

The Town of Williamsburg

Local Natural Hazards Mitigation Plan

Adopted by the Williamsburg Board of Selectmen on 

Prepared by:

The Williamsburg Natural Hazards Mitigation Planning Committee

and

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1: INTRODUCTION

Hazard Mitigation

The Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA) define Hazard Mitigation as any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazards such as flooding, storms, high winds, hurricanes, wildfires, earthquakes, etc. Mitigation efforts undertaken by communities will help to minimize damages to buildings and infrastructure, such as water supplies, sewers, and utility transmission lines, as well as natural, cultural and historic resources.

Planning efforts, like the one undertaken by the Town of Williamsburg and the Pioneer Valley Planning Commission, make mitigation a proactive process. Pre-disaster planning emphasizes actions that can be taken before a natural disaster occurs. Future property damage and loss of life can be reduced or prevented by a mitigation program that addresses the unique geography, demography, economy, and land use of a community within the context of each of the specific potential natural hazards that may threaten a community.

Preparing a local natural hazard mitigation plan before a disaster occurs can save the community money and facilitate post-disaster funding. Costly repairs or replacement of buildings and infrastructure, as well as the high cost of providing emergency services and rescue/recovery operations, can be avoided or significantly lessened if a community implements the mitigation measures detailed in the plan. FEMA requires that a community adopt a pre-disaster mitigation plan as a condition for mitigation funding. For example, the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance Program (FMA), and the Pre-Disaster Mitigation Program are programs with this requirement.

Planning Process

The natural hazard mitigation planning process for the Town of Williamsburg included the following tasks:

- Identifying the natural hazards that may impact the community.
- Conducting a Vulnerability/Risk Assessment to identify the infrastructure at the highest risk for being damaged by the identified natural hazards, particularly flooding.
- Identifying and assessing the policies, programs, and regulations a community is currently implementing to protect against future disaster damages.
- Identifying deficiencies in the current strategies and establishing goals for updating, revising or adopting new strategies.
- Adopting and implementing the final Local Natural Hazards Mitigation Plan.

The key product of this process is the development of an Action Plan with a Prioritized Implementation Schedule.

Public Committee Meetings

11/30/09, 1 pm: Informational and organizational meeting with EMD held at Williamsburg Town Offices.

12/18/09, 10:30 am: Working committee meeting held at Town Offices.

12/28/09, 10:30 am: Working committee meeting held at Town Offices.

A mailing was made to each committee member prior to each meeting that contained information from the previous meeting, an agenda sheet, and information to be covered. All meetings were posted per Massachusetts open meetings law and the public was invited to attend.

Public Meetings

In 2005 the Town of Williamsburg agreed to collaborate with the Pioneer Valley Planning Commission to develop a local Hazard Mitigation plan and participate in the development of a regional Hazard Mitigation plan. Because PVPC is facilitating development of 32 local plans, it is not until 2009 that Williamsburg's plan was finalized.

2010: The Select Board adopted the Local Natural Hazard Mitigation Plan. Meeting held at Williamsburg Town Offices.

Public and Neighboring Jurisdiction Involvement in the Planning Process

From 2007-2009 the Pioneer Valley Planning Commission sent a series of press releases to all area media outlets to inform private citizens that the planning process for development of local Hazard Mitigation plans in the Pioneer Valley had commenced and that all residents of Williamsburg were invited to attend plan development sessions.

In addition to media outreach, all public meetings were posted at the Williamsburg Town Hall (Appendix G) in compliance with the Commonwealth of Massachusetts' open meeting law.

In the initial stages of the process for developing this mitigation plan, the Pioneer Valley Planning Commission conducted a series of outreach efforts to make the public aware of the scope of the region's mitigation activities. In October of 2005, the Planning Commission notified all Select Boards and Chief Elected Officials that their community could participate in the region's mitigation planning process. Again, on April 4, 2006, the Planning Commission mailed a notice of planning activities to all Chief Elected Officials and Select Boards in the Pioneer Valley. Both mailings explained the purpose of mitigation planning and invited communities to participate in either Round I or Round II of the region's mitigation planning process.

On 10/26/09 the Pioneer Valley Planning Commission sent a press release (see Appendix E) to all area media outlets to inform the public that a draft of Williamsburg's Hazard Mitigation Plan had had been placed on PVPC's and Williamsburg's websites and hard copies were available at PVPC's offices and Williamsburg Town Hall and that all residents, businesses and other concerned parties of Williamsburg and adjacent communities were encouraged to comment on the plan. The plan was made available in this manner for 30 days. Citizens from adjacent municipalities were also encouraged to comment on Williamsburg's plan.

Additionally, the Western Region Homeland Security Advisory Council (WRHSAC) and the Regional Emergency Planning Committees of western Massachusetts have been kept informed of the Hazard Mitigation planning process underway in western Massachusetts since 2005. The WRHSAC includes representatives of all emergency disciplines who are charged with bringing the information they learn at the meetings back to their colleagues. In this way, emergency response professionals, Fire Fighters, Police, Ambulance, municipal officials, dispatch, transit and EMS from all of western Massachusetts have been educated about hazard mitigation planning in the region and have been specifically encouraged to review and comment on neighboring jurisdictions plans.

2: LOCAL PROFILE

Community Setting

Williamsburg is a small, historic town of approximately 2,400 inhabitants. The Town is nestled in the foothills of the Berkshires of Western Massachusetts, immediately northwest of Northampton. Other neighboring towns include Hatfield, Whately, Conway, Goshen, Chesterfield and Westhampton.

Regionally, Williamsburg lies between the larger communities and college towns in the Connecticut valley and the Berkshire Hilltowns. As a result, Williamsburg is attractive to residents for both its convenience to larger communities and its small-town, rural atmosphere and abundant natural resources.

The earliest settlements in town were located on high ground. By the mid-nineteenth century, four water-powered industrial villages had grown up on the banks of the Mill River: Haydenville, Skinnerville, Williamsburg and Searsville. The river's steep drop and dependable flow eventually helped make the town a significant manufacturing center.

In 1874 a large dam high on the East Branch of the Mill River suddenly collapsed. In one of the most significant industrial disasters of the era, a twenty-foot wall of water roared through the three lower villages, devastating dozens of homes and nearly all of Williamsburg's industries. In an hour the economic heart of the Town was wiped out, and well over a hundred lives were lost. The direction of the Town's growth was profoundly and permanently changed.

In the first half of the 20th century most of the factories prevalent in Town during the 19th century disappeared. Some of the workers left Town, and Williamsburg became once more dependent on farming for much of its economic vitality. Many people who were not fully involved in these land-based occupations began commuting out of town to work. This trend continues today, with Williamsburg becoming attractive to residential development.

Infrastructure

Williamsburg's infrastructure reflects its history, small population, and terrain.

Roads and Highways

Williamsburg is just west of Interstate 91. This proximity enables residents of Williamsburg to travel easily to the major population centers in the Connecticut River valley including Springfield and Hartford, CT for work and leisure.

In addition to Interstate 91, Williamsburg's other key routes include Route 9, or Main Street, which runs in a northwest-southeast direction through town and defines the

Town's two village centers. Mountain Street, traveling north into Hatfield, and Chesterfield Road, branching off Route 9 to the west, are other key transportation veins.

There are a total of 50.2 miles of roads in Town, 41.7 of which are Town roads. Six to seven miles of Town roads are unpaved gravel roads. All Town roads have been designated Scenic Roads under Mass. General Laws, Ch. 40, Sec. 15-c, by vote of Town Meeting.

Rail

None

Public Water and Sewer Service

Williamsburg's public water supply system draws very high quality water from a gravel-packed well located in the 1,375-acre drainage basin of Unquomok Brook. The town is fortunate in that the whole drainage basin lies within the town's boundaries and its protection is thus entirely under local control. The public water supply system serves roughly half the dwelling units in town: those along South Street, in and near the village centers, along Route 9 between the villages, and along Fort Hill Road.

Residents in outlying areas are served by private wells. No local regulations govern the location, construction or periodic testing of private wells, and no centralized records are kept of them.

There is a public sewer system, and the community has excellent regulations in place to protect the public water supply.

Natural Resources

Covering 16,378 acres (25.57 square miles) in an L-shaped configuration, the town's boundaries do not follow any natural features such as watercourses or ridges. The two village centers of Haydenville and Williamsburg lie two miles apart along Route 9, with less densely settled land between and surrounding them.

Williamsburg has been significantly shaped by its natural resources, originally growing up along the banks of the Mill River, establishing an agricultural base, and more recently, protecting its scenic resources.

Water Resources

The Mill River and its various tributaries was and remains probably the single most critical natural feature in identifying what Williamsburg was and what it will be. The vast majority of Town land drains into the Mill River. Key tributaries include Bradford Brook (East Branch of Mill River), Rogers or Devil's Den Brook (West Branch of Mill River), Meekins Brook, Joe Wright Brook, Unquomok Brook, and Beaver Brook, in addition to several unnamed streams and brooks.

Williamsburg has no substantial bodies of open water except Northampton's Mountain Street Reservoir. The upper Unquomok Reservoir, at about five or six acres, comes in a

distant second in area. Approximately 800 acres of wetlands are scattered widely across the town, with the largest occurring in the valley of Beaver, Nungee and Grass Hill Brooks along Mountain Street. Additionally, there are 3,380 acres of riparian land in Williamsburg as defined by MassGIS; 85% of which are considered to be in a natural state.

Forests and Fields

The most plentiful of Williamsburg's natural resources are its trees. Covering over 80% of the Town's landscape, the forest helps create the rural, undeveloped character of the area. At the foot of the hilltowns, Williamsburg lies in a transition zone between the two hardwoods associations. On the eastern side of town one finds the central hardwoods: black oak, white oak, red oak, chestnut oak, black birch, white birch, hickory and red maple, mixed with white pine and some hemlock. As the elevation rises toward the western side of town, one finds the northern hardwoods: birch, beech, red maple and sugar maple associated with red oak, ash, cherry, basswood and some hemlock. The transition between these two forest types accompanied by a diverse geology creates a diversity of natural communities. Most of Williamsburg is designated as a Forest Legacy area.

There are also several hundreds of acres (approximately 9% of Town) of cropland, pastureland, and open land in Williamsburg, due to a significant agricultural economy. These land types also provide additional vegetation types and habitat opportunities.

Development

Williamsburg has a development pattern and landscape shaped both by its topography and historic patterns of 18th and 19th century land use. The community of Williamsburg is centered around the two streamside villages of Haydenville and Williamsburg, which have a naturally denser development and an attractive mix of residential and commercial architecture. Radiating from these villages centers is a pattern of roads connecting Williamsburg's villages to the surrounding villages. Many of these roads follow stream valleys. A few additional roads such as O'Neill Road and Hemenway Road make links between some of these rural roads. In between this pattern of residential roads are large blocks of open space, which cover many of the ridge lines and define the landscape. Together, this pattern of development and open space both connects and protects the natural, scenic, community and economic landscape of Williamsburg.

However, Williamsburg has seen a striking increase in land values in recent years. This has encouraged new residential development, but not always in the most appropriate locations. But the town's topography, soils, and physiography (rivers, wetlands and watershed areas) shape and constrain these land use patterns.

In addition to other factors, zoning and other land use regulations constitute Williamsburg's "blueprint" for its future. Land use patterns over time will continue to look more and more like the town's zoning map until the town is finally "built out"—that is, there is no more developable land left. Therefore, in looking forward over time, it is

critical that the town focus not on the current use and physical build-out today, but on the potential future uses and build-out that are allowed under the town's zoning map and zoning bylaws. Zoning is the primary land use tool that the town may use to manage development and direct growth to suitable and desired areas while also protecting critical resources and ensuring that development is in keeping with the town's character.

The Williamsburg Zoning Bylaw establishes three base zones, and two overlay zones:

- Village Residential (VR);
- Village Mixed (VM);
- Rural (RU); and
- Two overlay zones –Floodplain, Water Supply.

Although appropriate zoning is all relevant to protecting the health and safety of the Town residents, two of Williamsburg's districts are specifically relevant to natural hazard mitigation. These are outlined here:

- Floodplain - The floodplain overlay applies to those areas within the boundary of the one-hundred-year flood that are considered hazardous according to FEMA. It limits some uses for preventing potential flood damage.
- Water Supply Protection District - This purpose of this overlay district is to protect and preserve Williamsburg's groundwater resources from potentially damaging pollution or environmental degradation by regulating certain uses within the district. The regulations state specific prohibited and restricted uses, regulates drainage, details site plan requirements and special permit procedures.

The Zoning Bylaw also establishes a Site Plan/Special Permit Approval procedure for specific uses and structures within Williamsburg. This review allows the Special Permit Granting Authority the ability to review development to ensure that the basic safety and welfare of the people of Williamsburg are protected, and includes several specific evaluation criteria that are relevant to natural hazards.

Current Development Trends

Today, the vast majority of Williamsburg's 25.7 square miles (16,428 acres) is undeveloped land, totaling close to 13,765 acres. Residential land is the second most prolific land use, at approximately 1,220 acres, followed closely by agricultural land at approximately 1,130 acres. Industrial land comprises a relatively significant 96 acres, and commercial uses constitute another 50 acres. Land characterized as urban open/public land constitutes 38 acres, and there are 64 acres of outdoor recreational land throughout Town.

Currently, development in Williamsburg is encouraged by existing zoning and other land use regulations to seek areas where the environmental conditions and existing public utilities support such development. The community has a very active open space committee working to protect the wetland fringe areas of the community. The Town is

also very active in exercising its right of first refusal under Massachusetts Chapter 61 program to purchase open space as part of the municipality's efforts to manage growth and development. A volunteer group is working with surrounding communities to develop a Mill River Greenway Plan to assure protection of the river way and environs.

Development in Hazard Areas

Hazards identified in this plan are regional risks and, as such, all new development falls into the hazard area. The exception to this is flooding. According to the Community Information System (CIS) of FEMA, there were 76 residential structures, and 8 other structures located within the Special Flood Hazard Area (SFHA) in Williamsburg as of February 1997, the most current records in the CIS for the Town of Williamsburg.

3: HAZARD IDENTIFICATION & ANALYSIS

Profiling the Natural Hazards

Historical research, conversations with local officials and emergency management personnel, available hazard mapping and other weather-related databases were used to identify and profile the natural hazards which are most likely to have an impact on Williamsburg.

Each of these hazards was assessed by the Committee for location of occurrence, extent, previous occurrences, and probability of future events. (See Appendix C for sources, methodology.) This resulted in a ranking of hazard, by risk, see Table 3.1. More detailed descriptions of each of the points of analysis are included in the Identification and Vulnerability Assessment (below).

Table 3.1: Hazard Profiling and Risk Index Worksheet

Type of Hazard	Location	Extent	Previous Occurrences	Probability of Future Events	Hazard Risk Index Rating
Flooding (100-year)	Large	Catastrophic	Yes	Low	1
Flooding (localized)	Medium	Minor	Yes	Very High	1
Severe Snow/Ice Storms	Large	Limited	Yes	Very High	1
Hurricanes/Severe Wind	Large	Limited	Yes	High	2
Tornado/Microburst	Small	Limited	Yes	Moderate	3
Wildfire/Brushfire	Small	Minor	Yes	Very High	4
Earthquake	Large	Catastrophic	No	Very Low	5
Dam Failure	Small	Limited	Yes (1874)	Low	5
Drought	Small	Minor	No	Very Low	5
Man-Made Hazard: Hazardous Materials	Large	Catastrophic	Yes	Low	2

Natural Hazard Identification and Vulnerability Assessment

The following is a description of natural and manmade disasters, and the areas affected by them, that have or could affect the Town of Williamsburg. The *Past and Potential Hazards/Critical Facilities Map* (Appendix D) reflects the contents of this analysis.

Vulnerability Assessment Methodology

In order to determine estimated losses due to natural hazards in Williamsburg, each hazard area was analyzed with results shown below. The data below was calculated using FEMA's *Understanding Your Risks: Identifying Hazards and Estimating Losses*, August 2001.

Total value of all structures in Williamsburg (2006): \$293,872,691

Median value of a home in Williamsburg (2006): \$212,000

Average household size: 2.4 persons

Human losses are not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. Most of these figures exclude both the land value and contents of the structure. The damage calculations are rough estimate and likely reflect worst-case scenarios. Computing more detailed damage assessment based on assessor's records is a labor-intensive task and beyond the scope of this project.

Flooding

The average annual precipitation for Williamsburg and surrounding areas in northwestern Massachusetts is 46 inches. There are three major types of storms that bring precipitation to Williamsburg. Continental storms that originate from the west continually move across the region. These storms are typically low-pressure systems that may be slow-moving frontal systems or more intense, fast-moving storms. Precipitation from coastal storms, also known as nor'easters, that travel into New England from the south constitute the second major storm type. In the late summer or early fall, the most severe type of these coastal storms, hurricanes, may reach Massachusetts and result in significant amounts of rainfall. The third type of storm is the result of local convective action. Thunderstorms that form on warm, humid summer days can cause locally significant rainfall.

Floods can be classified as either flash floods, which are the product of heavy, localized precipitation in a short time period over a given location or general floods, which are caused by precipitation over a longer time period in a particular river basin. There are several local factors that determine the severity of a flooding event, including: stream and river basin topography, precipitation and weather patterns, recent soil moisture

conditions, amount of impervious surface area, and the degree of vegetative clearing. Furthermore, flooding can be influenced by larger, global climate events. Global warming and climate change have the potential to shift current rainfall and storm patterns. Increased precipitation is a realistic result of global warming, and could potentially increase the frequency and intensity of flooding in the region. Currently, floods occur and are one of the most frequent and costly natural hazards in the United States.

Flash flooding events typically occur within minutes or hours after a period of heavy precipitation, after a dam or levee failure, or from a sudden release of water from an ice jam. Most often, flash flooding is the result of a slow-moving thunderstorm or the heavy rains from a hurricane. In rural areas, flash flooding often occurs when small streams spill over their banks. However, in urbanized areas, flash flooding is often the result of clogged storm drains (leaves and other debris) and the higher amount of impervious surface area (roadways, parking lots, roof tops).

In contrast, general flooding events may last for several days. Excessive precipitation within a watershed of a stream or river can result in flooding particularly when development in the floodplain has obstructed the natural flow of the water and/or decreased the natural ability of the groundcover to absorb and retain surface water runoff (e.g., the loss of wetlands and the higher amounts of impervious surface area in urban areas).

A floodplain is the relatively flat, lowland area adjacent to a river, lake or stream. Floodplains serve an important function, acting like large “sponges” to absorb and slowly release floodwaters back to surface waters and groundwater. Over time, sediments that are deposited in floodplains develop into fertile, productive farmland like that found in the Connecticut River valley. In the past, floodplain areas were also often seen as prime locations for development. Industries were located on the banks of rivers for access to hydropower. Residential and commercial development occurred in floodplains because of their scenic qualities and proximity to the water. Although periodic flooding of a floodplain area is a natural occurrence, past and current development and alteration of these areas will result in flooding that is a costly and frequent hazard. In addition to damage of buildings directly in the floodplain, development can result in a loss of natural flood storage capacity and can increase the water levels in water bodies. Flood levels may then increase, causing damage to structures not normally in the flood path.

The Floodplain Map for the Town of Williamsburg shows the 100-year and 500-year flood zones identified by FEMA flood maps. The 100-year flood zone is the area that will be covered by water as a result of a flood that has a one percent chance of occurring in any given year. Likewise, the 500-year flood has a 0.2 percent chance of occurring in any given year. In Williamsburg, there are several floodplain areas – primarily along the Mill River and.... There are some smaller 500-year floodplains mapped as well, in several low-lying areas throughout Williamsburg.

The major floods recorded in Western Massachusetts during the 20th century have been the result of rainfall alone or rainfall combined with snowmelt. Williamsburg has

experienced many flooding events over the last decade. Generally, these small floods have had minor impacts, temporarily impacting roads and residents' yards.

As described above, flooding can happen on a range of scales. For the purposes of this analysis, the hazard has been broken into two separate types – **Flooding (100-year)** and **Flooding (localized)**. Risk and vulnerability assessment for these separate types of flooding are analyzed below.

Flooding (100-year base flood): High Risk

There are approximately 511 acres of land within the FEMA mapped 100-year floodplain and 501 acres of land within the 500-year floodplain within the Town of Williamsburg. According to the Community Information System (CIS) of FEMA, there were 76 residential structures and 8 other structures located within the Special Flood Hazard Area (SFHA) in Williamsburg as of February 1997, the most current records in the CIS for the Town of Williamsburg. Therefore, a vulnerability assessment for a 100-year flood equals approximately \$16.1 million of damage to residential structures, with approximately 202 people impacted.

The Town of Williamsburg is in the midst of a detailed planning process to identify and assess flood issues and other environmental issues pertaining to the Mill River. When this planning process is complete—results will be integrated into the Williamsburg Hazard Mitigation Plan. At this time the Town of Williamsburg has no repetitive loss properties as defined by FEMA's NFIP.

There is a 1 percent chance of localized flooding within the 100-year flood plain every year (by definition).

Flooding (localized) – High Risk

In addition to the floodplains mapped by FEMA for the 100-year and 500-year flood, Williamsburg often experiences minor flooding at isolated locations due to drainage problems, or problem culverts.

There are a total of 3 problem culverts or other localized flooding areas in Williamsburg, and these have been mapped on the Past and Potential Hazards/Critical Facilities Map (Appendix D). Most of the flood hazard areas listed here were identified due to known past occurrence in the respective area. There are many areas with no record of previous flood incidents that could be affected in the future by heavy rain and runoff.

To determine the vulnerability of the Town to localized flood events, the property within identified areas was visually analyzed using aerial photography (Pictometry), which allowed structures to be identified and tallied. Specific vulnerability assessments were estimated for sites which have been susceptible to localized flooding in the past, and are described below.

Location

Depot Road

An undersized culvert floods once or twice each year. The water floods over the road blocking access for up to eight hours. One house experiences flooding in its basement and a private bridge is threatened. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be \$212,000 (not including the bridge). Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included. There is also potential for the road to be damaged.

Route 9 at the corner where McFaddens is located

Route 9 floods every Spring and the road, a major evacuation and trucking route, is blocked for 12-24 hours. One business is threatened. The flood plain area has been slowly re-forested and the level of the Mill River is rising. Last year MassHighway installed stone gabions, but that did not reduce the flooding problem.

Route 9 (Goshen Road) going west towards Goshen

Water comes off road and washes away driveways and floods basements affecting five homes. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be \$1,060,000. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included. There is also potential for the road to be damaged.

Extent

See information in Location section

Previous Occurrences

See information in Location section

Probability of Future Events

Severe Snow/Ice Storm – High Risk

Severe winter storms can pose a significant risk to property and human life because the rain, freezing rain, ice, snow, cold temperatures and wind associated with these storms can disrupt utility service, phone service, and make roadways extremely hazardous. Severe winter storms can also be deceptive killers. The types of deaths that can occur as a result of a severe winter storm include: traffic accidents on icy or snow-covered roads, heart attacks while shoveling snow, and hypothermia from prolonged exposure to cold temperatures. Infrastructure and other property are also at risk from severe winter storms and the associated flooding that can occur following heavy snow melt. Power and telephone lines, trees, and telecommunications structures can be damaged by ice, wind, snow, and falling trees and tree limbs. Icy road conditions or roads blocked by fallen trees may make it difficult to respond promptly to medical

emergencies or fires. Prolonged, extremely cold temperatures can also cause inadequately insulated potable water lines and fire sprinkler pipes to rupture and disrupt the delivery of drinking water and cause extensive property damage.

Location

Severe winter weather occurs regionally and therefore would impact the entire town. Any area over 600 feet could be severely damaged by severe snow and ice as evidenced by the effects of the ice storm of 2009.

Snow Drift Areas

Given new technology for snow plowing, there are no areas of drifting that snow plows can not address.

Extent

New England generally experiences at least one or two severe winter storms each year with varying degrees of severity. Research on climate change indicates that there is great potential for stronger, more frequent storms as the global temperature increases. Severe winter storms typically occur during January and February; however, they can occur from late September through late April.

The Northeast Snowfall Impact Scale (NESIS) developed by Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service ([Kocin and Uccellini, 2004](#)) characterizes and ranks high-impact Northeast snowstorms. These storms have large areas of 10 inch snowfall accumulations and greater. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. The index differs from other meteorological indices in that it uses population information in addition to meteorological measurements. Thus NESIS gives an indication of a storm's societal impacts.

NESIS scores factor in the area affected by the snowstorm, the snow, and the number of people living in the path of the storm. The NESIS score varies from around one for smaller storms to over ten for extreme storms. The raw score is then converted into one of the five NESIS categories. The largest NESIS values result from storms producing heavy snowfall over large areas that include major metropolitan centers.

Effects experienced in the past include loss of power for extended periods of time, loss of timber, and roof damage.

Previous Occurrences

Williamsburg's recent history has not recorded any loss of life due to the extreme winter weather, but there are usually several incidents of property damage or personal injury each winter. In addition, during heavy snow years, accumulations can reach several feet deep.

- Williamsburg has been subject to 22 winter storms categorized as major to extreme according to the NESIS scale since 1960. Additional historically significant winter storms to affect Williamsburg include the Great Snow of 1717 and the Blizzard of 1888
- Moderate risk town wide due to snow, ice and extreme cold.
- Elderly are affected by extreme weather.

Probability of Future Events

Based on the NESIS scale, Williamsburg is at risk of a major to extreme winter storm in any given year is slightly less than 50 percent.

Hurricanes/Severe Wind – Medium-High Risk

Hurricanes are violent rainstorms with strong winds that can reach speeds of up to 200 miles per hour, and large amounts of precipitation. Hurricanes generally occur between June and November and can result in flooding and wind damage to structures and above-ground utilities. Severe wind can also occur in the absence of a hurricane, especially impacting mountain tops. Global warming will increase the threat of hurricanes and severe wind as oceans and the atmosphere warms. Climate change research indicates that storms like hurricanes will become more intense and more frequent in the future.

Location

All of Williamsburg is at risk from hurricanes with ridgetops more susceptible to wind damage and the flood-prone portions of town to flooding from the heavy rains.

Extent

Williamsburg's location in Western Massachusetts reduces the risk of extremely high winds that are associated with hurricanes, although it can experience some high wind events. During hurricanes or severe wind events, the Town has experienced small blocks of downed timber and uprooting of trees onto structures.

- Estimated wind damage: 5% of the structures with 10% damage, \$1,469,363;
- Estimated flood damage: 10% of the structures with 20% damage, \$5,877,454;
- Vulnerability assessment for a hurricane event (both wind and flood damages): \$7,346,817;
- Cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included.

Previous Occurrences

In Massachusetts, sixteen hurricanes have had landfall since 1851, two of which impacted Western Massachusetts. These include Hurricane Carol in 1954 and Hurricane Gloria in 1985. Hurricanes are usually ranked category 1-5, using the Saffir-Simpson Scale, with category 5 hurricanes being the most severe. Both Hurricane Carol and Gloria were category 1-2 storms, meaning winds ranged from 74-110 mph with the

potential for some roofing or window damage to buildings, damage to unanchored mobile homes, trees, or poor construction, and/or some minor flooding.

- 1938 hurricane was a major event - wind damage and flooding statewide.
- Power and phone lines - disruptions of services.
- Flooding/washing of evacuation routes.

Table 3.2 Major Non-Winter Storms to Affect Williamsburg Area		
Hurricane/Storm Name	Year	Saffir/Simpson Category (when reached MA)
Great Hurricane of 1938	1938	Unclear, 3 or 4
Great Atlantic Hurricane	1944	1
Carol	1954	3
Edna	1954	1
Diane	1955	Tropical Storm
Donna	1960	Unclear, 1 or 2
Groundhog Day Gale	1976	Not Applicable
Gloria	1985	1
Bob	1991	2
Floyd	1999	Tropical Storm

Probability of Future Events

Based upon the past events, it is reasonable to say that there is a low frequency of major hurricanes in Williamsburg (once every fifty years is less than a one percent chance of any such storm occurring in a given year) while the possibility of a less severe hurricane or tropical storm affecting Williamsburg in any given year is approximately 10 percent.

Tornadoes/Microbursts – Medium High Risk

Tornadoes are swirling columns of air that typically form in the spring and summer during severe thunderstorm events. In a relatively short period of time and with little or no advance warning, a tornado can attain rotational wind speeds in excess of 250 miles per hour and can cause severe devastation along a path that ranges from a few dozen yards to over a mile in width. The path of a tornado may be hard to predict because they can stall or change direction abruptly. Within Massachusetts, tornadoes have occurred most frequently in Worcester County and in communities west of Worcester, including towns in Hampshire County.

Of additional concern are microbursts, which often do tornado-like damage and can be mistaken for tornadoes. In contrast to the upward rush of air in a tornado, air blasts rapidly downward from thunderstorms to create microbursts. Microbursts and tornadoes are expected to become more frequent and more violent as the earth’s atmosphere warms, due to predictions of climate change from global warming.

Location

The hazard area for tornadoes in Williamsburg varies according to the intensity and size of the tornado. There have not been enough tornadoes in Worthington to accurately predict sections of town that are more likely to experience a tornado.

Extent

Because tornadoes and microbursts rarely occur in this part of the country, assessing damages is difficult. Furthermore, buildings have not been built to Zone 2, Design Wind Speed Codes. The entire Town of Williamsburg is vulnerable.

- Tornadoes/microburst hazard estimates 20% damage to 10% of structures in Town;
- Vulnerability assessment estimates in damages; \$2,905,149
- Estimated cost does not include building contents, land values or damages to utilities.

Previous Occurrences

In the summer of 08 a microburst took out trees and powerlines and damaged some private property. In Western Massachusetts, the majority of sighted tornadoes have occurred in a swath east of Williamsburg, known as "tornado alley." Thirteen incidents of tornado activity (all F2¹ or less) occurred in Hampshire County between 1959 and 2005.

Probability of Future Events

Based upon the past events, it is reasonable to say that there is a low frequency of tornadoes in Williamsburg.

Wildfires/Brushfire – Medium Low Risk

According to FEMA, there are three different classes of wildland fires: surface fires, ground fires and crown fires. The most common type of wildland fire is a surface fire that burns slowly along the floor of a forest, killing or damaging trees. A ground fire burns on or below the forest floor and is usually started by lightning. Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions. While wildfires or brushfires have not been a significant problem in Williamsburg, there is always a possibility that changing land use patterns and weather conditions will increase a community's vulnerability. For example, drought conditions can make forests and other open, vegetated areas more vulnerable to ignition. Once the fire starts, it will burn hotter and be harder to extinguish. Soils and root systems starved for moisture are also vulnerable to fire. Residential growth in rural, forested areas increases the total area that is vulnerable to fire and places homes and neighborhoods closer to areas where wildfires are more likely to occur. Global climate changes may also influence precipitation patterns, making the region more susceptible to drought and therefore, wildfires.

¹ F2 refers to the commonly used Fujita Tornado Damage Scale which ranks tornados F0-F5 depending on estimated wind speeds and damages, with F5 the most severe.

Hampshire County has approximately 252,000 acres of forested land, which accounts for 72% of total land area. Forest fires are therefore a potentially significant issue. In Williamsburg, approximately 80% of the town's total land area is forest, or about 13,187 acres, and is therefore at risk of fire.

Location

Approximately 68% of Williamsburg is forested so the entire town is at risk of wildfires.

Extent

The Williamsburg Fire Department reports that they responded to 18 fires in the last year, but they were all house-related fires. No permitted burns got out of control.

Low risk exists for potential wildfire incidents, especially near some of the town's forested, agricultural, and recreational lands. Forested and agricultural areas with high fuel content have more potential to burn. In addition, it is often very difficult to access some of the locations to extinguish the brushfire.

- Up to 4 structures could be impacted by a wildfire in one of the Town's agricultural areas;
- Assuming 100% damage to 100% of the structures, not including costs repairing or replacing any power lines, telephone lines, and contents of structures;
- Vulnerability assessment estimates approximately \$848,000 in damages for a wildfire.

Previous Occurrences

There is no record, authenticated or anecdotal, of wildfires in Williamsburg.

Probability of Future Events

Based upon the past events, it is reasonable to say there is a low frequency of wildfires in Williamsburg.

Earthquakes – Low Risk

An earthquake is a sudden, rapid shaking of the ground that is caused by the breaking and shifting of rock beneath the Earth's surface. Ground shaking from earthquakes can rupture gas mains and disrupt other utility service, damage buildings, bridges and roads, and trigger other hazardous events such as avalanches, flash floods (dam failure) and fires. Un-reinforced masonry buildings, buildings with foundations that rest on filled land or unconsolidated, unstable soil, and mobile homes not tied to their foundations are at risk during an earthquake. Earthquakes can occur suddenly, without warning, at any time of the year. New England experiences an average of 30 to 40 earthquakes each year although most are not noticed by people.

Location

In the event of an earthquake, all of Worthington would be affected with some portions more impacted than others, depending on the magnitude of the earthquake.

Table 3.3: New England Earthquakes (1924-2002)² magnitude 4.2 or higher		
Location	Date	Magnitude
Ossipee, NH	December 20, 1940	5.5
Ossipee, NH	December 24, 1940	5.5
Dover-Foxcroft, ME	December 28, 1947	4.5
Kingston, RI	June 10, 1951	4.6
Portland, ME	April 26, 1957	4.7
Middlebury, VT	April 10, 1962	4.2
Near NH Quebec Border, NH	June 15, 1973	4.8
West of Laconia, NH	Jan. 19, 1982	4.5
Plattsburg, NY	April 20, 2002	5.1

Table 3.4: New England States Record of Earthquakes²		
State	Years of Record	Number of Earthquakes
Connecticut	1568 - 1989	137
Maine	1766 - 1989	391
Massachusetts	1627 - 1989	316
New Hampshire	1728 - 1989	270
Rhode Island	1766 - 1989	32
Vermont	1843 - 1989	69
New York	1737 - 1985	24
Total Earthquakes in New England (1568-1989)		1,239

Extent

Massachusetts introduced earthquake design requirements into their building code in 1975. However, these specifications apply only to new buildings or to extensively-modified existing buildings. Buildings, bridges, water supply lines, electrical power lines and facilities built before 1975 may not have been designed to withstand the forces of

² Northeast States Emergency Consortium Web site: www.nesec.org/hazards/earthquakes.cfm

an earthquake. The seismic standards have also been upgraded with the 1997 revision of the State Building Code.

- Because many of the buildings were built well before 1975, there is potential for serious damage in downtown Williamsburg;
- Structures are mostly wood frame construction, so loss estimates predict 20% of town assessed value, not including costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures;
- Vulnerability assessment estimates approximately \$29,051,488.

Previous Occurrences

Nineteen earthquakes, intensity V (Modified Mercalli scale) or greater, have centered in Massachusetts since it was colonized by Europeans. A shock in 1755 reached intensity VIII at Boston and was felt across the State. In addition, Massachusetts was affected by some of the more severe Canadian shocks plus the earthquake of 1929 that centered on Grand Banks of Newfoundland.

Strong earthquakes in the St. Lawrence Valley in 1638, 1661, 1663, and 1732 were felt in Massachusetts. The 1638 and 1663 shocks damaged chimneys at Plymouth, Salem, and Lynn. On June 11, 1643, Newbury, Massachusetts, was strongly shaken. Again in 1727 (November 9) an earthquake described as "tremendous" in one report and "violent" in another caused much damage at Newbury. The shock was felt from the Keenebec River to the Delaware River and from ships at sea to the extreme western settlements. Several strong aftershocks were reported from the area through February 1728.

Tables 3.3 & 3.4 contain information regarding most of the earthquakes, including all of affecting New England, the significant ones. None have been noted to cause any damage in Worthington or the surrounding area.

Probability of Future Events

Based upon the past events, it is reasonable to say that there is a low frequency of major earthquakes in Williamsburg (there have been no earthquakes over 4.2 on the Richter scale in nearly 100 years) while the possibility of a less severe earthquake or tropical storm affecting Williamsburg in any given year is slightly less than 1 percent but these are unlikely to cause any significant damage.

Dam Failure – Low Risk

Although dams and their associated impoundments provide many benefits to a community, such as water supply, recreation, hydroelectric power generation, and flood control, they also pose a potential risk to lives and property. Dam failure is not a common occurrence but dams do represent a potentially disastrous hazard. When a dam fails, the potential energy of the stored water behind the dam is released. Often dam breaches lead to catastrophic consequences as the water ultimately rushes in a torrent downstream flooding an area engineers refer to as an "inundation area." The number of casualties and the amount of property damage will depend upon the timing

of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Many dams in Massachusetts were built in the 19th century without the benefit of modern engineering design and construction oversight. Dams can fail because of structural problems due to age and/or lack of proper maintenance. Dam failure can also be the result of structural damage caused by an earthquake or flooding brought on by severe storm events. Most earthen dam failures occur when floodwaters above overtop and erode the material components of the dam.

The Massachusetts Department of Conservation and Recreation (MA DCR) was the agency responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the implementing regulations 302 CMR 10.00). Until 2002, DCR was also responsible for conducting dam inspections but then state law was changed to place the responsibility and cost for inspections on the owners of the dams. This means that individual dam owners are now responsible for conducting inspections.

The state has four hazard classifications for dams:

- High Hazard: Dams located where failure or improper operation will likely cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads.
- Significant Hazard: Dams located where failure or improper operation may cause loss of life and damage to homes, industrial or commercial facilities, secondary highways or railroads or cause interruption of use or service of relatively important facilities.
- Low Hazard: Dams located where failure or improper operation may cause minimal property damage to others. Loss of life is not expected.
- Non-jurisdictional: The storage capacity of the impoundment and height of dam are such that they need not be regulated.

The inspection schedule for dams is as follows:

- Low Hazard dams – 10 years
- Significant Hazard dams – 5 years
- High Hazard dams – 2 years

The time intervals represent the maximum time between inspections. More frequent inspections may be performed at the discretion of the state. Dams and reservoirs licensed and subject to inspection by the Federal Energy Regulatory Commission (FERC) are excluded from the provisions of the state regulations provided that all FERC-approved periodic inspection reports are provided to the DCR. All other dams are subject to the regulations unless exempted in writing by DCR.

Location

According to DCR sources, as well as local knowledge, there are currently eight (8) dams³ in Williamsburg. The follow table identifies the dams within the town as well as whether they are classified as low, significant, or high hazard.

Table 3.5: Dams in Williamsburg					
Dam name/ date built	ID	Owner	Purpose	Condition/last inspected	Hazard Risk
Mountain Street Reservoir Dam	MA00082	City of Northampton Conservation Committee	Water Supply	Satisfactory/ 10-18-06	High
Brass Mill Pond Dam	MA01803	The Brassworks Associates	???	Unknown / Unknown	Significant
Mountain Street Reservoir Dikes	MA01295	City of Northampton Conservation Committee	Water Supply	Unknown / Unknown	Low
Unquomok Upper Reservoir Dam	MA00081	Town of Williamsburg	Water Supply	Drained 2007	Low
Graham Pond Dam	MA00601	Thomas Hodgkins	Recreation	Unknown / Unknown	Low
Unquomok Lower Reservoir Dam	MA02342	Town of Williamsburg	Water Supply	Unknown / Unknown	Non-jurisdictional
Fuller Pond Dam	MA01801	Roland M. Emerick	???	Unknown / Unknown	Non-jurisdictional
John P. Webster Dam	MA01802	Reverend John P. Webster	???	Unknown / Unknown	Non-jurisdictional

Extent

A vulnerability assessment was done for the inundation area below the one high risk, Mountain Street Reservoir Dam, and the one significant risk, Brass Mill Pond Dam.

Mountain Street Reservoir Dam

- 20 homes located in the inundation zone of the Mountain Street Reservoir Dam;
- Assumes 100% damage to 100% of the structures, but does not include costs of repairing or replacing the road, or any power or telephone lines, or the contents of structures;
- Vulnerability assessment estimates \$4,240,000 in damages;

Water flow during a dam failure could also significantly impact the culvert under Mountain Street, most likely washing out that stretch of the road.

³ It is difficult to track down accurate records of dams, as ownership and exact location is not clear. Furthermore, many very old dams listed in DCR records are not in existence anymore, according to local knowledge. This list is compiled from a combination of sources, and then verified by the Committee.

Previous Occurrences

Williamsburg has a history of one dam failure, the collapse of a dam on one of the tributaries to the Mill River in 1874 caused one of the most disastrous floods in New England, destroying the Town's industrial section and killing 145 people.

Probability of Future Events

Based upon the past events, it is reasonable to say that there is a low frequency of dam failure in Williamsburg.

Drought – Low Risk

Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. In the most general sense, drought originates from a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental sector.

Reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat are a few examples of the direct impacts of drought. Of course, these impacts can have far-reaching effects throughout the region and even the country.

Location

A drought would affect all of Williamsburg.

Extent

The severity of a drought would determine the scale of the event.

When evaluating the region's risk for drought on a national level, utilizing a measure called the Palmer Drought Severity Index, Massachusetts is historically in the lowest percentile for severity and risk of drought. Even so, there have been several years of drought-like conditions in Western Massachusetts: 1940-1952, 1980-1983, and 1995-2001. Furthermore, global warming and climate change may have an effect on drought risk in the region. With the projected temperature increases, some scientists think that the global hydrological cycle will also intensify. This would cause, among other effects, the potential for more severe, longer-lasting droughts. Additionally, even minor droughts will increase the risk of wildfire, especially in areas of high recreational use.

Previous Occurrences

In Massachusetts, six major droughts have occurred statewide since 1930. They range in severity and length, from three to eight years. In many of these droughts, water-supply systems were found to be inadequate. Water was piped in to urban areas, and water-supply systems were modified to permit withdrawals at lower water levels.

Williamsburg has had limited experience with severe drought conditions. The town has not experienced a threat to its water supply, and doesn't anticipate any severe water shortages throughout town.

Probability of Future Occurrences

Based upon the past events, it is reasonable to say that there is a low frequency of drought in Williamsburg.

Man-Made Hazards – Hazardous Materials – Medium High Risk

Hazardous materials are chemical substances, which if released or misused can pose a threat to the environment or health. These chemicals come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. Hazardous materials in various forms can cause death, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Many products containing hazardous chemicals are used and stored in homes and businesses routinely. These products are also shipped daily on the nation's highways, railroads, waterways, and pipelines.

The Toxics Release Inventory (TRI), a publicly available EPA database that contains information on specific toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. According to TRI, there are no industries currently releasing hazardous materials within Williamsburg's town limits.

Williamsburg relies on Holyoke's HazMat team for responding to incidents involving hazardous materials through a mutual aid agreement.

Location

The Verizon building at 18 Main Street is considered a Tier II Hazardous Materials storage facility, and is included on the Past & Potential Hazards/Critical Facilities Map (Appendix D).

In addition, varying quantities of hazardous materials are manufactured, used, or stored at an estimated 4.5 million facilities in the United States--from major industrial plants to local dry cleaning establishments or gardening supply stores. These hazardous materials are transported regularly over our highways and by rail and if released can spread quickly to any community. Incidents can occur at any time without warning. Human error is the probable cause of most transportation incidents and associated consequences involving the release of hazardous materials. Williamsburg is particularly at risk because there is so much water located close to major roads, especially the Mill river along Route 9.

Extent

The extent of hazardous chemical release is not predictable as it is dependent on the location including whether it is from a stationary or moving source, amount and type of chemical released, and weather conditions at the time of the release, but given the relative lack of hazardous chemicals present in Worthington the extent is likely to be limited.

Previous Occurrences

Available data dating from 1998-2003 shows zero releases of hazardous materials.

There is no history of any major accidents involving some sort of oil or chemical spill, but transportation of chemicals and bio-hazardous materials by vehicle transport on Route 9 is a concern. A number of trucks transporting fuel oil have spilled, especially at the intersection of Rte 9 and Rte 143 from Chesterfield. Small areas of hazardous materials storage increase the potential for future incidents as does a winding road with steep inclines and a major thoroughfare to the Berkshires. A scrap metal truck overturned in the center of town.

Probability of Future Events

Based upon the past events, it is reasonable to say that there is a low likelihood of hazardous chemical releases in Williamsburg, but it is an area of concern for residents as trucks not carrying hazardous materials have over-turned. Residents feel lucky.

4: CRITICAL FACILITIES

A Critical Facility is defined as a building, structure, or location which:

- Is vital to the hazard response effort;
- Maintains an existing level of protection from hazards for the community;
- Would create a secondary disaster if a hazard were to impact it.

Critical Facilities within Hazard Areas

Hazards identified in this plan are regional risks and, as such, all critical facilities fall into the hazard area. The exception to this is flooding. There are several critical facilities that fall within the 100-year floodplain as shown in the table at the end of this section.

The Critical Facilities List for the Town of Williamsburg has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Williamsburg's Hazard Mitigation Committee has broken up this list of facilities into four categories:

- The first category contains facilities needed for Emergency Response in the event of a disaster.
- The second category contains Non-Emergency Response Facilities that have been identified by the Committee as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of Williamsburg.
- The third category contains Facilities/Populations that the Committee wishes to protect in the event of a disaster.
- The fourth category contains Potential Resources, which can provide services or supplies in the event of a disaster.

The critical facilities and evacuation routes potentially affected by hazard areas are identified in Table 4-1, following this list. The Past and Potential Hazards/Critical Facilities Map (Appendix D) identifies these facilities.

Category 1 – Emergency Response Services

The Town has identified the Emergency Response Facilities and Services as the highest priority in regards to protection from natural and man-made hazards.

- 1) Emergency Operations Center
Primary: Williamsburg Police Dept. #16 South Main St., Haydenville
Secondary: Anne T Dunphy School- 1 Petticoat Hill Rd.

- 2) Fire Station
 - Williamsburg Fire Department – 5 North Main St.
 - Haydenville Fire Department – 16 South Main Street
- 3) Police Station
 - Williamsburg Town Police Department – 16 South Main Street
- 4) Highway Department
 - Highway Department – 24 Main Street
- 5) Water
 - One small community system, fed by a well
- 6) Emergency Fuel Stations
 - Highway Department – 24 Main Street
- 7) Emergency Electrical Power Facility
 - Town Offices
 - 3 portable generators at Fire Department
- 8) Emergency Shelters
 - Anne T Dunphy School- 1 Petticoat Hill Rd. Also a regional shelter for Hilltowns
 - Helen James School- 16 Main St
 - Williamsburg Town Offices- 141 Main Street
 - Meekins Public Library- 2 Main Street
- 9) Water Sources
 - Numerous locations in Williamsburg, any available.
- 10) Transfer Station
 - On Past & Potential Hazards/Critical Facilities Map – Mountain street
- 11) Helicopter Landing Sites
 - School parking lot – 1 Petticoat Hill Rd.
 - (Permitted anywhere feasible.)
- 12) Communications
 - # cell/radio towers throughout town – see Past & Potential Hazards/Critical Facilities Map
- 13) Primary Evacuation Routes
 - Route 9 – Main Street
 - Route 143 – Chesterfield Road
 - Mountain Street
 - South Street
- 14) Bridges/Culverts Located on Evacuation Routes
 - Bridges

<u>Evacuation Route</u>	<u>Crosses</u>	<u>Owner</u>	<u>Year Built</u>	<u>Year Rebuilt</u>
Route 143 (Chesterfield Road)	Meekins Brook	Mass Highway	1931	1964
Route 9 (Williams Street)	Mill River- West Branch	Mass Highway	1971	NA
Route 9 (Main Street)	Mill River	Mass Highway	1933	NA
Route 9 (Goshen Road)	Mill River- West Branch	Mass Highway	1926	1940
Route 9 (Goshen Road)	Mill River- West Branch	Mass Highway	1926	NA
Route 9 (Goshen Road)	Mill River- West Branch	Mass Highway	2002	2001
Route 143 (Chesterfield Road)	Mill River- West Branch	Mass Highway	1931	NA

Culverts

Mountain Street, Route 9 (Clark Farm), Rte 9 (below Sunoco Station)

Category 2 – Non Emergency Response Facilities

The town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Williamsburg.

- 1) Problem Culverts
Depot Road (3 problem culverts)
- 2) Water Supply
Community system fed by well, with many private wells serving individual properties

Category 3 – Facilities/Populations to Protect

The third category contains people and facilities that need to be protected in event of a disaster.

- 1) Special Needs Population
Service Net Group Home – Mountain Street
- 2) Elderly Housing/Assisted Living
Nash Hill Place
- 3) Public Buildings/Areas
Post Office- 140 Main Street
Post Office- 1 Williams Street
Meekins Public Library- 2 Main Street
Senior Center – Town Offices – 141 Main Street
- 4) Schools
Anne T. Dunphy Elementary- 1 Petticoat Hill Road
Helen James Elementary (and pre-school)- 16 Main Street
Hilltown Cooperative Charter School- 132 Main Street

<u>Day Care</u>	<u>Capacity</u>
Beattie, Francine A.- 78 South Street	8

- 5) Churches
 - Haydenville Congregational Church- 143 Main Street
 - Williamsburg Congregational Church- 4 N. Main Street
 - Our Lady of the Hills Catholic Church – 161 Main Street

- 6) Historic Buildings/Sites
 - Haydenville Cemetery- High Street
 - Mountain Street Cemetery- Mountain Street
 - Village Hill Cemetery- Village Hill Road
 - Williamsburg Cemetery- North Main Street
 - Town Center is an historic district
 - Brassworks Building – Rte 9
 - Old School Building

- 7) Employment Centers
 - Snow Farm-New England Craft- 5 Clary Road
 - M J Moran Inc- 4 South Main Street
 - Lashway Lumber
 - Lashway Logging

Category 4 – Potential Resources

Contains facilities that provide potential resources for services or supplies.

- 1) Food/Water
 - Williamsburg Market- 3 Main Street

- 2) Hospitals/Medical Supplies
 - Cooley Dickinson Hospital, Inc.- 30 Locust Street, Northampton (7 miles away)
 - Williamsburg Pharmacy and Hardware- 49 Main Street

- 3) Gas/Heating Fuel
 - Gas Stations
 - Cumberland Farms- 41 Main St
 - Cichy's Texaco- 5 Main St

- 4) Building Materials Suppliers
 - Williamsburg Pharmacy and Hardware- 49 Main Street

- 5) Heavy & Small Equipment Suppliers
 - Bacon's, Goshen Rd.

- 6) Gravel Pits

Hull's Gravel Pit, Goshen Rd.

Table 4.1: Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas

Hazard Type	Hazard Area	Critical Facilities Affected	Evacuation Routes Affected
Flooding (100-year)	Town Center along Mill River	Town Center	Rte 9
Flooding (localized)	Corner-McFadden's		Rte 9
Severe Snow/Ice Storm	Above 600 ft		
Hurricane/Severe Wind	Above 600 ft		
Wildfire/Brushfire			
Earthquake			
Dam Failure	Brass Mill Pond Dam Inundation area	Town Offices	Route 9
Drought			
Hazardous Materials	All along Rte 9	Town Center	Rte 9

(Past & Potential Hazards/Critical Facilities Map Located In Appendix D)

5: MITIGATION STRATEGIES

One of the steps of this Natural Hazard Mitigation Plan is to evaluate all of the town's existing policies and practices related to natural hazards and identify potential gaps in protection. Once these gaps in protection are identified, future mitigation strategies can be crafted and recommended. This is done by evaluating existing and future measures in comparison to the Town's goal statement for natural hazard mitigation.

Goal Statement

To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to natural disasters. To provide adequate shelter, water, food and basic first aid to displaced residents in the event of a natural disaster and to provide adequate notification and information regarding evacuation procedures, etc., to residents in the event of a natural disaster.

For the extent of this analysis, the Committee reviewed the following Town documents:

- Zoning By-Laws
- Subdivision Rules and Regulations
- Williamsburg Open Space and Recreation Plan (OSRP)
- CEM Plan
- Other relevant By-Laws as identified (Fire Department Burn Permit Procedures, Building Code, etc.)

This section of the plan serves to identify current mitigation strategies and recommend future mitigation strategies. This is done both generally, and by hazard type.

General Mitigation Measures

Several of the recommended mitigation measures have multiple benefits because, if implemented, they will mitigate or prevent damages from more than one type of natural hazard. These do not fall under one hazard type, but could be put into place for facilitation of better natural hazard protection generally.

Some of these general hazard-related strategies and measures do not fall specifically under the category of "mitigation," but are instead tools for

What's the CEM Plan?

An important existing general preparedness and response tool is Williamsburg's Comprehensive Emergency Management Plan (CEM Plan). Although the CEM Plan is focused on the procedural response to an emergency, it organizes information, includes supply and information inventories, and outlines detailed steps for increasing

preparedness. The Hazard Mitigation Planning Committee recognizes that these are also important recommendations for the Town, and has included them here:

- Form Local Emergency Planning Committee.
- Establish system to inventory supplies at existing shelters and develop a needs list and storage requirements. Establish arrangements with local or neighboring vendors for supplying shelters with food and first aid supplies in the event of a natural disaster.
- Collect, periodically update, and disseminate information on emergency information, what to include in a 'home survival kit,' how to prepare homes and other structures to withstand flooding and high winds, and the proper evacuation procedures to follow during a natural disaster.

Flooding

The key factors in flooding are the water capacity of water bodies and waterways, the regulation of waterways by flood control structures, and the preservation of flood storage areas and wetlands. As more land is developed, more flood storage is demanded of the town's water bodies and waterways.

Current Mitigation Measures

The Town currently addresses this problem with a variety of mitigation tools and strategies. Flood-related regulations and strategies are included in the Town's zoning by-law, subdivision regulations, as well as a proposed stormwater management by-law. Relevant goals are included in the adopted Open Space and Recreation Plan. Infrastructure like dams and culverts are in place to manage the flow of water. These current mitigation strategies are outlined in the following table.

Table 5-1: Existing Flood Hazard Mitigation Measures

Existing Strategy	Description	Effectiveness	Potential Changes
Flood Control Structures	Eight dams.	Somewhat effective.	Ensure dam owners realize their responsibility to inspect the dams.
Culvert Replacement	Priority list of necessary culvert replacements and other construction projects to effectively manage flooding.	Very effective for managing flood control needs.	Seek funding from HMGP for top-priority projects.
Zoning District	Floodplain District Overlay district to protect areas delineated as part of the 100-year floodplain by regulating uses and special permit requirements.	Very effective for preventing incompatible development within the flood prone areas.	

	Water Supply Protection District	District to protect groundwater resources by regulating certain uses, drainage, and other requirements within recharge area of aquifer.	Very effective for preventing groundwater contamination and managing infiltration.	
	Common Driveway	Provides for minor residential development without additional roads thereby lessening environmental impact.	Effective for minimizing impervious surface, allowing more groundwater infiltration.	
	District Locations and Area Provisions: Soil Mining	Special permit approval for soil mining, earth removal.	Somewhat effective for preventing water pollution and sedimentation.	
	Special Permit/Site Plan Approval	Environmental protection is included as a factor for all special permit and site plan reviews.	Somewhat effective for preventing incompatible development.	
Subdivision Regulations	Definitive Plan	Natural waterways and waterbodies must be shown; if proposed drainage empties into stream or brook, condition and proposed stabilization method must be included.	Effective for managing run-off and preventing contamination.	
		Environment and Development Impact Statement must be submitted, along with hydrology and drainage studies.	Effective for managing impacts from development.	
	Design Standards	Protection of natural features – minimize impact on surroundings.	Somewhat effective at promoting infiltration.	
		Provisions for groundwater recharge – to the extent it is feasible, storm water shall be recharged to groundwater rather than piped to surface water bodies or streams.	Very effective at promoting infiltration, preventing flooding from development.	
	Construction Standards	Site and Earthwork – all natural features considered community assets shall be preserved.	Effective for managing impacts from development.	
Williamsburg Open Space and Recreation Plan	The OSRP identifies key goals and actions to promote natural resource preservation in the town, including areas in the floodplain; such as wetlands, groundwater recharge areas, farms and open space, rivers, streams and brooks.	Effective at identifying key policy actions necessary to preserve open space.	Work to implement relevant goals and policies in Plan.	
National Flood Insurance Program Participation	As of 2006, there were 9 homeowners with flood insurance policies. (Note: 76 residential structures in SFHA.)	Somewhat effective.	The town should evaluate whether to become a part of FEMA's	

			Community Rating System.
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Future Mitigation Measures

Several potential changes to the Town’s current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Replace top priorities on culvert replacement list.
 - Depot Road—3 culverts that are under-sized and need replacement
- Ensure dam owners realize their responsibility to inspect the dams regularly.
- Implement the goals and strategies of the Williamsburg Open Space and Recreation Plan dealing with protection of floodplain, forests, and farmland. [Included here:]
 - Goal 3: Protect the rivers, streams, ponds, and wetlands of Williamsburg, and the watersheds that sustain them.
 - Protect priority lands (as identified in this plan) adjacent to streams, ponds and rivers, and in their watersheds.
 - Promote strategies that reduce pollution and other impacts of development on waterways.
 - Promote volunteer efforts to monitor and protect waterways.
- Evaluate whether to become a part of FEMA’s Community Rating System.
- Educate citizens living in the floodplain about the NFIP.

What is the NFIP’s Community Rating System?

The National Flood Insurance Program has developed suggested floodplain management activities for those communities who wish to more thoroughly manage or reduce the impact of flooding in their jurisdiction. Through use of a rating system (CRS), a community’s floodplain management efforts can be evaluated for effectiveness. The rating, which indicates an above average floodplain management effort, is then factored into the premium cost for flood insurance policies sold in the community. The higher the rating achieved in that community, the greater the reduction in flood insurance premium costs for local property owners. MEMA can provide additional information regarding participation in the NFIP-CRS Program.

Severe Snow/Ice Storm

Winter storms can be especially challenging for emergency management personnel. The Massachusetts Emergency Management Agency (MEMA) serves as the primary coordinating entity in the statewide management of all types of winter storms and monitors the National Weather Service (NWS) alerting systems during periods when winter storms are expected. Even though the storm has usually been forecast, there is no certain way for predicting its length, size or severity. Therefore, mitigation strategies must focus on preparedness prior to a severe snow/ice storm.

Current Mitigation Measures

The Town's current mitigation tools and strategies focus on preparedness, with many regulations and standards established based on safety during storm events. These current mitigation strategies are outlined in the following table.

Note: To the extent that some of the damages from a winter storm can be caused by flooding, all of the flood protection mitigation measures described in Table 5-1 in the previous section can also be considered as mitigation measures for severe snow/ice storms.

Table 5-2: Existing Severe Snow/Ice Storm Hazard Mitigation Measures

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Common Driveways	Allows for adjacent lots to share a driveway, fewer curb cuts.	Effective for providing access	
	Site Plan	Electric, telephone, cable TV, and other utilities are required to be underground unless proven to be physically and environmentally unfeasible.	Effective for preventing power loss, etc.	
	Wireless Communication Facilities	Strict requirements for height, setback, construction, and fencing are imposed upon WCFs, which must be as minimally invasive as possible to the environment.	Very effective for preventing damage in the case of a severe storm.	
Subdivision Regulations	Design Standards	Utilities (both public and private) must be placed underground.	Effective for preventing power loss.	
		Street grade regulations (maximum ranges from 6% to 12% depending on street category); minimum sight distances at intersections; guardrails can be required.	Effective.	

State Building Code	The Town of Williamsburg has adopted the Massachusetts State Building Code.	Effective.	
Backup Electric Power	Shelters have backup power, three mobile generators	Very effective in case of power loss.	
Tree Management	List of dangerous trees created annually for WMECO.	Very effective, preventative collaboration.	

Future Mitigation Measures

Several potential changes to the Town’s current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Work with Western Mass Electric Company to facilitate the underground placement of new utility lines in general and existing utility lines in locations where repetitive outages occur (as applicable).
- Determine if existing generators at shelters are effective, replace if not effective.
- Participate in the creation of a Regional Debris Management Plan.

What is a Regional Debris Management Plan?

Natural disasters can precipitate a variety of debris, including trees, construction and demolition materials and personal property. After a natural disaster, potential threats to the health, safety and welfare of impacted citizens can be minimized through the implementation of a debris management plan. Such a plan can be critical to recovery efforts after a disaster, including facilitating the receipt of FEMA funds for debris clearance, removal and disposal.

Hurricanes/Severe Wind

Of all the natural disasters that could potentially impact Williamsburg, hurricanes provide the most lead warning time because of the relative ease in predicting the storm’s track and potential landfall. MEMA assumes “standby status” when a hurricane’s location is 35 degrees North Latitude (Cape Hatteras) and “alert status” when the storm reaches 40 degrees North Latitude (Long Island). Even with significant warning, hurricanes can do significant damage – both due to flooding and severe wind.

The flooding associated with hurricanes can be a major source of damage to buildings, infrastructure and a potential threat to human lives. Therefore, all of the flood

protection mitigation measures described in Table 5-1 can also be considered hurricane mitigation measures.

The high winds that oftentimes accompany hurricanes can also damage buildings and infrastructure. But regulations can be put into place to help minimize the extent of wind damages.

The Town’s current mitigation strategies to deal with severe wind are equally applicable to wind events such as tornadoes and microbursts. Therefore, the analysis of severe wind strategies is coupled with this hazard.

Tornadoes/Microbursts

The location and extent of potential damaging impacts of a tornado are completely unpredictable. Most damage from tornadoes or microbursts comes from high winds that can fell trees and electrical wires, generate hurtling debris and, possibly, hail. According to the Institute for Business and Home Safety, the wind speeds in most tornadoes are at or below design speeds that are used in current building codes. In addition, current land development regulations can also help prevent wind damages.

The following table outlines the Town’s existing mitigation strategies that help prevent wind damages, whether from hurricanes, tornadoes, microbursts, or any other event.

**Table 5-3: Existing Severe Wind Hazard Mitigation Measures
(Including Hurricane, Tornado, Microburst Hazards)**

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Site Plan	Electric, telephone, cable TV, and other utilities are required to be underground unless proven to be physically and environmentally unfeasible.	Effective for preventing power loss, etc.	
	Restrictions	No mobile/manufactured homes/trailers are allowed to be used for sleeping quarters, except temporarily.	Somewhat effective for preventing damage to susceptible structures	
	Wireless Communications Facilities	Strict requirements for height, setback, construction, and fencing are imposed upon WCFs, which must be as minimally invasive as possible to the environment.	Very effective for preventing damage in the case of a severe storm.	
Subdiv Regs	Design Standards	Utilities (both public and private) must be placed underground.	Effective for preventing power loss.	

State Building Code	The Town has adopted the MA State Building Code.	Effective.	
Tree Management	List of dangerous trees created annually for WMECO.	Very effective, preventative collaboration.	

Future Mitigation Measures

Several potential changes to the Town’s current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Work with Western Mass Electric Company to facilitate the underground placement of new utility lines in general and existing utility lines in locations where repetitive outages occur (as applicable). [How?]
- Participate in the creation of a Regional Debris Management Plan.

Wildfire/Brushfire

Although somewhat common, the vast majority of brushfires in Williamsburg are small and quickly contained. However, as with any illegal fire or brushfire, there is always the risk that a small brushfire could grow into a larger, more dangerous wildfire, especially if conditions are right. Therefore, it is important to take steps to prevent wildfires and brushfires from turning into natural disasters.

Current Mitigation Measures

The following table identifies what the Town is currently doing to manage brushfires and makes some suggested potential changes and recommendations for decreasing the Town’s likelihood of being heavily impacted by a wildfire or brushfire.

Table 5-4: Existing Wildfire/Brushfire Hazard Mitigation Measures				
Existing Strategy		Description	Effectiveness	Potential Changes
Subdivision Regulations	Design Standards	Water Supply – criteria for fire prevention must be met.	Effective.	
	Administration and Inspection	Prior to final approval, the Fire Chief is involved in review of subdivision for fire safety.	Effective.	
Burn Permits		Residents must obtain burn permits, and personnel provide information on safe burn practices.	Somewhat effective.	Consider increasing enforcement of burning regulations, perhaps invoke penalties for offenders.

Public Education/ Outreach	The Fire Department has an ongoing educational program in the schools.	Effective.	None.
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Future Mitigation Measures

Several potential changes to the Town’s current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Increase education and enforcement of burn permits; including pre-season review of regulations in public outreach campaign and/or invoking penalties for offenders.

Earthquake

Although there are five mapped seismological faults in Massachusetts, there is no discernable pattern of previous earthquakes along these faults nor is there a reliable way to predict future earthquakes along these faults or in any other areas of the state. Consequently, earthquakes are arguably the most difficult natural hazard to plan for.

Most buildings and structures in the state were constructed without specific earthquake resistant design features. In addition, earthquakes precipitate several potential devastating secondary effects such as building collapse, utility pipeline rupture, water contamination, and extended power outages. Therefore, many of the mitigation efforts for other natural hazards identified in this plan may be applicable during the Town’s recovery from an earthquake.

Current Mitigation Measures

The Town’s most relevant existing mitigation measures are described in the following table.

Table 5-5: Existing Earthquake Hazard Mitigation Measures				
Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Wireless Communications Facilities	Strict requirements for height, setback, construction, and fencing are imposed upon WCFs, which must be as minimally invasive as possible to the environment.	Very effective for preventing damage in the case of an earthquake.	
State Building Code		The Town of Williamsburg has adopted the State Building Code.	Effective for new buildings only.	

Future Mitigation Measures

Potential changes to the Town’s current strategies have been identified in the above table, and these are compiled below:

Dam Failure

Dam failure is a highly infrequent occurrence, but a severe incident could prove catastrophic. In addition, dam failure most often coincides with flooding, so its impacts can be multiplied, as the additional water has no where to flow.

Current Mitigation Measures

The only mitigation measures currently in place are the state regulations governing the construction, inspection, and maintenance of dams. This is managed through the Office of Dam Safety at the Department of Conservation and Recreation.

Table 5-6: Existing Dam Failure Hazard Mitigation Measures

Existing Strategy	Description	Effectiveness	Potential Changes
New Dam Construction Permits	State law requires a permit for the construction of any dam.	Effective. Ensures dams are adequately designed.	
Dam Inspections	DCR has an inspection schedule that is based on the hazard rating of the dam (low, medium, high hazard).	Low. The responsibility for this is now on dam owners, who may not have sufficient funding to comply.	Identify sources of funding for dam safety inspections. Incorporate dam safety into development review process.

Future Mitigation Measures

Recent changes in legislation have shifted some of the responsibility of dam safety onto dam owners. The Town recognizes the need to adjust to this change. Several potential changes to the Town’s current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Identify sources of funding for dam safety inspections.

Drought

Although Massachusetts does not face extreme droughts like many other places in the country, it is susceptible to dry spells and drought. And unlike other places, drought can most likely be effectively mitigated in regions like the Pioneer Valley if measures are put into place.

Current Mitigation Measures

Williamsburg has several water protection regulations in place, as evidenced in the section on flooding. Additional regulations and mitigation options, specific to drought mitigation, are included here.

Table 5-7: Existing Drought Hazard Mitigation Measures

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Water Supply Protection District	District to protect groundwater resources by regulating certain uses, drainage, and other requirements within recharge area of aquifer.	Very effective for preventing groundwater contamination and managing infiltration.	
	Common Driveway	Provides for minor residential development without additional roads thereby lessening environmental impact.	Effective for minimizing impervious surface, allowing more groundwater infiltration.	
	District Locations and Area Provisions: Soil Mining	Special permit approval for soil mining, earth removal.	Somewhat effective for preventing water pollution and sedimentation.	
Subdivision Rules and Regulations	Definitive Plan	Hydrology and drainage studies must be included.	Effective for managing impacts from development.	
	Design Standards	Protection of natural features – minimize impact on surroundings.	Somewhat effective at promoting infiltration.	
		Provisions for groundwater recharge – to the extent it is feasible, storm water shall be recharged to groundwater rather than piped to surface water bodies or streams.	Very effective at promoting infiltration, preventing flooding from development.	
Williamsburg Open Space and Recreation Plan	Includes goals to strengthen pollution prevention in Town.	Potentially effective step, if taken.	Implement recommendation.	

Future Mitigation Measures

Potential changes to the Town’s current strategies have been identified in the above table, and these, as well as recommendations for other future mitigation strategies, are compiled below:

- Implement recommendations from the Williamsburg Open Space and Recreation Plan, dealing with water pollution prevention.

- Create Water Conservation Guidelines, as education to Town residents.

Hazardous Materials

Hazardous materials are in existence throughout Town, and are constantly being moved on Williamsburg’s roads and highways. However, there is no way to anticipate where and when a hazardous materials spill or explosion could take place. Therefore, it makes is somewhat difficult to determine mitigation strategies, but Williamsburg has some regulations currently in place to mitigate the impacts of a hazardous materials disaster.

Table 5-8: Existing Hazardous Materials Hazard Mitigation Measures

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Water Supply Protection District	No hazardous materials permitted within areas delineated as recharge areas for groundwater aquifers.	Very effective for preventing groundwater contamination.	

Future Mitigation Measures

Potential changes to the Town’s current strategies have been identified in the above table, and these are compiled below:

6: PRIORITIZED IMPLEMENTATION SCHEDULE

Summary of Critical Evaluation

The Williamsburg Hazard Mitigation Planning Committee reviewed each of the recommendation future mitigation measures identified, and used the following factors to prioritize mitigation projects:

- Ability to reduce loss of life
- Ability to reduce disaster damage
- Social acceptability
- Ability to complete or be combined w/other actions
- Technical feasibility / potential success
- Impact on the environment
- Administrative workability
- Ability to meet regulations
- Political acceptability
- Ability to save or protect historic structures
- Legal implementation
- Ability to meet other community objectives
- Economic impact
- The duration of its implementation period
- Environmental compatibility

Project Prioritization

The Williamsburg Hazard Mitigation Planning Committee created the following prioritized schedule for implementation of prioritized items. The table lists items in order of priority.

Note: As additional information becomes available regarding project leadership, timeline, funding sources, and/or cost estimates, the Plan will be reviewed and amended accordingly.

Table 6.1: Prioritized Implementation Schedule – Action Plan

Priority	Mitigation Action	Responsible Department/Board	Proposed Completion Date	Funding Source/ Estimated Cost	Incorporation into Existing Plans
1	Replace top 3 problem culverts, on Depot Rd.	Highway Dept.	2012	HMGP	Capital Improvements Plan
2	Ensure dam owners realize their responsibility to inspect their dams	Select Board/Town Administrator and EMD	2010	local	CEMP
3	Identify sources of funding for dam safety inspections.	EMD	2010	Local	
4	The town should evaluate whether to become part of FEMA’s Community Rating System	Select Board/Town Administrator	2010	Local	CEMP
5	The Town should continue to work to implement the recommendations of existing plans to protect the Town’s natural resources (for flood mitigation) and for water supply protection	Town committees as appropriate and Town Administrator and Select Board	ongoing	Local and other as available	CD Plan, OSRP
6	Consider participation in regional debris management plan	Highway Dept and EMD	When funded	Homeland Security	

7: PLAN ADOPTION & IMPLEMENTATION

Plan Adoption

Upon completion, copies of the Draft Local Hazards Mitigation Plan for the Town of Williamsburg were distributed to the town boards for their review and comment. A public meeting was held by the Williamsburg Board of Selectmen to present the draft copy of the Williamsburg Local Natural Hazards Mitigation Plan to town officials and residents and to request comments from this committee and the general public. The Natural Hazards Mitigation Plan was formally approved by the Board of Selectmen and forwarded to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency (FEMA) for their approval.

Plan Implementation

The implementation of the Williamsburg Local Natural Hazards Mitigation Plan will begin following its formal adoption by the Williamsburg Board of Selectmen and approval by MEMA and FEMA. Specific town departments and boards will be responsible for ensuring the development of policies, bylaw revisions, and programs as described in Sections 5 and 6 of this plan. The Williamsburg Natural Hazards Planning Committee will oversee the implementation of the plan.

Plan Monitoring and Evaluation

The measure of success of the Williamsburg Local Natural Hazards Mitigation Plan will be the number of identified mitigation strategies implemented. In order for the town to become more disaster resilient and better equipped to respond to natural disasters, there must be a coordinated effort between elected officials, appointed bodies, town employees, regional and state agencies involved in disaster mitigation, and the general public.

The Williamsburg Natural Hazards Planning Committee will meet on an annual basis or as needed (i.e., following a natural disaster) to monitor the progress of implementation, evaluate the success or failure of implemented recommendations, and brainstorm strategies to remove obstacles to implementation. Those parties noted in Section 6 of the plan will be responsible for seeing that the actions are implemented and will report on their progress at the annual plan review meetings. They will assure that the recommendations in this plan will be integrated into existing plans as appropriate.

Outreach to the public, surrounding communities, agencies, businesses, academia, non-profits, or other interested parties outside of the town of Williamsburg will be done in advance of each annual meeting in order to solicit their participation in assessment of the plan. Following these discussions, it is anticipated that the committee may decide to reassign the roles and responsibilities for implementing mitigation strategies to different town departments and/or revise the goals and objectives contained in the plan. At a minimum, the committee will review and update the plan every five years,

beginning in the fall of 2013. The meetings of the committee will be organized and facilitated by the Emergency Management Director or designee.

The approved Williamsburg Hazard Mitigation Plan will be available at the Town Hall, the public library and at the PVPC offices for ongoing public review and comment.

CERTIFICATE OF ADOPTION

TOWN OF WILLIAMSBURG, MASSACHUSETTS

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE WILLIAMSBURG

NATURAL HAZARD MITIGATION PLAN

WHEREAS, the Town of Williamsburg established a Committee to prepare the Williamsburg Hazard Mitigation plan; and

WHEREAS, several public planning meetings were held between February and March 2009 regarding the development and review of the Williamsburg Hazard Mitigation Plan; and

WHEREAS, the Williamsburg Hazard Mitigation Plan contains several potential future projects to mitigate hazard damage in the Town of Williamsburg, and

WHEREAS, a duly-noticed public hearing was held by the Williamsburg Board of Selectmen on _____, 2009 to formally approve and adopt the Williamsburg Hazard Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Williamsburg Board of Selectmen adopts the Williamsburg Hazard Mitigation Plan.

ADOPTED AND SIGNED this _____, 2009.

_____, Chair
Williamsburg Board of Selectmen

Williamsburg Board of Selectmen

Williamsburg Board of Selectmen

ATTEST

APPENDICES

Appendix A – Technical Resources

1) Agencies

Massachusetts Emergency Management Agency (MEMA).....	508/820-2000
Hazard Mitigation Section	617/626-1356
Federal Emergency Management Agency (FEMA)	617/223-4175
MA Regional Planning Commissions:	
Berkshire Regional Planning Commission (BRPC).....	413/442-1521
Cape Cod Commission (CCC).....	508/362-3828
Central Massachusetts Regional Planning Commission (CMRPC).....	508/693-3453
Franklin Regional Council of Governments (FRCOG).....	413/774-3167
Martha’s Vineyard Commission (MVC).....	508/693-3453
Merrimack Valley Planning Commission (MVPC).....	978/374-0519
Metropolitan Area Planning Council (MAPC).....	617/451-2770
Montachusett Regional Planning Commission (MRPC).....	978/345-7376
Nantucket Planning and Economic Development Commission (NP&EDC).....	508/228-7236
Northern Middlesex Council of Governments (NMCOG).....	978/454-8021
Old Colony Planning Council (OCPC).....	508/583-1833
Pioneer Valley Planning Commission (PVPC).....	413/781-6045
Southeastern Regional Planning and Economic Development District (SRPEDD).....	508/823-1803
MA Board of Building Regulations & Standards (BBRS).....	617/227-1754
MA Coastal Zone Management (CZM).....	617/626-1200
DCR Water Supply Protection.....	617/626-1379
DCR Waterways.....	617/626-1371
DCR Office of Dam Safety.....	508/792-7716
DFW Riverways.....	617/626-1540
MA Dept. of Housing & Community Development.....	617/573-1100
Woods Hole Oceanographic Institute.....	508/457-2180
UMass-Amherst Cooperative Extension.....	413/545-4800
National Fire Protection Association (NFPA).....	617/770-3000
New England Disaster Recovery Information X-Change (NEDRIX – an association of private companies & industries involved in disaster recovery planning).....	781/485-0279
MA Board of Library Commissioners.....	617/725-1860
MA Highway Dept, District 2.....	413/582-0599
MA Division of Marine Fisheries.....	617/626-1520
MA Division of Capital & Asset Management (DCAM).....	617/727-4050
University of Massachusetts/Amherst.....	413/545-0111
Natural Resources Conservation Services (NRCS).....	413/253-4350
MA Historical Commission.....	617/727-8470
U.S. Army Corps of Engineers.....	978/318-8502
Northeast States Emergency Consortium, Inc. (NESEC).....	781/224-9876
National Oceanic and Atmospheric Administration: National Weather Service; Tauton, MA.....	508/824-5116
US Department of the Interior: US Fish and Wildlife Service	413/253-8200
US Geological Survey	508/490-5000

2) Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP)	Massachusetts Emergency Management Agency
406 Public Assistance and Hazard Mitigation	Massachusetts Emergency Management Agency

Community Development Block Grant (CDBG).....	DHCD, also refer to RPC
Dam Safety Program.....	MA Division of Conservation and Recreation
Disaster Preparedness Improvement Grant (DPIG)	Massachusetts Emergency Management Agency
Emergency Generators Program by NESEC†	Massachusetts Emergency Management Agency
Emergency Watershed Protection (EWP) Program.....	USDA, Natural Resources Conservation
Service Flood Mitigation Assistance Program (FMAP)	Massachusetts Emergency Management Agency
Flood Plain Management Services (FPMS).....	US Army Corps of Engineers
Mitigation Assistance Planning (MAP).....	Massachusetts Emergency Management Agency
Mutual Aid for Public Works.....	Western Massachusetts Regional Homeland Security Advisory Council
National Flood Insurance Program (NFIP) †	Massachusetts Emergency Management Agency
Power of Prevention Grant by NESEC†	Massachusetts Emergency Management Agency
Roadway Repair & Maintenance Program(s).....	Massachusetts Highway Department
Section 14 Emergency Stream Bank Erosion & Shoreline Protection	US Army Corps of Engineers
Section 103 Beach Erosion.....	US Army Corps of Engineers
Section 205 Flood Damage Reduction.....	US Army Corps of Engineers
Section 208 Snagging and Clearing	US Army Corps of Engineers
Shoreline Protection Program.....	MA Department of Conservation and Recreation
Various Forest and Lands Program(s).....	MA Department of Environmental Protection
Wetlands Programs	MA Department of Environmental Protection

†NESEC – Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NESEC for more information.

† Note regarding National Flood Insurance Program (NFIP) and Community Rating System (CRS): The National Flood Insurance Program has developed suggested floodplain management activities for those communities who wish to more thoroughly manage or reduce the impact of flooding in their jurisdiction. Through use of a rating system (CRS rating), a community’s floodplain management efforts can be evaluated for effectiveness. The rating, which indicates an above average floodplain management effort, is then factored into the premium cost for flood insurance policies sold in the community. The higher the rating achieved in that community, the greater the reduction in flood insurance premium costs for local property owners. MEMA can provide additional information regarding participation in the NFIP-CRS Program.

3) Internet Resources

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/litbase/hazards/	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	http://wxp.eas.purdue.edu/hurricane	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center “Disaster Finder:	http://www.gsfc.nasa.gov/ndrd/disaster/	Searchable database of sites that encompass a wide

		range of natural disasters.
NASA Natural Disaster Reference Database	http://ftpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://h20.usgs.gov/public/realtime.html	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/artsci/geog/floods/	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/fema/csb.html	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
The Tornado Project Online	http://www.tornadoject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.uoknor.edu/	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	http://www.iaa.iix.com/ndcmap.html	A multi-disaster risk map.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.

Appendix B – List of Acronyms

FEMA	Federal Emergency Management Agency
MEMA	Massachusetts Emergency Management Agency
PVPC	Pioneer Valley Planning Commission
EPA	Environmental Protection Agency
DEP	Massachusetts' Department of Environmental Protection
NWS	National Weather Service
HMGP	Hazard Mitigation Grant Program
FMA	Flood Mitigation Assistance Program
SFHA	Special Flood Hazard Area
CIS	Community Information System
DCR	Massachusetts Department of Conservation and Recreation
FERC	Federal Energy Regulatory Commission
TRI	Toxics Release Inventory
FIRM	Flood Insurance Rate Map
NFIP	National Flood Insurance Program
CRS	Community Rating System
BOS	Board of Selectmen
BOH	Board of Health
LEPC	Local Emergency Planning Committee
EMD	Emergency Management Director
Con Com	Conservation Commission
EOC	Emergency Operations Center
CEM Plan	Comprehensive Emergency Management Plan
WMECO	Western Massachusetts Electric Company
HAZMAT	Hazardous Materials

Appendix C – Natural Hazard Profiling Methodology⁴

In order to adeptly profile each of the hazards, a Hazard Identification and Analysis Matrix was prepared to organize the information that was gathered for this project.

The matrix is organized into the following sections: Type of Hazard, Location of Occurrence, Extent of Impacts, Previous Occurrences, Probability of Future Occurrence, and Hazard Index. The Hazard Index was completed to rank the hazards according to the frequency of occurrence and the amount of potential damage likely to occur. The Hazard Index forms the basis for concentrating the future mitigation efforts outlined in this plan. A description of each of the matrix categories is provided below. The completed Matrix is shown as Table 3.1 (Section 3, page 9).

Location of Occurrence

The classifications are based on the area of the Town of Williamsburg that would potentially be affected by the hazard. The following scale was used:

Location of Occurrence	Percentage of Town Impacted
Large	More than 50% of the town affected
Medium	10 to 50% of the town affected
Small	Less than 10% of the town affected

Extent of Impacts

The extent of direct impacts an affected area could potentially suffer were classified according to the following scale:

Extent of Impacts	Magnitude of Multiple Impacts
Catastrophic	Multiple deaths and injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of facilities for 30 days or more.
Critical	Multiple injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 week.
Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 day.

⁴ Source: information adapted from Town of Holden Beach, NC Community-Based Hazard Mitigation Plan, July 15, 2003, and Hyde County, NC Multi-Hazard Mitigation Plan, Sept 2002; and the Massachusetts Emergency Management Agency (MEMA).

Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of facilities.
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Previous Occurrences

Whether or not previous hazard events had occurred is also included, with detailed descriptions of specific previous occurrences within the hazard identification and vulnerability assessments, if necessary.

Probability of Future Occurrence

The likelihood of a future event for each natural hazard was classified according to the following scale:

Table C.3: Frequency of Occurrence and Annual Probability of Given Natural Hazard	
Frequency of Occurrence	Probability of Future Event
Very High	70-100% probability in the next year
High	40-70% probability in the next year
Moderate	10-40% probability in the next year
Low	1-10% probability in the next year
Very Low	Less than 1% probability in the next year

Hazard Index

The hazard index ratings were determined after assessing the frequency, location and impact classifications for each hazard. The hazard index ratings are based on a scale of 1 (highest risk) through 5 (lowest risk). The ranking is qualitative and is based, in part, on local knowledge of past experiences with each type of hazard. The size and impacts of a natural hazard can be unpredictable however; many of the mitigation strategies currently in place and many of those proposed for implementation can be applied to the expected natural hazards, regardless of their unpredictability.

The Hazard Ratings are labeled as follows:

- 1 – High Risk
- 2 – Medium-High Risk
- 3 – Medium Risk
- 4 – Medium Low Risk
- 5 – Low Risk

Appendix D – Past & Potential Hazards/Critical Facilities Map

Appendix E – Documentation of the Planning Process

Williamsburg Hazard Mitigation Planning Committee
Meeting #1 November 30 , 2009 1 pm
Williamsburg Town Offices
AGENDA

1) Introduction & Purpose of Committee

2) What is Hazard Mitigation Planning?

3) Begin Review of Draft Plan

4) Identify Critical Facilities (to be shown on Base map)

- Identify Critical Facilities on Base Map. The following list contains items that should be clearly identified on the map, as they apply to your community:

- Emergency Operations Center
- Emergency Fuel Facilities
- Town/City Hall
- Police Station
- Fire Station
- Public Works Garages
- Water Treatment Facilities
- Sewage Treatment Plants
- Water Tower/Supply Pumps
- Power Plants
- Electrical Power Substations
- Schools
- Major Highways and Roadways
- Bridges
- Dams
- Nursing Homes
- Elderly Housing
- Day-Care Facilities
- Correctional Facilities
- Other Congregate Care Facilities
- Shelters
- Special Needs Populations
- Hazardous Materials Facilities
- Access Roads to Critical Facilities
- Evacuation Routes
- Unique or Historic Resources
- Commercial Economic Impact Areas
- Socio-Economic Impact Areas
- Areas with Second Language Needs
- Hospitals

and Evacuation Routes Potentially Affected By Hazard Areas

5. Hazards Analysis Methodology

- Identify Past Hazard Occurrences, Location and Damage Assessments
- Hazard Identification and Analysis Worksheet

6. Analyze Development Trends

Review local zoning districts. Identify planned and proposed subdivisions and other common developments. Is planned development at risk by natural hazards? Are there mitigation measures that can be taken to prevent loss of life, property damage, and disruption of governmental services and general business activities.

7. Review Vulnerability Assessment Methodology and Potential Loss Estimates

8. Schedule and Agenda for next meeting

TOWN CLERK: Please Post this notice per M.G. L. Chapter 39, Section 23, A-C

Williamsburg Hazard Mitigation Planning Committee
Meeting #2, December 18, 2009, 10:30 am
Williamsburg Town Offices
AGENDA

1. Finalize Critical Facilities and Evacuation Routes Potentially Affected By Hazard Areas
2. Review Vulnerability Assessment Methodology and Potential Loss Estimates
3. Establish Mitigation Goals and Objectives
4. Schedule and Agenda for next meeting

TOWN CLERK: Please Post this notice per M.G. L. Chapter 39, Section 23, A-C

Williamsburg Hazard Mitigation Planning Committee
Meeting #3
December 28, 2009 10 am
Williamsburg Town Offices
AGENDA

1. Finalize Revised Map of Critical Facilities
2. Final Review of plan
3. Affirm Action Plan of Hazard Mitigation Strategies
4. Review Plan Adoption and Implementation

CITY CLERK: Please Post this notice per M.G. L. Chapter 39, Section 23B

Appendix F – Public Outreach

PRESS RELEASE

CONTACT: Catherine Miller, Pioneer Valley Planning Commission, (413) 781-6045

FOR IMMEDIATE RELEASE
December 14, 2007

Pre-Disaster Mitigation Plans Under Development

The Pioneer Valley Planning Commission is beginning the process of drafting pre-disaster mitigation plans for the Communities of Amherst, Belchertown, Brimfield, Chicopee, Cummington, Goshen, Granby, Huntington, Palmer, Southampton, Springfield, Westfield, West Springfield, Westhampton, **Williamsburg**, and Worthington.

This planning effort is being undertaken to help communities assess the risks they face from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts. A mitigation action is any action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Individuals interested in their community's Hazard Mitigation plan can contact PVPC to request information on their community's plan development. In 2006-2007, PVPC facilitated development of plans for 16 communities in Hampshire and Hampden counties. Following completion of this second round of 16 hazard mitigation plans, PVPC will be developing a regional Hazard Mitigation plan. Communities with approved plans will be eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

These pre-disaster mitigation plans are being developed with assistance from the Pioneer Valley Planning Commission with funding provided by the Massachusetts Emergency Management Agency. For additional information, please contact Catherine Miller at (413) 781-6045 or cmiller@pvpc.org.

PRESS RELEASE

CONTACT: Catherine Miller, Pioneer Valley Planning Commission, (413) 781-6045

FOR IMMEDIATE RELEASE

June 30, 2008

Pre-Disaster Mitigation Plans Public Comment Period

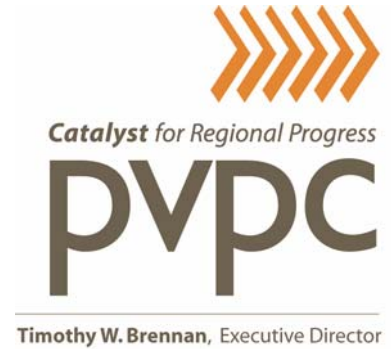
The Pioneer Valley Planning Commission, in conjunction with local Hazard Mitigation Planning Committees, has produced drafts of Pre-disaster Mitigation Plans for the communities of Cummington, Palmer, Southampton, Westfield and Westhampton. Residents, business owners and other concerned parties of the named municipalities as well as of adjacent communities are encouraged to comment on each and all of the plans. The plans are currently able to be viewed on the Pioneer Valley Planning Commission website (under Projects and Plans) and the websites of the municipalities, where possible. Paper copies of the plans may be obtained at the Pioneer Valley Planning Commission offices at 26 Central Street, West Springfield or at the individual City/Town Halls. The plans will be available for the next 30 days.

Over the upcoming months pre-disaster mitigation plans will be developed for Amherst, Belchertown, Brimfield, Chicopee, Goshen, Granby, Huntington, Springfield, West Springfield, **Williamsburg**, and Worthington and will also be available for public comment as they are developed.

This planning effort is being undertaken to help communities assess the risks they face from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts. A mitigation action is any action taken to reduce or eliminate the long-term risk to human life and property from hazards.

In 2006-2007, PVPC facilitated development of plans for 16 communities in Hampshire and Hampden counties. Following completion of this second round of 16 hazard mitigation plans, PVPC will be developing a regional Hazard Mitigation plan. Communities with approved plans are eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

These pre-disaster mitigation plans are being developed with assistance from the Pioneer Valley Planning Commission with funding provided by the Massachusetts Emergency Management Agency. For additional information, please contact Catherine Miller at (413) 781-6045 or cmiller@pvpc.org.



PRESS RELEASE

CONTACT: Catherine Miller, Pioneer Valley Planning Commission, (413) 781-6045

FOR IMMEDIATE RELEASE
February 5, 2009

Pre-Disaster Mitigation Plans Public Comment Period

The Pioneer Valley Planning Commission, in conjunction with local hazard mitigation planning committees, has produced drafts of pre-disaster mitigation plans for the communities of Huntington, Worthington, Granby, and Goshen. Residents, business owners, and other concerned parties of these municipalities and adjacent communities are encouraged to comment on these plans, which are currently available for viewing on PVPC's website at www.pvpc.org (under Projects and Plans) and the websites of the municipalities, where possible. Paper copies of the plans may be obtained at the Pioneer Valley Planning Commission offices at 26 Central Street, West Springfield or at the individual city and town halls. The plans will be available for the next 30 days.

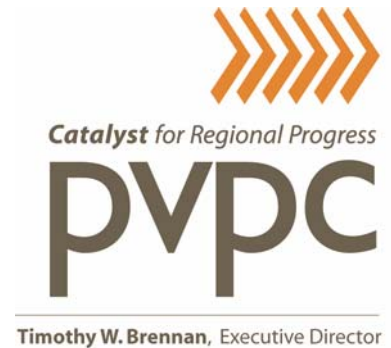
Starting this month pre-disaster mitigation plans will be developed for Amherst, Belchertown, Brimfield, Chicopee, Springfield, West Springfield, and **Williamsburg**, and will also be available for public comment as they are developed.

This planning effort is being undertaken to help communities assess the risks they face from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts. A mitigation action is any action taken to reduce or eliminate the long-term risk to human life and property from hazards.

PVPC has previously facilitated development of plans for 21 communities in the Hampshire and Hampden county areas. Following completion of all 32 local hazard mitigation plans, PVPC will be developing a regional hazard mitigation plan. Communities with approved plans are eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

These pre-disaster mitigation plans are being developed with assistance from the Pioneer Valley Planning Commission with funding provided by the Massachusetts Emergency Management Agency. For additional information, please contact PVPC's Catherine Miller at (413) 781-6045 or cmiller@pvpc.org.

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MEDIA RELEASE

CONTACT: Catherine Ratté, Pioneer Valley Planning Commission, (413) 781-6045

FOR IMMEDIATE RELEASE
October 26, 2009

Pre-Disaster Mitigation Plans Public Comment Period

The Pioneer Valley Planning Commission, in conjunction with local hazard mitigation planning committees, has produced drafts of pre-disaster mitigation plans for the communities of Amherst, Belchertown, Brimfield, Chicopee, Springfield, West Springfield, and Williamsburg. Residents, business owners, and other concerned parties of these municipalities and adjacent communities are encouraged to comment on these plans, which are currently available for viewing on PVPC's website at www.pvpc.org (under Projects and Plans). Paper copies of the plans may be obtained at the Pioneer Valley Planning Commission offices at 60 Congress Street, Springfield. The plans will be available for the next 30 days.

In addition, PVPC has produced a draft regional Hazard Mitigation plan for the Pioneer Valley, a copy of which is also available for public review and comment at www.pvpc.org.

This planning effort is being undertaken to help communities assess the risks they face from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts. A mitigation action is

any action taken to reduce or eliminate the long-term risk to human life and property from hazards.

PVPC has previously facilitated development of plans for 25 communities in the Hampshire and Hampden county areas. Communities with approved plans are eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

These pre-disaster mitigation plans are being developed with assistance from the Pioneer Valley Planning Commission with funding provided by the Massachusetts Emergency Management Agency. For additional information, please contact PVPC's Catherine Ratté at (413) 781-6045 or cratte@pvpc.org.

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