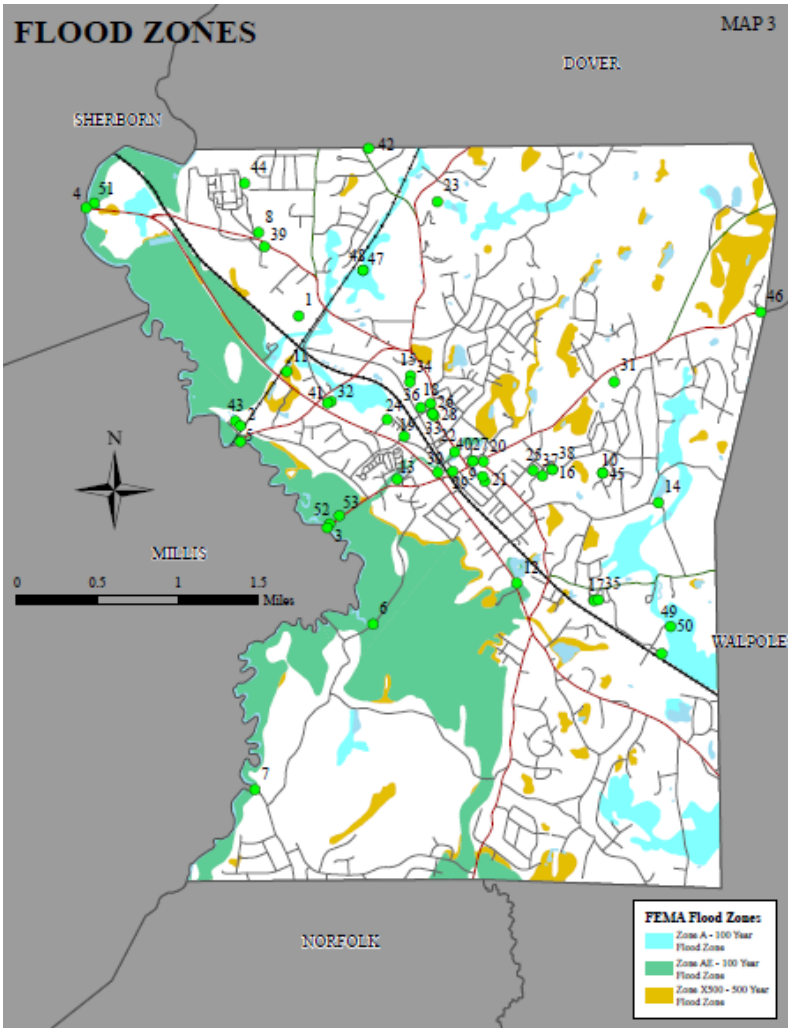
TOWN OF MEDFIELD
HAZARD MITIGATION PLAN



Metropolitan Area Planning Council

Final Plan
Adopted February 1, 2011

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ACKNOWLEDGEMENTS AND CREDITS

This plan was prepared for the Town of Medfield by the Metropolitan Area Planning Council (MAPC) under the direction of the Massachusetts Emergency Management Agency (MEMA) and the Massachusetts Department of Conservation and Recreation (DCR). The plan was funded by the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation (PDM) Grant Program.

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I. INTRODUCTION

Planning Requirements under the Federal Disaster Mitigation Act

The Federal Disaster Mitigation Act, passed in 2000, requires that after November 1 2004, all municipalities that wish to continue to be eligible to receive Federal Emergency Management Agency (FEMA) funding for hazard mitigation grants, must adopt a local multi-hazard mitigation plan. This planning requirement does not affect disaster assistance funding.

Massachusetts has taken a regional approach and has encouraged the regional planning agencies to apply for grants to prepare plans for groups of their member communities. The Metropolitan Area Planning Council (MAPC) received a grant from the Federal Emergency Management Agency (FEMA) under the Pre-Disaster Mitigation (PDM) Program, to assist the Town of Medfield and 17 other communities develop their local Hazard Mitigation Plans. The local Hazard Mitigation Plans produced under this grant are designed to meet the requirements of the Disaster Mitigation Act for each community.

What is Hazard Mitigation?

Natural hazard mitigation planning is the process of figuring out how to reduce or eliminate the loss of life and property damage resulting from natural hazards such as floods, earthquakes and hurricanes. Hazard mitigation means to permanently reduce or alleviate the losses of life, injuries and property damage resulting from natural hazards through long-term strategies. These long-term strategies can include planning, policy changes, programs, projects and other activities.

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II. COMMUNITY PROFILE

Overview

The Town of Medfield is an historic suburban town on an important crossing point of the Charles River valley leading to the western interior of the state. The town is bordered by Millis on the west, Sherborn on the northwest, Dover on the north and northeast,Walpole on the east and southeast and Norfolk on the south. It is 18 miles northwest of Brockton, 19 miles southwest of Boston, 29 miles north of Providence, RI and 208miles from New York City.

Located on a rugged upland watershed area and the adjacent river meadow, Medfield was the site of major native settlements and of early European settlements, although the latter were almost completely destroyed during the King Philip wars.

The early economic base of the community was agriculture and cattle raising with some dairying and orchards, and the community gradually evolved from a front line frontier town to a moderately prosperous rural town with little development outside of farming and grazing. In the 19th century, straw hat making became a significant business in town, recording over $1 million worth of goods for one manufacturer alone in 1875. The Medfield State Mental Hospital was developed in the 1890's, providing another source of jobs for an increasing population.

Presently, the town has a major suburban population and is very proud of its restored and preserved 18th and 19th century buildings.

The town has an Open Town Meeting form of government with a Board of Selectmen and a Town Administrator. It was incorporated as a town in 1857 and has a land area od roughly 14.51 square miles.

Narrative based on information provided by the Massachusetts Historical Commission.

Table 1
Medfield Characteristics from 2000 Census

Population = 12,273
- 8.5 % are under age 5
- 9.3 % are over age 65
- 0.7 % live in group quarters

Number of Housing Units = 4,048
- 14.3 % are renter-occupied housing units

Source: 2000 Census.

The Town of Medfield maintains a website at www.town.medfield.net.

The Town of Medfield has several unique characteristics to keep in mind while planning for natural hazards:

- A defining characteristic of the town is that most of its western edge is bordered by the Charles River, which is associated with a large amount of the town's floodplain.
- Additionally, several portions of the town's floodplain are protected as necessary flood storage for the Charles River, as a way of lessening the impacts on down river communities including the state's capital city, Boston.
- Another defining characteristic of the town are the tree-lined streets. Although these trees are vulnerable to high winds and ice storms, they are a tradeoff the town is willing to have.
- The town is home to several farms with animals such as horses that need to be considered in evacuation plans.
- The town has very proactive municipal officials that frequently share information and coordinate on a regular basis.
- Medfield is home to historic structures and sites that are irreplaceable and bring economic value to the town.
- Medfield has numerous bridge crossings and dams that could be at risk in the event of flooding. However, alterations or modifications to many of these structures would have to be approved by the US Army Corps of Engineers, which has authority over the aforementioned flood storage areas. Improvements to lessen flooding impacts in Medfield, cannot increase flooding impacts downstream or restrict in any way the municipality's flood storage function.
- Medfield would be a good candidate for flood-related grants due to the potential impact to property, transportation emergency routes, economic/historic resources, and the ability to solve the flooding problems through structural measures such as culvert upgrades, dam and bridge upgrades or flood proofing. The cost-benefit analysis would likely be in the town's favor.
- Much of the critical infrastructure in the town is located in clusters, often near areas of floodplain. These facilities are therefore at higher risk during natural hazards.

Existing Land Use

The most recent land use statistics available from the state are from 1999 aerial photography. Table 2 breaks the town into 21 land use categories. The table shows the acreage of each land use category and the percentage of land area in Medfield in each category. Open Land includes areas with abandoned agriculture, power lines or areas devoid of vegetation. Urban Open Land includes undeveloped land and protected green space.

Table 2
Existing Land Use, Medfield, 1999

Land Use	Acres	% of Town
Cropland	311	3.32
Pasture	84	.90
Forest	4426	47.21
Non-forested Wetlands	736	7.85
Mining	7	0.07
Open Land	284	3.03
Participatory Recreation	77	0.82
Spectator Recreation	0	0
Water Recreation	11	0.12
Multi-family Residential	23	0.24
High Density Residential (less than ¼ acre lots)	148	1.58
Medium Density Residential (¼ – ½ acre lots)	1328	14.17
Low Density Residential (Larger than ½ acre lots)	1474	15.73
Salt Water Wetlands	0	0
Commercial	64	0.68
Industrial	73	0.78
Urban Open	185	1.97
Transportation	48	0.51
Waste Disposal	26	0.28
Water	52	0.56
Woody Perennials	17	0.18
Total	*9,374*	

For more information on land use categories, see www.mass.gov/mgis/lus.htm.

Potential Future Land Use

In 2000, MAPC, under contract to the Executive Office of Environmental Affairs, prepared a buildout analysis for every community in the Boston region. A buildout analysis is a tool to help communities understand the potential impacts of future growth that might occur given the amount of developable land remaining and how that land is zoned.

The buildout is based on available land within each zoning district and it estimates the number of additional housing units and commercial development that could be accommodated. Generally, the projections account only for as-of-right development. The results of the 2000 Census were not released when MAPC performed the analyses.

Table 3: Buildout Impacts in Medfield, MAPC Analysis

Developable Land Area (acres)	343
Additional Residents	257
Additional K-12 Students	186
Additional Residential Units	315
Additional Commercial/Industrial (sq. ft.)	54,889
Additional Roadway at Buildout (miles)	6

While these statistics give an idea of how Medfield could grow, MAPC consulted with town staff to provide a more realistic picture of future development based on the town's recent comprehensive planning efforts and current trends and projects. The potential future development and redevelopment areas are shown on Map 2, "Potential Development" and are described below. The letters refer to those on Map 2.

Only five sites for development or potential development were cited in the meeting. The main reason for this is that the combination of protected land, existing flood plain and local zoning means that there are few properties large enough to be developed into multi-unit sites. There are a number of single-family house lots around town that are available individually, but few large development sites. The development sites mentioned by the local officials include:

(A) Hospital Property – This is a five-year project with a proposal for 440 residential units, which is now before the state legislature, because the property had to be rezoned by the town, and then must be approved by the state to go forward. It is a mixed use, residential/commercial development. The current owner of the property is the state Division of Capital Asset Management.

B) Hunt Club, on North Street – This former golf course is a private riding club with over 400 members, mostly from the town who use the site to ride their horses. No current proposal has been made with regard to this property. The Hunt Club is owned by Hunt Club members and there is no move to sell the land or develop it, but the property is zoned for agriculture and would likely be developed as a residential use if the Hunt Club were to decide to sell the property. It is a large piece of land that could be attractive to a developer, should the horse owners ever decide to go elsewhere.

C) Wood Ridge and Erik Road – This is an on-going, permitted development of single family house lots on two streets. An eight-house development called Wood Ridge off of Quarry Street and a six-house development on Erik Road that backs

up to Quarry Street, but does not connect. The two developments are not in any known hazard areas in town, though the two development do sit between areas identified as part of the 500-year FEMA floodplain. The project is already underway and the developer is Musto/Caldwell.

D) Maple Street – This development is a residential condo development with 33 units, being built in a residential zone, off of Spring Street.

E) Medfield Woods on West Street – This is a proposed 40B project of 36 three and four bedroom condominiums, this site is within an industrial zone and on a major commuter road, abutting the 500-year flood plain. The property is owned by Medfield Woods LLC.

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III. PUBLIC PARTICIPATION

Public participation occurred primarily at two levels: the Metro Boston South/West Hazard Mitigation Community Planning Team (regional committee) and the Medfield Multiple Hazard Community Planning Team (local committee). In addition, the town held one public meeting to present the plan and solicit input.

Medfield's Participation in the Regional Committee

In April 2007, MAPC notified the 18 communities of the first meeting of the Metro Boston South/West Regional Hazard Mitigation Community Planning Team (HMCPT) and requested that the Chief Elected Official designate at least two municipal employees and/or officials to represent the community. The following individuals represented Medfield on the regional committee:

Kristine Treirweiller, Assistant Town Administrator, Town of Medfield

The Metro Boston South/West Regional Hazard Mitigation Community Planning Team met over the course of the project on the following dates:

April 3, 2007
December 11, 2007
June 18, 2008

Agendas from these meetings are located in Appendix B.

The Local Multiple Hazard Community Planning Team

In addition to the regional committee meetings, MAPC worked with the local community representatives to organize a local Multiple Hazard Community Planning Team (MHCPT) for Medfield. This local team held its meetings on December 18, 2007, February 5, 2008 and March 15, 2008 to review existing mitigation measures, develop hazard mitigation goals, and discuss potential mitigation measures. Table 4 lists the attendees at each meeting of the team. The agendas for these meetings are included in Appendix B. In addition, MAPC collected information via one-on-one meetings, phone interviews, or email.

Table 4: Attendance at the Medfield Local Multiple Hazard Community Planning Team Meetings

December 18, 2007
Michael Sullivan, Town Administrator
Kristine Treirweiler, Asst. Town Administrator
William Kingsbury, Fire Chief
Ken Feeney, Superintendent of Public Works
February 5, 2008
Michael Sullivan, Town Administrator
Kristine Treirweiler, Asst. Town Administrator
Robert Meaney, Police Chief
Ken Feeney, Superintendent of Public Works
March 14, 2008
William Kingsbury, Fire Chief

Public Meeting

The town held a public meeting on April 7, 2009 at the Medfield Town Hall to introduce the plan to the public. Notice of the meeting was posted at Town Hall and was publicized as a regular Selectmen's meeting. MAPC presented an overview of the planning process and priority mitigation strategies to attendees. MAPC then edited the plan based on the comments at the meeting. The attendance list for the meeting is below.

Table 5: Attendance at April 7, 2009 Board of Selectmen's Meeting

Michael Sullivan, Town Administrator
Kristine Trierweiler, Assistant Town Administrator
Selectwoman Anne Thompson
Selectman Mark Fisher
Selectman Peterson
Evelyn Clarke

IV. OVERVIEW OF HAZARDS AND VULNERABILITIES

This section provides a general overview of how a number of natural hazards impact Medfield. The next section provides more detail about impacts at specific locations and existing mitigation efforts.

Overview of Hazards and Impacts

The Massachusetts Hazard Mitigation Plan provides an overview of natural hazards in Massachusetts. It indicates that Massachusetts is subject to the following natural hazards (listed in order of frequency): floods, heavy rainstorms, nor'easters, coastal erosion, hurricanes, tornadoes, urban and wildfires, drought and earthquakes.

Table 6 summarizes the hazard risks for the state and notes where risks in Medfield differ from the state assessment. The state analysis takes into account the frequency of the hazard, historical records and variations in land use. An explanation of the definitions used can be found at the end of the table. Table 7 lists those federal disaster and emergency declarations for Middlesex County.

Table 6: Frequency and Severity of Natural Hazards in the State

Hazard	Frequency in State	Severity in State	Issues in Medfield
Flood	High	Serious to extensive	Same as state
Dam Failure	Low	Extensive	Same as state
Hurricanes	Medium	Extensive to catastrophic	Same as state
Severe Storms (wind, hail, lightning)	Medium	Serious	Same as state
Tornadoes	Medium	Extensive to catastrophic	Not a major issue in Medfield
Winter Storms	High	Serious	Same as state
Earthquakes	Low	Catastrophic	Not a major issue in Medfield
Landslides	Low	Minor	Not a major issue in Medfield
Brush Fires	Medium	Serious	Not a major issue in Medfield

Definitions Used in the Commonwealth of Massachusetts State Hazard Mitigation Plan

Frequency
- Very Low Frequency: Events that occur less frequently than once in 1,000 years (less than 0.1% per year).
- Low Frequency: Events that occur from once in 100 years to once in 1,000 years (0.1% to 1% per year).
- Medium Frequency: Events that occur from once in 10 years to once in 100 years (1% to 10% per year).
- High Frequency: Events that occur more frequently than once in 10 years (greater than 10% per year).

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Severity
- Minor: Limited and scattered property damage; no damage to public infrastructure (roads, bridges, trains, airports, public parks, etc.); contained geographic area (i.e., 1 or 2 communities); essential services (utilities, hospitals, schools, etc.) not interrupted; no injuries or fatalities.
- Serious: Scattered major property damage (more than 50% destroyed); some minor infrastructure damage; wider geographic area (several communities); essential services are briefly interrupted; some injuries and/or fatalities.
- Extensive: Consistent major property damage; major damage to public infrastructure (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and fatalities.
- Catastrophic: Property and public infrastructure destroyed; essential services stopped, thousands of injuries and fatalities.

Table 7: Disaster and Emergency Declarations for Middlesex County

ID Number	Type	Date
1701	Severe Storms and Inland and Coastal Flooding	April 15-25, 2007
1642	Severe storms, flooding	May 12, 2006 (continuing)
1614	Severe storms, flooding, landslides, mudslides	October 7 - 16, 2005
1512	Severe winter storms	April 1, 2004 through April 30, 2004
3191	Snowstorm	December 5 – 6, 2003
3175	Snowstorm	February 17-18, 2003
3165	Blizzard	March 2001
1364	Severe storms, flooding	March 5, 2001 through April 16, 2001
1224	Heavy rain, flooding	June 13 to July 6, 1998
1142	Heavy rain, flooding	October 1996
1090	Blizzard	January 1996
3103	Blizzard	March 1993
920	Storm	October 1991
914	Hurricane (Bob)	August 1991

Sources: www.fema.gov and *State Hazard Mitigation Plan,* MEMA and DCR

Flood-Related Hazards

Flooding was the most prevalent natural hazard identified by local officials in Medfield. Flooding can occur during hurricanes, nor'easters, severe rainstorms and thunderstorms.

There have been a number of major rain storms that have resulted in significant flooding in eastern Massachusetts over the last fifty years. Excluding hurricanes, significant rain storms include:

- August 1954
- March 1968
- January 1979
- April 1987
- October 1991 ("The Perfect Storm")

- October 1996
- June 1998
- March 2001
- April 2004
- October 2005
- May 2006
- April 2007

Through October 2007, Medfield property owners filed a total of 37 losses with the National Flood Insurance Program. Of these, 26 have been paid for a total of just over $167,600. FEMA maintains a database on these flood insurance policies and claims, which can be found at www.fema.gov/business/nfip/statistics/pcstat.shtm. The following table provides further detail from the database:

Table 8: Flood Insurance Policies and Claims in Medfield (as of January 31, 2008)

Flood insurance policies in force	8
Coverage amount of flood insurance policies	$1,701,100
Premiums paid	$3,605
Total losses (all losses submitted regardless of the status)	1
Closed losses (Losses that have been paid)	1
Open losses (Losses that have not been paid in full)	0
CWOP losses (Losses that have been closed without payment)	0
Total payments (Total amount paid on losses)	$1,600.45

There are no repetitive loss structures in Medfield. As defined by the Community Rating System (CRS) of the National Flood Insurance Program (NFIP), a repetitive loss property is any property for which the NFIP has paid two or more flood claims of $1,000 or more in any given 10-year period since 1978. For more information on repetitive losses see http://www.fema.gov/nfip/replps.shtm.

Wind-Related Hazards

Wind-related hazards include hurricanes and tornadoes as well as high winds during severe rainstorms and thunderstorms.

The region has been impacted by hurricanes throughout its history, starting with the Great Colonial Hurricane of 1635. The eye of one hurricane passed right through Boston in 1944. Between 1858 and 2000, Massachusetts has experienced approximately 32 tropical storms, nine Category 1 hurricanes, five Category 2 hurricanes and one Category 3

hurricane. This equates to a frequency of once every six years. Hurricanes that have occurred in the region include[1]:

- Great New England Hurricane* September 21, 1938
- Great Atlantic Hurricane* September 14-15, 1944
- Hurricane Doug September 11-12, 1950
- Hurricane Carol* August 31, 1954
- Hurricane Edna* September 11, 1954
- Hurricane Hazel October 15, 1954
- Hurricane Diane August 17-19, 1955
- Hurricane Donna September 12, 1960
- Hurricane Gloria September 27, 1985
- Hurricane Bob August 19, 1991

*Category 3.

Not included in this list is the Portland Gale of November 26-28, 1898, which may well have been the most damaging coastal storm in Massachusetts history.

As shown in Map 5 in Appendix A, one tropical depression, one tropical storm, and two hurricanes have tracked through Medfield since 1861. A hurricane or storm track is the line that delineates the path of the eye of a hurricane or tropical storm. The town does experience the impacts of the wind and rain of hurricanes and tropical storms regardless of whether the storm track passed through the town. The hazard mapping also indicates that the 100 year wind speed is 110 miles per hour. No tornados have been recorded within the town.

Winds during other storms also can cause damage. Downed trees and limbs can be a problem due to weather conditions such as strong wind or heavy snow and ice. Tree limbs can down power and communication lines and impact major roadways.

Winter-Related Hazards

In Massachusetts, northeast coastal storms known as nor'easters, occur one to two times per year. Winter storms are a combination of hazards because they often involve wind, ice, flooding and snow fall. The average annual snowfall in the town is 36 - 48 inches.

As expected, a number of public safety issues can arise during snow storms. Impassible streets are a challenge for emergency vehicles and affect residents and employers. Snow-covered sidewalks force people to walk in streets, which are already less safe due to snow, slush, puddles and ice. Large piles of snow can also block sight lines for drivers, particularly at intersections. Not all residents are able to clear their properties, especially the elderly. Refreezing of melting snow can cause dangerous roadway conditions.

[1] Information on storms provided by Cambridge Emergency Management Department. It is assumed that these same storms affected eastern Massachusetts, including Medfield.

Fire-Related Hazards

Brush fires and drought fall under the category of fire-related natural hazards.

According to the State Plan, the most recent severe drought in the state occurred from 2001 to 2003 and other multi-year droughts occurred in 1879-83, 1908-12 , 1929-32, 1939-44, 1961-69, and 1980- 83.

Recent wild fires in the state, according to the state plan, affected 2,600 acres in 2002, and 1,600 acres in 2003. Approximately 90% of wild fires in the past 10 years were caused by humans and 10% by lightning. In addition to obvious threats to humans and property, because wildfires burn ground vegetation and ground cover, subsequent rains can worsen erosion.

According to local officials, natural fires in Medfield are not a significant issue. The town sees a handful of brush fires annually, but these fires do not usually cause property damage or injuries. It is important, however, to remember that fire can also be a result of other events such as from the aftermath of an earthquake.

Geologic Hazards

Geologic hazards include earthquakes, landslides, sinkholes, subsidence, and unstable soils such as fill, peat and clay.

Earthquakes

According to the State Hazard Mitigation Plan, New England experiences an average of five earthquakes per year. From 1627 to 1989, 316 earthquakes were recorded in Massachusetts. Most have originated from the La Malbaie fault in Quebec or from the Cape Anne fault located off the coast of Rockport. The region has experienced larger earthquakes, of magnitude 6.0 to 6.5 in 1727 and 1755. Other notable earthquakes occurred here in 1638 and 1663 (Tufts University).

As shown on Map 4 in Appendix A, no earthquake epicenters have been recorded within Medfield. Although new construction under the most recent building codes generally will be built to seismic standards, much of the development in the town pre-dates the most recent building code.

Earthquakes can result in many impacts beyond the obvious structural impacts. Buildings may suffer structural damage that is not readily apparent. Earthquakes can cause major damage to roadways, making emergency response difficult. Water lines and gas lines can break, causing flooding and fires. Equipment in buildings can be vulnerable. For example, a hospital may be structurally engineered to withstand an earthquake, but if the equipment inside the building is not properly secured, the

operations at the hospital could be severely impacted during an earthquake. Earthquakes can also trigger landslides.

The State Plan includes a map of Peak Ground Acceleration (PGA). The Plan explains that:

> "PGA measures the strength of a potential earthquake in terms of the peak acceleration of ground movement. The potential damages due to an earthquake increase as the acceleration of ground movement increases. Peak ground acceleration is expressed as a percentage of a known acceleration, the acceleration of gravity…Therefore, the geographic areas with the highest PGA have the highest potential for damages during an earthquake."

Landslides

Landslides can result from human activities that destabilize an area or can occur as a secondary impact from another natural hazard such as flooding. In addition to structural damage to buildings and the blockage of transportation corridors, landslides can lead to sedimentation of water bodies.

All of Medfield is classified as having a low risk for landslides, while the western half is classified as low risk. Local officials did not identify any significant issues related to landslides.

Overarching Impacts from Natural Hazards

A number of impacts can occur from any of the above-mentioned natural hazards. Most common and most visible are electrical outages and closures of roadways. This can occur due to high winds that knock down wires and limbs, from heavy snow falls that take time to clear, or from a landslide that carries large boulders or soil onto a roadway. In addition to causing inconveniences, these impacts can result in economic losses to local businesses that cannot function without electricity, or their customers or employees cannot get to the business. Minimizing vulnerability to natural hazards can help to reduce these and other impacts to people's safety, health, and overall economic viability.

Critical Facilities Infrastructure in Hazard Areas

Maps 1-7 in Appendix A and Table 9 list critical infrastructure in Medfield. Critical infrastructure includes those facilities that perform an important function during a natural disaster such as shelters and emergency operation centers. Critical infrastructure also includes locations that house sensitive populations, such as schools or nursing homes. There are other critical facilities and infrastructure that may not be mapped because the information was not available. These may include utilities, communication facilities, or transportation corridors. The purpose of mapping the natural hazards and critical facilities is to present an overview of hazards in the community and how they relate to critical facilities.

Much of the Critical infrastructure in Medfield is clustered near the center of town and clustered in West Medfield. Neither of these clusters are located in floodplain areas, though the center area cluster and several non-clustered infrastructure sites are located close to the floodplain. Specifically, there are eight facilities located within the 100-year floodplain (AE). Additionally, there are a handful of facilities that are located within locally-identified areas of flooding.

Landslide risks within the town are low.

The entire town has snow accumulation averages of 36 to 48 inches and therefore all critical facilities fall within this category. This also holds true for average wind speeds, which are uniform at 110 mph throughout the town.

Critical sites the town staff has emphasized that are particularly important and vulnerable include:

- Underground Storage Tanks (USTs) in or near flooding areas
- Water pump stations in or near flooding areas
- Fire Station / Police station vulnerable to earthquakes
- All bridges, particularly ones with weight restrictions that require detours

The breakdown of the critical sites and how they relate to selected hazards follows in Table 9.

Table 9: Relationship of Critical Facilities and Selected Hazard Types in Medfield

ID	Name	Type	FEMA Flood Zone	Locally-Identified Flood Area	Landslide Risk
1	Municipal Wells	Well	No	No	No
2	MAP at Memorial	Daycare	No	No	No
3	MAP at Middle School	Daycare	No	No	No
4	MAP at Wheelock School	Daycare	No	No	No
5	MAP at Dale Street	Daycare	No	No	No
6	American Legion Post	Place of Assembly	No	No	No
7	Beginning Years	Daycare	No	No	No
8	Medfield Children's Center	Daycare	No	No	No
9	Medfield Children's Center	Daycare	No	No	No
10	Explorations	Daycare	AE	No	No
11	Department of Public Works Garage	Department of Public Works	No	No	No
12	Tilden Village	Elderly Housing	No	No	No
13	Memorial School	School	No	No	No
14	Wheelock School	School	No	No	No
15	Dale Street School	School	No	No	No
16	Fire Station	Fire Station	No	No	No
17	Kingsbury High School	School	No	No	No
18	Blake Middle School	School	No	No	No
19	Thomas Upham House	Nursing Home	No	Frairi and Upham Road at train tracks	No
20	CVS	Pharmacy	No	Frairi and Upham Road at train tracks	No
21	Shaw's Supermarket	Pharmacy	No	No	No
22	Police Station	Police Station	No	No	No
23	Town Hall	Town Hall	No	No	No
24	Water Tank	Water	No	State Hospital	No

ID	Name	Type	FEMA Flood Zone	Locally-Identified Flood Area	Landslide Risk
		Storage Tank		property, eastern side	
25	Water Tank	Water Storage Tank	No	No	No
26	Wastewater Treatment Plant	Wastewater Treatment Facility	No	No	No
27	Medfield Vet Clinic	Veterinary Facility	No	No	No
28	Metro Residential Services	Special Needs	No	No	No
29	Tubular Wellfield	Well	A	No	No
30	Tubular Wellfield	Well	A	No	No
31	Well # 4	Well	A	No	No
32	Well # 3	Well	A	No	No
33	Well # 6	Well	AE	No	No
34	Well # 2	Well	AE	Main Street (Route 109) at Charles River	No
35	Well # 1	Well	AE	Main Street (Route 109) at Charles River	No
36	Castle Hill Academy	Daycare	No	No	No
37	Heritage Hill Vet. Clinic	Veterinary Facility	No	No	No
38	Medfield Fire Station - EOC Primary	EOC	No	No	No
39	Town Hall - Secondary EOC	EOC	No	No	No
40	Medfield Animal Shelter	Animal Shelter	No	No	No
42	Charles River Bridge at North Meadows Ro	Bridge	AE	No	No
43	Charles River Bridge at West Street	Bridge	AE	No	No
44	Causeway Street Bridge	Bridge	AE	Causeway Street, near Sewell Brook	No
45	Orchard Street	Bridge	AE	Orchard Street at	No

ID	Name	Type	FEMA Flood Zone	Locally-Identified Flood Area	Landslide Risk
	Bridge			Charles River	
46	Medfield Adult Community Center	Adult Center	No	No	No
47	Kingsbury Pond Dam	Dam	AE	No	No
48	Cemetery Pond Dam	Dam	No	No	No
49	Kenney Pond Dam	Dam	No	No	No
50	Verizon Communication Center	Comm. Hub - 911	No	No	No
51	Mount Nebo Communication Tower	Comm. Tower	No	No	No
52	NYNEX Communication Tower (Sam Whites)	Comm. Tower	X500	No	No
53	Civil Defense Communications	Comm. Facility	No	No	No

Explanation of Columns in Table 9

Column 1: ID #: ID number which appears on the maps. See Appendix A.

Column 2: Site Name: Name of the site. If no name appears in this column, this information was not provided to MAPC by the community.

Column 3: Site Type: Type of site.

Column 4: FEMA Flood Zone: Risk of flooding. No entry in this column means that the site is not within any of the mapped risk zones on the Flood Insurance Rate Maps (FIRM). If there is an entry in this column, it indicates the type of flood zone as follows:

Zone A - Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs (base flood elevations) or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.

Zone AE and A1-A30 - Zones AE and A1-A30 are the flood insurance rate zones that correspond to the 100-year floodplains that are determined in the FIS by detailed methods. In most instances, BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

Zones B, C, and X500 - Zones B, C, and X are the flood insurance rate zones that correspond to areas outside of the 100-year floodplains, areas of 100-year sheet flow flooding where average depths are less than 1 foot, areas of 100-year stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 100-year flood by levees. No BFEs or depths are shown within this zone.

Zone VE - Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply

Column 5: Locally-Identified Flood Area: Whether the site is located within an area that was identified by town officials and staff as a localized area of flooding. These areas may or may correspond with FEMA flood zones.

Column 6: Landslide Risk: The degree of landslide risk for that site. This information came from NESEC. The landslide information shows areas with moderate susceptibility to landslides based on mapping of geological formations. This mapping is highly general in nature. For more information, refer to http://pubs.usgs.gov/pp/p1183/pp1183.html. If there is no entry, it indicates that the site is located in an area with little or no risk of landslides. The other two risk categories, low and moderate, indicate higher degrees of risk.

Potential Damages to Existing Development

The purpose of the vulnerability assessment is to estimate the extent of potential damages from natural hazards of varying types and intensities. A vulnerability assessment and estimation of damages was performed for hurricanes, earthquakes and flooding. The methodology used for hurricanes and earthquakes was the HAZUS-MH software. The methodology for flooding was developed specifically to address the issue in many of the communities where flooding was not solely related to location within a floodplain.

Introduction to HAZUS-MH

HAZUS-MH is a tool to help estimate potential damages from certain types of natural hazards. We used HAZUS to estimate losses from a hurricane and earthquake. We did not use HAZUS to estimate flooding damages, for reasons explained below. The following overview of the HAZUS-MH is taken from the FEMA website. For more information, go to http://www.fema.gov/plan/prevent/hazus/.

> "HAZUS-MH is a nationally applicable standardized methodology and software program that contains models for estimating potential losses from earthquakes, floods, and hurricane winds. HAZUS-MH was developed by the Federal Emergency Management Agency (FEMA) under contract with the National Institute of Building Sciences (NIBS). Loss estimates produced by HAZUS-MH are based on current scientific and engineering knowledge of the effects of hurricane winds, floods and earthquakes. Estimating losses is essential to decision-making at all levels of government, providing a basis for developing and evaluating mitigation plans and policies as well as emergency preparedness, response and recovery planning.
>
> HAZUS-MH uses state-of-the-art geographic information system (GIS) software to map and display and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of hurricane winds, floods and earthquakes on populations."

There are three modules included with the HAZUS-MH software: hurricane wind, flooding, and earthquakes. There are also three levels at which HAZUS-MH can be run. Level 1 uses national baseline data and is the quickest way to begin the risk assessment process. The analysis that follows was completed using Level 1 data.

Level 1 relies upon default data on building types, utilities, transportation, etc. from national databases as well as census data. While the databases include a wealth of information on the communities that are a part of this study, it does not capture all relevant information. In fact, the HAZUS training manual notes that the default data is "subject to a great deal of uncertainty."

However, for the purposes of this plan, the analysis is useful. This plan is attempting to only generally indicate the possible extent of damages due to certain types of natural

disasters and allow for a comparison between different types of disasters. Therefore, this analysis should be considered a starting point to understanding potential damage from the hazard events. If interested, communities could build a more accurate database and further test disaster scenarios.

Table 10 displays damages from category 2 and 4 hurricanes. Table 11 displays damages if an historic earthquake were to occur today and if a stronger (7.0) earthquake were to occur.

Estimated Damages from Hurricanes

According to the State Hazard Mitigation Plan, between 1858 and 2000, there were 15 hurricanes: 60% were Category 1, 33% were Category 2 and 7% were Category 3. For the purposes of this plan a Category 2 and a Category 4 storms were chosen to illustrate damages. While the region has not experienced a Category 4 hurricane, modeling one helps to illustrate a "worst case scenario." This can help planners and emergency personnel evaluate the impacts of storms that might be more likely in the future, as we enter into a period of more intense and frequent storms.

Table 10. Estimated Damage in Medfield from a Category 2 or 4 Hurricane

	Cat. 2	Cat 4*
Building Characteristics		
Estimated total buildings	3,608	
Estimated total building replacement value (Year 2002 $)	$1,230,348,000	
General Building Damage		
# of buildings sustaining minor damage	476	1,211
# of buildings sustaining moderate damage	62	407
# of buildings sustaining severe damage	2	59
# of buildings destroyed	2	43
Population Needs		
% of hospital beds available on day of event	0	0
# of households displaced	12	105
# of people seeking public shelter	2	20
Debris		
Building debris generated	10,272	29,327
Tree debris generated	8,834	22,582
# of truckloads to clear building debris	57	277
Value of Damages		
Total property damage	$11,991,660	$73,530,830
Total business interruption loss	$1,139,970	$8,387,900

*No category 4 or 5 hurricanes have been recorded in New England. However, a Category 4 hurricane was included to help the communities understand the impacts of a hurricane beyond what has historically occurred in New England.

Estimated Damages from Earthquakes

The HAZUS earthquake module allows users to define different types of earthquakes and to input various parameters. The module is more useful where there is a great deal of data available on earthquakes. In New England, defining the parameters of a potential earthquake is much more difficult because there is little historical data. The earthquake module does offer the user the opportunity to select a number of historical earthquakes that occurred in Massachusetts. For the purposes of this plan, two earthquakes were selected: a 1963 earthquake with a magnitude of 5.0 and an earthquake with a magnitude of 7.0.

Table 11: Estimated Damage in Medfield from a Magnitude 5.0 and 7.0 Earthquake

	Magnitude 5.0	Magnitude 5.7
Building Characteristics		
Estimated total number of buildings	3,608	
Estimated total building replacement value (Year 2002 $)	$1,230,348,000	
Building Damages		
# of buildings sustaining slight damage	23	272
# of buildings sustaining moderate damage	4	55
# of buildings sustaining extensive damage	0	6
# of buildings completely damaged	0	1
Population Needs		
# of households displaced	0	4
# of people seeking public shelter	0	0
Debris		
Building debris generated (tons)	0	0
# of truckloads to clear building debris	0	0
Value of Damages		
Total property damage	$2,370,000	$12,580,000
Total losses due to business interruption	$2,450,000	$13,500,000

Estimated Damages from Flooding

MAPC did not use HAZUS-MH to estimate flood damages in Medfield. In addition to technical difficulties with the software, the riverine module is not a reliable indicator of flooding in areas where inadequate drainage systems, beaver activity, and increased impervious surfaces contribute to flooding even in areas outside of mapped flood zones. In lieu of using HAZUS, MAPC developed a methodology to give a rough approximation of flood damages.

Approximately 30 acres of Medfield's total land area of 9,878 acres have been identified by local officials as areas of flooding. This amounts to .30 percent of the land area. The number of structures in each flood area was estimated by applying the percentage of the total land area to the total number of structures (1,894) in Medfield, which is the same number of structures used by HAZUS for the hurricane and earthquake calculations. HAZUS uses an average value of $334,731 per structure for the building replacement value in this community. The calculations were done for a low estimate of 10% building

damages and a high estimate of 50% as suggested in the FEMA September 2002 publication, "State and Local Mitigation Planning how-to guides" (Page 4-13). The range of estimates for flood damages is $3,949,826- $19,749,129. These calculations are approximate only and are meant to show an order of magnitude of damage. These calculations are not based solely on location within the floodplain or a particular type of storm (i.e. 100 year flood).

Table 12: Estimated Damages from Flooding in Medfield

ID	Flood Hazard Area	Approx Area (Acres)	% of Total Land Area in Medfield	# of Struct.	Replacement Value	Low Estimate of Damages	High Estimate of Damages
3	Causeway Street, near Sewell Brook	65.3	0.70%	11	$3,749,999	$375,000	$1,875,000
4	Orchard Street at Charles River	7.8	0.08%	5	$1,704,545	$170,455	$852,273
5	Noon Hill Street at Stop River	14.8	0.16%	0	0	0	0
6	South Street at Norfolk Line and Stop River	8.3	0.09%	6	$2,045,454	$204,545	$1,022,727
7	Main Street (Route 109) at Charles River	37.3	0.40%	10	$3,409,090	$340,909	$1,704,545
8	Elm Street at Mill Brook	9.3	0.10%	7	$2,386,363	$238,636	$1,193,182
9	State Hospital property, eastern side	15.0	0.16%	12	$4,090,908	$409,091	$2,045,454
10	Frairi and Upham Road at train tracks	7.1	0.08%	10	$3,409,090	$340,909	$1,704,545
11	South Street near train tracks	15.3	0.16%	6	$2,045,454	$204,545	$1,022,727
12	Colonial Road, south to Hospital Road, and west to Harding Road	70.2	0.75%	30	$10,227,270	$1,022,727	$5,113,635
13	Causeway and Orchard streets	8.1	0.08%	5	$1,704,545	$170,455	$852,273
	Total	258.64	2.76%	102	$34,772,718	$3,477,272	$17,386,359

Potential Impacts to Future Development

The Town of Medfield has identified a number of parcels where development has been proposed, is underway or is expected to occur in the future. Table 13 indicates where areas of likely future development may be located within or partially within a natural hazard area.

Table 13: Relationship of Potential Development in Hazard Areas in Medfield

Parcel	Land Slide Risk	Flood Zone
Hospital Property - mixed residential units, in appeal	Low	2.0416% in AE
Hunt Club - potential at former golf course	Low	1.751% in A
Wood Ridge and Erik Road - single family	Low	25.0828% in X500
Maple Street - condos	Low	No
Medfield Woods - Proposed 40B project, 36 units	Low	6.0664% in X500

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V. HAZARDS AND EXISTING MITIGATION MEASURES

This section provides more detail on how certain natural hazards affect specific parts of Medfield. Existing mitigation measures are discussed under each hazard heading and existing mitigation measures for all natural hazards are compiled in Table 14.

Flood-Related Hazards

Overview of Town-Wide Flooding

Medfield is primarily impacted by the Charles River, which creates a natural border for the town on its Western edge with Millis and Sherborn. Medfield's waterways also include the Stop River and Sewell Brook, as well as low-lying wetland areas, and naturally formed ponds.

Flooding occurs in Medfield on a routine basis, ranging from minor nuisance roadway flooding, to basement flooding, to roadway closures, and to bridge scouring. However, since a large portion of the town's floodplain is protected by the Charles River Natural Valley Flood Storage Project of the 1960s, the town is limited in what it can do to address these flooding issues. The causes can be due to proximity to floodplain, improperly functioning drainage systems, beaver activity, and dam breaches. More detail on specific flooding regions within the town is provided in the site-specific flooding section below.

In the event of a large storm event, the greatest concerns are property damage, blockages of roadways or bridges vital for emergency response, and breaching of dams.

Medfield employs a number of practices to help minimize potential flooding and impacts from flooding, and to maintain existing drainage infrastructure. Existing town-wide mitigation measures include:

Existing Town-Wide Mitigation for Flood-Related Hazards

a) Participation in the National Flood Insurance Program (NFIP*)*. FEMA maintains a database on flood insurance policies and claims. This database can be found on the FEMA website at www.fema.gov/business/nfip/statistics/pcstat.shtm

b) Catch basins on public roads and property are cleaned annually.

c) The Highway Department provides maintenance to culverts, drainage pipes, and other drainage infrastructure on an as-needed basis. Drainage maintenance activities are coordinated with the Division of Natural Resources and are performed under the general maintenance permit issued by the Natural Resources Commission.

d) The town repairs and replaces drainage as needed.

e) Medfield's Zoning has a Flood Plain Conservancy District (Section 7.2) that restricts certain activities and requires a special permit for activities located within a flood zone.

f) Medfield's Zoning has a Wetlands By-Law intended to protect wetland resource areas and minimize flooding.

g) Medfield's zoning includes a restriction on the amount of impervious material that can be added to any new building or development in town, thus reducing runoff from new construction projects onto neighboring property.

h) The Massachusetts Stormwater Policy is applied to developments within the jurisdiction of the Natural Resources Commission.

i) The Town's subdivision regulations have general language about avoiding impacts to flood plains and minimizing drainage issues. Peak flows and runoff from the property can not be greater than pre-development rates. Drainage requirements for Site Plans are also general and require post-development rates to meet pre-development runoff rates.

j) Open Space Residential Developments are allowed under Medfield's Zoning.

k) The Town's Zoning also has a Groundwater Conservancy District to protect its drinking water supplies.

l) Medfield has substantial protected open space and preservation programs, including:
   - Low-lying wetland areas provide significant flood storage for the town's rivers.
   - Floodplain and Conservancy Districts, which have been enacted to protect the public health and welfare as well as the town's groundwater supply.
   - Flood plain has been preserved and is effective at minimizing flooding.

m) The town continues to implement its NPDES Phase II stormwater program which includes public education programs.

Site-Specific Flooding

The following areas were identified by Town staff as areas that have experienced more significant flooding in the past. The numbers in parentheses refer to the Areas of Concern on Map 8 in Appendix A.

Dams

Existing Town-Wide Mitigation for Dam Hazards

a) *DCR dam safety regulations* – All dams are subject to the Division of Conservation and Recreation's dam safety regulations. The dams must be inspected regularly and reports filed with the DCR Office of Dam Safety.

b) *Permits required for construction* – State law requires a permit for the construction of any dam.

Wind-Related Hazards

As shown on Map 5 in Appendix A, several severe storms with high winds have tracked through Medfield, but none have visited the town since 1944 and the three previous storms all occurred before 1900. To date the town has recorded a tropical depression, a tropical storm, a category one hurricane and a category three hurricane. The hazard mapping also indicates that the 100 year wind speed is 110 miles per hour. No tornados have been recorded within the town.

Tree damage during high winds has the potential to be a significant hazard in Medfield. Trees can knock out power lines and block major roadways, which hinders emergency response.

Medfield does experience downed trees that have caused isolated power outages and roadway blockages, but Medfield also prides itself on its tree-lined streets. Therefore, maintaining trees in a proactive fashion has been a trade-off for the tree amenities. The Medfield Highway Department has an effective tree trimming and removal program.

There are a large number of historic structures in town vulnerable to high winds because they are not structurally sound. The town does have an inventory of historic structures available.

The town of Medfield makes every effort to mitigate against damage due to high winds. Some of the specific actions are provided below.

Existing Town-Wide Mitigation for Wind-Related Hazards

a) The Highway Department has an effective tree trimming program in public areas and along Rights-of-Ways.

Winter-Related Hazards

Map 6 in Appendix A indicates that the average annual average snowfall in Medfield is between 36.1 inches to 48 inches. The town provides standard snow plowing operations, and clearing snow has not posed any significant challenges. The town does make plowing of roads a priority near emergency routes.

There have been no reports of problems with heavy snow collapsing roofs on structures throughout the town. However, the town does monitor snow loads on the roofs of municipal buildings and is keenly aware of the need to remove heavy snow loads from rooftops and ensure the structural integrity of roofs in town owned buildings.

Other winter issues include ice storms that can affect utilities and cause isolated power outages.

The town of Medfield currently employs a number of measures to mitigate for winter storm events. These are described below.

Existing Town-Wide Mitigation for Winter-Related Hazards

a) The Public Works Department provides standard snow plowing operations, including salting and sanding, but with a restricted salt policy.

b) Overnight street parking bans are in effect year round.

c) Public Education - Winter Maintenance information is available on the town website

d) The town has a Snow and Ice Disposal bylaw that states no person shall put any snow or ice in any public place or upon any part of a public street or sidewalk.

e) The town has sufficient snow storage available.

Fire-Related Hazards

The state is divided into 6 drought regions (see state plan) and has rated communities according to fire risk based on past occurrences. Medfield is rated as a low risk.

The Medfield Fire Department responds to a handful of brush fires annually, but they do not result in major property damage or deaths. The most common cause of these fires is due to human carelessness. The brush fires are typically not concentrated in certain locations, but are distributed throughout the town.

Vegetation management near residences can be an issue. If forested or vegetated areas encroach upon homes, the risk of brush fires impacting those homes is increased. A cleared buffer of 50-100 feet of clearance is ideal next to a structure, however it is hard to enforce over time as vegetation grows from year to year.

Medfield is home to several farms, and drought is a concern for the animals on those farms.

Existing Town-Wide Mitigation for Fire-Related Hazards (Town-Wide)

a) Town bylaws allow controlled open burning in accordance with state regulations, but a permit is required from the Fire Chief for each day of intended burning.

b) The Fire department reviews all subdivision and site plans for compliance with site access, water supply needs, and all other applicable regulations.

c) The town provides public education and notices during “drought watches.”

Geologic Hazards

Earthquakes

Most municipal officials acknowledged that earthquakes were the hazard for which their community was least prepared. There have been no recorded earthquake epicenters within Medfield. If an earthquake hits, the entire region, not just the town, would face significant challenges. Earthquakes often trigger fires. The water distribution system may be disrupted, thus posing a risk for public health and fighting the fires.

Although new construction under the most recent building codes generally will be built to seismic standards, much of the development in the town predates the most recent building code. The Fire and Police Stations are likely vulnerable to earthquakes as they were not structurally retrofitted to meet earthquake standards.

Existing Town-Wide Mitigation for Earthquake Hazards

a) The town does have shelters and backup facilities (see multi-hazard mitigation below).

b) The town does have an evacuation plan as specified in its Comprehensive Emergency Management Plan (CEMP).

Landslides

Map 4 in Appendix A indicates that the entire town of Medfield is classified as being at low risk for landslides. There are not many steep slopes in the town and local officials state that landslides are not a major threat or occurrence in Medfield. Rather, there are localized issues of erosion during construction, as a result of development, or as a result of clearing vegetation.

Existing Town-Wide Mitigation for Landslide Hazards

a) The subdivision regulations do have maximum slope requirements for new roads.

b) The town has an earth removal bylaw.

Existing Multi-Hazard Mitigation Measures

The Town of Medfield has several mitigation measures in place that address more than one hazard. In general, the town has a very thorough emergency response process, however, the challenge it faces is sheltering for residents and a number of non-traditional groups. The high school provides shelter and does have a generator, However, the elementary school in town does not have a generator.

The following describes the measures that are in place to mitigate for multiple hazards:

Existing Town-Wide Mitigation for Multiple Hazards

a) *Multi-Department Review of Developments* – Multiple departments, such as Planning, Zoning, Health, Public Works, Fire, Police, and Natural Resources, review all subdivision and site plans prior to approval.

b) *Comprehensive Emergency Management Plan (CEMP)* – Every community in Massachusetts is required to have a Comprehensive Emergency Management Plan. These plans address mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies. These plans contain important information regarding flooding, dam failures and winter storms. Therefore, the CEMP is a mitigation measure that is relevant to many of the hazards discussed in this plan. The CEMP is available online through secure access for town personnel.

c) *Enforcement of the State Building Code* – The Massachusetts State Building Code contains many detailed regulations regarding wind loads, earthquake resistant design, flood-proofing and snow loads.

d) *Local Emergency Management Planning Committee (LEPC)* – The LEPC consists of representatives from Public Works, Fire, Police, Health, School Transportation, Board of Selectmen, Emergency Management, and local businesses.

e) Emergency Preparedness public education is available on the town's website.

f) The Medfield High School is the designated community shelter site.

g) The Police and Fire Stations have backup generators..

h) The town works with the Council on Aging to help provide shelter to the elderly during extreme heat and cold weather.

Compilation of Existing Mitigation

The following table summarizes the many existing natural hazard mitigation measures already in place in Medfield. Because of the number of entities, public and private, involved in natural hazard mitigation, it is likely that this list is a starting point for a more comprehensive inventory of all measures. Please note that the numbers shown in parentheses correspond to the Hazard Areas of Concern included on the maps in Appendix A.

Table 14: Existing Natural Hazard Mitigation Measures in Medfield

Hazard	Area	Mitigation Measure
Flood-Related	Town-Wide	A) The town participates in the National Flood Insurance Program and has adopted the effective FIRM maps. The town actively enforces the floodplain regulations. B) Annual catch basin cleaning and annual street sweeping C) Long-term stormwater plan and funding, and ongoing system improvements D) Flood Plain District E) Wetlands Conservancy District F) Massachusetts Stormwater Policy G) Stormwater Requirements in Subdivision Regulations and Site Plan Review H) Open Space Residential Developments allowed I) Groundwater Conservancy District J) Protected open space and proactive land preservation programs K) Public Education on stormwater through the NPDES Phase II program
	Causeway Street near Sewell Brook (3)	Previously rebuilt and raised roadway. No other mitigation needed at this time.
	Orchard Street at Charles River (4)	State has previously rebuilt the roadway, no other mitigation needed at this time.
	Noon Hill Street at Stop River (5)	Previously rebuilt existing bridge. Dirt roadway here, but town sees no sense in paving it at this time.
	South Street at Norfolk Line and Stop River (6)	Town has previously rebuilt the roadway, bridge and replaced a culvert here in the 1990s. Area is part of flood storage project, no other mitigation possible at this time.
	Main Street at Charles River (7)	Town owned land on both sides and bridge previously raised to avoid flooding.
	Elm Street at Mill Brook (8)	Existing stone culvert in place. This culvert could be replaced tom increase drainage capacity, as long as new culvert remains within existing footprint.
	State Hospital property (9)	Division of Capital Asset Management has constructed a swale to help mitigate flooding of the area below the hospital. Town expects other mitigation to take place with development of the hospital site.
	Frairy Street and Upham Road (10)	Existing culvert is too small. Currently the town does its best to maintain culvert, to ensure maximum capacity.
	South Street near RR tracks (11)	Existing culvert is too small, but would need cooperation of railroad and Army Corps to expand culvert.
	Colonial Road to Hospital property and Harding (12)	Existing railroad culvert here is too small and there is an associated beaver problem with this site as well.
	Causeway and Orchard streets (13)	Existing culvert here is too small, but the culvert lies beneath utility lines and roadway. Replacement here would be a major project and very costly.

Table 14: Existing Natural Hazard Mitigation Measures in Medfield

Hazard	Area	Mitigation Measure
Dams	Town-Wide	A) DCR Dam Safety Regulations B) Construction permits required
Wind-Related	Town-Wide	A) Tree Maintenance Program by Public Work
Winter-Related	Town-Wide	A) Standard snow operations, restricted salt B) Public Education on snow operations and winter maintenance is on the town website C) Snow and Ice Disposal Bylaw D) Sufficient space for municipal snow storage
Fire-Related	Town-Wide	A) Open burning permits required B) Fire Department reviews all development plans C) Fire Department provides public education on its website D) Town provides public education on drought watches
Geologic - *Earthquake*	Town-Wide	A) Shelters and backup facilities available (see multi-hazard mitigation below) B) Evacuation plan in CEMP
Geologic - *Landslides*	Town-Wide	A) Maximum slopes for subdivision roads
Multi-Hazard	Town-Wide	A) Multi-department review of developments B) Comprehensive Emergency Management Plan (CEMP) C) Enforcement of State Building Code D) Local Emergency Management Planning Committee (LEPC) E) Emergency Preparedness public education on the town website F) Medfield High School is designated as a community shelter G) Police and Fire Stations have backup generators H) Citizen Emergency Response Team (CERT) I) Sheltering available for elderly during extreme heat and cold

VI. HAZARD MITIGATION GOALS AND OBJECTIVES

The Medfield Local Multiple Hazard Community Planning Team endorsed the following eight hazard mitigation goals at its November 29, 2007 team meeting:

1. Prevent and reduce the loss of life, injury, public health impacts and property damages resulting from all major natural hazards.

2. Identify and seek funding for measures to mitigate or eliminate each known significant flood hazard area.

3. Integrate hazard mitigation planning as an integral factor in all relevant municipal departments, committees and boards.

4. Prevent and reduce the damage to public infrastructure resulting from all hazards.

5. Encourage the business community, major institutions and non-profits to work with the Town to develop, review and implement the hazard mitigation plan.

6. Work with surrounding communities, state, regional and federal agencies to ensure regional cooperation and solutions for hazards affecting multiple communities.

7. Ensure that future development meets federal, state and local standards for preventing and reducing the impacts of natural hazards.

8. Take maximum advantage of resources from FEMA and MEMA to educate town staff and the public about hazard mitigation

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VII. POTENTIAL MITIGATION MEASURES

What is Hazard Mitigation?

Hazard mitigation means to permanently reduce or alleviate the losses of life, injuries and property damage resulting from natural and human-made hazards through long-term strategies. These long-term strategies include planning, policy changes, programs, projects and other activities. FEMA currently has three mitigation grant programs: the Hazards Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation program (PDM), and the Flood Mitigation Assistance (FMA) program. See http://www.fema.gov/government/grant/government.shtm for more information.

Identification and Prioritization of Potential Mitigation Measures

During the local hazard team meetings, officials in Medfield determined possible mitigation measures for the various natural hazards that have impacted or could impact the town. In addition, MAPC solicited suggestions for mitigation measures when it collected hazard information from town officials and from other town plans and studies. MAPC compiled all suggested strategies into a matrix. Local officials then prioritized the measures using the matrix. Prior to choosing priorities, participants reviewed the project Goals and STAPLEE evaluation considerations, such as:

- Is there political support and public support to implement the mitigation measures?
- Can the town provide the necessary maintenance when the mitigation measure is completed?
- Does the cost seem reasonable when considering the size of the problem and likely benefits from mitigation?

A description of high and medium priority measures, along with those for ensuring ongoing compliance with the National Flood Insurance Program, provided in the discussions below, and summarized in Table 15.

High Priority Mitigation Measures

A) Enlarge/Replace Culvert at Causeway and Orchard streets

This is a high flooding hazard with annual flooding that takes place on private property and spills into the roadway. A seasonal brook floods through a private backyard onto the roadway. There is an existing culvert that would need to be replaced to solve the problem, but a culvert replacement here would be difficult because utility lines run above the culvert, making it tricky and very expensive to undertake such a project. Further complicating this site is that the flooding on the road cuts off a major thoroughfare in town, meaning that some kind of mitigation here is high priority.

B) Replace Culvert on Elm Street at Mill Brook

Flooding at this site is considered severe and frequent. Officials believe the cause of the flooding is a back-up of water trying to pass beneath the road through an old stone box culvert. They suggest replacing the culvert with a newer pre-cast box culvert, with more capacity and possibly raise the road to take it above flood level. They consider this project a high priority.

C) Maintain Existing RR Culvert at Frairy and Upham streets

This high severity flooding hazard floods every four to five years as a result of an inadequate railroad culvert that backs up during high rain or runoff events. Officials explained that better maintenance of the culvert could go a long way to alleviating the issue, as could a new, expanded culvert. However, they've also noted that it is unlikely that the culvert will be replaced and have said that maintenance of the culvert should be the main priority here.

D) Additional Mitigation as needed during Redevelopment of Hospital Site

This site floods annually, impacting a neighborhood to the eastern side of the property, which sits at a lower grade than the hospital site. The flooding is considered severe. The state's Division of Capital Asset Management (DCAM) last year constructed a swale at the lower portion of the eastern side of the property in an attempt to mitigate the impacts, however that has worked with only limited success. Town officials expect that some kind of mitigation will take place at this site as a part of any re-development of the site, which is already in the planning stages. Mitigation here is considered to be a high priority, but they don't expect town funds to have to be used.

Medium Priority Mitigation Measures

E) Replace/Upgrade existing bridge and roadway on Main Street at Charles River

This moderate to high flooding hazard has a frequency of once every ten years, but does have a habit of staying flooded for several days. The main concern here is that Main Street Route 109 is a main thoroughfare into and out of the town and the road at this site stretches over the 100-year flood plain for several hundred yards. Though no homes are impacted, when this road does flood it can shut down Route 109 for quite some time. The bridge over the river has been previously raised and the town owns land on both side of the bridge. However, town officials have said they think a new bridge is needed and they would also suggest raising the portions of the road leading up the bridge to take it above the flood waters. This project is a moderate priority.

F) Expand/Replace RR culvert at South Street near tracks

This is a moderate flooding hazard that floods about every five years. Again the issue seems to be a too small railroad culvert, but local officials are not hopeful that the culvert will be replaced. In this case, there are some homes that could be impacted, but is considered a low priority, because of other downstream issues.

Measures to ensure continued compliance with National Flood Insurance Program requirements

G) Continuation of Open Space Protection and Land Acquisition

Although Medfield already has a significant amount of protected land, further protection of open space in the wake of development is important in order to ensure future development does not increase vulnerability to natural hazards, such as flooding. The town should continue its efforts for open space protection and purchases as prioritized in the Open Space Plan, Long-Range plan, and Community Preservation Plan.

H) Regulatory Revisions for Stormwater Management

The current subdivision and site plan requirements do have basic standards for stormwater management, but they could be updated to reflect more current trends to help prevent flooding from new development and redevelopment. In particular, the regulations should include:

- Requirements for aggressive and legally-binding operation and maintenance agreements, with enforcement mechanisms, for private drainage facilities.
- Regulatory controls to encourage Low-Impact Development (LID) practices.

I) Become Fully "Storm Ready"

The town aims to become "storm ready" with respect to its alerting systems. One possible method that the town is currently investigating is notification via television. By subscribing to a service, the town would have the ability to overwrite any TV programming to alert residents of an impending emergency or bad weather.

Other Potential Mitigation Measures

A number of additional mitigation measures arose during the course of the project. These additional measures were either considered to be a low priority, a better alternative was deemed a medium or high priority, or they were not considered feasible. However, it is worth recording them in the plan, because they could be revisited in the future. They include:

J) Assessment of Municipal Structures for Susceptibly to Snow Loads

The town owns structures that may not be able to withstand snow loads during extreme conditions. A priority for the town is to provide an assessment of those facilities that are at risk for collapses from snow loads, and what the best mitigation would be. In some cases the solution may be a structural retrofit, but in other cases it may just be a matter of knowing which buildings to clear snow from.

K) Maintain Culvert at Colonial Road

This is a moderate flooding hazard that floods about every five years. Again the issue seems to be a too small railroad culvert, but local officials are not hopeful that the culvert will be replaced. In this case, there are some homes that are impacted, but is considered a low priority, because of other downstream issues.

L) Establish New Slow Train Policies Along Brush Fire Areas in Town

A frequent cause of brush fires along railway rights of way, are the sparks thrown by fast-moving trains crossing through the town. One effort that has been tried with success in neighboring towns is to limit trains speeds along the brush-filled rights-of-way, or require rail companies to undertake better maintenance of the areas surrounding the tracks, especially in areas adjacent to wooded areas, such as exist in Medfield.

Potential Mitigation Summary Table

The following columns are included in the summary table below (Table 15):

Description of the Mitigation Measure – The description of each mitigation measure is brief.

Priority – The designation of high, medium or low priority was determined by the Local Multiple Hazard Community Planning Team meeting. In determining project priorities, the local team considered potential benefits and project costs. The designations could change as conditions in the community change.

Lead Implementation – MAPC designated implementation responsibility based on general knowledge of the community. It is likely that most mitigation measures will require that several departments work together and assigning staff is the sole responsibility of the governing body of each community. In some cases, a non-local entity would ideally be the lead implementer.

Time Frame – The time frame was based on a combination of the priority for that measure, the complexity of the measure and whether or not the measure is conceptual, in design, or already designed and awaiting funding. The identification of a likely time frame is not meant to constrain a community from taking advantage of funding opportunities as they arise. "Short-term" is an item that generally would not take more than a year or two to complete, and could conceivably occur within the 5 years of this plan. "Long-term" is a project that will could take more than one to two years to complete, and may not be completed within the five years of this plan.

Estimated Cost – The cost data are estimates that represent a point in time and would need to be adjusted for inflation and for any changes or refinements in the design of a

particular mitigation measure. Cost information is approximate only and is either provided by the community or from MAPC staff experience.

Potential Funding Sources – This column attempts to identify possible sources of funding for a specific measure. This information is preliminary and varies depending on a number of factors such as whether a mitigation measure has been studied, evaluated or designed or is still in the conceptual stages. Each grant program and agency has specific eligibility requirements that would need to be taken into consideration. In most instances, the measure will require a number of different funding sources. Identification of a potential funding source in this table does not guarantee that a project will be eligible for or selected for funding. Upon adoption of this plan, the local committee responsible for its implementation should begin to explore the funding sources in more detail.

The best way to determine eligibility for a particular funding source is to review the project with the funding agency. The following websites provide an overview of programs and funding sources.

Army Corps of Engineers (ACOE) – The website for the North Atlantic district office is http://www.nae.usace.army.mil/. The ACOE provides assistance for a number of types of projects including shoreline/streambank protection, flood damage reduction, flood plain management services and planning services.

FEMA – As noted earlier, see http://www.fema.gov/government/grant/government.shtm for more information.

Massachusetts Emergency Management Agency (MEMA) – The grants page http://www.mass.gov/dem/programs/mitigate/grants.htm has a useful table that compares eligible projects for the Hazard Mitigation Grant Program and the Flood Mitigation Assistance Program.

United States Department of Agriculture – The USDA has programs by which communities can get grants for fire fighting needs. See the link below for examples. http://www.rurdev.usda.gov/rhs/

Table 15: Potential Mitigation Measures in Medfield

Mitigation Measure	Priority	Lead Implementation	Time Frame	Estimated Cost Range	Potential Funding Sources
HIGH PRIORITY MITIGATION MEASURES					
A. Expand/Replace culvert at Causeway and Orchard streets	High	Public Works	Long-Term	$75,000 to $150,000	MHD, Town, FEMA
B. Replace culvert on Elm Street at Mill Brook	High	Public Works	Long-Term	$75,000 to $150,000	Town, FEMA, Public Safety Grants
C. Maintain existing culvert at Friary and Upham streets	High	Public Works	Long-term	$25,000 to $75,000	Town
D. Additional mitigation as needed at Hospital site	High	Developer or Private contractor	Ongoing & Long-Term	To be determined	Developer or Town
MEDIUM PRIORITY MITIGATION MEASURES					
E. Replace or upgrade existing roadway and bridge on Main Street at Charles River	Medium	Public Works	Long-Term	$75,000 to $150,000	Town, FEMA
F. Expand or replace existing railroad culvert at South St.	Medium	Public Works/ Railroad company	Short-Term	$100,000 t0 $250,000	Town, Railroad company
MEASURES TO INSURE COMPLIANCE WITH NFIP					
G. Continuation of Open Space Protection and Land Acquisition	NFIP	Natural Resources / Planning	Ongoing	Varies from town staff time to up to $750k to purchase land	Town, Community Preservation Act Funds, Gifts
H. Regulatory Revisions for Stormwater Management	NFIP	Planning / Natural Resources	Short-Term	Town Staff Time or $5k-10k for consultant	Town, MET grants, EOEA Smart Growth Grants
I. Become Fully “Storm Ready” / TV alert notification	NFIP	Fire Department	Short-Term	$5k-$15k	Town or Public Safety Grants

Table 15: Potential Mitigation Measures in Medfield

Mitigation Measure	Priority	Lead Implementation	Time Frame	Estimated Cost Range	Potential Funding Sources
OTHER MITIGATION MEASURES					
J. Assessment of Municipal Structures for Susceptibly to Snow Loads	Other	Public Works / Building	Short-Term	Town Staff Time or $2k-5k for consultant	Town, FEMA
K. Maintain culvert at Colonial Road	Other	Public Works	Short-term	$5k - $15 k	Town
L. Slow Train Policies	Other	Fire Department/ Zoning Boards	Short-term	Town staff time	Town

Abbreviations Used in Table 15

FEMA Mitigation Grants includes:
FMA = Flood Mitigation Assistance Program.
HMGP = Hazard Mitigation Grant Program.
PDM = Pre-Disaster Mitigation Program

ACOE = Army Corps of Engineers.

MHD = Massachusetts Highway Department.

EOT = Executive Office of Transportation.

DCR = Department of Conservation and Recreation

DHS/EOPS = Department of Homeland Security/Emergency Operations

EPA/DEP (SRF) = Environmental Protection Agency/Department of Environmental Protection (State Revolving Fund)

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VIII. REGIONAL AND INTER-COMMUNITY CONSIDERATIONS

Some hazard mitigation issues are strictly local. The problem originates primarily within the municipality and can be solved at the municipal level. Other issues are inter-community and require cooperation between two or more municipalities. There is a third level of mitigation which is regional and may involve a state, regional or federal agency or three or more municipalities.

Regional Partners

In many communities, mitigating natural hazards is more than a local issue. The facilities that serve these communities are complex systems owned and operated by a wide array of agencies, government, and private entities. The planning, construction, operations and maintenance of these facilities are integral to the hazard mitigation efforts of communities. These agencies must be considered the communities' regional partners in hazard mitigation. These agencies also operate under the same constraints as communities do, including budgetary and staffing constraints and numerous competing priorities. In the sections that follow, the plan includes recommendations for activities to be undertaken by these other agencies. Implementation of these recommendations will require that all parties work together to develop solutions.

Regional Facilities within Medfield

Major facilities owned, operated and maintained by federal, state, regional or private entities in Medfield include:

- Gas Trunk Line (Algonquin Gas Company)
- Charles River Gauging Stations (DCR)
- Park lands (Trustees of the Reservations)
- Cell Phone towers
- Route 109 and Route 27 (MassHighways)

Inter-Community Considerations

Mitigation measures for the following regional issues should be taken into account as Medfield develops it own local plan:

A) Coordinate and Review Developments on a Regional Basis

As Medfield and the surrounding communities are undergoing development, it is vital that these communities communicate and provide input during the review processes. When addressing housing, transportation, and economic development projects, the impacts to neighbors must be addressed. The Westwood Station Development in Westwood is a prime example of how one development has the potential to create impacts in neighboring communities. Though at this point the impacts to Medfield are expected to be minimal.

B) Long-Term Regional Management Plan To Control Beaver Activity

One regional issue of significance is the widespread effects of beaver dams in the area. Most streams, wetland areas, and ponds in the region have had some degree of beaver activity in the past several years. Much of the localized flooding that occurs is due to beaver activity. The towns will mitigate the problem temporarily by hiring trappers, removing dams, or installing pipes, but a long-term comprehensive approach should be considered.

C) Coordinate Community Sheltering with Norwood Hospital

In addition to seeking alternate sheltering for the Medfield community as noted under proposed mitigation, the town should coordinate with other communities to address sheltering issues at Norwood hospital and other regional facilities such as the prison in Walpole.

D) Dam Conditions and Emergency Plans Upstream of the Town of Medfield

Dams in upstream communities are frequently of concern to downstream communities. In the case of Medfield, the dams along the Charles River upstream in Medfield and Millis have been the greatest concern, particularly in the past when the dams have been in poor condition. The communities should continue to coordinate with each other to address concerns of dam conditions and emergency response plans in the event of a hazardous storm event.

IX. PLAN ADOPTION AND MAINTENANCE

Plan Adoption

The Medfield Hazard Mitigation Plan was adopted by the Board of Selectmen on February 1, 2011. See Appendix D for documentation. The plan was approved by FEMA on [ADD DATE] for a five-year period that will expire on [ADD DATE].

Plan Maintenance

MAPC worked with the Medfield Hazard Mitigation Planning Team to prepare this plan This group will continue to meet on an as-needed basis to function as the Local Hazard Mitigation Implementation Team, with one town official designated as the coordinator. Additional members could be added to the local implementation group from businesses, non-profits and institutions.

Implementation Schedule

Bi-Annual Survey on Progress– The coordinator of the Local Hazard Mitigation Implementation Team will prepare and distribute a biannual survey in years two and four of the plan. The survey will be distributed to all of the local implementation team members and other interested local stakeholders. The survey will poll the members on any changes or revisions to the plan that may be needed, progress and accomplishments for implementation, and any new hazards or problem areas that have been identified.

This information will be used to prepare a report or addendum to the Medfield Hazard Mitigation Plan. The Local Hazard Mitigation Implementation Team will have primary responsibility for tracking progress and updating the plan.

Develop a Year Four Update – At the beginning of the fourth year after plan adoption, the coordinator of the Local Hazard Mitigation Implementation Team will convene the team to begin to prepare for an update of the plan, which will be required by the end of year five in order to maintain the town's approved plan status with FEMA. The team will use the information from the year four biannual review to identify the needs and priorities for the plan update.

Prepare and Adopt an Updated Local Hazard Mitigation Plan – FEMA's approval of this plan is valid for five years, by which time an updated plan must be prepared and approved in order to maintain the town's approved plan status and its eligibility for FEMA mitigation grants. Because of the lead time required to secure a planning grant, prepare an updated plan, and complete the approval and adoption of an updated plan, the local Hazard Mitigation Planning Team should begin the process at the beginning of Year 4. This will help the town avoid a lapse in its approved plan status and grant eligibility when the current plan expires.

At this point, the Local Hazard Mitigation Implementation Team may decide to undertake the update themselves, contract with the Metropolitan Area Planning Council

to update the plan or to hire another consultant. However the Hazard Mitigation Implementation Team decides to update the plan, the group will need to review the current FEMA hazard mitigation plan guidelines for any changes. The update of the Medfield Hazard Mitigation Plan will be forwarded to MEMA and DCR for review and to FEMA for approval.

- Fire / Emergency Management
- Police
- Public Works / Highway
- Engineering
- Planning and Community Development
- Conservation
- Parks and Recreation
- Health
- Building

Other groups that will be coordinated with include large institutions, Chambers of Commerce, land conservation organizations and watershed groups. The plans will also be posted on a community's website with the caveat that the local team coordinator will review the plan for sensitive information that would be inappropriate for public posting. The posting of the plan on a web site will include a mechanism for citizen feedback such as an e-mail address to send comments.

X. RESOURCES

Commonwealth of Massachusetts. *McConnell Land Use Statistics*. 1999.

Commonwealth of Massachusetts. *State Hazard Mitigation Plan*. October 2007. Prepared by the Massachusetts Emergency Management Agency and the Massachusetts Department of Conservation and Recreation.

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Federal Emergency Management Agency. *Mitigation Planning Workshop for Local Governments, Student Manual.* May 2004.

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Federal Emergency Management Agency. *Website www.fema.gov.* Accessed March 2008.

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Town of Medfield, Massachusetts. *Comprehensive Emergency Management Plan.*

Town of Medfield, Massachusetts. *Open Space and Recreation Plan, Medfield, Massachusetts*. October 2004. Prepared by the Open Space Task Force and the Natural Resources Commission.

Town of Medfield, Massachusetts. *Personal Communication with Local Multiple Hazard Community Planning Team.* December 18, 2007, February 5, 2008 and March 15, 2008

Town of Medfield, Massachusetts. *Subdivision Rules and Regulations.* Amended through January 2005.

Town of Medfield, Massachusetts. *Website www.Medfieldma.org.* Accessed March 2008.

Town of Medfield, Massachusetts. *Zoning Bylaw*. Amended through April 2006.

United States Environmental Protection Agency. *NPDES Phase II Small MS4 General Permit Annual Report*. Reporting Period March 2005 - March 2006. Prepared by the Town of Medfield Department of Public Works.

United States Census Bureau. *United States Census*. 2000.

APPENDIX A: NATURAL HAZARDS MAPS

The MAPC GIS (Geographic Information Systems) Lab produced a series of maps for each community. Some of the data came from the Northeast States Emergency Consortium (NESEC). More information on NESEC can be found at http://www.serve.com/NESEC/. Due to the various sources for the data and varying levels of accuracy, the identification of an area as being in one of the hazard categories must be considered as a general classification that should always be supplemented with more local knowledge. The documentation for some of the hazard maps was incomplete as well.

The map series consists of four panels with two maps each plus one map taken from the State Hazard Mitigation Plan.

Map 1.	Population Density
Map 2.	Potential Development
Map 3.	Flood Zones
Map 4.	Earthquakes and Landslides
Map 5.	Hurricanes and Tornadoes
Map 6.	Average Snowfall
Map 7.	Composite Natural Hazards
Map 8.	Hazard Areas

Map1: Population Density – This map uses the US Census block data for 2000 and shows population density as the number of people per acre in seven categories with 60 or more people per acre representing the highest density areas.

Map 2: Potential Development – This map shows potential future developments, and critical infrastructure sites. MAPC consulted with town staff to determine areas that were likely to be developed or redeveloped in the future.

Map 3: Flood Zones – The map of flood zones used the FEMA Q3 Flood Zones as its source. For more information, refer to http://www.fema.gov/fhm/fq_q3.shtm. The definitions of the flood zones are described in more detail at http://www.fema.gov/fhm/fq_term.shtm. The flood zone map for each community also shows critical infrastructure and municipally owned and protected open space.

Map 4: Earthquakes and Landslides – This information came from NESEC. For most communities, there was no data for earthquakes because only the epicenters of an earthquake are mapped.

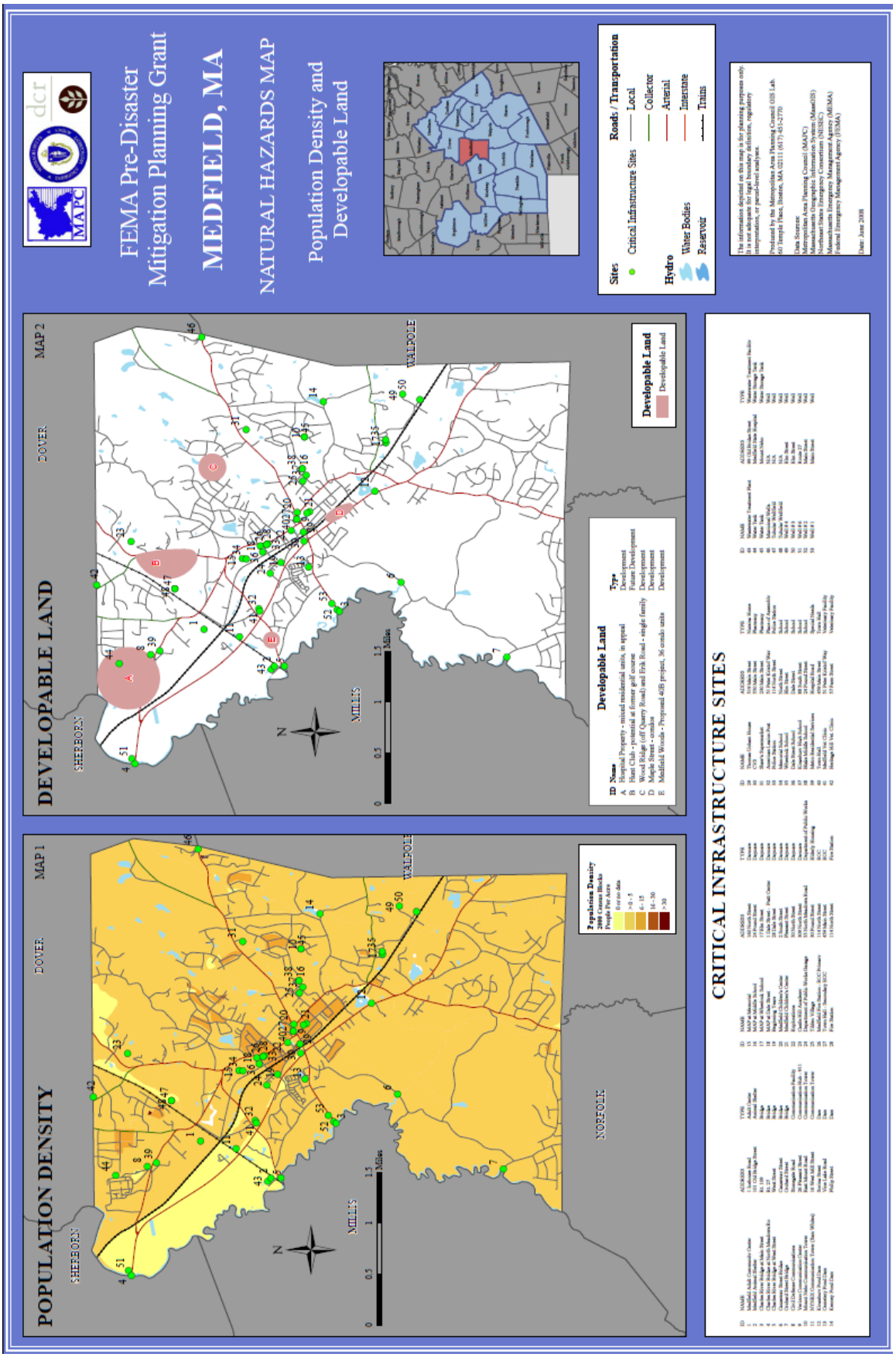
The landslide information shows areas with either a low susceptibility or a moderate susceptibility to landslides based on mapping of geological formations. This mapping is highly general in nature. For more information on how landslide susceptibility was mapped, refer to http://pubs.usgs.gov/pp/p1183/pp1183.html.

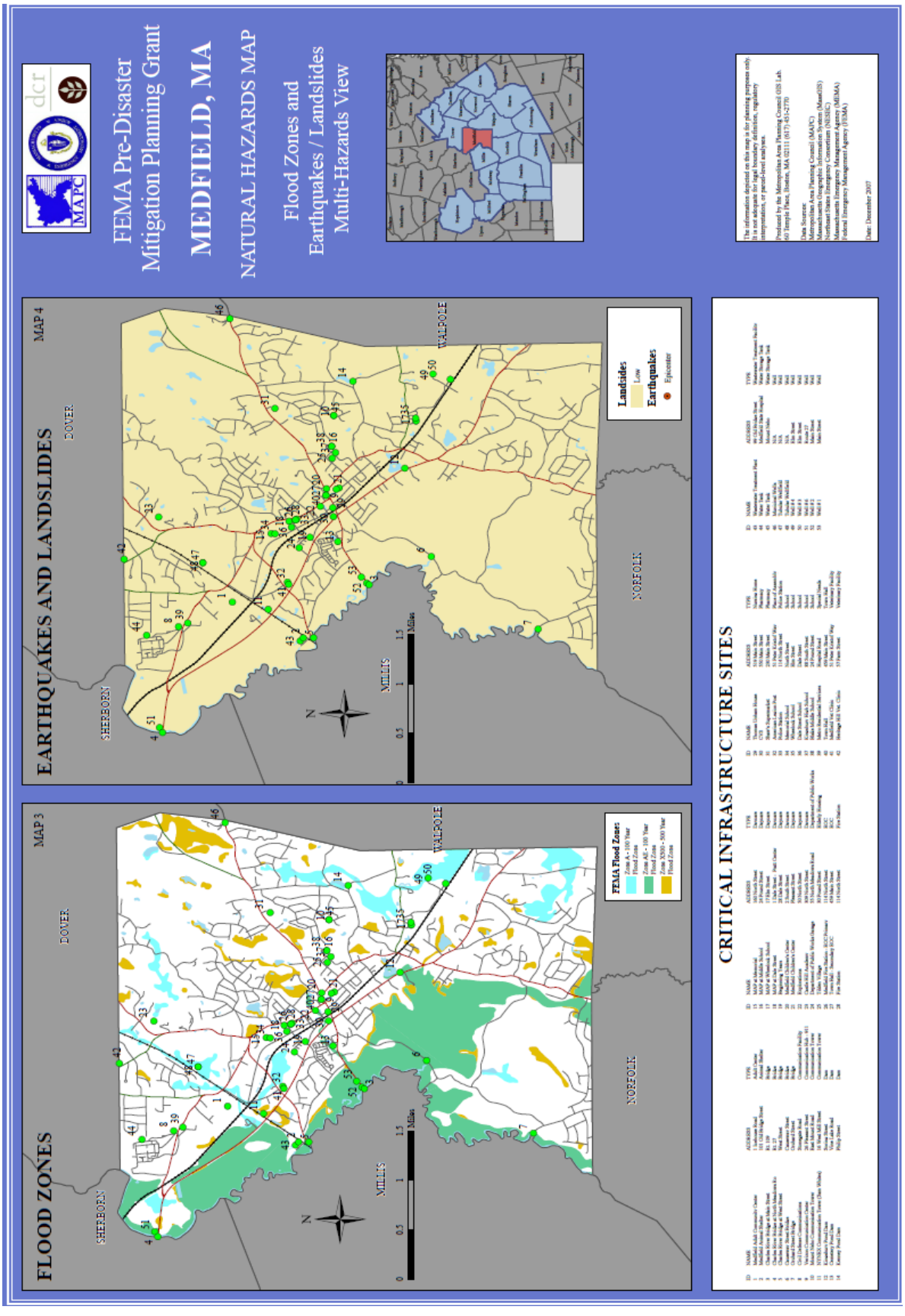
Map 5: Hurricanes and Tornadoes – This map shows a number of different items. The map includes the storm tracks for both hurricanes and tropical storms. This information must be viewed in context. A storm track only shows where the eye of the storm passed through. In most cases, the effects of the wind and rain from these storms were felt in other communities even if the track was not within that community. This map also shows the location of tornadoes with a classification as to the level of damages. What appears on the map varies by community since not all communities experience the same wind-related events. These maps also show the 100 year wind speed.

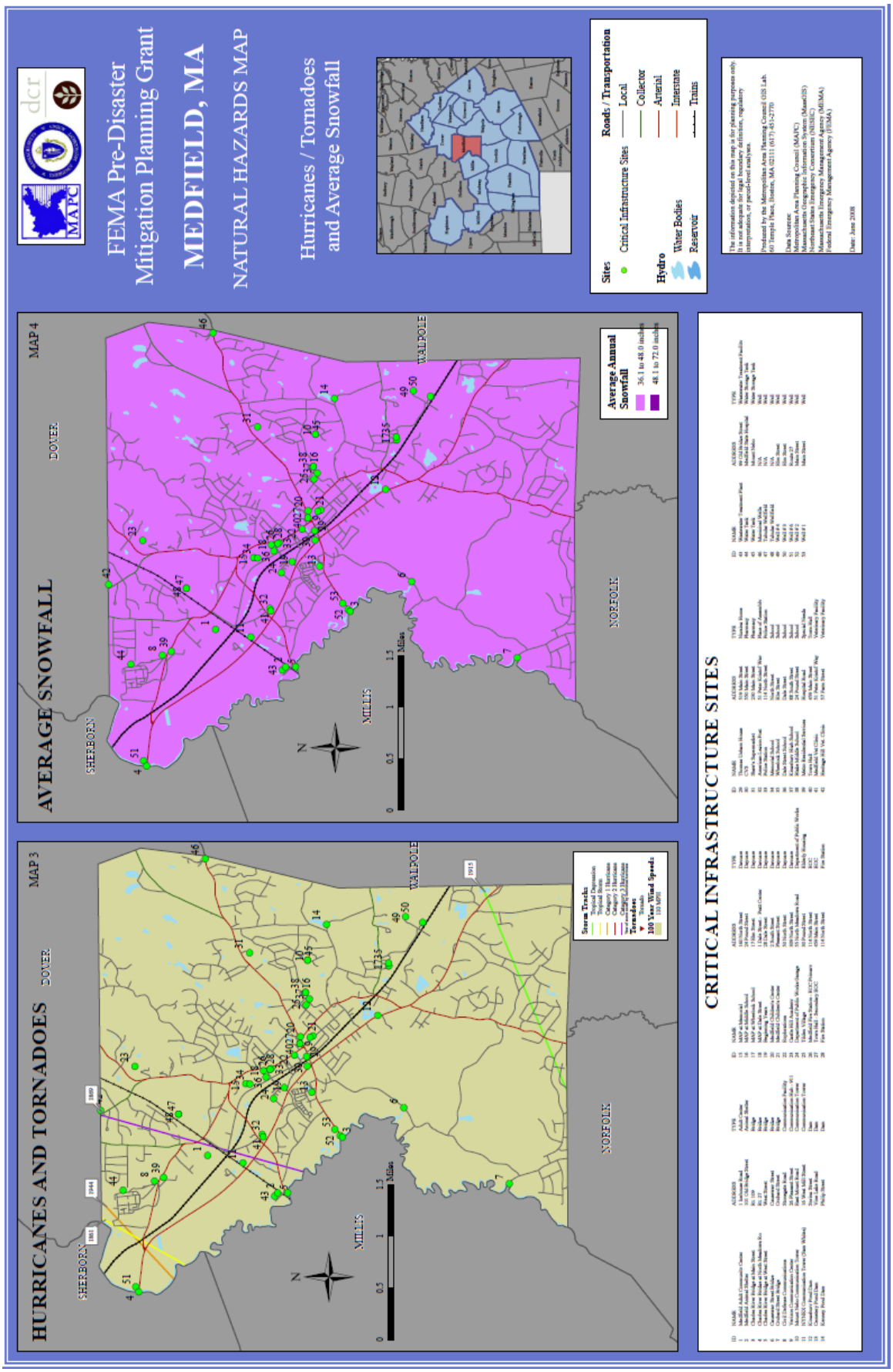
Map 6: Average Snowfall – This map shows the average snowfall and open space. It also shows storm tracks for nor'easters, if any storms tracked through the community.

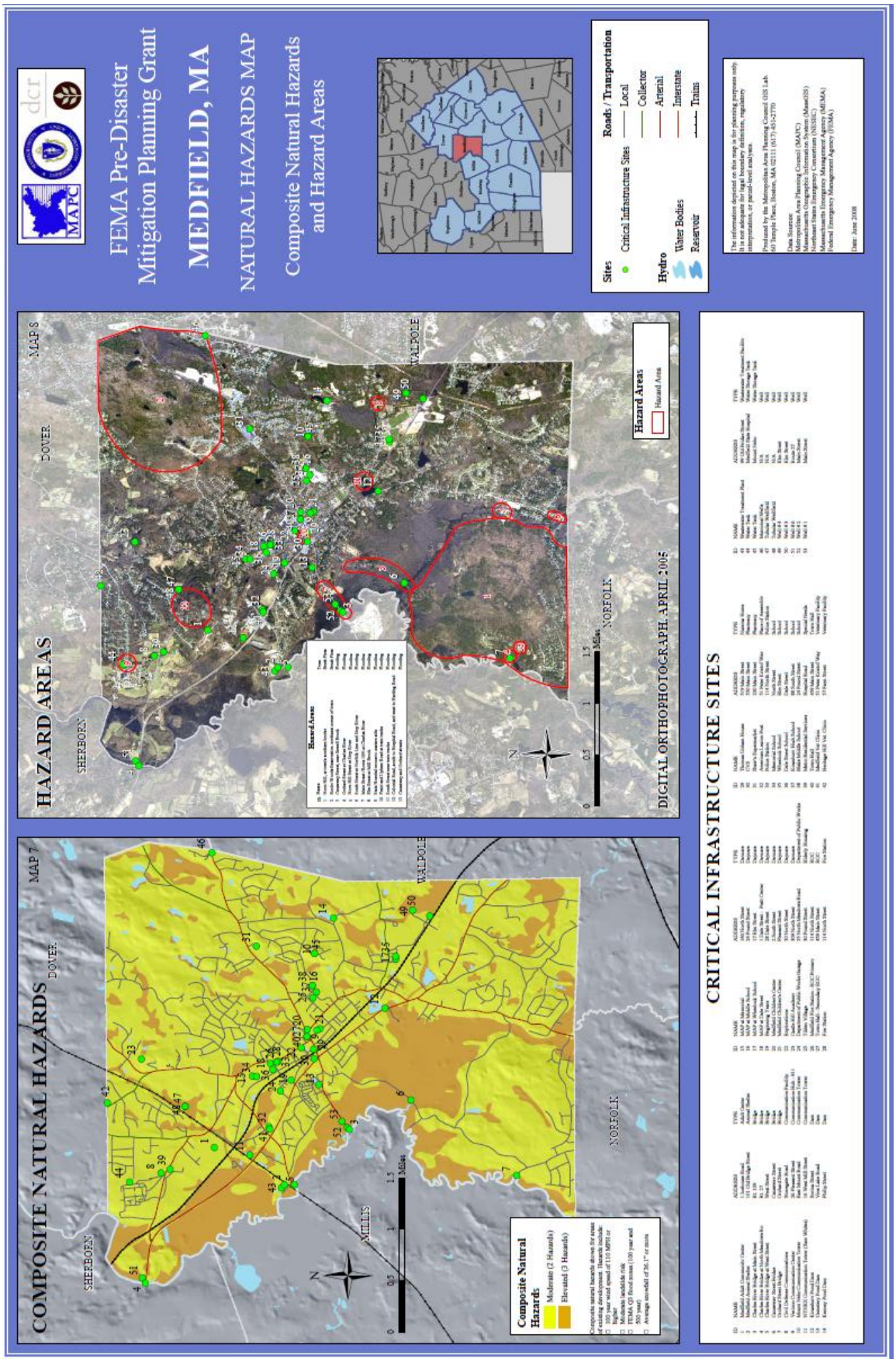
Map 7: Composite Natural Hazards - This map shows four categories of composite natural hazards for areas of existing development. The hazards included in this map are 100 year wind speeds of 110 mph or higher, low and moderate landslide risk, FEMA Q3 flood zones (100 year and 500 year) and hurricane surge inundation areas. Areas with only one hazard were considered to be low hazard areas. Moderate areas have two of the hazards present. High hazard areas have three hazards present and severe hazard areas have four hazards present.

Map 8: Hazard Areas – For each community, locally identified hazard areas are overlaid on an aerial photograph dated April 2005. The critical infrastructure sites are also shown. The source of the aerial photograph is Mass GIS.


FEMA Pre-Disaster Mitigation Planning Grant
MEDFIELD, MA
NATURAL HAZARDS MAP
Population Density and Developable Land
DEVELOPABLE LAND
MAP 2
DOVER
SHERBORN
MILLIS
WALPOLE
Developable Land
Developable Land
ID Name Type
A Hospital Property - mixed residential units, in appeal Development
B Hunt Club - potential at former golf course Future Development
C Wood Ridge (off Quarry Road) and Fisk Road - single family Development
D Maple Street - condos Development
E Medfield Woods - Proposed 40B project, 36 condo units Development
POPULATION DENSITY
MAP 1
DOVER
SHERBORN
MILLIS
WALPOLE
NORFOLK
Population Density
2000 Census Blocks
People Per Acre
0 or no data
>0 - 5
6 - 15
16 - 30
> 30
CRITICAL INFRASTRUCTURE SITES
Sites
Critical Infrastructure Sites
Roads / Transportation
Local
Collector
Arterial
Interstate
Trains
Hydro
Water Bodies
Reservoir
Produced by the Metropolitan Area Planning Council (MAPC)
60 Temple Place, Boston, MA 02111 (617) 451-2770
Date: June 2008


FEMA Pre-Disaster Mitigation Planning Grant
MEDFIELD, MA
NATURAL HAZARDS MAP
Flood Zones and Earthquakes / Landslides Multi-Hazards View
FLOOD ZONES
MAP 3
EARTHQUAKES AND LANDSLIDES
MAP 4
DOVER
SHERBORN
MILLIS
WALPOLE
NORFOLK
FEMA Flood Zones
Landslides
Low
Earthquakes
Epicenter
CRITICAL INFRASTRUCTURE SITES


FEMA Pre-Disaster
Mitigation Planning Grant
MEDFIELD, MA
NATURAL HAZARDS MAP
Hurricanes / Tornadoes
and Average Snowfall
MAPC
dcr
Sites
Critical Infrastructure Sites
Roads / Transportation
Local
Collector
Arterial
Interstate
Trains
Hydro
Water Bodies
Reservoir
MAP 3
HURRICANES AND TORNADOES
DOVER
SHERBORN
MILLIS
WALPOLE
NORFOLK
Storm Tracks
Tornadoes
100 Year Wind Speeds
MAP 4
AVERAGE SNOWFALL
Average Annual Snowfall
36.1 to 48.0 inches
48.1 to 72.0 inches
CRITICAL INFRASTRUCTURE SITES


FEMA Pre-Disaster Mitigation Planning Grant
MEDFIELD, MA
NATURAL HAZARDS MAP
Composite Natural Hazards and Hazard Areas
MAPC
dcr
HAZARD AREAS
MAP 8
SHERBORN
DOVER
WALPOLE
NORFOLK
MILLIS
Hazard Areas
Hazard Area
DIGITAL ORTHOPHOTOGRAPH, APRIL 2005
COMPOSITE NATURAL HAZARDS
MAP 7
Composite Natural Hazards
Moderate (2 Hazards)
Elevated (3 Hazards)
CRITICAL INFRASTRUCTURE SITES
Sites
Critical Infrastructure Sites
Roads / Transportation
Local
Collector
Arterial
Interstate
Trains
Hydro
Water Bodies
Reservoir
Prepared by the Metropolitan Area Planning Council (MAPC)
Data Sources
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Northeast States Emergency Consortium (NESEC)
Massachusetts Emergency Management Agency (MEMA)
Federal Emergency Management Agency (FEMA)
Date: June 2008

APPENDIX B:

MEETING AGENDAS FOR:

METRO BOSTON NORTH/WEST REGIONAL HAZARD MITIGATION COMMUNITY PLANNING TEAM

AND

LOCAL MULTIPLE HAZARD COMMUNITY PLANNING TEAM

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DON BOYCE
Director

dcr

Richard Sullivan
COMMISSIONER

MAPC

Marc D. Draisen
Executive Director

METRO SOUTH/WEST PRE-DISASTER MTITGATION PLAN

SWAP Regional Hazard Mitigation Team
Bellingham
Franklin
Hopkinton
Medway
Milford
Millis
Norfolk
Wrentham

TRIC Regional Hazard Mitigation Team
Canton
Dedham
Dover
Foxborough
Medfield
Needham
Norwood
Sharon
Foxborough
Westwood

The Commonwealth of Massachusetts

DEVAL PATRICK, GOVERNOR
Massachusetts Emergency Management Agency
400 WORCESTER ROAD, FRAMINGHAM, MA 01702-5399 508-820-2000 FAX 508-820-1404
Department of Conservation and Recreation
251 CAUSEWAY STREET, SUITE 600-900, BOSTON, MA 02114-2104 617-626-1250 FAX 617-626-1351
Metropolitan Area Planning Council
60 TEMPLE PLACE, 6TH FLOOR, BOSTON, MA 02111 617-451-2770 FAX 617-482-7185

Hazard Mitigation Community Planning Team
Three Rivers Interlocal Council (TRIC)

First Meeting

TUESDAY, APRIL 3, 2007 9:30 AM
Norwood Public Safety Building
137 Nahatan Street, Norwood, MA

AGENDA

9:30 WELCOME & INTRODUCTIONS *(Please sign contact sheet)*

9:40 OVERVIEW OF FEDERAL DISASTER MITIGATION ACT & PRE-DISASTER MITIGATION PLANNING

- *Presentation, Questions & Discussion*
  --Martin Pillsbury, Manager of Regional Planning, MAPC

10:00 GETTING STARTED: THE METRO SOUTH/WEST PRE-DISASTER MITIGATION PLAN – TRIC SUBREGION

- *Review of Scope of Work & Schedule*
- *Questions & Discussion – Local Issues & Priorities*

10:30 PREVIEW OF MAPPING AND DATABASES FOR THE PLAN

- *Examples from the North Shore & Metro Boston PDM Plans*
  --Alan Bishop, GIS Manager, MAPC

10:55 NEXT STEPS / MEETING SCHEDULE

11:00 ADJOURN

Please contact Martin Pillsbury at MAPC if you have any questions:
617-451-2770, ext. 2012 or mpillsbury@mapc.org

DON BOYCE
Director

dcr

Richard Sullivan
COMMISSIONER

MAPC

Marc D. Draisen
Executive Director

METRO SOUTH/WEST PRE-DISASTER MTITGATION PLAN

SWAP Regional Hazard Mitigation Team
Bellingham
Franklin
Hopkinton
Medway
Milford
Millis
Norfolk
Wrentham

TRIC Regional Hazard Mitigation Team
Canton
Dedham
Dover
Foxborough
Medfield
Needham
Norwood
Sharon
Foxborough
Westwood

The Commonwealth of Massachusetts

DEVAL PATRICK, GOVERNOR
Massachusetts Emergency Management Agency
400 WORCESTER ROAD, FRAMINGHAM, MA 01702-5399 508-820-2000 FAX 508-820-1404
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Metropolitan Area Planning Council
60 TEMPLE PLACE, 6TH FLOOR, BOSTON, MA 02111 617-451-2770 FAX 617-482-7185

Hazard Mitigation Community Planning Team
Three Rivers Interlocal Council (TRIC)

Second Regional Meeting

TUESDAY, DECEMBER 11, 2007 10:00 AM

Norwood Civic Center, Willet Room (2nd floor)
165 Nahatan Street, Norwood, MA

AGENDA

10:00 WELCOME, INTRODUCTIONS & OVERVIEW OF AGENDA
- *Martin Pillsbury, Project Manager*

10:05 REVIEW OF HAZARD MAPPING AND CRITICAL INFRASTRUCTURE DATA COLLECTION

- *Allan Bishop, GIS Manager, will present an overview of the draft Critical Facilities database and community hazard maps*

10:45 UPDATE ON LOCAL PLANS

- *Martin Pillsbury will introduce Joe Domelowicz, MAPC's project planner for the TRIC regional PDM plan*
- *Joe will review next steps in developing the local PDM plans*

11:00 SETTING GOALS AND OBJECTIVES FOR THE REGIONAL PDM PLAN

- *Martin Pillsbury will in review goals and objectives and ask the team to decide on priorities for the TRIC communities (see attachment)*

11:15 NEXT STEPS / MEETING SCHEDULE

Please contact Martin Pillsbury at MAPC if you have any questions:
617-451-2770, ext. 2012 or mpillsbury@mapc.org

DON BOYCE
Director

dcr

Richard Sullivan
COMMISSIONER

MAPC

Marc D. Draisen
Executive Director

METRO SOUTH/WEST PRE-DISASTER MTITGATION PLAN

SWAP Regional Hazard Mitigation Team
Bellingham
Franklin
Hopkinton
Medway
Milford
Millis
Norfolk
Wrentham

TRIC Regional Hazard Mitigation Team
Canton
Dedham
Dover
Foxborough
Medfield
Needham
Norwood
Sharon
Foxborough
Westwood

The Commonwealth of Massachusetts

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Metropolitan Area Planning Council
60 TEMPLE PLACE, 6TH FLOOR, BOSTON, MA 02111 617-451-2770 FAX 617-482-7185

Hazard Mitigation Community Planning Team
Three Rivers Interlocal Council (TRIC)

Third Regional Meeting
WEDNESDAY, JULY 9, 2008 10:00 AM

Norwood Civic Center
Willet Room (2nd floor)
165 Nahatan Street, Norwood, MA

AGENDA

10:00 WELCOME & INTRODUCTIONS *(Please sign contact sheet)*

10:05 REVIEW OF THE REGIONAL HAZARD MITIGATION MAP SERIES

Martin Pillsbury will present an overview of the regional Hazard Mitigation maps ***(copies will be distributed on CD-ROM)***

10:20 REGIONAL GOALS AND OBJECTIVES, ISSUES, RECOMMENDATIONS

The team will review goals and objectives and the regional issues to be included in the Regional Hazard Mitigation Plan.

11:00 OVERVIEW OF FEMA BENEFIT-COST ANALYSIS FOR GRANTS

Brad Stoler will present an overview of FEMA's requirements for Benefit-Cost Analysis for grant applications for mitigation projects.

11:25 REVIEW OF NEXT STEPS:

- Complete remaining local annexes and public meetings
- Plan review and approval by MEMA & FEMA
- Plan Adoption by the towns (Selectmen/Town Council)
- Final Approval letter issued by FEMA

If you have any questions please contact Martin Pillsbury at MAPC: 617-451-2770, ext. 2012 or mpillsbury@mapc.org

The Metro Boston South/West Multi-Hazard Mitigation Plan
First Local Committee Meeting

Town of Medfield Tuesday, December 18, 2007

Meeting Agenda

1. Welcome and introductions

2. Review of grant scope of work and progress to date

3. Review aerial photograph
    a. Identify natural hazard areas
        i. Hazard type
        ii. Hazard severity
        iii. Hazard frequency
        iv. Existing mitigation measures
        v. Potential mitigation measures
    b. Identify future/potential development
        i. Type of development
        ii. Classify (existing, under construction, future, potential)
        iii. Zoning
        iv. Number of units/square feet
        v. Developer/owner
        vi. Potential adverse effects

4. Next steps

The Metro Boston South/West Multi-Hazard Mitigation Plan
Second Local Committee Meeting

Town of Medfield
Wednesday, February 5, 2008

Meeting Agenda

1. Welcome and introductions

2. Review aerial maps of critical natural hazards and potential development and discuss:
    a. Severity and frequency
    b. Existing and potential mitigation measures
    c. Costs & funding
    d. Timeframes
    e. Priorities

3. Develop goals and objectives

4. Review of scope of work and progress to date

5. Next steps

The Metro Boston South/West Multi-Hazard Mitigation Plan
Third Local Committee Meeting

Town of Medfield
Friday, March 14, 2008

Meeting Agenda

1. Welcome and introductions

2. Review aerial maps of critical natural hazards and potential development and discuss:
    a. Severity and frequency
    b. Existing and potential mitigation measures
    c. Costs & funding
    d. Timeframes
    e. Priorities

3. Finalize goals and objectives

4. Review of scope of work and progress to date

5. Follow-up on unfinished business

6. Confirm goals and objectives

7. Next steps

APPENDIX C:
DOCUMENTATION OF THE PUBLIC MEETING

Board of Selectmen
Agenda – April 7, 2009 tentative agenda

Reorganization of the Board of Selectmen

7:00 PM John Carrigg, Gulf Resources
Requesting approval to increase capacity of underground storage tank at the Main Street Car Wash. Fire Chief approves

7:15 PM MAPC presentation

7:30 PM Public Hearing – Solicitation request
Renewal by Anderson, Window Replacement, Dustin Johnson, Manager

ACTION ITEMS
Vote to authorize Chairman to sign Certificate of Appointment for Town Clerk

Robert Wesley Piersiak has earned the rank of Eagle Scout. A Court of Honor will be held Saturday May 9 at St Edward Church

Town Administrator review fy2010 budgets and warrant articles

Review March 24, 2009 meeting minutes

PENDING
Request from First Parish Church and Basil restaurant to put up signs
** received request to place a a-frame sign for new business, Fernando Hair Design

Town Administrator evaluation

LICENSES & PERMITS
Norfolk Hunt Club requests a common victualler license for their annual Horse Show May 23, 24 & 25, 2009

Medfield Girl Scout Council requests permission to hold their annual registration night at the Pfaff Center Monday May 18 6:30-8:30PM and to place signs promoting the event

Girl Scout Troop #74900 requests permission to conduct a Bottle & Can Drive at the Transfer Station Saturday May 2 9-3PM and to post signs promoting the event

Medfield Green Moms requests permission to hold their event at The CENTER May 9th

SELECTMEN REPORT

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APPENDIX D:
DOCUMENTATION OF PLAN ADOPTION BY THE BOARD OF SELECTMEN

TOWN OF MEDFIELD
Office of
BOARD OF SELECTMEN
TOWN HOUSE, 459 MAIN STREET
MEDFIELD, MASSACHUSETTS 02052-0315
(508) 359-8505

MICHAEL J. SULLIVAN
Town Administrator

CERTIFICATE OF ADOPTION

Medfield, MASSACHUSETTS

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE

MEDFIELD HAZARD MITIGATION PLAN

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

WHEREAS, the Town of Medfield Hazard Mitigation Plan contains several potential future projects to mitigate potential impacts from natural hazards in Town of Medfield, , and

WHEREAS, a duly-noticed public meeting was held by the MEDFIELD BOARD OF SELECTMEN on Tuesday, February 1, 2011, and

WHEREAS, the Town of Medfield authorizes responsible departments and/or agencies to executes their responsibilities demonstrated in the plan, and

NOW, THEREFORE BE IT RESOLVED that the Medfield BOARD OF SELECTMEN, adopts the Hazard Mitigation Plan, in accordance with M.G.L. c. 40.

ADOPTED AND SIGNED this Tuesday, February 1, 2011

Mark Fisher, Chairman

Osler L. Peterson

Ann B. Thompson

Ann Thompson

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