

Chittenden County All-Hazards Mitigation Plan Review/Update Committee Meeting MINUTES

Date: **Wednesday, May 13, 2015**
Time: **2:30 p.m. – 4:30 p.m.**
Location: **Main Conference Room, CCRPC Offices, Winooski**

Attendees: Dan Albrecht (CCRPC), Regina Mahony (CCRPC), Sharon Murray (Bolton), Ryan McLaren (Buel's Gore), Seth Lasker (Burlington), Jeannine McCrumb (Charlotte), Sarah Hadd (Colchester), Todd Odit (Jericho), Roger Hunt (Milton), Clare Rock (Richmond), Barbara Young (St. George), Paul Conner (So. Burlington), Sarah McShane (Underhill), Melissa Manka (Westford), Ken Belliveau (Williston), Dave Bergeron (Winooski), and Staci Pomeroy (ANR)

1. **Call to Order, Introductions and Changes to the Agenda**
2. **Public comments on items not on the Agenda** – No one from the public was in attendance.
3. **Project Background, Update Process and timeline**

Dan reviewed the purpose of the All Hazard Mitigation Plan (AHMP) and the process for updating the Plan and the municipal annexes prior to August 2016 (when the current Plans will expire). Dan described some of the history of the previous plans. He further described that in thinking about the update it is best to describe strategies that are necessary but also feasible within the five year timeframe. The county-wide plan includes a detailed description of the required Plan elements, and therefore does not need to be repeated in the municipal annexes. Therefore, ultimately the municipalities need to adopt both the county wide plan and their individual annex. After today's meeting, CCRPC staff will work to create a new draft of the County-level Plan and this committee will meet at least one more time in the fall to review and approve those changes. Starting in the fall, CCRPC staff will work intensively with individual municipal staff to review and edit the municipal AHMPs

There were questions about why we need to have these Plans. They are necessary to obtain a lower municipal share requirement for FEMA emergency relief assistance declared disasters (Emergency Relief Assistance Funds - ERAF). It was also discussed that the municipal plans are now required to include a flood resiliency element and while the original intent was to use the AHMPs as the municipal plan element, statute reads that they can be used as a reference. Sharon Murray explained that the original intent was for the flood resiliency element was to be broader and not just focused on flooding. Staci Pomeroy asked when the five year timeframe will start depending on when each municipality adopts. Dan indicated that it would be easiest for everyone to adopt at nearly the same time, as was done on the last round. Ideally we will submit the second draft to FEMA before the August, 2016 deadline.

4. **Review Hazard Identification List**

The Committee reviewed and discussed the attached list of assessed hazards identified in the *2011 All Hazards Mitigation Plan*. Clare Rock asked how we will incorporate some of the hazards that come out of the local plans into the County-wide plan. Dan indicated that we will be able to circle back and incorporate them into the County plan. Sharon Murray also suggested that we look at the 2013 State Plan AHMP and include the hazards that they've identified. If one of the hazards that they identified are not an issue here then we just need to explain that in our Plan.

The additional hazards that were identified include:

High ground water levels – this was an issue in the spring lake floods as some damage occurred from water coming up through the basements. There was some discussion about a lack of data, but CCRPC will look into it.

Fluvial erosion – not all erosion problems have been caused by flooding so this should be identified on its own or at least under a more general category with inundation flooding. Jericho, Bolton and Underhill were identified as areas that have seen this problem. We have much more data on this now.

Extreme cold/frost – There was some discussion about the frozen pipes that most municipalities experienced this last winter and whether we could identify strategies to proactively address the issues. Roger Hunt explained that most of the problems were caused under the travelled roadway and one solution is to run deeper service connections and insulation.

Heat wave – It was agreed that this certainly is and may become more frequent, however it wasn't clear if we could run an assessment of it. There are notifications regarding power issues with AC when there is a heat wave. CCRPC will research it and if we come up with interesting data or strategies we will discuss it in the Fall.

Algal blooms – These are a challenge for water systems that pull from the lake. CWD's intakes are lower and are not impacted by algae, but other systems are impacted. There are also other public health issues associated with swimming, etc.

Solar flares – they are new but it is an emergency management issue b/c they can affect many things.

Other non-natural fires – those occurring as a result of crime, urban high density multi-family oriented. This can also be a challenge in more isolated communities where access to water systems is non-existent.

Fuel loss - expand gas service loss to more general fuel loss to include propane, wood, etc.

Invasive species – ash borer, zebra mussels, etc. – major challenge to public health, economic development, etc.

There was a suggestion to move radiological incident under hazardous materials incident; as well as adding pollution events as a broad category and organizing other events under it. There was a question about whether rail is included because there are a lot of challenges associated with the material that is transported via rail. This is included in the current plan and will be included in the update. Finally, there was discussion around terrorism and crime and whether they should be combined or categorized separately. We used the definition of terrorism that the State used in the last Plan and will do so again this time.

BREAK – Note: a reporter from WPTZ joined the meeting at this time.

5. **Review Risk Estimation discussion and scoring matrix**

The Committee reviewed and discussed the 2011 Plan's scoring system (attached) that uses various criteria to estimate the risk for each of the identified hazards and prioritize hazards for mitigation. Clare asked how we would rate how a municipality can handle the particular issue – essentially how equipped they are and their ability to respond. There was discussion about how and where to incorporate this into the Plan. Dan also noted that to some extent the ability of a municipality to respond to the relative effects and impacts of hazard is captured in the various scores. The intent of this Plan is to identify hazards and figure out where we are weak and how to improve on it and it may make sense to evaluate the risk first and foremost without consideration on how you would mitigate it. Dan explained organization of the Plan and how some of this will come at the end when we figure out how we deal with these issues. Though the inability of a municipality to address a hazard could be a hazard in and of itself. It was determined that there should be a three step process: identify the high hazards, then do a vulnerability assessment and then figure out strategies on how to address/deal with the hazards.

Other comments/discussion included:

Where would we account for loss of crops – under economic would probably make the most sense.

How do we deal with acute v. chronic losses – this is a great question and the Committee wasn't sure how to address this but CCRPC will put some thought into this.

The health & safety ratings seem low for technological hazards – particularly with the aging population that we have.

Paul questioned whether telecommunication risk really the highest occurrence over the others? The Committee will revisit this issue.

Societal – The opiate issue was raised; and there was a question about whether an epidemic is really a larger economic issue than economic recession. Should crime go up to 5, and/or epidemic regarding opiate use? We will re-visit this issue.

6. **Review Mitigation Strategies** (attachment)

The Committee reviewed and discussed the 2011 Plan's Mitigation Strategies (attached) with the following questions in mind:

- a. Should each of these strategies should still be a priority for the region?
- b. Which strategies should be modified to reflect progress or new developments?
- c. Should any new strategies should be included as priorities for the region?

Mitigation primarily happens at the local level, so these strategies are the broad regional strategies. Suggestions/discussion included:

The resource preparedness guide is a useful resource and should be updated. This information can be gathered from the LEOP's.

Broaden the police and dispatch services study to other emergency services (combined salt purchasing is an example as this is a need for emergency services). It was also suggested that this be called "sharing" services rather than "regionalizing".

Identify and include other organizations/agencies (i.e. Howard Center, etc.) that should be included/incorporated into continued efforts and new strategies.

Clarify strategy the stormwater assessments under #3 to be clear that we are only talking about municipal roads, and not everything that the sw utilities now take on because we aren't going to be able to analyze all of those in the next 5 years. Though it was noted that some of the undersized ponds on private property can be a real problem.

Next steps from the Climate Action Plan and the various project identified in the numerous fluvial erosion hazard studies will be included.

The tool for landslide assessment exists and some maps were done in select towns in the County.

It was suggested that rail not be dropped from the list as this has only been more of an issue nationally, not less of one.

There was some discussion regarding the shelter-in-place workshops and whether this is happening or needed. The Red Cross may be doing some of this work. CCRPC will research this further.

There was a suggestion for CCRPC to help groups of municipalities get CRS certification.

7. **Next Steps**

This was not discussed, but the following steps were included on the agenda for the *2016 Plan* update:

- a. Do we maintain college appendices (UVM, Champlain College and St. Michaels College)
- b. Agency review of draft *2016 Plan*
- c. *2016 Plan* adoption process: review by municipalities, VDEMHS and FEMA

Adjourn – the meeting was adjourned at approximately 4:40pm.

Excerpt from 2011 Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan:

6.3 Updating the Chittenden County Multi-Jurisdictional All Hazards Mitigation Plan and Municipal Annexes

FEMA regulations require that the All Hazards Mitigation Plan be updated, adopted and approved every five years in order for jurisdictions to maintain eligibility for pre-disaster mitigation funding. This five-year update cycle helps ensure that the plan remains current and relevant.

CCRPC anticipates that the following plan update procedure will be followed:

1. CCRPC will seek pre-disaster mitigation grant or other grants to fund the plan update.
2. CCRPC will convene an All-Hazards Mitigation Plan Update Committee. Representatives appointed by each municipality's governing body, one or more representatives appointed by LEPC #1, one or more commissioner representatives of CCRPC, and ex-officio officials from VEM and Vermont ANR will be invited to serve on the committee.
3. The Plan Update Committee will review the annual summary monitoring and evaluation reports. The Committee will also review the Plan's identified hazards, the hazard evaluation process, and the multi-jurisdictional mitigation strategies to determine whether they are still appropriate, or whether modifications or additions are needed based on current knowledge and conditions.
4. Based on Committee input, CCRPC staff will update relevant data in the Plan and prepare a draft Plan update. CCRPC will convene a second meeting of the Review/Update committee to review the draft Plan update. The Committee will reach consensus on changes to the draft Plan update and the format of the municipal annexes. In the event no consensus is reached, a vote by a simple majority of the Committee voting members present will decide.
5. CCRPC will incorporate the changes as recommended by the Committee and then work with municipal staff and officials to update their individual annexes to accurately reflect the municipality's current hazard mitigation concerns and recommended municipal goals and actions.
6. CCRPC will schedule a public presentation to each municipal governing body in order to formally present the draft update of the Multi-Jurisdictional Plan and to the municipal annex. Each governing body may provide, if it chooses, recommendations for further changes to the updated Multi-Jurisdictional Plan and to its individual annex.
7. The public may observe the presentations and provide comments, if desired, on the Multi-Jurisdictional Plan and the individual municipal annexes. The draft updated plans will be posted on the CCRPC website for public review and comment.
8. CCRPC staff will incorporate the public and municipal comments into the Multi-Jurisdictional Plan and the individual municipal annexes.

9. CCRPC may submit the Multi-Jurisdictional Plan and municipal annexes to FEMA Region I for approval pending adoption.
10. CCRPC staff will finalize the changes to the Multi-Jurisdictional Plan and the annexes and distribute these to CCRPC, LEPC #1, and municipal governing bodies for consideration of a resolution of re-adoption. Upon adoption by CCRPC, LEPC#1 and within three months of the time that the CCRPC has finished presentations to all of the municipal governing bodies, CCRPC will submit the updated Plan to FEMA Region I along with copies of the annexes adopted to date.

A municipality may choose not to re-adopt the updated Multi-Jurisdictional Plan and its respective local annex, recognizing that they may no longer use the updated Plan and annex to be eligible for FEMA hazard mitigation grants. A municipality may choose to develop, adopt and submit its own Local All-Hazards Mitigation Plan to FEMA Region I, consistent with the requirements of the *Disaster Mitigation Act of 2000* and regulations contained in 44CFR201 & 206 in order to maintain eligibility.

6.4 Incorporation into Existing Planning Mechanisms

The All-Hazards Mitigation Plan was used as a source when updating the Chittenden County Regional Plan in 2006. The 2006 Regional Plan contained a new Public Safety chapter, the text and stated goals of which relied heavily on the All-Hazards Mitigation Plan.

The mitigation strategies contained in this Plan can be incorporated into CCRPC's future planning mechanisms in two primary ways:

The Chittenden County Regional Plan – CCRPC's process for updating the *Chittenden County Regional Plan* will consider and incorporate as appropriate the data, analyses and mitigation strategies of this All Hazards Mitigation Plan.

The CCRPC annual Work Program – CCRPC will consider and incorporate mitigation strategies and actions into its annual Work Program, contingent on sufficient resources being available.

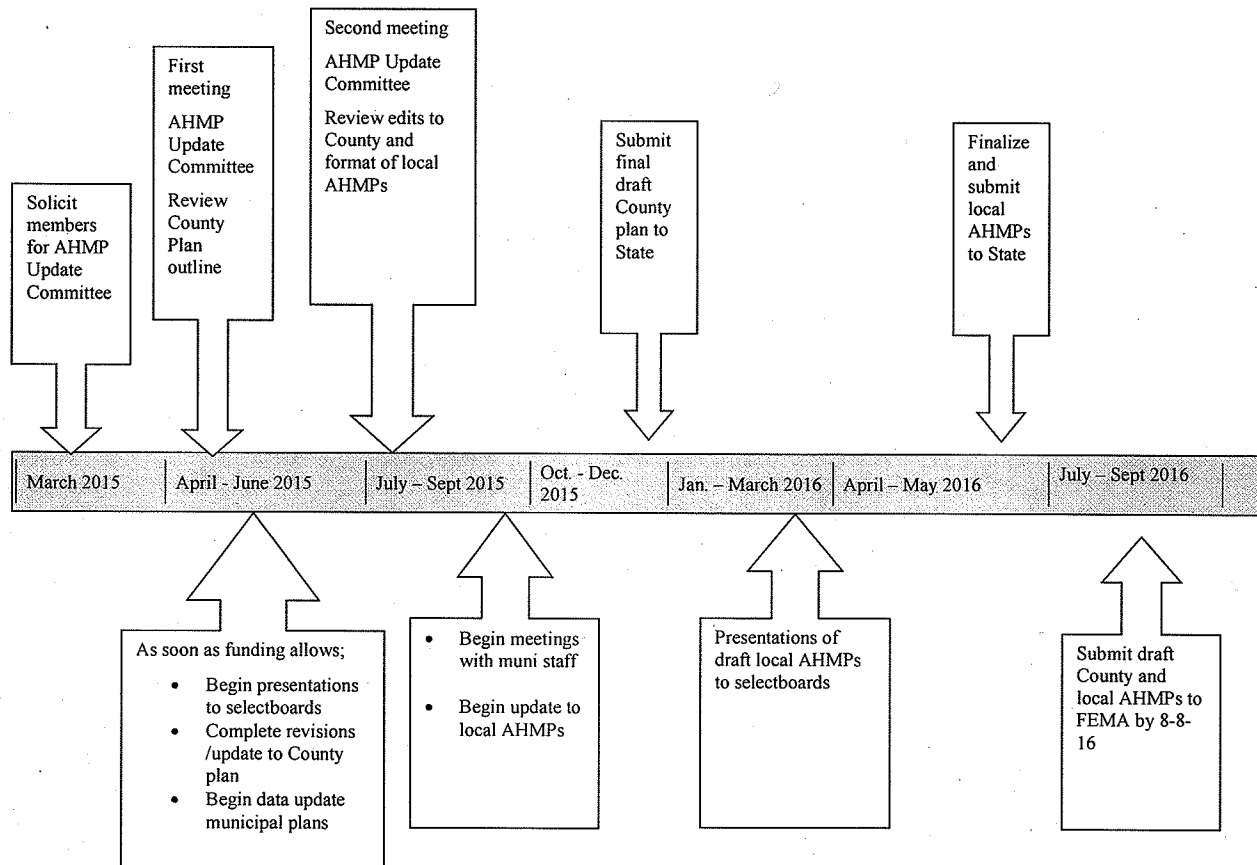
Opportunities exist for municipalities and other entities to incorporate this Plan's mitigation strategies into their own planning mechanisms, including but not limited to:

- Municipal comprehensive plans
- Municipal capital budgets
- Municipal zoning bylaws and subdivision regulations
- Municipal permitting processes (e.g., zoning permits, subdivision approvals, site plan reviews, road access permits, etc)
- Redevelopment plans
- Transportation improvement programs
- Open space preservation programs
- Mutual aid agreements

Some of the mitigation strategies in this Multi-jurisdictional All Hazards Mitigation Plan and the municipal annexes specifically identify actions to incorporate mitigation strategies into other

planning mechanisms. Other opportunities may become apparent when the strategies are implemented. The ability of municipalities and other entities to incorporate this Plan's mitigation strategies into other planning mechanisms is contingent on adequate funding and staffing resources.

Timeline: Updating the All-Hazards Mitigation Plans (AHMPs) Multi-Jurisdictional (County) and Municipal Annexes (local plans)



2011 All-Hazards Mitigation Plan: hazards assessed for risk estimation

Natural

- Drought
- Flooding
- High Winds
- Landslide
- Lightning
- Multi-structure Urban Fire
- Wildfire
- Winter Storm
- Radiological (Natural)

Technological

- Gas Service Loss
- Hazardous Materials Incident
- Power Loss
- Radiological Incident
- Sewer Service Loss
- Telecommunications Failure
- Water Service Loss
- Major Transportation Incident
- Military Ordnance Incident

Societal

- Crime
- Civil Disturbance
- Terrorism
- Epidemic
- Economic Recession
- Key Employer Loss

Other hazards discussed in report but not included in risk estimation matrix:

- Earthquake
- Tornadoes and Hurricanes
- Hail
- Climate Change
- Ice Jams
- High Hazard Dams
- Inundations, Floodplains, and the NFIP
- Fluvial Erosion
- Pollution Event
- Several categories of Hazardous Substances hazards
- Several categories of Transportation Incident
- Food Supply Crisis

Each town has had a declared disaster; however, analysis of this table reveals some interesting differences between different areas of the County. The four non-lakeshore floods from 1990 through 1996 primarily affected the more upland municipalities, the gravel and dirt roads of which were vulnerable to washout. The unique flooding in July of 1998, caused by a rare combination of heavy summer rains falling on ground still saturated from the January ice storm and subsequent snowfall, affected both metropolitan and rural communities. Excluding the two somewhat anomalous events of the lakeshore flooding of 1993 (caused by a confluence of extremely high lake levels and strong onshore winds) and the July 1998 flooding (aggravated by saturated soil from the January Ice Storm), the urban and suburban communities of the county with their paved roads, lack of significant hills or small mountains and more developed stormwater systems, suffer flood damages less often and less severely. The lowland distribution of the 1998 Ice Storm is evident. Municipalities in the hills and mountains of the county had temperatures below the freezing point during that event.

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 Estimation analysis, which was subsequently reviewed and revised by the Plan Review/Update Committee in 2009. 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:

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

Consequences consist 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.

3.4.1 Future Natural Hazard Events

According to the updated Hazard Risk Estimation analysis (*Table 3-2*) the following natural hazards received the highest risk ratings out of a possible high score of 80 and are considered significant and worth mitigating against.

- Severe Winter Storm (45)
- Flooding (32)
- Fluvial Erosion (24)
- Multi-Structure Urban Fire (16)

Previous FEMA disaster relief funds were used both to address Severe Winter Storm and Flooding Events, which occurred at least once in every municipality. The *2005 All Hazard Mitigation Plan* combined Fluvial Erosion with Landslides. Based on increased awareness of fluvial erosion and the consequences of erosion damage to roads or bridges, fluvial erosion is now being addressed separately. The potential damage from a major urban or multi-structure fire is relatively high in certain municipalities given the aging housing stock in the area and the lack of adequate building inspection.

Table 3-2 Natural hazard risk estimation matrix

	Drought	Flooding	High Winds	Landslide	Fluvial Erosion	Lightning	Multi-Structure Urban Fire	Wildfire	Winter Storm	Radiological (Nuclear)
Area Impacted Key: 0 = No developed area impacted 1 = Less than 25% of developed area impacted 2 = Less than 50% of developed area impacted 3 = Less than 75% of developed area impacted 4 = Over 75% of developed area impacted	0	1	1	0	1	1	1	0	4	1
Consequences										
Health & Safety Consequences Key: 0 = No health and safety impact 1 = Few injuries or illnesses 2 = Few fatalities or illnesses 3 = Numerous Fatalities	0	1	0	0	1	1	1	0	1	1
Property Damage Key: 0 = No property damage 1 = Few properties destroyed or damaged 2 = Few destroyed but many damaged 2 = Few damaged and many destroyed 3 = Many properties destroyed and damaged	1	2	1	1	2	1	1	1	1	0
Environmental Damage Key: 0 = Little or no environmental damage 1 = Resources damaged with short-term recovery 2 = Resources damaged with long-term recovery 3 = Resources destroyed beyond recovery	0	2	0	1	1	0	0	1	1	0
Economic Disruption Key: 0 = No economic impact 1 = Low direct and/or indirect costs 2 = High direct and low indirect costs 2 = Low direct and high indirect costs 3 = High direct and high indirect costs	1	2	1	1	1	0	1	0	2	1
Sum of Area & Consequences Scores	2	8	3	3	6	3	4	2	9	3
Probability of Occurrence Key: 1 = Unknown but rare occurrence 2 = Unknown but anticipate an occurrence 3 = 100 years or less occurrence 4 = 25 years or less occurrence 5 = Once a year or more occurrence	4	4	5	4	4	4	4	3	5	4
TOTAL RISK RATING Total Risk Rating = Sum of Area & Consequences Scores x Probability of Occurrence	8	32	15	12	24	12	16	6	45	12

3.4.2 Future Technological Hazard Events

According to the updated Hazard Risk Estimation analysis (Table 3-3), the following technological hazards received the highest risk ratings out of a possible high score of 80 and are considered significant and worth mitigating against.

- Telecommunications Failure (30)
- Power Loss (28)
- Major Transportation Incident (28)

As discussed in Section 1, large portions of Chittenden County are urban or suburban in nature, and much of its population is dependent upon municipal services such as water, sewer, electricity and gas. Losses of these services could therefore deprive many individuals, including vulnerable populations such as the elderly, of basic human needs.

CCRPC has had limited success in identifying “trouble spots” that have repeated occurrences of service outages or downed lines. VT Department of Public Service requires electric companies to report outage data (day, time, duration, general street location and determined cause. However, an exact location (i.e., near which exact utility pole) is not provided. Therefore, at this time, CCRPC cannot detail the geographic area with repeated service losses nor provide any detailed information on the likely frequency of future events.

Small scale transportation incidents—accidents involving a small number of vehicles—occur with relative frequency in Chittenden County, and can result in fatalities. However, the transportation incident rating in the risk estimation matrix concerns rarer, large-scale events. These could include an airline crash, an incident with a passenger ferry or large boat, a rail incident, a roadway accident involving a large number of vehicles, or major road infrastructure failure. Although the potential impacts are high, the rarity of such transportation events makes it difficult to identify specific geographic areas where such large transportation accidents are likely to occur.

Table 3-3 Technological hazard risk estimation matrix

	Gas Service Loss	Hazardous Materials Incident	Power Loss	Radiological Incident	Sewer Service Loss	Telecommunications Failure	Water Service Loss	Major Transportation Incident	Military Ordnance Incident
Area Impacted Key: 0 = No developed area impacted 1 = Less than 25% of developed area impacted 2 = Less than 50% of developed area impacted 3 = Less than 75% of developed area impacted 4 = Over 75% of developed area impacted	1	1	4	2	2	4	3	1	1
Consequences									
Health & Safety Consequences Key: 0 = No health and safety impact 1 = Few injuries or illnesses 2 = Few fatalities or illnesses 3 = Numerous Fatalities	1	1	1	2	1	1	1	2	1
Property Damage Key: 0 = No property damage 1 = Few properties destroyed or damaged 2 = Few destroyed but many damaged 3 = Few damaged and many destroyed 4 = Many properties destroyed and damaged	1	1	1	2	0	0	0	1	1
Environmental Damage Key: 0 = Little or no environmental damage 1 = Resources damaged with short-term recovery 2 = Resources damaged with long-term recovery 3 = Resources destroyed beyond recovery	0	2	0	3	0	0	0	1	1
Economic Disruption Key: 0 = No economic impact 1 = Low direct and/or indirect costs 2 = High direct and low indirect costs 2 = Low direct and high indirect costs 3 = High direct and high indirect costs	1	1	1	3	1	1	1	2	2
Sum of Area & Consequences Scores	4	6	7	12	4	6	5	7	6
Probability of Occurrence Key: 1 = Unknown but rare occurrence 2 = Unknown but anticipate an occurrence 3 = 100 years or less occurrence 4 = 25 years or less occurrence 5 = Once a year or more occurrence	3	1	4	1	2	5	3	4	2
TOTAL RISK RATING Total Risk Rating = Sum of Area & Consequences Scores x Probability of Occurrence	12	6	28	12	8	30	15	28	12

3.4.3 Future Societal Hazard Events

According to the Hazard Risk Estimation analysis (Table 3-4), the following societal hazards received the highest risk ratings out of a possible high score of 80 and are considered significant and worth mitigating against:

- Epidemic (21)

- Crime (16)
- Civil Disturbance (16)

For the most part, the risk of Societal Hazards is less than that of Natural and Technological Hazards. The exception to this is the risk of an epidemic. While epidemics are rare, they do have the potential of mass casualties and significant economic disruption over a wide area. Appropriately, efforts have been made in recent years on the county and municipal levels to mitigate the hazards associated with an epidemic, though most pandemic mitigation still takes place at the state or federal level. The recent swine flu pandemic raised public awareness of epidemics, even though few cases were reported in Vermont.

Table 3-4 Societal hazard risk estimation matrix

	Crime	Civil Disturbance	Terrorism	Epidemic	Economic Recession	Key Employer Loss
Area Impacted Key: 0 = No developed area impacted 1 = Less than 25% of developed area impacted 2 = Less than 50% of developed area impacted 3 = Less than 75% of developed area impacted 4 = Over 75% of developed area impacted	1	1	1	2	1	1
Consequences						
Health & Safety Consequences Key: 0 = No health and safety impact 1 = Few injuries or illnesses 2 = Few fatalities or illnesses 3 = Numerous Fatalities	1	1	1	2	0	0
Property Damage Key: 0 = No property damage 1 = Few properties destroyed or damaged 2 = Few destroyed but many damaged 3 = Few damaged and many destroyed 4 = Many properties destroyed and damaged	1	1	1	0	0	0
Environmental Damage Key: 0 = Little or no environmental damage 1 = Resources damaged with short-term recovery 2 = Resources damaged with long-term recovery 3 = Resources destroyed beyond recovery	0	0	0	0	0	0
Economic Disruption Key: 0 = No economic impact 1 = Low direct and/or indirect costs 2 = High direct and low indirect costs 2 = Low direct and high indirect costs 3 = High direct and high indirect costs	1	1	2	3	2	2
Sum of Area & Consequences Scores	4	4	5	7	3	3
Probability of Occurrence Key: 1 = Unknown but rare occurrence 2 = Unknown but anticipate an occurrence 3 = 100 years or less occurrence 4 = 25 years or less occurrence 5 = Once a year or more occurrence	4	4	3	3	4	4
TOTAL RISK RATING Total Risk Rating = Sum of Area & Consequences Scores x Probability of Occurrence	16	16	15	21	12	12

3.4.4 Summary of Future Hazard Events

Based on this risk estimation analysis, the highest rated hazards for Chittenden County are:

- Severe Winter Storm (45)
- Flooding (32)

- Telecommunications Failure (30)
- Power Loss (28)
- Major Transportation Incident (28)
- Fluvial Erosion (24)
- Epidemic (21)

It should be noted that the top natural hazard on the list—severe winter storm—could be the cause of two of the highest-rated technological hazards, telecommunications failure and power loss. The current swine flu pandemic has not significantly affected Chittenden County but has raised local awareness of the potential risks of an epidemic. This partially accounts for epidemic being the highest ranking social hazard.

Table 3-5 shows the distribution of significant hazards for each municipality. This table represents the subjective opinion of officials from each municipality, either based on direct municipal input or on the highest-rated hazards from the municipal annex. As a result, this assessment of relative risk and/or significance is not consistent from community to community. However, the table does illustrate which issues are of most importance to each municipality.

Table 3-5 Significant hazards, by municipality, Chittenden County, Vermont.

	BOLTON	BUEL'S GORE	BURLINGTON	CHARLOTTE	COLCHESTER	ESSEX / ESSEX JUNCTN.	HINESBURG	HUNTINGTON	JERICHO	MILTON	RICHMOND	ST. GEORGE	SHELBURNE	SOUTH BURLINGTON	UNDERHILL	WESTFORD	WILLISTON	WINOOSKI
Natural Hazards																		
Drought																		
Flooding	x	x		x	x	x	x	x	x	x	x		x	x	x	x	x	x
High Winds		x	x	x	x					x								
Landslide																		
Fluvial Erosion			x	x				x		x	x							
Lightning																		
Multi-Structure Urban Fire			x			x						x	x	x				
Major Wildfire		x																
Winter Storm	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Radiation (Natural)					x					x								
Technological Hazards																		
Gas Service Loss			x										x	x				x
Hazardous Materials			x			x							x		x		x	
Power loss	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Radiological Incident																		
Sewer Service Loss			x										x				x	x
Telecommunications failure	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Major Transportation Incident	x		x	x		x				x	x		x	x			x	x
Water Service Loss			x			x	x						x	x			x	x
Societal Hazards																		
Crime			x		x													
Civil Disturbance			x															
Epidemic / Mass Casualty	x		x	x	x		x	x	x	x	x	x	x	x	x	x	x	x
Terrorism			x											x				
Economic Recession			x	x	x		x	x			x		x	x	x	x	x	x
Key Employer Loss	x		x			x											x	

It is important to remember that the significance of a hazard is a function of its frequency and the amount of damage it might cause. Some hazards, such as drought, can occur every few years in the county, but effects are usually limited to farmers and a few individual homeowners being without well water because of a temporary low water table. A major urban fire encompassing several structures is not a common event but has the potential to cause serious damage.

Excerpt from 2011 Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan:

6.5 Implementation and Monitoring of Mitigation Strategies

The following table will aid responsible entities in implementing the mitigation actions for Chittenden County, and facilitate annual monitoring of the plan.

Table 6-1 Chittenden County Multi-Jurisdictional All-Hazards Mitigation Plan Implementation Matrix

Mitigation Strategy	AHMP Page #	Primary Responsible Entity	Task	Brief Description	Progress (Initial staff comments, March 31, 2015)
#1 Develop mechanisms and plans for coordination and cooperation between municipal, non-profit and private emergency service providers.	79	LEPC #1, CCRPC	Basic EOP Preparation/Update Workshops	Sponsor workshops to help municipalities prepare and update their Basic Emergency Operation Plan.	CCRPC assists towns to update in updating their Local Emergency Operations Plan every spring.
	79	LEPC #1	LEPC #1 Resource Preparedness Guide	Update the resource guide for emergency responders dealing with hazardous materials.	
	79	CCRPC, VLCT, municipalities	Regional Police and Dispatch Services Study	Study feasibility of regional policing and dispatching for Chittenden County.	CCRPC staff have had informal discussions with municipalities regarding regional policing
	80	LEPC #1, CCRPC	Continued Efforts and New Strategies	Continue to develop and enhance domestic preparedness and emergency planning in Chittenden County.	CCRPC has a formal MOU with VT DEMHS to assist in staffing of State EOC and now regularly collects data on damages in towns during hazards events to forward to VTDEMHS.
	81	VT ANR, CCRPC	Fluvial Geomorphic Assessments	Continue Phase I and Phase II fluvial geomorphic assessments on streams and waterways in Chittenden County.	Completed.
#2 Complete fluvial geomorphology assessments and develop strategies in response to identified risk.	82	VT ANR, CCRPC	Fluvial Erosion Hazard Mapping	Rate the fluvial erosion hazard for each assessed reach and develop a fluvial erosion hazard map for the waterway using SGAT. Create map of all assessed reaches. Submit to VT ANR for QA/QC.	Completed
	82	TBD, determined by funding.	River Corridor Management Plans	Where Phase I and II assessments are complete, develop a river corridor management plan.	River Corridor Plans and/or reach-by-reach project ideas have been developed for numerous streams throughout the County.
	82	Municipalities (see annex for specific responsible entity)	Fluvial Erosion Hazard Mitigation Implementation	Develop strategies to mitigate losses from identified fluvial erosion hazards.	Municipalities are incorporating discussions of FEH and Flood Resiliency in their comprehensive plans and working to formally address FEH and River Corridor Protections in their bylaws.

Agenda #6

Mitigation Strategy	AHMP Page #	Primary Responsible Entity	Task	Brief Description	Progress (Initial staff comments, March 31, 2015)
#2, continued.	82	CCRPC, VT ANR	Flood Insurance Map Updates	Assist ANR in conducting outreach to municipalities on the Draft FIRM data, solicit input to the final revisions, and provide assistance to municipalities in updating floodplain regulations and zoning bylaws.	Completed
#3 Evaluate capabilities of existing road and stormwater infrastructure	83	VT ANR, VTrans, CCRPC, CCMP	Infrastructure Assessment for Stormwater Vulnerability	Assess the vulnerability and operational capability of municipal-owned roads, culverts and other stormwater infrastructure in areas with recurring stormwater and snowmelt problems.	CCRPC is working on an analysis tool to collate information from various data sources to facilitate prioritization of repair and/or replacement of infrastructure.
	84	VT ANR, VTrans, CCRPC, CCMP	Infrastructure Assessment for Fluvial Erosion/Landslide Vulnerability	Assess the vulnerability and operational capability of municipal-owned roads, culverts, bridges and other infrastructure to fluvial erosion and landslide events.	CCRPC is working on an analysis tool to collate information from various data sources to facilitate prioritization of repair and/or replacement of infrastructure.
#4 Develop a regional climate action guide with goals and strategies to help reduce energy consumption, reduce greenhouse gas emissions and mitigate climate change.	84	CCMP; CCRPC	Energy and Climate Action Guide	Research and develop an Energy and Climate Action Guide for Chittenden County and its municipalities.	Completed
#5 Complete landslide hazard assessments and develop strategies in response to identified risks.	85	VGS, CCRPC	Landslide Hazard Assessment Protocol	Develop a landslide hazard protocol to evaluate county slopes and waterways.	Completed by Vermont Geological Survey with CCRPC as partner. Protocol development testing included the towns of Essex, South Burlington, Colchester, Bolton and Shelburne.
	85	CCRPC, VGS	Landslide Hazard Assessment and Mapping	Assess landslide hazards and prepare landslide hazard maps.	Other than the mapping described in the previous row, no funding has been secured to prepare additional maps.
	85	Municipalities (see annex for specific responsible entity)	Landslide Hazard Mitigation Implementation	Develop strategies to mitigate losses from identified landslide hazards.	No action taken to date. For the towns identified above, the 2016 updates to their individual AHMPs will include such strategies.

Mitigation Strategy	AHMP Page #	Primary Responsible Entity	Task	Brief Description	Progress (Initial staff comments, March 31, 2015)
#6 Identify data gaps that affect all-hazards mitigation planning and develop multi-0partner research projects to address identified data needs.	87	LEPC #1	Hazardous Materials Transportation	Identify recent studies and current state databases to help identify hazardous materials transport and transportation-related hazardous materials incidents.	
	87	CCRPC, LEPC #1	Hazard Mitigation Planning by Other Entities	Identify hazard mitigation planning being done by other entities in Chittenden County.	Staff will utilize CCRPC connections forged during its ECOS Plan development to see what other entities are doing.
	87	CCRPC, LEPC #1	Identify Unmet Mitigation Data Needs	Determine emergency organizations' and municipalities' data needs for hazard mitigation planning.	No formal action to date.
	87	CCRPC, LEPC #1	Determine Data Development Feasibility	Determine which data gaps are feasible to fill given time and financial constraints.	No formal action to date.
	87	CCRPC, LEPC #1	Data Development	Identify partners for data development process. Plan projects to address data needs. Seek funding for research projects.	No formal action to date.
#7 Develop multi-partner public communications, outreach and education projects to improve the capacity of the general public and private sector to mitigate the effects of and endure hazards.	88	LEPC #1, CCRPC	Shelter-in-Place Workshops	Develop and conduct Shelter-in-Place information workshops for schools, businesses, early childhood education centers and nursing homes.	
	89	LEPC #1, VT 2-1-1	Coordination with Vermont 2-1-1	Strengthen coordination and partnerships with Vermont 2-1-1, in order to better communicate information to the public in an emergency.	
	89	LEPC #1, CCRPC	Communications, Outreach & Education	Identify and implement projects to coordinate communications, outreach and education for emergency management and hazard mitigation.	