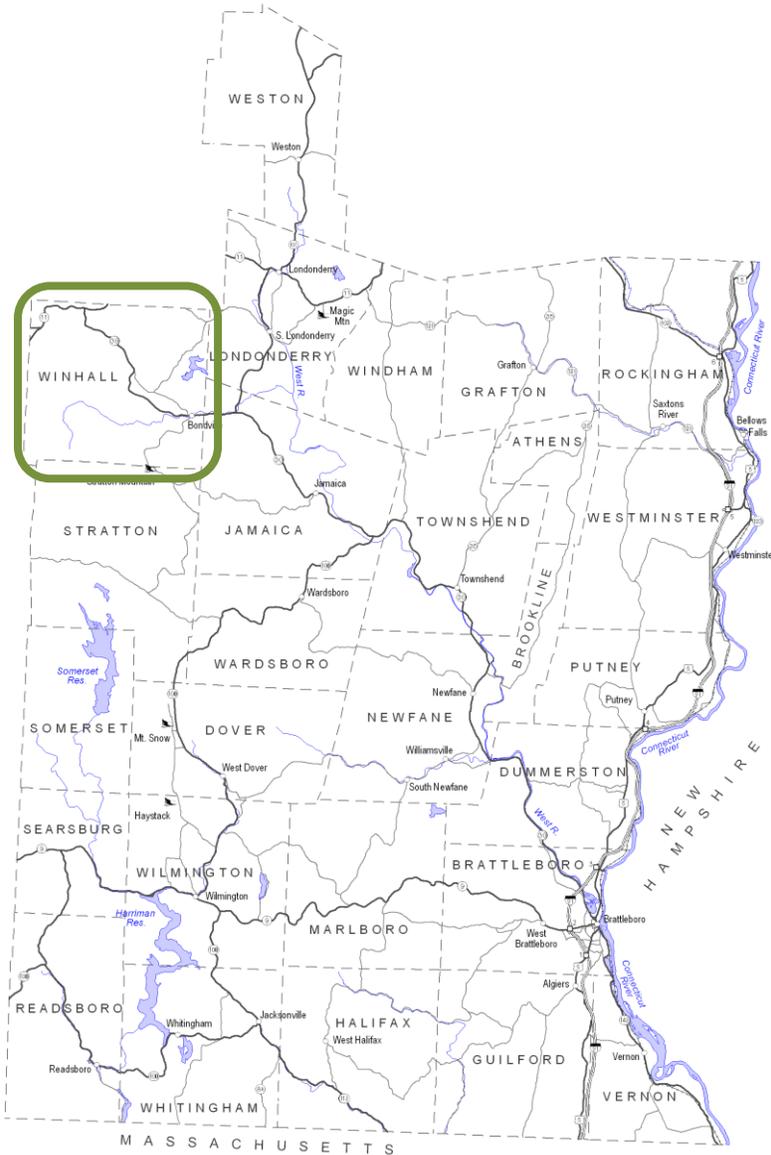


Town of Winhall, Vermont Local Hazard Mitigation Plan



Prepared for the Town of Winhall by
the Windham Regional Commission



THIS DRAFT IS OPEN FOR PUBLIC COMMENT THROUGH MARCH 30, 2015 –
PLEASE SEND ANY COMMENTS TO ASABETTO@WINDHAMREGIONAL.ORG
OR CALL 802-257-4547 X 109

Table of Contents

	Pg
INTRODUCTION AND PURPOSE	1
WINDHAM REGIONAL GEOGRAPHY	1
WINHALL GEOGRAPHY & TOWN PROFILE	2
Winhall Existing Land Use Map.....	4
PLANNING PROCESS	
Documentation of the Planning Process, Public Involvement and Input from Neighboring Communities	5
RISK ASSESSMENT	
Methodology.....	6
Analysis.....	7
Flooding / Fluvial Erosion Profile.....	8
Floodplain / River Corridor Mapping.....	9
Landslide Profile.....	13
ASSESSING VULNERABILITY	
Structures in the Special Flood Hazard Area	15
Repetitive Loss Properties	16
Community Facilities in Winhall.....	16
Market Values of Structures in Winhall	17
Participation in and Compliance with the NFIP	17
Development Trends	18
MITIGATION STRATEGY	
Local Hazard Mitigation Goals	18
Relevant Town Plan Policies that Support Mitigation	19
Progress between 2011 and 2015	19
Ongoing Efforts	20
Identification of Mitigation Actions	21
Mitigation Actions Table	22
Existing Planning and Regulatory Capabilities.....	25
How this Plan will Improve Existing Capabilities	25
PLAN MAINTENANCE PROCESS	
Monitoring, Evaluating, and Updating the Plan – Yearly Review	27
Plan Maintenance – 5 Year Update Process	27
Post Disaster Review/Update Process.....	28
Continued Public Participation	29
APPENDIX.....	30
Adoption Sheet.....	31

INTRODUCTION AND PURPOSE

This Single Jurisdiction Hazard Mitigation Plan is a new plan. It is not an update to an older plan.

The purpose of this plan is to assist the Town of Winhall in identifying all of the natural hazards facing the town and to identify new and continuing strategies to reduce risks from identified hazards.

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

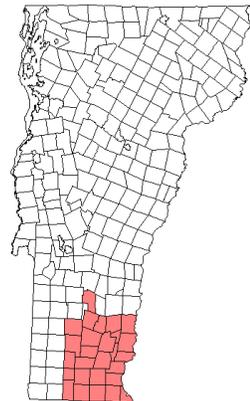
Hazard mitigation strategies and measures alter the hazard by: eliminating or reducing the frequency of occurrence; averting the hazard by redirecting the impact by means of a structure or land treatment; adapting to the hazard by modifying structures or standards; or avoiding the hazard by stopping or limiting development. Mitigation could include projects such as:

- Flood-proofing structures
- Tying down propane/fuel tanks in flood-prone areas
- Elevating furnaces and water heaters
- Identifying and modifying high traffic incident locations and routes
- Ensuring adequate water supply
- Elevating structures or utilities above flood levels
- Identifying and upgrading undersized culverts
- Planning for land use for floodplains and other flood-prone areas
- Proper road maintenance and construction
- Ensuring critical facilities are safely located
- Establishing and enforcing appropriate building codes
- Public information

WINDHAM REGION GEOGRAPHY

Situated in Vermont’s southeastern corner, the Windham Region consists of 23 towns in Windham County, the neighboring towns of Readsboro, Searsburg, and Winhall in Bennington County, and Weston in Windsor County. The region is bordered by Massachusetts to the south and New Hampshire to the east. At over 920 square miles (590,000 acres), the region accounts for roughly 9.6% of the State’s total land area. The Windham Region has several distinctive identities, largely defined by the diverse natural environment.

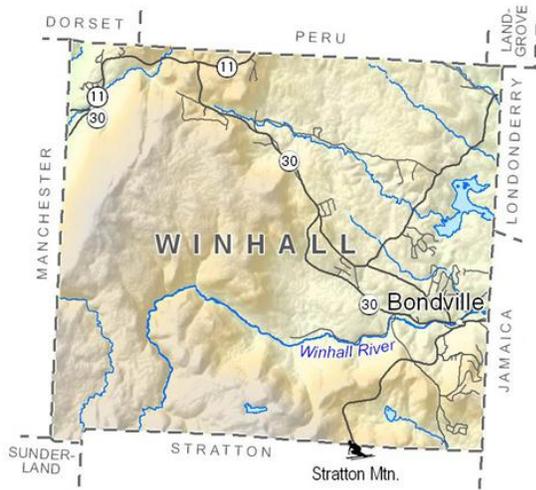
The Region’s topography is relatively flat or gently rolling land in the Connecticut River valley in the east, while the western part of the region is characterized by the Green Mountain ridges and peaks with narrow stream valleys. Stratton Mountain is the highest point in the region at 3,936 feet. The lowest point is along the Connecticut River in Vernon, at 200 feet.



In addition to the Connecticut, other major rivers of the region are the Deerfield, Green, North, Saxtons, West, and Williams, all tributaries of the Connecticut. There are two major flood control reservoirs on the West River, Ball Mountain and Townshend, and two major storage reservoirs for hydropower generation on the Deerfield River, Somerset and Harriman.

WINHALL GEOGRAPHY & TOWN PROFILE

Over half of the area of the Town of Winhall is public or conserved forest land. The Town of Winhall is a bedroom community for three ski resorts; Stratton Mountain, Bromley Mountain and Magic Mountain. The skier population on a busy weekend can exceed 15,000 compared to the permanent population of less than 900. Every year the area hosts the Burton U.S. Snowboard Championship, an international event that draws upwards of 25,000 people at the final competition on the last day. The Town has a separate and specific emergency operations plan written for that annual occurrence, which is typically held in March.



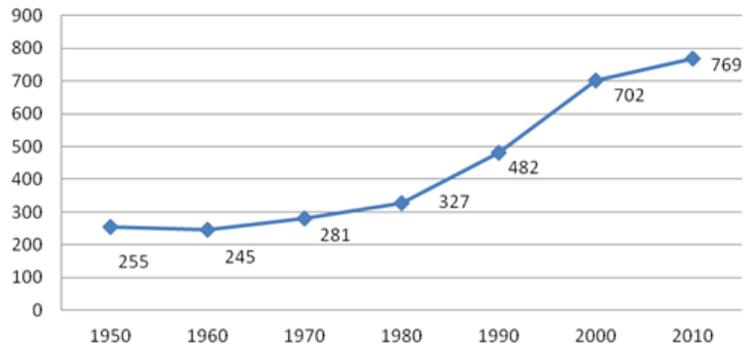
Better than 50% of the roads in this area are over 9% in grade. All emergency vehicles are necessarily 4-wheel drive. The same issues are true of this area as are towns nearby with a huge influx of tourists, in that the tourists rely on GPS units in their cars to navigate the roads in this remote region and end up on Class 3 or Class 4 roads in the middle of winter and need to be rescued. This type of emergency activity is a strain on the resources of the town, given that there are so few emergency personnel on staff.

Additionally, the main thoroughfares passing through the town have significant truck traffic carrying gas and propane, as well as UPS and Fed Ex trucks containing potentially hazardous materials. Stratton Mountain has three very large propane tanks that sit above ground.

The Town of Winhall consists of rolling topography with elevations that range from approximately 2,680' at the highest point to approximately 1,250' at the lowest point in the unincorporated Village of Bondville. As with all towns in the Green Mountains, development tends to occur along major thoroughfares. As the graph below shows, population is growing at the slow and steady rate. Route 30 is the major thoroughfare in the Town with an elevation of approximately 1,293' in that area of the Village of Bondville. The Town has a recreation and retail based economy with recreation supporting much of the retail trade. Recreational development has generally occurred in the highlands with Stratton Mountain Corporation being the area's largest employer. Seasonal residential development consists of subdivisions spread throughout the Town along with condominiums clustered near the resort area. Year round residential development tends to be around the Village center. Winhall is located in Bennington County.¹

The Town is centrally located among several major ski resorts. Route 30 and Route 100 provide a steady stream of visitors throughout the year. The historic character of the area, the scenic agricultural land, natural scenic beauty of the river valley, and the forested ridges surrounding the Town make it a desirable tourist destination, inviting visitors to stop and shop, eat and sleep, and take advantage of the outdoors. An abundance of recreational opportunities are easily accessible, including golf, fishing, skiing, hunting, swimming, boating, and hiking.

Town Population



¹ 2012 Winhall Town Plan <<http://winhall.org/pdf/WinhallTownPlan2012.pdf>>

Winhall is but one town in a region of diverse and changing communities. The Town is a member of the Windham Regional Commission and borders Jamaica, Londonderry and Stratton in Windham County. Dorset, Landgrove, Manchester, Peru and Sunderland border the town in Bennington County. It is linked to these communities via roadways, waterways, recreation resources, contiguous forestland and wildlife habitat, and through the sharing of important community facilities and services. In addition, many of Winhall’s residents have strong social and economic ties to the region’s important employment and cultural centers. As the chart below shows, Winhall’s population growth relative to its neighbors is higher than all except Stratton, whose growth rate is high but population remains low.

Population Change for Winhall and Surrounding Towns

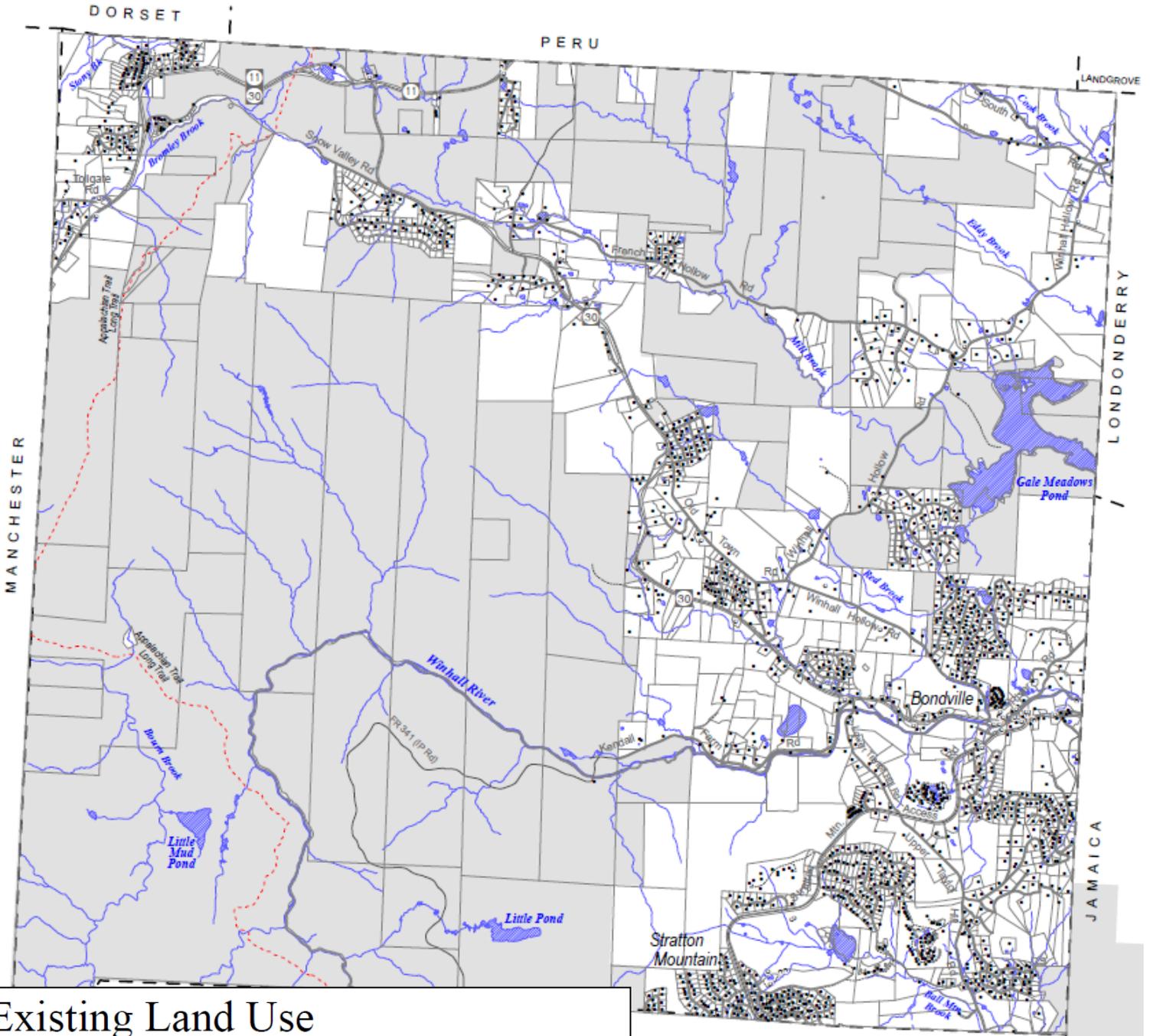
Population Trends in Surrounding Towns	Town	1990	2000	2010	% Change 1990-2000	% Change 2000-2010
	Winhall	482	702	769	46%	10%
Stratton	121	136	216	12%	59%	
Jamaica	754	946	1,035	26%	9%	
Londonderry	1,506	1,709	1,769	14%	4%	
Dorset	1,918	2,036	2,031	6%	-0.2%	
Peru	324	416	375	28%	-10%	
Manchester	3,622	4,180	4,391	15%	5%	

Winhall encourages emergency planning and disaster preparedness. Planning and preparedness may help reduce the risk to life and health, damage to public and private property and environmental damage that often occurs as a result of a disaster. This plan encourages the Town to prepare calmly and realistically for likely emergencies; to know the location of resources and equipment that will be needed; to inform residents of the potential dangers and the ways to avoid these potential dangers; and to quickly arrange for help when it is needed. The Winhall Police & Rescue and Volunteer Fire Department provide the residents of Winhall with police and emergency services.¹

The Town participates in the National Flood Insurance Program (NFIP), has adopted town road and bridge standards, has a Local Emergency Operations Plan, has conducted a culvert inventory and participated in the Better Back Roads Project in 2014. Adopting this local all-hazards pre-disaster mitigation plan, will be another step forward in the Town’s emergency and disaster preparedness planning process. In the future, mitigation funding may be reliant upon mitigation planning.

The Town has no health care facilities and relies on services in adjacent towns. Mountain Valley Health Care Clinic is located in Londonderry. The Otis Clinic is located at Stratton Mountain and Grace Cottage is in Townshend. The Northshire Medical Center is in Manchester.

Winhall Existing Land Use Map



Existing Land Use

Town of Winhall, Vt.

June 2006



- Parcel boundary
- Commercial or industrial building
- Other building (residential, public, etc.)
- Public or conservation land *
- ~ Stream/river
- Pond

* - Public or conservation land are large parcels of federal, state, or town land, or private land parcels with a conservation easement.

PLANNING PROCESS

Town residents who took part in the planning process for developing the Single Jurisdiction Hazard Mitigation Plan for Winhall tend to be affiliated with more than one association for the town. In rural areas of Vermont, it is typical that people who are most interested in the safety, health and welfare of their community will preside on more than one board, and for example, hold the role of Fire Chief, or school teacher, or be a small business owner, in addition to owning personal property in the town. Therefore, although the meeting may not have as many in attendance, as in a more populated community, those present at the meeting are representing not only a variety of roles, but many roles that would be held by multiple individuals in a more populated area.

Documentation of the Planning Process, Public Involvement and Input from Neighboring Communities

The Town of Winhall held their initial planning meeting to discuss the risk assessments and hazards vulnerability to Winhall on December 2, 2010. The meeting was attended by the Fire Chief, Highway Department Foreman, Chief of Police, Town Administrator and the Emergency Planner at the Windham Regional Commission. The 2nd meeting was held on June 14, 2011 and involved a more in depth discussion about the town's development trends and mitigation strategies.

- December 2, 2010 – Police/Fire Station, Winhall, VT
- June 14, 2011 – Police/Fire Station, Winhall, VT

The Winhall Hazard Mitigation Plan was made available for public comment using the following outlets:

- An advertisement of the Pre-disaster Hazard Mitigation Plan was posted in the *Vermont News Guide* for the Town of Winhall, also available online (<http://www.vermontnews-guide.com/>). This opportunity served to make the public aware where they can find hard copies to review or download.
- Copies of the draft plan were made available at Town Meeting Day in March 2011.
- The first draft of the Winhall Draft Plan was posted to the Windham Regional Commission website on their Hazards Page from 2011 until mid 2014.
- The final draft plan was discussed at the March 18, 2015 Selectboard meeting.
- The plan was posted to the Town of Winhall website providing opportunity for the public to comment.
- Flyers were posted advertising that the draft plan was available for review and comment both on the town website and a hard copy was available for review at the town office from _____ to _____.

Compared to other towns in the Windham region, Winhall suffered less damage from Tropical Storm Irene in August 2011. Since most of the attention given to hazard mitigation plans in the Windham Region focused on towns that suffered major damage. For this reason there was a large gap of time in the development of Winhall's hazard mitigation plan between June 2011 and mid-2014. A draft was never completed and submitted for FEMA review during that time.

The Town commenced the planning process again in the late summer of 2014 when the draft that was started in 2011 was picked back up for review and update by Windham Regional Commission Emergency Planner, Alyssa Sabetto. Because the draft had been developed with input from two public meetings already, Winhall decided to not hold another public meeting to develop the plan. Town Administrator, Lissa Stark, and Road Foreman, Trevor Dryden, did however meet with Alyssa to discuss what had been developed thus far and to update the draft. This meeting, which took place on September 15, 2014, lasted for several hours and involved:

- a detailed review of the draft document with discussion of more recent hazard events,
- progress made in mitigation efforts that were noted several years ago,

- development of new hazard mitigation projects,
- review of mapping of the town to note where hazard events are causing repeated or large scale damage, and
- general overview of the draft for relevancy and updating purposes.

There were numerous changes, additions and updates that came out of that meeting. Alyssa revised the draft and presented the updated draft for review again by Lissa Stark. The draft was finalized and then discussed at a Selectboard meeting on March 18, 2015. It was decided that because the major decisions had been made at two previous public meetings, it was unnecessary to hold a third public meeting devoted exclusively to the hazard mitigation plan. **The selectboard reviewed the draft at the meeting and did not have comments.** It was then put out for public comment and simultaneously distributed to adjacent towns for comment. **Were comments received back?** The draft was then finalized and submitted to Vermont Department of Emergency Management and Homeland Security (DEMHS) and FEMA for review.

The following people were involved throughout the multi-year mitigation planning process²:

Participants (2010-11)	Affiliations	Home
Dennis McCarthy	Town Administrator	Shaftsbury
Harold Coleman	Winhall fire Chief Owns Farm, Sawmill and Sugaring Operation	Jamaica
Randy Kimball	Highway Department	South Londonderry
Jeff Whitesell	Chief of Police Chief of Rescue Squad Emergency Management Director	North Bennington
Steve Avison	First Assistant Fire Chief Caretaker in town	Winhall
Barb Ferguson	Facilities Manager	Jamaica
Dave Campbell	Custodian	Bondville
Steve Blanchard	Homestead Landscaping	Shaftsbury
Dinah Reed	Assistant Planner, Windham Regional Commission	Brattleboro
Participants (2014)	Affiliation	Home
Lissa Stark	Town Administrator	Winhall
Trevor Dryden	Road Foreman	Winhall
Alyssa Sabetto	Planner, Windham Regional Commission	Brattleboro

RISK ASSESSMENT / VULNERABILITY ANALYSIS

The risk assessment portion of a Hazard Mitigation Plan contributes to the decision-making process for allocating available resources to mitigation projects. 44 CFR Part 201.6(c)(2) of FEMA's mitigation planning regulations requires local municipalities to provide sufficient hazard and risk information from which to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Methodology

A **vulnerability analysis** for each community begins with an inventory of possible hazards and an assessment of the risk that they pose. These are the questions to be answered. What hazards can affect

² See Appendix A for sign-in sheets.

your community? How bad can it get? How likely are they to occur? What will be affected by these hazards? How will these hazards affect you? The **magnitude** (percentage of the community affected) of the impact of the hazard can be classed as follows:

- Negligible: < 10% of properties damaged/Minimal disruption to quality of life.
- Limited: 10% to < 25% of properties damaged/Loss of essential facilities/services for up to 7 days/few (< 1% of population) injuries possible.
- Critical: 25% to 50% of properties damaged/Loss of essential facilities/services for > 7 days < 14 days/Major (< 10% of population) injuries/few deaths possible.
- Catastrophic: > 50% of properties damaged/loss of essential facilities/services for > 14 days/Severe (> 10% of population) injuries/multiple deaths possible.

The frequency of occurrence (**Likelihood**) is classified as shown:

- Unlikely: < 1% probability in the next 100 years.
- Possible: 1% to 10% probability in the next year, or at least one chance in the next 100 years.
- Likely: 10% to 100% probability in the next year, or at least one chance in the next 10 years.
- Highly Likely: Near 100% probability in the next year.

Additionally, seasonal patterns that may exist are considered, what areas are likely to be affected most, the probable duration of the hazard, the speed of onset (amount of warning time, considered with existing warning systems). These are all part of the discussion when doing the vulnerability analysis.

The combination of the **magnitude** of the hazard and the **likelihood** was used to determine the **community vulnerability** as HIGH, MODERATE or LOW. For example, a flood event is highly likely (nearly 100% probability in the next year) in many communities but the degree of impact varies. A highly likely flood with critical or catastrophic impact rates the community vulnerability as HIGH. Another community with a highly likely or likely (at least one chance in the next 10 years) flood with a limited impact would receive a vulnerability rating of MODERATE. The vulnerability of a community having the occurrence of an event as possible or unlikely with limited or negligible impact would be LOW.

Likelihood/Frequency:

- U = unlikely
- P = possible
- L = likely
- HL = highly likely

Impact/Magnitude:

- N = negligible
- L = limited
- CR = critical
- CA = catastrophic

Analysis

Winhall conducted their vulnerability analysis as a group exercise and the following table shows the results.

Possible Hazard	Likelihood	Impact / Magnitude	Community Vulnerability	Most vulnerable facilities and populations
Structure Fire	P	N	Moderate	Residences, Businesses
Power Failure	HL	N	Moderate	Residences, Businesses
Winter & Ice Storm / Severe winter weather	HL	L/CR	Moderate	Residences, Businesses
Highway Accidents	HL	L	Moderate	Route 30
Drought	P	L	Moderate	Residents, Farms, Businesses
Wildfire	P	L	Moderate	Residents, Businesses
Flooding/Fluvial Erosion	HL	L/CR	Moderate	Low lying hills, brooks, drainage ditches, culverts, West River Corridor
Hazardous materials	P	L	Moderate	Route 30
Radiological Incident	U	CA	Moderate	Town-wide
High Wind	L	L	Low	Residences, Businesses

Landslide	HL	L	Low	Roads
Terrorism	P	N	Low	Potential for Town-wide
School Safety Issues	L	N	Low	Elementary School; Homes
Tornado/Microburst	P	L	Low	Roads, Bridges, Utilities
Air crash	P	N	Low	Could occur anywhere
Hurricane	U	CR	Low	Town-wide
Earthquake	U	CR	Low	Town-wide
Dam Failures	U	L	Low	Stratton snowmaking pond/dam
Volcano	U	U	Low	No active volcanoes in Vermont
Water Supply Contamination	NA	NA	NA	No public water supply
Railroad Accidents	NA	NA	NA	No Railroads in Town
Tsunami	NA	NA	NA	There is no coastline in Vermont

The community has identified and chosen to focus mitigation action items on the following hazards: Flooding/Fluvial Erosion and Landslide. These are the hazards that Winhall most commonly faces and has developed mitigation actions around. Though winter storms and high winds occur in Winhall, they are not addressed in this plan because they occur on a routine basis and the town already responds to these hazards in a routine way. Current methods are adequate at this time; therefore, mitigation actions are not deemed necessary. For hazards that are not profiled in this plan, the reader is directed to the Vermont State Hazard Mitigation Plan.

Hazard Profiles

The following hazards include a narrative explaining Location/Geographic Area and Extent (magnitude or severity), Probability, Impact and discussion of Past Occurrences of all natural hazards that affect the planning area. In putting together this hazard information

Flooding/Fluvial Erosion

Description

Flooding is the most widespread and destructive hazard in the United States. Flooding has also been the most common and costly hazard to affect Windham. Flooding can occur anytime of the year as a result of heavy rains, thunderstorms, tropical storms, hurricanes or Nor'easters. It can result from the overflow of major rivers and their smaller tributaries, or inadequate local drainage. Historically, floods have been a factor in over 80 percent of all federally declared disasters. People living in close proximity to bodies of water such as rivers, lakes, and streams are at greater risk from flooding than those not living in the floodplain. There is a 26 percent chance of experiencing a flood during the life of a 30-year mortgage compared to a 4 percent chance of a fire. Winhall has an NFIP compliant floodplain ordinance, which gives residents access to discount flood insurance and enables the Town to regulate development within the SFHA. SFHAs are subject to inundation by the 1% annual chance flood (100-year flood). Official Special Flood Hazard Area (SFHA) maps from FEMA can be found in the vault at the Town Office or online at the FEMA Map Service Center.³

Impact and Geographic Area of the Hazard

Most of the destruction from flooding in Winhall is due to fluvial erosion rather than inundation flooding, which is the type of flooding targeted through the NFIP. Fluvial erosion is the destruction of river banks caused by the movement of rivers and streams. This occurs when the stream is unstable and has more energy than is needed to transport its sediment load, due to channel alterations or runoff events that increase water speed in the channel. Fluvial erosion hazard mapping was released by the VT Agency of Natural Resources in early December 2014. This mapping will assist municipalities in developing bylaws and effective mitigation strategies to regulate development within fluvial erosion hazard zones. Winhall has been proactive in developing a fluvial erosion bylaw, which is included with their floodplain

³ <https://msc.fema.gov/portal>

regulations. This bylaw is considered interim for the river corridor criteria that DEMHS has set. Winhall should work with the regional commission and DEMHS to ensure that their floodplain bylaw remains inclusive of river corridors.

Flash floods typically occur in high elevation drainage areas as a result of summer thunderstorm activity. Infrastructure and structures along higher elevation streams and drainage areas are most susceptible to damage from flash flooding. Drainage ditches and culverts are the biggest concern for local flash flooding events. Areas in Winhall that are particularly susceptible include Cranberry Hill which is dead-end road with twelve houses on it. This roadway has seen frequent flooding. Several culverts have been replaced and several still need to be replaced.

Winhall Industrial Society owns the fairgrounds on Route 30 and along the Winhall River. This area does get flooded, but the couple buildings on the fairgrounds have not been damaged by flooding. Whiskey Dicks had some land lost into the river during Irene.

Though much of the area of Bondville lies in the floodplain there is generally minimal damage. Buildings were luckily built outside the floodplain for the most part, though portions of peoples properties are in the floodplain and may be damaged.

The assessed value of all property in Winhall is \$702,504,453. Assuming a range of town-wide damage of 1% to 5%, a heavy snow or ice storm could result in \$7,025,044 to \$35,125,222 of total damage.

As for damage costs, from 2003-2006 flood repair costs have varied with total costs of \$942,621 for 2003 and \$1,184,144 in 2004, and \$15,000 was received in 2008. \$153,208.64 total assistance received for damages in Winhall due to Tropical Storm Irene. These are the only flood repair costs that the town could verify.

Extent / Probability

Flash floods are a locally probable hazard event. There have been 23 recorded flash flood events and 27 flood events in Bennington County in between 1996 and 2013. Flash floods typically occur during summer when a large thunderstorm or a series of rain storms result in high volumes of rain over a short period of time. Higher-elevation drainage areas and streams are particularly susceptible to flash floods. Flash floods are likely in Winhall, and potential damage to Route 30 could limit access to town, as it is the major transportation corridor through the community. Flooding and fluvial erosion are considered highly likely by the town.

There are no stream gauges on the Winhall River, Ball Mountain Brook or Batton Kill, which are the three watersheds that lie within Winhall. The Winhall River is a tributary to the West River, and there is a gauge in Jamaica on the West River. This is the closest gauge to Winhall and the highest recorded measurement was 14.87 feet, which was measured on December 31, 1948.⁴ Average height for this reach is about 6.13 feet.

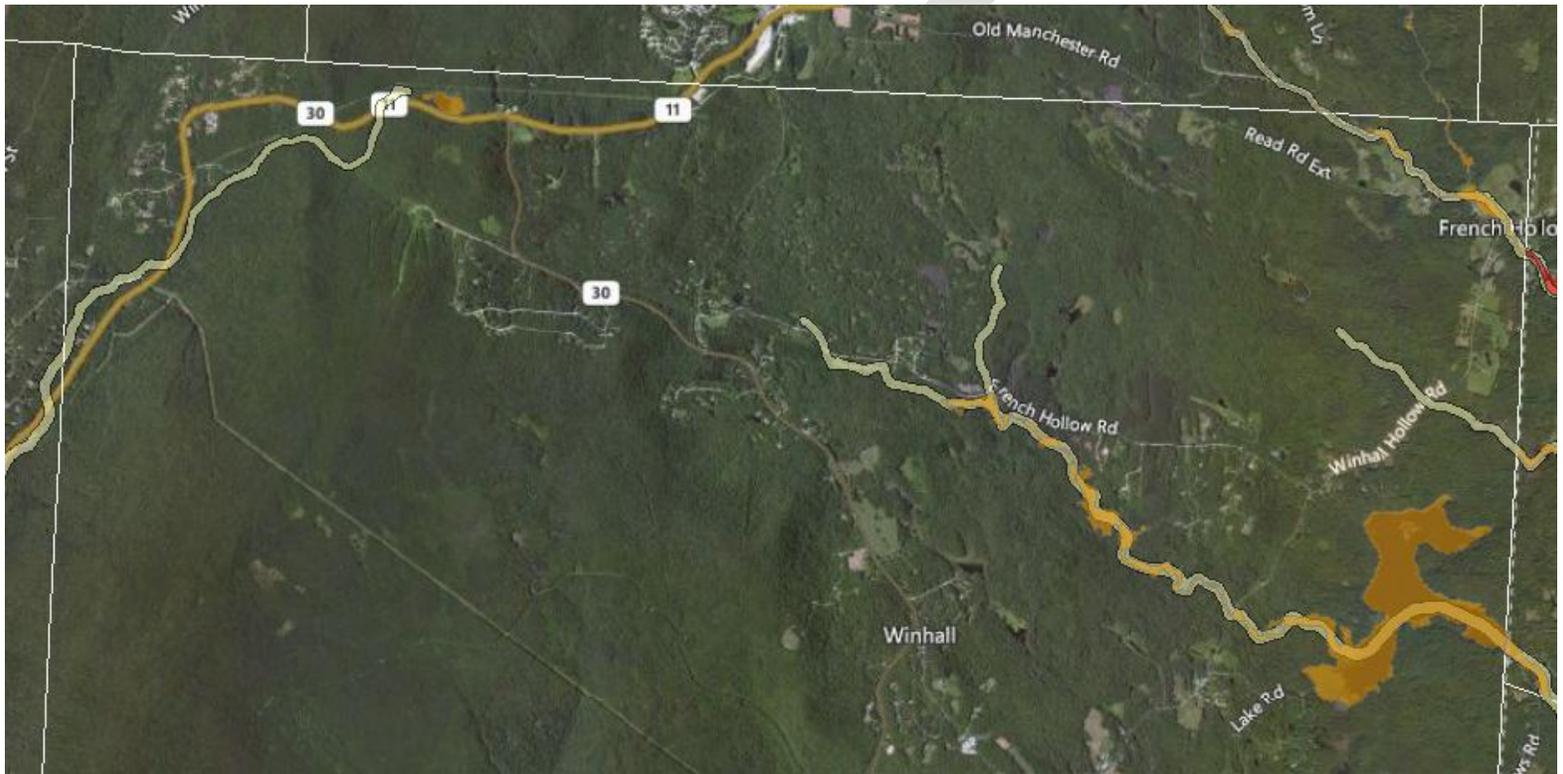
Floodplain/River Corridor Mapping

The following maps were created using the Vermont Agency of Natural Resources (ANR) 'Natural Resources Atlas' which is an online mapping tool. These maps are snips showing all of the special flood hazard areas (SFHAs) that FEMA has designated in Winhall, as well as the River Corridors that VT ANR has designated. It should be noted that the current map effective date (as of this plan writing) for the Flood Insurance Rate Maps (FIRMS) for Bennington County is 6/19/1989, but they are in the process of being updated and are expected to be finalized in December 2015.

⁴ USGS Stream gauge 01155500 Tributary to West River Tributary near Jamaica, VT
<<http://waterwatch.usgs.gov/index.php>>

The below map shows the northern half of Winhall. The orange shaded areas are SFHAs, red areas are FEMA Floodways, and the white shaded areas are the ANR River Corridors.

The large orange SFHA is Gale Meadows Pond. Mill Brook flows into Gale Meadows Pond. In the very northeast corner of Winhall, there is SFHA along Cook Brook in the area of South Road and Read Road, going into Londonderry. In the northwest corner of Winhall is a small pond just north of Routes 11/30 near the border with the town of Peru. This area sees flooding. There are no floodways shown on the below map in Winhall. The river corridors span more stream length than the SFHAs. It is worth noting that river corridors are only mapped for streams with watershed of two or more square miles, but they do also apply to the area within fifty feet of top of bank for all mapped streams in the Vermont Hydrography Dataset⁵. Areas within mapped river corridors are included in the restrictions set out in Winhall's floodplain bylaw.



⁵ USGS houses the National Hydrography Dataset, out of which you can extract data by state < <http://nhd.usgs.gov/>>

The below map shows the southern half of Winhall. The orange shaded areas are SFHAs, red areas are FEMA Floodways, and the white shaded areas are the ANR River Corridors.

In the very southeast corner, the north branch of Ball Mountain Brook has SFHA that extends over the southern border into Winhall. However, the most serious flood hazard in Winhall lies in the red area of the map below, which is the floodway area along the Winhall River, in and around Bondville. Floodplain and floodway extend through the town and along Kendall Farm Road and up along Route 30 until approximately Goslings Way. The floodway is the area of the floodplain that accommodates moving flood waters; whereas other designated A and AE zone SFHAs accommodate standing floodwaters. Therefore, intrusions in the floodway are prohibited. The River Corridors shown in the below map extend to much more stream length than the SFHA.



Past Occurrences

June 2, 2013 - A warm and humid air mass was in place across the region on Sunday, June 2nd with temperatures well into the 80s. A cold front and associated pre-frontal surface trough was moving towards the area during the afternoon hours. With plenty of moisture and instability in place, showers and thunderstorms developed across the region. These thunderstorms were aided by very strong winds aloft and a few storms became severe across southern Vermont, producing large hail and wind damage. The thunderstorms also produced very heavy rainfall, which caused flash flooding within the town of Bennington. The thunderstorms weakened by evening as the cold front moved across the area, ending the threat for severe weather and flooding. Amateur radio operators reported eight to ten inches of water was flowing across streets in downtown Bennington as a result of heavy rain from thunderstorms.

May 29, 2013 - The thunderstorms reached southern Vermont by the evening hours. In addition to gusty winds and lightning, these thunderstorms produced extremely heavy rainfall. With the region already rather saturated from repeated thunderstorms over the past week, the additional heavy rainfall that occurred caused flash flooding in some areas. This caused roads to be closed due to being impassable by flowing water. Thunderstorms pushed east of the area by around midnight, ending the threat of heavy

rainfall. Flash flooding was reported as a result of heavy rainfall from thunderstorms in Bennington. South Street (Route 7) was reported to be closed due to flooding on the roadway.

Aug. 28, 2011 – The Federally Declared Disaster DR-4022, Tropical Storm Irene tracked north northeast across eastern New York and western New England during Sunday, August 28th, producing widespread flooding, and damaging winds across the region. ||Irene tracked from a position over New York City around 8 AM EST Sunday, to approximately 10 miles west of Danbury, CT at 10 AM EST, to approximately 15 miles south of Pittsfield, MA at 1 PM EST Sunday, to approximately 65 miles south of Rutland, VT at 4 PM EST. ||The greatest impact from Irene across southern Vermont was due to heavy to extreme rainfall, which resulted in catastrophic flooding. Rainfall amounts generally averaged 4 to 8 inches. Much of the rain which fell occurred within a 12 hour period, beginning early Sunday morning, and ending Sunday evening. ||This heavy to extreme rainfall resulted in widespread flash flooding and river flooding across southern Vermont. In Bennington County, widespread flash flooding and associated damage was reported countywide, with many roads closed due to flooding and downed trees and power lines. Route 9, the main route across southern Vermont, was closed. The city of Bennington was inaccessible for a period of time. Record flooding occurred on the Walloomsac River at Bennington. ||In Windham County, catastrophic flooding was reported countywide, along with widespread damage and road closures. Route 9, the main route across southern Vermont was closed, with the city of Wilmington inaccessible for a period of time. Numerous evacuations were reported. In addition, record flooding occurred on the Saxtons River at Saxtons and the Williams River at Rockingham. \$153,208.64 total assistance received for damages in Winhall.

March 2008 - The Town of Winhall received \$15,000 from FEMA in for upgrading culverts and road paving on Rt. 11 in the Bromley Forest, due to a flood event.

In 2007 Bennington County was part of a Presidentially Declared Disaster associated with severe storms and flooding during the period of April 15-21 2007. Rain and snow caused damage to roads and utility lines across Windham and Bennington Counties, including Winhall. Kendall Farm Road in Winhall was completely washed out by torrential rainfall during several thunderstorms. In addition, animals had to be rescued from a farm in Winhall, which were stranded by high water levels. Across, the State, nearly 3.6 million dollars was obligated as part of the FEMA Public Assistance Program. While it is not normal for the town to receive this type of damage from severe flooding and thunderstorms on an annual basis, road washouts and culvert repairs from these associated events have ranged in the ballpark of \$200,000 to \$400,000.

July-August 2003 - Bennington County, including the Town of Winhall, experienced nearly constant rain and thunderstorms from the period of July 21 through August 18, 2003. FEMA Declaration DR – 1488 was associated with this event. Many roads were washed out and culverts needed replacing throughout town. The following year, another severe period of flooding and thunderstorms, which lasted from the period of August 12- September 12, 2004 engendered Presidential Disaster Declaration DR – 1559.

July 14, 2000 - A very moist air mass moved over extreme southern Vermont during the afternoon of July 14. A cold front stalled to the west of the region. This scenario along with terrain enhancement, resulted in a cluster of thunderstorms developing across this region. The thunderstorms contained torrential rainfall which produced Doppler radar estimates of up to 3 inches in extreme northeast Bennington County. The result was flash flooding which washed out sections of roadways in northeast Bennington County. There was \$44,000 of reported property damage in Bennington County.

September 1999 - The remnants of Hurricane Floyd moved up the eastern seaboard on September 16 and during the early hours on September 17. The storm brought both high winds and heavy rainfall to Southern Vermont, which included a large swath of 3 to 6 inch amounts. Specific rainfall amounts included 2.91 inches in Bennington, 3.89 inches in Sunderland, 4.54 inches at Peru and 5.70 inches at Brattleboro. The rain produced significant flooding across the region, which proved destructive. Many smaller tributaries reached or exceeded bankfull. Water from the Millbrook in Weathersfield washed away a portion of State Route 5. The World's Fair in Tunbridge was cancelled for the first time in many years.

Winds from the passage of Floyd were estimated to have gusted to over 60 mph, especially over hill towns. The combination of the wind and very saturated ground, produce widespread downing of trees and power lines across much of Southern Vermont. A woman was injured on Tavern Hill in Putney, Windham County when a tree came crashing down on her Volvo, destroying the vehicle. Some trees fell on vehicles and houses. The rain and wind produced power outages across the region. As many as 2,000 people lost power in Southern Vermont. There was \$476,000 of property damage in Bennington County from this event.

In 1996, flooding ravaged communities in northern New England resulting in significant damage and a Presidential Declaration of Emergency. During 1978, flooding occurred throughout New England causing millions of dollars in damage.

The flood of 1976 wiped out most beaver dams that were prevalent near Kendall Farm which is within national forest property. Since that time, numerous and large beaver dams have again been built in that area on the Winhall River. Any major storm event in the near future could cause a situation where those beaver dams break, causing a cascading affect down the river which would cause a flash flooding event significant enough to wreak havoc on roads, property, bridges and culverts.

The Vermont Flood of 1927 was the deadliest natural disaster in the history of the State; eighty-four people were killed with over \$28 million in property damage. The Spring Floods of 1938, which had an effect on all of New England, caused \$113 million in damage, killed 24 people and made 77,000 people homeless. During this flood alone, the main street of Hooksett, New Hampshire was 18 to 20 feet underwater.

Sources used

Local town knowledge and records, National Climatic Data Center storm events database, FEMA's Presidential Disaster Declarations search page

Landslide

Description / Probability

Landslides are a serious geologic hazard common to almost every state in the United States. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Gravity is the force driving landslide movement. Factors that allow the force of gravity to overcome the resistance of earth material to landslide movement include: saturation by water, steepening of slopes by erosion or construction, alternate freezing or thawing, removal of trees and other vegetation and earthquake shaking. Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Landslides in Winhall are all related to road cutting and fluvial erosion for the most part, areas where roads have been built between steep slopes on one side of the road, and slopes to a river or brook on the opposite side. Existing homes are dotted on the landscape along these roads which have existed for 200 years or more, so cannot be easily closed or relocated. In some instances stabilization/mitigation projects in Winhall have helped some landslides. In other areas, issues remain.

There are several areas in Winhall with landslide risks, primarily to roadways that would cut off residences. All of the landslides in Winhall that are issues of concern are along roadways and disturbance is more of a risk than letting them alone. Risks with these landslides are to passing drivers and residents being cut off by landslide debris covering roadways. Small landslides, primarily related to fluvial erosion events, are highly likely in Winhall.

Impact / Areas of Concern / Extent

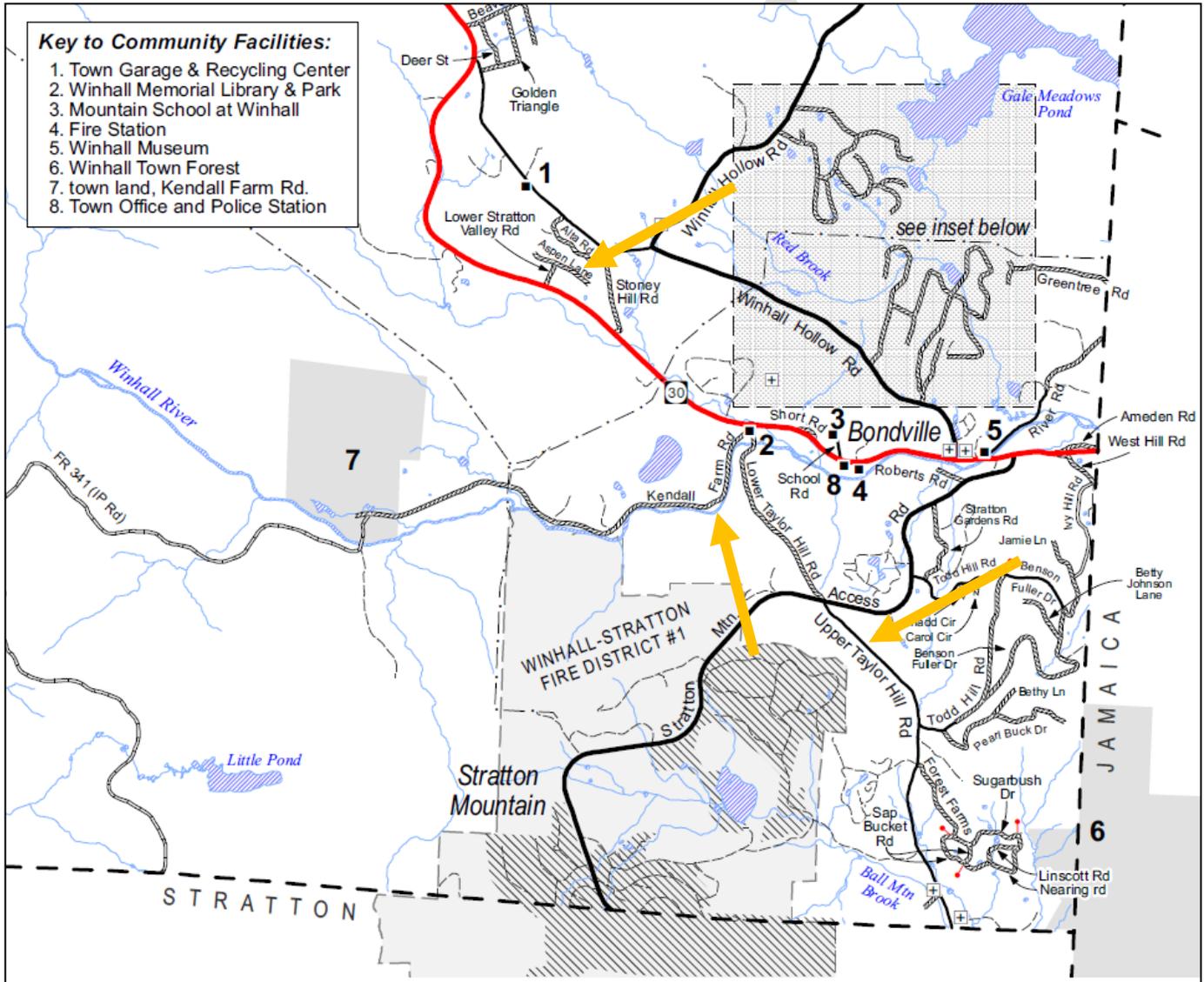
There have been no major occurrences in memory as of this plan. There are several areas of particular risk that the town road crew is keeping an eye on.

The bank along Upper Taylor Hill Road is eroding above the road. There are no structures at risk, but failure would result in loss of the road and utilities along it. If this landslide would occur this would create emergency access issues related to response times.

Kendall Farm Road, before the pump house on the right, there is a steep embankment that is at risk for landslide. If that would occur, there are no structures that would be damaged but the road would be shut off, which would cut off access to at least twenty homes.

Aspen Lane bank erosion failure would cut off access for at least three homes on this road.

The arrows on the below map point to the three areas of concern.



Sources used

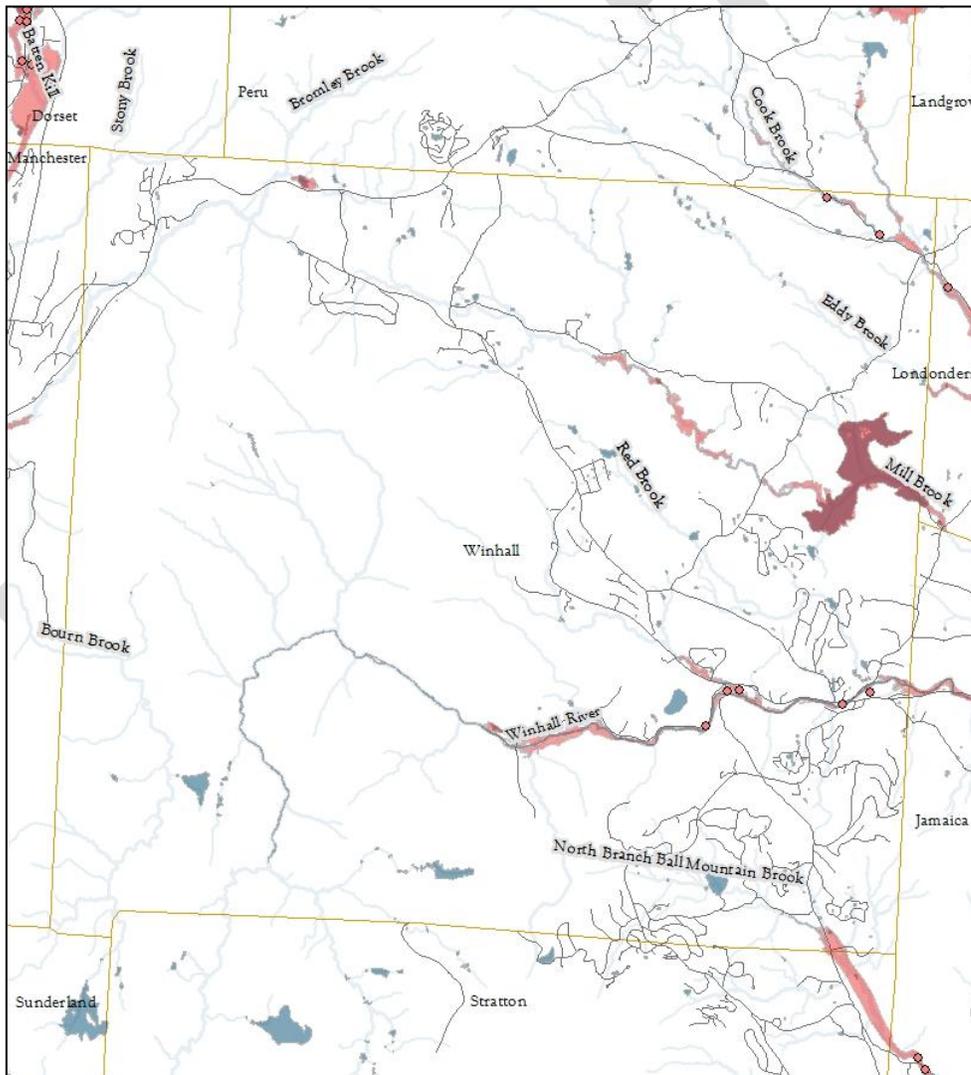
Local town knowledge, meeting with Road Foreman Trevor Dryden (September 15, 2014), 2014 Winhall Better Back Roads Program project summary

ASSESSING VULNERABILITY

Structures in the SFHA

There are approximately 7 buildings within FEMA-designated Special Flood Hazard Areas (SFHAs).⁶ The below map shows structures (red dots on map below) that are located in the SFHA. Five of the seven buildings are located in the Village of Bondville, the highest risk flood area in Winhall. These structures are particularly vulnerable to flooding and fluvial erosion hazards described in this plan.

Properties within SFHAs, that have a mortgage, are required to purchase flood insurance. Winhall's participation in the National Flood Insurance Program (NFIP) gives residents and business owners access to discount flood insurance through the National Flood Insurance Program. Flood insurance can still be purchased privately, however it is more expensive. Development in SFHAs must meet additional construction standards as outlined in Winhall's floodplain regulations.



⁶ 3/12/15 Flood Hazard Summary Report for Winhall, available on VT ANR's Floodready website <<https://anrweb.vt.gov/DEC/FoFReports/>>

Repetitive Loss Properties

According to the State Hazard Mitigation Officer, Winhall has no repetitive loss properties.

The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended, 42 U.S.C. 4102a. An SRL property is defined as a **residential property** that is covered under an NFIP flood insurance policy and:

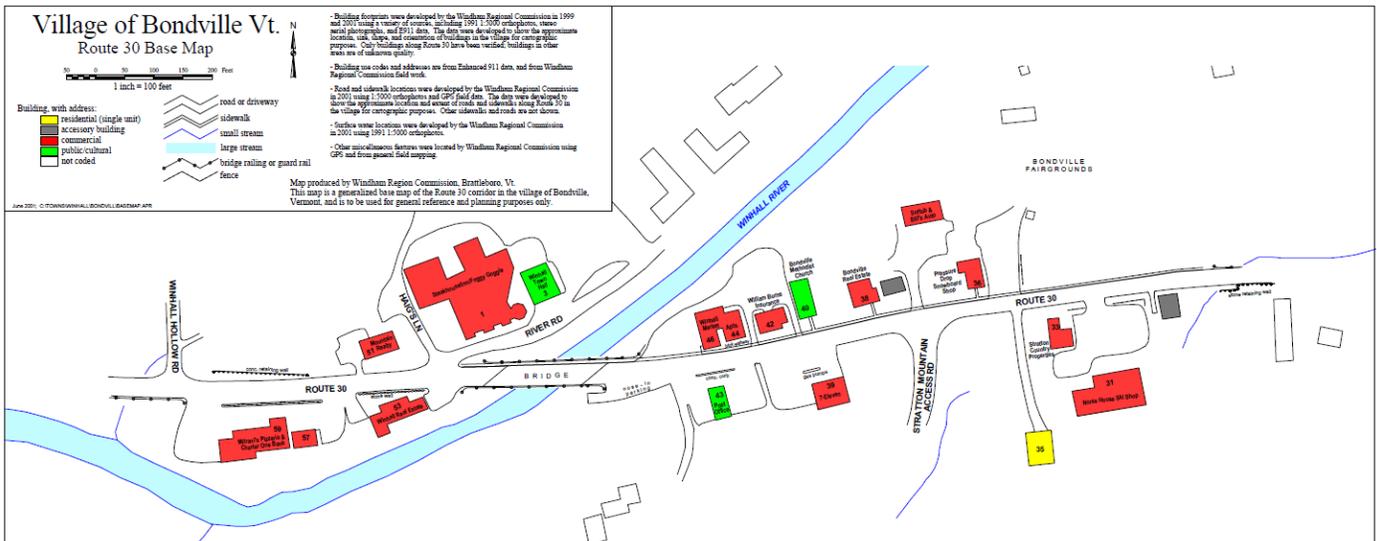
- (a) That has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or
- (b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.⁷

Community Facilities in Winhall

The Town office used to be in the floodplain, but was recently relocated farther north on Route 30 to the same location as the police station.

Town Garage (2 buildings)	64 Old Town Road
Winhall Memorial Library	2 Lower Taylor Hill Road
Police Station	113 VT Rt. 30
Volunteer Fire Station	107 VT Rt. 30
School/Community Center	9 School Road
Transfer Station	66 Old Town Road
The Town Offices	115 VT Route 30
Bondville Post Office	Center of the Village of Bondville
Winhall Museum/Old Town Hall	3 River Road – along the river but not in the floodplain



⁷ Description provided by FEMA <<http://www.fema.gov/severe-repetitive-loss-program>>

Market Values of Structures in Winhall⁸

	Number	<u>Value includes land</u>
Residential Homes	315	\$108,020,600
Seasonal Homes	990	\$415,407,900
Mobile Homes – Unlanded	1	\$7,000
Mobile Homes – Landed	3	\$545,800
Commercial	37	\$30,411,000
Other (Utilities, Woodland and Miscellaneous)	587	\$147,758,871
Total Listed Value	1,933	\$702,151,171

Participation in and Compliance with the National Flood Insurance Program (NFIP)

The National Flood Insurance Program (NFIP) is a voluntary program organized by FEMA that includes participation from 20,000 communities nationwide and 247 Vermont towns and cities. Combined with floodplain mapping and floodplain management at the municipal level, the NFIP participation makes affordable flood insurance available to all homeowners, renters, and businesses, regardless of whether they are located in a floodplain.

The NFIP was instituted in 1968 to make flood insurance available in those communities agreeing to regulate future floodplain development. As a participant in the NFIP, a community must adopt regulations that: 1) require any new residential construction within the 100 year floodplain to have the lowest floor, including the basement, elevated above the 100 year flood elevation; 2) allow non-residential structures to be elevated or dry flood proofed (the flood proofing must be certified by a registered professional engineer or architect); 3) require anchoring of manufactured homes in flood prone areas. The community must also maintain a record of all lowest floor elevations or the elevations to which buildings in flood hazard areas have been flood proofed.

In return for adopting floodplain management regulations, the federal government makes flood insurance available to the citizens of the community. In 1973, the NFIP was amended to mandate the purchase of flood insurance as a condition of any federally regulated, supervised or insured loan on any construction or building within the 100-year floodplain. In 2012, Congress passed the Biggert-Waters Flood Insurance Reform Act to reduce subsidies for structures built before the NFIP was instituted (called pre-FIRM structures). Over 50 percent of Vermont's NFIP policies are pre-FIRM, which means that flood insurance premiums for many will increase over the ensuing years.

While the NFIP floodplain management criteria are administered by States and communities through their floodplain management regulations, FEMA's role is to provide technical assistance and to monitor communities for compliance with the minimum NFIP criteria. Winhall is a member in good standing with the NFIP (CID 500022). The latest floodplain ordinance was adopted December 7, 2011 and is a standalone ordinance that includes a fluvial erosion bylaw.

The latest record indicates that there are twelve (12) active NFIP policies in Winhall. These policies have a total coverage value of \$3,346,000. There have been seven NFIP claims filed in Winhall since 1978 totaling \$111,235.⁹

⁸ These numbers are from the 2014 Winhall Grand List.

⁹ FEMA NFIP Insurance Report available at floodready.vermont.gov – accessed 10/3/14

The Town works with the elected officials, Windham Regional Commission, the state and FEMA to correct existing compliance issues and prevent any further NFIP compliance issues through continuous communications, training and education.

Development Trends

In 1870, the Town had 842 residents, which is the largest population in Winhall's long history. From 1870 to 1940, the population declined to only 212 people. Gradual growth since 1940 has brought the population to 702 people in 2000 and this growth is projected to continue over the next twenty (20) years. Towns that border Winhall have also experienced significant growth during the past fifty (50) years. Ninety-nine percent of the houses in Winhall are for seasonal, recreational, or occasional use and approximately 60% of those houses were built between the years 1970-1989. With approximately 60% of the Town in National Forest, which doesn't allow for development, there is limited potential for substantial growth. Winhall does have zoning and this protects particularly high risk areas. Development on slopes above 15% is discouraged in the town plan.

In the Village of Bondville, development is characterized by a concentration of structures and land uses devoted to small-scale commercial, residential, governmental and recreational uses. The character of the Village is an important social and economic asset to the community. Bondville does not have adequate water or sewer thereby making the potential for building anything new minimal. This coincides with Winhall's desire to maintain its rural character.

The town sees population fluxes because of the draw of local resorts. However, the town is spread out and has less concentrated infrastructure to accommodate the influx of winter travelers, compared to towns like Stowe or Dover, which also have a huge influx of population during ski season. There is a huge second home population, because of proximity and access to a ski mountain. On a weekend Winhall can have 20,000 people in town --- in which case the town's capabilities are limited for a population of that size. They have a low full time population but a very high seasonal population. This ties up resources, so they are taxed and have to call in mutual aid if there is an emergency. But for the regular population of locals, they are considered to have more resources than towns of their size in the region.

MITIGATION STRATEGY

Local Hazard Mitigation Goals

The Hazard Mitigation Goals as outlined below were developed by consensus among the emergency management stakeholder group during meetings for the Town of Winhall Single Jurisdiction Hazard Mitigation Plan.

General Goals:

- Reduce the loss of life and injury resulting from all hazards.
- Reduce the impact of hazards on the town's water bodies, natural resources, and historic resources.
- Reduce the economic impacts from hazard events.
 - Minimize disruption to the road network and maintain access,
 - Mitigate financial losses incurred by municipal, residential, industrial, agricultural and commercial establishments due to disasters,
 - Ensure that community infrastructure is not significantly damaged by a hazard event.
 - Being proactive in implementing any needed mitigation projects for public infrastructure such as roads, bridges, culverts, municipal buildings, etc.
- Encourage hazard mitigation planning to be incorporated into other community planning projects, such as the Town Plan, Capital Improvement Plan, and Town Basic Emergency Operation Plan

- Ensure that members of the general public continue to be part of the hazard mitigation planning process.

Relevant Town Plan Policies that support Mitigation

Health and Safety Policies

1. Provide facilities and effective equipment for adequate police and fire protection to meet the changing needs of the community within the financial constraints of the Town.

Health and Safety Recommendations

1. Necessary common fire protection features such as fire ponds and/or dry or charged hydrants should be installed where practicable by developers and subdividers to ensure the safety of the public.

Ground and Surface Water Policies

1. Encourage the maintenance of Winhall's surface waters and shorelines in their natural state. Areas of natural vegetation should be maintained along watercourses, lakes, ponds and wetlands sufficient to protect water quality, enhance wildlife habitat and, in the case of National Forest and Town-owned lands, to maintain scenic and recreational values.
6. Encourage the use of flood hazard areas for agricultural and conservation uses, open recreation, and other purposes which do not significantly impair the land's natural ability to handle floodwaters.

Ground and Surface Water Recommendations

1. The Town should designate, within the Winhall Zoning bylaw, setbacks and buffer zones where appropriate to protect water quality.
2. Road sand and salt storage areas should not be sited in the 100-year flood hazard area; Class I or II ground water zones; wellhead protection areas; any other area designated by the Town as an important groundwater protection area; or shoreline areas of any surface water.

Progress between 2011 and 2015

This planning process began in 2011. Due to the length of the planning process, this plan wishes to give recognition to the progress made during this time period, despite the fact that a hazard mitigation plan was not yet in place.

1. One of the greatest hazards in Winhall in 2011 was Lower Taylor Hill Road. In 2011, when this plan was first drafted this is what was said about Lower Taylor Hill Road:
One of the town's greatest perpetual hazardous areas, for a variety of issues, is Lower Taylor Hill Road. It is a one-way road that serves as a short cut off from the access road. It is an unpaved road (Class 3) that has an 11% grade, is crowned and ditched with a healthy canopy that causes ice to build up because of a lack of sunshine. The road begins with a gradual downhill grade, coming to a straight drop, with a bridge at the bottom crossing the Winhall River. Furthermore, development is happening along the road, with room for potentially 30 more residential properties. The Town averages one-two accidents with every storm. There is virtually no fire protection in winter because the fire truck cannot go down the hill, and it is extremely difficult for the truck to go up the hill. The road needs to be paved. Another problem is that people tend to go the wrong way on the road, even when knowing it's a one-way road.

An engineering study is currently being conducted to address the hazardous situation with Lower Taylor Hill Road discussed under the Development Trends section on page 6. The ongoing issue

is always included as a line item in the warned Selectboard meetings each month so that public comment can surface. The project is considered of high importance for the safety of the town.

2015 UPDATE – The bridge on Lower Taylor Hill was closed and the road was made a dead-end road, thus cutting off the most dangerous section of the road.

- The Town offices were formerly located at 3 River Road in Bondville. This location is in the SFHA. The flood of 1976 took the road out which is between the building and the Winhall River, and came up to the front door of the building. The building needs to either be moved from its current location out of the floodplain and into a more central location in the village, or have its foundation re-built to floodplain standards.

2015 UPDATE - The town offices were moved to 115 VT Route 30, which is out of the SFHA.

- In 2011, Winhall had four underground fuel storage tanks that were difficult to maintain and were posing a hazard to groundwater. Inspection and maintenance of the Town’s underground fuel storage tanks had recently become the responsibility of the Town, where it used to be the responsibility of the State. The highway crew needed to be trained and certified in this inspection and maintenance process.

2015 UPDATE – The four underground tanks were removed and are being replaced by above ground tanks – expected Fall 2014 completion.

- This is a forest government road that needed a large culvert replaced. It had been a “squash” culvert, and needed to be replaced with a box culvert with a gravel bed bottom. The bottom of the culvert was rotting out and would have caved in causing major flooding. There is government land on either side of the road. The culvert had about 1 year before it would have caved in.

2015 UPDATE – Two culverts were replaced on French Hollow Road in the Fall of 2014, including the “squashed” culvert.

HAZARD	MITIGATION ACTION	WHO (LEADERSHIP)	HOW (FUNDING SOURCE)	STATUS
Flood	Lower Taylor Hill Road re-engineering	Town & Highway Dept.	Grant funding	Bridge closed on Lower Taylor Hill and the road was made a dead-end road
Flood	3 River Road Town Hall move or foundation re-build	Town	Grant funding	The town offices were moved to 115 VT Route 30, which is out of the SFHA
Fire	Training for inspection and maintenance of underground fuel tanks	Highway crew	Town funding	Four underground tanks were removed and are being replaced by above ground tanks – expected Fall 2014 completion
Flood	French Hollow Road culvert replacement	Highway crew	Grant funding	Completed 2 culvert replacements Fall 2014

Ongoing Efforts

NIMS/ICS Training

The Town wants to ensure all town officials and volunteers (if possible) are trained in the Incident Command System.

Emergency education at Mountain School

A Town of Winhall police officer meets with the students at Mountain School (K-8) for a 3-hour block every year to provide training in wilderness safety, bike safety, first aid, snowboard safety, Internet safety, good touch/bad touch, and the affects of drug and alcohol, among other things.

Dead Tree Assessment

An inventory of dead and fallen trees near roadways is done yearly and as needed by the road crew. Large dead trees have a potential negative impact by falling on power lines in the next major high wind event as well as adding to the forest floor fuel loads. This is a town-wide issue and results in random safety issues on roadways.

Identification of Mitigation Actions

Winhall River Watershed Corridor Plan

This plan was completed in October 2014 and involved the towns of Winhall, Jamaica and Londonderry. In this plan, 19 improvement projects were identified in Winhall.

The participants in the Winhall Hazard Mitigation Plan effort identified the following hazard mitigation activities based on an evaluation of hazard event vulnerability not addressed by existing hazard mitigation initiatives and the feasibility of new activities. As a part of the ongoing plan process, these were updated in 2014 by the Town Administrator and the Road Foreman to reflect progress and new ideas.

Mitigation actions are listed in priority order, with the most critical needs listed at the top of the list. The following criteria were used in establishing project priorities. The ranking of these criteria is largely based on the best available information and best judgment as many projects are not fully scoped out at this time.

- Does the action reduce damage?
- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures or structures critical to town operations?
- Can the action be implemented quickly?
- Is the action socially acceptable?
- Is the action technically feasible?
- Is the action administratively possible?
- Is the action politically acceptable?
- Is the action legal?
- Does the action offer reasonable benefits compared to its cost of implementation?
- Is the action environmentally sound?

Cost-Benefit Analysis

At the time of applying for FEMA’s PDM-C, FMA or HMGP grant programs, each project listed below will undergo full benefit-cost analysis (BCA) methodology, version 4.5 or higher to maximize savings.

As part of public involvement, there was a rough cost/benefit analysis done for each action listed in the table. The below cost and benefits tables address the priorities for the mitigation strategies that are stated in the Mitigation Actions Table.

Cost Estimates

High	= >\$100,000
Medium	= \$25,000 – 100,000
Low	= < \$25,000

Benefit Estimates

High	Public Safety
Medium	Infrastructure/ Functionality
Low	Aesthetics/ General Maintenance

Implementation of the mitigation actions is summarized in the below table, as far as who, when and how they will be carried out. Further details about some actions can be found following the mitigation actions table, in text.

Mitigation Actions Table

HAZARD	ACTION	RESPONSIBLE PARTY	TIME-FRAME	FUNDING SOURCE	COST / BENEFIT	PRIORITY	STATUS
Flood / Fluvial Erosion	Cranberry Hill Road – replace undersized culvert with box structure	Selectboard and Highway Dept.	Summer 2017 start and end	Town Budget / grant funding	High/High	Medium High	Awaiting funding / budgeting – This project is outlined in Winhall River Corridor Plan (project # 25)
Landslide	Upper Taylor Hill Road (see details following this table)	Highway Department	Summer 2015 start and end	Grant funding possible		High	outlined in Better Back Roads project; Town looking for funding
Landslide	Kendall Farm Road culvert replacement (see details following this table)	Highway Department	Summer 2015 start and end	Grant funding possible		High	outlined in Better Back Roads project; Town looking for funding
All hazards	NIMS/ICS Training	Town officials and Volunteers	Summer 2015 start and end	DEMHS	Low / High	High	Highway crew and the fire department need to take training; most town officials have already done so.
All hazards	School Education	Police Department	Ongoing	Town	Low/High	High	This has been going on for several years and is successful.
Flood / Fluvial Erosion	Pull back River Road embankment to reduce encroachment on Winhall River and allow more room to disperse flood waters	Town of Winhall Selectboard and Highway Dept; WRC; VT ANR	Summer 2016 begin; finish within two years	Town Budget / grant funding	Low / High	High	This action was identified in the Winhall River Corridor Plan (Project # 12A). It has been studied, but work hasn't yet started. The Town is awaiting funding opportunities.
Flood / Fluvial Erosion	Along the southern bank of the Winhall River, near the fairgrounds, return the windrowed material to the channel and do buffer plantings.	Landowners; WRC; VT ANR; CRWC; Town of Winhall Selectboard and Highway Dept	Summer 2016 begin; finish within two years	Town Budget / grant funding	Low / High	Medium	This action was identified in the Winhall River Corridor Plan (Project # 12B). It has been studied, but work hasn't yet started. The Town is awaiting funding opportunities.
Flood / Fluvial Erosion	In the bend of Winhall River just south of Kendall Road near the intersection with Rt 30, return windrowed material to the channel and remove the berm that TS Irene created. Restore floodplain access to an undeveloped floodplain.	Landowners; WRC; VT ANR; CRWC; Town of Winhall Selectboard and Highway Dept	Summer 2016 begin; finish within two years	Town Budget / grant funding	Low / High	High	This action was identified in the Winhall River Corridor Plan (Project #15). It has been studied, but work hasn't yet started. The Town is awaiting funding opportunities.

HAZARD	ACTION	RESPONSIBLE PARTY	TIME-FRAME	FUNDING SOURCE	COST / BENEFIT	PRIORITY	STATUS
Flood / Fluvial Erosion	In the area just east of Lightfoot Camp Road, south of Kendall Farm Road and along the Winhall River, this section of the river is going through channel adjustments. This is an area that would be prime for preservation and is adjacent to existing easement.	Landowners, WRC, VT ANR, CRWC, Town of Winhall	As soon as possible begin, finish within one year	Landowner and Grant funding through State and Land Trust	Low / High	High	This action was identified in the Winhall River Corridor Plan (Project # 19). It has been studied, but work hasn't yet started. The Town is awaiting funding opportunities.
Flood / Fluvial Erosion	Replace undersized culvert on River Road. Major deposition above and scour below. Channel avulsion is present just upstream of the structure and may put it at risk of undermining during high flows.	Landowners, WRC, VT ANR, CRWC, Town of Winhall	Summer 2016 begin; finish within two years	Town Budget / grant funding	Low / High	High	This action was identified in the Winhall River Corridor Plan (Project # 21). It has been studied, but work hasn't yet started. The Town is awaiting funding opportunities.
Flood / Fluvial Erosion	Replace undersized culvert on Raspberry Hill Road; one of two pipes has a rusted out bottom	Landowners, WRC, VT ANR, CRWC, Town of Winhall	Summer 2016 begin; finish within two years	Town Budget / grant funding	Low / High	High	This action was identified in the Winhall River Corridor Plan (Project # 23). It has been studied, but work hasn't yet started. The Town is awaiting funding opportunities.
Flood / Fluvial Erosion	Replace undersized, perched and misaligned culvert on Winhall Hollow Road	Landowners, WRC, VT ANR, CRWC, Town of Winhall	Summer 2016 begin; finish within two years	Town Budget / grant funding	Low / High	High	This action was identified in the Winhall River Corridor Plan (Project # 28). It has been studied, but work hasn't yet started. The Town is awaiting funding opportunities.
Flood / Fluvial Erosion	Replace culvert just south of Taylor Hill Road on VT Route 30. Undersized, rusting out and likely AOP barrier.	Landowners, WRC, VT ANR, CRWC, Town of Winhall, Vtrans	Summer 2016 begin; finish within two years	Town Budget / grant funding	Low / High	High	This action was identified in the Winhall River Corridor Plan (Project # 29). It has been studied, but work hasn't yet started. The Town is awaiting funding opportunities.
Flood / Fluvial Erosion	Conservation easement on area along Red Brook, north and east of Winhall Hollow Road that would be a good easement. Stream is undergoing major planform adjustment and there is good forest buffers and floodplain access. Good for holding floodwaters.	Landowners, WRC, VT ANR, CRWC	As soon as possible begin, finish within one year	Landowner and Grant funding through State and Land Trust	Low / High	High	This action was identified in the Winhall River Corridor Plan (Project # 27). It has been studied, but work hasn't yet started. The Town is awaiting funding opportunities.

Upper Taylor Hill Road (outlined in Better Back Roads project)

The existing culvert is 15" wide. There is a lot of runoff that comes off of the clay embankment, from rain/snow melt, but also from a man-made pond. The bank is approximately 100 ft long, all on the southside of the road. This is a critical – moderate project. Recommended treatment is to first install 70-80ft of rock riprap bank stabilization treatment, larger riprap at the toe of the slop and a 12" layer of riprap above. Include filter fabric. Stone line ditch, at a2' minimum. Upsize culvert to 18", just large enough where the south end of the culvert is not too deep in the ground. Also, sawcut pavement, determine how deep culvert needs to be, fill and re-pave.



Upper Taylor Hill road bank erosion

Kendall Farm Road culvert replacement (# 6 and 7)

The two existing culverts are 15" wide. During a serve rain event and /or spring melt, both culverts get plugged and/or cannot handle the amount of water, therefore the water flows over Kendall Farm Road and into the West River. The bank continues to slump and be undermined from the bottom up. Upsize each culvert to 18 inches. Stabilize approximately 6-10ft of the bank from the bottom up with sizable riprap. Also stone-line the ditch, in-between the two culverts.



Kendall Farm Road bank slumping

Existing Planning and Regulatory Capabilities

Though Winhall has a low population, they have a full-time staff and high capabilities relative to other towns of their size. They have a planning and zoning department, a Zoning Administrator and a Town Administrator. They also have a three person highway department. The Winhall police department is all full-time and first responders. There are a number of part-time officers, but coverage is full-time. The force consists of five full-time officers, one chief who is full-time, and six part-time officers. The police chief is also the town Emergency Management Director. Winhall is the only town in Vermont that has all of their police also certified as first responders. The Winhall fire department is all volunteer. The three person highway department covers 56 miles of town highway. They are constantly treating roadways in winter months, so they are strained to do other things that come up. The town floodplain administrator could use training and better recognition. Floodplain development is an issue for Winhall because of the location of Bondville.

One of the strains on the town's emergency personnel is that on a weekend Winhall can have 20,000 people in town --- in which case the town's capabilities are limited for a population of that size. Winhall has a low full-time population, but a very high seasonal population. This ties up resources during emergencies, so they have to call in mutual aid at times.

Due to the high number of second homes, Winhall has a good tax base to pull from, compared to other towns in the region. This is a benefit to the town.

How this Plan will Improve Existing Capabilities

The following policies, programs and activities related to hazard mitigation are currently in place and/or being implemented in the Town of Winhall. The Town Administrator analyzed these programs for their effectiveness and noted improvements needed. Winhall uses all of the plans listed below to help plan for current and future activities with the town. For example: the Local Emergency Operation Plan has a contact list that is used for response purposes in the case of a hazard event, and is updated every year after Town Meeting. The Town Plan directs visions and goals that include Natural Resources and Land-Use decisions. In the development of this plan, the latest 2012 Town Plan was used. Town Road and Bridge Standards are followed by the town and they do an annual culvert and bridge inventory that is mapped by the WRC. The town is compliant with the NFIP.

As Winhall goes through the update process for the planning mechanisms outlined in the table below, they will look to the Hazard Mitigation Plan's Table of Actions and Risk and Vulnerability Assessments to help guide land use district decisions, and guide goals and policies for those districts. They have agreed to this. At the Town Meeting every March, policies and action items in the Town Plan are reviewed and integrated into hazard mitigation as needed. The Local Emergency Operations Plan contact list is updated after Town Meeting each year, including updates to vulnerable geographic locations, as well as locations of vulnerable populations. Updates to each of the planning mechanisms outlined in the table below are handled by the identified by the responsible party identified in the table. There is no timeframe for updating the below referenced plans and regulations to better incorporate hazard mitigation, however, as each document is updated the hazard mitigation plan will be reviewed for incorporation. The goals of this hazard mitigation plan will be incorporated in the upcoming town plan update to ensure that emergency preparedness and mitigation planning efforts are included in the Town Plan, with particular attention to including the projects in the Mitigation Actions Table. This will assist with ensuring that this plan is utilized and project follow-through occurs.

The next time the floodplain ordinance is updated, it will be encouraged that that update include a Fluvial Erosion Hazard bylaw. The LEOP is updated yearly and was updated last in 2014. Other mitigation/emergency planning related documents and their status are outlined in the below table:

Type of Existing Protection	Description	Effectiveness/Enforcement/Hazard that is addressed	Gaps in Existing Protection/Improvements Needed
Town Plan	Plan for coordinated town-wide planning for land use, municipal facilities, etc.	Town Plan was completed in 2012 and adopted by the Town; Emergency Preparedness addressed in plan.	Does not address flood resiliency and is very limited in terms of detail.
Town Local Emergency Operation Plan	Municipal procedures for emergency response	Incident Command; Hazard Annexes included	Local Emergency Operation Plan was completed in 2014 and is updated every year
School Crisis Planning	School resource officer is provided by Winhall Police Department on a part-time basis	School is private; resource officer runs programs with the school, he is not a patrol officer	town is unaware if school has a crisis plan
LEPC 7 Hazardous Materials Plan	Procedures for hazmat emergency response at regional level	LEPC 7 has the plan; Winhall Police Department has a rep that goes to LEPC 7 meetings	Continued involvement with the LEPC 7
Mutual Aid – Emergency Services	Agreement for regional coordinated emergency services	Keene (NH) Mutual Aid – written agreement/contract for Fire/Ambulance and HazMat; E911 is provided by the state dispatch center	None identified
Road Standards	Design and construction standards for roads and drainage systems	Town has adopted the 2013 Vtrans standards	None identified
Subdivision Regulations	Regulates the division of land, standards for site access and utilities	They do have this in place; adopted in 2009	None identified; Part of zoning
Sewage Regulations	Regulates on-site sewage systems	State Regulations apply	None Identified; No public sewer
Flood Hazard Area Regulations	Regulates development in FEMA flood hazard areas	Recently updated; Revised FIRM expected to be effective Dec 2015; VT ANR has deemed Winhall to have interim river corridor protection valid through June 2016.	None identified
Zoning regulations	Zoning Administrator; Zoning Board of Adjustment	Contain floodplain bylaw	Does not contain the floodplain bylaw
Maintenance Programs	Bridge & Culvert Inventory	Updated in 2014 by WRC	None Identified

PLAN MAINTENANCE PROCESS

Monitoring, Evaluating, and Updating the Plan – Yearly Review

Once the plan is approved and adopted, the Emergency Management Director in Winhall, along with interested and appointed volunteers and stakeholders, will continue to work with the Windham Regional Commission to monitor, evaluate, and update the plan throughout the next 5-year cycle. The plan will be reviewed annually at an April Selectboard meeting along with the review of the town's Local Emergency Operations Plan (LEOP). This meeting will allow town officials and the public to discuss the town's progress in implementing mitigation actions and determine if the town is interested in applying for grant funding for projects that can help mitigate future hazardous events; e.g., bridge and culvert replacements, road replacements and grading, as well as buying out any repetitive loss structures that may be in the Special Flood Hazard Area, and revise the plan as needed. Windham Regional Commission's emergency planner will assist the Winhall Emergency Management Director with this review, as requested by the Town. There will be no changes to the plan, unless deemed necessary by the Town. If so, the post disaster review procedure will be followed.

Plan Maintenance – 5 Year Update Process

The Hazard Mitigation Plan is dynamic. To ensure that the plan remains current and relevant, it is important that it undergo a major update periodically as required in 44 CFR § 201.6(c)(4)(i). This update process will be thorough and occur every five years. Participants outlined below will work with the Emergency Planner at the Windham Regional Commission (WRC) in accordance with the following procedure:

1. The Winhall Selectboard will appoint a team to convene a meeting of the hazard mitigation planning committee. The town's Emergency Management Director will chair the committee, and other members should include local officials such as Selectboard members, fire chief, zoning administrator, constable/police chief, road commissioner, Planning Commission members, health officer, interested stakeholders, etc. The Emergency Management Director will work with the Windham Regional Commission Emergency Planner and be the point person for the Town.
2. The WRC Emergency Planner will guide the Committee through the update process. This update process will include several advertised public meetings. At these meetings the Committee will use the existing plan and update as appropriately guided by the WRC Emergency Planner to address:
 - Update of hazard events and data gathered since the last plan update.
 - Changes in community and government processes, which are hazard-related and have occurred since the last review.
 - Changes in community growth and development trends and their effect on vulnerability.
 - Progress in implementation of plan initiatives and projects.
 - Incorporation of new mitigation 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, and their effect on capabilities of the town.
 - Evaluation of hazard-related public policies, initiatives and projects.
 - How mitigation strategy has been incorporated into other planning mechanisms
 - Review and discussion of the effectiveness of public and private sector coordination and cooperation.
3. From the information gathered at these meetings, and other interactions the Emergency Planner has with the Town, along with data collected independently during research for the update, the

WRC Emergency Planner will prepare the updated draft in conformance with the latest FEMA Region 1 *Local Hazard Mitigation Plan Review Crosswalk* document.

4. The Selectboard will review the draft report. Consensus will be reached on changes to the draft.
5. Changes will be incorporated into the Plan by the WRC Emergency Planner.
6. The Selectboard will notify the public that the draft is available for public comment and review. The Town will advertise and make available the draft plan for provide comments both electronically and in hard copy. The draft plan will simultaneously be distributed electronically to adjacent towns for review and comment.
7. Public and adjacent town comments will be incorporated by the WRC Emergency Planner.
8. WRC Emergency Planner will finalize the plan and submit electronically to DEMHS and FEMA.
9. The Plan will be reviewed by the DEMHS State Hazard Mitigation Officer (SHMO) and FEMA Region 1.
10. SHMO and FEMA comments will be addressed in the plan by the WRC Emergency Planner.
11. The plan will be resubmitted as needed until the plan is approved pending adoption. Once the plan is approved by FEMA, it will be ready for adoption.
12. The Selectboard will adopt the plan and distribute to interested parties.
13. The final adopted plan will be submitted by the WRC Emergency Planner to DEMHS and FEMA.
14. FEMA will issue final approval of the adopted plan and the five year clock will begin again.

Post-Disaster Review/Update Procedure

Should a declared disaster occur, a special review will occur amongst the Selectboard, the Emergency Management Coordinator, the WRC Emergency Planner, and those involved in the five year update process described above. This review will occur in accordance with the following procedures:

1. Within six months of a declared emergency event, the town will initiate a post disaster review and assessment. Members of the State Hazard Mitigation Committee will be notified that the assessment process has commenced.
2. This post disaster review and assessment will document the facts of the event and assess whether existing Hazard Mitigation projects effectively lowered community vulnerability/damages. New mitigation projects will be discussed, as needed.
3. A draft After Action Report of the review and assessment will be distributed to the hazard mitigation committee.
4. A meeting of the committee will be convened by the Selectboard to make a determination of whether the plan needs to be amended. If the committee determines that NO modification of the plan is needed, then the report is distributed to local communities.
5. If the committee determines that modification of the plan IS needed, then the committee drafts an amended plan based on the recommendations and forwards to the Selectboard for public input.

6. The Selectboard adopts the amended plan after receiving approval-pending-adoption notification from FEMA.

Continued Public Participation

Maintenance of this plan and implementation of the mitigation strategy will require the continued participation of local citizens, agencies, and other organizations. To keep the public aware of and involved in local hazard mitigation efforts, the town will take the following measures:

- Provide hazard mitigation information at Town Meeting
- Schedule and advertise a planning meeting each year, soon after Town Meeting
- Seeking participation from key players in addition to general public interest:
 - Select board
 - Planning Commission
 - Public Works
 - School
 - Fire & Rescue
 - Emergency Mgt/ 911 Coordinator
 - Town Administrator
- Post the hazard mitigation plan on the town website
- Selectboard will review past hazard mitigation committee members and consider whether new members should be added. Representatives of local businesses, nonprofits, academia, etc. should especially be considered.
- Notify the public of committee meetings through town bulletin board, website, newsletter, newspaper, Facebook, Front Porch Forum, etc.

APPENDIX

- A. Adoption Sheet
- B. Sign-in Sheet for December 2, 2010 Emergency Planning Committee Meeting
- C. Sign-in Sheet for June 14, 2011 Emergency Planning Committee Meeting
- D. June 14, 2011 Town website meeting announcement
- E. Flyer advertising comment period for draft Hazard Mitigation Plan (posted 3/16/15 through 3/30/15)
- F. Website advertisement for public comment on draft plan (posted _____)
- G. Email sent to adjacent towns, soliciting comment on draft plan
- H. Comments received back

A. PREREQUISITE

Adoption by the Local Governing Body

Certificate of Adoption
Town of Winhall, VT
Selectboard

**A Resolution Adopting the Local Hazard Mitigation Plan
for the Town of Winhall, VT**

WHEREAS, the Town of Winhall, VT has worked with the Windham Regional Commission to identify natural hazards, analyze past and potential future damages due to natural disasters, and identify strategies for mitigating future damages; and

WHEREAS, The Town of Winhall, VT Local Hazard Mitigation Plan analyzes natural hazards and assesses risks within the community; and

WHEREAS, the Town of Winhall, VT Local Hazard Mitigation Plan recommends the implementation of action(s) specific to the community to mitigate against damage from natural hazard events; and

WHEREAS, the Town of Winhall, VT authorizes responsible agencies to execute their responsibilities to implement this plan for the purposes of long term risk reduction and increased community resiliency and;

WHEREAS, the Town of Winhall, VT will follow the Plan Maintenance Process outlined in this plan to assure that the plan stays up to date and compliant; and

NOW, THEREFORE BE IT RESOLVED that the Town of Winhall, VT adopts the *Town of Winhall Local Hazard Mitigation Plan* as well as future revisions and maintenance required by 44 CFR 201.6 and FEMA for a period of five (5) years from the date of this resolution.

Duly adopted this _____ day of _____.
date month, year

Selectboard

Robert Oakes, Chair

William Schwartz

Stuart Coleman

ATTEST

Lissa Stark, Town Administrator

B. Sign-in sheet December 2, 2010 Emergency Planning Committee meeting

WINHALL – PRE-DISASTER HAZARD MITIGATION PLANNING MEETING
December 2, 2010
Location: Winhall Fire Department
SIGN IN SHEET

Name	Affiliations – Please list all	Town where you live	Phone	email
Dennis McCarthy	Town Administrator	Shattubury	802-297-2119	win@winhallvt.com
Harold Coleman	Fire Chief Winhall own farm sawmill sugaring operation	Jamaica	802-297-2783	
Randy Kimball	HWD	South Londonderry	802-824-3481	
Jeff Whitesell	Chief of Police Chief of Rescue Squad Emergency Management Director	North Bennington	802-688-5611	whp57jj@hotmail.com
Steve Avison	1st asst fire chief Cartaker in Town	Winhall	802-297-2727	
Dinah Reed	Wincham Regional Comm- Assistant Planner	Brattleboro	(802) 257-4547	dreed@sover.net

C. Sign-in sheet from June 14, 2011 Emergency Planning Committee meeting

WINHALL – PRE-DISASTER HAZARD MITIGATION PLAN
 June 14, 2011
 Location: Winhall Fire Station

SIGN IN SHEET

Name	Affiliations – Please list all	Town where you live	Phone
Barb Fenwood	Facilities Dept	Jamaica	802-444-0304
Dave Campbell	Costorliaw	Bondville	802-297-2230
Jeff Whitesell	Police & Rescue	North Bennington	802-688-5611
Bradford Kimball	Highway	Sabb non-dorand	802-824-3481
Dominic McCarthy	Town Administrator	SHATTISBURY	802-997-2119
Steve Blanchard	Homesite Landscaping	Bondville	802-947-1167

D. June 14, 2011 Town website meeting announcement

14Jun2011 Pre-Hazard Special Meeting - Winhall

Page 1 of 2



- [Home](#)
- [Winhall Town Government](#)
- [Annual Town Report for 2010](#)
- [Town Departments](#)
- [Boards and Committees](#)
- [Winhall Town Policies](#)
- [Public Town Notices](#)
- [Ordinances](#)
- [Town Meetings](#)
- [Warnings](#)
- [2010 Town Meeting Warning](#)
- [14Jun2011 Pre-Hazard Special Meeting](#)
- [Minutes Board Meetings](#)
- [Special Board Meetings](#)
- [Public & Private School Affairs](#)
- [Town Facilities Proposal 2007](#)
- [Helpful Links](#)
- [Town Employment and Opportunities](#)
- [Tourism](#)
- [Disclaimer](#)

Search

- Full Site
- This Section
- [Search Tips](#)



Winhall
 A Vibrant Vermont Community

Town of Winhall

**Pre-Disaster Hazard
 Mitigation Meeting
 June 14, 2011
 10:00 am to 12:00 pm**

Agenda

**The Meeting Will Be Held At
 107 Vermont Route 30
 Winhall, Vermont 05340**

10:00 am to 11:30 pm
 Meeting with Dinah Reed, Assistant Planner with the Windham Regional Commission.

The participants will discuss the "appendix", and when used with the appropriate sections of the basic plan, is an All-Hazard Mitigation Plan for the Town of Winhall. The purpose of this plan is to assist the town of Winhall in identifying all of the hazards facing the town and to identify strategies to begin reducing risks from identified hazards. This is a continuation of the meeting held on December 9, 2010.

11:30 am to 12:00 pm

E. Flyer advertising comment period for draft Hazard Mitigation Plan (posted 3/16/15 through 3/30/15)

Winhall Hazard Mitigation Plan

The draft Winhall Hazard Mitigation Plan is now available for public review at the Winhall Town Office and on the town website: www.winhall.org



The Plan will be available for comment until the end of the public comment period on March 30, 2015.

Anyone who would like to comment on the plan should contact Alyssa Sabetto at the Windham Regional Commission. She can be reached via phone at 802-257-4547 x109 or email at asabetto@windhamregional.org. We encourage your review and participation!

- F. Website advertisement for public comment on draft plan (posted _____)
- G. Email sent to adjacent towns, soliciting comment on draft plan
- H. Comments received back

DRAFT