recreation	\$ 18,456	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	05046
WOODSHED-ST	Forests, Parks, & Recreation	\$ 18,456	126 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
GARAGE-BD	Forests, Parks, & Recreation	\$ 31,476	303 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
MAINTENANCE/STORAGE BARN	Forests, Parks, & Recreation	\$ 277,475	1636 VT RT 232	PEACHAM	CALEDONIA	VT	05046
LUMBER STORAGE SHED	Forests, Parks, & Recreation	\$ 93,693	1636 VT RT. 232	PEACHAM	CALEDONIA	VT	05046
CONCESSION BUILDING-BB	Forests, Parks, & Recreation	\$ 53,238	440 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
MERRILL/OTIS CAMP	Forests, Parks, & Recreation	\$ 37,106	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	05046
BOULDER BEACH CONTACT STATION	Forests, Parks, & Recreation	\$ 3,194	126 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
BOULDER BEACH STORAGE SHED	Forests, Parks, & Recreation	\$ 7,028	126 BOULDER BEACH ROAD	GROTON	CALEDONIA	VT	05046
PUMPHOUSE	Forests, Parks, & Recreation	\$ 4,660	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
CONTACT STATION-ND	Forests, Parks, & Recreation	\$ 56,383	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
LAKESIDE CABIN-RP	Forests, Parks, & Recreation	\$ 22,995	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	05046
NEW DISCOVERY STORAGE BUILDING	Forests, Parks, & Recreation	\$ 7,466	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
OWL'S HEAD TOILET BUILDING	Forests, Parks, & Recreation	\$ 2,666	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
OWL'S HEAD OCTAGON BUILDING	Forests, Parks, & Recreation	\$ 56,103	52 NEW DISCOVERY ROAD	PEACHAM	CALEDONIA	VT	05046
SEYON REMOTE CABIN	Forests, Parks, & Recreation	\$ 20,871	400 SEYON PARK ROAD	GROTON	CALEDONIA	VT	05046
SEYON FISH HATCHERY	Forests, Parks, & Recreation	\$ 122,969	400 SEYON PARK ROAD	GROTON	CALEDONIA	VT	05046
SEYON WOODSHED	Forests, Parks, & Recreation	\$ 8,345	400 SEYON PARK ROAD	GROTON	CALEDONIA	VT	05046
RESIDENCE AT SEYON	Forests, Parks, & Recreation	\$ 1,154,746	400 SEYON PARK ROAD	GROTON	CALEDONIA	VT	05046
GARAGE-SR	Forests, Parks, & Recreation	\$ 84,310	400 SEYON PARK ROAD	GROTON	CALEDONIA	VT	05046
BARN-SR	Forests, Parks, & Recreation	\$ 46,706	400 SEYON PARK ROAD	GROTON	CALEDONIA	VT	05046
BARN/RESIDENCE AT SEYON	Forests, Parks, & Recreation	\$ 170,203	400 SEYON PARK ROAD	GROTON	CALEDONIA	VT	05046
OLD WHEEL HOUSE-SR	Forests, Parks, & Recreation	\$ 84,827	400 SEYON PARK ROAD	GROTON	CALEDONIA	VT	05046
RICKER POND CABIN 1	Forests, Parks, & Recreation	\$ 19,335	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	
RICKER POND CABIN 2	Forests, Parks, & Recreation	\$ 19,335	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	
RICKER POND CABIN 3	Forests, Parks, & Recreation	\$ 19,335	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
RICKER POND CABIN 4	Forests, Parks, & Recreation	\$ 19,335	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	
RICKER POND CABIN 5	Forests, Parks, & Recreation	\$ 19,335	526 STATE FOREST ROAD	GROTON	CALEDONIA	VT	
RESIDENCE	Forests, Parks, & Recreation	\$ 382,415	DUXBURY ROAD	BOLTON	CHITTENDEN	VT	05477
WEST BARN	Forests, Parks, & Recreation	\$ 176,833	DUXBURY ROAD	BOLTON	CHITTENDEN	VT	05477
EAST BARN	Forests, Parks, & Recreation	\$ 78,229	DUXBURY ROAD	BOLTON	CHITTENDEN	VT	05477
RANGER CABIN	Forests, Parks, & Recreation	\$ 203,127	DUXBURY ROAD	BOLTON	CHITTENDEN	VT	05477
RANGER'S CABIN	Forests, Parks, & Recreation	\$ 116,141	5425 MT. PHILO ROAD	CHARLOTTE	CHITTENDEN	VT	05445
PUMP HOUSE	Forests, Parks, & Recreation	\$ 31,718	5425 MT. PHILO ROAD	CHARLOTTE	CHITTENDEN	VT	05445
RECREATION BUILDING & TOILET #	Forests, Parks, & Recreation	\$ 6,654	5425 MT. PHILO ROAD	CHARLOTTE	CHITTENDEN	VT	05445
WORK SHOP/GARAGE	Forests, Parks, & Recreation	\$ 75,713	5425 MT. PHILO ROAD	CHARLOTTE	CHITTENDEN	VT	05445
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 44,197	5425 MT. PHILO ROAD	CHARLOTTE	CHITTENDEN	VT	05445
CONTACT STATION	Forests, Parks, & Recreation	\$ 9,316	5425 MT. PHILO ROAD	CHARLOTTE	CHITTENDEN	VT	05445
LODGE/SHELTER	Forests, Parks, & Recreation	\$ 207,905	5425 MT. PHILO ROAD	CHARLOTTE	CHITTENDEN	VT	05445
CAMPGROUND COMPOSTING TOILETS	Forests, Parks, & Recreation	\$ 156,210	5425 MT PHILO ROAD	CHARLOTTE	CHITTENDEN	VT	05445
LODGE COMPOSTING TOILETS	Forests, Parks, & Recreation	\$ 128,622	5425 MT PHILO ROAD	CHARLOTTE	CHITTENDEN	VT	05445
RADIO STATION	Public Safety	\$ 138,249	5425 MT PHILO ROAD	CHARLOTTE	CHITTENDEN	VT	05445
PERSONNEL QUARTERS #1	Forests, Parks, & Recreation	\$ 48,531	1215 US RT. 2	MILTON	CHITTENDEN	VT	05468
BATHHOUSE WEST	Forests, Parks, & Recreation	\$ 545,453	1215 US RT. 2	MILTON	CHITTENDEN	VT	05468
BATHHOUSE EAST	Forests, Parks, & Recreation	\$ 261,780	1215 US RT. 2	MILTON	CHITTENDEN	VT	05468

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
PERSONNEL QUARTERS #2	Forests, Parks, & Recreation	\$ 30,383	1215 US RT. 2	MILTON	CHITTENDEN	VT	05468
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 49,024	1215 US RT. 2	MILTON	CHITTENDEN	VT	05468
WORKSHOP GARAGE	Forests, Parks, & Recreation	\$ 36,934	1215 US RT. 2	MILTON	CHITTENDEN	VT	05468
CONTACT STATION	Forests, Parks, & Recreation	\$ 10,540	1215 US RT. 2	MILTON	CHITTENDEN	VT	05468
RANGER RESIDENCE	Forests, Parks, & Recreation	\$ 63,268	352 MOUNTAIN ROAD	UNDERHILL	CHITTENDEN	VT	05489
TOILET BUILDING	Forests, Parks, & Recreation	\$ 26,119	352 MOUNTAIN ROAD	UNDERHILL	CHITTENDEN	VT	05489
PARK SHELTER	Forests, Parks, & Recreation	\$ 63,555	352 MOUNTAIN ROAD	UNDERHILL	CHITTENDEN	VT	05489
WOODSHED	Forests, Parks, & Recreation	\$ 18,456	352 MOUNTAIN ROAD	UNDERHILL	CHITTENDEN	VT	05489
PUMP HOUSE	Forests, Parks, & Recreation	\$ 60,527	352 MOUNTAIN ROAD	UNDERHILL	CHITTENDEN	VT	05489
TOILET BUILDING/CONCESSION	Forests, Parks, & Recreation	\$ 26,068	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
NATURE CENTER	Forests, Parks, & Recreation	\$ 47,972	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
RANGER RESIDENCE	Forests, Parks, & Recreation	\$ 72,491	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 26,119	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 26,119	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
MAINTENANCE SHOP	Forests, Parks, & Recreation	\$ 70,136	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
WOODSHED	Forests, Parks, & Recreation	\$ 18,456	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
GARAGE	Forests, Parks, & Recreation	\$ 42,273	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
CABIN 1	Forests, Parks, & Recreation	\$ 12,609	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
CABIN 2	Forests, Parks, & Recreation	\$ 19,335	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	
CABIN 3	Forests, Parks, & Recreation	\$ 19,335	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
CABIN 4	Forests, Parks, & Recreation	\$ 19,335	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
CABIN 5	Forests, Parks, & Recreation	\$ 19,335	102 STATE PARK ROAD	BRIGHTON	ESSEX	VT	05451
PERSONNEL QUARTERS	Forests, Parks, & Recreation	\$ 99,580	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
RANGER RESIDENCE	Forests, Parks, & Recreation	\$ 236,216	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
BATHHOUSE & TOILET	Forests, Parks, & Recreation	\$ 80,508	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
STORAGE BARN & GARAGE	Forests, Parks, & Recreation	\$ 56,703	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 6,930	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
PARK SHELTER	Forests, Parks, & Recreation	\$ 61,136	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 6,930	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
TOILET BUILDING #4	Forests, Parks, & Recreation	\$ 26,119	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
TOILET BUILDING #5	Forests, Parks, & Recreation	\$ 26,119	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
TOILET BUILDING #6	Forests, Parks, & Recreation	\$ 26,119	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
ASST. RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 68,761	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
WOODSHED	Forests, Parks, & Recreation	\$ 18,456	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
PUMP HOUSE	Forests, Parks, & Recreation	\$ 7,996	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
PUMPHOUSE #3	Forests, Parks, & Recreation	\$ 6,122	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
NATURALIST MUSEUM	Forests, Parks, & Recreation	\$ 9,316	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
LIFE GUARD SHED	Forests, Parks, & Recreation	\$ 9,316	4876 MAIDSTONE ROAD	MAIDSTONE	ESSEX	VT	05905
FARM HOUSE	Forests, Parks, & Recreation	\$ 328,211	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
SIGN SHOP	Forests, Parks, & Recreation	\$ 161,662	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 98,610	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
GARAGE	Forests, Parks, & Recreation	\$ 97,528	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 26,119	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 37,312	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
TOILET BUILDING #4	Forests, Parks, & Recreation	\$ 37,312	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
TOILET BUILDING #5	Forests, Parks, & Recreation	\$ 77,289	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
TOILET BUILDING #6	Forests, Parks, & Recreation	\$ 59,166	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
CONTACT STATION	Forests, Parks, & Recreation	\$ 29,226	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 253,139	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
TOILET BUILDING #7	Forests, Parks, & Recreation	\$ 49,497	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
RENTAL CABIN A	Forests, Parks, & Recreation	\$ 35,295	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
WOODSHED	Forests, Parks, & Recreation	\$ 38,602	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
RENTAL CABIN B	Forests, Parks, & Recreation	\$ 9,410	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
PUMP HOUSE	Forests, Parks, & Recreation	\$ 35,581	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
CONCESSION BUILDING	Forests, Parks, & Recreation	\$ 55,332	460 MARSH FARM ROAD	FRANKLIN	FRANKLIN	VT	05457
HOTEL/RANGER'S OFFICE-HATHAWAY	Forests, Parks, & Recreation	\$ 784,517	2714 HATHAWAY POINT ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05478
GARAGE	Forests, Parks, & Recreation	\$ 44,414	2714 HATHAWAY POINT ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05478
CONTACT STATION	Forests, Parks, & Recreation	\$ 10,540	2714 HATHAWAY POINT ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05478
FILTER BUILDING	Forests, Parks, & Recreation	\$ 41,094	2714 HATHAWAY POINT ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05478

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
PICNIC SHELTER	Forests, Parks, & Recreation	\$ 40,897	2714 HATHAWAY POINT ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05478
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 93,468	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 116,553	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 116,553	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 86,057	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
GARAGE	Forests, Parks, & Recreation	\$ 59,219	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
STORAGE ROOM/BREAK ROOM	Forests, Parks, & Recreation	\$ 62,474	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
ASSISTANT RANGER'S QUARTERS	Forests, Parks, & Recreation	\$ 62,156	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
HELPER'S QUARTERS	Forests, Parks, & Recreation	\$ 62,156	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
CONCESSION BUILDING	Forests, Parks, & Recreation	\$ 110,806	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
NATURE CENTER	Forests, Parks, & Recreation	\$ 72,716	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
OFFICE	Forests, Parks, & Recreation	\$ 56,579	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
WOODSHED	Forests, Parks, & Recreation	\$ 29,919	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
PUMPHOUSE/FILTER BUILDING	Forests, Parks, & Recreation	\$ 60,128	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
DIMON CAMP	Forests, Parks, & Recreation	\$ 137,899	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
PUMP HOUSE	Forests, Parks, & Recreation	\$ 40,808	BURTON ISLAND	ST. ALBANS TOWN	FRANKLIN	VT	05478
CONTACT STATION	Forests, Parks, & Recreation	\$ 7,872	151 COON POINT ROAD	ALBURG	GRAND ISLE	VT	05440
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 254,419	151 COON POINT ROAD	ALBURG	GRAND ISLE	VT	05440
BARN	Forests, Parks, & Recreation	\$ 56,101	151 COON POINT ROAD	ALBURG	GRAND ISLE	VT	05440

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
AIRPLANE HANGAR	Forests, Parks, & Recreation	\$ 59,143	151 COON POINT ROAD	ALBURG	GRAND ISLE	VT	05440
WOOD SHOP	Forests, Parks, & Recreation	\$ 20,984	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
RECREATION BUILDING	Forests, Parks, & Recreation	\$ 271,039	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 141,381	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 26,119	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 37,312	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 48,346	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
TOILET BUILDING #4	Forests, Parks, & Recreation	\$ 48,346	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
TOILET BUILDING #6	Forests, Parks, & Recreation	\$ 59,166	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
HELPERS QUARTERS	Forests, Parks, & Recreation	\$ 177,051	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
GARAGE	Forests, Parks, & Recreation	\$ 39,514	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
STORAGE BARN	Forests, Parks, & Recreation	\$ 56,244	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
WOODSHED	Forests, Parks, & Recreation	\$ 33,673	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
CONTACT STATION	Forests, Parks, & Recreation	\$ 56,960	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
CABIN 2	Forests, Parks, & Recreation	\$ 19,335	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
CABIN 3	Forests, Parks, & Recreation	\$ 19,335	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
CABIN 4	Forests, Parks, & Recreation	\$ 19,335	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
CABIN 1	Forests, Parks, & Recreation	\$ 20,831	36 E SHORE ROAD S	GRAND ISLE	GRAND ISLE	VT	05440
KNIGHT TAVERN	Forests, Parks, & Recreation	\$ 769,483	44 KNIGHT POINT ROAD	NORTH HERO	GRAND ISLE	VT	05474
BARN/SHOP	Forests, Parks, & Recreation	\$ 633,029	44 KNIGHT POINT ROAD	NORTH HERO	GRAND ISLE	VT	05474

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
TOILET BUILDING-MEN	Forests, Parks, & Recreation	\$ 33,900	44 KNIGHT POINT ROAD	NORTH HERO	GRAND ISLE	VT	05474
CONTACT STATION	Forests, Parks, & Recreation	\$ 10,540	44 KNIGHT POINT ROAD	NORTH HERO	GRAND ISLE	VT	05474
PARK SHELTER	Forests, Parks, & Recreation	\$ 66,203	44 KNIGHT POINT ROAD	NORTH HERO	GRAND ISLE	VT	05474
STORAGE BARN	Forests, Parks, & Recreation	\$ 117,301	44 KNIGHT POINT ROAD	NORTH HERO	GRAND ISLE	VT	05474
TOILET BUILDING-WOMEN	Forests, Parks, & Recreation	\$ 76,371	44 KNIGHT POINT ROAD	NORTH HERO	GRAND ISLE	VT	05474
PUMP HOUSE	Forests, Parks, & Recreation	\$ 28,283	3803 LAKEVIEW DRIVE	NORTH HERO	GRAND ISLE	VT	05474
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 104,992	3803 LAKEVIEW DRIVE	NORTH HERO	GRAND ISLE	VT	05474
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 37,312	3803 LAKEVIEW DRIVE	NORTH HERO	GRAND ISLE	VT	05474
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 37,312	3803 LAKEVIEW DRIVE	NORTH HERO	GRAND ISLE	VT	05474
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 37,312	3803 LAKEVIEW DRIVE	NORTH HERO	GRAND ISLE	VT	05474
TOILET BUILDING #4	Forests, Parks, & Recreation	\$ 17,270	3803 LAKEVIEW DRIVE	NORTH HERO	GRAND ISLE	VT	05474
GARAGE	Forests, Parks, & Recreation	\$ 38,504	3803 LAKEVIEW DRIVE	NORTH HERO	GRAND ISLE	VT	05474
WOODSHED	Forests, Parks, & Recreation	\$ 33,673	3803 LAKEVIEW DRIVE	NORTH HERO	GRAND ISLE	VT	05474
CONTACT STATION	Forests, Parks, & Recreation	\$ 10,892	3803 LAKEVIEW DRIVE	NORTH HERO	GRAND ISLE	VT	05474
INFORMATION STATION	Forests, Parks, & Recreation	\$ 8,717	3803 LAKEVIEW DRIVE	NORTH HERO	GRAND ISLE	VT	05474
LOOKOUT TOWER - ELMORE MTN	Forests, Parks, & Recreation	\$ 90,025	856 VT RT. 12 S	ELMORE	LAMOILLE	VT	05661
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 26,119	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 62,364	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
GARAGE	Forests, Parks, & Recreation	\$ 33,399	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
PUMP HOUSE	Forests, Parks, & Recreation	\$ 8,795	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
CONTACT STATION	Forests, Parks, & Recreation	\$ 56,383	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
NATURE SHELTER	Forests, Parks, & Recreation	\$ 30,335	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
PICNIC SHELTER	Forests, Parks, & Recreation	\$ 34,084	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 57,059	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
STAFF QUARTERS	Forests, Parks, & Recreation	\$ 57,059	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
BATHHOUSE	Forests, Parks, & Recreation	\$ 345,797	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
GARAGE #2	Forests, Parks, & Recreation	\$ 37,316	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
WOODSHED	Forests, Parks, & Recreation	\$ 18,456	856 VT RT. 12	ELMORE	LAMOILLE	VT	05657
BASE LODGE	Forestry	\$ 908,086	7248 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 17,270	7248 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 37,312	7248 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672
SKI DORM	Forests, Parks, & Recreation	\$ 564,034	6292 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672
SKI DORM GARAGE	Forests, Parks, & Recreation	\$ 38,911	6292 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672
INFORMATION BOOTH	Forests, Parks, & Recreation	\$ 24,078	7248 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 205,972	7248 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672
RANGER'S GARAGE	Forests, Parks, & Recreation	\$ 34,477	7248 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672
WOODSHED	Forests, Parks, & Recreation	\$ 7,987	7248 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672
CCC STONE HUT	Forests, Parks, & Recreation	\$ 125,676	6292 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672
TOILET BUILDING PICNIC AREA	Forests, Parks, & Recreation	\$ 76,375	8380 MOUNTAIN ROAD	STOWE	LAMOILLE	VT	05672

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
TOILET BUILDING NOTCH PROPER	Forests, Parks, & Recreation	\$ 85,652	6690 MOUNTAIN ROAD	CAMBRIDGE	LAMOILLE	VT	05444
ALLIS TOWER	Forests, Parks, & Recreation	\$ -	284 ALLIS STATE PARK ROAD	BROOKFIELD	ORANGE	VT	05036
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 237,373	284 ALLIS STATE PARK ROAD	BROOKFIELD	ORANGE	VT	05036
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 73,407	284 ALLIS STATE PARK ROAD	BROOKFIELD	ORANGE	VT	05036
PARK SHELTER	Forests, Parks, & Recreation	\$ -	284 ALLIS STATE PARK ROAD	BROOKFIELD	ORANGE	VT	05036
GARAGE	Forests, Parks, & Recreation	\$ 73,291	284 ALLIS STATE PARK ROAD	BROOKFIELD	ORANGE	VT	05036
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 126,497	622 ACADEMY ROAD	THETFORD	ORANGE	VT	05074
TOILET BUILDING	Forests, Parks, & Recreation	\$ 93,399	622 ACADEMY ROAD	THETFORD	ORANGE	VT	05074
WOODSHED	Forests, Parks, & Recreation	\$ 30,705	622 ACADEMY ROAD	THETFORD	ORANGE	VT	05074
BATHHOUSE	Forests, Parks, & Recreation	\$ 769,274	96 BELL WEATHER AVENUE	BARTON	ORLEANS	VT	05822
CONTACT STATION	Forests, Parks, & Recreation	\$ 1,331	96 BELL WEATHER AVENUE	BARTON	ORLEANS	VT	05822
GARAGE	Forests, Parks, & Recreation	\$ 18,422	96 BELL WEATHER AVENUE	BARTON	ORLEANS	VT	05822
CABIN	Forests, Parks, & Recreation	\$ 34,747	96 BELL WEATHER AVENUE	BARTON	ORLEANS	VT	05822
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 168,844	96 BELL WEATHER AVENUE	BARTON	ORLEANS	VT	05822
RESIDENCE	Forests, Parks, & Recreation	\$ 326,728	HINTON HILL ROAD	WESTMORE	ORLEANS	VT	05860
GUEST COTTAGE	Forests, Parks, & Recreation	\$ 6,855	HINTON HILL ROAD	WESTMORE	ORLEANS	VT	05861
WORKSHOP	Forests, Parks, & Recreation	\$ 3,428	HINTON HILL ROAD	WESTMORE	ORLEANS	VT	05862
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 401,498	22 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735
RANGER'S GARAGE	Forests, Parks, & Recreation	\$ 51,541	22 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
HELPER'S RESIDENCE	Forests, Parks, & Recreation	\$ 246,417	23 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 161,548	22 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 85,639	22 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735
RESTROOM/CONCESSION BUILDING	Forests, Parks, & Recreation	\$ 231,491	22 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735
RESIDENCE-GLEN LAKE	Forests, Parks, & Recreation	\$ 148,426	22 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735
GARAGE-GLEN LAKE	Forests, Parks, & Recreation	\$ 39,364	22 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735
CONTACT STATION	Forests, Parks, & Recreation	\$ 38,115	22 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735
WOODSHED	Forests, Parks, & Recreation	\$ 27,270	22 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735
PICNIC SHELTER	Forests, Parks, & Recreation	\$ 44,057	22 CEDAR MOUNTAIN ROAD	CASTLETON	RUTLAND	VT	05735
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 52,267	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	05732
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 95,610	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	05732
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 82,411	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	05732
GARAGE	Forests, Parks, & Recreation	\$ 43,489	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	05732
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 119,466	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	05732
TALL TIMBERS HELPER'S QUARTERS	Forests, Parks, & Recreation	\$ 83,559	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	05732
WOODSHED	Forests, Parks, & Recreation	\$ 30,209	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	05732
CABIN 1 (DRAGONFLY)	Forests, Parks, & Recreation	\$ 19,335	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	
CABIN 2 (CRICKET)	Forests, Parks, & Recreation	\$ 19,335	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	
CABIN 3 (BUTTERFLY)	Forests, Parks, & Recreation	\$ 19,335	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	
CABIN 4 (CATEPILLAR)	Forests, Parks, & Recreation	\$ 19,335	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
CABIN 5 (BEETLE)	Forests, Parks, & Recreation	\$ 19,335	1621 BLACK POND ROAD	HUBBARDTON	RUTLAND	VT	
CABIN 1	Forests, Parks, & Recreation	\$ 19,335	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	
CABIN 2	Forests, Parks, & Recreation	\$ 19,335	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	
CABIN 3	Forests, Parks, & Recreation	\$ 19,335	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	
CABIN 4	Forests, Parks, & Recreation	\$ 19,335	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	
LOOKOUT	Forests, Parks, & Recreation	\$ 1,409	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 457,147	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	05751
GARAGE	Forests, Parks, & Recreation	\$ 10,646	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	05751
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 137,627	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	05751
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 173,400	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	05751
GIFFORD WOODS DISTRICT SHOP	Forests, Parks, & Recreation	\$ 430,269	515 VT RT. 100	KILLINGTON	RUTLAND	VT	05751
STORAGE BUILDING	Forests, Parks, & Recreation	\$ 40,929	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	05751
SHED #2	Forests, Parks, & Recreation	\$ 42,966	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	05751
WOODSHED NEAR HOUSE	Forests, Parks, & Recreation	\$ 665	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	05751
PUMP HOUSE	Forests, Parks, & Recreation	\$ 2,663	34 GIFFORD WOODS ROAD	KILLINGTON	RUTLAND	VT	05751
PARK STORE	Forests, Parks, & Recreation	\$ 75,551	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346
BATHHOUSE	Forests, Parks, & Recreation	\$ 217,732	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 214,012	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346
RANGER'S GARAGE	Forests, Parks, & Recreation	\$ 46,309	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
HELPER'S QUARTERS #1	Forests, Parks, & Recreation	\$ 216,244	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346
HELPER'S QUARTERS #2	Forests, Parks, & Recreation	\$ 157,124	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346
CONTACT STATION	Forests, Parks, & Recreation	\$ 49,709	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 155,823	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 104,588	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346
STORAGE/SHOP	Forests, Parks, & Recreation	\$ 215,643	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346
WOODSHED	Forests, Parks, & Recreation	\$ 32,115	3034 VT RT. 30S	POULTNEY	RUTLAND	VT	05346
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 88,841	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 46,562	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
STAFF RESIDENCE	Forests, Parks, & Recreation	\$ 326,360	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
TOILET #3	Forests, Parks, & Recreation	\$ 27,451	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
RANGER RESIDENCE	Forests, Parks, & Recreation	\$ 99,350	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
STORAGE BUILDING	Forests, Parks, & Recreation	\$ 14,808	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
STORAGE SHED	Forests, Parks, & Recreation	\$ 7,466	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
TOILET BUILDING #4	Forests, Parks, & Recreation	\$ 195,272	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
WOODSHED	Forests, Parks, & Recreation	\$ 21,355	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
CONTACT STATION	Forests, Parks, & Recreation	\$ 57,119	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
TOILET BUILDING #5	Forests, Parks, & Recreation	\$ 148,351	177 RESERVOIR ROAD	WATERBURY	WASHINGTON	VT	05676
STORAGE GARAGE	Forests, Parks, & Recreation	\$ 34,300	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
CONCESSION BUILDING	Forests, Parks, & Recreation	\$ 31,710	177 RESERVOIR ROAD	WATERBURY	WASHINGTON	VT	05676

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
CABIN 1	Forests, Parks, & Recreation	\$ 20,871	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
CABIN 2	Forests, Parks, & Recreation	\$ 20,871	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
CABIN 3	Forests, Parks, & Recreation	\$ 20,871	3444 LITTLE RIVER ROAD	WATERBURY	WASHINGTON	VT	05676
SWEET POND RESIDENCE	Forests, Parks, & Recreation	\$ 293,691	2763 SWEET POND ROAD	GUILFORD	WINDHAM	VT	05301
GARAGE	Forests, Parks, & Recreation	\$ 2,663	2763 SWEET POND ROAD	GUILFORD	WINDHAM	VT	05301
STONE HOUSE	Forests, Parks, & Recreation	\$ 377,290	STATE FOREST ROAD	GRAFTON	WINDHAM	VT	05148
FARM HOUSE	Forests, Parks, & Recreation	\$ 178,351	517 OLD GUILFORD ROAD	GUILFORD	WINDHAM	VT	05301
GARAGE	Forests, Parks, & Recreation	\$ 49,992	517 OLD GUILFORD ROAD	GUILFORD	WINDHAM	VT	05301
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 103,199	517 OLD GUILFORD ROAD	GUILFORD	WINDHAM	VT	05301
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 91,349	517 OLD GUILFORD ROAD	GUILFORD	WINDHAM	VT	05301
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 95,092	517 OLD GUILFORD ROAD	GUILFORD	WINDHAM	VT	05301
OLD GARAGE	Forests, Parks, & Recreation	\$ 1,331	517 OLD GUILFORD ROAD	GUILFORD	WINDHAM	VT	05301
WOODSHED	Forests, Parks, & Recreation	\$ 4,660	517 OLD GUILFORD ROAD	GUILFORD	WINDHAM	VT	05301
PUMP HOUSE	Forests, Parks, & Recreation	\$ 26,912	517 OLD GUILFORD ROAD	GUILFORD	WINDHAM	VT	05301
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 127,262	48 SALMON HOLE LANE	JAMAICA	WINDHAM	VT	05343
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 56,787	48 SALMON HOLE LANE	JAMAICA	WINDHAM	VT	05343
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 119,614	48 SALMON HOLE LANE	JAMAICA	WINDHAM	VT	05343
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 92,213	48 SALMON HOLE LANE	JAMAICA	WINDHAM	VT	05343
PUMP HOUSE & STORAGE	Forests, Parks, & Recreation	\$ 3,992	48 SALMON HOLE LANE	JAMAICA	WINDHAM	VT	05343

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
GARAGE	Forests, Parks, & Recreation	\$ 38,518	48 SALMON HOLE LANE	JAMAICA	WINDHAM	VT	05343
NATURE CENTER	Forests, Parks, & Recreation	\$ 81,742	48 SALMON HOLE LANE	JAMAICA	WINDHAM	VT	05343
WOOD SHED	Forests, Parks, & Recreation	\$ 3,992	48 SALMON HOLE LANE	JAMAICA	WINDHAM	VT	05343
STAFF QUARTERS	Forests, Parks, & Recreation	\$ 305,732	1756 LITTLE POND ROAD	LONDONDERRY	WINDHAM	VT	05148
ACTIVITY BUILDING	Forests, Parks, & Recreation	\$ 175,290	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #1	Forests, Parks, & Recreation	\$ 58,298	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
GARAGE (4 BAY)	Forests, Parks, & Recreation	\$ 140,548	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
STORAGE BARN (SAWMILL)	Forests, Parks, & Recreation	\$ 89,866	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
STORAGE BARN	Forests, Parks, & Recreation	\$ 64,160	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
ISLAND CAMP	Forests, Parks, & Recreation	\$ 93,196	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #2	Forests, Parks, & Recreation	\$ 58,298	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #3	Forests, Parks, & Recreation	\$ 58,298	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #4	Forests, Parks, & Recreation	\$ 58,298	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #5	Forests, Parks, & Recreation	\$ 58,298	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #6	Forests, Parks, & Recreation	\$ 58,298	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #7	Forests, Parks, & Recreation	\$ 58,298	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #8	Forests, Parks, & Recreation	\$ 58,298	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #9	Forests, Parks, & Recreation	\$ 63,656	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #10	Forests, Parks, & Recreation	\$ 74,033	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
CABIN #11	Forests, Parks, & Recreation	\$ 74,033	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
BATHHOUSE #1	Forests, Parks, & Recreation	\$ 51,009	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
BATHHOUSE #2	Forests, Parks, & Recreation	\$ 51,009	1099 LOWELL LAKE ROAD	LONDONDERRY	WINDHAM	VT	05148
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 302,482	2755 STATE FOREST ROAD	TOWNSHEND	WINDHAM	VT	05353
TOILET BUILDING	Forests, Parks, & Recreation	\$ 71,931	2755 STATE FOREST ROAD	TOWNSHEND	WINDHAM	VT	05353
STORAGE BUILDING	Forests, Parks, & Recreation	\$ 3,992	2755 STATE FOREST ROAD	TOWNSHEND	WINDHAM	VT	05353
GARAGE	Forests, Parks, & Recreation	\$ 37,708	2755 STATE FOREST ROAD	TOWNSHEND	WINDHAM	VT	05353
PUMP HOUSE	Forests, Parks, & Recreation	\$ 2,663	2755 STATE FOREST ROAD	TOWNSHEND	WINDHAM	VT	05353
WOODSHED	Forests, Parks, & Recreation	\$ 4,660	2755 STATE FOREST ROAD	TOWNSHEND	WINDHAM	VT	05353
OLGA LOOKOUT TOWER	Forests, Parks, & Recreation	\$ -	705 VT RT. 9 E	WILMINGTON	WINDHAM	VT	05363
OLGA LOOKOUT BUILDING	Forests, Parks, & Recreation	\$ -	705 VT RT. 9 E	WILMINGTON	WINDHAM	VT	05363
RANGER'S RESIDENCE & GARAGE	Forests, Parks, & Recreation	\$ 126,914	705 VT RT. 9 E	WILMINGTON	WINDHAM	VT	05363
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 236,369	705 VT RT. 9 E	WILMINGTON	WINDHAM	VT	05363
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 68,600	705 VT RT. 9 E	WILMINGTON	WINDHAM	VT	05363
PUMP HOUSE	Forests, Parks, & Recreation	\$ 37,358	705 VT RT. 9 E	WILMINGTON	WINDHAM	VT	05363
PARK SHELTER	Forests, Parks, & Recreation	\$ 36,580	705 VT RT. 9 E	WILMINGTON	WINDHAM	VT	05363
RESTROOM/BATHHOUSE	Forests, Parks, & Recreation	\$ 154,339	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
STAFF QUARTERS	Forests, Parks, & Recreation	\$ 187,074	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
PUMP HOUSE/WORKSHOP	Forests, Parks, & Recreation	\$ 7,987	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
TOILET BUILDING #3	Forests, Parks, & Recreation	\$ 51,900	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 157,034	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
TOILET BUILDING #4	Forests, Parks, & Recreation	\$ 113,119	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
RANGER RESIDENCE	Forests, Parks, & Recreation	\$ 85,345	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
PUMP HOUSE #2 - DEEP WELL	Forests, Parks, & Recreation	\$ 3,328	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
WOODSHED	Forests, Parks, & Recreation	\$ 4,660	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
PICNIC SHELTER	Forests, Parks, & Recreation	\$ 31,988	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
STAFF GARAGE	Forests, Parks, & Recreation	\$ 42,662	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
CONCESSION BUILDING	Forests, Parks, & Recreation	\$ 62,683	20 STATE PARK BEACH ROAD	BARNARD	WINDSOR	VT	05821
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 230,271	764 DEWEY MILLS ROAD	HARTFORD	WINDSOR	VT	05047
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 218,591	5800 US RT 4	HARTFORD	WINDSOR	VT	05047
GARAGE BARN	Forests, Parks, & Recreation	\$ 187,635	764 DEWEY MILLS ROAD	HARTFORD	WINDSOR	VT	05047
WOODSHED	Forests, Parks, & Recreation	\$ 46,489	5800 US RT 4	HARTFORD	WINDSOR	VT	05047
CONTACT STATION	Forests, Parks, & Recreation	\$ 62,657	5800 US RT 4	HARTFORD	WINDSOR	VT	05047
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 106,763	5800 US RT 4	HARTFORD	WINDSOR	VT	05047
DINING HALL	Forests, Parks, & Recreation	\$ 328,917	2016 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
TOILET BUILDING #2	Forests, Parks, & Recreation	\$ 163,744	1960 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 80,431	1960 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
CHERRY CABIN (RENTAL)	Forests, Parks, & Recreation	\$ 81,307	1979 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
CONTACT STATION	Forests, Parks, & Recreation	\$ 6,654	1960 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
APPLE CABIN (RENTAL)	Forests, Parks, & Recreation	\$ 77,309	1963 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
PUMPHOUSE	Forests, Parks, & Recreation	\$ 1,997	1960 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
GARAGE	Forests, Parks, & Recreation	\$ 30,733	1960 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
LARGE PICNIC SHELTER	Forests, Parks, & Recreation	\$ 54,772	1960 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
SMALL PICNIC SHELTER	Forests, Parks, & Recreation	\$ 40,240	1960 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
TOILET BUILDING #1	Forests, Parks, & Recreation	\$ 88,691	1960 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
CONCESSION BUILDING	Forests, Parks, & Recreation	\$ 90,353	1960 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
MAPLE CABIN (RENTAL)	Forests, Parks, & Recreation	\$ 77,309	1951 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
BIRCH CABIN (RENTAL)	Forests, Parks, & Recreation	\$ 79,344	1945 SCOUT CAMP ROAD	PLYMOUTH	WINDSOR	VT	05056
STORAGE BARN-PINNEY HOLLOW	Forests, Parks, & Recreation	\$ 255,008	46 RANGER'S ROAD	PLYMOUTH	WINDSOR	VT	05056
RANGER'S RESIDENCE-BRADLEY HILL	Forests, Parks, & Recreation	\$ 172,097	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
STORAGE BARN-BRADLEY HILL	Forests, Parks, & Recreation	\$ 60,658	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
KILLINGTON BASE LODGE	Forests, Parks, & Recreation	\$ 4,137,923	4563 KILLINGTON ROAD	PLYMOUTH	WINDSOR	VT	
TOILET BUILDING #3-AREA B	Forests, Parks, & Recreation	\$ 61,100	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
PARK SHELTER-BRADLEY HILL	Forests, Parks, & Recreation	\$ -	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
TOILET BUILDING#4-BRADLEY HILL	Forests, Parks, & Recreation	\$ 10,646	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
TOILET BUILDING #2-AREA A	Forests, Parks, & Recreation	\$ 203,919	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
TOILET BUILDING #1-AREA A	Forests, Parks, & Recreation	\$ 58,794	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
WOODSHED	Forests, Parks, & Recreation	\$ 5,990	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
OLD BLACKSMITH SHOP	Forests, Parks, & Recreation	\$ 5,324	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
RESIDENCE-PINNEY HOLLOW	Forests, Parks, & Recreation	\$ 237,367	46 RANGER'S ROAD	PLYMOUTH	WINDSOR	VT	05056
STONE HOUSE NORTHAM	Forests, Parks, & Recreation	\$ 188,533	SHREWSBURY ROAD	PLYMOUTH	WINDSOR	VT	05056
KILLINGTON LOOKOUT TOWER	Forests, Parks, & Recreation	\$ 174,909	4563 KILLINGTON ROAD	PLYMOUTH	WINDSOR	VT	05056
KILLINGTON RADIO BLDG. & QRTS	Forests, Parks, & Recreation	\$ 132,341	4563 KILLINGTON ROAD	PLYMOUTH	WINDSOR	VT	05056
COMMUNICATIONS TOWER	Forests, Parks, & Recreation	\$ 35,403	4563 KILLINGTON ROAD	PLYMOUTH	WINDSOR	VT	05056
JANEY SCHREIBER MEMORIAL NATURE CENTER	Forests, Parks, & Recreation	\$ 54,632	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
CONTACT STATION	Forests, Parks, & Recreation	\$ 7,650	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
STORAGE SHED	Forests, Parks, & Recreation	\$ 19,335	855 COOLIDGE STATE PARK ROAD	PLYMOUTH	WINDSOR	VT	05056
MAIN BUILDING	Forestry	\$ 489,256	DOWNER ROAD	SHARON	WINDSOR	VT	05065
DIRECTOR'S CABIN	Forestry	\$ 78,089	DOWNER ROAD	SHARON	WINDSOR	VT	05065
NURSE'S CABIN	Forestry	\$ 66,939	DOWNER ROAD	SHARON	WINDSOR	VT	05065
GARAGE	Forestry	\$ 41,873	DOWNER ROAD	SHARON	WINDSOR	VT	05065
TOILET/SHOWER BUILDING	Forestry	\$ 70,462	DOWNER ROAD	SHARON	WINDSOR	VT	05065
4-H RECREATION HALL	Forestry	\$ 205,454	DOWNER ROAD	SHARON	WINDSOR	VT	05065
CRAFTS CENTER	Forestry	\$ 72,641	DOWNER ROAD	SHARON	WINDSOR	VT	05065
NATURE CENTER	Forestry	\$ 72,412	DOWNER ROAD	SHARON	WINDSOR	VT	05065
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 345,356	3985 US RT. 5	WEATHERSFIELD	WINDSOR	VT	05156
TOILET BUILDING	Forests, Parks, & Recreation	\$ 112,299	3985 US RT. 5	WEATHERSFIELD	WINDSOR	VT	05156
PUMP HOUSE	Forests, Parks, & Recreation	\$ 40,788	3985 US RT. 5	WEATHERSFIELD	WINDSOR	VT	05156
CABIN 1	Forests, Parks, & Recreation	\$ 19,335	3985 US RT. 5	WEATHERSFIELD	WINDSOR	VT	05156

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
CABIN 2	Forests, Parks, & Recreation	\$ 19,335	3985 US RT. 5	WEATHERSFIELD	WINDSOR	VT	05156
ASCUTNEY TOWER	Forests, Parks, & Recreation	\$ 49,819	1826 BACK MOUNTAIN ROAD	WINDSOR	WINDSOR	VT	05089
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ -	1826 BACK MOUNTAIN ROAD	WINDSOR	WINDSOR	VT	05089
TOILET BUILDING - TENT AREA	Forests, Parks, & Recreation	\$ 158,804	1826 BACK MOUNTAIN ROAD	WINDSOR	WINDSOR	VT	05089
TOILET BUILDING - PICNIC AREA	Forests, Parks, & Recreation	\$ -	1826 BACK MOUNTAIN ROAD	WINDSOR	WINDSOR	VT	05089
PARK SHELTER	Forests, Parks, & Recreation	\$ 46,220	1826 BACK MOUNTAIN ROAD	WINDSOR	WINDSOR	VT	05089
TOILET BUILDING - LEANTO AREA	Forests, Parks, & Recreation	\$ 106,148	1826 BACK MOUNTAIN ROAD	WINDSOR	WINDSOR	VT	05089
RECREATION CENTER	Forests, Parks, & Recreation	\$ 85,984	1826 BACK MOUNTAIN ROAD	WINDSOR	WINDSOR	VT	05089
GARAGE	Forests, Parks, & Recreation	\$ 53,348	1826 BACK MOUNTAIN ROAD	WINDSOR	WINDSOR	VT	05089
WOODSHED	Forests, Parks, & Recreation	\$ 3,992	1826 BACK MOUNTAIN ROAD	WINDSOR	WINDSOR	VT	05089
CONTACT STATION	Forests, Parks, & Recreation	\$ 46,391	1826 BACK MOUNTAIN ROAD	WINDSOR	WINDSOR	VT	05089
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 73,825	KNIGHT ISLAND	NORTH HERO	GRAND ISLE	VT	05474
STORAGE SHED	Forests, Parks, & Recreation	\$ 20,896	KNIGHT ISLAND	NORTH HERO	GRAND ISLE	VT	05474
RANGER'S RESIDENCE	Forests, Parks, & Recreation	\$ 236,216	274 RAYMOND ROAD	COLCHESTER	CHITTENDEN	VT	05446
JEROME FARM RESIDENCE	Fish & Wildlife	\$ 275,250	966 VT RT. 17 W	ADDISON	ADDISON	VT	05491
OPERATIONS BUILDING	Fish & Wildlife	\$ 307,471	966 VT RT. 17 W	ADDISON	ADDISON	VT	05491
STORAGE BUILDING	Fish & Wildlife	\$ 176,109	966 VT RT. 17 W	ADDISON	ADDISON	VT	05491
OIL STORAGE BUILDING	Fish & Wildlife	\$ 7,321	966 VT RT. 17 W	ADDISON	ADDISON	VT	05491
GRAIN STORAGE BUILDING	Fish & Wildlife	\$ 21,220	966 VT RT. 17 W	ADDISON	ADDISON	VT	05491

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
BROODER HOUSE	Fish & Wildlife	\$ 22,719	966 VT RT. 17 W	ADDISON	ADDISON	VT	05491
GOOSE WINTERING HOUSE	Fish & Wildlife	\$ 142,427	966 VT RT. 17 W	ADDISON	ADDISON	VT	05491
LABORATORY	Fish & Wildlife	\$ 69,652	966 VT RT. 17 W	ADDISON	ADDISON	VT	05491
WINCH LOT BUILDING	Fish & Wildlife	\$ 27,947	966 VT RT. 17 W	ADDISON	ADDISON	VT	05491
JEROME FARM BARN	Fish & Wildlife	\$ 349,655	1470 GAGE ROAD	ADDISON	ADDISON	VT	05491
CONCRETE BLOCK	Fish & Wildlife	\$ 27,504	966 VT. RT 17 W	ADDISON	ADDISON	VT	05491
RESIDENCE/HATCHERY	Fish & Wildlife	\$ 856,604	646 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
SERVICE BUILDING	Fish & Wildlife	\$ 47,222	646 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
PUMP HOUSE #3	Fish & Wildlife	\$ 53,502	646 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
PUMP HOUSE #2	Fish & Wildlife	\$ 10,981	646 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
LIGHT CONTROL STRUCTURE	Fish & Wildlife	\$ 144,223	646 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
MOBILE HOUSE	Fish & Wildlife	\$ 58,526	646 LAKE DUNMORE ROAD	SALISBURY	ADDISON	VT	05769
SERVICE BUILDING	Fish & Wildlife	\$ 223,475	110 HATCHERY ROAD	BENNINGTON	BENNINGTON	VT	05201
FISH HATCHERY	Fish & Wildlife	\$ 278,133	110 HATCHERY ROAD	BENNINGTON	BENNINGTON	VT	05201
RESIDENCE	Fish & Wildlife	\$ 230,876	110 HATCHERY ROAD	BENNINGTON	BENNINGTON	VT	05201
OFFICE	Fish & Wildlife	\$ 83,502	110 HATCHERY ROAD	BENNINGTON	BENNINGTON	VT	05201
GARAGE	Fish & Wildlife	\$ 32,442	110 HATCHERY ROAD	BENNINGTON	BENNINGTON	VT	05201
AERATION BUILDING	Fish & Wildlife	\$ 63,580	110 HATCHERY ROAD	BENNINGTON	BENNINGTON	VT	05201
WATER TREATMENT FACILITY	Fish & Wildlife	\$ 191,882	110 HATCHERY ROAD	BENNINGTON	BENNINGTON	VT	05201
BECKWORTH HOUSE	Fish & Wildlife	\$ 490,190	134 VT RT. 7A S	MANCHESTER	BENNINGTON	VT	05255

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
UTILITY BUILDING	Fish & Wildlife	\$ 114,907	134 VT RT. 7A S	MANCHESTER	BENNINGTON	VT	05255
PINE MT WMA BARN	Fish & Wildlife	\$ 22,998	POWER SPRING ROAD	GROTON	CALEDONIA	VT	05046
SERVICE BUILDING	Fish & Wildlife	\$ 115,256	60 ABBOTT HILL ROAD	NEWARK	CALEDONIA	VT	05871
RESIDENCE	Fish & Wildlife	\$ 208,649	60 ABBOTT HILL RD	NEWARK	CALEDONIA	VT	05871
SCHOOL HOUSE	Fish & Wildlife	\$ 2,426	60 ABBOTT HILL RD	NEWARK	CALEDONIA	VT	05871
FISH HATCHERY	Fish & Wildlife	\$ 602,554	60 ABBOTT HILL ROAD	NEWARK	CALEDONIA	VT	05871
LOWER QUONSET HUT	Fish & Wildlife	\$ 165,475	60 ABBOTT HILL ROAD	NEWARK	CALEDONIA	VT	05871
SPRING WATER BUILDING	Fish & Wildlife	\$ 41,109	60 ABBOTT HILL ROAD	NEWARK	CALEDONIA	VT	05871
UPPER QUONSET HUT	Fish & Wildlife	\$ 102,833	60 ABBOTT HILL ROAD	NEWARK	CALEDONIA	VT	05871
FILTER BUILDING	Fish & Wildlife	\$ 531,554	60 ABBOTT HILL ROAD	NEWARK	CALEDONIA	VT	05871
FOREMAN'S RESIDENCE	Fish & Wildlife	\$ 190,116	50 GRAVELLE ROAD	MILTON	CHITTENDEN	VT	05468
GARAGE	Fish & Wildlife	\$ 46,793	50 GRAVELLE ROAD	MILTON	CHITTENDEN	VT	05468
STORAGE SHED - BOATS	Fish & Wildlife	\$ 60,184	50 GRAVELLE ROAD	MILTON	CHITTENDEN	VT	05468
STORAGE SHED-EQUIPMENT	Fish & Wildlife	\$ 70,298	50 GRAVELLE ROAD	MILTON	CHITTENDEN	VT	05468
BARN	Fish & Wildlife	\$ 69,713	50 GRAVELLE ROAD	MILTON	CHITTENDEN	VT	05468
OFFICE & GARAGE	Fish & Wildlife	\$ 275,702	50 GRAVELLE ROAD	MILTON	CHITTENDEN	VT	05468
OIL HOUSE	Fish & Wildlife	\$ 2,195	50 GRAVELLE ROAD	MILTON	CHITTENDEN	VT	05468
RESIDENCE	Fish & Wildlife	\$ 219,345	50 GRAVELLE ROAD	MILTON	CHITTENDEN	VT	05468
FERDINAND CAMP	Fish & Wildlife	\$ 70,872	PAUL STREAM ROAD	FERDINAND	ESSEX	VT	05905

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
BOAT HOUSE	Fish & Wildlife	\$ 171,628	SANDY POINT ROAD	SWANTON	FRANKLIN	VT	05488
STORAGE BUILDING	Fish & Wildlife	\$ 65,782	SANDY POINT ROAD	SWANTON	FRANKLIN	VT	05488
COTTAGE	Fish & Wildlife	\$ 217,331	SANDY POINT ROAD	SWANTON	FRANKLIN	VT	05488
RESIDENCE-MANAGER	Fish & Wildlife	\$ 333,906	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
FILTRATION FACILITY	Fish & Wildlife	\$ 785,391	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
STONE HOUSE	Fish & Wildlife	\$ 1,655,077	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
GARAGE	Fish & Wildlife	\$ 99,849	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
SHED	Fish & Wildlife	\$ 32,791	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
MILK HOUSE	Fish & Wildlife	\$ 7,495	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
HORSE BARN	Fish & Wildlife	\$ 91,934	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
BARN	Fish & Wildlife	\$ 205,651	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
FISH HATCHERY-MAIN BUILDING	Fish & Wildlife	\$ 12,095,939	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
HATCHERY PUMPHOUSE	Fish & Wildlife	\$ 1,432,362	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
SLUDGE TREATMENT PLANT	Fish & Wildlife	\$ 565,288	54 WEST SHORE ROAD	GRAND ISLE	GRAND ISLE	VT	05458
ASSISTANT MANAGER HOUSE	Fish & Wildlife	\$ 207,219	1 FISH HATCHERY ROAD	GRAND ISLE	GRAND ISLE	VT	05458
ENGINEER HOUSE	Fish & Wildlife	\$ 207,219	3 FISH HATCHERY ROAD	GRAND ISLE	GRAND ISLE	VT	05458
DINING HALL	Fish & Wildlife	\$ 88,275	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
RECREATION HALL	Fish & Wildlife	\$ 75,298	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
COUNSELOR CABIN	Fish & Wildlife	\$ 56,026	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
BATHHOUSE	Fish & Wildlife	\$ 208,069	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
DIRECTOR'S CABIN	Fish & Wildlife	\$ 48,175	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
BUNK HOUSE #1	Fish & Wildlife	\$ 42,153	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
ADMINISTRATION BUILDING	Fish & Wildlife	\$ 37,775	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
STORAGE BUILDING	Fish & Wildlife	\$ 6,654	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
NEW TRAILER	Fish & Wildlife	\$ 66,829	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
BATHROOM	Fish & Wildlife	\$ 6,654	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
PUMP HOUSE	Fish & Wildlife	\$ 32,692	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
BUNK HOUSE #2	Fish & Wildlife	\$ 42,153	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
BUNK HOUSE #3	Fish & Wildlife	\$ 42,153	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
BUNK HOUSE #4	Fish & Wildlife	\$ 42,153	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
BUNK HOUSE #5	Fish & Wildlife	\$ 42,153	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
BUNK HOUSE #6	Fish & Wildlife	\$ 42,153	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
BUNK HOUSE #7	Fish & Wildlife	\$ 43,242	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
FLEETWOOD WAVERLY CREST	Fish & Wildlife	\$ 163,569	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
METAL FABRICATING SHOP	Fish & Wildlife	\$ 105,936	634 POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
EDUCATION CENTER/DINING HALL	Fish & Wildlife	\$ 1,351,519	POINT OF PINES ROAD	CASTLETON	RUTLAND	VT	05735
FISH HATCHERY AND LAB	Fish & Wildlife	\$ 267,511	3693 ROXBURY ROAD	ROXBURY	WASHINGTON	VT	05669
GARAGE	Fish & Wildlife	\$ 96,267	3902 ROXBURY ROAD	ROXBURY	WASHINGTON	VT	05669
SERVICE BUILDING	Fish & Wildlife	\$ 62,848	3696 ROXBURY ROAD	ROXBURY	WASHINGTON	VT	05669

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
CCC BUILDING	Fish & Wildlife	\$ 104,376	3696 ROXBURY ROAD	ROXBURY	WASHINGTON	VT	05669
BIOLOGY BUILDING	Fish & Wildlife	\$ 326,092	3902 ROXBURY ROAD	ROXBURY	WASHINGTON	VT	05669
STORAGE BARN	Fish & Wildlife	\$ 84,462	3696 ROXBURY ROAD	ROXBURY	WASHINGTON	VT	05669
SPRING HOUSE	Fish & Wildlife	\$ 61,803	3696 ROXBURY ROAD	ROXBURY	WASHINGTON	VT	05669
BATH HOUSE	Fish & Wildlife	\$ 233,981	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
ADMINISTRATION BUILDING	Fish & Wildlife	\$ 77,719	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
GARAGE	Fish & Wildlife	\$ 66,544	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
KITCHEN MESS HALL	Fish & Wildlife	\$ 169,388	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
LATRINE #2	Fish & Wildlife	\$ 3,661	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
LATRINE #3	Fish & Wildlife	\$ 3,661	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
LATRINE #4	Fish & Wildlife	\$ 5,124	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
COTTAGE #1	Fish & Wildlife	\$ 67,649	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
COTTAGE #2	Fish & Wildlife	\$ 69,806	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
COTTAGE #3	Fish & Wildlife	\$ 72,881	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
BUNK HOUSE #1	Fish & Wildlife	\$ 52,003	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
STORAGE BUILDINGS (2)	Fish & Wildlife	\$ 5,124	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
BUNK HOUSE #2	Fish & Wildlife	\$ 53,850	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
BUNK HOUSE #3	Fish & Wildlife	\$ 53,850	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
BUNK HOUSE #4	Fish & Wildlife	\$ 53,850	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
BUNK HOUSE #5	Fish & Wildlife	\$ 53,850	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
BUNK HOUSE #6	Fish & Wildlife	\$ 53,850	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
PUMP HOUSE	Fish & Wildlife	\$ 30,884	BUCK LAKE ROAD	WOODBURY	WASHINGTON	VT	05681
UPTON CAMP	Fish & Wildlife	\$ 58,719	DENNIS POND ROAD	BRUNSWICK	ESSEX	VT	05905
VERGENNES ARMORY	Military	\$ 1,794,899	37 MONKTON ROAD	VERGENNES	ADDISON	VT	05491
VERGENNES ARMORY STORAGE	Military	\$ 60,461	37 MONKTON ROAD	VERGENNES	ADDISON	VT	05491
BENNINGTON ARMORY	Military	\$ 2,263,701	100 FRANKLIN LANE	BENNINGTON	BENNINGTON	VT	05201
LYNDONVILLE ARMORY	Military	\$ 1,864,118	4 HIGH STREET	LYNDONVILLE	CALEDONIA	VT	05851
OMS BUILDING	Military	\$ 357,314	286 HILL STREET	LYNDONVILLE	CALEDONIA	VT	05851
LYNDONVILLE ARMORY STORAGE	Military	\$ 47,749	286 HILL STREET	LYNDONVILLE	CALEDONIA	VT	05851
LYNDONVILLE HEMTT STORAGE SHELTER	Military	\$ 56,423	286 HILL STREET	LYNDONVILLE	CALEDONIA	VT	05851
ADMINISTRATIVE HEADQUARTERS	Military	\$ 1,512,144	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
CAMP JOHNSON OMS	Military	\$ 731,310	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
CAMP JOHNSON USPFO/WAREHOUSE	Military	\$ 1,845,168	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
CAMP JOHNSON ADMINISTRATION/WA	Military	\$ 1,033,138	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
COMBINED SUPPORT MAINTENANCE	Military	\$ 7,656,638	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 9-4	Military	\$ 84,569	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 9-5	Military	\$ 84,569	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 9-6	Military	\$ 84,569	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 10-5	Military	\$ 83,663	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
BLDG. 10-6	Military	\$ 82,652	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 10-7	Military	\$ 83,663	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 10-8	Military	\$ 83,663	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 10-9	Military	\$ 82,652	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 10-10	Military	\$ 82,652	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 10-11	Military	\$ 82,652	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 10-12	Military	\$ 82,652	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 10-13	Military	\$ 82,652	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 5-2	Military	\$ 130,978	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 5-11 (SALT SHED)	Military	\$ 54,719	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 17	Military	\$ 302,343	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 5-9	Military	\$ 133,776	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 9-7	Military	\$ 237,197	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 9	Military	\$ 394,314	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 14	Military	\$ 478,522	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 18	Military	\$ 177,457	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 9-2	Military	\$ 48,602	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 19	Military	\$ 113,153	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 16	Military	\$ 257,400	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG. 3-1	Military	\$ 210,731	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
CJ PUMP HOUSE	Military	\$ 195,279	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
OLD CJ PUMP HOUSE	Military	\$ 161,244	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
CJ USPFO FORKLIFT STORAGE BLDG	Military	\$ 164,529	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
LATRINE BUILDING 9-1	Military	\$ 84,569	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
CLASS 9 POLE BARN SHELTER	Military	\$ 70,616	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
WOOD CHIP STORAGE SILO	Military	\$ 76,446	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
BLDG 5 SECONDARY CONTAINMENT	Military	\$ 135,423	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
VTANG INFORMATION SYSTEM FACILITY	Military	\$ 6,434,990	789 VERMONT NATIONAL GUARD ROAD	COLCHESTER	CHITTENDEN	VT	05446
WILLISTON ARMORY	Military	\$ 1,661,836	708 WILLISTON ROAD	WILLISTON	CHITTENDEN	VT	05495
WINOOSKI ARMORY	Military	\$ 1,588,035	255 LA FOUNTAIN STREET	WINOOSKI	CHITTENDEN	VT	05404
ENOSBURG ARMORY	Military	\$ 1,720,837	134 PEARL STREET	ENOSBURG	FRANKLIN	VT	05450
ENOSBURG STORAGE	Military	\$ 60,288	134 PEARL STREET	ENOSBURG	FRANKLIN	VT	05450
ST. ALBANS ARMORY	Military	\$ 2,295,027	18 FAIRFIELD STREET	ST. ALBANS	FRANKLIN	VT	05450
SWANTON ARMORY	Military	\$ 1,706,085	13 FERRIS STREET	SWANTON	FRANKLIN	VT	05488
SWANTON ARMORY STORAGE	Military	\$ 63,265	13 FERRIS STREET	SWANTON	FRANKLIN	VT	05488
MORRISVILLE ARMORY	Military	\$ 1,712,466	45 FARR AVENUE	MORRISVILLE	LAMOILLE	VT	05661
MORRISVILLE ARMORY STORAGE	Military	\$ 71,479	45 FARR AVENUE	MORRISVILLE	LAMOILLE	VT	05661
BRADFORD ARMORY	Military	\$ 1,706,946	FAIRGROUND ROAD	BRADFORD	ORANGE	VT	05033
BRADFORD ARMORY STORAGE	Military	\$ 56,298	FAIRGROUND ROAD	BRADFORD	ORANGE	VT	05033

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
NEWPORT ARMORY	Military	\$ 13,715,891	540 UNION STREET	NEWPORT	ORLEANS	VT	05855
NEWPORT ARMORY STORAGE	Military	\$ 60,288	540 UNION STREET	NEWPORT	ORLEANS	VT	05855
RUTLAND ARMORY	Military	\$ 4,299,887	15 WEST STREET	RUTLAND	RUTLAND	VT	05701
RUTLAND MVSB	Military	\$ 433,314	15 WEST STREET	RUTLAND	RUTLAND	VT	05701
BERLIN ARMORY STORAGE	Military	\$ 244,327	363 FISHER ROAD	BERLIN	WASHINGTON	VT	05602
ARMORY	Military	\$ 3,080,619	363 FISHER ROAD	BERLIN	WASHINGTON	VT	05602
WATERBURY ARMORY	Military	\$ 1,834,808	11 ARMORY DR	WATERBURY	WASHINGTON	VT	05676
WATERBURY ARMORY STORAGE	Military	\$ 92,817	11 ARMORY DRIVE	WATERBURY	WASHINGTON	VT	05676
WESTMINSTER ARMORY	Military	\$ 2,310,091	SANDHILL LANE	WESTMINSTER	WINDHAM	VT	05158
WESTMINSTER ARMORY OMS	Military	\$ 782,005	SANDHILL ROAD	WESTMINSTER	WINDHAM	VT	05158
WESTMINSTER ARMORY STORAGE	Military	\$ 106,980	SANDHILL ROAD	WESTMINSTER	WINDHAM	VT	05158
WESTMINSTER GARAGE	Military	\$ 61,971	SANDHILL ROAD	WESTMINSTER	WINDHAM	VT	05158
WESTMINSTER FIRING RANGE	Military	\$ 1,389,618	SANDHILL LANE	WESTMINSTER	WINDHAM	VT	05158
CLASSROOM	Military	\$ 60,296	SANDHILL LANE	WESTMINSTER	WINDHAM	VT	05158
AMMUNITION BREAKDOWN BLDG	Military	\$ 16,758	SANDHILL LANE	WESTMINSTER	WINDHAM	VT	05158
CHP	Military	\$ 839,901	SANDHILL LANE	WESTMINSTER	WINDHAM	VT	05158
SPRINGFIELD ARMORY	Military	\$ 1,624,303	224 FAIRGROUNDS ROAD	SPRINGFIELD	WINDSOR	VT	05156
SPRINGFIELD OMS	Military	\$ 332,923	224 FAIRGROUNDS ROAD	SPRINGFIELD	WINDSOR	VT	05156
WINDSOR ARMORY STORAGE	Military	\$ 54,721	LA FOUNTAIN STREET	WINDSOR	WINDSOR	VT	05089
WINDSOR ARMORY	Military	\$ 1,817,092	LA FOUNTAIN STREET	WINDSOR	WINDSOR	VT	05089

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
FAIR HAVEN FMS #2	Military	\$ 1,112,811	792 AIRPORT ROAD	FAIR HAVEN	RUTLAND	VT	05743
FUEL BARN	Military	\$ 81,074	792 AIRPORT ROAD	FAIR HAVEN	RUTLAND	VT	05743
ST. ALBANS OMS	Military	\$ 298,432	666 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS MOTOR VEHICLE STOR	Military	\$ 353,942	666 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS MOTOR VEHICLE STORAGE	Military	\$ 174,389	666 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
ST. ALBANS FMS UNHEATED STORAGE	Military	\$ 66,445	666 LOWER NEWTON ROAD	ST. ALBANS TOWN	FRANKLIN	VT	05450
DEPT. OF EMPLOYMENT & TRAINING	Employment & Training	\$ 2,891,243	59-63 PEARL STREET	BURLINGTON	CHITTENDEN	VT	05401
VETERAN'S HOME ADMINISTRATION	Veterans Home	\$ 3,393,108	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
CHAPEL/MULTI-PURPOSE	Veterans Home	\$ 1,096,161	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
BOILER/LAUNDRY BUILDING	Veterans Home	\$ 2,756,097	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
COMMANDANT'S HOUSE	Veterans Home	\$ 310,152	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
UTILITY SHOP - BUILDING #7	Veterans Home	\$ 41,021	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
VETERAN'S HOME-4 BAY GARAGE	Veterans Home	\$ 49,501	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
COW BARN BUILDING #10	Veterans Home	\$ 254,837	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
HAY BARN - BUILDING #11	Veterans Home	\$ 250,735	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
STORAGE BUILDING #12	Veterans Home	\$ 41,901	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
ORIGINAL HOSPITAL	Veterans Home	\$ 9,415,424	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
VETERAN'S HOME 1978 ADDITION	Veterans Home	\$ 7,504,344	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201
VETERAN'S HOME 1985 ADDITION	Veterans Home	\$ 4,572,237	325 N. MAIN STREET	BENNINGTON	BENNINGTON	VT	05201

Appendix R

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
AGENCY OF NATURAL RESOURCES OFC	Natural Resources	\$ 746,188	111 WEST ST	ESSEX JUNCTION	CHITTENDEN	VT	05452
FISH AND WILDLIFE OFFICE	Fish & Wildlife	\$ 491,576	111 WEST ST	ESSEX JUNCTION	CHITTENDEN	VT	05452
FORESTRY, PARKS, REC OFFICE	Forestry	\$ 472,453	111 WEST ST	ESSEX JUNCTION	CHITTENDEN	VT	05452
FLAMMABLE STRG. BUILDING #17	Forestry	\$ 10,646	111 WEST STREET	ESSEX JUNCTION	CHITTENDEN	VT	05452
TOILET BUILDING #6	Forestry	\$ 5,856	OLD COLCHESTER ROAD	ESSEX JUNCTION	CHITTENDEN	VT	05452
STORAGE GARAGE #12	Forestry	\$ 117,370	111 WEST STREET	ESSEX JUNCTION	CHITTENDEN	VT	05452
VERMONT MONITORING CORP	Forestry	\$ 126,332	111 WEST ST	ESSEX JUNCTION	CHITTENDEN	VT	05452
MECHANIC/WOODWORK SHOP	Forestry	\$ 340,648	111 WEST ST	ESSEX JUNCTION	CHITTENDEN	VT	05452
STATE LANDS WORKSHOP	Forestry	\$ 30,335	111 WEST STREET	ESSEX JUNCTION	CHITTENDEN	VT	05452
FOREST PROTECTION WAREHOUSE	Forestry	\$ 71,832	111 WEST STREET	ESSEX JUNCTION	CHITTENDEN	VT	05452
VEHICLE STORAGE BUILDING #19	Forestry	\$ 165,926	111 WEST ST	ESSEX JUNCTION	CHITTENDEN	VT	05452
WOOD CHIP STRG. BUILDING #20	Forestry	\$ 9,583	111 WEST ST	ESSEX JUNCTION	CHITTENDEN	VT	05452
BUILDING 1705	Buildings & General Services	\$ 873,244	1705 HEGEMAN AVENUE	COLCHESTER	CHITTENDEN	VT	05446
BUILDING 1710	Buildings & General Services	\$ 836,759	1710 HEGEMAN AVENUE	COLCHESTER	CHITTENDEN	VT	05446
STORAGE BUILDING (1707)	Buildings & General Services	\$ 246,124	1707 HEGEMAN AVENUE	COLCHESTER	CHITTENDEN	VT	05446
CHIMNEY POINT TAVERN	Historic Preservation	\$ -	7305 VT RT. 125	ADDISON	ADDISON	VT	05734
INFORMATION CENTER	Historic Preservation	\$ -	7305 VT RT. 125	ADDISON	ADDISON	VT	05734
CHIMNEY POINT GARAGE	Historic Preservation	\$ -	7305 VT RT. 125	ADDISON	ADDISON	VT	05734
CHIMNEY POINT PRIVY	Historic Preservation	\$ -	7305 VT RT. 125	ADDISON	ADDISON	VT	05734
STORAGE BUILDING	Historic Preservation	\$ 1,331	7305 VT RT. 125	ADDISON	ADDISON	VT	05734

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
NEW HAVEN JUNCTION RR STATION	Historic Preservation	\$ -	5450 ETHAN ALLEN HIGHWAY	NEW HAVEN	ADDISON	VT	05472
MT. INDEPENDENCE VISITOR CENTER	Historic Preservation	\$ 1,769,802	497 MOUNT INDEPENDENCE ROAD	ORWELL	ADDISON	VT	05760
MT. INDEPENDENCE BISHOP CABIN	Historic Preservation	\$ -	689 MOUNT INDEPENDENCE ROAD	ORWELL	ADDISON	VT	05472
MT. INDEPENDENCE MAINTENANCE SHED	Historic Preservation	\$ 14,035	497 MOUNT INDEPENDENCE ROAD	ORWELL	ADDISON	VT	05472
SHOREHAM COVERED RR BRIDGE	Historic Preservation	\$ -	TOWN HWAY 48	SHOREHAM	ADDISON	VT	05770
CARETAKER'S RESIDENCE	Historic Preservation	\$ -	15 MONUMENT CIRCLE	BENNINGTON	BENNINGTON	VT	05201
WORKSHOP GARAGE	Historic Preservation	\$ -	15 MONUMENT CIRCLE	BENNINGTON	BENNINGTON	VT	05201
PUBLIC FACILITY BUILDING	Historic Preservation	\$ -	15 MONUMENT CIRCLE	BENNINGTON	BENNINGTON	VT	05201
BENNINGTON MONUMENT	Historic Preservation	\$ -	15 MONUMENT CIRCLE	BENNINGTON	BENNINGTON	VT	05201
ETHAN ALLEN MONUMENT	Historic Preservation	\$ -	GREENMOUNT CEMETERY	BURLINGTON	CHITTENDEN	VT	05201
CHESTER ARTHUR HISTORIC SITE	Historic Preservation	\$ 101,628	4588 CHESTER ARTHUR ROAD	FAIRFIELD	FRANKLIN	VT	05455
PUMP BUILDING	Historic Preservation	\$ 6,097	4588 CHESTER ARTHUR ROAD	FAIRFIELD	FRANKLIN	VT	05455
NORTH FAIRFIELD CHURCH	Historic Preservation	\$ -	5964 DUFFY HILL ROAD	FAIRFIELD	FRANKLIN	VT	05455
HIGHGATE FALLS PARABOLIC TRUSS	Historic Preservation	\$ -	VT RT. 207, TOWN HWAY 2	HIGHGATE	FRANKLIN	VT	05459
HYDE LOG CABIN	Historic Preservation	\$ -	228 US RT. 2	GRAND ISLE	GRAND ISLE	VT	05458
PUBLIC FACILITY	Historic Preservation	\$ -	228 US RT. 2	GRAND ISLE	GRAND ISLE	VT	05458
FISHER COVERED RR BRIDGE	Historic Preservation	\$ -	6640 VT RT. 15 E	WOLCOTT	LAMOILLE	VT	05680
IRONWORKS	Historic Preservation	\$ 11,977	BLAST FURNACE RD	BRANDON	RUTLAND	VT	
MORRILL HOMESTEAD	Historic Preservation	\$ -	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
HOT HOUSE	Historic Preservation	\$ 1,331	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072
MORRILL COW BARN	Historic Preservation	\$ -	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072
MORRILL BLACKSMITH SHOP	Historic Preservation	\$ -	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072
MORRILL CARRIAGE/HORSE BARN	Historic Preservation	\$ -	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072
MORRILL PAINT SHOP/RESTROOMS	Historic Preservation	\$ -	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072
SHUFFLE BOARD COURT	Historic Preservation	\$ -	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072
CORN CRIB	Historic Preservation	\$ -	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072
SHEEP BARN	Historic Preservation	\$ -	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072
ICE HOUSE	Historic Preservation	\$ -	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072
EDUCATION CENTER	Historic Preservation	\$ 442,689	214 JUSTIN MORRILL MEMORIAL HWY	STRAFFORD	ORANGE	VT	05072
BATTLEFIELD VISITOR CENTER	Historic Preservation	\$ -	5696 MONUMENT HILL ROAD	HUBBARDTON	RUTLAND	VT	05732
FULLER HOUSE	Historic Preservation	\$ -	5696 MONUMENT HILL ROAD	HUBBARDTON	RUTLAND	VT	05732
FULLER BARN	Historic Preservation	\$ -	5696 MONUMENT HILL ROAD	HUBBARDTON	RUTLAND	VT	05732
PAUL HOUSE	Historic Preservation	\$ -	5696 MONUMENT HILL ROAD	HUBBARDTON	RUTLAND	VT	05732
SCHOOL HOUSE	Historic Preservation	\$ -	5696 MONUMENT HILL ROAD	HUBBARDTON	RUTLAND	VT	05732
HAMMOND COVERED BRIDGE	Historic Preservation	\$ -	TOWN HWAY 1	PITTSFORD	RUTLAND	VT	05763
KENT TAVERN	Historic Preservation	\$ -	7 OLD WEST CHURCH ROAD	CALAIS	WASHINGTON	VT	05648
KENT BARN	Historic Preservation	\$ -	7 OLD WEST CHURCH ROAD	CALAIS	WASHINGTON	VT	05648
SCOTT COVERED BRIDGE	Historic Preservation	\$ -	VT RT. 30 S	TOWNSHEND	WINDHAM	VT	05353
BRADLEY LAW OFFICE	Historic Preservation	\$ -	3613 US RT. 5	WESTMINSTER	WINDHAM	VT	05158

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
MEDBURYVILLE IRON BRIDGE	Historic Preservation	\$ -	VT RT. 9	WILMINGTON	WINDHAM	VT	05353
THERON BOYD HOUSE	Historic Preservation	\$ -	75 HILLSIDE ROAD	HARTFORD	WINDSOR	VT	05047
THERON BOYD BARN	Historic Preservation	\$ -	75 HILLSIDE ROAD	HARTFORD	WINDSOR	VT	05047
ALDRICH TOURIST SHOP	Historic Preservation	\$ -	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
ALDRICH ASH HOUSE	Historic Preservation	\$ 1,331	249 COOLIDGE MEMORIAL ROAD	PLYMOUTH	WINDSOR	VT	05056
ADRICH SHOWER SHACK	Historic Preservation	\$ 1,331	249 COOLIDGE MEMORIAL ROAD	PLYMOUTH	WINDSOR	VT	05056
JOHNSON FARM SHED	Historic Preservation	\$ 1,331	384 MESSER HILL ROAD	PLYMOUTH	WINDSOR	VT	05056
JOHNSON FARM MILKHOUSE	Historic Preservation	\$ 1,331	384 MESSER HILL ROAD	PLYMOUTH	WINDSOR	VT	05056
CHEESE FACTORY	Historic Preservation	\$ -	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
ALDRICH TOURIST CABIN #2	Historic Preservation	\$ -	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
ALDRICH TOURIST CABIN #3	Historic Preservation	\$ -	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
COOLIDGE HOMESTEAD/BARN	Historic Preservation	\$ -	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
BIRTHPLACE/GENERAL STORE	Historic Preservation	\$ -	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
WILDER HOUSE RESTAURANT	Historic Preservation	\$ -	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
PRESIDENT CALVIN COOLIDGE MUSEUM AND EDUCATION CENTER	Historic Preservation	\$ 1,981,368	SHREWSBURY ROAD	PLYMOUTH	WINDSOR	VT	05056
WILDER BARN - FARMERS MUSEUM	Historic Preservation	\$ -	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
ALDRICH HOUSE AND BARN	Historic Preservation	\$ -	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
BLACKSMITH SHOP	Historic Preservation	\$ -	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
JOHNSON FARMHOUSE	Historic Preservation	\$ -	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
JOHNSON FARM GARAGE	Historic Preservation	\$ -	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
MAINTENANCE SHOP	Historic Preservation	\$ -	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
BROWN HOUSE - CARETAKERS HOME	Historic Preservation	\$ -	2780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
CHICKEN COOP	Historic Preservation	\$ -	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
SCHOOL HOUSE	Historic Preservation	\$ -	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
HOSKISON HOUSE	Historic Preservation	\$ 374,537	196 MESSER HILL ROAD	PLYMOUTH	WINDSOR	VT	05056
ALDRICH TOURIST CABIN #1	Historic Preservation	\$ -	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
BLANCHARD BARN	Historic Preservation	\$ -	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
BLANCHARD MILKHOUSE	Historic Preservation	\$ 665	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
BLANCHARD ASH HOUSE	Historic Preservation	\$ 1,331	3780 VT RT 100A	PLYMOUTH	WINDSOR	VT	05056
WHEY STORAGE BUILDING	Historic Preservation	\$ -	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
ICE HOUSE	Historic Preservation	\$ -	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
WILDER HORSE BARN	Historic Preservation	\$ 462,795	3780 VT RT. 100A	PLYMOUTH	WINDSOR	VT	05056
EUREKA SCHOOLHOUSE	Historic Preservation	\$ -	470 CHARLESTOWN ROAD	SPRINGFIELD	WINDSOR	VT	05156
BALTIMORE COVERED BRIDGE	Historic Preservation	\$ -	470 CHARLESTOWN ROAD	SPRINGFIELD	WINDSOR	VT	05156
PUBLIC FACILITY	Historic Preservation	\$ -	470 CHARLESTOWN ROAD	SPRINGFIELD	WINDSOR	VT	05156
OLD CONSTITUTION HOUSE	Historic Preservation	\$ -	22 MAIN STREET	WINDSOR	WINDSOR	VT	05089
RANGER'S HOUSE	Forests, Parks, & Recreation	\$ 6,654	DUTTON PINES	DUMMERSTON	WINDHAM	VT	
PICNIC SHELTER	Forests, Parks, & Recreation	\$ 6,654	DUTTON PINES	DUMMERSTON	WINDHAM	VT	
TOILET BUILDING	Forests, Parks, & Recreation	\$ 2,663	DUTTON PINES	DUMMERSTON	WINDHAM	VT	

STATE OF VERMONT-OWNED FACILITIES

BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
PUMP HOUSE	Forests, Parks, & Recreation	\$ 665	DUTTON PINES	DUMMERSTON	WINDHAM	VT	
WATERFOWL BAY CHECK STATION(QU	Fish & Wildlife	\$ 7,321	MUD CREEK WMA	ALBURG	GRAND ISLE	VT	
DPS BUILDING	Buildings & General Services	\$ 1,690,007	2490 ETHAN ALLEN HIGHWAY	NEW HAVEN	ADDISON	VT	05753
GARAGE	Buildings & General Services	\$ 199,913	2490 ETHAN ALLEN HIGHWAY	NEW HAVEN	ADDISON	VT	05753
REMOTE RADIO BUILDING	Buildings & General Services	\$ 54,479	2490 ETHAN ALLEN HIGHWAY	NEW HAVEN	ADDISON	VT	05753
OKEMO STATE FOREST TOWER	Forests, Parks, & Recreation	\$ -	OKEMO STATE FOREST	LUDLOW	WINDSOR	VT	05751
FREIGHT HOUSE	Agency of Transportation	\$ 165,216	13 LAKE ST.	BARTON	ORLEANS	VT	
RAILROAD HOUSE	Agency of Transportation	\$ 54,290	23520 DEPOT ST.	BRADFORD	ORANGE	VT	
LYNDON FREIGHT HOUSE	Agency of Transportation	\$ 311,381	1000 BROAD ST.	LYNDONVILLE	CALEDONIA	VT	
RADIO STATION	Public Safety	\$ 212,401	MT. MANSFIELD	STOWE	LAMOILLE	VT	
RADIO STATION	Public Safety	\$ 107,525	MILLSTONE HILL	BARRE TOWN	WASHINGTON	VT	
RADIO STATION	Public Safety	\$ 66,546		NEWFANE	WINDHAM	VT	
RADIO STATION	Public Safety	\$ 234,268	RUSS HILL	ROYALTON	WINDSOR	VT	
RADIO STATION	Public Safety	\$ 290,569		ST. ALBANS TOWN	FRANKLIN	VT	
RADIO STATION	Public Safety	\$ 144,635		DOVER	WINDHAM	VT	
RADIO STATION	Public Safety	\$ 101,914		TOPSHAM	ORANGE	VT	
AIR POLLUTION TRAILER	Environmental Conservation	\$ 33,273	1277 PUTNEY ROAD, RTE 5	BRATTLEBORO	WINDHAM	VT	
AIR POLLUTION TRAILER	Environmental Conservation	\$ 33,273	9 MERCHANTS ROW	RUTLAND	RUTLAND	VT	
AIR POLLUTION TRAILER	Environmental Conservation	\$ 33,273	MAIN STREET	BURLINGTON	CHITTENDEN	VT	

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BUILDING NAME	DIVISION	REPLACEMENT COST	STREET ADDRESS	CITY	COUNTY	STATE	ZIP CODE
AIR POLLUTION TRAILER	Environmental Conservation	\$ 33,273	MERCHANTS ROW	BARRE	WASHINGTON	VT	
AIR POLLUTION TRAILER	Environmental Conservation	\$ 33,273	AIRPORT ROAD	BENNINGTON	BENNINGTON	VT	
AIR POLLUTION TRAILER	Environmental Conservation	\$ 33,273	108 CHERRY ST	BURLINGTON	CHITTENDEN	VT	
AIR POLLUTION TRAILER	Environmental Conservation	\$ 33,273	PROCTOR MAPLE RESEARCH FACILITY	UNDERHILL	CHITTENDEN	VT	
WINDSOR COUNTY TOOL CACHES	TBD	\$ 1,331		WINDSOR	WINDSOR	VT	
RADIO STATION	Public Safety	\$ 58,700	HINMAN SETTLER ROAD	ORLEANS	ORLEANS	VT	
RADIO STATION	Public Safety	\$ 73,167	TOWER ROAD	WEST CHESTERFIELD		NH	
GARAGE	Buildings & General Services	\$ 214,690	140 FISHER POND ROAD	ST. ALBANS	FRANKLIN	VT	05478
TROOP HEADQUARTERS	Buildings & General Services	\$ 1,708,674	140 FISHER POND ROAD	ST. ALBANS	FRANKLIN	VT	05478