


The City of Westfield

Local Natural Hazards Mitigation Plan

Adopted by the City Council of the City of Westfield on 

Prepared by:

The Westfield Natural Hazards Mitigation Planning Committee

and

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1: INTRODUCTION

Hazard Mitigation

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

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

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

Planning Process

The natural hazard mitigation planning process for the City of Westfield included the following tasks:

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

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

Public Committee Meetings

February 27, 2008, 10:00 a.m.: Informational and organizational meeting with Local Emergency Planning Committee (LEPC), held at Westfield LEPC Headquarters.

March 19, 2008, 10:00- 11:00 a.m.: Working committee meeting held at Westfield LEPC Headquarters.

April 16, 2008, 10:00- 11:30 a.m.: Working committee meeting held at Westfield LEPC Headquarters.

May 21, 2008, 10:00- 11:30: Working committee meeting held at Westfield Fire Department Headquarters.

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

Public Meetings with the Mayor and City Council

Date: The Mayor and City Council adopted the Local Natural Hazard Mitigation Plan. Meeting held at Westfield City Offices.

Participation by Public & Entities in Surrounding Communities

On December 15, 2007 the Pioneer Valley Planning Commission sent a press release to all area media outlets to inform private citizens that the planning process for Westfield's Hazard Mitigation Plan had commenced and that all residents of Westfield were invited to attend plan development sessions. This press release (see Appendix E) resulted in a series of news articles that enhanced awareness of Westfield's Hazard Mitigation Planning Process.

In addition to media outreach, all public meetings were posted at the Westfield City Hall in compliance with the Commonwealth of Massachusetts' open meeting law.

On June 30, 2008 the Pioneer Valley Planning Commission sent a press release (see Appendix E) to all area media outlets to inform the public that a draft of Westfield's Hazard Mitigation Plan had had been placed on PVPC's and Westfield's websites and hard copies were available at PVPC's offices and Westfield City Hall and that all residents, businesses and other concerned parties of Westfield and adjacent communities were encouraged to comment on the plan. The plans were made available in this manner for 30 days. Citizens from adjacent municipalities were also encouraged to comment on Westfield's plan and on the plans of four other communities (Cumington, Palmer, Southampton, & Westhampton) that were available for the same period.

2: LOCAL PROFILE

Community Setting

The City of Westfield is nestled at the foot of the picturesque Berkshires in Western Massachusetts. The city is bordered by West Springfield on the east, Southwick on the south, Granville on the southwest, Russell and Montgomery on the west, Southampton on the north and Holyoke on the northeast. Comprised of over 47 square miles, Westfield is just northwest of the metropolitan area of Springfield, as well as 99 miles from Boston, and 134 miles from New York City.

From the time of its founding in 1669 to 1725, Westfield was the most western town in the Massachusetts Colony. Town meetings were held in a church meeting house until 1839 when Town Hall was erected on Broad Street. This building served as a City Hall from 1920 to 1958. Due to its alluvial lands, the inhabitants of this area were entirely devoted to agricultural pursuits for about 150 years. Early in the 19th century the making of bricks, whips, and cigars became the principal occupations. Other firms engaged in the production of bicycles, paper products, boilers and radiators, textile machinery, abrasives, wood products and precision tools. The establishment of industry in the community changed its character from agricultural to a thriving industrial city during the latter part of the 19th century.

Today, Westfield is a regional commercial and industrial center. Over the past 25 years, the city's economic and employment growth have outpaced the population growth, an uncommon trend in the Pioneer Valley. Manufacturing, education, health and social services and retail trade are the largest sources of employment. Westfield State College is located in the city, as well as two health care facilities, the municipally-owned Barnes Airport, and Stanley Park – one of the region's most outstanding parks. Even with these urban characteristics, the City maintains its rural roots and some agriculture is still carried on in parts of Westfield.

Westfield is a mixture of residential neighborhoods, industrial development, and a commercial downtown. It combines suburban and rural living with the services and amenities of a city.

Infrastructure

Westfield's infrastructure reflects its mix of rural and urban roots, coupled with its location along the Westfield River.

Roads and Highways

The Massachusetts Turnpike, Interstate 90, crosses Westfield just north of the central business district, providing excellent east-west access. Exit 3 is located a few minutes

from downtown. Route 20 is the major east-west arterial of the city; routes 10 and 202 are the major north-south arterials. These two routes meet in downtown Westfield.

Transit

The City is presently served by two Pioneer Valley Transit Authority bus routes to Springfield and Holyoke.

Air

Barnes Municipal Airport in Westfield is the third largest commercial airport in New England. Commuter and charter passenger service as well as freight service is available at Barnes.

Rail

Rail freight service is provided by Pioneer Valley Railroad and Conrail. More than 35 motor freight carriers with nearby terminals provide competitive freight service locally and to all distant points.

Public Water Service

The Westfield Water Department had its beginnings in 1873 when the Massachusetts Legislature authorized the Town of Westfield to construct a reservoir in Montgomery. The City of Westfield now receives water from several different sources. The main source, the Granville Reservoir, supplies up to 4 million gallons per day of water to the city. The city also receives water from 6 active wells. Westfield is also authorized to withdraw up to 3.2 million gallons per day from the Springfield water system through an interconnection located off Shaker Road.

The distribution system loops around the city and includes over 200 miles of water mains. The system includes over 1,600 fire hydrants and 10,300 services, all of which are metered.

Sewer Service

Since 1973, the City has had its own Wastewater Treatment Plant. The plant was recently upgraded in 2005 to increase its hydraulic capacity from 4 four million gallons per day up to 6.1 million. The plant serves about 75% of the Westfield area. The Wastewater Treatment Plant removes 95% to 99% of the pollutants before being discharged into the Westfield River.

Natural Resources

Westfield, at 30,000 acres, is the second largest city on Massachusetts. The northwest, southwest and southeastern areas of the city are characterized by ridges ranging from 1,111 feet along Ball Mountain in the northwest to 100 feet where the Westfield River meets Agawam in the southeast. These ridges are bisected in the western region by the Westfield River which flows easterly. The Little River enters at the southwestern border and joins the Westfield River about a mile west of the city's eastern border. The two rivers form one of the largest floodplains in the Connecticut River system. The floodplain

is an asset for farming and recreation but is also a potential flood hazard. Dikes have been built previously to mitigate the problem and are also used informally for passive recreation.

Numerous small streams flow through the city and provide a variety of recreation spots and wildlife habitat. A series of kettle holes in the north central part of Westfield is one of the city's most unique features.

Water Resources

Westfield has a wide variety of water resources including rivers and brooks of various sizes, many ponds, some natural and some man-made and a large number of wetlands.

The most significant of Westfield's water resources is the Westfield River, flowing through the heart of the city. It is very shallow most of the time, navigable only by canoes and kayaks. Most of the other waterways in the city drain into the Westfield River either in the city or just outside. The Westfield River is designated as a National Wild and Scenic River the purpose of which is to "protect outstanding rivers from the harmful effects of new Federal projects." To be designated a National Wild and Scenic River, a river must have at least one "outstandingly remarkable" natural, scenic, or cultural value. The Westfield far surpasses that standard with "outstandingly remarkable" values encompassing scenic, geologic, historic, fishery, and recreational resources, water quality and flow, and rare and endangered species.

Other streams include the Little and Manhan Rivers, Powdermill, Great, Brickyard, Pond, Arm, Ashley, 100 Acre, Jacks, Jim, Cook, Meadow, Sandy Mill, Munn, Barry's, Trask, Bush, and Cooley Brooks. Ponds include the Kettle holes, Pequot, Horse, Long, Doe, Buck, Round, Chapin (collectively the Hammond Ponds), Fuller Reservation, Crane, and Spectacle Ponds as well as a number of un-named ponds. Additionally, Westfield contains about 982 acres of wetlands

These water resources all provide important wildlife habitat, flood storage capacity, and recreation outlets, and in some cases they are water supply sources as well.

Forests and Fields

Almost 50% of the total acreage of Westfield remains forested, approximately 15,000 acres. The predominant forest habitat in Westfield is the northern hardwoods hemlock. Species vary with the topography but consist primarily of hemlock, beech, sugar maple, and yellow birch.

Approximately 2,300 acres of agricultural land (7%) remain which along with various open land in provide additional vegetation types and habitat opportunities.

Development

Westfield's growth was initiated first by farmers, then by industry and commercial development, and more recently commercial and residential redevelopment. But the city's topography, soils, and physiography (lakes, rivers, wetlands and watershed areas) shape and constrain these land use patterns.

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

The current Bylaw establishes twelve base zones and two overlay zones:

- Five residential districts: Rural Residential, Residence A, Residence B, Residence C, Residence C-1 (Project);
- Two commercial districts: Commercial A - Neighborhood, Commercial Office Retail Enterprise (CORE);
- Two business districts: Business A (General), Business B (Service);
- Two industrial districts: Industrial A, Industrial Park;
- One airport district: Airport; and
- Two overlay districts: Flood Zone, Water Resource Protection.

Although all appropriate zoning is relevant to protecting the health and safety of the City residents, two of Westfield's districts are specifically relevant to natural hazard mitigation:

- Flood Zone District - The flood zone overlay applies to those areas within the boundary of the one-hundred-year flood that are considered hazardous according to FEMA. It is derived from the FIRMs. It limits some uses in order to prevent potential flood damage.
- Water Resource Protection - The purpose of this overlay district is to protect and preserve Westfield's groundwater resources from potentially damaging pollution or environmental degradation by regulating certain uses within the district. The regulations state specific prohibited and restricted uses, regulates drainage, details special permit procedures.

The Zoning Bylaw also establishes a Site Plan/Special Permit Approval procedure for specific uses and structures within Westfield. This review allows the Special Permit Granting Authority the ability to review development to ensure that the basic safety

and welfare of the people of Westfield are protected, and includes several specific evaluation criteria that are relevant to natural hazards.

Current Development Trends

Because of its developable land, the Westfield area is expected to be a focal point for much of the region's growth. During the 1980s, there was rapid growth in residential development; in the 1990s Westfield's population growth slowed, but continued to increase and continues to do so. Currently there are over 40,000 residents.

Today, the vast majority of Westfield's 47.5 square miles is undeveloped land, totaling close to 15,600 acres. Residential land is the second most prolific land use, totaling close to 6,800 acres; followed next by agricultural land, totaling about 3,500 acres. Land for industrial uses constitutes a relatively large 1,043 acres; and land for commercial uses totals 558 acres. Westfield also has significant acreage for land characterized as urban open/public land and outdoor recreational land, at 587 acres and 654 acres, respectively. Lastly, land used for transportation totals 1,072 acres and water constitutes another 471 acres.

Currently, Westfield's zoning laws and land use regulations somewhat encourage development where most appropriate, with least impact on the environment, and where public infrastructure already exists.

Development in Hazard Areas

Most hazards identified in this plan are regional risks and, as such, most new development falls into the hazard area. The exception to this is flooding, either from storms or dam failures. According to the Community Information System (CIS) of FEMA, there were 1,910 residential structures and 34 additional structures located within the Special Flood Hazard Area (SFHA) in Westfield as of May 1999, the most current records in the CIS for the City of Westfield. Areas with significant development within the likely inundation zone of high risk dams located in Westfield or neighboring communities are those downstream from the Arm Brook, Powdermill, Granville and Montgomery dams. Also, significant portions of Westfield could be flooded if the Cobble Mountain Dam, located in Blandford, were to fail.

3: HAZARD IDENTIFICATION & ANALYSIS

Profiling the Natural Hazards

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

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

Table 3-1: Hazard Profiling and Risk Index Worksheet

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

Natural Hazard Identification and Vulnerability Assessment

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

Vulnerability Assessment Methodology

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

Total value of all structures in Westfield (2006): \$3,164,860,532

Median value of a home in Westfield (2006): \$205,500

Average household size: 2.4 persons

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

Flooding

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

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

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

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

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

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

The Floodplain Map for the City of Westfield 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. Westfield, has a number of large 100 year floodplain areas, mostly associated with the Westfield and Little Rivers and a number of their tributaries including Munn, 100 Acre, Great, Powdermill Brooks. Smaller such areas also exist along the banks of Pond, Barry, and Simmons Brooks, the Manhan River, and the Hammond and Kettle ponds, as well as in a few isolated areas of the city. Some large 500-year floodplains are mapped as well, generally near the confluence of the rivers and brooks mentioned above and in several low-lying areas throughout Westfield.

The major floods recorded in Western Massachusetts during the 20th century have been the result of rainfall alone or rainfall combined with snowmelt. Westfield has experienced a number of flooding events over the last decade. Generally, these were small floods within the 100 year flood plain have had minor impacts, temporarily closing roads and residents' yards and some businesses. However, major floods in 1936, 1938 and 1955 caused significant damage.

In the 1936 flood an unusually cold and snowy winter, followed by a spell of warm and rainy weather, turned the normal spring rising of the Connecticut River into an unprecedented natural catastrophe. The flood inundated Hadley, Hatfield, Northampton, Holyoke, and Springfield, as well as smaller towns (Westfield was one of these) and villages along its course. In Massachusetts alone, the Great Flood killed ten people and left 50,000 homeless. It was an unmatched natural catastrophe for the Bay State, causing over \$200,000,000 in damage in 1936 dollars.

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

Flooding (100-year base flood): Medium-High Risk

There are approximately 3,558 acres of land within the FEMA mapped 100-year floodplain and 2,065 acres of land within the 500-year floodplain within the City of Westfield [approximately 18.5% of Westfield's total land area]. According to the Community Information System (CIS) of FEMA, there were 1,910 residential structures and 34 other structures located within the Special Flood Hazard Area (SFHA) in Westfield as of May 1999, the most current records in the CIS for the City of Westfield. Therefore, a vulnerability assessment for a 100-year flood equals over \$392 million of damage to residential structures, with approximately 4,584 people impacted. A damage estimate for the "other" structures has not been completed but will be addressed in a plan update.

Specific vulnerability assessments were estimated for sites within the SFHA which have been susceptible to 100-year floods in the past, they are described below. At this time the City of Westfield has no repetitive loss properties.

Location

East Main Street (Rt. 20), Mainline Drive, Ascutney Avenue, Verona Street, Clifton Street Delmont Avenue

- The entirety of Ascutney Avenue, Verona Street, Clifton Street Delmont Avenue, East Main Street from Main Line Drive the intersection with Route 187, and the Northern portion of Mainline Drive are included in the threatened area;

- Flooding occurred in this area in 1999 and 2007. No record of actual damage exists.
- Approximately 14 residential structures and 42 structures housing businesses of various types in this area could be affected by a flood incident;
- Vulnerability assessment: \$2,023,800 for the residential properties and \$59,866,100 for the commercial/industrial properties (assuming 100% damage to 100% of the structures) The values stated include both land and building values and are derived from the City of Westfield Assessor's office;
- Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Springfield Road

- Springfield Road from the intersection with Union Street for ~1,500 feet southeast;
- Past record of flooding in this area. No record of actual damage exists;
- There are 0 residential structures and 14 commercial/business in this area that have been affected or could be affected by a flood incident;
- Vulnerability assessment: \$6,760,000 (assuming 100% damage to 100% of the structures) The values stated include both land and building values and are derived from the City of Westfield Assessor's office;
- Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Union Street

- Two properties on the northwest side of Sandy Hill Road;
- Past record of flooding in this area. No record of actual damage exists;
- There are 19 residential structures that encompass 2 apartment complexes in this area that have been affected or could be affected by a flood incident;
- Vulnerability assessment: \$10,048,800 (assuming 100% damage to 100% of the structures) The values stated include both land and building values and are derived from the City of Westfield Assessor's office;
- Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Union Street

- At the intersection of Union Street with Springdale Road and Paper Mill Road;
- Past record of flooding in this area. No record of actual damage exists;
- There are 3 residential structures and 5 business/commercial structures in this area that have been affected or could be affected by a flood incident;
- Vulnerability assessment: \$542,200 for the residential structures and \$626,900 for the business/commercial structures (assuming 100% damage to 100% of

the structures) The values stated include both land and building values and are derived from the City of Westfield Assessor's office;

- Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Extent

See information in Location section.

Previous Occurrences

See information in Location section.

Probability of Future Events

There is a good chance of localized flooding within the 100-year flood plain every couple of years, but these floods are small and generally cause little damage. The chance of a major flood in the 100-year flood plain is by definition 1% in any given year.

Flooding (localized) – Medium Risk

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

There are a total of 5 problem culverts responsible for minor localized flooding in the city, and they have been mapped on the Past and Potential Hazards/Critical Facilities Map (Appendix D). No other areas outside of the 100-year flood plain have a history of flooding. 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. Additionally, the vast majority of culverts throughout the city tend to be impacted by beavers, so localized flooding can potentially occur at any culvert crossing. At this time the City of Westfield has no repetitive loss properties.

Location

- Loomis Street @ House #154
- West Road @ House #159
- Granville Road @ Wood Road extension
- North Road @ Timberswamp Road
- New Broadway @ Birch Road

Extent

The flooding in the locations noted below has been quite minor, in most cases affecting a single structure or resulting in road washouts but no other property damage. Therefore the vulnerability assessments were estimated as the median price of a home in Westfield or \$205,500.

Previous Occurrences

See information in Location section.

Probability of Future Events

Based upon previous data, it is unlikely for localized flooding outside the 100 year flood plain to occur in any year in Westfield.

Severe Snow/Ice Storm – High Risk

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

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.

Location

Severe winter weather occurs regionally and therefore would impact the entire city, although several specific locations are more susceptible to damage. These problem areas have been identified and assessed for vulnerability.

Downtown(Intersections of Court Street, Broad Street, Main Street & Elm Street and assorted side streets connecting to the main roads)

Due to limited space in Westfield's downtown area a single major snowstorm can create large piles of snow from plowing operations which can obstruct views at busy intersections resulting in automobile accidents.

Snow Drift Areas

There are no significant problems in Westfield due to snow drifts. This is as a result of specialized snow plowing equipment used by the city.

Extent

New England generally experiences at least one or two severe winter storms each year with varying degrees of severity. The Northeast Snowfall Impact Scale (NESIS) developed by Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service (Kocin and Uccellini, 2004) characterizes and ranks high-impact Northeast snowstorms. These storms have large areas of 10 inch snowfall accumulations and greater. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. The index differs from other meteorological indices in that it uses population information in addition to meteorological measurements. Thus NESIS gives an indication of a storm's societal impacts.

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

Previous Occurrences

Westfield's recent history has not recorded any loss of life due to the extreme winter weather, but there are usually several incidents of property damage or personal injury each winter. In addition, during heavy snow years, accumulations can reach several feet deep. Westfield's historic road network often creates some steep grades, dangerous intersections, or narrow throughways, sometimes making plowing difficult and causing snow and ice hazards.

- Westfield 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 Westfield include the Great Snow of 1717 and the Blizzard of 1888
- Moderate risk town wide due to snow, ice and extreme cold.
- Elderly are affected by extreme weather.

Probability of Future Events

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

Hurricanes/Severe Wind – Medium-Low Risk

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

Location

All of Westfield 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

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

- Estimated wind damage: 5% of the structures with 10% damage, \$15,824,303;
- Estimated flood damage: 10% of the structures with 20% damage, \$63,297,211;
- Vulnerability assessment for a hurricane event (both wind and flood damages): \$79,121,513;
- Cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included.

Previous Occurrences

In Massachusetts, sixteen major hurricanes have made landfall since 1851, some of which affected Western Massachusetts. These include: Hurricane Carol in 1954 and Hurricane Gloria in 1985. Hurricanes are usually ranked category 1-5, using the Saffir-Simpson Scale, with category 5 hurricanes being the most severe. Both Hurricane Carol and Gloria were category 1-2 storms, meaning winds ranged from 74-110 mph with the potential for some roofing or window damage to buildings, damage to unanchored mobile homes, trees, or poor construction, and/or some minor flooding.

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

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

Probability of Future Events

Based upon the past events, it is reasonable to say that there is a low frequency of major hurricanes in Westfield (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 Westfield in any given year is approximately 10 percent.

Tornadoes/Microbursts – Low Risk

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

Location

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

Extent

Risk of tornadoes is considered to be medium in Hampden County. Tornadoes rarely occur in this part of the country; therefore, assessing damages is difficult. River corridors and hill tops are most prone to damage from these events, but as described in Hurricanes/ Severe Winds section, above, there are few hills in Westfield and little development on them.

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

- Tornadoes/microburst hazard estimates 20% damage to 10% of structures in the city;
- Vulnerability assessment estimates in damages; \$63,297,211;
- Estimated cost does not include building contents, land values or damages to utilities.

Previous Occurrences

In Western Massachusetts, the majority of sighted tornadoes have occurred in a swath east of Westfield, known as “tornado alley.” Fifteen incidents of tornado activity (all F2¹ or less) occurred in Hampden County between 1959 and 2005. No known tornados have touched down in Westfield, but there are occasional high-wind storms that result in tree damage and power outages.

Probability of Future Events

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

Wildfires/Brushfire – Medium Risk

According to FEMA, there are three different classes of wildland fires: surface fires, ground fires and crown fires. The most common type of wildland fire is a surface fire that burns slowly along the floor of a forest, killing or damaging trees. A ground fire burns on or below the forest floor and is usually started by lightening. Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions. While wildfires or brushfires have not been a significant problem in Westfield, 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.

Hampden County has approximately 273,000 acres of forested land, which accounts for 67% of total land area. Forest fires are therefore a potentially significant issue. In Westfield, somewhat less than 50% of the city’s total land area is in forest, or about 15,000 acres, and is therefore at risk of fire.

Location

Much of the western edge of Westfield is susceptible to wildfire as there are significant unfragmented forested areas in this section. The fires could start either in Westfield or the neighboring towns of Montgomery and Russell.

Extent

Other than in the previously described area of Westfield, wildfire is unlikely to occur as most forest areas are fragmented.

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

However, moderate risk exists for potential wildfire incidents, especially near some of the city's forested, agricultural, and recreational lands. Forested and agricultural areas with high fuel content have more potential to burn. In addition, it is often very difficult to access some of the locations to extinguish the brushfire. As it is difficult to predict where a wildfire might start, making specific damage estimates is not possible.

Previous Occurrences

Westfield has averaged slightly less than 40 brushfires per year since 2003, which as far back specific records were available. No damage to structures or people was associated with these brushfires. The vast majority are small and quickly contained. It is not clear how the number of burn permits relates to the number of brushfires because burn permits are not issued annually, but permanently, so an accurate number of burn permits granted does not exist.

There is no record, authenticated or anecdotal, of wildfires in Westfield. A wildfire in 1999 confined primarily to Tekoa Mountain in the neighboring town of Russell, occurred in an area connected to the forested areas in western Westfield. The Westfield Fire Department participated in fighting the fire which was a multi-day, multi-team effort. No structures were damaged in the fire but a number were threatened.

Probability of Future Events

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

Earthquakes – Low Risk

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

Location

In the event of an earthquake, all of Westfield would be affected with some portions more impacted than others, depending on the magnitude of the earthquake and the underlying population density.

Extent

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

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

- Because many of the buildings were built before 1975, there is potential for serious damage throughout Westfield, especially in downtown;
- Structures are mostly wood frame construction, so loss estimates predict 20% of city assessed value, not including costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures;
- Vulnerability assessment estimates approximately \$632,972,106.

Previous Occurrences

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

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

Tables 3-3 & 3-4 contain information regarding most of the earthquakes, including all of affecting New England, the significant ones. None have been noted to cause any damage in Westfield or the surrounding area.

Table 3-3: New England Earthquakes (1924-2002)² magnitude 4.2 or higher		
Location	Date	Magnitude
Ossipee, NH	December 20, 1940	5.5
Ossipee, NH	December 24, 1940	5.5
Dover-Foxcroft, ME	December 28, 1947	4.5
Kingston, RI	June 10, 1951	4.6
Portland, ME	April 26, 1957	4.7
Middlebury, VT	April 10, 1962	4.2
Near NH Quebec Border, NH	June 15, 1973	4.8
West of Laconia, NH	Jan. 19, 1982	4.5
Plattsburg, NY	April 20, 2002	5.1

Table 3-4: New England States Record of Earthquakes ²		
State	Years of Record	Number of Earthquakes
Connecticut	1568 - 1989	137
Maine	1766 - 1989	391
Massachusetts	1627 - 1989	316
New Hampshire	1728 - 1989	270
Rhode Island	1766 - 1989	32
Vermont	1843 - 1989	69
New York	1737 - 1985	24
Total Earthquakes in New England (1568-1989)		1,239

Probability of Future Events

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

Dam Failure – Low Risk

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

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

Location

According to DCR sources, as well as local knowledge, there are currently fourteen (14) dams³ in Westfield. Table 3-5 identifies the dams within the city as well as whether they are classified as non-jurisdictional, low, significant, or high hazard and Table 3-6 does the same for two dams outside Westfield that are potential hazards for the city. Refer to the Hazard Mitigation Map (Appendix E) for their locations.

The Arm Brook Dam, Powdermill Brook Dam, and West Parish Filter #3 Dam are all considered high risks and have the potential for serious damage. Inundation zones were recently determined for the Arm Brook and Powdermill dams in the city as well as the Granville and Montgomery dams, located outside Westfield but whose inundation zones would include parts of the city (see Table 3-6). Most of the other dams inundations zones are small and would not cause significant damage if breached, however, the inundation zones of the Arm Brook and Powdermill Brook Dams would share a significant amount of area and include substantial residential areas, the Westfield Gas and Electric generating facility, and Westfield Coatings, a Tier II Hazardous Material storage site. Therefore a breach of either dam could cause significant loss of life and property damage. The inundation zone West Parish Filter #3 Dam includes very few residential properties but the dam is part of the Springfield Water & Sewer Company’s water filtration plant which filters water from the Cobble Mountain Reservoir for the City of Springfield and is a Tier II Hazardous Material storage site. Therefore a breach in this dam would likely result in a hazardous material release as well as endangering Springfield’s water supply. A failure of the Granville Dam would affect a number of residences along the Munn Brook in Westfield and along the Little River in Westfield and includes a nursing home, two public schools, the Department of Public Works garage, Fire Department Headquarters, the Police Station, City Hall and the Post Office. The inundation area of Montgomery Dam affects a few residences along Moose Meadow Brook and the Massachusetts Turnpike.

Located in Blandford, the Cobble Mountain Dam is of great concern to the Westfield. The Cobble Mountain Reservoir, formed by the dam, is the source of the Little River and a breach of the dam would inundate significant portions of Westfield. However, the dam has had significant maintenance performed on it in recent years and has won two national awards, in 2007 & 2008, for the work.

Table 3-5: Dams in Westfield

Dam name/ date built	ID	Owner	Purpose	Condition/last inspected	Hazard Risk
Arm Brook Dam	MA00604	City of Westfield	Flood Control	Satisfactory- 10/23/06	High
Powdermill Brook Dam	MA00605	City of Westfield	Flood Control	Satisfactory- 10/23/06	High
Westfield Sportsmen Club Dam (1830)	MA00733	Westfield Sportsmen Club, Inc.	Recreation	Poor- Unknown	Significant
Florek Pond Dam	MA02698	Stanley Florek	Unknown	Unknown- Unknown	Significant

Table 3-5: Dams in Westfield

Dam name/ date built	ID	Owner	Purpose	Condition/last inspected	Hazard Risk
West Parish Filter #1 Dam	MA00608	Springfield Water & Sewer Commission	Water supply	Fair-11/16/05	Low
West Parish Filter #2 Dam	MA00609		Water supply	Fair-11/15/00	Low
West Parish Filter #3 Dam	MA00610		Water supply	Fair-11/14/05	High
Stevens Paper Co. Lower Dam	MA00074	Lower Mill, Inc.	Formerly industrial, currently no purpose.	Poor-Unknown	Low
Stevens Paper Co. Upper Dam (1901)	MA00075	Gleen Mill Condominium Trust		Fair- Unknown	Low
Chapin Pond (1900)	MA00603	City of Westfield	Aquifer Recharge	Fair- Unknown	Low
Howard Smith YMCA Pond Dam	MA02049	Westfield YMCA	Recreation	Unknown - Unknown	Non- jurisdictional
Stanley Park Dam	MA02050	Stanley Park of Westfield	Unknown	Unknown - Unknown	Non- jurisdictional
Sunny Side Pool Dam	MA02051	Henry D. Wilgus	Recreation	Unknown - Unknown	Non- jurisdictional
Horse Pond Dam	MA02365	City of Westfield	Recreation	Fair- 4/15/99	Non- jurisdictional

Table 3-6: Dams Located Outside Westfield with Inundation Zones including Westfield

Dam name/ date built	ID	Owner	Purpose	Condition/last inspected	Hazard Risk
Cobble Mountain Dam		Springfield Water & Sewer Commission	Water Supply		High
Montgomery Dam	MA 00734	Westfield Water Resources Dept	Emergency Water Supply	Fair/Unknown	High
Granville Dam	MA 00707		Water Supply	Fair/Unknown	High
Winchell Dam	MA 02364		Not used	Fair/Unknown	Significant
Tekoa Dam			Not used	Unknown	Low

Extent

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

The state has four hazard classifications for dams:

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

The inspection schedule for dams is as follows:

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

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

Previous Occurrences

The Powder Mill Dam failed during the flood of 1955. There is not data on the amount of damage caused.

Probability of Future Events

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

Drought – Low Risk

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

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

Location

A drought would affect all of Westfield.

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.

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

Previous Occurrences

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

Westfield has had limited experience with severe drought conditions. The city has not experienced a threat to its water supply, and doesn't anticipate any severe water shortages throughout the city. Occasionally, water pressure has dropped in some wells during droughts and the city has instituted alternate day water restrictions. However, these water pressure issues have been mitigated by improvements in the water system whereby water can be rerouted to areas experiencing low pressure.

Probability of Future Occurrences

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

Man-Made Hazards – Hazardous Materials – Medium Risk

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

The Toxics Release Inventory (TRI), a publicly available EPA database that contains information on specific toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. In addition, varying quantities of hazardous materials are manufactured, used, or stored at an estimated 4.5 million facilities in the United States--from major industrial plants to local dry cleaning establishments or gardening supply stores. These hazardous materials are transported regularly over our highways and by rail and if released can spread quickly to any community. Incidents can occur at any time without warning. Human error is the probable cause of most transportation incidents and associated consequences involving the release of hazardous materials.

Westfield relies on its HazMat team for responding to incidents involving hazardous materials through a mutual aid agreement. There is no history of any major accidents involving some sort of oil or chemical spill, but transportation of chemicals and bio-hazardous materials by vehicle transport on Interstate 90, route 20, and routes 10-202 is a concern. Westfield also has an unusually high number of facilities using hazardous chemicals, both Tier II chemicals and less hazardous ones.

Location

According to TRI, there are 15 industries currently releasing hazardous materials within Westfield’s city limits out of the 27 sites considered Tier II Hazardous Materials storage facilities (see Table 3-6). All sites are included on the Past & Potential Hazards/Critical Facilities Map (Appendix D).

Extent

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

Table 3-7 Tier II Hazardous Materials storage facilities in Westfield	
Site Name	Site Address
104th Fighter Wing Barnes ANG Base	175 Falcon Drive
Amerigas Propane L.P.	216 Lockhouse Road
C&S Wholesale Grocers	53 Summit Locks Road
Columbia Manufacturing Inc.	1 Cycle Street
Comcast of Massachusetts II, Inc.	1110 East Mountain Road
Gulfstream Aerospace Services Corporation	33 Elise Street
International Paper	39 South Broad Street
Jen-Coat, Inc.	132 North Elm Street
John S. Lane & Son, Inc.	311 East Mountain Road
John S. Lane & Son, Inc.	931 Pochassic Road
LESCO Westfield Facility	140 Apremont Way
Maarng Oms #2	137 Franklin Street
Main USPS Post Office	8 West Silver Street

Table 3-7 Tier II Hazardous Materials storage facilities in Westfield

Site Name	Site Address
Owest Westfield Amp	8 Williams Riding Way
Rinker Materials Hydro Conduit Division	69 Neck Road
Schwan's Home Service Inc.	125 Summit Lock Road
Southern States Cooperative	323 Lockhouse Road
Southwick Water Treatment Facility	Shaker Road
Star Gas Service	28 Arch Road
Verizon	22 Washington Street
WalMart Store #2174	141 Springfield Road
West Parish Filter, Springfield Water & Sewer Co	1515 Granville Road
Westfield Coatings Corporation	221 Union Street
Westfield Electroplating Co., Inc.	68 North Elm Street
Westfield Terminal	30 Summit Lock Road
Yellow Transportation	160 Falcon Drive

Previous Occurrences

Available data dating from 1998-2003 shows an average of slightly more than 13 releases of hazardous materials (total) from these sites per year and there has been no property damage or loss of life associated with these releases.

Probability of Future Events

Given available data there are likely to be 13-14 releases of hazardous chemicals each year, however the likelihood of a catastrophic release is very low.

4: CRITICAL FACILITIES

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

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

Critical Facilities within Hazard Areas

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

The Critical Facilities List for the City of Westfield has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Westfield'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 Westfield.
- The third category contains Facilities/Populations that the Committee wishes to protect in the event of a disaster.
- The fourth category contains Potential Resources, which can provide services or supplies in the event of a disaster.

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

Category 1 – Emergency Response Services

The City 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
Local Emergency Planning Committee Headquarters* - 179 Apremont Way

- 2) Fire Station
 Westfield Fire Department – Central Headquarters: 34 Broad Street
 North Side Substation: 129 Southampton Road
 Little River Substation: 366 Little River Road

- 3) Police Station
 Westfield Police Department – 15 Washington Street

- 4) Public Works Department
 Public Works Department – 59 Court Street (Administrative)
 15 Ponders Hollow Road

- 5) Wastewater Department
 Sewage & Wastewater Treatment Department – 59 Court St. (Administrative)
 Westfield Water Pollution Control Plant - 149 Neck Rd.

- 6) Emergency Fuel Stations
 Westfield Police Department* – 15 Washington St.
 Westfield Fire Department* – Central Headquarters: 34 Broad St.
 North Side Substation: 129 Southampton Road
 Little River Substation: 366 Little River Road
 Westfield-Barnes Airport – 110 Airport Road (is there a formal Agreement
 between the airport and city/)
 *For departmental use only

- 7) Emergency Electrical Power Facility: No city-wide facility, all listed facilities may
 generate power only for themselves
 Local Emergency Planning Committee Headquarters- 179 Apremont Way
 Munger Hill Elementary School- 33 Mallard Lane
 Noble Hospital- 115 West Silver Street
 North Middle School- 350 Southampton Road
 Paper Mill Elementary School- 148 Paper Mill Road
 South Middle School- 30 West Silver Street
 Western Massachusetts Hospital- 91 East Mountain Road
 Westfield High School- 177 Montgomery Street
 Westfield State College- 577 Western Avenue

- 8) Emergency Shelters
 Franklin Ave School- 22 Franklin Street
 Highland School- 34 Western Avenue
 Munger Hill- 33 Mallard Lane
 Noble Hospital- 115 West Silver Street
 North Westfield Middle School- 350 Southampton Road
 Paper Mill School- 148 Paper Mill Road
 South Middle School- 30 West Silver Street
 Southampton Road School- 330 Southampton Road
 Western Massachusetts Hospital- 91 East Mountain Road
 Westfield High School- 177 Montgomery Street

Westfield State College- 577 Western Ave.
Westfield Voc Tech High- 33 Smith Avenue

All shelters have generators.

9) Helicopter Landing Sites

Ames Distribution Plant Parking Lot, South- , N42 10.6 W 072 43.5
Hampton Ponds Plaza Parking Lot/ Access Road- , N42 10.5 W 072 41.6
South Middle School*- 30 West Silver Street, N42 06.6 W 072 45.0
Walmart*- 141 Springfield Road,N42 06.4 W 072 42.4
Westfield High School- , N42 08.7 W 072 45.3
Westfield State College/Second Congregational Church Parking Lot*-
577 Western Avenue ,N42 07.6 W 072 47.6
Westfield-Barnes Airport – 110 Airport Road

*Designated medical landing zones

10) Communications Facilities/Wireless Communication Towers

Westfield Police Department – 15 Washington St.
Westfield Fire Department – Central Headquarters: 34 Broad St.
North Side Substation- 129 Southampton Road
Little River Substation- 366 Little River Road
Local Emergency Planning Committee Headquarters- 179 Apremont Way
Westfield Water Pollution Control Plant - 149 Neck Rd.
Granville Reservoir
G & E Tower- Turnpike Industrial Road
Private Tower on Turnpike Industrial Road
Private Tower on North Elm Street

11) Primary Evacuation Routes

Route 20
Route 10-202
Interstate 90
Route 187

12) Bridges Located on Evacuation Routes

Elm Street (Route 202 &10)- At Westfield River & Conrail/Amtrak Railroad tracks
Little River Road (Route 187)- At Great Brook
North Elm Street (Route 202 &10)- At Pioneer Valley Railroad tracks
Route 90- At East Mountain Road
Route 90- At Pioneer Valley Railroad tracks
Southampton Road (Route 202 &10)- At intersection with Route 90
Southwick Road (Route 202 & 10)- At Little River, weight-limited due to deficient
condition
Springfield Road (Route 20)- At Little River
Springfield Road (Route 20)- At Westfield River

Category 2 – Non Emergency Response Facilities

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

1) Problem Culverts/Bridges/Underpasses

Culverts

Union Street (Frog Hole)

North Elm Street- where the railroad passes under Route 202-10

Bridges- weight-limited due to deficient condition

Lockhouse Road- At Pioneer Valley Railroad tracks

Pochassic Road- At Railroad overpass (Drug Store Hill)

Southwick Road (Route 202 & 10)- At Little River

Dry Bridge Road- At Pioneer Valley Railroad tracks

Underpasses- low clearance, frequent accidents, standard truck height is 11'9"

Chapel Street*- At Pioneer Valley Railroad, clearance 11'0"

Thomas Street*- At Pioneer Valley Railroad, clearance 11'5"

Orange Street*- At Pioneer Valley Railroad, clearance 11'5"

Street Name- Depot Square Arch, clearance 13'0" (at center)

East Mountain Road- At Conrail/Amtrak railroad tracks, by Western

Massachusetts Hospital, clearance 10' 7 1/8"

East Mountain Road- At Route 90, clearance 10'6"

*Located within ~0.3 miles of each other and just off of Routes 202 &10

2) Water Supply

Granville Reservoir

8 Public wells (see below)

Well No.	Location	Pump Capacity (million gal/day)
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Well #1	Off Holyoke Rd.	2.0
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Well #2	Union St.	2.0
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Well #3*	Shaker Rd.	3.195
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Well #4*	Shaker Rd.	2.02
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Well #5	Off Northwest Rd.	0.14
---------	-------------------	------

Well #6	Off Northwest Rd.	0.29
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Well #7	Behind E.Mtn.C.Club	2.0
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Well #8	Behind E. Mtn. C. Club	2.0
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Private Wells (~5-8 % of residents, mostly on the north side of the city)

Westfield is also authorized to withdraw up to 3.2 million gallons per day from the Springfield water system through an interconnection located off Shaker Road.

3) Sewer Infrastructure (Pump Stations)

See Critical Facilities Map

4) Transfer Station
Twiss Street

5) Electricity/Gas Supplier
Westfield Gas & Electric (municipal utility company)- 100 Elm Street

Category 3 – Facilities/Populations to Protect

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

1) Special Needs Population

Facility Name- 101 Meadow Street
Facility Name- 221 Dry Bridge Road
Facility Name- 284 East Mountain Road
Facility Name- Colony Circle
Facility Name- Cowles Court
Forum House- 55 Broad Street
Highland Valley Elder Services, Nutrition Site- 16 Court Street
Westbrook Services- 306 Elm Street
Westbrook Services- George Street

2) Elderly Housing/Assisted Living

Barnard Rest Home, Inc.- 0 Franklin Street
East Mountain View Senior Housing- 138 East Mountain Road
Governor's Center- 66 Broad Street
Harborside Healthcare Westfield- 60 East Silver Street
Renaissance Manor Of Westfield- 37 Feeding Hills Road
Westfield Assisted Living – 40 Court Street
Westfield Meadows Home for the Elderly- 74 Old Holyoke Road

3) Public Buildings/Areas

Amelia Park Children's Museum- 99 Elm Street
Apremont Park
Boy's & Girl's Club of Greater Westfield- 28 West Silver Street
Chapman Playground
Cross Street Playground
Hampton Ponds State Park
Holcomb Park
Sadie Knox Playground
Senior Center – 47 Main Street
Stanley Park
Westfield Athenaeum (Library)- 6 Elm Street
Westfield District Court- 224 Elm Street
Westfield Fairgrounds
Whitney Playground

4) Schools

Abner Gibbs Elementary School- 50 West Silver Street
 Alternative- 12 West Silver Street
 Fort Meadow School Early Childhood Center- 35 White Street
 Franklin Avenue Elementary School- 22 Franklin Avenue
 Highland Elementary School- 34 Western Avenue
 Juniper Park Elementary School- 715 Western Avenue
 Moseley Elementary School- 25 Dartmouth Street
 Munger Hill Elementary School- 33 Mallard Lane
 North Middle School- 350 Southampton Road
 Paper Mill Elementary School- 148 Paper Mill Road
 Parkside Academy- 22 Ashley Street
 South Middle School- 30 West Silver Street
 Southampton Road Elementary School- 330 Southampton Road
 St. Mary's High School- Bartlett
 The White Oak School- 533 North Road
 Westfield Area Head Start- 390 Southampton Road
 Westfield High School- 177 Montgomery Street
 Westfield State College- 577 Western Avenue
 Westfield Vocational Technical School- 33 Smith Avenue

Day Care/Nursery Schools

	Capacity
Agustynowicz, Donna Ann- 20 Laro Road	6
Allen, Susan- 52 Crown Street	8
Almeida, Jacqueline K.- 82 Kane Brothers Circle	6
Baird, Holly- 209 Steiger Drive	6
Barry, Betty Anne- 450 Shaker Road	8
Boys & Girls Club of Greater Westfield, Inc.- 28 West Silver St.	52
Brunelle, Diane M.- 73A Moseley Avenue	6
Burek, Angela B.- 25 Carroll Dr.	5
Burgos, Rebecca- 238 Springdale Road	7
Canty, Cynthia L.- 8 Carole Avenue	5
Charette, Lori- 7 Colony Drive	6
Chepurina, Marina L.- 17 Maple Street	5
Choiniere, Pamela J.- 304 Springdale Road	6
Church of the Atonement Nursery School- 36 Court Street	56
Cornelius, Tami- 38 Buschmann Avenue	5
Cotugno, Kathi M.- 7 Avery Street	10
Creative Kid's- 1251 East Mountain Road	78
Creech, Wendy M.- 92 Franklin Street	6
Cyrankowski, Roxanne- 32 Mill St.	7
Davila, Wanda- 67 King Street	4
De Aza, Veronica- 7 Bush St., 1st floor	8
Diamond, Kimberly A.- 62 Butternut Road	10
Franco, Isaura- 25 St. Paul Street	6
Giordano, Carolyn Lee- 244 Birch Bluffs Drive	5

Girouard, Jennifer- 114 Old Farm Road	5
Grigoryan, Erma- 53 Old County Rd.	6
Harris, Lorie M.- 9 Canal Drive	8
Jensen - Curran, Kimberly M.- 84 Tannery Road	10
Kellogg, April M.- 72 Rosedell Drive	5
Kirby's Kids Family Child Care- 92 Union Street	10
Kline, Lisa A.- 75 Crane Avenue	6
Kuchachik, Jodi- 11 Benham Street	6
LaMountain, Donna- 289 Sackett Road	9
Leal, Kelly Ann- 968 Russell Road	8
Little Explorers Learning Center- 1029 North Road	62
Loya, Sandra- 92 Orange Street	5
Morrill, Christine E.- 131 Barbara Street	6
Mulville, Patricia Ann- 68 Old Farm Road	8
Neuzil, Barbara M.- 65 Ridgecrest Drive	7
Norris, Theresa- 97 Mechanic Street	6
Open Door Preschool- 35 White Street	15
Serena's Place- 812 North Road	8
Ramos, Carmen M.- 36 Kellogg Street	6
Ribeiro, Stephanie- 27 Stratfield Ave.	6
Rivera, Amneris- 6 Laurel Terrace	5
Rivera, Tammy- 344 Prospect Street, Ext.	4
Sampson, Nicole- 684 North Road	6
Santiago, Ana L.- 26 Sackett Street	10
Scott, Nancy- 42 Old Holyoke Rd.	8
Sinico, Denise- 1124 East Mountain Rd	8
St. Sauveur, Susan- 128 Woodcliff Drive	5
Stopa, Jane- 144 City View Blvd.	8
The Growing Tree Learning Center- 6 Mainline Drive	36
The Kids'Place- 184 Southampton Road	99
Tirrell, Erinn S.- 36 Darby Drive	4
Torres, Carmen S.- 73 George Street	6
Tyler, Anne M.- 1199 East Mountain Road	4
Vogel, Paula Jean- 17 Oakdale Avenue	6
Westfield Area Head Start- 390 Southampton Road	100
Y's Kids Franklin Ave. School- 22 Franklin Avenue	24
Y's Kids Munger Hill- 33 Mallard Lane	24
Y's Kids Papermill- 148 Mill Road	26
Y's Kids-Juniper Park School- 675 Western Ave.	40
Y's Kids-Southampton Road- 30 Southampton Road	39
Y's Kids-Westfield- 67 Court Street	100
YMCA Nursery School- 67 Court Street	48
Yusenko, Liliya- 152 B. Miller Street	4

5) Churches

Advent Christian Church- 11 Washington Street
Central Baptist Church- 115 Elm Street
Christ the King Church- 297 Russell Road

Christian Church of New Jerusalem Assembly of God- 6 King Avenue
 Church of Atonement- 36 Court Street
 Emanuel Pentecostal Church- 30 Montgomery Street
 First Congregational Church- 18 Broad Street
 First United Methodist Church- 16 Court Street
 First United Pentecostal Church- 118 Meadow Street
 Full Gospel Church- 110 Union Street
 Genesis Spiritual Life Center- 53 Mill Street
 Greater Grace of the Pioneer Valley- 848 North Road
 Holy Trinity Church- 335 Elm Street (in process of being closed)
 Kingdom Hall of Jehovah's Witnesses- 117 Southwick Road
 New Life Christian Center Assembly of God- 157 Dartmouth Street
 Our Lady of The Blessed Sacrament Parish- Union Street
 Pioneer Valley Baptist Church- 265 Ponders Hollow Road
 Russian Evangelical Baptist Church- 866 North Road
 Second Congregational Church- 487 Western Avenue
 St. John's Lutheran Church- 60 Broad Street
 St. Joseph's Polish National Church-
 St. Mary Parish- 30 Bartlett Street
 St. Peter Parish - St. Casimir Parish - 24 State Street
 The Fullness of Truth Church-
 Westfield Alliance Church- 297 Russell Road
 Westfield Evangelical Free Church- 568 Southwick Road
 Word of Grace Church- 848 North Road
 Wyben Union Church- Montgomery Road

6) Historic Buildings/Sites

Dewey House- 87 South Maple Street
 Mechanic Street Cemetery
 Middle Farms Cemetery- North or Russellville Road
 Old Westfield Courthouse- 27 Washington Street
 Pilgrim Candle- Depot Square, 16-36 Union Avenue
 Pine Hill Cemetery- 140 West Silver Street
 St. Joseph's Cemetery
 St. Mary's Cemetery- 203 Southampton Road
 Westfield Athenaeum (Library)- 6 Elm Street

7) Apartment Complexes/Condominium Developments (over 8 units)

City View Commons Condominiums- 136 City View Road
 Colonial West Apartments- 115 Main Street
 Edgewood Apartments- 134 Union Street
 Lansdowne Place- 38 Thomas Street
 Meadows Apartments- 101 Meadow Street
 Park Square Townhouses- 140 Union Street
 Powder Mill Village- 126 Union Street
 Southwood Acres- 342 Southwick Road
 Willows Apartments- 19 Lockhouse Road
 6 & 8 Bates Street 83-101 Beveridge Boulevard

27 Dewey Ave
85A & 85B East Silver Street
4 & 6 Ellsworth Street
85-110 Ely Street
362 Granville Road
10 Greenwood Street
20 Greenwood Street
29A & 29B Harold Avenue
150 Hillside Road
160 Hillside Road
166 Hillside Road
36 Holland Avenue
21A & 21B Kellogg Street
8-14 Lindbergh Boulevard
83 Main Street (Rear)
112 Main Street
125 Main Street
138 Main Street
22A & 22B Maple Street
22 Montgomery Street
19 Morgan Avenue
16 Murray Avenue
5 Notre Dame Street
11A & 11B Notre Dame Street
21 Notre Dame Street
29 Notre Dame Street
37 Notre Dame Street
40 Prospect Street
6-18 Pumpkin Lane
324 Russell Road
434 Russell Road
549 Russell Road
555 Russell Road
627A & 627B Russell Road
690 Russell Road
936A & 936B Russell Road
942 Russell Road
1430 Russell Road
81 South Maple Street
82 South Maple Street
93 South Maple Street
929 Shaker Road
0 Southwick Road

200 Southwick Road
419 Southwick Road
4A & 4B Sunflower Lane
7-24 Sunflower Lane
23 & 25 Tannery Road
6A & 6B Toledo Avenue
7-23 Toledo Avenue
88 Union Street
119 Union Street
126 Union Street
134 Union Street
139 Union Street
140 Union Street
78 & 80 Western Avenue
5A - 5E Westminster Street
42 Arnold Street
33 Broad Street
47 Broad Street
59 Broad Street
25 Collins Street
69 Court Street
103 Court Street
6 Cycle Street
22 Feeding Hills Road
46 Franklin Street
60 Franklin Street
81 Franklin Street
5 & 9 Holland Avenue
100 Lockhouse Road
34 Meadow Street
59 Mechanic Street
8 Monroe Street
11 Monroe Street
370 North Elm Street
6 Pleasant Street
919 Southampton Road
14 Sycamore Street
28 Taylor Avenue
25 Thomas Street
38 Thomas Street
11 Yale Street
10 Spring Street

- 8) Mobile Home Parks
68 Klondike Avenue- 56 sites
0 Root Road- 23 sites
138 Root Road- 235 sites

404 Southwick Road- 44 sites
868 Southampton Road- 75 sites
189 Springfield Road- 25 sites

- 9) Major Employers (≥ 100 employees)/Employment Areas
- Atlas Copco Compressors Inc- 94 North Elm Street # 4
 - Barnes Airport Industrial Park
 - Big Y Foods- 475 East Main Street (Route 20)
 - Big Y Shopping Center- 10 East Silver Street
 - Commercial Distributing Co- 46 South Broad Street
 - Connleaf's Inc- 48 Hundred Acres Road
 - Governor's Center- 66 Broad Street
 - Gulfstream Aerospace Corp- 33 Elise Street
 - Home Depot- 1111 Southampton Road
 - Home Depot- 514 East Main Street
 - Little River Plaza- 485 East Main Street
 - Loomis Fargo & Co- 28 Ponders Hollow Road
 - Noble Hospital- 115 West Silver Street
 - Renaissance Manor-Westfield- 37 Feeding Hills Road
 - Savage Arms Inc- 100 Springdale Road # 1
 - Super Stop & Shop- 57 Main Street
 - Tekoa Country Club - 459 Russell Road
 - Tighe & Bond- 53 Southampton Road # 3
 - Wal-Mart- 141 Springfield Road
 - Western Massachusetts Hospital- 91 East Mountain Road
 - Westfield Shops- 475 East Main Street
 - Westfield State College- 577 Western Ave
 - Westfield Youth Service Center- 51 East Mountain Road
 - Westgate Plaza- 261 East Main Street
 - YMCA- 67 Court Street

Category 4 – Potential Resources

Contains facilities that provide potential resources for services or supplies.

- 1) Food/Water
- A Plus Mini Mart- 90 South Maple Street
 - All in One Shop- 1144 Southampton Road
 - Andy's Food Mart- 69 Franklin Street
 - Big Y World Class Market- 1 East Silver Street
 - Choice Health- 307 East Main Street
 - Country Mart- 397 Little River Road
 - Country Store- 518 Southampton Road
 - Dong Yahng- 284 Southampton Road
 - Getty Mart- 278 Elm Street
 - Meadow Mart- 45 Meadow Street
 - Murray's Mobil- 162 Southampton Road

Pleasant Street Market- 54 Pleasant Street
Quick Food- 358 Southwick Road
Raja Mart- Southampton Road
Southwick Road Shell- 27 Southwick Road
Stop & Shop Supermarket – 57 Main Street
Stop n Go- 37 Mill Street
Union Mart- 420 Union Street
Victory Store- 47 Elm Street
Westfield Exxon Tiger Mobil- 33 Main Street
Westfield Mobil- 162 Southampton Road

2) Hospitals/Medical Supplies/Pharmacies

Noble Hospital- 115 West Silver Street
Western Massachusetts Hospital- 91 East Mountain Road
Arrow Pharmacy- 427 North Elm Street
Big Y Pharmacy- 475 East Main Street
Brooks Pharmacy- 1 East Silver Street
CVS- 427 East Main Street, 47-55 Franklin Street, 208 Elm Street
Louis & Clark Drug- 1029 North Road
Rite Aid- 1 East Silver Street
Stop & Shop Pharmacy – 57 Main Street
Walgreen Drug Store- 78 Main Street
Walmart Pharmacy- 141 Springfield Road
A. J. Buck & Sons- 80 Mainline Drive (Veterinary supplies)
Westfield Animal Clinic- 422 North Elm Street

3) Gasoline/Propane/Home Heating Oil/Other Fuels

Gas Stations
A Plus Mini Mart- 90 South Maple Street
Belcher Citgo- 439 North Elm Street
Citgo Food & Fuel Station- 1400 Russell Road
Getty Gas Station- 41 Franklin Street
Getty Mart- 278 Elm Street
Gulf Station- 69 Main Street
Hess Station- 310 East Main Street
Ken Fife's Westfield Service Center- 128 Meadow Street
Lee Milts Petroleum Inc.- 288 Elm Street
Mheid-Kobeissi Inc.- 21 Southwick Road
Mobil Oil Corporation- 181 Elm Street
Murray's Mobil- 162 Southampton Road
Pride Gas Station- 322 East Main Street
Pride Station- 136 Meadow Street
Republic Oil- 322 East Main Street
Shell Oil Company- 259 North Elm Street
Southwick Road Shell- 27 Southwick Road
Sunoco Station 88 Maple Street
Sunoco Station- 163 Meadow Street

Sunoco Station- 90 South Maple Street
Union Mart- 420 Union Street
WBGLA OF Westfield- 560 East Main Street
Westfield Exxon Tiger Mobil- 33 Main Street
Westfield Mobil- 162 Southampton Road
(none have partnerships with the city)

Home Heating Oil

A-1 American Eagle Oil Company- 20 Roanoke Avenue
Brazee Fuel Company- 29 Bush Street
Hillside Oil Company- 292 Lockhouse Road
Lou's Fuel Service- 54 Jaeger Drive
Pioneer Valley Oil Inc.- 507 Southampton Road
Sunset Oil Company- 17 Old Quarry Road
Westfield Fuel Service- 100 Union Street

Natural Gas

Westfield Gas & Electric Corporation- 100 Elm Street

Propane

Amerigas Propane- 216 Lockhouse Road
Star Gas Service- 28 Arch Road
Taylor Rental- 202 Union Street
UHAUL- 50 Springfield Road

4) Building Materials Suppliers

A Whip City Siding & Windows- 81 Alexander Place
Absolute Windows & Siding Systems- 125 Union Street
Brother Woodworking, Inc.- 67 Katherine Street
B-Safe Locksmith- 77 Mill Street
Builder's Choice Kitchen & Bath- 77 Mill Street
Collier Fence Manufacturing- 549 Southampton Road
Commonwealth Guardrail- 210 Servistar Industrial Way
Construction Fasteners Supply- 61 Union Street
Conte Door Service- 174 Main Street
D & K Siding Co.- 76 Brookline Avenue
Dan Orszulak Windows, Siding & Doors- 14 School Street
Hardware Specialties, Inc- 94 North Elm Street
Home Depot- 514 East Main Street
Independent Roofing Company- 294 Union Street
Lashway Lumber- 16 Ponders Hollow Road
Lumber Center, Inc- 44 Broad Street
New England Custom Countertops- 14 Coleman Avenue
New England Granite- 104 Court Street
Oleksak Lumber Co.- 116 Cabot Road
Ponders Hollow Custom Moldings & Flooring-103 Mainline Drive
Precision Door Service- 15 Mosher Street
Rinker Materials- 69 Neck Road

Statewide Roofing & Siding- 646 Montgomery Street
Sullivan Siding & Windows- 83 Pinehurst Street
Wagner Rug Co.- 95C Mainline Drive
Western Mass Truss Co.- 100 Apremont Way
Westfield Fasteners- 202 Union Street
Westfield Glass Co.- 1 Montgomery Street
Westfield Transit Mix- 403 Paper Mill Road

- 5) Heavy & Small Equipment Suppliers
 - ACT Vehicle Equipment, Inc.- 946 Southampton Road
 - Specials, Inc.- 103 Mainline Drive

- 6) Gravel Pits
 - Westfield Sand & Gravel- 403 Paper Mill Road
 - John S Lane & Son- 311 East Mountain Road & 931 Pochassic Road

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

Hazard Type	Hazard Area	Critical Facilities Affected	Evacuation Routes Affected
Flooding (100-year)	100-year flood plain along Little & Westfield Rivers	Little River Fire Department Substation Westfield Water Pollution Control Plant Bridges crossing the Westfield & Little Rivers	Routes 20, 202, 10, & 187
Flooding (localized)	None identified		
Severe Snow/Ice Storm	Where roads ice up consistently	???	???
Dam Failure	Arm Brook & Powder Mill Dam inundation zones	Westfield Gas & Electric	Routes 202 & 10
	Granville Dam	Governor's Center nursing home, South Middle & Gibbs Elementary schools, the Department of Public Works garage, City Hall, Police station and Fire Department Headquarters and the Post office	Routes 202 & 10
	Montgomery Dam		Route 90
Hazardous Materials	Westfield-Barnes Airport and adjacent areas	Barnes Airport, LEPC Headquarters, Southampton Road School	Routes 90, 10 & 202

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

5: MITIGATION STRATEGIES

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

Goal Statement

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

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

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

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

General Mitigation Measures

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

Some of these general hazard-related strategies and measures do not fall specifically under the category of "mitigation," but are instead tools for preparedness. The Hazard Mitigation Planning Committee recognizes that these are also important recommendations for the City, and has included them here:

What's the CEM Plan?

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

Action Item: Establish system to inventory supplies at existing shelters and develop a needs list and storage requirements. 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: Shelter Subcommittee of the Local Emergency Planning Committee

Proposed Completion Date: 2009

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

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.

Responsible Department/Board: Public Information Subcommittee of the Local Emergency Planning Committee

Proposed Completion Date: Ongoing

Rationale: Increase likelihood of town residents being prepared in the event of a disaster.

Action Item: Develop mobile emergency facilities list (ie. mobile medical clinic), locate sources for the facilities, especially discounted/adaptable equipment, and purchase equipment as funds are available.

Responsible Department/Board: Emergency Management Department, Fire Department

Proposed Completion Date: 2009 (for list and sources, Ongoing (for acquisition)

Rationale: Increased emergency response capability.

Flooding

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

Current Mitigation Measures

The City currently addresses this problem with a variety of mitigation tools and strategies. Flood-related regulations and strategies are included in the City's zoning by-law, subdivision regulations, as well as a proposed stormwater management by-law. Relevant goals are included in the adopted Open Space and Recreation Plan.

Infrastructure like dams and culverts are in place to manage the flow of water. These current mitigation strategies are outlined in the following table.

Table 5-1: Existing Flood Hazard Mitigation Measures

Table 5-1: Existing Flood Hazard Mitigation Measures				
Existing Strategy	Description	Effectiveness	Potential Changes	
Culvert Replacement	Priority list of necessary culvert replacements and other construction projects to effectively manage flooding.	Very effective for managing flood control needs.	Seek funding from HMGP for top-priority projects.	
Zoning Bylaws	Flood Zone District	Overlay district to protect areas delineated as part of the 100-year floodplain by regulating uses and special permit requirements.	Effective, by requiring development is floodproofed and/or raised at or above base flood level requiring mobile homes be anchored to resist floatation, collapse, or lateral movement, and preventing incompatible development within the flood prone areas.	Prohibit new development (or at least mobile home parks) in flood zone altogether.
	Water Resource Protection District	District to protect groundwater resources by regulating certain uses, drainage, and other requirements within Zone 1 and Zone 2 recharge areas of aquifer.	Somewhat effective for preventing groundwater contamination and managing infiltration.	Enforce special permit requirements more effectively.
	Movement or Removal of Earth Materials	Residential – limits the size of the excavation, must have PB approval	Very effective for preventing erosion, siltation, run-off, groundwater contamination	
		Commercial – requires PB approval, and plan with measures to prevent erosion and groundwater contamination		
	Open Space Communities	Permitted in Rural Residential and Residence A districts; allows for reconfiguration of lots in order to preserve most open space	Effective for minimizing impervious surfaces and maximizing open space and thereby infiltration	
Manufactured Home Parks	Regulates conditions, site plan for parks; includes setbacks and tree coverage.	Somewhat effective for preventing dense, flood-damage-susceptible development.	Restrict location of parks to outside floodzone.	

Table 5-1: Existing Flood Hazard Mitigation Measures (continued)

	Site Plan Approval	Requires site plan to preserve environmental features	Somewhat effective for protecting natural flood retention systems such as wetlands	
Subdivision Regulations	Definitive Plan	Must include Development Impact Statement; proposed storm drainage, sewer, water supply, and significant natural features such as watercourses.	Somewhat effective for preventing incompatible development and ensuring sufficient measures for drainage.	
	Design Standards	Open space and natural features – PB may require open spaces or parks, protection of watercourses	Somewhat effective for protecting natural flood retention systems.	Include more specific performance-based standards.
	Required Improvements	Utilities - Requirements for storm drainage, and public water and sewer (if feasible).	Effective for preventing run-off and groundwater contamination.	
		Trees and Plantings – large caliper trees must be protected, and construction must take care to protect drip-zones	Effective for encouraging on-site infiltration.	
Westfield Open Space and Recreation Plan	The OSRP inventories natural features and promotes natural resource preservation in the town, including the floodplain; wetlands, groundwater recharge areas, farms and open space, rivers, streams and brooks. The Plan also identifies key goals and strategies to protect open space.	Effective in identifying sensitive resource areas, including floodplains. Encourages forest, farmland protection, help conserve the town’s flood storage capacity.	Implement relevant goals and policies in Plans.	
National Flood Insurance Program Participation	As of 2006, there were 221 homeowners with flood insurance policies. [Note: 1,944 properties on CIS list]	Somewhat effective, provided that the city remains enrolled in the National Flood Insurance Program.	The city could become a part of FEMA’s Community Rating System.	
Flood Control Commission	Established on December 1, 1960 it manages the City’s flood control structures.			

Future Mitigation Measures

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

Action Item: Identify, prioritize and replace, pending availability of funding, undersized and otherwise problematic culverts throughout City.

Responsible Department/Board: Department of Public Works, City Engineer

Proposed Completion Date: 2010

Rationale: Improved water flow will decrease water level increases in flood-prone areas during storms and lessen the likelihood of flooding

Action Item: Implement the Five-Year Action Plan strategies in Westfield's Open Space and Recreation Plan, particularly those dealing with protection of floodplains, forests and farmland.

Responsible Department/Board: Conservation Commission and Planning Department/Board

Proposed Completion Date: Ongoing

Rationale: Mitigates flooding damage through providing the city with natural buffers that would work to absorb floodwaters and rainwater while preventing development from increasing impervious surface area—large areas of impervious surfaces have been documented to worsen storm surge cycles and accelerate the flow of water.

Action Item: Become part of FEMA's Community Rating System

Responsible Department/Board: Mayor, City Council

Proposed Completion Date: 2009

Rationale: Practices instituted as part of CRS will lessen effects of flooding and by reducing insurance rates it will increase participation in NFIP.

Action Item: Implement recommendations contained in the 2008 Westfield River Levee Evaluation including height increases, upgrading drainage outlets and pumping stations and some additional evaluations.

Responsible Department/Board: Flood Commission, City Engineer, Department of Public Works

Proposed Completion Date: 2011

Rationale: Lessen the chance of flooding in major storm events.

Action Item: Update stormwater regulations.

Responsible Department/Board: Water Resources Department

Proposed Completion Date: 2010

Rationale: Will result in lower peak flows during storms therefore decreasing the likelihood of flooding.

What is the NFIP's Community Rating System?

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

Severe Snow/Ice Storm

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

Current Mitigation Measures

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

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

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

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-Law	Energy-Generating Wind Power Devices	Regulates erection of windmills, etc., including height and setback requirements.	Very effective for preventing damage in the case of a severe storm.	
	Wireless Communications Facilities	Regulations require special permit/site plan approval; structures must meet height and setback requirements.	Very effective for preventing damage in the case of a severe storm.	
	Off-Street Parking	Some uses have specific off-street parking requirements, thereby preventing overcrowding of street parking.	Very effective for facilitating easier snow removal along streets.	
Subdivision Regulations	Design Standards	Street grade regulations (maximum 5-8%)	Effective.	
	Required Improvements	Utilities must be placed underground at time of construction	Effective for preventing power loss.	
State Building Code		The City of Westfield has adopted the Massachusetts State Building Code.	Effective.	
Backup Electric Power		Shelters have backup power, three mobile generators	Very effective in case of power loss.	
Tree Management		List of dangerous trees created annually for Westfield Gas & Electric.	Very effective, preventative collaboration.	
Snow Removal Equipment		City has acquired modern snow removal equipment.	Very effective	
Emergency Shelter Generator Testing Program		The City of Westfield has instituted a program to regularly check the generators in all emergency shelters	Very effective	

Future Mitigation Measures

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

- Action Item:** Develop and implement plan to transport emergency personnel (ie. doctors) to areas of city as needed during severe winter storms.
Responsible Department/Board: Emergency Management Department , Fire Department
Proposed Completion Date: 2010
Rationale: Provide increased emergency services for town residents during a disaster.
- Action Item:** Develop and implement a plan for providing access to water, information, shelter, and food stores for special needs populations in town in the event of a severe winter storm.
Responsible Department/Board: Emergency Management Department, Board of Health
Proposed Completion Date: 2010
Rationale: Minimize loss of life among especially vulnerable populations during severe winter storms
- Action Item:** Drainage repairs on roads that consistently ice over during winter storms (see culvert replacement in flooding section).
Responsible Department/Board: Department of Public Works, City Engineer
Proposed Completion Date: 2010
Rationale: Lessen the potential for automobile accidents and removal of impediments to movement of emergency personnel in snow emergencies.
- Action Item:** Locate and purchase/rent/negotiate use of land for storing snow when it is removed from the Downtown area to mitigate the problems associated with restricted traffic that occur in the city's main centers.
Responsible Department/Board: City Council, Mayor's Office, Department of Public Works
Proposed Completion Date: 2010/Ongoing.
- Action Item:** Participate in the creation of a Regional Debris Management Plan.
Responsible Department/Board: City Council, Planning Board, and Emergency Management Department
Proposed Completion Date: 2010
Rationale: Will help recovery from a disaster.

What is a Regional Debris Management Plan?

Natural disasters can precipitate a variety of debris, including trees, construction and demolition materials and personal property. After a natural disaster, potential threats to the health, safety and welfare of impacted citizens can be minimized through the implementation of a debris management plan. Such a plan can be critical to recovery efforts after a disaster, including facilitating the receipt of FEMA funds for debris clearance, removal and disposal. Although Regional Debris Management Plans are important for communities to develop for recovering from a disaster, they are not considered a Hazard Mitigation Action because they do not help lessen the effects of a future disaster.

Hurricanes/Severe Wind

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

The flooding associated with hurricanes can be a major source of damage to buildings, infrastructure and a potential threat to human lives. Therefore, all of the flood protection mitigation measures described in Table 5-1 can also be considered hurricane mitigation measures.

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

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

Tornadoes/Microbursts

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

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

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

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Manufactured Home Parks	Regulates location of mobile home parks, requiring special permit, BOH approval, development impact statement, etc.	Not effective for preventing damage to susceptible structures	Restrict location of mobile homes.
	Energy-Generating Wind Power Devices	Regulates erection of windmills, etc., including height and setback requirements.	Very effective for preventing damage in the case of a severe storm.	
	Wireless Communications Facilities	Regulations require special permit/site plan approval; structures must meet height and setback requirements.	Very effective for preventing damage in the case of a severe storm.	
Subdiv Regs	Required Improvements	Utilities must be placed underground	Effective for preventing power loss.	
State Building Code		The City has adopted the MA State Building Code.	Effective.	
Tree Management		List of dangerous trees created annually for Westfield Gas & Electric.	Very effective, preventative collaboration.	
Emergency Communications		Westfield's emergency wireless communications facilities have been upgraded to microwave transmission so there are no wires to be damaged during severe wind events.	Very effective for maintaining coordination among emergency services during an emergency.	

Future Mitigation Measures

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

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

Responsible Department/Board: Planning Board

Proposed Completion Date: 2009

Rationale: Future telecommunications facilities will be better able to withstand extreme storm conditions decreasing creation of debris that could damage structures or injure people.

Action Item: In the Zoning regulations for Energy Generating Wind Power Devices, develop and add standards for prevention of wind-related damage.

Responsible Department/Board: Planning Board

Proposed Completion Date: 2009

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.

Wildfire/Brushfire

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

Current Mitigation Measures

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

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

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-Law	Site Plan	Fire Chief is involved in final review of site plan for structure.	Effective.	
	General Regulations	Prohibited Uses and Performance Standards – Fire Chief must approval any and all flammable and explosive materials.	Effective	
Subdivision Regulations	Preliminary Plan	Must be approved by the Fire Department.	Effective.	
	Required Improvements	Fire alarm systems required, needs approval by Fire Dept.	Effective.	
	Development Impact Statement	Fire protection is one of the impacts evaluated.	Effective.	

Table 5-4: Existing Wildfire/Brushfire Hazard Mitigation Measures (continued)

Burn Permits	Residents must obtain burn permits, and personnel provide information on safe burn practices.	Somewhat effective.	Require residents to get a new burn permit each year and include educational materials with permit. Increase enforcement of burning regulations, perhaps invoke penalties for offenders.
Public Education/ Outreach	The Fire Department has an ongoing educational program in the schools.	Effective.	

Future Mitigation Measures

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

Action Items: Use NNN communications system to contact all burn permit holders at the start of burning season with information on burn safety, procedures, and penalties.

Responsible Department/Board: Fire Department

Proposed Completion Date: Ongoing

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

Action Items: Develop penalties for violations of burning regulations especially regarding out-of-season and prohibited material burning.

Responsible Department/Board: City Council, Fire Department

Proposed Completion Date: 2009

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

Earthquake

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

Most buildings and structures in the state were constructed without specific earthquake resistant design features. In addition, earthquakes precipitate several potential devastating secondary effects such as building collapse, utility pipeline rupture, water contamination, and extended power outages. Therefore, many of the mitigation

efforts for other natural hazards identified in this plan may be applicable during the City's recovery from an earthquake.

Current Mitigation Measures

The City's most relevant existing mitigation measures are described in the following table.

Table 5-5: Existing Earthquake Hazard Mitigation Measures				
Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Energy-Generating Wind Power Devices	Regulates erection of windmills, etc., including height and setback requirements.	Very effective for preventing damage in the case of a severe storm.	
	Wireless Communications Facilities	Regulations require special permit/site plan approval; structures must meet height and setback requirements.	Very effective for preventing damage in the case of a severe storm.	
State Building Code		The City of Westfield has adopted the State Building Code.	Effective for new buildings only.	Evaluate older structures categorized as critical facilities to determine if they are earthquake resistant.
Debris Management Plan		A debris management plan could be developed.	Effective.	Participate in the creation of a Regional Debris Management Plan.

Future Mitigation Measures

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

Action Item: Evaluate EOC and shelters 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 Department

Proposed Completion Date: 2010/Ongoing

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

Dam Failure

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

Current Mitigation Measures

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

Table 5-6: Existing Dam Failure Hazard Mitigation Measures

Existing Strategy	Description	Effectiveness	Potential Changes
New Dam Construction Permits	State law requires a permit for the construction of any dam.	Effective. Ensures dams are adequately designed.	
Dam Inspections	DCR has an inspection schedule that is based on the hazard rating of the dam (low, medium, high hazard).	Low. The responsibility for this is now on dam owners, who may not have sufficient funding to comply.	Identify sources of funding for dam safety inspections. Incorporate dam safety into development review process.
Inundation zones	Westfield has developed approved Emergency Action Plans and determined inundation zones for the Powdermill Brook and Arm Brook dams within the city and for 2 additional dams outside the city which would inundate parts of the city if breached.	Effective. Allows for development of strategies to lessen damage in the event of a dam failure.	

Future Mitigation Measures

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

Action Item: Determine feasibility of constructing flood walls at critical facilities and construct if feasible.

Responsible Department/Board: Emergency Management Department, Conservation Commission, Highway Department.

Proposed Completion Date: 2011

Rationale: Lessen damage to critical facilities in the event of a dam breach.

Action Item: Develop evacuation plans for dam inundation zones

Responsible Department/Board: Emergency Management Department, Water Resources, Fire Department, Police Department.

Proposed Completion Date: 2010

Rationale: Lessen loss of life in the event of a dam breach.

Drought

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

Current Mitigation Measures

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

Table 5-7: Existing Drought Hazard Mitigation Measures

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Water Resource Protection District	District to protect groundwater resources by regulating certain uses, drainage, and other requirements within Zone 1 and Zone 2 recharge areas of aquifer.	Somewhat effective for preventing groundwater contamination and managing infiltration.	Enforce special permit requirements more effectively.
	Open Space Communities	Permitted in Rural Residential and Residence A districts; allows for reconfiguration of lots in order to preserve most open space	Effective for minimizing impervious surfaces and maximizing open space and thereby infiltration	

Table 5-7: Existing Drought Hazard Mitigation Measures (continued)

Subdivision Regulations	Definitive Plan	Must include Development Impact Statement; proposed storm drainage, sewer, water supply, and significant natural features such as watercourses.	Somewhat effective for preventing incompatible development and ensuring sufficient drainage.	
	Design Standards	Water supply is one of the criteria that needs to be met before the land can be deemed suitable.	Somewhat effective.	Define specific performance standards for water supply.
Westfield Open Space and Recreation Plan.		Makes several recommendations regarding preventing drought, protecting water supply and quality.	Potentially effective step, if taken.	Implement recommendations.
Drought Management Plan		Westfield has developed a drought management plan for all public wells in the city.	Effective	Develop a Drought management Plan for private wells
Rain Barrels		The Health Department has instituted a program to provide rain barrels to residents.	Somewhat effective	

Future Mitigation Measures

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

Action Item: Develop and implement Board of Health regulations requiring private well owners to comply with the City’s water use restrictions when imposed under the drought management plan

Responsible Department/Board: Health Department, Water Resources

Proposed Completion Date: 2010

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

Hazardous Materials

Hazardous materials are in existence throughout City, and are constantly being moved on Westfield'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 Westfield has some regulations currently in place to mitigate the impacts of a hazardous materials disaster.

Table 5-8: Existing Hazardous Materials Hazard Mitigation Measures

Existing Strategy		Description	Effectiveness	Potential Changes
Zoning By-law	Flood Zone Protection	Uses involving hazardous materials processing or transfer are prohibited.	Effective.	
	Water Resource Protection District	Special permit required for hazardous materials storage within aquifer recharge areas; specific performance standards must be met.	Somewhat effective at preventing damage.	Prohibit any hazardous material storage within district.
Subdiv Regs	Development Impact Statement	Impact of hazardous materials storage and waste must be included.	Effective.	

Future Mitigation Measures

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

Action Item: Update the Integrated Hazardous Material Plan (last done in 1997)

Responsible Department/Board: Fire Department and Emergency Management Department

Proposed Completion Date: 2009

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

6: PRIORITIZED IMPLEMENTATION SCHEDULE

Summary of Critical Evaluation

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

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

Project Prioritization

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

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

Table 6-1: Prioritized Implementation Schedule – Action Plan

Priority	Mitigation Action	Responsible Department/Board	Proposed Completion Date	Funding Source/ Estimated Cost
1	Implement recommendations contained in the 2008 Westfield River Levee Evaluation including height increases, upgrading drainage outlets and pumping stations and some additional evaluations.	Flood Commission, City Engineer, Department of Public Works	2011	City Staff/ \$2,000,000
2	Update the Integrated Hazardous Material Plan (last done in 1997)	Fire Department and Emergency Management Department	2009	City Staff
3	Identify, prioritize and replace, pending availability of funding, undersized and otherwise problematic culverts throughout City.	Department of Public Works, City Engineer	2010	City Staff
4	Develop evacuation plans for dam inundation zones	Emergency Management Department, Water Resources, Fire Department, Police Department.	2010	City Staff
5	Establish system to inventory supplies at existing shelters and develop a needs list and storage requirements. 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.	Shelter Subcommittee of the Local Emergency Planning Committee	2009	Homeland Security grants, Massachusetts Executive Office of Public Safety
6	Update stormwater regulations.	Water Resources Department	2010	City Staff Local Technical Assistance Program

Table 6-1: Prioritized Implementation Schedule – Action Plan (continued)

Priority	Mitigation Action	Responsible Department/Board	Proposed Completion Date	Funding Source/ Estimated Cost
7	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.	Public Information Subcommittee of the Local Emergency Planning Committee	Ongoing	City Staff/ Volunteers
8	Develop and implement a plan for providing access to water, information, shelter, and food stores for special needs populations in town in the event of a severe winter storm.	Emergency Management Department, Board of Health	2010	Homeland Security grants, Massachusetts Executive Office of Public Safety
9	Develop and implement plan to transport emergency personnel (ie. doctors) to areas of city as needed during severe winter storms.	Emergency Management Department , Fire Department	2010	City Staff
10	Become part of FEMA's Community Rating System	Mayor, City Council	2009	City Staff
11	Locate and purchase/rent/negotiate use of land for storing snow when it is removed from the Downtown area to mitigate the problems associated with restricted traffic that occur in the city's main centers.	City Council, Mayor's Office, Department of Public Works	2010/Ongoing	City Staff

Table 6-1: Prioritized Implementation Schedule – Action Plan (continued)

Priority	Mitigation Action	Responsible Department/Board	Proposed Completion Date	Funding Source/ Estimated Cost
12	Develop mobile emergency facilities list (ie. mobile medical clinic), locate sources for the facilities, especially discounted/adaptable equipment, and purchase equipment as funds are available.	Emergency Management Department, Fire Department	2010/Ongoing	City Staff
13	Use NNN communications system to contact all burn permit holders at the start of burning season with information on burn safety, procedures, and penalties.	Fire Department	Ongoing	City Staff
14	In the Zoning regulations for Telecommunication Facilities, add prevention of wind-related damage as a stated purpose.	Planning Board	2009	City Staff, Local Technical Assistance Program
15	Implement the Five-Year Action Plan strategies in Westfield’s Open Space and Recreation Plan, particularly those dealing with protection of floodplains, forests and farmland.	Conservation Commission and Planning Department/Board	Ongoing	City Staff/ Volunteers
16	Prepare and implement a Water Conservation Plan for private wells	Health Department, Water Resources	2010	City Staff
17	Develop penalties for violations of burning regulations especially regarding out-of-season and prohibited material burning.	City Council, Fire Department	2009	City Staff
18	In the Zoning regulations for Energy Generating Wind Power Devices, develop and add standards for prevention of wind-related damage.	Planning Board	2009	City Staff, Local Technical Assistance Program

Table 6-1: Prioritized Implementation Schedule – Action Plan (continued)

Priority	Mitigation Action	Responsible Department/Board	Proposed Completion Date	Funding Source/ Estimated Cost
19	Evaluate EOC and shelters to determine if they are earthquake resistant and make necessary upgrades if they are found to be deficient.	Building Inspector, Emergency Management Department	2010/Ongoing	City Staff
20	Determine feasibility of constructing flood walls at critical facilities and construct if feasible.	Emergency Management Department, Conservation Commission, Highway Department	2011	City Staff/ Volunteers
21	Participate in the creation of a Regional Debris Management Plan.	City Council, Planning Board, and Emergency Management Department	2010	City Staff

7: PLAN ADOPTION & IMPLEMENTATION

Plan Adoption

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

Plan Implementation

The implementation of the Westfield Local Natural Hazards Mitigation Plan will begin following its formal adoption by the Westfield City Council and approval by MEMA and FEMA. Specific city 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 Westfield Natural Hazards Planning Committee will oversee the implementation of the plan.

Plan Monitoring and Evaluation

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

The Westfield 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. Those parties noted in Section 6 of the plan, all of whom have a representative on the Westfield Natural Hazards Planning Committee, will be responsible for seeing that the actions are implemented and will report on their progress at the annual plan review meetings.

Outreach to the public, surrounding communities, agencies, businesses, academia, non-profits, or other interested parties outside of the city of Westfield 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 city departments and/or revise the goals and objectives contained in the plan. At a minimum, the committee will review and update the plan every five years,

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

Incorporation of Plan Requirements into other Planning Mechanisms/ Documents

At times when the City of Westfield 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

CITY OF WESTFIELD, MASSACHUSETTS

CITY COUNCIL

A RESOLUTION ADOPTING THE WESTFIELD

NATURAL HAZARD MITIGATION PLAN

WHEREAS, the City of Westfield established a Committee to prepare the Westfield Hazard Mitigation plan; and

WHEREAS, several public planning meetings were held between February and May 2008 regarding the development and review of the Westfield Hazard Mitigation Plan; and

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

WHEREAS, a duly-noticed public hearing was held by the Westfield City Council on _____, 2007 to formally approve and adopt the Westfield Hazard Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Westfield City Council adopts the Westfield Hazard Mitigation Plan.

ADOPTED AND SIGNED this _____, 2008.

Michael R. Boulanger, Mayor
City of Westfield

ATTEST

APPENDICES

Appendix A – Technical Resources

1) Agencies

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

2) Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP)	Massachusetts Emergency Management Agency
406 Public Assistance and Hazard Mitigation	Massachusetts Emergency Management Agency
Community Development Block Grant (CDBG).....	DHCD, also refer to RPC
Dam Safety Program.....	MA Division of Conservation and Recreation

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

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

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

3) Internet Resources

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

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

Appendix B – List of Acronyms

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

Appendix C – Natural Hazard Profiling Methodology⁴

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

The matrix is organized into the following sections: Type of Hazard, Location of Occurrence, Extent of Impacts, Previous Occurrences, Probability of Future Occurrence, and Hazard Index. The Hazard Index was completed to rank the hazards according to the frequency of occurrence and the amount of potential damage likely to occur. The Hazard Index forms the basis for concentrating the future mitigation efforts outlined in this plan. A description of each of the matrix categories is provided below. The completed Matrix is shown as Table 3.1 (Section 3, page 8).

Location of Occurrence

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

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

Extent of Impacts

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

Table C-2: Extent of Impacts, Magnitude of Multiple Impacts of Given Natural Hazard	
Extent of Impacts	Magnitude of Multiple Impacts
Catastrophic	Multiple deaths and injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of facilities for 30 days or more.
Critical	Multiple injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 week.
Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 day.
Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of facilities.

Previous Occurrences

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

Probability of Future Occurrence

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

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

Hazard Index

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

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

The Hazard Ratings are labeled as follows:

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

Appendix D – Past & Potential Hazards/Critical Facilities Map

Appendix E – Documentation of the Planning Process

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

AGENDA

DATE: Wednesday, February 27, 2008

TIME: 10:00 AM

Westfield LEPC Headquarters

- 1) Introduction & Purpose of Committee**
 - 2) What is Hazard Mitigation Planning?**
 - 3) Step 1: Organize Hazard Mitigation Team**
 - 4) Questions & Answer Period / Set Goals for Next Meeting**
-

Attendee List

Jim Wiggs	Emergency Management Director, City of Westfield
Matt Medeiros	Westfield Fire Department, LEPC Chair
Dan Reardon	Health Department Director, City of Westfield
Paul Beebe	Westfield Police Department
Ed Mello	WSC MRC
Mary Regan	Westfield Fire Department
Linda Dion	Health Department Nurse,
Debra Mulvenna	Health Department
Michael Rowbotham	Westfield (?) Red Cross
Pat McGinn	Westfield Resident (former ?)
Tom Kane	Westfield Fire Department, Chief
Len Nastiaka	WEMA
Brian Boldini	Westfield Police Department
Gerald Crawford	Emergency Management Department, City of Westfield
Robert Zajac	Western Massachusetts Hospital
Thomas Tremblay	Noble Hospital
Mark Jackson	Mestek
Patricia Berube	Westfield State College, Health Services
Ken Guertin	Westfield Water Resources
Jay Levine	Pioneer Valley Planning Commission

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

**Wednesday, March 19, 2008
10:00 AM
Westfield LEPC Headquarters**

AGENDA

1. Introduction and Purpose of Committee

2. Identify Critical Facilities (to be shown on Base map)

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

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

2. Identify Critical Facilities and Evacuation Routes Potentially Affected By Hazard Areas

3. Hazards Analysis Methodology

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

4. Analyze Development Trends

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

5. Review Vulnerability Assessment Methodology and Potential Loss Estimates

6. Schedule and Agenda for next meeting

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

Meeting 2 Attendee List

Matt Medeiros	Westfield Fire Department, LEPC Chair
Jim Wiggs	Emergency Management Director, City of Westfield
Peter Cowles	Westfield Police Department
Ed Mello	Greater Westfield MRC
Mary Regan	Westfield Fire Department
Jim Mulvenna	Westfield Department of Public Works
Len Nastiaka	WEMA
Gerald Crawford	Emergency Management Department, City of Westfield
Thomas Tremblay	Noble Hospital
Mike Nockunas	Westfield State College
Ken Guertin	Westfield Water Resources
Jay Levine	Pioneer Valley Planning Commission

**Westfield Hazard Mitigation Planning Committee
Meeting #3**

**Wednesday, April 16, 2008
10:00 AM
Westfield LEPC Headquarters**

AGENDA

- 1. Identify Critical Facilities and Evacuation Routes Potentially Affected By Hazard Areas**
- 2. Hazards Analysis Methodology**
 - Identify Past Hazard Occurrences, Location and Damage Assessments
 - Hazard Identification and Analysis Worksheet
- 3. Analyze Development Trends**

Review local zoning districts. Identify planned and proposed subdivisions and other common developments. Is planned development at risk by natural hazards? Are there mitigation measures that can be taken to prevent loss of life, property damage, and disruption of governmental services and general business activities.
- 4. Review Vulnerability Assessment Methodology and Potential Loss Estimates**
- 5. Establish Mitigation Goals and Objectives**
- 6. Schedule and Agenda for next meeting**

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

Meeting 3 Attendee List

Matt Medeiros	Westfield Fire Department, LEPC Chair
Jim Wiggs	Emergency Management Director, City of Westfield
Ed Mello	Greater Westfield MRC
Jim Mulvenna	Westfield Department of Public Works
Len Nastiaka	WEMA
Paul Beebe	Westfield Police Department
Don Humason	Westfield Fire Department
Jay Levine	Pioneer Valley Planning Commission

City of Westfield- Hazard Mitigation Planning

c/o Pioneer Planning Commission, 26 Central Street, West Springfield, MA 01089

MEETING NOTICE

Date: Wednesday, May 21, 2008
Time: 9:30 a.m.
Location: Fire Headquarters, 34 Broad Street

AGENDA

1. Review Revised Map of Critical Facilities
2. Establish Goals and Objectives
3. Develop Action Plan of Hazard Mitigation Strategies
4. Review Plan Adoption and Implementation

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

Meeting 4 Attendee List

Matt Medeiros	Westfield Fire Department, LEPC Chair
Mary Regan	Westfield Fire Department
Mark Jackson	Mestek, Inc.
Bill Phelan	Westfield Fire Department
Mindy Sullivan	Westfield State College
Charles Darling	Westfield Water Resources Department
Jay Levine	Pioneer Valley Planning Commission

Appendix F – Public Outreach

PRESS RELEASE

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

FOR IMMEDIATE RELEASE
December 14, 2007

Pre-Disaster Mitigation Plans Under Development

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

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

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

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

PRESS RELEASE

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

FOR IMMEDIATE RELEASE

June 30, 2008

Pre-Disaster Mitigation Plans Public Comment Period

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

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

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

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

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