TOWN OF WILLIAMSBURG
HAZARD MITIGATION PLAN Update 2016

Williamsburg Town Office Building and Haydenville Congregational Church

Adopted by the Board of Selectmen of Williamsburg on August 4, 2016

Prepared by:

Williamsburg Hazard Mitigation Committee
and
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Acknowledgements

Williamsburg Hazard Mitigation Plan Update Committee

Thanks to the members of the Williamsburg Hazard Mitigation Plan Update Committee who reviewed and updated this plan:

Denise Banister, Chair, Emergency Management Director, Select Board member
Jason Connell, Fire Chief
James Locke, Planning Board Chair
Kathy McKeown, Planning Board
Charlene Nardi, Town Administrator
Sgt. Jason Soukup, Police Department
Helen Symonds, Board of Health
William Turner, Highway Department Superintendent

Thanks also to the Massachusetts Emergency Management Agency (MEMA) for developing the Commonwealth of Massachusetts Hazard Mitigation Plan, which served as a model for this plan, as well as the Pioneer Valley Planning Commission for their assistance in securing funding for the Town to update this plan and for providing technical assistance and facilitation of the planning process.

Pioneer Valley Planning Commission

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1. PLANNING PROCESS

1.1 Introduction

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 in collaboration with the Pioneer Valley Planning Commission (PVPC), 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 it.

Preparing and updating a hazard mitigation plan before a disaster saves communities money and facilitates 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 their plan.

FEMA requires that a community adopt a hazard mitigation plan to be eligible for mitigation funding from the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance Program (FMA), and the Pre-Disaster Mitigation (PDM) Program are programs with this requirement.

The Town of Williamsburg developed their first Hazard Mitigation plan in collaboration with the PVPC in 2007-2009 and it was approved by FEMA on 9/9/2010. The plan expired in April 2016.

This plan is an update to the approved 2010 plan. There have not been any major changes in development in Williamsburg since 2010. Therefore, this plan primarily updates the work of Town staff, volunteers, and residents to implement the prioritized mitigation strategies of the 2010 plan.

1.2 Hazard Mitigation Planning Process and Municipal Committee

This document was prepared with the review and input of the Williamsburg Hazard Mitigation Plan Update Committee (aka Hazard Mitigation Committee--members listed in Acknowledgements). The committee represents Town government and the members engaged their colleagues, including the Police and Fire Departments, the Planning Board and others, in the local hazard mitigation planning process.

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

- Reviewing and incorporating existing local plans and other information.
- 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 the 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 Natural Hazards Mitigation Plan.

The key product of this process was the development of a list of prioritized new mitigation strategies to be implemented during the next five years.

Committee Meetings

Meetings of the Hazard Mitigation Committee took place at the Town Hall, 141 Main Street, Haydenville, MA 01039 in the Town Administrator's office on the following dates:

Committee Meeting 1: December 2, 2015 at 4:30PM
Overview of hazard mitigation planning, identification and organizing of the committee members, meeting schedule, discussion of hazard identification and risk assessment.

Committee Meeting 2: December 8, 2015 at 4:30PM
Continued discussion of hazard identification and risk assessment; identification of critical facilities.

Committee Meeting 3: December 12, 2015 at 4:30PM
Review critical facilities, and discussion of potential mitigation strategies to be implemented.

Committee Meeting 4: December 14, 2015 at 4:30PM
Review mitigation strategies and implementation strategies.

Committee Meeting 5: December 17, 2015 at 4:30PM
Review and finalize priority of implementation strategies; discuss plan adoption process and procedures for ongoing maintenance of the plan.

Agendas and list of committee members present at each meeting is provided in Appendix B. Members also contributed many hours outside of committee meetings reviewing this document to identify necessary updates. While not all members of the Hazard Mitigation Committee were able to attend each meeting, all members collaborated on the plan and were updated on progress by fellow Committee members subsequently.

Public Meetings

Two public meetings were held to solicit community input on this plan. Meetings were facilitated by PVPC staff and took place at the Town Hall, 141 Main Street, Haydenville, MA 01039 in the Auditorium on the following dates.

Public Meeting 1: December 8, 2015 at 6PM
Review of hazard mitigation planning process, local risks identified.

Public Meeting 2: December 14, 2015 at 6PM
Review of mitigation strategies and priorities proposed.

1.3 Participation by Public and Neighboring Communities

The public and surrounding communities had the opportunity to participate in the Town of Williamsburg's natural hazards planning process via a variety of means. The PVPC has worked with all its member cities and towns since 2005 to prepare and update Hazard Mitigation plans. The PVPC is governed by a Commission of representatives from the 43 cities and towns that comprise the Pioneer Valley, including Williamsburg. PVPC staff secure approval from the Executive Committee of the Commission before launching any new funded initiatives, and notes from these meetings are shared with the Commission. As a result, neighboring communities of Williamsburg have been kept up to date throughout the process to update Williamsburg's Hazard Mitigation plan. Neither PVPC staff nor the members of the Williamsburg Natural Hazards Mitigation Committee received any comments or input from neighboring communities during the Hazard Mitigation plan update process.

Similarly, the public in Williamsburg was informed of the Town's plans to update their Hazard Mitigation plan via a variety of means, including articles in the local paper and on social media. In January 2015, PVPC sent a media release to all area media outlets announcing the Commission's application to FEMA to secure funding to update existing and prepare new Hazard Mitigation plans for ten communities, including Williamsburg.

Two public planning sessions were held as part of the development of the Williamsburg plan – on December 8 and December 14, 2015. Both meetings occurred after the Hazard Mitigation Committee had provided input on hazards and mitigation strategies relevant to the community. Notice of both public meetings was posted at Williamsburg Town Hall in compliance with the Commonwealth of Massachusetts' open meeting law. Public meeting agendas and notices can be found in Appendix B.

On November 30, 2015, the Pioneer Valley Planning Commission sent a press release to all area media outlets and posted on the PVPC website announcing that the hazard mitigation planning process was underway and that the public outreach meetings would be held on December 8 and 14, 2015. PVPC also posted this press release on its website and social media pages and that a draft of the plan was available

on the Town and PVPC websites. Appendix B includes documentation of these press releases and any resulting coverage. The press release also indicated that hard copies of the plan were available at PVPC's offices and at the Williamsburg Town Hall, and that all residents, businesses and other concerned parties of Williamsburg were encouraged to comment on the plan by e-mailing or calling staff contacts at PVPC or the Town listed in the press releases.

The Pioneer Valley Planning Commission's regional scope ensured that residents and government officials throughout the Pioneer Valley saw the press release and the request for comments.

A list of media organizations that were sent the two press releases is provided in Appendix B. The list of media included television stations, radio stations, and newspapers located in western Massachusetts, northern Connecticut, and southern Vermont.

Public participation will be a critical component of the Hazard Mitigation Plan maintenance process, as discussed in Chapter 6: Plan Review, Evaluation, Implementation, and Adoption.

1.4 Local Adoption

In 2014, the Williamsburg Board of Selectmen agreed to collaborate with the PVPC to seek funds from FEMA (via MEMA) to update Williamsburg's Hazard Mitigation plan. PVPC was awarded funding in 2015. Updating Williamsburg's plan was part of a multi-community plan update funding award. Work on Williamsburg's plan update began in October 2015. After the plan was provisionally approved by FEMA in 2016, the Board of Selectmen adopted the updated plan on August 4, 2016.

2. LOCAL PROFILE

2.1 Community Setting

Geography

Williamsburg is located in Hampshire County within the Pioneer Valley region. The Town is bordered on the north by Conway; on the northwest and west by Goshen and Chesterfield; on the south by Westhampton and Northampton; and on the east by Hatfield and Whately. Williamsburg is close to the urbanized area of Northampton and is approximately 25 miles north of Springfield, the region's largest city. Williamsburg is part of the Springfield Metropolitan Statistical Area (MSA).

Population Characteristics

In 2014, there were 2,482 Williamsburg residents and 1,216 housing units (American Community Survey 2009-2013 five-year estimates). The population forecast for 2020 is 2,488, and so can be expected to remain relatively steady in coming years and decades (UMass Donahue Institute Population projections 2014). The median household income in Williamsburg is $62,683, with 7.2% of residents below the federal poverty threshold, which was $19,055 for a 3-person household including one child in 2015 (American Community Survey five-year estimates 2009-2013).

Economy

Williamsburg residents travel an average of 24.6 minutes to work each day (ACS 2009-2013). As of November 2015, the approximate labor force was 1,520 individuals and the unemployment rate was 4.1%, significantly below the state unemployment rate of 6.2%.

Climate

Williamsburg is located in Hampshire County, where annual rainfall averages 44 inches and is distributed throughout the year. In addition to rain, snowfall averages 40 inches per season. Prevailing winds from the south (and from the north/northwest to a lesser extent) reach their highest average speed during the month of April.

In the past few decades, Williamsburg and all of New England have seen an increase in the number of extreme precipitation events, usually defined as large amounts of rain in a short period of time (an inch or more in a 24-hour period). In Massachusetts, the increase in these types of events since 1948 has been 81% (Environment America Research & Policy Center, 2012). Notable among these in terms of impact in Williamsburg were Tropical Storm Irene in late August 2011, and the "Snow-tober" snow and ice storm of October 30, 2011.

Extreme rainfall is a cause of flooding, which is a major concern of this plan. In the last five years, there has also been an increased occurrence of tornadoes and large storms that generate strong wind gusts.

Notable History

This hazard mitigation plan has special historic significance for the Town of Williamsburg.
On May 16, 1874 a poorly constructed dam holding back a large impoundment on the East Branch of the Mill River in the northern area of town failed spectacularly, sending a wall of floodwater and debris reaching 40 feet in height roaring down the valley through Williamsburg Center and on to the meadows of Northampton 12 miles downstream. A total 139 people were killed; the dam keeper who raced ahead of the flood to warn residents is credited with saving thousands of lives. Most mills in Williamsburg subsequently relocated (many to Holyoke), returning the town to a primarily agrarian economy. It was the first major dam disaster in the United States, and is still second worst in U.S. history, exceeded only to the 1889 dam failure and flood disaster in Jonestown, Pennsylvania.

2.2 Infrastructure

Roads and Highways

Williamsburg Center is approximately 6 miles west of Interstate 91 (it is 7.5 miles to I-91 Exit 20 via Bridge Road). This proximity to the interstate highway system enables residents of Williamsburg to travel conveniently to the major population centers in the Connecticut River valley including Springfield and Hartford, Connecticut for work, recreation and cultural attractions. In addition to I-91, Williamsburg's other key routes include Route 9, or Main Street, which runs in a northwest-southeast orientation and defines the Town's two village centers (Town Center and Haydenville); Mountain Street, traveling north into Whately; Chesterfield Road, branching off Route 9 to the west; and Ashfield Road to the north.

Rail

There are no active rail lines.

Public Transportation

Within Williamsburg, there is fixed route transit service from Williamsburg to Florence and downtown Northampton via Route 9, provided by the Pioneer Valley Transit Authority (PVTA) Route 42 (the "Burgy Bullet"); PVTA also provides paratransit accessible van service for elderly and disabled residents within one-half mile of the Route 42 path during its hours of operation. In addition, the Council on Aging offers special shopping trips using the town's van.

Water and Sewer

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 Unquomonk 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 600 customers (both residential and commercial). The residential customers constitute approximately half the 1,216 dwelling units in town and are located mainly along South Street, in and near the village centers, along Route 9 between the villages, and along Fort Hill Road. The Board of Health adopted Private Well Regulations, effective May 1, 1990, to protect the public health, safety, and welfare by ensuring housing units with no access to public water supplies the

supply of safe drinking water from private wells and to provide for the protection of the town's groundwater resources. Per the BOH Private Well Regulation, all private wells must be constructed in accordance with MA DEP's Private Well Guidelines per certification by the well driller.

Residents in outlying areas are served by private wells. Local regulations govern the location, construction of private wells, and central records are kept by the Board of Health. The community has a water protection overlay zoning district in place to protect the public water supply.

The public sewer system has limited coverage in town. There is no treatment plant in Williamsburg; sewage is conveyed primarily by gravity south to the City of Northampton's treatment plant at 33 Hockanum Road via a line under and along Route 9.

2.3 Natural Resources

Watersheds

The Mill River and its various tributaries are probably the most critical natural features in Williamsburg's past and future community identity. This is owed largely to the flood disaster of 1874 (see page 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, Unquomonk Brook, and Beaver Brook, in addition to several unnamed streams and brooks.

Surface Waters

Williamsburg has no substantial bodies of open water except the City of Northampton's Mountain Street Reservoir, which measures approximately 69 acres of open water surface surrounded by approximately 400 areas of woodlands. The upper Unquomonk Reservoir, at about five or six acres, is a distant second in terms of surface area.

Aquifer Recharge Areas

The aquifer is a semi-confined, buried valley, sand and gravel aquifer adjacent to the Unquomonk Brook in the south central part of Town. The Water Department owns the entire 400-foot, Zone I protective radius around the wells and several acres of land within the Zone II and Zone III of the wells.

Wetlands

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. At least seven rare and endangered species of animals and plants are found in these areas, including a remarkably large type of dragonfly, the Ocellated Darner. Additionally, there are 3,380 acres of riparian land in Williamsburg as defined by MassGIS; of these, 85% are considered to be in a natural state.

Forest

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.

2.4 Development

Zoning

Williamsburg has three base zoning districts, and four overlay districts, which are described below.

Base districts:

- Residential – Village Residential Base District (VR)
- Mixed Use – Village Mixed Base District (VM)
- Rural - Rural Base District (RU)

Overlay districts:

- Floodplain Overlay District – Applies to areas within the boundary of the 100-year flood that are considered hazardous according to FEMA; limits some uses to prevent potential flood damage.
- Water Supply Protection Overlay District – Protects and preserves groundwater resources from potentially damaging pollution or environmental degradation by regulating certain uses. Regulations specify prohibited and restricted uses, regulate drainage, detail site plan requirements, and establish special permit procedures.
- Age Restricted Housing Community Overlay District – Defined as areas serviced at a public way by public sewer and public water for the purpose of promoting housing for senior residents.
- Solar Photovoltaic Overlay District – Defined as two town-owned parcels on the north side of High Street (landfill site) for the purpose of promoting solar energy facilities.

The Williamsburg 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. A volunteer group is working with surrounding communities to develop a Mill River Greenway Plan to assure protection of the river way and environs.

There have been no significant changes in development in Williamsburg since our first Hazard Mitigation plan was approved in 2010 that have affected our vulnerability to natural hazards.

National Flood Insurance Program

Williamsburg is a participating member of the National Flood Insurance Program, and had the following NFIP policy and claim statistics as of 08/31/2015.

- Flood Insurance Maps (FIRMs) are used for flood insurance purposes and are on file with the Williamsburg Town Clerk.
- FIRMs have been effective since June 1, 1981, with no updates since then. PVPC has requested an update to all Hampshire County FIRMs, but has not been advised if or when these will be completed. Hampden County FIRMs were updated by FEMA as of July 21, 2014 (http://www.mass.gov/anf/docs/itd/services/massgis/nfhl-status.pdf)
- There are 18 in-force policies in effect in Williamsburg for a total of $3,577,100 worth of flood insurance coverage.
- As of August 31, 2015, there were a total of 10 NFIP loss claims in Williamsburg for which a total $57,817 was paid. (http://bsa.nfipstat.fema.gov/reports/1040.htm#25)
- There are no homes defined as "Repetitive Loss Properties" under the NFIP within Williamsburg.

The Town will maintain compliance with the NFIP throughout the next 5-year hazard mitigation planning cycle by monitoring its Flood Plain Overlay District and ensuring that the district accurately reflects the 100-year floodplain and FEMA Flood Insurance Rate Map.

2.5 Classification of Water Bodies

This section describes water bodies within the Town of Williamsburg.

Mill River

The Mill River and its various tributaries are the principal and critical water features in the Town of Williamsburg. Approximately 95% of the town drains into the Mill River within the town borders. The Mill River rises in Goshen, Conway and Ashfield and has a drainage basin of 29.1 square miles above the point at which it flows to the south out of Williamsburg. Of that area, 16.6 square miles are within Williamsburg. These areas do not include the basin of Beaver Brook, the only substantial brook that

flows out of Williamsburg before it joins the Mill River. Beaver Brook owes some of its flow to a pipeline that carries water from the Northampton water supply reservoirs in West Whately to the Mountain Street Reservoir on the Williamsburg-Whately line. Overflow from that reservoir joins with Grass Hill Brook, Potash Brook (both rising in Whately) and Nungee Brook to become Beaver Brook. The entire Beaver Brook drainage basin above the Williamsburg-Northampton line covers 5.5 square miles, 3.4 of which are in Williamsburg. Of the West Brook drainage basin, from which Northampton's drinking water is piped to Mountain Street Reservoir, 1.25 square miles lie in Williamsburg.

Major Tributaries of the Mill River

Bradford Brook rises in Ashfield and Conway and on the North End Farm and joins the stream once held back by the great dam whose collapse drowned the town in 1874. Together these streams form the East Branch of the Mill River. Near the former Bullard Bridge they are joined by a brook that flows south out of a small valley east of Carey Hill. The West Branch originates in the Highland Lakes in Goshen, and is joined by Rogers (or Devil's Den) Brook, several unnamed streams, and Meekins Brook before meeting the East Branch in the center of Williamsburg village. Joe Wright Brook, flowing south from Whately and northeastern Williamsburg, joins the Mill River at Depot Road, and Unquomonk Brook flows into the main stream opposite Kellogg Road. One more unnamed stream flows from the highlands of the former Kellogg farm through the village of Haydenville (partly piped underground) and into the river below the old railroad bed, east of Fairfield Avenue. Finally, Beaver Brook joins the Mill River half a mile south of the Northampton line.

Bodies of Open Water

Williamsburg has no substantial natural bodies of open water. Human-made open water bodies are the Mountain Street Reservoir, owned by the City of Northampton and which measures approximately 69 acres in surface area, and the upper Unquomonk Reservoir, which measures approximately 5-6 acres in surface area (www.northamptonma.gov/DocumentCenter/ View/2175). There are also small beaver ponds throughout the town, but no other water bodies in Williamsburg of year-round significance.

Floodplains

In Williamsburg, there are several floodplain areas, primarily along the Mill River. There are some smaller 500-year floodplains in several low-lying areas throughout the town, as well. The 100-year flood zone is the area that will be covered by water as a result of a flood that has a 1% chance of occurring in any given year; the 500-year flood zone has a 0.2% chance of occurring in any given year. 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.

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 during the past decade. Generally, these have been small floods with relatively minor impacts, such as temporarily closing or restricting road access and ponding in residents' yards. Flooding in the 100-year floodplain particularly impacts the Town Center as the Mill River runs through it.

Williamsburg's generally rugged terrain and narrow, steep stream valleys, together with the channelization of the Mill River through the two villages, make the floodplains of our streams and river quite narrow in most places. Most of the exceptions are year-round wetland areas. The only place in

town where a large amount of building has occurred in a floodplain (predating floodplain zoning) is along the Ashfield Road, where many former summer cottages are now year-round homes. Some of these properties could be expected to experience heavy damage in a serious flood. In the villages, the river is not expected to crest above its present high, steep banks—in some places, walls—even in a very severe flood. The performance standards of the Floodplain Overlay District of the Williamsburg Zoning Bylaw are designed to prevent activities and construction in floodplain areas which would worsen flood damage either upstream (by backing up and deepening floodwaters) or downstream (by increasing floodwater velocity or volume) in the event of a major flood.

Riparian Areas

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. Riparian areas are those lands adjacent to water sources and provide many significant benefits including:

- Flood mitigation for agricultural crops and structures by storing and slowing runoff;
- Water supply protection through filtration of pollutants;
- Erosion control by absorbing and slowing stormwater runoff;
- Groundwater recharge; and
- Open space corridors for recreation, such as fishing, boating, and hunting.

Wetlands

There are approximately 800 acres of wetlands in Williamsburg, which are dispersed fairly widely throughout the town. The largest concentration is located in the valley area formed by Beaver, Nungee and Grass Hill Brooks along Mountain Street. Wetlands include rivers, ponds, swamps, wet meadows, beaver ponds, and land within the FEMA-defined 100-year flood area. Wetlands are specialized habitat areas that are always wet or are wet for extended periods of time during the year. They are home to wide array of species including frogs, fish, freshwater clams and mussels, beaver, muskrats, great blue herons, waterfowl, and bitterns, to name just a few. Wetlands also serve as temporary storage areas for flood waters allowing the water to percolate slowly into the ground rather than run off into streams and rivers quickly and violently.

Aquifer Recharge Areas

Williamsburg's public water supply system draws very high quality water from two gravel-packed wells located in the 1,375-acre drainage basin of Unquomonk Brook. The entire 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.

2.6 Access Status

There is no public recreational access to the water bodies described in the section above.

3. HAZARD IDENTIFICATION AND RISK ASSESSMENT

This section presents a summary of disasters that have affected, or could affect, Williamsburg. Historical research, conversations with local officials and emergency management personnel, available hazard mapping and other weather-related databases were used to develop this list. Information was also drawn from the Massachusetts State Hazard Mitigation Plan. Hazards are identified in the following categories:

1. Floods
2. Severe snows and ice storms
3. Hurricanes
4. Severe thunderstorms, winds, and tornadoes (includes microbursts)
5. Wildfire/brushfire
6. Earthquakes
7. Dam failure
8. Drought
9. Landslides
10. Extreme temperatures
11. Other, including vector-borne diseases, and secondary impacts from electric power outages

Natural Hazard Analysis Methodology

The analysis of the hazards above is organized in the following categories: Hazard Description, Location, Extent, Previous Occurrences, Probability of Future Events, Impact, and Vulnerability. A description of each of these analysis categories follows.

Hazard Description

The natural hazards identified for Williamsburg are: floods, severe snowstorms/ice storms, hurricanes, severe thunderstorms / wind / tornadoes, wildfire/brushfire, earthquakes, dam failure, and drought. Many of these hazards result in similar impacts to a community. For example, hurricanes, tornadoes and severe snowstorms may cause wind-related damage.

Location

Location refers to the geographic areas within the planning area that are affected by the hazard. Some hazards affect the entire planning area universally, while others apply to a specific portion, such as a floodplain or area that is susceptible to wild fires. Classifications are based on the area that would potentially be affected by the hazard, on the following scale:

Location of Occurrence, Percentage of Town Impacted by Given Natural Hazard	
Location of Occurrence	**Percentage of Town Impacted**
Large	More than 50% affected
Medium	10 to 50% affected
Small	Less than 10% affected

Extent

Extent describes the strength or magnitude of a hazard. Where appropriate, extent is described using an established scientific scale or measurement system. Other descriptions of extent include water depth, wind speed, and duration.

Previous Occurrences

Previous hazard events that have occurred are described. Depending on the nature of the hazard, events listed may have occurred on a local, state-wide, or regional level.

Probability of Future Events

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

Frequency of Occurrence and Annual Probability of Given Natural Hazard	
Frequency of Occurrence	**Probability of Future Events**
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

Impact

Impact refers to the effect that a hazard may have on the people and property in the community, based on the assessment of extent described above. Impacts are classified according to the following scale:

Impacts, Magnitude of Multiple Impacts of Given Natural Hazard	
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.
Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of facilities.

Vulnerability

Based on the above metrics, a hazard index rating was determined for each hazard. The hazard index ratings are based on a scale of 1 through 5 as follows:

1 – Very high risk
2 – High risk
3 – Medium risk
4 – Low risk
5 – Very low 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.

Hazard Identification and Analysis Worksheet for Williamsburg

Type of Hazard	Location of Occurrence	Probability of Future Events	Impact	Hazard Risk Index Rating
1. Floods	Small	Very High	Limited	3 – Medium Risk
2. Severe Snowstorms / Ice Storms	Large	High	Limited/Critical	2 – High Risk
3. Hurricanes/Tropical Storms	Large	Moderate	Limited	2 – High Risk
4. Severe Thunderstorms Wind/Tornado/Microburst	Large	Moderate	Minor/Limited	2 – High Risk
5. Wildfires / Brushfires	Small	Very High	Minor	5 – Very Low Risk
6. Earthquakes	Large	Very Low	Critical	5 - Very Low Risk
7. Dam Failure	Small	Very Low	Minor	5 - Very Low Risk
8. Drought	Large	Low	Minor	5 - Very Low Risk
9. Landslides	Small	Low	Limited	4 - Low Risk
10 . Extreme Temperatures	Large	Low	Minor	5 – Very Low Risk
11. Other (vector-borne illness, secondary impacts from power outages)	Large	High	Minor/Limited	5 – Very Low Risk

3.1 Floods

Hazard Description

Flooding in Williamsburg is typically caused by three general types of storms:

- **Continental storms**, which are typically low-pressure systems that can be either slow or fast moving. These storms originate from the west and occur throughout the year.

- **Coastal storms**, also known as nor'easters, usually occur in late summer or early fall and originate from the south. The most severe coastal storms, hurricanes, occasionally reach Massachusetts and generate very large amounts of rainfall.

- **Thunderstorms**, which form on warm, humid summer days and cause locally significant rainfall, usually over the course of several hours. These storms can form quickly and are more difficult to predict than continental and coastal storms.

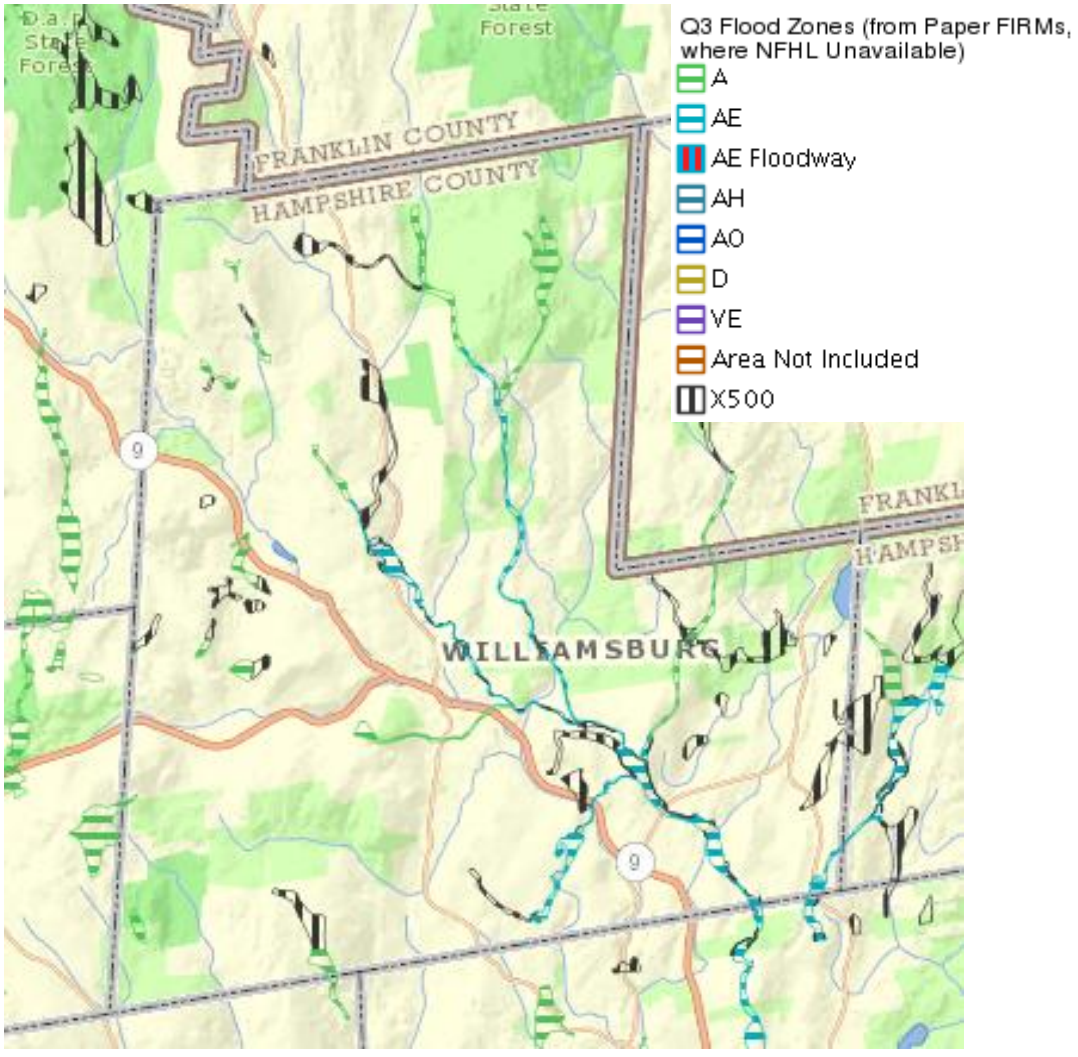
A floodplain is the relatively flat, lowland area adjacent to a river, lake or stream. Floodplains serve an important function, acting like large "sponges" to absorb and slowly release floodwaters back to surface waters and groundwater. Over time, sediments that are deposited in floodplains develop into 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.

Location

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.

In Williamsburg, there are several floodplain areas – primarily along the Mill River. There are some smaller 500-year floodplains mapped as well, in several low-lying areas throughout Williamsburg. In addition to the FEMA designated floodplain, the Hazard Mitigation Committee has identified the following specific areas that are in the 100-year floodplain and most prone to flooding on a regular basis.

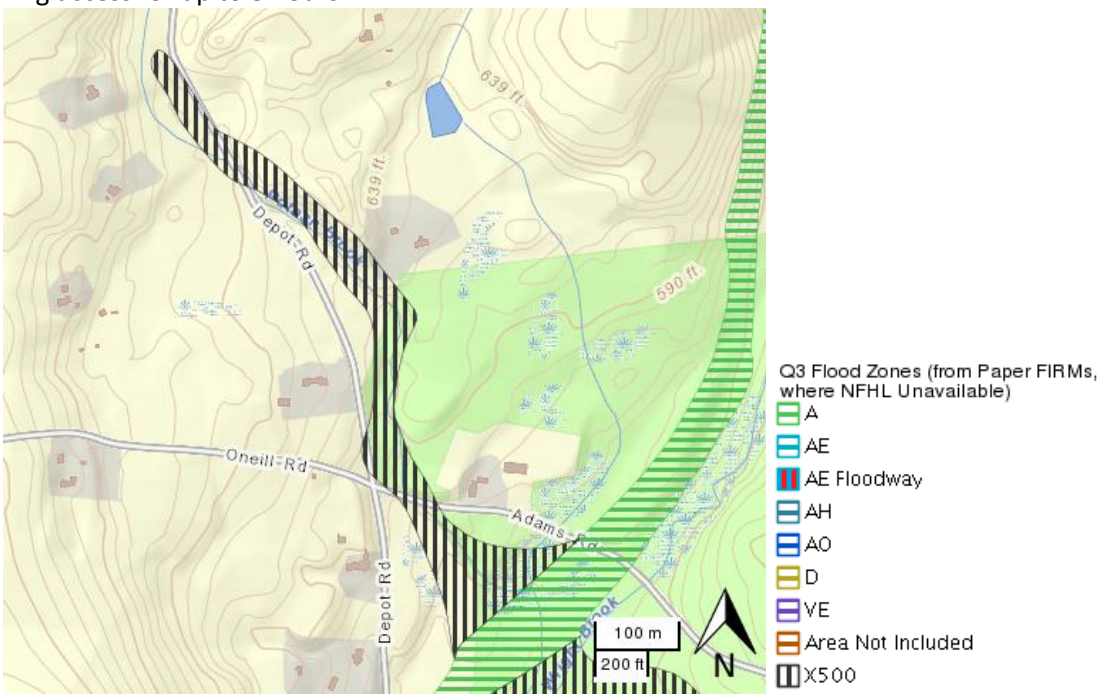
FIGURE: Williamsburg FEMA 100-year and 500-year Flood Zones



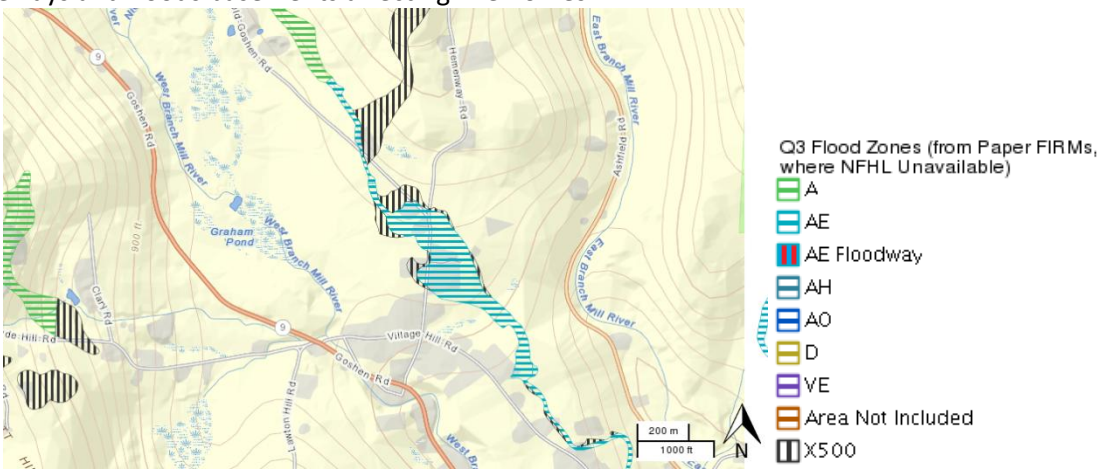
Source: MassGIS FEMA FIRM Maps 1980

In addition to the FEMA designated floodplain, the Hazard Mitigation Committee has identified the following areas that are in the 100-year and/or 500-year FEMA flood zones and prone to flooding on a regular or occasional basis.

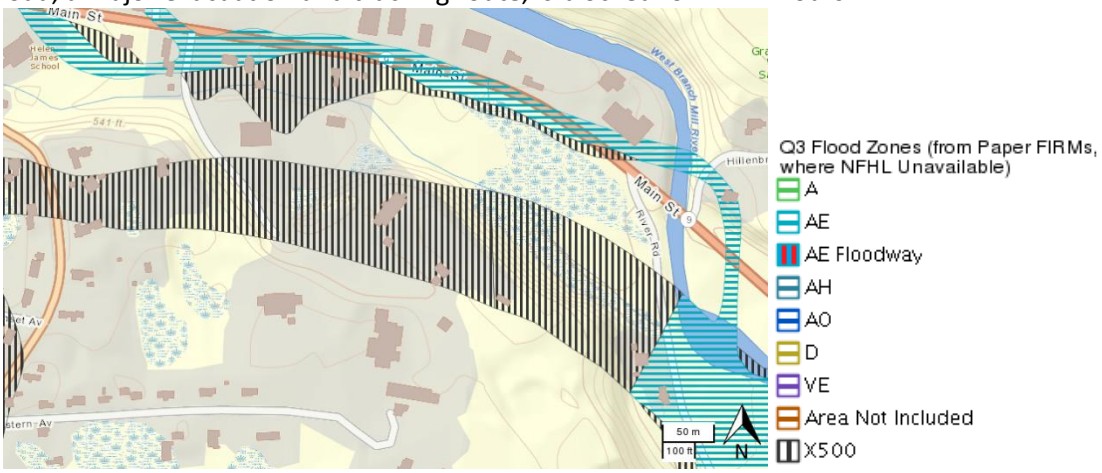
1. Depot Road An undersized culvert floods once or twice each year. The water floods over the road blocking access for up to 8 hours.



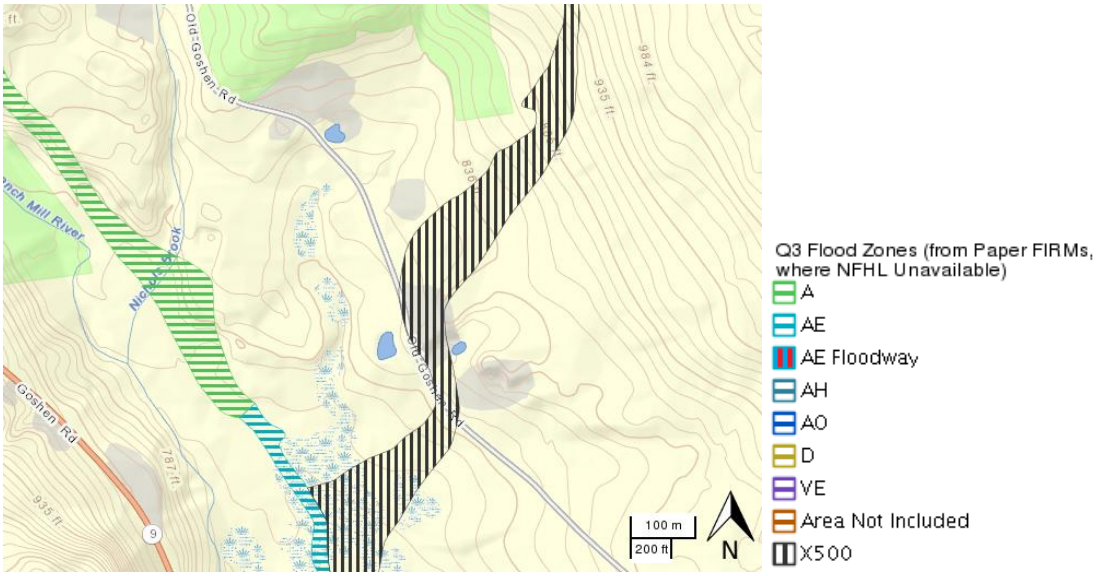
2. Route 9 (Goshen Road) going west towards Goshen, Water comes off road and washes away driveways and floods basements affecting five homes.



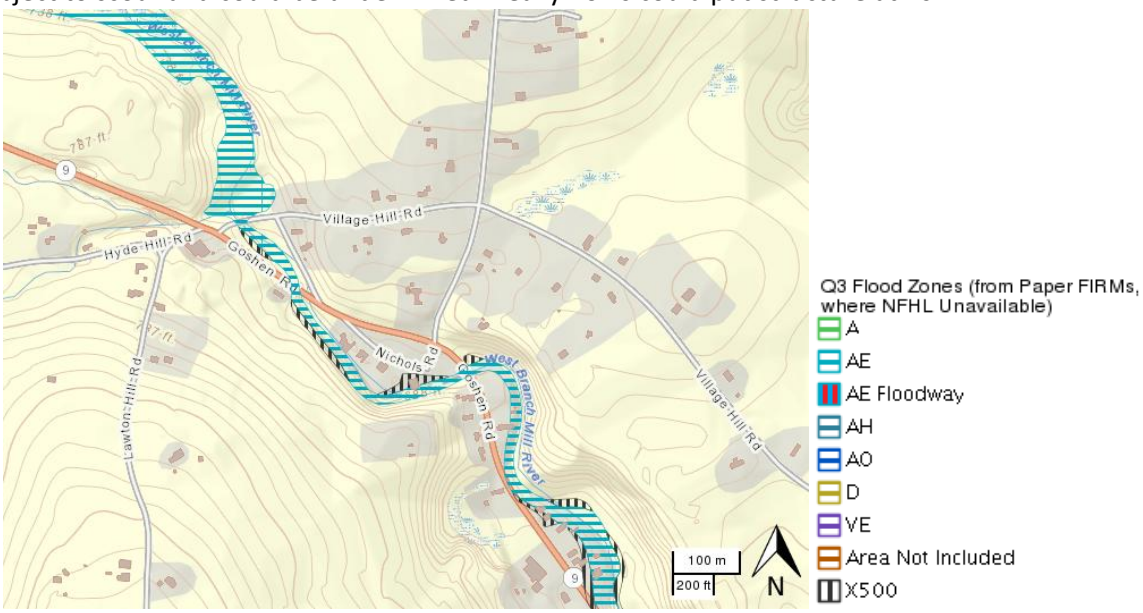
3. Route 9 at the corner where Williamsburg Snack Bar is located, Route 9 floods every spring and the road, a major evacuation and trucking route, is blocked for 12-24 hours.



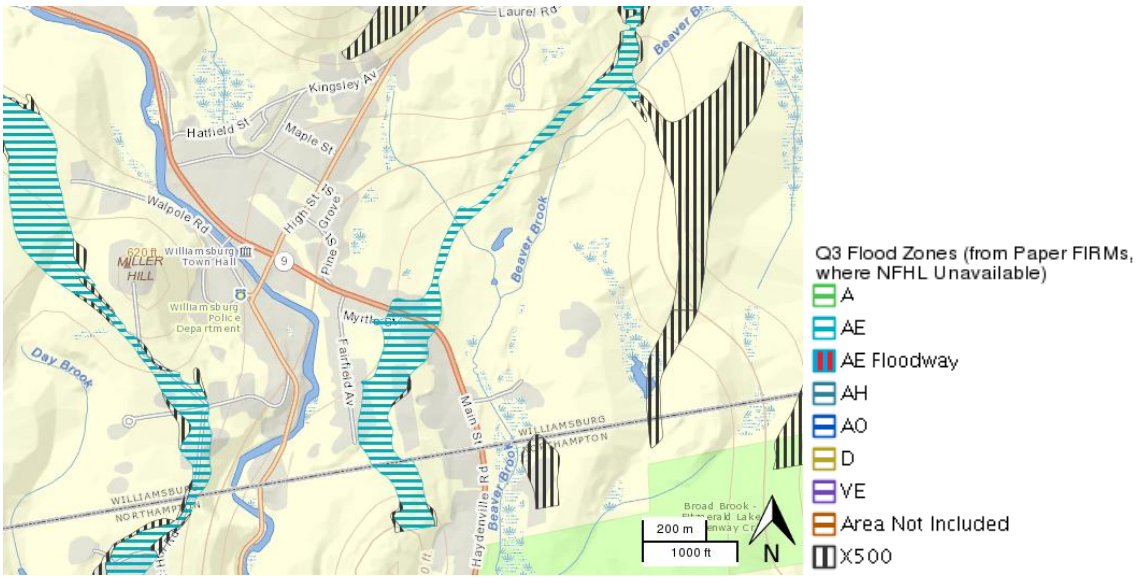
4. Old Goshen Road south of Nicols Brook



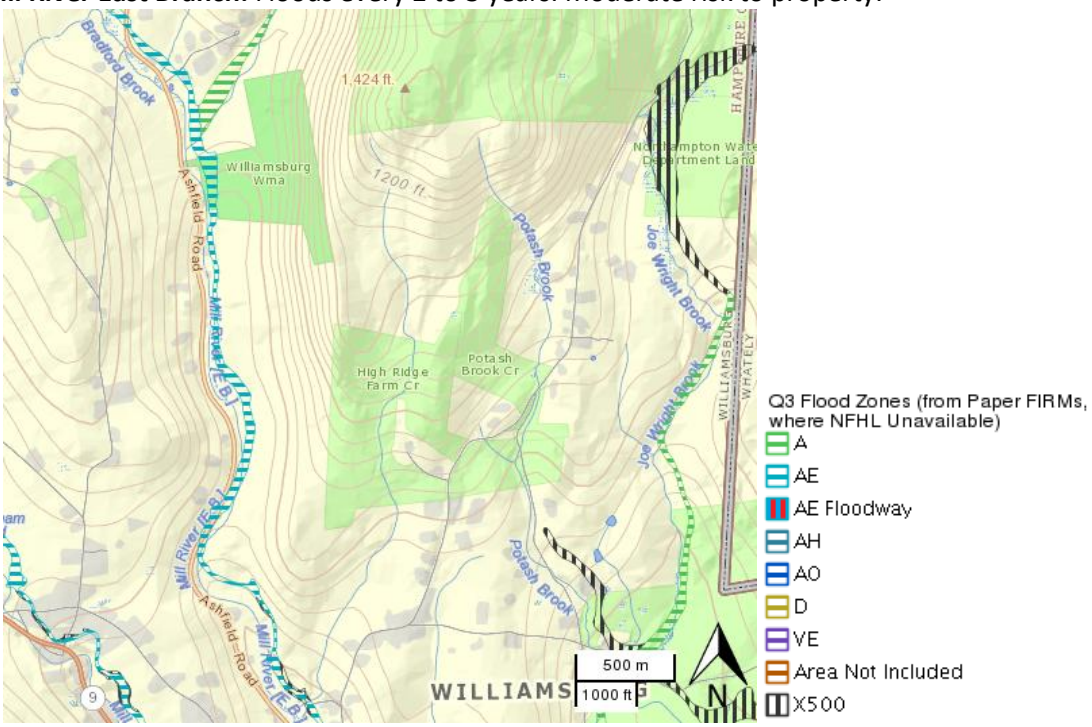
5. Bridge Street at American Legion Hall/Buttonshop Alley: Center bridge pier in Mill River is subject to scour and could be undermined. Heavy flows could put structure at risk.



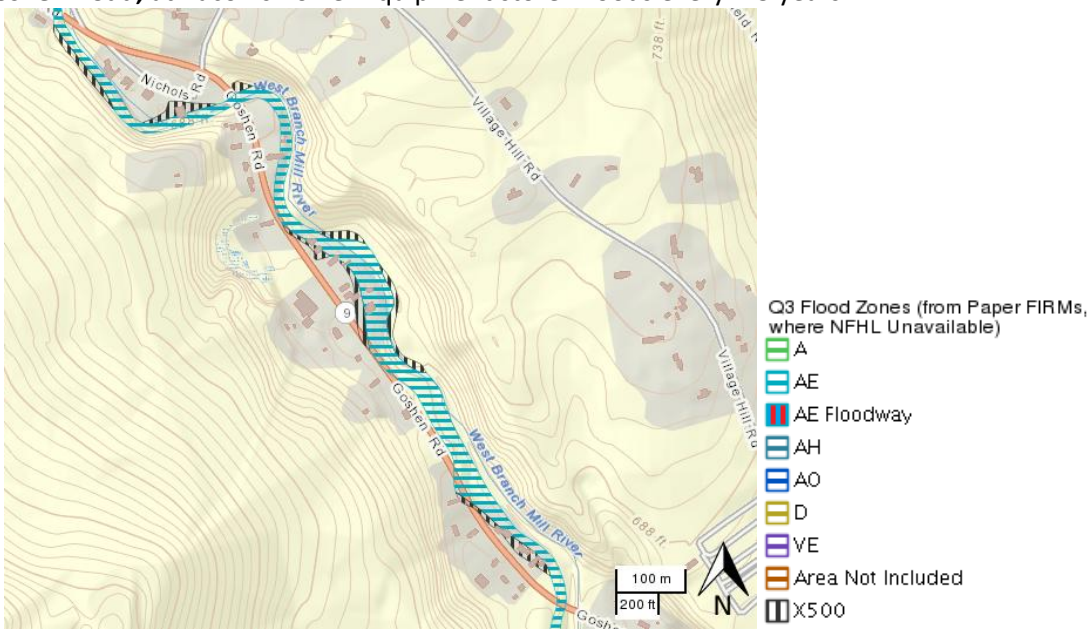
6. Beaver Brook: Floods annually, approximately 200 acres of property near and within Beaver Brook Golf Course. No structures affected.



7. Mill River East Branch: Floods every 2 to 3 years. Moderate risk to property.



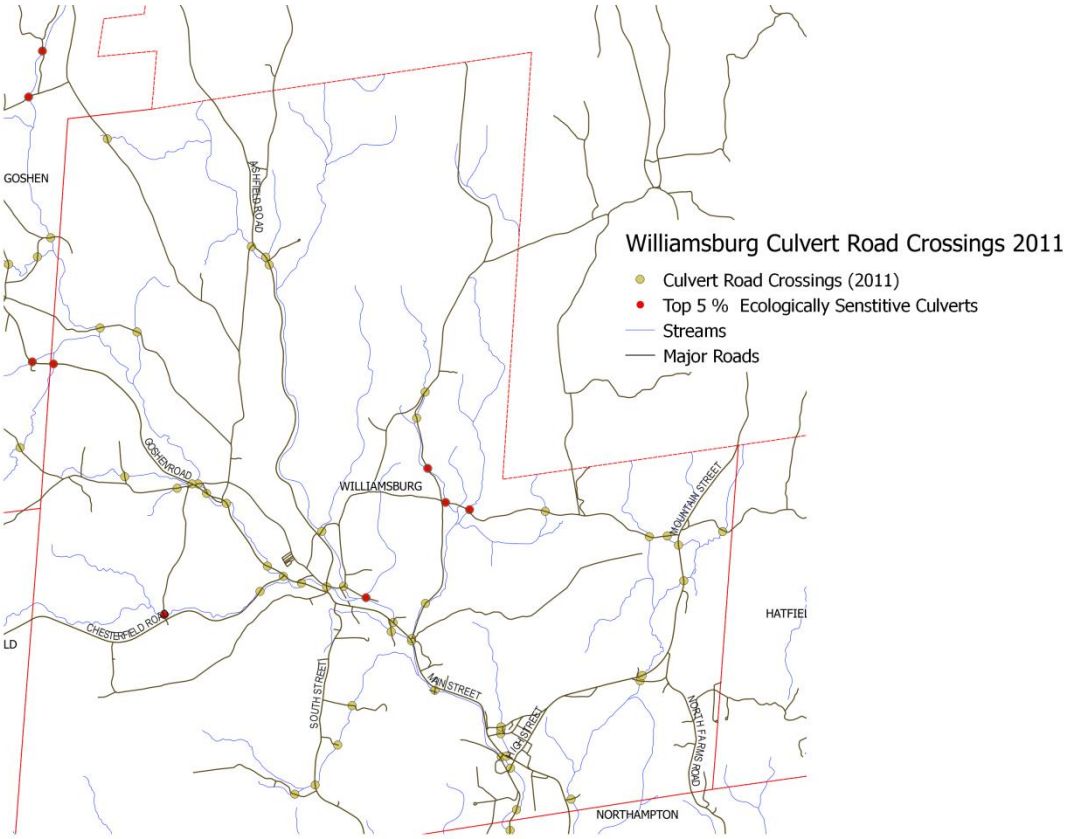
8. Goshen Road, at Bacon's Power Equipment store. Floods every 2-3 years.



9. Kingsley Avenue, area behind old Skinner Mansions: Floods occasionally after heavy rain (however, not in a 100-year or 500-year flood zone).

Related to the flood-prone areas identified above are the locations of 53 culvert road crossings in Williamsburg, which are shown on the map below.

Williamsburg Culvert Road Crossings (53)



Source: University of Massachusetts Stream Continuity Project 2011 <https://streamcontinuity.org/index.htm>

Based on these locations, flooding has a "small" location of occurrence, with less than 10% of land area in town affected.

Extent

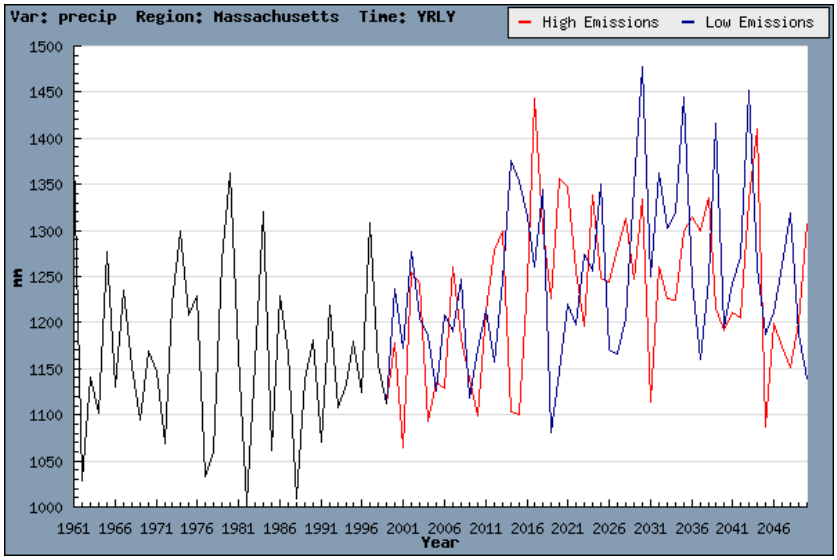
Floods are typically classified as one of the following two types:

- **Flash floods** are the product of heavy, localized precipitation in a short time period over a given location. 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).

- **General floods** may last for several days or weeks and are caused by precipitation over a longer time period in a particular river basin. 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).

The average annual precipitation for Williamsburg and surrounding areas in western Massachusetts is 46 inches. This is likely to increase. Rainfall has increased approximately 10% during the past 50 years, and is expected to continue increasing (see figure below).

Massachusetts Rainfall 1961-2050



Source: NECIA 2006

Previous Occurrences

Flooding at Depot Road and along Route 9/Goshen Road occurs annually. Other occurrences at intervals as noted above.

The National Weather Service monitors flooding crests for the Connecticut River, at the nearest National Weather Service station located directly downstream from Williamsburg in Northampton. The NWS has various flooding classifications based on water level. These classifications and their definitions are:

Action Stage, the stage which, when reached by a rising stream, represents the level where the NWS or a partner/user needs to take some type of mitigation action in preparation for possible significant hydrologic activity. The type of action taken varies for each gage location. Gage data should be closely monitored by any affected people if the stage is above action stage.

Minor Flooding, defined to have minimal or no property damage, but possibly some public threat. A Flood Advisory product is issued to advise the public of flood events that are expected not to exceed the minor flood category. Examples of conditions that would be considered minor flooding include:

- water over banks and in yards
- no building flooded, but some water may be under buildings built on stilts (elevated)
- personal property in low lying areas needs to be moved or it will get wet
- water overtopping roads, but not very deep or fast flowing
- water in campgrounds or on bike paths
- inconvenience or nuisance flooding
- small part of the airstrip flooded, and aircraft can still land
- one or two homes in the lowest parts of the community may be cut off or get a little water in the crawl spaces or homes themselves if they are not elevated

Moderate Flooding, defined to have some inundation of structures and roads near the stream. Some evacuations of people and/or transfer of property to higher elevations may be necessary. A Flood Warning is issued if moderate flooding is expected during the event. Examples of conditions that would be considered moderate flooding include:

- several buildings flooded with minor or moderate damage
- various infrastructure rendered temporarily useless (i.e. fuel tanks cannot be reached due to high water, roads flooded that have no alternates, generator station flooded)
- elders and those living in the lowest parts of the village are evacuated to higher ground
- access to the airstrip is cut off or requires a boat
- water over the road is deep enough to make driving unsafe
- gravel roads likely eroded due to current moving over them
- widespread flooding, but not deep enough to float ice chunks through the community
- water deep enough to disrupt normal life; cause some personal hardships
- airstrip closed
- travel is most likely restricted to boats

Major Flooding, defined to have extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations are necessary. A Flood Warning is issued if major flooding is expected during the event. Examples of conditions that would be considered major flooding include:

- many buildings flooded, some with substantial damage or destruction
- infrastructure destroyed or rendered useless for an extended period of time
- multiple homes are flooded or moved off foundations
- everyone in threatened area is asked to evacuate
- National Guard units assist in evacuation efforts
- erosion problems are extreme
- the airstrip, fuel tanks, and the generator station are likely flooded
- loss of transportation access, communication, power and/or fuel spills are likely
- fuel tanks may float and spill and possibly float downstream
- ice chunks floating though the community that could cause structural damage
- high damage estimates and high degree of danger to residents

The major flood stage for the Connecticut River at the Northampton station is 120 feet, which has been reached three times since 1935. The moderate flood stage is 115 feet, which has been reached 16 times since 1935. The minor flood stage is 112 feet, which has been reached 60 times since 1935. The action stage is 110 feet, which has been reached 11 times since 1935.

Historical Crests of the Connecticut River in Northampton, Directly Downstream from Williamsburg

3/19/36	129.4 ft	Major flooding
9/22/38	125 ft	Major flooding
5/31/84	120.8 ft	Major flooding
4/6/60	119.9 ft	Moderate flooding
1/1/49	118.6 ft	Moderate flooding
4/1/87	118 ft	Moderate flooding
3/23/48	117.7 ft	Moderate flooding
3/29/53	117.6 ft	Moderate flooding
8/30/11	117.16 ft	Moderate flooding
5/5/40	117 ft	Moderate flooding
10/9/05	116.3 ft	Moderate flooding
3/15/77	116.2 ft	Moderate flooding
6/3/52	116 ft	Moderate flooding
4/3/76	115.7 ft	Moderate flooding
4/23/69	115.5 ft	Moderate flooding
4/1/51	115.4 ft	Moderate flooding
4/24/58	115.3 ft	Moderate flooding
3/24/68	115.2 ft	Moderate flooding
5/1/56	115 ft	Moderate flooding
7/2/73	114.9 ft	Minor flooding
4/7/52	114.8 ft	Minor flooding
4/19/82	114.8 ft	Minor flooding
3/27/79	114.6 ft	Minor flooding
4/4/05	114.6 ft	Minor flooding
3/19/73	114.6 ft	Minor flooding
4/17/96	114.6 ft	Minor flooding
4/1/98	114.6 ft	Minor flooding
4/17/07	114.5 ft	Minor flooding
12/16/83	114.5 ft	Minor flooding
4/18/94	114.4 ft	Minor flooding
4/13/47	114.4 ft	Minor flooding
4/5/59	114.3 ft	Minor flooding
4/24/01	114.3 ft	Minor flooding
12/22/73	114.2 ft	Minor flooding
5/14/96	114.2 ft	Minor flooding
2/26/81	114.2 ft	Minor flooding
4/2/62	114.1 ft	Minor flooding
4/2/04	114 ft	Minor flooding
4/2/77	114 ft	Minor flooding
3/18/90	113.9 ft	Minor flooding
5/6/72	113.9 ft	Minor flooding
1/19/06	113.7 ft	Minor flooding
4/8/84	113.7 ft	Minor flooding
3/22/45	113.5 ft	Minor flooding
4/1/86	113.5 ft	Minor flooding
4/1/93	113.5 ft	Minor flooding
4/14/11	113.46 ft	Minor flooding
11/30/59	113.4 ft	Minor flooding
3/29/76	113.4 ft	Minor flooding
4/17/93	113.4 ft	Minor flooding
4/21/72	113.3 ft	Minor flooding
10/30/03	113.2 ft	Minor flooding
4/17/14	113.12 ft	Minor flooding
3/31/03	113 ft	Minor flooding
10/27/05	113 ft	Minor flooding
1/10/98	112.9 ft	Minor flooding
4/15/08	112.9 ft	Minor flooding
4/18/11	112.8 ft	Minor flooding
4/17/55	112.8 ft	Minor flooding
3/31/10	112.8 ft	Minor flooding
9/8/11	112.7 ft	Minor flooding
4/6/50	112.7 ft	Minor flooding
9/8/11	112.7 ft	Minor flooding
10/21/75	112.6 ft	Minor flooding
4/4/67	112.5 ft	Minor flooding
5/26/79	112.5 ft	Minor flooding
5/7/89	112.5 ft	Minor flooding
4/16/64	112.4 ft	Minor flooding
4/8/89	112.4 ft	Minor flooding
1/28/96	112.4 ft	Minor flooding
12/19/00	112.4 ft	Minor flooding
4/4/63	112.4 ft	Minor flooding
5/5/71	112.2 ft	Minor flooding
4/6/74	112.2 ft	Minor flooding
3/24/10	112.2 ft	Minor flooding
4/26/70	112.1 ft	Minor flooding
8/20/55	112 ft	Minor flooding
4/11/80	112 ft	Minor flooding
4/19/54	112 ft	Minor flooding
12/13/08	111.9 ft	Action Stage
4/5/90	111.8 ft	Action Stage
4/6/00	111.8 ft	Action Stage
5/21/06	111.8 ft	Action Stage
12/1/59	111.8 ft	Action Stage
4/17/02	111.7 ft	Action Stage
12/26/90	111.7 ft	Action Stage
4/30/88	111.6 ft	Action Stage
5/5/83	111.6 ft	Action Stage
4/4/73	111.6 ft	Action Stage
12/26/03	111.5 ft	Action Stage

Source: National Weather Service

Probability of Future Events

Based upon previous data, there is a very high probability (more than 70% in any given year) of flash flooding or general flooding occurring in Williamsburg. Flooding frequencies for the various floodplains in Williamsburg are defined by FEMA as the following:

- 10-year floodplain – 10% chance of flooding in any given year
- 25-year floodplain – 2.5% chance of flooding in any given year
- 100-year floodplain – 1% chance of flooding in any given year
- 500-year floodplain – 0.2% chance of flooding in any given year

Climate scientists predict that in the next few decades, climate change will increase the frequency and intensity of all storms that can cause flooding. Currently, floods are the most costly natural hazard in the United States, and climate change will only increase this damage. More information about the effect of Climate Change can be found in the Pioneer Valley Planning Commission's Climate Action Plan, available at www.sustainableknowledgecorridor.org.

The Massachusetts State Climate Change Adaptation Report has additional information about the impact of climate change and can be accessed at www.mass.gov/eea/air-water-climate-change/climate-change/climate-change-adaptation-report.html.

Impact

The Town faces a "limited" impact, with 10% or more of total area affected, from flooding. Based on the Town's median home value of $262,100 (2009-13 ACS) and an estimated 100% of damage to 100% of structures affected, the Town faces the following estimated impacts from flooding:

Ref #	Description	Structures at Risk
1	Depot Road	1 home; 1 outbuilding
2	Route 9 (Goshen Rd)	5 homes
3	Route 9 at Williamsburg Snack Bar	1 home; 1 commercial building
4	Old Goshen Road	1 home
5	Bridge St/Buttonshop Alley	5 homes, 2 commercial buildings
6	Beaver Brook	No structures at risk
7	Mill River East Branch	Up to 15 homes
8	Goshen Rd at Bacon's Power Equip	1 home, 1 commercial building
9	Kingsley Ave (Skinner Mansions)	
	TOTAL STRUCTURES	**Approximately 35 Structures @$262,100 each = $9,173,500**

In addition, the cost of repairing or replacing the roads, bridges, utilities, and contents of structures is significant, but cannot be estimated with sufficient accuracy for this plan. Water travels under West Street. Approximately ten years ago the culvert at West Street was re-lined inside because water was decaying the interior.

Vulnerability

Based on the above analysis, Williamsburg has a hazard index rating of **"3 - Medium risk"** for flooding.

3.2 Severe Snow and Ice Storms

Hazard Description

Snow is characterized as frozen precipitation in the form of six-sided ice crystal. In order for snow to occur, temperatures in the atmosphere (from ground level to cloud level) must be at or below freezing. The strongest form of a severe snow storm is a blizzard. Blizzards are characterized by frequent wind gusts above 35 miles per hour, limited to no visibility due to falling snow and extreme cold that lasts longer than three hours.

Ice storms are liquid rain that falls and freezes upon contact with cold objects. There must be an ice build-up of greater than ¼ inch for it to be considered an ice storm. When more than a ½ inch of ice build-up is forecasted a winter storm warning can be triggered.

Severe winter storms can pose a significant risk to property and human life. The rain, freezing rain, ice, snow, cold temperatures and wind associated with these storms can cause the following risks:

- Disrupted power and phone service
- Unsafe roadways and increased traffic accidents
- Infrastructure and other property are also at risk from severe winter storms and the associated flooding that can occur following heavy snow melt
- Tree damage and fallen branches that cause utility line damage and roadway blockages
- Damage to telecommunications structures
- Reduced ability of emergency officials to respond promptly to medical emergencies or fires

Location

The entire Town of Williamsburg is susceptible to severe snowstorms, making the location of occurrence "large," with over 50% of land area affected. There are no known areas with site-specific snow and ice problems. Road icing can occur in Williamsburg Center (Bridge Street/Buttonshop Alley) occasionally.

Extent

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 are a function of the area affected by the snowstorm, the amount of snow, and the number of people living in the path of the storm. The aerial distribution of snowfall and population information are combined in an equation that calculates a NESIS score which 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.

While the Town of Williamsburg has not tracked snowfalls in the community, the weather reporters for the local Channel 3 news station produced this summary report of the top 10 snowfalls recorded in the region since 1905.

24.0 inches | January 12, 2011

21.9 inches | February 12, 2006

21.0 inches | February 11-2, 1983

18.2 inches | December 19-20, 1945

17.7 inches | December 29, 1945

17.4 inches | February 19-20, 1934

17.0 inches | February 20-21, 1921

16.9 inches | February 6-7, 1978

16.9 inches | December 26-27, 1947

16.3 inches | March 5, 2001

16.2 inches | February 4, 1926

16.0 inches | February 14, 1914

Northeast Snowfall Impact Scale Categories		
Category	**NESIS Value**	**Description**
1	1—2.49	Notable
2	2.5—3.99	Significant
3	4—5.99	Major
4	6—9.99	**Crippling**
5	10.0+	**Extreme**

Source: http://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis

Previous Occurrences

Williamsburg generally experiences at least one or two severe winter storms each year with varying degrees of severity. Severe winter storms typically occur during January and February; however, they can occur from late September through late May.

Based on data available from the National Oceanic and Atmospheric Administration, there are 47 winter storms since 1958 that have registered on the Northeast Snowfall Impact Scale (NESIS). Of these, approximately 26 storms resulted in snow falls in the Pioneer Valley of at least 10 inches. These storms are listed chronologically on the following figure. Note that during the last 10 years (since 2005), there have been 21 storms (16 of which occurred since 2011) that merited a “notable” rating or greater, whereas there were only 10 rated storms during the decade 1958 to 1968, and 13 rated storms between 1978 and 2003.

Winter Storms Producing Over 10 inches of Snow in the Pioneer Valley, 1958-2015			
Date	**NESIS Value**	**NASIS Category**	**NESIS Classification**
1958-02-14	6.25	4	**Crippling**
1958-03-18	3.51	2	Significant
1960-03-02	8.77	4	**Crippling**
1960-12-11	4.53	3	Major
1961-01-18	4.04	3	Major
1961-02-02	7.06	4	**Crippling**
1964-01-11	6.91	4	**Crippling**
1966-01-29	5.93	3	Major
1966-12-23	3.81	2	Significant
1967-02-05	3.50	2	Significant
1969-02-08	3.51	2	Significant
1969-02-22	4.29	3	Major
1969-12-25	6.29	4	**Crippling**
1972-02-18	4.77	3	Major
1978-01-19	6.53	4	**Crippling**
1978-02-05	5.78	3	Major
1982-04-06	3.35	2	Significant
1983-02-10	6.25	4	**Crippling**
1987-01-21	5.40	3	Major
1993-03-12	13.20	5	**Extreme**
1994-02-08	5.39	3	Major
1995-02-02	1.43	1	Notable
1996-01-06	11.78	5	**Extreme**
1997-03-31	2.29	1	Notable
2000-01-24	2.52	2	Significant
2000-12-30	2.37	1	Notable
2003-02-15	7.50	4	**Crippling**
2005-01-21	6.80	4	**Crippling**
2006-02-12	4.10	3	Major
2007-02-12	5.63	3	Major
2007-03-15	2.54	2	Significant
2009-03-01	1.59	1	Notable
2010-02-23	5.46	3	Major
2010-12-24	4.92	3	Major
2011-01-09	5.31	3	Major
2011-01-26	2.17	1	Notable
2011-02-01	5.30	3	Major
2011-10-29	1.75	1	Notable
2013-02-07	4.35	3	Major
2013-03-04	3.05	2	Significant
2013-12-13	2.95	2	Significant
2013-12-30	3.31	2	Significant
2014-02-11	5.28	3	Major
2014-11-26	1.56	1	Notable
2014-12-09	1.49	1	Notable
2015-01-25	2.62	2	Significant
2015-01-29	5.42	3	Major
2015-02-08	1.32	1	Notable

Source: http://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis

Probability of Future Events

Based upon the availability of records for Hampshire County, there is a "High" probability (between 40% to 70% in any given year) that a severe snow or ice storm will occur in Williamsburg.

Research on climate change indicates that there is great potential for stronger, more frequent storms as the global temperature increases. More information about the effect of Climate Change can be found in the Pioneer Valley Planning Commission's Climate Action Plan, available at www.sustainableknowledgecorridor.org.

The Massachusetts State Climate Change Adaptation Report has additional information about the impact of climate change and can be accessed at www.mass.gov/eea/air-water-climate-change/climate-change/climate-change-adaptation-report.html.

Impact

The impact of a severe snow or ice storm is classified as "limited," with more than 10% of property in the affected area damaged or destroyed.

To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property of $310,064,300 is used. An estimated 20% of damage would occur to 10% of structures, resulting in a total of $6,201,286 worth of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on the above assessment, Williamsburg has a hazard index rating of **"2 – High Risk"** from severe snowstorms and ice storms.

3.3 Hurricanes and Tropical Storms

Hazard Description

Hurricanes are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and with a diameter ranging from 10 to 30 miles. The primary damaging forces associated with hurricanes are high-level sustained winds and heavy precipitation. Hurricanes are violent rainstorms with strong winds that can reach speeds of up to 200 miles per hour and which generate 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. In Western Massachusetts, which is 80 to 100 miles inland from the Atlantic Coast, hurricanes may degrade to tropical storms by the time they reach the region; nonetheless, impacts in some cases are similar to hurricanes.

Location

Because of the widespread and regional nature of hurricane damage, all of Williamsburg is considered to be at risk from hurricanes. This means that the location of the hazard occurrence is "large," or more than 50% of land area is likely to be affected. Ridge tops, in particular, are more susceptible to wind damage. Areas susceptible to flooding are also likely to be affected by the heavy rainfall that typically accompanies hurricanes and tropical storms.

Extent

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour, the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Hurricane Wind Scale, which rates hurricane wind intensity on a scale of 1 to 5, with 5 being the most intense.

Saffir-Simpson Scale	
Category	**Maximum Sustained Wind Speed (MPH)**
1	74–95 mph
2	96–110 mph
3	111–129 mph
4	130–156 mph
5	157+ mph

Source: National Hurricane Center, 2012

Previous Occurrences

Hurricanes and tropical storms that have affected Williamsburg are shown below. ("Super Storm Sandy" in 2012 was not considered a hurricane or tropical storm, as it did not meet the meteorological criteria for having a warmer temperature at its core; nonetheless, the storm was significant in Williamsburg.)

Major Hurricanes and Storms Affecting Williamsburg

Hurricane/Storm Name	Year	Saffir/Simpson Category (when reached MA)
Great Hurricane of 1938	1938	3
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
Irene	2011	Tropical Storm
Sandy	2012	Super Storm

Source: National Weather Service

No hurricanes have tracked directly through Williamsburg.

Probability of Future Events

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. Based upon past occurrences, it is reasonable to say that there is a "low" probability of hurricanes in Williamsburg, or a 1 to 10% probability in the next year.

Impact

A description of the damages that could occur due to a hurricane is described by the Saffir-Simpson scale, as shown below.

Hurricane Damage Classifications			
Storm Category	**Damage Level**	**Description of Damages**	**Wind Speed (MPH)**
1	**MINIMAL** Very dangerous winds will produce some damage	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage. An example of a Category 1 hurricane is Hurricane Dolly (2008).	74-95
2	**MODERATE** Extremely dangerous winds will cause extensive damage	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings. An example of a Category 2 hurricane is Hurricane Francis in 2004.	96-110
3	**EXTENSIVE** Devastating damage occurs	Some structural damage to small residences and utility buildings, with a minor amount of curtain wall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland. An example of a Category 3 hurricane is Hurricane Ivan (2004).	111-129
4	**EXTREME** Catastrophic damage occurs	More extensive curtain wall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland. An example of a Category 4 hurricane is Hurricane Charley (2004).	130-156
5	**CATASTROPHIC** Catastrophic damage occurs	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required. An example of a Category 5 hurricane is Hurricane Andrew (1992).	157+

Source: "Saffir/Simpson Hurricane Scale" NOAA National Climatic Data Center https://www.ncdc.noaa.gov
Note: The Saffir Scale uses "5" as its most severe category; this is the inverse of the Hazard Index Ratings used in this plan, in which "1" is the most severe.

To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property of $310,064,300 is used. Wind damage of 5% to 10% of structures would result in an estimated $1,550,322 of damage. Flood damage of 10% to 20% of structures would result in $6,201,286 of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on the above analysis, Williamsburg faces a hazard index rating of **"2 - High Risk"** from hurricanes and tropical storms.

3.4 Severe Thunderstorms, Tornadoes, High Winds and Microbursts

A thunderstorm is a storm with lightning and thunder produced by a cumulonimbus cloud, usually producing gusty winds, heavy rain, and sometimes hail. Effective January 5, 2010, the NWS modified the hail size criterion to classify a thunderstorm as "severe" when it produces damaging wind gusts in excess of 58 mph (50 knots), hail that is 1 inch in diameter or larger (quarter size), or a tornado (NWS, 2013).

Wind is air in motion relative to the surface of the earth. For non-tropical events over land, the NWS issues a Wind Advisory (sustained winds of 31 to 39 mph for at least 1 hour or any gusts 46 to 57 mph) or a High Wind Warning (sustained winds 40+ mph or any gusts 58+ mph). For tropical systems, the NWS issues a tropical storm warning for any areas (inland or coastal) that are expecting sustained winds from 39 to 73 mph. A hurricane warning is issued for any areas (inland or coastal) that are expecting sustained winds of 74 mph. Effects from high winds can include downed trees and/or power lines and damage to roofs, windows, etc. High winds can cause scattered power outages. High winds are also a hazard for the boating, shipping, and aviation industry sectors.

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. High wind speeds, hail, and debris generated by tornadoes can result in loss of life, downed trees and power lines, and damage to structures and other personal property.

Microbursts are sudden down bursts of air that that funnel air directly down until it hits the ground and disperses outwards. Microbursts most commonly occur during strong thunderstorms. The scale and suddenness of microbursts make them difficult to predict with certainty, but it is possible to forecast the conditions that make microbursts much more likely. The high winds associated with microbursts can knock over full grown trees, damage buildings and are especially problematic for aircrafts.

Location

As per the Massachusetts Hazard Mitigation Plan, the entire Town is at risk of high winds, severe thunderstorms, tornadoes, and microbursts. Because of this, the location of occurrence is “large," with over 50% of land area affected.

Extent

An average thunderstorm is 15 miles across and lasts 30 minutes; severe thunderstorms can be much larger and longer. Southern New England typically experiences 10 to 15 days per year with severe thunderstorms. Thunderstorms can cause hail, wind, and flooding.

Microbursts are typically less than three miles across. They can last anywhere from a few seconds to several minutes. Microbursts cause damaging winds up to 170 miles per hour in strength and can be accompanied by precipitation.

Tornadoes are measured using the enhanced F-Scale, shown with the following categories and corresponding descriptions of damage:

Enhanced Fujita Scale Levels and Descriptions of Damage			
EF-Scale Number	**Intensity Phrase**	**3-Second Gust (MPH)**	**Type of Damage Done**
EF0	Gale	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	Moderate	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	Significant	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	Severe	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	Devastating	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

Source: http://www.spc.noaa.gov/faq/tornado/f-scale.html

CONVERTING TRADITIONAL HAIL SIZE DESCRIPTIONS

Traditional object-to-size conversion for assessment and translation of severe hail reports. We encourage *measurement*, not estimation, of hail size.

HAIL SIZE (in.)	OBJECT ANALOG REPORTED
.50	Marble, moth ball
.75	Penny
.88	Nickel
1.00	Quarter
1.25	Half dollar
1.50	Walnut, ping pong
1.75	Golf ball
2.00	Hen egg
2.50	Tennis ball
2.75	Baseball
3.00	Tea cup
4.00	Grapefruit
4.50	Softball

Previous Occurrences

Because thunderstorms and wind affect the town regularly on an annual basis, there are not significant records available for these events. As per the Massachusetts Hazard Mitigation Plan, the best available data, there are approximately 10 to 30 days of thunderstorm activity in the state each year.

Between 1950 and 2004, no (0) tornadoes have touched down in Williamsburg. Since the 1950s, there have been close to 9 tornadoes in Hampshire County.

There are typically 1 to 3 tornadoes somewhere in southern New England per year. Most occur in the late afternoon and evening hours, when the heating is the greatest. The most common months are June, July, and August, but the Great Barrington, MA tornado (1995) occurred in May and the Windsor Locks, CT tornado (1979) occurred in October.

Within Massachusetts, tornadoes have occurred most frequently in Worcester County and in communities west of Worcester. In 2011, a tornado ranked F3 (Severe Damage) on the Fujita Scale of Tornado Intensity, blew through West Springfield, Westfield, Springfield, Monson, Wilbraham, Brimfield, Sturbridge, and Southbridge. The tornado and related storm killed 3 people and resulted in hundreds of injuries across the state.

There have been at least three microburst events in Williamsburg in recent memory:

- 1970 along Mountain Road
- Mid-1990s in the center of Haydenville (Route 9 at High St)
- July 4, 2014 in the area of South Street, Dept Road, and Mountain Road

Also in 2014, a powerful microburst affected the nearby city of Easthampton on October 8th. This event involved winds up to 100 miles per hour. The microburst began on the west side of Mount Tom and moved southwest to northeast along the edge of the range, causing significant damage to, and loss of, trees. Several homes lost power; some of these and others were damaged.

Probability of Future Events

One measure of tornado activity is the tornado index value. It is calculated based on historical tornado events data using USA.com algorithms. It is an indicator of the tornado level in a region. A higher tornado index value means a higher chance of tornado events. Data was used for Hampshire County to determine the Tornado Index Value as shown in the table below.

Tornado Index for Hampshire County	
Hampshire County	125.73
Massachusetts	87.60
United States	136.45

Source: http://www.usa.com/hampshire-county-ma-natural-disasters-extremes.htm

Based upon the available historical record, there is a “low” probability of tornado occurrence, or between a 1 to 10% chance, in any given year. There is a "moderate" probability, or 10 to 40% chance in any given year, of a severe thunderstorm or wind.

Impact

The impact of an event is determined to be "limited," with less than 25% of all structures in Williamsburg impacted.

The potential for locally catastrophic damage is a factor in any tornado, severe thunderstorm, or wind event. In Williamsburg, a tornado that hit the residential areas would leave much more damage than a tornado with a travel path that ran along its forested uplands, where little settlement has occurred. Most structures in Williamsburg have not been built to Zone 1, Design Wind Speed Codes. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975, with most of Williamsburg's housing built before this date.

To approximate the potential impact to property that could be affected by severe weather, tornado, or wind, the total value of all property in Williamsburg of $310,064,300 is used. For a tornado, an estimated 100% of damage would occur to 1% of structures, resulting in a total of $3,100,643 worth of damage. For a severe thunderstorm or wind, an estimated 20% of damage would occur to 10% of structures, resulting in a total of $6,201,286 worth of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in these estimates.

Vulnerability

Based on the above assessment, Williamsburg has a hazard index rating of **"2 – High Risk"** from severe thunderstorms, winds, and tornadoes.

3.5 Wildfire/Brushfire

Hazard Description

Wildfires are typically larger fires, involving full-sized trees as well as meadows and scrublands. Brushfires are uncontrolled fires that occur in meadows and scrublands, but do not involve full-sized trees. Both wildfires fires and brushfires can consume homes, other buildings and/or agricultural resources. FEMA has classifications for 3 different classes of wildfires:

- **Surface fires** are the most common type of wild land fire and burn slowly along the floor of a forest, killing or damaging trees
- **Ground fires** burn on or below the forest floor and are usually started by lightening
- **Crown fires** move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions

The wildfire season in Massachusetts usually begins in late March and typically culminates in early June, as well as another period of risk during the fall, corresponding with the driest live fuel periods of the year. April is historically the month in which wildfire danger is the highest. However, wildfires can occur every month of the year. Drought, snow pack, and local weather conditions can expand the length of the fire season. The early and late shoulders of the fire season usually are associated with human-caused fires.

Location

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.

Based on this data, the location of occurrence is deemed to be "small," with less than 10% of land area affected.

Extent

Wildfires can cause widespread damage to the areas that they affect. They can spread very rapidly, depending on local wind speeds and be very difficult to get under control. Fires can last for several hours up to several days. As of 2005, there were 13,187 acres of forested land in Williamsburg (Source, MassGIS 2012). Williamsburg is approximately 80% forestland. Certain forested areas in Williamsburg cover remote, impassable areas with rugged terrain that present an insurmountable challenge for firefighters. A large wildfire could damage a large proportion of this land mass, including vital watershed lands, in a short period of time. During a period of prolonged drought, this risk would be exacerbated.

There have not been any major wildfires recorded in Williamsburg. However, based on other major wildfires that have occurred in western Massachusetts, it is estimated that such a fire would likely destroy around 50 to 500 acres of forested area.

The overall extent of wildfires is shown in the table below:

FIGURE: Extent of Wildfires

Rating	Basic Description	Detailed Description
CLASS 1: Low Danger (L) Color Code: **Green**	Fires not easily started	Fuels do not ignite readily from small firebrands. Fires in open or cured grassland may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
CLASS 2: Moderate Danger (M) Color Code: **Blue**	Fires start easily and spread at a moderate rate	Fires can start from most accidental causes. Fires in open cured grassland will burn briskly and spread rapidly on windy days. Woods fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel – especially draped fuel -- may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.

CLASS 3: High Danger (H) Color Code: **Yellow**	Fires start easily and spread at a rapid rate	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuel. Fires may become serious and their control difficult, unless they are hit hard and fast while small.
CLASS 4: Very High Danger (VH) Color Code: **Orange**	Fires start very easily and spread at a very fast rate	Fires start easily from all causes and immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics - such as long-distance spotting - and fire whirlwinds, when they burn into heavier fuels. Direct attack at the head of such fires is rarely possible after they have been burning more than a few minutes.
CLASS 5: Extreme (E) Color Code: **Red**	Fire situation is explosive and can result in extensive property damage	Fires under extreme conditions start quickly, spread furiously and burn intensely. All fires are potentially serious. Development into high-intensity burning will usually be faster and occur from smaller fires than in the Very High Danger class (4). Direct attack is rarely possible and may be dangerous, except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions, the only effective and safe control action is on the flanks, until the weather changes or the fuel supply lessens.

Previous Occurrences

Williamsburg has a professional Fire Department with a chief and assistant chief who are supported by on-call firefighters and emergency responders. There is no record, recorded or anecdotal, of wildfires in Williamsburg. Williamsburg has averaged slightly more than 10 brushfires per year since 2001, which is as far back as specific records are available. No damage to structures or people was associated with these brushfires.

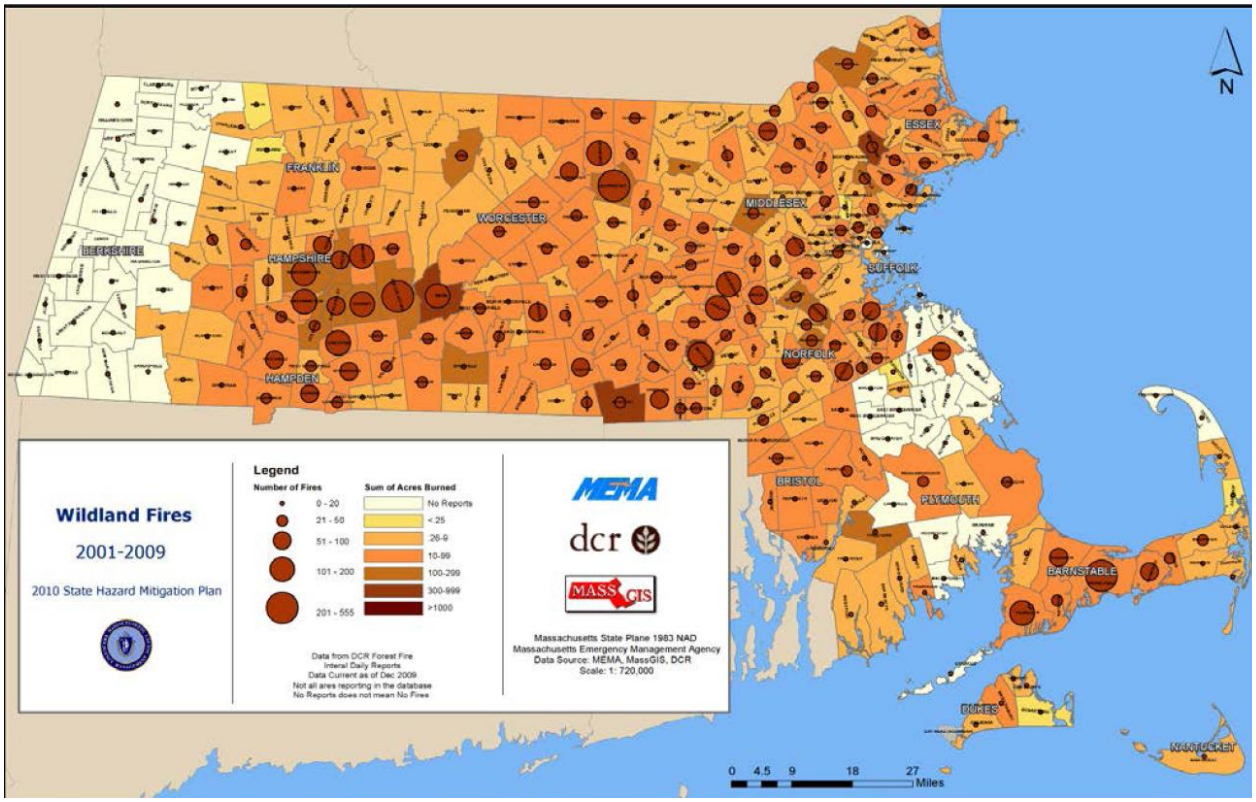
During the past 100 years, there have not been many wildfires occurring in the Pioneer Valley. However, some of the more significant regional wildfires that have occurred in the past 20 years are as follows:

- 1995 – Russell, 500 acres burned on Mt. Tekoa
- 2000 – South Hadley, 310 acres burned over 14 days in the Lithia Springs Watershed
- 2001 – Ware, 400 acres burned
- 2010 – Russell, 320 acres burned on Mt. Tekoa
- 2012 – Eastern Hampden County, dry conditions and wind gusts created a brush fire in Brimfield, and burned 50 acres

Total Brushfire Incidents in Williamsburg	
2009	10
2010	1
2011	3
2012	0
2013	10

Source: Massachusetts Fire Incidence Reporting System, County Profiles, 2013 Fire Data Analysis

FIGURE: Wildland Fires in Massachusetts, 2001-2009



Source: Massachusetts Hazard Mitigation Plan

Probability of Future Events

In accordance with the Massachusetts Hazard Mitigation Plan, the Williamsburg Hazard Mitigation Committee found it is difficult to predict the likelihood of wildfires in a probabilistic manner because the number of variables involved. However, based on previous occurrences, the Committee determined the probability of future events to be “low” (1% to 10% probability in the next year).

Climate scenarios project summer increases in summer temperature averages of 2ºC and 5ºC (3.6ºF to 9.0ºF) and precipitation decreases of up to 15%. Such conditions would exacerbate summer drought and further promote high-elevation wildfires, releasing stores of carbon and further contributing to the buildup of greenhouse gases. Forest response to increased atmospheric carbon dioxide—the so-called “fertilization effect”—could also contribute to more tree growth and thus more fuel for fires, but the effects of carbon dioxide on mature forests are still largely unknown.

Climate change is also predicted to bring increased wind damage from major storms, as well as new types of pests to the region. Both increased wind and the introduction of new pests could potentially create more debris in wooded areas and result in a larger risk of fires.

Impact

While a large wildfire could damage some of the landmass of Williamsburg, these areas are not populated by people, meaning that wildfire affected areas are not likely to cause damage to property or people. For this reason, the Town faces a "minor" impact from wildfires, with very few damages likely to occur.

Both wildfires and brushfires can consume homes, other buildings and/or agricultural resources. The impact of wildfires and brushfires are as follows:

- Impact to benefits that people receive from the environment, such as food/water and the regulation of floods and drought
- Impact on local heritage, through the destruction of natural features
- Impact to the economy, due to damage to property and income from land following a wildfire
- Impact through the destruction of people and property

Using a total value of all structures in Williamsburg of $310,064,300 and an estimated 20% of damage to 1% of all structures, the estimated amount of damage from a highly unlikely forest fire is $620,129. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on the above assessment, Williamsburg has a hazard index rating of **"5 – Very Low Risk"** for wildfires and brushfires.

3.6 Earthquakes

Hazard Description

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. 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. Ground shaking from earthquakes can rupture gas mains and disrupt other utility service. They can also 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 most at risk during an earthquake.

Location

Because of the regional nature of the hazard, the entire Town of Williamsburg is susceptible to earthquakes. This makes the location of occurrence "large," or more than 50% of the total land area affected.

Extent

The magnitude of an earthquake is measured using the Richter Scale, which measures the energy of an earthquake by determining the size of the greatest vibrations recorded on the seismogram. On this scale, one step up in magnitude (from 5.0 to 6.0, for example) increases the energy more than 30 times. The intensity of an earthquake is measured using the Modified Mercalli Scale. This scale quantifies the effects of an earthquake on the Earth's surface, humans, objects of nature, and man-made structures on a scale of I through XII, with I denoting a weak earthquake and XII denoting a earthquake that causes almost complete destruction.

FIGURE: Richter Scale Magnitudes and Effects	
Magnitude	**Effects**
< 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: FEMA

FIGURE: Modified Mercalli Intensity Scale for and Effects			
Scale	**Intensity**	**Description Of Effects**	**Corresponding Richter Scale Magnitude**
I	Instrumental	Detected only on seismographs.	
II	Feeble	Some people feel it.	< 4.2
III	Slight	Felt by people resting; like a truck rumbling by.	
IV	Moderate	Felt by people walking.	
V	Slightly Strong	Sleepers awake; church bells ring.	< 4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	Very Strong	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open.	< 6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

Source: FEMA

Previous Occurrences

The most recent earthquakes to affect the Pioneer Valley region are shown in the table below.

FIGURE: Major Earthquakes Affecting Pioneer Valley Region, MA, 1924 – 2014		
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
Bar Harbor, NH	October 3, 2006	4.2
Hollis Center, ME	October 16, 2012	4.6

Source: Northeast States Emergency Consortium <www.nesec.org/hazards/earthquakes.cfm>

FIGURE: New England States Record of Historic Earthquakes		
State	**Years of Record**	**Number Of Earthquakes**
Connecticut	1668 - 2007	137
Maine	1766 - 2007	544
Massachusetts	1668 - 2007	355
New Hampshire	1638 - 2007	360
Rhode Island	1776 - 2007	38
Vermont	1843 - 2007	73
New York	1840 - 2007	755
Total earthquakes in New England states between 1638 and 1989 is 2,262.		

Source: Northeast States Emergency Consortium <www.nesec.org/hazards/earthquakes.cfm>

There is no record of the Town of Williamsburg being affected by any of these earthquakes.

Probability of Future Events

One measure of earthquake activity is the Earthquake Index Value. It is calculated based on historical earthquake events data using USA.com algorithms. It is an indicator of the earthquake activity level in a region. A higher earthquake index value means a higher chance of earthquake events. Data was used for Hampshire County to determine the Earthquake Index Value as shown in the table below.

FIGURE: Earthquake Index for Hampshire County	
Hampshire County	0.17
Massachusetts	0.70
United States	1.81

Based upon existing records, there is a "very low" chance (less than 1% probability in any given year) of an earthquake in Williamsburg.

Impact

Massachusetts introduced earthquake design requirements into their building code in 1975 and improved building code for seismic reasons in the 1980s. 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 the 1980s may not have been designed to withstand the forces of an earthquake. This is particularly true for buildings in downtown Williamsburg, most of which could likely be completely destroyed by a significant earthquake. The seismic standards have also been upgraded with the 1997 revision of the State Building Code.

The Town faces a "critical" impact from significant earthquakes, with more than 25% of Williamsburg affected.

While a significant earthquake, estimated to be approximately of magnitude 6.1 or higher, would cause the impact described above, a smaller earthquake would have "minor" impact from a smaller earthquake, with only minor damage to property. As shown in the table of the Richter Scale above, an earthquake of 6.0 or lower would result in at most slight damage to well-designed buildings, which are the vast majority of structures in Williamsburg. Earthquakes between 3.5 and 5.4 would be felt but rarely cause damage, and earthquakes smaller than 3.5 would be unlikely to be noticed.

Using a total value of all structures in Williamsburg of $310,064,300 and an estimated 100% of damage to 25% of all structures ("critical" impact), the estimated amount of damage from an earthquake is $77,516,075. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on this analysis, the hazard index rating for Williamsburg is **"5 - Very Low Risk"** for earthquakes.

3.7 Dam Failure

Hazard Description

Dams, levees, and their associated impoundments provide many benefits to a community, such as water supply, recreation, hydroelectric power generation, and flood control. However, they also pose a potential risk to lives and property. Dam or levee 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 rapidly. Most dam failures occur when floodwaters above overtop and erode the material components of the dam.

Many dams in Massachusetts were built during the 19th Century without the benefit of modern engineering design and construction oversight. Dams of this age can fail because of structural problems due to age and/or lack of proper maintenance, as well as from structural damage caused by an earthquake or flooding.

Significant to the topic of dam safety in Williamsburg is the 1874 flood caused by the failure of a poorly constructed and badly maintained dam on the East Branch of the Mill River in the northern section of the town. The resulting flood killed 139 people, injured 800 more, and stands as the second worst dam failure disaster in U.S. history.

The Massachusetts Department of Conservation and Recreation Office of Dam Safety is the agency responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the implementing regulations 302 CMR 10.00). To be regulated, these dams are in excess of 6 feet in height (regardless of storage capacity) and have more than 15 acre feet of storage capacity in Town (regardless of height). Dam safety regulations enacted in 2005 transferred significant responsibilities for dams from the State of Massachusetts to dam owners, including the responsibility to conduct dam inspections.

Location

There are eight dams in Williamsburg, as shown below.

Williamsburg Dam Location, Ownership, Hazard Levels 2015

Dam	Ownership	Hazard Level*
Mountain Street Reservoir Dam	City of Northampton Conservation Committee	High
Brass Mill Pond Dam	The Brassworks Associates	Low
Mountain Street Reservoir Dikes	City of Northampton Conservation Committee	Low
Unquomonk Upper Reservoir Dam	Town of Williamsburg	Low
Graham Pond Dam	Thomas Hodgkins	Low
Unquomonk Lower Reservoir Dam	Town of Williamsburg	Non-jurisdictional
Fuller Pond Dam	Roland M. Emerick	Non-jurisdictional
John P. Webster Dam	Reverend John P. Webster	Non-jurisdictional

*Massachusetts Office of Dam Safety Rating as of October 2015

The Office of Dam Safety characterizes the potential failure of the Mountain Street Reservoir as a "High" hazard because flooding from a failure will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s) or railroad(s).

In addition to the Mountain Road Reservoir Dam (rated as High Hazard), the Lower Highland Lake Dam in Goshen is a concern for hazard mitigation in Williamsburg, as it is upstream on the West Branch of the Mill River. The Lower Highland Lake Dam is owned by the Massachusetts Department of Conservation and Recreation is also rated a High Hazard dam, and is currently considered to be in poor condition. The impoundment area measures 88 acres. Failure of this dam could send large volumes of water down the Mill River along Goshen Road to Williamsburg Center, where it would pick up the path of the 1874 flood. Design of repairs to the dam is currently in process and construction of the repairs is expected to begin in the summer of 2016 (MEPA Project #15405. ENF available at: <209.80.128.250/EEA/emepa/mepacerts/2015/sc/enf/15405%20ENF%20Lower%20Highland%20Lake%20Dam%20Rehabilitation%20Goshen.pdf>).

There are two other High Hazard dams nearby in Whately which hold back a large impoundment area for the Northampton Reservoir. However, these dams are not considered a safety concern in Williamsburg, as water would flow down the West Brook (away from town) in the event of a failure.

Extent

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.

Dams in Massachusetts are assessed according to their risk to life and property. The state has three 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.

Previous Occurrences

On May 16, 1874, a poorly constructed dam holding back a large impoundment on the East Branch of the Mill River failed spectacularly, sending a wall of floodwater and debris reaching 40 feet in height roaring down the valley through Williamsburg Center and on to the meadows of Northampton 12 miles downstream. A total 139 people were killed; the dam keeper, George Cheney, raced ahead of the flood to warn residents and is credited with saving thousands of lives. Hundreds of homes were destroyed. Most mills subsequently relocated (many to Holyoke), leaving the town with a primarily agrarian

economy. It was the first major dam disaster in the United States, and is still second in our history only to the 1889 dam failure and flood disaster in Jonestown, Pennsylvania.

There have been no other significant dam failures or concerns since.

Probability of Future Events

As Williamsburg's dams age, and if maintenance is deferred, the likelihood of a dam failure will increase, but, currently the frequency of dam failures is less than 1% in any given year, or "very low."

As described in the Massachusetts Hazard Mitigation Plan, dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hygrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream.

Dams are constructed with safety features known as "spillways." Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often referred to as "design failures," result in increased discharges downstream and increased flooding potential. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

Impact

The Hazard Mitigation Committee has determined that Williamsburg faces a "minor" impact from dam failure, with minimal damage to property occurring. Using a total value of all structures in Williamsburg of $310,064,300 and an estimated 10% of damage to 1% of all structures, the estimated amount of damage from a dam failure is $31,006,430. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on this analysis, Williamsburg has a hazard risk index rating of **"5 - Very Low Risk"** from dam failure.

3.8 Drought

Hazard Description

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. These impacts can have far-reaching effects throughout the region.

Location

Because of this hazard's regional nature, a drought would impact the entire Town, meaning the location of occurrence is "large," or over 50% of total land area affected.

Extent

The U.S. Drought Monitor records information on historical drought occurrence. Unfortunately, data could only be found at the state level. The U.S. Drought Monitor categorizes drought on a D0-D4 scale as shown below.

FIGURE: U.S. Drought Monitor

Classification	Category	Description
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

Source: US Drought Monitor, http://droughtmonitor.unl.edu/classify.htm

Previous Occurrences

In Williamsburg, six major droughts have occurred 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. The following table indicates previous occurrences of drought since 2000, based on the US Drought Monitor:

FIGURE: Annual Drought Status

Year	Maximum Severity
2000	No drought
2001	D2 conditions in 21% of the state
2002	D2 conditions in 99% of the state
2003	No drought
2004	D0 conditions in 44% of the state
2005	D1 conditions in 7% of the state
2006	D0 conditions in 98% of the state
2007	D1 conditions in 71% of the state
2008	D0 conditions in 57% of the state
2009	D0 conditions in 44% of the state
2010	D1 conditions in 27% of the state
2011	D0 conditions in 0.01% of the state
2012	D2 conditions in 51% of the state

Source: U.S. Drought Monitor <http://droughtmonitor.unl.edu/>

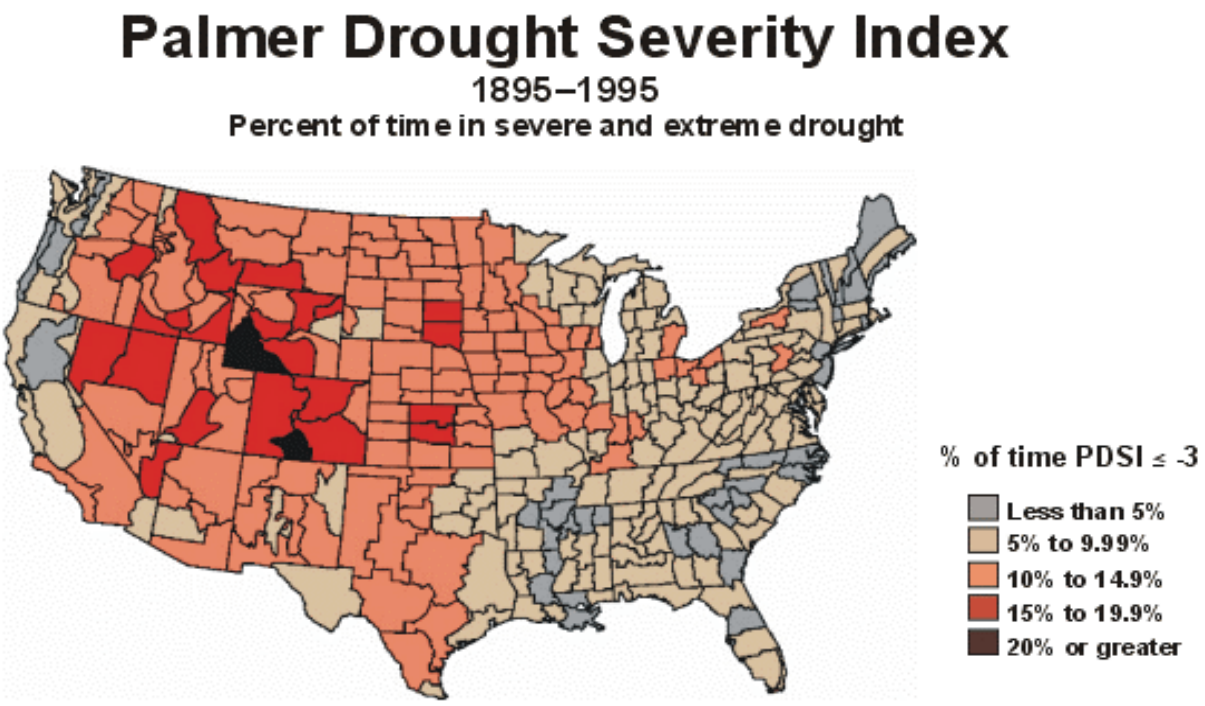
Williamsburg has not been impacted by any previous droughts in the state.

Probability of Future Events

In Williamsburg, as in the rest of the state, the probability of drought is “low," or between 1 and 10% in any given year. No water use restrictions have been necessary in the town, although neighboring Northampton has implemented moderate water use restrictions (i.e., reduced lawn watering) in recent years.

Based on past events and current criteria outlined in the Massachusetts Drought Management Plan, it appears that western Massachusetts may be more vulnerable than eastern Massachusetts to severe drought conditions. However, many factors, such as water supply sources, population, economic factors (i.e., agriculture based economy), and infrastructure, may affect the severity and length of a drought 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. However, 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.



Impact

Due to the water richness of western Massachusetts, Williamsburg is unlikely to be adversely affected by anything other than a major, extended drought. While such a drought would require water saving measures to be implemented, there would be no foreseeable damage to structures or loss of life resulting from the hazard. Because of this, the Hazard Mitigation Committee has determined the impact from this hazard to be "minor," with minimal damage to people and property.

Vulnerability

Based on the above assessment, Williamsburg has a hazard index rating of **"5 – Very Low Risk"** from drought.

3.9 Landslides

Hazard Description

Landslides have not previously been identified as a hazard for the Town of Williamsburg. However, the anticipated in the increase in the number of heavy precipitation events in the region potentially increases the risk for landslides, especially in areas with steep slopes. For example, on October 8, 2014 a powerful microburst in Easthampton on Mount Tom along Mountain Road/Route 141 stripped the mountainside of many trees and damaged the vegetated slopes, thus greatly increasing the risk of landslide. Therefore, landslides are being considered as part of this updated plan for Williamsburg.

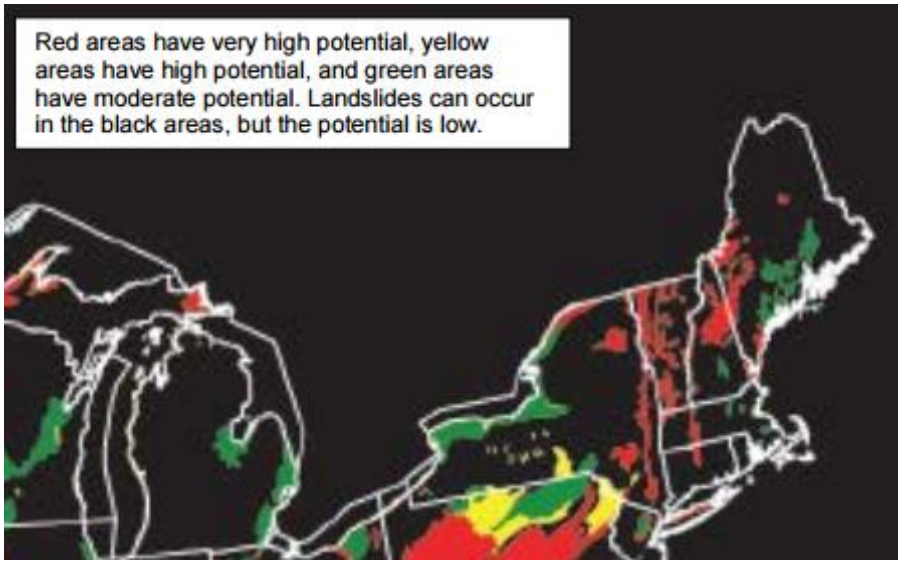
The following description of landslides is excerpted from the Massachusetts Hazard Mitigation Plan, p. 12-1:

> The term "landslide" includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over steepened slope is the primary reason for a landslide, there are other contributing factors (USGS, 2013). According to the Massachusetts state geologist, Steve Mabee, slope saturation by water is a primary cause of landslides in the Commonwealth. This effect can be in the form of intense rainfall, snowmelt, changes in groundwater level, and water level changes along coastlines, earth dams, and the banks of lakes, rivers, and reservoirs. Water added to a slope can not only add weight to the slope, which increases the driving force, but can increase the pore pressure in fractures and soil pores, which decreases the internal strength of the earth materials needed to resist the driving forces.
>
> Landslides in Massachusetts can be divided into four general groups: 1) construction related, 2) over steepened slopes caused by undercutting due to flooding or wave action, 3) adverse geologic conditions, and 4) slope saturation. Construction related failures occur predominantly in road cuts excavated into glacial till where topsoil has been placed on top of the till. This juxtaposition of materials with different permeability often causes a failure plane to develop along the interface between the two materials resulting in sliding following heavy rains. […] Other construction related failures occur in utility trenches excavated in materials that have very low cohesive strength and associated high water table (usually within a few feet of the surface). The clays often formed in the deepest parts of many of the glacial lakes that existed in Massachusetts following the last glaciation. Some of the major glacial lakes are Bascom, Hitchcock [which encompassed the area of present-day Williamsburg], Nashua, Sudbury, Concord, and Merrimack. (Mabee, 2010).

Location

The entire U.S. experiences landslides, with 36 states having moderate to highly severe landslide hazards. Expansion of urban and recreational developments into hillside areas leads to more people being threatened by landslides each year. The figure below shows landslide potential mapped by the USGS for the eastern U.S. Landslides are common throughout the Appalachian region and New England. The greatest eastern hazard is from sliding of clay-rich soils. Based on the U.S. data set for landslides, it appears that areas along the Connecticut River in western Massachusetts, and the greater Boston area have the highest risk to landslide. The figure below, excerpted from the Massachusetts Hazard Mitigation Plan, illustrates the landslide incidence and susceptibility zones in Massachusetts. Note a band of red, indicating "high" risk, along the Connecticut River Valley through Western Massachusetts.

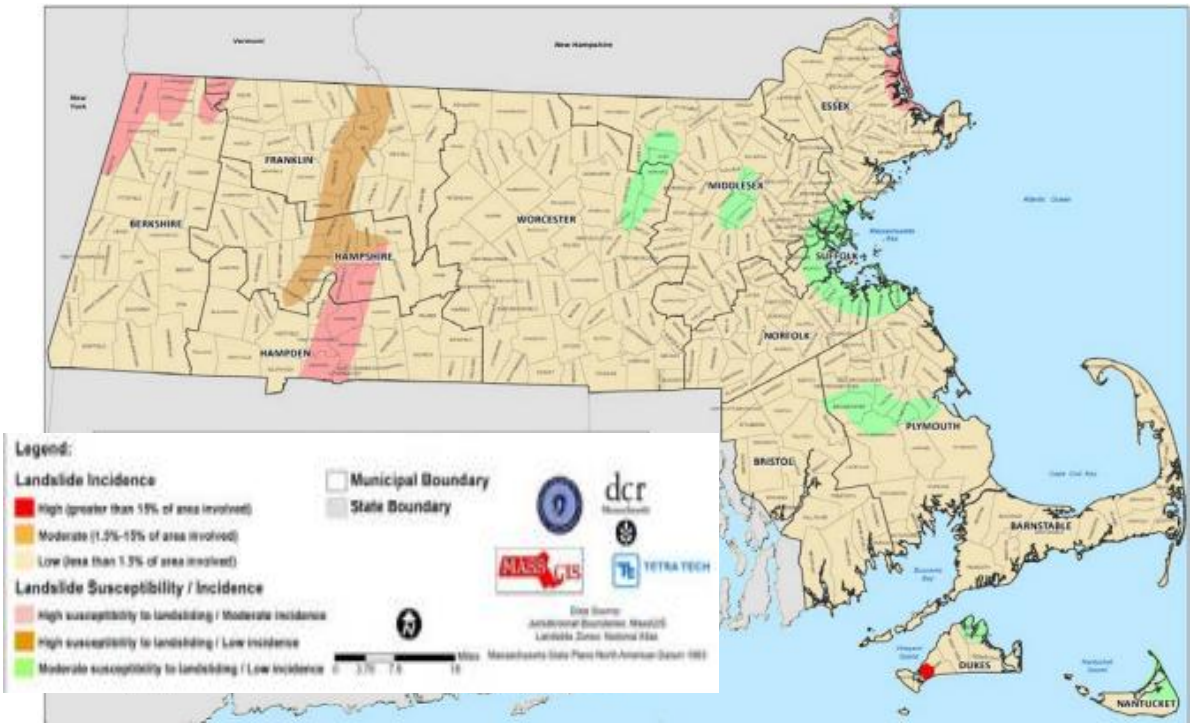
FIGURE: Landslide Incidence and Susceptibility Map U.S. Northeast



Source: http://geology.com/usgs/landslides/

The figure below illustrates the landslide incidence and susceptibility zones in Massachusetts. Note that Williamsburg lies just west of the brown band of "moderate" landslide incidence and susceptibility that passes through Hatfield and Northampton.

FIGURE: Landslide Incidence and Susceptibility Zones 2013 Massachusetts



Source: Massachusetts Department of Conservation Resources

Extent

To determine the extent of a landslide hazard, the affected areas need to be identified and the probability of the landslide occurring within some time period needs to be assessed. Natural variables that contribute to the overall extent of potential landslide activity in any particular area include soil properties, topographic position and slope, and historical incidence. Predicting a landslide is difficult, even under ideal conditions. As a result, the landslide hazard is often represented by landslide incidence and/or susceptibility, defined below:

> Landslide incidence is the number of landslides that have occurred in a given geographic area. High incidence means greater than 15% of a given area has been involved in landslides; medium incidence means that 1.5% to 15% of an area has been involved; and low incidence means that less than 1.5% of an area has been involved.

Landslide susceptibility is defined as the probable degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high precipitation or changes in existing conditions can initiate landslide movement in areas where rocks and soils have experienced numerous landslides in the past. Landslide susceptibility depends on slope angle and the geologic material underlying the slope. Landslide susceptibility only identifies areas potentially affected and does not imply a time frame when a landslide might occur. “High,” “Medium,” and “Low” susceptibility are delimited by the same percentages used for classifying the incidence of landslides. Landslides destroy property and infrastructure and can take the lives of people. Slope failures in the United States result in an average of 25 lives lost per year and an annual cost to society of about $1.5 billion.

Previous Occurrences

Erosion of private driveways has been noted at homes along Goshen Road. Also, the area of the upper end of Depot Road at the intersection with Nash Hill Road (near Potash Brook) is susceptible to landslides.

Probability of Future Events

Increasing short-term heavy precipitation events will increase the risk of landslides in Williamsburg.

Impact

There are less than 10 homes that could be affected by a landslide in the Goshen Road and Depot Road areas described above.. Because of this, the Hazard Mitigation Committee has determined the impact from this hazard to be "minor," with minimal damage to people and property.

Vulnerability

Based on the above assessment, Williamsburg has a hazard index rating of **“4 –Low Risk”** from Landslides.

3.10 Extreme Temperatures

As per the Massachusetts Hazard Mitigation Plan, extreme cold and extreme heat are dangerous situations that can result in health emergencies for susceptible people, such as those without shelter or who are stranded or who live in homes that are poorly insulated or without heat/access to cooling (air conditioning). There is no universal definition for extreme temperatures, with the term relative to local weather conditions. For Massachusetts, extreme temperatures can be defined as those that are far outside the normal ranges. The average temperatures for Massachusetts are:

- Winter (Dec-Feb) Average = 27.51ºF
- Summer (Jun-Aug) Average = 68.15ºF

Criteria for issuing alerts for Massachusetts are provided on National Weather Service web pages: http://www.erh.noaa.gov/box/warningcriteria.shtml.

Extent

As per the Massachusetts Hazard Mitigation Plan, the extent (severity or magnitude) of extreme cold temperatures are generally measured through the Wind Chill Temperature Index. Wind Chill Temperature is the temperature that people and animals feel when outside and it is based on the rate of heat loss from exposed skin by the effects of wind and cold. The chart shows three shaded areas of frostbite danger. Each shaded area shows how long a person can be exposed before frostbite develops. In Massachusetts, a wind chill warning is issued by the NWS Taunton Forecast Office when the Wind Chill Temperature Index, based on sustained wind, is –25ºF or lower for at least three hours.

Extreme temperatures would affect the whole community.

Wind Chills

Wind (mph) \ Temperature (°F)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes; 10 minutes; 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph) *Effective 11/01/01*

For extremely hot temperatures, the heat index scale is used, which combines relative humidity with actual air temperature to determine the risk to humans. The NWS issues a Heat Advisory when the Heat Index is forecast to reach 100-104 degrees F for 2 or more hours. The NWS issues an Excessive Heat Warning if the Heat Index is forecast to reach 105+ degrees F for 2 or more hours. The following chart indicates the relationship between heat index and relative humidity:

Heat Index

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Category	Heat Index	Health Hazards
Extreme Danger	130 °F – Higher	Heat Stroke or Sunstroke is likely with continued exposure.
Danger	105 °F – 129 °F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Extreme Caution	90 °F – 105 °F	Sunstroke, muscle cramps, and/or heat exhaustions possible with prolonged exposure and/or physical activity.
Caution	80 °F – 90 °F	Fatigue possible with prolonged exposure and/or physical activity.

Previous Occurrences

The following are some of the lowest temperatures recorded in parts of Massachusetts for the period from 1895 to present (Source: NOAA, www.ncdc.noaa.gov.):

- Blue Hills, MA- –21°F
- Boston, MA- –12°F
- Worcester, MA- –19°F

The following are some of the highest temperatures recorded for the period from 1895 to present (Source: NOAA, www.ncdc.noaa.gov.):

- Blue Hills, MA - 101°F
- Boston, MA - 102°F
- Worcester, MA - 96°F

Probability of Future Events

The probability of future extreme heat and extreme cold is considered to be "low," or between 1 and 10 percent in any given year.

Impact

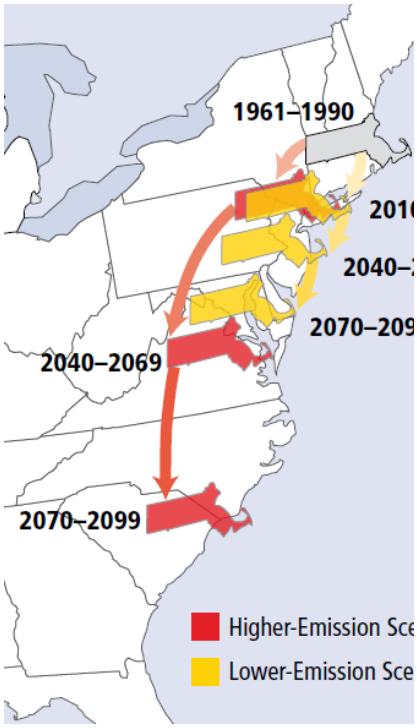
The impact of extreme heat or cold in Williamsburg is considered to be "minor," with no property damage and very limited affect on humans.

Vulnerability

Williamsburg's vulnerability from extreme heat and cold is considered to be, "5 - Lowest Risk."

Impacts of Climate Change

Greater variation and extremes in local atmospheric temperatures due to global changes in climate are now among the natural hazards that this plan anticipates. Williamsburg is likely to experience more instances of extreme and sustained heat and cold. And, because warmer air holds more moisture, higher temperatures will also bring wetter winters, more severe storms, and more frequent flooding. Locally, there will also be more single-day records highs, and more total days with highs above 90 degrees, and more heat waves with 3 or more days above 90 degrees. More extreme temperatures throughout Western Massachusetts and New England mean that there will be more floods, droughts, and tornados. There will also be more Atlantic hurricanes and nor-easters. Anticipated increases in extreme local temperatures is directly related to many of the previously described vulnerabilities, as well as increasing the risk of heat-related disease and injury, especially among senior citizens and residents unable to afford air conditioning.



At current rates of greenhouse gas accumulation and temperature increases, the climate of Massachusetts will become similar to those of present-day New Jersey or Virginia by 2040-2069, depending on future GHG emissions. *Source: NECIA 2006*

Anticipated Climatic Variation

In Western Massachusetts, annual precipitation is expected to increase by 14% by the end of the 21st century. However, most of this precipitation increase will come during the winter months – as much as 30% more than today – while summertime precipitation will actually decrease slightly. Also, most of the added winter precipitation is expected to be in the form of rain, rather than snow. This will mean a continuation of the current regional trend of a decreasing snowfall totals, as well as the number of days with snow cover on the ground, but more precipitation overall. The increased amount of strong precipitation events and overall increase in rainfall, combined with the aging stormwater infrastructure in the region, will likely result in more flooding in the region.

Anticipated Climatic Variations for Massachusetts Due to Climate Change

Category	Current (1961-1990 avg.)	Predicted Change 2040-2069	Predicted Change 2070-2099
Average Annual Temperature (°F)	46°	50°to 51°	51° to 56°
Average Winter Temperature (°F)	23°	25.5° to 27°	31° to 35°
Average Summer Temperature (°F)	68°	69.5° to 71.5°	74° to 82°
Days over 90 °F	5 to 20 days	-	30 to 60 days
Days over 100 °F	0 to 2 days	-	3 to 28 days
Annual Precipitation	41 inches	43 to 44 inches	44 to 47 inches
Winter Precipitation	8 inches	8.5 to 9 inches	9 to 10.4 inches
Summer Precipitation	11 inches	10.9 to 10.7 inches	10.9 to 11 inches

Sources: Massachusetts Climate Adaptation Report 2011, NECIA

Increased temperatures will likely have the following projected impacts to people, property, and the local economy:

- There will be greater stress on special populations, such as senior citizens and economically disadvantaged people, without access to air conditioning during heat waves. The Board of Health has already initiated education and outreach to seniors in Williamsburg and neighboring Goshen to advise them of strategies for keeping their homes and themselves cooler during heat waves.
- Increased temperatures and changes in growing seasons for various crops will put stress on current food production and require farming operations to adjust by planting new varieties of crops. There are several farms in Williamsburg that will likely be affected.
- Livestock will be at greater risk from extreme and extended heat. There is one dairy farm that will likely need to adapt to increased heat, as well as horse farms and an alpaca farm.
- Maple sugaring businesses are at risk due to changes in spring temperature patterns needed for successful sap collection. There are four maple sugaring operations in Williamsburg that will likely be affected.
- Increased energy usage in order to cool buildings in the summer and long-term electrical needs will increase.

3.11 Other Hazards

In addition to the hazards identified in previous sections, the Hazard Mitigation Committee reviewed the other hazards included in the full list of hazards in the Massachusetts Hazard Mitigation Plan: coastal hazards, atmospheric hazards, , ice jam, coastal erosion, sea level rise, nor'easter, tsunami, and determined that the hazard is included in an existing hazard--severe winter weather-nor'easter, or determined to be not relevant to Williamsburg.)

The following consequences of natural hazards were identified as concerns to the people of Williamsburg and are considered to be very likely to occur.

- Increased instances of standing water will lead to increased mosquito populations and greater risk of vector-borne diseases, particularly equine encephalitis, instances of which the committee believes have increased since the last update of this plan.
- Changes in over winter temperatures are likely to increase the number of deer ticks and other insects that carry Lyme Disease and Ehrlichiosis, both tickborne bacterial infections. Committee members said reports of these diseases have increased significantly during the past five years.
- Increased flooding is likely to increase the incidents of mold in homes, especially in basements, which will lead to increased incidents of asthma and other respiratory disorders.
- Increased flooding may also increase the number of vehicles that are flooded, also increasing incidents of diseases caused by long-term exposure to mold, as well as property damage and loss of value to vehicles.
- Extended power outages are a significant public health concern in Williamsburg because approximately half of the homes in town obtain drinking water from private wells with water extracted by electric pumps. During the October 2011 "Snow-tober" storm when power was out for much of town for four days or more, the Fire Department delivered water to homes with private wells that did not have generators to power their extraction pumps.
- Higher difficulty in the ability of residents to obtain basic services that are heavily reliant on electric power to provide their services after severe weather events, including gasoline (lack of power and internet/phone connections for pumps and payment systems) and perishable food items that require refrigeration.
- Disruption of communications services due to damage to cellular phone towers and other communications devices. Due to topographic and elevation variation in Williamsburg, cellular phone (2G) and wireless data coverage (3G and 4G) in outlying areas varies significantly by wireless carrier.

Vulnerability

The above assessments indicate that while these hazards are very likely to occur, their impacts will not pose immediate life-threatening consequences or damage to property. Therefore, Williamsburg has a hazard index rating of **"5 –Low Risk"** from these other hazards.

4. CRITICAL FACILITIES

4.1 Facility Classification

A "Critical Facility" is defined by the Massachusetts Emergency Management plan as a building, structure, or location which:

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

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 three categories:

1. Facilities needed for emergency response in the event of a hazard event.

2. Facilities identified as non-essential and not required in an emergency response event, but which are considered essential for the everyday operation of the Town.

3. Facilities or institutions that include special populations which would need additional attention in the event of a hazard event.

The critical facilities and evacuation routes potentially affected by hazard areas are identified following this list. The Past and Potential Hazards/Critical Facilities Map (Appendix D) also 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: Fire Station, 5 North Main St, Haydenville
Secondary: Police Department/Fire Station No.2, 16 South Main St, Haydenville
Town Office Building, 141 Main St, Haydenville

2. Fire Stations

Fire Department. 5 North Main St
Fire Station No. 2 (shared with Police Dept), 16 South Main St, Haydenville

3. Police Station

Police Department (shared with Fire Station No. 2), 16 South Main St

4. Highway Garage

24 Main St

5. Water Department

Community system, fed by well. Pump station located at 42 South Main St

6. Emergency Fuel Stations

Highway Garage, 24 Main St

7. Emergency Electrical Power Facilities

Facilities with fixed emergency generators:

Town Office Building, 141 Main St, Haydenville
Dunphy School, 1 Petticoat Hill Rd
Police Department/Fire Station No. 2, 16 South Main St, Haydenville
Town Office Building, 141 Main St, Haydenville
Highway Garage, 24 Main St

Portable/mobile generators:

Fire Department has 5 portable generators that may be deployed as needed.
Fire Department also has a light plan with generator that can be deployed as needed.

8. Emergency Shelters

Anne T. Dunphy School- 1 Petticoat Hill Rd. (also Emergency Dispensary Site for Bd of Health)
Williamsburg Town Offices- 141 Main St (also warming and cooling shelter)
Meekins Public Library- 2 Williams St (also cooling shelter)

9. Dry Hydrants - Fire Ponds - Water Sources

None

10. Transfer Station

27 Mountain St

11. Utilities

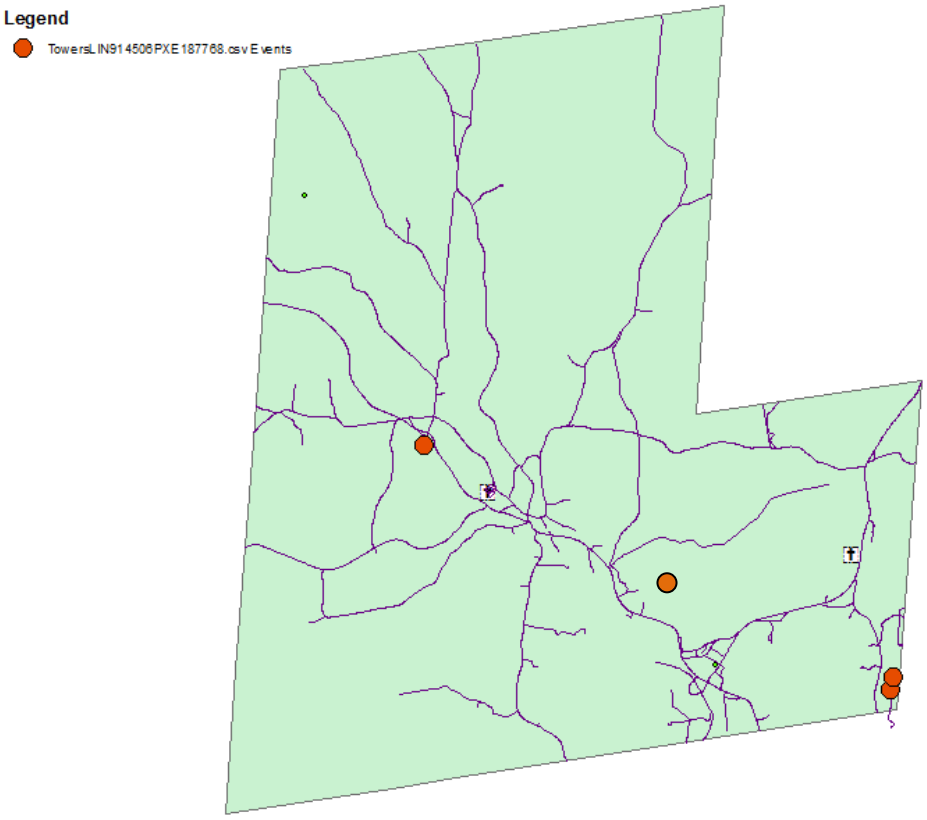
Electricity: National Grid
Natural gas: none
Cable television: ComCast
Telephone (land line): Verizon
Cellular telephone: coverage varies by carrier

12. Helicopter Landing Sites

Anne Dunphy School, 1 Petticoat Hill Rd
Ellen Ames Ballfield on Route 9
Fairfield/Myrtle Ave
(helicopter landings are also permitted at any other location that is safe and feasible)

13. Communications

Town police and fire communications antennas are located at an elevated site in Goshen. In addition, there are 4 registered communication towers and approximately 35 communication antennas in the vicinity of Williamsburg that provide a variety of radio communication, including municipal police and fire communications, cellular phone and data services for several carriers, towing companies, utility companies, and other private owners. There are four cellular telephone and wireless data communication towers located at: Lashway Lumber, Kellogg Rd off Route 9, and two towers in the southeast corner of town behind the Northampton Veterans Administration Hospital accessible only via North Farms Road in Northampton.



Sources: www.antennasearch.com retrieved 12/15/16; Williamsburg Hazard Mitigation Committee 12/17/15

14. Primary Evacuation Routes

Route 9 – Main Street
Route 143 – Chesterfield Road
Mountain Street
South Street
South Main Street
Ashfield Road

15. Bridges Located on Evacuation Routes

Route 143 (Chesterfield Road) crosses Meekins Brook
Route 9 (Williams Street) crosses Mill River-West Branch
Route 9 (Main Street) crosses Mill River
Route 9 (Goshen Road) #1 crosses Mill River- West Branch
Route 9 (Goshen Road) #2 crosses Mill River- West Branch
Route 9 (Goshen Road) #3 crosses Mill River- West Branch
Route 143 (Chesterfield Road crosses Mill River- West Branch
South Main Street (2 bridges)
Bridge Street (2 bridges)
Lower South Main St

16. Retention Basins

No municipal retention basins. Private retention basins exist but may not be suitable for fire-fighting needs.

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. Water Supply

Community system fed by 2 wells serving 600 residential and commercial customers. Private wells are water source for approximately 600 additional residences, most of which are at elevations above the storage tanks (and therefore not able to be on the gravity-fed system).

2. Water Infrastructure (pump station)

1 pump station, located on Roger Bisbee Road

3. Water Storage Tanks

2 storage tanks located on South Street

4. Sewer Infrastructure (Pump Station only)

1 meter station (system is gravity-fed to Northampton waste water treatment plant at 33 Hockanum Road)

5. Problem Culverts

Depot Road
Old Goshen Rd

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 – 102 South St

2. **Elderly Housing/Assisted Living**
   7 Nash Hill Place

3. **Civic Buildings**
   Post Office- 140 Main St
   Post Office- 1 Williams St
   Meekins Public Library- 2 Main St
   Senior Center – Town Offices – 141 Main St

4. **Schools**
   Dunphy Elementary- 1 Petticoat Hill Road (also an Emergency Dispensary Site for Bd of Health)

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

6. **Historic Buildings/Sites**
   Brassworks Building – Route 9 at Kingsley Ave
   Grange – Main St
   Grist Mill Farm Museum – Mill St
   Hayden Houses - Main St
   Haydenville Cemetery - High Street
   Mountain Street Cemetery - Mountain Street
   Old School Building – Nash Hill Rd
   Old Town Hall – Main St
   Village Hill Cemetary – Village Hill Rd
   Old Village Hill Cemetery - Village Hill Rd
   Williamsburg Cemetery – Village Hill Rd
   Williamsburg Town Center Historic District

7. **Apartments**
   Hilltown Development Corp, Bridge St

8. **Major Employers**
   M J Moran Inc, 4 South Main Street
   Lashway Lumber, 18-24 Main Street
   Lashway Logging, 67 Main Street
   Anne T. Dunphy School, 1 Petticoat Hill Rd
   Brewmasters Tavern, 4 Main St

9. Recreation Areas/Camps

Ellen Ames Ballfield
Williamsburg Woodland Trails and other hiking trails
Snow Farm-New England Craft - 5 Clary Road

10. Mobile Home Parks

None

5. MITIGATION STRATEGIES

One of the steps of this Hazard Mitigation Plan is to evaluate all of the Town's existing plans, policies and practices related to natural hazards and identify potential gaps in protection. After reviewing these plans, policies and the hazard identification and assessment (using the FEMA Capability Assessment worksheet as a guide) the Hazard Mitigation Committee developed a set of hazard mitigation strategies it will work to implement in the five years after FEMA approval of this plan.

Plans reviewed include the Town's Open Space and Recreation Plan, the Community Development Plan, the Green Communities Plan, and the Comprehensive Emergency Management Plan (CEMP). As noted previously, Town zoning and land use regulations were also reviewed. All boards, departments, committees that regulate development were represented on the plan committee.

The Town of Williamsburg has developed the following goal to serve as a framework for mitigation of the hazards identified in this plan.

Goal Statement

To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to the following hazards: flooding, severe snowstorms/ice storms, severe thunderstorms, winds, hurricanes, tornadoes, wildfires/brushfires, earthquakes, dam failures, and drought.

Existing Mitigation Capabilities/Strategies

The Town of Williamsburg had many mitigation strategies and various mitigation capabilities in place prior to the update of this Hazard Mitigation Plan in 2015. These capabilities/strategies are described on the following pages and have been summarized in a table at the end of this chapter.

The CEMP details specific Town responsibilities for each natural (as well as man-made) hazard, providing detailed assignments for each hazard by mitigation and preparedness. To obtain a copy of the CEMP, contact Town EMD.

For a list of completed strategies that were previously identified as part of the prioritized implementation list, see the table of "Deleted and Completed Strategies" later in this section.

Williamsburg's local Hazard Mitigation Committee used the FEMA Capability Assessment worksheet, as a guide to assess local capabilities to mitigate the consequences on natural hazards in the community.

Williamsburg has most of the no cost or low cost hazard mitigation capabilities in place. Land use zoning, subdivision regulations and an array of specific policies and regulations that include hazard

mitigation best practices, such as limitations on development in floodplains, stormwater management, tree maintenance, etc. Williamsburg also has appropriate staff dedicated to hazard mitigation-related work for a community its size, including an Emergency Management Director, a professionally run Department of Public Works, a part-time Building Inspector, a Conservation Commission and a Planning Board, as well as a Tree Warden, and Williamsburg has recommended plans in place, including an Open Space and Recreation Plan, and a Comprehensive Emergency Management Plan. Not only does Williamsburg have these capabilities in place, but they are also deployed for hazard mitigation as appropriate. The Town also has very committed and dedicated volunteers who serve on Boards and Committees and in Volunteer positions. The Town collaborates closely with surrounding communities and is party to Mutual Aid agreements through the MEMA. Williamsburg is also an active member community of the Pioneer Valley Planning Commission (PVPC) and can take advantage of no cost local technical assistance as needed provided by the professional planning staff at the PVPC.

Williamsburg's most obvious hazard mitigation need is for federal funds to implement prioritized actions. While Williamsburg is a well-managed fiscally sound Town, it is not a wealthy community and with state constraints on municipalities raising their own funds, Williamsburg has very limited financial resources to invest in costly hazard mitigation measures. Williamsburg is, however, committed to locally matching all HMGP grants received.

5.1 Overview of Mitigation Capabilities by Hazard

An overview of the general concepts underlying mitigation capabilities for each of the hazards identified in this plan is as follows:

1. Flooding (3 - Medium Risk)

The key factors in flooding are the 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. The Town of Williamsburg currently addresses this problem with a variety of mitigation tools and strategies. Flood-related regulations and strategies are included in the Town's zoning bylaw and subdivision regulations, such as ensuring adequate driveway drainage, restricting development in the floodplain, requiring drainage easements where applicable for subdivisions, and following the Wetlands Protection Act.

2. Severe Snowstorms / Ice Storms (2 - High Risk)

The Town's current mitigation strategy is to restrict the location and height of telecommunications facilities. To the extent that some of the damages from a winter storm can be caused by flooding, flood protection mitigation measures also assist with severe snowstorms and ice storms. The State Building Code provides minimum snow load requirements for roofs, which also assist in mitigation of severe snow storms and ice storms.

3. Hurricanes/Tropical Storms (2 - High Risk)

The flooding associated with hurricanes can be a major source of damage to buildings, infrastructure and a potential threat to human lives. Flood protection measures can thus also be considered hurricane

mitigation measures. The high winds that often accompany hurricanes can also damage buildings and infrastructure, similar to tornadoes and other strong wind events. Meeting the requirements of the State Building code also reduce damages from hurricanes.

4. Severe Thunderstorms / Winds/Tornadoes/Microbursts (2 - High Risk)

Most damage from tornadoes and severe thunderstorms come from high winds that can fell trees and electrical wires, as well as generate hurtling debris. Adherence to the Massachusetts Building Code is a primary current mitigation strategy. Current land development regulations, such as restrictions on the height of telecommunications towers, also help prevent wind damages.

5. Wildfires / Brushfires (5 - Very Low Risk)

Residents must obtain a permit from the Fire Department when they plan to have a controlled burn on their property. In addition, the Town conducts local outreach to schools and seniors about fire safety.

6. Earthquakes (5 - Very Low Risk)

Most buildings and structures in the state were constructed without specific earthquake resistant design features. However, the State Building Code helps maintain the structural integrity of structures and helps to mitigate earthquakes.

7. Dam Failure (5 - Very Low Risk)

The mitigation measures currently in place focus on regular inspections and permitting process required by the Massachusetts DCR.

8. Drought (5 - Very Low Risk)

The Town's Aquifer Protection District Overlay designates areas for recharge of aquifers to ensure plentiful access to drinking water. The Town also has a Water Use Restriction Ordinance that allows it to declare a State of Water Conservation, in order to limit water use by residents and businesses.

9. Landslides (5 - Very Low Risk)

Landslides are not a significant concern.

10. Extreme Heat (5 - Very Low Risk)

Extreme heat is very likely to occur in Williamsburg, but likelihood of damage is very low so this is not a significant concern.

11. Other Hazards (5 - Very Low Risk)

While increases in vector-borne disease and secondary effects from extended power outages are expected to increase, the damage to property resulting from them is expected to be relatively low.

5.2 Existing Mitigation /Capabilities

The Town of Williamsburg currently has 23 mitigation capabilities in place. These are listed on the following pages and have been evaluated in the "Effectiveness" column. This inventory of existing Mitigation Strategies was developed using the FEMA Capability Assessment worksheet 4.1 in the FEMA Local Mitigation Planning Handbook as a guide. Plans reviewed for Mitigation Capabilities are addressed in Chapter 6.

FIGURE 5.2: Existing Capability Assessment

Existing Capability	Description	Hazards Mitigated	Effectiveness	Potential Changes
5.2.1: Backup Electric Power	All 5 shelters (Dunphy School, Town Offices, Library, Fire Station #1, Police/Fire Station #2) and now have backup generators; also, Fire Dept now has 5 mobile generators and a mobile trailer light stand with its own generator.	All hazards	Effective.	None.
5.2.2: State Building Code	Williamsburg adopted the Massachusetts State Building "Stretch" Code in 2011 (effective Jan. 1, 2012), which sets standards for the construction of all new structures.	All hazards	Effective.	"Stretch" version of state building code adopted 2011, effective 1/1/12.
5.2.3: Flood Control Structures	8 dams in Williamsburg (1 High Hazard) and 1 dam in Goshen (1 High Hazard): regular inspections by municipal staff, regular communication with Office of Dam Safety 53 culverts in Williamsburg inspected and maintained as needed and/or when road improvements are considered.	Floods	Somewhat effective	Continue to advise dam owners of inspection requirements; communicate with DCR about High Hazard dams, design/construction of Goshen Lower Highland Dam improvements..

Existing Capability	Description	Hazards Mitigated	Effectiveness	Potential Changes
5.2.4: Zoning Bylaws: Water Supply Protection District	Areas delineated as primary recharge areas for groundwater aquifers, and watershed areas for reservoirs are protected by strict use regulations.	Floods Droughts	Effective for preventing groundwater contamination, controlling runoff, promoting groundwater recharge	None.
5.2.5: Zoning Bylaws: Site Plan Approval and Special Permit	Sets forth specific requirements for protecting wetlands and other related natural features, and water quality and supply.	Floods	Very effective for managing very specific impacts	None.
5.2.6: Zoning Bylaws: Additional Regulations	Town has environmental protection standards and filling standards that govern stormwater management, erosion control, and other applicable development impacts. New bylaw adopted 2012 for large-scale solar facilities requires storm water management plan.	Floods	Somewhat effective for managing specific impacts, managing stormwater runoff.	None.
5.2.7: Subdivision Regulations: Construction Standards	Site and Earthwork – all natural features considered community assets shall be preserved.	Floods	Effective for managing impacts from development.	None.
5.2.8: Wetlands Protection Act River and Stream Protection	Town enforces the standards established by Wetlands Protection Act, which protects water bodies and wetlands through the Conservation Commission.	Floods	Somewhat effective at protecting water bodies and wetlands.	None.
5.2.9: National Flood Insurance Program	The Town participates in the National Flood Insurance Program and restricts development in the 100-year floodplain. As of 2006, there were 9 homeowners with flood insurance policies. (Note: 76 residential structures in SFHA.)	Floods	Effective.	None.

Existing Capability	Description	Hazards Mitigated	Effectiveness	Potential Changes
5.2.10: Williamsburg Open Space and Recreation Plan (2011)	Plan describes natural features and promotes natural resource preservation, including areas in the floodplain; such as wetlands, groundwater recharge areas, farms and open space, rivers, streams and brooks. The plan highlights the importance of balancing future development with the preservation of natural and scenic resources, and preservation of open space and farmland to provide flood storage capacity in Town.	Floods Droughts	Effective in identifying sensitive resource areas, including floodplains. Encourages forestland and farmland protection, which helps conserve flood storage capacity.	Continue to regularly update the Open Space and Recreation Plan.
5.2.12: Subdivision Grade Regulations	Development must meet street grade regulations, which allows a 9% maximum grade, per section 7:09.1 of Williamsburg Subdivision Regulations, as well as intersection grade regulations.	Severe snowstorm / ice storm	Effective.	None.
5.2.13: Subdivision Regulations: Underground Utilities	Utilities must be placed underground in all new developments per section 8:15 of the Williamsburg Subdivision Regulations.	Severe snowstorm / ice storm, Hurricane, Tornado, Severe Wind, Severe Thunderstorm	Effective for preventing power loss.	None.
5.2.14: Wireless Communication Services District	Strict requirements for height, setback, construction, and fencing are imposed upon WCFs, which must be as minimally invasive as possible to the environment.	Severe snowstorm / ice storm, Hurricane, Tornado, Severe Wind, Severe Thunderstorm	Somewhat effective for preventing damage to nearby property.	None.
5.2.16: Burn Permits	Residents must obtain burn permits, and personnel provide information on safe burn practices.	Wildfire / brushfire	Effective.	None.
5.2.17: Subdivision Review for Fire Safety	Fire Chief is involved in review of subdivision plans. The Definitive Plan of a subdivision is reviewed by the Fire Chief to assure sufficient fire protection standards.	Wildfire / brushfire	Effective.	None.

Existing Capability	Description	Hazards Mitigated	Effectiveness	Potential Changes
5.2.18: Fire Safety Public Education / Outreach	Fire Department ongoing educational program in the schools, which includes an Open House and three S.A.F.E. (Student Awareness of Fire Education) instructors who teach fire safety in all public and private elementary schools throughout the year. Several members participate in educational presentations and demonstrations to the public throughout the year, including portable fire extinguisher instruction and CPR.	General fire hazard prevention, including Wildfire / brushfire	Effective.	None.
5.2.19: New Dam Construction Permits	State law requires a permit for the construction of any dam, issued by the Massachusetts Department of Conservation and Recreation	Dam Failure	Effective. Ensures dams are adequately designed.	None.
5.2.20: Dam Inspections	Massachusetts DCR has an inspection schedule that is based on the hazard rating of the dam.	Dam Failure	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.
5.2.21: Williamsburg Water Use Restriction Ordinance	Allows the Town to declare a State of Water Conservation and enforce restrictions, conditions, and requirements limiting the use of water by residents and businesses	Drought	Very effective for enforcing water conservation measures during a drought.	None.
5.2.22: Produce a municipal master plan (added 2016)	Master plan will include goals and recommendations to address topics with relevance to hazard mitigation planning, especially flood control, property protection.	Flooding, severe weather	Effective	Added 2016
5.2.23: Culvert inspections (added 2016)	Will provide improved information on status of 53 culvert road crossings, including problem culvert at Depot Road.	Flooding, heavy thunderstorms	Very effective	Added 2016

5.3 Deleted Mitigation Strategies

The Town of Williamsburg is retaining all mitigation strategies identified in Section 5.2 of this Hazard Mitigation Plan.

FIGURE 5.3: Deleted Mitigation Strategies					
Action Name	**Action Type**	**Description**	**Hazards Mitigated**	**Responsible Agency**	**Reason for Deletion**
NONE					

5.4 Prioritized Implementation Plan

Several of the action items previously identified in the previous version of this Hazard Mitigation Plan are currently continuing, either because they require more time to secure funding or their construction process is ongoing. In addition, the Hazard Mitigation Committee identified several new strategies that are also being pursued. These new strategies are based on experience with currently implemented strategies, as well as the hazard identification and risk assessment in this plan.

Prioritization Methodology

The Hazard Mitigation Planning Committee reviewed and prioritized a list of previously identified and new mitigation strategies using the following criteria:

- **Application to multiple hazards** – Strategies are given a higher priority if they assist in the mitigation of several natural hazards.

- **Time required for completion** – Projects that are faster to implement, either due to the nature of the permitting process or other regulatory procedures, or because of the time it takes to secure funding, are given higher priority.

- **Estimated benefit** – Strategies providing the highest degree of reduction in loss of property and life are given a higher priority. This estimate is based on the Hazard Identification and Analysis Chapter, particularly with regard to how much of each hazard's impact would be mitigated.

- **Cost effectiveness** – in order to maximize the effect of mitigation efforts using limited funds, priority is given to low-cost strategies. For example, regular tree maintenance is a relatively low-cost operational strategy that can significantly reduce the length of time of power outages during a winter storm. Strategies that have identified potential funding streams, such as the Hazard Mitigation Grant Program, are also given higher priority.

- **Eligibility Under Hazard Mitigation Grant Program –** The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Funding is made available through FEMA by the Massachusetts Emergency Management Agency. Municipalities apply for grants to fund specific mitigation projects under MEMA requirements

The following categories are used to define the priority of each mitigation strategy:

- **Low** – Strategies that would not have a significant benefit to property or people, address only one or two hazards, or would require funding and time resources that are impractical.
- **Medium** – Strategies that would have some benefit to people and property and are somewhat cost effective at reducing damage to property and people.
- **High** – Strategies that provide mitigation of several hazards and have a large benefit that warrants their cost and time to complete.

Several hazard mitigation strategies identified in the previous Hazard Mitigation Plan have not yet been completed, but were changed in priority during the update of this plan by the Hazard Mitigation Committee. The Committee changed priorities by evaluating the entire list of mitigation strategies in a comprehensive manner according to the factors listed above. For strategies that have changed in priority, the previous priority is provided in parenthesis in the "Priority" column.

Cost Estimates

Each of the following implementation strategies is provided with a cost estimate. Projects that already have secured funding are noted as such. Where precise financial estimates are not currently available, categories were used with the following assigned dollar ranges:

- **Low** – cost less than $50,000
- **Medium** – cost between $50,000 – $100,000
- **High** – cost over $100,000

Cost estimates take into account the following resources:

- **Municipal staff time** for grant application and administration
- **Consultant design and construction cost** (based on estimates for projects obtained from Town and general knowledge of previous work in the Town)
- **Municipal staff time** for construction, maintenance, and operation activities

Project Timeline

Each strategy is provided with an estimated length of time it will take for implementation. Where funding has been secured for the project, a specific future date is provided for when completion will occur. However, some projects do not currently have funding and thus it is difficult to know exactly when they will be completed. For these projects, an estimate is provided for the amount of time it will take to complete the project once funding becomes available.

FIGURE 5.4: Mitigation Strategies to be Implemented									
Mitigation Action	**Status**	**Action Type**	**Description**	**Hazards Mitigated**	**Responsible Entity**	**Timeframe**	**Funding source**	**Cost**	**Priority**
5.4.1: Replace problem culvert on Depot Rd.	New	Operational Strategy	Town previously applied for hazard mitigation grant that was not awarded; will do so again	Flooding Dam Failure	Highway Dept	18 months from funding award	HMGP, local match	High	High
5.4.2: Evaluate whether to become part of FEMA's Community Rating System	New	Operational Strategy	Identification of appropriate municipal bodies and action needed	All Hazards	Select Board/ Town Administrator	Anticipated Start-Jan 2019-Oct 2019	Town Staff, DLTA reg srvs	Low	Low
5.4.3: Identify sources of funding for dam safety inspections.	New	Operational Strategy	Support needed for Highway Dept and other municipal staff to address dam safety, coordinate with MA Office of Dam Safety - Contact DCR, mtgs-phone or in person as needed, collect info. apply as needed to secure funds	All Hazards	EMD	Anticipated Start-July 2018-Jan 2019	Town Staff, DLTA reg srvs	Low	Medium
5.4.4: Participate in regional debris management plan	New	Operational Strategy	Agreement with MEMA and surrounding communities for reimbursement and shared approach to/ for debris removal	Wildfire Severe Storms Hurricanes, Flooding, Dam failure, Tornados	Highway Dept, EMD	18 months from funding award	Homeland Security	High	High

FIGURE 5.4: Mitigation Strategies to be Implemented									
Mitigation Action	**Status**	**Action Type**	**Description**	**Hazards Mitigated**	**Responsible Entity**	**Timeframe**	**Funding source**	**Cost**	**Priority**
5.4.5: Implement top recommendations of Open Space and Recreation (OSRP) and Capital Improvement Plan (CIP) related to Hazard Mitigation ~~to protect natural resources (for flood mitigation) and for water supply protection~~	New	Operational Strategy	The Open Space and Recreation (OSRP) and Capital Improvement Plan (CIP) have top recommendations pertaining to hazard mitigation: CIP-build Public Safety Complex and authorize borrowing for new Fire Truck; OSRP-"promote the development of management plans on town-owned forest lands..." and "encourage re-use of vacant buildings in village ctrs..."	Flooding, Dam or culvert failure	Town committees as appropriate, Town Admin., Select Board	July 2017 start work implementing top recommendation from CIP-complete by June 30 2018, with #,s 2 & 3, following, alternating with OSRP.	Town Staff	Medium	Medium
5.4.6: Educate owners of properties in floodplain about NFIP	New	Operational strategy	Encourage enrollment in NFIP; distribute brochures at Town Hall, events; publicize www.floodsmart.gov; participate in flood awareness campaigns.	Flooding Dam Failure	EMD, Town Clerk, Conservation Commission	Anticipated Start-July 2018-Jan 2019	MEMA TA with Town Staff	Low	Medium
5.4.7 Stay abreast of and adopt as needed new floodplain management regulations, including limits on new and substantially improved construction in Special Flood Hazard Areas	New	Operational strategy	Prevent property loss from flooding by limiting new construction and significant improvements in flood zones	Flooding Dam Failure	Conservation Commission, Planning Board, Building Inspector	Anticipate 9-12 months to adopt a new regulation after new regs are promulgated	Town Staff	Low	Medium
5.4.8: Conduct floodplain identification and mapping, including local requests for map updates	New	Operational strategy	FEMA FIRM maps have not been updated since late 1980s; PVPC requested an update from MEMA in 2015; new flood zone info is needed	Flooding, Dam and culvert failure	MEMA, PVPC	Anticipate 3-6 months to complete mapping request after request is placed	Town Staff with FEMA/MEMA leadership	Low	High

FIGURE 5.4: Mitigation Strategies to be Implemented									
Mitigation Action	**Status**	**Action Type**	**Description**	**Hazards Mitigated**	**Responsible Entity**	**Timeframe**	**Funding source**	**Cost**	**Priority**
5.4.9: Radio/Television Stations Emergency Notifications (revised 2015)	New	Operational strategy	Collect, periodically update and disseminate information on which local TV/radio stations and websites provide emergency notifications (i.e. school cancellations, business closures, other)	All Hazards	EMD	July 2017-Dec 2017	Town Staff	Low	High
5.4.10: Fire Safety Pamphlet and Distribution	New	Operational strategy	Develop and distribute an educational pamphlet on fire safety and prevention	All fire hazards, including Wildfire Brushfire	Fire Department	Anticipated Start-July 2018-Jan 2019	Town Staff / Volunteers	Low	Medium
5.4.11: Back-up Generators at Shelters	Done 2012; ongoing	Operational strategy	Install and maintain back-up generators at all shelters (5) so sufficient back-up electricity is available during primary power failure.	All hazards	EMD	9 months after funding award announcement	Commercial Equipment Direct Assistance Program (CEDAP)	Low	High
5.4.12: Integrate Hazard Mitigation into municipal Master Planning process (added 2016)	New	Planning strategy	Master plan will include goals and recommendations to address topics with relevance to hazard mitigation planning, especially flood control	Flooding, erosion	Planning Board and/or appointed committee	Anticipate 24 months from funding award	Town staff	Medium	High
5.4.13: Culvert Inspections (added 2016)	New	Operational strategy	Highway Dept inspections of culverts; Coordination with MassDOT for Route 9 culvert improvements as needed	Flooding	Highway Dept	Start work on top priority culvert inspection in January 2017-March 2017, then move to #2, etc	Town staff	Low	High
5.4.14: Cable access TV emergency messaging (added 2016)	Done	Operational	Emergency messages posted on ComCast local cable access Channel 15	All	EMD, Cable Access Coordinator	Anticipated Start-July 2017-Oct 2017	Town staff	Low	High

FIGURE 5.4: Mitigation Strategies to be Implemented									
Mitigation Action	**Status**	**Action Type**	**Description**	**Hazards Mitigated**	**Responsible Entity**	**Timeframe**	**Funding source**	**Cost**	**Priority**
5.4.15: Town website emergency messaging (added 2016)	Done	Operational	Posting of emergency information on www.burgy.org	All	Town Clerk, EMD	Anticipated Start-July 2017-Oct 2017	Town staff	Low	High
5.4.16: Town siren warning system (added 2016)	New	Operational	Test and maintain two municipal warning sirens at Fire Stations	All	EMD, Fire Dept	Anticipated Start-July 2018-Oct 2018	Town staff	Low	Medium
5.4.17: Dunphy School back-up generator connection to kitchen circuit(s) (added 2016)	New	Operational	Connection from emergency generator to kitchen needed so hot meals can be served when in use as shelter	All	Bldg Supervisor	Anticipated Start-July 2018-Oct 2018	Town staff, MEMA	Low	Medium
5.4.18: Municipal water interconnection aid agreement	Done	Operational	Sign on to agreement with City of Northampton to share drinking water in event of emergency.	All	Highway Dept, Water Com.	Anticipated Start-July 2017-Jan 2018	Town staff	Low	High
5.4.19: Portable emergency electric power	Done	Operational	Fire Dept obtain and maintain 5 portable electric generators to be deployed as needed; 1 portable light stand also has generator that can power other loads	All	EMD, Fire Dept	3 months from funding award or inclusion in budget	Town staff, local foundations, businesses	Medium	High

FIGURE 5.5: Mitigation Strategies Accomplished since last plan was adopted in 2010 ☑ = Complete

Mitigation Action	Status	Action Type	Description	Hazards Mitigated	Responsible Entity	Timeframe	Funding Source
5.5.1: Notification System and Reverse 911	☑	Operational strategy	Examine current notification system including feasibility of Reverse 911 Town implemented Black Board Connect	Floods, Snow/ice storms, severe thunderstorms, hurricanes/tropical storms, tornadoes, wildfire/brushfire, earthquakes, dam failure	Town Administrator	Done	Town Staff
5.5.2: Existing Shelters	☑	Operational strategy	Identify existing shelters that are outside of floodplain and inundation areas. Disseminate this information to appropriate Town departments	Flooding, dam failure, snow/ice, extreme heat, extended power failure	EMD	Done	Town Staff
5.5.3: Shelter Inventory	☑	Operational strategy	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	Snow/ice storms, Tornadoes, Hurricanes	EMD	Ongoing	Homeland Security grants MA EOPS
5.5.4: Shelter Supplies Plan	☑	Operational strategy	Develop and implement a plan for providing access to water, information, shelter, and food stores for special needs populations in Town in event of severe winter storm	Floods, Snow/ice storms, severe thunderstorms, hurricanes/trpical storms, tornadoes, wildfire/brushfire, earthquakes, dam failure	EMD, Board of Health	Ongoing	Town Staff
5.5.5: Williamsburg Open Space and Recreation Plan	☑	Planning document	Work to implement goals in the OSRP on protection of water supply and quality	Flooding Drought	Conservation Commission	Done 2011	Town Staff

5.5.6: Emergency Electric Power Generators at Shelters		Operational strategy	Install emergency generators at town's 5 shelters	All hazards.	EMD	Done 2012	
5.5.7: Emergency Electric Power Generators (portable)		Operational strategy	Provide Fire Dept with 5 portable electric generators and portable light stand with generator to be deployed as needed.	All hazards.	Fire Dept	Done 2012	
5.5.8: Municipal water supply interconnection agreement		Operational	Agreement in 2014 with City of Northampton to share drinking water supplies in event of emergency	All hazards	Highway Dept, Water Com, Select Board	Done 2014	
5.5.9: Regional debris management agreement		Operational	Regional agreement to manage disaster-related debris and receive reimbursement from MEMA for costs incurred	All hazards	Select Board	Done 2014	MEMA
5.5.10: Regulations to reduce flooding from storm water runoff		Planning	Stormwater management requirements for large-scale solar facilities improves on-site infiltration	Flooding	Planning Board	Done 2012	Town staff

6. PLAN REVIEW, ADOPTION, IMPLEMENTATION, MONITORING, AND EVLAUATION

6.1 Plan Adoption

Upon completion of the draft Hazard Mitigation Plan, a public meeting was held by the Town staff and the Pioneer Valley Planning Commission on December 14, 2015 to present and request comments from residents. The Hazard Mitigation Plan was then submitted to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency for their review. Upon receiving conditional approval of the plan by FEMA, the plan was adopted by the Board of Selectmen.

6.2 Plan Implementation

The implementation of this plan began upon its formal adoption by the Select Board and approval by MEMA and FEMA. Those Town departments and boards responsible for ensuring the development of policies, ordinance revisions, and programs as described in Chapter 5 of this plan will be notified of their responsibilities immediately following approval. The Hazard Mitigation Committee will continue to oversee the implementation of the plan.

6.3 Incorporation with Other Planning Documents / Documentation of Williamsburg's Existing Authorities, Policies and Programs to Mitigate Hazards

Williamsburg has a series of planning and regulatory capabilities that prevent and reduce the impacts of hazards. Many of these are assessed in the tables in Chapter 5. Existing plans, studies, reports and municipal documents were incorporated throughout the planning process. This included a review and incorporation of significant information from the following key documents:

- **Williamsburg Capital Improvements Plan**
- **Williamsburg Comprehensive Emergency Management Plan** - used to identify critical infrastructure, current emergency operations, and special needs populations
- **Williamsburg Open Space and Recreation Plan 2011 -** used to identify existing hazard mitigation strategies, already proposed mitigation strategies, natural resources, and critical infrastructure
- **Williamsburg Zoning Bylaw and Subdivision Regulations** - used to identify existing mitigation strategies
- **Massachusetts State Hazard Mitigation Plan** - used to ensure consistency with state identification of mitigation strategies, critical infrastructure, and hazards
- **Massachusetts Climate Change Adaption Report 2008** – used to estimate impacts on local infrastructure and environment

- **Pioneer Valley Planning Commission Our Next Future: An Action Plan for Building a Smart, Sustainable, and Resilient Pioneer Valley -** used for data, information, context and strategies, including the 8 elements plans:
    1. Climate Action and Clean Energy
    2. Food Security
    3. Sustainable Transportation
    4. Environment
    5. Green Infrastructure
    6. Housing
    7. Brownfields
    8. Land Use

The 2016 update of the Williamsburg Hazard Mitigation Plan will also be incorporated into updates of the Town's Comprehensive Emergency Management Plan.

The members of the Town's Hazard Mitigation Committee will stay engaged with the status and advancement of these plans and whenever any of these plans are in the process of being updated, the Hazard Mitigation Committee will provide copies of the Hazard Mitigation Plan to relevant Town staff and brief them on the content of the Hazard Mitigation Plan. The Hazard Mitigation Committee will also review current Town programs and policies to ensure that they are consistent with the mitigation strategies described in this plan.

Plan Monitoring and Evaluation

The Town's Emergency Management Director will call meetings of all responsible parties to evaluate progress on the plan's implementation annually and as needed, based on occurrence of hazard events. The public will be notified of these meetings in advance through a posting of the agenda at Town Offices. Responsible parties identified for specific mitigation actions will be surveyed and asked to submit status reports on prioritized actions in advance of the meeting.

Meetings will involve evaluation and assessment of the plan, regarding its effectiveness at achieving the plan's goals and stated purpose. The following questions will serve as the criteria that is used to evaluate the plan:

Plan Mission and Goal

- Is the Plan's stated goal and mission still accurate and up to date, reflecting any changes to local hazard mitigation activities?

- Are there any changes or improvements that can be made to the goal and mission?

Hazard Identification and Risk Assessment

- Have there been any new occurrences of hazard events since the plan was last reviewed? If so, these hazards should be incorporated into the Hazard Identification and Risk Assessment.

- Have any new occurrences of hazards varied from previous occurrences in terms of their extent or impact? If so, the stated impact, extent, probability of future occurrence, or overall assessment of risk and vulnerability should be edited to reflect these changes.

- Is there any new data available from local, state, or Federal sources about the impact of previous hazard events, or any new data for the probability of future occurrences? If so, this information should be incorporated into the plan.

Existing Mitigation Strategies

- Are the current strategies effectively mitigating the effect of any recent hazard events?
- Has there been any damage to property since the plan was last reviewed?
- How could the existing mitigation strategies be improved upon to reduce the impact from recent occurrences of hazards? If there are improvements, these should be incorporated into the plan.

Proposed Mitigation Strategies

- What progress has been accomplished for each of the previously identified proposed mitigation strategies?
- How have any recently completed mitigation strategies affected the Town's vulnerability and impact from hazards that have occurred since the strategy was completed?
- Should the criteria for prioritizing the proposed mitigation strategies be altered in any way?
- Should the priority given to individual mitigation strategies be changed, based on any recent changes to financial and staffing resources, or recent hazard events?

Review of the Plan and Integration with Other Planning Documents

- Is the current process for reviewing the Hazard Mitigation Plan effective? Could it be improved?
- Are there any Town plans in the process of being updated that should have the content of this Hazard Mitigation Plan incorporated into them?
- How can the current Hazard Mitigation Plan be better integrated with other Town planning tools and operational procedures, including the zoning bylaw, the Comprehensive Emergency Management Plan, and the Capital Improvement 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. The committee will review and update the Hazard Mitigation Plan every five years.

Public participation will be a critical component of the Hazard Mitigation Plan maintenance process. The Hazard Mitigation Committee will hold all meetings in accordance with Massachusetts open meeting laws and the public invited to attend. The public will be notified of any changes to the Plan via the meeting notices board at Town Hall, and copies of the revised Plan will be made available to the public at Town Hall.

7. APPENDICES

Appendix A: Technical Resources

A.1 Agencies

Massachusetts Emergency Management Agency (MEMA).....508/820-2000
Hazard Mitigation Section 617/626-1356
Federal Emergency Management Agency (FEMA) 617/223-4175
Berkshire Regional Planning Commission (BRPC).....413/442-1521
Franklin Regional Council of Governments (FRCOG).....413/774-3167
Metropolitan Area Planning Council (MAPC).....617/451-2770
Pioneer Valley Planning Commission (PVPC).....413/781-6045
MA Board of Building Regulations & Standards (BBRS).....617/227-1754
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 1.....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.....508/824-5116
US Department of the Interior: US Fish and Wildlife Service 413/253-8200
US Geological Survey.....508/490-5000

A.2 Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP) ……..MA Emergency Management Agency
406 Public Assistance and Hazard Mitigation .....MA 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) ……MA Emergency Management Agency
Emergency Generators Program by NESEC‡ .....MA Emergency Management Agency
Emergency Watershed Protection (EWP) Program.....USDA, Natural Resources Conservation Service Flood Mitigation Assistance Program (FMAP)……..MA Emergency Management Agency
Flood Plain Management Services (FPMS).....US Army Corps of Engineers
Mitigation Assistance Planning (MAP).....MA Emergency Management Agency
Mutual Aid for Public Works.....Western Massachusetts Regional Homeland Security Advisory Council
National Flood Insurance Program (NFIP) † ……..MA Emergency Management Agency
Power of Prevention Grant by NESEC‡ .....MA 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.

A.3 Internet Resources

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, University 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/dis aster/	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.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/g eog/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.tornadoroject.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.iiaa.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: Documentation of Hazard Mitigation Planning Process

B.1 Hazard Mitigation Committee

The Williamsburg Hazard Mitigation Committee is the focus of the local Hazard Mitigation Planning process. The committee held five meetings in December 2015 to review and update the 2010 plan. Local knowledge, updates and revisions were incorporated into the plan by PVPC staff.

The agendas for these meetings are presented below.

Williamsburg Hazard Mitigation Planning Committee **Meeting #1**

AGENDA
Dec 2, 2015
4:30PM
Town Office Building, 141 Main St, Haydenville

1) Introductions, Review Plan process

2) Review in-kind contribution documentation requirements

3) Review Plan Chapters 1, 2, 3 (partial)

Name and Affiliation	Signature
Denise Banister - EMD, Select Board	Denise A Banister
Charlene Nardi - Town Administrator	Charlene L Nardi
Bill Turner - Highway Superintendent	Bill Turner
Jim Locke - Planning Board Chair	Jim Locke
~~Donna Gibson~~	
Helen Symons - Board of Health	Helen Symons
~~Rusty Luce~~	
JASON Connell - Fire Chief	Jason Connell
Kathy McKeown	Kathy McKeown
David Elwin, PVPC	David Elwin

Williamsburg Hazard Mitigation Planning Committee **Meeting #2**

AGENDA
Dec 8, 2015
4:30PM
Town Office Building, 141 Main St, Haydenville

1) Continue review of Chapter 3, Profiling Hazards

2) Begin review of Chapter 4 Critical Facilities

3) Reminder of Public meeting #1 at 6PM

Name and Affiliation	Signature
Denise Banister, EMD, Select Board	
Charlene Nardi, Town Administrator	
Bill Turner, Highway Superintendent	
Jim Locke, Planning Board Chair	
Jason Connell, Fire Chief	
Helen Symons, Board of Health	
Kathy McKeown, Planning Board	
David Elvin, PVPC	
JASON SOUKUP, SGT POLICE	

Williamsburg Hazard Mitigation Planning Committee **Meeting #2** 3

AGENDA
~~**Dec 8, 2015**~~ Dec. 10, 2015
4:30PM
Town Office Building, 141 Main St, Haydenville

1) Continue review of Chapter 3, Profiling Hazards

2) Begin review of Chapter 4 Critical Facilities

3) Reminder of Public meeting ~~#1~~ 2 monday at 6PM

Name and Affiliation	Signature
Denise Banister, EMD, Select Board	
Charlene Nardi, Town Administrator	
Bill Turner, Highway Superintendent	
Jim Locke, Planning Board Chair	
Jason Connell, Fire Chief	
Helen Symons, Board of Health	
Kathy McKeown, Planning Board	
David Elvin, PVPC	
JASON SOUKUP, POLICE	

Williamsburg Hazard Mitigation Planning Committee **Meeting #4**

AGENDA
Dec 14, 2015
4:30 PM
Town Office Building, 141 Main St, Haydenville

1) Continue and complete review of Chapter 5 Mitigation Strategies

2) Begin review of Chapter 6 Prioritized Implementation Schedule

3) Reminder of Public meeting #2 on 12/14 at 6PM

Name and Affiliation	Signature
Denise Banister, EMD, Select Board	
Charlene Nardi, Town Administrator	
Bill Turner, Highway Superintendent	
Jim Locke, Planning Board Chair	
Jason Connell, Fire Chief	
Helen Symons, Board of Health	
Sgt Jason Soukup, Police Dept	
Kathy McKeown, Planning Board	
David Elvin, PVPC	

Williamsburg Hazard Mitigation Planning Committee **Meeting ~~#1~~ #5**

AGENDA
~~**Dec 2, 2015**~~ Dec 17, 2015
4:30PM
Town Office Building, 141 Main St, Haydenville

1) ~~Introductions, Review Plan process~~ Finish Chapter 5

2) ~~Review in-kind contribution documentation requirements~~ Finish Ch 6

~~3) Review Plan Chapters 1, 2, 3 (partial)~~ Review public comments, next steps

Name and Affiliation	Signature
Denise Banister	
Charlene Nardi	
Bill Turner	
Jim Locke	
~~Donna Gibson~~	
Helen Symons	
~~Rusty Luce~~	
D. Elvin	
Jason Connell	
Kathy McKeown	

B2. Public Meetings

PVPC staff held two public meetings to present the planning process, the hazards and vulnerabilities identified by the committee, and the mitigation strategies and their status. The agendas and sign in sheets for these meetings and the public slide presentation available at these meetings and the posting notice from the Williamsburg Town Clerk are presented below.

Williamsburg Hazard Mitigation Plan Public Meeting #1

AGENDA
Dec 8, 2015
6:00PM
Town Office Building, 141 Main St, Haydenville

1) Summary of Hazard Mitigation Plan process and draft plan to be updated

2) Discussion of hazards identified to date

3) Reminder of public meeting #2 at on Monday Dec 14 at 6:00PM

Name and Affiliation	Signature
David Elvin, PVPC	

Williamsburg Hazard Mitigation Plan Public Meeting #2

AGENDA
Dec 14, 2015
6:00PM
Town Office Building, 141 Main St, Haydenville

1) Summary of Hazard Mitigation Plan process and draft plan to be updated

2) Discussion of hazards identified to date

3) Reminder of Committee mtg #5

Name and Affiliation	Signature
David Elvin, PVPC	
Donna Sue Gibson	

vn of Williamsburg, ssachusetts

141 Main St., P.O. Box 447, Haydenville, MA 01039-0447
ph: (413) 268-8400
fx: (413) 268-8409

c Mtg - Hazard Mitigation Plan Update

ıy, December 8, 2015 at 6:00 PM
)ffices - Haydenville

MEDIA RELEASE

:T: David Elvin (413) 781-6045 or delvin@pvpc.org

ıEDIATE RELEASE
er 25, 2015

Williamsburg Sets Public Meetings for Hazard Mitigation Plan December 8 and 14

burg residents are invited to provide comments on the development of the Town of Williamsburg's Hazard ın Plan at two public meetings, which will be held **Tuesday, December 8, 2015 and Monday December 15.** Both meetings will begin at 6:00 p.m. at the Town Office Building, 141 Main Street in Haydenville. All s of the public are welcome to attend the event. Local businesses, residents of neighboring communities, ıicipal officials of neighboring communities are also encouraged to attend and provide their feedback.

:tings will include an introduction to the Hazard Mitigation planning process, a summary of existing ın initiatives, and an overview of past hazards in the Town. Municipal officials and PVPC staff will be : to answer questions and listen to comments.

ı is being produced by the Town with assistance from the Pioneer Valley Planning Commission and is ɔy the Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management (MEMA). This planning effort is being undertaken to help the Town of East Longmeadow assess the risks ɔm natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, ritize funding for mitigation efforts. A mitigation action is any action taken to reduce or eliminate the long- ‹ to human life and property from hazards.

POSTED 9AM BML
DEC 04 2015
Williamsburg Town Clerk

Town of Williamsburg, Massachusetts

141 Main St., P.O. Box 447, Haydenville, MA 01039-0447
ph: (413) 268-8400
fx: (413) 268-8409

Public Mtg - Hazard Mitigation Plan Update

Monday, December 14, 2015 at 6:00 PM
Town Offices - Haydenville

MEDIA RELEASE

CONTACT: David Elvin (413) 781-6045 or delvin@pvpc.org

Williamsburg Sets Public Meetings for Hazard Mitigation Plan December 8 and 14

Williamsburg residents are invited to provide comments on the development of the Town of Williamsburg's Hazard Mitigation Plan at two public meetings, which will be held **Tuesday, December 8, 2015 and Monday December 14, 2015.** Both meetings will begin at 6:00 p.m. at the Town Office Building, 141 Main Street in Haydenville. All members of the public are welcome to attend the event. Local businesses, residents of neighboring communities, and municipal officials of neighboring communities are also encouraged to attend and provide their feedback.

The meetings will include an introduction to the Hazard Mitigation planning process, a summary of existing mitigation initiatives, and an overview of past hazards in the Town. Municipal officials and PVPC staff will be available to answer questions and listen to comments.

The plan is being produced by the Town with assistance from the Pioneer Valley Planning Commission and is funded by the Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA). This planning effort is being undertaken to help the Town of East Longmeadow assess the risks faced 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.

POSTED
DEC 10 2015
Williamsburg Town Clerk
9:00 AM
BML

Williamsburg Hazard Mitigation Plan

Public Outreach Mtg #2

December 14, 2015

FEMA

pvpc

Agenda

2

- Overview of hazard mitigation
- Content of Williamsburg Hazard Mitigation Plan
  - Hazard identification and risk assessment
  - Critical infrastructure
  - Existing strategies for mitigating hazards
  - Proposed strategies for mitigating hazards
- Question and comment period

What is Hazard Mitigation?

3

According to FEMA:

"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."

Photo: MassLive.com, Nov. 2015

Benefits of Hazard Mitigation

4

- Makes community eligible to apply for Hazard Mitigation funds from FEMA
- Mitigation is less expensive than disaster clean up
- Having a plan provides an approach for using limited resources more effectively

Photo: WSJ.com, Aug. 2011

Overview of a Hazard Mitigation Plan

5

Purpose of plan:

Lessen the long-term consequences of natural disasters

Key plan components:

1. Hazard identification and assessment
2. Identification of critical infrastructure
3. Existing and proposed mitigation strategies
4. Proposed schedule for implementation of strategies

Hazard Assessment for Williamsburg (ch 3)

Type of Hazard	Location of Occurrence	Probability of Future Events	Impact	Hazard Risk Index Rating
1. Floods	Small	Very High	Limited	3 – Medium Risk
2. Severe Snowstorms / Ice Storms	Large	High	Limited	2 – Medium Risk
3. Hurricanes	Large	Medium	Limited	2 – Medium Risk
4. Severe Thunderstorms Wind/Tornado/Microburst	Large	Medium	Minor/Limited	2 – Medium Risk
5. Wildfires / Brushfires	Small	Very High	Minor	5 – Very Low Risk
6. Earthquakes	Large	Very Low	Critical	5 - Very Low Risk
7. Dam Failure	Small	Very Low	Minor	5 - Very Low Risk
8. Drought	Large	Low	Minor	5 - Very Low Risk
9. Landslides	Small	Low	Limited	4 - Low Risk
10. Extreme Heat	Large	High	Minor	5 – Very Low
11. Other				

Existing and New Mitigation Strategies

7

- Williamsburg's draft plan includes a list of existing mitigation strategies, as well as strategies to be pursued in the future
- The Hazard Mitigation Committee is evaluating existing strategies in terms of effectiveness and added additional strategies
- The list of strategies to be pursued in the future will be prioritized.

Proposed Mitigation Strategies

8

- Back up electric power
- Flood control structures (dams and culverts)
- Water Supply Protection District
- Site plan approval to protect wetlands
- Fire Dept review of new subdivision plans
- Grade regulations for subdivisions
- Underground utilities in new development
- Burn permits
- Fire safety education and outreach

Next Steps in Planning Process

9

- Plan available for public review at www.pvpc.org
- Plan to be submitted for review by MEMA and FEMA, with public comments incorporated

CONTACT: David Elvin
Pioneer Valley Planning Commission
E-mail: delvin@pvpc.org
Phone: 413-781-6045

B.3 Media Outreach

General media outreach to publicize the Williamsburg Hazard Mitigation Plan update process was accomplished through a press release sent via email on November 30, 2015 to media outlets available in the Pioneer Valley region. This press release is reproduced below, followed by the list of media organizations to which it was sent.

Catalyst for Regional Progress

PVPC

Timothy W. Brennan, Executive Director

MEDIA RELEASE

CONTACT: David Elvin, PVPC Senior Planner, (413) 781-6045 or delvin@pvpc.org

FOR IMMEDIATE RELEASE
November 30, 2015

Williamsburg Schedules Two Public Meetings for Hazard Mitigation Plan

Williamsburg residents are invited to provide comments on the development of the Town of Williamsburg's Hazard Mitigation Plan at two public meetings that will be held on **Tuesday, December 8 and Monday December 14.** Both meetings will begin at 6:00 p.m. at the Town Office Building, 141 Main Street in Haydenville. All members of the public are welcome to attend the event. Local businesses, residents of neighboring communities, and municipal officials of neighboring communities are also encouraged to attend and provide their feedback.

The meetings will include an introduction to the Hazard Mitigation planning process, a summary of existing mitigation initiatives, and an overview of past hazards in the Town. Municipal officials and PVPC staff will be available to answer questions and listen to comments.

The plan is being produced by the Town with assistance from the Pioneer Valley Planning Commission and is funded by the Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA). This planning effort is being undertaken to help the Town of East Longmeadow assess the risks faced 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.

For more information, please contact PVPC's David Elvin at delvin@pvpc.org or (413) 781-6045.

—30—

Media Organizations to which the press release was sent on Nov. 30, 2015

Media Organization	Address	Town	State	Zip
African American Point of View	688 Boston Road	Springfield	MA	01119
Agawam Advertiser News	23 Southwick Street	Feeding Hills	MA	01030
Amherst Bulletin	115 Conz Street	Northampton	MA	01060
Belchertown Sentinel	1 Main Street	Belchertown	MA	01007
Berkshire Eagle	75 South Church Street	Pittsfield	MA	01202
Brattleboro Reformer	62 Black Mountain Rd.	Brattleboro	VT	05301
CBS 3 Springfield	One Monarch Place	Springfield	MA	01144
Chicopee Register	380 Union Street	West Springfield	MA	01089
CommonWealth Magazine	18 Tremont Street	Boston	MA	02108
Country Journal	5 Main Street	Huntington	MA	01050
Daily Hampshire Gazette	115 Conz Street	Northampton	MA	01060
El Sol Latino	P.O. Box 572	Amherst	MA	01004
Going Green	PO Box 1367	Greenfield	MA	01302
Hilltown Families	P.O. Box 98	West Chesterfield	MA	01084
Holyoke Sun	138 College Street	South Hadley	MA	01075
Journal Register	24 Water Street	Palmer	MA	01069
La Voz Hispana	133 Maple Street #201	Springfield	MA	01105
Ludlow Register	24 Water Street	Palmer	MA	01069
Massachusetts Municipal Association	One Winthrop Street	Boston	MA	02110
Quaboag Current	80 Main Street	Ware	MA	01082
Recorder	14 Hope Street	Greenfield	MA	01302
Reminder	280 N. Main Street	East Longmeadow	MA	01028
Southwick Suffield News	23 Southwick Street	Feeding Hills	MA	01030
State House News Service	State House	Boston	MA	02133
Tantasqua Town Common	80 Main Street	Ware	MA	01082
The Longmeadow News	62 School Street	Westfield	MA	01085
The Republican	1860 Main Street	Springfield	MA	01102
The Westfield News	62 School Street	Westfield	MA	01085
Town Reminder	138 College Street	South Hadley	MA	01075
Urban Compass	83 Girard Avenue	Hartford	CT	06105
Valley Advocate	115 Conz Street	Northampton	MA	01061
Vocero Hispano	335 Chandler Street	Worcester	MA	01602
WAMC Northeast Public Radio	1215 Wilbraham Road	Springfield	MA	01119
Ware River News	80 Main Street	Ware	MA	01082
West Springfield Record	P.O. Box 357	West Springfield	MA	01098
WFCR-Public Radio	131 County Circle	Amherst	MA	01003
WGBY-Public TV	44 Hampden Street	Springfield	MA	01103
WGGB ABC40/FOX 6 News	1300 Liberty Street	Springfield	MA	01104
WHMP-FM	15 Hampton Avenue	Northampton	MA	01060
Wilbraham-Hampden Times	2341 Boston Road	Wilbraham	MA	01095
Worcester Telegram & Gazette	20 Franklin Street	Worcester	MA	01615
WRNX/WHYN/WPKR Radio	1331 Main Street	Springfield	MA	01103
WWLP-TV 22	PO Box 2210	Springfield	MA	01102

Town of Williamsburg Website Posting effective 11/30/15

http://www.burgy.org/Pages/WilliamsburgMA_News/022A3EC5-000F8513

B.4 Outreach to Other Municipalities in the Region

In addition to media releases publicizing the planning process and inviting input, PVPC assured that surrounding communities were aware of Williamsburg's work updating their plan by informing the members of the Commission that oversees PVPC's work through articles in the quarterly newspaper published by the PVPC and also by presenting at meetings of the Executive Committee. They are copied below. The PVPC "Regional Reporter" is emailed to all 43 cities and towns in the Pioneer Valley and also to Businesses, Chambers of Commerce, Educational Institutions and Developers.

Pioneer Valley Planning Commission Website Posting effective 11/30/15

PIONEER VALLEY PLANNING COMMISSION

TRANSLATE PAGE CHANGE FONT SIZE

ABOUT PLANNING DOING MEASURING

Tags Media Release

Williamsburg Schedules Two Public Meetings for Hazard Mitigation Plan

30 Nov 2015

Williamsburg residents are invited to provide comments on the development of the Town of Williamsburg's Hazard Mitigation Plan at two public meetings that will be held on Tuesday, December 8 and Monday December 14. Both meetings will begin at 6:00 p.m. at the Town Office Building, 141 Main Street in Haydenville. All members of the public are welcome to attend the event. Local businesses, residents of neighboring communities, and municipal officials of neighboring communities are also encouraged to attend and provide their feedback.

The meetings will include an introduction to the Hazard Mitigation planning process, a summary of existing mitigation initiatives, and an overview of past hazards in the Town. Municipal officials and PVPC staff will be available to answer questions and listen to comments.

The plan is being produced by the Town with assistance from the Pioneer Valley Planning Commission and is funded by the Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA). This planning effort is being undertaken to help the Town of East Longmeadow assess the risks faced 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.

For more information, please contact PVPC's David Elvin at delvin@pvpc.org or (413) 781-6045.

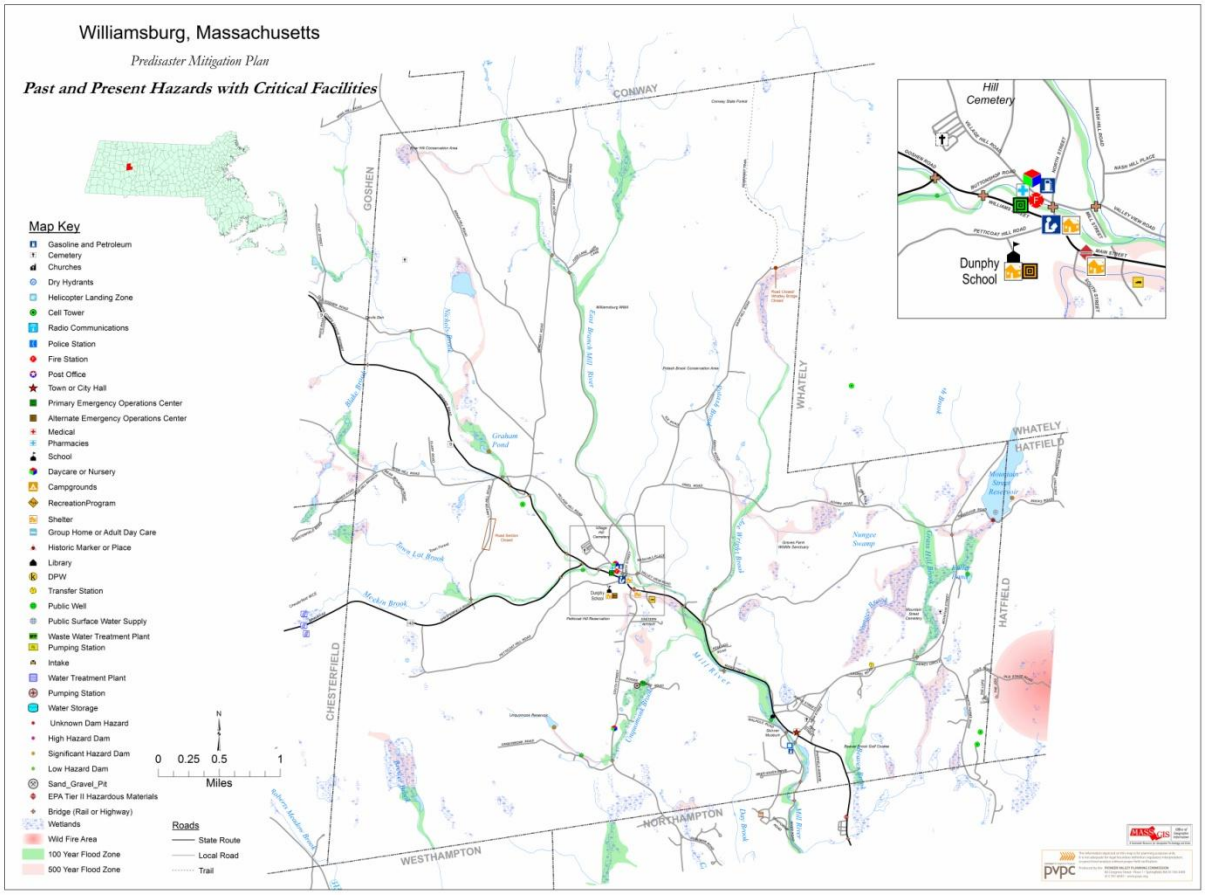
Tweet Share G+1 Share

http://www.pvpc.org/content/williamsburg-schedules-two-public-meetings-hazard-mitigation-plan

Appendix C: 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
DPW	Department of Public Works
LEPC	Local Emergency Planning Committee
EMD	Emergency Management Director
Con Com	Conservation Commission
Ag Com	Agricultural Commission
EOC	Emergency Operations Center
CEM Plan	Comprehensive Emergency Management Plan
EMA	Emergency Management Agency
RACES	Radio Amateur Civil Emergency Service
WMECO	Western Massachusetts Electric Company
HAZMAT	Hazardous Materials

Appendix D: Critical Facilities Map



CERTIFICATE OF ADOPTION

TOWN OF WILLIAMSBURG, MASSACHUSETTS

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE

WILLIAMSBURG HAZARD MITIGATION PLAN Update 2016

WHEREAS, the Town of Williamsburg established a Committee to prepare the Williamsburg Hazard Mitigation Plan Update 2016; and

WHEREAS, public planning meetings were held on December 8, 2015 and December 14, 2015 regarding the review of the Williamsburg Hazard Mitigation Plan Update 2016; and

WHEREAS, the Williamsburg Hazard Mitigation Plan Update 2016 contains several potential future projects to mitigate hazard damage in the Town of Williamsburg; and

WHEREAS, the Federal Emergency Management Agency has conditionally approved the Town's updated Hazard Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Board of Selectmen of Williamsburg adopts the Williamsburg Hazard Mitigation Plan Update 2016.

ADOPTED AND SIGNED this 4th day of August 2016

Board of Selectmen
Town of Williamsburg

ATTEST