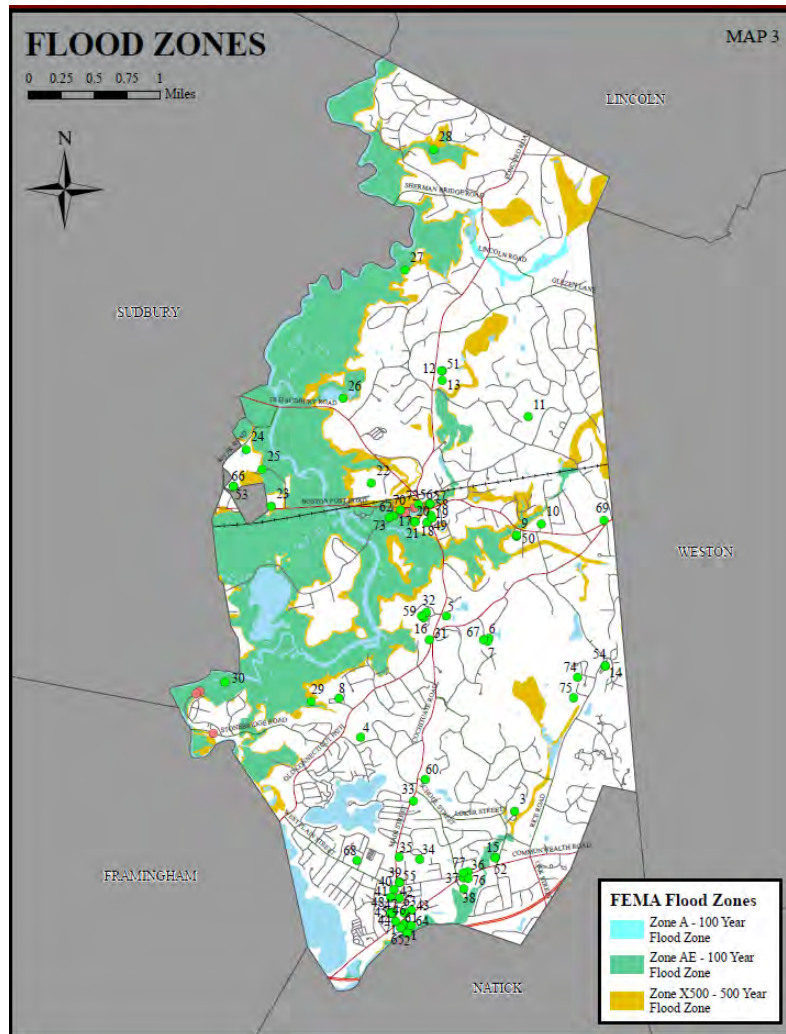


TOWN OF WAYLAND

HAZARD MITIGATION PLAN



Conditionally Approved by FEMA
January 21, 2011

WAYLAND HAZARD MITIGATION PLAN

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WAYLAND HAZARD MITIGATION PLAN

ACKNOWLEDGEMENTS AND CREDITS

This plan was prepared for the Town of Wayland 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.

MAPC Officers

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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 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 Wayland and other Metro North/West communities to 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.

In order to address multijurisdictional and regional issues, the participating municipalities were afforded the opportunity to meet with their neighboring communities during plan development, and MAPC has also produced a regional document that summarizes the issues and recommendations for the Metro North/West communities.

What is a Natural Hazard?

A widely accepted definition characterizes natural hazards as "those elements of the physical environment, harmful to man and caused by forces extraneous to him" (Burton, 1978). The term "natural hazard" refers to all atmospheric, hydrologic, geologic (seismic and volcanic), and wildfire phenomena that, because of their location, severity, and frequency, have the potential to affect humans, their structures, or their activities adversely. The qualifier "natural" eliminates such exclusively manmade phenomena as war, pollution, and chemical contamination.

Natural hazards such as flood, fire, earthquake, tornado, and windstorms threaten lives, property, and other assets. Often, natural hazards can be predicted. They tend to occur repeatedly in the same geographical locations because they are related to weather patterns or physical characteristics of an area and can affect thousands of people every year.

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 resulting from natural hazards by lessening the impact of natural disasters through long-term strategies. These long-term strategies include planning, policy changes, programs, projects and other activities.

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Mitigation of disasters entails reducing the vulnerability of the elements at risk, changing the hazard-proneness of a site, or modifying its function. Mitigation measures can have a structural character, such as the inclusion of safety or vulnerability reduction measures in the design and construction of new structures and facilities, the separation or duplication of critical facilities, the retrofitting of existing structures and facilities, or the building of protective devices.

II COMMUNITY PROFILE

Overview

Wayland is a peaceful community located in MetroWest just 18 miles from Boston, and 26 miles from Worcester. The Town of East Sudbury was incorporated on April 10, 1780. On March 11, 1835, East Sudbury became Wayland, a farming community, presumably in honor of Dr. Francis Wayland, who was President of Brown University and a friend of East Sudbury's Judge Edward Mellen. Both Wayland and Mellen became benefactors of the town's library, the first free public library in the State.

New England farms began to decrease as canals and railroads brought cheaper produce from the mid-west. Local farmers suffered a major setback when the Middlesex Canal Dam raised the river level and hay crops needed for livestock were ruined. The Industrial Revolution caused local and regional transportation patterns to change. By 1881, a new train station connected Wayland Center with Boston and Northampton, and Wayland became a bustling commuter town. Even before commuting was made easy, Wayland's attractiveness appealed to well-to-do Bostonians as a location for their summer residences.

Wayland became more accessible and attractive as a suburb as industries began to locate along Route 128 and the state began construction on the Massachusetts Turnpike. In 1955, Raytheon built a large-scale industrial laboratory near the Center, which increased the need for housing. Many farms and large estates broke up and were replaced by housing developments. The population soared to 13,000 by 1968. Since that time, the number of residents has leveled off.

The town has a total area of 15.9 square miles of which, 15.2 square miles is land and 0.7 square miles is water. The meadows and marshes along the ten-mile course of the Sudbury River through Wayland have been kept relatively unspoiled and are now the object of private and public efforts to maintain them in their natural state. They are still full of wild life and are beautiful to see. They provide an open, rural setting and an attractive feature of what has become an almost purely residential town.¹

The Town is governed by a Board of Selectmen with a Town Administrator. The town operates under the open town meeting format. According to the U.S. 2000 Census, the 2000 population was 13,100 people and there were 4,625 households out of which 41.4% had children under the age of 18 living with them, 71.5% were married couples living together, 7.1% had a female householder with no husband present, and 19.5% were non-families. 16.1% of all households were made up of individuals and 7.6% had someone living alone who was 65 years of age or older. The average household size was 2.80 and the average family size was 3.15.

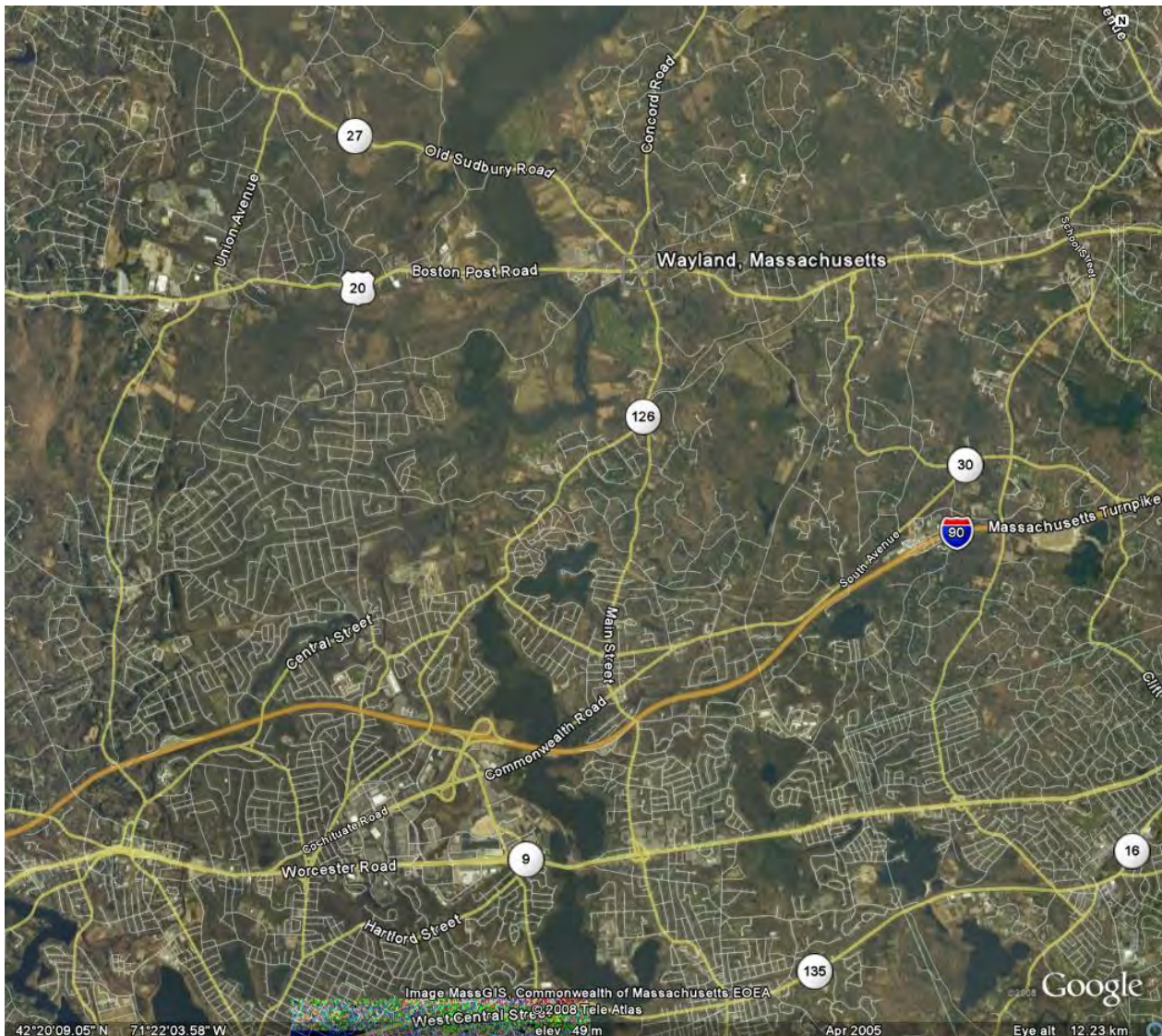
The town maintains a website at <http://www.wayland.ma.us>.

¹ Narrative based on information derived from many sources, including the Town of Wayland website

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The following map shows Wayland's roadway network and natural features.

Figure 1. Wayland, MA



Source: Google Earth

Existing Land Use

The most recent land use statistics available from the state are based on aerial photography done in 1999. Table 1 shows the acreage and percentage of land in both 1985 and 1999. If the three residential categories are aggregated, residential uses make up 40.3% of the area of the town. The highest percentage land use is forest at 29.9 % of the total area followed closely by low density residential at 27.9%. In addition, nearly 27% of the Town (about 2,700 acres) is permanently protected open space, including large portions of the Sudbury River corridor.

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For more information on how the land use statistics were developed and the definitions of the categories, please go to <http://www.mass.gov/mgis/lus.htm>.

As of 1999, 44% of the Town of Wayland had been developed, which left about 5,450 acres, or 56% of the town, undeveloped. Forest is the largest category of undeveloped land uses, comprising about 30% of the Town's land area. Although Wayland was mainly an agricultural community originally, today only 5.8% of the town's undeveloped land is agricultural.

Table 1. Wayland Land Uses 1985 and 1999

Land Use ^a	1985		1999		1985 –1999
	Acres	%	Acres	%	Change
Agriculture	792.5	7.8	590.2	5.8	-26%
Forest	3,140.9	31.0	3,035.2	29.9	-3%
Unforested Wetlands	1,272.3	12.5	1,272.4	12.5	0%
Recreation	278.7	2.8	280.5	2.8	1%
Planned Residential Development	74.8	0.7	128.3	1.3	72%
Medium Density Residential	1,117.6	11.0	1,126.4	11.1	1%
Low Density Residential	2,548.7	25.1	2,825.9	27.9	11%
Commercial	100.1	1.0	114.0	1.1	14%
Industrial	72.9	0.7	81.1	0.8	11%
Open and Urban Open Land	299.4	2.9	280.6	2.7	-6%
Mining	36.2	0.4	0.0	0.0	-100%
Transportation	36.5	0.4	36.1	0.4	0%
Water	372.0	3.7	371.9	3.7	0%
Total	10,142.6	100%	10,142.6	100%	

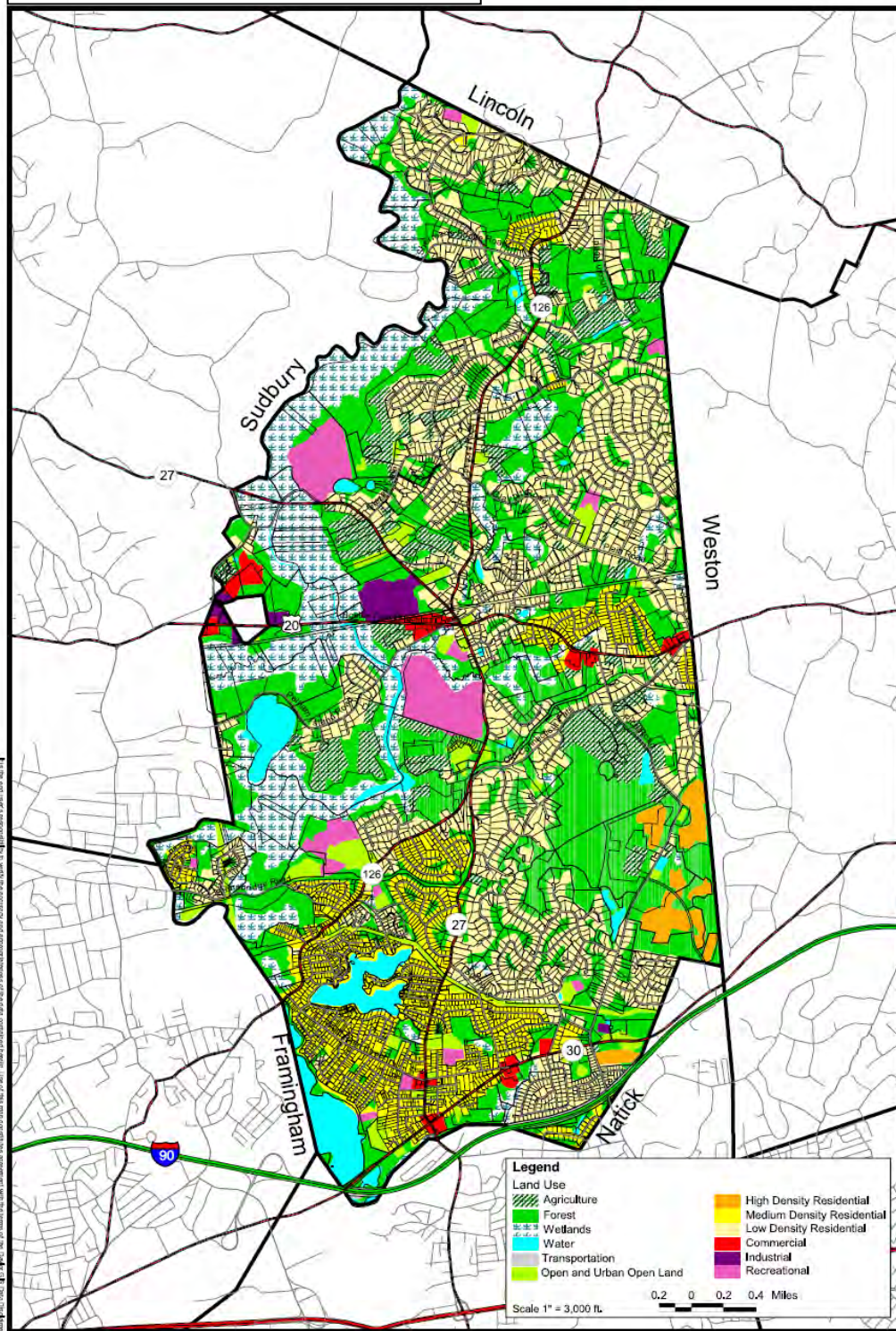
^a MassGIS classifies land use in Massachusetts using a 21-category classification system. This system has been simplified to 13 categories in the above table, and is based on aggregation of the following Land Use Codes (LUCs): Agriculture = LUCs 1, 2, 21; Forest = LUC 3; Unforested Wetlands = LUC 4; Recreation = LUCs 7, 8, 9; Multi-Family Residential = LUC 10; Medium Density Residential = LUC 12; Low-Density Residential = LUC 13; Commercial = LUC 15; Industrial = LUC 16; Open and Urban Open Land = LUCs 6, 17; Mining = LUC 5; Transportation = 18; Water = LUC 20.

Source: MassGIS.

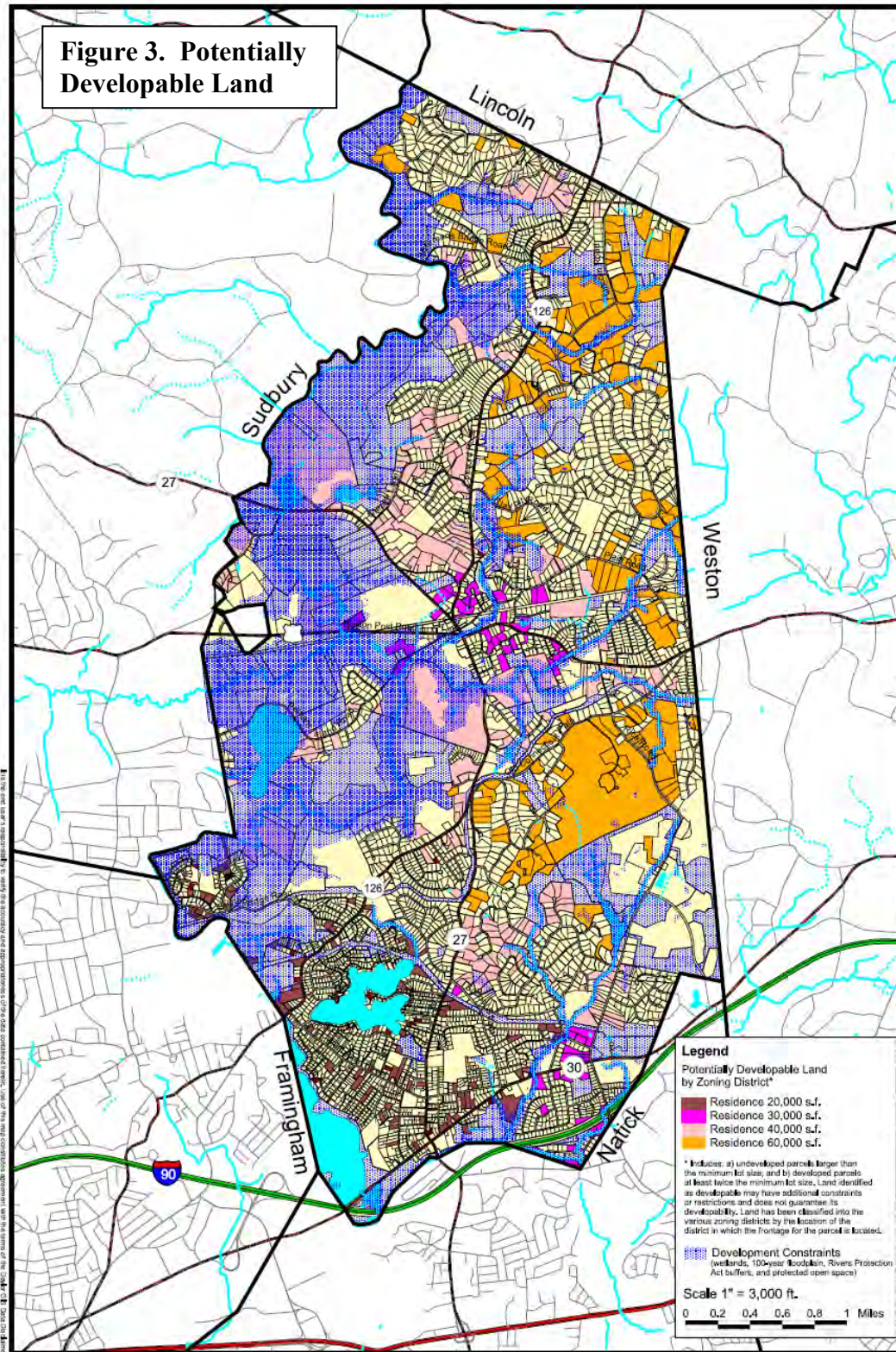
Figure 2 below shows that most of the 1,272 acres of unforested wetlands are located in the Sudbury River floodplain. It is important to note that this category does not include the 200 acres of forested wetlands included within the forest land use category.

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Figure 2. Wayland Land Use, 1999



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Potential Future Land Uses

Wayland has conducted serious community planning efforts over the past decade. For example, they town had 3 separate build-out analyses performed within 5 years, each with slightly different methodologies. A build-out analysis allows a community to test its existing land use regulations - to glimpse at its potential future when all land is developed to the maximum extent allowed under existing laws.

Table 2. Potential Development, MAPC Buildout, 2000

Developable Land Area (acres)	1,462
Total Residential Lots	1,111
Commercial/Industrial Buildable Floor Area (sq. ft.)	0
Total Additional Water Demand (gallons per day)	220,000
Total Additional Solid Waste (tons per year)	1,760
<i>Additional Recyclable Solid Waste</i>	700
<i>Additional Non-Recyclable Solid Waste</i>	1,060
New Residents	2,930
New Students	655
New Residential Subdivision Roads (miles)	23.1

Source: MAPC Buildout Analysis. Assumptions: 1) Residential Water Consumption = 75 gallons per day per person. 2) Municipal solid waste = 1,206 pounds per person per year. 3) Non-recyclable solid waste is a subset of municipal solid waste and is based on 730 pounds per person per year ending in a landfill or incinerator. 4) The number of residents and students at buildout is based on averages from the 1990 U.S. Census data. 5) New residential subdivision roads are based on the assumption that 60% of the new residential lots will have required frontage on new subdivision roads.

As the Town of Wayland Master Plan explains, “The buildout analysis determines how much of Wayland’s land area is already developed, how much is legally or environ-mentally constrained, and how much is available for new development.... Finally, the buildout analysis provides a clear picture of where Wayland is headed, and can help its residents evaluate whether the Town is going in the right direction.... estimates the possible impact of new development in terms of its demand on municipal services, environmental resources, and transportation infrastructure. This information in turn can help in the fiscal and physical planning of new facilities to accommodate future development”.

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. Table 2. Potential Development (shown above) is from the buildout analysis performed by the Metropolitan Area Planning Council in 2000.

MWGMC consulted with town staff to determine areas that were likely to be developed in the future. These areas are shown on Figure 2. “Potentially Developable Land”.

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Table 3 below, Recent and New Development, is a listing of recent and new commercial and residential development in Wayland as of May 2008. Details were provided by Joseph Laydon, Wayland Town Planner.

Table 3. Recent and New Development	
32 Pelham Island Road	
Address: 32 Pelham Island Road Developer: Banner Construction Company, Inc. - Jonathan Buchman - 781-235-3500 Type: Commercial -- Office Size: 1,948 s.f. three-story building	Status: Complete Development website: None Available Impact Reviews: None
Islamic Center Boston	
Address: 126 Boston Post Road Developer: Islamic Center Boston Type: Other Size: expansion of 8,000 s.f to 14,000 s.f.	Status: Complete Development website: None Available Impact Reviews: None
CVS	
Address: 325 Boston Post Road Developer: Type: Other Size: 14,000 sf	Status: Other: ZBA approved, Conservation & Planning Board approvals pending Development website: None Available Impact Reviews: None
Nextel	
Address: BECO Tower 111 Boston Post Road Developer: Type: Public Infrastructure --> Public Works/Utility Size: under 10,000 sf	Status: Approved [NOTE: construction has not started;] Development website: None Available Impact Reviews: None
Verizon/AT&T	
Address: Reeves Hill Cell Tower Developer: Type: Public Infrastructure --> Public Works/Utility Size: under 10,000 sf	Status: Pending [NOTE: building permit submitted] Development website: None Available Impact Reviews: None

[Table 3 continued next page]

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Table 4. Recent and New Development (Continued)	
Wayland Town Center	
Address: 400 Boston Post Road Developer: Twenty Wayland LCC Type: Public Infrastructure --> Institutional Residential -- Multi-Family Commercial -- Retail Size: 412,500 sf	Size: 40,000 sf municipal; 167,500 sf residential; 156,750 retail sf; office 10,000 sf Status: Other Special Permit Process
Address: Old Sudbury Road Wayland Commons 48 Units in development, 12 affordable units	Type: Ch. 40B Status: Approved January 31, 2006
Address: 89 Oxbow Road, Nike Site 16 Units in development, 11 affordable units	Type: Ch. 40B Status: Approved September 17, 2007
Address: 137 Boston Post Road Wayland Forest 16 Units in development, 4 affordable units	Type: Ch. 40B Status: Approved October 1, 2007
Address: 132 Commonwealth Rd Housing Authority 1 Unit in development 1 affordable unit	Type: Ch. 40B Status: Approved November 15, 2007
Address: 225 Old Connecticut Path Tripolis Circle 8 Units in development, 2 affordable units	Type: Ch. 40B Status: Approved January 25, 2008

III. PUBLIC PARTICIPATION

Public participation occurred at two levels; the Metro Boston North/West Multiple Hazard Community Planning Team (regional committee) and the Wayland Multiple Hazard Community Planning Team (local committee). In addition, the town held one meeting open to the general public to present the plan and hear citizen input.

Wayland's Participation in the Regional Committee

On July 7, 2006, a letter was sent notifying the communities of the first meeting of the Metro Boston North/West Regional Committee and requesting that the Chief Elected Official designate two municipal employees and/or officials to represent the community. The following individuals were appointed to represent Wayland on the regional committee: Gale McNiff and Gary Slep.

The Metro Boston North/West Regional Committee met on the following dates:

July 26, 2006

March 13, 2007

November 15, 2007

The Local Multiple Hazard Community Planning Team

In addition to the regional committee meetings, MWGMC worked with the local community representatives to organize a local Multiple Hazard Community Planning Team for Wayland. MWGMC briefed the local representatives as to the desired composition of that team as well as the need for representation from the business community and citizens at large.

The Local Multiple Hazard Community Planning Team Meetings

On March 29, 2007 MWGMC conducted the first meeting of the Wayland Local Committee. The meeting was organized by Donna Jacobs, MWGMC Director. The purpose of this meeting was to review existing mitigation measures, to develop hazard mitigation goals and to begin the discussion of potential mitigation measures.

Table 4. Attendance at the Wayland Local Committee Meetings January 26, 2007 and March 12, 2007	
Name	Representing
Robert F. Loomer	Fire Chief
Stephen Kadlik	Highway Department
Brendan Decker	GIS
Steve Calichman	Public Health Director
Joseph Laydon	Town Planner
Alf Berry	Town Surveyor
Brian Monahan	Conservation Administrator
Gale McNiff	Regional PDM Team
Gary Slep	Regional PDM Team
Donna Jacobs	MWGMC Director

WAYLAND HAZARD MITIGATION PLAN

Table 4 lists the attendees at each meeting of the team. The agendas for these meetings are included in Appendix A. Throughout the planning process, there were several meetings held. Table 5. Lists those meeting dates and attendees at each meeting.

Table 5. Other Local Meetings		
Date	Participants	Purpose
10/20/06	Steve Calichman	Data collection
	Donna Jacobs, MWGMC Director	
12/20/06	Gale McNiff	Data collection
	Gary Slep	
	Donna Jacobs, MWGMC Director	
4/11/07	Gale McNiff	Team
	Donna Jacobs, MWGMC Director	
4/26/07	Joe Laydon	Plan review
	Donna Jacobs, MWGMC Director	
5/9/07	Joe Laydon	Plan review
	Donna Jacobs, MWGMC Director	
12/4/07	Fred Turkington, Town Mgr John Stasik, MWGMC Chair Donna Jacobs, MWGMC Director	Plan Review & Data Collection
12/18/07	Joe Laydon	Plan Review
	Donna Jacobs, MWGMC Director	
5/2/08	Gary Slep	Plan Review & Data Collection
	Joe Laydon	
	Gale McNiff	
	Donna Jacobs, MWGMC Director	
5/6/08	Gary Slep	
	Gale McNiff	

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The Public Meeting

The plan was introduced to the public at a meeting of the Board of Selectmen on January 21, 2007. The meeting was held in the Wayland Town Hall. The meeting was publicized as a regular Selectmen's meeting. The plan was presented to the Board of Selectmen on May 21, 2008. The attendance list for that meeting can be found in Table 6. below.

Table 6.	
Attendance at the May 19, 2008 Board of Selectmen's Meeting	
Name	Representing
Donna Jacobs	MWGMC Director
Gary Slep	PDM Team
Gale McNiff	PDM Team
Fred Turkington,	Town Mgr
Joseph F. Nolan	Selectman
Douglas J. Leard	Selectman
Michael L. Tichnor	Selectman
William D. Whitney	Selectman
Steven J. Correia	Selectman

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IV. OVERVIEW OF HAZARDS AND VULNERABILITY

Overview of Hazards and Impacts

The Massachusetts Hazard Mitigation Plan 2007 (state plan) provides an in-depth overview of natural hazards in Massachusetts. The state plan 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 7 summarizes the hazard risks for Wayland. This evaluation takes into account the frequency of the hazard, historical records and variations in land use. This analysis is based on the vulnerability assessment in the Commonwealth of Massachusetts State Hazard Mitigation Plan, October 2007. The statewide assessment was modified to reflect local conditions in Wayland using the definitions for hazard frequency and severity listed below Table 7.

Table 7. Hazard Risks Summary		
Hazard	Frequency	Severity
Flooding	High	Serious
Winter storms	High	Serious
Hurricanes	Medium	Serious
Earthquakes	Low	Extensive
Tornadoes	Medium	Serious
Landslides	Low	Minor
Brush fires	High	Minor

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).

Severity

Minor: Limited and scattered property damage; no damage to public infrastructure (roads, bridges, trains, airports, public parks, etc.); contained geographic area (i.e. one or two 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 public infrastructure damage (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.

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Flood Hazards

Flooding is caused by hurricanes, nor'easters, severe rainstorms, snow melt, periods of persistent rain, and thunderstorms. Flooding was the most prevalent serious natural hazard identified by local officials in Wayland.

Repetitive Loss Properties

The state Hazard Mitigation Plan indicates that Massachusetts is one of the 10 states that account for 76% of all repetitive loss buildings (buildings that have been damaged more than once or twice) in the United States. As defined by the Community Rating System (CRS) of the National Flood Insurance Program (NFIP), a repetitive loss property is any property which the NFIP has paid two or more flood claims of \$1,000 or more in any given 10-year period since 1978.

There are a five repetitive loss structures in Wayland. Three of these are single family residences, one is a 2-4 family residence, and one is a non-residential property, all of which are located within the Sudbury River watershed. These are shown on all of the maps in Appendix B. These five properties experienced a total of 12 losses from 1979 through 2001, for a total of \$32,454 in damages.

Depending on individual circumstances, appropriate mitigation measures commonly include elevating buildings above the level of the base flood, demolishing buildings, and removing buildings from the Special Flood Hazard Area. Sometimes, mitigation takes the form of a local drainage-improvement project that meets NFIP standards.

For more information on repetitive losses see <http://www.fema.gov/business/nfip/replps.shtm>.

Regionally Significant Storms

There have been a number of major rain storms that have resulted in significant flooding in northeastern Massachusetts over the last fifty years. Significant storms include:

- August 1954
- March 1968
- January 1979
- April 1987
- October 1991 ("The Perfect Storm")
- October 1996
- June 1998
- March 2001
- April 2004
- May 2006
- April 2007

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Wind-related hazards

Wind-related hazards include hurricanes and tornadoes as well as high winds during severe rainstorms and thunderstorms. As with many communities, falling trees that result in downed power lines and power outages are an issue in Wayland.

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. A hurricane or storm track is the line that delineates the path of the eye of a hurricane or tropical storm. However, 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 indicates that the 100 year wind speed is 110 miles per hour. The following is a list of significant hurricanes that impacted Massachusetts.

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.

There have been no tornadoes or hurricanes recorded within the Town limits. On 6/9/1953, a category 4 (max. wind speeds 207-260 mph) tornado 11.7 miles away from the Wayland town center killed 90 people and injured 1,228 people and caused between \$50,000,000 and \$500,000,000 in damages. On 10/3/1970, a category 3 (max. wind speeds 158-206 mph) tornado 19.2 miles away from the town center killed one person and caused between \$50,000 and \$500,000 in damages.

Microbursts have recently occurred in towns neighboring Wayland. The term microburst was defined by severe weather expert Tetsuya Theodore Fujita as affecting an area 2.5 mi in diameter or less, distinguishing microbursts as a type of downburst and apart from common wind shear which can encompass greater areas. In a microburst, the atmosphere is warm and humid in the lower levels and dry aloft. When thunderstorms develop, heavy rain is produced but some of the rain evaporates in the drier air aloft. As a result the air aloft is cooled thereby causing it to sink and spread out rapidly as it hits the ground. The result can be both strong damaging winds and heavy rainfall occurring in the same area.

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Winter Storms

In Massachusetts, northeast coastal storms known as nor'easters occur 1-2 times per year. Winter storms are a combination hazard because they often involve wind, ice and heavy snow fall. An additional hazard resulting from winter snow storms is the failure of flat roofs due to snow-loading. The average annual snowfall for Wayland is 36-48 inches.

The most significant winter storm in recent history was the "Blizzard of 1978," which resulted in over 3 feet of snowfall and multiple day closures of roadways, businesses, and schools. Historically, severe winter storms have occurred in the following years:

Blizzard of 1978	February 1978
Blizzard	March 1993
Blizzard	January 1996
Severe Snow Storm	March 2001
Severe Snow Storm	December 2003
Severe Snow Storm	January 2005

More recently, 2008 was a record year for snowfall. By the end of the February 2008, Boston's Logan International Airport broke a new February record for total precipitation. In March 2008, many cities and towns in Massachusetts exceeded the highest snowfall records. The above-average snowfall this season increased groundwater and surface water levels to a high level, and contributed to flooding experienced in Wayland in spring 2008.

Fire Related Hazards

Based on an interview with the Wayland Fire Chief Robert Loomer, there are generally about 15-25 brush fires annually. None result in any significant property damage except for damages to trees and grass. There have been no deaths as a result of brush fires.

There are two major causes of brush fires in Wayland; intentionally set, and careless disposal of smoking materials. There is a high incidence of brush fires along the MWRA aqueduct because the area is frequented by juveniles.

At particularly high risk is the extensive area of marshland owned by the National Wildlife Refuge. Should conditions be dry enough, a rapidly spreading fire can be anticipated. Smoke would compromise traffic on two state highways (Route 20, a major east-west arterial road, and Route 27, the major north-south arterial).

The Fire Department has requested federal assistance in obtaining an ATV that could be used to respond to brush fires.

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Geologic Hazards

Geologic hazards include earthquakes, landslides, sinkholes, subsidence and unstable soils such as fill, peat and clay. Most town officials admitted that earthquakes were the hazard for which their community was least prepared. Although new construction under the most recent building codes generally will be built to seismic standards, there are still many structures which pre-date the most recent building code. Although there have been no epicenters in Wayland, many earthquakes have occurred in nearby communities.

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. There have been no recorded earthquake epicenters within Wayland. However, according to the Weston Observatory, between 2005 and 2007, there were 7 earthquakes recorded in Massachusetts, the most recent in October 2007 with an epicenter 8 miles NNW of Maynard, Massachusetts.

Earthquakes are a hazard with multiple potential impacts beyond the obvious building collapse. Buildings may suffer structural damage which may or may not be readily apparent. Earthquakes can cause damage to bridges and roadways, making emergency response difficult. Water lines and gas lines can break, causing flooding and fires. Another potential vulnerability is equipment within structures. 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 by an earthquake. Wayland's communication towers/antennas, its reverse 911 system, its dams, and its water tanks are potentially at risk from earthquakes. Earthquakes can also trigger landslides.

Landslides - The majority of Wayland is considered to have a low risk for landslides. The northern-most area of town is considered to have a moderate risk of landslides because of the geologic formation. However, there have been no recorded landslides in Wayland.

Critical Infrastructure in Hazard Areas

Critical infrastructure includes facilities that are important for disaster response and evacuation (such as emergency operations centers, fire stations, water pump stations, MWRA Aqueduct, water tanks and gas lines, etc.) and facilities where additional assistance might be needed during an emergency (such as nursing homes, elderly housing, day care centers, etc.). It also includes facilities that might pose a particular danger during a natural disaster such as a sewage treatment plant or chemical facility. These facilities are listed in Table 8 and are shown on all of the maps in Appendix B.

The purpose of mapping the natural hazards and critical infrastructure is to present an overview of hazards in the community and how they relate to critical infrastructure.

WAYLAND HAZARD MITIGATION PLAN

Flooding Hazards

There are eight facilities located within the X500 food zone, including three town well sites, three retail sites, a branch Post Office, and a landfill. There are also ten facilities located in or near locally identified areas of flooding or drainage problems.

Landslides

The Campbell Road well and pumping station is located in an area considered to have a moderate risk of landslides due to the geologic formation. However, as noted above, there have been no recorded landslides in Wayland.

Explanation of Columns in Table 8.

Column 1: Site Name: The first column is the name of the site. If no name appears in this column, this information was not provided to MAPC by the community.

Column 2: Site Type: The second column indicates what type of site it is to help identify the relationship to hazards and emergency support.

Column 3: Locally Identified Areas of Flooding: The locally identified areas of flooding were identified by town staff as areas where flooding occurs. These areas do not necessarily coincide with the flood zones from the FIRM maps. They may be areas that flood due to inadequate drainage systems or other local conditions rather than location within a flood zone. The numbers correspond to the numbers on Map 8, "Hazard Areas".

Column 4: Landslide Risk: This column indicates the degree of landslide risk for that site. This information came from NESEC. 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>.

Column 5: FEMA Flood Zone: The fifth column addresses the risk of flooding. A "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 maps).

Column 6: Average annual snowfall: The snowfall mapping indicates that there are two bands of snowfall in southeastern Massachusetts. An entry of "high" indicates an annual average of 48.1 – 72 inches of snow. An entry of "low" indicates a range of 36-48 inches.

WAYLAND HAZARD MITIGATION PLAN

Table 8: Relationship of Critical Infrastructure to Hazard Areas						
ID	NAME	TYPE	Within Locally Identified Area of Flooding	Landslide	Within FEMA Flood Zone	Average Annual Snow Fall
1	Sunoco Gas	Fuel Depot	No	No	No	Low
2	MWRA Cochituate Aqueduct	Aqueduct	No	No	No	Low
3	Loker Elementary School	School	No	No	No	Moderate Susceptibility
4	Happy Hollow School	School	No	No	No	Low
5	St. Ann's Church	Place of Assembly	No	No	No	Low
6	Primary Water Tank	Water Storage Tank	No	No	No	Low
7	Secondary Water Tank	Water Storage Tank	No	No	No	Low
8	Wayland High School	School	No	No	No	Moderate Susceptibility
9	Temple Shir Tikva	Place of Assembly	No	No	No	Low
10	Islamic Center of Boston	Place of Assembly	No	No	No	Low
11	Claypit Hill School	School	No	No	No	Moderate Susceptibility
12	Peace Lutheran Church	Place of Assembly	No	No	No	Low
13	Congregation Or Atid	Place of Assembly	No	No	No	Low
14	Church of the Holy Spirit	Place of Assembly	No	No	No	Low
15	Celebration International Church	Place of Assembly	No	No	No	Low
16	Traditions of Wayland	Assisted Living	No	No	No	Low
17	Town Hall	Town Hall	Town Center B	No	No	Moderate Susceptibility
18	Trinitarian Congregational Church	Place of Assembly	No	No	No	Low
19	First Parish Church	Place of Assembly	Town Center A	No	No	Low

WAYLAND HAZARD MITIGATION PLAN

Table 8: Relationship of Critical Infrastructure to Hazard Areas

ID	NAME	TYPE	Within Locally Identified Area of Flooding	Landslide	Within FEMA Flood Zone	Average Annual Snow Fall
20	Public Safety Building	Public Safety Building	Town Center A	No	No	Low
21	The Children's Way	Daycare	Town Center B	No	No	Low
22	Wayland Wastewater Treatment Plant	Wastewater Treatment Plant	No	No	No	Low
23	Wayland-Sudbury Septage Treatment	Wastewater Treatment Plant	No	No	No	Low
24	Tenneco Gas	Fuel Depot	No	No	No	Low
25	Wayland Landfill	Department of Public Works	No	No	X500	Low
26	Baldwin Pond Wells	Well	No	No	No	Low
27	Chamberlain Well	Well	No	No	X500	Low
28	Campbell Road Well	Well	No	Moderate Susceptibility	X500	High
29	Happy Hollow Wells	Well	No	No	X500	Low
30	Meadowview Well	Well	No	No	AE	Low
31	Weston Aqueduct	Aqueduct	No	No	No	Low
32	Greenways Treatment Plant	Wastewater Treatment Plant	No	No	No	Low
33	MWRA Hultman Aqueduct	Aqueduct	No	No	No	Low
34	Wayland Middle School	School	No	No	No	Moderate Susceptibility
35	Wayland Highway Dept.	Department of Public Works	No	No	No	Low
36	Wayland Sunoco	Fuel Depot	No	No	No	Low
37	Wayland Mobil	Fuel Depot	No	No	No	Low
38	Sunrise of Wayland	Assisted Living	No	No	No	Low
39	Alternate EOC - Station 2	EOC	No	No	No	Low
40	Wayland Gulf	Fuel Depot	No	No	No	Low

WAYLAND HAZARD MITIGATION PLAN

Table 8: Relationship of Critical Infrastructure to Hazard Areas

ID	NAME	TYPE	Within Locally Identified Area of Flooding	Landslide	Within FEMA Flood Zone	Average Annual Snow Fall
41	Wayland Housing Authority	Elderly Housing	No	No	No	Low
42	St. Zepherin Catholic Church	Place of Assembly	No	No	No	Low
43	Wayland Nursing and Rehab. Center	Medical Facility	No	No	No	Low
44	Barat Montessori School	School	No	No	No	Low
45	Community Nursery School	School	No	No	No	Low
46	United Methodist Church	Place of Assembly	No	No	No	Low
47	Barat Montessori School	Daycare	No	No	No	Low
48	Community Nursery School of Wayland	Daycare	No	No	No	Low
49	Wayland Creative Pre School	Daycare	No	No	No	Low
50	JCC Preschool-Wayland	Daycare	No	No	No	Low
51	Little Dove Early Childhood Center	Daycare	No	No	No	Low
52	Little Lamb Nursery School	Daycare	No	No	No	Low
53	Longfellow Children's Center	Daycare	No	No	No	Low
54	Toddler Loving Care II, Inc.	Daycare	No	No	No	Low
55	Wayland Fire Department Station II	Fire Station	No	No	No	Low
56	Wayland Fire Department Station I	Fire Station	Town Center A	No	No	Low
57	Public Safety Building	EOC	Town Center A	No	No	Low
58	Wayland Police Department	Police Station	Town Center A	No	No	Low
59	Parmenter Adult Day Health Center	Adult Daycare	No	No	No	Low
60	Parmenter Adult Day Health Center	Emergency Dispensing Site	No	No	No	Low
61	Brooks Pharmacy	Pharmacy	No	No	No	Low
62	CVS Pharmacy	Pharmacy	Pelham Island Road	No	X500	Low
63	Wayland Animal Clinic	Veterinary Facility	No	No	No	Low

WAYLAND HAZARD MITIGATION PLAN

Table 8: Relationship of Critical Infrastructure to Hazard Areas

ID	NAME	TYPE	Within Locally Identified Area of Flooding	Landslide	Within FEMA Flood Zone	Average Annual Snow Fall
64	Donelan's Supermarket	Shopping Mall	No	No	No	Low
65	Especially for Pets	Veterinary Facility	No	No	No	Low
66	Longfellow Health Club	Place of Assembly	No	No	No	Low
67	Communication Tower	Communication Tower	No	No	No	Low
68	Bent Park Apartments	Elderly/Disabled Housing	No	No	No	Low
69	Wayland Exxon	Fuel Depot	No	No	No	Low
70	US Post Office - Wayland Branch	Post Office	No	No	X500	Low
71	US Post Office - Cochituate Branch	Post Office - Branch	No	No	No	Low
72	Phoenix Veterinary Hospital	Vet. Facility	Town Center A	No	X500	Low
73	Whole Foods	Supermarket	Pelham Island Road	No	X500	Moderate Susceptibility
74	Broomstones	Temporary Morgue	No	No	No	Low
75	Meadow's at Mainstone Treatment Facility	Wastewater Treatment Facility	No	No	No	Low
76	Bright Horizons at Wayland	Daycare	No	No	No	Low
77	Wayland Apothecary	Pharmacy	No	No	No	Low

WAYLAND HAZARD MITIGATION PLAN

Vulnerability Assessment

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 (multiple-hazards) is a computer program developed by FEMA to estimate losses due to a variety of natural hazards. The following overview of HAZUS-MH is taken from the FEMA website. For more information on the HAZUS-MH software, go to <http://www.fema.gov/plan/prevent/hazus/index.shtm>

“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 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 nine 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 to allow for a comparison between different types of disasters. Therefore, this analysis should be

WAYLAND HAZARD MITIGATION PLAN

considered to be a starting point for understanding potential damages from the hazards. If interested, communities can build a more accurate database and further test disaster scenarios.

Estimated Damages from Hurricanes

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.

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 storm was chosen to illustrate damages. The reason is to present more of a “worst case scenario” that would 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 9.		
Estimated Damages from Hurricanes		
	Cat. 2	Cat 4
Building Characteristics		
Estimated total buildings	4,734	
Estimated total building replacement value (Year 2002 \$)	\$1,009,000,000	
General Building Damage		
# of buildings sustaining minor damage	1,604	190
# of buildings sustaining moderate damage	488	621
# of buildings sustaining severe damage	76	1,167
# of buildings destroyed	61	2,740
Population Needs		
% of hospital beds available on day of event	0	0
# of households displaced	95	4,040
# of people seeking public shelter	17	754
Debris		
Building debris generated (tons)	7,663	124,458
Tree debris generated (tons)	120,056	231,137
# of truckloads to clear building debris	303	4,899
Value of Damages		
Total property damage	\$70,452	\$1,111,440
Total business interruption loss	\$78,675	\$1,228,147
Note: 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.		

WAYLAND HAZARD MITIGATION PLAN

Estimated Damages from Earthquakes

Methodology Used

To assess damages from earthquakes, the HAZUS-MH earthquake module was used. For more information, see the description of the HAZUS-MH software above.

The HAZUS earthquake module allows users to define a number of different types of earthquakes and to input a number of different parameters. The module is more useful where there is a great deal of data available on earthquakes.

Table 10. Estimated Damages from Earthquakes		
	Magnitude 5.0	Magnitude 7.0
Building Characteristics		
Estimated total number of buildings	4,734	
Estimated total building replacement value (Year 2002 \$)	\$1,009,000,000	
Building Damages		
# of buildings sustaining slight damage	1	1
# of buildings sustaining moderate damage	0	0
# of buildings sustaining extensive damage	0	0
# of buildings completely damaged	0	0
Population Needs		
# of households displaced	0	0
# 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	\$17,640	\$100,000
Total losses due to business interruption	\$0	\$10,000

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.

Estimated Damages from Flooding

Methodology Used

MAPC did not use HAZUS-MH to estimate flood damages in Wayland. In addition to technical difficulties with the software, the riverine module is not a reliable indicator of flooding in areas where inadequate drainage systems contribute to flooding even when those structures are not within a mapped flood zone. In Wayland, much of the flooding is due to low lying areas along the Sudbury River and deficiencies in the drainage system. In lieu of using HAZUS, MAPC developed a methodology to give a rough approximation of flood damages.

WAYLAND HAZARD MITIGATION PLAN

Wayland is 15.28 square miles or 10,142 acres of which 1,272 acres are wetlands, most are located in the Sudbury River floodplain. It is important to note that this category does not include the 200 acres of forested wetlands.

Figure 4
Wetlands and Water Bodies in NW Quadrant

This amounts to 14.5% of the land area in Wayland. Figure 4. shows the northwest quadrant of Wayland. The areas in blue represent water bodies, and the green areas with blue flecks represent wetlands. Figure 5. shows the wetlands and water bodies in southwest quadrant of Wayland.



Approximately 344.5 acres of Wayland's total land area of 10,142 acres have been identified by identified by local officials as areas of flooding. This amounts to 3.395% 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 in Wayland, which is the same number of structures used by HAZUS for the hurricane and earthquake calculations. HAZUS uses an average value of \$252,000 per structure for the building replacement value in Wayland.

This was used to calculate the total building replacement value in each of the flood areas. 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 \$4,258,800 - \$21,294,000. 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).

WAYLAND HAZARD MITIGATION PLAN

Figure 5
Wetlands and Water Bodies in SW Quadrant

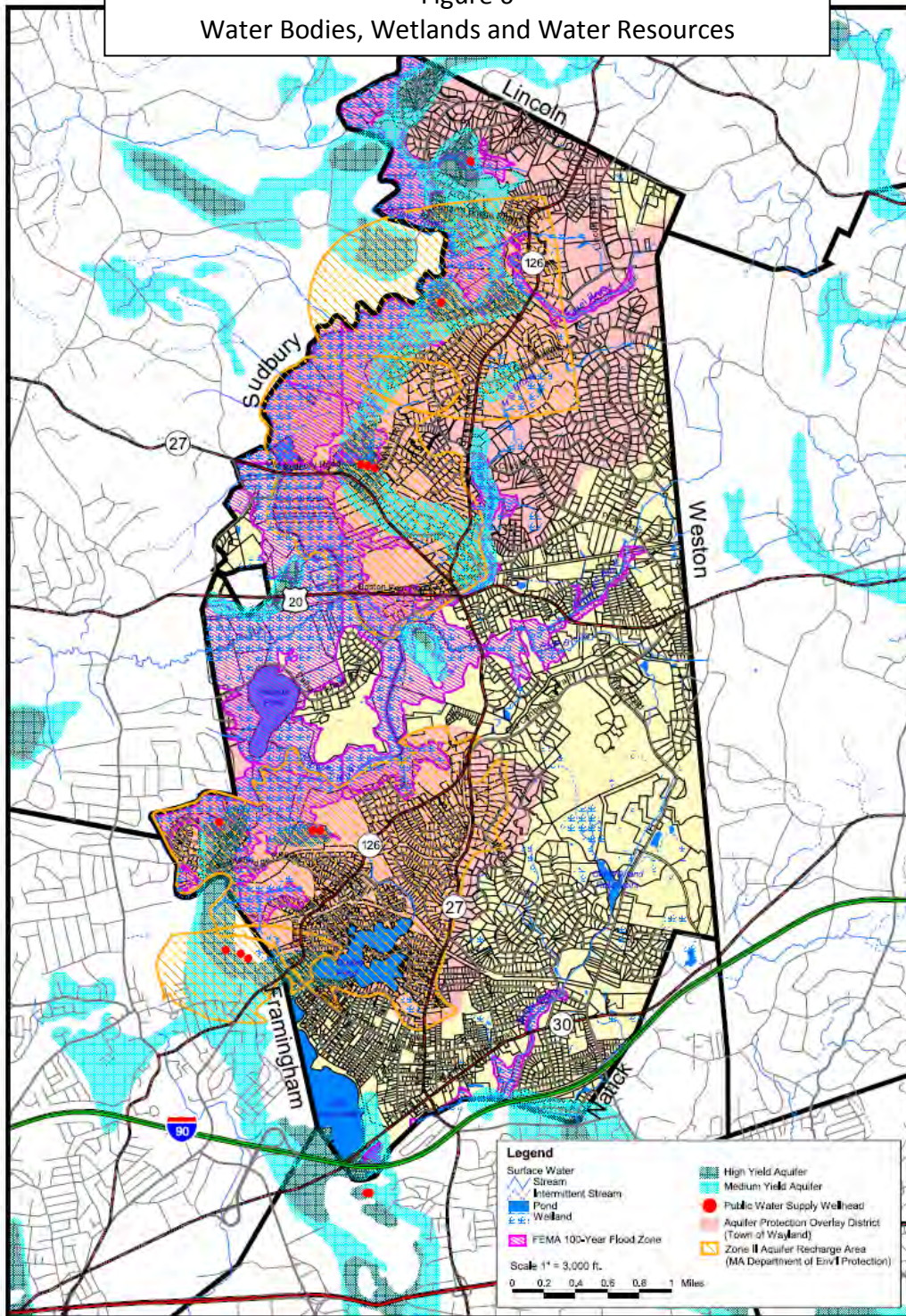


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Table 11 Estimated Damages from Flooding							
					Value per Structure \$252,000	10%	50%
ID	Flood Hazard Area	Approximate Area in Acres	% of Total Land Area				
1	Route 27 by Town line	106.13	1.05	42	\$10,584,000	\$1,058,400	\$5,292,000
2	Stonebridge Road	10.40	0.10	6	\$1,512,000	\$151,200	\$756,000
3	Boston Post Road	46.84	0.46	25	\$6,300,000	\$630,000	\$3,150,000
4	Pelham Island Road	28.05	0.28	15	\$3,780,000	\$378,000	\$1,890,000
5	Town Center A	17.71	0.17	9	\$2,268,000	\$226,800	\$1,134,000
6	Town Center B	10.17	0.10	5	\$1,260,000	\$126,000	\$630,000
7	Pelham Island Road at Heard Pond	125.19	1.23	67	\$16,884,000	\$1,688,400	\$8,442,000
	TOTAL	344.50	3.39511	169	\$42,588,000	\$4,258,800	\$21,294,000

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Figure 6
Water Bodies, Wetlands and Water Resources



Daylor
Consulting
Group
Inc.

Ten Forbes Road, Framingham, MA 01904 (508) 849-1000

Created by: Jennifer Chen

Water Resources
Wayland Master Plan



Source: MassGIS, Town of Wayland

0104Lap

WAYLAND HAZARD MITIGATION PLAN

Future Development in Hazard Areas

The Town of Wayland has identified a number of parcels where development has occurred, been proposed, or is expected to occur in the future. Table 12. shows the relationship of these parcels to two of the mapped hazards. This information is provided so that planners can ensure that development proposals meet all flood plain zoning and that careful attention is paid to drainage issues.

Table 12. Relationship of Potential Development to Hazard Areas		
Parcel	Landslide risk	Flood Zone
Town Center - Nike	Low	22.0439% in X500 2.6363% in AE
Shopping Center	Low	13.2063% in X500 39.6768% in AE

V. HAZARDS AND EXISTING MITIGATION MEASURES

Flood-Related Hazards

Overview of SuAsCo Watershed and Flooding

The Sudbury-Assabet-Concord Watershed, located in the MetroWest area of the state, encompasses a large network of tributaries that ultimately flow into the Merrimack River. The watershed has a total drainage area of approximately 377 square miles. The Assabet River flows north for 30 miles from its headwaters in Westborough, through the now densely developed urban centers of Northborough, Hudson, and Maynard, to its confluence with the Sudbury River at historic Egg Rock in Concord. The Sudbury River also has its beginnings in Westborough, flowing eastward from the Great Cedar Swamp toward Framingham. It then proceeds north to Concord a total of 29 miles from Westborough to its confluence with the Assabet River at Egg Rock. The Sudbury and Assabet Rivers join together at Egg Rock to form the Concord River which flows north for 15.5 miles to join the Merrimack River in Lowell. At the Saxonville dam, the Sudbury River falls to 114 feet as it winds north. After the dam, the gradient changes to barely a one inch drop per mile and the river broadens and meanders to the Great Meadows National Wildlife Refuge in Wayland and Sudbury through marsh meadows in Wayland, Sudbury, Lincoln, and Concord.



The SuAsCo encompasses all or part of 36 municipalities and supports a population of 365,000 people. Acton, Carlisle, Framingham, Hudson, Marlborough, Maynard, Northborough, Southborough, Stow, and Sudbury all lay completely within the Watershed. Ashland, Bedford, Berlin, Billerica, Bolton, Boxborough, Boylston, Chelmsford, Clinton, Concord, Grafton, Harvard, Holliston, Hopkinton, Lincoln, Littleton, Lowell, Natick, Sherborn, Shrewsbury, Tewksbury, Upton, Wayland, Westborough, Westford, and Weston are partially within the Watershed.

Retaining the natural beauty and rural character of the SuAsCo Watershed is challenged by growth and development, as this area is one of the most rapidly growing in Massachusetts and, as such, is facing severe resource challenges. Rapid growth and development have placed land prices at a premium, making open space and habitat protection ever more difficult. Many stretches of the Sudbury, Assabet, and Concord Rivers routinely fail their water quality standard for nutrient enrichment and experience both severe flooding and low flow concerns. Water shortages are evidenced as many towns post water bans during the summer. The rivers' assimilative capacity to handle nutrients is severely stressed by nonpoint sources (storm water) and wastewater treatment plant discharges (SuAsCo Watershed Council, 2006)

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Locally Identified Areas of Flooding

When a water body can no longer accommodate increased discharge from heavy rains or snow melt, the excess water flows on the adjacent land. Development in floodplains is regulated in order to protect the health and safety of people in the area and to protect property. Unregulated development in the floodplain can increase the likelihood of flooding by decreasing flood storage and increasing the surface runoff into the stream channel. In addition, water contamination from flood-damaged sewage or septic systems and debris swept downstream from flooded properties can result in unnecessary hazards to those downstream.



Information on flood hazard areas was taken from two sources. The first was the National Flood Insurance Rate Maps. The FIRM flood zones are shown on Map 3 in Appendix B. The second was discussions with local officials. The locally identified areas of flooding described below were identified by town staff as areas where flooding occurs. These areas do not necessarily coincide with the flood zones from the FIRM maps. They may be areas that flood due to inadequate drainage systems or other local conditions rather than location within a flood zone.

Sudbury River - The River meanders through the town, and is subject to annual flooding. Table 13. lists flood events from 1987 to the present. The flood stages are shown below.

Major Flood Stage:	13 ft.
Moderate Flood Stage:	12 ft.
Flood Stage:	10 ft.
Action Stage:	8.5 ft.

Portions of the Town of Wayland flood routinely during small storm events, primarily near the center of Town. The most affected area is Pelham Island Road along Heard Pond. Minor flood events have necessitated the closing of a portion of this scenic and residential road, which connects Sudbury and Framingham to Wayland and serves as a two-mile by-pass for Boston Post Road (Route 20) traffic. Closures typically last for one to two weeks and typically occur one to three times a year. Emergency services are impaired by the closure of the western end of the road, and emergency response time is lengthened during these flooding events.

Table 13. Flood Events		
Source: NWS		
Date	Water Level	
04/08/1987	13.47 ft	
06/07/1982	13.30 ft	
03/23/2001	12.61 ft	
10/15/2005	12.04 ft	
06/03/1984	11.98 ft	
04/01/1993	11.97 ft	
10/21/1996	11.08 ft	
04/18/2007	11.01 ft	
04/24/2000	10.90 ft	
06/14/1998	10.77 ft	
03/09/2008	10.57 ft	

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During moderate flooding events, portions of both ends of Pelham Island Road, including a quarter mile stretch from Boston Post Road to a hundred feet short of Jeffrey Road are closed, typically for two weeks during each such flood event. These flood events force the closure of that stretch of the road, including the bridge over the Sudbury River, and the section of the road around Heard Pond, thereby isolating four residential streets, a neighborhood of nearly 200 residents.

In the past moderate flood events have necessitated the intervention of the Massachusetts National Guard for an average event period of about ten days. With much of the Guard assigned overseas, continuing flood assistance would place a significant burden on the unit, and that might result in the evacuation of the neighborhood for two weeks during moderate and severe flooding events as opposed to providing transport during the daytime so that residents can remain in their homes but commute to work, go to medical appointments, care for pets, etc. Evacuation for two weeks at a time would put an extra onus on the Town and the residents, and their problems would be significantly magnified if a regional flood event occurs, thereby putting a strain on regional resources and personnel.

Moderate flood events also occur along Old Sudbury Road (Route 27) in an area immediately to the North of the Boston Post Road, and along River Road, which intersects Old Sudbury Road in the north section of Wayland near one of the Sudbury River bridges. Some local flooding also occurs at the Sudbury River crossing on Stonebridge Road. Moderate flood events have occurred at least four times in the past thirty years.

Major flood events have a 7% probability (more or less) of occurring in any one year (i.e., they occur on average about once every 15 years). These serious floods cause road closures in the above areas, are more expansive in size and depth – up to five feet deep in some areas – and expand to include the center of Town where the Boston Post Road and Old Sudbury Road intersect with Route 126 (the 20-27-126 intersection). Many businesses and municipal buildings in this area are affected, and many experience on-site flooding. A couple of residences have experienced flooding as well. Flood waters usually recede to below flood stage after two to three weeks, depending on the cause of the flood and the flood stages of the Merrimac River and the Assabet, Sudbury, and Concord Rivers and their flood plains. In some cases, snow and ice melt impacts the four rivers and can impede the rapidity with which flood waters recede throughout the region.

Catastrophic floods (100-year and 500-year events) have not occurred in the past fifty years, and the Wayland Local Multiple Hazard Community Planning Team (PDM Team) has had no experience with them.

Since 1987 there have been six flooding events that have affected portions of Routes 20, 27 and 126 in Wayland Center. These events have caused temporary road closures on Route 27 and lane closures on Route 20. More frequent road closures have occurred on Pelham Island Road; three such closures occurred during the winter of 2007-2008.

Pelham Island Road Several sections of Pelham Island Road are below flood grade. As stated above, the section of road around Heard Pond floods routinely; and the eastern-most section

WAYLAND HAZARD MITIGATION PLAN

floods every few years, from six inches to five feet in depth. In moderate and major flood events, when both the eastern and western sections of the road have been under flood waters, residents have been isolated in their homes; and the Massachusetts National Guard (MassNG) has had to intervene. As many as three MassNG trucks have been assigned to a single flood event. MassNG trucks have experienced frequent breakdowns in the past due to damage from flood waters and unrelated mechanical problems. MassNG trucks were used to transport people and supplies, to change emergency crews, and, at times, for emergency evacuation of persons in need of medical attention.

Closure of the road due to flooding affects emergency response since ambulances, small trucks, fire engines, police cars, school buses, and passenger vehicles cannot cross the flooded portions of the road. Emergency response to the westernmost part of the neighborhood during road closures has been the result of a cooperative arrangement with the Town of Sudbury, as road access to the westernmost neighborhood is limited to entry from Sudbury.

Wayland has, in several flood events, placed a fire engine, equipped with some medical supplies, on the “island” as flooding became imminent, along with a crew to man the engine, and a trailer for the crew to live in during their tour of duty.

In 2007 the Town of Wayland contracted with TEC, a Lawrence Mass.-based road and traffic consulting firm, to perform a mitigation study of Pelham Island Road in the frequently flooded area around Heard Pond. The study was confined to finding feasible road solutions for a stretch of approximately 0.7 miles that would, if manageable, allow the road to remain open during all but catastrophic flood events. (Other possible solutions were not included in the TEC feasibility study due to limited project funding.) The 0.7 mile stretch of road lies between Griscom Road and Erwin Road, both dead-end residential streets emanating off Pelham Island Road.

TEC has provided the Town with a draft report that provides several preliminary options, all of which require some level of road reconstruction. As of early April, 2008, the draft was being finalized, but no delivery date has been given to the Town. A draft of the report, submitted to the Wayland Highway Director for initial review and comment in February, 2008, contains three reconstruction options. Only two of the options are considered workable, in the view of the Wayland PDM Team, for the purpose of keeping the road open during moderate and most major flood events. None of the options are thought to be sufficient in a catastrophic 100-year flood event. Option 1 is not considered responsive to the flooding issue and is not recommended. Option 2 would require approximated 16,000 cubic yards of fill to raise the road and would cost about \$2.35 million. Option 3 would provide a safeguard against the most road closures; it would require about 17,000 cubic yards of fill material, and cost an estimated \$4.55 million. The additional cost is mostly due to the inclusion of retaining walls, which is not necessary in Option 2. Option 3 would raise the road about two feet more than that called for in Option 2. The final report may alter or clarify the figures for the road height, amount of fill, and cost. The cost estimates in the draft do not appear to include the cost of engineering and related administrative and permitting expenses; the final report may clarify the full costs for each option proposed.

Based on a preliminary environmental report contained in the TEC draft, both Options 2 and 3 would have negligible effects on the environment. It should be noted that this part of Pelham

WAYLAND HAZARD MITIGATION PLAN

Island Road is adjacent to conservation land on both sides of the road (including the Great Meadows National Wildlife Refuge). To the South is Heard Pond; to the North are vegetated wetlands (BVW) and a brook that flows into the Sudbury River.

The road in the area of concern is currently in very poor condition, but passable when dry. Safety is currently a major concern as the road is very winding, close to the pond, not lighted at night, subject to dense fog, and very narrow (16-20 feet of pavement). Winter storms exacerbate the safety concerns. The edges of the road have collapsed in some areas, as have the banks that separate the road from the pond. Recent flood events and winter freezes have undermined the road.

The road serves local and commuter traffic from Sudbury, Framingham, and Wayland. School buses use this road to transport resident children to and from local elementary, middle, and high schools. Heavy trucks and oil tankers also use Pelham Island Road.

Water Main Breaks

There are eight gravel-packed ground wells that serve the town, which are located at six different sites throughout the Town. These wells are known as Baldwin Pond Wells #1, #2, and #3, Happy Hollow Wells #1 and #2, Chamberlain Well, Campbell Well and Meadowview Well. These wells are tested in compliance with the Safe Drinking Water Act. The system has 85 miles of water mains and has been in operation for over 100 years.

There are relatively few water main breaks for a system the size of Wayland, about 28/year average, including mains, curb boxes, and service lines. Specific information is shown in the following table, which lists 49 breaks recorded in 2005 and 2006.

Table 14. Water Main Breaks						
LOCATION		SIZE (INCHES)	DATE OF BREAK		NATURE OF BREAK	COMMENTS
Street			Year	Month & Day		
Boston Post Rd	55	8" Main	2005	28-Jan	75 gpm	63,000 gallons lost.
Bow Rd	30	Service Line	2005	5-Oct		39,000 gallons lost
Cochituate Rd/17 Forty Acres	112	Service Line	2005	22-Sep		
Commonwealth Rd	119	Curb box	2005	13-Aug		Shut valve
Grace Rd	10	6" Main	2005	21-Jan		
Hawthorne Rd	66	Service Line	2005	5-Sep		
Highgate Rd	7	Service Line	2005	2-May		
Lakeview Rd	42	Service Line	2005	30-Mar		Coordinate with homeowner work
Main St	163	Service Line	2005	28-Dec		
Mathews Dr	45	Service Line	2005	12-Sep		
Mathews Dr @ Main St	7	2" Main	2005	11-Jun		
Moore Rd	45	Service Line	2005	3-Dec		Contractor problem

(Table continued on next page)

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Table 14. Water Main Breaks (Continued)						
LOCATION		SIZE (INCHES)	DATE OF BREAK		NATURE OF BREAK	COMMENTS
West Plain St	100	Service-6" Main	2005	16-Mar		
Windy Hill	N/A	Hydrant	2005	11-Jan		Low Flow hydrant-used 24,000 gallons in fix
Winter St	27	8" Main	2005	11-Feb		
Total in 2005		18				
Oxbow	118	Service Line	2005	28-Sep		
Pequot Rd		Main	2005	17-Sep		Happy Hollow School
Sunset	28	6" Main	2005	5-Oct		
Boston Post Rd	54	Service Line	2006	30-Apr		Finagle Bagel
Boston Post Rd	180	Service Line	2006	8-Aug		
Bow Rd	21	Service Line	2006	4-May		
Coolidge Rd & Plain St		8" Main	2006	17-Sep		
Clubhouse Ln	18	Service Line	2006	30-May		
Clubhouse Ln	38	N/A	2006	29-Dec		Large flow
Coolidge Rd & Plain St	3	Service Line	2006	2-Dec		
Draper Rd	111	Service Line	2006	8-May		
Forest Hills	19	Service Line	2006	19-Dec		
French Ave	9	Service Line	2006	22-Feb		Contractor repairing line
Goodman	7	Service Line	2006	5-Dec		
Hawthorne Rd	18	Service Line	2006	24-May		
Highgate Rd	7	Service Line	2006	3-Dec		Minor
Highland Circle	29	8" Main	2006	2-Feb		
Hill Rd	14	Service Line	2006	31-Aug		
Maguire Rd	22	6" Main	2006	4-Jan		
Old Connecticut Path	125	Service Line	2006	13-Dec		
Old Connecticut Path	291	Service Line	2006	20-Jun		
Old Connecticut Path	336	Service Line	2006	20-Sep		
Pequot Rd	8	Service Line	2006	5-May		
Pequot Rd	18	Service Line	2006	22-May		
Pequot Rd	18	Service Line	2006	19-Apr		
Rice Rd	83	12" Main	2006	24-Apr		
Ripley Ln	7	Service Line	2006	11-Mar		
River Rd	36	4" Main	2006	24-Apr		
Sears Rd	16	Service Line	2006	27-Jun		
Sedgemoor Rd	70	8" Main	2006	12-Apr		Lost 100,000 gallons
Shawmut Ave	27	Service Line	2006	6-Oct		
South St by Winter St	N/A	8" Main	2006	7-May		
Winthrop Rd	12	6" Main	2006	4-Jan		
Woodridge Rd	126	Service Line	2006	9-Sep		
Total in 2006		31				

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Existing Flood Hazard Mitigation Measures

Participation in the National Flood Insurance Program (NFIP) – The Town complies with the NFIP by enforcing floodplain regulations, maintaining up-to-date floodplain maps, and providing information to property owners and builders regarding floodplains and building requirements.

FEMA maintains a database on flood insurance policies and claims. This database can be found on the FEMA website at <http://www.fema.gov/business/nfip/statistics/pcstat.shtm>.

The following NFIP information is summarized for the Town of Wayland.

Table 15. Flood Insurance	
Flood insurance policies in force (as of March 31, 2008)	39
Coverage amount of flood insurance policies	\$11,845,000
Premiums paid	\$31,227
Total losses (all losses submitted regardless of the status)	18
Closed losses (Losses that have been paid)	16
Open losses (Losses that have not been paid in full)	0
CWOP losses (Losses that have been closed without payment)	2
Total payments (Total amount paid on losses)	\$44,517

Street sweeping – Every street gets swept each spring and fall and as necessary (storms, local projects, grass & brush cutting – as necessary). Street sweeping is done by the town.

Catch basin cleaning –They are cleaned annually. In areas that normally clog up, such as at the bottom of hills, inlet screens are cleaned when a storm is forecast.

Roadway treatments – Over the past 2-3 years the town has elected to use sand only where necessary. Salt and liquid calcium is used instead on the roads to prevent clogging and stream sedimentation.

Subdivision Rules and Regulations – The subdivision rules and regulations contain a number of requirements that address flood hazard mitigation. Some of these provisions also relate to other hazards.

FLOOD HAZARDS

The Planning Board will review all proposed subdivisions within a flood hazard area as designated on the FIA Flood Hazard Boundary (or Rate) Maps, or to some map that may be adopted by the Town at some future date, as part of the zoning bylaw, to determine if such subdivisions provide adequate drainage so as to minimize flood damage within the subdivision by requiring that all public utilities and facilities, such as sewer, gas, electrical, and water systems to be located, elevated and constructed so as to minimize or eliminate flood damage.

STORM AND SURFACE DRAINAGE

When, in the opinion of the Planning Board, development of an area will increase runoff substantially to downstream properties, it shall require that a retention area be

WAYLAND HAZARD MITIGATION PLAN

constructed. Such retention area will be designed to handle the 100 year storm and such size shall be determined by the flood routing procedure as described in the U.S.D.A., Soil Conservation Service National Engineering Handbook, HYDROLOGY, Section 4. Sideslopes shall be no greater than three (3) to one (1) and shall be loamed, seeded, and rolled in accordance with the specifications of the Highway Department. Fencing of all or part of such retention areas shall be required as directed by the Planning Board

Zoning Bylaw – Section X B establishes a Flood Plain District. Excerpts are stated below.

In the Flood Plain District, any use otherwise permitted by this by-law shall be permitted except that (i) no filling, excavating or transferring of any material which will reduce the natural flood-water storage capacity or interfere with the natural flow or recession of any flood-water shall be done in the Flood Plain District and (ii) no structure shall be erected or placed in the Flood Plain District unless a special permit for such action or structure has been issued by the Board of Appeals created under Section X after a hearing with due notice given.

Existing Wind Hazard Mitigation Measures

Massachusetts State Building Code – The town enforces the Massachusetts State Building Code whose provisions are generally adequate to mitigate against most wind damage. The code's provisions are the most cost-effective mitigation measure against tornados given the extremely low probability of occurrence. If a tornado were to occur, the potential for severe damages would be extremely high.

Tree Trimming Program - Wayland is a tree-friendly town and as such does occasionally have damage from wind, storms and ice. The town performs some tree trimming (called “upbranching”) in the winter months along the town owned right of ways to keep the roads clear, below the power lines. If a cherry picker is needed to do the work, or if large trees need to be removed from town property, the town contracts the work. The town also cuts shrubs and small growth along the road and street right of ways. Critical work is done as necessary. Non-critical town-wide work is spread out over several years. The town has a branch chipper but does not own a stump grinding machine. Stump removal is done by contractors. The town does not work near power lines. Power and utility lines are done by the various utilities that either do the work with their own crews/equipment or use contractors.

Potential impacts from wind damages and wildfires can occur in any part of the town. The town has not identified any areas that are at particularly higher risk from wind damages than others.

Existing Winter Hazard Mitigation Measures

Snow disposal – Taken to area reserved for fill/cover material in the front of the landfill on Route 20 (Boston Post Road). Snow is collected from business areas, sidewalks, the routes 27/30 intersection and similar areas. No current need for more space

WAYLAND HAZARD MITIGATION PLAN

Existing Geologic Hazard Mitigation Measures

Massachusetts State Building Code – The State Building Code contains a section on designing for earthquake loads (780 CMR 1612.0). Section 1612.1 states that the purpose of these provisions is “to minimize the hazard to life to occupants of all buildings and non-building structures, to increase the expected performance of higher occupancy structures as compared to ordinary structures, and to improve the capability of essential facilities to function during and after an earthquake”. This section goes on to state that due to the complexity of seismic design, the criteria presented are the minimum considered to be “prudent and economically justified” for the protection of life safety. The code also states that absolute safety and prevention of damage, even in an earthquake event with a reasonable probability of occurrence, cannot be achieved economically for most buildings.

Section 1612.2.5 sets up seismic hazard exposure groups and assigns all buildings to one of these groups according to a Table 1612.2.5. Group II includes buildings which have a substantial public hazard due to occupancy or use and Group III are those buildings having essential facilities which are required for post-earthquake recovery, including fire, rescue and police stations, emergency rooms, power-generating facilities, and communications facilities.

Existing Multi-Hazard Mitigation Measures

There are several mitigation measures that impact more than one hazard. These include the Comprehensive Emergency Management Plan (CEMP), the Massachusetts State Building Code and participation in a local Emergency Planning Committee.

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.

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.

Participation in the Local Emergency Management Planning Committee (LEPC) Wayland has its own Local Emergency Management Planning Committee (LEPC).

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Table 16. Existing Mitigation Measures				
Type of Existing Protection	Description	Area Covered	Effectiveness /Enforcement	Improvements/ Changes Needed
MITIGATION MEASURES RELATING TO MULTIPLE HAZARDS				
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.	Town-wide.	Emphasis is on emergency response.	None.
Massachusetts State Building Code	The Massachusetts State Building Code contains many detailed regulations regarding wind loads, earthquake resistant design, flood-proofing and snow loads.	Town-wide.	Most effective for new construction.	None.
Local Emergency Planning Committee (LEPC)	The Wayland LEPC serves the community	Local	Provides local cooperation on issues related to natural and man-made disaster.	None.
FLOOD RELATED HAZARDS				
National Flood Insurance Program (NFIP)	The town participates in the NFIP and has adopted the effective FIRM maps. The town actively enforces the floodplain regulations.	Areas identified on the FIRM maps.	There are 39 policies in force.	Encourage all eligible homeowners to obtain insurance.
Catch basin cleaning	All 2,500 catch basins are cleaned out once a year.	Town-wide.	Effective.	None.
Street sweeping	Every street is swept each spring and fall and as necessary (storms, local projects, grass & brush cutting – as necessary). Street sweeping is done by the town.	Town-wide.	Effective.	None.

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Table 16. Existing Mitigation Measures				
Type of Existing Protection	Description	Area Covered	Effectiveness /Enforcement	Improvements/ Changes Needed
Roadway treatments	Over the past 2-3 years the town has elected to use sand only where necessary. Salt and liquid calcium is used instead on the roads to prevent clogging and stream sedimentation.	Town roads.		None.
WINTER-RELATED HAZARDS				
There are no specific measures beyond regular salting and sanding of the roads and local plowing.				
Dam Failures				
State permits required for dam construction	State law requires a permit for the construction of any dam.	State-wide.	Effective for ensuring initial construction meets the code.	Improvements needed to the statewide system for dam inspections.
DCR dam safety regulations	The state has enacted dam safety regulations mandating inspections and emergency action plans.	State-wide.	Enforcement is an issue.	Staffing and budgeting needs to be addressed.
Comprehensive Emergency Management Plan (CEMP)	The CEMP covers dam issues.	Town-wide.	Emphasis is on emergency response.	None.

WAYLAND-HAZARD MITIGATION PLAN

Table 16.
Existing Mitigation Measures

Type of Existing Protection	Description	Area Covered	Effectiveness /Enforcement	Improvements/ Changes Needed
Tree trimming program	Wayland is a tree-friendly town and occasionally has damage from wind, storms and ice. The town performs some tree trimming (“upbranching”) in winter months along town owned rights of way to keep the roads clear. If a cherry picker is needed, or if large trees need to be removed from town property, the town contracts the work. The town cuts shrubs and small growth along the road and street right of ways. Critical work is done as necessary. Non-critical town-wide work is spread out over several years. Stump removal is done by contractors. The town has a branch chipper but does not own a stump grinding machine. Power and utility lines are done by the various utilities. The town does not work near power lines.	Town wide.	Effective.	None.
BRUSH FIRE RELATED HAZARDS				
Permits required for outdoor burning.	The Fire Department requires a written permit for outdoor burning. The permit must be obtained from the Fire Dept.	Town-wide.	Effective.	None.
Brush Fires	The town has some limited firefighting equipment/capability to fight brush fires along the waterway, but not enough.	Along Waterway	May need improvement.	Additional equipment may be needed.
Subdivision Review	The Fire Department is involved in reviewing all subdivision plans.	Town-wide.	Effective.	None.

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Table 16. Existing Mitigation Measures				
Type of Existing Protection	Description	Area Covered	Effectiveness /Enforcement	Improvements/ Changes Needed
GEOLOGIC HAZARDS				
The Massachusetts State Building Code	The Town enforces the Massachusetts State Building Code.	Town-wide.	Effective for most situations.	None.
The Massachusetts State Building Code	The Town enforces the Massachusetts State Building Code.	Town-wide.	Effective for most situations except severe storms	None.
MULTI-HAZARD				
	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) Reverse 911 G) Citizen Emergency Response Team (CERT) H) El Paso Tenneco Energy company monitors its gas line	Town-Wide		

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Table 16. Existing Mitigation Measures				
Type of Existing Protection	Description	Area Covered	Effectiveness /Enforcement	Improvements/ Changes Needed
Zoning Bylaw	<p>Section X B establishes a Flood Plain District In the Flood Plain District, any use otherwise permitted by this by-law shall be permitted except that (i) no filling, excavating or transferring of any material which will reduce the natural flood-water storage capacity or interfere with the natural flow or recession of any flood-water shall be done in the Flood Plain District and (ii) no structure shall be erected or placed in the Flood Plain District unless a special permit for such action or structure has been issued by the Board of Appeals created under Section X after a hearing with due notice given.</p>	Town-wide.		
Subdivision Rules and Regulations	<p>Section F. FLOOD HAZARDS, requires that the Planning Board will review all proposed subdivisions within a flood hazard area as designated on the FIA Flood Hazard Boundary (or Rate) Maps or to some map that may be adopted by the Town at some future date, as part of the zoning bylaw, to determine if such subdivisions provide adequate drainage so as to minimize flood damage within the subdivision by requiring that all public utilities and facilities, such as sewer, gas, electrical, and water systems to be located, elevated and constructed so as to minimize or eliminate flood damage.</p> <ul style="list-style-type: none"> • Section 8 sets forth review requirements for definitive plans. • Section 7.2 stipulates that water courses, 	Town-wide or areas shown on the zoning and FIRM maps as floodplain.	Effective.	None.

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	ponds, flood plains, marshes, swamps, and seasonal wet areas may be included as part of a lot, but may not be altered, filled, drained, relocated, used as a building site, used for waste-disposal, or used for ways except as allowed under applicable laws and regulations administered by the Board of Health, Conservation Commission, and Board of Zoning Appeals.			
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VI. HAZARD MITIGATION GOALS AND OBJECTIVES

At a meeting of the Wayland Local Multiple Hazard Community Planning Team on March 12, 2007, Wayland's representatives considered options for the development of multi-hazard mitigation goals for the Town: The team reviewed a proposed draft set of goals prepared by MAPC and decided to make modifications, additions, or deletions as necessary to reflect the needs of the Town of Wayland. At a meeting on May 2, 2008, the Wayland Community Planning Team modified the set of goals developed by the MAPC, and, in post-meeting activities, added several goals of their own. The composite goals are as follows:

1. Prevent and reduce loss of life, injury, public health impacts, and property damage resulting from all major natural hazards.
2. Prevent and reduce damage to public infrastructure resulting from all natural hazards by periodically inspecting them for weaknesses, hardening them or otherwise correcting deficiencies, and funding replacements or upgrades when they near the end of their life or technological usefulness.
3. Maintain functionality of infrastructure by establishing duplicative infrastructure and contingency plans, mitigating vulnerability, and restoring operations as quickly as practical.
4. Mitigate disruption and interruption of public and private life; business and commerce; education; and medical, communications, and government services by restoring utilities and services and reopening infrastructures on a priority basis following a natural hazard event.
5. Integrate hazard mitigation and contingency planning as dynamic tools in the planning and budgeting cycles of all facilities management departments and for all other relevant municipal and school departments, committees, and boards, and by including such planning in any future revisions of the Town's Master Plan, Disaster Plans, or Zoning Bylaws.
6. Identify and seek federal, state, and regional funding for measures to mitigate or eliminate flood related costs, post-loss recovery activities, community interruption, personal injuries, and property losses.
7. Encourage the business community, major institutions, non-profits, and volunteer groups to work with the Town to develop, review, and implement the hazard mitigation plan.
8. Work with the surrounding communities and state, regional, and federal agencies to ensure regional cooperation and solutions for mitigating natural hazards affecting multiple communities, including floods, storms, and fires.
9. Ensure that future developments and major renovations meet or exceed federal, state, local, and industry standards for preventing and reducing the impacts of natural hazards,

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including, but not exclusively, earthquake codes, wind-resistant building codes, snow and ice roof-loading standards, isolation valves in gas and water systems, and the installation, maintenance, and testing of sprinkler systems.

10. Take maximum advantage of resources from FEMA and MEMA to educate and train Wayland's municipal employees, volunteers, contractors, developers, and the public about hazard prevention and mitigation.

VII. POTENTIAL MITIGATION MEASURES

What is hazard mitigation?

Hazard mitigation means to permanently reduce or alleviate the losses of life, injuries and property 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 (HGMP), the Pre-Disaster Mitigation program (PDM), and the Flood Mitigation Assistance (FMA) program. The three links below provide additional information on these programs.

<http://www.fema.gov/government/grant/hmgp/index.shtm>

<http://www.fema.gov/government/grant/pdm/index.shtm>

<http://www.fema.gov/government/grant/fma/index.shtm>

Identification of Potential Mitigation Measures

During the local hazard team meetings, officials in Wayland 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.

Decisions on priorities were based on conversations with the Local Committee. Priority setting was based on local knowledge of the hazard areas, cost information, and consideration of potential benefits.

MAPC staff attended the FEMA Benefit-Cost Analysis Training Course on October 31-November 1, 2005 and on November 15, 2007. Information from this training was shared with local officials. This was done in order to help the local team understand the role of a benefit/cost analysis in developing and evaluating potential mitigation projects. MAPC staff also informally advised the Local Team to consider STAPLEE evaluation criteria in setting priorities.

The listing of high, medium, and other potential mitigation measures is provided in the sections below and summarized in Table 17.

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A. High Priority Mitigation Measures

The following list is for All Hazards for the entire town. The objective is to ensure the severity of the impact of any major emergency in Wayland is minimized.

1. Catch Basins drainage upgrades along sections of Route 20 and 27.
2. Raise Pelham Island Road along Heard Pond to an elevation (above sea level) of no less than 122 to 124 feet. (The current road surface is about 116 feet in elevation at its low point, and past flood levels have been 120 ft. to 124 ft.).
3. Redesign and replace the Pelham Island Bridge over the Sudbury River so that the new structure does not function as a dam during flood events. The current arch bridge is overwhelmed by flood waters, holding the river back sufficiently to create a problem on the western end of the road before it does to the eastern end even though the road is lower in one section on the eastern end than at the western end of the road by about one foot.
4. Review procedures for flood water release on all upstream dams to see if there are any procedural and/or timing-of-release changes that would mitigate the extent of downstream flooding upon release of those waters from those dams.
5. Review existing dam projects along the Sudbury-Assabet-Concord River systems with the purpose of eliminating any that contribute to the backup of flood waters in the three-river system if the dams no longer have a useful function or if those benefits are outweighed by their contribution to flooding.
6. “Truck or duck” (alternative to #2 and #3) -- If recommendations 2, and 3 cannot be funded and implemented, purchase or make a stand-alone passenger compartment sufficient for twelve - twenty people that could be mounted on one of the Town’s waste recycling transfer trucks during flood events. The compartment would be outfitted with a canvas top, benches to seat passengers, a step ladder, tailgate, and interior lights. It would be used to transport persons on and off Pelham Island and would replace the need for such service from the already laden Mass. National Guard, which has provided this service in the past.
7. Dam inspection, repair, and maintenance: repair any town-owned dams and maintain as necessary (the state should request private dam owners to repair any non-government owned dams).
8. Develop a contingency plan for the Rice Road Dam – This is a town-owned earthen dam, built in the 1870’s. Formerly the pond was used as the town’s reservoir. It is located at the intersection of Rice and Woodridge Roads. A contingency plan is needed because a catastrophic failure, e.g., an earthquake, would release a large volume of water that could cause serious flooding at the Loker Elementary School and the adjacent neighborhood.
9. Review all infrastructure roofs (schools, senior housing, nursing homes, and other town-owned buildings and sheds), especially flat roofs, to determine if they are of sufficient design

WAYLAND HAZARD MITIGATION PLAN

strength to withstand 100-year snow and ice loadings, or if they are in need of maintenance or replacement. Attention should be paid to current code requirements and improved roof design concepts as well as potentially dangerous joint and truss design flaws that have been found in other communities across the nation in recent years.

10. Determine if the Town's key communications towers need to be reinforced or strengthened (e.g., by additional stay cables) to withstand hurricane force winds; and, if so, procure engineering and design services, and obtain funding for implementation/rectification.
11. Review the structural integrity of the Town's two water tanks to determine if there are any weak areas that may need maintenance or reconstruction, and to determine what would happen if either or both of the tanks cracked or broke during an earthquake. Consideration should be given to the immediate effect on people and structures downhill of the tanks if they break, and how the Town would deliver critical domestic and fire-fighting water throughout the Town if there is a loss of one or both tanks. Develop contingency plans for such an event. Fund solutions if weaknesses are found in either tank system.
12. Off site storage capability and remote access of critical data necessary for the continuity of critical operations of the Town of Wayland.
13. Town Vault – install fire suppression system. Provide clean agent fire suppression system for Town vault (approximately 750 ft² x 10 ft)
14. Obtain two Mobile Containers for Storage of CERT, Shelter, and Animal Shelter supplies. These containers would ensure they could be moved at a moment's notice and be available to our regional EPC partners.
15. Obtain pick-up truck for LEPC and CERT to move barriers, cots, supplies, and critical emergency response equipment during drills and emergencies.
16. Improve the Town's communication capabilities by including cellular and regional capabilities as soon as the technology becomes available. Expand on the number of portable two-way radios that can be made available for emergency personnel and volunteers who might be drafted into action by a severe or catastrophic event, such as a hurricane or blizzard. Wayland has a CERT team, but suffers from the lack of good communications capability.
17. Work with Comcast and Verizon, the Town's two broadband/FIOS providers, to promote emergency alerts on their broadcast channels, including any pre-recorded audio/video messages that can be initiated from the EOC or the police/fire dispatch center. Ensure that all Wayland residents are informed, even if they are served by Natick TV stations.

Note: Some of these measures (especially 2 and 3), if feasible, would mitigate flooding in several communities. They would mitigate flooding in Wayland in all areas designated in the hazard maps, namely Pelham Island Road, Stonebridge Road, River Road, Routes 20 and 27, and the center of Town with positive impacts on Wayland's Safety Building (EOC, police, fire, and ambulance) and Wayland Town Hall.

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B. Medium Priority Mitigation Measures

1. Determine if the construction of levees on existing high ground (a) between the Sudbury River and Heard Pond and (b) between Pelham Island Road and Hop Brook would eliminate the flooding of Pelham Island Road, and, if so, what amount of flood storage capacity would have to be replaced and where (perhaps at the adjacent Heard Farm which is conservation area).
2. Dredge the main channel of the Sudbury River and remove any vegetation, trees, logs, accumulated sand and silt, and flood-borne debris from the Sudbury River and its tributaries to recreate lost flood water storage capacity, improve river flow, and reduce flooding. This should also improve the general ecology and the river during the dry season.
3. ‘Storm drains: Determine if the existing storm drainage system works properly during floods and is of appropriate design to maintain the environmental integrity (namely oil runoff) of the Sudbury River and the Town’s watersheds and domestic water aquifers.
4. Work with the MWRA to determine if their tunnels, which carry water from several reservoirs into the Boston area, are vulnerable to earthquakes; and, if so, what damage a breach or collapse would cause in the Town, the region, and the MWRA service area.
5. Work with Tenneco Corp. to determine whether their gas line presents any threat to the town in the event of an earthquake that might damage the line. Assess whether there is anything that the Town should do in the event there is pipeline damage, to prevent property losses, bodily injuries, business and traffic interruption, and general disruption. Possible actions might include contingency plans, regional coordination, shut-off equipment, special fire-fighting expertise and equipment, notifications, and first responder training.
6. Review all building and zoning codes for potential changes to accommodate hazard mitigation measures within the codes. Consider refusal, by code, of any further building or development in 100-year flood zones even though the specific property may not be subject to flooding but access would be. Acquire legal assistance to determine feasibility of code changes and the affect on property values. This will not be necessary if other mitigation steps are taken to eliminate the risks of road closures and neighborhood isolation.
7. Continue to work with regional authorities and communities to coordinate hazard mitigation for the region as most of the communities around Wayland have the same problems and hazard risks.

C. Measures to Ensure Compliance with NFIP

1. Continuation of Open Space Protection and Land Acquisition

Although Wayland 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 town plans.

WAYLAND HAZARD MITIGATION PLAN

2. 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.

D. Low Priority Mitigation Measures

1. Obtain funding for the periodic training of “assistant” CERT volunteers whose only responsibility would be general shelter assistance, such as cooking and cleaning, moving light weight items (supplies, cots, etc.), and helping with registration and other administrative matters.
2. Assess options for fire water service if there is an earthquake. 95% of the town is served by fire hydrants. If the water system goes down, such as a result of a major earthquake, it would be difficult to find water for fire fighting. There are some fire ponds, but not likely enough if a major earthquake hit. An assessment of options for water service in the event of an earthquake should be completed.
3. Assess the stability of the Town’s landfill hill to determine whether heavy rains over several days might cause a mudslide and whether an earthquake could cause a landslide. Trash and low-level toxics might run-off into the Sudbury River or wetlands. Determine whether there is a potential risk from brush fires during a drought once the landfill is closed and vegetation is allowed to grow atop the large, waste-filled hill.
4. Community Outreach – Annual funding of information preparation and dissemination to community
5. High tension lines – Provide Wayland LEPC with an assessment of potential for loss of high tension lines and pylons due to high winds, ice, and earthquakes.
6. Review and determine the need for an emergency generator at the Claypit Hill School. Obtain funding if the finding is positive. This school is the Town’s secondary emergency shelter.
7. Shell Fuel Pipeline – Determine if pipeline is empty or purged; determine if the pipeline is vulnerable to rupturing during an earthquake; and develop a contingency plans in the event there is a gasoline or fuel oil release, including plans to notify other towns in the proximity of a rupture.

WAYLAND HAZARD MITIGATION PLAN

Introduction to Potential Mitigation Measures (Table 17)

Description of the Mitigation Measure – The description of each mitigation measure is brief, and cost information is given only if cost data were already available from the community. The cost data 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.

Priority – The designation of high, medium or low priority was done at the meeting of the Local Multiple Hazard Community Planning Team meeting. In determining project priorities, the local team considered potential benefits and project costs. The designations reflect discussion and a general consensus developed at the meeting but could change as conditions in the community change.

Implementation Responsibility – The designation of implementation responsibility was done by MAPC based on a general knowledge of what each municipal department is responsible for. It is likely that most mitigation measures will require that several departments work together. Assigning staff is the sole responsibility of the governing body of each community.

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. Because the time frame for this plan is five years, the timing for all mitigation measures has been kept within this framework. The identification of a likely time frame is not meant to constrain a community from taking advantage of funding opportunities as they arise.

Potential Funding Sources – This column attempts to identify the most likely sources of funding for a specific measure. The information on potential funding sources in this table is preliminary and varies depending on a number of factors. These factors include whether or not a mitigation measure has been studied, evaluated or designed or are still in the conceptual stages. MEMA and DCR assisted MAPC in reviewing the potential eligibility for hazard mitigation funding. 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.

Additional information on funding sources – The best way to determine eligibility for a particular funding source is to review the project with a staff person at 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 in a number of types of projects including shoreline/stream bank protection, flood damage reduction, flood plain management services and planning services.

WAYLAND HAZARD MITIGATION PLAN

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 firefighting needs. See the link below for some example. <http://www.rurdev.usda.gov/rd/newsroom/2002/cfg.html>

Abbreviations Used in Table 17

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)

USDA = United States Department of Agriculture

WAYLAND HAZARD MITIGATION PLAN

Table 17 Potential Mitigation Measures						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
High Priority (Continued)						
Flooding	Improve catch basins along sections of Routes 20 and 27.	H-1	Wayland DPW	0	N/A	Completed 2007
Flooding	Raise Pelham Island Rd. along Heard Pond to an elevation of no less than 122 to 124 feet above sea level.	H-2	Wayland DPW (Support from Selectmen)	3-5	2,500,000-5,000,000	FEMA
Flooding	Redesign &/or replace the Pelham Island Bridge – Alternative (1) Replace existing failed bridge with a new arch bridge that is already designed and bid. Alternative (2) Redesign bridge so that it does not function as a dam during flood events. <i>(The current arch bridge is overwhelmed by flood waters, holding the river back sufficiently to create a problem on the western end of the road.)</i>	H-3	Selectmen and Town Administrator Mass. Hwy/DPW/DEP/EP A/ACOE	1-5	\$2 million to \$5 million	Mass. DOT

WAYLAND HAZARD MITIGATION PLAN

Table 17
Potential Mitigation Measures

Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
High Priority (Continued)						
Flooding	Review procedures for flood water release at all upstream dams to see if there are any procedural and/or timing-of-release changes that would further mitigate the extent of downstream flooding upon release of those waters from those dams, especially from the Southborough reservoir.	H-4	MWRA/DEP	1	Staff time (for Wayland) (Minor expense overall. Should be MWRA or state project as it affects region)	MWRA
Flooding	Review existing dam projects along the Sudbury-Assabet-Concord River systems with the purpose of eliminating any that contribute to the backup of flood waters in the three-river system if the dams no longer have a useful function or if those benefits are outweighed by their contribution to flooding.	H-5	ACOE/State (MAPC for coordination)	3-5	Staff time for Wayland State review: estimated costs: under \$20,000 (Cost of removal of problematic dams, if any: unknown)	FEMA

WAYLAND HAZARD MITIGATION PLAN

Table 17 Potential Mitigation Measures						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
High Priority (Continued)						
Flooding	<p>Truck or Duck. This is an alternative to raising Pelham Island Rd. (See H-2 & H-3)</p> <p>(1) Purchase and outfit a stand-alone passenger compartment sufficient for 12-20 people that could be mounted on the town's waste recycling transfer truck during flood events. Outfit the compartment with a canvas top, passenger benches, a step ladder, tailgate, and interior lights. Use to transport persons on and off Pelham Island.</p> <p>(2) Buy an amphibious "duck" boat. Either vehicle would replace the need for transportation service from the already laden Mass. National Guard, which has provided this service in the past.</p>	H-6	Wayland DPW (Support from LEPC)	1	<p>Alternative (1) Passenger Compartment: \$15,000 to \$20,000</p> <p>Alternative (2) amphibious duck boat: cost unknown</p> <p>Order of magnitude: \$250,000</p>	<p>Alt. (1) Town</p> <p>Alt. (2) FEMA</p>

WAYLAND HAZARD MITIGATION PLAN

Table 17 Potential Mitigation Measures						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
High Priority (Continued)						
Flooding	Conduct inspections of dams within Wayland. Repair any town-owned dams and maintain as necessary. (State should request private owners to repair any non-government owned dams.)	H-7	Selectmen LEPC & Conservation Commission	1-3	(Unknown if any town-owned dam needs repair)	FEMA DCR
Flooding & Earthquake	Develop contingency plan for Rice Road dam – This is a town-owned earthen dam, built in the 1870's. Formerly the pond was used as the town's reservoir. It is located at the intersection of Rice and Woodridge roads. A contingency plan is needed because a catastrophic failure, e.g., an earthquake, would release a large volume of water that could cause flooding at the Loker Elementary School and the adjacent neighborhood.	H-8	Selectmen LEPC & Conservation Commission DCR	1-4	Staff time	DCR/FEMA

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Table 17 Potential Mitigation Measures						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
High Priority (Continued)						
Winter and Wind Storms	Snow & ice loading of roofs - Review key flat roofed buildings to determine if they have sufficient strength to sustain 100-year snow and ice loadings and high winds. (5 Schools, Safety Bldg., Town Hall, Library, Highway Garage, Senior Housing)	H-9	Public Buildings Director & School Committee	1-3	Staff time (In-house review) (Significant cost if modifications are necessary)	Town/FEMA (If modifications are needed)
Wind/Earthquakes	Communications tower - Obtain construction specifications, drawings, and related documents. Review & determine if the town's key communications tower/monopole needs to be reinforced or strengthened (e.g., by additional stay cables) to withstand hurricane force winds and earth movements.	H-10	LEPC (Request documents from cell tower owner)	0-1	None (Town Staff)	Town

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Table 17
Potential Mitigation Measures

Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
High Priority (Continued)						
Earthquake	Water tanks – Obtain engineering specifications. Review structural integrity of the town’s two water tanks to determine if there are any weak areas that may need maintenance, modification, or reconstruction. Determine the impact if either or both of the tanks crack or brake during an earthquake.	H-11	Board of Public Works	1-3	Staff time (In-house review) (Significant cost if modifications are necessary)	Town/FEMA (If modifications are needed)
All hazards	Implement off-site data storage capability with remote data access for critical operations continuity.	H-12	Town Administrator	1-3	Modest	Town
All hazards	Town Vault – install fire suppression system. Provide clean agent fire suppression system for Town vault. (Approximately 750 ft ² x 10 ft)	H-13	Public Buildings Director, Town Clerk & Chief - WFD	1-3	\$42,000 to \$52,000 (for an Ansul system)	Town

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Table 17 Potential Mitigation Measures						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
High Priority (Continued)						
All hazards	Obtain two mobile storage container pods. Stock with supplies. To provide CERT teams with storage space and supplies for emergency response and shelter operations. Stock with food, water, medical, & other supplies.	H-14	Emergency Management Director	As soon as funding is available	\$15,000 (for both containers) & \$5,000 (for supplies)	FEMA
All hazards	Obtain pick-up truck for LEPC & CERT to move barriers, cots, supplies, and critical emergency response equipment during drills and emergencies.	H-15	Emergency Management Director	0-1	\$21,000	FEMA
All hazards	Improve communication capabilities - Increase the number of portable two-way radios that can be made available for Wayland emergency responders.	H-16	LEPC	1-4	\$8,000-\$12,000	FEMA

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Table 17 Potential Mitigation Measures						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
High Priority (Continued)						
<i>All hazards</i>	Cable/FIOS TV channels – Provide emergency alerts on both of Waycam’s channels. Alerts would be either emergent, computer-generated messages or pre-recorded a/v messages. Access to the channels would be gained remotely from the EOC, police/fire dispatch center, or other approved location using secure codes for broadcast system entry.	H-17	Selectmen, LEPC and Waycam	0-1	\$25,000 to \$50,000	Town/FEMA
Medium Priority (M)						
Flooding	Construct Levees – This is an alternative to raising Pelham Island Rd. (See H-4) Determine if the construction of levees in a few low areas would eliminate the flooding of Pelham Island Road by overflows from the Sudbury River via Heard Pond and Landham Brook.	M-1	ACOE/DEP/EPA	3-5	TBD - Major (Actual cost estimates not available. Need survey to determine feasibility and extent of project.)	FEMA

WAYLAND HAZARD MITIGATION PLAN

Table 17 Potential Mitigation Measure						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
Medium Priority (Continued)						
Flooding	River system dredging - Dredge the main channel of the Sudbury River; remove vegetation, trees, logs, sand & silt, and flood-borne debris from the river & its tributaries to recreate lost flood water storage capacity, improve river flow, & reduce flooding. (River is mercury-contaminated from Nyanza.)	M-2	ACOE/DEP/EPA	3-10	TBD - Major (Actual cost estimates not available. Need survey to determine feasibility and extent of project.)	ACOE/EPA DCR
Flooding	Storm Drains - Determine if the existing storm drainage system works properly during floods and is of appropriate design to maintain the environmental integrity (e.g., oil runoff) of the Sudbury River and the town's watersheds and domestic water aquifers. (Temporary solution implemented near senior housing may not hold under very heavy rains or snow melt.)	M-3	Wayland DPW (Some concerns around Bent Rd/Snake Brook and on Pelham Island Rd. May not be feasible to change or add to systems due to terrain, relative water tables, and environmental issues.)	1-3	Staff time (There would be some cost if contracted.)	Town/FEMA

WAYLAND HAZARD MITIGATION PLAN

Table 17 Potential Mitigation Measure						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
Medium Priority (Continued)						
Earthquake	MWRA tunnels – Part A Obtain specifications for each tunnel. Determine if the MWRA tunnels, which channel water from several reservoirs into the metropolitan Boston area, are vulnerable to earthquakes, especially if a quake causes a downstream blockage and an upstream rupture. Obtain any test or computer simulation results. Determine what damage a breach or collapse would cause in Wayland. (State should do review for the region & the MWRA service area.)	M-4A	Selectmen and LEPC MWRA	1-3	Staff time for Wayland (If Wayland pursues a study of the specifications, the cost of reviewing the plans/specs. would be internal.) (There would be some cost if contracted.)	MWRA
Earthquake	MWRA tunnels – Part B Develop contingency plans in the event there is a water release, including notification to other towns in the proximity of the rupture.	M-4B	LEPC & MWRA	1-3	Staff time for Wayland (There would be some cost if contracted.)	Town/MWRA/FE MA

WAYLAND HAZARD MITIGATION PLAN

Table 17 Potential Mitigation Measure						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
Medium Priority (Continued)						
Earthquake	Tenneco Gas line – A Obtain specifications & results of any rupture test or computer simulation. Determine whether the pressurized gas line presents any rupture, fire, or explosion threat to the town if there is an earthquake at various seismic levels.	M-5A	Selectmen and LEPC FERC Tenneco	0-2	Staff time for Wayland	Tenneco & FERC, FEMA
Earthquake	Tenneco Gas line – B Develop contingency plans in the event there is a pressurized gas release, including plans to notify other towns in the proximity of a rupture.	M-5B	LEPC, Tenneco, FERC	0-3	Staff time for Wayland	Tenneco & FERC, FEMA
All hazards	Code improvements - Review all town zoning codes for potential changes to accommodate within the codes any identified hazard mitigation measures.	M-6	Planning and other town departments	1-4	Staff time for Wayland	Town

WAYLAND HAZARD MITIGATION PLAN

Table 17 Potential Mitigation Measure						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
Medium Priority (Continued)						
All Hazards	Continue regional coordination on hazard mitigation.	M-7	Selectmen, LEPC & Regional LEPC	Ongoing	Staff time	Town
Measures to Ensure Compliance with NFIP						
NFIP	Continuation of Open Space Protection and Land Acquisition	NFIP-1	Selectmen, Conservation Commission	0-4	TBD	EOEAA Grants & Town
NFIP	Regulatory Revisions for Stormwater Management	NFIP-2	Planning Board, DPW	0-2	Staff time	
Low Priority (L)						
All hazards	Training – Fund training of shelter volunteers. Purchase additional emergency kit & training supplies for CERT teams.	L-1	LEPC/CERT & Emergency Management Director	0-4 Biennial Expense	\$10,000 to \$15,000	FEMA/Town
Earthquake	Assess options for fire water service if there is an earthquake. Determine feasibility of regional hookups to Wayland water services.	L-2	Fire Chief	0-2	Staff time (for assessment only; cost: modest to major to implement)	Town

WAYLAND HAZARD MITIGATION PLAN

Table 17 Potential Mitigation Measure						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
Low Priority (Continued)						
Earthquake, mud flow, landslide, and brush fires	Landfill – Determine vulnerability to (a) landslides from earth movements and multi-day heavy rains, (b) drought enabled brush fires. Determine likelihood of toxic outflow to Sudbury River.	L-3	DPW, Emergency Management Director, & Fire Chief	0-4	Staff time (Minor if contracted.)	FEMA/Town
All hazards	Community Outreach – Annual funding of information preparation and dissemination to community	L-4	LEPC	Annual or Biennial Expense	\$4,000 to \$8,000	FEMA/Town
All hazards	High tension lines – Provide Wayland LEPC with an assessment of potential for loss of high tension lines and pylons due to high winds, ice, and earthquakes.	L-5	Selectmen and LEPC	0-4	Staff time for Wayland	NSTAR & National Grid

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Table 17 Potential Mitigation Measure						
Hazard Type	Mitigation Measure	Priority	Implementation Responsibility	Time Frame (Years)	Estimated Cost	Potential Funding Sources
Low Priority (Continued)						
All hazards	Generator - Claypit Hill School – Design, obtain, install, & test emergency generator & equipment at this secondary shelter.	L-6	Selectmen and LEPC	2-8	\$150,000 to \$175,000	FEMA
Earthquake	Shell Fuel Pipeline – A Determine if pipeline is empty or purged; determine if the pipeline is vulnerable to rupturing during an earthquake; and develop a contingency plans in the event there is a gasoline or fuel oil release, including plans to notify other towns in the proximity of a rupture.	L-7A	Selectmen and LEPC FERC Shell Oil	0-2	Zero for Wayland	Shell & FERC, FEMA

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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 issues that involve cooperation between two or more municipalities. There is a third level of mitigation which is regional; involving a state, regional or federal agency or an issue that involves three or more municipalities.

Regional Partners

In many communities, mitigating natural hazards, particularly flooding, is more than a local issue. The drainage systems that serve these communities are a complex system of storm drains, roadway drainage structures, pump stations and other facilities owned and operated by a wide array of agencies including but not limited to the Town of Wayland, the Department of Conservation and Recreation (DCR), the Massachusetts Water Resources Authority (MWRA), Massachusetts Highway Department (MHD) and the Massachusetts Bay Transportation Authority (MBTA). The planning, construction, operations and maintenance of these structures are integral to the flood 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 Wayland

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

- Great Meadows National Wildlife Refuge (US Fish and Wildlife)
- Tenneco Gas Line (El Paso Energy Company)
- Routes 27, 20, 30, I-90, and 126 (MassHighway)

Inter-Community Considerations

Regional Issues

Nyanza Superfund (CERCLA) in Ashland, MA

The Nyanza site is a 35-acre parcel in downtown Ashland, and is the location of the former Nyanza Chemical Company, which operated a dye manufacturing facility in Ashland from 1965 until 1978. Sludges containing large quantities of heavy metals (such as cadmium, chromium, lead, and mercury), aromatic amines (such as benzidine and 1-naphthylamine), and VOCs (such as 1,4-dichlorobenzene, trichloroethylene, and vinyl chloride) spilled and washed into the adjacent wetlands. In addition, approximately 45-75 metric tons of mercury (greater than 100,000 lbs) was released to the Sudbury River between 1940-1970.

WAYLAND HAZARD MITIGATION PLAN

In 1983, the United States Environmental Protection Agency (EPA) placed the Nyanza site on the National Priorities List because of local soil and groundwater contamination from improper waste disposal.

In 1986, the Massachusetts Department of Public Health issued a fish advisory for the Sudbury River in Ashland to its confluence with the Assabet River in Concord, MA. The fish advisory warns residents to not eat any fish from the Sudbury River between Ashland and Concord due to mercury contamination.

In 1992, the EPA concluded that there was no increase in risk determined for human health from incidental ingestion or direct contact with river sediments and surface water from swimming or wading, but there was more information needed to determine the risks posed by mercury within the river system. Since then, it has been determined that the majority of the mercury in the Sudbury River system is from the Nyanza Site, and that mercury can accumulate in sediments of lakes and rivers far from the source.

The estimated Mercury load increased six-fold as the Sudbury River passed the Nyanza site prior to 2001 wetland cleanup. Mercury is metabolized by bacteria in sediment, and converted to a more toxic, organic form called methyl mercury. Methyl mercury is very biologically active- it bioaccumulates (building up within an organism) and biomagnifies (increasing in concentration as it goes up the food chain). Methylation occurs much more in wetlands and other areas with frequent flooding/drying cycles.

After further studies, in June 2007, the EPA reported that the sediment chemistry, aquatic community, birds, and the mammal community have been affected by contamination as far as the Great Meadows Wildlife Refuge in Wayland and Sudbury. Sediments in the Sudbury River have high mercury levels, and nearby wetlands and fish in the Sudbury River are contaminated with mercury.

The Sudbury River is designated as a Class B Inland Water, as such it is designated as a habitat for aquatic and wildlife, recreational uses including wading and swimming as well as fishing, boating and shoreline activities. Portions of the Sudbury River, including the river as it passes through Wayland, are designated as Wild and Scenic. Wild and Scenic designation protects the rivers from “federally initiated, funded, or permitted actions that would harm the values for which the rivers were designated” (US Department of Interior Wild and Scenic Designation Qand A).

More than 120,000 people live in the affected communities along the Sudbury River. Of concern are the potential public health risk impacts on residents of the downstream communities extending to the confluence of the Sudbury, Concord and Assabet Rivers.

The Metropolitan Area Planning Council and the MetroWest Growth Management Committee has begun to develop a health risk assessment of the Sudbury River. Funded by a grant from the MetroWest Community Health Care Foundation, the project will take about a year and a half to complete. From a pre-disaster mitigation perspective, the group hopes to determine if there is

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additional risk to the environment and the public during periods of flooding when the river moves more quickly, and turbidity may stir contaminants in the sediment of the river bed and banks.

Beaver Dams

Another regional issue of significance is the widespread effects of beaver dams in the area. 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.

Inter-Community Considerations

A) Dam Conditions and Emergency Plans Upstream of the Town of Wayland

Dams in upstream communities are frequently of concern to downstream communities. In the case of Wayland, the dam along the Sudbury River upstream in Framingham have been the greatest concern. From an elevation of 146 feet above the Saxonville dam, the Sudbury River falls to 114 feet as it winds north. After the Saxonville dam, the gradient changes to barely a one inch drop per mile and the river broadens and meanders to the Great Meadows National Wildlife Refuge in Wayland and Sudbury through marsh meadows in Wayland, Sudbury, Lincoln, and Concord. These meadows usually flood annually in the spring. Periodically there are also summer and fall floods. These typically occur when more than 3" of rain falls along the Sudbury River drainage area during a short time period. Any damage to the dam in Saxonville (Framingham) is likely to have catastrophic consequences in Wayland. The Saxonville dam is slated for significant upgrades in the near future.

At present, Framingham officials are working on a federally mandated plan to clean the area near the Sudbury River at the approach to the Saxonville dam, which has become overgrown with vegetation. 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.

B) Coordinate and Review Developments on a Regional Basis

As Wayland 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. MWGMC developed a Regional Impact Review process over a decade ago, and the organization routinely holds committee meetings to discuss the potential regional impacts of a proposed development. The Danforth Farms Development in Framingham is a prime example of how one development has the potential to create impacts in Wayland. The Natick Mall expansion in Natick near the Wayland town line is another prime example of how development has the potential to create local regional impacts in Framingham, Wayland, Sudbury and Wellesley.

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IX. PLAN ADOPTION AND MAINTENANCE

Plan Adoption

The Wayland Hazard Mitigation Plan was adopted by the Board of Selectmen on [ADD DATE]. 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 Wayland Hazard Mitigation Planning Team to prepare this plan. MAPC recommends that this team continue to meet on an as-needed basis to function as the Hazard Mitigation Implementation Team, with one town department or official designated as the coordinator. Additional members could be added to the Hazard Mitigation Implementation Team from businesses, non-profits and institutions.

Implementation Schedule

Bi-Annual Survey on Progress– The coordinator of the 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 group 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 local hazard mitigation plan. The Hazard Mitigation Implementation Team will have primary responsibility for tracking progress and updating the plan.

Develop a Year Four Update – During the fourth year after initial plan adoption, the coordinator of the 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 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. At this point, the 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.

Prepare and Adopt an Updated Local Hazard Mitigation Plan – 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 Wayland Hazard Mitigation Plan will be forwarded to MEMA and DCR for review and to FEMA for approval.

Integration of the Plans with other Planning Initiatives

Upon approval of the Wayland Hazard Mitigation Plan by MEMA, the Hazard Mitigation Implementation Team will provide all interested parties and implementing departments with a

WAYLAND HAZARD MITIGATION PLAN

copy of the plan and will initiate a discussion regarding how the plan can be integrated into each department's ongoing work. At a minimum, the plan will be reviewed and discussed with:

- Engineering Department
- Highway Department
- Department of Public Works
- Parks and Recreation Department
- Planning and Community Development Department
- Conservation Commission
- Board of Health
- LEPC
- Police
- Fire
- Water Department

Other groups that local team may coordinate with include large institutions (hospitals, colleges), chambers of commerce, land conservation organizations and watershed groups. The plan will also be posted on the 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 (such as critical facilities). 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.

In addition, the plan will be reviewed with state agencies such as MEMA, DCR, and DOT and regional agencies such as the MWRA.

X. LIST OF REFERENCES

In addition to the specific reports listed below, much of the technical information for this plan came from meetings with town department heads and staff.

- Federal Emergency Management Agency, Flood Insurance Rate Maps for Wayland, MA
MA Executive Office of Environmental Affairs, Buildout Analysis for Wayland, MA 2000
Commonwealth of Massachusetts. *McConnell Land Use Statistics*. 1999.
Commonwealth of Massachusetts. *State Hazard Mitigation Plan*. October 2004. Prepared by the Massachusetts Emergency Management Agency and the Massachusetts Department of Conservation and Recreation.
Metropolitan Area Planning Council, Geographic Information Systems Lab
Metropolitan Area Planning Council, Regional Plans and Data
State Hazmat plan
US Census Data, 2000
MAPC Buildout Analysis for the town of Wayland
FEMA flood maps
FEMA How-to Guides
Wayland CEMP plan
Wayland Local Emergency Planning Committee
Wayland Town Master Plan, 2004
Wayland Zoning Bylaw
- Zoning Map
- Wayland Subdivision Regulations
Wayland Local Emergency Plan
Pelham Island Road Flood Mitigation Study
Wayland Site Plan Review and Regulations
Wayland Wetland Bylaw
- Wetlands Regulations, 2004
- SuAsCo Watershed Action Plan, 2005*

WAYLAND HAZARD MITIGATION PLAN

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APPENDIX A HAZARD MAPPING

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

Map 1: 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 Appendix III and in more detail at http://www.fema.gov/fhm/fq_term.shtm. The flood zone map for each community also shows repetitive loss sites, critical infrastructure and municipally owned and protected open space. As defined by the Community Rating System (CRS) of the National Flood Insurance Program (NFIP), a repetitive loss property is any property, 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>.

WAYLAND HAZARD MITIGATION PLAN

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>.

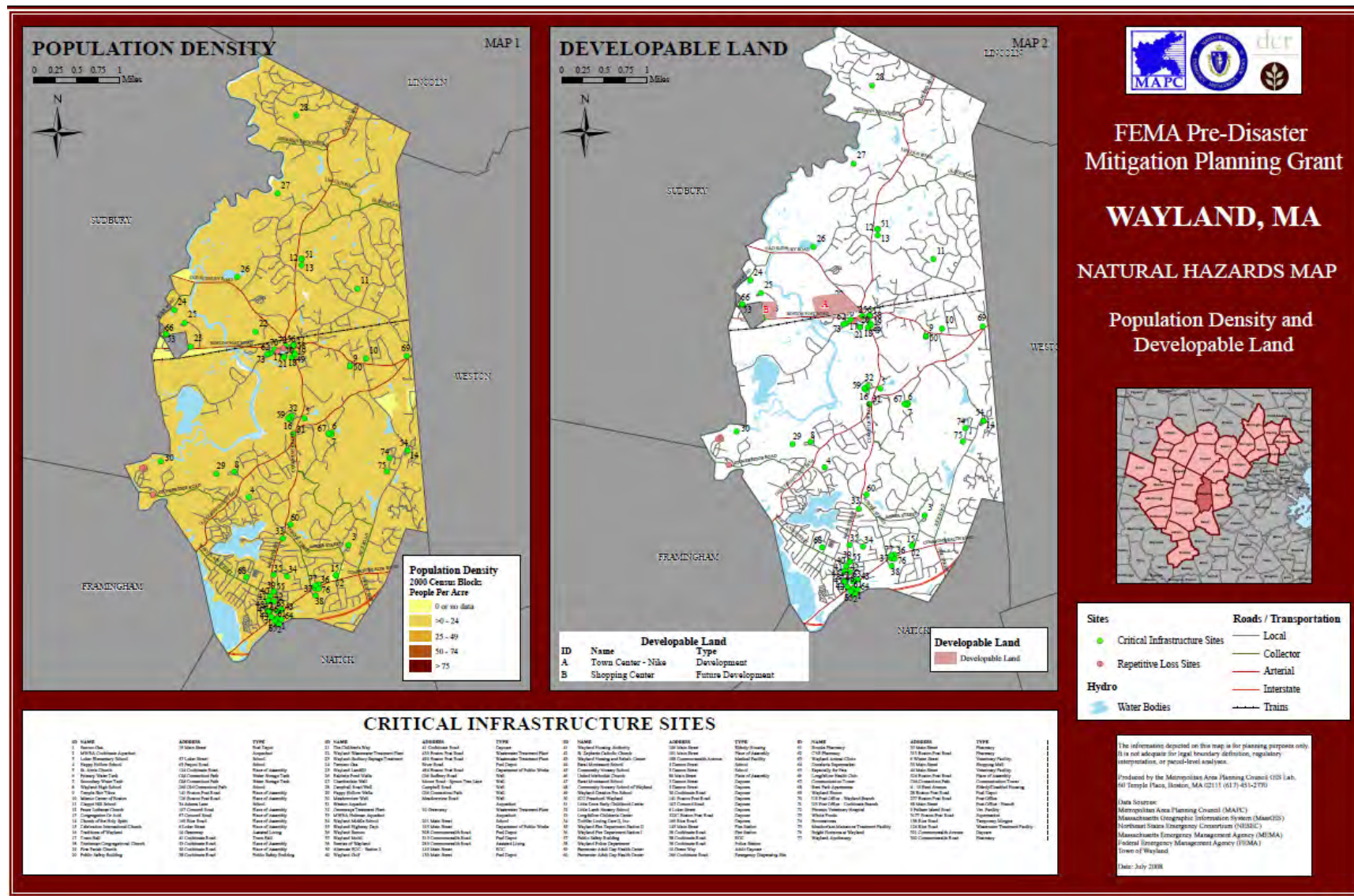
Map 5: Hurricanes and Tornadoes – This map shows a number of different items. The map includes the storm tracks for both hurricanes and tropical storms. This information must be viewed in context. A storm track only shows where the eye of the storm passed through. In most cases, the effects of the wind 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, repetitive loss structures and open space. It also shows storm tracks for nor'easters, if any storms tracked through the community.

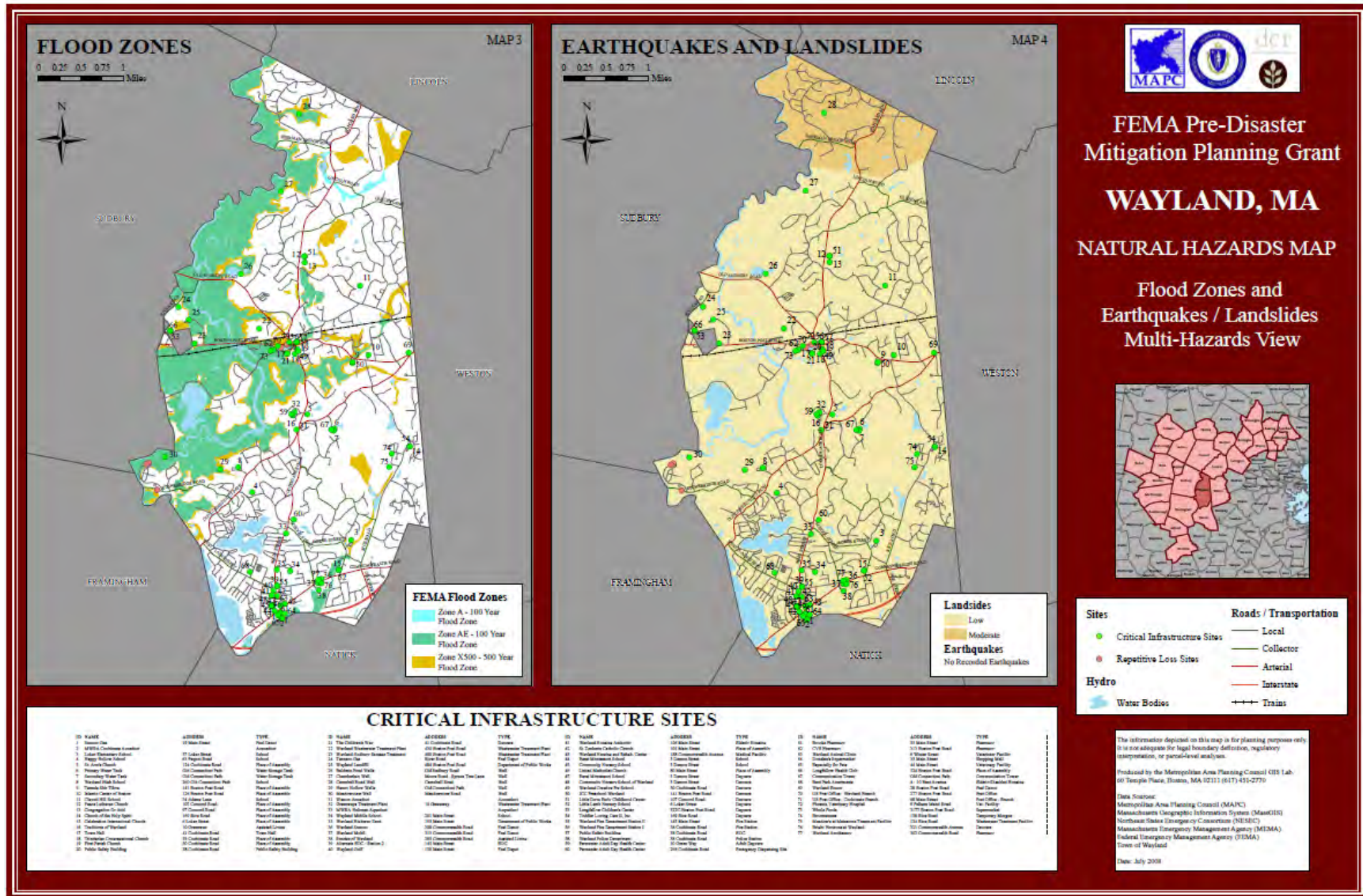
Map 7: Composite Natural Hazards - This map shows four categories of composite natural hazards for areas of existing development. The hazards included in this map are 100 year wind speeds of 110 mph or higher, low and moderate landslide risk, FEMA Q3 flood zones (100 year and 500 year) and hurricane 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, 2001. The critical infrastructure sites and repetitive loss sites are also shown. The source of the aerial photograph is Mass GIS.

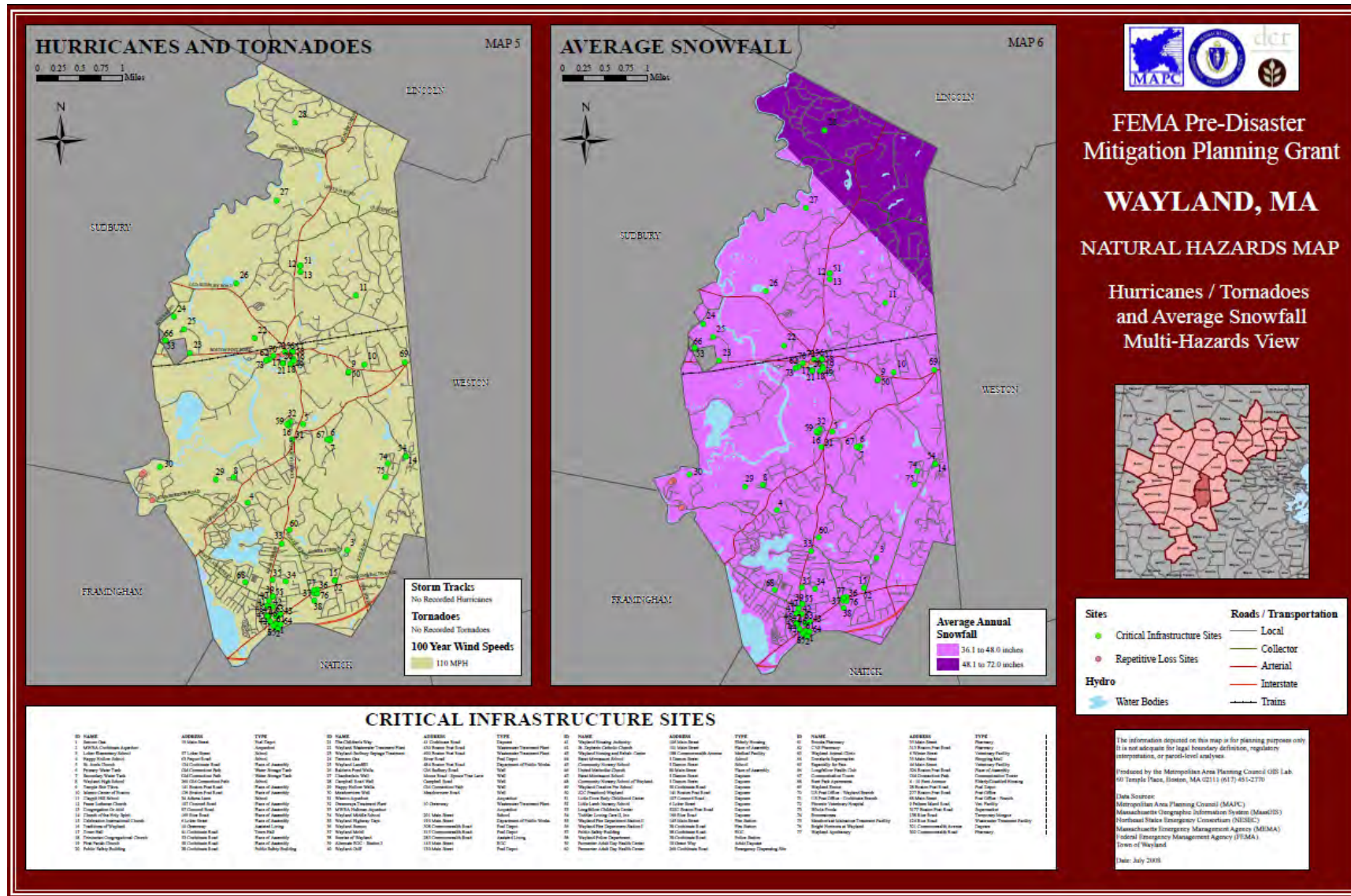
WAYLAND-HAZARD MITIGATION PLAN



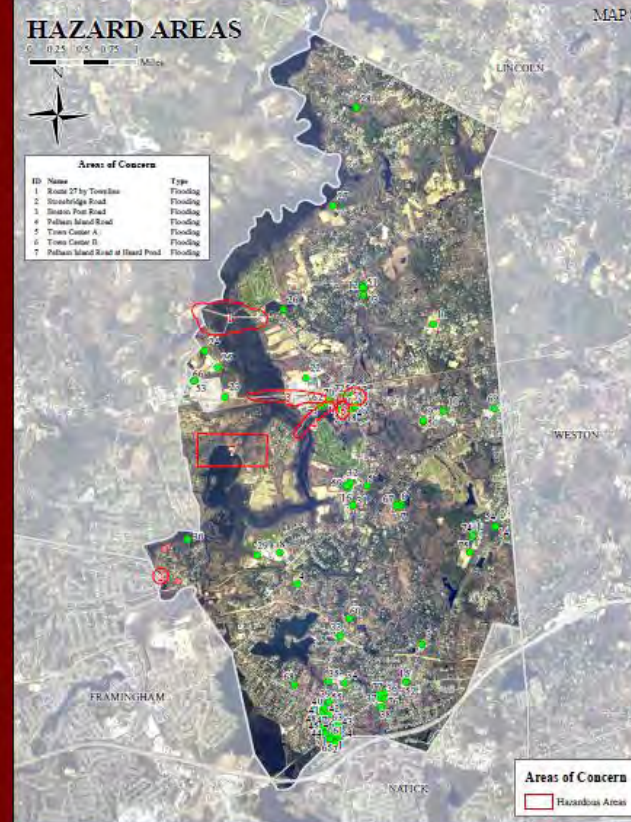
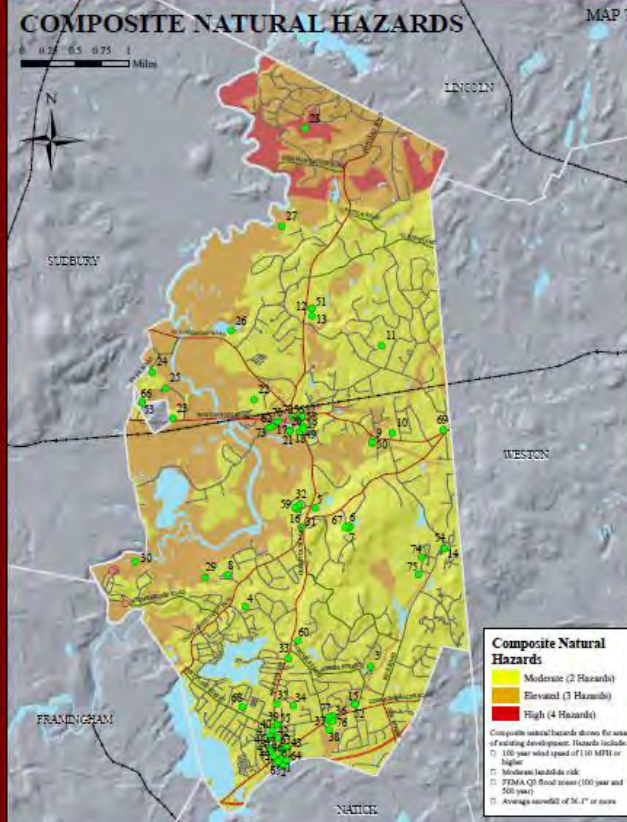
WAYLAND HAZARD MITIGATION PLAN



WAYLAND HAZARD MITIGATION PLAN



WAYLAND HAZARD MITIGATION PLAN



CRITICAL INFRASTRUCTURE SITES

[illegible]

FEMA Pre-Disaster Mitigation Planning Grant

WAYLAND, MA

NATURAL HAZARDS MAP

Composite Natural Hazards and Hazard Areas



Sites

- Critical Infrastructure Sites
- Repetitive Loss Sites

Hydro

- Water Bodies

Roads / Transportation

- Local
- Collector
- Arterial
- Interstate
- Trains

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis.

Produced by the Metropolitan Area Planning Council GIS Lab.
 60 Temple Place, Boston, MA 02111 (617) 451-2770

Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Northeast States Emergency Consortium (NESC)
Massachusetts Emergency Management Agency (MEMA)
Federal Emergency Management Agency (FEMA)
Towns of Wayland

Date: July 2008

APPENDIX B:

MEETING AGENDAS FOR:

**METRO BOSTON NORTH/WEST REGIONAL HAZARD MITIGATION
COMMUNITY PLANNING TEAM**

AND

LOCAL MULTIPLE HAZARD COMMUNITY PLANNING TEAM



Cristine McCombs
Director



Stephen H.
Burrington
COMMISSIONER



Marc D. Draisen
Executive Director

**METRO
NORTH/WEST
PRE-DISASTER
MITIGATION PLAN**

MetroWest

Ashland
Framingham
Holliston
Natick
Southborough
Wayland
Weston

MAGIC

Acton
Bedford
Bolton
Boxborough
Carlisle
Concord
Hudson
Lexington
Lincoln
Littleton
Maynard
Stow

NORTH SUBURBAN

Burlington
Natick
Reading
Stoneham
Wakefield
Wilmington
Woburn

The Commonwealth of Massachusetts

Mitt Romney, 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 ST, SUITE 600-900, BOSTON, MA 02114-2104 617-626-1250 FAX 617-626-351

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

MetroWest

Hazard Mitigation Community Planning Team

First Meeting

Tuesday, August 15, 10:00 AM
MetroWest Growth Management Committee
20 Main Street, Suite 205, Natick, MA

AGENDA

10:00 WELCOME & INTRODUCTIONS

10:15 OVERVIEW OF FEDERAL DISASTER MITIGATION ACT & PRE-DISASTER MITIGATION PLANNING

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

10:45 GETTING STARTED: THE METRO NORTH/WEST PRE-DISASTER MITIGATION PLAN - METROWEST SUBREGION

- *Review of Scope of Work & Schedule*
-- MAPC planning team: Sam Cleaves and Donna Jacobs
- *Questions & Discussion - Local Issues & Priorities*

11:15 PREVIEW OF MAPPING AND DATABASES FOR THE PLAN

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

11:35 NEXT STEPS / MEETING SCHEDULE



Ken McBride
Acting Director



Priscilla E.
Geigis
Acting
Commissioner



Marc D. Draisen
Executive Director

**METRO
NORTH/WEST
PRE-DISASTER
MITIGATION PLAN**

MetroWest

Ashland
Framingham
Holliston
Natick
Southborough
Wayland
Weston

MAGIC

Acton
Bedford
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Carlisle
Concord
Hudson
Lexington
Lincoln
Littleton
Maynard
Stow

NORTH SUBURBAN

Burlington
Natick
Reading
Stoneham
Wakefield
Wilmington
Woburn

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 ST, 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

MetroWest

Hazard Mitigation Community Planning Team

Second Regional Meeting

March 15, 10:00 AM

Morse Institute Library, Community Room
14 East Central Street, Natick

10:00 WELCOME, INTRODUCTIONS & OVERVIEW OF AGENDA

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

- *Allan Bishop, GIS Manager, will present the draft regional hazard map and a sample community map,*
- *Draft local hazard maps will be distributed on CD ROM to all towns*
- *Update on Critical Facilities data base and process for local review and QA/QC of draft hazard maps and data*

11:00 UPDATE ON LOCAL PLANS

- *Donna Jacobs and Sam Cleaves will discuss local and regional issues emerging in the planning process*
- *Review next steps in mapping localized hazard areas*
- *Martin Pillsbury will review plan approval requirements*

11:20 QUESTIONS AND DISCUSSION WITH TEAM MEMBERS

11:30 NEXT STEPS / MEETING SCHEDULE / ADJOURN



Don Boyce
Director



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

Richard Sullivan
COMMISSIONER



Marc D. Draisen
Executive Director

MetroWest

Hazard Mitigation Community Planning Team Thursday, November 15, 10:00 AM

Natick Town Hall
Selectmen's Room, 2nd Floor
13 East Central Street, Natick

MetroWest

Ashland
Framingham
Holliston
Natick
Southborough
Wayland
Weston

MAGIC

Acton
Bedford
Bolton
Boxborough
Carlisle
Concord
Hudson
Lexington
Lincoln
Littleton
Maynard
Stow

NORTH SUBURBAN

Burlington
Natick
Reading
Stoneham
Wakefield
Wilmington
Woburn

10:00 WELCOME, INTRODUCTIONS & OVERVIEW OF AGENDA

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

- *David dos Reis, GIS Analyst, will present the final draft of the hazard maps and Critical Facilities data base*
- *A copy of the final draft maps and Critical Facilities data base will be distributed to each town (printed maps and on CD-ROM)*

10:30 UPDATE ON LOCAL PLANS

- *Update on local PDM plans (Donna Jacobs & Sam Cleaves)*
- *Review of next steps for plan completion, review, and approval*

10:45 REGIONAL ISSUES IN THE PDM PLAN

- *Facilitated discussion to identify and prioritize key regional issues that should be included in the Regional PDM Plan for MetroWest*

11:15 QUESTIONS AND DISCUSSION WITH TEAM MEMBERS

11:30 NEXT STEPS / MEETING SCHEDULE / ADJOURN

WAYLAND HAZARD MITIGATION PLAN

The Wayland Multi-Hazard Mitigation Planning Team

March 29, 2007
Wayland Town Hall
9:30 -11:00 AM

1. Welcome and introductions
2. Review of grant scope of work and progress to date
3. Maps and critical infrastructure
4. Review aerial photograph showing natural hazard areas and future development
5. Develop goals and objectives
6. Discuss potential mitigation measures
7. Next steps

MetroWest Daily News

Hazard mitigation plan to help towns get grants

By **Claudia Torrens**/ Daily News Staff
Tuesday, August 1, 2006

Federal grant money will allow 28 communities across MetroWest to identify areas sensitive to flooding, wind damage, storms and fires, and create measures to prevent natural disasters in those spots.

Cities and towns will soon work on a Natural Hazards Mitigation Plan that will make them eligible to receive grants from the Federal Emergency Management Agency in the future. The plan will identify areas in each town that are in risk of damage from natural hazards, identify current prevention measures and study new ones.

"The goal is to see what disasters can be mitigated before they happen," said Mark Racicot, manager of government services for the Metropolitan Area Planning Council (MAPC).

FEMA has approved a \$206,868 grant for MAPC to develop the plan for nearly all the communities in MetroWest and surrounding towns. The project will be developed with the help of the MetroWest Growth Management Committee.

Some towns and cities participating in the plan are Ashland, Framingham, Holliston, Hudson, Marlborough, Natick, Southborough, Wayland, Weston, Sudbury and Maynard.

The motivation for the plan is the recent flooding in eastern Massachusetts, which has called attention to potential natural risks, staff at MAPC said. Racicot said part of the plan will include wind damage, areas where there have been problems with severe winter storms and forests that suffer the most from fires.

Towns and cities will also look for geological hazards like areas more at risk for earthquakes.

"We will map the hazards, examine the potential damage and look at what has already being done," Racicot said.

Donna Jacobs, executive director of MAPC, could not be reached for comment. Racicot said the MetroWest Growth Management Committee will provide \$21,300 in staff time to the project.

Each city or town will designate two officials to be part of the MetroWest Hazard Mitigation Community Planning Team. The team will meet six times over the next 18 months to complete the plan.

Natick Selectman Carol Gloff said the town is ready to jump on the initiative.

"It makes a lot of sense. I hope Natick participates along with other communities to make sure we know about the potential hazards we have," Gloff said.

(Claudia Torrens can be reached at 508-626-3976 or ctorrens@cnc.com.)

APPENDIX C:
DOCUMENTATION OF THE PUBLIC MEETING

WAYLAND HAZARD MITIGATION PLAN



TOWN OF WAYLAND

41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

AFR
6/9/08

FREDERIC E. TURKINGTON JR.
TOWN ADMINISTRATOR
TEL. (508) 358-7755
www.wayland.ma.us

Board of Selectmen Meeting Minutes May 19, 2008

BOARD OF SELECTMEN
STEVEN J. CORREIA
DOUGLAS J. LEARD
JOSEPH F. NOLAN
MICHAEL L. TICHNOR
WILLIAM D. WHITNEY

Attendance: S. Correia, D. Leard, J. Nolan, W. Whitney

Also Present: Town Administrator F. Turkington, Secretary M. DiNapoli

Chair W. Whitney called the meeting of the Board of Selectmen to order at 7:12 p.m. in the Selectmen's Meeting Room and reviewed the agenda for the viewing audience. F. Turkington noted that the Wayland Memorial Day parade will start on Monday, May 26, at 11:00 a.m. at the Middle School. He said the Board of Health will meet on May 20 to discuss the future of the landfill, and the Community Preservation Committee will be meeting on May 22 to review the request for \$80,000 to study the field use of the Paine Estate.

A2. Public Comment There was no public comment.

A3. Presentation on Wayland High School Field House Floor/Bleacher Replacement Project Doug Sacra of Maple Hill Architects, Barbara Fletcher, Chair of the School Committee, and Dr. Gary Burton, Superintendent of Schools, appeared before the Board to provide an overview of the plans for the Wayland High School Field House. D. Sacra said the main reasons for initiating the project were safety and a more flexible design. J. Nolan said his concerns were separation, acoustics, and funding. D. Sacra explained the flexibility of the system and how functions could be separated; he said the renovation did not include acoustics because there was not enough funding. G. Burton said it is really a floor replacement, and will make it possible to increase the usage of the facility. The Board questioned the use of a composite rubber flooring instead of a wood flooring for a basketball court. G. Burton said he concurred with his staff that the composite floor was acceptable. He said the state is not providing any reimbursement, but noted the project will help impress the MBSA that the town is willing to make improvements without state funding. W. Whitney asked about funding and liability issues. D. Sacra said private funding is going through the Wayland Public School Foundation to the contractor. The design team will be liable for structural issues, the contractor has the liability for the building, then the final product will be passed on to the school to be covered by standard insurance. D. Sacra said Public Buildings Director John Moynihan will monitor the construction. S. Correia asked about seating capacity; D. Sacra said it will go from the

WAYLAND HAZARD MITIGATION PLAN

current 800 seats to approximately 650. W. Whitney asked if the construction will trigger ADA compliance; D. Sacra it will not, as it is below the trigger limit, but the restrooms will be made handicapped accessible. J. Nolan said the Board encourages public/private partnerships.

A4. Presentation by MetroWest Growth Management Committee on Pre-Disaster Mitigation Plans Donna Jacobs of the MetroWest Growth Management Committee appeared before the Board to present and review pre-disaster mitigation plans. She discussed available grants, and asked the Board to list and prioritize its mitigation needs. She thanked the town staff for their cooperation in preparing the plan, and suggested that it be posted on the town website. S. Correia asked about the availability of funding if Wayland were to offer assistance to another town; D. Jacobs said she is working regionally to create cooperative agreements. She said the plan requires adoption by the Board of Selectmen, and a revised plan will be ready for review by the end of the month.

A5. Discussion with Board of Water Commissioners on Recent Billing Joel Goodmonson, Chair, Board of Water Commissioners, appeared before the Board to discuss recent billing issues. F. Turkington said the Board has received complaints that longer billing cycles have created inflated water bills, and asked how the Board of Water Commissioners is dealing with it. J. Goodmonson explained that the Water Department was underfunded in the spring of 2007, and invoices were sent early to maximize revenue. The next readings were late due to heavy snowfall, and main breaks in January 2008 caused further delays. In the meantime, the Board voted a rate change, along with a change in the amount of units of water per step and the number of steps. He said that if a resident has a bill that encompasses eight to nine months of service, there is a compelling reason to adjust the bill if the resident changed steps; however, if they did not change steps, it is to their advantage to accept the invoice as billed. Therefore, the Water Department is re-calculating invoices on an individual basis. S. Correia asked how many residents were affected. J. Goodmonson said approximately 25%, or 1,200 people, from North Wayland. He said about 150 bills have been adjusted. The Board discussed adding radio reads to the meters. J. Goodmonson said the cost is roughly \$110 per meter plus \$30,000 for readers, for a total of approximately \$500,000. He said the costs could be recovered through timely meter readings, improved cash flow, and fewer write-offs due to undetected leaks. The Board thanked him for taking the time to meet with them.

A7. Consent Calendar J. Nolan moved, seconded by S. Correia, to approve the Consent Calendar items 1 through 4 (Warrants S0824, SA051908, TA051908, T0847, and MT0846). YEA: S. Correia, D. Leard, J. Nolan, W. Whitney. NAY: none. ABSENT: M. Tichnor. Adopted 4-0. J. Nolan moved, seconded by D. Leard, to approve Consent Calendar item 5, the minutes of May 5, 2008. YEA: S. Correia, D. Leard, J. Nolan. NAY: none. ABSTAIN: W. Whitney. ABSENT: M. Tichnor. Adopted 3-0-1.

A8. Correspondence The Board reviewed the week's correspondence.

WAYLAND HAZARD MITIGATION PLAN

A9. Report of the Town Administrator F. Turkington said he met with Oxbow Associates and Town Counsel Mark Lanza last week, and the closing on the Nike site property is confirmed for June 16. He said he met with department heads today to review the remaining details, including fencing, restoring the parkland, the handicapped accessible trail, and coordinating issues between departments. He said bid specifications are now available for the Public Safety Building repairs to the exterior envelope. He presented a summary to the Board which compared the allocation of PEG capital funding between the Comcast license and the Verizon license agreements. The Board reviewed, edited, and approved a letter to the editor of the Town Crier regarding WayCAM spending. F. Turkington presented a summer meeting schedule for Board approval.

A10. Selectmen's Reports and Concerns J. Nolan said he missed the dedication of the Lokerville Green this past weekend due to illness in his family and offered his apologies. S. Correia asked for feedback from the Raytheon PIP meeting last week; Linda Segal said progress is being made, and the meeting was taped by WayCAM for re-broadcast.

J. Nolan moved, seconded by S. Correia, to adjourn the meeting at 8:38 p.m. YEA: S. Correia, D. Leard, J. Nolan, W. Whitney. NAY: none. ABSENT: M. Tichnor. Adopted 4-0.

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

[To be added when final plan is adopted by the town]

WAYLAND HAZARD MITIGATION PLAN

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