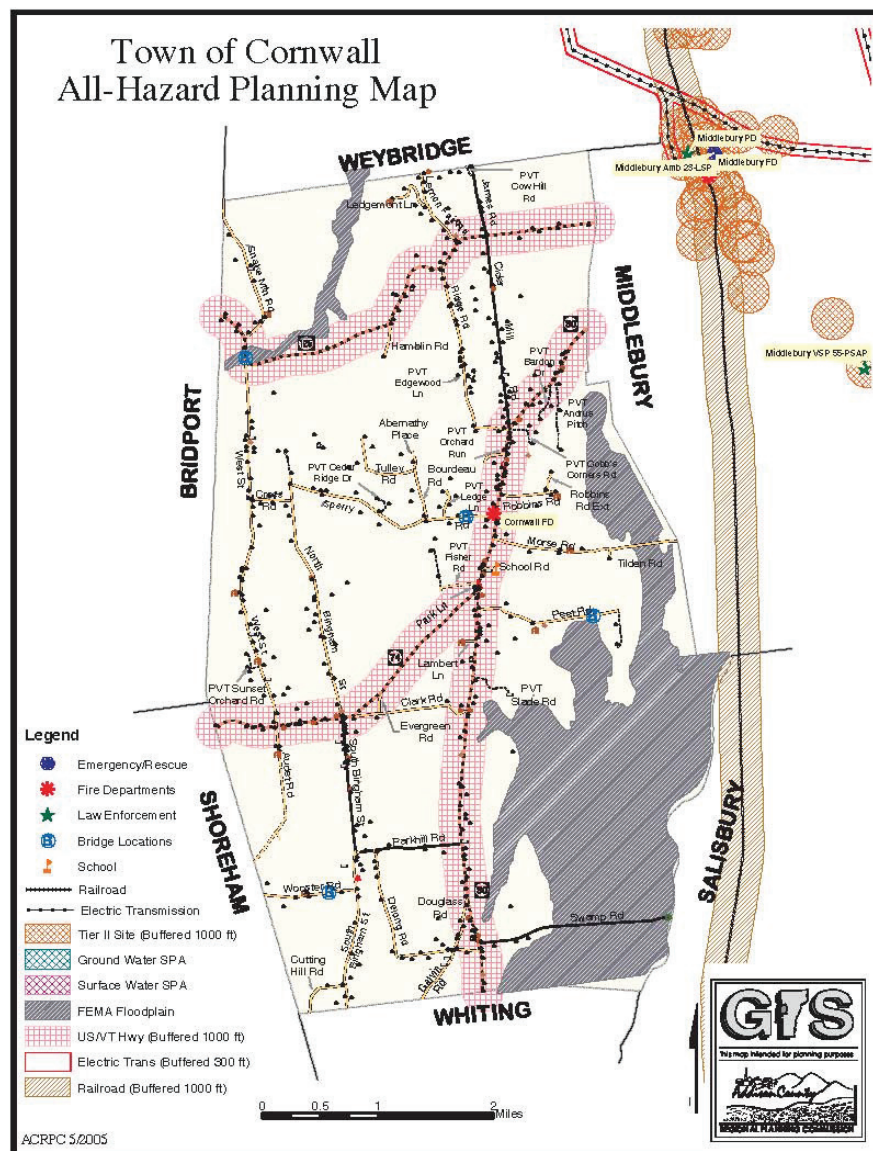


Town of Cornwall, Vermont



Single Jurisdiction All-Hazards Mitigation Plan

Final Plan Adopted:

FEMA Approval Date:

Cornwall, Vermont Single Jurisdiction All-Hazards Mitigation Plan

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Cornwall, Vermont All-Hazards Mitigation Plan

1. Planning Process

1.1 Current Plan Development Process **44 CFR 201.6 (c)(1)**

The Town of Cornwall was approached for its support for the creation of an All-Hazards Mitigation Plan for the Town and for this planning process. The Cornwall Emergency Management Network was identified as the most appropriate entity to spearhead this planning process.

An initial draft Single Jurisdiction Plan was prepared by staff of the Addison County Regional Planning Commission (ACRPC) converting a previous draft annex to a regional plan into a Single Jurisdiction Plan. The Cornwall Emergency Manager was tasked with bringing together residents from throughout the community to form a hazard mitigation plan committee. Those responding to the initial request were:

Kate Gieges – Cornwall Emergency Manager
Sue Johnson – Cornwall Town Clerk
Stu Johnson – Cornwall Road Commissioner
Raph Worrick – Cornwall Fire Dept/Emergency Management Network
Ken Manchester – Cornwall Highway Dept/Fire Dept/Emergency Management Network
Marge Drexler – Cornwall Shelter manager/Emergency Management Network
Norm Grenier – Cornwall Fire Dept/Emergency Management Network

All committee meetings were open to the public and those who attended were asked to give input. The committee met on 10/2/2014 (see annex A) to complete a Hazards Inventory and Risk Assessment matrix, brainstorm additional possible hazard locations, and to identify additional mitigation projects. The committee met again on 10/23/2014 (see Annex A) to complete their review and brainstorming session.

Outreach efforts to get a broad representation from the Cornwall Community continued and eventually resulted in additional members:

Mary Dodge – Co-Chair - Cornwall Conservation Commission

The committee continued to make suggested changes via e-mail to confirm suggested revisions and corrections to the initial draft plan until initial submission to the Vermont State Hazard Mitigation Officer (SHMO) on 2/28/2015.

Input on the draft plan was requested from town residents during open meetings of the Town Planning Commission and the Town Selectboard where copies of the draft plan were available for review. The town also made a copy of the plan available at the Town offices for review and on its website www.cornwallvt.com to reach a broader distribution.

Based on comments from the public process, the draft plan was further edited and forwarded to FEMA Region I by Vermont DEMHS on XXXXX for comments and preliminary approval. Comments were received back from FEMA reviewers on XXXXX.

Changes were made to the draft plan based on FEMA recommendations and an updated draft was completed on XXXXX. Upon completion of this draft, the plan was further circulated to the Town Selectboard and hazard mitigation committee for approval prior to being returned to FEMA for Approval Pending Adoption (APA) status. Upon receipt of the FEMA APA on XXXXX, the resulting document was adopted by the Cornwall Selectboard on XXXXX. The final adopted plan was then forwarded to FEMA Region I for confirmation. Final FEMA approval was received on _____.

1.2 Opportunities for public comment 44CFR 201.6(b)(1) and 44 CFR 201.6(c)(1)

As indicated in 1.1, multiple opportunities for public comment were made available during the planning process:

- A hazard mitigation planning committee was assembled from volunteers on 10/2/2014 by the Town Emergency Manager.
- The committee invited members of the Town Planning Commission, Conservation Commission, Zoning Board of Adjustment, Selectboard and other residents involved in community efforts to participate in the planning process.
- The plan was made available in the town office and on the Town website <http://www.cornwallvt.com> for public comment while in draft form beginning in October 2014..
- All meetings of both the Town Selectboard and the Town Planning Commission were open for public comment throughout the planning and draft phases of this plan.

1.3 Opportunities for additional comments 44CFR 201.6(b)(2)

Additional opportunities for regional and state-level comments in the draft stage were provided throughout the planning process.

- A copy of the draft plan was posted on the ACRPC website www.acrpc.org for regional review and notice was given during the December 2014 ACRPC full commission meeting as to its availability. No comments received.
- The December 2014 ACRPC newsletter included an announcement that a draft plan was available for public review and comment. That draft was posted in the ACRPC office for review and comment. No comments received.
- A copy of the draft plan was provided to the State Hazard Mitigation Officer, Ray Doherty on 2/27/2015 for comments. Comments were received on XXXXX.
- An updated copy was sent to Ray Doherty for submission to FEMA on XXXXX
- A substantially completed draft was submitted to the State of Vermont Agency of Natural Resources staff for comment on 2/27/2015.
- FEMA Region 1 staff received a draft for comment on XXXXX.
- The bordering Communities of Shoreham, Whiting, Salisbury, Middlebury, Weybridge and Bridport were notified of the posting of the draft plan on 2/27/2015 and comments were requested.

1.4 Extent of review 44 CFR 201.6(b)(3)

Throughout the planning process all sections of an earlier regional plan were reviewed for accuracy. Recently completed studies and newly developed data were included in the document. Examples of changes due to new data include addition of information from:

- 2014 Local Emergency Operations Plan (previously identified high hazard and vulnerable sites)

- 2012 Cornwall Town Plan (support for the committee's prioritization process and section 2 narrative)
- 2011 Addison County Regional Plan (transportation section used to identify high accident locations)
- 2013 State of VT Hazard Mitigation Plan (provided a listing of statewide hazard concerns)
- Recently declared disasters (Provided background data for inclusion in Table #1)
- 2012 Report of the State Fire Marshall (provided data to inform structure and wild fire risks)
- www.fema.gov (provided official data on declared disasters)
- The Vermont Weather Book - David Ludlum (provided historic accounts of disasters for Section 4.3)
- National Climatic Data Center website (provided information for Section 4.3)
- FEMA Snow Load Safety Guide (informed Section 4.3)
- FEMA FIRMS for Cornwall dated 3/21/1975 (incorporated into maps and section 4.3)
- VT Center for Geographic Information data layers (incorporated into map products)
- Town of Cornwall Grand List for 2014 (utilized to determine value of identified properties)
- www.healthvermont.gov (incorporated arbovirus information into section 4.3)
- State of Vermont dam inventory database (incorporated into section 4.3)
- Cornwall Annual Town Reports 1980-2013 (informed FEMA reimbursements in table #1)

2. Community Background

The Town of Cornwall, which celebrated its 250th anniversary in 2011, is located in west central Vermont about 10 miles east of the southern end of Lake Champlain. Cornwall is located in the southern portion of Champlain Valley and has an area of 18,688 acres or roughly 29.2 square miles. It is bounded on the north by Weybridge, on the west by Bridport and Shoreham, on the south by Whiting, and on the east by Salisbury and Middlebury. Its village center is located southwest of Middlebury at the junction of Vermont Routes 30 and 74. A second smaller grouping of homes, West Cornwall, is located on Rte 74 along a north/south ridge which some have theorized is the remnant of a major rift fault which created the Champlain Valley.

Route #30, originally an old stage road, splits the town east/west. Route #125 passes through the northern half of Cornwall and serves as a major east/west route from New York through Middlebury and eventually to Route 100 in the center of the state. The eastern town line with Salisbury is formed by the Otter Creek which includes a large floodplain and is host to one of the states largest floodplain forest/wetlands complexes known as the Cornwall Cedar Swamp.

Cornwall has seen a rapid increase in population since the 1960's when a large influx of new residents sought refuge from more urban areas during the "Back-to the Land" movement. As of the 2010 census the population was at 1185 and is expected to grow to 1250 by 2015.

According to the 2010 census, there are 517 housing units in Cornwall, 40% of which were built prior to 1940. Of those units, 489 are year-round and 23 are seasonal. In Cornwall, most year-round homes are owner occupied structures (~79%), while 21% of homes are renter occupied. 87% of housing in Cornwall is single-family residences while the remainder (13%) are split into multi-family and mobile homes.

Cornwall has a workforce of just over 600 workers and 85% of them work outside of the town in nearby communities. One of the most affluent communities in the region, many of those working outside of town work in the health care and education professions in nearby Middlebury. Green Mountain Power is the sole provider of electrical power and nearly all landline telephone service is provided by OTT Communications. Cellular reception is available in many areas of town but is very limited in others due to the limited number of towers and the effects of terrain changes. Residents of Cornwall provide for their own water and sewage needs through wells and springs as well as individual on-site septic systems.

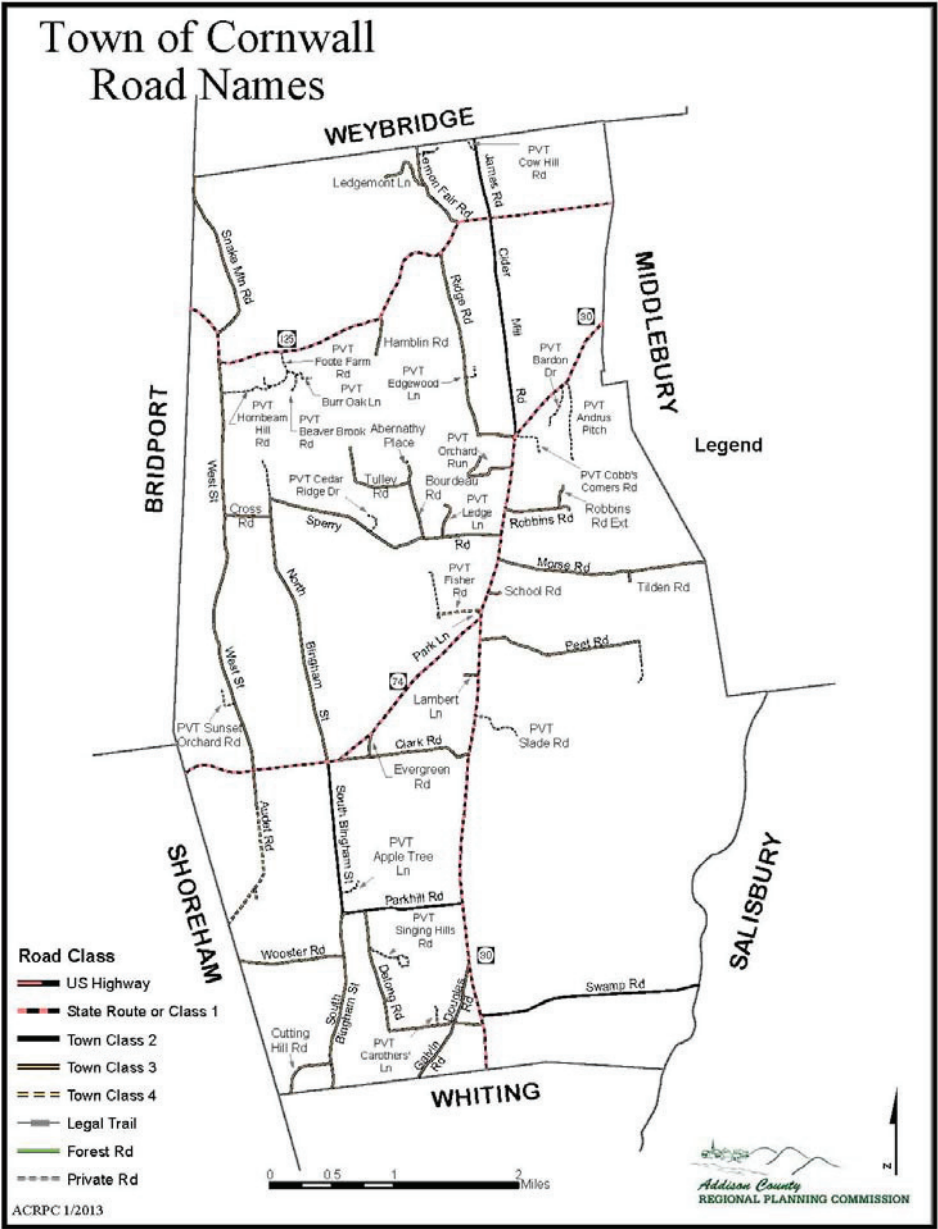
The Town of Cornwall is host to a combination fire department and first response (EMS) squad. Fire services are provided by the Cornwall Volunteer Fire Department, a privately incorporated volunteer department with additional expanded capacity through mutual aid assistance from the members of the Addison County Firefighters Association. The Cornwall Volunteer Fire Department responded to a total of 79 calls in 2014 including 38 medical assists, 12 Auto accidents and 4 structure fires. Emergency Medical Services are also provided by the Cornwall Volunteer Fire Department with paramedic and ambulance support from the Middlebury Regional EMS. Patients are generally transported to Porter Medical Center in nearby Middlebury. Law enforcement in the Town is provided by the Vermont State Police. Routine traffic enforcement is provided under contract to the town by the Addison County Sheriff. The town is also an active participant in the Vermont State Police's Community Advisory Board.

The Town has an appointed Emergency Management Coordinator and has an ongoing Emergency Management Network which was started in 2007. The team uses a Local Emergency Operations Plan (LEOP) to plan responses to larger incidents. The LEOP identifies the Town Hall as its primary Emergency Operations Center, and the residences of the Emergency Manager and the Town Clerk as the primary back-up locations. Emergency shelters are identified in the LEOP as the Town Hall, the Town Garage and the

Municipal Building in nearby Middlebury. The LEOP also identifies high hazard areas and vulnerable sites. Specifically called out are flooding along Swamp Road, the Peet air strip, roads subject to snow drift, primary power lines and telephone substations.

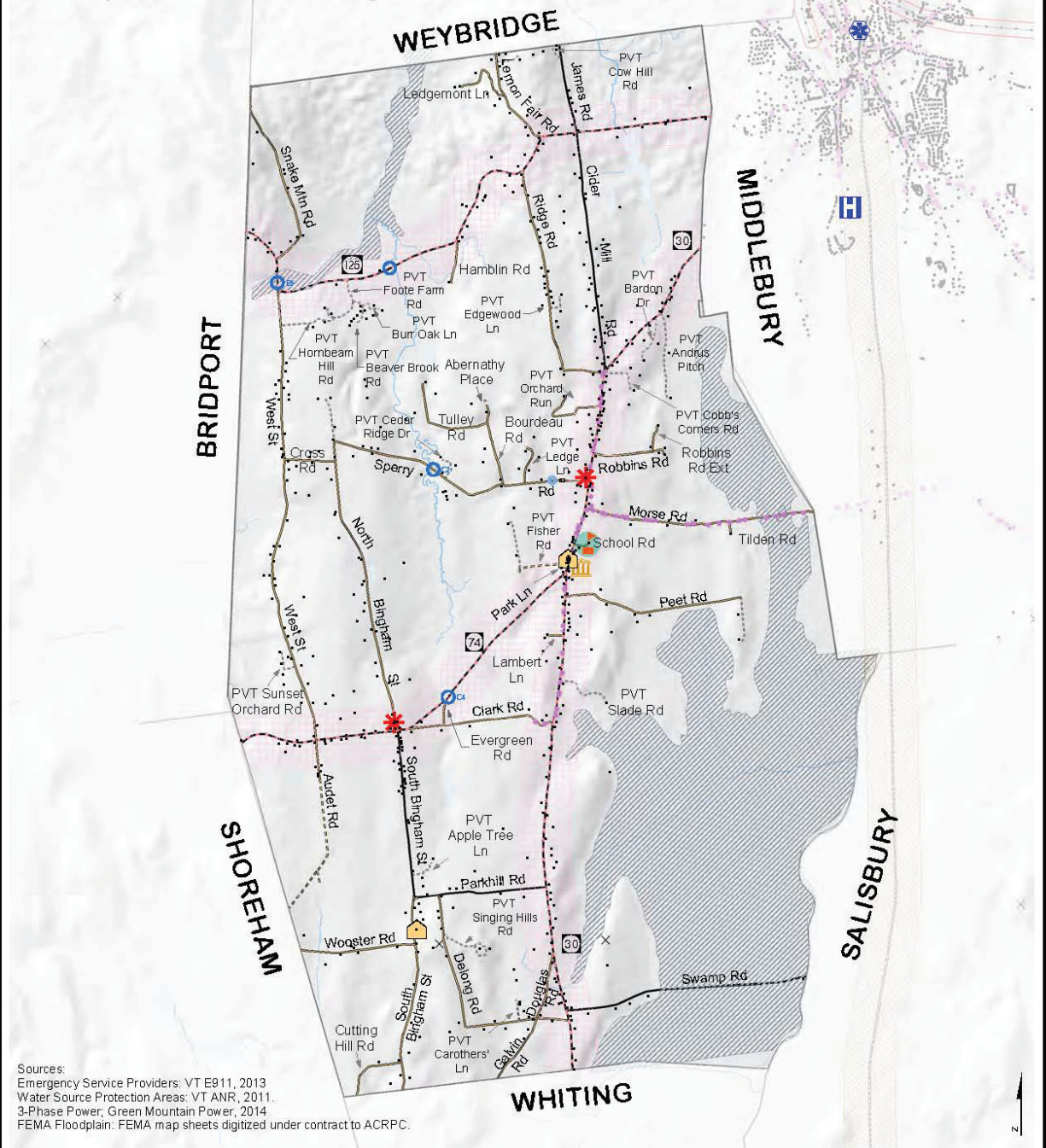
The Town is a member of the National Flood Insurance Program and, as such, has adopted zoning by-laws designating Flood Hazard Areas including associated regulations for administering those areas. Fortunately, much of the identified floodplain is associated with Otter Creek which floods regularly once or twice a year. This frequent flooding has effectively discouraged development in recent times due to difficulties in disposing of septage and the availability of alternate non-flooding sites in town.

2.1 Local Maps



Local Services, Facilities and Infrastructure

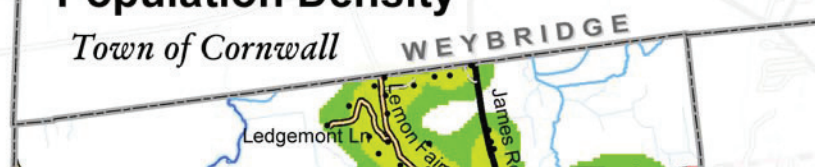
Town of Cornwall - Hazard Mitigation Plan



ACRPC 12/2014

Population Density

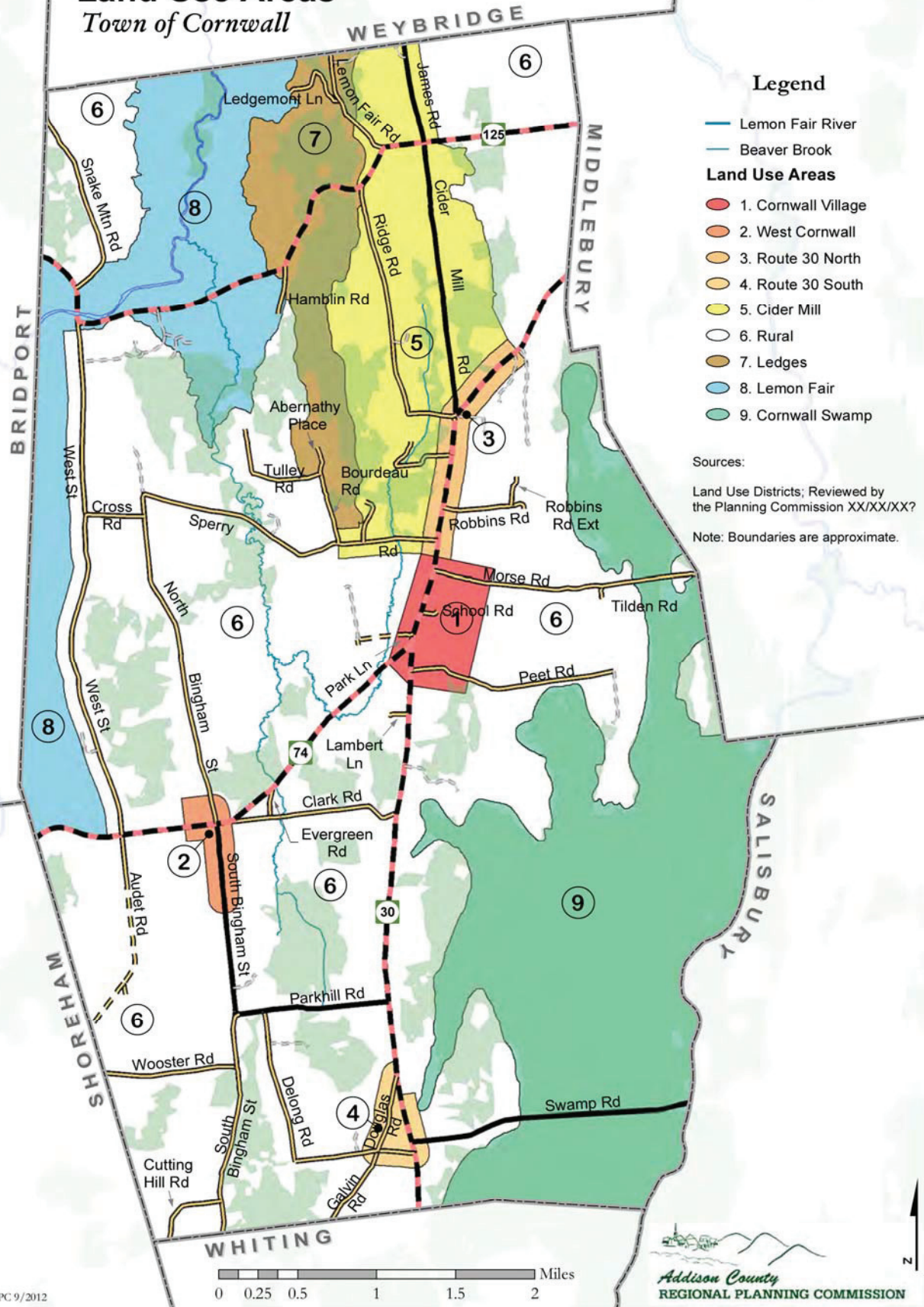
Town of Cornwall



Legend

Land Use Areas

Town of Cornwall



3. Existing Adopted Plans which support Hazard Mitigation

The following plans pre-date this plan and are used to illustrate how the community, the Addison region and the State of Vermont have incorporated mitigation into standard planning mechanisms. As planning efforts continue forward, this plan will continue to inform and be integrated into these and other future planning processes.

3.1 Cornwall Local Emergency Operations Plan (Mitigation repairs identified)

- *Flooding on Swamp Road (Ongoing maintenance and upgrades)*
- *Trees across roads (Periodic assessment/cutting)*
- *Snow Drifts across roads (Snow Fence/natural barriers, increased monitoring & plowing)*
- *Undersized Culverts (Upgrade according to plan)*
- *Flooding on Rte 125 (VTrans)*

3.2 Cornwall Town Plan (2014) Goals that support Hazard Mitigation

- *Reduce safety hazards throughout Cornwall's transportation system*
- *Ensure that private roads and drives are constructed and maintained to minimum standards*
- *Maintain and, where necessary, improve the quality of Cornwall's groundwater, surface waters and wetlands.*

3.3 Cornwall Town Plan (2014) Statements supporting Hazard Mitigation

- *Promote and recognize the value of volunteerism in the provision of community services*
- *Continue to explore opportunities for coordinating services with neighboring towns and sharing resources such as equipment and personnel in a manner similar to the fire department's mutual aid system.*
- *Continue to support high quality fire and rescue services in town and ensure there is adequate access to all development for emergency vehicles.*
- *Continue to support the organizational and planning efforts of the Emergency Management Committee to insure adequate preparation of potential large-scale weather related events.*
- *Work with landowners, land trusts, state and federal agencies...preserve functioning wetland systems.*
- *Encourage the gathering and analysis of information on the yield and quality of wells....support testing of water sources for pollutants. The town does not favor the construction of underground utility transmission infrastructure near wells and groundwater supplies.*
- *All corridors for transmission lines or pipes, whether for electricity or gas, shall be located outside of populated areas and away from residences, businesses and public buildings and spaces to provide the maximum margin for safety, noise and other impacts.*
- *Utilities shall fully explain to Town officials and Town emergency responders, and shall provide the necessary training, support and equipment for our emergency personnel to respond successfully to any emergency situation involving the infrastructure proposed.*

3.4 Cornwall Town Plan (2014) Recommended actions supporting hazard mitigation:

- *Complete the reconstruction (or relocation) of Route 125 at its intersection with Cider Mill Road in a manner that...provides adequate sight distance consistent with prevailing speeds on these roads.*
- *...revise the current intersection of Route 30 and Route 74 to provide a straightforward "T" intersection.*

- *Enter into substantive talks with VTrans when the next round of repaving approaches for Route 125 and 74 for the purposes of establishing paved shoulders, wide enough to accommodate bicycles, joggers and pedestrians.*
- *Maintain the town's current standards for private roads to ensure they are in-keeping with state standards for safe access for emergency vehicles.*
- *Review and update zoning regulations to include specific setback requirements from riparian corridors*
- *Limit development in the floodplain to protect the ecological services that this area provides of mitigating flood hazards.*
- *Limit development in areas of steep slopes and other areas with high erosion potential.*

3.5 Addison County Regional Planning Commission Regional Plan (2011) Goals that support Hazard Mitigation

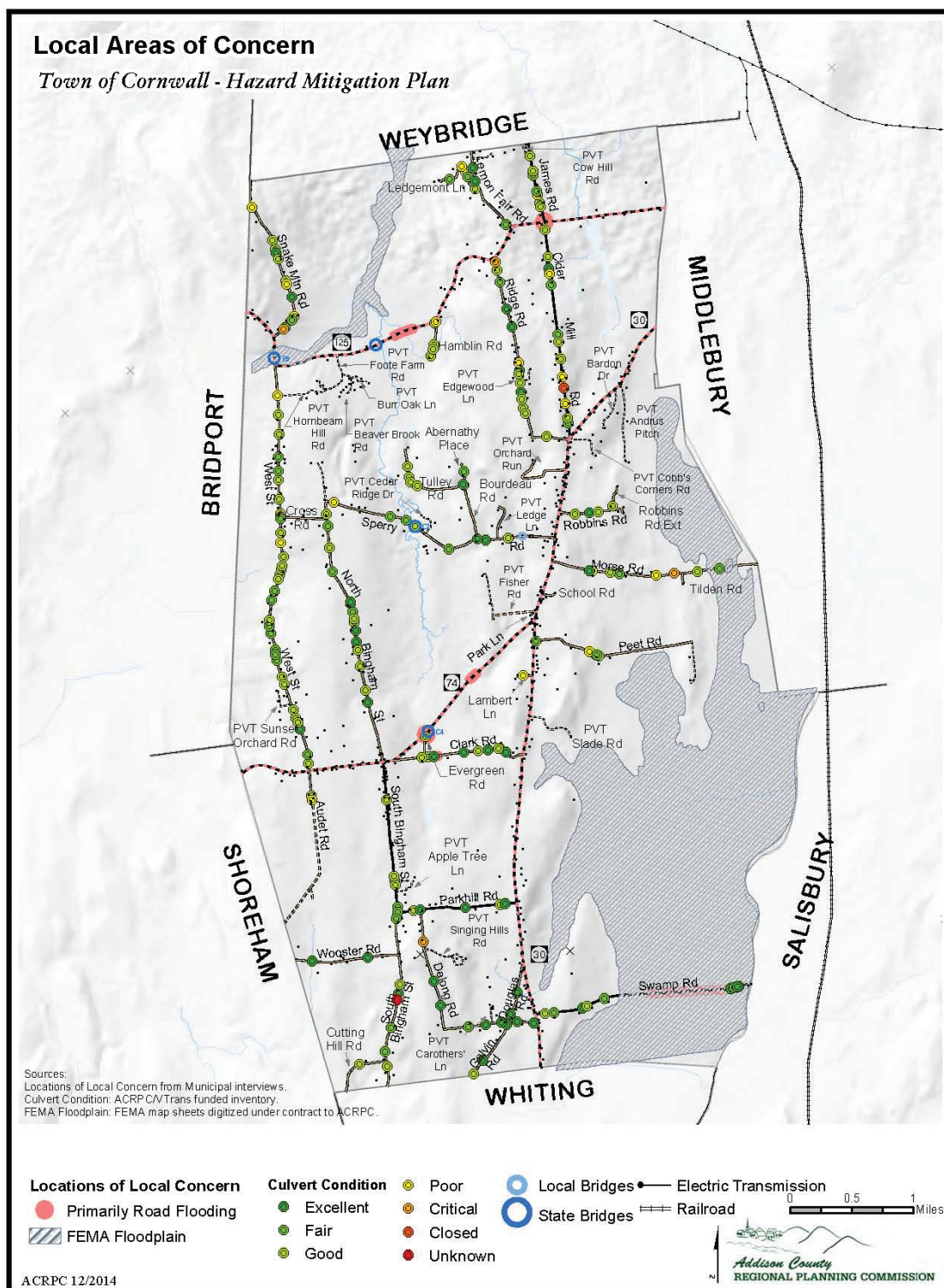
- *Work to restore and maintain stream equilibrium by developing and implementing river corridor plans.*
- *Reduce flooding and related damages through appropriate mitigation techniques.*
- *Encourage watershed based cooperation and educate towns and the general public about water quality and stream dynamics*
- *Provide communities the support they need to be proactive in reducing flood and erosion hazards by adopting appropriate zoning regulations to limit development in hazardous areas.*
- *Encourage proper maintenance and sizing of bridges, culverts and other structures to accommodate flow from storm events and to mitigate flood hazards.*
- *Reduce the loss of life and injury resulting from all hazards.*
- *Mitigate financial losses incurred by municipal, residential, industrial, agricultural and commercial establishments due to disasters.*
- *Reduce the damage to public infrastructure resulting from all hazards.*
- *Recognize the connections between land use, storm-water, road design/ maintenance and the effects from disasters.*
- *Ensure that mitigation measures are sympathetic to the natural features of the region's rivers, streams and other surface waters; historic resources; character of neighborhoods; and the capacity of the community to implement them.*
- *Encourage hazard mitigation planning as a part of the Municipal Planning Process.*
- *Encourage municipalities and landowners to consider VT Agency of Natural Resources riparian guidelines for habitat and flood protection.*

3.6 State of Vermont Hazard Mitigation Plan (2013) Hazard Mitigation Goals

- *Ensure that current and proposed legislation and regulatory policies require effective hazard mitigation practices throughout the State.*
- *Ensure that grant-related funding processes allow for expedient and effective mitigation actions to take place at the municipal and State level.*
- *Provide timely and accurate technical assistance that supports hazard mitigation activities to regional and local jurisdictions as well as private sector partners.*
- *Identify state-level risks and vulnerabilities and protect or harden state infrastructure against hazards.*
- *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.*

4. Community Risk Assessment

4.1 Local Areas of Concern Map



4.2 Risk Prioritization Process and Results

The Town of Cornwall's Hazard Mitigation Planning Committee reviewed a broad range of hazards in its risk assessment. In terms of overall vulnerability, the committee scored the following hazards as their high priority hazards: Widespread Power Failure, Flash Flood, Winter Storm/Ice Storm.

Town of Cornwall Risk Assessment

Hazard Type	Probability	Warning	Geographic Impacts	Property Damage	Vulnerability
Drought	2	1	4	1	8 (1)
Widespread Power Failure	3	4	2	2	11 (3)
Flash Flood	3	4	2	2	11 (3)
High Winds	3	3	2	2	10 (2)
Landslide/Erosion	1	4	1	1	7 (1)
Lightning Strike	4	3	1	2	10 (2)
Transportation Accident	2	4	1	1	8 (1)
Structure Fire	4	4	1	1	10 (2)
Wildfire	3	4	1	1	9 (2)
Winter Storm/Ice Storm	4	1	4	2	11 (3)
Earthquake	2	4	1	1	8 (1)
Dam Failure	1	4	1	2	8 (1)
Inundation Flooding	3	1	1	1	6 (1)
Insect Borne Illness	4	1	4	1	10 (2)
Pandemic	1	1	4	1	7 (1)
Large-Scale HazMat Incident	2	4	1	2	9 (2)

Probability: Frequency of Occurrence

1= Unlikely	<1% in a given year
2= Occasionally	1%-10% probability in a given year
3= Likely	>10% but <100% in any given year
4= Highly Likely	100% probability in a given year

Warning: Time available to give notice to the majority of the population

1= More than 12 hours
2= 6-12 Hours
3= 3-6 hours
4= <3 hours (minimal)

Geographic Impacts: How much of the population is expected to be impacted

1= Isolated Locations/neighborhood	<20% of population impacted
2= Moderate impact	>20% and <75% of population impacted
3= Community-wide	>75% of population impacted within community
4= Region-wide	Level 2 & 3 impacts in surrounding communities

Property Damage: Severity of damages and disruption

1= Negligible	Isolated property damage, minimal disruption to infrastructure
2= Minor	Isolated moderate to severe property damage, brief disruption to infrastructure
3= Moderate	Severe damages at neighborhood level, temporary closure of infrastructure
4= Major	Severe damages town-wide, temporary to long-term closure of infrastructure

Vulnerability: Total score of Probability, Warning, Extent, and Impact

1= Low Priority	≤8 total score, low cost –no cost mitigation projects only
2= Medium Priority	>8 and ≤10 total score
3= High Priority	>10 and ≤12 total score
4= Regional/State-wide Priority	>12 total score

Declared Disasters by County 2003-2013

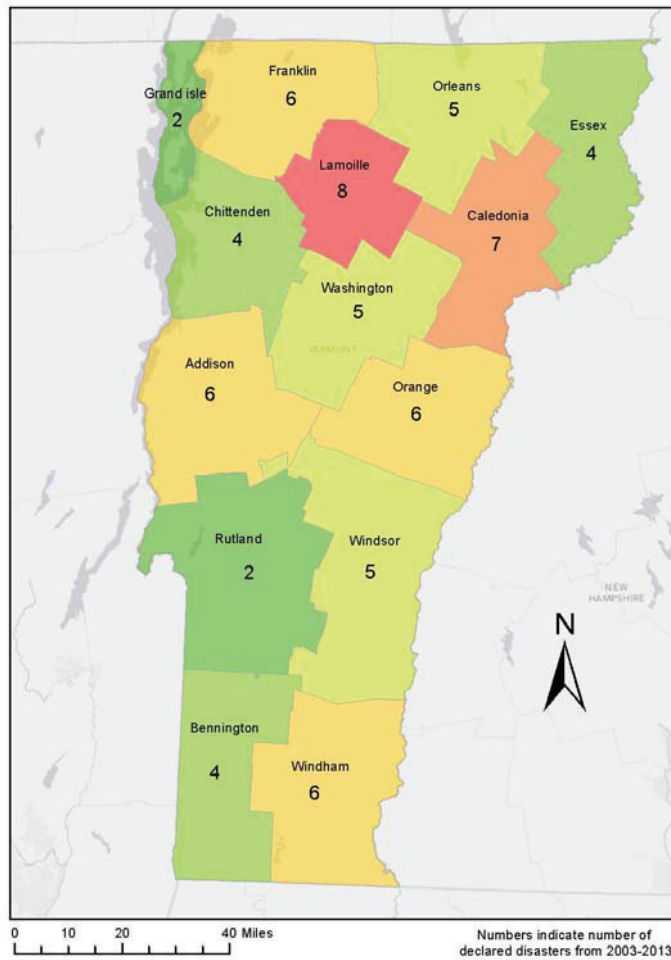


Table #1: Federally declared disasters affecting Addison County

Year	Date	Description	Dec. #	County Cost	Cornwall
1973	7/6/1973	Severe Storms, Flooding, Landslides	DR397	\$ Unavailable	\$ 0.00
1976	8/5/1976	Severe Storms, High Winds, Flooding	DR518	\$ Unavailable	\$ 10,418.00
1977	9/6/1977	Drought	EM3053	\$ Unavailable	\$ 0.00
1989	8/4-5/1989	Severe Storms, Flooding	DR840	\$ 31,033	\$ 0.00
1993	4/24-5/26/1993	Flooding, Heavy Rain, Snowfall	DR990	\$ 17,639	\$ 0.00
1996	1/19-2/2/1996	Storms, Flooding	DR1101	\$ 130,529	\$ 0.00
1998	1/6-16/1998	Ice Storms	DR1201	\$ 662,388	\$ 28,884.00
1998	7/17-8/17/1998	Severe Storms and Flooding	DR1228	\$2,146,484	\$ 7,717.00
2000	7/14-18/2000	Severe Storms and Flooding	DR1336	\$ 744,075	\$ 0.00
2001	3/5-7/2001	Snowstorm	EM3167	\$ Unavailable	\$ 0.00
2004	8/12-9/12/2004	Severe Storms and Flooding	DR1559	\$ 365,661	\$ 0.00
2008	6/14-17/2008	Severe Storms and Flooding	DR1778	\$ 486,850	\$ 0.00
2008	7/21-8/12/2008	Severe Storms and Flooding	DR1790	\$ 438,900	\$ 13,889.00
2011	4/23-5/9/2011	Severe Storms and Flooding	DR1995	\$ Unavailable	\$ 0.00
2011	8/26-9/2/2011	Hurricane Irene	EM3338	\$ Unavailable	\$ 0.00
2011	8/27-9/2/2011	Tropical Storm Irene	DR4022	\$ Unavailable	\$ 0.00
2012	5/29/2012	Severe Storm, Tornado and Flooding	DR4066	\$ Unavailable	\$ 30,810.00

4.3 Hazard Type, Location, Extent, Previous Occurrences, Future Probability and Vulnerability **44CFR 201.6 (c)(2)(i) and 44CFR 201.6(c)(2)(ii)**

The following hazard types have been identified, evaluated and prioritized in a risk assessment exercise conducted with the Cornwall hazard mitigation committee. The matrix in 4.2 shows the results of that evaluation process for the Town of Cornwall. Other hazards identified in Vermont's hazard mitigation plan did not rise to the level of concern by the local planning committee. The following hazard types are listed in their order of priority with highest vulnerability described first.

- **Widespread Power Failure – (Risk Score-11)**

Location: Based on local knowledge, widespread power outages are a common yet low impact event throughout the Town of Cornwall.

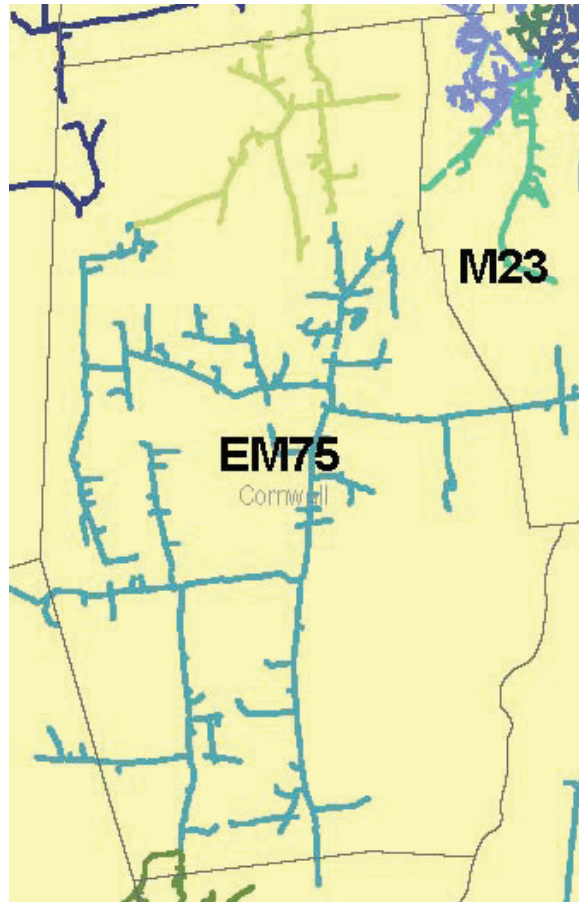
Extent: The majority of Cornwall is served via one primary trunk line, which originates in neighboring Middlebury. Loss of power from this main line would impact about 75% of the residences in town. Lower impact lines also originate in neighboring towns and Cornwall is at the terminus of these trunks. While overall impacts would be minor, it is likely that the duration of an outage from these lines would much longer.

- Central Cornwall – Middlebury (major impact – shorter duration)
- North end – Weybridge (minor impact – longer duration)
- South end – Whiting (minor impact – longer duration)
- Northwest – Bridport (minor impact – longer duration)

Previous Occurrences: Widespread outages have been common through much of the past 50 years with limited overall impact to the community. In 1998 a severe ice storm hit much of northern Vermont and much of the Addison region. No community in the region was spared damage by downed power lines. Power outages continued for several days as remote power lines were accessed by off-road vehicles. In December 2014 a power outage of several days duration impacted much of Vermont including the Town of Cornwall resulting in Disaster Declaration DR4207.

Future Probability: Subsequent to the ice storm of 1998, power companies have re-routed many remote lines onto town highway rights of way and increased annual pruning efforts. Frequency of occurrence and length of outage duration have been reduced thereby reducing the overall impacts to residents. If these and similar efforts continue, a reasonable person would predict fewer power outages of shorter duration. The effect of these improvements to infrastructure may be cancelled out by the general increase in the types of storms which lead to power outages.

Vulnerability Summary: Summertime power outages caused by severe summer storms mostly cause inconvenience to residents unless extended outages impact a family's frozen food supply or their ability to pump water from deep wells. Possible during all seasons of the year, the lack of power becomes particularly an issue during winter as it often translates into lack of heat as well. Extended outages during winter months, coupled with extreme cold, periodically result in more extensive damage associated with freezing pipes particularly in private residences. The Town of Cornwall has retrofitted both its town hall and town garage with emergency generators in the past few years to allow for use as emergency shelters and for the use of the town hall as an emergency operations center.



Green Mountain Power Distribution Lines in Cornwall

The community vulnerability rating for Widespread Power Outage is 3 and would be considered HIGH PRIORITY. Widespread power outages have been extensively mitigated in the past few years effectively reducing the community's vulnerability. Actual vulnerability could be considered LOW based on limited unmitigated impacts to infrastructure, health, and environment.

- **Flash Flood (Risk Score 11)**

Location: In Cornwall, the combination of heavy rainfall and moderate to steep terrain conducive to flash flooding only occurs in the geographic center of town. Committee members particularly cited Beaver Brook which runs north to south, crossing Clark Road, Route 74 and Route 125 as places where sudden rain events can cause damage due to flash flooding. Fortunately, both eastern and western Cornwall are dominated by the large floodplains of the Lemon Fair and Otter Creek making them not particularly susceptible to flash flooding.

Extent: Summer downpours and remnants of tropical storms can have the effect of concentrating flood waters into small and narrow areas, particularly in steeper geographic regions. According to statistics from the National Climatic Data Center (NCDC), the Addison Region has experienced 31 flash flood events over the past 25 years. The highest record of damage was \$1,000,000 during a period in July of 1998. During the period an estimated \$32,310,000 in property damages and \$1,500,000 in crop damages were incurred county-wide. Flooding in 2008 (DR 1790) and an undeclared event in 2009 impacted Cornwall with flash flooding which washed out culverts and closed roads. \$14,000 in damages were reimbursed due to the 2008 flooding.

Previous Occurrences: The worst recorded instance of flash flooding in the Addison region occurred in New Haven in 1830 when a “freshet” along the New Haven River resulted in 14 deaths and thousands of dollars in property damages. Flash Flooding is a relatively common occurrence in the Town of Cornwall. The Town of Cornwall has been hit with 2 presidentially declared disasters in the past 10 years as a result of flash flooding which resulted in \$44,699 in FEMA reimbursements. In 2009, flash flooding from an undeclared event prompted the town to implement some previously planned mitigation activities in the form of culvert replacements.

Partially due to an ongoing culvert upgrading policy, Cornwall was spared damage that impacted much of Vermont due to flash flooding from tropical storm Irene in 2011. This allowed the town highway crew to generously assist other, more heavily impacted, communities.

Future Probability: With the increased frequency of heavy rains experienced in the past 25 years, conditions for flash flooding would appear to be increasing as well.

Vulnerability Summary: Cornwall’s program of progressive highway maintenance has reduced its overall vulnerability over the past few years as crews are routinely planning for increasing flood events. That maintenance seems to have spared Cornwall much extensive damage during Irene and will serve the town well into the future. The town’s primary vulnerability currently lies on State highways 74 and 125 where periodic flooding has threatened to wash out these primary connectors in town.

The community vulnerability rating for Flash Flood is 3 and would be considered HIGH PRIORITY.

- **Winter Storm/Ice Storm (Risk Score 11)**

Location: Severe winter storms are common throughout Vermont and can occur geographically in any part of Cornwall. As in much of the Champlain Valley, the prevailing winds are either from the south or the north. Due to these winds, blowing and drifting snow impacts east/west roads the most.

Extent: When conditions are predicted, the National Weather Service issues warnings ranging from a Winter Storm Warning (heavy snowstorm predicted within 24 hours) to Blizzard Warning (sustained wind and snow with gusts up to 35 mph for at least 3 hours) to Heavy Snow Warning (accumulations of over 6 inches in a 24 hour period).

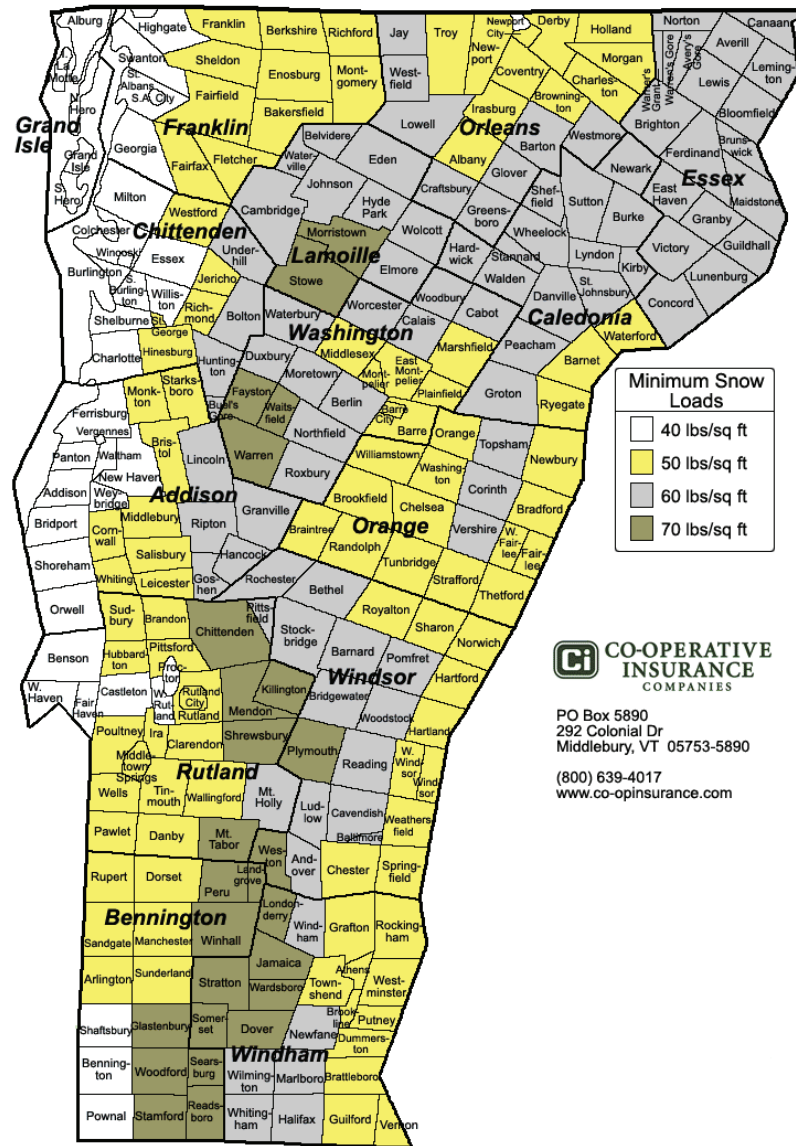
Construction standards for snow load (see map) indicate that structures in the Town of Cornwall should be built to withstand loads of 50 pounds per square foot. This would indicate an average depth of snow of 40 inches or 10 inches of ice on a square foot of roof surface. At that point, design standards would be exceeded and the structure runs the risk of collapse. Given this standard, a snowstorm which dumped 40 inches of snow or 5 inches of ice would likely result in a few collapsed roofs, especially on structures which are not built to these standards.

Previous Occurrences: The National Climatic Data Center reports that the Addison Region has experienced 2 major Ice Storm events over the past 25 years. The highest recorded damages were incurred during the 1998 Ice Storm which impacted most of the northeastern US and resulted in \$750,000 in damages to Addison County properties. During the 25 year period an estimated \$850,000 in cumulative property damages due to winter storms, were recorded in the region. The Town of

Cornwall recorded \$45,000 in reimbursable damage from DR 1201. In addition to these PA reimbursements, residents were impacted by loss of power and the associated damages.

NCDC records indicate that the Addison Region also experienced 123 winter storm events over the past 25 years. The worst storms resulted in \$100,000 in damages in both 2010 and 2005. During the period an estimated \$1,743,000 in cumulative property damages and \$10,000 in crop damages were incurred.

Minimum Snow Loads for Estimating Construction Design (Cornwall=50lb/sq ft)

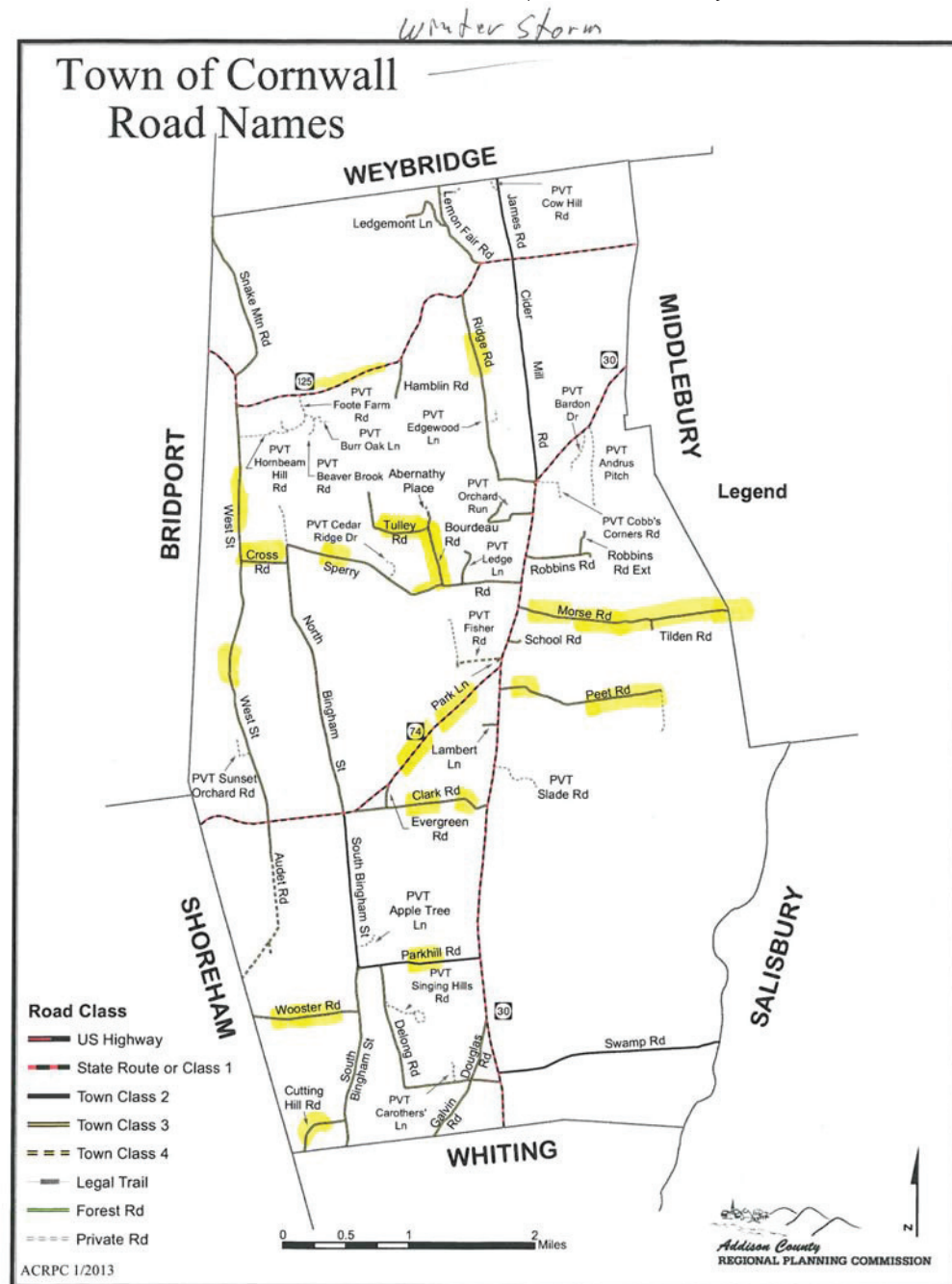


A March 1993 snowstorm left a record 51.4 inches in Lincoln. In March of 2001, the so-called “Town Meeting Day” snow event (Emergency Declaration #EM3167) caused reduced ability for residents to travel to the voting booth due to hazardous conditions. In some Addison County communities, additional efforts to keep polling places open were reimbursed with federal funds but Cornwall managed without any additional assistance.

As recently as February 2007, a significant snowstorm coupled with high wind nearly crippled much of Vermont including the Addison County region which suffered a reported \$237,000 in damages. This “Valentines’ Day Blizzard” stressed the resources of most local communities, including the Town of Cornwall, to capacity but did not ultimately result in a federal declaration.

Future Probability: The number and severity of winter storms have been increasing since the 1980’s. If the current trend continues, it is likely there will be a continued increase in severe winter storms that will impact the Town of Cornwall in the future.

Cornwall Winter Storm Hazard Areas (as identified by local committee)



Vulnerability Summary: With a regular occurrence of a significant snow or ice storm, the town feels the impact of a winter storm most on the transportation infrastructure of the community. The town is able to keep the roads open and treated for most storms and rarely has lost the ability to keep up with a winter storm due to the Town's high preparedness level and ongoing mitigation actions. Fortunately, the regular occurrence of winter storms also causes most residents to maintain a high level of preparedness for winter storms.

As population growth and housing expand along remote road corridors, increasing dependency on local roads by the new homeowners requires changes in winter maintenance. The town has, thus far, been able to keep up with those increased demands on its services through its combination of town employee utilization and equipment.

Without the existing preparedness level and with a community vulnerability score of 3, Winter Storm/Ice Storm would be considered HIGH PRIORITY based on the highly likely occurrence and the high portion of the community impacted.

- **High Winds (Risk Score – 10)**

Location: Severe damages due to high winds are rare in Cornwall and are dependent on the location of the wind gusts and/or cyclonic wind. While the location of these weather events cannot be precisely predicted, the prevailing winds are generally from the north or south. The entire Town of Cornwall is at risk of high wind damage depending on where the winds strike.

Extent: High winds come in many forms in Addison County and are included in damages associated with Hurricane, Tornado, Wind Shear, and Thunderstorms. The National Weather Service issues a wind advisory for sustained winds of 31 to 39 mph (Beaufort #7) or gusts of 46 to 57 mph. Winds of greater than 58 mph (Beaufort #10) trigger a High Wind Warning.

Many of these wind events are accompanied by hail, which generally results in minor property damages (auto, metal roof, etc). Hail can also have a devastating effect on agricultural crops like corn and apples during certain times of the growing season. The largest recorded hail size in the past 25 years was 2" in diameter in New Haven.

Remnants of hurricanes striking Vermont are uncommon, but can bring not only heavy rain but high winds. Similarly, tornadoes are known to occur and have been reported in the Addison Region. Tornadoes are less common than other high wind types, but have occurred throughout Vermont.

The worst case high wind event could uproot trees, tear roofing from structures and collapse old or poorly constructed buildings. The loss of power and land line phone service is also possible during these events due to downed lines caused by the falling trees.

Previous Occurrences: NCDC records indicate the Addison Region has experienced 34 High Wind events and 35 Strong Wind events over the past 25 years resulting in \$1,451,000 in cumulative property damage and \$25,000 in crop damages. No official information was found that would corroborate specific wind damage in the Town of Cornwall.

Locally developing thunderstorms due to convective forces in the atmosphere can generate high winds, such as those experienced in parts of eastern Vermont on July 6, 1999, downing hundreds of large trees in a few minutes. In June of 2005 and in July of 2003, locally developing lines of thunderstorms resulted in a combined total of over \$150,000 in damages to communities in Addison

County. Another high wind event occurred in 2007 to the south of Addison County which resulted in the so-called Nor-easter. This storm became a presidentially declared event (DR 1698) and resulted in over \$1,000,000 in reported damages.

A total of 108 Thunderstorm wind events have been recorded in the Addison Region over the past 25 years with the highest recorded winds of 65 knots in July of 2012. Within the 25 year record, a total of \$1,433,000 in cumulative property damages due to high wind events were recorded.

Beaufort Wind Scale

MPH	Beaufort #	Description	Effects
0-1	0	Calm	Calm; Smoke rises straight up
1-3	1	Light Air	Wind motion causes smoke to drift slowly
4-7	2	Slight Breeze	Leaves rustle, wind is felt on exposed skin
8-12	3	Gentle Breeze	Leaves and small twigs in constant motion
13-18	4	Moderate Breeze	Small branches move; dust and loose paper raised
19-24	5	Fresh Breeze	Small trees sway;
25-31	6	Strong Breeze	Large branches sway; overhead wires “whistle”
32-38	7	Near Gale	Whole trees in motion; walking into wind takes effort
39-46	8	Gale	Twigs break off trees; cars veer on the road
47-54	9	Severe Gale	Branches break; Light structural damages
55-63	10	Whole Gale	Trees blown over; considerable structural damage
64-73	11	Storm	Widespread structural damages
74+	12	Hurricane	Considerable and widespread damage to structures

Tornadoes are uncommon in Vermont. The most significant of these was the “Lake Champlain Tornado” which cut a 275 mile track starting at Lake Ontario in New York State, travelling through the Adirondacks and ending in the Champlain Valley in 1845. Since 1953 40 tornadoes have been recorded in the State ranging from F1 to F2 on the Fujita Scale. These storms killed 9 people and

caused over \$8.4 million dollars in estimated property damage. Addison County experienced two of those storms. In June of 1965, a twister touched down resulting in \$37,000 in damage and one death. Another in 1983 struck the northern portion of the county and resulted in crop losses exceeding \$500,000. More recently, on May 27, 2014 an unsubstantiated tornado was reported to have touched down in Cornwall and neighboring Bridport.

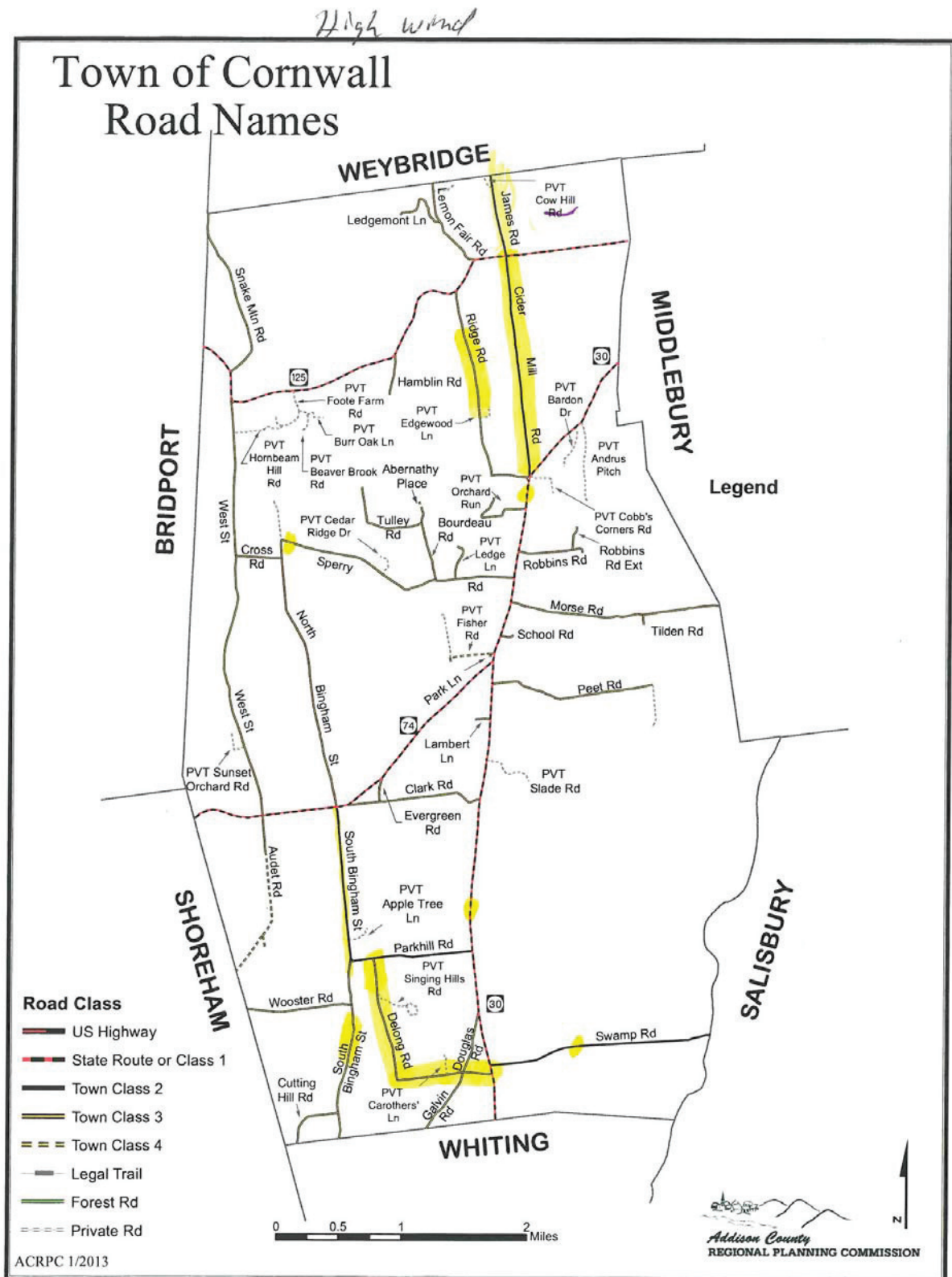


Storm Damage from a 5/27/14 reported tornado in Bridport and Cornwall, Vermont

Hurricane remnants in 1938 and 1950 are still remembered by older residents when barns collapsed and animals needed to be rescued or put down due to injuries. The “Great Windstorm of 1950” caused by the remnants of a hurricane were reported in local papers as: “Hundreds of Trees were uprooted, miles of fences ruined, seven out of every ten houses suffered roof damage, some slight, some severe. Barns were blown down, 1,000 head of cattle are dead, Families are homeless.” More recently the remnants of Tropical Storm Irene in 2011, brought heavy rains and flooding to much of Vermont, fortunately without the typical high winds.

Future Probability: Over the past 15-20 years there has been an observable increase in the severity and frequency of storms in Cornwall and the region. Extremes in warming and cooling which we have seen in recent years lead to high winds as convective forces meet cooling forces. It is probable that in the future, we will not see a lessening in winds or wind producing storms. The current cycle would predict an increase in tropical storms and tornados. The tornado observed in 2014 is an example of what can be expected.

Cornwall High Wind Hazard Locations (as identified by local committee)



Vulnerability Summary: While Cornwall has managed to avoid many of the larger high wind events, localized strong winds have resulted in occasional damage to roof panels and loss of

shingles. High winds also result in increased damage to trees, which results in power outages. Because of its gently rolling terrain, the entire Town of Cornwall is at risk for damage during high wind events.

With a community vulnerability score of 2, a High Wind incident is a MEDIUM PRIORITY based on the likely annual occurrence of an incident with the potential for isolated impacts.

- **Lightning (Risk Score 10)**

Location:

Severe storms which include lightning along with wind and rain events are a common occurrence in Cornwall during summer months. While unpredictable, lightning tends to be drawn to exposed areas of higher elevation. Public buildings are relatively exposed along Route 30 in Cornwall village (Town Hall, Bingham School, Fire Station, and the Congregational Church.) and are therefore more highly susceptible to lightning strike than most residential structures. Another area of possible attraction is in “The Ledges” area where exposed bedrock juts up from the Lemon Fair valley. Fortunately, this area has little development that could be at risk.

Extent:

Lightning strikes in western Addison County, Vermont averaged between 4-6 strikes per square kilometer each year based on data collected by NASA satellites between 1995 and 2002. Within the Town of Cornwall, these numbers would extrapolate into between 300 and 450 lightning strikes per year.

Lightning strikes routinely cause fires to trees along ridge tops in Vermont and less commonly start fires in structures. Fires associated with lightning strikes to inhabited buildings occur fewer than once every five years on average. However, power surges due to lightning strike often activate fire alarms causing the local fire department to be called out. The most common impact of lightning is loss of power and damage to electronic equipment in homes where there has been a proximity strike. Anecdotally, there are multiple reports each year of electronic equipment unprotected by surge suppressors which are damaged by lightning strikes. Generally, these homeowners file insurance claims for damages and total annual damages in the entire community likely do not exceed \$10,000.

Previous Occurrences:

Relatively little information has been recorded of recent significant lightning strikes. However, in nearby Bridport in 1910, a lightning strike killed Cyrus Stone, outside his house. Given the estimated numbers of lightning strikes in Cornwall, it is certain that there have been strikes on homes and barns resulting in fires. Another common strike location is at a power line transformer.

Future Probability:

It is unlikely that lightning strikes will be reduced over the next few decades, however, If predicted increases in storm numbers and severity are true, increased numbers of lightning strikes would be expected. As newer buildings are built with fire resistant materials the likelihood of fire due to lightning is reduced.

Vulnerability Summary:

Cornwall’s susceptibility to lightning strike seems to be relatively stable. While historically, buildings may have been protected from lightning-caused fires by a lightning rod system, these seem to have

fallen out of favor in recent years. During that same time period, an increase in fire protection capability has allowed the community to keep their perceived risk at a constant level.

The highest risk area for lightning strikes with the highest resultant damage to the public infrastructure continues to be where multiple public buildings are located along Route 30 in the traditional village center. Loss, due to fire caused by lightning or electrical surge could be quite disruptive to the community if it were to strike any of the public buildings located in this area.

The community risk rating for Lightning Strike is 2 and would be considered MEDIUM PRIORITY.

- **Structure Fire (Risk Score 10)**

Location: There are wood frame buildings susceptible to structure fire scattered throughout the Town of Cornwall. The highest concentration of public buildings in town is located around the traditional village center. This area would pose the highest risk of damage to public infrastructure. Most of these buildings were built before modern fire-resistant construction materials and methods were developed. The risk of general property damage due to structure fire is highest at agricultural businesses with farm buildings often built close by each other and susceptible to fire passing from one structure to another.

Extent:

The community's greatest risk for structure fire would be in the village area where a cluster of historic buildings (Town Hall, Congregational Church, DAR Hall) effectively defines Cornwall. Because Cornwall has such a loosely defined village area a fire destroying any of these buildings would have a large effect on residents' ability to connect with the community.

Past Occurrences:

Responses by the Cornwall Volunteer Fire Department for all calls over the past 10 years have remained relatively stable with an average of 62 per year. Roughly 6% of these calls are for structure fires.

Cornwall Volunteer Fire Department Annual Responses

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Avg.
# of responses	56	62	42	62	65	57	70	67	62	79	62
# structure fires	3	6	3	3	3	4	1	6	3	4	3.6
# new residences in town	4	8	9	1	2	1	0	5	2	6	3.8

Future Probability:

The Town of Cornwall has issued an average of 3.8 building permits per year over the past 10 years for the construction of new residences. These are generally built on new lots created by subdivision but the overall number of new homes in town seems to be relatively stable. Those homes which are being built are generally built to more fire resistant standards than the older homes and over time, the risk to structure fire will be lessened. Fire alarms are now required by statute whenever properties change hands which should also result in fewer destructive fires and loss of life.

Vulnerability summary:

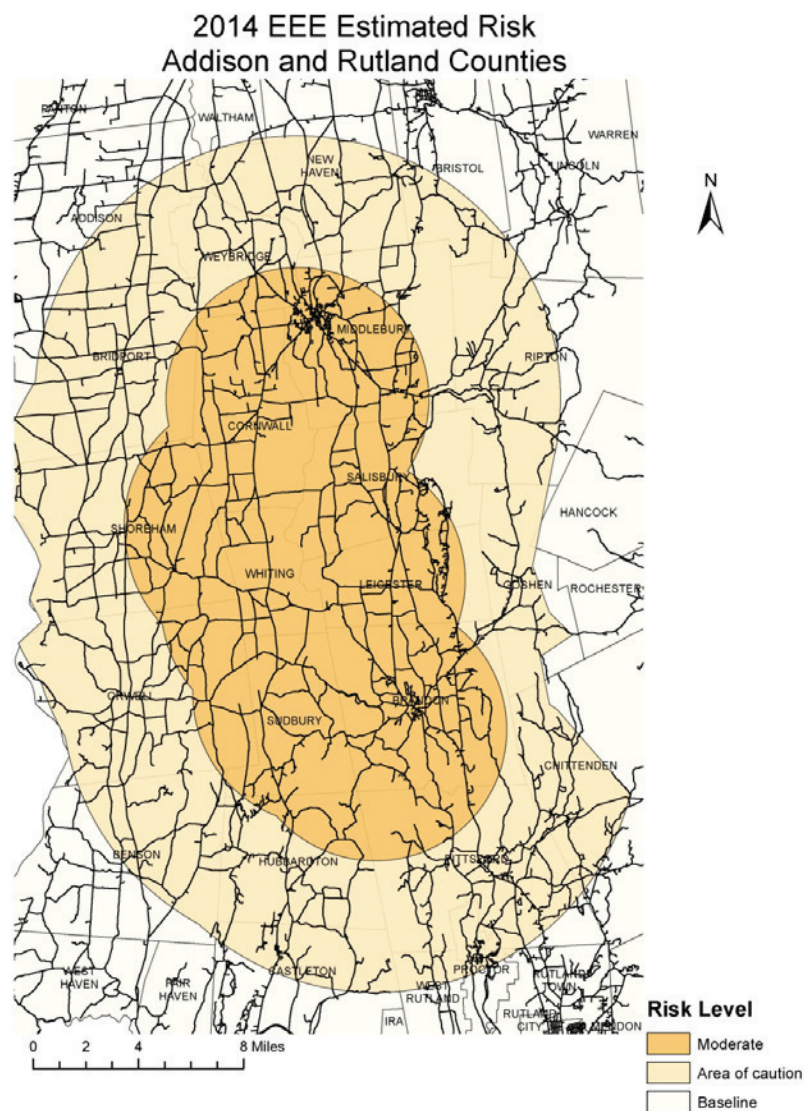
A well-trained and equipped fire department, coupled with state-mandated fire alarm installations continue to keep Cornwall's overall fire risk at a minimum. Unfortunately, risks to firefighters continue to escalate as newer construction materials often produce a dangerous combination of gasses when burned. Poorly constructed driveways can impact the fire department's ability to

respond. While a landowner may have saved money in constructing these driveways, a much higher cost is associated with a structure fire at a location with limited access as well as an additional risk to volunteer firefighters who respond.

The community vulnerability score for Structure Fire is 2 and would be considered MEDIUM PRIORITY.

- **Insect-Borne Illness (Risk Score 10)**

Location: Mosquitoes are common throughout Cornwall and the surrounding towns due to the large acreages of swamp and poorly drained soils. *Culiseta melanura* (CM), the specific vector for Eastern Equine Encephalitis (EEE), lives in hardwood swamps such as the Cornwall Swamp along the Otter Creek. Trapping efforts funded by the Vermont Agency of Agriculture and the Vermont Department of Health have identified populations of CM carrying EEE in the Town of Cornwall.



Extent: The discovery of West Nile Virus (WNV) in mosquito populations in the Addison region and a 2012 outbreak of Eastern Equine Encephalitis (EEE) have elevated the awareness of risks associated with mosquito bites. Due to the endemic mosquito populations, infection from either of these arboviruses is highly likely and could result in multiple deaths in the Town of Cornwall.

Previous Occurrences: A 2012 EEE outbreak resulted in two deaths in the Addison/Rutland region due to the disease which was first recorded in animal populations in Vermont in 2010. Unfortunately, spraying of larvicides for the nuisance species normally conducted by the mosquito control district, has essentially no effect on this specific EEE carrier. In late summer of 2012, the State of Vermont conducted targeted aerial spraying of known population centers in an effort to knock down these populations. While no human cases of EEE were reported in Addison County in 2014, it is assumed that the disease is endemic in the local mosquito population.

Future Probability: Mild winters and a high water table have lead to an increased population of mosquitoes which carry WNV and EEE in the State of Vermont. Two conflicting assumptions can be made to forecast the current trend. If the current global climate change is a temporary spike, populations of many of these mosquitoes would be expected to be reduced as the trend reverses itself. On the obverse, if the current trend continues over the next few decades, these and other disease carrying insect populations will likely increase. This increase in populations will likely result in an increasing risk to residents.

Vulnerability Summary: Concerns about the hazards related to mosquito bites and the transmission of diseases resulting from those bites have accelerated in Cornwall over the past few years. Mosquitoes have been a known nuisance pest and have limited the enjoyment of outdoor activities in parts of Cornwall for years. In 2006, the towns of Bridport, Cornwall and Weybridge created the Lemon Fair Insect Control District to help combat this nuisance problem. Ongoing programs that monitor populations and spray larvacides have been successful in keeping overall nuisance populations to within acceptable levels. Recently, however, public concerns have evolved from nuisance issues to life safety issues associated with two arbovirus types. The Vermont Department of Health identifies Cornwall within their moderate risk areas for EEE due to the discovery of infected CM in early October of 2014.

The community vulnerability score for Insect-Borne Illness is 2 and would be considered MEDIUM PRIORITY. Assuming recent conditions projected forward, there is a high likelihood of occurrence with a high economic impact to the community.

- **Wildfire (Risk Score 9)**

Location: Generally, two different wildfire fuels can be found within the boundaries of the Town of Cornwall. The forested areas of town are characterized by fuels found in the duff layer (leaves, fallen branches, etc.). The agricultural portions of Cornwall generally have a fuel base of dried grasses and shrubs. The entire community is at risk of wildfire during dry periods. Forested areas and open fields are both most at risk each year in the spring following snow melt and before spring growth has started.

Extent: Springtime burning of open fields has been a longstanding historic practice thought to improve field fertility. Every few years, these get out of control due to either poor planning or unexpected winds. Generally, this type of wildfire is limited to a few acres and poses limited threats

to structures lying close to the fuel source in the path of the fire. Fires in the forest tend to be smaller, usually limited to under an acre in size. These are generally mitigated by hardwood tree species and cover on the forest floor.

Past Occurrences: No records of wildfire activity have been found for the Town of Cornwall. However, the State Agency of Natural Resources keeps track of fires in the entire state. Most wildfires are never reported to State forestry officials and are therefore not shown in their annual reports. Based on the period between 2001 and 2010 those reported averaged just under 120 fires which burned a total of 215 acres.

Vermont Wildfire Statistics

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
# fires	189	100	101	86	221	118	81	115	95	88
# Acres	295	146	95	250	547	254	180	138	164	84
Ave. Size	1.56	1.46	.95	2.91	2.48	2.15	2.22	1.20	1.73	.95

Addison County Wildfire Statistics

Year	2006	2007	2008	2009	2010
# fires	2	4	6	10	1
# Acres	.5	9	10	4.5	1.2

Within the past 50 years, forests have been closed to recreation state-wide 3 times due to extreme fire conditions. While these incidents have not resulted in large-scale damage in the Town of Cornwall, the conditions existed for widespread forest fires. In addition, an unusually dry spring will often result in a no-burn proclamation most recently seen in 2009.

Future Probability: The combinations of factors which lead to widespread wildfires usually coincide with extended drought conditions. Droughts occur every 30-40 years in Vermont and based on observed patterns, would next be expected in the decade between 2020 and 2030. During this period additional risk for wildfire would exist and an increase in wildfires would also be expected.

Vulnerability Summary: In spite of an historically active agricultural base, much of the Town of Cornwall is either forested or growing woody plant material in abandoned fields. It is these formerly farmed areas which tend to attract subdivisions and new homes. Consequently, many of the newer structures, in town would fall within an urban/wildfire interface. This increased risk for forest fire due to proximity is moderated by the so-called “Teflon Forest” conditions of the Northeastern US. While moisture levels generally tend to be higher than in the fire-plagued western forests, scattered periods of drought can increase fire danger levels to *Extreme* particularly during spring and fall seasons when dry leaves cover much of the forest floor.

It is becoming increasingly important that residences and essential facilities be constructed with an eye toward wildfire resistance by establishing no-burn zones around structures and by providing suitable water supplies for fire fighting to more remote residences.

With a community vulnerability score of 2, wildfire is considered a MEDIUM PRIORITY based on a high likelihood of occurrence and a low overall impact to the community.

- **Large-Scale Hazardous Material Incident (Risk Score 9)**

Location: There are no sites in town that have sufficient types and/or quantities of hazardous materials to require Tier II reporting, however, several local farms likely store fuels in excess of the quantities which require reporting. In addition, two local mobile businesses provide agricultural chemicals and supplies to farmers in retail sized packaging. In aggregate, the quantities could represent a significant hazard should a multiple package spill occur.

Highway accidents also, could result in a release of hazardous materials and several high accident locations are identified in the section on Transportation Accidents

Extent:

A 1000 foot buffer was superimposed over state highways and all class 1 and 2 town roads that represent a possible impact area should a large hazardous material spill occur on these highways. Based on this analysis, there are 242 structures that could be impacted should an incident with a vehicle carrying HAZMAT occur.

Essential facilities which could be impacted by such a spill within the Town of Cornwall are:

- Cornwall Town Hall/Office
- Bingham Memorial School
- Cornwall Fire Stations #1 or 2

Previous Occurrences: Large trucks are prone to roll over at certain locations along Routes 125 and 74 in Cornwall. The most recent occurrence of a hazardous environmental spill at one of these locations was the rollover of a milk tanker in 2014. A rollover in 2011 of a box trailer did not contain hazardous material but easily could have.

Future Probability: With ever-increasing numbers of trucks on Vermont's highways which were built originally for horse and buggy, a large-scale hazardous material spill is inevitable. Where and when are the only questions. Both the Cornwall highway crew and the Vermont Agency of Transportation are committed to improving highway safety but the task continues to be overwhelming.

A fixed site hazardous materials storage location is unlikely to be established in Cornwall in the near future. With adequate industrial space available in nearby Middlebury, it is likely that any future needs for such a facility will be accommodated there.

Vulnerability Summary: State highways in Cornwall are used by many trucks headed south and east out of Middlebury carrying hazardous materials as their payload. While the Cornwall Volunteer Fire Department has training in hazardous materials, the entire State of Vermont is highly dependent on the limited resources of the State's HazMat team. Fortunately, highway safety is improving both in alignments of the highways themselves and in safer vehicle designs.

The community risk rating for a Large-Scale Hazardous Materials Incident is 2 and would be considered MEDIUM PRIORITY.

- **Drought (Risk Score 8)**

Location: Drought, due to lack of rain resulting in a receding water table is generally a regional issue due to its widespread nature. Any location within the town could experience drought and/or lowered

water table. Non-potable water could be pumped from the Lemon Fair or Otter Creek in times of drought but potable water would have limited availability.

Extent: Four types of drought are identified in the State of Vermont’s Hazard Mitigation Plan: meteorological, agricultural, hydrological and socioeconomic. Local knowledge indicates dry spells are periodic in nature and would be considered moderate to severe every 10 years on the average. Within the Town of Cornwall the most obvious risks associated with drought include drying up of shallow wells (Hydrological) and reduced productivity of agricultural crops (Agricultural). Lands bordering Otter Creek would suffer least from a drought due to the ability to pump water from those sources.

Palmer Drought Index Table

≥ 4	3. -3.99	2-2.99	1-1.99	.5-.99	.49 -.49	-.5 -.99	-1 -1.99	-2 -2.99	-3 -3.99	≤-4
Extremely Wet	Very Wet	Moderately Wet	Slightly Wet	Incipient Wet Spell	Near Normal	Incipient Dry Spell	Mild Drought	Moderate Drought	Severe Drought	Extreme Drought

Previous Occurrences: Within the past 25 years NCDC reported no severe drought events. However, an extended drought period in the region occurred during the 1960s, when much of Vermont experienced severe drought in 1964 and extreme drought in 1965 and 1966. The years following that drought saw the development of several community-owned water systems in towns along Lake Champlain. In construction of the Tri-Town Water District, a small portion of northwest Cornwall was provided access. Future drought conditions could result in new calls for a public water supply in communities like Cornwall. Most recently, a dry period in 2000 saw a few residents in the Addison region without water for several weeks which was finally relieved by fall rains.

Future Probability: Historical records show periods of moderate to severe drought impact Vermont every 30-40 years with the last occurring during the 1990s. Were this pattern to continue, a moderate to severe drought would be expected sometime in the decade between 2020 and 2030.

Vulnerability Summary: Residents depending on shallow wells always run the risk of them drying up in droughty years. When these wells do dry up, residents tend to depend on a neighbor’s water supply or another nearby water source. Following occurrences such as that, an increase in well drilling can often be observed in the Addison region. The limiting factor in drilling a deep well is usually the cost of the drilling itself. Direct costs of drought conditions tend to be borne by individual residents and therefore are difficult to track accurately.

With a community vulnerability score of 1, drought would be considered LOW PRIORITY based on a moderate overall impact to the community with a relatively common period of occurrence.#

• **Highway/Transportation Accidents (Risk Score 8)**

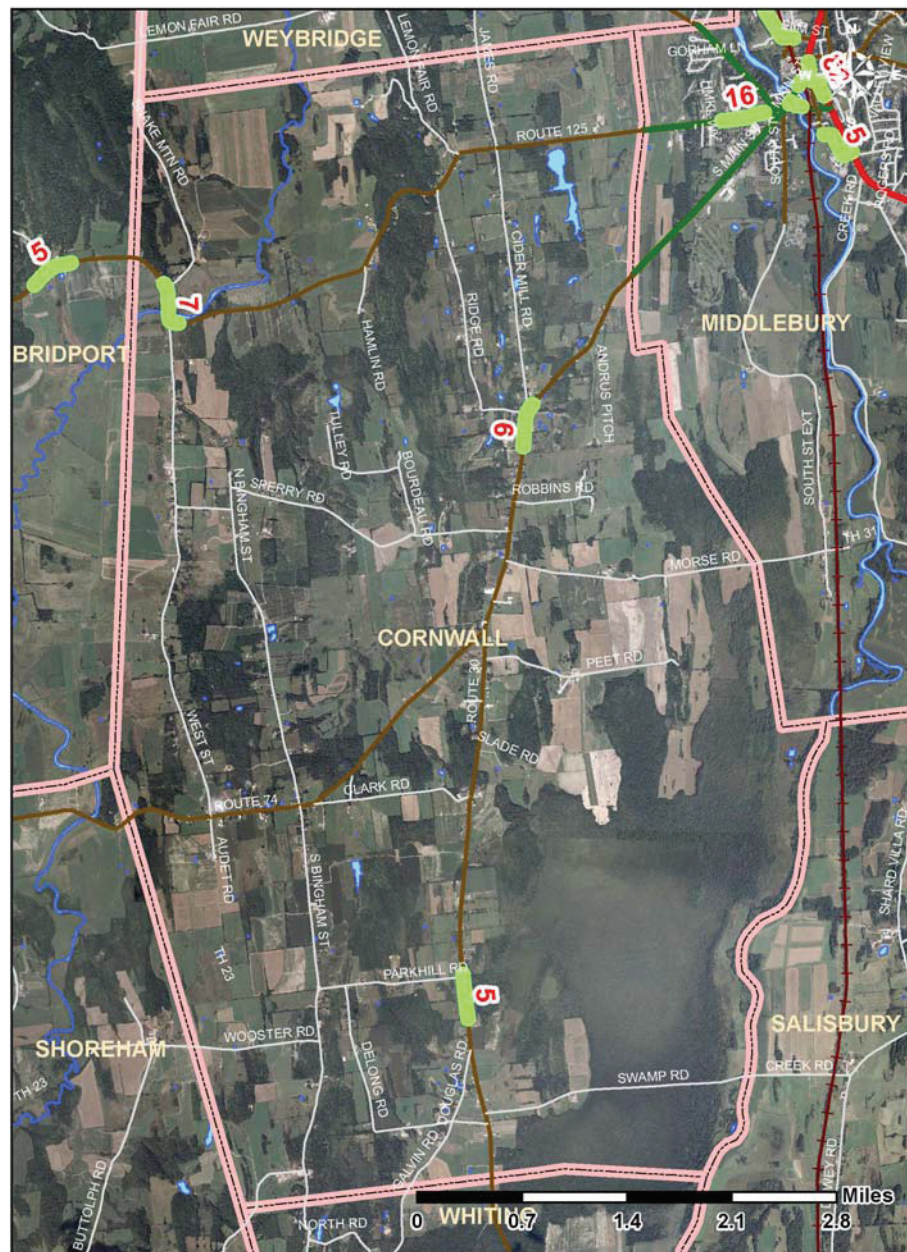
Location: The Town recognizes that certain locations along town and state highways are High Crash Locations (HCL). Three HCLs have been identified in the Town of Cornwall through police and VTrans reports:

- Route #125 at the Lemon Fair bridge
- Route #30 at the Cider Mill Road intersection
- Route #30 south of Parkhill Road

Additional frequent accident locations were identified by members of the hazard mitigation committee which did not show up on the State of Vermont's database:

- Route #74 by Evergreen Lane and the Cemetery
- Route #125 and Cider Mill Road intersection
- Parkhill Road and South Bingham Street intersection
- Clark Road and Swamp Road

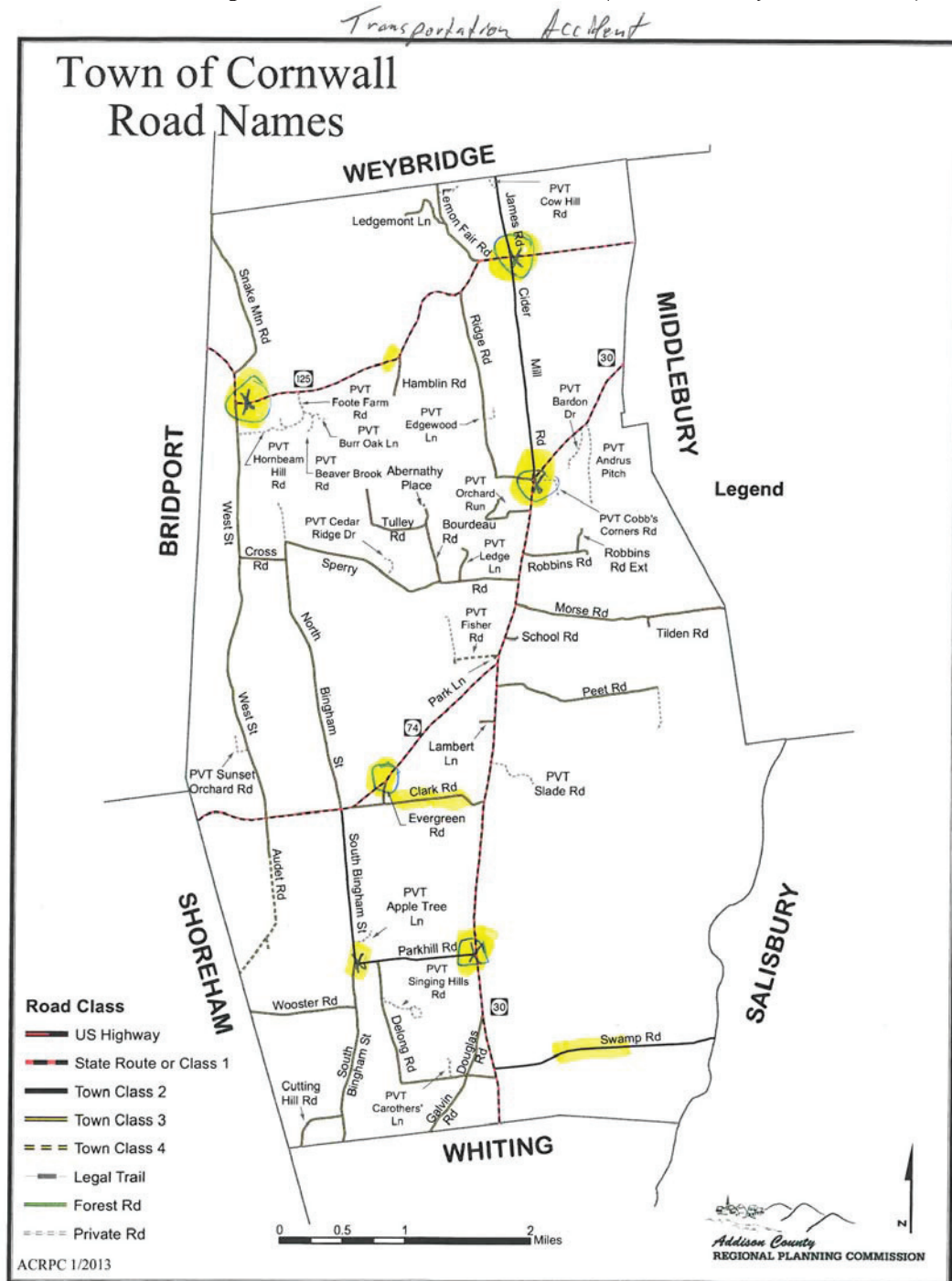
Cornwall ~ High Crash Locations: 2006-2010



* Labels ~ indicate "Total Number of Crashes" within the 5-year period

Extent: Each of the identified hazardous locations has the possibility of hosting a fatal accident. If a severe accident or roll-over were to occur involving a vehicle carrying hazardous material, residents located within 1,000 feet may need to be evacuated. While many hazardous products would pose life threatening conditions for only a short period of time, others could cause severe and lasting environmental degradation.

Cornwall Transportation Accident Locations (Identified by Committee)



Previous Occurrences: Reports from the Cornwall Volunteer Fire Department indicate that calls for auto accidents occur at a rate four times as often as structure fires. Annual Town Reports include photos of fire department responses to truck rollovers along state highways. While firm figures are not available, anecdotal reports indicate that truck rollovers occur on average at least once per year.

Future Probability: Even with improved highway safety efforts by the Agency of Transportation and the local road crew, it is likely that highway accidents including truck roll-overs will continue. Increased levels of traffic along Routes 30, 125, and 74 will result in increased numbers and severity of accidents as well.

Vulnerability Summary: Increased traffic, higher speeds, and the likelihood of a hazardous material cargo all factor into the Town of Cornwall's vulnerability to a high impact transportation accident. Fortunately the town and state continue to improve highway safety as well as provide a trained cadre of responders. Because of these ongoing actions, the community vulnerability rating for Highway/Transportation Accidents is 1 and would be considered LOW PRIORITY.

- **Earthquake (Risk Score 8)**

Location: Surprising as it is to some, all of Vermont, including the Town of Cornwall, is classified as an area with "moderate" seismic activity. This can be compared to the west coast of the U.S., which is classified as "very high" and the north-central states classified as "very low." Located in the Champlain Valley, Cornwall is at higher risk for earthquake than some other areas. Though an ancient "rift" fault known as "The Ledges" is visible in Cornwall, the rift occurred millions of years ago and is considered basically inactive.

Extent: Based on information provided by the Vermont Geological Survey, Department of Environmental Conservation, Agency of Natural Resources, HAZUS outputs for the region are summarized as follows:

The Middlebury Once-in-500 year earthquake (5.7 magnitude) could cause significant damage in Addison County. The Goodnow, NY Once-in-500 year earthquake (6.6 magnitude) could cause shaking just above the lower limit for building damage. The Montreal, Quebec (6.8 magnitude) and the Tamworth, NH (6.2 magnitude) Once-in-500 year earthquakes probably would not cause damage in Addison County. Only the loss data from the Middlebury and Goodnow events are shown below:

Middlebury Scenario (5.7 magnitude, 1/500 yr):

- Building damage – HAZUS estimates that over 1600 buildings will receive at least moderate damage. This is a little more than 13% of the total number of buildings in the county. (13% of buildings in Cornwall would be 67). HAZUS also estimates that region-wide, all essential facilities (hospital, schools, police stations and fire stations will receive at least moderate damage. 4 families would be predicted to be displaced from their homes and will need temporary shelter in Cornwall.
- Transportation & utility systems – HAZUS estimates overall minor disruption of the transportation and utility systems. However, over 9000 households in the region are expected to be without electrical power for up to three days.

- Casualties – Minimal casualties are also expected with less than twenty-five requiring medical attention and less than three needing hospitalization in the region.
- Economic loss – Direct building losses are estimated at > \$83 million and business interruption losses are expected to be as much as \$105 million. HAZUS estimates that although there was minimal damage to the transportation system the loss would still be close to \$15 million. Approximately \$4.4 million would be needed to repair damaged communications systems.

Goodnow Scenario (6.6 magnitude, 1/500 yr)::

- Building damage – HAZUS estimates that over 600 buildings will receive at least moderate damage. This is a little more than 5% of the total number of buildings in the county. (5% of buildings in Cornwall would be 26) HAZUS also estimate that all essential facilities (hospital, schools, police stations and fire stations in the region will receive at least moderate damage. 2 families are predicted to be displaced from their homes and will need temporary shelter.
- Transportation & utility systems – HAZUS estimates minimal disruption of the transportation and utility systems. However, over 4000 households are expected to be without electrical power for up to three days in the region.
- Casualties – Minimal casualties are also expected with less than six requiring medical attention and only one needing hospitalization.
- Economic loss – Direct building losses are estimated at > \$17 million and business interruption losses are expected to be as much as \$24 million. HAZUS estimates that although there was minimal damage to the transportation system the loss would still be close to \$3.6 million. Approximately \$0.9 million would be needed to repair damaged communications systems.

Previous Occurrences: Sixty-three known or possible earthquakes have been centered in Vermont since 1843 (*Ebel, et al 1995*). The two strongest recorded quakes 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 in nearby Middlebury. The Swanton quake caused little damage, but the Middlebury quake did result in broken windows, cracked plaster and falling objects (*VEM, 1995*).

Earthquakes centered outside the state have also occasionally been felt in Vermont. Twin quakes 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*).

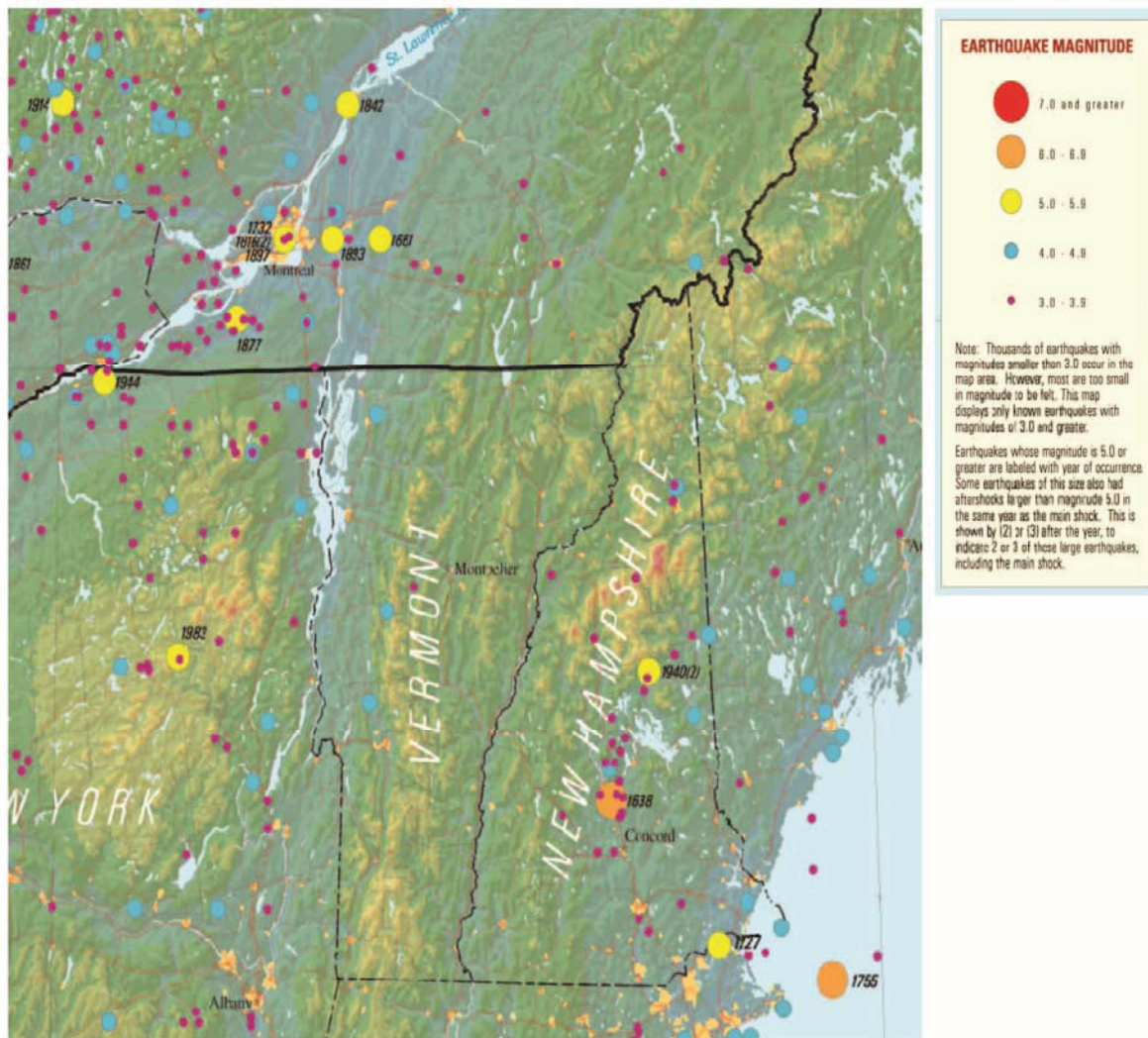
In May 2001 and again in the summer of 2010, earthquakes in the 5.0-5.5 range have been felt in Cornwall with epicenters in New York and Quebec respectively.

Future Probability: The USGS database shows there is a 2.26% probability of an earthquake measuring 5.0 or above within 31 miles of the Town of Cornwall in the next 50 years.

Vulnerability Summary: The Cornwall Hazard Mitigation Committee scored Earthquake hazard a risk score of 8 resulting in a vulnerability score of 1. Residents of the community do not generally consider earthquake to be a high enough risk to require preparing for one. This results in little or no preparedness should an earthquake occur. With a community vulnerability score of 1, earthquakes

would be considered LOW PRIORITY based on a low probability of a significant event in any given year but with a high overall impact to infrastructure should a significant event occur.

Regional Historical Earthquake Records



- **Dam Failure (Risk Score 8)**

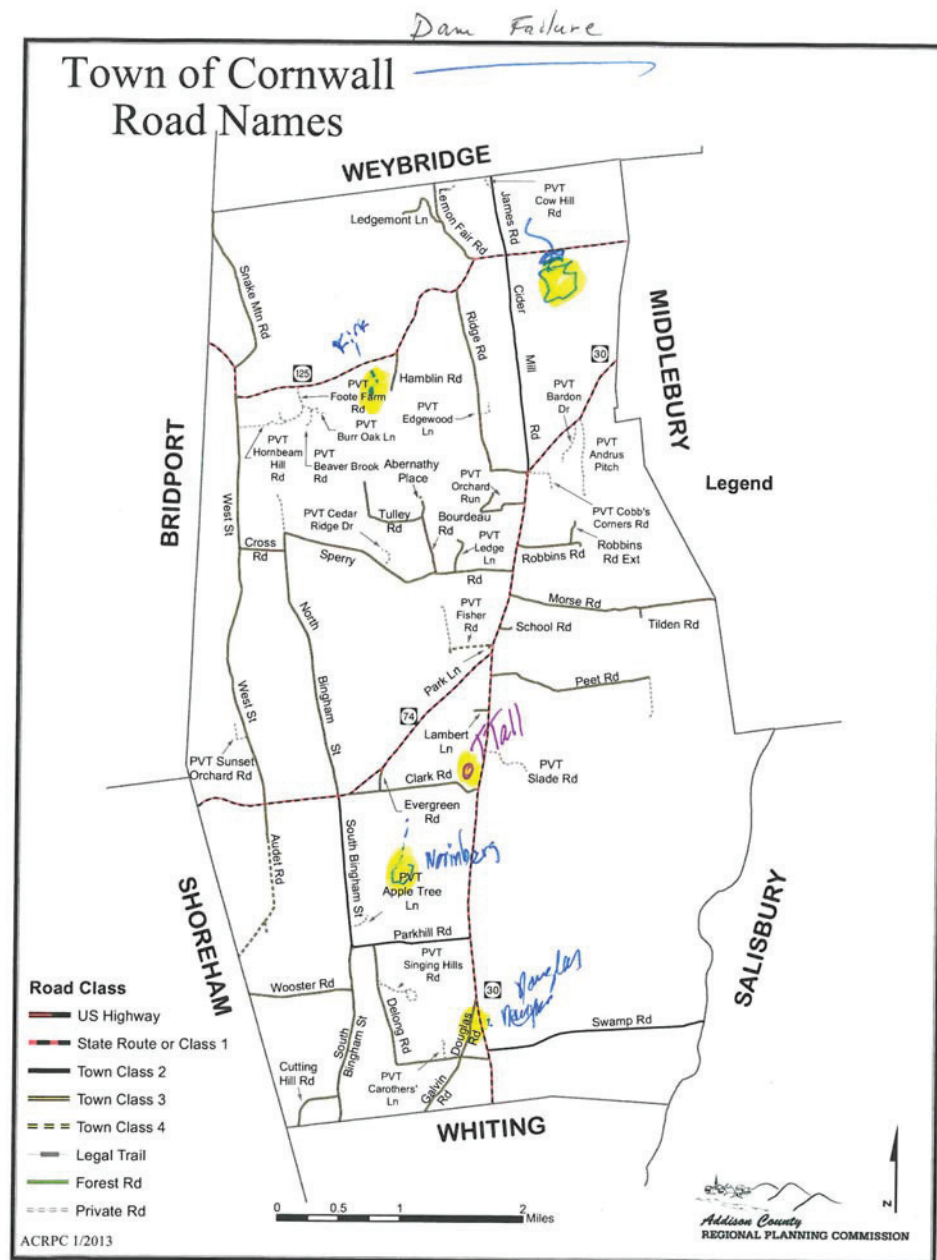
Location: Cornwall has 4 dams identified in the State's dam inventory database. These are: Cornwall #1 located on Douglas Road, Norinberg, located off South Bingham Street, Kirk, located off Tulley Road and Perry-Jackson, located off Route #125.

Extent: Though small enough to not require emergency planning by the State of Vermont, individually, if any of these dams were to experience catastrophic failure, the impacts on downstream infrastructure would be significant. Downstream impacts of a dam failure would likely be failed culverts with lessening impacts at distances further from the dam site. These dams have a collective surface area of 32 acres with the largest being the Perry-Jackson pond at 25 acres. Of the dams identified by the hazard mitigation committee, only the Perry-Jackson dam located in northeastern

Cornwall rises to the level of “Significant Hazard Potential” on the State of VT dam database. The earthen dam was built in 1988 and has a 1.23 sq mi drainage area that feeds it. Used primarily for recreation, the catastrophic failure of this dam could result in severe downstream damages to State Route 125.

Previous Occurrences: There is no history of catastrophic dam failure in the Town of Cornwall. Historic records indicate that due to the topography of the area, early settlers found few locations where the effort needed to dam the water courses in town were justified by the resultant water power. This poor water power resource has never resulted in construction of dams which would be prone to catastrophic failure.

Cornwall Dam Locations (as identified by local committee)



Future probability: Torrential rains as are forecasted in the future due to climate change could result in catastrophic failure of any of the known dams in Cornwall. Close monitoring of the Perry-Jackson Dam by state officials should lessen the risks that it would fail unexpectedly and allow for gradual draining if issues with the dam structure were to be found.

Vulnerability Summary: Overall, the Town of Cornwall is at limited risk to dam failure that would cause severe damages. Only the Perry-Jackson Dam has the real potential for major damage to Route 125 should a catastrophic failure occur. The remaining dams located in town would only result in minor road washouts should a failure occur.

The community vulnerability rating for Dam Failure is 1 and would be considered LOW PRIORITY.

- **Invasive Species (Insects) (Risk Score 8)**

Location: All of the Town of Cornwall is at risk to damages caused by Invasive Insects. The primary concerns statewide in 2015 are the impacts of Emerald Ash Borer and the Asian Longhorned Beetle should they gain entrance into the State of Vermont. Many target tree species are located throughout Cornwall.

Exent: A major infestation of Emerald Ash Borer would have the effect of killing ash trees throughout Cornwall. White ash is a common landscape tree and is found in the wild throughout town. Ash is a valuable tree species for hardwood lumber though it is not extensively harvested in Cornwall.

A major infestation of Asian Longhorned Beetle would be catastrophic to the local maple sugar industry since Sugar Maple is its preferred host. While maple sugaring is not a large economic driver in Cornwall, the impacts due to the loss of maples in the landscape would have a huge impact on fall foliage and the tourism industry throughout Vermont

Previous Occurrences: To date, no examples of either Asian Longhorned Beetle or Emerald Ash Borer have been found in Vermont. Most informed foresters, however, feel the ash borer is probably already in Vermont. The surrounding states of New York New Hampshire, Massachusetts and the province of Quebec all currently have resident populations of the ash borer.

The longhorned beetle is being battled extensively in neighboring Massachusetts where discovery of beetles results in removal of all host species for miles around.

Future Probability: Both invasives are expected to eventually reach Vermont. The ash borer in particular is expected within the next year or so. The state is currently encouraging communities to begin identifying specimen ash trees for treatment and is encouraging alternate landscape plantings. Communities are also being encouraged to begin to build a “war chest” to fund hazardous tree removals on municipal property.

With any luck and with an aggressive response if the longhorned beetle is discovered in Vermont, populations will be able to be kept under control.

Vulnerability Summary: Cornwall itself is probably unable to have much of an impact if either of these species is found within the town boundaries. They will be highly dependent on state and possibly federal assistance should a major infestation occur. Statewide, Vermont's maple industry could collapse and that signature product could cease to exist if aggressive actions are not taken to combat and prevent an infestation of the longhorned beetle.

This hazard is relatively unknown and the committee community vulnerability rating for Invasive Species was scored at 1. This would be considered LOW PRIORITY.

- **Landslide/Erosion Hazard (Risk Score 7)**

Location: Landslide/erosion issues are generally limited to erosive actions of high water on riverbanks in town. The banks of Otter Creek along the Cornwall Swamp and the banks of the Lemon Fair are at the most at risk for erosion associated with river channel movements. One ongoing gradual slump which has affected a portion of Route #125 east of the Lemon Fair Bridge has been observed.

Extent: The ongoing erosion of the river banks in town along the Otter Creek and the Lemon Fair will not pose much of a problem to existing structures unless the erosion somehow advances along bridge abutments. If bridge abutments are undermined by the erosive actions of a changing channel alignment, it is possible to have a bridge failure.

Past Occurrences: No known instances of catastrophic landslide/erosion events have been found. The Route 125 slump has been ongoing for many years. The State has applied patches to the area to retain the level of the highway in this location over the years. The latest fix, applied in 2010, seemed initially to have stabilized the issue but recent observations indicate the slump is still active.

Future Probability: Much of the erosion susceptible property along the rivers and their floodplains are in agricultural use and not currently at risk. However, future development in floodplains near river banks is still possible due to the limited protections adopted by Cornwall to meet the requirements for the National Flood Insurance Program (NFIP).

Vulnerability Summary: Due to the generally rolling terrain, the Town of Cornwall is at limited risk for landslide/erosion hazards. Because of the easy access to the natural floodplain by flood waters, they rarely are constricted enough to create the conditions which would cause a rapid realignment of any river channels. There is limited risk associated with slumps in Cornwall though one has been observed in one location. It is possible that conditions exist elsewhere in the community for slumping but at this point, no additional locations have been identified where a slump would affect public or private infrastructure.

The community vulnerability rating for Landslide/Erosion Hazard is 1 and would be considered LOW PRIORITY. The communities risk could change depending on future development since the area most susceptible to erosion is not currently protected by NFIP-based bylaws.

- **Pandemic - (Risk Score 7)**

Location: The risk for a future pandemic exists throughout the world and at any point in time, pandemic conditions are present somewhere in the world. Cornwall is as much at risk for pandemic as any other locations.

Extent: A pandemic caused by H1N1 was extensively exercised in Vermont and the nation In 2004 and 2005 in anticipation of its coming. This scenario indicated as much as 60% of the residents in Vermont could be infected and unable to perform their jobs for an extended period of time. Such an event would severely tax local medical facilities in neighboring Middlebury as well as drastically limit the ability of a town to perform basic functions of highway maintenance, fire protection and operations in general.

Previous Occurrences: Pandemics have occurred worldwide since the beginning of time. Within the past century, the 1918 influenza outbreak was the most severe and resulted in thousands of deaths. More recently, the Hong Kong flu outbreak of the 1960s and swine flu in the early 1990s have threatened populations worldwide.

Future Probability: The most dangerous of diseases are the result of humans living in close quarters with animals. Tight quarters invite transference between animal (bird, swine) hosts and human caretakers. Past examples have included avian flu, HIV, Ebola and others. Because these mutated viruses are unfamiliar to humans, there is little resistance resulting in rapid spread of the disease. These conditions are not expected to change, especially in developing countries.

Vulnerability Summary: Public health experts are constantly monitoring diseases worldwide to discover newly emerging diseases. The hope is that early detection will allow enough time for appropriate treatments or vaccines to be developed. When new diseases are discovered the CDC is quite active in increased public awareness activities. State health officials are also quite proactive and work well with Town Health Officers whose job is to manage response at the local level. In spite of this structure, mutations can emerge at any point in time or location and until there are treatments, towns remain at high risk for reduction or cessation of public services in spite of all COOP/COG plans in place.

The community vulnerability rating for Pandemic is 1 and would be considered LOW PRIORITY mostly due to the inability of the town to have much impact beyond that which is already in place nationwide..

- **Inundation Flooding (Risk Score 6) 44CFR 201.6(c)(2)(ii)**

Location: The Town of Cornwall is most susceptible to inundation flooding in the mapped floodplains along Otter Creek, the Lemon Fair and their tributaries. This area includes the Swamp Road which crosses Otter Creek into Salisbury.

Extent: FIRM flood maps, digitized in 2006 by ACRPC and E911 points as documented by the State E911 database were compared digitally and where the two sets of data intersect, there are no structures in the town that are potentially vulnerable to flooding. Data on the Flood-Ready Vermont website compiled by the Agency of Natural Resources indicate a single structure meets these same requirements. Unfortunately, the quality of the FEMA map products in this area coupled with inconsistencies in digitally scanning those maps results in this discrepancy. As one of 517 residences in town, the overall impact to the town should this home be located in the floodplain and destroyed due to flood, would be less than two tenths of one percent of the Cornwall grant list. This would represent a possible loss of \$6,300 in tax revenue to the town should the property fall into an “average” value.

Damages within the Town of Cornwall are usually limited to the closure of Swamp Road when waters rise. Once waters have subsided, it is usually a matter of clearing away debris which has settled on the road from the flooding. Increased commuting times are the primary issue when the road is closed due to high water. Wetland restoration by the Nature Conservancy and others consisting of plugging drainage ditches in the Cornwall Swamp area promises to extend Swamp Road closures by retaining flood waters longer.

Past Occurrences: The Addison Region has experienced 21 flooding events over the past 25 years with reportable damages. The highest record of damages experienced during that period was \$250,000 in Panton in 2011. During the 25 year period an estimated \$570,000 in property damages were incurred.

The town's lack of at-risk structures can be heavily attributed to the topographic conditions surrounding the Lemon Fair and Otter Creek. Both of these rivers have extensive floodplains which have, over the years, not been compromised by human interference. These floodplains effectively mitigate damages by slowing currents in these rivers and by reducing the levels of flooding experienced. Otter Creek was an exceptional example of this following tropical storm Irene when flooding all along the river downstream of Rutland resulted in very limited damages.

The Town of Cornwall has been hit with 3 of these presidentially declared disasters in the past 10 years (August 2008, September 2011 and May of 2012) as a result of flooding. Reimbursements for the 2008 and 2012 storms totaled over \$44,000 and the final tally for work completed following tropical storm Irene in 2011 has yet to be determined.

Future Probability: Since the desirability of a "home on the water" is quite high, pressure to develop additional lands within floodplains is increasing. While current long-term residents of Cornwall generally know better than to build on any floodplain that floods every few years, newcomers to town could view these locations as desirable. Given the poor quality of the FIRMs serving the Town of Cornwall, it is not hard to imagine the incremental process of filling in the natural floodplain to elevate new homes. While these new homes would be considered safe from flooding, the impacts of lands both upstream and downstream would likely put additional infrastructure at risk.

Vulnerability Summary: The Town of Cornwall, in its historic development patterns, is relatively flood-safe. There are effectively no residences currently at risk due to inundation flooding in town and risks associated with public infrastructure are limited to bridges and seasonal flooding of Swamp Road.

Unfortunately, limitations for development in floodplains provided by base NFIP standards subsidize growth in a mapped floodplain and may not sufficiently address the hazards associated with proximity to the river. In addition to an increased demand for development, the Town is limited in its ability to effectively regulate the mapped flood areas due to the overall poor quality of the available FIRMs. These factors leave the door wide open to increasing the town's overall vulnerability to inundation flooding.

The community vulnerability score of 1 for inundation flooding is a LOW PRIORITY based on the highly likely occurrence of an incident with only an isolated extent and minor impacts.

5. Community Mitigation Strategies

5.1 Hazard Mitigation Goals by Hazard Type **44CFR 201.6(c)(3)(i)**

Each hazard type identified in Section 1.4 “Community Risk Assessment” can be mitigated depending on the willingness to do so at the local, state or federal level. For example, the mitigation of flood damage is basically a simple fix: don’t allow anything in the floodplain that can’t afford to be lost, and when it is lost, don’t replace it. This would include all forms of infrastructure whether it be homes, highways, dams or croplands. Unfortunately, political will can rarely stand up to the simplicity of mitigation.

The Town of Cornwall has identified that its goals for hazard mitigation are to reduce and/or avoid all long and short term vulnerabilities to the hazards identified in section 4.3. In doing so, it also recognizes that political will and lack of funding stand in the way of many mitigation projects. The town particularly supports local residents’ efforts to mitigate their personal risks. The Town also supports projects that lead to a positive benefit vs. cost evaluation and which the voters can afford.

Identified Hazard	Primary Mitigation Goal
Widespread Power Failure	Ensure that essential services can function during disaster
Flash Flood	Reduce loss of infrastructure due to flash flooding
Winter Storm/Ice Storm	Ensure that essential services can function during disaster
High Winds	Ensure that essential services can function during disaster
Lightning	Protect the health and safety of the public
Structure Fire	Protect the health and safety of the public
Insect-Borne Disease	Provide for the outdoor recreational safety of the public
Wildfire	Protect the health and safety of the public
Large-Scale HazMat Incidents	Ensure that highway improvements result in safer conditions
Drought	Ensure that all new and existing residences are drought resistant
Transportation Accident	Ensure that highway improvements result in safer conditions
Earthquake	Protect existing and new properties and structures
Dam Failure	Protect the health and safety of the public
Invasive Species	Reduce impacts to residents and local industry
Landslide/Erosion	Reduce loss of infrastructure due to erosion
Pandemic	Protect the health and safety of the public
Inundation Flooding	Protect existing floodplain from development

5.2 Authorities, Policies, Programs, Resources (and the ability to expand upon these) **44CFR 201.6(c)(3)**

Authorities of Town Officials:

Selectboard: The Selectboard is responsible for the basic administration of the town. They take care of roads, make appointments to other boards and commissions, and authorize expenditures of voted budgets. The selectboard may enact ordinances and rules in many areas including traffic regulation, regulating nuisances, managing solid waste, dogs and recreation, and establishing bike paths.

Planning Commission: The Planning Commission is responsible for long range planning in a town particularly as it relates to future land uses. They prepare a municipal plan and zoning bylaws which are adopted by the Selectboard. Planning Commission members are elected for three year terms.

Conservation Commission: The Town Conservation Commission is responsible for inventories of the natural resources of a town and making recommendations to the Planning Commission related to conserving them. Conservation Commission members are appointed by the Selectboard.

Zoning Administrator: The Zoning Administrator (ZA) is appointed by the town's Selectboard with consideration given to the recommendation of the planning commission. The ZAs responsibilities include administration and enforcement of a town's zoning bylaws, The ZA in Cornwall also serves as the administrator of town floodplain regulations.

Tree Warden: The Town Tree Warden is responsible for the shade and ornamental trees within the town rights-of-way. The Tree Warden oversees tree health and removal when necessary. The tree warden is appointed by the Selectboard.

Fire Warden: The Town Forest Fire Warden has the responsibility for suppression of wildland fires, regulating open burning in the town by issuing burn permits, and wildfire education/prevention. The Town Fire Warden is appointed by the state Commissioner of Forests, Parks and Recreation with approval by the town's Selectboard.

Health Officer: The Town Health Officer is the executive officer of the local Board of Health. A local board of health may make and enforce rules and regulations...relating to the prevention, removal, or destruction of public health hazards and the mitigation of public health risks. The Town Health Officer is appointed by the Commissioner of Health with approval by the local Selectboard. They take direction from the state Department of Health in investigation and enforcement of public health issues.

Emergency Management Director or Coordinator: By default, a town's Selectboard chair is the town's emergency management director (EMD) unless one is appointed. Many communities retain the authorities of an EMD within the Selectboard and appoint an emergency coordinator instead. The emergency management coordinator is responsible for the administration and operation of the local emergency management organization. Emergency management coordinators prepare local emergency operations plans, coordinate a local emergency management group and perform emergency management functions at the local level.

Current policies, programs, resources and the ability to expand on these for identified hazards:

All Hazards:

The Town of Cornwall's Emergency Management Network is a well organized and active presence in Cornwall. Their mitigation strategy includes increasing the awareness of all hazards planning, and promoting preparedness in the school.

Widespread Power Failure

Many private residences have back-up power sources and essential Town facilities like the Town Hall/Office and Town Garage have been retrofitted in recent years.

As population growth and housing expands along remote road corridors, increasing reliance on dependable power by the new homeowners requires changes in line maintenance. Green Mountain Power (GMP), the utility servicing the Town of Cornwall has an ongoing program of line clearing and relocation to ensure outages are kept to a minimum. In addition, recent improvements to the transmission system in northwest Vermont have provided redundant systems to bring electric power to the region.

The Town of Cornwall supports continued development of a robust and redundant local electric generation and transmission system for its residents. This support is limited to that which can prove that the benefit to local residents outweighs the societal costs associated with industrial generation and transmission degradation of the local landscape.

Flash Flood

The Town of Cornwall adopted the 2013 version of road and bridge standards as recommended by VT AOT on 3/18/2014. These standards address road and bridge construction, are designed to mitigate local traffic issues and are particularly designed to mitigate potential damages due to flooding and flash flooding. The standards address culvert sizing, ditch treatments and driveway access to reduce flood-caused erosion. The adopted standards are attached as Annex F of this mitigation plan.

The town supports the Vermont Culvert Database VOBCIT by updating records whenever they replace or upgrade culverts.

Winter Storm/Ice Storm

Mitigation activities by power companies have re-routed many of the remote lines along town highways since a 1998 ice storm and an increased pruning effort has reduced the impact of a similar event would it happen today.

The Town of Cornwall generally mitigates its winter storm risk through preparedness activities in the form of appropriately sized equipment and training. The cutting of brush along town highways also mitigates the effects of large winter storm events by reducing their ability to act as snow fence dropping windblown snow into the town highway system. Reduced brush also mitigates snow storms by allowing space to plow snow off the roads.

All improvements to the road system take into account ease of snow removal in design

High Winds

Residents of the Town generally do not recognize high wind as a hazard which can be mitigated with the exception of the effects previously discussed under widespread power failure.

Newly constructed buildings may have tie downs between roof and side walls but no building codes exist within the community that require construction to any particular standard.

Where high wind hazards have been recognized, it is usually a function of damage that might be caused if a tree were to be blown over and its effect on a resident's home. For this reason, some trees are removed from the landscape to reduce their vulnerability to high wind events. The Town of Cornwall supports removal of dead and hazardous trees in the town right-of-ways to mitigate the hazards associated with their falling either on town highways or on power lines.

Lightning

The town has mitigated potential damage to some Town-owned structures due to lightning strike by installing lightning rods to channel the electrical energy directly to ground rather than through the structure's electrical system.

Most larger privately owned structures in vulnerable locations have similarly installed lightning rod systems to protect them from lightening strike with the encouragement from insurance companies and extension agents.

The Town has no adopted building standards which would require this action but feels the risk to private residences should be borne by residents on an individual basis.

Structure Fire

Installation of dry hydrants at water supply locations can increase the availability of and speed in which water can be accessed for firefighting purposes. The Town of Cornwall supports installation of these hydrants as funding permits and suitable locations can be identified.

Actions identified under the Drought hazard would also mitigate structure fire and wildfire risk in future developments.

Insect-Borne Illness

Cornwall has a high percentage of its land mass in frequently flooded soils and abandoned farmlands. These lands are home to insects, some of which also carry arboviruses. The town is a member of the Lemon Fair Insect Control District and annually contributes tax money toward the district's efforts to keep insect populations in check.

The Town supports efforts by the Vermont Department of Health in educating the population by making handouts available at the town office and by supporting the educational efforts of the town's health officers.

Wildfire

Cornwall has an active fire warden who requires permits prior to any outdoor burning in the town. This process includes site visits to a proposed burn site and a subsequent issuance of a permit. Enforcement is usually limited to a warning if the fire seems lit out of ignorance and can result in fines if the fire department is called out.

The town has no guidelines for home construction in place that would limit the risk to wildfire in Cornwall. Actions taken as described above should limit the setting of uncontrolled outdoor fires and should result in an overall limited risk. Fire ponds may be required in larger developments, which should mitigate future fire risk in those developments.

Large-Scale Hazardous Materials Incident

A representative from the Town of Cornwall is an active member of the Local Emergency Planning Committee in planning for hazardous materials incidents.

The nearby Town of Middlebury is host to a regional HazMat Decontamination trailer, providing mitigation through proximity of response resource.

The Town zoning bylaws section 521 specifically limits storage of explosives and requires conditional use review by the Board of Adjustment prior to a permit being issued. In addition, Town zoning bylaws limit storage of hazardous materials or any other materials in the mapped floodplain.

Drought

Most homeowners with shallow wells have learned to live with the inconvenience of dry spells by purchasing bottled water and using public toilets and laundries for the short periods they would be without a dependable water supply. When the inconvenience has become too much, many of these homeowners have mitigated the problem by drilling deep wells. Increasingly, home mortgages are requiring a dependable deep well water supply as a condition of a loan.

Agricultural activities highly dependent on water such as fruit and vegetable crops can be severely impacted by lack of rain. Most of these businesses have mitigated the effects of periodic droughts by providing irrigation systems. Other farms, dependent on crops to feed livestock rather than humans, are highly impacted by low water supplies and may be dependent on a USDA disaster declaration to find relief.

Reduced water supplies also impact the community's fire fighting capabilities. Since no public water supply is available, the fire department is highly dependent on surface water supplies for fire fighting. The Cornwall Volunteer Fire Department is active in installing dry hydrants in deep water ponds and streams to make access to water easier within the Town of Cornwall. As housing continues to expand into rural areas, the potential lack of a dependable water supply for fighting fire is becoming an issue.

As a mitigation measure shared with structure fire and wildfire, future development may need to be required to provide fire ponds as part of an impact assessment. Cornwall's current subdivision regulations call for "adequate" water supply to be provided for any subdivision.

Transportation Accidents

A representative from the town sits on the local Transportation Advisory Committee, a regional group whose purpose is to prioritize potential transportation related projects within the region. This group rates High Crash Locations (HCL) highly in prioritizing projects to mitigate the risks associated with these locations by changing alignments, adding signage, and reducing speed limits.

Earthquake

Despite the probability of an earthquake within the next 50 years, most town residents do not even attempt to mitigate its hazard.

The Town of Cornwall has also not identified earthquake as a hazard it feels is imminent enough to justify much in the way of mitigation actions.

Dam Failure

The Town of Cornwall does not generally address dam failure mitigation in its day-to-day activities leaving the protection of the public up to State dam safety inspectors. Since the most catastrophic dam failure would primarily impact the state highway, mitigation actions have been left up to the State and Federal authorities.

The Town Planning Commission has considered writing of water impoundment construction standards into its zoning regulations. The intent of such standards would be to limit the volume of water which could be stored in a man-made impoundment and therefore limit risk.

Invasive Species (Insects)

The Town of Cornwall has an active tree warden appointed annually to oversee the publicly owned trees located in the Town's right-of-way. The elected Road Commissioner is usually appointed to fill this position due to the ability to evaluate dangerous and/or diseased trees along with their town highway duties.

Unhealthy or hazardous trees are removed on a regular basis. Any drastic increase in tree deaths due to invasives may need to be budgeted for separately from the highway budget should the need arise.

Landslide/Erosion Hazard

Unfortunately, the relatively short lives (compared to geologic time) of property owners lead them toward the belief that the river has always been stable and that it is poor management that causes channel migration rather than the unstoppable forces of nature.

In the most current Town Plan, adopted in 2012, the town planning commission indicates a desire to reduce the erosion of river banks and the resultant sedimentation which cause nutrient loading into the river systems. By encouraging vegetative buffers along riverbanks it is believed that future erosion will be reduced.

Adoption of zoning regulations which would require a buffer along all riverbanks is an acceptable option but could be difficult to adopt as property owners often do not recognize the threats associated with river channel migration over time.

Pandemic

The Town of Cornwall has an active Town Health Officer who also serves as a member of the town's emergency management network. The Town Health Officer is active in training opportunities offered by the VT Department of Health including pandemic preparedness when it has been offered.

Inundation Flooding

The Town has been a member in good standing of the NFIP for over 30 years. There are no identified "Repetitive Loss" properties located in Cornwall. One flood insurance policy is in effect for a residence in the town located outside of the identified flood hazard zone. This property is currently insured for \$350,000.

The Town supports continued compliance with the NFIP and would support Community Rating System (CRS) improvements where the benefits to the town's residents would outweigh the costs of additional administration and compliance.

5.3 Project Prioritization Process

Projects and actions included in Section 5.2 are generally supported by the Town of Cornwall or regional and State agencies where noted. The Town encourages its residents to adopt mitigation actions which could protect their personal property by making educational materials available to residents. Many of these potential actions are contained in Annex C as mitigation measures for

individuals Mitigation actions identified in Section 5.4, however, are considered the jurisdiction's priority mitigation actions. These actions/projects are constantly evaluated for benefit to the community, estimated project cost and political will to implement and will be implemented as those factors indicate. The actions identified in Section 5.4 under each hazard have passed a preliminary evaluation utilizing those general concepts by the hazard mitigation committee, and are listed in their order of priority. Before undertaking these projects, they will additionally be prioritized based on their feasibility and a benefit vs. cost review. A minimum C/B result of 1.0 will be required prior to any request for federal mitigation funds. Annex D identifies only some of the available programs which can help to fund some of these actions/projects. All projects in section 5.4 will be reviewed for progress following any local disaster declaration and will be considered annually as part of overall town budgeting.

5.4 Proposed Mitigation Actions and Projects by Hazard Type 44CFR 201.6(c)(3)(ii)

In developing the following list of proposed mitigation actions and projects, care was taken to include only those projects which could be considered reasonable and feasible based primarily on cost and political willingness. In the event of a presidentially declared disaster, the town will access FEMA 406 Mitigation funds as part of its standard repair/reimbursement process.

Each project in this action plan includes an estimated cost, possible funding sources, the lead person or agency responsible for completion of the project and an estimated timeframe for project completion. Timeframes are indicated as Short Term (1-2 years), Medium Term (2-4 years) and Long Term (> 4 years)

All Hazards

Institute an EM preparedness/Fire Safety education program in the school

Estimated cost: \$200-\$300

Source of Funds: Town Emergency Management, School Budget

Responsibility: Town EM Coordinator/Fire Dept

Timeframe: Medium Term

Purchase EBS/NOAA emergency radios for use in appropriate locations throughout town

Estimated cost: \$200-\$300

Source of Funds: Town Emergency Management Budget

Responsibility: Town EM Coordinator

Timeframe: Medium Term

Prepare an agricultural emergency response plan for local farms

Estimated cost: \$200-\$300

Source of Funds: Town Emergency Management budget

Responsibility: Town EM Coordinator

Timeframe: Medium Term

Conduct drills and exercises to test plans

Estimated cost: \$0

Source of Funds: Volunteer time

Responsibility: Town Emergency Manager/Fire Dept

Timeframe: Short Term

Widespread Power Failure

In future requests for Right of Way usage for maintenance purposes, the Town will normally grant access. Due consideration in granting these permissions will be given when such access will adversely impact scenic corridors and residents desires to keep the beauty of tree-lined streets and roads.

Estimated cost: \$0

Source of Funds: None needed

Responsibility: Selectboard

Timeframe: Short term-Long term

Acquire back-up power capacity for the Bingham Memorial School

Estimated cost: \$15,000-\$20,000

Source of Funds: Town General Fund, HMGP

Responsibility: Emergency Manager

Timeframe: Medium to Long Term

Flash Flood

The following specific road projects have been identified which will serve to mitigate the effects of flash flooding in the road network system to be implemented as funding allows. All identified culvert and bridge replacements are subject to the State of Vermont's stream alteration permit system and the codes and standards adopted by the Town of Cornwall.

- State Route 125 box culvert replacement/rebuild
Estimated cost: \$300,000-400,000
Source of funds: State highway budget/HMGP
Responsibility: Joint Road Commissioner, Selectboard, VTrans
Timeframe: Long Term
- Upgrade cross culverts from Trombley to Gorton properties on West Street
Estimated cost: \$20,000- 60,000
Source of funds: Town highway budget/HMGP
Responsibility: Joint Road Commissioner and Selectboard
Timeframe: Short Term to Medium Term
- Upgrade and lengthen 3ft culvert south of Bolduc Farm on West Street
Estimated cost: \$10,000
Source of funds: Town highway budget/HMGP
Responsibility: Joint Road Commissioner and Selectboard
Timeframe: Medium Term
- Upgrade 30" culvert South of Payne Farm on West Street
Estimated cost: \$5,000
Source of funds: Town highway budget/HMGP
Responsibility: Joint Road Commissioner and Selectboard
Timeframe: Medium Term
- Upgrade and lengthen 18" culvert west of Beaver Brook bridge on Sperry Road

Estimated cost: \$5,000

Source of funds: Town highway budget/HMGP

Responsibility: Joint Road Commissioner and Selectboard

Timeframe: Short Term to Medium Term

- Add an additional culvert at the multi-plate culvert west of the asphalt on Wooster Road

Estimated cost: \$10,000

Source of funds: Town highway budget/HMGP

Responsibility: Joint Road Commissioner and Selectboard

Timeframe: Medium Term

- Add a 4' culvert east of Evergreen Lane on Clark Road

Estimated cost: \$10,000

Source of funds: Town highway budget/HMGP

Responsibility: Joint Road Commissioner and Selectboard

Timeframe: Medium Term

- Add additional cross culverts or improve ditches south of Severy Farm on Delong Road

Estimated cost: \$5,000 each

Source of funds: Town highway budget/HMGP

Responsibility: Joint Road Commissioner and Selectboard

Timeframe: Medium Term

Winter Storm/Ice Storm

The Town has historically mitigated the effects of winter storms/ice storms through the annual funding of the highway crew and its equipment. While an eye is always kept open for new approaches and equipment options, no actions are currently required.

The Town has identified installation of back-up power for the school as an important need to allow continued operation in the event of a severe winter storm. This project has previously been identified and evaluated in the Widespread Power Outage section.

In future requests for Right of Way usage for maintenance purposes, the Town will normally grant access. Due consideration in granting these permissions will be given when such access will adversely impact scenic corridors and residents desires to keep the beauty of tree-lined streets and roads.

Estimated cost: \$0

Source of Funds: None needed

Responsibility: Selectboard

Timeframe: Short term-Long term

Manage vegetation in the ROW to allow space for heavy/wet snow and ice events

Estimated cost: \$5,000 annual cost

Source of funds: Town highway budget

Responsibility: Joint Road Commissioner and Selectboard

Timeframe: Short Term

Create “living snow fences” in cooperation with landowners where feasible

Install snow fences annually where drifting snow commonly occurs

Estimated cost: \$2,000 annual cost

Source of funds: Town highway budget/HMGP

Responsibility: Joint Road Commissioner and Selectboard

Timeframe: Medium Term

High Winds

The town road crew, with assistance from the tree warden, currently removes dead and dying trees from its right of way as part of normal maintenance. This is ongoing work which requires no new actions.

Lightning

The Town believes it is the homeowner's responsibility to mitigate their susceptibility to lightning. The town will support education in this area by providing educational materials in the town office.

Estimated cost: None to town

Source of funds: Government printing office

Responsibility: Town Clerk/ACRPC

Timeframe: Short term

Structure Fire

The Town supports efforts by the fire department to install dry hydrants throughout town.

Estimated cost: None additional beyond annual FD support

Source of funds: Federal Rural fire protection grants and FD funds

Responsibility: CVFD

Timeframe: Short Term

The Town supports upgrading of driveway standards in the next planning commission zoning bylaw rewrite to support basic accessibility for emergency vehicles to all structures in town.

Estimated cost: \$2,000 as part of an overall rewrite

Source of funds: Municipal planning grants.

Responsibility: Joint Selectboard and Planning Commission

Timeframe: Medium Term

Insect-Borne Illness

The Town believes it has a responsibility to its residents to address heavy mosquito populations and is a partner in funding the efforts of the Lemon Fair Insect Control District.

Estimated cost: \$15,000 annually

Source of funds: Annual Town Meeting allocation- general fund

Responsibility: LBSG and Selectboard with support from the voters

Timeframe: Short term

The Town believes its residents also share in this responsibility and encourages use of appropriate repellants and behavior patterns which reduce the likelihood of mosquito bites through education.

Estimated cost: None to town

Source of funds: VT Dept Health printing

Responsibility: Town Clerk/ACRPC

Timeframe: Short term

Wildfire

The Town supports the fire warden system requiring outdoor burn permits prior to any outdoor burning.

Estimated cost: None

Source of funds: Town General Fund

Responsibility: Joint Selectboard and Fire warden

Timeframe: Short Term

The Town believes it is the homeowner's responsibility to mitigate their susceptibility to wildfire through "firewise" practices. The town will support education in this area by providing educational materials in the town office.

Estimated cost: None to town

Source of funds: Government printing office

Responsibility: Town Clerk/ACRPC

Timeframe: Short term

Large-Scale Hazardous Materials Incident

The Town supports ongoing HazMat training efforts of the Cornwall Volunteer Fire Department through its annual funding.

Estimated cost: \$2,000-\$3,000

Source of funds: Town General Fund

Responsibility: Town Taxpayers

Timeframe: Short term

Drought

The town believes the State of Vermont's new water/wastewater rules will likely help mitigate the impacts of future droughts. No new action is needed at this time.

Highway Transportation Accidents

The Town has identified the following high risk location on the highway system and supports mitigation of the hazard in any future construction/reconstruction activities:

- The intersection of US Rte #30 and Cider Mill Road is a high accident location and efforts should be taken to reduce that risk. The town will request additional safety measures be applied to this location.

Estimated cost: None to town

Source of funds: State highway budget.

Responsibility: Joint Selectboard and State AOT

Timeframe: Medium Term

- The area around the base of the "Ledges" on Route 74 is a high accident location. The town will request additional safety treatments at this location.

Estimated cost: None to town

Source of funds: State highway budget

Responsibility: Joint Selectboard and State AOT

Timeframe: Medium Term

- The area on Route 74 from the “Old Red Barn” site to the junction of Clark Road is a high accident location. The town will request additional safety treatments at this location.
Estimated cost: None to town
Source of funds: State highway budget.
Responsibility: Joint Selectboard and State AOT
Timeframe: Medium Term

Earthquake

The Town believes it is the responsibility of private homeowners to be ready for earthquakes. The town generally believes that building construction standards are the responsibility of each private homeowner. The Town also does not believe the risks associated with earthquake are large enough to require any town building retrofits at this time.

The Town feels education is the key to preparing private homes for an earthquake and will make earthquake education materials available at the town office.

Estimated cost: None to town
Source of funds: Government Printing Office
Responsibility: Town Clerk/ACRPC
Timeframe: Short term

Dam Failure

The Town Planning Commission, will explore writing of water impoundment construction standards into its zoning regulations. The intent of such standards would be to limit the volume of water which could be stored in a man-made impoundment and therefore limit risk.

Estimated cost: \$2,000 as part of an overall rewrite
Source of funds: Municipal planning grants.
Responsibility: Joint Selectboard and Planning Commission
Timeframe: Medium Term

Landslide/Erosion Hazard

The Town will explore adoption of a Fluvial Erosion Hazard Overlay district in its next zoning bylaw rewrite.

Estimated cost: \$2,000 as part of an overall rewrite
Source of funds: Municipal planning grants
Responsibility: Joint Selectboard and Planning Commission
Timeframe: Medium Term

Pandemic

The Town currently supports training of the Town Health Officer to help mitigate the effects of a pandemic on the community. No new actions are required.

Inundation Flooding

The town will fund attendance by the Zoning Administrator at local NFIP trainings when offered locally.

Estimated cost: \$200-\$300
Source of Funds: Town General Fund Planning and Zoning budget
Responsibility: Town Zoning Administrator/ACRPC
Timeframe: Short Term

The Town will evaluate inclusion of a river corridor overlay in its next zoning bylaw rewrite.

Estimated cost: \$2,000 as part of an overall rewrite

Source of funds: Municipal planning grants.

Responsibility: Joint Selectboard and Planning Commission

Timeframe: Medium term

The Town will request updated and digitized FIRMs from FEMA to support their flood mitigation efforts.

Estimated cost: None to town

Source of Funds: FEMA map modernization funds

Responsibility: Selectboard to make the request

Timeframe: Short term

6. Plan Maintenance Procedures

Any Hazard Mitigation Plan is dynamic and should not be fixed. To ensure that the plan remains current and relevant, it is important that it be updated periodically. The plan will be updated at a minimum every five years in accordance with the following procedure:

6.1 Plan Review/Update Process (5 year Cycle) 44CFR 201.6 (c)(4)(i) and 44CFR 201.6 (c)(4)(iii)

1. The Cornwall Selectboard assembles a Review/Update Committee.
2. The Committee will discuss the process to determine if any modifications or additions are needed due to changing conditions since the last update occurred. Data needs will be reviewed, data sources identified and responsibility for collecting/updating information will be assigned to members.
3. Other Town plans (Emergency Operations Plan, Town Plan, Road Plan, etc) will be reviewed to ensure a common mitigation thread still exists throughout.
4. A draft update will be prepared based on these evaluation criteria:
 - Changes in community and government processes, which are hazard-related and have occurred since the last review.
 - Progress in implementation of plan initiatives and projects.
 - Effectiveness of previously implemented initiatives and projects.
 - Evaluation of unanticipated challenges or opportunities that may have occurred between the date of adoption and the date of the report.
 - Evaluation of hazard-related public policies, initiatives and projects.
 - Review and discussion of the effectiveness of public and private sector coordination and cooperation.
5. Selectboard members will have an opportunity to review the draft update. Consensus will be reached on any changes to the draft.
6. The Selectboard will notify and schedule a public meeting to ensure adequate public input.
7. The Selectboard will recommend incorporation of community comments into the draft update.

6.2 Programs, Initiatives and Projects Review

Although the plan should be reviewed in its entirety every five years as described above, the Town will monitor and evaluate its goals, strategies and actions/projects annually as the town budget is created. This review will ensure that progress will be reviewed and actions/projects either added or removed from the towns work plan based on changing local needs and priorities. In creation of the municipal plan by the planning commission, concepts, goals and strategies from this plan will be used to inform the development of that plan and incorporated into that plan when appropriate.

6.3 Post-Disaster Review Procedures

Should a declared disaster occur, a special evaluation process will occur in accordance with the following procedures:

1. Within six (6) months of a declared emergency event, the Town will initiate a post disaster review and assessment.
2. This post disaster review and assessment will document the facts of the event and assess whether existing Hazard Mitigation Plans effectively addressed the hazard.
3. A report of the review and assessment will be created by a Review/Update Committee.
4. The committee will 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.
5. If the committee determines that modification of the plan IS needed, then the committee drafts an amended plan based on its recommendations and forwards it to the Selectboard for public input.
6. Following completion of a public input process, further amendments may be made and a final plan delivered to the Selectboard for adoption.
7. The Selectboard adopts the amended plan.

7. Plan Adoption Resolution

RESOLUTION

Selectperson, _____ offers the following resolution and moves its adoption. Seconded by
Selectperson _____.

RESOLVE: That in order to provide for sustained actions to reduce or eliminate long-term risk to people and property from hazards and their effects in the Town of Cornwall, VT, the Town Selectboard deems it advisable and in the best interests of the community to adopt the attached Hazard Mitigation Plan.

PASSED AND APPROVED THIS ____ DAY OF _____, 2014.

_____, Chairperson

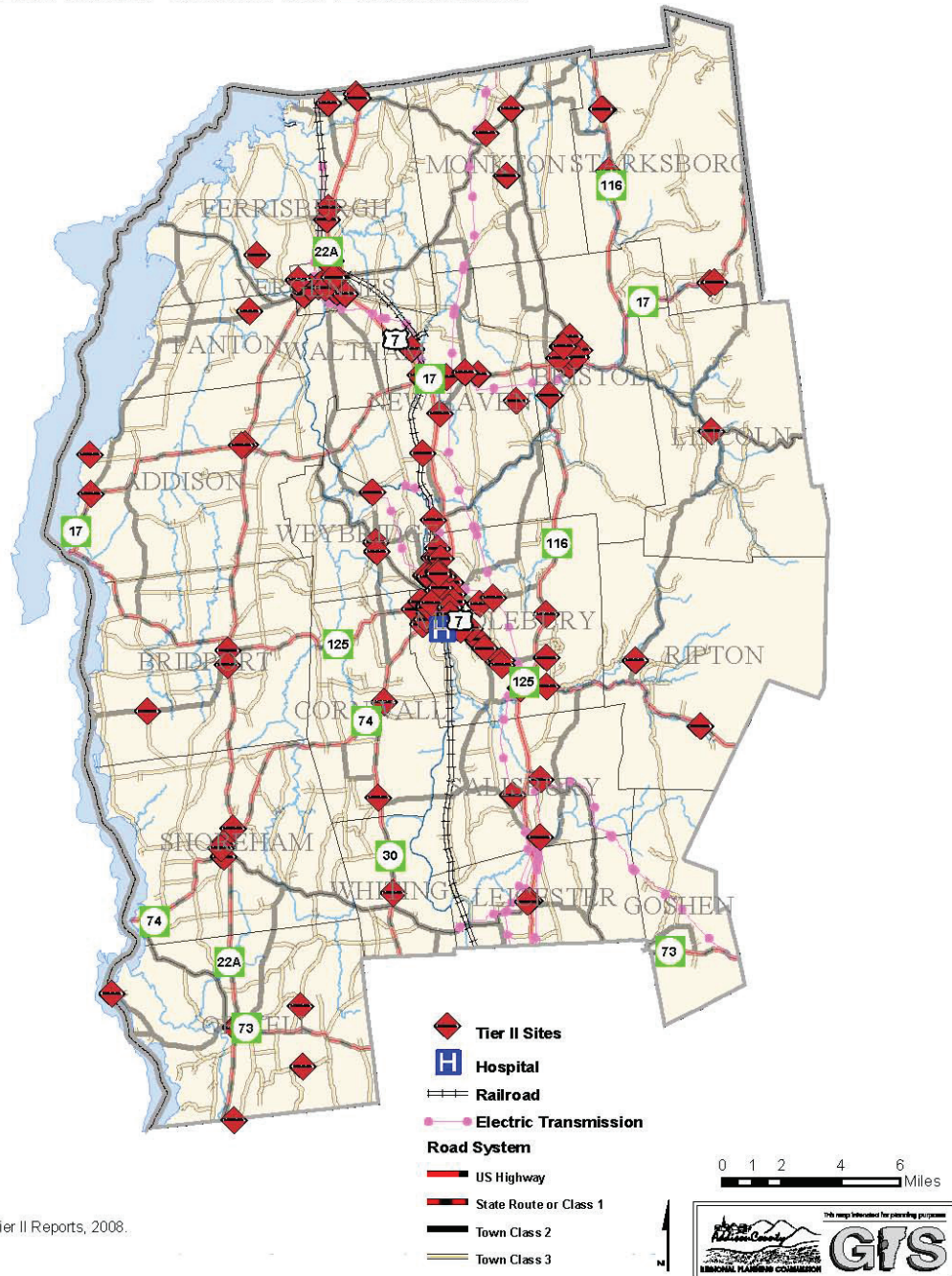
Town of Cornwall, VT

ATTEST:

Town/City/Village Clerk

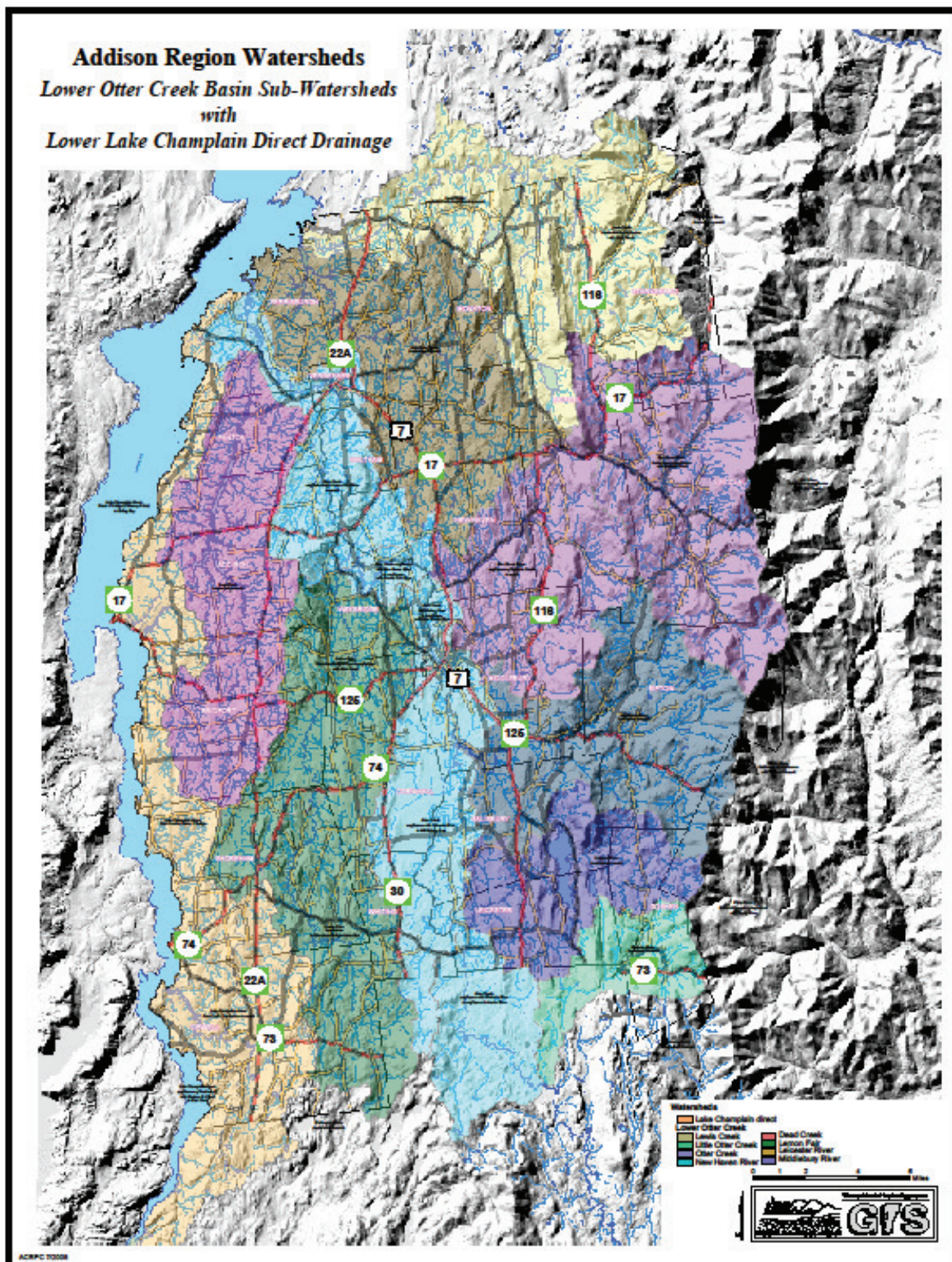
Annex A
Regional Maps

Addison Region
Hazardous Material Locations



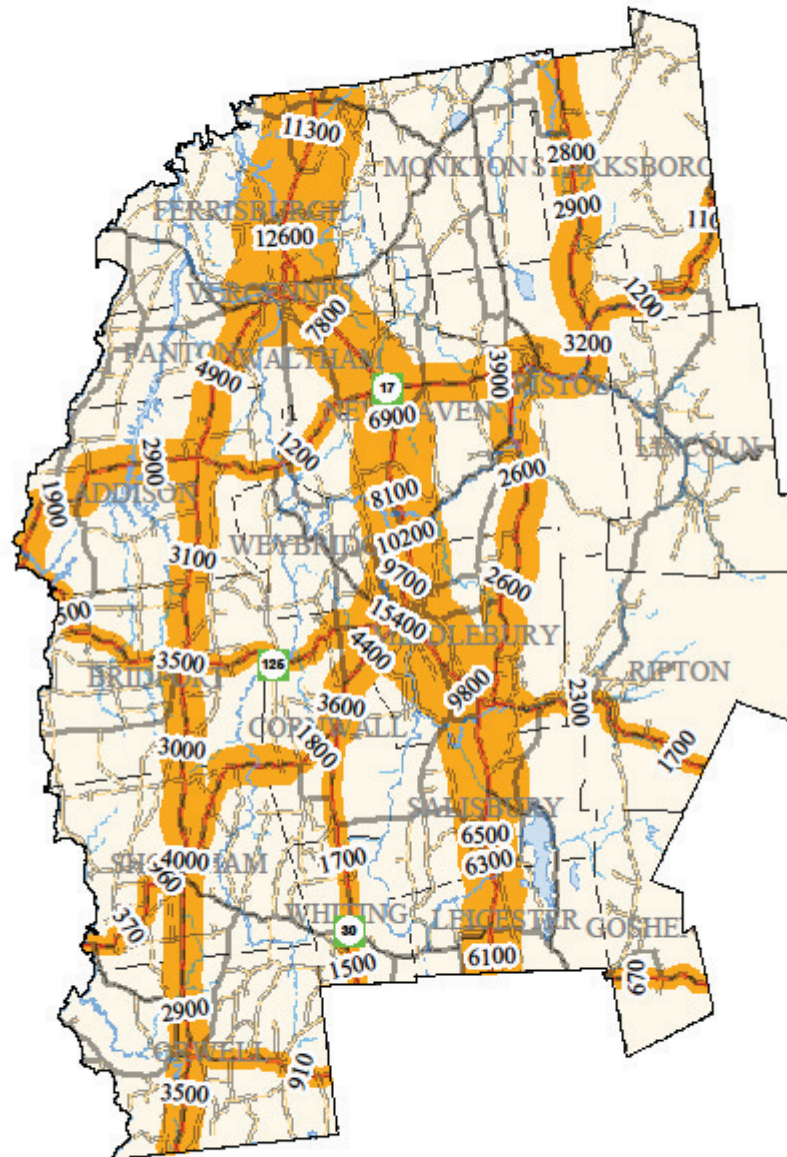
Source:
EPCRA Tier II Reports, 2008.

ACRPC 7/08



Addison Region

Average Annual Daily Traffic 2002



Source:
Vermont Agency of Transportation, 2007.

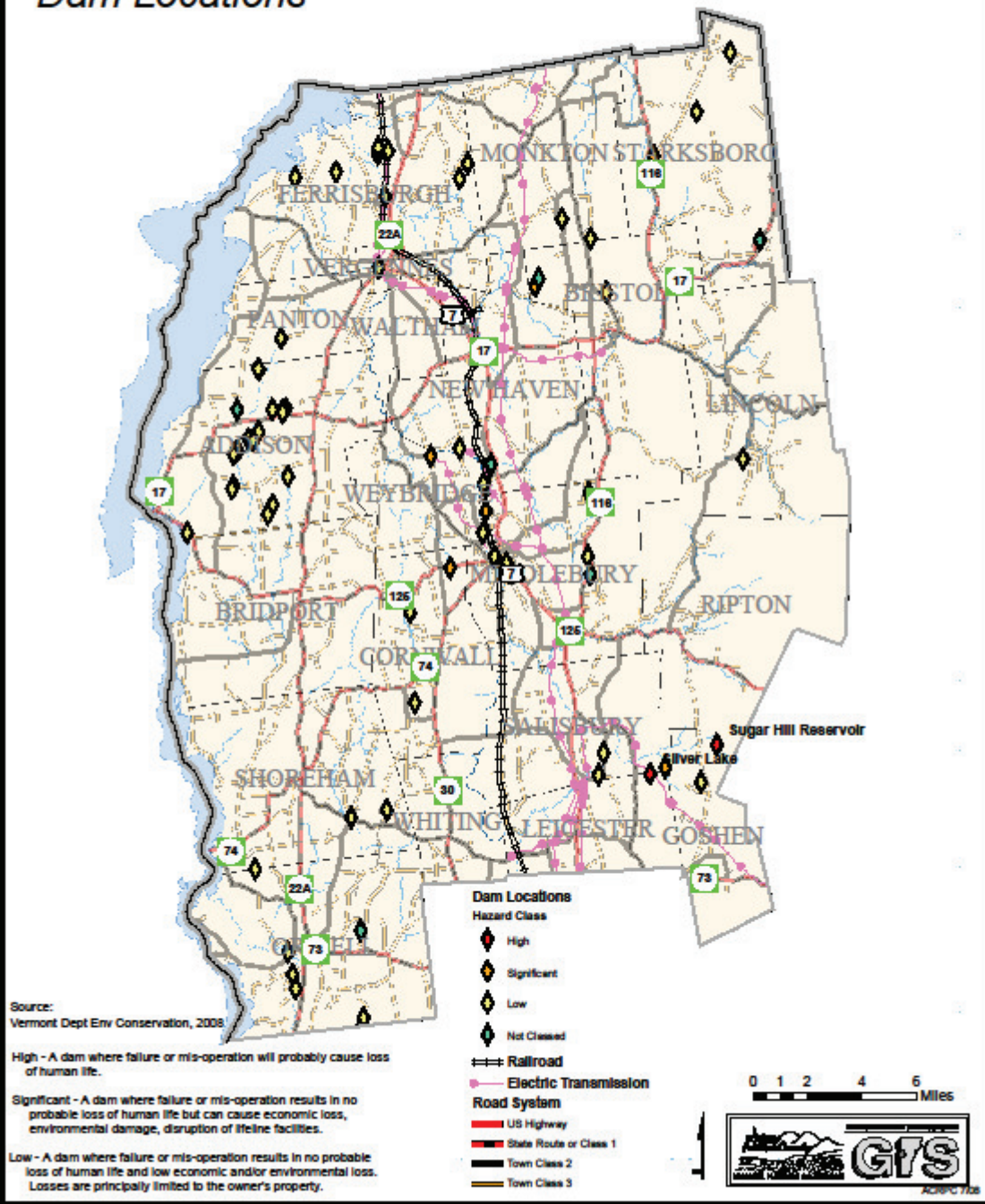
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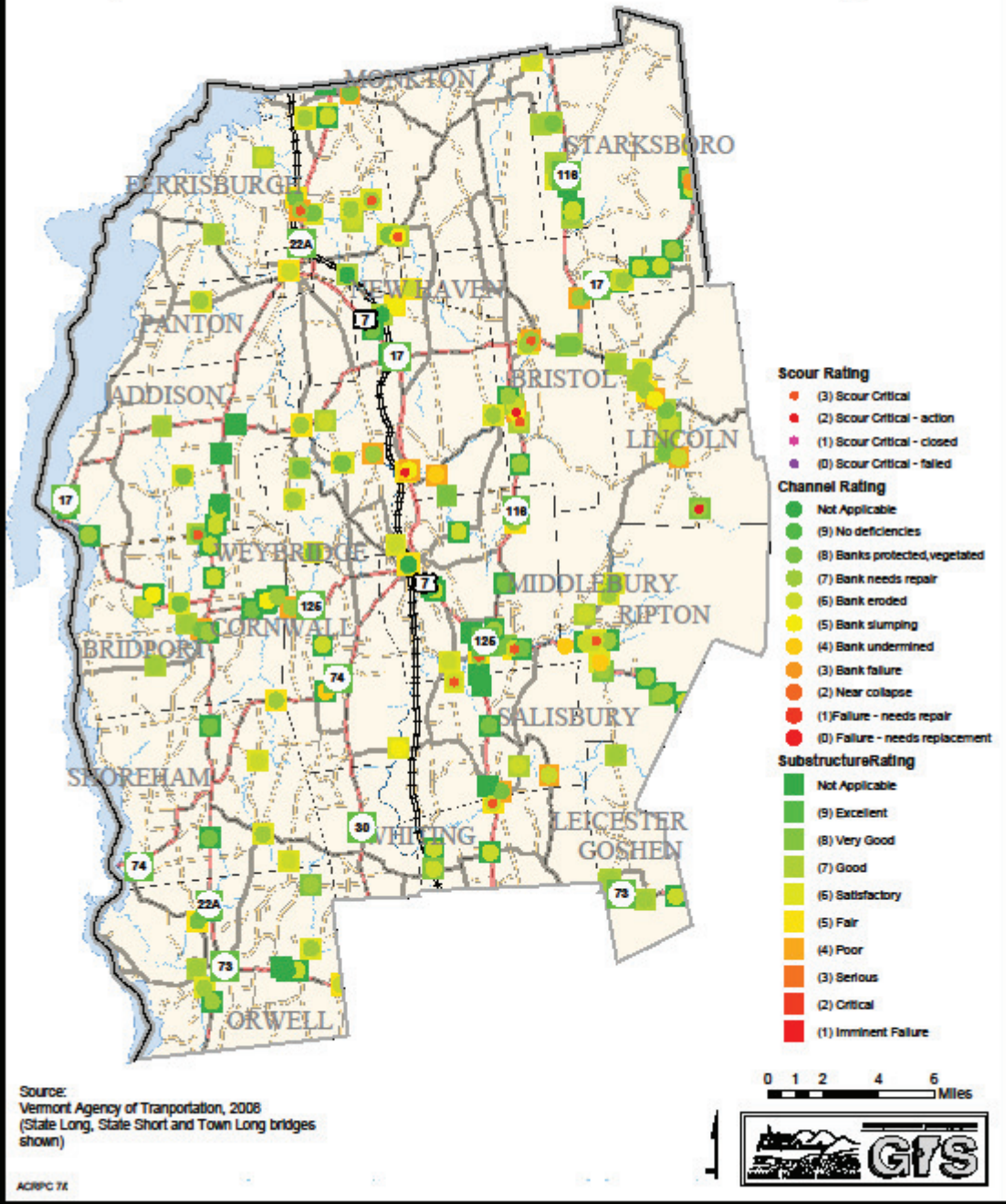
Addison Region

Dam Locations



Addison Region

Bridge Locations with fluvial associated ratings



Annex B
Local Documents:
Local Road and Bridge Standards

January 23, 2013

TOWN ROAD AND BRIDGE STANDARDS
TOWN OF CORNWALL, VERMONT

The Town of CORNWALL hereby adopts the following Town Road and Bridge Standards which shall apply to the construction, repair, and maintenance of all town roads and bridges.

The standards listed here are considered minimum and apply to construction projects and repair and maintenance activities. The standards include management practices and are designed to: ensure the safety of the traveling public, minimize damage to road infrastructure during flood events, and enhance water quality protections by minimizing sediment delivery to surface waters and/or wetlands.

The select board reserves the right to modify the standards for a particular project or repair or maintenance activities where, because of unique physical circumstances or conditions, there is no possibility that the project or activities can be completed in strict conformance with these provisions. Any modifications to the standards must be done in a manner that serves the underlying intent of the management practice, be it public safety, flood hazard avoidance, or water quality protection. Fiscal reasons are not a basis for modification of the standards. Questions about modifications to the standards should be directed to the VTrans District Office.

Municipalities must comply with all applicable state and federal approvals, permits and duly adopted standards when undertaking road and bridge activities and projects.

Any new road regulated by and/or to be conveyed to the municipality shall be constructed according to the minimums of these standards. If any federal and/or state funding is involved in a project, the VTrans district office must be notified prior to any field changes taking place that would alter the original scope of work.

Roadways

- All new or substantially reconstructed gravel roads shall have at least a 12-inches thick processed gravel sub-base, with an additional 3 inches (minimum) top course of crushed gravel.
- All new or substantially reconstructed paved roads shall have at least a 15 inches thick processed gravel sub-base.
- All roadways shall be graded so water does not remain on the road surface. For roadways that are not super-elevated, this generally means a 2-4% ($\frac{1}{4}$ " - $\frac{1}{2}$ " per ft) crown for gravel roads and a 1-2% ($\frac{1}{8}$ " - $\frac{1}{4}$ " per ft) crown for paved roads to promote sheeting of water.
- Proper grading techniques for gravel roadways must be used to avoid creating a ridge or berm between the crown and the ditch.
- Any berm along the roadway shoulder that prevents the proper sheeting of water must be removed.

Ditches and Slopes

Soil exposed during ditch and slope construction, repair or maintenance must be treated immediately following the operation and temporary erosion prevention and sediment control practices must be installed and maintained during construction activities and until the ditch or slope is permanently stabilized.

The following are minimum erosion control measures. Careful attention must be given to areas vulnerable to erosion and immediately adjacent or discharging to surface waters and/or roadway drainage facilities:

- Seed and mulch all ditches with grades less than 5% when undertaking projects or repairs or maintenance activities that result in exposed soil. Vegetation must be established and monitored. If vegetation is not established within 10 days of placement, install biodegradable non-welded matting with seed.
- Stone line all new or reconstructed ditches or whenever soils are disturbed by maintenance activities with grades equal to and greater than 5%; alternatively, install stone check dams. The check dams must meet criteria outlined in the *"Standards and Specifications for Check Dams,"* from the *Vermont Standards and Specifications for Erosion Prevention and Sediment Control*. Specifically, dams must be placed so that the crest of the downstream check dam is at the same elevation as the base of the upstream dam.
- Create parabolic (wide "U" shaped) ditches when constructing new or substantially reconstructing ditches, rather than narrow "V" shaped ditches wherever lateral space allows. Ditches with gradual side slopes (maximum of 1:2, vertical to horizontal ratio) and a wide bottom (at least 2 feet) are preferred. Use biodegradable, non-welded matting to stabilize side-slopes where slopes are greater than 1:2 and less than 1:1 ½; apply seed and mulch to any raw or exposed side-slope if slopes are less than 1:2.
- All ditches must be turned out to avoid direct outlet into surface waters. There must be adequate outlet protection at the end of the turnout, either a structural (rock) or vegetative filtering area.
- If in the best professional engineering judgment of the VTrans Operations Division, there is a cost effective ditch treatment that will meet the intent of the management practices described above, but represents a departure from these standards, the municipality may implement the more cost effective ditch treatment alternative with the professional recommendation submitted in written form by VTrans prior to the municipality executing the work.
- When constructing new or substantially reconstructing side slopes, use appropriately sized stone armament on slopes that are 1:1 ½ or greater. If perennial streams are affected by the toe of slope the project must conform to the statewide Stream Alteration standards.

Culverts and Bridges

- Replacement of existing culverts and any new culvert must have a minimum culvert diameter of 18 inches.
- Replacement of existing bridges and culverts and any new bridges and culverts must be designed in accordance with the VTrans Hydraulics Manual, and, in the case of perennial streams, conform to the statewide Stream Alteration standards.
- All new driveway culverts must have a minimum diameter of 15 inches.
- When installing or replacing culverts, use appropriate techniques such as headwalls and wingwalls, where there is erosion or undermining or where it is expected to occur.
- Install a splash pad or plunge pool at the outlet of new or repaired drainage culverts where there is erosion or where erosion may occur. Splash pads and plunge pools are not appropriate for use in streams supporting aquatic life.

Guardrails

When roadway, culvert, bridge, or retaining wall construction or reconstruction projects result in hazards such as foreslopes, drop offs, or fixed obstacles within the designated clear-zone, a roadside barrier such as guardrail must be installed. The most current version of the AASHTO Roadside Design Guide will govern the analysis of the hazard and the subsequent treatment of that hazard.

Access Management

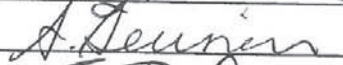
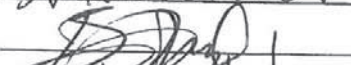
The town must have a process in place, formal or informal, to review all new drive accesses and development roads where they intersect Town roads, as authorized under 19 V.S.A. Section 1111. Towns may reference VTrans A-76 Standards for Town & Development Roads and B-71 Standards for Residential and Commercial Drives; and the VTrans Access Management Program Guidelines for other design standards and specifications.

Training

Town highway maintenance crews must collectively attend a minimum total of 6 hours of training per year on best road management practices. The town must keep documentation of their attendance for a period of three years.

Passed and adopted by the Selectboard of the Town of CORNWALL, State of Vermont on
MARCH 18, 2014

Select Board:


10/2/14 HM Committee Meeting

Town of Cornwall
Hazard Mitigation Planning Committee Initial Meeting
Thursday, October 2. 5:30pm – 7:30pm
Town of Cornwall Town Office

Minutes:

5:30 – Convene meeting/Introductions – Meeting convened at 5:30 beginning with a brief discussion of 9-1-1 signage and the importance of Fire and Emergency Management working together. Issues that need to be addressed are up to date maps for the Fire Dept(ACRPC can provide) and signage on private roads.

Introductions were given around the table (Attendance sheet attached)

5:35 - Brief overview of the hazard mitigation planning process – Tim gave a quick overview of the state's new ERAF rules and what the committee could expect in relation to the planning and adoption process for this plan.

5:45 – Current Plan Status - Tim passed out an early draft for committee review and told the committee to watch out for incorrect town references as the draft is rough and some of the written information may have been drawn from other sources.

6:00 – Brainstorming additional committee membership – This was inadvertently missed as a specific subject in the meeting but the necessity of having representation from both the Planning Commission and the Selectboard was addressed. PC representation is important because considerable work in mitigation can be codified within a town's zoning bylaws. The committee should have Selectboard representation to ensure that the adopting body is on board with the plan throughout its development rather than waiting for the date of adoption.

6:15 - Filling out the Hazard Inventory/Risk Assessment matrix – Tim introduced the HIRA matrix and the committee filled out the matrix by consensus. The committee decided to separate Flash flood from inundation flooding, Separate Hazardous Materials spills from transportation accidents and add in the hazards of insect borne illness and pandemic. (completed matrix is attached). Maps were passed around for committee members to highlight areas of concern for the hazards of Dam Failure, Winter Storm, High Wind and Transportation Accident (attached).

6:45 – Project brainstorming (if time allows) – Tim instructed the committee to be thinking about this subject for the next meeting which was tentatively scheduled for 10/16 starting at 5:30.

7:30 - Adjourn

Minutes

Local Hazards Mitigation Plan Meeting

Cornwall Town Hall

Thursday, October 23, 2014, 5:30 PM

5:30 Welcome/Introductions- No new members were present so introductions were dispensed with.

Plan Overview & Process- Again, because no new members were present and this was done at the last meeting, no action was taken.

Review Risk Assessment- In reviewing the risk assessment, committee members felt they would like to add a new hazard and identified Invasive insects. The new hazard was scored and resulted in a final score of 8. This places Invasive insects in the same risk rate grouping as drought, transportation accidents, earthquakes and dam failures

Develop Mitigative Steps- Each identified hazard was gone through and possible projects identified for each. Many projects that had been identified in an earlier planning effort have already been completed. Extended discussion included the value of a generator for the school, the value of the newsletter in educating the public about mitigation actions individuals can take, and the value of driveway construction guidelines. Several new culvert locations were identified where replacements should be larger when they are replaced.

Next Meeting- Tim will need a little while to pull all this together. He needs dollar figures from Sue if she can find them and is looking for any good photos of past events or even just nice photos representative of town.

Adjourn, at 7:20pm

Attendees:

Marge Drexler, Sue Johnson, Norm Grenier, Bill Johnson, Stu Johnson, Ken Manchester, Kate Gieges.

Annex C

Common Mitigation Measures by Hazard Type

Mitigation measures for “all-hazards” have been adapted from a flood mitigation approach developed by French Wetmore, of Wetmore and Associates in Park Forest, Illinois, into six categories:

- Prevention – measures intended to keep a hazard risk problem from becoming worse. They ensure that future development does not increase hazard losses. Examples would include: Planning and Zoning, Open space preservation, Land Development regulations, Storm water management.
- Property Protection – measures used to modify buildings, or their surroundings, subject to hazard risk rather than prevent the hazard from occurring. Examples are: Acquisition of vulnerable properties, Relocation from hazard prone areas, Rebuild or modify structures to reduce damage by future hazard events, Flood-proofing of flood-prone buildings.
- Natural Resource Protection – measures intended to reduce the intensity of hazard effects as well as improve the quality of the environment and wildlife habitats. Erosion and sediment control and Wetlands protection are examples.
- Emergency Services – measures that protect people before and after a hazard event. That would include: Warning, Response, Critical facilities protection, Health and safety maintenance.
- Structural Projects – measures that involve construction of man-made structures to control hazards. Some examples would include: dams, reservoirs, debris basins, channel modifications, storm sewers, elevated roadways.
- Public Information – activities intended to inform and remind people about hazardous areas and the measures to avoid potential damage and injury. Examples are: Outreach projects, Real estate disclosure, Technical assistance, Community education programs.

The following suggested Mitigation Measures were taken from the website of the Northeast States Emergency Consortium (NSEC).

ALL HAZARDS

- Map vulnerable areas and distribute information about the hazard mitigation strategy and projects.
- Provide information to contractors and homeowners on the risks of building in hazard-prone areas.
- Develop a list of techniques for homeowner self-inspection and implementation of mitigation activities.
- Organize and conduct professional training opportunities regarding natural hazards and hazard mitigation.
- Distribute NOAA weather radios.
- Develop sound land use planning based on known hazards.
- Enforce effective building codes and local ordinances.
- Increase public awareness of community hazards.
- Provide sites that are as free as possible from risk to natural hazards for commercial and industrial activities.
- Consider conservation of open space by acquisition of repetitive loss structures.
- Consider conservation of open space by acquisition of areas identified as “vulnerable or at risk”

- Ensure a balance between residential growth, conservation of environmental resources through a detailed analysis of the risks and vulnerability to natural hazards.
- Conduct joint planning and sharing of resources across regions, communities, and states.
- Establish a hazard mitigation council.
- For future proposed development design guidelines, incorporate hazard mitigation provisions, including improved maps.
- Consider adding a "safe room" requirement for all new buildings.
- Establish incentives to encourage business owners and homeowners to retrofit buildings with hazard-resistant features.
- Teach disaster and hazard awareness in schools.

FLOOD

Flood Hazard Mitigation Measures for Communities:

- Developing and enforcing all-hazards building codes,
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into future land use plans through riparian corridor protection, limiting flood hazard area development, and other measures.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.
- Participate in the National Flood Insurance Program (NFIP).
- Conduct watershed geomorphic assessments.
- Encourage riparian corridor protection.

Flood Hazard Mitigation Measures for Individuals:

How to Protect Your Property:

- Keep insurance policies, documents, and other valuables in a safe-deposit box. You may need quick, easy access to these documents. Keep them in a safe place less likely to be damaged during a flood.
- Avoid building in a floodplain. Some communities do not permit building in known floodplains. If there are no restrictions, and you are building in a floodplain, take precautions, making it less likely your home will be damaged during a flood.
- Raise your furnace, water heater, and electric panel to higher floors or the attic if they are in areas of your home that may be flooded. Raising this equipment will prevent damage. An undamaged water heater may be your best source of fresh water after a flood.
- Install check valves in building sewer traps to prevent flood water from backing up into the drains of your home. As a last resort, when floods threaten, use large corks or stoppers to plug showers, tubs, or basins.
- Seal walls in basements with waterproofing compounds to avoid seepage through cracks.
- Consult with a construction professional for further information if these and other damage reduction measures can be taken. Check local building codes and ordinances for safety requirements.
- Contact your local emergency management office for more information on mitigation options to further reduce potential flood damage. Your local emergency management office may be able to provide additional resources and information on ways to reduce potential damage.

HAZARDOUS MATERIALS

Hazardous Material Hazard Mitigation Measures for Communities:

FEMA's National Mitigation Action Plan suggests that state and local mitigation plans include the following:

- Developing and enforcing all-hazards building codes,
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into land use management plans.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.

Natural hazard events have often triggered technological hazards such as ruptured pipelines and building fires, clearly linking the natural and technological risks. Accordingly, the National Mitigation Strategy, as an all-hazards strategy, will build upon existing programs that mitigate technological hazards, and focus on the critical importance of coordination among efforts to mitigate hazards, regardless of the source of the risk.

- Recognize the dangers posed by hazardous materials.
- Identify places where hazardous materials are likely to be encountered.
- Understand when a hazard may exist.
- Contact the appropriate persons or agencies to give or receive specific hazardous materials information.
- Identify procedures to minimize personal and community exposure to hazardous materials.

Hazardous materials events can and do occur as independent events. Natural hazard events, however, have often triggered technological hazards such as ruptured pipelines and building fires, clearly linking the natural and technological risks. Accordingly, the National Mitigation Strategy, as an all-hazards strategy, will build upon existing programs that mitigate technological hazards, and focus on the critical importance of coordination among efforts to mitigate hazards, regardless of the source of the risk.

Communities can and should:

- Recognize and identify the dangers posed by hazardous materials in the community.
- Identify industries and other locations places where hazardous materials are stored and used.
- Develop a community hazardous materials emergency plan.
- Develop an early warning and notification system.
- Work with local businesses and industry to Identify procedures to minimize personal and community exposure to hazardous materials.

Hazardous Materials Hazard Mitigation Measures for Individuals: Individual and families should develop a personal plan of what to do in case of a hazardous materials accident.

How to Plan for a Hazardous Materials Incident:

- Learn to detect the presence of a hazardous material.
- Many hazardous materials do not have a taste or an odor. Some materials can be detected because they cause physical reactions such as watering eyes or nausea. Some hazardous materials exist beneath the surface of the ground and can be recognized by an oil or foam-like appearance.
- Contact your Local Emergency Planning Committee (LEPC) or local emergency management office for information about hazardous materials and community response plans.
- Find out evacuation plans for your workplace and your children's schools.
- Be ready to evacuate. Plan several evacuation routes out of the area.
- Ask about industry and community warning systems.
- Have disaster supplies on hand.

- Flashlight and extra batteries
- Portable, battery-operated radio and extra batteries
- First aid kit and manual
- Emergency food and water
- Non-electric can opener
- Essential medicines
- Cash and credit cards
- Sturdy shoes
- Develop an emergency communication plan. In case family members are separated from one another during a hazardous materials accident (this is a real possibility during the day when adults are at work and children are at school), develop a plan for reuniting after the disaster. Ask an out-of-state relative or friend to serve as the "family contact." After a disaster, it's often easier to call long distance. Make sure everyone knows the name, address and phone number of the contact person.

STRUCTURE FIRE

Fire Hazard Mitigation Measures for Communities:

FEMA's National Mitigation Action Plan suggests that state and local mitigation plans include the following:

- Developing and enforcing all-hazards building codes,
- Adopting driveway and water supply standards for new development.
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into land use management plans.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.

The United States Fire Administration (USFA) serves as the national focus on reducing fire deaths, injuries, and property losses. In 1974, Congress passed the Federal Fire Prevention and Control Act which established the USFA and the fire research program at the National Institute of Standards and Technology (NIST). The USFA works to involve the public and private sector to reduce losses through public education, arson detection and control, technology and research, fire data collection and analysis and fire service training and education. NIST performs and supports research on all aspects of fire with the aim of providing scientific and technical knowledge applicable to the prevention and control of fires.

Fire Hazard Mitigation Measures for Individuals:

How to Protect Your Property:

- Keep lawns trimmed, leaves raked, and the roof and rain-gutters free from debris such as dead limbs and leaves.
- Stack firewood at least 30 feet away from your home.
- Store flammable materials, liquids and solvents in metal containers outside the home at least 30 feet away from structures and wooden fences.
- Create defensible space by thinning trees and brush within 30 feet around your home.
- Landscape your property with fire resistant plants and vegetation to prevent fire from spreading quickly.
- Post home address signs that are clearly visible from the road.
- Provide emergency vehicle access with properly constructed driveways and roadways, at least 12 feet wide with adequate turnaround space.
- Make sure water sources, such as hydrants and ponds, are accessible to the fire department.

- Burning yard waste is a fire hazard. Check with your local fire agency on a non-emergency number for fire permit requirements and restricted burning times.
- Use fire resistant, protective roofing and materials like stone, brick and metal to protect your home. Avoid using wood materials that offer the least fire protection.
- Cover all exterior vents, attics and eaves with metal mesh screens no larger than 6 millimeters.
- Install multipane windows, tempered safety glass or fireproof shutters to protect large windows from radiant heat.
- Use fire-resistant draperies for added window protection.
- Have chimneys, wood stoves and all home heating systems inspected and cleaned annually by a certified specialist.
- Fire Alarm Safety requires checking on or installing fire alarms in your home.
- Residential sprinklers have become more cost effective for homes. Currently, they protect few homes.

How to Prepare for a Fire Emergency:

- Know how to contact fire emergency services in your area.
- Plan ahead. Make sure you and your family are prepared for a fire emergency.
- Develop and practice escape and evacuation plans with your family.
- Install smoke alarms on every level of your home. Test them monthly and change the batteries at least once a year. Consider installing the new long-life smoke alarms.

WINTER STORM

Winter Storm Hazard Mitigation Measures for Communities:

FEMA's National Mitigation Action Plan suggests that state and local mitigation plans include the following:

- Developing and enforcing all-hazards building codes,
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into land use management plans.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.

In addition, FEMA recommends the following actions to further protect communities from the effects of Winter Storms:

- Building code development and enforcement of snow loads
- Develop a storm water management plan for snowmelt
- Assuring adequate supplies of sand and salt
- Maintaining snow removal equipment so that it is ready to be deployed
- Retrofitting public buildings to withstand snowloads and prevent roof collapse
- Clearing roofs of excessive snow accumulations
- Develop a winter storm plan or annex to the local emergency management plan
- Develop a capability to monitor weather forecasts, conditions and warnings issued by the National Weather Service
- Identify appropriate shelters for people who may need to evacuate due to loss of electricity, heat or coastal flooding due to storm surge
- Assure that critical facilities such as police and fire stations and schools are accessible and equipped
- Clearing streets and roads of snow to assure the passage of public safety vehicles and general traffic.

Winter Storm Hazard Mitigation Measures For Individuals:

How to Protect Your Property:

- Make sure your home is properly insulated. If necessary, insulate walls and attic. This will help you to conserve electricity and reduce your home's power demands for heat. Caulk and weather-strip doors and windowsills to keep cold air out, allowing the inside temperature to stay warmer longer.
- Install storm windows or cover windows with plastic from the inside. This will provide an extra layer of insulation, keeping more cold air out.
- To keep pipes from freezing:
- Wrap pipes in insulation or layers of old newspapers.
- Cover the newspapers with plastic to keep out moisture.
- Let faucets drip a little to avoid freezing.
- Know how to shut off water valves.
- If the pipes freeze, remove any insulation or layers of newspapers and wrap pipes in rags. Completely open all faucets and pour hot water over the pipes, starting where they were most exposed to the cold (or where the cold was most likely to penetrate). A hand-held hair dryer, used with caution to prevent overheating, also works well.
- Consider storing sufficient heating fuel. Regular fuel sources may be cut off. Be cautious of fire hazards when storing any type of fuel.
- Before winter, be sure you install and check smoke alarms.
- Consider keeping safe emergency heating equipment:
- Fireplace with ample supply of wood.
- Small, well-vented wood, coal, or camp stove with fuel.
- Portable space heater or kerosene heater. Check with your local fire department on the legality of using kerosene heaters in your community. Use only the correct fuel for your unit and follow the manufacturer's instructions. Refuel outdoors only, and only when cool. Keep your kerosene heater at least three feet away from furniture and other flammable objects.
- When using alternative heat from a fireplace, wood stove, space heater, etc., use fire safeguards and ventilate properly. Fire hazard is greatly increased in the winter because alternate heating sources are used without following proper safety precautions.
- Install snow fences in rural areas to reduce drifting in roads and paths, which could block access to homes, barns, and animals' feed and water.
- If you live in a flood-prone area, consider purchasing flood insurance to cover possible flood damage that may occur during the spring thaw. Homeowners' policies do not cover damage from floods. Ask your insurance agent about the National Flood Insurance Program if you are at risk.

How to Plan for a Winter Storm:

- Understand the hazards of wind chill, which combines the cooling effect of wind and cold temperatures on exposed skin. As the wind increases, heat is carried away from a person's body at an accelerated rate, driving down the body temperature. "Wind chill" is a calculation of how cold it feels when the effects of wind speed and temperature are combined. A strong wind combined with a temperature of just below freezing can have the same effect as a still air temperature about 35 degrees colder.
- Service snow removal equipment before winter storm season. Equipment should be available for use if needed. Maintain it in good working order.
- Keep your car's gas tank full for emergency use and to keep the fuel line from freezing.
- Get training. Take an American Red Cross first aid course to learn how to treat exposure to the cold, frostbite, and hypothermia.

- Discuss with your family what to do if a winter storm WATCH or WARNING is issued. Designate one household member as the winter storm preparedness leader. Have him or her discuss what to do if a winter storm watch or warning is issued. Have another household member state what he or she would do if caught outside or in a vehicle during a winter storm. Everyone should know what to do in case all family members are not together. Discussing winter storms ahead of time helps reduce fear and lets everyone know how to respond during a winter storm.

HIGH WINDS

High Wind Hazard Mitigation Measures for Communities:

FEMA's National Mitigation Action Plan suggests that state and local mitigation plans include the following:

- Developing and enforcing all-hazards building codes,
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into land use management plans.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.

FEMA also suggests that communities further reduce their vulnerability to hurricanes through the adoption and enforcement of wind- and flood-resistant building codes. Sound land-use planning can also ensure that structures are not built in the highest hazard areas.

High Wind Hazard Mitigation Measures for Individuals:

- Make a list of items to bring inside in the event of a storm. A list will help you remember anything that can be broken or picked up by strong winds. High winds, often in excess of 40 miles per hour, can turn unanchored items into missiles, causing damage or injury when they hit.
- Keep trees and shrubbery trimmed. Make trees more wind resistant by removing diseased or damaged limbs, then strategically remove branches so that wind can blow through. High winds frequently break weak limbs and hurl them at great speed, causing damage when they hit property. Debris collection services may not be operating just before a storm, so it is best to do this well in advance of approaching storms.
- Remove any debris or loose items in your yard. High winds can pick up anything unsecured, creating damage to property when the debris hits.
- Install protection to the outside areas of sliding glass doors. Glass doors are as vulnerable as windows to breakage by wind-driven objects.
- If you live in a flood plain or are prone to flooding, also follow flood preparedness precautions. Nor'easters and severe thunderstorms can bring great amounts of rain and frequently cause floods.

EARTHQUAKE

Earthquake Hazard Mitigation Measures for Communities:

FEMA's National Mitigation Action Plan suggests that state and local mitigation plans include the following:

- Developing and enforcing all-hazards building codes,
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into land use management plans.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.

FEMA's Earthquake Program has four basic goals directly related to the mitigation of hazards caused by earthquakes. They are to:

- Promote Understanding of Earthquakes and Their Effects.
- Work to Better Identify Earthquake Risk.
- Improve Earthquake-Resistant Design and Construction Techniques.
- Encourage the use of Earthquake-Safe Policies and Planning Practices.

Earthquake Hazard Mitigation Measures for Individuals

How to Protect Your Property:

- Bolt bookcases, china cabinets, and other tall furniture to wall studs. Brace or anchor high or top-heavy objects. During an earthquake, these items can fall over, causing damage or injury.
- Secure items that might fall (televisions, books, computers, etc.). Falling items can cause damage or injury.
- Install strong latches or bolts on cabinets. The contents of cabinets can shift during the shaking of an earthquake. Latches will prevent cabinets from flying open and contents from falling out.
- Move large or heavy objects and fragile items (glass or china) to lower shelves. There will be less damage and less chance of injury if these items are on lower shelves.
- Store breakable items such as bottled foods, glass, and china in low, closed cabinets with latches. Latches will help keep contents of cabinets inside.
- Store weed killers, pesticides, and flammable products securely in closed cabinets with latches, on bottom shelves. Chemical products will be less likely to create hazardous situations from lower, confined locations.
- Hang heavy items, such as pictures and mirrors, away from beds, couches, and anywhere people sit. Earthquakes can knock things off walls, causing damage or injury.
- Brace overhead light fixtures. During earthquakes, overhead light fixtures are the most common items to fall, causing damage or injury.
- Strap the water heater to wall studs. The water heater may be your best source of drinkable water following an earthquake. Protect it from damage and leaks.
- Bolt down any gas appliances. After an earthquake, broken gas lines frequently create fire hazards.
- Install flexible pipe fittings to avoid gas or water leaks. Flexible fittings will be less likely to break.
- Repair any deep cracks in ceilings or foundations. Get expert advice if there are signs of structural defects. Earthquakes can turn cracks into ruptures and make smaller problems bigger.
- Check to see if your house is bolted to its foundation. Homes bolted to their foundations are less likely to be severely damaged during earthquakes. Homes that are not bolted have been known to slide off their foundations, and many have been destroyed because they are uninhabitable.
- Consider having your building evaluated by a professional structural design engineer. Ask about home repair and strengthening tips for exterior features, such as porches, front and back decks, sliding glass doors, canopies, carports, and garage doors. Learn about additional ways you can protect your home. A professional can give you advice on how to reduce potential damage.
- Follow local seismic building standards and safe land use codes that regulate land use along fault lines. Some municipalities, counties, and states have enacted codes and standards to protect property and occupants. Learn about your area's codes before construction.

How to Plan for an Earthquake:

- Pick "safe places" in each room of your home. A safe place could be under a sturdy table or desk or against an interior wall away from windows, bookcases, or tall furniture that could fall on you. The shorter the distance to move to safety, the less likely you will be injured. Injury statistics show that

persons moving more than 10 feet during an earthquake's shaking are most likely to experience injury.

- Practice drop, cover, and hold-on in each safe place. Drop under a sturdy desk or table, hold on, and protect your eyes by pressing your face against your arm. Practicing will make these actions an automatic response. When an earthquake or other disaster occurs, many people hesitate, trying to remember what they are supposed to do. Responding quickly and automatically may help protect you from injury.
- Practice drop, cover, and hold-on at least twice a year. Frequent practice will help reinforce safe behavior.
- Talk with your insurance agent. Different areas have different requirements for earthquake protection. Study locations of active faults, and if you are at risk, consider purchasing earthquake insurance.
- Inform guests, babysitters, and caregivers of your plan. Everyone in your home should know what to do if an earthquake occurs. Assure yourself that others will respond properly even if you are not at home during the earthquake.
- Get training. Take a first aid class from your local Red Cross chapter. Get training on how to use a fire extinguisher from your local fire department. Keep your training current. Training will help you to keep calm and know what to do when an earthquake occurs.
- Discuss earthquakes with your family. Everyone should know what to do in case all family members are not together. Discussing earthquakes ahead of time helps reduce fear and anxiety and lets everyone know how to respond.

Annex D

Potential Mitigation Project Funding Sources

Federal

FEMA

- **Pre-Disaster Mitigation Program.** As part of the Disaster Mitigation Act of 2000 (Section 322 of the Robert T. Stafford Disaster Relief and Emergency Act), FEMA's Pre-Disaster Mitigation Competitive (PDM-C) Grant Program provides funds to states, territories, and federally recognized tribes for pre-disaster mitigation activities. The grant program is administered by FEMA for pre-disaster mitigation planning and projects primarily addressing natural hazards. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. The intent of the PDM-C grant program is to provide a consistent source of funding for pre-disaster mitigation planning and projects.
- **Hazard Mitigation Grant Program.** The Hazard Mitigation Grant Program (Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act) is activated during Presidential Disaster Declarations to assist in identifying mitigation projects, and funding these projects on a 75% Federal/25% non-Federal cost share basis. Mitigation program funding is based on 20% of the federal funds expended for the Infrastructure and Individual Assistance Programs. The HMGP supports other program activities, i.e. participation the NFIP is required for recipients of HMGP funds.
- **Section 406 Hazard Mitigation.** Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act provides funding to mitigate certain projects as they are being repaired as part of overall disaster assistance to a community. Under Section 406, if it can be shown to be cost effective to mitigate a Public Assistance eligible project as part of the repair, FEMA may fund the mitigation as part of the overall project cost.
- **Disaster Preparedness Improvement Grants.** Under the Disaster Preparedness Improvement Grants (Section 201 of the Stafford Act), FEMA provides up to 50% matching funds to states annually to improve or update their disaster assistance plans and capabilities. States can use these funds to: implement measures in a Hazard Mitigation Plan; develop pre-disaster Hazard Mitigation Plans; expand an existing Hazard Mitigation Plan; develop hazard specific annexes; or develop administrative plans for the implementation of the Hazard Mitigation Grant Program.
- **Hazard Mitigation Technical Assistance Program Contract.** HMTAP was established to provide FEMA with response capability for various post-disaster mitigation opportunities. The contractor has the capability to: (1) evaluate construction science techniques and practices, including build codes; (2) prepare environmental assessments or impact statements and historic preservation reviews and assessments; (3) conduct biological assessments and surveys, (4) conduct surveys, assessments, and reviews of other areas of impact such as water quality and wetland delineation; (5) conduct benefit/cost, social science, and public administration assessments; (6) conduct post-event assessments to identify mitigation opportunities; (7) Provide post-disaster land surveying, mapping services and cost estimates

using GIS, GPS, and remote sensing; (8) Perform floodplain analyses; (9) conduct hazard identification and risk assessment to confirm accuracy and specific actions or methodologies needed for disaster areas; (10) document estimated flood elevations to guide reconstruction and to compute flood frequency; and (11) provide training for benefit/cost analysis, retrofit options, the Hazard Mitigation Grant Program, and National Environmental Policy Act.

- **National Flood Insurance Program (NFIP).** The National Flood Insurance Program (NFIP) makes federally subsidized flood insurance available to property owners in locations agreeing to participate in the NFIP. If communities enter the NFIP, they are required to adopt floodplain ordinances meeting criteria established by FEMA. These criteria include: requiring permits for development within designated floodplains; review development plans and subdivision proposals to determine whether proposed sites will be reasonably safe from flooding; require protection of water supply and sewage systems to minimize infiltration of floodwater; obtain, review, and utilize all base flood elevation data; and assure the maintenance of flood carrying capacities within all watercourses.
- **The Community Rating System.** An element of the NFIP, is designed to promote the availability of flood insurance, reduce future flood damages, and ensure the accurate rating of flood insurance policies. Participating communities may receive credit for proven mitigation measures, thus reducing the cost of flood insurance within their jurisdictions.
- **The Individual Assistance Loss Prevention Program.** Available to provide eligible owner-occupants, who sustained damage and received Disaster Housing Minimal Repair Funds, the opportunity to participate in a voluntary program where additional 100% federal funds are made available to break the damage-rebuild-damage cycle and help homeowners reduce or eliminate losses from future weather-related damage.
- **The Individual and Family Grant (IFG) Minimization Program.** Available to provide IFG-eligible owner- occupants the opportunity to participate in a voluntary program where additional state and federal funds are made available to break the damage-rebuild-damage cycle, and help reduce or eliminate losses from future weather-related damage. In addition, FEMA's 800 series provides funding for low cost mitigation measures.
- **The Infrastructure Program (Section 406 of the Stafford Act).** Authorizes funding for the repair, restoration, or replacement of damaged facilities belonging to public and private non-profit entities, and for other associated expenses, including emergency protective measures and debris removal. The Infrastructure Program also authorizes funding for appropriate cost-effective hazard mitigation related to damaged public facilities.
- **The National Inventory of Dams (US Army Corps of Engineers project).** Identifies high-hazard dams and encourages the development of warning systems and emergency plans for many of these facilities.
- **Hazardous Materials Program.** FEMA's mission under this program is to provide technical and financial assistance to States and local jurisdictions and to coordinate with public and private sector entities to develop, implement, and evaluate HAZMAT emergency preparedness programs. FEMA supports State and local agencies in the design, implementation, and evaluation of HAZMAT- related training and planning exercises, and

cooperates with the U.S. Department of Transportation in the maintenance of electronic bulletin boards to provide the latest information on HAZMAT planning, training, exercises, and conferences.

- **US Fire Administration (USFA).** Through the USFA, FEMA administers a nationwide program to enhance fire prevention and control activities and to reduce significantly the loss of life and property caused by fires. Programs are carried out by: National Fire Academy; Office of Fire Prevention and Arson Control; Office of Firefighter Health and Safety; Office of Fire Data and Analysis; Office of Federal Fire Policy and Coordination; Office of National Emergency Training Center Operations and Support, and Office of Educational Technology.

The Emergency Planning and Community Right-to-Know Act of 1986 imposed upon state and local governments planning and preparedness requirements for emergencies involving the release of hazardous materials. The role of the federal government in response to an emergency involving the release of hazardous materials is to support local and state emergency operations. Activation of the federal Regional Response Team (RRT) provides access to federal resources not available at the state and local levels. An on scene coordinator is designated to manage federal resources and support. The national warning and communications center for emergencies involving the release of hazardous materials is manned 24 hours a day, and is located at the U.S. Coast Guard headquarters in Washington, D.C.

The National Weather Service provides meteorological and hydrologic services that include weather and hydrologic warnings, forecasts, and related information. The primary mission of the NWS is to save lives and reduce property damage through timely issuances of tornado and flood warnings and river stage forecasts. To cope with dangerous weather, the NWS interacts with emergency services personnel throughout the state by: issuance of tornado and flash flood watches or warnings for those areas in which a threat is posed; issuance of flood watches and warnings for major streams and rivers within the state. Addison County is within the coverage area of the NWS office in Burlington but also may receive information from the Albany, NY office.

The U.S. Army Corps of Engineers undertake a broad range of civil works projects to develop, manage, and conserve the nation's water resources. No work may be undertaken without authorization and funding from Congress, either from specific legislation or continuing authorities. Projects **are** planned to serve as many purposes as are feasible and to protect or improve the environment as much as possible. The Corps is involved in developing and implementing plans for flood control, navigation, hydropower, recreation, and water supply. The Corps has authority for emergency operations, bank protection, permit administration, and technical assistance. Corps of Engineers assistance includes:

- Studies and Projects
- Discretionary Authority to implement certain types of water resources projects without specific Congressional approval. These projects are typically limited in cost and duration, and include:
 - Section 14 - Emergency Stream bank Protection of Public Facilities, limitation of \$500,000 per project.

- Section 107 - Small Navigation Projects, usually for port facilities and navigation channels. Work on channels usually improves stream flow and aids flood control efforts.
- Section 205 - Small Flood Control Projects, not to exceed \$5 million. Funds may be used for projects such as upgrading flood protection structures and channelization of streams.
- Floodplain Technical Assistance, to include:
 - Conducting floodplain mapping surveys to provide either first-time mapping of an area or to correct older floodplain maps;
 - Conducting flood studies in cooperation with FEMA to determine actual flood levels for settlement of flood insurance claims;
 - Providing technical advice regarding proposed floodplain ordinances and building codes.
- Emergency operations to respond to flood emergencies, to include flood fighting, constructing advance temporary measures in anticipation of imminent flood, and the repair of damaged flood control works after the flood event.
- Permit authority, the Corps has the authority to issue Permits to cover construction excavation and other related work in or over navigable waterways; and Permits covering the discharge of fill material in all waters of the United States and adjacent wetlands.

Department of Housing and Urban Development

- Community Development Block Grant Program. Funds are provided as grants to units of local government. Local governments can use the funds to: construct flood and drainage facilities; finance rehabilitation projects that include flood proofing, elevation, purchase of flood insurance, etc.; finance acquisition and relocation of homes to remove them from the floodplains.
- Rental Rehabilitation Program. Funds to rehabilitate rental properties can be used for flood proofing and repair to flood damage.
- Section 312 Loan Program. Provides funds to rehabilitate both residential and non-residential properties, including flood repair and flood proofing.

Department of Agriculture Natural Resource Conservation Service (NRCS) can provide technical assistance in the conservation, development, and productive use of water resources. In addition, the NRCS monitors use of prime farmland.

- Watershed Protection and Flood Prevention. Technical and financial assistance to local entities to plan and install works of improvement for watershed protection, flood prevention, agricultural water management, and other approved purposes.
- Resource Conservation and Development. Technical and financial assistance to local entities to plan and install works of improvement for watershed protection, flood prevention, agricultural water management, and other approved purposes.
- Emergency Watershed Protection. Provides assistance to reduce hazards to life and property in watersheds damaged by severe natural events. NRCS can provide 100% of the cost of exigency situations, and 80% of the cost for non-exigency situations, if funds are available.
- Conservation Technical Assistance. Provided to land users to control erosion, sediment, and to reduce upstream flooding.

- River Basin Surveys and Investigations. Includes Conservation River Basin Studies to assist in solving existing problems or meeting existing or projected needs, and Floodplain Management Studies to provide information and assistance for reducing future flood damages. Financial assistance is provided by sponsors.

U.S. Geological Survey (USGS) provides certain hazard studies and recommendations. A portion of the mission of the USGS is to collect and analyze data on the quantity of surface water through a network of gauging stations. The data is used in preparing flood frequency reports to evaluate the severity of floods. This data is useful in flood hazard mitigation studies, establishing flood prone areas, and potential flood heights near hydraulic structures.

Economic Development Administration was established to generate new jobs, to help protect existing jobs, and to stimulate commercial and industrial growth in economically distressed areas of the United States.

Small Business Administration (SBA) Disaster Assistance Programs provide loans to businesses and individuals affected by presidential and SBA disaster declarations. The program provides direct loans to businesses to repair or replace uninsured disaster damage to property owned by the business, including real estate, machinery, and equipment, inventory and supplies. Businesses of any size are eligible. Non-profit organizations are also eligible. Assistance to individuals comes in the form of low-interest loans for repair or replacing damaged real and personal property. The SBA administers the Disaster Assistance Programs.

- Pre-Disaster Mitigation Loans. This new loan program began in January 2000 and is funded for five years. This program makes funds for mitigation available to businesses in Project Impact communities.

State

VTrans

- Town Highway Grants Program. State aid grants for highways are made annually to the governing body based on the number of Class 1,2 or 3 miles in the Municipality. The General Assembly appropriates a lump sum annually for this purpose (19 V.S.A. Section 306(a)). Distribution is made quarterly, with no application required. There is no requirement that State funds be matched with local funds, other than a requirement that municipalities expend no less than \$300 per mile of local tax revenues of their highways (19 V.S.A. Section 307).
- Town Highway Bridge Program. State assistance for major rehabilitation or reconstruction of bridges with a span of six feet or more on class 1, 2 or 3 town highways is made available by the Secretary of Transportation from annual appropriations for that purpose (19 V.S.A. Section 306(b)). State assistance amounts are not limited for any one project. The State assistance requires 10 percent participation or match of total project cost with town funds for replacement projects and 5% for rehabilitation projects. The local match is capped at the amount raised by a municipal tax rate of \$0.50 on the Grand List (19 V.S.A. Section 309(a)).
- Town Highway Structures Program. State grants for bridges, culverts and retaining walls that are part of the municipalities highway (Class 1, 2 or 3) infrastructure are made by the

Secretary of Transportation from annual appropriations for the purpose. State grant amounts are limited to \$150,000 for any one project. State funds are required to be matched, as follows:

- By at least 20% of the total project cost, or
 - By at least 10% of the total project cost providing that town has adopted Town Highway codes and standards and the town has conducted a highway infrastructure study (not less than three years old), which identifies all town culverts, bridges and identified road problems.
- Town Highway Class 2 Roadway Program. State grants to provide for the preservation of any Class 2 highways by providing grants for resurfacing or reconstruction are made by the Secretary of Transportation or his/her designee from annual appropriations for that purpose. State grants are limited to \$150,000 for any one project and there are match requirements for the town similar to the Town Highway Structures Program.
- Town Road & Bridge Standards, Infrastructure Study. As a result of legislative action relating to the Town Aid programs an incentive program was created providing additional funding to towns meeting two requirements:
 - Adopted codes and standards.
 - Conducted a network infrastructure study.

Agency of Natural Resources

- Ecosystem Restoration Grant Program. As part of a governor's initiative to improve water quality in Lake Champlain, Funds have been allocated to assist in clean-up. Funds from this source have paid for a large portion of recent geomorphic studies in the Addison region as well as supporting the development of Fluvial Erosion Hazard Zones. Additionally, funds have been allocated to purchase development rights in hazardous locations.

Department of Public Safety, Division of Emergency Management

- Hazard Mitigation Grant Program. Previously described under Federal Programs.
- Pre-Disaster Mitigation Program. Previously described under Federal Programs.
- Local Emergency Management Director Program. A continuing program of training for local emergency management directors to provide a consistent base of knowledge to understand their roles and responsibilities in Emergency Management.
- Generator Grant Program. VEM allocates funds from FEMA EMPG to allow towns to purchase back-up power sources for emergency shelters for continued use in the event of a power failure.

Regional

The Addison County Regional Planning Commission (ACRPC) provides assistance to local governments concerning planning for future land use, business, transportation, emergency management and population.

In addition to the specific programs mentioned below, ACRPC has identified Municipal Development Plans and Capital Improvement Plans as appropriate local planning mechanisms suitable for incorporating many of the provisions of this plan. These plans, by statute, need to be updated on a 5 year rotation. In Addison County, each municipality adopts these new or updated plans according to their own timetable and therefore, each is at a different place in the planning and adoption process. At the time of each rewrite, ACRPC generally assists local planning commissioners and will encourage inclusion of appropriate provisions of this plan into any new document.

ACRPC annually sets aside funds from its transportation planning activities to be administered by the Transportation Advisory Committee (TAC). Proposals are entertained each year to fund planning projects for transportation projects. One effective ongoing program is a local culvert survey and upgrade program, which funds updates of culvert surveys for 2-3 towns annually. TAC grants have funded several mitigation studies in the past including:

- Route 125 relocation study
- Bakers Bridge mitigation study

ACRPC assists community mitigation projects and planning through utilization of:

- FEMA PDM-C planning grants
- FEMA HMGP planning grants
- FEMA HMGP project grants
- Federal Emergency Planning Grants

Annex E
Local Plan Review Tool Self Assessment

LOCAL MITIGATION PLAN REVIEW TOOL

Jurisdiction Name & State: Town of Cornwall, Vermont

Jurisdiction: Town of Cornwall ,Vermont	Title of Plan: Town of Cornwall Vermont Single Jurisdiction Hazard Mitigation Plan	Date of Plan: 2/27/2014
Single or Multi-jurisdiction plan? <u>Single</u>		New Plan or Plan Update? <u>New</u>
Regional Point of Contact: Tim Bouton Title: Sr. Planner Agency: ACRPC Phone Number: (802) 388-3141 E-Mail: tbouton@acrpc.org		Local Point of Contact: Kate Gieges Title: Emergency Management Coordinator Agency: Town of Cornwall, Vermont Phone Number: (802) 462-2182 E-Mail: Gieges@shoreham.net

State Reviewer:	Title:	Date:

FEMA Reviewer:	Title:	Date:
Date Received in FEMA Region I		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

1. REGULATION CHECKLIST		Location in Plan	Met	Not
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section #1 – 1.1 Page 3. “Current Plan Development Process”			
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section #1 – 1.3 Page 4. “Opportunities for additional comments”			
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section #1 – 1.2 Page 3. “Opportunities for public comment/input”			
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section # 1 – 1.4 Page 3-4. “Extent of Review”			
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section #6 – 6.1, 6.3 Pages 55-56, “Plan Maintenance procedures”			
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section #6 – 6.1 Page 55 “Plan Review/Update Process (5 year cycle)”			
ELEMENT A: REQUIRED REVISIONS				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section #4 – 4.3 Pages 16-41 “Hazard type, location, extent, occurrences, future probability and vulnerability”			
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section #4 – 4.3 Pages 16-41 “Hazard type, location, extent, occurrences, future probability and vulnerability”			
B3. Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section #4 – 4.3 Pages 16-41 “Hazard type, location, extent, occurrences, future probability and vulnerability”			
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section #5 - 5.2 Page 42-47 “Authorities, policies, programs, resources (and the ability to expand on these)” Specifically, 5.2 page 47 Flood (Inundation)			

1. REGULATION CHECKLIST		Location in Plan	Met	Not
Regulation (44 CFR 201.6 Local Mitigation Plans)				
<u>ELEMENT B: REQUIRED REVISIONS</u>				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section #5 - 5.2 Pages 42-47 “Authorities, policies, programs, resources (and the ability to expand on these)”			
C2. Does the Plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section #5 - 5.2 Page 42-47 “Authorities, policies, programs, resources (and the ability to expand on these)” Specifically, 5.2 page 47 Flood (Inundation)			
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section #5 – 5.1 page 42 “Hazard Mitigation Goals by Hazard Type”			
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section #5 – 5.4 Pages 48-54 “Proposed Mitigation Projects/Action Plan by Hazard Type”			
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section #5 – 5.3 Page 47-48 “Project Prioritization Process”			
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section #3 – Page 11-12 “Existing Adopted Plans Which Support Hazard Mitigation”			
<u>ELEMENT C: REQUIRED REVISIONS</u>				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Section 7 Page 57 “Plan Adoption Resolution”			

Acknowledgements:

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