TOWN OF HINESBURG, Vermont 2017 All-Hazards Mitigation Plan

Annex 7 to the 2017 Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan

Prepared by:

The Chittenden County Regional Planning Commission and the Town of Hinesburg, Vermont

Adopted by the Town of Hinesburg Selectboard on August 17, 2017

Approved by FEMA on September 21, 2017



U.S. Department of Homeland Security FEMA Region I 99 High Street, Sixth Floor Boston, MA 02110-2132



JUL 11 2017

Lauren Oates State Hazard Mitigation Officer Vermont Department of Public Safety 45 State Drive Waterbury, Vermont 05671-1300

Dear Ms. Oates:

We would like to congratulate the participating jurisdictions and the State of Vermont for their dedication and commitment to mitigation planning. The Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA) Region I Mitigation Planning Team has completed its review of the 2017 Chittenden County, Vermont Multi-Jurisdictional All-Hazards Mitigation Plan and determined it meets the requirements of 44 C.F.R. Pt. 201. This plan approval includes the following participating jurisdictions that provided a copy of their resolution adopting the plan. The newly approved jurisdictions are highlighted in **bold**.

Colchester	Huntington	Jericho	Milton
Richmond	Underhill	Westford	Williston

With this plan approval, the communities above are eligible to apply to the Vermont Division of Emergency Management & Homeland Security for mitigation grants administered by FEMA. Requests for mitigation funding will be evaluated individually according to the specific eligibility requirements identified for each of these programs. A specific mitigation activity or project identified in your community's plan may not meet the eligibility requirements for FEMA funding; even eligible mitigation activities or projects are not automatically approved.

Approved mitigation plans are eligible for points under the National Flood Insurance Program's Community Rating System (CRS). Complete information regarding the CRS can be found at <u>http://www.fema.gov/national-flood-insurance-program-community-rating-system</u>, or through your local floodplain administrator.

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The 2017 Chittenden County, Vermont Multi-Jurisdictional All-Hazards Mitigation Plan must be reviewed, revised as appropriate, and resubmitted to FEMA for approval within **five years of the plan approval date of March 6, 2017** in order to maintain eligibility for mitigation grant funding. We encourage Chittenden County Regional Planning Commission communities to continually update the plan's assessment of vulnerability, adhere to its maintenance schedule, and implement, when possible, the mitigation actions proposed in the plan.

Once again, thank you for your continued dedication to public service demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please do not hesitate to contact Melissa Surette at (617) 956-7559.

Sincerely,

Paul F. Ford Acting Regional Administrator

PFF: ms

cc: Ben Rose, Recovery and Mitigation Section Chief, VT DEMHS Stephanie Smith, Hazard Mitigation Planner, VT DEMHS

Enclosure

Town of Huntington, VT



CERTIFICATE OF ADOPTION June 5, 2017

TOWN OF HUNTINGTON VERMONT SELECTBOARD

A RESOLUTION ADOPTING THE 2017 Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan and Annex #8, the 2017 Town of Huntington All-Hazards Mitigation Plan (Plan).

WHEREAS, the Town of Huntington has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of the hazards profiled in the 2017 Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan and Annex #8, the 2017 Town of Huntington All-Hazards Mitigation Plan which result in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Huntington has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the 2017 Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan and Annex #8, the Town of Huntington All-Hazards Mitigation Plan (Plan) under the requirements of 44 CFR 201.6; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies, and Plan maintenance procedures for the Town of Huntington; and

WHEREAS, the Plan recommends several hazard mitigation actions (projects) that will provide mitigation for specific natural hazards that impact the Town of Huntington with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make the Town of Huntington eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Town of Huntington Selectboard:

1. The 2017 Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan and Annex #8, the 2017 Town of Huntington All-Hazards Mitigation Plan (Plan) is hereby adopted as an official plan of the Town of Huntington;

2. The respective officials identified in the mitigation action plan of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;

3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as part of this resolution for a period of five (5) years from the date of this resolution; and

4. An annual report on the process of the implementation elements of the Plan will be presented to the Selectboard by the Emergency Management Director or Coordinator.

IN WITNESS WHEREOF, the undersigned have affixed their signature on June 5, 2017.

Dori Barton, Chair

Andrew Hendrickson

arphiday of January, A.D., 2017 by

Dan Rissacher

Received for record this

Racht, Town Cler

Executive Summary

Hazard Mitigation is a sustained effort to permanently reduce or eliminate long-term risks to people and property from the effects of reasonably predictable hazards. The purposes of this updated Local All-Hazards Mitigation Plan are to:

- Identify specific natural, technological and societal hazards that impact the Town of Hinesburg;
- Prioritize hazards for mitigation planning;
- Recommend town-level goals and strategies to reduce losses from those hazards; and
- Establish a coordinated process to implement the plan, taking advantage of a wide range of resources.

This plan is a local annex to the *Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan.* In order to become eligible to receive various forms of Federal hazard mitigation grants, a Chittenden County municipality must formally adopt its Local All-Hazards Mitigation Plan along with the *Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan*, or develop and adopt an independent, stand-along Local All-Hazards Mitigation Plan.

<u>Section 1: Introduction and Purpose</u> explains the purpose, benefits, implications and goals of this plan. This section also describes municipal demographics and development characteristics, and describes the planning process used to develop this plan.

<u>Section 2: Hazard Identification</u> expands on the hazard identification in the *Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan* with specific municipal-level details on selected hazards.

<u>Section 3: Risk Assessment</u> discusses identified hazard areas in the municipality and reviews previous federally-declared disasters as a means to identify what risks are likely in the future. This section presents a hazard risk assessment for the municipality, identifying the most significant and most likely hazards which merit mitigation activity. The top three Hazards by type with the most risk in Hinesburg are:

<u>Natural Hazards:</u>	Severe Winter Storm, Flooding, Fluvial Erosion
Technological Hazards	Power Loss, Telecommunications Failure, Water Service Loss
Societal Hazards	Epidemic, Economic Crisis, Crime

<u>Section 4: Vulnerability Assessment</u> discusses buildings, critical facilities and infrastructure in designated hazard areas, vulnerable populations, and the issue of estimating potential losses.

<u>Section 5: Mitigation Strategies</u> is the heart of this All Hazards Mitigation Plan. This section begins with an overview of goals and policies in the 2013 Hinesburg Town Plan that support hazard mitigation. This is followed by an analysis of existing municipal actions that support hazard mitigation, such as planning and zoning, and public works. This section presents the following municipal all-hazards mitigation goals:

- 1) Reduce at a minimum, and prevent to the maximum extent possible, the loss of life and injury resulting from all hazards.
- 2) Mitigate financial losses and environmental degradation incurred by municipal, educational, residential, commercial, industrial and agricultural establishments due to various hazards.
- 3) Maintain and increase awareness amongst the town's residents and businesses of the damages caused by previous and potential future hazard events as identified specifically in this Local All-Hazards Mitigation Plan and as identified generally in the Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan.
- 4) Recognize the linkages between the relative frequency and severity of disaster events and the design, development, use and maintenance of infrastructure such as roads, utilities and stormwater management and the planning and development of various land uses.
- 5) Maintain existing municipal plans, programs, regulations, bylaws and ordinances that directly or indirectly support hazard mitigation.
- 6) Consider formal incorporation of this Local All-Hazards Mitigation Plan into the municipal comprehensive plan as described in 24 VSA, Section 4403(5), as well as incorporation of proposed new mitigation actions into the municipality's/town's bylaws, regulations and ordinances, including, but not limited to, zoning bylaws and subdivision regulations and building codes.
- 7) Consider formal incorporation of this Local All-Hazards Mitigation Plan, particularly the recommended mitigation actions, into the municipal/town operating and capital plans and infrastructure, utilities, highways and emergency services.

This section includes the following Mitigation Actions planned by the Town:

<u>Category A: Improve capabilities of existing road and stormwater management</u> <u>infrastructure</u>

- Action A-1: Address repetitive road flooding
- Action A-2: Implement stormwater management projects

<u>Category B: Implement Road Stormwater Management Plan consistent with Vermont</u> <u>Municipal Roads General Permit (MRGP)</u>

- Action C-1: Obtain MRGP and develop Road Stormwater Management Plan
- Action C-2: Implement Road Stormwater Management Plan and file annual reports

Finally, this section includes an Implementation Matrix to aid the municipality in implementing the Mitigation Actions and annual monitoring and evaluation of this Plan.

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SECTION 1: INTRODUCTION AND PURPOSE

1.1 Purpose and Scope of this Plan

The purpose of this Local All-Hazards Mitigation Plan is to assist this municipality in identifying all hazards facing their community and in identifying strategies to reduce the impacts of those hazards. The plan also seeks to coordinate the mitigation efforts of this municipality with those outlined in the *Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan* as well as efforts of quasi-governmental organizations such as Local Emergency Planning Committee, District #1 and the Chittenden County Regional Planning Commission.

This annex, when used with the appropriate sections of the Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan, constitutes an All-Hazards Mitigation Plan for the Town of Hinesburg. Community planning can aid significantly reducing the impact of expected, but unpredictable natural and human-caused events. The goal of this plan is provide hazard mitigation strategies to aid in creating disaster resistant communities throughout Chittenden County.

1.2 Hazard Mitigation

The 2013 Vermont State All-Hazards Mitigation Plan defines hazard mitigation as

any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. The Federal Emergency Management Agency (FEMA) and state agencies recognize that it is less expensive to prevent disaster or mitigate its effects than to repeatedly repair damage after a disaster has struck. This plan recognizes that communities have opportunities to identify mitigation strategies and measures during all of the other phases of Emergency Management—Preparedness, Response, Mitigation and Recovery. Hazards cannot be eliminated, but it is possible to determine what the hazards are, where they are most severe and to identify actions that can be taken to reduce the severity of the hazard.

Hazard mitigation strategies and measures can reduce or eliminate the frequency of a specific hazard, lessen the impact of a hazard, modify standards and structures to adapt to a hazard, or limit development in identified hazardous areas.

1.3 Hazard Mitigation Planning Required by the Disaster Mitigation Act of 2000

Hazard mitigation planning is the process that analyzes a community's risk from natural hazards, coordinates available resources, and implements actions to reduce risks. According to 44 CFR Part 201, Hazard Mitigation Planning, this planning process establishes criteria for State and local hazard mitigation planning authorized by Section 322 of the Stafford Act as amended by

Section 104 of the *Disaster Mitigation Act of 2000*. Effective November 1, 2003, local governments now have to have an approved local mitigation plan prior to the approval of a local mitigation project funded through federal Pre-Disaster Mitigation funds. Furthermore, the State of Vermont is required to adopt a State Pre-Disaster Mitigation Plan in order for Pre-Disaster Mitigation funds or grants to be released for either a state or local mitigation project after November 1, 2004.

There are several implications if the plan is not adopted.

- Flood Mitigation Assistance Grant Program (FMAGP) funds will be available only to communities that have adopted a local Plan
- A community without a plan is not eligible for HMGP project grants but may apply for planning grants under the 7% of HMGP available for planning.
- For the Pre-Disaster Mitigation (PDM) program, a community may apply for PDM funding but must have an approved plan in order to receive a PDM project grant.
- Under Vermont's Emergency Relief Assistance Fund rules, contributions from the State to cover the non-Federal share of a municipality's FEMA Public Assistance project costs varies depending on whether a community has a plan. A community without a plan would have to cover 17.5% of the overall project cost, but a community with a plan would have to cover only 7.5% to 12.5% of the cost if it had a plan in place.

1.4 Benefits

Adoption and maintenance of this Plan will:

- Make certain funding sources available to complete the identified mitigation initiatives that would not otherwise be available if the plan was not in place.
- Ease the receipt of post-disaster state and federal funding because the list of mitigation initiatives is already identified.
- Support effective pre- and post-disaster decision making efforts.
- Lessen each local government's vulnerability to disasters by focusing limited financial resources to specifically identified initiatives whose importance has been ranked.
- Connect hazard mitigation planning to community planning where possible, such as in emergency operations plans, comprehensive plans (aka "town plans"), capital improvement plans and budgets, open space plans, and stormwater master plans.

1.5 All-Hazards Mitigation Plan Goals

The Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan establishes the following general goals for the county as a whole and its municipalities:

- 1) Recognize the mixed urban-suburban-rural nature of Chittenden County and its position as the state's most populous and most economically powerful county and incorporate these facts in hazard mitigation planning.
- 2) Promote awareness among municipalities, residents and business in the county of the linkages between the relative frequency and severity of disaster events and the design, development, use and maintenance of infrastructure such as roads, utilities and stormwater management and the planning and development of various land uses.
- 3) Ensure that regionally-initiated mitigation measures are consistent with municipal plans and the capacity of municipalities to implement them.
- 4) Encourage municipalities to formally incorporate their individual Local All-Hazards Mitigation Plan into their municipal plan as described in 24 VSA, Section 4403(5), as well as incorporate their proposed mitigation actions into their various bylaws, regulations and ordinances, including, but not limited to, zoning bylaws and subdivision regulations and building codes.
- 5) Encourage municipalities to formally incorporate elements of their Local All-Hazards Mitigation Plan, particularly their recommended mitigation strategies, into their municipal operating and capital plans and programs, especially, but not limited to, as they relate to public facilities and infrastructure, utilities, highways and emergency services.
- 6) Educate regional entities on the damage to public infrastructure resulting from all hazards and work to incorporate hazard mitigation planning into regional land use planning, such as the Chittenden County Regional Plan, and regional transportation planning conducted by the Chittenden County Metropolitan Planning Organization.
- 7) Maintain existing mechanisms or develop additional processes to foster regional cooperation in hazard mitigation, specifically and emergency planning, generally.

1.6 Town of Hinesburg: Demographics and Development Characteristics

The Town of Hinesburg (*cf. Figure-1.1*) is located in the southeastern portion of Chittenden County. It is bordered on the west by Charlotte, on the north by Shelburne, St. George, Williston and Hinesburg, on the east by Huntington and on the south by Monkton. Chartered in 1762, Hinesburg's history is rooted in farming and early water-powered manufacturing. About 6 miles square, the western half of the town lies in the Champlain Valley, while the eastern half is foothills up to 1700 feet in elevation.

Based on U.S. Census data, the University of Vermont's Center for Rural Studies reports a municipal population of 4,396 people in 2010. Selected population characteristics are as follows:

Category	Number	%
Total Population	4,396	
Median Age	41.3 years	

Table 1-1 Town of Hinesburg, selected population characteristics, 2010 Census

Population age 65 years and over	391	8.9
Population (and %) under 10 years old	542	12
Population (and %) in group quarters	2	0

U.S. Census Bureau, 2010 Census of Population and Housing, Population and Housing Unit Counts

Types of housing within Hinesburg, also based on the 2010 U.S. Census data, are below:

Table 1-2 Town of Hinesburg, selected housing unit data, 2010 Census

Category	Number	%
Total Housing Units	1,847	
Occupied housing units	1,737	94
Vacant housing units	110	6
Vacant housing units used for seasonal, recreational or occasional use	70	3.8
Detached 1-unit housing units	1,186	69.9
Housing units with 5 or more units in structure	48	2.9
Category	Number	%
Mobile homes	241	14.2
Housing structures built in 1939 or earlier	284	16.7

U.S. Census Bureau, 2010 Census of Population and Housing, Population and Housing Unit Counts

The concentration of residential and commercial/industrial development in Hinesburg is shown in (*cf. Figure 1.2*). State Highway 116 runs from north to south through the village, where most development is concentrated. Also in the village area are an array of stores and services, a local elementary/middle school, a local 4-town union high school, 4 churches, a library, senior housing, and a number of manufacturing concerns. Lake Iroquois in the hills offers a public beach and boat access, and several parks and recreation facilities offer year-round activities. With regards to land uses, town zoning is depicted in *Map 1-2*.

Population trends for the town are as follows;

Year	Population
1960	1,180
1970	1,175
1980	2,690
1990	3,780
2000	4,340
2010	4,396
2014	4,497

Table 1-3 Town of Hinesburg, Historic Population Trends

April 1 census counts for 1960, 1970, 1980, 1990, 2000 and 2010; July 1 estimates for 2014

1.7 Summary of Planning Process

As noted above, the update of this municipal All Hazard Mitigation Plan (AHMP) was part of the planned 2017 update of the Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan and the municipal AHMPs that are annexes to the Multi-Jurisdictional Plan. The CCRPC, with funding provided by the State of Vermont via a FEMA Hazard Mitigation Grant, began this update process in the spring of 2015.

1.7.1 Development of the 2017 update to the Hinesburg All Hazards Mitigation Plan

On September 28, 2015, CCRPC staff met with Town Administrator Trevor Lashua to describe the AHMP update process and the associated Mitigation 20/20 forms. The meeting focused on the following issues:

- 1. Reviewing the matrix used in 2011 to identify and prioritize hazards facing Hinesburg, and determining whether the overall scoring still makes sense
- 2. Discussing any newly significant hazards in Hinesburg, and identifying any new actions that could be taken to address them.
- 3. Discussing any progress that has been made on the strategies and tasks from the 2011 plan.

In addition, the following materials were reviewed:

- 1. The 2013 Hinesburg Town Plan
- 2. River corridor plan for the LaPlatte River
- 3. The 2013 Vermont All-Hazards Mitigation Plan
- 4. Information on previous disasters

- 5. Information from Vermont Agency of Natural Resources on fluvial erosion hazards and flood hazards
- 6. Information from the Vermont Agency of Transportation

1.7.2 Opportunities for involvement in the planning process and formal public review and governing body approval

Emergency management planners are obligated to provide opportunities for the general public, neighboring communities, local, regional and state agencies, development regulation agencies and other interests to be involved in the review and development of Hazard Mitigation Plans. Additionally, the CCRPC, as a public agency is obligated to provide public notice and opportunities for input into its programming and processes. With regard to public involvement in the develop of the first drafts of this Municipal AHMP prior to release of public drafts, there was no formal solicitation process to recruit or invite the public to come to staff level meetings wherein the first process of updating data in the old 2011 Plan. That being said, however, the public has been free to review the 2011 Plans on the CCRPC website since they were first posted in 2011. Additionally as noted in Section 1.10.2.4 of the Multi-Jurisdictional AHMP, in the period before the first municipal draft AHMPs were publicly released in August 2016 (see below) there were twelve public meetings held by the CCRPC Board and the Plan Update Committee wherein the overall Hazard Mitigation planning process was discussed including the content and purpose of the local, Municipal AHMPs as well as the planned timeline for their development starting in 2015 and extending well into 2016. [Note that opportunities for public review and development of the Multi-Jurisdictional AHMP are described in Section 1.10.2 of the *that document.*]

Commencing with an August 5, 2016 press release and with a comment deadline of August 19, 2016, the CCRPC issued a press release and also posted to all of the electronic bulletin boards of Front Porch Forum in every municipality in the County to solicit and receive comments on the first drafts of this Town of Hinesburg All-Hazards Mitigation Plan as well as the AHMPs of the other 18 municipalities in the County. On <u>August</u> 5, 2016, emails to the same state agency staff and executive directors of neighboring Regional Planning Commissions as noted above, were also sent to encourage their review and comment. The public, agency staff and RPC staff were directed to provide comments to Dan Albrecht, Senior Planner at the CCRPC.

With regard to opportunities for public involvement and input from neighboring communities in development of individual Local All-Hazards Mitigation Plans including this Plan for the **Town** of Hinesburg, opportunities were as follows:

- a) On August 5, 2016, the CCRPC posted all the first drafts of the 18 local AHMPs on the CCRPC website and via various means (press release, electronic newsletter, etc) made the public aware of the opportunity to comment. The public was advised to send comments directly to Dan Albrecht, CCRPC Senior Planner by August 19, 2016.
- b) On August 5, 2016, the CCRPC staff sent direct emails to the Agency staff noted above notifying them as well of the opportunity to review the 18 local AHMPs posted on the

<u>CCRPC</u> website and encouraging them to send any comments directly to Dan Albrecht, <u>CCRPC Senior Planner by August 19, 2016.</u>

c) On August 5, 2016 direct emails were also sent to the municipal Mayors/ Managers/ Administrators and/or Clerks of the abutting 12 communities outside of Chittenden County (South Hero, Georgia, Fairfax, Cambridge, Stowe, Waterbury, Duxbury, Fayston, Lincoln, Starksboro, Monkton and Ferrisburgh) that abut the County notifying them of the opportunity to review the 18 local AHMPs posted on the CCRPC website and encouraging them to send any comments directly to Dan Albrecht, CCRPC Senior Planner by August 19, 2016.

No comments were received on the draft Town of Hinesburg AHMP prior to the August 19th deadline. Additionally, no inquiries were received concerning this AHMP after August 19th through December 31, 2016 while the Plan was posted on the CCRPC website.

1.7.3 Review and adoption process

On June 3, 2016, the first draft of the Plan was sent to the Vermont Department of Emergency Management and Homeland Security (VDEMHS) for review. Comment and required revisions were received from VDEMHS on August 8, 2016. CCRPC staff, working in concert with municipal staff, then made revisions to the Plan to address the required revisions and formal submissions to VDEMHS and FEMA then progressed as follows:

On June 20, 2017, the revised final draft annex was submitted to VDEMHS for review and forwarding to FEMA for formal review and approval pending municipal adoption

On July 13, 2017 FEMA Region One issued a notice that the Town of Hinesburg AHMP was approved pending adoption by the relevant municipal governing body.

On July 14 2017, CCRPC staff provided the final versions of the Multi-Jurisdictional Plan and this Municipal Annex to the Town manager for distribution to the Town of Hinesburg Selectboard members and also provided draft language for a resolution of adoption to be discussed at a regularly scheduled and properly warned Town of Hinesburg Selectboard meeting

On August 17, 2017 the revised annex was adopted by the Selectboard and a copy of the resolution sent to VDEMHS and FEMA Region One on August 29, 2017.

On September 21, 2017 FEMA issued a letter that the Town of Hinesburg's Plan was approved.

1.7.4. Monitoring, Evaluation and Updating of the Plan

Section 6 of the Multi-Jurisdictional AHMP document provides extensive details on the role each municipality and the Chittenden County RPC will play to be certain that progress on the implementation of this local AHMP is monitored and evaluated and that the AHMP is updated as needed and no later than its anticipated expiration in early 2022. <u>In short, the Town of Hinesburg will:</u>

• in the fall of 2017 and each fall thereafter, the municipal departments as noted in Section

5.5 as the conclusion of this document shall respond to CCRPC's questionnaire seeking information on the status (progress, problems if any, etc.) of each identified mitigation strategy detailed in Section 5;

- in the fall of 2018 and the fall of 2020, provide information to aid CCRPC in its more comprehensive review of the Multi-Jurisdictional AHMP and this local AHMP which will address issues such as goals, risks, resources, implementation problems, and partners; in partnership with the municipalities, the CCRPC will make the public aware of the availability of these review documents (via press releases, posting on the CCRPC website, electronic newsletters, one formal announcement in a paper of general circulation in the County, and other mechanisms) and provide detailed instructions on how to provide comment on these reviews;
- provide at least one representative of Hinesburg to participate as a member of the Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan Update and Review Committee which, after the current Plan update process is completed, to resume meeting in 2018; and
- participate in the Plan update process (assumed to commence in 2020 and conclude by early 2022).

<u>Finally, it should be reemphasized that the Town of Hinesburg may review and update its own</u> programs, initiatives and projects more often by working directly with the State Hazard <u>Mitigation Officer (SHMO) based on changing local needs and priorities.</u> Formal changes to individual municipal annexes may be made at any time by each municipality's governing body in order to reflect changing conditions, priorities, and opportunities during the 5-year life cycle of their single jurisdiction plan.

SECTION 2: HAZARD IDENTIFICATION

Detailed descriptions of the natural, technological, and societal hazards affecting the municipalities of Chittenden County are contained in the Multi-Jurisdictional All-Hazards Mitigation Plan. Designated and non-designated hazard areas are described in Section 3 of this annex. Vulnerability of structures and infrastructure to hazards is also described in Section 4 and depicted in *Figure 4.1*.

2.1. Profiled Hazards

This Plan profiles six Natural Hazards: Severe Winter Storm, Flooding, Fluvial Erosion, Severe Rainstorm, Extreme Temperatures and Wildfire. Prior to this discussion of Hazards and the subsequent analysis of Risk and Vulnerability, it will be first helpful to summarize the general state of knowledge regarding Location, Extent and Impact in the Town of Hinesburg:

Hazard (section of MJAHMP) where discussed	Are Location data available?	Are Extent data available?	Are Impact data available?
Severe Winter Storm (2.1.1.1)	No, occurs across the municipality and not mapped	No, only long-term data is at single point of National Weather Service station in South Burlington	Yes, if FEMA declares disaster. See 3.3 below.
Flooding (2.1.1.3)	Yes, 100 & 500 year flood areas delineated in the municipality <i>See Figure 2.1</i>	*Yes but only at a few discrete locations with gauge data such as U.S. Army Corps of Engineers for Lake Champlain.	Yes, if FEMA declares disaster but co-mingled with fluvial erosion and severe rainstorm hazards events. See 3.3 below.
Fluvial Erosion (2.1.1.4)	Yes, fluvial erosion hazards areas (now termed river corridor protection areas) are mapped in the municipality <i>See</i> <i>Figure 2.1</i> .	Though fluvial erosion is considered a significant hazard in the municipality, the number of feet- acres of soil lost in any one event has not been recorded nor is there a record with such data.	Yes, if FEMA declares disaster but data co-mingled with flood and severe rainstorm events. See 3.3 below.

Severe Rainstorm	No, occurs across the	*Yes, but only long-	Yes, if FEMA
(2.1.1.2)	municipality and not	term data is at single	declares disaster but
	mapped. Damage	point of National	data co-mingled with
	locations are mapped	Weather Service	flood and fluvial
	but damages can just	station in South	erosion events. See
	as easily be a function	Burlington.	3.3 below.
	of poorly designed		
	road and/or driveway		
	drainage as it is a		
	function of heavy rain		
	exceeding		
	infrastructure		
	capacity.		
Extreme	No, occurs across the	*Yes, but only at	†Data not
Temperatures	municipality and not	single point of	systematically
(2.1.1.5)	mapped.	National Weather	collected on impacts.
		Service station in	
		South Burlington	
Wildfire	No, occurs across the	Some compiled data	‡Data not
(2.1.1.6)	municipality and not	on a countywide	systematically
	mapped.	basis as shown in the	collected on impacts.
		Multi-Jurisdictional	
		Plan but no	
		systematic data	
		collected after 2010.	

* It is useful to note that while this NWS data is reliable it represents one discrete location in a county that has an area of 620 square miles in area. Likewise, while there are likely other systematic point-specific records being collected by individuals, business or organizations these data do not appear to be easily accessible. Finally, even if such data were accessible, only if the data was collected by mutually compatible means would it be useful. †An intensive search of municipal public works records may reveal documentation of some prior repair or labor costs associated with frozen or burst sewer and/or water pipes caused by Extreme Cold. However, such analysis would show where past events happened not the location of inadequately buried pipes which might be vulnerable to future events.

‡ An intensive search of fire department records may reveal documentation of locations and acres burned caused by Wildfire. However, such analysis would show where past events happened but would not show the location of areas susceptible to future events (warnings by the US Forest Service and local fire departments are not location-specific) nor the location of individuals who are likely to unwisely burn trash or leaves or fail to extinguish a campfire during dry conditions.

This Plan profiles several Technological Hazards. Prior to this discussion of Hazards and the subsequent analysis of Risk and Vulnerability, it will be first helpful to summarize the general state of knowledge regarding Location, Extent and Impact in the Town of Hinesburg for these hazards:

Hazard (section of MJAHMP where discussed)	Are Location data available?	Are Extent data available?	Are Impact data available?
Water Pollution (2.2.1)	Impaired streams that lack adequate biota are identified.	Phosphorus-loading for general locations is known but non- point sources are varied and dispersed.	Annual budgetary impacts to individual municipalities are significant but vary depending upon location and whether they are a designated MS4 community. Hinesburg is not an MS-4. However, the municipality is subject to the requirements of the pending Municipal Roads General Permit.
Hazardous Materials Incident (2.2.2)	Storage locations are known known (see listing below of addresses). Incidents occurring during transportation could occur anywhere.	Rough estimates of spill amounts are recorded.	No formal data readily available on cleanup costs.

Power Loss	Outage locations	During an actual	Outage data are broad
(2.2.3)	not mapped	outage, some data are	and refer to total
()	not mapped	recorded on duration.	customers within a
		although typically	county.
		this is stated as	
		"x 000 customers	
		within the power	
		company's service	
		area"	
Invasive Species	Several species	No formal damage	No formal damage
(2.2.4)	known to occur	has been documented	has been documented
(2.2.1)	throughout unland	to date	to date
	and agricultural		
	areas but no		
	systematic manning		
	has been done		
Multi-Structure Fire	Could happen	Data not formally	Data not formally
(2, 2, 5)	anywhere within	collated across	collated across
(2.2.3)	the more developed	agencies	agencies
	nortions of the	ageneies	ageneies
	municipality		
Major Transportation	Depending upon	No formal database	Varies depending
Incident	type of incident	of damages	upon type of incident
(2.2.6)	could happen	or dumages.	upon type of meldent.
	anywhere		
Water Supply Loss	Water distribution	Data not formally	Data not formally
	systems are	collated across	collated across
	mapped (cf. Figure	agencies	agencies
	1.4): other residents	ageneres	ageneres
	and businesses use		
	private wells.		
Sewer Service Loss	Sewer lines are	Data not formally	Data not formally
(2.2.8)	mapped (cf. Figure	collated across	collated across
	1.4): other	agencies	agencies
	residences and	"Beneres	"Beneres
	businesses use		
	private septic		
	systems		

Natural Gas Service Loss (2.2.9)	There is VT Gas service in the village (<i>cf. Figure</i> 1.4) but specific locations of loss not recorded.	Information for this rare occurrence not publicly available.	No formal damage has been documented to date.
Telecommunications Failure (2.2.10)	Depending upon type of incident, could happen anywhere	Information for this rare occurrence not publicly available.	No formal damage has been documented to date
Other Fuel Service Loss (2.2.11)	Distribution points of fuels such as firewood, fuel oil and propane are individual addresses and not mapped nor publicly available.	No formal loss of service has been documented.	No formal damage has been documented to date

<u>The following discussion of societal hazards</u> is based upon qualitative information from discussions with Chittenden County law enforcement professionals as well as quantitative data from the State of Vermont.

Hazard	Are Location data	Are Extent data	Are Impact data
(section of MJAHMP	available:	available:	available:
Crime	Significant	Data collection is not	Significant socio-
(2.4.1.1)	incidents could happen anywhere	standardized across municipalities.	economic impacts
	in the municipality.		
Economic Recession	Would occur across	Historic data on	Longer lasting
(2.4.1.2)	the community.	unemployment levels	impacts hard to
		& poverty rates	measure below
			county level
Terrorism	The FBI does not	Unknown but	Unknown but
(2.4.1.3)	share a list of	assumed to be	assumed to be
	potential targets.	significant if incident	significant if incident
		occurs	occurs

Civil Disturbance	County-wide.	No formal damage	No formal damage
(2.4.1.4)	Significant	has been documented	has been documented
	incidents can	to date	to date
	happen anywhere.		
	The likelihood of		
	an event may not		
	be geographically		
	likely but rather		
	related to the type		
	of event (political		
	event, sporting		
	event, protest, etc.)		
Epidemic	Could happen	Data not formally	Other than 1917
(2.4.1.5)	anywhere	collated across	Influenza epidemic
		agencies	no formal damage
			has been documented
			to date
Key Employer Loss	Depending upon	No formal database	No formal database
(2.4.1.6)	type of employer	of damages.	of key employer loss
			is maintained

SECTION 3: RISK ASSESSMENT

3.1 Mapped Hazard Areas

3.1.1 Flood Hazard Areas

A simple GIS intersection analysis reveals that portions of town roads are also located within the 100-year floodplain as well as culverts and bridges and utility poles. Unfortunately, this level of analysis does not take into account the fluvial geomorphology (volume, velocity, direction, etc.) nor most critically does not factor in the elevation of the road relative to flood elevation. Analysis also reveals farmland located within the floodplain, however, without detailed studies at each location, it is not currently possible to predict how many cubic yards of productive soils would be a net loss during a flood event. The Town participates in the regular NFIP as of January 2017, and limits/regulates development accordingly in these hazard areas.

Figure 2.1 shows the current extent of the FEMA-FIRM flood hazard area in Hinesburg, as well as structures, infrastructure, and critical facilities located in the flood hazard area.

3.1.2 Fluvial Erosion Hazard and River Corridor Areas

During development and adoption of both the 2005 and 2011 Multi-Jurisdictional Plan and the municipal AHMPs, threats from stream erosion were identified as Fluvial Erosion Hazard (FEH) Areas through the analytical lens of Stream Geomorphic Assessment (SGA). The SGA approach is still used by the Vermont Agency of Natural Resources but the Vermont General Assembly adopted two related terms that are now used in managing fluvial erosion hazards. The ANR now identifies and maps:

- *River Corridor* which is the land area adjacent to a river that is required to accommodate the dimensions, slope, planform, and buffer of the naturally stable channel and that is necessary for the natural maintenance or natural restoration of a dynamic equilibrium condition, as that term is defined in 10 V.S.A. §1422, and for minimization of fluvial erosion hazards, as delineated by the Agency in accordance with the ANR Flood Hazard Area and River Corridor Protection Procedures.
- *River Corridor Protection Area* means the area within a delineated river corridor subject to fluvial erosion that may occur as a river establishes and maintains the dimensions, pattern, and profile associated with its dynamic equilibrium condition and that would represent a hazard to life, property, and infrastructure placed within the area. The river corridor protection area is the meander belt portion of the river corridor without an additional allowance for a riparian buffer to serve the functions of bank stability and slowing flood water velocities in the near-bank region.

Some level of geomorphic assessment has been completed for most of the streams that run through Hinesburg. Fluvial Erosion Hazard areas have been identified for some of these waterways. Notably, sections along the banks of the LaPlatte River (and tributaries) and Lewis Creek have been identified as fluvial erosion hazard areas. *Figure 2.1* shows the progress of

geomorphic assessments and identified Fluvial Erosion Hazard areas in Hinesburg.

3.1.3 Repetitive Loss Properties

Repetitive loss properties are public or private buildings insured under the National Flood Insurance Program that have made at least two insurance claims of more than \$1,000 each during a ten-year period.

According to the National Flood Insurance Program there are no such properties located in the Town of Hinesburg.

Initial Flood Hazard Boundary Map	Initial Flood Insurance Rate Map	Current effective Map Date	Date of joining Regular NFIP	Date of most recent Community Assistance Visit
01/31/75	09/27/85	08/04/14	09/27/85	02/25/92

The status of the town participation's in the National Flood Insurance Program is as follows:

The Town Zoning Administrator and the Town's Development Review Board (DRB) monitor compliance with the National Flood Insurance Program. The DRB reviews and adjudicates applications for development within the floodplain including any proposed new construction in the SFHA which is highly regulated. The Town also works with DEC to respond to any local requests for Floodplain identification including questions about mapping.

3.2 Other Information

The following hazards are not formally analyzed nor mapped due to the random nature of where such damage occurs; however, they occur with some frequency, and are thus discussed here.

3.2.1 1998 Ice Storm Damage

The area hardest hit during this event was the southeast quadrant of the Town.

3.2.2 Severe Rainstorms

In prior versions of this Annex and the County Plan, damage to roads, culverts and bridges from thunderstorm events was discussed as either the result of flooding or fluvial erosion. It was assumed that overflowing nearby streams, rivers or lakes were the cause of the damage. Analysis has shown that this damage is caused by intense, localized thunderstorms which cause excessive and rapid water flows on and over paved and gravel roads, roadside ditches, driveway culverts, stormwater systems, etc. In many cases, damaged infrastructure is located nowhere near a formally mapped Floodplain or Fluvial Erosion Hazard Area or River Corridor. This was the case in more recent FEMA-declared disasters in the summer of 2013 and 2015. Because of this new information, CCRPC has decided to add "Severe Rainstorm" to the 2017 Update to the County Plan and its annexed local AHMPs. While past damage locations can sometimes be

mapped (depending upon the degree and accuracy of data collection efforts) this may or may not provide any degree of predictability of the potential locations for future events.

High Winds and Lightning

Ridgeline and hilltop homes, utility lines, and homes located in the midst of mature forests are the most vulnerable to damage from falling trees and tree limbs. Eight high wind events have been specifically identified as affecting Hinesburg by the National Climatic Data Center. According to the National Climatic Data Center, lightning has not struck and damaged structures in Hinesburg, although local officials indicate that many more lightning incidents have occurred than are recorded in the database.

3.2.3 High Accident Locations

The following High Accident Locations have been identified by the Vermont Agency of Transportation in Hinesburg.

Table 3-1 Town of Hinesburg, high accident road sections, based on 2010 - 2014 data

			Severity Index
Road	Road Type	Section (miles)	(\$/crash)
VT-116, FAS 0210	Minor Arterial (r)/Major Collector (r)		\$23,997
		5.410 - 5.510	

Source: VTrans

3.2.4 Road Infrastructure Failure

Of the 8 bridges inventoried by VTrans for Hinesburg, two are rated functionally deficient, and none are considered structurally deficient. These ratings do not mean that the bridges are in imminent danger of collapse, however. None of the bridges in Hinesburg are rated Scour Critical with regards to fluvial undermining of bridge structure. For a listing of culverts identified as "geomorphically-incompatible" either due to inadequate size or improper alignment, see Section 4.2.2.

Scour/erosion challenges are noted for the Hollow Brook bridge. Flooding does occur on Hollow Road quite variably.

3.2.5 Hazardous Substances

Hazardous material release is discussed as a possible hazard in the Multi-Jurisdictional All-Hazards Mitigation Plan. Sites that contain large amounts of fuel or store what VEM calls Extremely Hazardous Substances are more likely to cause significant problems in a hazardous materials incident. According to Vermont Emergency Management, there are several reported hazardous material storage sites in Hinesburg.

Table 3-2 Town of Hinesburg, Hazardous Materials and Petroleum Products storage and/or use locations

Chittenden Solid Waste District	Beecher Hill Road
Green Mountain Organic Creamery	10516 Vermont Route 116
Hart & Mead, Inc.	10919 Vermont Route 116
Hinesburg Community School	10888 Vermont Route 116
Hinesburg General Store	14312 Vermont Route 116
Iroquois Manufacturing Company	695 Richmond Road
Jiffy Mart Hinesburg	198 Ballard Corner Road
NRG Systems, Inc.	110 Riggs Road
RCC-Hinesburg, USID 102904	249 Leavensworth Road
SB Collins, Inc. (Hinesburg Short Stop)	21 Commerce Street
Verizon Wireless (#8670264)	249 Leavensworth Road
Vermont Smoke & Cure	10516 Vermont Route 116

3.3 Previous FEMA-Declared Natural Disasters and Snow Emergencies

Since 1990, Hinesburg has received public assistance funding from FEMA for the following natural disasters:

3.3.1 Public Assistance

Table 3-3 Town of Hinesburg	FEMA-declared disasters and	l snow emergencies,	1990-2016.
-----------------------------	-----------------------------	---------------------	------------

Date (FEMA ID#)	Type of Event	Total repair estimates
June 1990 (DR 875)	flooding	\$17,275
January 1996 (DR 1101)	flooding	\$13,058
January 1998 (DR 1201)	ice storm	\$34,952
July 1998 (DR1228)	flooding	\$10,152
April 2001 (EM3167)	snow emergency	\$11,703
December 2010 (DR 1951)	severe storm	\$5,627
August 2013 (DR 4140)	flood	\$71,871
February 2015 (DR	Ice storm	\$70,424.43 Federal share

Sources: Vermont Department of Housing & Community Affairs; Vermont Agency of Transportation. Dollar value figures represent the total estimated repair costs for damages suffered to municipal resources. This table does not include damage claims submitted to FEMA by non-municipal organizations or by private individuals or businesses.

The Town of Hinesburg was reimbursed at a rate of 75 percent by FEMA for the estimated repair costs coupled with additional dollars from the State's Emergency Relief Assistance Fund (ERAF), typically averaging 12.5%. Funds provided in response to these natural disasters were used as follows:

• June 1990 flooding: Gravel & bituminous roadway repair at 10 sites; floodwaters caused ditch, culvert, gravel road and asphalt road washouts. Town Highways affected include #2, #16, Sherman Hollow Road, Pond Brook, Hinesburg Road, Texas Hill Road, Bridge #14 on Texas Hill Road, #37, Hayden Hill Road, Bridge #26 on town highway #18.

New 6 ft. culvert installed (replacing 5ft. culvert) on Hayden Hill road as mitigation project.

- January 1996 flooding: Town-wide, funds were used for emergency protective measures requiring personnel and equipment to erect barricades and signs to direct traffic safely around the washed out areas or onto alternate routes. On Hayden Hill Road, the roadway surface and base material were washed out by floodwaters. Repairs consisted of 1,000 l.f. of ditch cleaning and shaping, and replacement of lost fill and associated surface aggregate. On Lincoln Hill Road, flood damaged road surface, culvert and ditches. Repairs consisted of 2,000 l.f. of ditch cleaning and shaping, replacement of lost road base and aggregate surface material, installation of new culvert, and relaying of an existing culvert.
- January 1998 ice storm: Repairs consisted of debris clearance, emergency protective measures to provide emergency power, and pumping out water from houses.
- July 1998 flooding: On Lavigne Road, flood damaged road surface, culvert and ditches. Repairs consisted of replacement of lost aggregate surface material, installation of a new culvert, re-grading the road surface, and repair of ditches. On Town Highway 14, flood damaged the road surface, culvert and ditches. Repairs consisted of replacement of lost aggregate surface material, relaying the existing culvert, re-grading the surface and repairing ditches. On Piette Road and Magee Hill Road, the roadway surface was washed out by floodwaters. For repair, replaced the lost fill and surface aggregate, and, where applicable, graded, and shaped the roadway and shoulders and cleaned and shaped ditches.
- April 2001

Protective Measures: Snow Removal Costs

• December 2010

A - Debris Removal	Town of Hinesburg - Hinesburg Town Office
B - Protective Measures	Town of Hinesburg - Hinesburg Town Office

• <u>August 2013:</u> locations of FEMA Public Assistance projects were as follows:

C - Roads & Bridges	Lavigne Hill Road (TH-21) - Lavigne Hill Road (TH-21), Hinesburg, VT. 05401. Hayden Hill Road East (TH-19) - Hayden Hill Road East (TH-19), Hinesburg,
C - Roads & Bridges	VT. 05401.
C - Roads & Bridges	Magee Hill Rd (TH-10) - Magee Hill Rd (TH-10), Hinesburg, VT. 05461.
C - Roads & Bridges	Texas Hill Rd (TH-17) - Texas Hill Rd (TH-17), Hinesburg, VT. 05461. Hayden Hill Road West (TH-19) - Hayden Hill Road West (TH-19), Hinesburg,
C - Roads & Bridges	VT. 05401.

See *Figure* 3.1. to see locations where repairs funded in part with FEMA Public Assistance took place for disasters between 2001 and 2015. Note that some Debris Removal and Protective Measures locations are shown at the location of the municipal office. This indicates assistance

was at various locations throughout the municipality, not that damages were incurred at the office.

3.3.2 Individual Assistance funds

As noted in Section 3.3 of the County Plan, due to privacy concerns, the individual homes or businesses which received Individual Assistance funds are not public information. However, the names of the streets of such homes or businesses from which claims are filed is available as are the funds provided. With regard to the Town of Hinesburg, data indicate that 10 individual assistance claims were approved after the June 2011 disaster and Tropical Storm Irene in September 2011. These streets are shown in *Figure 3.1.1*.

Table 3-4 Town of Hinesburg, location of individual assistance claims, Spring 2011 flood & Tropical Storm Irene, September 2011

Disaster Number	Damaged Address Street	Registrations	IHP Amount
June 2011	MAJOR STREET	1	\$0
June 2011	PLACE RD E	1	\$ 1550.97
June 2011	TYLER BRIDGE RD	1	\$ 531.78
Tropical Storm Irene	N/A	-	-

3.4 Future Events

Although estimating the risk of future events is far from an exact science, CCRPC staff used best available data and best professional judgment to conduct an updated Hazards Risk Estimate analysis, which was subsequently reviewed and revised by town officials in early 2016. This analysis assigns numerical values to a hazard's affected area, expected consequences, and probability. This quantification allows direct comparison of very different kinds of hazards and their effect on the county, and serves as a rough method of identifying which hazards hold the greatest risk. CCRPC staff applied the following scoring system:

<u>Area Impacted</u>, scored from 0-4, rates how much of the municipality's developed area would be impacted.

<u>Consequences</u> consists of the sum of estimated damages or severity for four items, each of which are scored on a scale of 0-3:

- Health and Safety Consequences
- Property Damage,
- Environmental Damage,
- Economic Disruption.

Probability of Occurrence (scored 1-5) estimates an anticipated frequency of occurrence.

To arrive at the overall risk value, the sum of the Area and Consequence ratings was multiplied by the Probability rating. The highest possible score is 80.

As explained in detail in Section 3.4 of the Multi-Jurisdictional Plan, for the 2011 Plan, the following hazards were considered to occur or have the potential to occur with sufficient frequency and/or severity for them to be profiled in the Risk Estimation of that Plan.

Natural Hazards:

- Drought
- Flooding
- Fluvial erosion
- High winds
- Landslide
- Lightning
- Multi-structure urban fire
- Radiological (natural)
- Wildfire
- Winter storm

Technological Hazards:

- Gas service loss
- Hazardous materials incident
- Major transportation incident
- Military ordnance incident
- Power loss
- Radiological incident
- Sewer service loss
- Telecommunications failure
- Water service loss

Societal Hazards:

- Crime
- Civil disturbance
- Economic recession
- Epidemic
- Key employer loss
- Terrorism

Then, for the 2017 update, the CCRPC and its All-Hazards Mitigation Plan Update Committee made slight changes to this list by consolidating some hazards or delineating hazards with greater specificity.

Natural Hazards:

- Flooding
- Fluvial erosion
- Severe rainstorm
- Wildfire
- Severe winter storm
- Extreme temperatures

- **Technological Hazards:**
 - Hazardous materials incident
 - Major transportation incident
 - Multi-structure fire
 - Natural gas service loss
 - Water pollution
 - Power loss
 - Sewer service loss
 - Telecommunications failure
 - Water service loss
 - Other fuel service loss
 - Invasive Species

However, the specific hazard rankings did not change for Hinesburg between 2011 and 2017.

3.4.1 Natural Hazards

According to the updated Hazard and Risk Estimation analysis for Hinesburg, the following natural hazards received the highest risk ratings out of a possible high score of 80 (see Table below):

- Winter Storm (50)
- Severe Rainstorm (40)
- Flooding (24)

Societal Hazards:

- Crime
- Civil disturbance
- Economic recession
- Epidemic
- Key employer loss
- Terrorism

While flooding is likely to have a significant impact over a smaller area, severe winter storms tend to affect the entire town and are more common, hence the higher rating. Although much of Hinesburg is rural, the village area has dense enough development to raise the risk of a multi-structure fire. Hinesburg has several fluvial erosion hazard areas along stream banks, and some areas where property and infrastructure are threatened by fluvial erosion.

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			/ ·				
Area Im							
кеу:	0 = No developed area impacted						0
	1 = Less than 25% of developed area impacted			1	1	1	
	2 = Less than 50% of developed area impacted						
	3 = Less than 75% of developed area impacted	4					
	4 = Over 75% of developed area impacted	4	4				
Conseq	uences						
Health 8	3 Safety Consequences						
Kev:	$0 = N_0$ health and safety impact			0	0	0	0
	1 = Few injuries or illnesses		1				
	2 = Few fatalities or illnesses	2					
	3 = Numerous Fatalities						
_							
Property	/ Damage						
кеу:	0 = No property damage						
	1 = Few properties destroyed or damaged	1	1	2	1	1	1
	2 = Few destroyed but many damaged			2			
	2 = Few damaged and many destroyed						
	3 = Many properties destroyed and damaged						
Environr	mental Damage						
Key:	0 = Little or no environmental damage					0	
	1 = Resources damaged with short-term recovery	1	1	1	1		1
	2 = Resources damaged with long-term recovery						
	3 = Resources destroyed beyond recovery						
Economi	ic Disruption						
Key:	0 = No economic impact						
	1 = Low direct and/or indirect costs		1			1	1
	2 = High direct and low indirect costs	2		2	2		
	2 = Low direct and high indirect costs						
	3 = High direct and high indirect costs						
Sum of .	Area & Consequences Scores	10	8	6	5	3	3
Brobah:	lity of Occurrance						
Kov	1 - Unknown but rare occurrence						
Key.	2 - Unknown but anticipate an occurrence						2
	2 = 100 years or less occurrence						2
	4 = 25 years or less occurrence			Δ	Δ	4	
	5 = Once a year or more occurrence	5	5	-	-	-	
TOTAL		_	-				
IUIALI		50	40	24	20	12	C
		50	40	24	20	12	b
	sum of Area & Consequences Scores						
	x Probability of Occurrence	1	L	I			L

Table 3-5 Natural hazards risk estimation matrix, Hinesburg

2017 Town of Hinesburg All-Hazards Mitigation Plan Approved by FEMA, 9-21-2017 24

3.4.2 Technological Hazards

According to the updated Hazard Risk Estimation analysis for Hinesburg, the following technological hazards received the highest risk ratings out of a possible high score of 80 (see Table below):

- Power Loss (40)
- Telecommunications Failure (24)
- Water Service Loss (24)

Hinesburg is vulnerable to Power Loss and Telecommunications Failure because the population is dispersed, and repairing utility infrastructure in rural areas can take more time. While much of the town does not have water service, water service loss in the village could cause both severe disruptions in everyday life and create difficulties in firefighting, hence the higher rating. The Town has also struggled in recent years to provide adequate capacity to serve demands upon its municipal water system.

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Area In	pacted												
Key:	0 = No developed area impacted												
	1 = Less than 25% of developed area impacted				1	1	1			1	1	1	
	2 = Less than 50% of developed area impacted							2	2				
	3 = Less than 75% of developed area impacted		3										
	4 = Over 75% of developed area impacted	4		4									
Conseq	uences												
Health a	& Safety Consequences												
Key:	0 = No health and safety impact							0		0	0	0	1 I
	1 = Few injuries or illnesses	1	1	1	1		1		1				1
	2 = Few fatalities or illnesses					2							1
	3 = Numerous Fatalities					-							1
	-												1
Propert	y Damage			0							0		
Key:	U = No property damage			0							0	0	
	1 = Few properties destroyed or damaged	1	1		1	1	1	1	1	1			
	2 = Few destroyed but many damaged												
	3 = Few damaged and many destroyed												
	4 = Many properties destroyed and damaged												1
Environ	mental Damage												1
Key:	0 = Little or no environmental damage	0	0	0	0		0		0	0			
	1 = Resources damaged with short-term recovery					1		1			1	1	
	2 = Resources damaged with long-term recovery												
	3 = Resources destroyed beyond recovery												
Econom	ic Disruption												
Kev:	$0 = N_0 e conomic impact$										0		
	1 = I ow direct and/or indirect costs		1	1		1	1	1			Ĭ	1	1
	2 = High direct and low indirect costs	2	-	-	2	-	-	-	2	2			1
	2 = Low direct and high indirect costs	-			-				-	-			1
	3= High direct and high indirect costs												
Curry of			6	6	6			-	6			2	
Sum Of	Area & consequences scores	•	0	0	3		*	5	0	4		3	1
Probabi	lity of Occurrence												
Key:	1 = Unknown but rare occurrence									1		1	
	2 = Unknown but anticipate an occurrence		-			-			2		2		
	3 = 100 years or less occurrence					3		3					
	4 = 25 years or less occurrence	-	4	4	4		4				-		
	5 = Once a year or more occurrence	5											
TOTAL	RISK RATING												
	Total Risk Rating =	40	24	24	20	18	16	15	12	4	4	3	
	Sum of Area & Consequences Scores												
	x Probability of Occurrence												

Table 3-6 Technological hazards risk estimation matrix, Hinesburg

3.4.3 Societal Hazards

According to the updated Hazard Risk Estimation analysis for Hinesburg, the following societal hazards received the highest risk ratings out of a possible high score of 80 (see Table below):

- Epidemic (21)
- Economic Crisis (21)
- Crime (16)

Economic recession is highly ranked for both its direct impacts and its secondary effects on health, safety, and the environment. The likelihood of an epidemic is difficult to gauge, but its consequences could be severe. Hinesburg has some vulnerability to property crime due to the variety of businesses located in the town.

		fonomic.	Ebiden.	n je	tev timologe	Gullos	errorise	ş /
Area Im	pacted	1	Í	Í	Í	Í	1	Í
Key:	0 = No developed area impacted							1
	1 = Less than 25% of developed area impacted			1	1	1	1	
	2 = Less than 50% of developed area impacted		2					
	3 = Less than 75% of developed area impacted	3						1
	4 = Over 75% of developed area impacted							
Conseq	uences							1
Health a	& Safety Consequences							
Kev:	0 = No health and safety impact				0	0		1
- /	1 = Few injuries or illnesses	1		1			1	1
	2 = Few fatalities or illnesses		2					1
	3 = Numerous Fatalities		_					
Propert	v Damage							
Kev	0 = No property damage	0	0		0			1
Key.	1 = Few properties destroyed or damaged	0	0	1	0	1	1	
	2 = Few destroyed but many damaged			-		-	-	1
	3 = Few damaged and many destroyed							1
	4 = Many properties destroyed and damaged							1
	- Many properties destroyed and damaged							
Environ	mental Damage							
Key:	0 = Little or no environmental damage		0	0	0	0	0	
	1 = Resources damaged with short-term recovery	1						
	2 = Resources damaged with long-term recovery							
	3 = Resources destroyed beyond recovery							4
Econom	ic Disruption							1
Key:	0 = No economic impact]
	1 = Low direct and/or indirect costs			1		1		1
	2 = High direct and low indirect costs							
	2 = Low direct and high indirect costs	2			2		2	
	3 = High direct and high indirect costs		3]
Sum of	Area & Consequences Scores	7	7	4	3	3	5	
Probabi	lity of Occurrence							
Key:	1 = Unknown but rare occurrence						1	1
	2 = Unknown but anticipate an occurrence					2		1
	3 = 100 years or less occurrence	3	3					1
	4 = 25 years or less occurrence			4	4			1
	5 = Once a year or more occurrence							
TOTAL	RISK RATING							
TOTAL	RISK RATING Total Risk Rating =	21	21	16	12	6	5	
TOTAL	RISK RATING Total Risk Rating =	21	21	16	12	6	5	

Table 3-7 Societal hazards risk estimation matrix, Hinesburg

3.4.4 Hazard Summary

According to the risk estimation analysis, the highest rated hazards by type for Hinesburg are:

Natural Hazards

- Winter Storm (50)
- Severe Rainstorm (40)
- Flooding (24)

Technological Hazards Power Loss (40) Water Service Loss (24) Telecommunications Failure (24)

Societal Hazards

- Epidemic (21)
- Economic Crisis (21)
- Crime (16)

It should be noted that the two natural hazards on the list—flooding and severe winter storm—could be the cause of the highest-rated technological hazards, power loss, telecommunications failure, and water service loss. Hinesburg's risk for societal hazards is less than for natural and technological hazards. Winter storms are the highest rated hazard for Hinesburg, due in large part to their widespread nature and frequent occurrence.

SECTION 4: VULNERABILITY ASSESSMENT

As discussed in Section 4 of the County Plan, <u>typical vulnerabilities</u> from the County's common hazards consist primarily of:

Damage to public infrastructure especially roads and culverts;

Temporary closures of roads and bridges including from debris;

Temporary loss of power and/or telecommunications;

Temporary isolation of vulnerable individuals such as the elderly or those in poverty.

More specifically, these vulnerabilities typically occur in association with the Profiled Natural Hazards as follows:

Hazard	Typical vulnerabilities	Occasional additional
		vulnerability
Severe Winter Storm	-temporary closures of roads and	-budget impacts from
	bridges including from debris;	debris cleanup
	-temporary loss of power and/or	
	telecommunications, and	
	-temporary isolation of vulnerable	
	individuals	
Flooding	-temporary closures of roads and	-budget impacts from
	bridges including from debris;	road/bridge closures
	-temporary loss of power and/or	and repairs to public
	telecommunications, and	infrastructure
	-temporary isolation of vulnerable	-damages to
	individuals	individuals' properties
	-damage to public infrastructure	and businesses
Fluvial Erosion	-temporary closures of roads and	-budget impacts from
	bridges including from debris;	road/bridge closures
	-temporary loss of power and/or	and repairs to public
	telecommunications, and	infrastructure
	-temporary isolation of vulnerable	-damages to
	individuals	individuals' properties
	-damage to public infrastructure	and businesses
Severe Rainstorm	-temporary closures of roads and	-budget impacts from
	bridges including from debris;	road/bridge closures
	-temporary loss of power and/or	and repairs to public
	telecommunications, and	infrastructure
	-temporary isolation of vulnerable	-damages to
	individuals	individuals' properties
	-damage to public infrastructure	and businesses
Extreme Temperatures	-damage to public infrastructure	-budget impacts due to
_	-loss of water service	needed repairs
Wildfire	-damage to private property	_

Table 4-1 Town of Hinesburg: Natural Hazards and typical vulnerabilities

Relative to the County as a whole the Town of Hinesburg has a higher vulnerability to:

• Severe Rainstorms and Fluvial Erosion due to high amount of gravel roads and mountainous terrain.

Vulnerabilities with regard to Technological Hazards are harder to project as these incidents occur with less frequency and less predictability.

Hazard	Typical vulnerabilities	Occasional additional
Major Transportation Incident	-temporary closures of transportation infrastructure -injuries, deaths	vulnerability -if major event, potential long term closure of infrastructure.
Power Loss	 -temporary loss of electrical service -temporary impacts to vulnerable individuals -damage to public infrastructure 	-if extended event, damage to perishable goods or business income. -if extensive loss, potential budget impacts to service providers.
Hazardous Materials Incident	-temporary closures of roads and bridges during cleanup.	-if large event, potential high cleanup costs. -injuries to persons
Water Service Loss	 -temporary loss of service -temporary impacts to vulnerable individuals -only affects municipal water service area) 	-if extensive loss, potential budget impacts to service providers.
Gas Service Loss	 -temporary loss of service -temporary impacts to vulnerable individuals -only affects limited area in Village serviced by Vermont Gas. 	-if extensive loss, potential budget impacts to service providers.
Telecommunications Failure	-temporary loss of service -temporary impacts to vulnerable individuals	-if extensive loss, potential budget impacts to service providers.
Other Fuel Service Loss	-temporary loss of service -temporary impacts to vulnerable individuals	-if extensive loss, potential budget impacts to service providers.

Table 4-2 Town of Hinesburg: Technological Hazards and typical vulnerabilities

Sewer Service Loss	 -temporary loss of service -temporary impacts to vulnerable individuals -only affects municipal service area 	-if extensive loss, potential budget impacts to service providers.
Water Pollution	-ongoing budgetary impacts due to permit requirements.	-if repeat events, impacts to tourism- based businesses
Invasive Species	-small but ongoing cost to monitoring level of occurrence	-unknown at this point.

<u>Relative to the County as a whole the Town of Hinesburg has a slightly higher vulnerability</u> to:

• Power Loss and Telecommunications Failure due to its mountainous terrain

With regard to Societal Hazards, vulnerabilities are typically more dispersed among individuals and societal sectors compared to the natural environment and to technology which is fixed.

Hazard	Typical vulnerabilities	Occasional additional
		vulnerability
Crime	-increased demands on police services and social services	-injuries -deaths
Epidemic	-temporary closures of schools, businesses, places of assembly -increased demand on medical services	-if an epidemic is widespread and long- lasting, impact could be severe
Key Employer Loss	-loss of economic activity -loss of portion of tax base -increased demands on social services	-effects increased if employer is of significant size
Economic Recession	-loss of economic activity -increased demands on social services -some loss of tax revenue	-effects increased if event is of extended duration
Civil Disturbance	-injuries to persons -damage to public and private property	-budget impacts to police services depending upon severity of event -deaths

Table 4-3 Town of Hinesburg: Societal Hazards and typical vulnerabilities

Terrorism	-injuries to persons -damage to public and private property	-budget impacts to police services depending upon severity of event
		-deaths

<u>Relative to the County as a whole there are insufficient data to conclude whether the Town</u> is more vulnerable to one of the six Societal Hazards noted above.

With regard to the vulnerability of <u>critical facilities</u>, infrastructure and vulnerable populations, quantitative and locational data for the Town are available as follows.

4.1 Critical Facilities

The Center for Disaster Management and Humanitarian Assistance defines critical facilities as: "Those structures critical to the operation of a community and the key installations of the economic sector." *Figure 1.4* shows the geographic distribution of some critical facilities and utilities. Table 4-1 identifies critical facilities in Hinesburg, excluding those designated as hazardous materials and petroleum storage sites, which are shown in Section 3.2.5. This list includes all critical facilities, not only the facilities located in designated hazard areas.

Facility Type	Number of Facilities
Veterinary Hospital / Clinic	1
Education Facility	2
Fire Station	1
Emergency Shelters	2
Emergency Operations Center	1
Energy	1
Government and Military	2
Police Station	1
Mail and Shipping	1
Public Attractions and Landmark Buildings	1
Water Supply and Treatment	5

Table 4-4 Critical facilities in the Town of Hinesburg

Source: VCGI

4.2 Infrastructure

4.2.1 Town Highways

The following is a statistical overview of roads in the Town of Hinesburg. These tables show the range of road types within the town, from state highway to unimproved unpaved roads. The different road types have different hazard vulnerabilities. Unpaved roads are more vulnerable to being washed out in a flood or heavy storm, while traffic incidents are more likely to occur on large, arterial roads.

Municipal highways, bridges and dams are well mapped in Chittenden County. The following three tables show the diversity of municipal highways and road surface in the Town of Westford.

The Vermont Agency of Transportation divides municipal (town) highways into various classes as follows:

<u>Class 1 town highways</u> are subject to concurrent responsibility and jurisdiction between the municipality and VTrans. Class 1 town highways are state highways in which a municipality has assumed responsibility for most of the day to day maintenance (pot hole patching, crack filling, etc.). The state is still responsible for scheduled surface maintenance or resurfacing. In Chittenden County Class 1 highways are generally paved.

<u>Class 2 town highways</u> are primarily the responsibility of the municipality. The state is responsible for center line pavement markings if the municipality notifies VTrans of the need. The municipality designates highways as Class 2 with approval from VTrans. These are generally speaking the busier roads in a given town second to Class 1. In Chittenden County, most Class 2 highways are generally paved although in the more isolated areas these are gravel roads.

<u>Class 3 town highways</u> are the responsibility of and designated by the municipality. These are to be maintained to an acceptable standard and open to travel during all seasons. In Chittenden County, Class 3 roads are both paved or gravel.

<u>Class 4 town highways</u> are all other highways and the responsibility of the municipality. However, pursuant to Vermont State Statutes, municipalities are not responsible for maintenance of Class 4 town highways. These are generally closed during the winter and minimally maintained, and almost exclusively dirt or gravel.

Table 4-5 T	own highwav	mileage l	by class.	Town of	^F Hinesburg

							Total 1, 2, 3,
Class 1	Class 2	Class 3	Class 4	State Hwy	Fed Hwy	Interstate	State Hwy
	21.370	32.27	4.940	7.238			60.818

Source: derived from VTrans TransRDS GIS data – surface class and arc length, Hinesburg Town officials.

Table 4-6 Town highway mileage by surface type, Town of Hinesburg

Paved	Gravel	Soil or Graded	Unimproved	Impassable	Unknown	Total
29.538	29.11	5.74	0.75	1.12	0	66.258
Total K	Known	Total Unpaved	% Paved	% Un	paved	
	66.258	36.72	44.6	%	55.4%	

Source: derived from VTrans TransRDS GIS data – surface class and AOTmiles

See Figure 3.2 for locations of paved vs. gravel and/or soil roads.

4.2.2 Bridges, Culverts, and Dams

There are a variety of bridges, culverts and dams located in the municipality. As noted in Section 4 of the County Plan, a large portion of the County's stream have had detailed Phase II Stream Geomorphic Assessments conducted. With regard to Hinesburg, studies identify specific stream reaches where fluvial erosion is a concern as well as where infrastructure, primarily culverts, as noted in the table below (and illustrated in *Figure 2.1*) is at risk.

Table 4-7 Culverts with geomorphic compatibility rating of "Mostly Incompatible" or "Incompatible"

Bankfull	Compatibility	Location	Road Name	Stream Name
Width	Score			
28.77	2		LEWIS CREEK RD	Unnamed
		At south end of the golf		
40.75		course just past Old Route		
18.75	4	116 outlet.	ROUTE 116	
28.77	4		LINCOLN HILL RD	Unnamed
00.00	0	Just after Old Route 116		
23.08	6	across from the golf course	ROUTE 116	
		First crossing south of CVU		
16 67	7	corn field	ROUTE 116	
18.02	7			Uppamod
10.92	'			Trib to Texas
45.22	8		Town Rec Trail	Brook
		North of Rocky Mountain		
	0	Lane, next to #8412 Route		
33.08	8	116	ROUTE 116	
29.41	8		CHARLOTTE RD	
49.08	9	1st crossing on Bishop Road	BISHOP RD	Texas Brook
		North of Route		
		116/Bissonette Lane		
		Route 116/Beecher Hill Road		
25.00	9	intersection. On the Hill	ROUTE 116	
		150 feet north of Hickory		
16.67	9	Place	ROUTE 116	
24.27	9		LINCOLN HILL RD	Unnamed

23.08	10	South of Merchantsville Road. North of Charlotte. Just south of Kelly's Feild Road	ROUTE 116	
40.70	10	Abovo Bishon Road		Toyas Brook
57.90	10	Above bishop Road		
57.09	10		BEECHER HILL RD	Beecher Hill Brook
17.86	10	400 feet from intersection with North Road @ Jct of Swamp & Palmer	HAYDEN HILL RD W	Beecher Hill Brook
57.80	10	Roads	SHERMAN HOLLOW RD	Johnnie Brook

Information on dams is available from two sources: a database of dams regulated by the Vermont Department of Environmental Conservation and the National Dam Inventory maintain by the U.S. Army Corps of Engineers. Information from the DEC is as follows:

 Table 4-8 Dams under the jurisdiction of VT Department of Environmental Conservation

 VT Dem Safety

VT Dam Safety	Current as of:	May 18, 2016)				
Dams under the Jurisdiction of VT Department of Environmental Conservation (DEC) pursuant to 10 V5A Chapter 43 §1081 and subject to							
10 VSA Chapter 43 §1082 Authorization (i.e. dams capable of impounding more than 500,000 cubic feet of water or other liquid.							
DamName	StateID	Location (Town)	Hazard Class	Owner			
Lower Pond	97.02	Hinesburg	Significant	Private			
Lake Iroquois	97.01	Hinesburg	Low	Private			
Twitchell	97.05	Hinesburg	Low	Private			
Champlain Valley Union High School	97.07	Hinesburg	Low	Champla in Valley Union High School			

The National Dam Inventory identifies seven dams in the municipality, shown in the table below. The Town has concerns about the dams on Patrick Brook, and risk of failure.

Table 4-9 National Dam Inventory Data

Name	Owner	River	Description	Maximum Storage (acre/feet)	Hazard Potential
Lake Iroquois	Iroquois Manufacturing Company	Patrick Brook	Stone Masonry/Concrete originally built for recreation purposes in 1870.	1515	Low-losses limited to owner's property.
Lower Pond	Iroquois Manufacturing Company	Patrick Brook	Stone Masonry originally built for Water Level Retention in 1867	246	Significant-no probable loss of human life but can cause significant economic or environmental damage and disrupt lifeline concerns.
Iroquois Manufactur- ing Co. Mill Pond (Upper)	None recorded	Patrick Brook	Material, original purpose and date of construction unrecorded	0	Low-losses limited to owner's property.
Cemetary Pond	None recorded	Patrick Brook	Material, original purpose and date of construction unrecorded	0	No rating
Twitchell	Jane Finn	LaPlatte River- TR	Built in 1969. Material and original purpose unrecorded.	29	Low-losses limited to owner's property.
Champlain Valley Union High School	Champlain Valley Union High School	Patrick Brook- OS	Earthfill dam, constructed in 1983 for fire protection purposes	16	Low-losses limited to owner's property.
Iroquois Manufactur- ing Co. Mill Pond (Lower)	None recorded	Patrick Brook	Material, original purpose and date of construction unrecorded	0	No rating

Source: National Dam Inventory

4.2.3 Water, Wastewater and Natural Gas Service Areas

The town operates a water and wastewater system that serves the village area along VT Route 116 and CVU road. Residents and businesses outside of these service areas receive water from wells and dispose of wastewater through septic systems. Vermont Gas has recently expanded service to Champlain Valley Union High School and Hinesburg village (cf. *Figure 1.4*).

4.2.4 Electric Power Transmission Lines and Telecommunications Land Lines

A VELCO high tension power transmission line runs from south to north through the Town's western half, while another line from Hinesburg enters the Town's northeast corner and terminates at a substation (cf. *Figure 1.4*). Above ground telecommunication land lines run along the street grid.

4.3 Estimating Potential Losses in Designated Hazard Areas.

A simple GIS intersection of e-site data with the 2010 FIRM floodplain data indicates the following with regard to structures located in mapped flood hazard areas (*cf. Figure 2-1*):

- There are 27 residential structures and three commercial/industrial structures located within the 100-year floodplain. Based on the 2014 median grand list values, the estimated potential loss due to a major flood event inundating the floodplain is \$6,201,103.
- This estimate only takes structures into account. It does not account for personal property or business losses. Repair and replacement cost data were not available for all infrastructure located within the floodplain.

A simple GIS intersection of esite data with the 2016 River Corridor Protection Area data (*cf. Figure 2-1*) indicates the following with regard to structures vulnerable to Fluvial Erosion.

- There are 1891 total structures in Hinesburg.
- There are 16 residential structures and two commercial/industrial structures located within the River Corridor Protection Area. Based on 2014 median grand list value, the estimated potential losses due to a major flood event inundating the floodplain are \$3,911,332.
- This estimate only takes structures into account. It does not account for personal property or business losses.

At this time, a more detailed analysis of potential losses to structures, infrastructure, and agricultural lands cannot be made. Such an analysis would require individual site visits and analysis conducted by both river geomorphologists and structural engineers which is beyond the capacity of the CCRPC due to funding limitations.

4.4 Vulnerable Populations

Like most of the County's rural communities, census data more detailed than the town boundaries is not available to see if there are concentrations of either elderly populations or lowincome populations. In other words, the town's boundaries form one single census tract. Demographic information on the relative percentages of vulnerable populations is as follows:

	Hinesburg	Chittenden County	Vermont	National
Percent Minority (non-white) ¹	5.4%	7.7%	4.8%	26.7%
Children <18 in poverty ¹	16.2%	11.1%	14.8%	21.6%
Families w/children in poverty ¹	17.4%	10.5%	13.4%	17.8%
Families w/ female householder, no husband present w/children in poverty ¹	35.1%	37.0%	37.4%	40%
Population, age $65+$ in poverty ¹	0%	6.5%	7.5%	13.4%

Table 4-10 Vulnerable populations, Hinesburg

¹US Census Bureau, 2011-2015 American Community Survey, <u>http://factfinder2.census.gov</u>

Given the coarseness of the available data, CCRPC is not able to determine specific locations with a concentration of vulnerable individuals within individual municipalities. However, a useful analysis known as a Social Vulnerability Analysis has been prepared by the Vermont Department of Health. Data for the Town is shown in *Figure 4.1*.

The Social Vulnerability Index (SVI) draws together 16 different measures of vulnerability in three different themes: socioeconomic, demographic, and housing/transportation. The 16 individual measures include poverty, unemployment, per capita income, educational attainment, health insurance, children/elderly, single parent households, disability, minority, limited English, location of apartment buildings, mobile homes, crowding, no vehicle access, and population living in group quarters. The measures are combined to create relative vulnerability index. For every vulnerability measure, census tracts above the 90th percentile, or the most vulnerable 10%, are assigned a flag. The vulnerability index is created by counting the total number of flags in each census tract. It is important to remember that this Social Vulnerability Index is just a first step in screening for populations that may be more or less vulnerable to a variety of hazard. Depending on the situation, different measures could be more or less important and should be looked at more closely. These data are NOT saying that one census tract is more vulnerable than another. Rather it is saying that there is a higher concentration of various vulnerable populations living within a tract and seeks to identify the conditions that make a population vulnerable.

4.5 Land Use and Development Trends Related to Mitigation

As noted in the Introduction, Hinesburg's land use is primary residential and agricultural. An analysis of GIS data shows the following percentages for land use and the percentages of land allocated to each zoning district.

Hinesburg Structures	Esite Count	Percent	Hinesburg Zoning	Area (mi²)	Percent
Residential	1740	92.01%	AG	17.34049	43.72%
Commercial	65	3.44%	С	0.054506	0.14%
Industrial	13	0.69%	I-1	0.717403	1.81%
Institutional / Infrastructure	21	1.11%	I-2	0.013767	0.03%
Mass Assembly	8	0.42%	I-3	0.015997	0.04%
Leisure / Recreation	1	0.05%	1-4	0.001144	0.00%
Natural Resources	12	0.63%	R1	0.166519	0.42%
Total:	1860	98.36%	R2	0.028428	0.07%
			RR1	5.833194	14.71%
			RR2	14.18502	35.77%
			SH	0.785652	1.98%
			VG	0.330193	0.83%
			VG-NE	0.102716	0.26%
			VG-NW	0.084558	0.21%
Total Esites:	1891		Total Area:	39.65958	

Table 4-11 Structures compared to zoning, Town of Hinesburg

Source: 2015 e911 Data and 2013 Town of Hinesburg Zoning Regulations, Note: The structure categories relate to the Land Based Classification System (LBCS) used in the 2011 AHMP not E-911 site types. E-911 site types were assigned to each LBCS category to create synergy between the 2011 AHMP and 2017 AHMP.

4.5.1 Conserved or Undevelopable Parcels

There are a variety of conserved or undevelopable parcels in Hinesburg. Most of these parcels have been conserved through conservation easements for their scenic, agricultural, or natural resource values. The Town of Hinesburg typically allocates approximately between \$2,500-\$7,500 annually in its municipal budget towards land conservation. The Town works in partnership with the Hinesburg Land Trust and regional land conservation entities such as the Vermont Land Trust and the Vermont Housing and Conservation Board.

Table 4-12 Conserved Land, Town of Hinesburg

		Acres of		Acres of		Total	Porcont
		Public	Percent	Conserved	Percent	Public &	Conserved
Town Name	Acres	Land	Public	Land	Conserved	Conserved	Land
Hinesburg	25,398.79	2,463.22	10%	2,294.79	9%	4,758.11	19%
Country	0.47 004 50	40.044.04	400/	00 704 00	00/	00.040.40	4.00/

Source: VLT Data and ANR Public Lands

Additionally, as noted below in Table 5.1, the Town's zoning bylaws include both a Water Resources Overlay District and a Floodplain District which preclude the construction of new homes or businesses and effectively act as conserved lands.

4.5.2 Recent and Future Development

At present and for the foreseeable future the current development pattern will continue: residential and commercial/industrial growth in the Village Growth Area and continued, low density residential growth in the Rural Residential 1 district as well as the more rural Agricultural and Rural Residential 2 districts. At this time, the main way CCRPC has to predict future development is by analysis of municipal zoning bylaws. As the municipality participates in the NFIP, zoning bylaws heavily regulate development in designated flood hazard areas. . Additionally, the Town also regulates development near other waterbodies and wetlands. Some infill and new development are projected in a small portion of the Patrick Brook flood hazard area in the Village Growth Area. Aside from this, little to no other development is likely to take place in flood hazard areas or river corridor protection areas. Hinesburg's zoning requirements effectively mitigate damages from Flood and Fluvial Erosion hazards to future structures, and require a demonstration of no undue adverse impacts to surrounding properties, infrastructure, and water quality. Additionally, the Town has adopted zoning regulations to restrict building in areas prone to fluvial erosion.

As shown in *Figure 4.2*, from 2011 through 2014, the municipality has seen 48 new residential buildings and 3 new commercial/industrial buildings. <u>None</u> of these buildings were constructed in the SFHA, River Corridor or River Corridor Protection Area.

As best can be ascertained based upon data maintained by the Chittenden County RPC and the Town of Hinesburg, since the adoption of the last municipal AHMP in 2011, development activity in the Town has not significantly increased vulnerability. Additionally, through at least 2021, there is no known or projected development of new buildings or infrastructure anticipated to be constructed in areas known to be particularly vulnerable to Natural Hazards.

SECTION 5: MITIGATION STRATEGY

The Town considered a range of mitigation actions across the categories of Planning and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, and Education and Awareness Programs. <u>As is demonstrated in the discussion that follows</u> the Town carries out numerous efforts as part of its day-to-day operations that fit within these categories and address and serve to mitigate the impacts of various hazards. The section concludes within an analysis of which vulnerabilities need additional attention and therefore stipulates discrete tasks to be carried out by the Town during the 5-year period this Plan is in effect to address these vulnerabilities.

5.1 Existing 2013 Hinesburg Town Plan Goals and Objectives That Support Hazard Mitigation

The following selected excerpts illustrate how mitigation planning and activities is formally promoted and supported through the Town Plan.

GOAL 4. To preserve and protect the natural resources and special features of Hinesburg. *Objectives:*

4.1 To enhance and protect the surface and groundwater resources of the Town.

4.2 To preserve significant natural areas such as wetlands, wildlife habitat, streams, and shorelines.

4.3 To restrict development in areas that would be detrimental to human health, safety and the public good.

4.4 To promote the wise use and conservation of natural resources.

4.5 To conserve viable agricultural and forestry lands in the rural regions of Hinesburg.

4.6 To encourage a pattern of development that maintains open spaces and scenic resources.

4.7 To encourage recycling, the use of renewable resources and the safe cost effective disposal of wastes.

Studies and Reports

A variety of studies have been conducted that shed light on critical Village issues such as wetland and flood hazard area delineation, growth center concepts, and transportation. These studies include:

LaPlatte River Watershed Stormwater Infrastructure Study (prepared by the LaPlatte Watershed Partnership Stream corridor plan and geomorphic assessment of the LaPlatte River and tributaries (prepared by the LaPlatte Watershed Partnership) – 2007 West Side Road Feasibility Study – 2003 Route 116 Hinesburg Village Scoping Study – 2002 USGS Flood Study for the LaPlatte River, Patrick Brook, and the Canal – 2003 Village area wetland delineation by Arrowwood Environmental – 2008 UMASS Wetland Delineation – 1997 (based on 1993 aerial photography) Village Wetlands Delineation Project – 1995 Growth Center Pilot Project – 1993

The LaPlatte River Watershed Stormwater Infrastructure Study (prepared by Milone & MacBroom 2010) analyzes the stormwater impacts on the LaPlatte River and tributaries in Shelburne, Charlotte and Hinesburg. The work includes both GIS analysis and field verification to identify primary stormwater impacts to water quality and stream geomorphology within the LaPlatte Watershed. Stormwater accumulation areas and collection systems discharging within the village area subwatersheds were identified for possible future stormwater mitigation projects. Contributing drainage area and amount of impervious surface were calculated to guide project implementation. The sources of unregulated and unmitigated stormwater are substantial in the watershed but because the Laplatte River watershed is not yet designated as a stormwater impaired watershed according to EPA 303(d) list this report outlines the steps that should be taken to improve stream health and avoid a future impaired designation.

5.1.2 Land Use

5.1.2.1 The Village: Goals and Recommendations

3.2.2) To change the character of Route 116 to a "Main Street", and to create and reinforce "gateways" into the Village to give people a sense of arrival.

Work aggressively with the CCMPO, CCRPC, VTrans, and Hinesburg's State Legislators to implement provisions of the Route 116 Hinesburg Village Corridor Study. Pay particular attention to intersection improvements at Silver Street, Charlotte Road, Mechanicsville Road, and Commerce Street. Redesign the main portion of Route 116 through the Village to make it safer, more pedestrian friendly, more efficient, and more attractive. Overall, the roadway (traveled area plus shoulders) should be narrowed to reduce speeding, eliminate passing on the right, and provide more room in the right-of-way

for pedestrian infrastructure, street trees, etc. Additional features should include: curbing, more sidewalks, street trees, improved lighting that is pedestrian friendly and attractive, and improved signage.

3.2.3) To create a truly "walkable" community by working toward safe and convenient pedestrian access to all portions of the Village.

As soon as possible, improve the safety of existing crosswalks through additional signage, curbing, road striping, and even relocation if necessary.

Create a plan and an official map for future sidewalks and paths to link all destinations in the Village as well as significant destinations outside the Village. Coordinate this with efforts to create a system of footpaths and trails in the rural areas of town (see section 6.7).

Continue to make regular improvements to pedestrian infrastructure using Municipal, State, and Federal funds.

Plan for and install sidewalks on both sides of Route 116 through the Village area.

3.2.8) To make available adequate community facilities and services to facilitate Village area goals.

Continue to research ways to expand the capacity and efficiency of the Town's sewer treatment facility. Any future expansion should be of a size and scope to facilitate Village growth while preserving the ecological integrity of the LaPlatte River.

Develop a comprehensive stormwater plan for the village growth area.

5.1.2.3 Rural Regions: Goals and Recommendations

3.4.5) To develop policies throughout the rural areas that preserve conservation lands for their ecological, recreational, and traditional uses.

Revise zoning bylaws to create one or more conservation districts. Lands to be included within this district may include the Town Forest, Fred Johnson Wildlife Management Area, and other publicly owned lands to be protected from development or inappropriate use.

4.3.1) To protect, enhance, and restore the town's surface water resources.

a) Require adequate vegetative buffers and erosion control along rivers, streams, and lakes to protect water quality, allow natural channel modification, and protect buildings. Consider differentiating buffers based on land use.

Consider revising the zoning regulations to discourage new structures and the excessive enlargement of existing development in the shoreline district.

Maintain stringent camp conversion

oversight pertaining to septic performance and stormwater in the shoreline district.

In coordination with local and regional groups, and the towns of Williston and St. George, develop a plan to regularly monitor water quality in Lake Iroquois and Sunset Lake, report the

findings, and take action to reduce pollution from point and nonpoint sources. Continue working with the State and watershed groups to review and implement site-specific vegetated buffer and setback requirements based on geomorphological studies and fluvial erosion hazards. Encourage reforestation of native plants where appropriate along the riverbanks and within defined buffer areas. Encourage the preservation of existing vegetative buffers and reforestation of riparian buffers.

Educate landowners about the value and fragility of vernal pools, how to identify them, and how to protect them.

g) Work with the State to add vernal pools as State recognized wetlands.

h) Continue as an active participant on watershed protection associations.

i) Support the eradication of invasive plants that threaten ecological, aesthetic, and recreational values of surface waters.

4.3.2) To control impacts from storm water runoff.

a) Insure clean and healthy surface water by making sure that storm water runoff doesn't adversely affect streams and rivers, and does not exceed their carrying capacity.

Study the current and future impacts of storm water runoff on the town's surface waters, and consider writing tighter provisions in the regulations. Consider innovative and "low impact development" techniques that help minimize stormwater runoff.

c) Consider establishing a storm water utility responsible for a town-wide systematic approach to storm water management.

d) Study and address the contribution of town roads to storm water runoff.

4.3.3) To serve as a component of a greenway network.

a) Use inventories of the Lewis Creek and LaPlatte River corridors to identify existing features that would contribute to a greenway network. Ensure that greenways providing wildlife habitat connectivity are not adversely impacted by improvements or use related to human activity (e.g., trails).

4.4.1) To protect the town's groundwater resources.

a) Create a groundwater conservation overlay district that includes source water protection areas. Development in these areas should receive a higher level of scrutiny. Review the data already collected and supplement with field studies, if needed.

b) Decide how best to provide information about low-yield well areas to the DRB: either review town-wide well-log data to update information about low-yield areas, or require developers to provide such information at sketch plan review.

c) Expand the capacity of the Town water supply via the options listed above.

d) Consider establishing a source water protection area around the inactive Town well at Geprags Park,

to ensure that it remains a viable source for future water needs in the municipal water supply area. e) Encourage water conservation.

4.5.1) To preserve wetlands within the town.

a) Abide by existing or develop regulations to protect town wetlands that are essential for treating storm water runoff and protecting surface water quality and providing habitat.

b)Continue to work to clarify the location of wetlands in Hinesburg. Utilize the UMASS and NWI wetland locations (Map 7, Wetlands & Floodplains), or more detailed site specific studies if available, for planning and development review with appropriate field delineation as needed. c)Conduct field studies to identify and better understand priority wetlands.

d)Continue to strive to insure that wetlands are not adversely impacted by development or alteration to lands around them.

e)Consider acquiring easements to, or acquiring outright, priority wetlands that are particularly

vulnerable.

f)Restore wetlands in a public/private partnership to improve water quality, habitat, and facilitate stormwater management with consideration to surrounding properties

4.5.2) To serve as a component of a greenway network.

a)Include wetlands as a component of a greenway network. Separate greenway features that connect wetlands and areas for wildlife habitat from trails and other human activities.

4.6.1) Work with the VT Agency of Natural Resources and local watershed groups to develop, refine, and implement river corridor plans to address water quality, channel adjustments, riparian habitat, flood hazard avoidance, and to meet the requirements of pre-disaster mitigation.

4.6.2) Revise Hinesburg's flood hazard regulations to address fluvial erosion hazard areas in addition to inundation risks in the special flood hazard areas. 4.6.3)Review and revise flood hazard regulations as needed to ensure continued enrollment in the National Flood Insurance Program.

4.7.1) To protect important natural areas, wildlife habitats of special concern, and overall biodiversity, with the help of landowners.

*a)*Work with the VT Fish and Wildlife Department, UVM, and other partners to conduct and maintain inventories of natural areas and wildlife habitat, with the help of landowners.

b)Protect areas of sufficient size and character to support continued preservation of wildlife habitat and hunting through mechanisms like landowner covenants, conservation easements, etc.

c)When reviewing new development, encourage the preservation of the six habitats of special concern discussed above.

d)Support the eradication of invasive plants that threaten the future of natural areas, forests, and farm lands.

5.2 Existing Town of Hinesburg Actions that Support Hazard Mitigation

The following table illustrates how mitigation activities and plans are carried out by various municipal departments and whether such capabilities are adequate to address hazard vulnerabilities and whether the department, if needed, has the ability to improve policies and programs and programs to unmitigated vulnerabilities.

Types of Programs and Policies	Description /Details	Adequacy of municipal capabilities to address hazards and ability to expand upon or improve policies & programs
Highway Services	Town Highway Department	1) Generally adequate with regards to mitigating the impacts of common hazards.
		2) However, the Public Works Department, through the strategies noted below is taking on a stronger role to mitigate against damages caused by Severe Rainstorm, Fluvial Erosion and Water Pollution.
Highway personnel	4 FTE field personnel.	1) Generally adequate with regards to mitigating the impacts of common hazards.
		2) However, the Public Works Department, through the strategies noted below is taking on a stronger role to mitigate against damages caused by Severe Rainstorm, Fluvial Erosion and Water Pollution.
Water / Sewer Department	Hinesburg Buildings and Facilities Dept, oversees water/sewer and	1) Generally adequate with regards to mitigating the impacts of common hazards.
	sidewaiks.	2) However, the Public Works Department, through the strategies noted below is taking on a stronger role to mitigate against damages caused by Severe Rainstorm, Fluvial Erosion and Water Pollution.
Water / Sewer Personnel	2.25 FTE Water/Sewer combined, .75 FTE personnel for other Buildings and	1) Generally adequate with regards to mitigating the impacts of common hazards.
	Facilities tasks.	2) No need to expand upon or improve policies & programs with regard to hazards under its purview.
Planning and Zoning personnel	1.2 FTE Planner, 1.2 FTE Zoning Administrator	1) Generally adequate with regards to mitigating the impacts of common hazards.
		2) No need to expand upon or improve policies & programs with regard to hazards under its purview.
Residential Building Code / Inspection	No local building code.) Generally adequate with regards to mitigating the impacts of common hazards.
		2) No need to expand upon or improve policies & programs with regard to hazards under its purview.

Table 5-1 Existing municipal capabilities addressing hazard mitigation, Town of Hinesburg

Types of Programs and Policies Description /Details		Adequacy of municipal capabilities to address hazards and ability to expand upon or improve policies & programs		
Municipal Plans				
Town / Municipal	2013	1) As noted at the start of Section 5, several elements		

Comprehensive Plan		of the municipal Comprehensive Plan promote Hazard Mitigation.
		2) When the Town updates its Plan, it will reference this 2017 AHMP accordingly.
		Town has recently added the State-required Flood Resiliency Chapter to its town plan.
Zoning Bylaws and Subdivision Regulations	2009	1) Generally adequate with regard to mitigating the impacts of common hazards.
		2) No need, at this time, to expand upon or improve policies & programs with regard to hazards under its purview. The Town Administrator is responsible for assuring compliance by landowners with the NFIP.
Hazard Specific Zoning (slope, wetland, conservation,		1) Generally adequate with regards to mitigating the impacts of common hazards.
industrial, etc.)		2) No need, at this time, to expand upon current flood hazard bylaws.
	Floodplain overlay, stream setback, Shoreland, Industrial.	3) Over the next 5 years, Town may consider adoption of River Corridor or River Corridor Protection Area zoning regulations.
Participation in National Flood	Yes	1) New DFIRMS adopted in 2014.
Insurance Program (NFIP) and Floodplain/Flood Hazard Area Ordinance		The Town Zoning Administrator and the Town's Development Review Board (DRB) monitor compliance with the National Flood Insurance Program. The DRB reviews and adjudicates applications for development within the floodplain.
		2) No need, at this time, to expand upon NFIP participation
Open Space Plans; Conservation Funds	Conservation Fund. Annual line item of approx. \$7,500 in town budget for Fund.	 Yes Municipality considers regulatory programs and voluntary conservation efforts as adequate to address any hazard mitigation concerns. However, various areas may be conserved in the future by the use of the Fund but as of now, specific parcels conducive to hazard mitigation have not yet been targeted.
Private / non-profit hazard mitigation efforts active in municipality	Lewis Creek Association: Responsible for impervious surface Mapping for Lewis Creek and Laplatte, water quality monitoring for Lewis Creek watersheds; conservation and restoration actions in the riparian corridor at "reference" and degraded reaches as defined by geomorphic assessment data	

reculto	
results.	
LaPlatte River	
Partnership.	
Responsible for	
LaPlatte River fluvial	
geomorphic	
assessments, water	
quality monitoring,	
and other	
conservation and	
restoration actions in	
the riparian corridor.	

The following table illustrates how Emergency Preparedness, Response & Recovery actions are carried out in the Town.

Table 5-2 Existing municipal emergency services & plans, Town of Hinesburg

Type of Existing Protection	Description /Details/Comments
Emergency Services	Emergency response personnel may have overlapping responsibilities with other town response organizations.
Police Services	Hinesburg Community Police
Police Department Personnel	~6 Paid FTE Officers, .5 Paid FTE Admin
Fire Services	Hinesburg Volunteer Fire Department
Fire Department Personnel	-0- FTE, approx. 45 volunteers
Fire Department Mutual Aid Agreements	FD participates in the Chittenden County and Addison County Mutual Aid compacts
EMS Services	Hinesburg VFD 1st Response, St. Michael's Rescue
EMS Personnel	Approximately 18 volunteers
EMS Mutual Aid Agreements	Various through VT EMS District #3
Emergency Plans	
Local Emergency Operations Plan (LEOP)	2015
School Emergency Evacuation Plan	2004
Primary Shelter	Champlain Valley Union High School, capacity 1100.
Replacement Power, backup generator	Yes
Secondary Shelter	Hinesburg Community School, capacity 600
Replacement Power, backup generator	No

5.3 Town of Hinesburg All-Hazards Mitigation Goals

The following goals were first developed and recommended by CCRPC staff in 2004, and approved by Town of Hinesburg officials for their local 2005 and 2011 AHMPs and reaffirmed for this 2017 annex:

- 1) Reduce at a minimum, and prevent to the maximum extent possible, the loss of life and injury resulting from all hazards.
- 2) Mitigate financial losses and environmental degradation incurred by municipal, educational, residential, commercial, industrial and agricultural establishments due to various hazards.
- 3) Maintain and increase awareness amongst the town's residents and businesses of the damages caused by previous and potential future hazard events as identified specifically in this Local All-Hazards Mitigation Plan and as identified generally in the *Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan*.
- 4) Recognize the linkages between the relative frequency and severity of disaster events and the design, development, use and maintenance of infrastructure such as roads, utilities and stormwater management and the planning and development of various land uses.
- 5) Maintain existing municipal plans, programs, regulations, bylaws and ordinances that directly or indirectly support hazard mitigation.
- 6) Consider formal incorporation of this Local All-Hazards Mitigation Plan into the municipal comprehensive plan as described in 24 VSA, Section 4403(5), as well as incorporation of proposed new mitigation actions into the municipality's/town's bylaws, regulations and ordinances, including, but not limited to, zoning bylaws and subdivision regulations and building codes.
- 7) Consider formal incorporation of this Local All-Hazards Mitigation Plan, particularly the recommended mitigation actions, into the municipal/town operating and capital plans & programs especially, but not limited to, as they relate to public facilities and infrastructure, utilities, highways and emergency services.

With regard to a more formal process by which the Town will integrate the requirements of this mitigation plan into the Town's Comprehensive Plan, as required by Vermont law, municipalities must update their Comprehensive Plans every eight years. During any update process undertaken while this Plan document is in effect, the Town will review the recommended Actions detailed below to see if formal incorporation within the Comprehensive Plan (or any Plan implementation tasks) is warranted. The Town will be updating its Comprehensive Plan in 2017.

Additionally, as the CCRPC is tasked with also reviewing and approving each such municipal comprehensive plan for consistency with various requirements in state statute and consistency with the Chittenden County Regional Plan (aka the *ECOS 2013 Plan*). This review includes a detailed staff critique with recommendations for improvement. This CCRPC review provides another opportunity to formally integrate elements of this local AHMP into the Town's Comprehensive Plan.

With regard to a more formal process by which the Town will integrate the requirements of this mitigation plan while developing the annual update to its capital improvement plans/budgets, for the next five years, the Town will review the recommended Actions detailed below to see if formal incorporation within these annual capital plans is warranted prior to annual review and voting by Town residents. Additionally, CCRPC staff can assist the town with drafting grant applications to fund mitigation projects.

5.4 Mitigation Actions

The table below records the strategies from the 2011 Plan and progress on their implementation. This table also encapsulates the Town's decision making with regards to which Actions to continue, which to establish as new actions and which to discontinue. During the development of this Municipal AHMP and its parent Multi-Jurisdictional AHMP, FEMA staff indicated to the CCRPC a need to separate out or remove strategies which are more properly considered to be Preparedness, Response or Recovery strategies rather than Mitigation. Additionally, upon revisiting and reviewing the 2011 actions and devising action for this 2017 local AHMP CCRPC and municipal staff thought it would be best to focus on known and likely actions with a high likelihood of implementation versus consideration of more expansive but largely aspirational strategies.

Action Primary Responsible Entity	Task	Brief Description	Progress since 2011 and recommendations for 2017 Plan
#1 Complete fluvial	geomorphology assessm	ent and develop strategi	es in response to identified risk
TBD, determined by funding.	River Corridor Management Plans	Where Phase I and II assessments are complete, develop a River Corridor Management Plan.	Several studies have been completed. REMOVE FROM 2017 PLAN.
Town Manager, Town Planner	Fluvial Erosion Hazard Mitigation Implementation	Implement strategies from above referenced Corridor Management Plan to mitigate losses from identified fluvial erosion hazards.	Strategies carried over to Road & Stormwater Infrastructure Task and MRGP Action

Table 5-3 Progress on the actions of the 2011 Hinesburg All-Hazards Mitigation Plan

Town Manager, Town Planner	Flood Insurance Rating Map Updates	Review draft FIRM data. Develop strategies to mitigate losses from identified flood hazards.	DFIRMS updated. REMOVE FROM PLAN
#2 Evaluate capabili	ties of existing road and	l stormwater manageme	nt infrastructure
Road Foreman	Infrastructure Assessment for Stormwater Vulnerability	Assess the vulnerability and operational capability of municipal roads, culverts and stormwater infrastructure.	ASSESSMENT IS NOT CONSIDERED MITIGATION. REMOVE FROM NEW PLAN
Road Foreman	Infrastructure Assessment for Fluvial Erosion/Landslide Vulnerability	Assess the vulnerability and operational capability of municipal roads, culverts, bridges and other infrastructure to fluvial erosion.	ASSESSMENT IS NOT CONSIDERED MITIGATION. REMOVE FROM NEW PLAN
Road Foreman	Culvert Upgrades	Upgrade culverts and ditching along roads to mitigate against repeated damages from stormwater or spring snowmelt.	CONTINUE FOR 2017 PLAN
Road Foreman	Continued Monitoring of Vulnerable Infrastructure	Monitor bridges and culverts with erosion and scouring concerns.	Monitoring is ongoing. <u>MONITORING IS NOT CONSIDERED</u> <u>MITIGATION. REMOVE FROM NEW PLAN</u>
Road Foreman	Road Improvement	Consider paving certain road sections to lower overall maintenance costs, improve snow plowing speeds and improve overall capability of roads to handle current and projected traffic volumes.	NOT CONSIDERED MITIGATION. REMOVE FROM NEW PLAN
Road Foreman	Erosion/Landslide Mitigation	Undertake erosion or landslide mitigation projects where roads regularly incur damage from adjacent rivers/streams and hillsides.	RENAME AS DRAINAGE IMPROVEMENTS FOR 2017 PLAN
	Evaluate and Improve capabilities of shelters and evacuation/sheltering plans		NOT A MITIGATION ACTION. REMOVE FROM 2017 PLAN.

Ensure town and school emergency plans are fully coordinated	NOT A MITIGATION ACTION. REMOVE FROM 2017 PLAN.
Raise public awareness of hazards, hazard mitigation, disaster preparedness	NOT A MITIGATION ACTION. REMOVE FROM 2017 PLAN.

5.4.1 Current Capabilities and Need for Mitigation Actions

The Town Comprehensive Plan's policies and programs that support hazard mitigation and the progress noted above demonstrate the variety of policies and actions forming the foundation of this All Hazards Mitigation Plan. <u>As detailed in the *Table* below, generally, the Town considers its existing capabilities, regulatory structure and programs as adequate to address its vulnerabilities however continuation of existing mitigation actions or the implementation of new actions are warranted for the 5-year period this Plan is effect.</u>

Hazard	Adequacy of Municipal Capabilities to address associated vulnerabilities (Excellent, Good, Average, Below Average)	Additional expansion or improvement in policies & programs needed to address hazard given long-term vulnerability
Severe Winter Storm	Excellent	No
Flooding	Excellent	Yes, see actions below.
Fluvial Erosion	Good	Yes, see actions below
Severe Rainstorm	Good	Yes, see actions below.
Extreme Temperatures	Good	No, rare occurrence and extent, impact &
		vulnerabilities are limited.
Wildfire	Excellent	No, rare occurrence and extent, impact &
		vulnerabilities are limited.

Table 5-4 Town of Hinesburg: Capabilities to address vulnerabilities from natural hazards

Table 5-5 Town of Hinesburg: Capabilities to address vulnerabilities from technological hazards

Hazard	Adequacy of Municipal Capabilities to address vulnerabilities (Excellent, Average, Below Average)	Additional expansion or improvement needed to address hazard given long- term vulnerability
Major Transportation	Good	No, rare occurrence and extent, impact &
Incident	+ State agencies provide	vulnerabilities are limited.
	support	
Power Loss	Average.	No, given that events are limited in

	Private utilities are	duration and vulnerabilities are short-		
	primarily responsible	lived.		
Hazardous Materials	Good	No, rare occurrence and extent, impact &		
Incident	+ State agencies provide	vulnerabilities are limited.		
	support			
Water Service Loss	Excellent.	No, rare occurrence and extent, impact &		
		vulnerabilities are limited.		
Gas Service Loss	Average.	No, rare occurrence and extent, impact &		
	Private utility is	vulnerabilities are limited.		
	primarily responsible.			
Telecommunications	Private utilities are	No, rare occurrence and extent, impact &		
Failure	primarily responsible	vulnerabilities are limited.		
Other Fuel Service	Private businesses are	No, rare occurrence and extent, impact &		
Loss	primarily responsible	vulnerabilities are limited.		
Sewer Service Loss	Excellent.	No, rare occurrence and extent, impact &		
		vulnerabilities are limited.		
Water Pollution	Good	Yes, see actions below		
Invasive Species	Average	No, rare occurrence and extent, impact &		
		vulnerabilities are limited.		

Table 5-6 Town of Hinesburg: Capabilities to address vulnerabilities from societal hazards

Hazard	Adequacy of Municipal Capabilities to address vulnerabilities (Excellent, Average, Below Average)	Additional expansion or improvement in policies & programs needed to address hazard given long-term vulnerability
Crime	Good +State agencies provide support.	No. Municipality participates in programs lead by regional and state entities.
Economic Recession	Good +State Agencies provide support	No Diversity of county economy mitigates vulnerabilities. The Town considers its municipal plan as also supportive of the goal of economic diversification.
Terrorism	Good +State & Federal agencies provide support	No, rare occurrence.
Civil Disturbance	Good + State agencies provide support.	No, rare occurrence
Epidemic	Average +State & Federal agencies provide	No, rare occurrence. The Town's abilities to mitigate an epidemic are limited The Town relies on state and school

	support	efforts related to epidemic preparedness, prevention and mitigation, and medical facilities and services in neighboring
		communities for response.
Key Employer Loss	Good	No. Diversity of employers in
	+State agencies provide	municipality mitigates vulnerabilities.
	support	

Note that this Plan does not recommend a discrete mitigation action regarding "future development." Our justification for this is as follows:

- The municipality's regulations, programming and staffing have prevented and will prevent new buildings and infrastructure being constructed in areas vulnerable to hazards. As documented in detail in section 4.6.2, despite active residential and commercial development, no structures and infrastructure subject to municipal regulation, have been constructed in either the Special Flood Hazard Areas or mapped River Corridor Protection Areas.
- For the next five years, there are no known or anticipated plans for the construction of municipal infrastructure in areas vulnerable to hazards.
- There is no evidence that unwise or poorly regulated development in the municipality has been a significant contributor to putting people or property in harm's way.

Therefore, the reader will note that the proposed Mitigation Actions for the next five years represent a much more focused and achievable list of actions focused on those hazards (e.g. Severe Rainstorm, Flooding, Fluvial Erosion, Water Pollution, etc.) that cause more frequent if less dramatic damages. It is these more mundane damages of erosion along road beds, damaged small culverts and the ongoing struggle to maintain and improve water quality (which cost the municipality and its taxpayers both time and money) that deserve the most attention rather than hazards that could hypothetically cause damage but which are rare and wherein the benefit-to-cost ratio for potential mitigation actions is weak (e.g. Major Transportation Incident, Hazardous Material Incident, Terrorism). No new discrete action is recommended with regard to Education & Awareness as the Town does not have adequate funds or staff to undertake such an effort nor is such an effort warranted given the identified vulnerabilities. Lastly, it is also worthwhile to note that in comparison to the 2011 Plan the priorities for this 2017 Plan have not changed. The hazards and vulnerabilities remain the same as well. Indeed, the only real change is that there is a more heightened awareness due to the severity of recent disasters starting in 2011 to the present.

5.4.2 Specific Mitigation Actions

The Town plans to conduct the following mitigation actions during the 5 year period this Plan is in effect.

Specific Identified Actions:

<u>CATEGORY A:</u> Improve capabilities of existing road and stormwater management <u>infrastructure</u>

Status: Ongoing

<u>Primary Responsible Entities:</u> Town of Hinesburg Town Planner; Highway Foreman; Director of Buildings and Facilities

<u>Potential Partner Entities</u>: VT ANR; LaPlatte Watershed Partnership; Lewis Creek Association; Vermont Agency of Transportation (VTrans); CCRPC;

Timeframe: Month 2017 through March 5, 2022 (update after FEMA approval date)

<u>Funding Requirements and Sources:</u> Various Federal and State grants; municipal operating funds only if sufficient

Action A-1: Address repetitive road flooding

Continue to work towards implementing a long-term solution to repeated flooding of Shelburne-Hinesburg Road, O'Neil Road and Leavensworth Road. The problem is that there is no place for the water to go, very flat terrain, water backs up at culverts and bridges. Raising the bridges/culverts would not really help since long stretches of roads are flooded. It would be very costly to raise such a large section of roadway. The problem is manageable but various portions of these roads can be closed for one to three days on an annual basis at minimum with some portions flooded by as much 2 feet of water. One location suffered buildup of 2 feet of ice caused by flooding-freezing-thawing-freezing cycle.

Action A-2: Implement stormwater management projects

The Town as well as local watershed organization have identified numerous areas in the Town that would benefit from small-scale stormwater management projects. These projects, primarily using Green Stormwater Infrastructure practices such as swales, rain gardens, culvert improvements, ditch improvements, etc. would reduce repetitive damages from Severe Rainstorms and Fluvial Erosion.

Rationale / Cost-Benefit Review:

These areas suffer low-level but consistent damage during heavy rains and snowmelt. Mitigating against these problems would reduce short and long term maintenance costs; reduce the likelihood of significant damages and improve the flow of traffic for personal and commercial purposes during hazard events.

CATEGORY B: Implement Roads Stormwater Management Plan

Hazards Addressed: Water Pollution, Fluvial Erosion, Severe Rainstorm,

<u>Vulnerabilities Addressed:</u> damage to public infrastructure especially roads and culverts; impairment of local waterways and Lake Champlain, budgetary impacts

Status: Ongoing

Lead Responsible Entities: Town of Hinesburg Highway Foreman

Potential Partner Entities: VT ANR; Vermont Agency of Transportation (VTrans); CCRPC

Timeframe: Month 2017 through March 5, 2022 (update after FEMA approval date)

<u>Funding Requirements and Sources:</u> Various Federal and State grants especially VAOT Better Roads Grants and VANR Ecosystem Restoration Grants; municipal operating and capital budget funds if necessary.

<u>Rationale / Cost-Benefit Review:</u> The Vermont Clean Water Act, signed into law in the summer of 2015, authorized the development of a new Municipal Roads General Permit (MRGP) to lessen erosion from roads that have "hydrologically-connected" segments. This action is required by the Act. Additionally, the plans and their implementation will assist municipalities in mitigating erosion of connected infrastructure.

Specific Identified Actions:

Action C-1 Develop Roads Stormwater Management Plan

The Town will first complete an Inventory of Priority Road Segments (PRS)[aka "hydrologically-connected" road segments] both currently meeting and not meeting MRGP standards. The CCRPC will conduct this inventory in 2017. The Town will then apply for MRGP coverage starting in July 2018. After issuance of the permit by the State, the Town will then work to use this information to develop a formal Roads Stormwater Management Plan for submission to the VT-DEC in 2019. The Plan will include a remediation plan (capital budget) and implementation schedule for each site not currently meeting standards.

Action C-2 Begin Roads Stormwater Management Plan implementation

Obtain funding for and complete projects as identified in the Roads Stormwater Management Plan. Submit annual reports to DEC, documenting progress in remediation efforts towards meeting schedule to be in compliance with the MRGP. Reports will briefly describe which segments have been improved, practices installed, and whether segments now meet MRGP standards. The MRGP standards must be implemented on all priority road segments as soon as possible, but no later than 20 years from permit issuance.

5.4.3 Prioritization of Mitigation Strategies

The above mitigation actions were listed in order of priority. Descriptions of specific projects, where available, are listed in below. Because of the difficulties in quantifying benefits and costs, it was necessary to utilize a simple "Action Evaluation and Prioritization Matrix" in order to effect a simple prioritization of the mitigation actions identified by the jurisdiction. The following list identifies the questions (criteria) considered in the matrix so as to establish an order of priority. Each of the following criteria was rated according to a numeric score of "1" (indicating poor), "2" (indicating below average or unknown), "3" (indicating good), "4" (indicating above average), or "5" (excellent).

- Does the action respond to a significant (i.e. likely or high risk) hazard?
- What is the likelihood of securing funding for the action?

- Does the action protect threatened infrastructure?
- Can the action be implemented quickly?
- Is the action socially and politically acceptable?
- Is the action technically feasible?
- Is the action administratively realistic given capabilities of responsible parties?
- Does the action offer reasonable benefit compared to its cost of implementation?
- Is the action environmentally sound and/or improve ecological functions?

The ranking of these criteria is largely based on best available information and best judgment, as many projects are not fully scoped out at this time. The highest possible score is 45.

It is anticipated that, as municipalities begin to implement the goals and actions of their Mitigation Strategies, they will undertake their own analysis in order to determine whether or not the benefits justify the cost of the project. Also, all proposed FEMA mitigation projects will undergo a benefit-cost analysis using a FEMA BCA template and approved methodology.

Based on feedback from FEMA, CCRPC Staff have concluded that several strategies previously identified in 2011 by the Town of Hinesburg as mitigation strategies are more accurately classified as preparedness, response and recovery strategies. These strategies are not intended to mitigate the hazards identified in Section 3, and should not be evaluated as such. As such, these strategies are not included in the prioritization below. However, they are discussed at the end of the plan to serve as a record of the strategies being undertaken by the Town in order to prepare for, respond to and recover from damage caused by those hazards.

Other than the reclassification of some strategies as non-mitigation strategies, there have not been significant changes in the prioritization of strategies between 2011 and now, with one notable exception. Strategies related to landslide assessment have been removed from the plan. CCRPC and municipal staff, in consultation with FEMA, have concluded that landslides are not a discrete threat in Chittenden County and are adequately captured in the plan's discussion of fluvial erosion. Additionally, further work on the development of a Vermont-specific landslide risk estimation protocol has not progressed making landslide-specific strategies inappropriate at this time for inclusion in the County plan and its annexes.

Note that these priorities are within categories, as this is more appropriate, rather than ranking project that address different hazards.

Table 5-7 Hinesburg action evaluation and prioritization matrix

Militian Caregory & Actions	Significants to	Injoh men	hundring of the transformed of transformed of the transformed of the transformed of the transformed of transforme	Structure	q_{uick_1} g_{0ijk_1} g_{0jk_1}	Political acceptade	Administra.	Realistic Men	Environment	Tory, Cornella	ACONE.
CATEGORY A: Improve capabilit	ies of exis	ting road	and storm	water ma	nagemen	t infrastru	cture				
Action A-1: Address repetitive road flooding	4	4	5	4	5	5	5	4	5	41	
Action A-2: Implement Stormwater Management Projects	4	4	4	4	5	5	5	4	5	40	
CATEGORY C: Implement Roads	Storm wat	er Manag	ement Pla	n							
Action C-1: Develop Roads Stormwater Management Plan	5	3	5	3	4	4	4	3	5	36	
Action C-2: Begin Roads Stormwater Management Plan implementation	5	3	5	3	4	4	3	3	5	35	
5 = Excellent; 4=Good; 3=Average; 2	2=Below Av	erage or Uk	known; 1=Pe	oor							

5.5 Implementation and Monitoring of Mitigation Strategies

The following Table is intended to aid municipal officials in implementing their mitigation actions and to facilitate the annual monitoring & evaluation of the plan as outlined in Section 1.7.4 above.

Table 5-8 Town of Hinesburg Mitigation Actions: Implementation Monitoring Worksheet

<u>Category A: Improve capabilities of existing road and stormwater management</u> <u>infrastructure to mitigate</u> Severe Rainstorm, Flooding, Fluvial Erosion and Water Pollution and their associated vulnerabilities of:

- Damage to new/existing public infrastructure and buildings
- Temporary road and bridge closure
- Budgetary impacts
- Temporary loss of power and/or telecommunications
- Temporary isolation of vulnerable individuals

Action (Primary Responsible Entity)	Report on Progress since Plan adoption See Section 5.4 for details on locations identified during Plan development.
Action B-1: Address repetitive road flooding (Town Road Foreman)	-note any options scoped/costed out -note year and work undertaken
Action B-2: Implement stormwater management projects (Town Road Foreman)	-note any options scoped/costed out -note year and work undertaken

CATEGORY B: Implement Roads Stormwater Management Plan to mitigate Severe Rainstorm, Fluvial Erosion and Water Pollution and their associated vulnerabilities of:

- Damage to new/existing public infrastructure
- Impairment of local waterways and Lake Champlain
- Budgetary impacts

Action	Report on Progress since Plan adoption
(Primary Responsible Entity)	See Section 5.4 for details on locations identified during Plan development.
Action C-1 Develop Roads	-MRGP obtained from State?
<u>Stormwater Management</u> Plan	-note projects developed and scoped with costs
(Town Road Foreman)	-Roads Stormwater Management Plan filed with State
Action C-2 Begin Roads	-note which RSMP projects underway/completed
Stormwater Management Planimplementation (Town RoadForeman)	-note annual MRGP reports filed with State