

# THE TOWN OF CHESTER

## LOCAL NATURAL HAZARDS MITIGATION PLAN



Adopted by the Chester SelectBoard on \_\_\_\_\_

**Prepared by:**  
**The Chester Natural Hazards Mitigation Planning Committee**  
**and**

**The Pioneer Valley Planning Commission**

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# 1 - INTRODUCTION

## Hazard Mitigation

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

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

## Planning Process

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

- Identifying the natural hazards that may impact the community.
- Conducting a Vulnerability/Risk Assessment to identify the infrastructure (i.e., critical facilities, public buildings, roads, homes, businesses, etc.) at the highest risk for being damaged by the identified natural hazards, particularly flooding.
- Identifying and assessing the policies, programs, and regulations a community is currently implementing to protect against future disaster damages. Examples of such strategies include:
  - Preventing or limiting development in natural hazard areas like floodplains;

- Implementing recommendations in existing planning documents including Stormwater Management Plans, Master Plans, Open Space and Recreation Plans, and Emergency/Evacuation Plans that address the impacts of natural hazards; and
  - Requiring or encouraging the use of specific structural requirements for new buildings such as buried utilities, flood-proofed structures, and lightning grounding systems.
- Identifying deficiencies in the current strategies and establishing goals for updating, revising or adopting new strategies.
  - Adopting and implementing the final Local Natural Hazards Mitigation Plan.

During the planning process, the Town’s Local Natural Hazard Planning Committee identified Action Plan items and specific time frames. Actions were selected from a list of local strategies which were compiled by the Pioneer Valley Planning Commission from a review of approved hazard mitigation plans and others identified by the Town during their review of existing programs, policies, and regulations. From this list, specific Action Items were prioritized by the Town’s Local Natural Hazards Planning Committee based on the following criteria:

- Select Action Items which have the ability to significantly mitigate the negative impact of natural hazards on people and property;
- Select Action items which the Town has the ability to implement given the financial and staff resources available;
- Select Action Items with the greatest influence on achieving Local Goals & Objectives;
- Select a diverse set of Action Items which will address different Natural Hazards that present a high or moderate risk to the region; and
- Select Action items which will address those mitigation measures identified as deficient or in need of attention to ensure that the Town is in the best possible position to address natural hazards which impact property and residents.

For example, updating or adopting a local floodplain bylaw would be a relatively low cost action item, which could have a significant impact on mitigating hazards caused by flooding. If adopted by the Town, this bylaw would discourage development in floodplain areas and prevent harm to people and damage to property. Another action item was to review and maintain shelters for victims of natural hazards within the Town and to conduct outreach to residents so that they are aware of the availability of those shelters.

First, however, the Town must identify what services are available at the different shelters (e.g. food preparation, potable water, back-up electrical power, heat, showers, etc.) and whether the location of different shelters will be impacted by different hazards (i.e. whether flooding will make the shelter inaccessible to some residents). This action item, review and maintain shelters, also addressed a number of different natural hazards and would help ensure that suitable shelters are available for different types of natural hazards. The action items selected were all considered to have a low to moderate cost to implement. In some cases grant funding would be sought for implementation given the limited resources available in the Town.

The local action items represent a multi-faceted approach to addressing natural hazards in the Town and will be undertaken as resources become available and will be integrated into ongoing planning activities. As part of the review and adoption process, the Committee approved the action items that were in keeping with the goals and criteria established by the Town and assigned appropriate bodies within the Town to implement them within a five-year framework.

### **Public Committee Meetings**

**December 8, 2006, 10:00 a.m.** Public informational and organizational meeting, held at Chester Town Hall.

**December 8, 2006, 10:30 a.m.** Working committee meeting held at Chester Town Hall.

**January 12, 2006, 10:00 a.m.** Working committee meeting held at Chester Town Hall.

**February 9, 2007, 10 a.m.** Working committee meeting held at Chester Town Hall.

**March 2, 2007, 10 a.m.** Working committee meeting held at Chester Town Hall.

**April 3, 2007, 9:30 a.m.** Working committee meeting held at Chester Town Hall

**November 13, 2007, 4:15 p.m.** Working committee meeting held at Chester Town Hall  
Meeting agendas can be found in Appendix B.

### **Public Meetings with the Select Board**

**January 31, 2005:** The Select Board agreed to begin the process of developing a Local Hazard Mitigation Plan.

**Date to be inserted:** The Select Board adopted the Local Hazard Mitigation Plan. Hearing held at Chester Town Offices.

A mailing was made to each committee member, prior to each meeting that contained information from the previous meeting, and an agenda describing information to be covered.

### **Participation by Public & Entities in Surrounding Communities**

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

During the development of the Town of Chester's Hazard Mitigation Plan, all plan development meetings were posted in the Town Hall and the public was welcome to attend. At several of the plan development meetings local residents and business owners did participate.

On September 13, 2007 the Pioneer Valley Planning Commission sent a press release to all area media outlets to inform the general public that drafts of the region's Hazard Mitigation plans were complete and available for public comment and review on the Commission's website ([www.pvpc.org](http://www.pvpc.org)). This press release (Appendix B) resulted in a series of news articles (Appendix F) that further enhanced awareness of the Hazard Mitigation Planning Process.

On November 20<sup>th</sup>, 2007 the Pioneer Valley Planning Commission presented the planning process that led to the creation of the *Chester Local Natural Hazards Mitigation Plan* to a meeting of the Western Regional Homeland Security Council, the oversight entity responsible for orchestrating the homeland security planning activities of Berkshire, Franklin, Hampden and Hampshire Counties. Collectively, this body is responsible for 101 communities and includes representatives of all key homeland security and disaster preparedness professions, including police, fire, EMS, public works and public health as well as municipal and state governance. Neighboring communities to Chester knew of Chester's hazard mitigation planning efforts from this body.

Also, on September 23, 2007 the Republican Newspaper based in Springfield ran an article about the Pre-Disaster Mitigation Plans which included a solicitation of comments on the plans from the public. A copy of the article is included in Appendix B.



## 2 – LOCAL PROFILE

### Community Setting

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Covering about 37 square miles in the foothills of the Berkshires, the Town of Chester is located in northwestern Hampden County in western Massachusetts. Chester is a town nestled within a beautiful landscape, and home to several lovingly restored historic homes and shops, attractive parks, and the wild and scenic Westfield River.

Chester is bordered by the Towns of Huntington to the east, Worthington and Middlefield to the north, Becket to the west and Blandford to the south. The Town falls within the purview of the Pioneer Valley Planning Commission and is one of the Highland communities. It is located 30 miles southeast of Pittsfield, 30 miles northwest of Springfield, 115 miles west of Boston, 70 miles from Albany, New York, and 140 miles from New York City.

As late as the 1930s, Chester was home to a number of flourishing industries, among them a granite quarry, a stone processing shed, an emery mill (General Abrasives Treibacher, Inc.), and the Cortland Grinding Wheels Company. Most of these no longer exist. However, the Bannish Lumber Company, established 25 years ago, does still provide employment and revenue in the Town. Although the mills' significance to the community's recent economy is negligible, the physical development of the mill areas has had a long-lasting impact on the configuration of the village settlement.

The Middle Branch of the Westfield River is the location where the early industrial and village development occurred. The first 10 keystone bridges built for use by the railroads in 1839 are the historic Keystone Arch Bridges at the Cheater/Middlefield border. These bridges are being restored by the Friends of the Keystone Arches and adventurous tourists can hike them today.

Today, industry in Chester has declined leaving behind a rural bedroom community with a small residential tax base and a few small businesses. The upper Westfield River Valley and surrounding hills are attracting second-home owners in addition to artists, craftspeople and small home-based businesses. Except for small industrial and commercial sections on Route 20 and another commercial section in the northwest area, Chester is mostly single family homes.

The Town has capitalized on its picturesque location at the foothills of the Berkshires and is home to both full-time and seasonal residents, and attracts artisans, sightseers, and sportspeople. Chester's Miniature Theatre is both a local and regional attraction during the summer months. The restored Boston and Albany Railroad Station has become a regional attraction as well.

Chester is also a part of the Jacob's Ladder Trail area that stretches from Russell to Lee along the Route 20 corridor, and connects it to the Berkshire region. This area has been recognized as unspoiled by commercial franchises, flashy signs, and grid development even today. The Jacob's Ladder Trail Committee proposes allowing economic growth to occur while limiting the negative

impact of such development on the scenic and historic character of the communities Chester, Huntington, Russell, Becket, and Lee, through local controls utilizing land use planning tools.

## **Infrastructure**

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Chester's geography has been a major factor in the development of its industry and in turn, its infrastructure. With a history as a mill town, most of the Town's infrastructure has been concentrated around the branches of the Westfield River. Today, these same areas are becoming increasingly important tourist destinations for cultural and recreational activities.

### **Roads and Highways**

Route 20 is the major roadway through Chester, entering at the Huntington border in the southeastern corner, and running east-west along the southern portion of Town into Becket. Route 112 is another major roadway adjacent to the Town; it intersects with Route 20 just to the southeast of the Town's border with Huntington. In addition, the Massachusetts Turnpike (I-90) passes just to the south of the Town.

Chester has approximately 66 miles of roadway and nearly 12,000 acres of steep slopes keeping much of the backland open space protected from development due to inaccessibility. Most new development has been along existing road frontage.

### **Rail**

A rail line runs through Chester and once served the industries that were located in the Town. The rail system, currently owned by CSX, still exists as a through station for the transportation of goods from Springfield to New York.

### **Public Transportation**

The Town is not serviced by public transit.

### **Water and Sewer**

The Town is served by individual on-site septic systems, a municipal water system, and private wells.

The Chester municipal water supply is served by two reservoirs: Austin Brook Reservoir and Horn Pond. Austin Brook Reservoir is the primary water supply for the Town of Chester. Horn Pond serves as Chester's secondary, or back-up, water supply. Horn Pond has a safe yield of 0.2 MGD safe yield and a 41 million gallon storage capacity. The Chester water system serves approximately 260 households, roughly 43 percent of the Chester population. The remaining 57 percent of Chester households draw water from private wells.

There is no sewer service in Chester. Residents and businesses owners rely on individual on-site septic systems. The closest municipal sewage treatment plant, located in Huntington, currently operates at approximately 40% of capacity. Chester's Westfield River Protection district prohibits wastewater treatment facilities, including residential package treatment plants, from discharging directly to the West and Middle Branches of the Westfield River.

Much of the undeveloped land presents limitations for adequate septic systems under the current Title-V Code; however, revisions of the code (effective January, 2004) have relaxed percolation rates and now permit development on land that was once considered constrained to development. The lack of sewer service in Town may no longer be a deterrent to development.

## **Schools**

Public schools serving Chester include Chester Elementary and the Gateway Regional Middle and High School, located in Huntington.

## **Natural Resources**

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The following in the Natural Resources section include excerpts from the Chester Open Space and Recreation Plan (2003).

A combination of steep, rocky, forested hills adjoining the West and Main Branches of the Westfield River with some rolling open farmland above the valley characterize the natural landscape. The river is a significant feature of the landscape carving its way through rocky hillsides and the valleys to create many of the Town's scenic vistas. The recreational opportunities provided by the river range from whitewater boating to swimming, fishing, hiking and cross-country skiing and bird watching. The banks of the river nurture a wide variety of flora and fauna. Also along the banks are rich gravel resources that are an asset, but also an issue of concern as their mining could endanger land along the river and the aesthetic qualities of the surrounding area.

Glacially scoured hills, rough rocky terrain, outcroppings of steep bedrock cliffs and deep forests are typical features of the landscape. Pastures and open fields are decreasing as fewer people pursue farming.

The historic village center provides a contrast to the natural landscape while it has shaped its evolution and location in the Town. The historic buildings characterize the cultural landscape as the mill buildings characterize Chester's part in the industrial age. Preserving the historic integrity of these places and adding to their vibrancy is important to maintaining the Town's character.

## **Water Resources**

### Watershed

Chester lies within the Westfield River Watershed of west-central Massachusetts. The basin drains an area of approximately 517 square miles and includes all or some of twenty-nine

municipalities in portions of Franklin, Hampshire, Hampden, and Berkshire Counties. The drainage area forms a general “L” shape, 48 miles long and 20 miles wide, extending from the Berkshire Mountains to the Connecticut River. The River drops 2,000 feet before entering the Connecticut River. The watershed is bound on the north by the Deerfield River Basin, on the East by the Connecticut River Basin, and on the west and south by the Housatonic and Farmington River Basins. Thin soils in the hills combine with steep gradients to produce extreme and rapid differences in the rate of flow, occasional flooding, and at times resulting in low water conditions. The annual spring run-off usually provides excellent whitewater canoeing and months of trout fishing.

### Rivers and Streams

The Westfield River corridor encompasses many valuable features and resources including:

- One of Massachusetts’ best cold water fisheries including naturally reproducing trout populations along some segments;
- The largest uncontrolled river in the state (West Branch of the Westfield River);
- Exciting and challenging whitewater canoeing, including the course for the Westfield River Whitewater Canoe Race, the oldest continuously run whitewater race in the United States;
- Outstanding historic resources including ten stone arch railroad bridges and five historic villages;
- The highest waterfall in Hampshire County, Glendale Falls, and other beautiful falls including Shaker Mill Falls and Center Pond Brook Falls;
- Unique scenic geologic features such as the Chesterfield Gorge, gorges in Gardner State Park and on Shaker mill Brook, and the spectacular Windsor Jams;
- One of the largest roadless wilderness areas remaining in Massachusetts;
- Habitat for over 100 rare and endangered species; and,
- Excellent water quality, suitable for drinking on the Middle Branch.

Both the Middle Branch and West Branch of the Westfield River pass through Chester. They are fast-flowing rocky streams with a water purity classification of A and B. Class B is characterized as suitable for bathing and recreational purposes, acceptable for public water supply, excellent for fish and wildlife habitat with an aesthetic aspect. The Middle Branch exceeds fishable, swimmable standards for the state and is classified as Class A, suitable for public drinking water supply.

These upper branches have the coveted “Wild and Scenic” designation from the federal government. The Westfield is the first river in Massachusetts to be recognized in this way. According to the National Wild and Scenic Rivers Act:

“...selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or

sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.”

The Westfield River in Chester is protected by an overlay district, the Westfield River Protection and Floodplain Overlay District; that increases oversight of development and also limits some kinds of development. In addition, protection comes from the Commonwealth’s Rivers Protection and Wetlands Protection Acts.

There are numerous small brooks and ponds in the Town as well as an aquifer located within the Town. In addition to the many unnamed tributaries in Town, other significant rivers and streams in Chester include:

**Table 2-1: Streams and Brooks in Chester**

Kinne Brook	Moss Meadow Brook
Austin Brook	Blair Brook
Sanderson Brook	Griffin Brook
Winchell Brook	Day Brook
Otis Wait Brook	Smith Brook
Roaring Brook	Cook Brook
Abbott Brook	Mica Mill Brook

Lakes and Ponds

Littleville Lake was formed in 1965 when a flood control/water reservoir dam was constructed by the Army Corp of Engineers. The lake and dam are located mostly in Chester with public boating access and parking provided in Huntington. Littleville Lake is a Class A water which provides emergency water supply for the Springfield water system while reducing flooding along the Westfield and Connecticut Rivers.

The MA Division of Fisheries and Wildlife stocks both Littleville Lake and the Westfield River with trout each spring providing fisherman a favorite destination. In addition, each spring, water released at Littleville Lake are coordinated with those from nearby Knightville Dam to provide flows for the annual Westfield River Wildwater Canoe Races.

Aside from the many unnamed ponds and occasional swamps in Town, the Round Hill Pond located in the Chester State Wildlife Management Area contributes to the Town’s 388 acres of surface waters.

Wetlands

Wetlands include rivers, ponds, swamps, wet meadows, beaver ponds, and land within the FEMA-defined 100-year flood area. Wetland areas are home to frogs, fish, freshwater clams and mussels, beaver, muskrats, great blue herons, waterfowl, bitterns, and several other species. Wetlands filter toxins improving water quality, provide shellfish and wildlife habitat, and store water. Common wetland plants in Chester include red maple, water lily, arrowheads, cattails, sedges, and many species of ferns.

There are approximately 944 acres of wetlands in Chester, much of which are wooded. If open waters are included in this accounting, the total acreage of wetlands in Chester rises to over 1,300 acres, over 5% of the total area. It is important to note that much of the wetland areas in Town have not yet been identified by MassGIS or USGS maps and must be identified in the field by wetland scientists.

Identified wetland habitats in Town occur primarily along the streams and rivers as well as in lands adjacent to major ponds. The most extensive isolated wetland areas are located in the northeastern corner of Town, east of Meadow Brook and north of Skunk Brook.

Wetlands that border rivers and streams are called bordering vegetated wetlands (BVW) and are offered protection by the Massachusetts Wetlands Protection Act and the Rivers Protection Act. Developments within the wetland or the buffer zone are reviewed by the local conservation commission and occur only at their discretion.

State law does not protect non-BVW, called isolated wetlands, unless they are certified vernal pools. Because Chester currently has no local wetlands bylaw, protection of these critical natural areas is not guaranteed. Historically, and for practical reasons, both wetlands and floodplain development in the Town has been limited.

### Water Supply

The Chester municipal water supply is served by two reservoirs: Austin Brook Reservoir and Horn Pond. Austin Brook Reservoir is the primary water supply for the Town of Chester. The watershed is approximately 1.23 square miles with 78 percent located in the adjacent Town of Becket. Austin Brook Reservoir has a safe yield of 115,000 gallons per day (MGD) and a 1.1 million-gallon storage capacity. Horn Pond serves as Chester's secondary, or back-up, water supply. The approximately ½ square mile watershed to Horn Pond is located entirely in the Town of Becket, approximately 3.15 miles west of Austin Brook Reservoir, nestled between Bancroft and Captain Whitney Roads. Horn Pond has a safe yield of 0.2 MGD safe yield and a 41 million gallon storage capacity. The Chester water system serves approximately 260 households, roughly 50 percent of the Chester population. The remaining households in Chester draw water from private wells.

Austin Brook Reservoir is divided into two pools. The lower pool serves as the main storage reservoir. Above it, a smaller pool is separated from the lower pool by a stone wall and weir. Austin Brook flows into the upper pool through a second stonewall and weir. Both the lower and upper stone walls and weirs are breached on both sides. Sedimentation in the upper pool has significantly limited the pool depth to 1 to 2 feet. This sedimentation is caused by the flashy nature of the shallow Austin Brook. Austin Brook Reservoir ranges in depth from 4 to 20 feet with the depth of the intake at approximately 12 feet.

Water from Horn Pond flows by gravity through a pipe conduit to Austin Brook for use if the water level in the Austin Brook reservoir drops below a prescribed level. Otherwise, the water from Horn Pond is diverted below the Austin Brook reservoir dam where it joins the steady overflow from the reservoir.

## **Forests**

Interrupted by development along roadsides and in the village center, Chester is predominantly a forested landscape (90%). Hardwoods consist predominantly of oak, maple, and birch. Hemlock and white pine intermix with hardwoods in much of the forest. Some of this land is under Chapter 61 protection that requires owners to file management plans with the Commonwealth and the local Conservation Commission, thereby providing a significant check on forestry operations.

The economic value and greater value of the forest resources to the community as a whole extends beyond lumbering and sale of forest species. Trees that are not harvested for their commercial application provide flood mitigation and water supply filtration, which benefits residents and businesses alike. In addition to these public health benefits, forest resources also provide significant wildlife habitat. The extensive forestland in the hills and along riparian corridors provides vital resources for wildlife.

Without forested areas, floodwaters from heavy storms would runoff more rapidly, raising flood waters and assuring more property and crop damage. Other environmental impacts such as air quality degradation, reduction of visual buffers from adjacent uses and elimination of habitat could ensue as well. Deforested areas can also cause erosion from runoff, sending sediment onto farmland and other properties and potentially causing greater damage to homes and businesses during major storm events. Erosion can cause streams and rivers to fill with silt, resulting in oxygen deprivation to water plants and animal species. This can ultimately eliminate food sources for migratory birds and land animals.

## **Development in Chester**

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### **Development Patterns**

Several factors have played, and will continue to play, an important role in the development of Chester. These include: the existing development pattern and availability of land for future development; the present road network; physical factors such as steep slopes, poor soil conditions, land set aside for conservation, the Westfield River, its tributaries and floodplains; and the availability of utilities such as public water and sanitary sewers. These factors have an impact, both individually and cumulatively, on where and how development occurs.

Zoning and other land use regulations constitute a town's "blueprint" for its future. Land use patterns over time will continue to look more and more like the town's zoning map until the town is finally "built out"—that is, there is no more developable land left. Therefore, in looking forward over time, it is critical that the town focus not on the current use and physical build-out today, but on the potential future uses and build-out that are allowed under the town's zoning map and zoning bylaws. Zoning is the primary land use tool that the town may use to manage development and direct growth to suitable and desired areas while also protecting critical resources and ensuring that development is in keeping with the town's character.

Chester has three base zoning districts and three overlay districts with a fourth overlay district pending. The base districts define the allowed uses and dimensional requirements in all parts of the town, while the overlay districts provide for additional restrictions in certain areas. These districts are described below.

R-Residential: Areas of town which are best suited for low-density residential development.

AR-Agricultural-Residential: Areas of town which are best suited for low-density residential development; land uses and activities in keeping with the Town's rural character, primarily but not limited to farm and forest uses.

B-Mixed Use Village Business: An area which reflects the historic character of the Town and serves as the focus for many municipal services and most commercial development.

I-Industrial: Areas of Town where industrial development would be appropriate.

Chester's Overlay Districts further regulate land use within the community. These include:

FWR-Flood plain and Westfield River Protection Overlay District: Areas abutting the Westfield River encompassing floodplain areas or within 100 feet of the river bank.

Route 20 Commercial Overlay District (pending): Would allow commercial development along Route 20 subject to Special Permit.

The Zoning Bylaw establishes a Commercial Site Plan Approval procedure for all business, industrial, and commercial buildings within the Mixed Use Village Business district. Site Plan Approval allows the Planning Board the ability to review development proposals to ensure that the basic safety and welfare of the people of Chester are protected.

### **Current Development Trends**

Chester's landscape is characterized by steep slopes—which make development very difficult, a village center and two main ridetops with roads. Twenty-one percent of Chester's land is permanently protected, and a total of 47 % has some kind of protection. The land is 90% forestland and all developed areas of the community, residential and commercial, are directly adjacent to these forested areas and/or interspersed with trees that connect to the forested areas. The only undeveloped, unforested areas are the estimated 4% of wetlands and water and the 4% used for agriculture. The final approximately 2% encompasses the town's residential and commercial areas.

Today, this small community is home to approximately 1,308 residents in 500 households with 83% of the homes being owner occupied. The average commute time for Chester residents is 39 minutes (one way!) so people spend a lot of time on the road. Development happens very slowly in Chester. The Town is working to promote development in places where infrastructure exists to support it, for example, the Town is working on a Route 20 Commercial overlay district which will allow business development along Route 20.



### **Development in Hazard Areas**

Hazards identified in this plan are regional risks and, as such, all new development falls into the hazard area. The exception to this is flooding. According to the Community Information System (CIS) of FEMA, there were 191 structures (150 1-4 family homes and 41 “other structures”) located within the Special Flood Hazard Area (SFHA) in Chester as of May 6, 1999, the most current records in the CIS for the Town of Chester.

### **National Flood Insurance Program (NFIP)**

Chester is a participating member of the National Flood Insurance Program. Flood Insurance Rate Maps, all bearing the effective date of August 15, 1989, are used for flood insurance purposes and are on file with the Chester Planning Board. As of 2006, there were 52 policies in effect in Chester for a total of \$5,487,200 worth of insurance. There are currently no “Repetitive Loss Properties” insured under the NFIP within the Town of Chester.

# 3 – HAZARD IDENTIFICATION & ANALYSIS

## Natural Hazard Identification

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Historical research, conversations with local officials and emergency management personnel, available hazard mapping and other weather-related databases were used to identify the natural hazards which are most likely to have an impact on the Town of Chester. The magnitude and severity of the hazards are summarized in Table 3-7.

### Floods

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

Floods can be classified as either *flash floods*, which are the product of heavy, localized precipitation in a short time period over a given location or *general floods*, which are caused by precipitation over a longer time period in a particular river basin. There are several local factors that determine the severity of a flooding event, including: stream and river basin topography, precipitation and weather patterns, recent soil moisture conditions, amount of impervious surface area, and the degree of vegetative clearing. Furthermore, flooding can be influenced by larger, global climate events. Global warming and climate change have the potential to shift current rainfall and storm patterns. Increased precipitation is a realistic result of global warming, and could potentially increase the frequency and intensity of flooding in the region. Currently, floods occur and are one of the most frequent and costly natural hazards in the United States.

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

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

A floodplain is the relatively flat, lowland area adjacent to a river, lake or stream. Floodplains serve an important function, acting like large “sponges” to absorb and slowly release floodwaters back to surface waters and groundwater. Over time, sediments that are deposited in floodplains develop into fertile, productive farmland like that found in the Connecticut River valley. In the past, floodplain areas were also often seen as prime locations for development. Industries were located on the banks of rivers for access to hydropower. Residential and commercial development occurred in floodplains because of their scenic qualities and proximity to the water. Although periodic flooding of a floodplain area is a natural occurrence, past and current development and alteration of these areas will result in flooding that is a costly and frequent hazard.

The major floods recorded in Western Massachusetts during the 20<sup>th</sup> century have been the result of rainfall alone or rainfall combined with snowmelt. Flooding along the Westfield River is a chronic problem in Chester. In 1938, a major flood impacted the entire town. Over the years, smaller flood events have destroyed several of the buildings along the river. As more land is being developed, these small floods have worsened. The River tends to freeze every winter, and then overflows its banks during the spring thaw.

Flooding is a top priority risk for the Town of Chester. In October, 2005, when the region received a significant rainfall and flooding caused severe damage in a number of communities in Massachusetts, Chester narrowly escaped flooding in the village center.

### **Severe Snowstorms/Ice Storms**

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

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

### **Hurricanes**

Hurricanes are violent rainstorms with strong winds that can reach speeds of up to 200 miles per hour, and large amounts of precipitation. Hurricanes generally occur between June and

November and can result in flooding and wind damage to structures and above-ground utilities. Global warming will increase the threat of hurricanes as oceans and atmosphere warms. Climate change research indicates that storms like hurricanes will become more intense and more frequent in the future. In Massachusetts, major hurricanes occurred in 1904, 1938, 1954, 1955, 1960 and 1976.

## **Tornadoes**

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

Of additional concern are microbursts, which often do tornado-like damage and can be mistaken for tornadoes. In contrast to the upward rush of air in a tornado, air blasts rapidly downward from thunderstorms to create microbursts.<sup>1</sup>

Microbursts and tornadoes are not uncommon in the region, and they are expected to become more frequent and more violent as the earth's atmosphere warms, due to predictions of climate change from global warming. In the last fifty years, no known tornados have touched down in Chester, although there have been several high-wind storms and hail events. In Western Massachusetts, the majority of sighted tornadoes have occurred in a swath just east of Chester, known as "tornado alley."

## **Wildland Fires/Brushfires**

According to FEMA, there are three different classes of wildland fires: *surface fires*, *ground fires* and *crown fires*.<sup>2</sup> The most common type of wildland fire is a surface fire that burns slowly along the floor of a forest, killing or damaging trees. A ground fire burns on or below the forest floor and is usually started by lightening. Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions. While wildland fires have not been a significant problem in Chester, there is always a possibility that changing land use patterns and weather conditions will increase a community's vulnerability. For example, drought conditions can make forests and other open, vegetated areas more vulnerable to ignition. Once the fire starts, it will burn hotter and be harder to extinguish. Soils and root systems starved for moisture are also vulnerable to fire. Residential growth in rural, forested areas increases the total area that is vulnerable to fire and places homes and neighborhoods closer to areas where wildfires are more likely to occur. Global climate changes may also influence precipitation patterns, making the region more susceptible to drought and therefore, wildfires.

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<sup>1</sup> <http://www.fema.gov/regions/vii/2003/03r7n06a.shtm>

<sup>2</sup> FEMA, "Fact Sheet: Wildland Fires," September 1993.

Exact numbers of brushfires per year could not be obtained, but there are some every year. The brush fires tend to originate from careless activities, trains passing through town and grinding the tracks, unattended campfires or controlled burns that have gotten away from their attendant.

## Earthquakes

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.<sup>3</sup> Ground shaking from earthquakes can rupture gas mains and disrupt other utility service, damage buildings, bridges and roads, and trigger other hazardous events such as avalanches, flash floods (dam failure) and fires. Un-reinforced masonry buildings, buildings with foundations that rest on filled land or unconsolidated, unstable soil, and mobile homes not tied to their foundations are at risk during an earthquake.<sup>4</sup>

**Table 3-1  
New England Earthquakes with a Magnitude of 4.2 or more 1924 - 2002**

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

Source: Northeast States Emergency Consortium Web site:  
[www.nesec.org/hazards/earthquakes.cfm](http://www.nesec.org/hazards/earthquakes.cfm)

<sup>3</sup> Northeast States Emergency Consortium Web site: [www.nesec.org/hazards/earthquakes.cfm](http://www.nesec.org/hazards/earthquakes.cfm).

<sup>4</sup> Federal Emergency Management Agency Web site: [www.fema.gov/hazards/earthquakes/quake.shtm](http://www.fema.gov/hazards/earthquakes/quake.shtm).

**Table 3-2  
New England States Record of Historic Earthquakes**

State	Years of Record	Number Of Earthquakes
Connecticut	1568 - 1989	137
Maine	1766 - 1989	391
Massachusetts	1627 - 1989	316
New Hampshire	1728 - 1989	270
Rhode Island	1766 - 1989	32
Vermont	1843 - 1989	69
New York	1737 - 1985	24
<i>Total Number of Earthquakes within the New England states between 1568 and 1989 = 1,239.</i>		

Source: Northeast States Emergency Consortium Web site:  
[www.nesec.org/hazards/earthquakes.cfm](http://www.nesec.org/hazards/earthquakes.cfm)

Massachusetts introduced earthquake design requirements into their building code in 1975. However, these specifications apply only to new buildings or to extensively modified existing buildings. Buildings, bridges, water supply lines, electrical power lines and facilities built before 1975 may not have been designed to withstand the forces of an earthquake. The seismic standards have also been upgraded with the 1997 revision of the State Building Code.

### **Dam Failure**

Although dams and their associated impoundments provide many benefits to a community, such as water supply, recreation, hydroelectric power generation, and flood control, they also pose a potential risk to lives and property. Dam failure is not a common occurrence but dams do represent a potentially disastrous hazard. When a dam fails, the potential energy of the stored water behind the dam is released. Most earthen dam failures occur when floodwaters above overtop and erode the material components of the dam. Often dam breaches lead to catastrophic consequences as the water ultimately rushes in a torrent downstream flooding an area engineers refer to as an “inundation area.” The number of casualties and the amount of property damage will depend upon the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Many dams in Massachusetts were built in the 19<sup>th</sup> century without the benefit of modern engineering design and construction oversight. Dams can fail because of structural problems due to age and/or lack of proper maintenance. Dam failure can also be the result of structural damage caused by an earthquake or flooding brought on by severe storm events.

The Massachusetts Department of Conservation and Recreation (MA DCR) was the agency responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the

implementing regulations 302 CMR 10.00). Until 2002, DCR was also responsible for conducting dam inspections but then state law was changed to place the responsibility and cost for inspections on the owners of the dams. This means that individual dam owners are now responsible for conducting inspections.

The state has 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.

The inspection schedule for dams is as follows:

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

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

The Massachusetts Emergency Management Agency (MEMA) identifies four (4) dams in Chester. The follow table identifies the dams within the town as well as whether they are classified as low, significant, or high hazard

**Table 3-3: Chester Dams, Classified by Hazard Risk**

<b>Dam</b>	<b>Hazard Risk</b>
Littleville Lake Dam	High
Chester-Blandford State Forest Dam	Low
Chester Water Works Dam	Low
Ideal Lodge Dam	Low

Source: Massachusetts Emergency Management Agency (MEMA)

It is also important to consider and plan for the potential critical failure of dams upstream in Middlefield or Worthington – although none of these upstream dams are of high hazard.

## **Drought**

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.

In Massachusetts, six major droughts have occurred statewide since 1930<sup>5</sup>. 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.

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

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.<sup>6</sup> 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.

## **Man-Made Hazards – Hazardous Materials**

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

The Toxics Release Inventory (TRI), a publicly available EPA database that contains information on specific toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities.<sup>7</sup>

However, varying quantities of hazardous materials are manufactured, used, or stored at an estimated 4.5 million facilities in the United States--from major industrial plants to local dry cleaning establishments or gardening supply stores. These hazardous materials are transported regularly over our highways and by rail and if released can spread quickly to any community. Incidents can occur at any time without warning. Human error is the probable cause of most transportation incidents and associated consequences involving the release of hazardous materials.

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<sup>5</sup> US Geological Survey Water-Supply Paper 2375. "National Water Summary 1989 – Floods and Droughts: Massachusetts." Prepared by S. William Wandle, Jr., US Geological Survey.

<sup>6</sup> National Drought Mitigation Center – <http://drought.unl.edu>

<sup>7</sup> 2004 Toxic Releases Inventory (TRI) Data Files for Massachusetts. [www.epa.gov/tri/](http://www.epa.gov/tri/)



Chester is bypassed by the CSX Rail line. Trains that pass through Chester routinely carry hazardous materials. The train tracks drop from two to one in Chester and oftentimes trains carrying hazardous materials sit for days waiting for their turn. This is an area of concern for Chester’s Hazard Mitigation committee.

**Table 3-4: Chester Tier II Chemical Storage Facilities**

Industry	Address
Osterman Gas	Baystate Drive
Town of Chester-Town Garage	2 Town Road
Town of Chester-Old Elementary School	10 Middlefield Road
Town of Chester -Town Hall	15 Middlefield Road

Source: TRI Data Files for Massachusetts

## **Natural Hazard Analysis Methodology**

In order to review the likelihood of a specific hazard occurring, to identify the location of occurrence, and to assess the impacts of the hazard event, a *Hazard Identification and Analysis Matrix* was prepared to organize the information that was gathered for this project. The matrix is organized into the following sections: Type of Hazard, Frequency of Occurrence, Severity of Impacts and Hazard Index. The Hazard Index was completed to rank the hazards according to the frequency of occurrence and the amount of potential damage likely to occur. The Hazard Index forms the basis for concentrating the future mitigation efforts outlined in this plan. A description of each matrix category is provided below and shown in Table 3-7.

### **Type of Hazard**

The natural hazards identified for Chester include floods, severe snowstorms/ice storms, hurricanes, tornadoes, wildfires/brushfires, dam failure and earthquakes. Many of these hazards result in similar impacts to a community. For example, hurricanes, tornadoes and severe snowstorms may cause wind-related damage. A more detailed description of each type of hazard is included in the earlier section of this chapter.

Frequency of each natural hazard was classified according to the following scale:

**Table 3-5: Frequency of Occurrence and Annual Probability of Given Natural Hazard**

Frequency of Occurrence	Annual Probability
<i>Very High</i>	70-100% probability in the next year
<i>High</i>	40-70% probability in the next year
<i>Moderate</i>	10-40% probability in the next year
<i>Low</i>	1-10% probability in the next year
<i>Very Low</i>	Less than 1% probability in the next year

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

## Location of Occurrence

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

**Table 3-6**  
**Location of Occurrence and Percentage of Town Impacted of Given Natural Hazard**

<b>Location of Occurrence</b>	<b>Percentage of Town Impacted</b>
<i>Large</i>	More than 50% of the town affected
<i>Medium</i>	10 to 50% of the town affected
<i>Small</i>	Less than 10% of the town affected

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

## Severity of Impacts

The severity of potential direct impacts classified according to the following scale:

**Table 3-7**  
**Severity of Impacts and Magnitude of Multiple Impacts of Given Natural Hazard**

<b>Severity of Impacts</b>	<b>Magnitude of Multiple Impacts</b>
<i>Catastrophic</i>	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.
<i>Critical</i>	Multiple injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 week.
<i>Limited</i>	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 day.
<i>Minor</i>	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of facilities.

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

## Hazard Index

The hazard index ratings were determined after assessing the frequency, location and impact classifications for each hazard. The hazard index ratings are based on a scale of 1 (highest risk) through 5 (lowest risk). The ranking is qualitative and is based, in part, on local knowledge of

past experiences with each type of hazard. The size and impacts of a natural hazard can be unpredictable however; many of the mitigation strategies currently in place and many of those proposed for implementation can be applied to the expected natural hazards, regardless of their unpredictability.

**Table 3-8  
Hazard Identification and Analysis Worksheet for Chester**

<b>TYPE OF HAZARD</b>	<b>FREQUENCY OF OCCURRENCE</b>	<b>LOCATION OF OCCURRENCE</b>	<b>IMPACT</b>	<b>HAZARD RISK INDEX RATING</b>
Flooding (100 yr base flood)	<b>Very High</b>	<b>Medium</b>	<b>Critical</b>	<b>1</b>
Flooding	<b>Very High</b>	<b>Medium</b>	<b>Critical</b>	<b>1</b>
Severe Snowstorms/ Ice Storms	<b>High</b>	<b>Large</b>	<b>Limited</b>	<b>2</b>
Severe Thunderstorms/ Microbursts	<b>High</b>	<b>Large</b>	<b>Limited</b>	<b>2</b>
Hurricanes	<b>Low</b>	<b>Large</b>	<b>Limited</b>	<b>3</b>
Tornadoes	<b>Low</b>	<b>Small</b>	<b>Critical</b>	<b>4</b>
Wildfire/Brushfire	<b>Moderate</b>	<b>Large</b>	<b>Limited/Critical</b>	<b>3</b>
Earthquakes	<b>Very Low</b>	<b>Large</b>	<b>Critical</b>	<b>5</b>
Dam Failures	<b>Moderate</b>	<b>Medium</b>	<b>Critical</b>	<b>3</b>
Drought	<b>Low</b>	<b>Large</b>	<b>Minor</b>	<b>5</b>
Man-Made Hazards: Hazardous Materials	<b>High</b>	<b>Medium</b>	<b>Critical/Catastrophic</b>	<b>1</b>

Source: information adapted from Town of Holden Beach North Carolina Community-Based Hazard Mitigation Plan, July 15, 2003 and the Massachusetts Emergency Management Agency (MEMA).

## Vulnerability Assessment

The following is a list of natural and manmade disasters, and the areas affected by them, that have or could affect the Town of Chester. The Past and Potential Hazards Map at the end of this Plan reflects the contents of this list.

In order to determine estimated losses due to natural and man made hazards in Chester, each hazard area was analyzed with results shown below. Human losses are not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. Most of these figures exclude both the land value and contents of the structure. The value of all structures in the Town of Chester, including exempt structures such as schools and churches, is \$114,049,178 as of FY2006. The data below was calculated using FEMA's Understanding Your Risks: Identifying Hazards and Estimating Losses, August 2001. In addition, the Committee completed the Vulnerability Assessment Worksheets which provided more data to estimate the potential losses.

**Table 3-9: Estimated losses based on 2006 Property Value by municipality & hazard**

Community	2006 Property Value	Hurricanes/Severe Thunderstorms			Tornadoes	Earthquakes
		Flooding	Wind	Total		
Agawam	2,896,851,574	57,937,031	14,484,258	72,421,289	57,937,031	579,370,315
Brimfield	406,673,450	8,133,469	2,033,367	10,166,836	8,133,469	81,334,690
Chester	114,049,178	2,280,984	570,246	2,851,229	2,280,984	22,809,836
Chesterfield	140,174,510	2,803,490	700,873	3,504,363	2,803,490	28,034,902
Cumington	127,875,812	2,557,516	639,379	3,196,895	2,557,516	25,575,162
Chester	1,367,635,376	27,352,708	6,838,177	34,190,884	27,352,708	273,527,075
Hadley	880,902,107	17,618,042	4,404,511	22,022,553	17,618,042	176,180,421
Hampden	541,483,705	10,829,674	2,707,419	13,537,093	10,829,674	108,296,741
Hatfield	424,816,804	8,496,336	2,124,084	10,620,420	8,496,336	84,963,361
Holland	314,276,700	6,285,534	1,571,384	7,856,918	6,285,534	62,855,340
Holyoke	2,336,440,444	46,728,809	11,682,202	58,411,011	46,728,809	467,288,089
Ludlow	1,734,554,340	34,691,087	8,672,772	43,363,859	34,691,087	346,910,868
Monson	763,165,138	15,263,303	3,815,826	19,079,128	15,263,303	152,633,028
Northampton	3,534,473,816	70,689,476	17,672,369	88,361,845	70,689,476	706,894,763
South Hadley	1,559,228,299	31,184,566	7,796,141	38,980,707	31,184,566	311,845,660
Southwick	947,111,352	18,942,227	4,735,557	23,677,784	18,942,227	189,422,270
Wales	168,032,382	3,360,648	840,162	4,200,810	3,360,648	33,606,476
Ware	765,049,285	15,300,986	3,825,246	19,126,232	15,300,986	153,009,857
Wilbraham	1,663,077,600	33,261,552	8,315,388	41,576,940	33,261,552	332,615,520

## **Past and Potential Hazards**

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### **Flooding: 1 –Very High Risk**

The 100-year floodplain is defined as an area with a 1% chance of flooding in a given year. The floodplain serves as a critical habitat for many plant and animal species and provides some of the most fertile soils in the region. Areas in the 100-year flood zone in Chester are primarily those lands adjacent to and including the open water areas along the Middle Branch and West Branch of the Westfield River. In all, over 1,300 acres of land are located within the 100-year flood zone in Chester.

Much of this flood area is currently open wetlands adjacent to large areas of forest cover; however, floodplain lands do surround much of Route 20. Protective regulations and disincentives that limit development in the floodplain exist at several levels:

Lending institutions may require flood insurance for those structures built in the 100-year flood zone. Although the consumer cost of this federally supported insurance program is relatively inexpensive, some prospective homeowners simply do not want to take on this added burden. The Town should, however, consider the role of the lender in guiding development in these areas and be proactive in its approach to educating the loan officers and boards of the effect of floodplain development.

The Massachusetts Wetlands Protection Act limits the impacts of construction and alteration activities in the floodplain through its local enforcement by the local Conservation Commission.

Local zoning bylaws are an additional regulatory layer that can control development in these critical areas. Chester's Floodplain and Westfield River Protection District sets additional submittal standards for those wishing to build in the district but does not disallow underlying uses. This is a critical weakness in that it does not prevent residential development in these areas. A new regulatory strategy may be needed to protect the floodplain in Chester.

The State Building Code requires the elevation of structures in the floodway—the floor of the lowest habitable area in the structure must be above the base elevation for floodwaters during a 100-year storm event. The code also reinforces the overlay district regulations by prohibiting any change in the flood storage capacity of the area.

In this section, a preliminary vulnerability assessment was prepared to evaluate the potential impact that flooding could have on the portions of Chester located within the 100-year floodplain. Flooding was chosen for this evaluation because it is a natural hazard likely to impact the community and the location of the impact can be determined by mapping of areas inundated during severe flooding events. Flooding can be caused by severe storms, such as hurricanes, nor'easters, and microbursts, as well as ice dams and snow melt.

There are approximately 1300 acres of land within the FEMA mapped 100-year floodplain within the Town of Chester. According to the Community Information System (CIS) of FEMA,

there were 150 1-4 family structures and 41 “other” structures located within the Special Flood Hazard Area (SFHA) in Chester as of May 6, 1999, the most current records in the CIS for the Town of Chester. Utilizing the Town’s median home value of \$106,100, a preliminary damage assessment was generated. For the estimated number of people living in the floodplain, an average household size of 2.69<sup>8</sup> people was used.

A total of 191 structures are located within the SFHA in Chester, totaling approximately \$20,265,100 of damage, and 514 people impacted. The damage estimate is a rough estimate and likely reflects a worst-case scenario. Computing more detailed damage assessments based on assessor’s records is a labor-intensive task and beyond the scope of this project.

### **Flooding: 1-Very High Risk**

There is potential for annual flood incidents in Chester due to the community’s many steep slopes. Most of the flood hazard areas listed here were identified due to known past occurrence in the respective area. There are many areas with no record of previous flood incidents that could be affected in the future by heavy rain and runoff from surrounding slopes.

#### Location

The areas listed below are those most susceptible to flooding, but not the only areas at risk of flooding in Chester.

#### Main Street

Approximately 13 structures<sup>9</sup> could be affected by a flood incident. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be \$1,379,300. Cost for repairing or replacing any dams or bridges, power lines, telephone lines, and contents of structures are not included.

- This area is within a FEMA mapped 100-year flood zone.
- Past record of flooding in this area.
- Annual potential for flooding in floodplain from both spring runoff and heavy summer/fall rains.
- Potential for damage/repair to Main Street road surface.

#### Middlefield Road

There are 8 structures<sup>11</sup> located in this area that have been affected or could be affected by a flood incident. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be \$848,800. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Heavy rains in 2003 caused flooding in this area; 1 structure was affected with minor damage.
- Potential annual event due to heavy rains and runoff. - Flooding of road - due to accumulation of heavy rain and runoff.
- Potential for damage/repair to the road surface.

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<sup>8</sup> Figure courtesy of 2000 U.S. Census.

<sup>9</sup> Determined through the use of aerial photography from MassGIS

### Riverfront Road

There are 6 structures<sup>11</sup> located in this area that have been affected or could be affected by a flood incident. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be \$636,600. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Heavy rains in 2003 caused flooding in this area; 1 structure was affected with minor damage.
- Potential annual event due to heavy rains and runoff. - Flooding of road - due to accumulation of heavy rain and runoff.
- Potential for damage/repair to the road surface.

### Old State Road

There are 8 structures<sup>11</sup> located in this area that have been affected or could be affected by a flood incident. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be \$848,800. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Heavy rains in 2003 caused flooding in this area; 1 structure was affected with minor damage.
- Potential annual event due to heavy rains and runoff. - Flooding of road - due to accumulation of heavy rain and runoff.
- Potential for damage/repair to the road surface.

### Maple Ave

There are 7 structures<sup>11</sup> located in this area that have been affected or could be affected by a flood incident. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be \$742,700. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Heavy rains in 2003 caused flooding in this area; 1 structure was affected with minor damage.
- Potential annual event due to heavy rains and runoff. - Flooding of road - due to accumulation of heavy rain and runoff.
- Potential for damage/repair to the road surface.

### Maple Street

There are 16 structures<sup>11</sup> located in this area that have been affected or could be affected by a flood incident. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be \$1,697,600. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Heavy rains in 2003 caused flooding in this area; 1 structure was affected with minor damage.
- Potential annual event due to heavy rains and runoff. - Flooding of road - due to accumulation of heavy rain and runoff.
- Potential for damage/repair to the road surface.



### Andrews Ave

There are 2 structures<sup>11</sup> located in this area that have been affected or could be affected by a flood incident. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be \$212,200. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Heavy rains in 2003 caused flooding in this area; 1 structure was affected with minor damage.
- Potential annual event due to heavy rains and runoff. - Flooding of road - due to accumulation of heavy rain and runoff.
- Potential for damage/repair to the road surface.

### Extent

### Previous Occurrences

See information in Location section

### Probability of Future Events

Based upon previous data, it is difficult to predict the chance of minor or severe flooding occurring in any year in Chester. The area within the 100-year flood plain still has a one (1) percent chance of a severe flood in any given year.

## **Severe Snowstorms/Ice Storms: 4—Low-Medium Risk**

Three types of winter events are heavy snow, ice storms, and extreme cold which cause concern. Occasionally heavy snow years will collapse buildings. Ice storms have disrupted power and communication services. Timberland has been severely damaged. Extreme cold affects the elderly.

### 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.

Chester's recent history has not recorded any loss of life due to the extreme winter weather.

These random events are difficult to set a cost to repair or replace any of the structures or utilities affected.

Previous occurrences

- Chester has been subject to 22 winter storms categorized as major to extreme according to the NESIS scale since 1960. Additional historically significant winter storms to affect Chester include the Great Snow of 1717 and the Blizzard of 1888
- Moderate risk town wide due to snow, ice and extreme cold.
- 1969 heavy snow - several 3 feet events.
- 1988 temperature below 0 degrees for a month (Nov.-Dec.).
- Elderly are affected by extreme weather.

Probability of Future Events

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

**Hurricanes/Severe Wind: 3—Medium Risk**

Location

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

Extent

Chester’s location within western Massachusetts and against the Berkshire Mountains reduces the risk of extremely high winds that are associated with hurricanes. The Town has experienced small blocks of downed timber and uprooting of trees onto structures. Hurricanes can and do create flooding. Estimated wind damage 5% of the structures with 10% damage is \$1,140,492. Estimated flood damage 10% of the structures with 20% damage is \$2,803,490. Cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included.

Previous Occurrences

**Table 3-10** Major Non-Winter Storms to Affect Chester Area since 1900

Hurricane/Storm Name	Year	Saffir/Simpson Category (when reached MA)
New England Hurricane of 1938	1938	3
Great Atlantic Hurricane	1944	1
Carol	1954	3
Edna	1954	1
Donna	1960	Unclear, 1 or 2
Groundhog Day Gale	1976	Not Applicable
Gloria	1985	1
Bob	1991	2
Floyd	1999	Tropical Storm

### Probability of Future Events

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

## **Tornadoes/Microbursts: 4—Low-Medium Risk**

### Location

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

### Extent

Risk of tornadoes is considered to be high in Hampden County, however historically, they have more often occurred in a swath more than 10 miles east of Chester and there are no recorded tornadoes in Chester. Tornadoes rarely occur in this part of the country; therefore, assessing damages is difficult. Buildings have not been built to Zone 2, Design Wind Speed Codes. Estimated damages to 10% of structures with 20% damages \$2,803,490. Estimated cost does not include building contents, land values or damages to utilities.

### Previous Occurrences

- No known tornado activity in Chester
- 9 incidents of tornado activity (F3 or less) occurred in Hampshire County from 1954 to 2006.

### Probability of Future Events

Given the low number of previous recorded occurrences the probability of future events is considered to be medium to low.

## **Wildfires/Brush Fires: 3—Medium Risk**

### Location

Because of the railroad tracks passing through Chester there are a number of brushfires each summer caused by sparks from the tracks.

### Extent

Approximately 90% of Chester is forested so the entire town is at risk of wildfires. These brush fires occur frequently, but do not pose a significant risk to the population. As timber harvesting is reduced, wood roads are closed, and debris builds up on the ground, the potential for wildfire increases town-wide. The entire town has minimal forest fire protection and is dependent on 20 on-call firefighters for that protection. Some areas of the community could become inaccessible in the event of a fast spreading fire.

### Previous Occurrences

Exact numbers of brushfires per year could not be obtained, but there are some every year. No wildfires have been recorded in Chester

### Probability of Future Events

Based upon the availability of data, there is a low frequency of wildfires in Chester.

## **Earthquakes: 5—Low Risk**

### Location

In the event of an earthquake, all of Chester would be affected with some portions, especially in the western edge of town along the fault line, more impacted than others, depending on the magnitude of the earthquake and the underlying population density.

### Extent

Like the rest of Massachusetts, Chester is at low risk (FROM CEMP) for earthquake occurrence and impact. Moderate potential for serious damage Structures are mostly of wood frame construction, estimated loss 20% of town assessed structural valuation is \$28,034,902. Costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures are not included.

### Previous Occurrences

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

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

None of the recorded earthquakes have been noted to cause any damage Chester or the surrounding area.

### Probability of Future Events

Based upon the availability of data, there is a low frequency of earthquakes in Chester with a between a 1% and 2% chance of an earthquake occurring in any given year.

## **Dam Failure: 5—Low Risk**

### Location

Chester has 4 dams on public and private land. Refer to the Hazard Mitigation Map (Appendix E) for their locations and Table 3-3 on page 19.

### Extent

Dams in Massachusetts are assessed according to their risk to life and property. Dams with a *Low Hazard* rating may cause minimal property damage with no expected loss of life; *Significant Hazard* dams 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; *High Hazard* dams will most probably cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads. The following dams have the following ratings:

### Previous Occurrences

To date, there have been no records of dam failures in Chester.

### Probability of Future Events

As Chester's high hazard dams age, and if maintenance is deferred, the likelihood of a dam bursting will increase, but, currently the frequency of dam failures is very low with a less than one percent chance of a dam bursting in any given year.

## **Drought: 5—Low Risk**

### Location

A drought would impact all of Chester.

### Extent

The severity of a drought would determine the scale of the event and would vary among town residents depending on whether the residents' water supply is derived from a private well or the public water system.

### Previous Occurrences

In Massachusetts, six major droughts have occurred statewide since 1930. They range in severity and length, from three to eight years. In many of these droughts, water-supply systems were found to be inadequate. Water was piped in to urban areas, and water-supply systems were modified to permit withdrawals at lower water levels. Chester has had limited experience with severe drought conditions. Drought will increase the risk of wildfire, especially in areas of high recreational use and as more timberland is set aside as non-harvested timberland, the potential for the risk of wildfire will increase.

### Probability of Future Events

In Chester, as in the rest of the state, drought occurs at a medium frequency, with a range of a 1% or a 10% chance of drought occurring in a single given year. However, due to the water

richness of Western Massachusetts Chester is unlikely to be adversely affected by anything other than a major, extended drought.

### **Man-Made Hazards - Hazardous Materials: 1—Very High Risk**

#### Location

Four (4) sites in Chester are U.S. EPA Tier II Hazardous Material sites. These sites are listed in Table 3-4 on page 21.

#### Extent

The extent of hazardous chemical release is not predictable as it is dependent on the location including whether it is from a stationary or moving source, amount and type of chemical released, and weather conditions at the time of the release. Also, because Chester relies on the support of the District 4 HazMat Team based in Holyoke for responding to incidents involving hazardous materials, response time is an additional factor.

#### Previous Occurrences

Available data dating to 1998 shows no releases of hazardous materials from these sites. No releases of hazardous materials from accidents on the highways and rail lines in Chester have been recorded.

#### Probability of Future Events

Given available data it is unlikely for a release of hazardous chemicals in any year however the due to the transport of chemicals by rail through Chester, there remains a risk of future occurrences.

**(Past and Potential Hazards Map Located In Back of Plan)**

## 4 – CRITICAL FACILITIES

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

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

### **Critical Facilities within Hazard Areas**

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

The Critical Facilities List for the Town of Chester has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer and supplemented, modified as necessary by the Chester Hazard Mitigation Committee. Chester's Hazard Mitigation Committee has broken up this list of facilities into four categories. The first category contains facilities needed for Emergency Response in the event of a disaster. The second category contains Non-Emergency Response Facilities that have been identified by the Committee as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of Chester. The third category contains Facilities/Populations that the Committee wishes to protect in the event of a disaster. The fourth category contains Potential Resources, which can provide services or supplies in the event of a disaster. The Critical Facilities Map at the end of this Plan identifies these facilities.

### **Category 1 – Emergency Response Services**

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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**
  - Chester Town Hall – 15 Middlefield Road
  - Chester Elementary School – 325 Middlefield Road
- 2. Fire Station**
  - Chester Fire Station – 300 Route 20
- 3. Police Station**
  - Chester Police Station-Basement of Town Hall – 15 Middlefield Road
- 4. Highway Garage**
  - Town Garage – 2 Town Road
- 5. Town Offices**

Chester Town Hall – 15 Middlefield Road

- 6. Emergency Fuel Stations**  
Town Garage – 2 Town Road
- 7. Mass Care Shelters and Reception Centers**  
Chester Town Hall – 15 Middlefield Road  
Chester Elementary School – 325 Middlefield Road
- 8. Primary Evacuation Routes**  
Route 1 – Route 20 west toward Becket  
Route 2 – Route 20 east toward Huntington  
Route 3 – Middlefield Road toward Middlefield  
Route 4 – Blandford Road toward Blandford
- 9. Bridges Located on Evacuation Routes**  
Walker Brook  
Sanderson Brook

## **Category 2 – Non Emergency Response Facilities**

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

- 1. Hospitals**  
Baystate Medical Center, Springfield  
Noble Hospital, Westfield  
Berkshire Medical Center, Pittsfield  
Cooley-Dickinson Hospital, Northampton
- 2. Water Supply**  
Austin Brook Reservoir  
Horn Pond
- 3. Dry Hydrants – Fire Ponds – Water Sources**  
Numerous locations in Chester -- see Critical Facilities map at back of plan
- 4. Transfer Station**  
Chester Transfer Station, Emery Street
- 5. Communications**  
Communication Towers/Telephone Cross boxes, 207 Bromley Road-Gilman's, near  
Ellershaw's-471 Skyline Trail  
Firetower in area of 625-627 Skyline Trail, FAA off Abbott Hill Rd.



**6. Alternate Transportation Pick Up Points**

Chester Elementary School – 325 Middlefield Road  
Meecham’s Field – 190 Skyline Trail  
Willander’s Field – 475 Rte 20  
Ball Lot – 25 Emery St.  
Wright’s Field – 55 Rte 20

**7. Transportation Resources**

Airport - Westfield  
Ambulance (primary) Huntington  
Ambulance (secondary) Westfield  
Towing: Richie’s Towing 260 Rte 20 or Michael’s - Westfield

**8. Mortuary Facilities**

O’Brien’s Funeral Home - Huntington

**9. Emergency Food Storage/Goods Warehousing**

None

**Category 3 – Facilities/Populations to Protect**

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

**1. Special Institutions**

Senior Center at Town Hall

**3. Schools**

Chester Elementary School – 325 Middlefield Road

**4. Churches**

United Church of Christ – 334 Skyline Trail  
Second Congregational Church – 1 Middlefield Road  
St. John’s

**5. Daycare or Nursery**

149 Prospect St  
14 Olin Ave.

**6. Historic Buildings/Sites**

Old Chester Jail – 220 Rte 20  
North Chester Chapel – 4 N. Chester Rd.  
Grant’s House – 1 Crane Rd.  
Train Station – 10 Prospect St.  
Masonic Hall – 221 Rte 20  
Chester Center School House – 343 Skyline Trail  
Pease’s Store – 11 Main St.  
Chester Hotel – 20 Main St.

7. **Apartment Complexes**  
Chester Commons – School Street
8. **Large Employment Centers**  
Bannish Lumber – 632 Rte 20
9. **Camps**  
Walker Island Family Camping – 27 Route 20
10. **EPA Tier II Hazardous Materials Facilities**  
Chester Water Dept. Reservoir Rd.  
Old Elementary School – 10 Middlefield Rd.  
Chester Town Hall – 10 Middlefield Rd.  
Chester Highway Garage – 2 Town Rd.  
Wheeler Oil – 382 Rte 20  
E. Osterman – Baystate Dr.
11. **Other**  
Rice’s Trailer Park 220 Middlefield Road

**Table 4-1: Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas**

<b>Hazard Type</b>	<b>Hazard Area</b>	<b>Critical Facilities Affected</b>	<b>Evacuation Routes Affected</b>
Flooding (100-year Flood)	133 Middlefield Road - Treibacher 104 Middlefield Road – Kathy Engwer’s		Route 20 east and west—2 feet of water in past flooding events Walker Brook bridge is vulnerable Hampden Street bridge—brand new If trees or other tree waste are washed into RR bridge culvert and plug it up, then Town may lose Walker Brook bridge
Flooding In October 2005 there was a lot of rain that caused flooding throughout the region—if it had rained for one more hour Chester’s downtown would have been inundated.	RR Bridge Main Street Bridge Old State Road	Treibacher Daycare Center Town Center Multiple homes	Egress-Middlefield Road, if this road is breached, then there will be no access to secondary EOC at Elementary School All Evac Routes would be affected—Rte 20 and Middlefield Road
Wildfires/Brushfires		None	None
Hazardous Materials	Wheeler’s-has 30,000 gallons of oil—if it leaked it would affect groundwater and the Westfield River Osterman’s is a Tier II site Trains that pass through Chester transport huge reportable quantities of hazardous materials	The population of Chester would be adversely affected by a hazardous materials spill from the Train	
Snow drifts	Route 20 –Willander Flats Skyline Trail	Could block access to Huntington	Skyline Trail Route 20 east
Dams-If the dam in the Sherwood forest broke, Chester’s downtown would be lost.	Downtown	Downtown	

(Critical Facilities Map Located In Back of Plan)

## 5 – CURRENT MITIGATION STRATEGIES

### **Flooding**

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The Floodplain Map for the Town of Chester shows the 100-year and 500-year flood zones identified by FEMA flood maps. The 100-year flood zone is the area that will be covered by water as a result of a flood that has a one percent chance of occurring in any given year. Likewise, the 500-year flood has a 0.2 percent chance of occurring in any given year. Areas in the 100-year flood zone in Chester are primarily those lands adjacent to and including the open water areas along the Middle Branch and West Branch of the Westfield River. In all, over 1,300 acres of land are located within the 100-year flood zone in Chester. Much of this flood area is currently open wetlands adjacent to large areas of forest cover; however, floodplain lands do surround much of Route 20.

One of the goals of this Natural Hazards Mitigation Plan is to evaluate all of the town's existing policies and practices related to natural hazards and identify potential gaps in protection.

### **Management Plans**

The Comprehensive Emergency Management (CEM) Plan for Chester lists the following generic mitigation measures for flood planning:

1. Identify areas in the community that are flood prone and define methods to minimize the risk. Review National Flood Insurance Maps.
2. Disseminate emergency public information and instructions concerning flood preparedness and safety.
3. Community leaders should ensure that Chester is enrolled in the National Flood Insurance Program.
4. Strict adherence should be paid to land use and building codes, (e.g. Wetlands Protection Act), and new construction should not be built in flood prone areas.
5. Ensure that flood control works are in good operating condition at all times.
6. Natural water storage areas should be preserved.
7. Maintain plans for managing all flood emergency response activities including addressing potentially hazardous dams.

The Comprehensive Emergency Management (CEM) Plan for Chester also lists the following generic preparedness and response measures for floods:

1. Place EOC personnel on standby during stage of flood 'watch' and monitor NWS/New England River Forecast Center reports.
2. Ensure that public warning systems are working properly and broadcast any information that is needed at this time.
3. Review mutual aid agreements.

4. Monitor levels of local bodies of water.
5. Arrange for all evacuation and sheltering procedures to be ready for activation when needed.
6. Carry out, or assist in carrying out needed flood-proofing measures such as sand bag placement, etc.
7. Regulate operation of flood control works such as floodgates.
8. Notify all Emergency Management related groups that will assist with flood response activities to be ready in case flood ‘warning’.
9. Broadcast warning/notification of flood emergency.
10. Coordinate traffic control and proceed with evacuation of affected populations as appropriate.
11. Open and staff shelters and reception centers.
12. Undertake, or continue to carry out, flood proofing measures.
13. Dispatch search and rescue teams.
14. Dispatch emergency medical teams.

#### *Evacuation Options*

Route 20 is the major evacuation route for the Town of Chester. Additionally, residents may need to evacuate using Middlefield Road.

#### **Flood Control Structures**

FEMA has identified four dams within the Town of Chester.

#### **Land Use Regulations that Mitigate Impacts from Flooding**

The Town of Chester has adopted several land use regulations that serve to limit or regulate development in floodplains, to manage stormwater runoff, and to protect groundwater and wetland resources, the latter of which often provide important flood storage capacity. These regulations are summarized below and their effectiveness evaluated in Table 4-1.

#### ***Zoning By-Laws***

The Town of Chester has established a set of bylaws designed in part to “promote the health, safety, and general welfare of the inhabitants of the Town of Chester, to protect and conserve the value of property within the Town; and to secure safely from fire, congestion, or confusion...”

In Chester’s Zoning By-Law, the Floodplain and Westfield River Protection District sets additional submittal standards for those wishing to build in the district, however it does not disallow underlying uses. See below:

#### *Section IV: Overlay District Regulations*

#### 4.0: Floodplain and Westfield River Protection District

#### 4.0.1 Purposes

The purposes of the Floodplain and Westfield River Protection Districts are to:

- (a) Protect life, public safety and property from flooding hazards;
- (b) Preserve the natural flood control and flood storage characteristics of the floodplain;
- (c) Promote the preservation of agricultural lands along the Westfield River;
- (d) Prevent any alterations to the natural flow of the river;
- (e) Protect fisheries and wildlife habitat within and along the river;
- (f) Control erosion and siltation;
- (g) Enhance and preserve existing scenic or environmentally sensitive areas along the shoreline;
- (h) Conserve shore cover and encourage well-designed developments;
- (i) Prevent water pollution caused by erosion, sedimentation, nutrient or pesticide run-off; and
- (j) Preserve and maintain the groundwater table and water recharge areas within the floodplain.

#### 4.0.2 District Delineation

(a) The Floodplain District is herein established as an overlay district and includes all special flood hazard areas designated on the Chester Flood Insurance Rate Maps (FRM).

(b) The Westfield River Protection District is herein established as an overlay district. The area subject to the bylaw shall be the entire length of the West Branch, of the Westfield River and that section from the Chester - Middlefield/Worthington town line to the confluence with Kinne Brook of the middle Branch of the Westfield River within the Town of Chester.

Where the floodplain has not been delineated on the FIRM maps or where the delineation is less than 100 feet from the riverbank the Westfield River Protection District shall be defined as that area within 100 feet, measured horizontally, of the riverbank.

(c) The boundaries of the Floodplain and Westfield River Protection Districts shall be determined by scaling distances on the Flood Insurance Rate Map. When interpretation is needed as to the exact location of the boundaries of a District, the Building Inspector shall make the necessary interpretation.

#### 4.0.3 Use Regulations

(a) All development, including structural and non-structural activities, whether permitted as a right or by special permit must be in compliance with the Mass. Wetlands Protection Plan, Chapter 13 1, Section 40 of the Massachusetts General Laws and with the requirements of the Massachusetts State Building Code 780 CMR 744.i pertaining to construction in the floodplain, with the State Environmental Code, Title V, and must comply in all respects to the provisions of the underlying district except that where the floodplain and Westfield River Protection Zoning imposes additional regulations such regulations shall prevail.

##### (b) Permitted Uses

The following uses of lowflood-damage potential and causing no obstruction to flood flows shall be permitted in the Floodplain and Westfield River Protection Districts provided they do not require new structures or fill:

1. Agricultural use such as farming, grazing and horticulture,
2. Forestry and nurseries.
3. Outdoor recreational uses, including fishing, boating, play areas and foot, bicycle or horse paths.
4. Conservation of water, plants, and wildlife.
5. Wildlife management areas.
6. Structures existing prior to the adoption of these provisions which conform with the provisions of the bylaws regulating underlying districts, including maintenance and repair-usual for continuance of such an existing structure and improvements to such structures provided that the footprint increase of those improvements does not exceed 25% of the overall footprint of the structure. In the event such structure is destroyed said structure may be rebuilt on the same location but no larger than the original overall footprint.

(c) Uses by Special Permit in the Floodplain and Westfield River Protection Districts

The following uses may be allowed by Special Permit from the Zoning Board of Appeals in accordance with the Special Permit regulations in Section 6.5 of this bylaw, and additional restrictions and criteria contained herein:

1. Residence and Agricultural-Residence Districts

- (i) Single-family residences, not including mobile homes.
- (ii) Residential accessory uses including garages, driveway, private roads, utility rights-of-way and on-site wastewater disposal systems.
- (iii) Substantial improvements to structures or buildings, which conform to the provisions of the underlying districts.

2. Business and Industrial Districts

- (i) Uses which are in compliance in all respects with the provisions of the underlying districts.

(d) Special Permit Requirements in the Floodplain District

The following Special Permit Requirements apply in the Floodplain District:

1. Where base flood elevation is to provided on the FIRM the applicant shall obtain any existing base flood elevation data. These data will be reviewed by the Building Inspector for their reasonable utilization toward meeting the elevation or floodproofing requirements, as appropriate, of the State Building code.
2. No encroachments (including fill, new construction, substantial improvements to existing structures, or other development) shall be allowed unless it is demonstrated by the applicant that the proposed development, as a result of compensating actions, will not result in any increase in flood levels during the occurrence of a 100-year flood in accordance with the Federal Emergency Management Agency's regulations for the National Flood Insurance Program.
3. The proposed use shall comply in all respects to the provisions of the underlying District in which the land is located.
4. The Zoning Board of Appeals may specify such additional requirements and conditions as it finds necessary to protect the health, safety and welfare of the public and the occupants of the proposed use.

5. Within 10 days of the receipt of the application, the Zoning Board of Appeals shall transmit one copy of the development plan to the Conservation Commission, Board of Health, Building Inspector, and the Planning Board. Final action shall not be taken until reports have been received from the above boards or until 35 days have elapsed.

(e) Special Permit Requirements in the Westfield River Protection District

The following Special Permit requirements apply in the Westfield River Protection District, in addition to those requirements specified in Sections 4.0.3(d) and 6.5.

1. A buffer strip extending at least one hundred (100) feet in depth, to be measured landward from each riverbank of the Westfield River shall be required for all lots within the River Protection District. If any lot, existing at the time of adoption of this bylaw, does not contain sufficient depth, measured landward from the riverbank, to provide a one hundred foot buffer strip, the buffer strip may be reduced to 50% of the available lot depth, measured landward from the riverbank.

(i) The buffer strip shall be kept in a natural or scenic condition.

(ii) No buildings nor structures shall be erected, enlarged, altered or moved within the buffer strip except as provided for in Section 4.0.3(b)6.

(iii) On-site wastewater disposal systems shall be located as far from the Westfield River as is feasible.

(f) Special Permit Criteria

In addition to the provisions of Section 6.5 the Zoning Board of Appeals may issue a special permit if it finds the proposed use is compliant with the following provisions:

1. In the Floodplain District, proposed uses must:

(i) Not create increased flood hazards which are detrimental the public health, safety and welfare.

(ii) Comply in all respects to tie provisions of the underlying District or Districts within which the land is located.

(iii) Comply with all applicable state and federal laws, including the Massachusetts Building Code and the Massachusetts Wetlands Protection Act (M.G.L. C. 13 1, s.40).

2. In the Westfield River Protection District, proposed uses must also:

(i) Be situated in a portion of the site that will most likely conserve shoreland vegetation and the integrity of the buffer strip

(ii) Be integrated into the existing landscape through features such as vegetative buffers and through retention of the natural shorelines;

(iii) Not result in erosion or sedimentation;

(iv) Not result in water pollution.

(g) Restricted Uses Within the Westfield River Protection District

1. No altering, dumping, filling or removal of riverine materials or dredging is permitted, except that maintenance of the river, including stabilization or repair of eroded riverbanks, erosion control or removal of flood debris, may be done under requirements M.G.L., Chapter 131, Section 40, and any other applicable laws, bylaws, and regulations.



Riverbank repairs shall be undertaken utilizing only natural materials (i.e. rock) and not with man-made materials (i.e. tires).

2. All forest cutting over 25,000 board feet at one time shall require the filing of a Forest Cutting Plan in accordance with the Mass. Forest Cutting Practices Action (M.G.L. Chapter 132, Sections 4046). In addition, no commercial cutting of forest shall occur within 50 feet of the riverbank. In the area between 50 feet and 100 feet from the riverbank, no more than 50% of existing forest, shall be cut.

3. No new impoundments, dams or other water obstructions may be located within the district.

4. No private wastewater treatment facilities, including residential package treatment plants, shall discharge directly to the West and Middle Branches of the Westfield River.

5. All other uses not specifically permitted or allowed by special permit approval within the overlay zone are prohibited.

6. All utilities shall meet the following standards:

(i) ALL new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.

(ii) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharge from the system into flood waters.

(iii) New on-site waste disposal systems shall be located to avoid impairment or contamination from them during the flooding and shall be located no less than 150 feet from the riverbank. Replacement of existing on-site waste disposal systems shall be located as far away from the riverbank as is feasible.

(h) Prohibited Uses in the Floodway

In Zones AI-30 and AE, along watercourses that have a regulatory floodway designated on the Chester Flood Boundary and Floodway Map encroachments are prohibited in the regulatory floodway which would result in any increase in flood levels within the community during the occurrence of the base flood discharge.

#### 4.0.4 Definitions

For the purposes of Section 4.0 of this bylaw, the following definitions apply:

**FLOODWAY:** the channel of a river or other watercourse plus an adjacent areas that must be kept free of encroachment in order that the 100-year flood may be carried without any increase in flood heights, as shown on the Chester Flood Boundary and Floodway map.

**RIVERBANK:** the mean annual high-water line, located within a river bank, that is apparent from visible markings, changes in the character or soils or vegetation due to the prolonged presence of water and which distinguishes between predominantly aquatic and predominantly terrestrial land.

**ENCROACHMENT:** fill, construction of new structures, substantial improvement to existing structures or other development.

**RIVERINE:** stone, rock, gravel, soil or other materials which Material comprise the rivers bed or riverbank.

**SUBSTANTIAL:** improvement to a structure or building which exceeds 25% of Improvement the original footprint of such structure or building.

FLOODPLAIN : areas which would be flooded during the occurrence of the 100-year flood, shown as Zones A, A1-30 on the Chester Flood Insurance Rate Maps.

### ***Rules and Regulations for Governing the Subdivision of Land***

Chester’s most recent draft of its Rules and Regulations for Governing the Subdivision of Land was adopted for the purpose of “protecting the safety., convenience and welfare of the inhabitants of the Town of Chester by regulating the laying out and construction of ways in subdivisions providing access to the several lots therein, but which have not become public ways, and ensuring sanitary conditions in subdivisions and in proper cases parks and open areas.” The Subdivision Rules and Regulations contain one small provisions that mitigates the potential for, and impact of, flooding, including:

#### *Section III: Procedure for Submission and Approval of Plans*

##### B. Definitive Plan

###### 2. Contents:

- (1) Proposed layout of storm drainage, water supply and sewage disposal systems.

#### *Section IV: Design Standards*

##### B. Easements

2. Where a subdivision is traversed by a water course, drainage way, channel or stream, the Planning Board may require that there be provided a storm water easement or drainage right-of-way of adequate width to conform substantially to the lines of such water course, drainage way, channel or stream, and to provide for construction or other necessary purposes.

### ***River and Stream Protection***

The Town of Chester follows the standards established by the Wetlands Protection Act, which protects water bodies and wetlands through the town Conservation Commission. The Town also has instituted its Floodplain and Westfield River Protection District, an overlay district that provides restrictions on the development and use of lands either within the floodplain or within 100 feet of the Westfield River.

### ***Chester Community Development Plan and Open Space and Recreation Plan***

In 2004, the Town of Chester completed its Community Development Plan. The intent of the document is not to address hazard mitigation or flood control in a direct or comprehensive way; however, the Community Development Plan and Open Space and Recreation Plan inventory the natural features and environments in the town, many of which, such as wetlands, groundwater recharge areas, farms, rivers, streams, and brooks, contain floodplain, dam failure inundation or localized flooding areas.

The plans highlights the importance of balancing future development with the preservation of the community’s natural and scenic resources. The preservation of open space and farmland will

provide flood storage capacity, which reduces the amount of impervious surfaces in an area, as well as other benefits not directly related to natural hazard mitigation.

The Plans also make several recommendations for further protecting these areas, and thereby preventing flooding impacts. The plan specifically points out one key weakness in Chester's Floodplain and Westfield River Protection District – it does not disallow underlying uses. This is a critical flaw in that it does not prevent residential development in these areas. Other recommendations include adding vernal pools to assessor's maps, and identifying critical wetland areas and seeking long-term protection.

### ***National Flood Insurance Program***

The Town of Chester participates in the National Flood Insurance Program. As of 2006, there were fifty-two (52) policies in effect for a total of \$5,487,200 worth of insurance. The town is not a member of the Community Rating System, which entitles policyholders to a discount on flood insurance premiums. The CRS ranking is based on the steps that a town has taken to control flood losses.

The Community Rating System reduces flood insurance premiums to reflect what a community does above and beyond the National Flood Insurance Program's (NFIP) minimum standards for floodplain regulation. The objective of the CRS is to reward communities for what they are doing, as well as to provide an incentive for new flood protection activities. To participate in the CRS, a community must fill out an application and submit documentation that shows what it is doing and that its activities deserve at least 500 points. More information including instructions and applications is available at <http://training.fema.gov/EMIWeb/CRS/m3s1main.htm>

**Table 5-1: Existing Flood Hazard Mitigation Measures**

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
<b>Flood Control Structures</b>	Four dams.	Flood inundation zones below dams	Very effective for preventing flooding downstream.	<b>Ensure dam owners realize their responsibility to inspect the dams.</b>
<b>Zoning By-Laws</b>				
<b>Floodplain and Westfield River Protection District Overlay</b>	Areas delineated as part of the 100-year floodplain, and/or within 100 feet of the Westfield River are protected by use regulations	100-year flood plain, area around river	Somewhat effective for preventing incompatible development within the floodplain.	<b>Consider prohibiting underlying uses so that no residences are built in potential flood areas.</b>
<b>Subdivision Regulations</b>				
<b>Submission Requirements</b>	Water supply and drainage systems	All subdivisions	Somewhat effective for managing stormwater runoff	<b>Consider adding infiltration requirements, impervious surface limits, etc.</b>
<b>Design Standards</b>	Required enforcement of standards established by Wetlands Protection Act.	Proposed subdivisions	Somewhat effective at protecting water bodies and wetlands.	<b>None.</b>
<b>River and Stream Protection</b>	As of 2006, there were 52 homeowners with flood insurance policies.	Entire town.	Somewhat effective, provided that the town remains enrolled in the National Flood Insurance Program.	<b>The town should evaluate whether to become a part of FEMA's Community Rating System.</b>

Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
<b>Chester Community Development Plan – Open Space Element</b>	Community development plan that addresses economic development, natural resource protection, housing and transportation.	Entire town.	Needs to be updated.	<b>None.</b>
<b>Participation in the National Flood Insurance Program</b>	As of 2006, there were 52 homeowners with flood insurance policies.	Areas identified by the FEMA maps.	Somewhat effective, provided that the town remains enrolled in the National Flood Insurance Program.	<b>The town should evaluate whether to become a part of FEMA’s Community Rating System.</b>

## **Severe Snowstorms/Ice Storms**

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Winter storms can be especially challenging for emergency management personnel even though the storm has usually been forecast. The Massachusetts Emergency Management Agency (MEMA) serves as the primary coordinating entity in the statewide management of all types of winter storms and monitors the National Weather Service (NWS) alerting systems during periods when winter storms are expected.<sup>10</sup>

### **Management Plans**

The CEM Plan for Chester lists the following generic mitigation measures for severe winter storms:

1. Develop and disseminate emergency public information concerning winter storms, especially material which instructs individuals and families how to stock their homes, prepare their vehicles, and take care of themselves during a severe winter storm.
2. As it is almost guaranteed that winter storms will occur annually in Massachusetts, local government bodies should give special consideration to budgeting fiscal resources with snow management in mind.
3. Maintain plans for managing all winter storm emergency response activities.

To the extent that some of the damages from a winter storm can be caused by flooding, all of the flood protection mitigation measures described in Table 4-1 can also be considered as mitigation measures for severe snowstorms/ice storms.

The CEM Plan for Chester lists the following generic preparedness and response measures for severe winter storms:

1. Ensure that warning/notification, and communications systems are in readiness.
2. Ensure that appropriate equipment and supplies, (especially snow removal equipment), are in place and in good working order.
3. Review mutual aid agreements.
4. Designate suitable shelters throughout the community and make their locations known to the public.
5. Implement public information procedures during storm 'warning' stage.
6. Prepare for possible evacuation and sheltering of some populations impacted by the storm (especially the elderly and special needs).

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<sup>10</sup> Comprehensive Emergency Management Plan for the Town of Chester, August 1999.

7. Broadcast storm warning/notification information and instructions.
8. Conduct evacuation, reception and sheltering activities.
9. If appropriate, activate media center. Refer to Resource Manual for media center information.
10. Dispatch search and rescue teams.
11. Dispatch emergency medical teams.
12. Take measures to guard against further danger from power failure, downed trees and utility lines, ice, traffic problems, etc.
13. Close roads, and/or limit access to certain areas if appropriate.
14. Provide assistance to homebound populations needing heat, food, and other necessities.
15. Provide rescue and sheltering for stranded/lost individuals.

### **Restrictions on Development**

There are no restrictions on development that are directly related to severe winter storms. However, the Town of Chester's Land Development Ordinance sets grade limits on streets, and restrictions on utility placement, which, although not specified as weather hazard mitigation, can serve to minimize accident potential and power loss from severe winter storms:

#### *Section V: Special Use Regulations (Zoning By-Laws)*

##### 5.95 Common Access Driveways

The proposed Common Access Driveway provisions allow land owners to apply to the Planning Board for a special permit to construct a single driveway to serve two adjacent lots along an existing road. Common access driveways will reduce the number of driveways, curb cuts and traffic entry points along roadways. The Common Access Driveway option will increase traffic safety, encourage developers to retain more of the native vegetation, and encourage the preservation of Chester's rural character and visual appearance by minimizing the degree to which the landscape appears to be cut up into separate lots.

#### *Section IV: Design Standards (Subdivision Rules and Regulations)*

##### A. Streets

3. Grade: Grades of streets shall be not less than 0.5%. Grades shall not be more than 6.0% for principal streets nor more than 12.0% for secondary streets.

### **Other Mitigation Measures**

Severe snowstorms or ice storms can often result in a small or widespread loss of electrical service. The Elementary School is served by a large pad-mounted generator that will provide electric power in the event of primary power failure.

### **State Building Code**

For new or recently built structures, the primary protection against snow-related damage is construction according to the State Building Code, which addresses designing buildings to withstand snowloads. The Town of Chester currently employs a building inspector to ensure that construction meets state standards.



**Table 5-2: Existing Severe Snowstorms/Ice Storms Hazard Mitigation Measures**

<b>Existing or Proposed Protection</b>	<b>Description</b>	<b>Area Covered</b>	<b>Effectiveness</b>	<b>Potential Changes</b>
<b>Special Use Regulations</b>	Standards include options for common driveways.	Entire town.	Effective.	<b>None.</b>
<b>Design Standards</b>	Standards include street grade regulations (six to twelve percent maximum).	All Subdivisions	Effective	<b>None.</b>
<b>State Building Code</b>	The Town of Chester has adopted the Massachusetts State Building Code.	Entire town.	Effective.	<b>None.</b>

## **Hurricanes/Severe Thunderstorms**

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Of all the natural disasters that could potentially impact Chester, hurricanes provide the most lead warning time because of the relative ease in predicting the storm's track and potential landfall. MEMA assumes "standby status" when a hurricane's location is 35 degrees North Latitude (Cape Hatteras) and "alert status" when the storm reaches 40 degrees north Latitude (Long Island).<sup>11</sup> The flooding associated with hurricanes can be a major source of damage to buildings, infrastructure and a potential threat to human lives. Therefore, all of the flood protection mitigation measures described in Table 4-1 can also be considered hurricane mitigation measures. High winds that oftentimes accompany hurricanes can also damage buildings and infrastructure.

Town of Chester's land development standards and State Building Code regulations, as listed below, are equally applicable to wind events such as hurricanes and tornadoes.

### **Management Plans**

The CEM Plan for Chester includes the following generic mitigation measures for hurricane planning and response:

1. Develop and disseminate emergency public information and instructions concerning hurricane preparedness and safety.
2. Community leaders should ensure that Chester is enrolled in the National Flood Insurance Program.
3. Develop and enforce local building codes to enhance structural resistance to high winds and flooding. Build new construction in areas that are not vulnerable to direct hurricane effects.
4. Maintain plans for managing all hurricane emergency response activities.

The CEM Plan for Chester includes the following generic preparedness and response measures for hurricanes:

1. Ensure that warning/notification systems and equipment is ready for use at the 'hurricane warning' stage.
2. Review mutual aid agreements.
3. Designate suitable wind and flood resistant shelters in the community and make their locations known to the public.

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<sup>11</sup> Comprehensive Emergency Management Plan for the Town of Chester, August 1999.

4. Prepare for coordination of evacuation from potentially impacted areas including alternate transportation systems and locations of special needs facilities.
5. Activate warning/notification systems to inform public of protective measures to be taken including evacuation where appropriate.
6. Conduct evacuation of affected populations.
7. Open and staff shelters and reception centers.
8. Dispatch search and rescue teams.
9. Dispatch emergency medical teams.
10. Activate mutual aid activities.
11. Take measures to guard against further danger from downed trees and utility lines, debris, etc.

#### *Evacuation Options*

Route 20 is the major evacuation route for the Town of Chester. Additionally, residents may need to evacuate using Middlefield Road.

### **Land Development Standards**

There are no restrictions on development that are directly related to hurricanes. However, the Town of Chester's Land Development Ordinance does have some provisions that are wind-related, specifically, zoning bylaws related to wireless communications facilities and mobile home parks. In addition, the Ordinance sets restrictions on utility placement, which, although not specified as weather hazard mitigation, can serve to minimize accident potential and power loss from severe wind. (See previous section.)

#### *Section V: Special Land Use Regulations*

### 5.4: Wireless Communications Structures and Facilities

#### 5.4.5 Siting and Height Requirements

##### (a) Setbacks

1. The minimum distance from the base of the wireless communication structure to any property line or road right-of-way, shall be at least 1.25 times the height of the structure.
2. The setbacks for the wireless communication building shall comply with the setback requirements for the zoning district.
3. The wireless communication structure shall be a minimum distance of three times the height from school buildings, playgrounds, athletics fields, and abutting residences to

prevent the structure from appearing to "tower" over; and so as not to adversely affect property values.

(b) The height shall be the minimum height necessary, as determined by the Independent Consultant, to accommodate anticipated and future use, but in no case shall exceed one hundred twenty (120) feet.

(c) The wireless communication structure shall, when possible, be sited off ridge lines and where the visual impact is the least detrimental in historic and scenic areas.

#### 5.4.6 Design Requirements

(g) Existing on-site vegetation shall be preserved to the maximum extent possible.

(h) Vegetative screening shall be used to screen abutting residential properties and roadways. Plants that fit in with the surrounding natural vegetation shall be used.

### *Section III: General Use Regulations*

#### 3.1 Mobile Homes

No mobile homes may be occupied except in a trailer park operating under a license from the Board of Health.

#### **State Building Code**

For new or recently built structures, the primary protection against wind-related damage is construction that adheres to the State Building Code, which, when followed, results in buildings that withstand high winds. The Town of Chester currently employs a building inspector to ensure that construction meets state standards.

## **Tornadoes/Microbursts**

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Worcester County and areas just to its west, including portions of Hampden County, have been dubbed the “tornado alley” of the state because the majority of significant tornadoes in Massachusetts’s weather history have occurred in that region.<sup>12</sup> According to the *Institute for Business and Home Safety*, the wind speeds in most tornadoes are at or below design speeds that are used in current building codes.<sup>13</sup> The location and extent of potential damaging impacts of a tornado are completely unpredictable. Most damage from tornadoes comes from high winds that can fell trees and electrical wires, generate hurtling debris and, possibly, hail.

### **Management Plans**

The CEM Plan for Chester includes the following generic mitigation measures for tornado planning and response:

1. Develop and disseminate emergency public information and instructions concerning tornado safety, especially guidance regarding in-home protection and evacuation procedures, and locations of public shelters.
2. Strict adherence should be paid to building code regulations for all new construction.
3. Maintain plans for managing tornado response activities. Refer to the non-institutionalized, special needs and transportation resources listed in the Resource Manual.

The CEM Plan for Chester includes the following generic preparedness and response measures for tornadoes:

1. Designate appropriate shelter space in the community that could potentially withstand tornado impact.
2. Periodically test and exercise tornado response plans.
3. Put Emergency Management on standby at tornado ‘watch’ stage.
4. At tornado ‘warning’ stage, broadcast public warning/notification safety instructions and status reports.
5. Conduct evacuation, reception, and sheltering services to victims.
6. Dispatch search and rescue teams.
7. Dispatch emergency medical teams.

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<sup>12</sup> Comprehensive Emergency Management Plan for the Town of Chester, August 1999.

<sup>13</sup> [www.ibhs.org](http://www.ibhs.org).

8. Activate mutual aid agreements.
9. Take measures to guard against further injury from such dangers as ruptured gas lines, downed trees and utility lines, debris, etc.
10. Acquire needed emergency food, water, fuel, and medical supplies.
11. Take measures relating to the identification and disposition of remains of the deceased.

*Evacuation Plans*

Route 20 is the major evacuation route for the Town of Chester. Additionally, residents may need to evacuate using Middlefield Road.

**Table 5-3: Existing Hurricane and Tornado Hazard Mitigation Measures (Wind-Related)**

<b>Existing or Proposed Protection</b>	<b>Description</b>	<b>Area Covered</b>	<b>Effectiveness</b>	<b>Potential Changes</b>
<b>Zoning – Wireless Communications Structures and Facilities</b>	Restrictions on height, and other features of wireless communication towers	Entire town	Somewhat effective for preventing damage to nearby property	<b>None.</b>
<b>General Use Regulations</b>	Mobile homes/RVs are not permitted within town limits as permanent living quarters.	Entire town	Somewhat effective for preventing damage to susceptible structures (mobile homes).	<b>None.</b>
<b>State Building Code</b>	The Town of Chester has adopted the Massachusetts State Building Code.	Entire town.	Effective.	<b>None.</b>
<b>Shelters</b>	There are 4 shelters planned for victims of hurricanes but they are not yet equipped.	Entire town.	Somewhat effective.	<b>Need to equip shelters—stackable cots and utensils.</b>

## **Wildfires/Brushfires**

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Hampden County has approximately 273,000 acres of forested land, which accounts for 67 percent of total land area. Forest fires are therefore a potentially significant issue. In Chester, approximately 90 percent of the town's total land area is in forest, or about 21,448 acres, and is therefore at risk of fire.

### **Management Plans**

The Chester CEM Plan does not include any specific information on wildfires.

### **Land Development Standards**

There are currently no restrictions on development that are based on the need to mitigate the hazards of wildfires/brushfires. However, sufficient fire protection is one factor considered during subdivision review, and the application for the review of a wireless communication structure is reviewed by the Fire Chief.

### **Regulatory Measures**

Burn Permits: Burn permits for the Town of Chester are issued from the Chester Fire Department. Approximately 86 permits were issued in 2006. During this process, the applicant is given the guidelines for when and where the burn may be conducted as well as fire safety tips provided by the control center.

Public Education/Outreach: The Chester Fire Department works with fourth graders in school and provides educational programs at the Harvest Fair, which occurs during Fire Prevention Week, which is the first week of October. The Light Department also conducts educational programs on electrical safety.



**Table 5-4: Existing Wildfire/Brushfire Hazard Mitigation Measures**

<b>Existing or Proposed Protection</b>	<b>Description</b>	<b>Area Covered</b>	<b>Effectiveness</b>	<b>Potential Changes</b>
<b>Burn Permits</b>	86 issued in 2006	Entire town.	Effective.	<b>None.</b>
<b>Public Education/ Outreach</b>	The Fire Department has an ongoing educational program in the schools and the Chester Electric Light Department educates children on electrical safety.	Entire town.	Effective.	<b>None.</b>
<b>Subdivision Review Fire Safety</b>	The Fire Department is involved in the review of subdivision plans and site plans.	Entire town.	Effective.	<b>None.</b>

## **Earthquakes**

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Although there are five mapped seismological faults in Massachusetts, there is no discernable pattern of previous earthquakes along these faults nor is there a reliable way to predict future earthquakes along these faults or in any other areas of the state. Consequently, earthquakes are arguably the most difficult natural hazard to plan for. Most buildings and structures in the state were constructed without specific earthquake resistant design features.

In addition, earthquakes precipitate several potential devastating secondary effects such as building collapse, utility pipeline rupture, water contamination, and extended power outages. Therefore, many of the mitigation efforts for other natural hazards identified in this plan may be applicable during the Town's recovery from an earthquake.

### ***Management Plans***

The Chester CEM Plan lists the following generic mitigation measures for earthquakes:

1. Community leaders in cooperation with Emergency Management Personnel should obtain local geological information and identify and assess structures and land areas that are especially vulnerable to earthquake impact and define methods to minimize the risk.
2. Strict adherence should be paid to land use and earthquake resistant building codes for all new construction.
3. Periodic evaluation, repair, and/or improvement should be made to older public structures.
4. Emergency earthquake public information and instructions should be developed and disseminated.
5. Earthquake drills should be held in schools, businesses, special care facilities, and other public gathering places.

The Chester CEM Plan lists the following generic preparedness and response measures for earthquakes:

1. Earthquake response plans should be maintained and ready for immediate use.
2. All equipment, supplies and facilities that would be needed for management of an earthquake occurrence should be maintained for readiness.
3. Emergency Management personnel should receive periodic training in earthquake response.
4. If the designated Emergency Operations Center (EOC) is in a building that would probably not withstand earthquake impact, another building should be chosen for an earthquake EOC.
5. Mass Care shelters for earthquake victims should be pre-designated in structures that would be most likely to withstand earthquake impact.
6. EOC will be activated and response will immediately be engaged to address any and all earthquake effects listed.

7. Emergency warning/notification information and instructions will be broadcast to the public.
8. Search and rescue teams will be dispatched.
9. Emergency medical teams will be dispatched.
10. Firefighters will address fires/explosions, and HAZMAT incidents.
11. Law enforcement personnel will coordinate evacuation and traffic control.
12. Reception centers and shelters will be opened and staffed.
13. Animal control measures will be taken.
14. Law enforcement personnel will protect critical facilities and conduct surveillance against criminal activities.
15. Immediate life-threatening hazards will be addressed such as broken gas lines, downed utility wires, and fire control resources.
16. Emergency food, water, and fuel will be acquired.
17. Activate mutual aid.
18. Measures will be taken relating to identification and disposition of remains of deceased by the Chief Medical Examiner.

#### Evacuation Options

Route 20 is the major evacuation route for the Town of Chester. Additionally, residents may need to evacuate using Middlefield Road.

#### ***State Building Code***

State and local building inspectors are guided by regulations put forth in the Massachusetts State Building Code. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975 and included specific earthquake resistant design standards. These seismic requirements for new construction have been revised and updated over the years and are part of the current, 6<sup>th</sup> Edition of the Massachusetts State Building Code. Given that most structures in Massachusetts were built before 1975, many buildings and structures do not have specific earthquake resistant design features. According to the 2000 U.S. Census, 68% of the housing in Chesterfield was built before 1970. In addition, built areas underlain by artificial fill, sandy or clay soils are particularly vulnerable to damage during an earthquake.

#### ***Restrictions on Development***

There are no seismic-related restrictions on development.

**Table 5-5: Existing Earthquake Hazard Mitigation Measures**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
<b>State Building Code</b>	The Town of Chester has adopted the State Building Code.	Entire town but applies to new construction only.	Effective for new buildings only. The Chester elementary school—the secondary EOC is the only building built to these new standards.	<b>Evaluate older structures to be used as shelters to determine if they are earthquake resistant.</b>
<b>Debris Management Plan</b>	A debris management plan could be developed.	Entire town.	Effective.	<b>Consider participation in the creation of a Regional Debris Management Plan.</b>
<b>Shelters</b>	Shelters have been identified for victims of earthquakes in Chester.	Entire town.	Effective.	<b>None.</b>

## **Dam Failures**

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The only mitigation measures in place for dams are the state regulations that control their construction and inspection.

### ***Management Plans and Regulatory Measures***

The Chester CEM Plan states that there are three categories of dam failure or overspill and that action should be taken according to hazard rating:

#### **Type 1: Slowly Developing Condition**

1. Activate EOC
2. Activate all communication networks
  - Establish communications with Command Position on a 24-hour basis.
3. Release public information
4. Notify:
  - MEMA Region Headquarters
  - American Red Cross
  - Downstream communities
5. Review Plans for evacuation and sheltering
  - a. Evacuation
    - routes
    - notification
  - b. Shelter
    - availability and capacity
    - food, supplies, and equipment
    - shelter owners and managers
    - other communities (if out of town sheltering is required)
6. Require “Stand By” status of designated emergency response forces.

#### **Type 2: Rapidly Developing Condition**

1. Establish a 24-hour communications from dam site to EOC.
2. Assemble, brief and assign specific responsibilities to emergency response forces.
3. Release public information.
4. Obtain and prepare required vehicles/equipment for movement.
5. Prepare to issue warning.

#### **Type 3: Practically Instantaneous Failure**

1. Issue warning
2. Commence immediate evacuation.
3. Commit required resources to support evacuation.
4. Activate shelters or coordinate activation of shelters located outside the community.
5. Notify:
  - MEMA Region Headquarters
  - Red Cross
6. Initiate other measures as required to protect lives and property.

The Chester CEM Plan contains the following generic mitigation measures for dam failure:

1. Develop and conduct public education programs concerning dam hazards.
2. Maintain up-to-date plans to deal with threat and actual occurrence of dam over-spill or failure.
3. Emergency Management and other local government agencies should familiarize themselves with technical data and other information pertinent to the dams, which impact Chester. This should include determining the probable extent and seriousness of the effect to downstream areas.
4. Dams should be inspected periodically and monitored regularly.
5. Repairs should be attended to promptly.
6. As much as is possible burdens on faulty dams should be lessened through stream re-channeling.
7. Identify dam owners.
8. Determine minimum notification time for down stream areas.

The Chester CEM Plan contains the following generic preparedness and response measures for dam failure:

1. Pre-place adequate warning/notification systems in areas potentially vulnerable to dam failure impact.
2. Pre-place procedures for monitoring dam site conditions at first sign of any irregularity that could precipitate dam failure.
3. Identify special needs populations, evacuations routes, and shelters for dam failure response.
4. Have sandbags, sand, and other items to reinforce dam structure or flood proof flood prone areas.
5. Disseminate warning/notification of imminent or occurring dam failure.
6. Coordinate evacuation and sheltering of affected populations.
7. Dispatch search and rescue teams.

8. Coordinate evacuation and sheltering of affected populations.
9. Activate mutual aid if needed.
10. Acquire additional needed supplies not already in place, such as earth moving machinery.
11. Establish incident command post as close to affected area as safely possible.
12. Provide security for evacuated public and private property.

### Evacuation Options

The Chester CEM Plan identifies the several dams and their associated inundation zones and evacuation routes. Depending on the dam that failed, there could be an estimated peak population of up to 10,000 people downstream, and several special needs facilities.

Route 20 is the major evacuation route for the Town of Chester. Additionally, residents may need to evacuate using Middlefield Road.

If the Dam in Sherwood Forest is breached, the Chester Hazard Mitigation committee is concerned that downtown Chester would be inundated..

### ***Permits Required for New Dam Construction***

Massachusetts State Law (M.G.L. Chapter 253 Section 45) regulates the construction of new dams. A permit must be obtained from the Department of Conservation and Recreation (DCR) before construction can begin. One of the permit requirements is that all local approvals or permits must be obtained.

### ***Dam Inspections***

The DCR requires that dams rated as Low Hazards are inspected every ten (10) years, dams that are rated as Medium/Significant Hazards are inspected every five (5) years, and dams that a rated as High Hazards are inspected every two (2) years. This is the responsibility of the dam owner.

### ***Restrictions on Development***

No new impoundments, dams, or other water obstructions are permitted with the Floodplain and Westfield River Protection Overlay District

There are no town restrictions on dam locations. The DCR issues permits for new dams and does have the authority to deny a permit if it is determined that the design and/or location of the dam is not acceptable.

**Table 5-6: Existing Dam Failure Hazard Mitigation Measures**

<b>Existing or Proposed Protection</b>	<b>Description</b>	<b>Area Covered</b>	<b>Effectiveness</b>	<b>Potential Changes</b>
<b>New Dam Construction Permits</b>	State law requires a permit for the construction of any dam.	Entire town.	Effective. Ensures dams are adequately designed.	<b>None.</b>
<b>Dam Inspections</b>	DCR has an inspection schedule that is based on the hazard rating of the dam (low, medium, high hazard).	Entire town.	Low. The responsibility for this is now on dam owners, who may not have sufficient funding to comply.	<b>Identify sources of funding for dam safety inspections. Incorporate dam safety into development review process.</b>
<b>Evacuation Plans</b>	Comprehensive evacuation plans would ensure the safety of the citizens in the event of dam failure.	Inundation areas in town.	None.	<b>None.</b>



## **Drought**

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Although Massachusetts does not face extreme droughts like many other places in the country, it is susceptible to dry spells and drought. And unlike other places, drought can most likely be effectively mitigated in regions like the Pioneer Valley if measures are put into place. Chester has several water protection regulations in place, as evidenced in the section on flooding. Additional regulations and mitigation options, specific to drought mitigation, are included here.

### ***Management Plans***

The Chester CEM Plan contains the following generic mitigation measures for drought:

1. Seeks to balance demand on water supply through land use, zoning and other tools.
2. Encourages water conservation and water control measures to ease demand on water supply.
3. Improves efficiency and capacity of the water supply system, including leak detection and repair.

The Chester CEM Plan contains the following generic preparedness and response measures for drought:

1. Identify potential emergency water sources, such as purchase from adjoining communities if available.
2. Keep abreast of drought forecasts issued by the State Drought Task Force.
3. Encourages businesses and other bulk users to develop water conservation and shortage plans.
4. Implement water use controls as needed.
5. Coordinate requests for potable water in emergency situations.

### ***Land Development Regulations***

Chester's Zoning Ordinance includes two sections which indirectly deal with water supply. The first is the overlay district for Floodplain and Westfield River Protection, which includes criteria dealing with water conservation, groundwater infiltration, and water pollution prevention. (See Flooding section, above for actual text.) These all play important roles in maintaining and protecting water supply.

In addition, the Zoning Ordinance also includes criteria to protect groundwater and water quality within its special permit review, and application review for wireless communications structures.

### ***Chester Community Development Plan***

Water is a main focus of the Open Space and Recreation Plan Element of the Chester Community Development Plan, and it makes several recommendations to protect and manage Chester's water sources. Four key actions are listed:

- Continue to support the Wild and Scenic Advisory Committee and other regional watershed organizations to promote stewardship of the regions nationally recognized water resources.
- Work with the Chester Highway Department and MHD to identify potential areas for reduced or substitute road-salt use.
- Implement the proposed Water Supply Protection District to regulate land use activities and set performance standards for activities on privately owned land within the watersheds as recommended in The Chester Source Water Protection Plan for Austin Brook Reservoir and Horn Pond (PVPC, 2002).
- Continue to implement actions as identified in the Source Water Protection Plan. Priority should be given to deed research at Horn Pond.

### ***Other Mitigation Measures***

As mentioned, Chester also has some rigorous source water protection actions in place, from the Austin Brook Reservoir and Horn Pond Source Water Protection Plan. These actions are primarily focused on protecting the water quality in the drinking water source for the Town.

**Table 5-7: Existing Drought Hazard Mitigation Measures**

<b>Existing or Proposed Protection</b>	<b>Description</b>	<b>Area Covered</b>	<b>Effectiveness</b>	<b>Potential Changes</b>
<b>Floodplain and Westfield River Protection Overlay District</b>	Areas delineated as part of the 100-year floodplain, and/or within 100 feet of the Westfield River are protected by use regulations	100-year flood plain, area around river	Somewhat effective for managing water quality and groundwater supply through restrictions on development.	<b>None.</b>
<b>Chester Community Development Plan</b>	Makes recommendations for protecting Chester’s water quality.	Entire town.	Effective for raising awareness about protecting water quality, but not water supply/conservation. Also very effective at protecting water quality if action steps are completed.	<b>None.</b>

## **Man-Made Hazards/Hazardous Materials**

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

### ***Management Plans***

A Model Hazardous Materials Response Plan is provided in the Chester CEM Plan framework for community and/or LEPC use under the Specific Hazards Annexes section. Complete plans may be attached to the CEM or referenced as a separate document. The CEM Plan may also support regional emergency planning committees.

### ***Land Development Regulations***

Neither Chester's Zoning Ordinance nor Subdivision Regulations address hazard materials management.

### ***Chester Community Development Plan***

The Community Development Plan notes that there have been six reported hazardous waste spills in Chester, but all have been appropriately cleaned-up.

### ***Other Mitigation Measures***

**Table 5-8: Existing Man-Made Hazard/Hazardous Materials Mitigation Measures**

<b>Existing or Proposed Protection</b>	<b>Description</b>	<b>Area Covered</b>	<b>Effectiveness</b>	<b>Potential Changes</b>
<b>Chester Community Development Plan</b>	Identifies hazardous waste spills in town.	Entire town.	Somewhat effective at bringing to light the risk of hazardous waste contamination.	

## 6 – FUTURE MITIGATION STRATEGIES

### Goal Statements and Action Items

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As part of the natural hazards mitigation planning process undertaken by the Chester Natural Hazards Planning Committee, existing gaps in protection and possible deficiencies were identified and discussed. The committee will has developed general Goal Statements and Action Items that, when implemented, will help to reduce risks and future damages from natural hazards. The Goal Statements, Action Items, town department(s) responsible for implementation, and the proposed timeframe for implementation for each category of natural hazard are described below.

Several of the Action Items have multiple benefits because, if implemented, these Action Items will mitigate or prevent damages from more than one type of natural hazards. For example, updating the Subdivision Regulations to require new utility lines be placed underground will prevent property damage and loss of service in the event of high winds (tornado or hurricane) or severe snow and ice storms.

### General Mitigation Action Items

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**Goal Statement:** To assure electric service reliability.

**Action Item:** In addition to the hazards identified previously, the Town of Chester is vulnerable to loss of electricity. The Town recommends another interconnection point for the Light Department. Currently the Town receives its power over WMECO's lines coming from Becket. The primary interconnection point is at the Chester/Becket town line on Route 20. The Town would like to have an alternate interconnection point at the Chester/Huntington town line on Old State Highway. This would involve extending the Town's three-phase power line from the Post Office on Route 20 to the interconnection point. This would give the Town an alternate feed in the event that WMECO's line in Becket went down.

**Responsible Department/Board:** Chester Electric Light Department with WMECO

**Proposed Completion Date:** 2008

**Rationale:** To assure adequate electric service during and emergency.

**Goal Statement:** To provide adequate shelter, water, food and basic first aid to displaced residents in the event of a natural disaster and to provide adequate notification and information regarding evacuation procedures, etc., to residents in the event of a natural disaster.

**Action Item:** Establish a Community Emergency Response Team (CERT) with neighboring communities.

**Responsible Department/Board:** Emergency Management Director, Board of Selectmen, Police & Fire Departments

**Proposed Completion Date:** On-going

**Rationale:** Increase ability of Chester to respond to a disaster including being able to easily enlist aid of surrounding communities if needed.

**Action Item:** Identify existing shelters that are earthquake resistant as well as outside of floodplain and inundation areas. Make sure that these shelters are equipped with basic supplies, first aid, power source, food and water and means to prepare and consume. Disseminate this information to appropriate town departments.

**Responsible Department/Board:** Emergency Management Director

**Proposed Completion Date:** 2008

**Rationale:** Ensure shelters are not damaged just at times when they are needed to protect the public.

**Action Item:** Inventory supplies at existing shelters and develop a needs list and storage requirements, and re-supply shelters if needed. Establish arrangements with local or neighboring vendors for supplying shelters with food and first aid supplies in the event of a natural disaster.

**Responsible Department/Board:** Emergency Management Planning Committee, School Facilities Manager

**Proposed Completion Date:** 2008

**Rationale:** Increase ability to support public in shelters during a disaster.

**Action Item:** Examine current notification system including feasibility of Reverse 911.<sup>14</sup> Develop a preliminary project proposal and cost estimate.

**Responsible Department/Board:** Select Board

**Proposed Completion Date:** 2008

**Rationale:** Increase ability of Town to inform and keep in touch with all town residents in the event of a disaster.

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<sup>14</sup> In essence, Reverse 911 is a Windows compatible software program, which uses GIS and database technology to create call lists of phone numbers within a specified geographical area and provide prerecorded messages to the residents at those numbers. Call lists can be created ahead of time or as emergency or other situations arise. The system is voluntary and it is a simple matter to remove those residents who do not wish to participate. Cost of the system varies depending on a number of factors. The Town of Green Tree, Pennsylvania was able to subsidize their purchase of a Reverse 911 system through a \$10,000 Community Development Block Grant.

**Action Item:** Collect, periodically update, and disseminate information on which local radio stations provide emergency information, what to include in a ‘home survival kit,’ how to prepare homes and other structures to withstand flooding and high winds, and the proper evacuation procedures to follow during a natural disaster. CMELD distributes annual newsletter with guidance on what residences should have in a home survival kit.  
**Responsible Department/Board:** Emergency Management Director  
**Proposed Completion Date:** On-going  
**Rationale:** Increase likelihood of town residents being prepared in the event of a disaster.

## **Flooding**

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Overall, the Town of Chester’s existing land use regulations regulate development, reduce or eliminate localized flooding events and control the quantity and quality of stormwater runoff. Long-range planning documents such as the town’s Community Development Plan also address flood prevention and mitigation directly or indirectly in their goals and objectives.

**Goal Statement:** To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to flooding.

**Action Item:** Implement stream bank stabilization for portions of the Westfield River that flow through the community.  
**Responsible Department/Board:** Community Development Committee, Planning Board, Select Board, Conservation Commission,  
**Proposed Completion Date:** 2010  
**Rationale:** Stabilized stream banks will erode less during floods, therefore less debris that could damage property or injure people will be carried by the flood waters and foundations of buildings near the stream banks are less likely to be destabilized.

**Action Item:** Add flood prevention and mitigation to the purpose section of the Subdivision Rules and Regulations.  
**Responsible Department/Board:** Planning Board, Conservation Commission, Select Board, Community Development Committee  
**Proposed Completion Date:** 2008  
**Rationale:**-Will result in less future development being sited in areas likely to be affected by flooding.

**Action Item:** Ensure that the Development Impact Statement identifies impacts of the proposed development could have on the potential for flooding, and include mitigation measures, if deemed necessary by the Planning Board.  
**Responsible Department/Board:** Planning Board  
**Proposed Completion Date:** 2008  
**Rationale:** Development will not be sited in areas likely to be affected by flooding or exacerbate future flooding.



- Action Item:** Implement standards in the Subdivision Rules and Regulations to require temporary and permanent erosion control measures for streams and surface water bodies.  
**Responsible Department/Board:** Planning Board, Conservation Commission  
**Proposed Completion Date:** 2008  
**Rationale:** Will result in future development being less likely to destabilize stream and other water body banks.
- Action Item:** Add specific impacts to address in the Special Permit process including topographic change, removal of cover vegetation, risk of erosion or siltation and increased stormwater runoff.  
**Responsible Department/Board:** Planning Board, Conservation Commission  
**Proposed Completion Date:** 2008  
**Rationale:** Development will not exacerbate future flooding.
- Action Item:** In regards to the Chester Open Space and Recreation Plan, implement the Five-Year Action Plan strategies, particularly those dealing with protection of forests and farmland.  
**Responsible Department/Board:** Conservation Commission and the Select Board  
**Proposed Completion Date:** Ongoing  
**Rationale:** Will help maintain functionality of flood storage areas due to decreased erosion.
- Action Item:** Develop and implement a Beaver Management Strategy.  
**Responsible Department/Board:** Board of Health, Fire Department  
**Proposed Completion Date:** 2009  
**Rationale:** Beaver dams block existing water flow and can exacerbate flooding. Beaver management will decrease number of dams.
- Action Item:** Identify all Pre-FIRM structures throughout Town that need to be elevated above the base-flood elevation.  
**Responsible Department/Board:** Building Inspector, Fire Department  
**Proposed Completion Date:** 2010  
**Rationale:** Once identified, the Town can start to elevate the identified structures, decreasing damage in future floods.
- Action Item:** Identify, prioritize and replace undersized culverts throughout Town.  
**Responsible Department/Board:** Select Board, Highway Department  
**Proposed Completion Date:** 2011  
**Rationale:** Improved water flow will decrease water level increases in flood-prone areas during storms and lessen the likelihood of flooding.

## Severe Snow Storms/Ice Storms

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**Goal Statement:** To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to severe snow and ice storms.

**Action Item:** Evaluate the EOCs--Town Hall and the Elementary School-- to determine if they are capable of supporting potential snow loads and make necessary upgrades if they are found to be deficient.

**Responsible Department/Board:** Building Inspector, Emergency Management Director

**Proposed Completion Date:** 2010

**Rationale:** EOCs will be better able to withstand disasters and provide adequate shelter for town residents during a disaster.

**Action Item:** Identify and upgrade structures to create additional shelters in remote locations in town.

**Responsible Department/Board:** Emergency Management Director

**Proposed Completion Date:** 2010

**Rationale:** Provide shelters for town residents unable to reach existing shelters during a disaster.

## Hurricanes, Tornadoes & Microbursts

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The Action Items listed above, under flooding, address the flooding that can result from a hurricane.

**Goal Statement:** To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to high winds associated with hurricanes and tornadoes.

**Action Item:** Evaluate the EOCs--Town Hall and the Elementary School-- to determine if they are resistant to potential winds effects from hurricanes, tornadoes and microbursts and make necessary upgrades if they are found to be deficient.

**Responsible Department/Board:** Building Inspector, Emergency Management Director

**Proposed Completion Date:** 2010

**Rationale:** EOCs will be better able to withstand disasters and provide adequate shelter for town residents during a disaster.

**Action Item:** In the Zoning regulations for Telecommunication Facilities, add safety and prevention of wind-related damage as a stated purpose.

**Responsible Department/Board:** Planning Board

**Proposed Completion Date:** 2008

**Rationale:** Will result in future telecommunications facilities being better able to withstand extreme storm conditions, lowering communications breakdowns among public safety officials during storms and decreasing creation of debris that could damage structures or injure people.

## **Wildfires/Brushfires**

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**Goal Statement:** To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to wildfires/brushfires.

**Action Item:** Work with the railroads to know when they plan to grind the tracks. Have Firefighters on alert at these times.

**Responsible Department/Board:** Fire Department and Conservation Commission

**Proposed Completion Date:** 2008

**Rationale:** Will decrease likelihood of a small brushfire becoming a large, damaging wildfire.

**Action Item:** Revise the Subdivision Rules and Regulations Required Improvements section to include the construction of an underground water tank(s) (10,000 gal. minimum) in new subdivisions for fire suppression purposes.

**Responsible Department/Board:** Planning Board

**Proposed Completion Date:** 2008

**Rationale:** Will increase ability to quickly suppress structure fires and prevent them from spreading to adjacent vegetation and becoming a wildfire.

**Action Item:** Develop and distribute an educational pamphlet on fire safety and prevention to all town residents.

**Responsible Department/Board:** Fire Department

**Proposed Completion Date:** Ongoing

**Rationale:** Will decrease likelihood of allowed, open burning of spreading and becoming a wildfire.

## Earthquakes

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**Goal Statement:** To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to earthquakes.

**Action Item:** Evaluate the EOCs--Town Hall and the Elementary School-- to determine if they are earthquake resistant and make necessary upgrades if they are found to be deficient.

**Responsible Department/Board:** Building Inspector, Emergency Management Director

**Proposed Completion Date:** 2010

**Rationale:** EOCs will be better able to withstand disasters and provide adequate shelter for town residents during a disaster.

**Action Item:** Conduct inspection of existing back-up generators and upgrade if needed to ensure that all identified shelters have sufficient back-up utility service in the event of primary power failure.

**Responsible Department/Board:** Emergency Management Director

**Proposed Completion Date:** 2008

**Rationale:** EOCs will be better able to withstand disasters and provide adequate shelter for town residents during a disaster.

## Dam Failure

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**Goal Statement:** To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to dam failures. Action listed below is will also mitigate Flooding and Hurricane hazards.

**Action Item:** Create schedule of required dam inspections, send letters of notification to private dam owners at both one year and six months prior to required inspection dates, determine if inspections have been completed, require copies of inspection reports be provided to the town, and initiate appropriate legal actions if inspections are not completed as required.

**Responsible Department/Board:** Planning Board, Selectboard

**Proposed Completion Date:** Ongoing

**Rationale:** Will lessen the possibility of dam failures.

## **Drought**

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**Goal Statement:** To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to drought.

**Action Item:** Prepare and implement a Water Conservation Plan for the Town.

**Responsible Department/Board:** Planning Board, Select Board, Conservation Commission

**Proposed Completion Date:** 2009

**Rationale:** Will create water storage to be used in the event of drought.

## **Man-Made Hazards/Hazardous Materials**

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**Goal Statement:** To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to man-made hazards/hazardous materials

**Action Item:** Provide training to public safety staff/first responders in how to handle hazardous substance releases.

**Responsible Department/Board:** Fire Department and Conservation Commission

**Proposed Completion Date:** Ongoing

**Rationale:** Increase efficiency of public safety officials/first responders in event of a hazardous material release to help contain/counteract release.

## **Prioritized Implementation Schedule**

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### **Summary of Critical Evaluation**

The Chester Hazard Mitigation Planning Committee reviewed each of the actions identified above, as well as existing mitigation strategies using the following factors to prioritize mitigation projects:

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

### **Project Prioritization**

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

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

**PRIORITIZED IMPLEMENTATION SCHEDULE  
(ACTION PLAN)**

**IMPLEMENTATION STRATEGY FOR PRIORITY MITIGATION ACTIONS**

The Chester Hazard Mitigation Planning Committee created the following prioritized schedule for implementation:

<b>ACTION NUMBER</b>	<b>MITIGATION ACTION</b>	<b>RESPONSIBLE DEPARTMENT/BOARD</b>	<b>PROPOSED COMPLETION DATE</b>	<b>HAZARD ACTION INTENDED TO MITIGATE</b>	<b>POTENTIAL FUNDING SOURCE(S)</b>	<b>ESTIMATED COST</b>
1	Stream bank stabilization for portions of the Westfield river that flow through the community.	Chester Select Board, Hazard Mitigation committee, EMD	2010	Flooding	FEMA	\$150,000
2	Identify, prioritize and replace undersized culverts throughout Town.	Select Board, Highway Department	2011	Flooding	FEMA	\$200,000
3	Establish an alternate interconnection point for the Light Department at the Chester/Huntington town line on Old State Highway. This would involve extending the Town's three-phase power line from the Post Office on Route 20 to the interconnection point.	Chester Electric Light Department with WMECO	2008	All, except drought	WMECO	N/A
4	Develop a Preliminary Project Proposal and Cost Estimate for Updating Current 911 System including Feasibility of Reverse 911	Board of Selectmen, EMD	2009	All, except drought	Municipal funds, Volunteers Homeland Security MEMA	\$5,000
5	Work with the railroads to know when they plan to grind the tracks as this produces the greatest risk of wildfires. Have Firefighters on alert at these times.	Fire Department	2008	Wildfires/Brushfires	Municipal funds, Volunteers	N/A
6	Identify existing shelters that are earthquake, winter storm, and high wind resistant as well as outside floodplain and dam inundation areas. Upgrade as needed.	Building Inspector, EMD	On-going	Flooding, Severe Snow/Ice storms, Hurricanes, Tornadoes/Microbursts, Earthquakes, Dam Failure	Municipal funds, Volunteers	N/A
7	Evaluate the EOCs to determine if they are disaster resistant and make necessary upgrades if they are found to be deficient.	Building Inspector, Board of Selectmen, Planning Board, EMD		All, except drought		N/A
8	Inventory supplies at existing shelters and develop a needs list and storage requirements	Emergency Management Planning Committee, School Facilities Manager	2008	All, except drought	Municipal funds, Volunteers	N/A
9	Establish a Community Emergency Response Team (CERT) with neighboring communities.	Board of Selectmen, Police & Fire Departments, EMD	On-going	All	MEMA Municipal funds, Volunteers	\$1,000

**PRIORITIZED IMPLEMENTATION SCHEDULE** (continued)

<b>ACTION NUMBER</b>	<b>MITIGATION ACTION</b>	<b>RESPONSIBLE DEPARTMENT/BOARD</b>	<b>PROPOSED COMPLETION DATE</b>	<b>HAZARD ACTION INTENDED TO MITIGATE</b>	<b>POTENTIAL FUNDING SOURCE(S)</b>	<b>ESTIMATED COST</b>
10	Identify and upgrade structures to create additional shelters in remote locations in Town.	EMD	2008	All, except drought	Municipal funds, Volunteers	N/A
11	Conduct inspection of existing back-up generators and upgrade if needed to ensure that all identified shelters have sufficient back-up utility service in the event of primary power failure.	Building Inspector, EMD	2009	All, except drought	DHS	\$50,000
12	Develop and distribute an educational pamphlet on Fire Safety and Prevention to all town residents. (SAFE PROGRAM)	Fire Department	On-going	Wildfires/Brushfires	Municipal funds, Volunteers MEMA Dept. of Fire Safety	\$3,000
13	Provide training to public safety staff/first responders in how to handle hazardous substance releases.	Fire Department	On-going	Wildfires/Brushfires	Municipal funds, Volunteers MEMA Dept. of Fire Safety	N/A
14	Collect, update, and disseminate information on local radio/TV stations emergency information	EMD	2008	All, except drought	Municipal funds, Volunteers	N/A
15	Implement Standards in the Subdivision Rules and Regulations to require temporary and permanent erosion control measures	Planning Board	2008	Flooding	Municipal funds, Volunteers MEMA	\$1000
16	Revise the Subdivision Rules and Regulations Required Improvements section to include the construction of an underground water tank(s) (10,000 gal. minimum) in new subdivisions for fire suppression purposes.	Fire Department, Planning Board	2008	Wildfires/Brushfires	Municipal funds, Volunteers MEMA	\$1000
17	Amend the Special Permit and Site Plan Approval Provisions in the Chester Zoning Bylaw by adding more specific Requirements to Address Flood Related Issues	Conservation Commission, Planning Board	2008	Flooding	Municipal funds, Volunteers MEMA	\$500
18	Add Flood prevention and mitigation to the purpose section of the Subdivision Rules and Regulations.	Planning Board	2008	Flooding	Municipal funds, Volunteers MEMA	\$1000
19	Ensure that the Development Impact Statement identifies impacts of the proposed development could have on the potential for flooding, and include mitigation measures, if deemed necessary by the Planning Board.	Planning Board	2008	Flooding	Municipal funds, Volunteers MEMA	\$500



**PRIORITIZED IMPLEMENTATION SCHEDULE** (continued)

<b>ACTION NUMBER</b>	<b>MITIGATION ACTION</b>	<b>RESPONSIBLE DEPARTMENT/BOARD</b>	<b>PROPOSED COMPLETION DATE</b>	<b>HAZARD ACTION INTENDED TO MITIGATE</b>	<b>POTENTIAL FUNDING SOURCE(S)</b>	<b>ESTIMATED COST</b>
20	Implement standards in the Subdivision Rules and Regulations to require temporary and permanent erosion control measures for streams and surface water bodies.	Planning Board	2008	Flooding	Municipal funds, Volunteers MEMA	\$500
21	Add specific impacts to address in the Special Permit process including topographic change, removal of cover vegetation, risk of erosion or siltation and increased stormwater runoff.	Planning Board	2008	Flooding, Hurricanes	Municipal funds, Volunteers MEMA	\$500
22	In regards to the Chester Open Space and Recreation Plan, implement the Five-Year Action Plan strategies, particularly those dealing with protection of forests and farmland.	Planning Board	2008	Flooding, Hurricanes	EOEA DCR	N/A
23	Develop and implement a Beaver Management Strategy	Planning Board	2008	Flooding	Municipal funds, Volunteers	N/A
24	Create schedule of required dam inspections, send letters of notification to private dam owners at both one year and six months prior to required inspection dates, determine if inspections have been completed, require copies of inspection reports be provided to the town, and initiate appropriate legal actions if inspections are not completed as required.	Board of Selectmen	On-going	Dam Failure	Municipal funds, Volunteers	N/A
25	Prepare and implement a Water Conservation Plan	Board of Selectmen, Conservation Commission	2009	Drought	Smart Growth Technical Assistance Grant Program	\$7,500
26	Identify all Pre-FIRM Structures throughout Town that need to be Elevated above the Base-Flood Elevation	Building Inspector, Fire Department	2010	Flooding	Municipal funds,	N/A
27	In the Zoning regulations for Telecommunication Facilities, add safety and prevention of wind-related damage as a stated purpose.	Planning Board	2008	Hurricanes/Tornadoes/ Microbursts	Municipal funds, Volunteers	N/A

## 7 – PLAN ADOPTION & IMPLEMENTATION

### Plan Adoption

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Upon completion, copies of the final draft of the Chester Hazard Mitigation Plan were distributed to the Chester Hazard Mitigation Planning Committee for their review and approval. The final draft of the plan was forwarded to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency (FEMA) for their conditional approval (all required components of the plan were completed with the exception of local adoption). Once conditional approval is given by MEMA/FEMA, a public meeting will be held by the Chester Select Board to present the final copy of the Chester Hazard Mitigation Plan to Town officials and residents and to request comments from this board and the general public. Once the Chester Hazard Mitigation Plan is formally approved by the Select Board, it will be forwarded to MEMA/FEMA for their final approval.

### Plan Implementation

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

### Plan Monitoring and Evaluation

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

The Chester Natural Hazards Planning Committee will meet on an annual basis or as needed (i.e., following a natural disaster) to monitor the progress of implementation, evaluate the success or failure of implemented recommendations, and brainstorm for strategies to remove obstacles to implementation. Outreach to the public, surrounding communities, agencies, businesses, academia, non-profits, or other interested parties outside of the town of Chester will be done in advance of each annual meeting in order to solicit their participation in assessment of the plan. Following these discussions, it is anticipated that the committee may decide to reassign the roles and responsibilities for implementing mitigation strategies to different town departments and/or revise the goals and objectives contained in the plan. At a minimum, the committee will review and update the plan every five years, beginning in the fall of 2011. The meetings of the committee will be organized and facilitated by the Emergency Management Director or the Chester Select Board.

### **Incorporation of Plan Requirements into other Planning Mechanisms/Documents**

At times when the town of Chester is considering creation of or changes to local planning documents or procedures including, but not limited to comprehensive plans, capital improvement plans, zoning and building codes site reviews and permitting processes the information and recommendations contained in this plan will be reviewed by the people and committees involved in those processes and, when appropriate, will incorporate those recommendations into the new planning procedures.

**CERTIFICATE OF ADOPTION**  
**TOWN OF CHESTER, MASSACHUSETTS**  
**BOARD OF SELECTMEN**  
**A RESOLUTION ADOPTING THE CHESTER**  
**HAZARD MITIGATION PLAN**

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

WHEREAS, several public planning meetings were held between December 2006 and April 2007 regarding the development and review of the Chester Hazard Mitigation Plan; and

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

WHEREAS, a duly-noticed public hearing was held by the Chester Select Board on \_\_\_\_\_, 2007 to formally approve and adopt the Chester Hazard Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Chester Select Board adopts the Chester Hazard Mitigation Plan.

ADOPTED AND SIGNED this **Date** \_\_, 2008.

Andy Myers, Chair  
Chester Select Board

Michael Crochiere, Clerk  
Select Board

John Baldasaro,  
Select Board

ATTEST

# **APPENDICES**

# Appendix A

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## TECHNICAL RESOURCES

### 1) Agencies

Massachusetts Emergency Management Agency (MEMA).....	508/820-2000
Hazard Mitigation Section .....	617/626-1356
Federal Emergency Management Agency (FEMA) .....	617/223-4175
MA Regional Planning Commissions:	
Berkshire Regional Planning Commission (BRPC).....	413/442-1521
Cape Cod Commission (CCC).....	508/362-3828
Central Massachusetts Regional Planning Commission (CMRPC).....	508/693-3453
Franklin Regional Council of Governments (FRCOG).....	413/774-3167
Martha’s Vineyard Commission (MVC).....	508/693-3453
Merrimack Valley Planning Commission (MVPC).....	978/374-0519
Metropolitan Area Planning Council (MAPC).....	617/451-2770
Montachusett Regional Planning Commission (MRPC).....	978/345-7376
Nantucket Planning and Economic Development Commission (NP&EDC).....	508/228-7236
Northern Middlesex Council of Governments (NMCOG).....	978/454-8021
Old Colony Planning Council (OCPC).....	508/583-1833
Pioneer Valley Planning Commission (PVPC).....	413/781-6045
Southeastern Regional Planning and Economic Development District (SRPEDD).....	508/823-1803
MA Board of Building Regulations & Standards (BBRS).....	617/227-1754
MA Coastal Zone Management (CZM).....	617/626-1200
DCR Water Supply Protection.....	617/626-1379
DCR Waterways.....	617/626-1371
DCR Office of Dam Safety.....	508/792-7716
DFW Riverways.....	617/626-1540
DEP Wetlands and Waterways.....	617/292-5500
MA Dept. of Housing & Community Development.....	617/573-1100
Woods Hole Oceanographic Institute.....	508/457-2180
UMass-Amherst Cooperative Extension.....	413/545-4800
National Fire Protection Association (NFPA).....	617/770-3000
New England Disaster Recovery Information X-Change (NEDRIX – an association of private companies & industries involved in disaster recovery planning).....	781/485-0279
MA Board of Library Commissioners.....	617/725-1860
MA Highway Dept, District 2.....	413/582-0599
MA Division of Marine Fisheries.....	617/626-1520
MA Division of Capital & Asset Management (DCAM).....	617/727-4050
Massachusetts Association of Regional Planning Agencies (MARPA).....	413/781-6045
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
U.S. Department of Commerce: National Oceanic and Atmospheric Administration: National Weather Service; Tauton, Massachusetts .....	508/824-5116
U.S. Department of the Interior: US Fish and Wildlife Service .....	413/253-8200
U.S. Geological Survey .....	508/490-5000

### 2) Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP) .....	Massachusetts Emergency Management Agency
406 Public Assistance and Hazard Mitigation .....	Massachusetts Emergency Management Agency
Community Development Block Grant (CDBG).....	DHCD, also refer to RPC

Dam Safety Program.....	MA Division of Conservation and Recreation
Disaster Preparedness Improvement Grant (DPIG) .....	Massachusetts Emergency Management Agency
Emergency Generators Program by NESEC <sup>†</sup> .....	Massachusetts Emergency Management Agency
Emergency Watershed Protection (EWP) Program.....	USDA, Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMAP) .....	Massachusetts Emergency Management Agency
Flood Plain Management Services (FPMS).....	U.S. Army Corps of Engineers
Mitigation Assistance Planning (MAP).....	Massachusetts Emergency Management Agency
Mutual Aid for Public Works.....	Western Massachusetts Regional Homeland Security Advisory Council
National Flood Insurance Program (NFIP) <sup>†</sup> .....	Massachusetts Emergency Management Agency
Power of Prevention Grant by NESEC <sup>†</sup> .....	Massachusetts Emergency Management Agency
Roadway Repair & Maintenance Program(s).....	Massachusetts Highway Department
Section 14 Emergency Stream Bank Erosion & Shoreline Protection .....	U.S. Army Corps of Engineers
Section 103 Beach Erosion.....	U.S. Army Corps of Engineers
Section 205 Flood Damage Reduction.....	U.S. Army Corps of Engineers
Section 208 Snagging and Clearing .....	U.S. 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

<sup>†</sup>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.

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

### 3) Websites

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	<a href="http://www.colorado.edu/litbase/ha_zards/">http://www.colorado.edu/litbase/ha_zards/</a>	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	<a href="http://wxp.eas.purdue.edu/hurricane">http://wxp.eas.purdue.edu/hurricane</a>	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	<a href="http://nemaweb.org">http://nemaweb.org</a>	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center “Disaster Finder:	<a href="http://www.gsfc.nasa.gov/ndrd/dis_aster/">http://www.gsfc.nasa.gov/ndrd/dis_aster/</a>	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	<a href="http://ltpwww.gsfc.nasa.gov/ndrd/main/html">http://ltpwww.gsfc.nasa.gov/ndrd/main/html</a>	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	<a href="http://www.statelocal.gov/">http://www.statelocal.gov/</a>	General information through the federal-state partnership.
National Weather Service	<a href="http://nws.noaa.gov/">http://nws.noaa.gov/</a>	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	<a href="http://h20.usgs.gov/public/realtime.html">http://h20.usgs.gov/public/realtime.html</a>	Provisional hydrological data
Dartmouth Flood Observatory	<a href="http://www.dartmouth.edu/artsci/geog/floods/">http://www.dartmouth.edu/artsci/geog/floods/</a>	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	<a href="http://www.fema.gov/fema/csb.html">http://www.fema.gov/fema/csb.html</a>	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	<a href="http://www.met.fsu.edu/explores/tropical.html">http://www.met.fsu.edu/explores/tropical.html</a>	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	<a href="http://lightningsafety.com/">http://lightningsafety.com/</a>	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	<a href="http://www.ghcc.msfc.nasa.gov/ot_d.html">http://www.ghcc.msfc.nasa.gov/ot_d.html</a>	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	<a href="http://www.wep.es.llnl.gov/www/wep/geohp.html">http://www.wep.es.llnl.gov/www/wep/geohp.html</a>	General hazard information developed for the Dept. of Energy.
The Tornado Project Online	<a href="http://www.tornadoject.com/">http://www.tornadoject.com/</a>	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	<a href="http://www.nssl.uoknor.edu/">http://www.nssl.uoknor.edu/</a>	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	<a href="http://www.iaaa.iix.com/ndcmap.html">http://www.iaaa.iix.com/ndcmap.html</a>	A multi-disaster risk map.
Earth Satellite Corporation	<a href="http://www.earthsat.com/">http://www.earthsat.com/</a>	Flood risk maps searchable by state.
USDA Forest Service Web	<a href="http://www.fs.fed.us/land">http://www.fs.fed.us/land</a>	Information on forest fires and land management.



## **Appendix B: Documentation of the Planning Process**

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**Chester Hazard Mitigation Team**  
**Meeting #1**

**AGENDA**  
**12/8/06**  
**10:00 a.m.**  
**Town Hall**

**1) Introduction**

**2) Purpose of Committee**

- Why selected to serve on Committee
- What we are doing and why

**3) What is Hazard Mitigation Planning?**

- PowerPoint Presentation on Hazard Mitigation

**4) Step 1: Organize Hazard Mitigation Team**

- Establish a chairperson/point of contact

**5) What must we do to prepare a Hazard Mitigation Plan?**

- Explain/set milestones (5 committee meetings)
- Agree on next committee meeting date

**6) Question and Answer Period**

**7) Set Goals for Next Meeting**

**Chester Hazard Mitigation Team**  
Meeting #2

**AGENDA**  
12/8/06  
10:30 a.m.  
Town Hall

**1) Identify Hazards (past and potential) on Base Map**

- What are the hazards?
- What is at risk from those hazards?

**2) Develop Base Map with Critical Facilities**

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

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

**3) Question and Answer Period**

**4) Set Goals for Next Meeting**

**Chester Hazard Mitigation Team**  
Meeting #3

**AGENDA**  
January 12 2007  
10:00 a.m.  
Town Hall

**1) Review Identification of Hazards**

- Past and Potential
- Critical Facilities

**2) Assess Vulnerability**

- Estimating Potential Losses

**3) Analyze Development Trends**

- Looking at Community Change
- Map out Development Patterns

**4) Question and Answer Period**

**5) Set Goals for Next Meeting**

**Chester Hazard Mitigation Team**  
Meeting #4

**AGENDA**  
2/9/07  
10:00 a.m.  
Town Hall

- 1) Identify What's in Place & Identify gaps in the current protection**
  - Review of Draft Existing Protection Measures
  - Identify gaps in existing protection
  
- 2) Review of Draft Goal Statements**
  
- 3) Brainstorm Mitigation Actions**
  - What actions can be taken?
  - Evaluating Action Feasibility
  
- 4) Question and Answer Period**
  
- 5) Set Goals for Next Meeting**

**Chester Hazard Mitigation Team**  
**Meeting #5**

**AGENDA**

3/2/07

10:00 a.m.

Town Hall

**2) Prioritize List of Mitigation Actions in Order of Importance**

- Fill out the Evaluation Chart for each action.

**2) Establish a Minimum Acceptable Level for Actions**

**4) Prioritize Final List of Actions**

- Select Actions which Best Suit Community's Needs
- Include actions that can be implemented quickly

**5) Question and Answer Period**

**6) Set Goals for Next Meeting**

Develop Strategy to Implement Selected Prioritized Actions:

- Who will be responsible for implementing each prioritized action;
- When will these actions be implemented;
- How will the community fund the projects?

Develop Process for Adoption and Monitoring of the Plan

**Chester Hazard Mitigation Team**  
Meeting #6

**AGENDA**

4/3/07

9:30 a.m.

Town Hall

- 1) **Develop Strategy to Implement Selected Prioritized Actions**
  - Who will be responsible for implementing each prioritized action;
  - When will these actions be implemented?
  - How will the community fund the projects?
  
- 2) **Develop Process for Adoption and Monitoring of the Plan**
  
- 3) **Review & Revise as Necessary Final Draft of the Chester *Hazard Mitigation Plan***
  
- 4) **Discuss Next Steps for the Chester *Hazard Mitigation Plan* including FEMA Review and Adoption by the Board of Selectmen/City Council.**
  
- 5) **Question and Answer Period**

**Chester Hazard Mitigation Team**  
**Meeting #7**

**AGENDA**  
**11/13/07**  
**4:15 p.m.**  
**Town Hall**

- 1) Introduction**
- 2) Review FEMA comments on Draft Plan and discuss proposed changes to Plan**
- 3) Discuss Next Steps for the Chester *Hazard Mitigation Plan* including FEMA Review and Adoption by the Board of Selectmen/City Council.**
- 4) Question and Answer Period**



(Documentation of Public Notices)

**PRESS RELEASE**

CONTACT: Andrew Smith, Pioneer Valley Planning Commission, (413) 781-6045

FOR IMMEDIATE RELEASE  
September 12, 2007

**Public Input Sought on Pre-Disaster Mitigation Plans**

The Pioneer Valley Planning Commission has completed final working drafts of pre-disaster mitigation plans for thirteen communities in the region: Agawam, Chester, Chesterfield, Chester, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton, and South Hadley.

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

The draft plans are posted for public review and comment on PVPC's website at [www.pvpc.org](http://www.pvpc.org). Please submit comments to PVPC's Andrew Smith at (413) 781-6045 or [asmith@pvpc.org](mailto:asmith@pvpc.org) no later than November 30, 2007. Communities with approved plans will be eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

These pre-disaster mitigation plans are being developed with assistance from the Pioneer Valley Planning Commission with funding provided by the Massachusetts Emergency Management Agency.

# The Republican.

## 'Predisaster plans' readied for grants

Sunday, September 23, 2007

By **NANCY H. GONTER**  
ngonter@repub.com

It's the public's turn to weigh in on plans prepared by local communities to keep the damage from natural disasters to a minimum. Sixteen "predisaster mitigation plans," developed by the Pioneer Valley Planning Commission working with local officials from each community, are part of an effort to secure grant money from the Massachusetts Emergency Management Agency, said Catherine M. Miller, principal planner with the commission.

"This comes from an effort by the Federal Emergency Management Agency that while we are aware you can't prevent natural disasters from happening, you can prevent the long term consequences," Miller said.

The plans, which average more than 100 pages each, can be viewed on the agency's Web site at [www.pvpc.org](http://www.pvpc.org) Plans for Agawam, Chester, Chesterfield, Chester, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton, South Hadley, Southwick, Ware and Wilbraham are available, she said.

"This is largely an education exercise so people know local government is looking into these things and thinking about what the consequences of natural disasters would be. It's reassuring to know local governments are looking at this kind of thing especially after all the awareness following (hurricane) Katrina," Miller said.

Comments may be made by calling Andrew Smith at the Commission at (413) 781-6045 or by e-mailing him at [asmith@pvpc.org](mailto:asmith@pvpc.org) by Nov. 30.

The plans were developed with a state grant of \$224,962 which was supplemented by local communities for total cost of just under \$300,000, she said.

Each plan looks at the risks communities may face from natural disasters such as flooding, tornadoes, drought and earthquakes, and what can be done to prevent damage to property and loss of life. They also prioritize projects for funding for mitigation efforts, Miller said. An example of a mitigation project is Greenfield's purchase of the Wedgewood Gardens mobile home park which was badly flooded by the Green River in 2005 and had previously been flooded, although that was not part of this program, Miller said.

The commission is working with 32 communities in this area and a second round of 16 more communities will soon be started. They are Amherst, Belchertown, Brimfield, Chicopee, Cummington, Goshen, Granby, Huntington, Palmer, Southampton, Springfield, Westfield, West Springfield, Westhampton, Williamsburg and Worthington.

After that, a plan for the entire region will be prepared, Miller said.

Northampton Deputy Fire Chief Dana Cheverette, a member of the local committee that worked with the commission on the city's plan, said going through the process of preparing the plan was helpful.

"You identify the flood plans and you identify the area where you need to put your resources. In 1988 when the Oxbow area flooded, a lot of people got isolated. Now we know where the people could get isolated," Cheverette said.

# Sunday's news briefs

Posted by The Republican Newsroom September 30, 2007 12:04PM

## **Predisaster plan drafts**

The Pioneer Valley Planning Commission has completed final working drafts of predisaster mitigation plans for 13 communities in the region. The draft plans are posted for public review and comment on the commission's Web site at [www.pvpc.org](http://www.pvpc.org). The deadline for comments is Nov. 30.

This planning effort is being undertaken to help communities assess the risks they face from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts. Communities with approved plans will be eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

Affected are Agawam, Chester, Chesterfield, Chester, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton and South Hadley.

# Appendix C

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## 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
HMGF	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

# Past and Potential Hazards/Critical Facilities Map

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