TOWN OF WEBSTER
MULTI-HAZARD MITIGATION PLAN

5-YEAR UPDATE

DRAFT – JANUARY 2025

Prepared for the Town of Webster by Tighe & Bond

Adopted DATE

Volume 1

TABLE OF CONTENTS

Contents

Appendices

TABLE OF CONTENTS

List of Figures

TABLE OF CONTENTS

List of Photos

List of Maps

TABLE OF CONTENTS

List of Tables

TABLE OF CONTENTS

ACKNOWLEDGEMENTS AND CREDITS

Acknowledgements and Credits

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EXECUTIVE SUMMARY

Executive Summary

Hazard Mitigation planning is a proactive effort to identify actions that can be taken to reduce the dangers to life and property from natural hazard events. In the communities of the central region of Massachusetts, hazard mitigation planning tends to focus most on severe winter weather and flooding, the most likely natural hazards to impact these communities. The Federal Disaster Mitigation Act of 2000 requires all municipalities that wish to be eligible to receive FEMA funding for hazard mitigation grants, to adopt a local multi-hazard mitigation plan and update this plan in five-year intervals.

The planning process included updating the plan to reflect the new Massachusetts State Hazard Mitigation Plan and incorporating a variety of natural hazard risk and vulnerability assessments into the plan including future impacts due to climate change. The Town of Webster recognized climate change as a factor that will affect weather patterns, flooding extent, habitat and species distribution, and ultimately impact the ability to recover from disaster and risk to the economy of Webster. The update incorporates information from the 2023 Commonwealth of Massachusetts (MA) State Hazard Mitigation and Climate Adaptation Plan and 2022 MA climate data assessment to address all natural hazard risk and vulnerability assessments including future impacts due to climate change.

Several notable changes to the 5-year update include:

- New goals and objectives for Webster Multi-Hazard Mitigation Planning
- Expansion of natural hazard risk to include climate change
- Expanded public participation through involvement of the MVP Core Team, Stakeholders and Community Resilience Building Workshops
- Clearly defined and systematically prioritized mitigation strategies
- Carryover of 7 mitigation actions from 2018 and addition of 23 new actions for the next 5-year planning cycle

A resiliency vision for Webster includes empowering the residents, neighboring communities and Town Leaders to make near, mid and long-term changes that will reduce future climate change impacts, protect its vital community assets, and adapt to changes already occurring. The mitigation actions included in the 2024 Hazard Mitigation Plan complement and support this resiliency vision.

INTRODUCTION

Section 1 Introduction

Planning Requirements under the Federal Disaster Mitigation Act

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The Federal Disaster Mitigation Act, passed in 2000, requires that after November 1, 2004, all municipalities that wish to continue to be eligible to receive Federal Emergency Management Agency (FEMA) funding for hazard mitigation grants must adopt a local Hazard Mitigation Plan (HMP) and update the plan every 5 years. This planning requirement does not affect disaster assistance funding.

The federal hazard mitigation planning and grant programs are administered in Massachusetts by the Massachusetts Emergency Management Agency (MEMA) in partnership with the Department of Conservation and Recreation (DCR).

The single jurisdiction local HMP is designed to meet the requirements of the Disaster Mitigation Act, following guidance provided in FEMA's Local Mitigation Planning Handbook (May 2023)[1] and FEMA's Local Mitigation Planning Policy Review Guide (April 19, 2023)[2]. Where text in the Hazard Mitigation Plan meets an element identified in the Review Guide, it is called out in a blue box in the margins.

What is Hazard Mitigation?

The purpose of hazard mitigation is to reduce loss from current and future natural hazards. Storms and other natural disasters such as floods, earthquakes, and hurricanes can cause loss of life, damage to buildings and infrastructure, and negatively affect a community's economic, social, and environmental well-being. Webster has developed the HMP as a means to permanently reduce or alleviate the losses of life, injuries, and damage to property resulting from natural hazards through adopting long-term strategies. These long-term strategies address not only municipal infrastructure but also societal, economic, and environmental assets of Webster through planning, policy changes, programs, projects, educational outreach, and other activities. The desired outcome of implementing the HMP will be creating a more resilient community that is better prepared prior to a natural disaster and can recover more quickly after one occurs.

[1] FEMA (2023), "Local Mitigation Planning Handbook", https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-handbook_052023.pdf

[2] FEMA (2023), "Local Mitigation Planning Policy Guide", https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-policy-guide_042022.pdf.

INTRODUCTION

1.1 COMMUNITY PROFILE

The Town of Webster is located in Worcester County, in the southern part of Massachusetts (**Figure 1.1**).

The Town of Webster was incorporated in 1832. The Town is located on I-395, 18 miles south of the City of Worcester and 56 miles southwest of Boston. The Town has a total size of 9,332 acres: 8,000 acres of land and 1,332 acres of water, mostly from Webster Lake, the Town's largest waterbody and most distinctive landscape feature. Webster is bordered by the towns of Dudley to the west, Oxford to the north, Douglas to the east, and Connecticut to the south. Webster lies within the French River Basin.

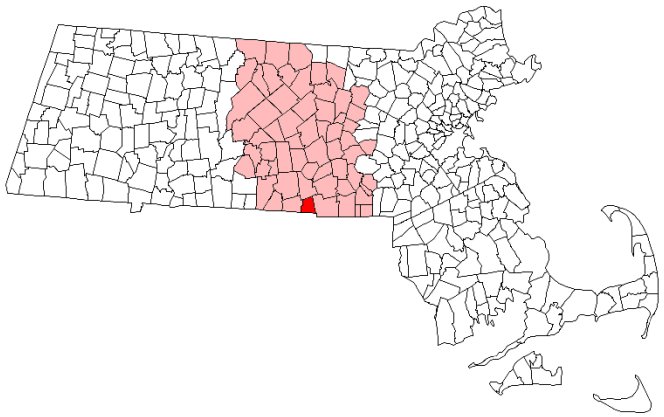

Figure 1.1: Map of Massachusetts towns with Worcester County highlighted in light red and Webster highlighted in dark red (source: Justin H. Petrosek).

Webster is part of the 40-town planning area covered by the Central Massachusetts Regional Planning Commission (CMRPC) and is considered part of CMRPC's Western Subregion, which also includes the towns of Oxford, Auburn, Dudley, Charlton, Southbridge, and Sturbridge. Webster's steep to moderately sloped terrain is consistent with that of the surrounding Worcester County area and contributes to the scenic hillsides found along either side of I-395 from Oxford to the Connecticut border.

The historic town center and hub of commercial activity is located along the banks of the French River, slightly west of (Webster Lake), which is located in the middle of Town. Webster's eastern half is much more rural and undeveloped. The Town's circulation system provides easy access to the region's major employment, shopping and service centers. Route 12 extends south into town before continuing in a westerly direction through the town center, essentially functioning as the Town's Main Street. Route 193 extends through the town in a southerly direction, closely paralleling the shoreline of Webster Lake. Route 16 extends in an easterly direction into neighboring Douglas. Taken together, Routes 12 and 16 form a segment of the Maine-to-Virginia Bike Route.

Interstate-395 (part of the interstate highway system) extends through Town in a north-to-south direction. Webster's three exits along I-395 generate two forms of traffic circulation: commute trips in and around Worcester and the lower portion of the County, and vehicles using the highway as a shortcut when local roads are heavily congested. I-395 provides an artificial delineation of Webster's land use pattern, for the area west of the highway is far more densely populated than the portion of the Town located east of the highway. This development pattern means that the Town's open space and recreational needs will vary greatly depending on which geographic half of Webster is considered.

INTRODUCTION

The community's most distinctive geographic feature is a beautiful glacial lake created thousands of years ago during the Ice Age. A significant Native American population inhabited the area, primarily the Nipmuc tribe. The lake's long and unusual name, Lake Chargoggagoggmanchaugagoggchaubunagungamaugg, which evolved during colonial times, roughly translates as "English knifemen and Nipmuc Indians at the neutral fishing place."[3]

Photo 1.1: Entering Webster Sign

As with other New England towns located on major rivers, Webster experienced heavy industrial development during the 1800s. This development was centered along the shoreline of the French River, which was used to supply power to the industries. As the Industrial Revolution slowed towards the end of the 1800s, the Town was left with a number of mill buildings and railroad transportation networks. Since then, many of the mill buildings have been adapted and reused for other industries. The town center has increased its presence as a commercial hub while adding population to become a mini-urban center. During the past century, much of Webster Lake's shoreline has been developed as seasonal cottages and high-end residences. The eastern part of town remains largely undeveloped and rural.

Prior to the late 1990's there has been relatively little attention given to environmental, conservation, and passive recreation issues in Webster. In the 1990's, the threat of a regional landfill in neighboring Douglas uphill from Webster Lake galvanized the community and the project was subsequently halted. Additionally, significant flooding of the downtown area occurred in 1938 and again in 1955, leading to the construction of flood control dams upstream of town on the French and Little Rivers.

Public schools in Webster include Park Avenue School (grades K-4), Webster Middle School (grades 5-8), and Barlett High School (grades 9-12).

[3] "Early History of Webster, Dudley, and Oxford," Paul J Macek and James R Morrison, copyright 2000, 2001.

1.2 WEBSTER DEMOGRAPHICS

The 2020 U.S. Census counted 17,776 residents in Webster, an increase of 1,009 persons from the 2010 Census count of 16,767 residents. With a total landmass that consists of 14.5 square miles, Webster has a population density of 1,314.2 residents per square mile. Figure 1.2 presents Webster's population growth from 1970 to 2020.

Webster is a demographically stable community, with population growth slowing. According to the Central Massachusetts Regional Planning Commission's (CMRPC) Long Range Transportation Plan, Mobility 2040, the Town of Webster is expected to experience lower population growth, compared to the region, over the next 25 years.

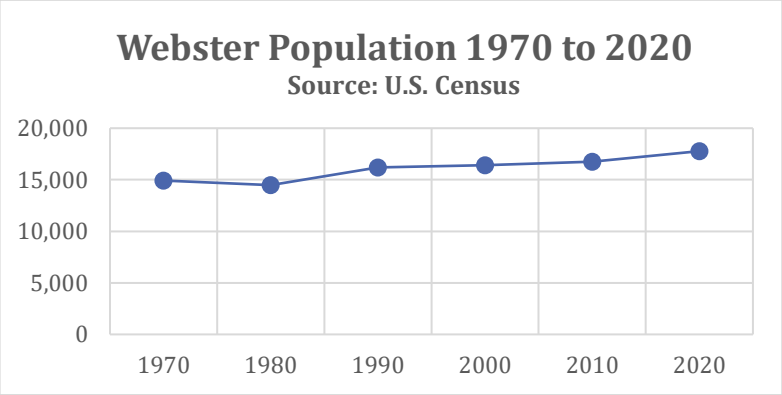

Figure1.2: Webster Population Growth 1970-2020

In 2020, there were 8,453 total housing units in Webster. The 2020 Decennial Census and 2022 American Community Survey indicates that Webster has 7,706 households with 2.87 persons per household. The median age in Webster is 40.6 years, with 17.2% of the population being 65 years of age or older. Approximately 14.3% of the population was below the poverty level.

Webster's population has very little ethnic or racial diversity, with 80% of the population self-identifying as white alone, 14% identifying as Hispanic or Latino, 4% Black or African American, and 2% Asian on the 2020 Decennial Census.

1.3 WEBSTER ECONOMY

The Town's early economy was influenced by Samuel Slater, known as the "the Father of American Manufacturers." After leaving England with an understanding of the highly protected English textile manufacturing process, Slater set up mills in the 1790s in Rhode Island, and in 1812, he established a mill in what would become East Webster. Slater was attracted to the area by the water power potential of the lake, and the Maanexit, or French River to power his mills, and the potential workers available on local farms. Late in the 19th century, Webster Lake's recreational resources were parlayed into significant economic activity. Webster Lake became one of the top summer destinations in all of Worcester County. The 20th century saw

continued expansion throughout the community in terms of population, town services, schools, churches, industry, recreation, and housing, but it also signaled the end of the Slater dominance, with the sale of their mill complexes in the 1920s and 1930s. In the middle of the 20th century, a reduction in the bustling Main Street activity and the disappearance of industry began.[4]

Currently, Webster is a mixed residential, commercial, and agricultural community, with MAPEFRE Insurance being the largest employer. Other large employers include Indian Ranch, a summer concert venue located on Webster Lake, and Goya Foods, which has its Massachusetts division in Webster. The Town has an employment rate of 60%, according to the 2022 American Community Survey. In 2023, Webster had 640 business establishments employing approximately 6,671 individuals.[5] Today, Webster is a diversified commercial center and industrial/residential Town. Education and health services and trade, transportation, and utilities are the primary economic pursuits, followed by professional and business services, leisure, and hospitality. Table 1.1 lists the major categories of income and employment from 2018 through 2022.

Table 1.1 Webster Income and Employment 2019-2022

Industry	2018	2019	2020	2021	2022
Construction	196	188	159	171	175
Manufacturing	378	405	380	416	348
Trade, Transportation, and Utilities	1,231	1,144	1,010	1,013	1,135
Information	31	30	20	25	29
Professional and Business Services	961	919	1,212	1,318	1,036
Education and Health Services	1,613	1,605	1,424	1,454	1,476
Leisure and Hospitality	689	640	418	564	584
Other Services	141	154	107	116	152
Total Employment	7,384	7,136	6,888	7,042	6,737
Number of Establishments	595	591	595	614	642
Average Weekly Wages	$943	$977	$1,109	$1,089	$1,118
Total Wages	$358,867,134	$371,277,205	$378,006,431	$389,621,034	$395,972,479
Source: Massachusetts Department of Labor and Workforce Development					

[4] Manzi, Carla; Manzi James J.; and Mrazik, John J. Images of America, Webster Arcadia Publishing 2005.
[5] Source: Massachusetts EOWLD, "ES-202 data," 2023

1.4 WEBSTER GROWTH AND DEVELOPMENT

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The Town has experienced modest growth over the past 5 years since the last HMP update. There have been 2 new duplex apartment building, nine new commercial building, 2 new commercial solar projects, 2 new Water Treatment Facilities, upgrades to the High School as well as stormwater, utilities and roadway improvements. Section 4 Asset Inventory and Table 4-1 provides more detail on the developments since the last plan.

WEBSTER'S NATURAL ENVIRONMENT

Webster is situated in the southern portion of the French River Valley. The landscape exhibits geo-morphological results that are typically associated with glaciated landscapes in central New England. The terrain is hilly with generally north to south oriented ridgelines that are interspersed with extensive wetland systems in areas of lower relief. Elevations range from a high of 905 feet above sea level at Woods Hill to a low of 480 feet above sea level at Webster Lake. Other significant hills in Webster include Sugarloaf Hill (767 feet) and Emerson Hill (688 feet). Most of the landscape ranges in elevation from 500 feet to 600 feet above sea level.

Photo 1.2: Webster offers recreational opportunities on Webster Lake.

Webster is located on the central plateau of Worcester County. The plateau is so thoroughly dissected that large areas of smooth plateau surface do not exist within the county – and certainly not within Webster. The surface of the plateau is interrupted in many places by hills rising higher than the general plateau elevation, which averages 800 to 900 feet in the southern portions of the county. These hills are predominately small in area and consist largely of elongated, rounded hills with the longer axes generally oriented north-to-south.

Photo 1.3: Webster Conservation Area scenic view

Some of Webster's hills are piles of unconsolidated clay, grave, and sand, called "drumlins" by geologists. These drumlins are the result of past glacial activity. The most recent glacier is estimated to have retreated some 12,000 to 15,000 years ago. As the glacier melted and retreated, it dumped along the receding face the load of boulders, stones and soils it gathered while moving southward. The material left by the glacier is called glacial "till" and, with drumlins, constitutes most of the land surface area of Worcester County. Many of the hills within the central plateau consist of rock hills with a thin layer of unconsolidated material covering them. Large areas of the Town are overlain with thick deposits of glacial till. Materials moved by glaciers and subsequently sorted and deposited by streams flowing from melting ice are called Glaciofluvials. Webster has several examples of these types of stratified drift deposits including eskers, kames, and kettle holes.

INTRODUCTION

Predominantly a small residential community, Webster's urban core developed along the French River during the 19th century when textile mills were a landscape fixture along riverbanks throughout New England. Industrial development created a host of environmental problems that the State and the Town (along with many community organizations and private citizens) have been slowly but steadily addressing. Upgrades to wastewater treatment plants have resulted in significant water quality improvements for the river. Nevertheless, there are still lingering concerns regarding the river's water quality and thus the river is not used to its full potential for public recreation.

The area east of Webster Lake includes most of the Town's forestlands, rolling hills, and ledge. The relatively undeveloped landscape includes Wood Hill, which abuts the Douglas State Forest. There are still portions of this area that are served by on-site wells and septic systems. This portion of Webster contains the majority of the Town's vacant developable land, and currently faces development pressure.

Water Resources

Watersheds:

The vast majority of Webster's land area falls within the French River Watershed (Figure 1.3), although 87 acres of the Blackston River Watershed extend into Webster at three locations along the Town's eastern boundary line, and a small portion (260 acres) of the Town's southeast corner falls within the Quinebaug River Watershed. The Town adopted a Lake Watershed Protection District that covers the eastern half of the Town, including the entirety of Webster Lake. The district prohibits several potentially hazardous land uses and requires the use of Best Management Practices for others.

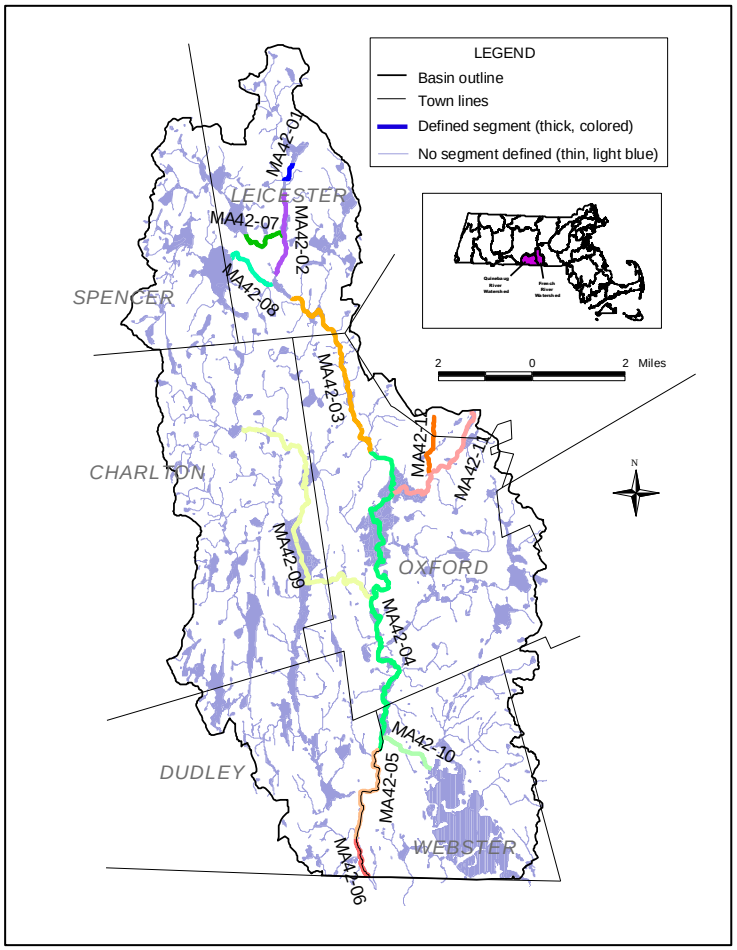

Figure 1.3: French River Basin Watershed Map

Surface Waters:

Webster Lake is 1,278 acres, has eight islands, some of which are inhabited, and has two marinas. It is a natural Lake but has a dam, Webster Lake Dam, which raises the water level by several feet. This dam requires regular attention to maintain the level of the lake. Besides Webster Lake, there are two other named water bodies: Club Pond, which is hydrologically connected to Webster Lake but is located on the north side of Route 16, and Nipmuck Pond (20 acres in size) located in the northeast corner

of Town just south of Sutton Road. There are a handful of small unnamed ponds scattered throughout Webster.

Photo 1.4 French River Greenway trail views

The French River is Webster's most significant watercourse, and the river forms the Town's western boundary line (approximately 3.5 miles in length). The river is the most prominent natural feature in the downtown area. Other significant watercourses in Town include Mill Brook (starts in the northwest corner and drains into the French River), Sucker Brook (starts in the north and drains into Webster Lake), Mine Brook (starts in the east and drains into Webster Lake), Brown's Brook (starts in the east and drains into Webster Lake), and Freeman's Brook (starts in the southwestern corner of Town and flows south before joining the French River in Connecticut). It should be noted that the Massachusetts River Protection Act establishes a 200-foot buffer zone on either side of all perennial watercourses, with the first 100-feet being a 'no build' zone while the second 100-feet allowing for limited development (10% of the affected land area). In Webster, a total of approximately 506 acres fall under the River Protection Act's jurisdiction (256 acres in the primary 100-foot 'no build' zone and 250 acres in the secondary 100-foot limited development area).

Floodplains:

Webster's floodplains are located near its major surface water resources, such as Webster Lake, Club Pond, the French River, Freeman's Brook, Mine Brook, Mill Brook and Sucker Brook. Webster has 1,572 acres of land falling within its 100-year flood zones, or 16.8% of the Town's total land area. Webster has adopted a Floodplain Protection Overlay District, which regulates development within the Town's flood hazard areas.

Wetlands:

The Wetlands Protection Act, administered locally by the Webster Conservation Commission, requires monitoring, preserving, and protecting all riverfront areas, fresh water wetlands, coastal wetlands, beach, dune, flats, marsh, meadow, swamp, creek, river, stream, pond, lake, and land under lakes. Webster contains extensive critical lands subject to this jurisdiction. Webster's wetlands include three major swamp areas: Sucker Brook Swamp in the north, Cedar Swamp in the southeast, and Cranberry Meadows Swamp in the southeast. As mapped by the DEP Wetlands Conservancy Program, Webster contains 544 acres of critical functioning wetland areas, or close to 6% of the Town's total land area.

Aquifers:

The United States Geological Survey (USGS) has identified seven stratified drift aquifers within Webster's boundaries: six bordering the shoreline of Webster Lake and one in the northwest corner of Town bordering the French River (see the Water Resource Map for exact locations). At 254 acres in size, the aquifer bordering

the French River is the largest aquifer in Town and the Water Department's Bigelow Road wellfield is located above. The Water Department's wellfields on Thompson Road and Memorial Beach Drive are located above a 67-acre stratified drift aquifer. The other aquifers abutting the Lake include an 84-acre aquifer in the vicinity of Sucker Brook, a 122-acre aquifer is located directly underneath Killdeer Island, a 26-acre aquifer in the vicinity of Wawela Park, a 25-acre aquifer in the vicinity of Winter Cove and an 82-acre aquifer located in the very southern end of Town, in the vicinity of Bates Grove and Colonial Park.

Vernal Pools:

Massachusetts Division of Fisheries & Wildlife's Natural Heritage Endangered Species Program (NHESP) serves the important state role of officially "certifying" vernal pools. Twenty-six vernal pools have been certified in Webster as of 2024. Vernal pools are unique wildlife habitats best known for the amphibians and invertebrate animals that use them to breed. Vernal pools are protected in Massachusetts under the Wetlands Protection Act regulations as well as several other federal and state regulations.

1.5 WEBSTER INFRASTRUCTURE

Transportation Systems

Webster's transportation network consists of approximately 85-miles of roadways, which provide easy access to the region's major employment, shopping and service centers. Route 12 extends south into town from Oxford until reaching the East Village where it then extends through Town in a southwesterly direction. Route 12 runs through the town center and serves as Webster's Main Street. Route 193 starts in the East Village and extends through the town in a southerly direction in close proximity to the shoreline of Webster Lake. Route 16 extends in an easterly direction into neighboring Douglas. Taken together, Routes 12 and 16 form a segment of the Maine-to-Virginia Bike Route.

Interstate-395 extends through town in a north-to-south direction before it enters Thompson Connecticut. Webster's three exits along I-395 generate two forms of traffic circulation: commute trips in and around Worcester and the lower portion of the County, and vehicles using the highway as a shortcut when local roads are heavily congested. I-395 provides an artificial delineation of Webster's land use pattern, for the area west of the highway is far more densely populated than the portion of the Town located east of the highway. In terms of public transportation, the Worcester Regional Transit Authority (WRTA) provides a bus service into downtown Webster five times a day during the weekdays.

Water and Wastewater

Webster's water supply system consists of three wellfields, over 600 hydrant locations, and approximately 62 miles of pipes (some of which are close to 100 years old). There are approximately 4,600 customers, including residences, businesses, industries and institutional uses (municipal buildings, schools, churches, etc.). All customers are metered, and the Division uses a new radio-read system for reading the meters on a monthly basis. The system makes use of three groundwater wellfields for its water supply sources: Bigelow Road Wellfield, Thompson Road Wellfield, and Memorial Beach Drive Wellfield. The wells are protected by Zone I and II wellhead protection areas.

All of Webster's wastewater is disposed of via on-site septic systems. The sewer treatment plant located on Hill Street along the French River was initially built in 1950, with substantial upgrades occurring in 1973, 1984 and 1990. The last major improvement to the system was begun in 2009 and was completed in 2011. The treatment plant accepts wastewater from almost the entirety of Webster, the central area of Dudley and the IPG industrial park area of Oxford.

1.6 FEDERAL/STATE DISASTER DECLARATIONS

Webster has experienced 18 natural hazard incidents that triggered federal or state disaster declarations since 1992, listed in **Table 1-2**. Most events involved high winds and winter storms.

Table 1-2
Federal and State Disaster Declarations 1992-2023

Disaster Name (Date of Event)	FEMA Disaster #	Type of Federal Assistance Provided	Declared Areas in Massachusetts
Nor'easter-Winter Coastal Storm (December 1992)	DR-975	FEMA Public Assistance Project Grants FEMA Individual Household Program	Counties of Barnstable, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk, Worcester
March Blizzard (March 1993)	EM-3103	FEMA Public Assistance Project Grants	Statewide
January Blizzard (January 1996)	DR-1090	FEMA Public Assistance Project Grants	Statewide
June Flood (June 1998)	DR-1224	FEMA Individual Household Program Hazard Mitigation Grant Program Community Development Block Grant- HUD	Counties of Bristol, Essex, Middlesex, Plymouth, Norfolk, Suffolk, Worcester Statewide Hazard Mitigation
March Flood (March 2001)	DR-1364	FEMA Individual Household Program Hazard Mitigation Grant Program	Counties of Bristol, Essex, Middlesex, Plymouth, Norfolk, Suffolk, Worcester Statewide Hazard Mitigation
January Blizzard (January 22-23, 2005)	EM-3201	FEMA Public Assistance Project Grants	Statewide
May Rainstorm/Flood (May 12-23, 2006)	DR-1642	Hazard Mitigation Grant Program	Statewide Hazard Mitigation
April Nor'easter (April 15-27, 2007)	DR-1701	Hazard Mitigation Grant Program	Statewide Hazard Mitigation

Disaster Name (Date of Event)	FEMA Disaster #	Type of Federal Assistance Provided	Declared Areas in Massachusetts
Flooding (March 2010)	DR-1895	FEMA Public Assistance FEMA Individual and Household Programs SBA Loans Project Grants/Hazard Mitigation Grant Program	Counties of Bristol, Essex, Middlesex, Plymouth, Norfolk, Suffolk, Worcester Statewide Hazard Mitigation
Hurricane Earl	EM-3315	FEMA Public Assistance Grants Hazard Mitigation Grant Program	Counties of Worcester, Middlesex, Essex, Suffolk, Norfolk, Bristol, Plymouth, Barnstable, Dukes and Nantucket Statewide Hazard Mitigation
"Snowtober" October 29-30, 2011,	DR-4051	FEMA Public Assistance Grants Hazard Mitigation Grant Program	Counties of Berkshire, Franklin, Hampshire, Hampden, Worcester and Middlesex Statewide Hazard Mitigation
October 29-30, 2011, Severe Storm,	EM-3343	FEMA Public Assistance Grants Hazard Mitigation Grant Program	Counties of Berkshire, Franklin, Hampshire, Hampden, Worcester and Middlesex Statewide Hazard Mitigation
Hurricane Sandy October 27- Nov 8, 2012	EM-3350	FEMA Public Assistance Grants /Hazard Mitigation Grant Program	Counties of Bristol, Plymouth, Barnstable, Dukes and Nantucket Statewide Hazard Mitigation
Winter Storm Nemo February 8-10, 2013	DR-4110	FEMA Public Assistance Grants Hazard Mitigation Grant Program	Statewide
Winter Storm Juno January 26-29, 2015	DR-4214	FEMA Public Assistance Grants Hazard Mitigation Grant Program	Counties of Worcester, Middlesex, Essex, Suffolk, Norfolk, Bristol, Plymouth, Barnstable, Dukes and Nantucket Statewide Hazard Mitigation
Winter Storm Greyson **March 13-14, 2018**	DR-4379	FEMA Public Assistance Grants Hazard Mitigation Grant Program	Counties of Norfolk, Worcester, Middlesex, Essex Statewide Hazard Mitigation
Severe Storms and Flooding **September 11-13, 2023**	DR-4780	FEMA Public Assistance Grants	Counties of Worcester, Bristol

Disaster Name (Date of Event)	FEMA Disaster #	Type of Federal Assistance Provided	Declared Areas in Massachusetts
Hurricane Lee September 15-17, 2023	EM-3599-MA	FEMA Public Assistance Grants	Statewide

Section 2 The Planning Process

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To develop this HMP, the Town of Webster used a planning process framework consistent with FEMA's hazard mitigation planning guidance, also focusing on local needs and priorities, and maintaining a regional perspective on natural hazard events. The process included the following main steps:

1. **Identifying and Mapping the Hazards** – The Town used data from federal, state, and locally developed data to identify hazards that impact Webster. A profile of each hazard was developed including previous occurrences, magnitude and severity of the hazard, and probability for future occurrences. Maps were created to show areas affected by the identified natural hazards and were used as the basis for developing the risk assessment. The **Natural Hazards Risk Assessment** is included in Section 3.
2. **Assessing the Critical Community Assets and Potential Damages** – Critical community assets including municipal facilities, infrastructure, vulnerable populations, economic, and natural resources were located and compared with hazard data to identify those that may be vulnerable to hazards. Webster developed estimates of the potential impacts of certain hazard events on the community including flooding, earthquakes, and hurricane winds. Further discussion is included in the **Asset Inventory** in Section 4 **and the Vulnerability Assessment** in Section 5.
3. **Reviewing Existing Mitigation** – Webster has implemented many mitigation strategies including floodplain zoning, wetland protection, and other measures as well as enforcing the State Building Code. All current municipal mitigation measures were documented and discussed as part of the **Capabilities Assessment** in Section 6.
4. **Developing Mitigation Strategies** – The Town worked with a designated planning group, local stakeholders, and their consultants to identify new mitigation measures, utilizing information gathered from the hazard identification, vulnerability assessment, and exiting mitigation measures to determine where additional work is needed to reduce potential future damages from hazard events. The **Mitigation Strategy** discussed in Section 7 includes goals and objectives, mitigation actions, and an implementation strategy.
5. **Plan Approval and Adoption** – Once a final draft of the HMP update is complete it is sent to MEMA for the state level review and pending the completion of any revisions, it is sent to FEMA for approval. Once FEMA approves the Plan, FEMA issues a conditional approval pending adoption of the Plan by the Town of Webster. The **Plan Approval Process** is included in Section 7.
6. **Implementing and Updating the Plan** – Implementation is the final and most important part of any planning process. Hazard Mitigation Plans must also be updated on a 5-year basis making preparation for the next Plan update an important on-going activity. A schedule for implementation, **Plan Evaluation and Maintenance** is included in Section 8.

The steps included public participation as an important component of the process, providing critical information about the local occurrence of hazards, a discussion on regional issues, and building support for hazard mitigation activities.

The Town identified other interested stakeholders including neighboring communities and solicited their input for the HMP. Public participation was supplemented through the Community Resilience Building Process. Webster held two public meetings open to the general public to present and discuss aspects of the Hazard Mitigation Plan 5-year Update.

THE PLANNING PROCESS

2.1 THE PLANNING TEAM

The Hazard Mitigation Advisory Group, listed in **Table 2-1**, was assembled at the start of the HMP 5-year update project to solicit input from multiple staff in the Town of Webster. The advisory group met on March 14, 2024, to kick-off the HMP planning process. The meeting was led by Ann Morgan, Director of Planning and Economic Development, and the Town's consultant, Tighe & Bond. Presentations served to outline the HMP project, to discuss new HMP goals, and to provide guidance for department representatives on project responsibilities.

Table 2-1
2024 Hazard Mitigation Advisory Group

Name and Title	Title	Department
Ann Morgan	Director of Planning and Economic Development, HMP Project Lead	Planning, Conservation and Economic Development
Richard LaFond	Town Administrator	Town of Webster
Ted Tetreault	Previous Building Commissioner	Building Department
Sebastian Mrozcka	Building Commissioner and Floodplain Administrator	Building Department
Camille Griffin	Heath Director	Health Department
Joey Wigglesworth	PSM, Conservation Agent	Planning, Conservation and Economic Development
Carol Cyr	Director of Community Development	Community Development
Tom Cutler	Water & Sewer Superintendent	Webster Water & Sewer Department
Kenneth Pizzetti	Highway Superintendent	Webster Highway Department
Brian Hickey	Fire Chief, Emergency Management Director	Webster Fire Department

2.2 OUTREACH STRATEGY

A2 a

The Town of Webster completed the required public outreach for the HMP in part through the MVP Community Resilience Building Workshop and Municipal Vulnerability Plan listening session held in 2022, and other public meetings during the HMP update in 2024. Recent outreach efforts included Core Team meetings, a public meeting held during the development of the HMP, a Focus Group meeting for climate vulnerable stakeholders, presentation of the draft HMP to the Board of Selectmen, and multi-media outreach including public notices on the Town's website and social media. Core Team members included the Director of the Planning and Economic Development, Conservation Agent and Building Inspector. Together with the Water & Sewer Superintendent and Highway Superintendent these staff have the authority to regulate development and share a keen interest in the Hazard Mitigation Planning Process. The Fire Chief also reviews all developments in Webster and has a role in regulating development.

Meetings and public outreach efforts specifically targeting the HMP 5-year update were held throughout 2024. The HMP 5-year update kick-off meeting was held on March 14, 2024, to present the plan update scope, schedule, and goals to the Advisory Core Team. The HMP update included eight additional planning meetings and two public community meetings and one focus group meeting. Various stakeholders and representatives from adjacent communities were invited to the public meetings. Outreach materials are included in **Appendix B**.

Table 2-2 summarizes the meetings and public forums conducted for the HMP update, and other resiliency efforts.

Table 2-2
Meetings and Public Forums

A3a

Meeting Date	Topic	Audience / Purpose
November 3, 2021	MVP Kickoff	Tighe and Bond and MVP Core Team
April 13, 2022	MVP Workshop	MVP Core Team and Stakeholders
April 14,2022	MVP Workshop	MVP Core Team and Stakeholders
May 23, 2022	Listening Session	Board of Selectman, Public and Stakeholders- Summary of Findings Presentation
HMP Kickoff Meeting #1- March 14, 2024	Kickoff Meeting	Tighe & Bond and Project Core Team
April 19, 2024	Progress Meeting	Tighe & Bond and Project Lead
May 14, 2024	Progress Meeting	Tighe & Bond and Project Lead
June 17, 2024	Core Team Meeting	Core Team- Finalize Assets
June 24, 2024	Planning Board Public Meeting	Planning Board, Public and Stakeholders- Presentation on HMP process
July 25, 2024	Core Team Meeting	Core Team- Vulnerability Assessment
August 22, 2024	Core Team Meeting	Core Team Capabilities Assessment
September 26 2024	Core Team Meeting	Core Team- Action Review and Problem Statements
October 15, 2024	Community Focus Group	Core Team Representative, Community Leaders discussion to address needs of climate vulnerable populations
October 24, 2024	Core Team Meeting	Project Core Team- New Actions
November 21, 2024	Core Team Meeting	Core Team presentation on HMP Draft
November 25,2024	Planning Board Public Meeting	Planning Board, Public and Stakeholders- Presentation on HMP draft and start of Public Review

THE PLANNING PROCESS

A4a

2.3 AVAILABLE DOCUMENTS

See **Appendix A** for a list of all reports, plans, studies, and technical information that was used in the development of the HMP 5-year Update. Information that was used to develop key findings is cited directly in the document.

2.4 DISCLAIMER

The information in this plan related to potential extent of inundation due to climate change is based on publicly available data and best available science and is subject to change as new data become available. Information is being provided only to help understand the extent of possible future risk, and not for the purposes of construction regulations, flood insurance, or other insurance requirements. The information and maps included in this HMP are for planning purpose only, they are not adequate for legal boundary definition, regulatory interpretation, actual hazard assessment, or parcel level analysis. The presentation of the material in this Plan does not imply the expression of any opinion whatsoever on the part of the Town concerning the accuracy of information or extent of the potential inundation areas.

2.5 REVIEW TOOL DESCRIPTION

Local Hazard Mitigation Plans and make sure they will meet the requirements of the Stafford Act and Title 44 Code of Federal Regulations (CFR) 201.6. The most recent version of this guide (April 19, 2023) was used in updating the Webster Multi-Hazard Mitigation Plan. Where text in the Hazard Mitigation Plan meets an element identified in the Review Guide, it is called out in a blue box in the margins. The complete FEMA Review Tool is included in **Appendix D**.

Section 3 Natural Hazards (Risk Assessments)

3.1 HAZARDS IDENTIFICATION

State Hazards

The 2023 Massachusetts Hazard Mitigation and Climate Adaption Plan (State Plan) provides an in-depth overview of natural hazards in Massachusetts. The State Plan identifies 15 natural hazards that have an impact or have a history of impacting communities in the Commonwealth of Massachusetts. These hazards are as follows:

- Flooding from precipitation (includes dam overtopping)
- Coastal flooding and storm surge
- Drought (including impacts to groundwater)
- Changes in groundwater
- Average and extreme temperatures
- Hurricane and Tropical Cyclones
- Other Severe Weather (includes high winds, thunderstorms, extreme temperatures)
- Tornados
- Severe Winter Storms/Nor'easters
- Coastal Erosion
- Landslides and mudflow
- Tsunami
- Earthquake
- Wildfires
- Invasive species

The 2023 State Hazard Mitigation and Climate Adaption Plan reviewed and retained all hazards from the 2018 MA State Hazard Mitigation Plan and added one new hazard for 2023 – groundwater changes – after reviewing anticipated future conditions and the project impacts of climate change and determining that these changes present conditions that could result in significant hazard to the Commonwealth. Additional reorganization of the 2023 natural hazards risk profiles include combining "flooding from precipitation" with dam failure, and "nor'easters" with severe winter weather.

NATURAL HAZARDS (RISK ASSESSMENTS)

B1 a

Selection of Hazards that affect the Town of Webster

As suggested under FEMA planning guidance, the Planning Team reviewed the full range of natural hazards identified in the State Plan and identified natural hazards that have impacted Webster in the past or could impact Webster in the future. The hazards selection for Webster was made using local expertise from the Core Team, information from the 2022 Webster Municipal Vulnerability Preparedness (MVP) Program and other sources.

Webster has elected to include 12 hazards from the 2023 State Plan as the basis for evaluating hazards for the Webster HMP 5-year update. Coastal natural hazards including coastal flooding, coastal erosion and tsunamis are not applicable for this inland community. Climate change impacts are integrated into the natural hazard elements where appropriate, consistent with the strategy used in the 2023 State Plan.

Table 3-1 includes all hazards selected by Webster for inclusion in the HMP update. The Planning Team reviewed each natural hazard and developed **Table 3-1** below indicating the history and possibility for future occurrence of each hazard, current frequency and geographical extent, severity of hazard impact, and results of a hazard index rating based on a scale of 1 (highest risk) through 5 (lowest risk).

The definition of hazard probability, geographical extent, and impact severity are provided in **Table 3-2**.

Table 3-1
Relevant Natural Hazards for Webster

Type of Natural Hazard	History of Occurrence in Webster	Hazard Probability	Geographic Extent	Severity of Impact	Hazard Risk Ranking	Score (Sum)
Hydrologic Impact						
Flooding from precipitation (including Dam Overtopping)	Yes	4	2	1	3	7
Changes in groundwater	Yes	4	3	3	2	10
Drought	Yes	4	3	3	2	10
Atmospheric Impact						
Extreme Temperature	Yes	3	3	3	2	9
Hurricanes/Tropical Cyclones	Yes	1	3	2	4	6
Severe Winter Storms / Nor'easters	Yes	5	3	3	1	11
Other Severe Weather- High Winds, Thunderstorms	Yes	4	3	3	2	10
Tornadoes	Yes	3	1	3	3	7
Geologic Impact						
Earthquake	Yes	1	2	1	5	4
Landslide and mudflow	Yes	1	1	1	5	3
Other Hazards						

Wildfires	Yes	2	1	1	5	4
Invasive Species	Yes	4	2	1	3	7

The hazard risk rankings were calculated by assigning points to each hazard (see **Table 3.2**) and totaling the scores. A score of 11 ranked as #1,9-10 as #2, 7-8 as #3 and 5-6 as #4 and 3-4 as #5. #1 is ranked as the highest hazard risk and #5the lowest hazard risk for Webster.

Table 3-2
Hazard Profile Definitions

Points		Description
Hazard Probability (Likelihood of Occurrence)[6]		
1	Very Low	Very Unlikely; minimal examples of historical occurrences
2	Low	Likely to occur at least once by the end of the century, some examples of historical occurrences, anticipated every 10 years
3	Medium	Likely to occur at least once every 50 years (two of more occurrences in the next century)
4	High	Almost certain to occur at least once in a year
5	Very High	Almost certain to occur multiple times in a year
Geographical Extent (Area Impacted by a Given Natural Hazard)		
1	Small	Less than 10% of the Town affected
2	Medium	10-50% of the Town affected
3	Large	More than 50% of the Town affected
Severity of Impact from Hazard		
1	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.
2	Serious	Scattered major property damage (more than 10% destroyed); some minor infrastructure damage; wider geographic area (several communities); essential services briefly interrupted up to 1 day; some minor injuries.
3	Extensive	Consistent major property damage (more than 25%); major damage public infrastructure damage (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and possible fatalities.
4	Catastrophic	Property and public infrastructure destroyed (more than 50%); essential services stopped for 30 days or more, multiple injuries and fatalities.

[6] 2022 MA Climate Change Assessment Report Appendix B Chapter 5.1-26

Webster Climate Change Projections

Climate change projections for Webster were reviewed using the 2022 Massachusetts Climate Change Assessment, including updated data information included in Appendix B of the Assessment[7] on Climate Inputs and assessment methods. The 2022 assessment objective was to provide high quality and up-to-date climate projections for inclusion in the 2023 Massachusetts State Hazard Mitigation and Climate adaptation plan (SHMCAP). The Webster 2024 HMP includes the data that is relevant for the Town.

Highlights from the 2022 Climate Assessment are included below[8]:

- Updated information on climate impacts through the Sixth International Panel on Climate Change including new insights on climate change impacts and human responses.
- Improved understanding of precipitation and temperature regarding likely variability and extremes.
- Updated biological diversity data using BioMap 3 data to understand the impact of hazards to critical, rare and other native species and their habitats in MA.

3.2 COMMUNITY SURVEY OPINON ON NAURAL HAZARDS AND CHANGING CLIMATE

A3a

Webster conducted a survey aimed at gauging public opinion on climate change and natural hazards, receiving 6 responses. Respondents expressed significant concern about various climate impacts, with 33% ranking flooding, drought, extreme temperatures, high winds, microburst and invasive species. Nor'easters, thunderstorms, and high winds were common hazards experienced annually or more frequently, with residents particularly worried about future occurrences. When asked about protecting community assets from the impacts of extreme weather events and climate hazards, 100% highlighted protection critical facilities including transportation networks, Harrington Hospital, Webster EMS, Fire and Police stations. as their primary concern. The survey also revealed that Webster Town Hall, Harrington Hospital, Webster Fire and Police, Webster Highway Department, Reverse 911call system, National Grid, supermarket, pharmacy, and gas stations were crucial community assets during storm events, while Webster Lake, the French River, Downtown buildings including Emergency Services and Government agencies, Thompson Road- Hospital, electrical infrastructure and roadway closures were most affected by these events. Overall, there is a clear call for urgent action on climate change, with respondents showing strong interest in protecting critical facilities and private property.

3.3 HAZARD PROFILES

B1 a b c d e

Hazard profiles are provided in Sections 3.4 Hydrologic Hazards, 3.5 Atmospheric Hazards, 3.6 Geologic Hazards and 3.7 Other Hazards for each of the 12 natural hazards that could impact Webster in the future or have impacted the Town in the past. Each hazard profile includes a definition and description of the hazard, previous occurrence and extent, local areas of impact, and probability for future occurrence. A discussion of previous occurrences includes historic data. Evaluation of the extent or severity of the hazard includes the measuring scale for a specific hazard. Locally identified areas of impact include maps showing the areas

[7] 2022 MA Climate Change Assessment Report Appendix B Chapter 5

[8] 2023 Resilient MA Appendix 5C SHMCAP Risk Assessment

identified by the hazard whenever possible. The probability of future occurrences is based on the best available science and historic events using the hazard probability scale provided in **Table 3.2**.

B2a

For each natural hazard, the major vulnerability issues for five exposure and vulnerability sectors are summarized. The key sectors or categories of community assets include:

- Human - Special populations and places (vulnerable populations and cultural assets)
- Infrastructure (municipal buildings and critical infrastructure)
- Natural environment
- Economy
- Governance

Resources used are referenced as footnotes for each hazard profile that follows.

3.4 HYDROLOGIC HAZARDS

Flood hazard includes inland flooding as the direct result of Nor'easters, heavy rains, poor urban drainage, tropical storms, hurricanes, and drainage impeded by storm surge. Flooding also occurs from dam or culvert failures that may or may not be associated with a storm event. Coastal flooding does not impact this inland community. At the other end of the spectrum, drought impacts are included as a hydrologic hazard for Webster, primarily based on the negative impacts to regional water supplies.

3.3.1 INLAND FLOODING

Inland or Riverine Flooding occurs where the rate of precipitation from a severe storm like a Nor'easter or tropical storm causes a large amount of rain in a short period of time, overwhelming the capacity of natural or constructed drainage systems causing overflows.

Urban drainage occurs in flat areas where runoff or rain collects and cannot drain. Poor drainage after flood events is usually associated with poorly infiltrating soils and undersized stormwater conveyance, including channelized streambeds and culverts that do not have adequate capacity to handle runoff from larger storm events. Larger storm events and other sources of water including snow melt and high groundwater can overload the system and result in backups, flooding streets and properties.

FEMA Flood Hazard Areas

Areas at risk of flooding are mapped by FEMA as part of the National Flood Insurance Program (NFIP) established in 1968 to reduce the nation's flood losses via local floodplain management practices. A floodplain is defined by the NFIP as any land area susceptible to being inundated by floodwaters from any source[9]. FEMA's flood maps, the Flood Insurance Rate Maps (FIRM) delineate flood zones that are defined according to varying risk of, or potential for, flooding due to the land area's characteristics (proximity to a waterbody, topography/slope) and current water body conditions (water/sea levels, wave action, historic storm experience).

[9] https://www.fema.gov/national-flood-insurance-program/definitions

The frequency and severity of flooding are measured based on the probability that a certain river discharge (flow) will be equaled or exceeded in a given year. Flood studies use historical records to determine the probability of occurrence for the different flooding levels. For example, the 100-year flood has a 1-percent chance of being equaled or exceeded in any given year. The 100-year flood, or 1% chance annual flood is **not** inherently a flood that will occur once every 100 years.

The 100-year flood is used by the NFIP to guide floodplain management and determine the need for flood insurance. The term "500-year flood" or 0.2% annual chance flood, is the flood that has a 0.2-percent chance of being equaled or exceeded each year.

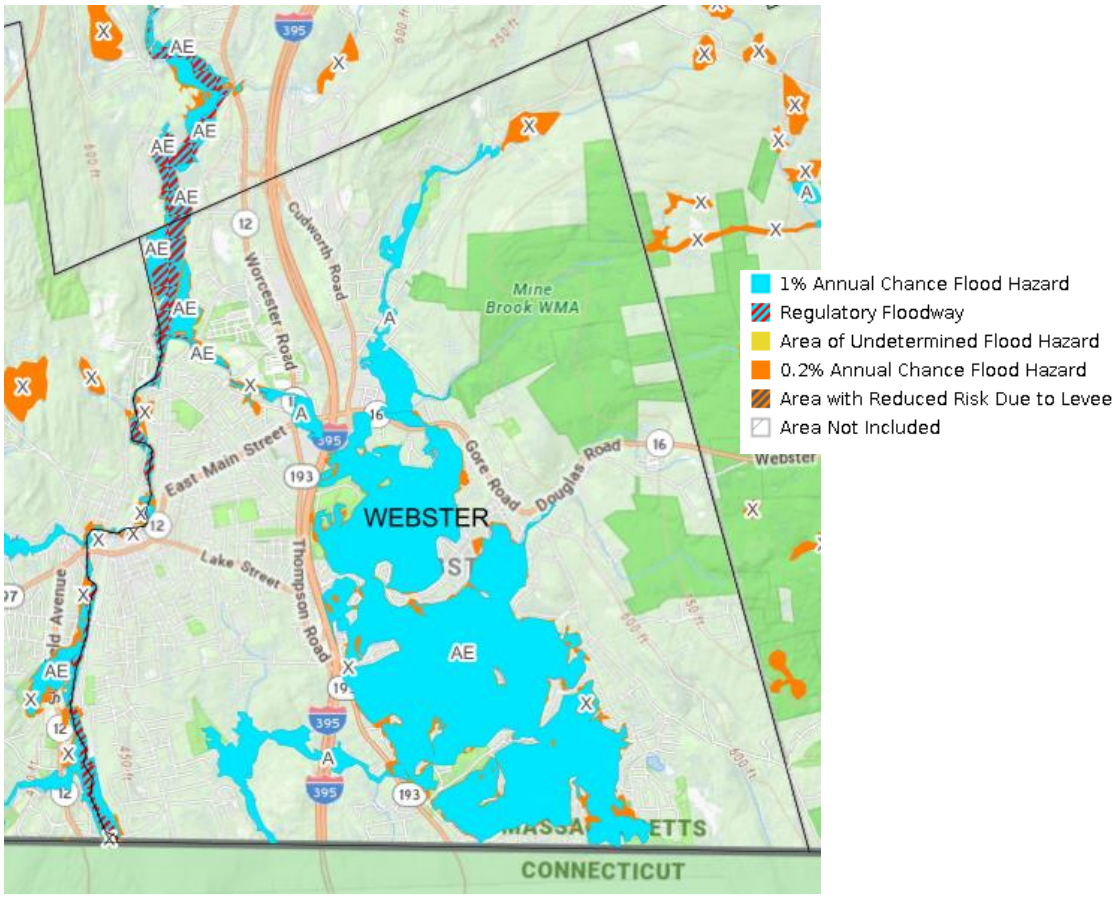


Figure 3.1: Webster's FEMA Flood Hazard Zones

The 100- and 500- year floodplains and areas subject to flooding within Webster, shown above in **Figure 3.1** were defined by the National Flood Insurance Program with an effective date of June 21, 2023. **Table 3-3** describes the risk associated with each zone.

Table 3-3
Definitions of FEMA Flood Zones

Risk Type	Zone	Description
Low Risk	X (unshaded)	Area of minimal flood hazard
Moderate Risk	X (shaded)	0.2 % Annual Chance Flood
High Risk	A	1% Annual Chance Flood *Inland floodplains that do not have a base flood elevation (BFE)*
High Risk	AE	1% Annual Chance Flood *Special flood hazard area with determined BFE & wave height is <3 feet*

Previous Occurrence and Extent of Town-Wide Flooding (Inland)

Flooding and flood-prone areas in Webster are closely associated with the course of the French River and its tributary water bodies and waterways. According to a GIS analysis performed by Central Massachusetts Regional Planning Commission (CMRPC), there are 947 parcels in Webster that are susceptible to flooding during a 100-year or base flood events, with 123 of these parcels containing structures. Much of Webster is upland, away from rivers and ponds and as a result, the location of this hazard is relatively "small." Despite much of the town being upland, the urban environment, and extensive network of imperviousness combined with inadequate drainage systems and steep slopes often leads to localized flooding due to excessive surface water runoff. In the past 10 years alone, Worcester County has experienced 70 flooding events[10].

The most notable flood events include the Hurricane of September 1938 (a Category 3 hurricane), the Hurricane Diane 1955 (a Category 3 hurricane), the Great Flood of 1936, and the Blizzard of 1978 (the most devastating Nor'easter in Massachusetts history), **Table 3-4** summarizes these historic flooding events.[11]

Table 3-4
Historic Flooding Events and Local Impacts for Webster

Date	Type of Event	Local Impacts
January 28, 1996	Flood	Extreme rainfall and flooding.
April 17, 1996	Flood	Extreme rainfall and flooding, road closures.
March 9, 1998	Severe Storm & Floods	Heavy rainfall, flooding, extreme wind gusts.
April 22, 2000	Flood	Extreme rainfall and flooding.
March 22, 2001	Flood	Widespread flooding as a result of melting snow and heavy rainfall.
October 15, 2005	Tropical Storm	Extreme rainfall and flooding, road closures.
August 28, 2011	Hurricane Irene	Widespread flooding, and utility damage.

[10] NOAA Storm Event Data base (https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=25%2CMASSACHUSETTS)
[11] NOAA Storm Event Data base

Date	Type of Event	Local Impacts
September 21, 2017	Tropical Storm	Strong winds and heavy rain caused trees to fall with widespread power outages
August 4, 2020	Tropical Storm	Heavy rainfall and high winds
August 21, 2021	Tropical Storm Henri	Strong wind gusts and flash flooding.

Locally Identified Areas of Impact

Flooding in upland areas occur during heavy rains. The excessive stormwater runoff floods low-lying areas and surcharges the existing inadequate or malfunctioning drainage systems and problem culverts.

A list of areas of local flooding concern from Town officials is provided in **Table 3-5**. The FEMA Flood Zones and areas of flooding concern are shown above on **Figure 3.1.**

Table 3-5[12]
Locally Identified Areas of Flooding (June 2022)

	Location	Flooding Concern
1	Dams [Fish & Game Pond Dam, Club Pond Dam, Webster Lake Dam]	Flooding issues, debris, beavers
2	Bridges [Mill Bridge]	Flood risk
3	Culverts [Lower Gore, Sutton Road]	Culvert backs up due to beavers, experiences flooding during rain event
4	Middle and Elementary Schools	
5	Brookside Senior Living	Flooding
6	Town Hall	Basement flooding, leaking roof, groundwater induced flooding
7	Fire Station	Basement flooding

Repetitive Loss Structures

B2 c

The frequency and locations of flood hazard events in Webster can be estimated based on the reported loss occurrences for repetitive loss properties and from local knowledge of flood hazard areas.

As defined by the Community Rating System (CRS) of the NFIP, a repetitive loss property[13] 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. A severe repetitive loss property is any NFIP-insured property that has met at least one of the following paid flood loss criteria since 1978, regardless of ownership:

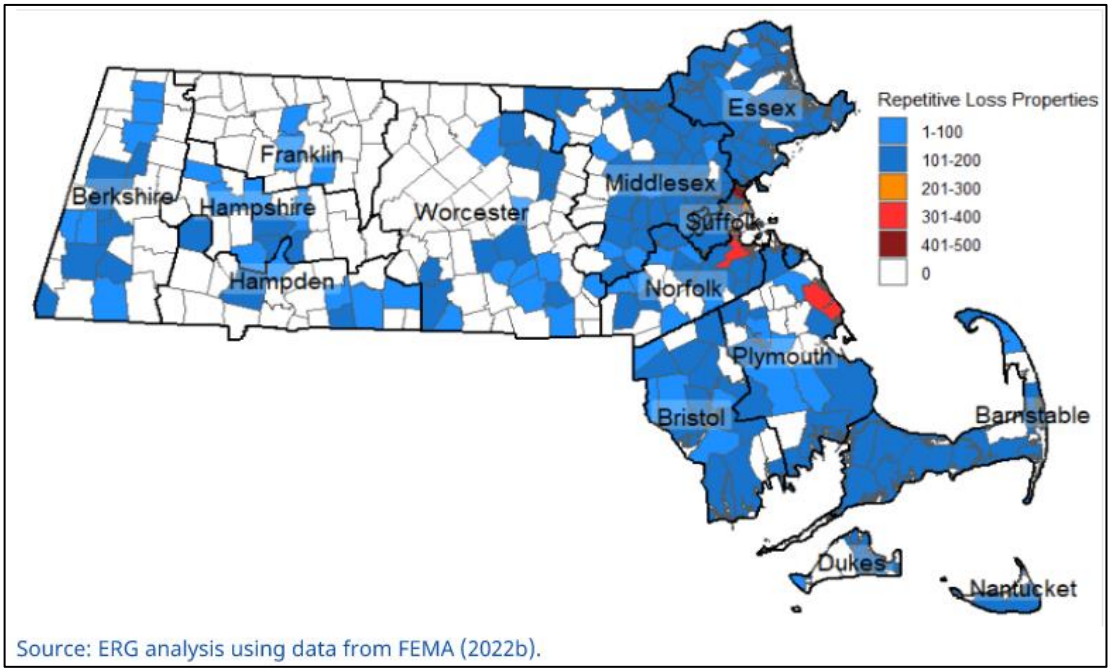
- Four or more separate claim payments of more than $5,000 each (including building and contents payments); or

[12] Webster MVP Plan 2022
[13] For more information on repetitive losses see https://crsresources.org/files/500/mapping_repetitive_loss_areas.pdf

- Two or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property.

As shown in **Figure 3.2**, the majority of repetitive and severe repetitive loss properties are located in eastern Massachusetts. There are no repetitive loss structures in Webster according to claims data as of January 13, 2022.

Figure 3.2 Distribution of NFIP repetitive loss properties



Probability of Future Occurrence

The potential effects of climate change significantly impact inland flooding due to the increased frequency of severe storm events including nor'easters and hurricanes. Global climate change models suggest that the historical 10 percent annual chance daily rainfall event (2.8 to 4 inches) could occur five times more frequently in Worcester County by 2070.[14] The Planning Team has determined that it is HIGHLY LIKELY that flooding will impact Webster in the future.

A storm with sufficient magnitude could result in damage far greater than any the community has known, impacting the economy, natural resources, cultural and historic assets, and buildings and structures. Therefore, it is in the best interest of the Town and residents to understand how climate change may influence flooding and begin proactive planning to adapt or mitigate these impacts.

A more detailed discussion of flooding risk with climate change is provided in the following section.

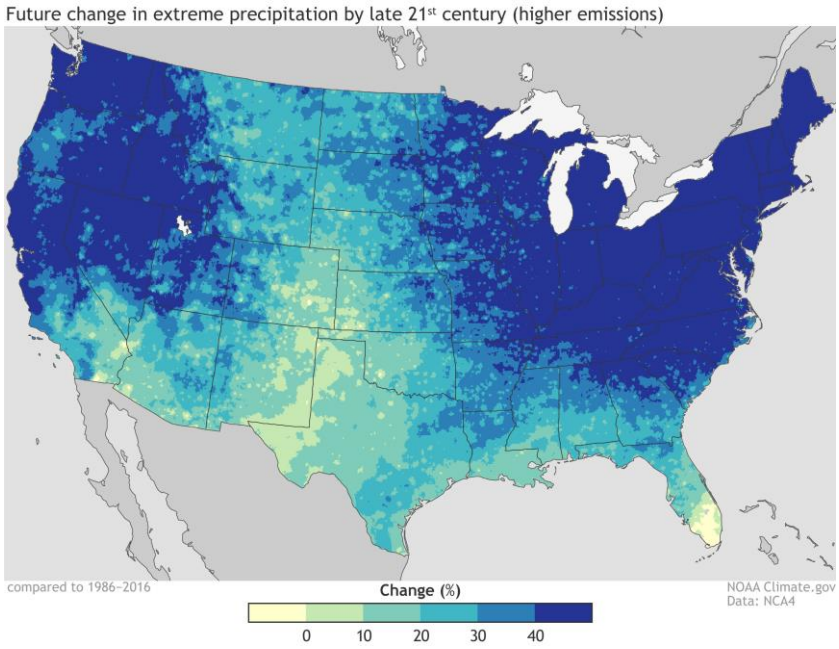
[14] 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan

Inland Flooding with Climate Change

Precipitation and temperature changes due to climate change are key factors that will impact inland flooding in the future. These changes have the potential to modify the current floodplain, impacting areas of Webster that have not flooded in the past. Climate change is projected to affect precipitation patterns according to analysis conducted for the 2022 Massachusetts Climate Assessment. According to climate projections for Massachusetts, annual precipitation will increase and fall more intensely at the daily to weekly scale. The most significant change is with seasonal precipitation with drier summers and wetter winters, primarily in the form of rain on frozen ground.[15]

The climate projections suggest that the frequency of high-intensity or extreme rainfall events will trend upward. As shown in **Figure 3.3**, the amount of precipitation released by storms in the northeast has increased by 71% from the baseline level (recorded 1901-1960) and present-day levels (measured 2001-2012)[16].

Figure 3.3: Nation-wide comparison of increase in extreme precipitation



Overall, it is anticipated that the severity of flood-inducing weather events and storms will increase, with events that produce sufficient precipitation to present a risk of flooding likely increasing. A single intense downpour can cause flooding and widespread damage to property and critical infrastructure.

[15] ResilientMA Plan 2023 Appendix 5C

[16] https://www.climate.gov/news-features/featured-images/prepare-more-downpours-heavy-rain-has-increased-across-most-united-0

The number of days each year with extreme precipitation are also anticipated to increase overtime (**Table 3-6**).

Table 3-6
Projected Annual Frequency of Future Extreme Precipitation Events in the Quinebaug Basin (Days)

	2030s	2050	2070	2090
Number of Days >1" precipitation	7	7	8	8
Number of Days >2" precipitation	0	0	1	1
Number of Days >4" precipitation	0	0	0	0

Source: ResilientMA, 2023 Climate Change Projections, https://resilientma-mapcenter-mass-eoeea.hub.arcgis.com/

Extreme Precipitation Impact on Engineering Design

Estimating changes in the expected intensity of future rainfall events is constantly evolving with technological advancements, increases in available precipitation records, and climate change models. Utilizing rainfall values that reflect the changing climate are important in engineering design. Accounting for extreme precipitation is necessary to design adequate capacity in drainage system and provide sufficient structural elevation to avoid flooding.

There are a variety of opinions on the definition of "extreme precipitation," and which precipitation metric to compare over time. Rainfall can be compared using statistical thresholds (e.g., 95th percentile), absolute thresholds (e.g., greater than 1 inch) and return intervals (e.g., 100-year storm), all of which can be applied over a range of time scales from minutes to years.[17]

The "design storm" approach is a practical way to compare extreme precipitation amounts that is consistent with values used for engineering design. Rainfall amounts are compared over time periods based on storms of a similar size and duration called recurrence intervals or "return period," typically ranging from a 2-year to 100-year storm event. For example, a 2-year storm event has a 1 in 2 chance of occurring in a given year or a 50% probability. A 100-year storm event has a 1 in 100 chance of occurrence in a given year, or a 1% probability. A "design storm" is based on the historical precipitation records for a particular return interval and duration of the storm event such as a 2-year, 24-hour storm.

The National Oceanic and Atmosphere Administration (NOAA) Atlas 14 has been used for a number of years as an improved source of extreme precipitation. The Atlas was completed in 2016 and is the most current rainfall intensity dataset in Massachusetts. **Table 3-7** shows the 24-hour rainfall depths for Webster Massachusetts using NOAA Atlas 14, Volume 10, Version 3. For comparison, the Resilient MA climate projections for precipitation frequency are provided for 2030, 2050 and 2070.

[17] Boston Research Advisory Group, Draft Climate Change and Sea Level Rise Projections for Boston, January 18, 2016.

Table 3-7
Webster Massachusetts 24-hour Rainfall Depth Estimates NOAA Atlas 14 vs 2030-2070 Climate Change Projections

Recurrence Interval Storm Event	NOAA 24 hour Rainfall Depth for Webster Massachusetts (inch)	24 hour Rainfall Depth Projected for Quinebaug Basin 2030	24 hour Rainfall Depth Projected for Quinebaug Basin 2050	24 hour Rainfall Depth Projected for Quinebaug Basin 2070
2-year	3.28	3.9	4.3	4.6
10-year	5.07	6.1	6.8	7.3
25-year	6.19	7.5	8.3	8.9
50-year	7.02	8.6	9.5	10.2
100-year	7.92	9.7	10.8	11.5

Source: ResilientMA, 2023 Climate Change, Projections https://resilientma-mapcenter-mass-eoeea.hub.arcgis.com/

Implications for Inland Flooding with Climate Change

Rainfall is expected to increase in spring and winter months particularly in Massachusetts, with increasingly consecutive dry days in summer and fall. More total rainfall can have an impact on the frequency of minor but disruptive flooding events, especially in areas where storm water infrastructure has not been adequately sized to accommodate higher levels.

More intense downpours often lead to inland flooding as soils become saturated and stop absorbing more water, river flows rise, and the capacity of storm water systems is exceeded. Flooding may occur as a result of heavy rainfall, snowmelt, ice or dam failure, but precipitation is the strongest driver of flooding in Massachusetts. Winter flooding is also common in the state, particularly when the ground is frozen.

Webster's current FEMA Flood Insurance Maps provide an important baseline for gaging the extent of future flood condition; however, it is important to note that FEMA defined floodplain areas are based on historic and existing conditions; but do not include future or projected climate conditions. This floodplain will expand in the future as extreme precipitation impacts inland flood levels. **Figure 3.1 and Table 3-3** shown previously, include areas of high- and moderate- to low-flood risk.

This floodplain will expand in the future as extreme precipitation impact inland flood levels.

Flooding Impacts on Webster's Key Sectors

Inland Flood Exposure and Vulnerability by Key Sector[18]	
INFRASTRUCTURE	Flooding can also wash out sections of roadways, culverts, and bridges, as well as cause extensive damage to public utilities and disruptions to the delivery of services.
NATURAL ENVIRONMENT	Severe floods cause a wide range of environmental impacts. Animals can lose their habitats if habitat elements are swept away or destroyed. Riverbank and soil erosion transform existing habitats and deposit sediment in downstream areas. If high levels of nutrients are present in the soil, this can also lead to eutrophication in downstream ecosystems.
ECONOMY	Economic losses due to a flood include but are not limited to damages to buildings (and their contents) and infrastructure, agricultural losses, business interruption (including loss of wages),

[18] 2023 ResilientMass Plan

Inland Flood Exposure and Vulnerability by Key Sector[18]	
	impacts on tourism, and tax base. High-tide flooding, exacerbated by rising seas, leads to traffic delays that affects people's ability to work.
HUMAN	Populations that are particularly vulnerable to this hazard include the economically disadvantaged, who may face greater difficulty in evacuating (people aged over 65 and under 5, people with mobility limitations), and individuals with medical needs who may have not be able to receive required medical care either during evacuation or if isolated by flooded infrastructure. Flooding may interrupt local food availability during and after the event.
GOVERNANCE	Town-owned infrastructure may be increasingly subject to precipitation flooding jeopardizing use by employees or residents of affordable housing. Inland flooding will put an increased demand for emergency response and law enforcement deployment during emergency flood events.

DAM AND CULVERT FAILURE

Dams

A dam is an artificial barrier that has the ability to impound water for the purpose of storage or control of water. Dam failure is a catastrophic type of failure characterized by a sudden, rapid, and uncontrolled release of impounded water. Dam failure can occur as a result of structural failure, independent of a hazard event, or as the result of the impacts of a hazard event such as flooding associated with storms or an earthquake. In the event of a dam failure, the energy of the water stored behind even a small dam can cause loss of life and property damage if there are people or buildings downstream. The number of fatalities from a dam failure depends on the amount of warning provided to the population and the number of people in the area in the path of the dam's floodwaters. Dam failure in general is infrequent but has the potential for severe impacts. An issue for dams in Massachusetts is that many were built in the 19th century without the benefits of modern engineering or construction oversight.

The Massachusetts DCR has three hazard classifications for dams:

High Hazard: Dams located where failure or mis-operation will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s) or railroad(s).

Significant Hazard: Dams located where failure or mis-operation may cause loss of life and damage home(s), industrial or commercial facilities, secondary highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities.

Low Hazard: Dams located where failure or mis-operation may cause minimal property damage to others. Loss of life is not expected.

In general, DCR requires that dams that are rated as low hazard be inspected every ten years while dams that are rated as significant hazards must be inspected every five years.

Culverts

A culvert is defined as a structural opening under a roadway that allows water to pass from one side of a roadway to the other. A culvert can impound water similar to a dam under certain flood conditions, and if

conditions are extreme, culverts can fail, causing road and property damage. A culvert can fail under the following conditions:

- clogged with debris and sediment, invasive species and other vegetation
- buildup of flood water or on the upstream side of the culvert exceeding the capacity of the culvert
- loss of structural integrity
- culvert and road are washed out during a heavy rain or from snowmelt
- soil around the culvert erodes, and without support, the culvert will buckle, or sag and the culvert will collapse

Previous Occurrence and Extent

Historically, dam failure has had a low occurrence in Webster. However, extreme weather events led to dams in neighboring towns to breach in the past. Nearly every dam along the French River was destroyed in 1955, this led to flooding in the Webster area.

Locally Identified Areas of Impact

The Department of Conservation and Recreation (DCR) Office of Dam Safety lists 9 dams in Webster, of which 4 are significant hazard dams. All dams in Webster are privately owned as listed in **Table 3-8** below.

Table 3-8
Webster Dam Information[19]

National ID	Dam Name	Owner Type	Hazard Potential
MA02925	Pool Dam	Private Association or other non-profit	N/A
MA02048	Recreation Pond Dam	Private	N/A
MA02923	Fish & Game Pond Dam	Private	N/A
MA02924	Webster Lake Dam	Private	Significant Hazard
MA00953	Club Pond Dam	Private Association or other non-profit	N/A
MA02047	Storage Pond Dam	Private	Significant Hazard
MA02922	Mill Brook Canal Dam	Private	Significant Hazard
MA00954	Nipmuck Pond Dam	Private	N/A
MA00108	North Webster Village Pond Dam	Private	Significant Hazard

[19] Massachusetts Office of Dam Safety (ODS) Database-2024

Probability of Future Occurrence

Climate change is likely to increase the severity of extreme precipitation events, increasing the probability that dams and culverts will exceed their capacity. The Planning Team determined that based on past history of culvert failure events it is **HIGHLEY LIKELY** that this natural hazard risk will impact the planning area in the future.

Dam and Culvert Failure Impacts on Webster's Key Sectors

Dam and Culvert Failure Exposure and Vulnerability by Key Sector[20]	
INFRASTRUCTURE	Flood waters from dam and culvert failure may potentially cut off evacuation routes, limit emergency access, and create isolation issues. Utilities such as overhead power lines, cable and phone lines in the inundation zone are also vulnerable.
NATURAL ENVIRONMENT	Following a dam failure, the impounded reservoir would experience a reduction water levels, displacing aquatic organisms and exposing the benthic community to air. Downstream, habitat impacts would likely include direct mortality of flora and fauna, toppling of trees and removal of soil and inhibition of plant respiration in areas that remain flooded for long periods of time.
ECONOMY	In addition to buildings and infrastructure in the inundation area, any habitat or agricultural operations in the area would also be exposed to this hazard, which could cause extensive economic damage if crops were ruined.
HUMAN	Given the relatively short warning time associated with dam failure, culvert or tide gate failure, any population that is exposed inundation and cannot rapidly evacuate would be considered vulnerable. This population includes households without vehicles, the elderly and young children who may be unable to get themselves out of the inundation area.
GOVERNANCE	Town-owned high hazard dam are at risk of damage or destruction.

Drought

Drought is a period characterized by long durations of below normal precipitation.[21] Drought conditions typically last a season or more and result in water shortages, causing adverse impacts on vegetation, animals, and people. A drought may also increase the probability of a wildfire occurring.

Drought characteristics vary significantly from one region to another since they are relative to the normal precipitation in that area. Drought is a temporary aberration, and is different from aridity, which is a permanent feature of climate in areas where low precipitation is normal, such as in a desert.

Previous Occurrence and Extent

The entire planning area can be affected by drought, impacting local water resources often requiring voluntary or required water-use restrictions. In Massachusetts, drought is defined by a combined look at several indices, as defined by the Massachusetts Drought Management Plan (the Plan) (EEA and MEMA, 2023)[22]. The indices are

[20] 2023 ResilientMass Plan

[21] NOAA May 2008, Drought Public Fact Sheet (http://www.nws.noaa.gov/om/brochures/climate/DroughtPublic2.pdf)

[22] https://www.mass.gov/doc/massachusetts-drought-management-plan/download

1.1 Standardized Precipitation Index for 3-,6-, and 12-month time periods

1.2 Precipitation as a percentage of normal (or historic average) for 2-, 3-,6-, and 12-month time periods

1.3 Crop Moisture Index

1.4 Keetch-Byram Drought Index (KBDI)

1.5 Groundwater Levels

1.6 Stream Flow

1.7 Reservoir Levels

These indices are analyzed on a monthly basis to generate a hydrological conditions report and used to determine the onset, severity and end of droughts. Five levels of increasing drought severity are defined in the Plan – Normal, Mild Drought, Significant Drought, Critical Drought, and Emergency Drought. The drought levels are associated with state actions as outlined in the Plan. Recommendations of drought levels are made by the Drought Management Task Force (DMTF) to the Secretary of Energy and Environmental Affairs (EEA) who declares the drought level from each region of the state. Current drought status and indices data can be viewed through the Northeast Drought Early Warning System dashboard.[23]

While drought does involve multiple indices, historic multi-year droughts were identified by the USGS by analyzing annual and cumulative departures from long-term average streamflow at gauging stations across Massachusetts. Streamflow deficits were analyzed, and recurrence intervals computed for selected droughts. The droughts of 1929-32, 1939-44, 1961-69, 1980-83, and 2016-2017 stand out as particularly significant because of their severity and areal extent. The severest drought on record in the Northeastern United States was during 1961 through 1969. The driest year on record was 1965 with an average statewide precipitation total of 29 inches. The 2016-2017 drought was the most significant drought since the 1960's with rainfall of 37 inches. Water supplies and agriculture were affected because of the severity and long duration of the drought with an estimated economic impact of over $18 million.[24] More recently drought periods include Level 3 drought occurring in many locations between May 2020-August 2021, and in April-December 2022 and a critical drought declaration on November 19, 2024 following three months of unprecedented low precipitation. An overview of drought-status for Massachusetts, which includes the Town of Webster, is provided in **Figure 3.4**[25].

[23] http://nedews.nrcc.cornell.edu

[24] U.S. Geological Survey Water-Supply Paper 2375 National Water Summary 1988-89--Floods and Droughts: Massachusetts Floods and Droughts

[25] https://www.mass.gov/info-details/drought-status

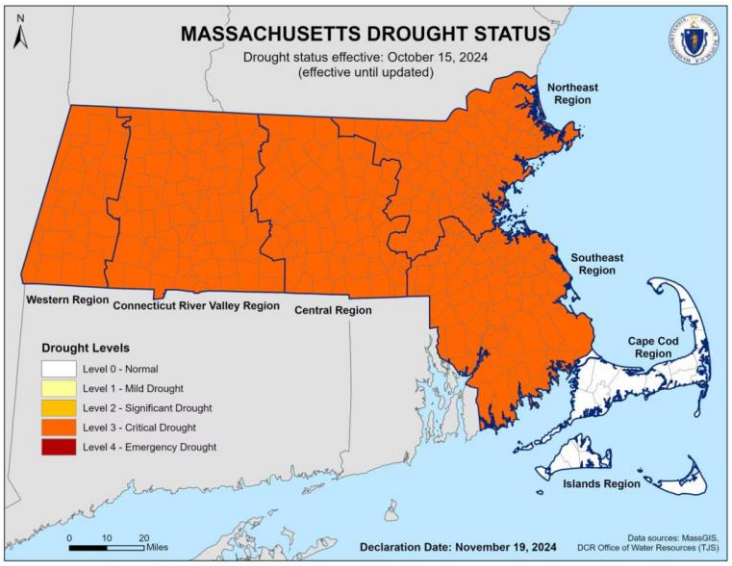


Figure 3.4: Massachusetts Drought Status Map 2024

Droughts will create challenges for local water supply by reducing surface water storage and the recharge of groundwater supplies, including private wells. More frequent droughts could also exacerbate the impacts of flood events by damaging vegetation that could otherwise help mitigate flooding impacts. Droughts may also weaken tree root systems, making them more susceptible to toppling during high wind events.

Locally Identified Areas of Impact

The entire planning area can be affected by drought, impacting local water resources often requiring voluntary or required restrictions on water use. Webster obtains 100% of their water supply from groundwater including private and public water supply wells. The Massachusetts Office of the USGS provides local data to monitor streamflow and drought conditions across Massachusetts. The USGS maintains statistics and streamflow information on their Water Watch website,[26] and the DCR Water Resource Commission issues monthly reports of hydrologic conditions.[27] Data obtained from Worcester Regional Airport and USGS stream gauges located on Quinebaug River in Southbridge and Blackstone River near Uxbridge[28] provides information on local conditions for the Central Region including Webster. The data are interpreted by the USGS and DCR to establish the local water conditions.

Probability of Future Occurrence

Massachusetts has recorded many periods of drought dating back to 1895. The current average range of consecutive dry days per year is currently 31 days based on baseline data between 1986 and 2005. The National Weather Service' Climate Prediction Center releases projections for drought conditions monthly based on

[26] http://newengland.water.usgs.gov/drought/index.html
[27] https://www.mass.gov/drought-management
[28] https://waterdata.usgs.gov/ma/nwis/uv?site_no=01105585

short- and medium-term temperature and precipitation forecasts, monthly dynamic models, soil moisture and other seasonal and temporal climate factors. Drought is extremely likely or certain in the future.[29]

A second resource is provided by is the U.S. Drought Monitor[30]. **Figure 3.5** includes an example map for November 2024 indicating drought tendency.

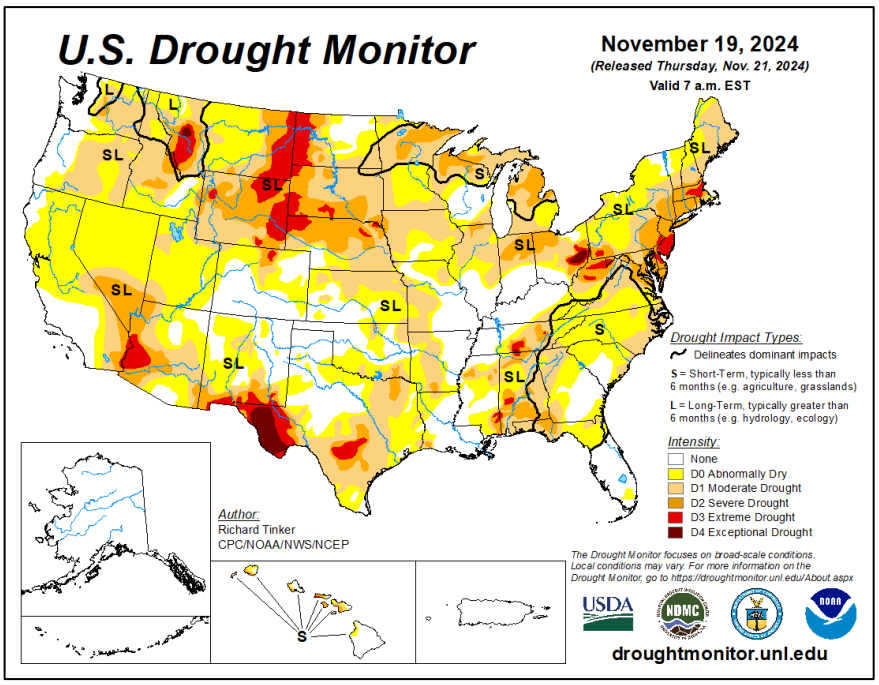


Figure 3.5: US Monthly Drought Outlook November 2024

Drought with Climate Change

Although research suggests that the overall amount of precipitation is likely to increase under climate change, the distribution of precipitation events will continue to become more extreme, with periods of minimal rain alternating with extreme rain events. Climate change increases the risk of drought in a number of ways. Increased evapotranspiration due to rising temperature will reduce surface water and soil moisture. Shifts in water availability due to rising temperatures will ultimately reduce recharge to streams and aquifers with a combination of less snowfall, more rapidly melting snowmelt, or rainfall on frozen ground. Finally, seasonal precipitation is projected to include more severe and unpredictable dry spells. More rain falling over shorter time periods will reduce groundwater recharge, even in undeveloped areas, as the ground becomes saturated, and rain runs off rather than recharge groundwater.

[29] https://www.cpc.ncep.noaa.gov/products/Drought/

[30] https://droughtmonitor.unl.edu/About/WhatistheUSDM.aspx

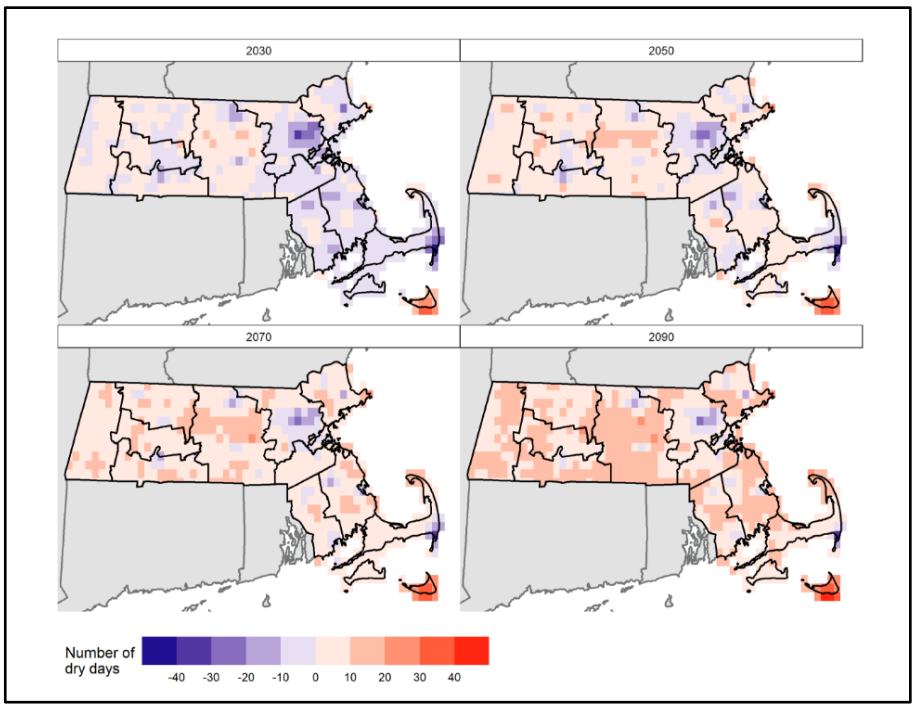


Figure 3.6: Projected annual consecutive dry days for 2030, 2050, 2070, and 2090[31]

Table 3-9 provides data from the 2022 MA Climate Assessment for the Central Massachusetts from the Stochastic Weather Generator model for the number of events of consecutive dry days (of any length in number of days). This data indicates an increase of about 5% for both drought indicators by the end of the century.

Table 3-9
Indicators of Drought for Central Massachusetts[32]

Planning Year	Baseline	2030	2050	2070	2090
Consecutive dry day events (number of multiple-dry-day events per year)	32	32	32	33	33
Annual number of days without rain (days per year)	180	182	185	188	192

The Planning Team determined that based on past history of drought events and climate change data provided by EEA, it is **HIGHLY LIKELY** that drought will impact the planning area in the future.

[31] Steinschneider & Najibi (2022)
[32] 2022 MA Climate Change Assessment Report Vol 2 Statewide Report V2

Drought Impacts on Webster's Key Sectors

Drought Exposure and Vulnerability by Key Sector[33]	
INFRASTRUCTURE	Drought impacts on elements of the built environment are limited. Drought conditions decrease urban tree cover, increase stream on public water utilities.
NATURAL ENVIRONMENT	Prolonged droughts can have severe impacts on ecosystems and natural resources, as most organisms require water throughout their life cycle. Forests managed for timber or other economic uses could experience reduced growth rates or mortality during periods of drought. Drought can shift distribution of native and invasive species, increase incidence of wildfires, and cause coastal wetland degradation.
ECONOMY	The economic impacts of drought can be significant in the agriculture, recreation, forestry, and energy sectors. Crop failure can also result in an increase in food prices, placing economic stress on a broader portion of the economy.
HUMAN	Citizens with a private water supply, such as a well, are more vulnerable to drought than those who receive water through a public provider. Drought can increase the concentration of airborne pollutants, presenting a health hazard for those with respiratory health conditions like asthma. Drought can also increase mental health stressors and health effects from aeroallergens and mold.
GOVERNANCE	Increase demand for municipal services, impacts to wildfire fighting due to water shortages. Disruption in landscaping at parks and natural areas.

Changes to Groundwater

The 2023 SHMCAP added "Changes in Groundwater" as a new natural hazards for the entire state of Massachusetts due to dependence on groundwater resources for a variety of ecosystem services and benefits. Changes to groundwater either through groundwater rising or depletion or changes in groundwater quality presents challenges to human and natural systems. As groundwater rises due to increasing precipitation, water quality impacts may occur. The depletion of groundwater due to drought conditions will damage ecosystems, endanger water supply and present risk to structures whose design depends on a stable water table. Contamination of groundwater can result from higher runoff transporting pollutants.

Previous Occurrence and Extent

The Town receives its water from three wellfields, Bigelow Road Wellfield, Thompson Road Wellfield, and Memorial Beach Drive Wellfield. The Thompson Road Wellfield is currently offline and is in the process of being rehabilitated. The Town received a low-interest loan from the MA Water Pollution Abatement Trust for this rehabilitation project. Each wellfield has its own treatment plant on-site providing disinfection and aeration. **Figure 3.7** shows the location of the low, medium and high yield aquifers in Southern Massachusetts including Webster.

[33] 2023 ResilientMass Plan

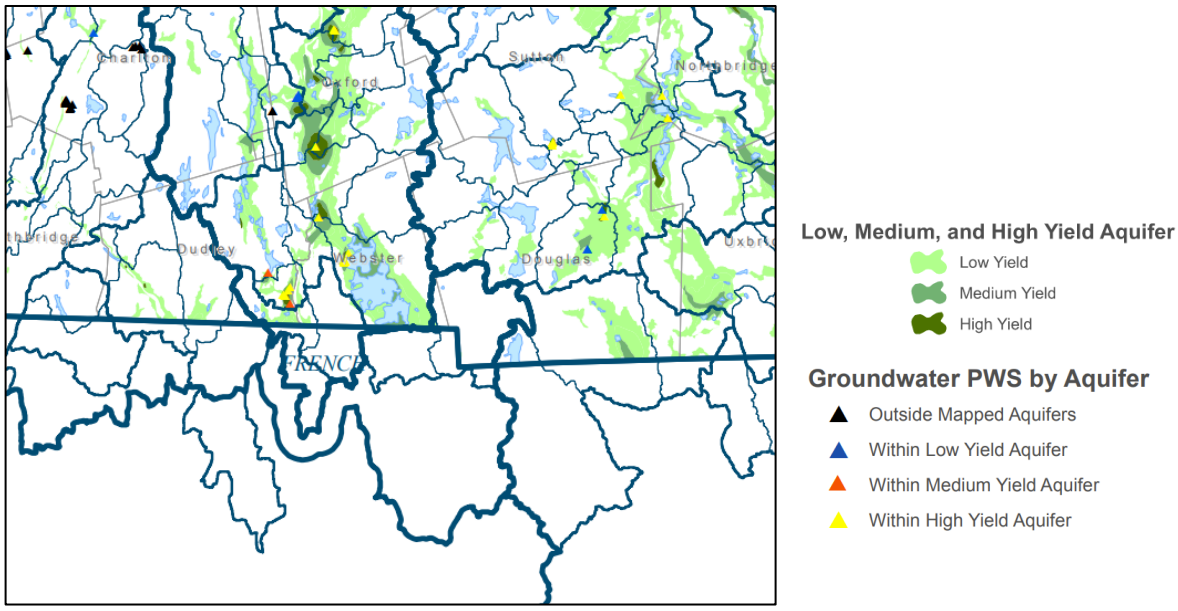


Figure 3.7 Location of Aquifers in Massachusetts[34]

Locally Identified Areas of Impact

Areas of Webster with high water tables are the most exposed and susceptible to groundwater flooding. The water table is vulnerable to environmental contaminants from industry, stormwater, and wastewater infrastructure. Belowground living spaces, basements, utilities, and infrastructure are at risk from groundwater flooding. Rising groundwater levels can amplify or lead to flooding events when the water table rises to an elevation that interacts with infrastructure. Residential buildings and basements are especially susceptible to this type of flooding. Flooding from groundwater may occur outside the designated Federal Emergency Management Agency (FEMA) flood zones, and many community members and business owners are unaware of their flood risk. In addition to expenses associated with recovering from a flood event, residents that experience flooding are more susceptible to mold and other damage. In areas that experience repeated flooding, households incur costs to operate flood management techniques such as sump pumps and other forms of drainage. Pumps often use electricity or fuel; their use can result in additional costs to residents, and they run the risk of being non-operational or inaccessible during a hazard event.

Probability of Future Occurrence

Groundwater elevation changes happen over days, months, and years. Saturation can happen over days in connection with precipitation events and coastal storms, while depletion usually happens over a longer duration. It is **HIGHLY LIKELY** that groundwater changes will impact Webster in the future.

[34] https://www.mass.gov/doc/map-1statewideaquiferpdf/download

Changes to Groundwater with Climate Change

Climate change can affect the severity of groundwater rise, depletion, and contamination due to the following factors: changes in precipitation, groundwater recharge, impacts from sea level rise, and changing temperatures.

Impacts on Webster's Key Sectors

CHANGES TO GROUNDWATER EXPOSURE AND VULNERABILITY BY KEY SECTOR[35]	
INFRASTRUCTURE	Below ground living spaces, basements, utilities and infrastructure are at risk from groundwater flooding. Rising groundwater levels can amplify or lead to flooding events when the water table rises to an elevation that interacts with infrastructure. Depletion of the groundwater table can have an impact on soil stability and adjacent above ground structures.
NATURAL ENVIRONMENT	Changes in groundwater chemistry, especially increased salinity, can cause wetland species, including invasives to transition and migrate inland as salinity intrudes into new areas. Water bans may limit the irrigation of planted trees and gardens.
ECONOMY	Flooding, groundwater depletion, and contamination can generate costs for businesses and industries, particularly small businesses and water-related and -dependent businesses due to increased flooding or reduced water supply.
HUMAN	Health impacts can also emerge when living quarters are flooded. Increases in humidity and water damage can lead to mold, which affects respiratory health. These impacts are particularly pronounced for residents with pre-existing conditions including asthma, the very young, and the elderly.
GOVERNANCE	A rising water table can expose government assets to flooding and damage. It can also reduce the useful life of government property exposed to flooding events. In areas where saltwater intrusion is happening, groundwater flooding can also expose government buildings and infrastructure to corrosion from increased salinity.

3.5 ATMOSPHERIC HAZARDS

Extreme Temperatures

Extreme temperatures are defined as temperatures that are far outside the normal ranges for the season in a specific area. Extreme cold events are characterized in a temperate zone by the air temperature dropping to approximately 0 ºF or below. Extreme heat is identified as the number of days with a maximum temperature greater than or equal to 90ºF and greater than or equal to 100ºF. Temperature variations occur due to several atmospheric phenomena. Increased greenhouse gas emissions from human activities are contributing to an increase in the earth's surface temperature, causing more extreme temperatures.

[35] 2023 ResilientMass Plan

Extreme Cold

The extent (severity or magnitude) of extreme cold temperatures can be measured through the Wind Chill Temperature Index (**Figure 3.8**). Wind Chill Temperature is based on the rate of heat loss from exposed skin by the effects of wind and cold. As the wind increases, the body loses heat at a faster rate, causing the skin's temperature to drop.

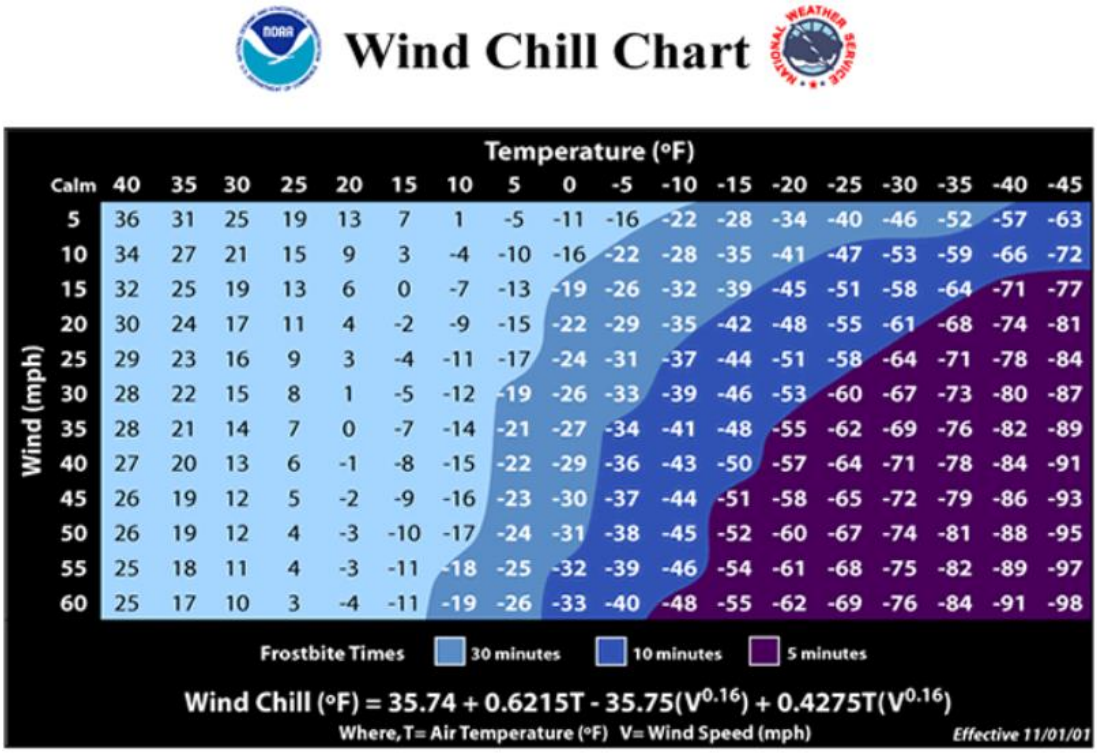


Figure 3.8: NOAA Wind Chill Index

Source: http://www.nws.noaa.gov/om/cold/wind_chill.shtml

When winter temperatures drop significantly below normal, staying warm and safe can become a challenge. Extremely cold temperatures often accompany a winter storm, which may also cause power failures, icy roads and saltwater freezing in coastal bays and harbors.

Cold weather also can present hazards indoors. Many homes will be too cold, either due to a power failure or because the heating system is not adequate for the weather. Exposure to cold temperatures, whether indoors or outside, can cause other serious or life-threatening health problems. The use of space heaters and fireplaces to stay warm, and/or the use of generators and candles in power outages, increases the risks of residential fires and carbon monoxide poisoning.

Extreme Heat

The extent of extreme heat is documented by the National Weather Service (NWS) Heat Index. NWS issues a Heat Advisory when the Heat Index is forecast to reach 100-104°F in 2 or more hours. NWS issues an Excessive

Heat Warning if the Heat Index is forecast to reach 105+ °F in 2 or more hours. The Heat Index describes a temperature that the body feels and is based both on temperature and relative humidity (**Figure 3.9**). A heat wave is defined as 3 or more days of temperatures 90°F or above.

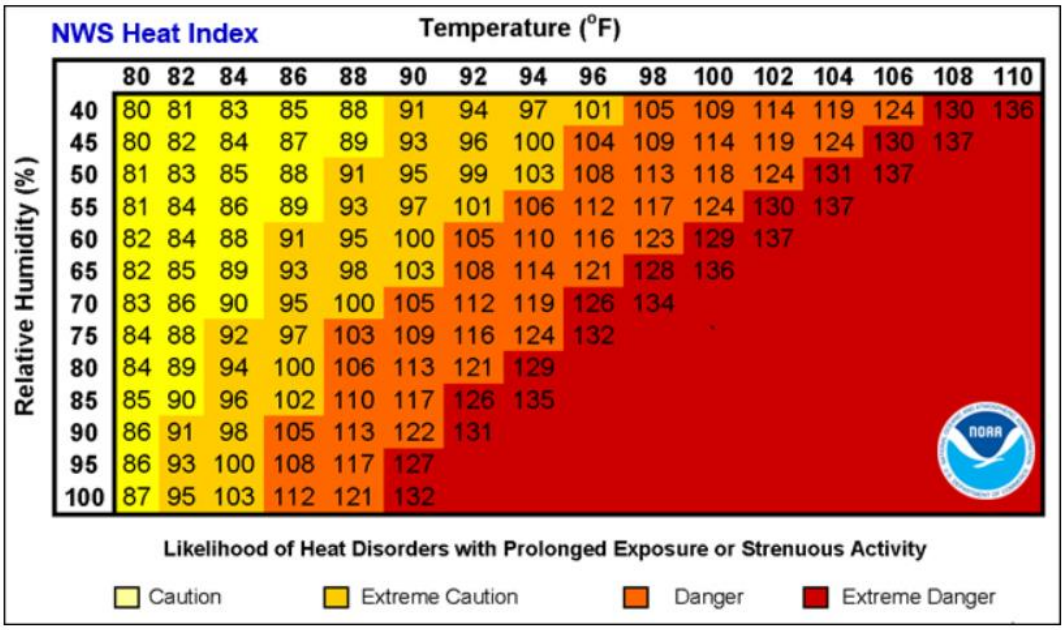


Figure 3.9: NOAA Heat Index

Source: http://www.nws.noaa.gov/om/heat/heat_index.shtml

Extreme heat is currently the leading weather-related cause of death in the United States.[36] Prolonged exposure to high temperatures can cause heat-related illnesses, such as heat cramps, heat syncope, heat exhaustion, heat stroke, and death. Heat exhaustion is the most common heat-related illness and if untreated, it may progress to heat stroke. Additionally, heat is expected to contribute to the exacerbation of chronic health conditions.[37] In particular, hyperthermia—elevated body temperature due to failed thermoregulation can be caused by heat stroke — is a contributing factor to cardiovascular, metabolic, and other causes of death.[38]

Those at particularly high risk of adverse health effects from extreme heat exposure are older adults, children, those living alone and/or with chronic illnesses, urban residents, minorities, lower income families, people with less education, and people without access to air conditioning. In addition, people with chronic mental disorders or pre-existing medical conditions (e.g., cardiovascular disease, obesity, diabetes, neurologic or psychiatric disease), and those participating in outdoor manual labor or sports in hot weather also are at increased risk for

[36] Luber, G., & McGeehin, M. (2008b). Climate change and extreme heat events. American Journal of Preventive Medicine, 35(5), 429–435. http://doi.org/10.1016/j.amepre.2008.08.021
[37] Kravchenko, J., Abernethy, A. P., Fawzy, M., & Lyerly, H. K. (2013). Minimization of heat wave morbidity and mortality. American Journal of Preventive Medicine, 44(3), 274–282. http://doi.org/10.1016/j.amepre.2012.11.015
[38] O'Neill, M. S., & Ebi, K. L. (2009). Temperature Extremes and Health: Impacts of Climate Variability and Change in the United States. Journal of Occupational and Environmental Medicine, 51(1), 13–25. https://pubmed.ncbi.nlm.nih.gov/19136869/

heat-related illness.[39] Extreme heat adversely impacts utility companies that may struggle meet the extra demand created by operation of air conditioners. Brown outs may result in secondary impacts to vulnerable populations.

Previous Occurrence and Extent

According to NOAA NCDC data, the entire area is vulnerable to extreme temperatures. Temperatures in Massachusetts have risen almost 3.5 ºF since the beginning of the 20th century. In 2012, Boston experienced the warmest January to July in 85 years. During that span, Boston's average temperature was 53.5 ºF, almost 4 ºF warmer than the historical average temperature.[40] Over the last century, annual air temperatures increased at an average rate of 0.5 ºF per decade.[41] 2022 was one of the hottest and driest summers on record in Massachusetts. **Figure 3.10** depicts the trend of maximum and minimum yearly temperatures from 1895 to 2023 in Massachusetts.

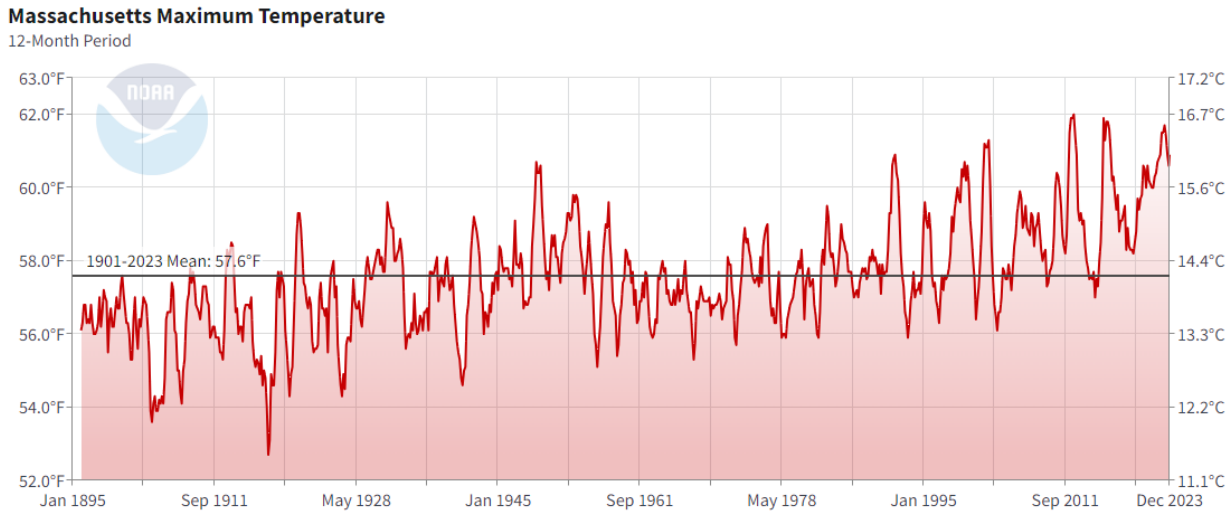
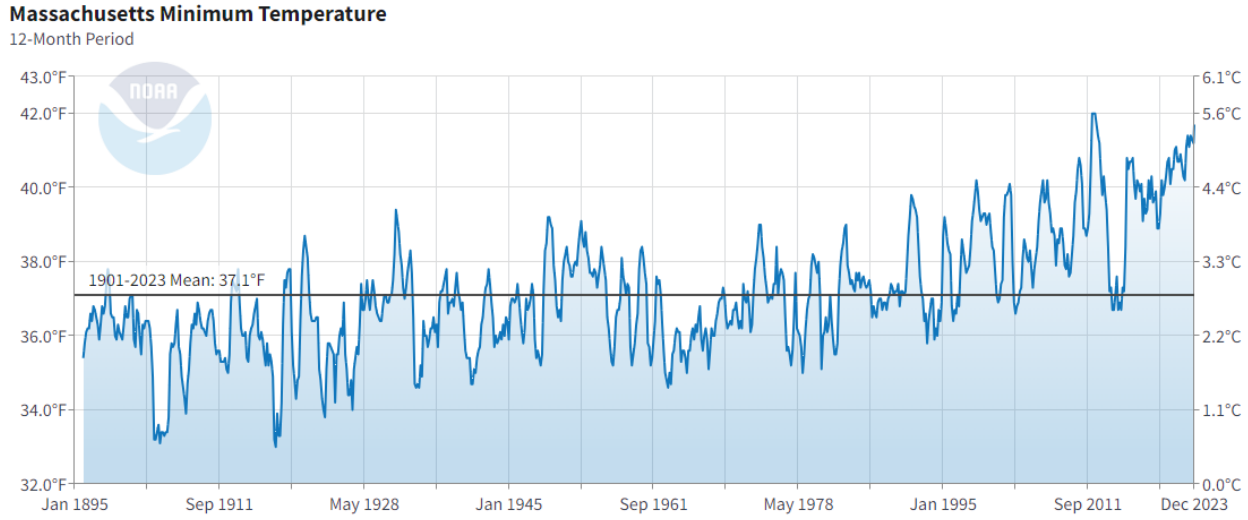


Figure 3.10: Maximum Temperature (top) and Minimum Temperature (bottom) Yearly Temperatures in Massachusetts (1895-2023)

[39] Holstein, J., Canouï-Poitrine, F., Neumann, A., Lepage, E., & Spira, A. (2005). Were less disabled patients the most affected by 2003 heat wave in nursing homes in Paris, France? Journal of Public Health (Oxford, England), 27(4), 359–365. https://pubmed.ncbi.nlm.nih.gov/16234262/

[40] https://statesummaries.ncics.org/downloads/Massachusetts-StateClimateSummary2022.pdf

[41] ResilientMass Plan 2023



According to the Northeast Regional Climate Center at Cornell University, 2012 was the warmest year in the US to date, and the third hottest summer. Massachusetts' hottest recorded temperature was 107ºF in August 1975, and its coldest was -35ºF in February 1943. **Figure 3.11** shows the average temperatures in Worcester County from 1895 to 2023.

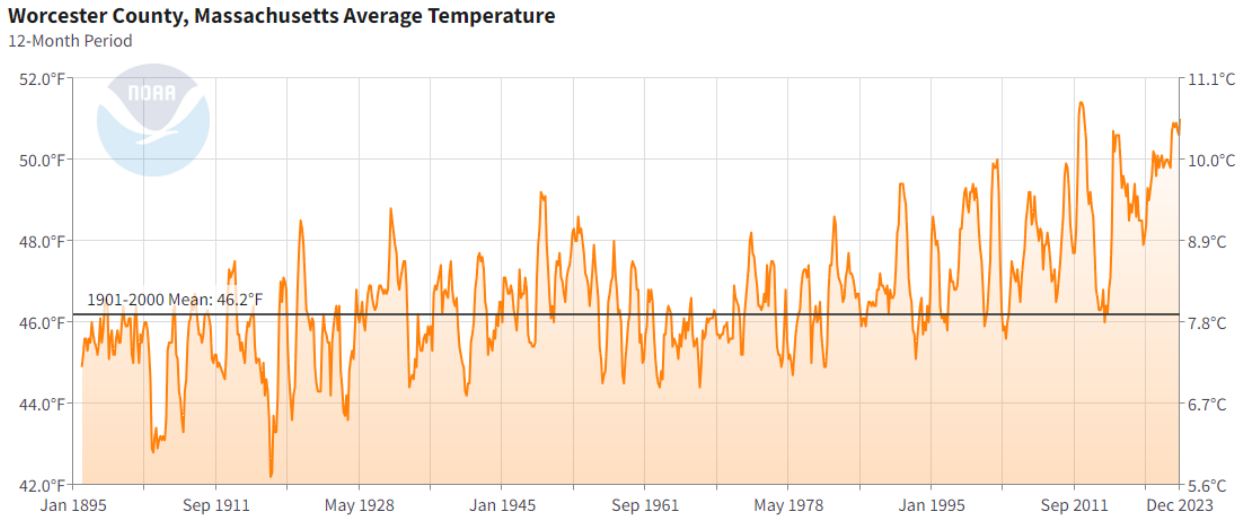


Figure 3.11 Worcester County, Massachusetts Average Temperature 12-month

Table 3-10 shows the recent history of extreme temperatures for Webster (past 17 years), downloaded from the NOAA National Centers for Environmental Information.[42] A total of 57 days were reported with

[42] https://www.ncdc.noaa.gov/cdo-web/

temperatures above or equal to 90ºF with 0 days above or equal to 100ºF. A total of 127 days were reported with temperatures less than or equal to 5ºF with 53 days less than or equal to 0ºF.

Table 3-10
Extreme Temperatures for Webster 2007-2023

Year	Number of days ≥90 degrees	Number of days≥ 100 degrees	Number of days ≤5 degrees	Number of days ≤0 degrees
2007	6	0	12	3
2008	3	0	4	0
2009	0	0	11	3
2010	6	0	3	1
2011	3	0	4	2
2012	4	0	3	3
2013	5	0	5	4
2014	0	0	17	5
2015	1	0	19	11
2016	3	0	8	5
2017	2	0	11	3
2018	3	0	7	4
2019	1	0	9	5
2020	4	0	1	0
2021	5	0	3	1
2022	9	0	8	1
2023	2	0	2	2
TOTAL	57	0	127	53

According to the NOAA'S National Climatic Data Center, there are no extreme heat and extreme cold events reported for Worcester County between January 1, 1950, and December 31, 2023.

Locally Identified Areas of Impact

Extreme heat is expected to occur within Webster, particularly surrounding highly impervious areas. The entire planning area is at risk for impacts due to extreme temperatures.

Probability of Future Occurrence

The IPCC forecasts temperatures continuing to increase worldwide during the 21st century due to the GHG emission trajectory we are on. The latest scenarios from the 2015 United Nations Paris Climate Summit for average temperature changes across all RCP greenhouse gas emissions scenarios show a continuation of increased global temperatures. The average temperature in Massachusetts between 1950 and 2013 has been

approximately 50.1 degrees Fahrenheit (°F). By mid-century this is anticipated to be 53.7°F. By the latter part of the 21st century (2100) average temperatures are expected to increase to 58.2°F. [43]

More recent Massachusetts Statewide Climate Projections shown in **Table 3-11** are consistent with the findings that Webster (Quinebaug) is expected to experience increased average temperatures throughout the 21st century. Maximum and minimum temperatures are also expected to increase throughout the end of the century. These increased temperature trends are expected for annual and seasonal projections.

Table 3-11
Seasonal and Annual Temperature Projections for the Quinebaug River Basin

Quinebaug		Observed Baseline 1950-2013 (°F)	Projected Change in 2030s (°F)	Mid-Century Projected Change in 2050s (°F)	Projected Change in 2070s (°F)	End of Century Projected Change in 2090s (°F)
Average Temperature	Annual	48.3	50.1	53.7	56.4	58.2
	Winter	27.8	31.4	34.1	35.9	37.7
	Spring	45.8	48.5	51.2	53.0	54.8
	Summer	67.9	71.5	73.3	76.0	77.8
	Fall	51.4	55.0	56.8	59.5	61.3
Maximum Temperature	Annual	83.7	87.3	89.1	91.8	93.6
	Winter	72.4	76.0	78.7	80.5	82.3
	Spring	79.4	82.1	84.8	86.6	88.4
	Summer	83.7	87.3	89.1	91.8	93.6
	Fall	81.6	85.2	87.0	89.7	91.5
Minimum Temperature	Annual	-6	-2.4	-0.6	2.1	3.9
	Winter	-6	-2.4	0.3	2.1	3.9
	Spring	2.7	5.4	8.1	9.9	11.7
	Summer	34.3	37.9	39.7	42.4	44.2
	Fall	9.6	13.2	15.0	17.7	19.5

Based on historical data and local projections, the Planning Team determined that there is a **MEDIUM** likelihood that extreme temperatures will impact the planning area.

[43] ResilientMA, 2023 Climate Change, Projections https://resilientma-mapcenter-mass-eoeea.hub.arcgis.com/

Extreme Temperature Impacts on Webster's Key Sectors

Average and Extreme Temperature Exposure and Vulnerability by Key Sector[44]	
INFRASTRUCTURE	Extreme heat events can sometimes cause short periods of utility failure due to increased usage from air conditioners and other appliances, as well as deforming of commuter and freight rail lines. Heavy snowfall and ice storms, associated with extreme cold temperature events, can also cause power interruption. Backup power is recommended for critical facilities and infrastructure.
NATURAL ENVIRONMENT	Because the species that exist in a given area are designed to survive within a specific temperature range, extreme temperatures events can place significant stress both on individual species and ecosystems. Warming temperatures across the globe force species poleward, or upward in elevation, while species that cannot relocate fast enough face local extinction. Reduced ecosystem services, such as carbon sequestration and storage in forests or water filtering in coastal wetlands, due to ecosystem stress. Increases in sea surface temperature can alter weather patterns and storm tracks and force marine species beyond their historic range in search of a suitable habitat.
ECONOMY	Extreme temperature events can have significant economic impacts on people's ability to work and make a living due to damage to infrastructure, our natural environment, or people's health. Specifically, decrease in marine fisheries and aquaculture productivity, decrease in agriculture productivity, reduced ability to work, and increased possible cost for water and electricity, caused by higher demand.
HUMAN	Populations that are most at risk to extreme cold and heat events include individuals aged over 65, infants and young children, individuals who are physically ill, low-income individuals who cannot afford proper heating and cooling, and those whose jobs involve exposure to extreme temperature events. Extreme temperature is the leading cause of weather-related mortality in the U.S. Environmental justice populations are also at risk because they reside in temperature hotspots. Linguistically isolated populations are most disproportionately exposed to this hazard.
GOVERNANCE	Increased demand for government services. All Town-owned buildings are exposed to extreme temperatures, increasing government expenditures for energy and maintenance. Increase expenditures for adaptation efforts. Health risk and reduced productivity for Town employees who work outdoors.

[44] 2023 ResilientMA Plan

Severe Weather-Wind Related Hazards

Severe weather wind related hazards include hurricanes, tropical and extra-tropical storms, and tornadoes as well as high winds during severe rainstorms and thunderstorms. The typical wind speed in Webster ranges from 9-13 miles per hours over the course of the year, with peak gusts over 71 mph.[45] The prevailing wind direction is west-northwest, and the highest wind speeds occur January through March.

Figure 3.12 shows the average monthly wind speed for the contiguous US for March.[46] The east coast, including Worcester County, is located in the hurricane-susceptible region.

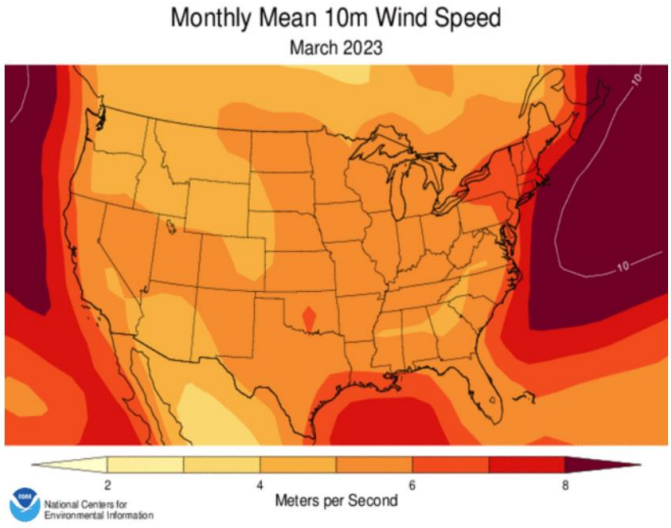


Figure 3.12: March Average Wind Speeds in the US (2023)

High winds can occur as an isolated event or accompany other weather events such as:

- Before and after frontal systems
- Hurricanes and tropical storms
- Severe thunder and lightning storms
- Tornadoes
- Nor'easters (extra-tropical storms)

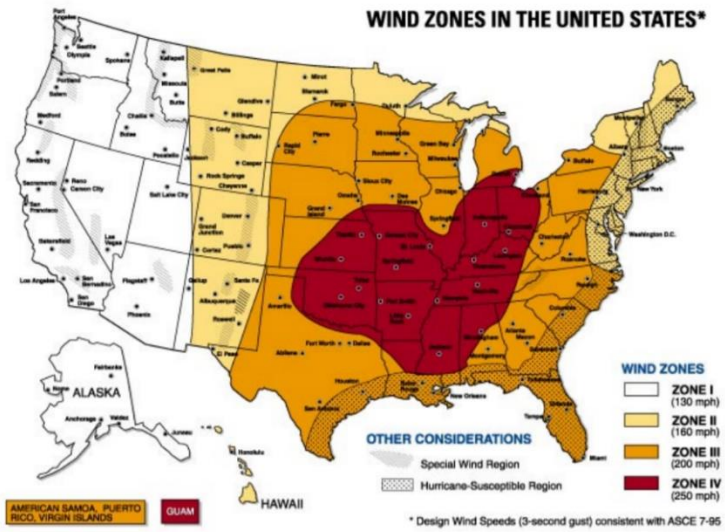


Figure 3.13: Wind Zones in the United States

National wind zone designations were developed by FEMA based on 40 years of tornado history and 100 years of hurricane history. As shown in **Figure 3.13**, Worcester County lies within Zone II with maximum winds of 160 mph. Webster is also within the Hurricane-Susceptible Region along with the entire East Coast and Gulf of Mexico.[47]

45 NOAA Climatic Wind Data for the United States 1930-1996- Data for Boston
[46] https://www.ncdc.noaa.gov/societal-impacts/wind/w-mean/201603
47 FEMA Taking Shelter from the Storm: Building a Safe Room Inside Your House. https://www.fema.gov/pdf/library/ism2_s1.pdf

Table 3-12 includes the high wind warning categories issued by the NWS for both non-tropical and tropical events. Winds measuring under 30 mph are not considered to be hazardous under most conditions.[48]

Table 3-12
NWS High Wind Warning Categories

Type of Warning	Wind Speeds
Non-tropical event over land	
Wind Advisory	Sustained winds of 31-39 mph for at least 1 hour, or any gust 46 to 57 mph
High Wind Warning	Sustained winds 40+ mph or any gust 58+ mph
Non-tropical event over water	
Small Craft Advisory	Sustained winds 25-33 knots
Gale Warning	Sustained winds 24-47 knots
Storm Warning	Sustained winds 48 to 63 knots
Hurricane Force Winds	Sustained winds 64+ knots
Tropical storm events (inland or coastal)	
Tropical Storm Warning	Sustained winds 39 to 73 mph
Hurricane warning	Sustained winds of 74+ mph

Effects from high winds can include downed trees and/or power lines, damage to structures, etc. This is especially true after periods of heavy snow, rain or prolonged drought due to the weakening of tree branches and roots. High winds can cause scattered power outages and are a hazard for the boating, shipping, and aviation industry sectors. More specific discussion on severe weather and high wind events impacting Webster follows in Sections on Hurricanes and Tropical Storms, Nor'easters and Tornados, High winds, and Thunderstorms,

Hurricanes/ Tropical Storms

A tropical cyclone is a rotating, organized system of clouds and thunderstorms that originate over tropical or subtropical water. The 4 types of tropical cyclones are classified as follows:

- **Tropical Depression:** A tropical cyclone with maximum sustained winds of 38 mph (33 knots) or less.
- **Tropical Storm:** A tropical cyclone with maximum sustained winds of 39 to 73 mph (34 to 63 knots).
- **Hurricane:** A tropical cyclone with maximum sustained winds of 74 mph (64 knots) or higher.
- **Major Hurricane:** A tropical cyclone with maximum sustained winds of 111 mph (96 knots) or higher, corresponding to a Category 3, 4 or 5 on the Saffir-Simpson Hurricane Wind Scale.

Hurricanes are characterized by high winds and extratropical moisture resulting in torrential rainfall, especially if the storm is moving slowly. The rotational nature of hurricanes often results in winds changing direction as the storm passes, altering wave generation and surge setup. A hurricane is strongest as it travels over the ocean

[48] FEMA Taking Shelter from the Storm: Building a Safe Room Inside Your House. https://www.fema.gov/pdf/library/ism2_s1.pdf

and is particularly destructive to coastal property as storms hit the land. In the Atlantic Basin, the hurricane season runs from June 1 to November 30 with peak activity occurring in early to mid-September.[49]

Hurricanes are classified by the Saffir-Simson Scale, which categorizes intensity linearly based upon maximum sustained winds, barometric pressure, and storm surge potential. **Table 3-13** shows the wind speeds, surges, and range of damage caused by different hurricane categories:

Table 3-13
Saffir/Simson Scale to Measure Hurricane Intensity

Scale No. (Category)	Winds (mph)	Surge (ft.)	Potential Damage
1	74-95	4-5	Minimal
2	96-110	6-8	Moderate
3	111-130	9-12	Extensive
4	131-155	13-18	Extreme
5	>155	>18	Catastrophic

Previous Occurrence and Extent

Since 1950, Worcester County has had three Tropical Storms (Henri – August 2021, Isaias – August 2020, and Jose – September 2017) and one Category 1 hurricane (Irene – August 2011) pass directly through or adjacent to the Region.

Within the last 25 years, hurricanes and tropical storms that have impacted Massachusetts include Hurricane Irene (Category 2, 2011), Earl (Category 4, 2010), and Bob (Category 2, 1991); and Tropical Storms Sandy (2012), Bill (2009), Hanna (2008), and Beryl (2006).[50] Hurricane Gloria, a Category 3 hurricane, was the most severe to have impacted Webster, with sustained winds of 115 mph and up to 12 feet of storm surge. From 1842 to 2022, 97 hurricanes or tropical storms occurred near Massachusetts, averaging one storm every two years. Four occurred between 2020 and 2022.[51]

While historic records include 39 tropical storms and hurricanes for New England, only 5 events have resulted in FEMA hurricane-related disasters for Worcester County as listed in **Table 3-14**.[52]

Table 3-14
FEMA Hurricane-Related Declared Disasters Impacting Worcester County

FEMA Disaster #	Name	Date	Category
DR-751	Hurricane Gloria	9/27/1985	Cat 3
DR-914	Hurricane Bob	8/19/1991	Cat 2
EM-3315	Hurricanes Earl	9/1/-9/4/2010	Cat 4
EM-3350	Hurricane Sandy	10/27- 11/8/12	Cat 3

[49] National Hurricane Center Educational Resources http://www.nhc.noaa.gov/climo/
[50] https://nesec.org/hurricanes/
[51] ResilientMass Plan 2023
[52] https://nesec.org/hurricanes/

FEMA Disaster #	Name	Date	Category
EM-3599	Hurricane Lee	9/15-9/17/2023	Cat 2

Locally Identified Areas of Impact

Based on past history, the Planning Team determined the entire planning area is at risk for impacts due to hurricanes and tropical storms.

Probability of Future Occurrence

According to the 2023 MassResilient Plan and NOAA Hurricane Research Division, the Commonwealth averages one tropical storm or hurricane affecting the area every two years. The probability increases moving from the northwest corner of the state to the southeast, with the highest probability along the coast, specifically Cape Cod and the Islands. New England averages about one hurricane per decade, but there is some evidence that more and stronger hurricanes occur when Atlantic Sea-Surface-Temperatures are warm. While the science of global warming and hurricanes is evolving, present research calls for slightly stronger and wetter storms, but changes in frequency are unknown. Based on the past regional and local history of tropical cyclones, the Planning Team determined that it is **a VERY LOW** likelihood that a hurricane or tropical storm will impact the area in the future**.**

Hurricane Impacts on Webster's Key Sectors

Hurricane Exposure and Vulnerability By Key Sector[53]	
INFRASTRUCTURE	Hurricanes may impact buildings, transportation systems, and electricity and water systems. Hurricane flooding can also wash out sections of roadways and bridges, as well as cause extensive damage to public utilities and disruptions to the delivery of services. Hurricane wind can down trees and powerlines and damage buildings.
NATURAL ENVIRONMENT	A storm can cause short-term disruptions to normal ecosystem function. As the storm is occurring, flooding, or wind – or water-borne detritus can cause mortality to animals if it strikes them or transports them to a non-suitable habitat. Estuarine habitats and species are vulnerable to coastal storm surge and changing salinity of their water. In the longer term, environmental impacts can occur as a result of riverbed erosion, tree loss, or contamination of ecosystems by transported pollutants.
ECONOMY	Hurricanes and severe winter storms, can greatly impact the economy, including loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, wage loss, road repair, and rental loss due to the repair/replacement of buildings.
HUMAN	Of the population exposed, the most vulnerable include the economically disadvantaged and populations over the age of 65. Economically disadvantaged populations are more likely to evaluate the economic impact of evacuating, and individuals over 65 are more likely to face physical challenges in evacuating or to require medical care while evacuated. Health effects of extreme storms and power outages, including injury, carbon monoxide poisoning, and medical device failure.
GOVERNANCE	Increase cost of responding to climate migration, and of coordination between sending (coastal) and receiving (inland) locations. Increase cost associated with public safety agency responses due to higher magnitude and frequency of events.

[53] 2023 ResilientMA Plan

Hurricane Exposure and Vulnerability By Key Sector[53]	
	Loss or damage to City-owned buildings and infrastructure located in Storm surge inundation zones for Category 1 hurricane.

Tornadoes, High Winds and Thunderstorms

Tornadoes

A tornado is a violently rotating column of air extending from a cumuliform cloud, such as a thunderstorm, to the ground. Tornadoes are not always visible as funnel clouds because they may appear nearly transparent until they pick up dust and debris. The average tornado moves from southwest to northeast, but they can move in any direction and can suddenly change direction. The average speed of a tornado is 30 mph, but they can be stationary or move as fast as 70 mph. The strongest tornadoes have rotating winds of more than 200 mph.[54] **Table 3-15** shows the Enhanced Fujita Tornado Damage Scale developed by T. Theodore Fujita.[55]

Table 3-15
Enhanced Fujita Scale Levels and Description of Damage

EF-Scale Number	Intensity Phrase	3-Second Gust (MPH)	Type of Damage Done
EF0	Gale	65-85	Some damage to chimneys; breaks branches off trees; shallow rooted trees pushed over; sign boards damaged
EF1	Moderate	86-110	Peels surfaces off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
EF2	Significant	111-135	Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	Severe	136-165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	Devastating	166-200	Well-constructed houses leveled; structures with weak foundations blown off some distances; cars thrown and large missiles generated.

Thunderstorms

A thunderstorm is a storm with lightning and thunder produced by a cumulonimbus cloud, usually producing gusty winds, heavy rain, and sometimes hail. The NWS classifies a thunderstorm as 'severe' when it produces damaging wind gusts in excess of 58 mph (50 knots), hail that is 1 inch in diameter or larger (quarter size), or a tornado (NWS, 2013).

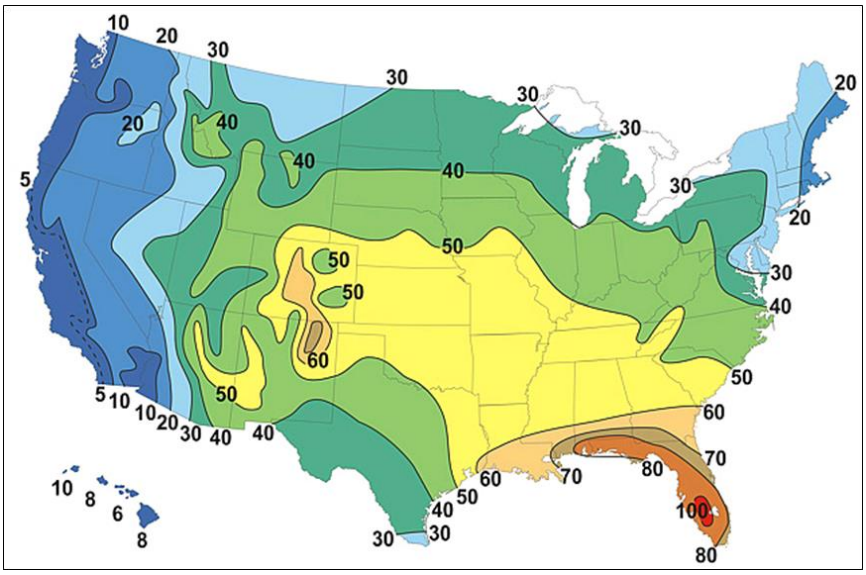
Three basic ingredients are required for a thunderstorm to form:[16]

- Moisture to form clouds and rain.

[54] Thunderstorms, Tornadoes, Lightning: Nature's Past Violent Storms, A Preparedness Guide, US Department of Commerce, NOAA, and the National Weather Service
[55] http://www.spc.noaa.gov/efscale/

- Rising unstable air warm air that can rise rapidly.
- Lift- caused by cold or warm fronts, sea breezes, mountains, or the sun's heat.

While less severe than other types of storms, a thunderstorm can lead to localized damage and represents a hazard risk for all communities in Massachusetts. An average thunderstorm is 15 miles across and lasts 30 minutes; severe thunderstorms can be much larger and longer. Southern New England typically experiences 10 to 15 days per year with severe thunderstorms (**Figure 3.14**).



Thunderstorms have masses of air, an updraft (rising air), and a downdraft (sinking air). A strong downdraft, also known as a downburst, can cause tremendous wind damage similar to a tornado. Damage from hail and lightning are secondary impacts to thunderstorms. Hail can cause damage to vehicles and crops especially when the hail stones are large in diameter.

Figure 3.14: Annual Average Number of Thunderstorm Days in the U.S

Source: NOAA NWS

Previous Occurrence and Extent

According to the NOAA National Climatic Data Center (NCDC), Worcester County experienced the following events between January 1, 1950, and December 31, 2023:

- 36 days with reported Tornado (EF0-F4 magnitude, 92 deaths and 1,254 injuries, $264.274M property damage)
- 64 days with reported Lightning (29 injuries, $3.007M property damage)
- 130 days with reported Hail (0-2-inch diameter, 2 injuries, $125K property damage, no crop damage)
- 174 days of reported High/Strong Wind (up to 65 knots, 2 deaths, 4 injuries, $1.746M property damage)
- 223 days of reported Thunderstorm Wind (up to 110 knots, 4 deaths, 8 injuries, $14.390M property damage)

Locally Identified Areas of Impact

Based on local experience and NOAA weather records, the entire planning area has experienced severe weather events due to wind, including lightning, hail, strong winds, thunderstorms and tornadoes. There is one reported tornado in Webster. In August 2018, an EF-1 tornado, with maximum winds estimated at 110 mph, passed through the downtown portion of Webster. Three buildings were condemned and at least 5 were uninhabitable. In August 2021, an EF-0 tornado, with maximum winds of 80 to 85 mph, was recorded in Webster. The tornado caused power outages from fallen trees and minor backyard damage.

Figure 3.15 illustrates the reported tornado occurrences across the Commonwealth as documented in the NOAA NCDC Storm Events Database.

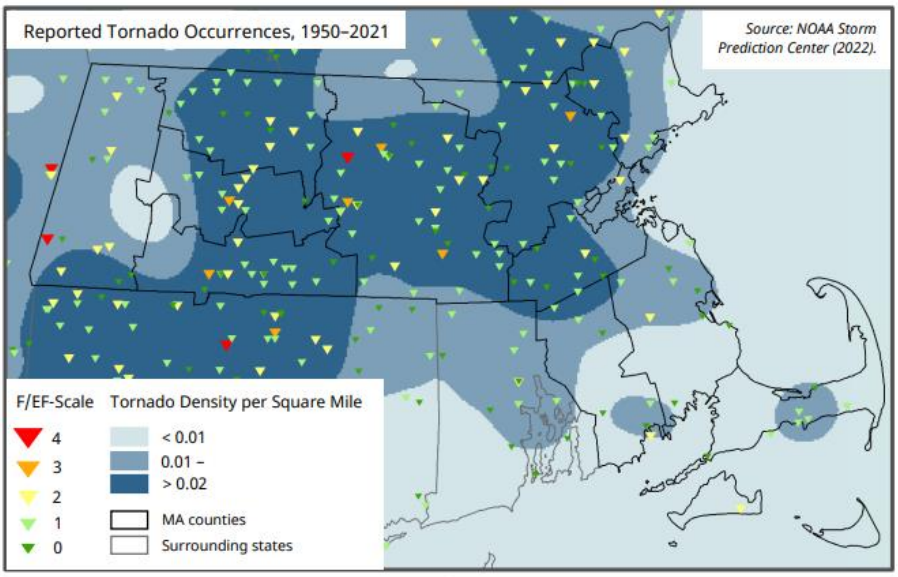


Figure 3.15: Reported Tornado Occurrences in MA, 1950-2021

Probability of Future Occurrence

Based on the past regional and local history of severe weather wind events, the Planning Team determined that it is **HIGHLY LIKELY** that a weather event due to wind, including lightning, hail, strong winds, and thunderstorms will impact the area in the future**.** The planning team thinks that it is **MEDIUM** likelihood that a weather event due to tornadoes will impact the area in the future.

Tornado Impacts on Webster's Key Sectors

Tornado Exposure and Vulnerability by Key Sector[56]	
INFRASTRUCTURE	All critical facilities and infrastructure are exposed to tornado events. Hail, rail, and wind can create flying debris and contribute to flash flooding, which can damage

[56] 2023 ResilientMA Plan

Tornado Exposure and Vulnerability by Key Sector[56]	
	water infrastructure. Power lines are likely to be damaged in a tornado area. Flying debris can cause structural damage.
NATURAL ENVIRONMENT	Direct impacts may occur to flora and fauna small enough to be transported by the tornado. Even if the winds are not sufficient to transport trees and other large plants, they may still uproot them. Material transported by tornados can also cause environmental havoc in surrounding areas, particularly if contaminating materials are introduced into the atmosphere or local water supplies. Disturbances from high winds may impact biodiversity and the composition of forests. Disruptions to the ecosystem and biodiversity can allow for invasive plant species to establish in disrupted areas.
ECONOMY	Tornado events are typically localized; however, in those areas, economic impacts can be significant. Types of impacts may include loss of business function, water supply system damage, damage to inventory, relocation costs, wage loss, and rental loss due to the repair/replacement of buildings. Recovery and clean-up can also be costly. Tornadoes can impact emergency response coordinated by first responders, law enforcement and national guard.
HUMAN	Vulnerable populations include all those who may have difficulty evacuating, including car-free households, individuals over 65, and households with young children. Individuals with limited internet or phone access may not be aware of impending tornado warnings. The potential insufficiency of older or less stable housing to offer adequate shelter from tornados is also a concern.
GOVERNANCE	Typically, very localized event but can have significant economic impact on Town resources and finances.

Extra-Tropical Storms – Nor'easters

Nor'easters are a ferocious type of northeastern coastal storm that typically occur in the winter months. The storm's name refers to the continuous strong northeasterly winds blowing in a large counter-clockwise circulation pattern around a low-pressure center, resulting in heavy snow and rain, gale force winds, rough seas, and coastal flooding that often cause shoreline erosion.[57] Impacts along the coast are typically worse than inland locations due to the additional moisture picked up from the ocean. Nor'easters may be especially damaging because they can sit stationary for several days, affecting multiple tidal cycles and producing extended periods of heavy precipitation, resulting in increased flooding, shoreline erosion, and damage to coastal infrastructure.

There is no widely used scale to classify Nor'easters, but a combination of scales including the Beaufort Scale for wind speed, Regional Snowfall Index for snowfall, and precipitation associated with a historic recurrence interval (i.e., 100-year rainfall) can be combined to evaluate the magnitude of the storm. Winter and spring flooding from Nor'easters may be exacerbated due to snow melt and frozen ground conditions. The severity of a nor'easter also depends on the time of occurrence relative to the lunar tide cycles (spring or neap tides) and during what tide stage the maximum storm surge occurs at (high tide or low tide). Depending on the metric used to measure the storm, assigned severity may also take into account the storm's societal and economic impacts.

[57] 2023 ResilientMA Plan

The level of damage in a hurricane is often more severe than a Nor'easter, but historically Massachusetts has suffered more damage from Nor'easters because of the greater frequency of these coastal storms (1 to 2 per year). As another comparison, the duration of high surge and winds in a hurricane is 6 to 12 hours while a Nor'easter can last from 12 hours to 3 days.

Nor'easters are not typically named the way that hurricanes are by the National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS), though locally coined names have been used. For example, Winter Storm Juno and Winter Storm Nemo were named by the Weather Channel in 2014 and 2015.[58] The unofficial storm naming is controversial with meteorologists because winter storms can reform more than once, making naming hard and redundant. Naming a storm may bring more attention to the event and help people with advanced emergency preparations.

Previous Occurrence and Extent

There have been 42 recorded winter storm events in Worcester County since 1950.[59] Based on data available from the National Oceanic and Atmospheric Administration (NOAA), there are 88 high-impact snowstorms, according to the NESIS scale, since 1956, which affected the Northeast Corridor. Of these, 34 storms resulted in snowfalls in Webster of at least 10 inches. Since 1954, there have been 13 Nor'easters of significant magnitude to trigger federal disaster funds (**Table 3-16**).

Table 3-16
FEMA Nor'easter Related Winter Storm Disaster Declarations (1954-2023)

Disaster #	Dates	Unofficial Storm Name	Impact
DR-546	February 6-8, 1978	"Blizzard of '78"	Coastal Storms, Flood, Ice, Snow
DR-920	December 30-November 2, 1991	"Perfect Storm"	Severe Coastal Storms
DR-975	December 11-13, 1992	Nor'easter	Winter Coastal Storm
EM-3201	January 22-23, 2005	Nor'easter	Coastal Storm, Flood, Snow
DR-1614	October 7-16, 2005	Nor'easter	Severe Storms and Flooding
DR-1701	April 15-16, 2007	Patriots Day Nor'easter	Severe Storm, Flood, Snow
DR-1959	January 11-12, 2011	Nor'easter	Severe Winter Storm and Snowstorm
EM-3343	October 29-30, 2011	"Snowtober"	Severe Storm
DR-4110	February 8-10, 2013	"Winter Storm Nemo"	Severe winter storm, Snowstorm, Flood
DR-4214	January 26-29, 2015	"Winter Storm Juno"	Severe winter storm, Snowstorm, Flood

[58] https://en.wikipedia.org/wiki/Winter_storm_naming_in_the_United_States

[59] https://www.ncdc.noaa.gov/stormevents/

Disaster #	Dates	Unofficial Storm Name	Impact
DR-4372	March 2-3, 2018	"Winter Storm Riley"	Severe winter storm, Snowstorm, Flood
DR-4379	March 13-14, 2018	"Winter Storm Skylar"	Severe winter storm, Snowstorm, Flood
DR-4651	January 28-29, 2022	"Winter Storm Kenan"	Severe Winter Storm and Snowstorm

Locally Identified Areas of Impact

The entire planning area is at risk due to Nor'easters. Webster's overall vulnerability for Nor'easters is similar to severe winter weather and flooding.

Probability of Future Occurrence

Nor'easters may occur at any time of the year; however, they are most common from September to April. Based on the historical record of the top winter storm events from 1953 to 2011, Nor'easters have an average frequency of 1 or 2 per year. Nor'easters are likely to become more intense in the future due to potential effects of climate change including increased snowfall, sea level rise, storm surge and a concentration of storm events in the coldest winter months. Nor'easters along the coast coinciding with astronomical high tides will result in increased flooding and more significant structural damages as sea level continue to rise.

Increased sea surface temperature in the Atlantic Ocean will cause air moving north over this ocean to hold more moisture. As a result, when these fronts meet cold air systems moving from the north, an even greater amount of rain and snow than normal can be anticipated to fall on Massachusetts. Although no one storm can be linked directly to climate change, the severity of rain and snow events has increased dramatically in recent years.

Based on the historic record of Nor'easters impacting Webster and the future predictions for increased severity and intensity of Nor'easters, the Planning Team determined that it is **VERY HIGHLY LIKELY** that a Nor'easter will impact the planning area in the future.

Nor'easter Impacts on Webster's Key Sectors

Nor'easter Exposure and Vulnerability by Key Sector[60]	
INFRASTRUCTURE	Flooding can also wash out sections of roadways and bridges, as well as cause extensive damage to public utilities and disruptions to the delivery of services and emergency response vehicles. Wind can take down power lines, disrupting power service and damage buildings. Damage to roofs and structures due to the weight of snow and ice.
NATURAL ENVIRONMENT	The environmental impacts of nor'easters are similar to those of hurricanes and severe winter storms. They often involve flood and wind damage, can cause direct mortality to individuals, and transform habitats. Damaged salt marshes and wetlands from severe winds, flooding, and decreased water quality, which can reduce coastal protection. Damaged forests from loss of tree cover, poor water quality, increased soil erosion, and changes in nutrient pathways from flooding.

[60] 2023 ResilientMA Plan

Nor'easter Exposure and Vulnerability by Key Sector[60]	
ECONOMY	Nor'easter events, similar to hurricanes and severe winter storms, can greatly impact the economy, including loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, wage loss, road repair, and rental loss due to the repair/replacement of buildings. Impacts on aquaculture and marine fisheries from damage to ports and processing facilities, which may prevent fisher's ability to process, land, and sell catches.
HUMAN	Of the population exposed, the most vulnerable include the economically disadvantaged and populations over the age of 65. North- and east- facing coastal areas are the most exposed to nor'easter winds and storm surge. Economically disadvantaged populations are more likely to evaluate the economic impact of evacuating, and individuals over 65 are more likely to face physical challenges in evacuating or to require medical care while evacuated.
GOVERNANCE	Increase demand for government services to address damage from extreme weather events and implement pre-disaster preparations including warning systems and evacuation procedures. Loss or damage to Town-owned buildings and infrastructure including communications located in high-wind zones.

Severe Winter Storms: Snow and Blizzard

Severe Winter Weather includes snowstorms, blizzards, and ice storms. A winter storm occurs when there is significant precipitation during periods of low temperatures. Winter storms are a combination of hazards because they often involve wind, ice, and heavy snowfall. Winter storms can occur from early autumn to late spring and include any of the following events:[61]

- Blizzards
- Blowing Snow
- Snow Squalls
- Snow Showers
- Snow Flurries
- Ice pellets and sleet
- Icing
- Coastal flooding
- Ice jams and flow
- Snow melt

[61] http://www.nws.noaa.gov/om/winter/index.shtml

Impacts from winter weather – in addition to non-passable streets and sidewalks – include downed power lines causing loss of electric power service, catch basins being buried and sometimes clogged, water service pipes bursting and shut-off valves being buried (more common when cold and windy), fire hydrants being buried by snow, older water mains bursting, and dangerous icicles forming on buildings. Snow can also block building ventilation, increasing the risk of indoor carbon monoxide poisoning and place a heavy load on roofs.

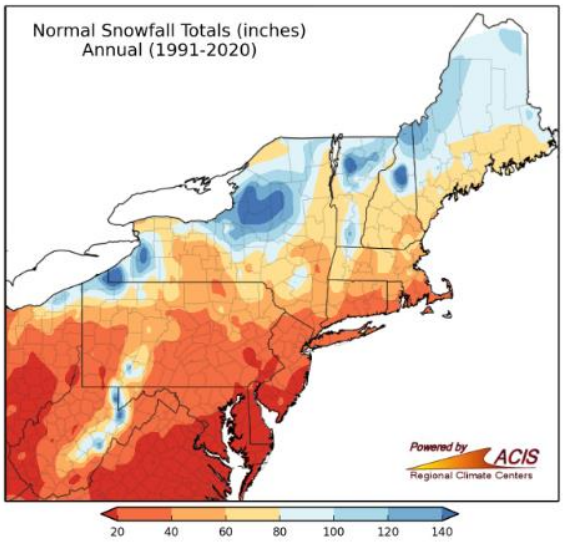


Figure 3.16: Normal Annual Snow Totals

Previous Occurrence and Extent

Snow and other forms of winter precipitation occur frequently in Webster, with a normal 30-year average between 40-50 inches per year as shown in **Figure 3.16**.[62] From 2013 to 2022, there have been 63 heavy snow days, 12 blizzard days, and two ice storm days in Massachusetts.[63]

A recent winter storm brought heavy snow to Worcester County in February 2024. According to the National Weather Service, the snowfall in Webster was recorded at 7 inches, and the highest snowfall observed was 9.3 inches in Dudley.

According to the 2023 ResilientMass Plan, the precipitation volume from the heaviest storms in the Northeast has increased by 55% since 1958. Massachusetts experiences an average of 10 to 15 days per year with severe thunderstorms.

Federally declared disasters from winter storm events in Worcester County are provided in **Table 3-17**.

Table 3-17
FEMA Winter Storm related disaster declarations (1978-2023)

Number	Disaster Type	Incident Period
DR-546	Coastal storms, flood, ice, snow	February 6-8, 1978
DR-975	Winter coastal storm	December 11-13, 1992
EM-3103	Blizzard, high winds and record snowfall	March 16, 1993
DR-1090	Blizzard	January 7-13, 1996
EM-3175	Severe Snowstorm	February 17-18, 2003
EM-3191	Severe Snowstorm	December 6-5, 2003

[62] http://www.nrcc.cornell.edu/regional/climatenorms/climatenorms.html

[63] 2023 ResilientMass Plan

Number	Disaster Type	Incident Period
EM-3201	Severe Snowstorm	January 22-23, 2005
DR-4110	Severe winter storm, snowstorm and flooding	February 8-10, 2013
DR-4214	Severe winter storm, snowstorm, flooding	January 26-29, 2015
DR-4372	Severe winter storm, snowstorm, flooding	March 2-3, 2018
DR-4379	Severe winter storm, snowstorm, flooding	March 13-14, 2018
DR-4561	Severe winter storm, snowstorm	January 28-28, 2022

Locally Identified Areas of Impact

The entire planning area is at risk for severe winter weather.

Probability of Future Occurrence

Based on the record of previous occurrences, winter storm events in Webster are high frequency events, almost certain to occur every year, as defined by the 2023 ResilientMass Plan. Higher temperatures due to climate change will increase the atmosphere's capacity to hold moisture, increasing the intensity of extreme participation events. The number of days of precipitation are expected to be more variable. Based on the past record, the Planning Team concludes that it is **VERY HIGHLY LIKELY** that severe winter weather will impact Webster in the future.

Severe Winter Storm Impacts on Webster's Key Sectors

Severe Winter Storm Exposure and Vulnerability by Key Sector[64]	
INFRASTRUCTURE	All elements of the built environment in Webster are exposed to the severe winter weather hazard.
NATURAL ENVIRONMENT	Winter storms are a natural part of the Massachusetts climate, and native ecosystems and species are well-adapted to these events. However, more extreme winter storms can result in direct mortality, habitat modification, and flooding when snow and ice melt, especially in areas with high road salt applications. Loss of tree cover, poor water quality, and increased soil erosion.
ECONOMY	Potential impacts from winter storms include loss of utilities, interruption of transportation corridors, loss of business function and loss of income during business closures. The cost of snow and ice removal and repair of roads from the freeze/thaw process can also strain local financial resources.
HUMAN	Populations over 65 are considered most susceptible due to their increased risk of injury and death from falls and overexertion and/or hypothermia from attempts to clear snow and ice or related to power failures. Residents with low incomes may not have access to housing or their housing may be less able to withstand cold temperatures (e.g., homes with poor insulation and heating supply).
GOVERNANCE	Loss or damage to Town-owned infrastructure including communications facilities. Increased demand and cost for government services for storm preparation, response, and recovery.

[64] 2023 ResilientMA Plan

3.5 GEOLOGIC HAZARDS

Earthquake

An earthquake is the movement or trembling of the ground produced by a sudden displacement of rock in the Earth's crust. The theory of plate tectonics is commonly used to explain much of the earthquake activity in the world. The plates over the Earth are in constant slow motion and this movement can cause earthquakes, most frequently at the boundary of the plates.[65]

In general, magnitude measures the size of an earthquake, while intensity measures the effects, which vary according to how far you are from the earthquake and the soils you are on.[4] Two scales are frequently used to measure earthquakes: Richter Scale measures the amount of energy released by an earthquake, or its magnitude. The Richter Scale ranges from 3.5 to 8.0, where 3.4 may be felt but does not cause damage, to an 8 which includes Great Earthquakes, and serious damage over extremely large areas. The Modified Mercalli Intensity Scale measures the intensity or impact of an earthquake on people and the built environment, and the Scale ranges from a Level 1, where the earthquake is not felt except by very few under especially favorable circumstances to a X11, with total damage: where all works of construction are damaged or destroyed, lines of sight and level are distorted, and objects are thrown into the air.[4]

Earthquake hazards have multiple impacts beyond the obvious building collapse. Buildings may suffer structural damage that may or may not be readily apparent. Earthquakes can cause major damage to 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 during an earthquake. Earthquakes can also trigger landslides.

Previous Occurrence and Extent

Massachusetts is not near tectonic plate boundaries, but it is still susceptible to earthquakes that can occur within the interior North American plate. Earthquakes centered in other parts of New England or Canada could also affect the Commonwealth. **Figure 3.17** shows an earthquake hazard map representing peek ground accelerations having a 2% probability of being exceeded in 50 years, for a firm rock site.

[65] Earthquake Causes and Characteristics, FEMA Emergency Management Institute Training Guide, https://training.fema.gov/emiweb/is/is8a/is8a-unit3.pdf

Massachusetts is located in a "moderate" earthquake zone and experiences several small tremors every year.[66] Between 1668 and 2016, 408 earthquakes were recorded in Massachusetts.[67] Most earthquakes in the northeast region tend to be small in magnitude and cause little damage; however, between 1924 and 2012 there have been 104 earthquakes measured at a magnitude of 4.5 or greater on the Richter Scale. Due to the geologic composition and rock structure in the Northeast, seismic shaking for many of these larger earthquakes were felt throughout all of New England. Most of the earthquakes originated from the La Malbaie fault in Quebec or from the Cape Ann fault located off the coast of Rockport. According to the Weston Observatory Catalog, 6,470 earthquakes have occurred in New England and adjacent areas. In 2011, a magnitude 5.8 earthquake centered in Mineral, Virginia, was felt throughout Massachusetts but caused no damage.[68] The list below includes earthquakes that affected eastern Massachusetts:

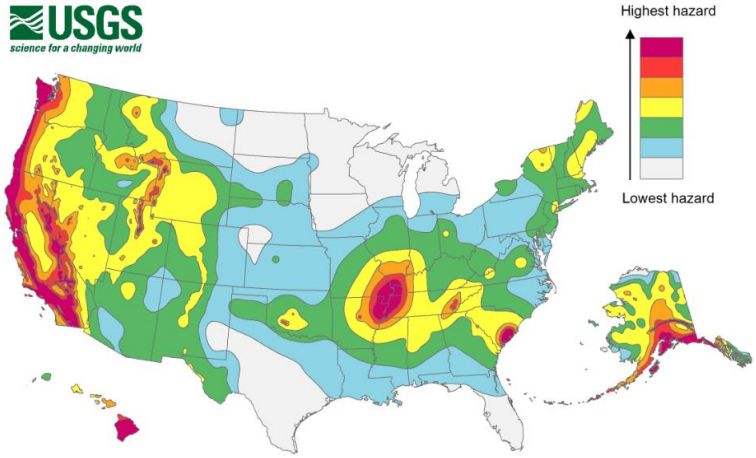


Figure 3.17: 2018 National Seismic Hazard Map

- 1755 earthquake centered off coast of Cape Ann, had an estimated magnitude of 6.2.
- August 8, 1847: No data available on the extent of hazard.
- November 27, 1852: No data available on the extent of hazard.
- December 10, 1854: No data available on the extent of hazard.
- September 21, 1876: No data available on the extent of hazard.
- May 21, 1880: No data available on the extent of hazard.
- January 21, 1903: No data available on the extent of hazard.
- April 24, 1903: No data available on the extent of hazard.
- October 15, 1907: No data available on the extent of hazard.
- January 7, 1952: Earthquake occurred off of Cape Ann and the reported felt area extended from Providence, RI to Kennebunk, ME.

[66] https://westernmassready.org/stay-informed/possible-disasters-in-ma/earthquakes/

[67] NESEC, https://nesec.org/massachusetts-earthquakes/

[68] https://www.usgs.gov/news/featured-story/10-year-anniversary-uss-most-widely-felt-earthquake

- April 24, 1925: No data available on the extent of hazard.
- January 28, 1940: Magnitude 5.0 Ossippee Mountains of New Hampshire
- October 16, 1963: Intensity VI, caused plaster to fall in a house, crack walls, dishes and windows.
- October 30, 1963: No data available on the extent of hazard.
- October 24, 1965: Slight damage to homes on Nantucket, house timbers creaked, doors, windows and dishes rattled.
- December 30, 2012: Magnitude 1.2 earthquake about 7 miles south of Gardner, MA. No extent data available.
- April 2012: A swarm of 12 or more earthquakes occurred off of the New England coast about 250 miles east of Boston. The largest of these earthquakes measured a magnitude of 4.4 on the Richter Scale. This swarm of earthquakes was of particular concern because of the major earthquake on the continental shelf further north in 1929 that produced a deadly and damaging tsunami in Nova Scotia.
- August 5, 2021: Small earthquakes with magnitude 1.4 and 1.2 were detected 10 days apart in Peabody with ground shaking but no reported damage.

There have been no earthquake declared disasters for Massachusetts. There have been no recorded earthquake epicenters within Webster and there have been no historical recorded effects on the Town associated with earthquake impacts originating from outside of Webster. FEMA has published maps with seismic design categories (SDCs) for building design and construction professionals. Most of New England is classified as SDC "B," as areas that could experience shaking of moderate intensity.[69]

Locally Identified Areas of Impact

Based on mapping by FEMA, the entire planning area is at risk from impacts due to earthquakes. Greater Boston, Cape Cod, and the Connecticut River Valley have softer soils that can amplify shaking.

Probability of Future Occurrence

Earthquakes cannot be predicted and may occur at any time of the day and any time of the year. Research has found that the probability of a magnitude of 5.0 or greater earthquake centered in New England in a 10-year

[69] https://www.fema.gov/earthquake-hazard-maps

period is about 10-15%.[70] However, for the purpose of this Plan, the 2023 ResilientMass Plan Seismic Hazard Map was used to review the probability of future occurrence as shown in **Figure 3.18**.

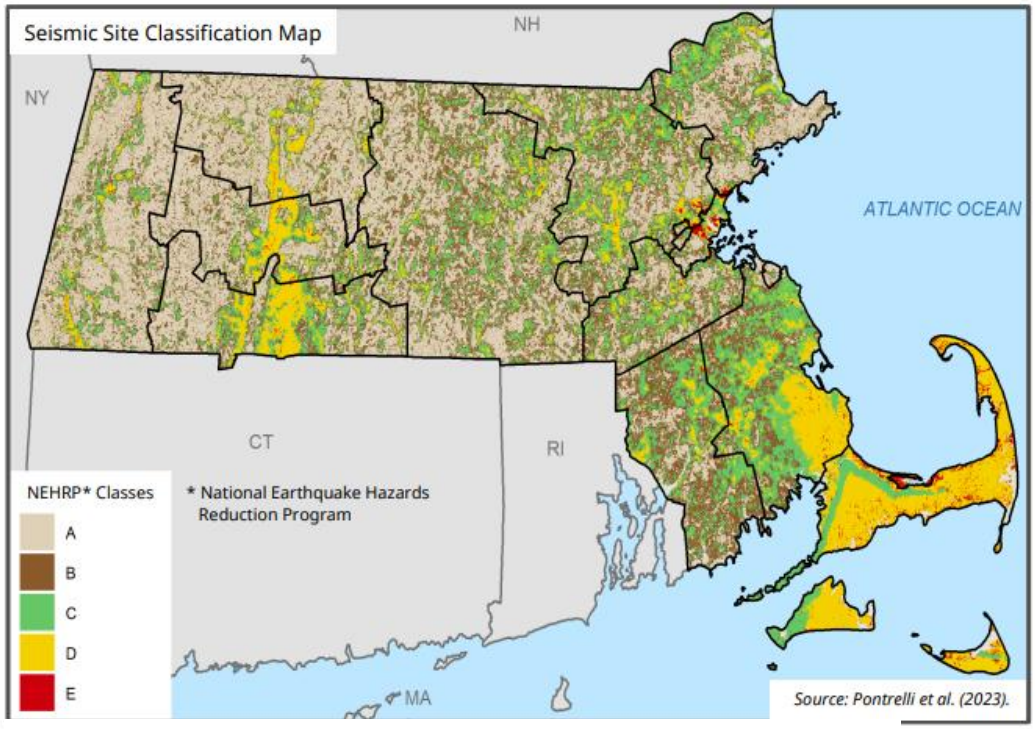


Figure 3.18: 2023 Seismic Hazard Map of Massachusetts

Softer soil types amplify and magnify ground shaking relative to nearby bedrock, which may increase building damage and losses. Figure 3.17 shows five different soil and rock types (NEHRP Classes) in Massachusetts.

Webster is similar to many communities in Massachusetts and may not be prepared for earthquakes. Although new construction under the most recent building codes will be built to seismic standards, much of the development in the Town predates the most recent building code.

The Planning Team determined that there is a **LOW** likelihood that an earthquake will impact Webster in the future and therefore are included in the Multi-Hazard Mitigation Plan.

[70] 2023 ResilientMA Plan

Earthquake Impacts on Webster's Key Sectors

Earthquake Exposure and Vulnerability by Key Sector[71]	
INFRASTRUCTURE	Impacts to buildings, transportation systems, and electricity and water systems. In addition to direct impacts, earthquakes also present a risk associated with hazardous materials releases, which have the potential to impact a production or storage facility during transportation, or a result of pipeline damage. These events could cause widespread interruption of services, as well as air and water contamination.
NATURAL ENVIRONMENT	If strong shaking occurs in a forest, trees may fall – resulting not only in environmental impacts but also potential impact to any industries relying on that forest. Disrupting the physical foundation of the ecosystem can cause species displacement and modify the species balance in that ecosystem and leave the area more vulnerable to the spread of invasive species. Damaged infrastructure may leak hazardous materials into the local environment or watershed.
ECONOMY	Earthquake losses can include structural and non-structural damage to buildings (which could include damage to architectural components like ceilings and lights, or power systems), loss of business function, damage to inventory, relocation costs, wage loss, and rental loss due to the repair/replacement of buildings.
HUMAN	Elderly and low-income populations, and people living in substandard housing, are more vulnerable to the impacts of earthquakes. This is due to their physical and financial ability to react or respond during a hazard, the location and construction quality of their housing, and the ability to be self-sustaining after an incident due to limited ability to stockpile supplies. Direct health risks include trauma-related injuries and deaths. Access to hospitals and medical intervention may be limited following severe earthquakes.

Landslide

Landslides encompass a wide variety of ground movements under the effect of gravity including rock falls, slope failures, and shallow debris flows. In the Commonwealth of Massachusetts, most landslides and mudflows are caused by a combination of unfavorable geological conditions, steep slopes, and/or excessive soil moisture.[72] Increasing the pore pressure will decrease the cohesiveness of the soil, making the land more vulnerable to outside pressures (i.e., gravity). In Massachusetts, landslides are often caused by construction-related failures, undercut slopes, and water saturation.

- Construction-related failures are caused by construction activities that weaken the slope by increasing the steepness of the bank and decreasing supporting material along the bank.
- Undercut slopes occur when streams, tides, or other water movement cut into the toe of the slope, eventually undermining.
- Slope saturation on a slope occurs after high precipitation events and drastic water level changes that augments the weight on the slope and diminishes the slope's cohesiveness.

[71] 2023 ResilientMA Plan
[72] 2023 ResilientMA Plan

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

Previous Occurrence and Extent

Landslides tend to coincide with other natural disasters such as earthquakes and floods that exacerbate relief and reconstruction efforts. As a result, landslide frequency is related to the frequency of other hazards. There have been zero federally declared landslide disasters from 1954 to 2024.[73] According to the 2023 ResilientMass, reported landslides and mudflows occur every other year. Many landslides occur unobserved in remote areas, meaning that the actual rate of occurrence is higher than the rate of observed and reported events. Landslide and mudflow risk is higher in the western portion of the Commonwealth. There is no specific data on events in Webster. There are no known problems with areas of geologic instability such as sinkholes or subsidence, or any past occurrences with landslides, sinkholes or subsidence.

Locally Identified Areas of Impact

The entire planning area is identified as having a very low risk for landslides.

Probability of Future Occurrence

Due to the low incidences of historic landslides, the Planning Team determined that it is **UNLIKELY** that landslides will impact Webster in the future. Potential effects of climate change could increase the likelihood of landslides due to slope saturation with more frequent and intense storms, and reduced vegetation cover due to the increased frequency of drought events or increased urbanization.

Landslide Impacts on Webster's Key Sectors

Landslide Exposure and Vulnerability by Key Sector[74]	
INFRASTRUCTURE	Landslides can cause damage to elements of the built environment and can interfere with travel if large enough to block or damage roads. Damage and disruption to electric transmission and utility distribution infrastructure. Reduced potability of water due to organic materials entering streams.
NATURAL ENVIRONMENT	Landslides can affect many facets of the environment, including the landscape itself, water quality, and habitat health. Transported soil may harm aquatic habitats, and mass movement of sediment may result in stripping of forests and other vegetated systems.
ECONOMY	Direct costs include the actual damage sustained by buildings, property, and infrastructure. Indirect costs from a large landslide event could include clean-up costs, business interruption, loss of tax revenues, reduced property values, and loss of productivity.
HUMAN	Populations who rely on potentially impacted roads for vital transportation needs are considered to be particularly vulnerable to this hazard. Populations who cannot quickly evacuate (people aged over 65 or under 5) and populations with mobility limitations.

[73] https://www.fema.gov/disaster/declarations
[74] 2023 ResilientMA Plan

GOVERNANCE	Increased need to prepare for and respond to damage and disruption from landslides and mudflows.

3.6 OTHER HAZARDS

Wildfire

Fire needs the right combination of heat source, fuel, and oxygen in order to ignite and thrive. Availability of fuel, weather conditions, and terrain all dictate how a fire will behave. Fires are classified as disasters when they affect people or developed areas. Fires can start from a variety of natural or anthropogenic causes. Urban fires occur in developed landscapes, where a fire has the potential to spread from one structure to another.

A wildfire is any non-structural fire that occurs in the vegetative wildlands. The 3 major classes of wildfires are surface, ground, and crown fires. A surface fire creeps slowly on the forest floor, while killing or damaging trees. Often occurring during droughts, ground fires burn organic ground cover below the forest floor. Rapidly spreading due to wind, crown fires quickly jump along the treetops.

Major urban and wildfires often result from other hazards, such as storms, earthquakes, gas leaks, transportation accidents, hazardous material spills, criminal activity, or terrorism. In contrast, small structural fires occur frequently from mundane events.

Previous Occurrence and Extent

The wildfire season in Massachusetts typically begins in late March and usually culminates in early June, following the driest live fuel moisture periods of the year. Wildfires occur most frequently during the open burning season between January 15th through May 1st of every year. Historical average of fewer than 50 fires per month during a regular fire season. As of November 28, 2022, 1,027 fires burned 2,176 acres in 2022. Significant increase in acres burned in the U.S. from 1992 (around 2 million acres) to 2020 (over 10 million acres).[75]

Locally Identified Areas of Impact

The Webster Fire Department responds to approximately 5 wildfires annually. Webster's forested areas are primarily composed of oaks, hickories, white and red pine, red maple and Atlantic white cedar. A portion of Webster's forested areas are wetlands, which has limited the ability of these fires to grow and spread.

Within the past year there were no wildfires that resulted in significant property damage.

The Northeast Wildfire Risk Assessment Geospatial Work Group under the U.S. Forest Service determined the wildfire risk based off of fuels, wildland-urban interface and topography, as shown in **Figure 3.19**[76] Webster includes areas of high risk. Based on this mapping, the planning area is at risk for wildfires.

[75] 2023 ResilientMass Plan

[76] U.S. Forest Service Fire Modeling Institute, USA Wildland Fire Potential: https://www.arcgis.com/home/item.html?id=fc0ccb504be142b59eb16a7ef44669a3

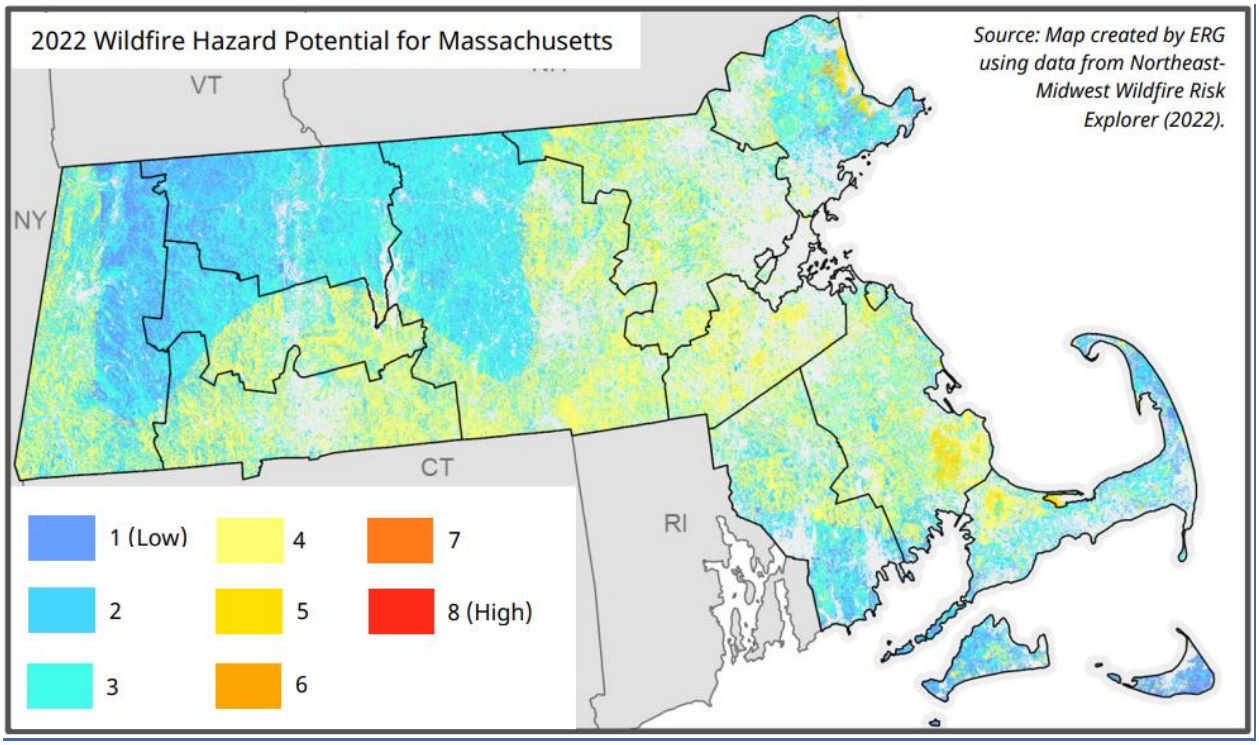


Figure 3.19: Wildfire Risk in New England

Probability of Future Occurrence

It is difficult to predict the likelihood of wildfires given the complexity of predicting the factors leading to fires. Fires will continue to present a risk, and that risk is likely to increase with potential drought impacts of climate change. Periods of hot, dry weather and more frequent lighting strikes may increase wildfires. Research has found that the frequency of lightning strikes could increase by approximately 12 percent for every degree Celsius of warming. The Planning Team determined that there is a **LOW-MEDIUM** likelihood that wildfire will impact the planning area based on the location of open space and past history of fires.

Wildfire Impacts on Webster's Key Sectors

Wildfire Exposure and Vulnerability by Key Sector[77]	
INFRASTRUCTURE	Fires can damage roads, culverts, and potentially bridges, creating conditions that block or prevent access and can isolate residents and emergency service providers. They can also damage infrastructure elements such as power and communication lines.
NATURAL ENVIRONMENT	Fire serves important ecological purposes; however, it can also cause environmental impacts. In addition to direct mortality, wildfires and the ash they generate can distort the flow of nutrients through an ecosystem, reducing the biodiversity that can be supported.

[77] 2023 ResilientMA Plan

Wildfire Exposure and Vulnerability by Key Sector[77]	
ECONOMY	Wildfire events can have major economic impacts on a community, both from the initial loss of structures and the subsequent loss of revenue from destroyed business and decrease in tourism. Costs associated with cleaning up and restoring natural and recreational areas. Costs of debris management and removal. Additionally, wildfires can require thousands of taxpayer dollars in fire response efforts.
HUMAN	All residents whose homes are located in wildfire hazard areas are vulnerable to this hazard. Smoke and air pollution from wildfires can also be a severe health hazard, especially for sensitive populations, including children, the elderly, and those with respiratory and cardiovascular diseases. Populations who are unable to evacuate quickly (people aged over 65 or under 5) and populations with mobility limitations.
GOVERNANCE	Public safety personnel and equipment costs associated with wildfire preparation and response. Increase demand for government services to address impacts from loss and damage.

Invasive Species

The Massachusetts Invasive Plant Advisory Group (MIPAG) defines invasive plants as "non-native species that have spread into native or minimally managed plant systems in Massachusetts, causing economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems." [78] These species have biological traits that provide them with competitive advantages over native species, particularly because in a new habitat they are not restricted by the biological controls of their native habitat. As a result, these invasive species can monopolize natural communities, displacing many native species and causing widespread economic and environmental damage.

The Massachusetts Invasive Plant Advisory Group (MIPAG) recognized 73 species as "Invasive," "Likely Invasive," or "Potentially Invasive." In order to be considered “invasive,” a plant species must meet the following criteria[79]:

- Be nonindigenous to Massachusetts.
- Have the biologic potential for rapid and widespread dispersion and establishment in minimally managed habitats.
- Have the biologic potential for dispersing over spatial gaps away from site of introduction.
- Have the biological potential for existing in high numbers away from intensively managed artificial habitats.
- Be naturalized in Massachusetts (persists without cultivation in Massachusetts).
- Be widespread in Massachusetts, or at least common in a region or habitat type(s) in the state.

[78] https://www.massnrc.org/mipag/
[79] https://massnrc.org/mipag/docs/MIPAG_FINDINGS_FINAL_042005.pdf#page=6

- Have many occurrences of numerous individuals in Massachusetts that have high numbers of individuals forming dense stands in minimally managed habitats.
- Be able to out-compete other species in the same natural plant community.
- Have the potential for rapid growth, high seed or propagule production and dissemination, and establishment in natural plant communities.

The damage rendered by invasive species is significant. About 3 million acres within the United States (an area twice the size of Delaware) are lost each year to invasive plants.[80] The massive scope of this hazard means that the entire Commonwealth experiences impacts from these species. Furthermore, the ability of invasive species to spread quickly allows these species to propagate over a large geographic area.[81]

Regulations on Invasive Species

Massachusetts has a variety of laws and regulations in place that attempt to mitigate the impacts of these species. The Department of Agricultural Resources (DAR) has added the plant species described to a list of noxious weeds regulated with prohibitions on importation, propagation, purchase and sale in the Commonwealth. Additionally, the Massachusetts Wetlands Protection Act (310 CMR 10.00) includes language requiring all activities covered by the Act to account for, and take steps to prevent, the introduction or propagation of invasive species.

In 2000, Massachusetts passed an Aquatic Invasive Species Management Plan, making the Commonwealth eligible for federal funds to support and implement the plan through the federal Aquatic Nuisance Prevention and Control Act. The Commonwealth also has several resources pertaining to terrestrial invasive species, such as the Massachusetts Introduced Pest Outreach Project, although a strategic management plan has not yet been prepared for these species. More specific regulations are discussed below.

330 CMR 6.0(d) requires any seed mix containing restricted noxious weeds to specify the name and number per pound on the seed label. 339 CMR 9.0 restricts the transport of currant or gooseberry species in an attempt to prevent the spread of white pine blister rust.

There are also a number of state laws pertaining to invasive species. Chapters 128, 130, and 132 of Part I of the General Laws of the state include language addressing water chestnuts, green crabs, the Asian longhorn beetle and a number of other species. These laws also include language allowing orchards and gardens to be surveyed for invasive species, and for quarantines to be put into effect, at any time.

Locally Identified Areas of Impact- Flora

The 37 plant species listed on the MIPAG website (last updated 2022) as "Invasive"[82] are listed in **Table 3-18**.

[80] Mass.gov "Invasive Plant Facts"
[81] 2023 ResilientMass Plan
[82] MIPAG, "Annotated Species Lists: Invasive": https://www.massnrc.org/mipag/invasive.htm

Table 3-18
Invasive Species (Flora) in Massachusetts

Species	Common name
Acer platanoides	Norway maple
Acer pseudoplatanus	Sycamore maple
Aegopodium podagraria	Bishop's goutweed, bishop's weed; goutweed
Ailanthus altissima	Tree of heaven
Alliaria petiolata	Garlic mustard
Alnus glutinosa	Black alder, European alder
Berberis thunbergii	Japanese barberry
Cabomba caroliniana	Carolina fanwort; fanwort
Celastrus orbiculatus	Oriental bittersweet; Asian or Asiatic bittersweet
Cynanchum louiseae	Black swallow-wort; Louise's swallow-wort
Elaeagnus umbellata	Autumn olive
Eragrostis curvula	Weeping lovegrass
Euonymus alatus	Winged euonymus, burning bush
Euphorbia esula	Leafy spurge; wolf's milk
Frangula alnus	European buckthorn, glossy buckthorn
Glaucium flavum	Sea or horned poppy, yellow hornpoppy
Hesperis matronalis	Dame's rocket
Iris pseudacorus	Yellow iris
Lepidium latifolium	Broad-leaved pepperweed, tall pepperweed
Lonicera japonica	Japanese honeysuckle
Lonicera morrowii	Morrow's honeysuckle
Lonicera x bella [morrowii x tatarica]	Bell's honeysuckle
Lysimachia nummularia	Creeping jenny, moneywort
Lythrum salicaria	Purple loosestrife
Myriophyllum heterophyllum	Variable water-milfoil; two-leaved water-milfoil
Myriophyllum spicatum	Eurasian or European water-milfoil; spike water- milfoil
Phalaris arundinacea	Reed canary-grass
Phragmites australis	Common reed
Polygonum cuspidatum / Fallopia japonica	Japanese knotweed; Japanese or Mexican bamboo
Polygonum perfoliatum	Mile-a-minute vine or weed; Asiatic tearthumb
Potamogeton crispus	Crisped pondweed, curly pondweed

Species	Common name
Ranunculus ficaria / Ficaria verna	Lesser celandine; fig buttercup
Rhamnus cathartica	Common buckthorn
Robinia pseudoacacia	Black locust
Rosa multiflora	Multiflora rose
Salix atrocinerea/Salix cinerea	Rusty Willow/Large Gray Willow complex
Trapa natans	Water chestnut

Massachusetts has also implemented biological control programs aimed at controlling the invasive species purple loosestrife (*Lythrum salicaria*), mile-a-minute vine (*Persicaria perfoliata*), hemlock woolly adelgid (*Adelges tsugae*), and winter moth (*Operophtera brumata*).

Locally Identified Areas of Impact- Fauna

According to the 2023 ResilientMass Plan, there are a number of animals that have disrupted natural systems and inflicted economic damage on the Commonwealth, as described in **Table 3-19**. Because of the rapidly evolving nature of the invasive species hazard, this list is subject to modification.

Table 3-19
Invasive Species (Fauna and Fungi) in Massachusetts

Species	Common name
Lymantria dispar	Gypsy moth (insect)
Ophiostoma ulmi, Ophiostoma himal-ulmi, Ophiostoma novo-ulmi	Dutch elm disease (fungus)
Adelges tsugae	Hemlock woolly adelgid (insect)
Cryphonectria parasitica	Chestnut blight (fungus)
Anoplophora glabripennis	Asian long-horned beetle
Cronartium ribicola	White pine blister rust (fungus)
Carcinus maenus	European green crab (crab)
Hemigrapsis sanguineus	Asian shore crab
Membranipora mambranacea	Lace Bryozoan
Codium fragile ssp. fragile	Codium
Didemnum vexillum	Tunicate
Palaemon elegans	European Shrimp
Dreissena polymorpha	Zebra mussel
Ostrea edulls	European oyster
Styela clava	Club tunicate

Probability of Future Occurrence

Because the presence of invasive species is ongoing, rather than a series of discrete events, it is difficult to quantify the frequency of these occurrences. However, increased rates of global trade and travel have created many new pathways for the dispersion of exotic species. A warming climate may place stress on colder-weather species, while allowing non-native species accustomed to warmer climates to spread northwards. Elevated atmospheric CO2 concentrations could reduce the ability of ecosystems to recover after a major disturbance, such as flood or fire. As a result, invasive species, which are often able to establish more rapidly following a disturbance, could have an increased probability of successful establishment or expansion. The Planning Team determined that it is **HIGHLY LIKELY** that invasive species will continue to impact the planning area in the future.

Invasive Species Impacts on Webster's Key Sectors

Invasive Species Exposure and Vulnerability by Key Sector[83]	
INFRASTRUCTURE	Facilities that rely on biodiversity or the health of surrounding ecosystems, such as outdoor recreation areas or agricultural/forestry operations, could be vulnerable to impacts from invasive species. As described above, water bodies such as reservoirs could be exposed to the zebra mussel if it is introduced. Invasive species can pose a threat along roadways by impeding sight lines if left unchecked.
NATURAL ENVIRONMENT	Invasive species present a significant threat to the environment and natural resources present in Webster. Research has found that competition or predation by alien species is the second most significant threat to biodiversity, only surpassed by direct habitat destruction or degradation. Native species are pressured by the spread of invasive insects and disease
ECONOMY	Invasive species are widely considered to be one of the costliest natural hazards in the United States, as invasive control efforts can be quite extensive, and these species can damage crops, recreational amenities, and public goods such as water quality.
HUMAN	Individuals who are particularly vulnerable to the economic impacts of this hazard would include all groups who depend on existing ecosystems for their economic success. People with compromised immune systems or pre-existing health conditions, children under 5, and people over 65 might be particularly vulnerable to new diseases or aggravated health problems.
GOVERNANCE	Water bodies are vulnerable to invasive species such as zebra mussels. Wildlife areas face impacts now and are vulnerable to future impacts. Invasive species pose a cost and management burden to the Town tasks with preventing or controlling the spread of these plants, animals, and fungi. The cost of restoration due to damage from invasive species can be significant.

[83] 2023 ResilientMass Plan

Section 4 Asset Inventory

Section 4 provides an inventory of the community assets that are important to the Town of Webster. This Section is broken up into three parts: a discussion of current and future land use trends, a description of the community asset categories used, and the results of the Webster Community Assets Inventory. Identifying community assets allows the Town to investigate how they will be impacted by the different natural hazards.

4.1 LAND USE TRENDS-FUTURE DEVELOPMENT

E1 a

The Town of Webster is primarily suburban, with several business districts located along major roads such as MA-16, MA-12, and MA-193. The Town is also bisected by Interstate 395, which provides convenient access via three interchanges. While the infrastructure supports mobility and potential commercial activity, new development in Webster remains limited, with isolated single-family dwellings making up the majority of new construction. This trend is expected to continue, with a few changes anticipated in the near future.

Photo 4.1: Webster Town Hall

The Town's boards and commissions are tasked with ensuring that any new development or redevelopment considers potential hazards and conforms to current regulations.

Table 4.1 shows developments that have occurred since the last plan update

Table 4-1
Town of Webster – Developments Since 2017

Development Area	Location (Address)	Type of Development	Approval Year
137 East Main Street	137 East Main Street	Commercial / Retail - Gas Station, Car Wash, Convenience Store w/ Drive Thru	Under construction.
138 East Main Street	138 East Main Street	Commercial / Retail - Gas Station, Convenience Store w/ Drive Thru	Permitting complete. Awaiting the start of demolition / construction.
PFAS - Bigelow	29 Bigelow Road	Municipal - PFAS Facility	Construction to begin soon.
PFAS - Memorial Drive	6 Memorial Beach Drive	Municipal - PFAS Facility	Construction to begin soon.
Goya Warehouse	5-9 Goya Drive	Commercial - Warehouse Expansion	Project complete.
United Medical Waste	64 Worcester Road	Commercial - Medical Waste	Construction underway.

ASSET INVENTORY

Development Area	Location (Address)	Type of Development	Approval Year
		Transfer Facility	
Curaleaf	30 Worcester Road	Commercial - Marijuana Cultivation Facility - Parking Lot Expansion	Built.
Batten Street Solar	7 Malden Drive	Utilities - Soar Field	Built.
Bigelow Road Solar	14 Harry's Way / Bigelow Road	Utilities - Soar Field	Built.
Bartlett High School	52 Lake Parkway	Municipal - Bartlett High School Renovation and Site Work	Construction underway.
Lake Parkway	Lake Parkway - whole street	Infrastructure - Complete Streets	Built.
Unified	1 Cudworth Road	Commercial - Stormwater	Built.
56 Worcester Road	56 Worcester Road	Infrastructure - Restoration of construction laydown area - stormwater	Built.
National Grid	52 Worcester Road	Infrastructure - Substation Site Improvements - stormwater	Built.
118 Thompson Road	118 Thompson Road	Residential - Duplex, stormwater	Built.
120 Thompson Road	120 Thompson Road	Residential - Duplex, stormwater	Built.
UHaul	74 Worcester Road	Commercial - Change of use; parking lot reconfiguration / stormwater	Built.
Pinewood Estates II	Oakwood Drive - Partial	Infrastructure - Modification of Definitive Subdivision Plan - Cul de sac, stormwater infrastructure	Built. Awaiting stabilization of stormwater infrastructure to issue COC and release bond.
0 Douglas Road	0 Douglas Road	Stormwater - site stabilization.	Complete.
13 Old Worcester Road	13 Old Worcester Road	Commercial - New commercial buildings and associated site work; stormwater	Under construction.
15 Old Worcester Road	15 Old Worcester Road	Commercial - contractor yard	Complete.
Webster First	44 East Main Street	Commercial - site redevelopment for new bank / parking / stormwater	Built.

ASSET INVENTORY

Potential Future Development

Based on 2022 Assessors data, there are 6,374 parcels in Webster and 354 are classified as developable land (land use codes 130, 390, or 440). Of those, there are only 14 parcels greater than 10 acres in size and potential future use as subdivisions. The Town expects to see continued slow development consistent with historical levels.

Areas that are likely to be developed or redeveloped in the future, defined for the purposes of this plan as a ten-year time horizon, are shown in **Table 4-2**.

Table 4-2
Areas Slated for Future Development within 10 Years

Development Area	Location (Address)	Type of Development	Approval Year
Juniper Lane Subdivision	Off Cranberry Road / Juniper Lane	Residential - Subdivision	16 Lots; expired subdivision permit; new property owner is working on a Planning Board submission.
Pearl Street	21-35 Pearl Street	Mixed Use - 169 Residential Units; Commercial Space	Development Team met with project engineer. No permits have been issued.
Lakeview Marine	300R Thompson Road	Commercial - parking / boats	In permitting phase with Planning Board. Order of Conditions issued by Conservation Commission.
Intersection Redesign	395 / Route 16 Interchange	Infrastructure - new traffic circle and other traffic flow improvements	75% design phase.
Samuel Slater Experience	31 Ray Street	Educational - new parking lot, stormwater management, other site work	Permitting phase with Planning Board.
12 Harry's Way	12 Harry's Way	Commercial - new building and site work.	Permitting phase with Planning Board.
Webster Cannabis	4 Town Forest Road	Commercial - conversion of a portion of the Hazard Marine building into a retail marijuana store; site work for parking	Permitting phase with Planning Board.
0 Rosemont Street	0 Rosemont Street	Residential / Religious - New church, rectory, 26 bed refugee facility and associated parking and site work	Permitting phase with Planning Board.

As shown **Table 4-3**, changes in population patterns and land use and development will influence each profiled hazard's impacts.

B2a

Table 4-3
Impacts from Population and Land Use

Hazards	Changes in Population Patterns	Changes in Land Use and Development
Inland Flooding	Populations who rely on potentially impacted roads for vital transportation needs. Populations who cannot quickly evacuate (people aged over 65 or under 5) and populations with mobility limitations. Approximately 20% of the Webster population is 65 years and older.	New development areas may produce additional flooding due to the addition of impervious surfaces.
Droughts	Approximately 20% of the Webster population is 65 years and older.	All new development will create more demand for water resources. Drought conditions decrease urban tree cover, increase stream on public water utilities.
Landslides	Should not be impacted by population changes.	Existing land use regulations will help keep development out of landslide prone areas.
Extreme Temperatures	Approximately 20% of the Webster population is 65 years and older.	All new developments will exacerbate heat island effect if the development includes tree removal and adding impervious surfaces such as asphalt and roofs.
Wildfires	Elderly individuals located near forested areas, including Mine Brook Wildlife Management Area, are exposed to potential brush fires.	Development in or adjacent to a forested or brushland area can lead to a higher risk of wildfire.
Invasive Species	Should not be impacted by population changes.	Should not be impacted by changes in land use and development.

Hazards	Changes in Population Patterns	Changes in Land Use and Development
Hurricanes and Tropical Storms	Approximately 20% of the Webster population is 65 years and older.	Should not be impacted by changes in land use and development.
Severe Winter Storms	Approximately 20% of the Webster population is 65 years and older.	Should not be impacted by changes in land use and development.
Tornadoes	Approximately 20% of the Webster population is 65 years and older.	Should not be impacted by changes in land use and development.
Other Severe Weather	Approximately 20% of the Webster population is 65 years and older.	Should not be impacted by changes in land use and development.
Earthquakes	Approximately 20% of the Webster population is 65 years and older.	Elderly and low-income populations, and people living in substandard housing, are more vulnerable to the impacts of earthquakes.

4.2 COMMUNITY ASSET INVENTORY

FEMA defines a community asset as anything that is important to the character and function of a community. Community assets can be split up into four different categories: People, Economy, Built Environment, and Natural Environment.

The People category includes populations that are more vulnerable to disaster (e.g., elderly, children, visiting populations), densely populated areas, and societal assets such as cultural and historical resources. Economy is included because economic drivers are a major part of disaster recovery. Community assets in the Economy category can include major employers, commercial centers, and locations providing food, medical supplies and building materials. The Built Environment is the largest category and includes existing structures, infrastructure (transportation and utilities) and critical facilities important for disaster response and evacuation (e.g., police, fire stations and medical facilities). The Natural Environment category is meant to capture any natural resources important to the community's character, economy (tourism, recreation, and the protection of clean air and water), and ecosystem services (e.g., wetlands providing flood storage).

Table 4-4 summarizes the community asset categories included in FEMA guidelines, relevant critical sectors within each category, and the general characteristics that describe why these assets are important to include in a hazard mitigation plan.

Table 4-4

Community Asset Categories and Characteristics

FEMA Community Asset Categories	Critical Sectors	Characteristics of Community Assets
People- Societal Assets	Schools, Vulnerable Populations, Cultural and Historical Facilities	Areas of greater population density, or population with unique vulnerabilities or less able to respond and recover during a disaster.
Built Environment- Infrastructural Assets	Critical Municipal Facilities, Water, Wastewater, Energy, Stormwater, Transportation	Critical facilities are necessary for a community's response to and recovery from emergencies, infrastructure critical for public health and safety, economic viability, or for critical facilities to operate.
Economic Assets	Seaport, Business District, Food and Medical Supplies, Building Supplies	Major employers, primary economic sectors and commercial centers where loss or inoperability would have severe impact on the community and ability to recover from a disaster.
Environmental Assets	Natural Resources	Areas that provide protective function to reduce magnitude of hazard impact and increase resiliency. Areas of sensitive habitat that are vulnerable to hazard events, protection of areas that are important to community objectives, such as the protection of sensitive habitat, provide socio-economic benefits, etc.

Each Community Asset Category was further subdivided into 35 subtypes (e.g., schools, open space, employers, municipal facility) to provide a more comprehensive picture of resources. In total, 117 site-specific community assets were identified within the four FEMA categories. The most prevalent subtype identified was religious institutions, followed by medical facilities, and buildings that house special needs populations.

Maps 1-4 provided at the end of **Section 4** shows the locations of all identified community assets relative to FEMA flood zones, and a detailed list of assets is provided in **Tables 4-5**, **4-6, 4-7 and 4-8** below. **Section 5 Vulnerability Risk Assessment** provides a discussion on **natural hazards that may impact** the community assets, and their vulnerability. [

People – Societal Assets

Societal assets in Webster include historic and cultural resources, buildings that support community needs, vulnerable populations, and gathering places (**Table 4-5 and Map 1**). Strengths include the central information and support resources at the Webster Public Library and Senior Center, and the strong community social network and neighbor-helping-neighbor arrangement in Town. The Town has over 400 documented historic resources including buildings, landscapes, cemeteries and structures[84]. Vulnerabilities include the need for active communication and outreach to environmental justice populations in Webster, particularly through the Council on Aging, to ensure effective hazard mitigation.

[84] Massachusetts Cultural Resource Information System (MACRIS)- www.mhc-macris.net

ASSET INVENTORY

Photo 4.2 Webster Park Avenue Elementary School

Table 4-5
Societal Assets in Webster

Asset ID	Name	Subtype
98	Christopher Heights	Assisted Living
145	Mount Zion Cemetery	Cemetery
146	St Anthony Cemetery	Cemetery
163	Lakeside Cemetery	Cemetery
86	Guild of St Agnes	Child Care
103	Adams, Kimberly	Child Care
104	Ms. Dawn Neighbor School	Child Care
105	Desrosiers, Rebecca	Child Care
106	Ditullio, Leona M.	Child Care
110	May, Jane	Child Care
111	Rose, Patricia Silva De	Child Care
112	Skladzian, Melanie	Child Care
147	Torres-Ortiz, Naomi	Child Care
148	Roselund, Crystal	Child Care
149	Bigwood, Shaunna	Child Care
150	Reloso, Erin	Child Care

ASSET INVENTORY

Asset ID	Name	Subtype
151	Carranza, Milagro	Child Care
152	Park Ave Elementary AS Program	Child Care
153	Guzman, Linda	Child Care
154	De Castro Anjos, Claudete	Child Care
155	Swift, Laurie	Child Care
156	Maldonado, Glorimar	Child Care
157	WCAC Headstart - Webster	Child Care
158	Mercado Laracuente, Madeline	Child Care
73	Webster Senior Center	Elder Housing
85	Slater Estates	Elder Housing
87	Webster Manor Rehabilitation	Elder Housing
90	55 + Housing - Concord Ct	Elder Housing
77	Housing Authority	Federal Office
95	Indian Ranch	Food
160	Fenner Hill Schoolhouse	Historic
161	World War II Memorial Athletic Fieldhouse	Historic
164	Slater and Howard Woolen Company Worker Housing	Historic
166	World War II Memorial Beach Bath House	Historic
167	Corbin, B. A. Shoe Factory Building	Historic
171	Joslin - Marble House	Historic
172	North Village Schoolhouse	Historic
74	Public Library	Library
89	Brookside Rehab & Healthcare	Medical Facility
99	Harrington Healthcare	Medical Facility
138	May Street Playground	Public Open Space
139	Slater Street Playground	Public Open Space
140	Berthold Field	Public Open Space
141	Starzec Field	Public Open Space
142	Slater Memorial Park	Public Open Space
143	Memorial Field	Public Open Space
144	George Street Playground	Public Open Space

ASSET INVENTORY

Asset ID	Name	Subtype
78	Bartlett High School	School
79	Park Avenue Elementary School	School
80	Webster Middle School	School
81	St. Joseph School	School
97	All Saints Academy	School
88	Sitkowski School Apartments	Shelter
94	Mobile Home Park	Shelter
127	Group Home	Shelter
100	Life Skills	Special Needs
128	Webster Lake Island Residents	
178	Price Chopper	Food

Built Environment – Infrastructural Assets

Infrastructural sectors with vulnerabilities or strengths in Webster consist of flood control infrastructure, transportation corridors, critical facilities, and communications and energy (**Table 4.6 and Map 2**). Infrastructural asset strengths include the flood control provided by the Mill Brook Canal, Storage Pond, Nipmuck Pond, Recreation Pond, Club Pond, Webster Lake, Pool, Fish and Game Pond Dams, evacuation routes used by both Town residents and adjacent communities, and emergency services provided by the Fire and Police Departments. Vulnerabilities are that the evacuation routes are subject to flooding, many culverts in Town are undersized and overtop under major rainfall conditions, and back-up power is not available at the public library.

ASSET INVENTORY

Photo 4.3: Webster Fire Department

Table 4-6
Infrastructural Assets in Webster

Asset ID	Name	Subtype
82	Water/Cell Tower	Communication Utility
83	Substation - Worcester Rd	Communication Utility
93	Cell Tower - Goya Drive	Communication Utility
69	EMS	Emergency Services
70	DPW - Highway	Federal Office
71	DPW - Water/Sewer Dept.	Federal Office
67	Webster Fire Department - HQ	Fire Station
68	Webster Fire Department	Fire Station
72	Webster Town Hall	Municipal Facility
84	Transfer Station - Cudworth Rd	Municipal Facility
66	Webster Police Department	Police Station
118	Police Station	Police Station
75	Webster Hydro Electric Co	Power Utilities
126	Fish and Game Pond Da,	Public Open Space

ASSET INVENTORY

Asset ID	Name	Subtype
91	Bridge - Mai St/MA-12	Transportation
92	Bridge - Pleasant St	Transportation
119	Mill Brook Canal Dam	Water Utility
120	Storage Pond Dam	Water Utility
121	Nipmuck Pond Dam	Water Utility
122	Recreation Pond Dam	Water Utility
123	Club Pond Dam	Water Utility
124	Webster Lake Dam	Water Utility
125	Pool Dam	Water Utility
165	Webster Pumping Station	Water Utility
189	Webster Pumping Station	Water Utility

Environmental Assets

Environmental assets identified in Webster as having vulnerabilities or strengths are hydrologic resources, open space and conservation lands, parks and recreational areas, and lands used for forestry and agriculture. (**Table 4-7 and Map 3**). Strengths include the space provided for community functions on parks and recreation land, the recreation, tourism, and environmental education opportunities provided by conservation lands, and water and air purification provided by forested lands. Vulnerabilities of environmental assets are flooding due to storm events, high groundwater, and erosion and other impacts to resource areas and public safety concerns related to environmental justice populations[85].

[85] Town of Webster Municipal Vulnerability Preparedness (MVP) Plan 2022

Photo 4.4: Webster Lake Boat Ramp

Table 4-7
Environmental Assets in Webster

Asset ID	Name	Subtype
115	Well Island	Environmental
116	Long Island	Environmental
117	Cobble Island	Environmental
180	Little Island	Environmental
182	Goat Island	Environmental
183	Freemans Brook	Environmental
184	Mine Brook	Environmental
185	Sucker Brook	Environmental
186	Browns Brook	Environmental
187	Mill Brook	Environmental
188	French River	Environmental
181	Strip Island	Federal Office
191	Lakeside Boat Ramp	Natural Resource
96	Douglas Forest RV Resort	Public Open Space
137	Memorial Beach	Public Open Space

ASSET INVENTORY

Economic Assets

Economic assets in Webster include food, medical, financial, and the major employers (**Table 4-8 and Map 4**). Vulnerabilities include the location of essential services in the flood zone and potential loss of services in the event of a major flood.

Photo 4.5: Goya Foods of Massachusetts (telegram.com)

Table 4-8
Economic Assets in Webster

Asset ID	Name	Subtype
114	Moog, Inc	Dry Goods
175	Aubuchon Hardware	Dry Goods
131	AA Transportation Co	Employer
132	Goya Foods of Massachusetts	Employer
133	Old Dominon Trucking	Employer
134	Industrial Packaging	Employer
135	Curaleaf	Employer
136	United Medical Waste	Employer
174	Un1F1ED2 Global Packaging Group	Employer
190	Old Dominion Trucking	Employer
130	Webster Federal Credit Union	Financial Services

ASSET INVENTORY

Asset ID	Name	Subtype
179	Santander Bank	Financial Services
178	Price Chopper	Food
129	MAPRE USA Corp	Insurance
101	Animal Hospital of Webster	Medical Facility
102	Webster Lake Veterinary Hospital	Medical Facility
176	CVS Pharmacy	Medical Facility
177	Walgreens Pharmacy	Medical Facility
173	Hometown Band	Financial Services

Asset ID	Asset Name	Sub Category
73	Webster Senior Center	Elder Housing
74	Public Library	Library
77	Housing Authority	Federal Office
78	Bartlett High School	School
79	Park Avenue Elementary School	School
80	Webster Middle School	School
81	St. Joseph School	School
85	Slater Estates	Elder Housing
86	Guild of St Agnes	Child Care
87	Webster Manor Rehabilitation	Elder Housing
88	Sitkowski School Apartments	Shelter
89	Brookside Rehab & Healthcare	Medical Facility
90	55 + Housing - Concord Ct	Elder Housing
94	Mobile Home Park	Shelter
95	Indian Ranch	Food
97	All Saints Academy	School
98	Christopher Heights	Assisted Living
99	Harrington Healthcare	Medical Facility
100	Life Skills	Special Needs
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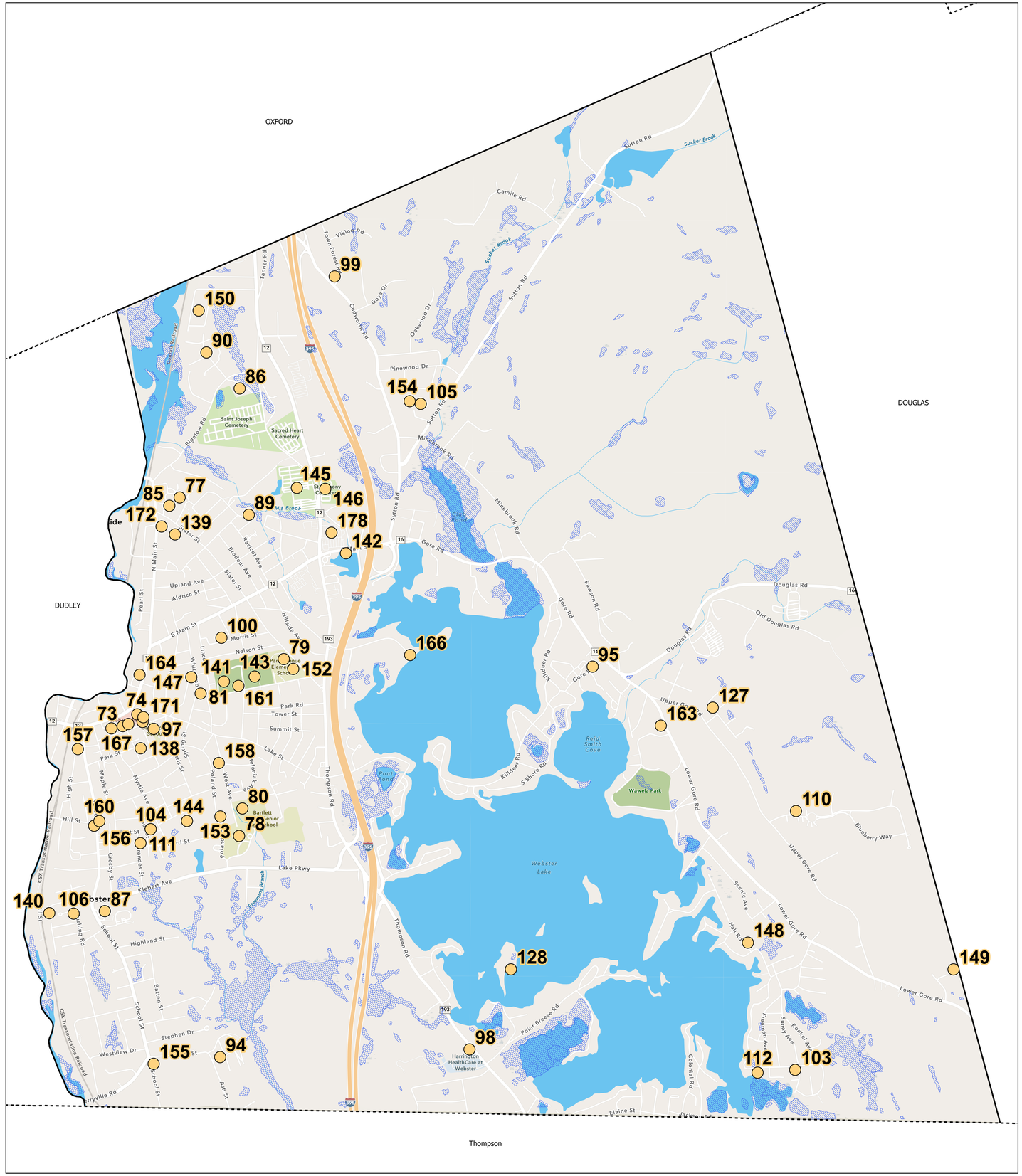
104	Ms. Dawn NeighborSchool	Child Care
105	Desrosiers, Rebecca	Child Care
106	Ditullio, Leona M.	Child Care
110	May, Jane	Child Care
111	Rose, Patricia Silva De	Child Care
112	Skladzian, Melanie	Child Care
127	Group Home	Shelter
128	Webster Lake Island Residents	Housing
138	May Street Playground	Park/ Playground
139	Slater Street Playground	Park/ Playground
140	Berthold Field	Park/ Playground
141	Starzec Field	Park/ Playground
142	Slater Memorial Park	Park/ Playground
143	Memorial Field	Park/ Playground
144	George Street Playground	Park/ Playground
145	Mount Zion Cemetery	Cemetary
146	St Anthony Cemetery	Cemetary
147	Torres-Ortiz, Naomi	Child Care
148	Roselund, Crystal	Child Care
149	Bigwood, Shaunna	Child Care
150	Reloso, Erin	Child Care
151	Carranza, Milagro	Child Care
152	Park Ave Elementary AS Program	Child Care
153	Guzman, Linda	Child Care
154	De Castro Anjos, Claudete	Child Care
155	Swift, Laurie	Child Care
156	Maldonado, Glorimar	Child Care
157	WCAC Headstart - Webster	Child Care
158	Mercado Laracuente, Madeline	Child Care
160	Fenner Hill Schoolhouse	Historic
161	World War II Memorial Athletic Fieldhouse	Historic
163	Lakeside Cemetery	Cemetary
164	Slater and Howard Woolen Company Worker Housing	Historic
166	World War II Memorial Beach Bath House	Historic
167	Corbin, B. A. Shoe Factory Building	Historic
171	Joslin - Marble House	Historic
172	North Village Schoolhouse	Historic
178	Price Chopper	Food

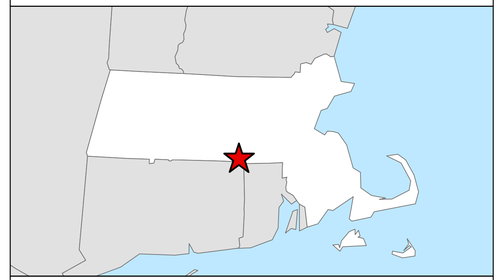


Community Assets Inventory: Societal Resources

LEGEND

- Societal Resource
- Water Bodies
- MassDEP Inland Wetlands
- Town Boundary

LOCUS MAP



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NOTES

Community Asset locations based on data provided by Town of Webster, April, 2024

Webster, MA

Map 1

November 2024

Tighe&Bond

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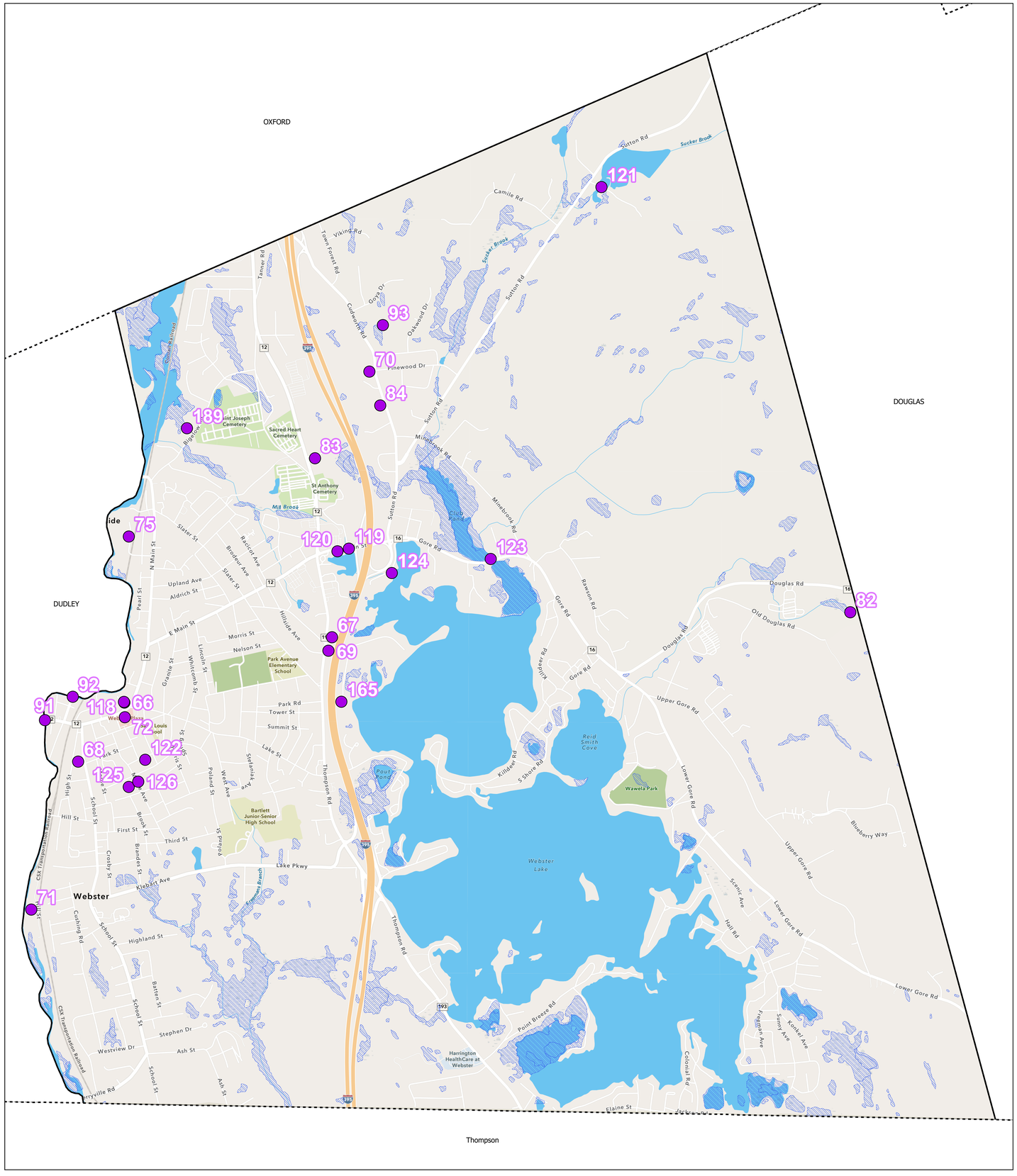
W-1548

Asset ID	Asset Name	Sub Category
66	Webster Police Department	Police Station
67	Webster Fire Department - HQ	Fire Station
68	Webster Fire Department	Fire Station
69	EMS	Emergency Services
70	DPW - Highway	Federal Office
71	DPW - Water/Sewer Dept.	Federal Office
72	Webster Town Hall	Municipal Facility
75	Webster Hydro Electric Co	Power Utilities
82	Water/Cell Tower	Communication Utility
83	Substation - Worcester Rd	Communication Utility
84	Transfer Station - Cudworth Rd	Municipal Facility
91	Bridge - Mai St/MA-12	Transportation
92	Bridge - Pleasant St	Transportation
93	Cell Tower - Goya Drive	Communication Utility
118	Police Station	Police Station
119	Mill Brook Canal Dam	Water Infrastructure
120	Storage Pond Dam	Water Infrastructure
121	Nipmuck Pond Dam	Water Infrastructure
122	Recreation Pond Dam	Water Infrastructure
123	Club Pond Dam	Water Infrastructure
124	Webster Lake Dam	Water Infrastructure
125	Pool Dam	Water Infrastructure
126	Fish and Game Pond Dam	Water Infrastructure
165	Webster Pumping Station	Water Utility
189	Webster Pumping Station	Water Utility

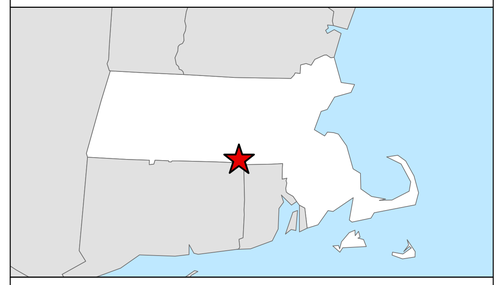


Community Assets Inventory: Infrastructural Resources

LEGEND

- Infrastructure Asset
- Water Bodies
- MassDEP Inland Wetlands
- Town Boundary

LOCUS MAP



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NOTES

Community Asset locations based on data provided by Town of Webster, April, 2024

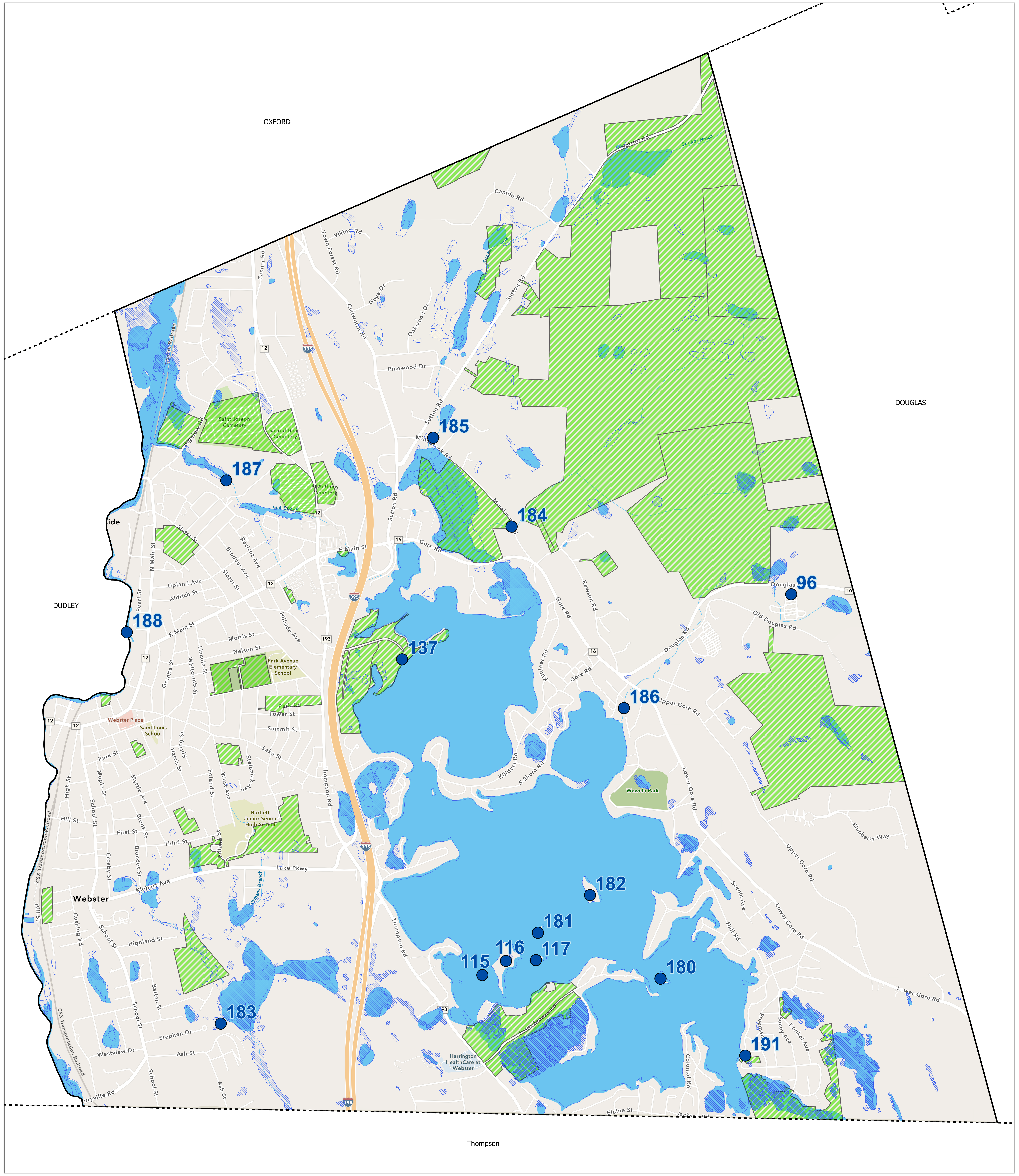
Webster, MA

Map 2

November 2024

Tighe&Bond

Asset ID	Asset Name	Sub Category
96	Douglas Forest RV Resort	Public Open Space
115	Well Island	Natural Resource
116	Long Island	Natural Resource
117	Cobble Island	Natural Resource
137	Memorial Beach	Public Open Space
180	Little Island	Natural Resource
181	Strip Island	Natural Resource
182	Goat Island	Natural Resource
183	Freemans Brook	Natural Resource
184	Mine Brook	Natural Resource
185	Sucker Brook	Natural Resource
186	Browns Brook	Natural Resource
187	Mill Brook	Natural Resource
188	French River	Natural Resource
191	Lakeside Boat Ramp	Natural Resource



Community Assets Inventory: Environmental Resources

LEGEND

- Environmental Assets
- Water Bodies
- MassDEP Inland Wetlands
- Town Boundary

LOCUS MAP

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NOTES

Community Asset locations based on data provided by Town of Webster, April, 2024

Webster, MA

Map 3

November 2024

Tighe&Bond

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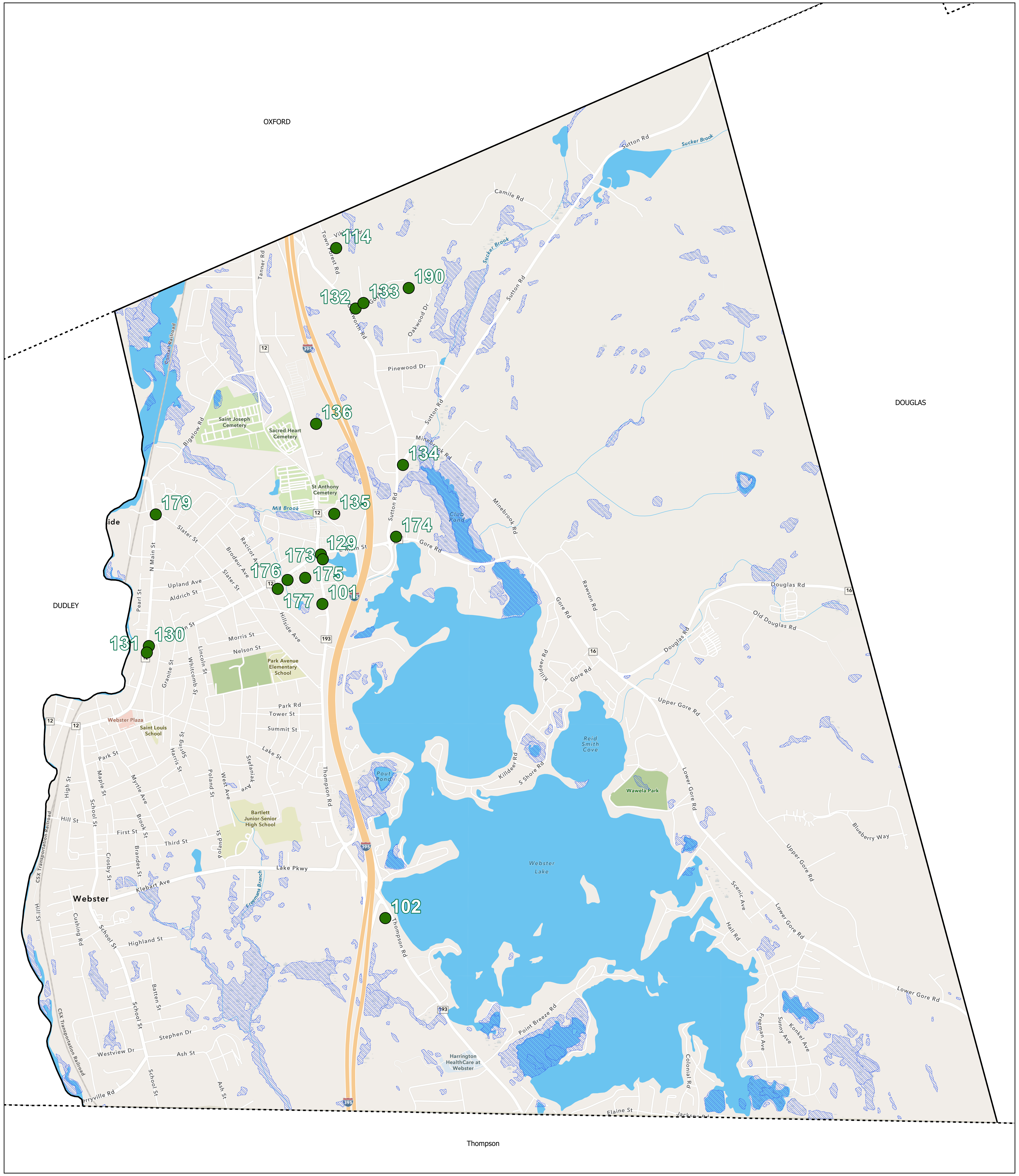
W-1548

Asset ID	Asset Name	Sub Category
101	Animal Hospital of Webster	Medical Facility
102	Webster Lake Vetrinary Hospital	Medical Facility
114	Moog, Inc	Employer
129	MAPRE USA Corp	Insurance
130	Webster Federal Credit Union	Financial Services
131	AA Transportation Co	Employer
132	Goya Foods of Massachusetts	Employer
133	Old Dominon Trucking	Employer
134	Industrial Packaging	Employer
135	Curaleaf	Employer
136	United Medical Waste	Employer
173	Hometown Band	Financial Services
174	Un1F1ED2 Global Packaing Group	Employer
175	Aubuchon Hardware	Employer
176	CVS Pharmacy	Medical Facility
177	Walgreens Pharmacy	Medical Facility
179	Santander Bank	Financial Services
190	Old Dominion Trucking	Employer



Community Assets Inventory: Economic Resources

LEGEND

- Economic Asset
- Water Bodies
- MassDEP Inland Wetlands
- Town Boundary

LOCUS MAP

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0 2,400 Feet

NOTES

Community Asset locations based on data provided by Town of Webster, April, 2024

Webster, MA

Map 4

November 2024

Tighe&Bond

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W-5002

Section 5 Vulnerability Assessment

5.1 VULNERABILITY ASSESSMENT OVERVIEW

B2a

The purpose of the vulnerability assessment is to estimate the extent or magnitude of potential damages from natural hazards of varying types and intensities. Section 5 ties together the hazards identified in Section 3 and the community assets identified in Section 4 to estimate the potential losses that Webster could experience during a natural hazard event. There are three assessments included in **Section 5** of the 2024 Webster Multi-Hazard Mitigation Plan:

1. **HAZUS-Multi Hazards (MH) Assessment:** Hazus is a standardized hazard assessment methodology created by FEMA. This vulnerability assessment includes estimation of damages for hurricanes and earthquakes using HAZUS-MH software and is described in **Section 5.2**.

2. **Exposure Assessment of Parcels and Building Flood Risk**: This assessment was completed using GIS analysis for existing flooding and future flooding due to climate change for the entire Town, assessor's data, and the most recent FEMA Flood Zones. This assessment is described in **Section 5.3.1**.

3. **Vulnerability Assessment for Future Development:** This assessment was completed for areas slated for future development, identifying natural hazard risk from hurricanes, earthquakes, and flooding, and is further described in **Section 5.3.2.**

4. **Vulnerability of Community Assets: This** assessment was completed to determine whether critical facilities and other identified community assets could be exposed to flooding. The assessment looks at existing flood conditions based on approved FEMA Flood Zones. This assessment is described in **Section 5.4**.

5. **Vulnerability of Historic Properties:** This assessment was completed using GIS mapping to provide a high-level assessment of all historic properties located in Webster with Flood Exposure. This assessment is described in **Section 5.5**.

5.2 HAZUS-MH FOR HURRICANES AND EARTHQUAKES

Methodology

Hazus-MH (multiple-hazards) is a computer program developed by FEMA to estimate losses due to a variety of natural hazards. For the purposes of this Plan, Hazus-MH 6.1 was used to estimate losses due to hurricane winds and earthquakes.

The following overview of Hazus-MH is taken from the FEMA website:[86]

"Hazus is a nationally applicable standardized methodology that estimates potential losses from earthquakes, hurricane winds, and floods. FEMA developed Hazus under contract with the National Institute of Building Sciences (NIBS).

[86] For more information on the Hazus-MH software, go to https://www.fema.gov/hazus

Hazus uses state-of-the-art 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 earthquakes, hurricane winds, and floods on populations.

Estimating losses is essential to decision-making at all levels of government, providing a basis for developing mitigation plans and policies, emergency preparedness and response, and recovery planning."

There are three modules included with the Hazus-MH Version 6.1 software: hurricane wind, flooding, and earthquakes, which reference 2020 Census Data. 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 in this Plan 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 community, 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 considered a starting point for understanding potential damages from hazards.

Results - Hurricanes

For the purposes of this Plan, a Category 2 and Category 4 storm were 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 5-1** below presents estimated damages from hurricanes.

Table 5-1
Estimated Damages from Hurricanes

Damage Categories	100-Year Storm Event	500-Year Storm Event
Building Characteristics		
Estimated total square footage of buildings	16,281,000	16,281,000
Building Damages		
% of buildings with no damage	91.6%	72.8%
% buildings sustaining minor damage	7.4%	20.9%
%of buildings sustaining moderate damage	0.9%	5.1%
% of buildings sustaining severe damage	0.04%	0.5%
% of buildings destroyed	0.03%	0.7%
Population Needs		
# of households displaced	8	77
# of people seeking short-term public shelter	4	44
Debris		
Building debris generated (tons)	1,937	8,075
Tree debris generated (tons)	5,749	12,847

Damage Categories	100-Year Storm Event	500-Year Storm Event
Damages (Millions of dollars)		
Total direct economic losses from building damage	$21.2	$102.4
***No Category 4 or 5 hurricanes have been recorded in New England. However, a Category 4 hurricane was included to help the community understand the impacts of a hurricane beyond what has historically occurred in New England.**		

Results - Earthquakes

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. 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: an earthquake with a 5.0 magnitude and 10 fault depth and a 7.0 with 10 fault depth. **Table 5-2** below presents estimated damages from earthquakes.

Table 5-2
Estimated Damages from Earthquakes

Damage Categories	Magnitude 5	Magnitude 7
Building Characteristics		
Estimated total number of buildings	2,888	2,888
Building Damages		
# of buildings with no damage	1,450	3
# of buildings sustaining slight damage	868	56
# of buildings sustaining moderate damage	441	496
# of buildings sustaining extensive damage	106	825
# of buildings completely damaged	23	1,508
Population Needs		
# of households displaced	48	1,775
# of people seeking short-term public shelter	19	700
Debris		
Debris generated (tons)	34,000	297,000
Damages (Millions of dollars)		
Total direct building economic loss	$224.4	$1,640.6

5.3 EXPOSURE ASSESSMENT OF PARCEL AND BUILDING FLOOD RISK

An exposure assessment was used to estimate losses due to flooding. An exposure assessment is a geospatial evaluation where geographic areas and hazards are mapped together to show the physical relationship to one another. The geospatial relationship can also be used to quantify the number and value of parcels and structures within the hazard area to estimate losses. For flooding, a GIS-based exposure analysis was used to identify potential losses of developed properties that fall within Webster's 100-year and 500-year flood zones, as defined in **Section 3.2.1**.

The analysis for current conditions was based on Webster's 2022 Assessor's data and the most recent FEMA approved flood zones (6/21/2023). Future flooding with climate change was evaluated using the extent of the 500-year flood zone.

Existing Flood Vulnerability Assessment Methodology

The vulnerability assessment will identify locations that are at risk from flooding inundation based on current and historic flooding extent as defined by the FEMA 100-year flood plain and predicted future flooding extent using the 500-year flood. The following assumptions were used in the methodology.

Risk of Current Flooding- FEMA Analysis for Developed Parcels, and Community Assets

The current risk of flooding is evaluated based on the most recent approved FEMA flood zones (dated 6/21/2023).

- Developed properties and Community Assets currently within the FEMA mapped A, and AE zones were identified, including areas with defined base flood elevations or inundation depth.
- Determination of risk was based on whether a mapped building is within the zone, not based on whether the parcel boundary alone is within the zone.
- The total building value for A zone parcels is included in Table 5.3. Individual properties and land use classifications were not identified for privacy.
- Community Asset located within FEMA flood zones were also identified

Risk of Future Flooding- FEMA Analysis for Developed Parcels

- Developed properties currently within the FEMA mapped X500 zones will be identified following the same selection criteria as described above for A zone analysis.

Results

Out of a total of 5,678 developed parcels in Webster, about 17% (993) are located in the FEMA 100-year flood plain. Based on the building value of the developed property, estimated potential losses for inland areas are tabulated in **Table 5-3**.

Table 5-3
Flooding Vulnerability in Webster Current Development- Building Values

FEMA 100-year Flood Zone	Number of Developed Parcels within the Zone	Building Value
A	79	$5,3425,300
AE	914	$277,404,200
Total	993	$330,829,500

A total of 88 of Webster's developed parcels are located within inland or riverine 500-year flood hazard areas. Out of a total of 5,678 developed parcels in Webster, less than 2% (88) are located within the FEMA 500-year flood plain. Based on the building value of the developed property, estimated potential losses for inland areas are tabulated in **Table 5-4**.

Table 5-4
Future Flooding Vulnerability in Webster Current Development- Building Values

FEMA 500-year Flood Zone	Number of Developed Parcels within the Zone	Building Value
X500	88	$15,245,800

The total value of developed properties located within flood zones is over $346 million dollars.

5.4 FUTURE DEVELOPMENT IN HAZARD AREAS

E1a

The Town of Webster has identified parcels where development has been proposed, is underway or is expected to occur in the future. **Table 5-5** shows the relationship between these parcels and three mapped hazards. Based on 2022 Assessors data, there are 6,374 parcels in Webster and only 354are classified as developable land (land use codes 130, 390, or 440). Of those, there are only 14 parcels greater than 10 acres in size and potential future use as subdivisions. The Town expects to see continued slow development consistent with historical levels of approximately 50 new units per decade. Locations for future development include a redevelopment of 21-35 Pearl Street for 169 residential units, a 16-lot subdivision, and a new church, rectory and refugee center in addition to several commercial projects., one of which is a water dependent use and located in the flood zone.

Future development proposals will need to meet all floodplain zoning requirements and careful attention must be paid to preventing potential drainage issues.

Table 5-5: Natural Hazard Risk in Areas Slated for Future Development within 10 years

Area of Future Development	Earthquakes	Hurricanes	Flood zone
138 East Main Street- Commercial	x	x	
Juniper Lane 16 lot subdivision	x	x	
21-35 Pearl Street 169 residential Units and Commercial Space	x	x	
Lakeview Marine- Commercial	x	x	x
Route 395/ Route 16 new traffic circle	x	x	
12 Harry's Way- Commercial	x	x	
4 Town Forest Road- Commercial	x	x	
0 Rosemont Street- Church, rectory and 26 bed refugee facility	x	x	

B2

5.5 IMPACTS TO COMMUNITY ASSETS

Methodology

One hundred seventeen community assets were identified by Webster in **Section 4**. The assets were selected due to their importance to the character and function of the Town of Webster. Community assets include critical facilities or infrastructure, centers of economic importance, locations that serve vulnerable

populations, areas of unique cultural value or natural areas that provide a hazard mitigation-based ecological function. A vulnerability assessment for community assets was completed including both current flood impacts.

Similar to the method used for parcel-based flood vulnerability, the assessment for community assets is based on whether the parcel includes the community asset within the modeled area.

Present and Historic Risk

The first step in the analysis was the evaluate current and historic flood risk based on FEMA map locations. Out of the 116 assets, 17 were identified within the 100-year flood zone. An additional l6 community assets were located in the 500-year flood zone. See below **Table 5-6**.

Table 5-6: Present Flood Risk for Community Assets

Community Asset #	Community Asset	FEMA 100-year Floodplain	FEMA 500-year Floodplain
129	MAPRE USA Corp Insurance	X	
173	Hometown Band Financial	X	
115	Well Island	X	
117	Cobble Island	X	
184	Mine Brook	X	
185	Sucker Brook	X	
186	Browns Brook	X	
187	Mill Brook	X	
181	Strip Island	X	
191	Lakeside Boat Ramp	X	
119	Mill Brook Canal Dam	X	
120	Storage Pond Dam	X	
123	Club Pond Dam	X	
124	Webster Lake Dam	X	
142	Slater Memorial Park	X	
128	Webster Lake Island Residents	X	
178	Price Chopper	X	
116	Long Island		X
180	Little Island		X
75	Webster Hydro Electric Co		X
121	Nipmuck Pond Dam		X
165	Webster Pumping Station		X
112	Skladzian, Melanie Child Care		X

Section 6 Capability Assessment

6.1 EXISTING PLANNING MECHANISM

C1a

The Planning Team updated available information regarding existing planning mechanisms to mitigate natural hazards in the Town of Webster. **Table 6-1** summarizes the local plans that include hazard mitigation elements. The complete FEMA Capabilities Worksheets are included in **Appendix C**.

Table 6-1
Summary of Current Planning Efforts related to Hazard Mitigation

E2c

Date of Plan	Status	Plan Name	Department Responsible for Update
2014	Needs Update	Town of Webster Master Plan	Board of Selectmen/ Town Administrator
2019	Update in Progress	Webster Open Space and Recreation Plan	Board of Selectmen
2018	Update in Progress	Webster Natural H Plan	Board of Selectmen
2023	Completed	Webster MS4 Stormwater Management Plan	Conservation Commission
2024	Completed	Comprehensive Emergency Management Operations Plan	Emergency Management
2019	Completed	Capital Improvement Plan- includes capital assets used in mitigation	Board of Selectmen
2021	Completed	Municipal Vulnerability Preparedness (MVP) Plan	Board of Selectmen
2024	In Progress	Community Preservation Plan	Webster Historical Commission

Webster Master Plan- this comprehensive plan was used to identify major topics and future development plans in Webster. The plan summarizes conditions and outlines goals for land use, housing, economic development, natural/cultural resources, public facilities, and traffic/circulation. Based on community input, the plan was valuable for identifying critical infrastructure and for understanding the future goals and implementation timetables that relate in many cases to natural hazards.

Webster Open Space and Recreation Plan (OSRP) – The Town of Webster OSRP and plan updates are approved by EEA. The purpose of the plan is to guide future management and development of the Town's Recreation and Open Space assets. The Plan is a continuation and expansion of the goals and objectives outlined in Webster's previous Open Space and Recreation Plan (2009) and is consistent with the Town of Webster Master Plan (2014). The goals of this Plan will serve as a guide for Webster in its future efforts to protect open space and provide recreation resources for its citizens and include protection of undeveloped space, preservation of natural resources, and link recreation areas.

Massachusetts State Hazard Mitigation and Climate Action Plan – This plan was used to ensure that the towns HMP was consistent with the State Plan

Webster MS4 Stormwater Management Plan – The plan was developed in 2019 and is annually reviewed to assess improvements to the Town Stormwater infrastructure.

Webster Comprehensive Emergency Management Plan (CEMP) – The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies. The plan contains important information regarding flooding, hurricanes, tornadoes, dam failures, earthquakes, and winter storms. Therefore, the CEMP is a mitigation measure that is relevant to all of the hazards discussed in this plan. Webster Emergency Management maintains the plan on an ongoing basis.

Capital Improvement Plan sets the community's investment goals for major public infrastructure projects and other improvements for a five-year period. The plan is updated every year.

Municipal Vulnerability and Preparedness Plan – The MVP plan summarized the planning process implemented in 2022 to assist the town in planning for and implementing strategies to adapt to predicted changes due to a warming climate. The plan included a series of workshops where stakeholders collaborated on identification of community strengths and weaknesses with climate change and prioritized actions to address vulnerabilities and protect strengths.

Community Preservation Plan – The Webster Historical Commission is in the process of completing the Webster Community Preservation Plan. Once completed, the Community Preservation Committee will be able to make recommendations to the Town meeting for acquisition, creation and preservation of important open space and ways to strengthen and enhance Websters' historic character through cooperative actions.

EXISTING ADMINISTRATIVE CAPACITY

C1b

The Town has multiple staff members and volunteer boards that assist with planning, development, and implementation of hazard mitigation. The roles are further described below.

E2c

The **Planning Board** and **Building Commissioner** enforce local bylaws and State Building Code to ensure that development in Webster conforms to all applicable codes, regulations and Town bylaws, which ensures that buildings are safe for people to inhabit and minimizes the risk of natural hazards from development. In addition, the Planning Board is responsible for guiding the process of zoning amendments and updating the Master Plan. In addition, the Planning Board and Building Inspector have the authority to regulate development through project approval (Planning Board) and enforcement (Building Inspector). Their actions are guided by the Town's bylaws. The Town's Flood Plain Overlay District regulations are enforced through the Zoning Bylaw.

The **Board of Selectmen** assists with dissemination of information in the event of an emergency through social media and the Town's website.

The **Highway Department** is responsible for maintenance programs to reduce risk including tree trimming, maintenance of the municipal stormwater drainage system, cleaning of public waterways as needed, brush clearing, and clearing snow from major arterial routes to ensure access for emergency vehicles. The DPW collaborates with the **Police Department** to enforce residential parking bans during snow removal.

The **Webster Fire Department** supports all aspects of the Hazard Mitigation Plan, with an emphasis on community preparedness and emergency response. The Emergency Management Director (EMD) role is served by the Fire Chief, who implements the CEMP and provides education on community preparedness, disseminates information to the public in the event of a possible natural disaster through CodeRED and reverse 911.

The **Fire Department** participates in the review of all the new development in town**.** The Department issues a limited number of burn permits based on fire hazard levels, air quality, and wind conditions, and participates in mutual aid agreements with surrounding communities, regional agencies, and MEMA to provide and receive assistance during emergency events.

The Tree Warden addresses problem trees and works with utility providers to trim trees that may impact utilities.

The **Central Massachusetts Regional Planning Commission (CMRPC)** develops regional plans and goals for the Town of Webster.

The **National Grid** perform regular inspections and coordinate with the **Tree Warden** to perform tree maintenance to cut branches threatening power lines and overhead utilities.

The Massachusetts **Department of Conservation and Recreation** performs periodic inspections of the West Meadow Dam in accordance with the requirements of the **Massachusetts Office of Dam Safety.**

6.2 EXISTING FUNDING MECHANISMS

The Town has multiple funding mechanisms in place or planned to help fund mitigation projects.

- Capital Improvement Funding has been used for flood control projects, Town equipment and facility improvements.
- The Town charges user fees for water and sewer, including new hookups to maintain these utilities and expand services.
- The Town has utilized funding from a variety of State and Federal sources to fund hazard mitigation projects. The Town received a FEMA grant to complete the 5-year HMP update.
- The Town may incur debt through general obligation bonds and/or special tax bonds
- Community Development Block Grant have been used to improve municipal assets.

6.3 EDUCATION AND OUTREACH METHODS

Due to the abundant natural resources in Webster, there are a number of environmental non-profits that meet regularly and provide public education regarding environmental resources and potential concerns in Town. Numerous Town Associations such as the Webster Lake Association and The Last Green Valley, provide the public with information on conservation efforts and natural resources protection.

Other Agencies involved in education and outreach include:

- Open Space and Recreation Committee - information on natural resource protection.

- Conservation Commission - information on wetlands protection. Public meetings are held when bacteria is found in recreational water bodies.
- Fire Department - annual Fire Prevention week at all school, SAFE schools and SAFE seniors. Medical programs and Fire Prevention Presentations are held with community groups upon request.
- Police Department - contracts with Onsolve to license its CodeRED high-speed notification system. This allows Webster officials the ability to quickly deliver messages to targeted areas or the entire town in the event of an emergency.

The Public is informed about publicly funded mitigation projects/programs by the following methods:

- Town website – Planning Department and Conservation Commission webpages
- Local cable broadcast
- Social media

6.4 EXISTING MITIGATION MEASURES

Flood Hazard Mitigation Measures

C2 a

Participation in the National Flood Insurance Program (NFIP)

The Town of Webster 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 https://nfipservices.floodsmart.gov/reports-flood-insurance-data. Data for Webster is presented in **Table 6-2** including data through June 30, 2024. NFIP statistics were not provided in 2018 plan, however there are no repetitive losses in Webster, MA,

Table 6-2
Flood Insurance Categories

Flood Insurance Categories	Values
Flood insurance policies in force (as of 6/30/2024)	11
Coverage amount of flood insurance policies	$2,815,000
Premiums paid	$8.779
Total losses (all losses submitted regardless of the status)	6
Total payments (Total amount paid on losses)	$1,471

According to FEMA records on non-repetitive NFIP claims, data on the 6 losses were not available. The Building Department is a lead agency.

Identification of Repetitive Loss Areas – There were no reported repetitive losses in Webster.

Land Acquisition for Open Space –The Webster Open Space and Recreation Plan serves as a tool for development, land acquisitions, and preserving land.

Highway Department Operations/Maintenance Activities – The Highway Department maintains and cleans all drainage structures including catch basins and culverts on a regular schedule. The Highway Department periodically maintains the Town's waterways, including trash and debris removal. The following specific activities serve to maintain the capability of the drainage system through the reduction of sediment and litter build up and proper maintenance and repair.

- **Tree Trimming** – Tree trimming is conducted as needed throughout Town.
- **Culvert Maintenance** – Maintain existing culverts through regular maintenance and (in some cases) beaver controls. The Department is replacing culverts where needed to allow for adequate stormwater flow.
- **Drainage System Maintenance** – The Highway Department and Planning Department ensure effective municipal drainage facilities.
- **Street Sweeping –** Street sweeping is performed April-November throughout Town.
- **Catch Basin Maintenance –** Catch basin cleaning is conducted April-November.

Tree Maintenance Activities – The Highway Department works with utility providers to trim trees that may impact utility lines.

Communications Equipment – The Town and the Fire Department utilize multiple methods to broadcast information about emergency conditions including state emergency broadcasting methods, CodeRED, Reverse 911, community list serve email, social media, and posting to the Town website.

Emergency Power Generators – Water & Sewer Department and the Fire Department each have multiple portable generators that can be used to run pumps, lighting and supply limited emergency power for small scale activities. Each Department is responsible for the maintenance of the generators.

Webster Regulations and Ordinances

A summary of the Town bylaws and State and Federal regulations that provide natural hazard mitigation benefits is provided in **Table 6-3**.

Table 6-3
Regulations, Bylaws and Policies That Provide Natural Hazard Mitigation

Regulatory Category	Applicable Section	Flood Mitigation Benefit	Lead Agency
Zoning Bylaw Special Districts	Floodplain District	Requires all development to be in compliance with state building code requirements for construction in floodplains. Webster has a Floodplain District (§650-22) in its Zoning Bylaws.	Building Commissioner / Zoning Enforcement Officer with support from the Planning Department and Conservation Agent
Zoning Bylaw Special Districts	Lake Watershed Protection District	The purpose of the Lake Watershed Protection District is to protect, preserve and maintain the existing and potential ground and surface water resources of the Town of Webster and the watershed of Webster Lake. Webster should	Building Commissioner/ Planning Board

Regulatory Category	Applicable Section	Flood Mitigation Benefit	Lead Agency
		continue active enforcement of this bylaw (§650-24).	
Local Regulations & **Bylaw**s	Chapter 570 – Stormwater Management	Planning Boards or Conservation Commissions review projects for consistency with MA DEP standards. This helps ensure adequate on-site retention and recharge. Webster does have a Stormwater Management Bylaw (570). Draft Stormwater Regulations to be reviewed and voted upon by the Planning Board in 2025.	Building Commissioner/ Planning Board/ Conservation Commission
Local Regulations & Bylaws	Chapter 636 – Local Wetlands Protection Bylaw	Local bylaws building upon the State's Wetlands Protection Act and Regulations. These add regulatory oversight provisions for development within the jurisdictional buffer zone, adding increased attention to alteration of wetlands and the opportunity to preserve capacity and quality. Webster does not have a Wetlands Bylaw	Conservation Agent/ Conservation Commission
State Regulations	DCR Dam Safety Regulations	The state has enacted dam safety regulations mandating inspections and emergency action plans. All new dams are subject to state permitting.	
100-Year Flood Zone	Federal Regulations	FEMA regulations require elevations at about 100-year flood level for new and substantially improved residential structures located in the floodplain.	
Fire Code	Fire Department ISO ratings	ISO4 rating	Fire Department

Wind Hazard Mitigation Measures

Massachusetts State Building Code – The Town enforces the Massachusetts State Building Code whose provisions are generally adequate to protect against most wind damage. The code's provisions are the most cost-effective mitigation measure against high wind 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 – The Highway Department Plan ensures routine maintenance of trees to reduce likelihood of vegetative debris in response to storm events. The Department conducts roadside mowing from April-November to remove juvenile trees. Tree trimming (take-downs and clearing dead branches) takes place as needed. Webster should work with its electrical utility, National Grid, to coordinate a more systematic tree trimming program.

Winter Storm

Residential Parking Bans – Parking bans are put in place to enable effective snow removal from residential streets. Notices are sent through the Town's Code Red System. The Police Department is responsible for enforcement.

Snow Removal – The Highway Department is responsible for clearing snow from Town owned roads and to ensure access for Emergency Access Vehicles. Additional equipment and personnel are needed for effective and timely snow clearing during storm events.

Wildfire Hazard Mitigation Measures

Permits Required for Outdoor Burning – The Fire Department Chief limits burn permits based on fire hazard levels, air quality, and wind speed and direction. Currently, notification on the day of the burning is communicated to the Fire Department through voicemail.

Mutual Aid Agreements – The Fire Department is part of county- and state-wide fire mobilization mutual aid agreements to provide and receive assistance during emergency events.

Limited Brush Clearing – The Highway Department frequently provides brush clearing to provide access to Emergency Service vehicles.

Public Education – Increases awareness by educating property owners on actions that they can take to reduce risk to property by developing and distributing an educational pamphlet on Fire Safety and Prevention (SAFE PROGRAM and SENIOR SAFE) and wildfire prevention and posting on Fire Department Facebook Page.

Geologic Hazard Mitigation Measures

Massachusetts State Building Code – The State Building Code contains a section on designing for earthquake loads (780 CMR 1613.0). Section 1613 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 1604.5 sets up seismic hazard exposure groups and assigns all buildings to one of these groups. Group III includes buildings that have a substantial public hazard due to occupancy or use and Group IV are those buildings having essential facilities that are required for post-earthquake recovery, including fire, rescue and police stations, emergency rooms, power-generating facilities, and communications facilities.

Multi-Hazard Mitigation Measures

There are several mitigation measures that impact more than one hazard. These include the Comprehensive Emergency Management Plan, the Massachusetts State Building Code, Public Alerts and Emergency Warning Systems. A summary of all the hazard mitigation measures are provided in **Table 6-4**.

Comprehensive Emergency Management Plan (CEMP) – Every community in Massachusetts is required to have a CEMP. 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. Worcester has just recently updated the CEMP.

Massachusetts State Building Code- The Massachusetts State Building Code is enforced by the Building Commissioner, including many detailed regulations regarding wind loads, earthquake resistant design, flood-proofing, and snow loads.

CodeRED and Reverse 911 - The Town utilizes CodeRED to provide residents with critical information quickly in a variety of situations, such as severe weather, unexpected road closures, missing persons and evacuation of buildings or neighborhoods.

Local Emergency Planning –In Webster, the Fire Chief serves as the Emergency Management Director (EMD) and the Assistance Deputy Fire Chief serves as the Assistant EMD. The EMD works to minimize negative effects of local, regional, or national emergencies and disasters of natural or man-made origins on the citizens of Webster. This is accomplished by assessing and mitigating against known hazards as well as preparing thoroughly for, responding appropriately to, and pro-actively assisting with recovery from such events. The Webster EMD coordinates with adjacent Towns and regional planning agencies, attends MEMA, FEMA, and Homeland Security meetings.

Southern Worcester County Communications Center (SWCCC) – The SWCCC serves the Town s of Webster and Dudley and is a state-of-the-art facility located in the Webster Police Department**.** Regional dispatch for the Town of Webster and Dudley is provided by a minimum of two Public Safety Telecommunicators 24/7/365. The Center handles an average of 90 calls for service per day or 32,500 calls for service per year.

E2c

Table 6-4
All Hazard Mitigation Measures

Hazard	Mitigation Measure
Flood-Related	The Town participates in the National Flood Insurance Program and adopted the FIRM maps. There are 11 policies in force. The Town actively enforces floodplain regulations. 2. The Town cleans catch basins annually. 3. Emergency pump deployment 4. Drainage infrastructure performed using MA Chapter 90 funds. 5. Subdivision Rules for drainage 6. Floodplain Overlay Districts 7. Site Plan Review for stormwater and erosion 9. Stormwater Management regulations are included in the Zoning Ordinance.
Dams	1. DCR Dam Safety Regulations 2. State permits required for dam construction 3. Comprehensive Emergency Management Plan addresses dam safety.

CAPABILITY ASSESSMENT

Hazard	Mitigation Measure
Wind-Related	1.Town capabilities for tree trimming 2. Eversource maintains trees within its power line corridors 3. The Town enforces the MA State Building Code.
Winter-Related	1. Pretreatment with brine and standard snow operations with 50/50 salt/sand mix.
Brush Fire-Related	1. No outdoor burning allowed 2. The Fire Department reviews all subdivision development plans.
Geologic-Earthquake	1. The Town enforces the MA State Building Code. 2. Evacuation plans in CEMP 3. Shelters and backup facilities available
Multi Hazard	1. The Town enforces the MA State Building Code. 2. Comprehensive Emergency Management Plan has been updated 3. Town utilizes Worcester County Emergency Incident Command Unit. 4. Webster is a member of the Worcester County and Boston Area Police Emergency Radio Network (BAPERN). 6. Most critical facilities Webster have fixed generators including Town Hall, Water, Sewer, Police, Fire, Highway Department and Emergency Management. 7. Multi department review of all developments and sub-divisions.

Section 7 Mitigation Strategy

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E2-c

7.1 MITIGATION GOALS AND OBJECTIVES

The Planning Team noted that there were no goals in the 2018 plan. The 2024 Hazard Mitigation Plan includes specific plan goals, objectives and addresses additional community assets including the environment, economy and cultural facilities.

2024 Webster Hazard Mitigation Goals

1. **Public Health and Safety**

Recommended Goal: Protect the health and safety of the public.

Objectives:

- Promote cost-effective hazard mitigation actions that protect and promote public health and safety from all hazards.
- Encourage people to be prepared before, during and after a hazard event by providing neighborhood training events and neighbor-helping-neighbor based on the MEMA model.
- Ensure that services related to public health (e.g., sanitation, water, debris removal, hospital access, and emergency services) can function during and after a hazard.
- Ensure that evacuation can happen in an organized and efficient manner.
- Minimize secondary impacts from hazards, such as the release of pollutants. (e.g., fuel spills into waterbodies).
- Promote public communications including materials and voice communications.

2. **Protection of Existing Infrastructure**

Recommended Goal: Protect existing properties and structures

Objectives:

- Provide resources for residents and businesses to make their buildings and properties more disaster resistant.
- Educate the public on measures they can take to protect their property from natural hazards.
- Maintain existing drainage to protect residential and municipal areas from flooding.
- Ensure that critical facilities and infrastructure are protected from hazards.
- Ensure that future development / redevelopment does not make existing properties more vulnerable to hazards.

3. **Protection of Natural Resources**

Recommended Goal: Increase resilience by protecting and enhancing natural resources.

Objectives:

- Protect natural areas (including open space, wetlands, green spaces) to ensure that they buffer impacts to developed areas during a natural disaster.
- Protect and increase tree canopy.
- Manage stormwater with Low Impact Development techniques (provide capital resources to encourage investment in LID upgrades).
- Optimize techniques to provide safe lakes and river access to avoid erosion.

4. **Emergency Response to Hazards**

Recommended Goal: Ensure that essential services can function during and after a hazard event.

Objectives:

- Ensure that critical infrastructure is protected from natural hazards.
- Ensure that key service emergency personnel and employees can get into and around to provide services.
- Promote effective and consistent interdepartmental communication.
- Maintain the Comprehensive Emergency Management Plan (CEMP).

5. **Planning for Future Development**

Recommended Goal: Minimize hazard risks for future development

Objectives:

- Encourage future development in areas that are not prone to natural hazards.
- Enforce existing zoning and building regulations and make updates to address known hazards and risks.
- Ensure that future development meets federal, state, and local standards for preventing and reducing the impacts of natural hazards including impacts due to climate change on natural and historic resources.

6. **Regional Cooperation**

Recommended Goal: Work regionally to mitigate impacts from natural hazards and to respond to and recover from hazard events.

Objectives:

- Continue to participate in regional efforts.
- Cooperate with other agencies, communities, and private entities.
- Understand priorities and capabilities of other entities to allow for resource-sharing, mutual aid, and enter into memoranda of understanding (MOU).

7. **Hazard Awareness**

Recommended Goal: Maintain Hazard Awareness

Objectives:

- Track and compile hazard related data.
- Understand the potential implications of climate change on the frequency and extent of natural hazard events and incorporate that knowledge into hazard mitigation efforts.
- Maintain publicly available information on natural hazard risks in the Town
- Integrate hazard mitigation into other Town initiatives and plans.
- Encourage local agencies representing vulnerable populations to work with the Town to participate in development of the hazard mitigation plan.
- Plan outreach events educating the broader community on hazard risks and community vulnerability, and the benefits of hazard mitigation.

8. **Hazard Mitigation Resources**

Recommended Goal: Determine priorities for directing resources for hazard mitigation and response.

Objectives:

- Maintain adequate staff resources and facilities.
- Prioritize mitigation projects.
- Continue to include mitigation projects in the Capital Improvement Plan.
- Pursing various funding sources.
- Encourage private property owners to implement measures to protect their own properties.

7.2 MITIGATION ACTIONS

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What is Hazard Mitigation?

Hazard mitigation means to permanently reduce or alleviate the losses of life, injuries, and property resulting from natural hazards through long-term strategies. These long-term strategies include planning, policy changes, education programs, infrastructure projects, and other activities.

Hazard mitigation measures can generally be sorted into six categories, according to FEMA's Local Multi-Hazard Mitigation Planning Guidance:

1. **Prevention:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built, and direct public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.

2. **Property Protection:** Modification or removal of existing buildings or infrastructure to protect them from a hazard. Examples include acquisition, elevation, relocation, structural retrofits, flood proofing, storm shutters, and shatter resistant glass.
3. **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the potential risks from hazards and ways to mitigate them. Such actions include outreach projects, real estate disclosure requirements, hazard information centers, and school-age and adult education programs.
4. **Natural Resource Protection and Green Infrastructure:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems. These actions include low impact development, sediment and erosion control, stream corridor restoration, watershed management, urban forest and vegetation management, and wetland restoration and preservation.
5. **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include storm water controls (e.g., culverts), floodwalls, seawalls, retaining walls, and safe rooms.
6. **Emergency Services Protection:** Actions that will protect emergency services before, during, and immediately after an occurrence. Examples of these actions include protection of warning system capability, protection of critical facilities, and protection of emergency response infrastructure.

Funding to implement hazard mitigation projects may come from a variety of federal, state, and local sources. FEMA currently has three mitigation grant programs: the Hazards Mitigation Grant Program (HGMP), Building Resilient Infrastructure and Communities (BRIC), and the Flood Mitigation Assistance (FMA) program.

Other potential funding sources include EEA MVP Action Grants, EEA Environmental Dam and Seawall Removal and Repair Fund, Massachusetts State Revolving Funds, U.S. Army Corps of Engineers, and the Small Business Administration. See Section 7.6 and Table 7.4 for more information on funding sources.

Progress on Prior Actions

E2 b

The Planning Team reviewed the 2018 Mitigation Actions to determine what progress had been made towards implementation. During the previous HMP cycle, out of 31 actions, only 2 projects were completed, 8 projects were deleted as not being needed, and14 were considered to be existing capabilities not mitigation actions. The remaining 7 actions are still in progress and recommended for inclusion in the 2024 HMP.

Table 7-1 provides an update on all previous mitigation actions including the description, responsible department, implementation status, and comments to describe the status.

Table 7-1

Review of 2018 Mitigation Actions-

E2b

Category of Action & Hazard(S) To Mitigate	2018 Mitigation Action Item # and Description	Responsible Department	Status: Completed/ Existing Capability/ In Progress/ Deferred/ Deleted	Explanation Of Status as of 2024
All	Develop and implement a Town Wetlands Bylaw	Conservation Commission	Completed	Revisions in progress
All	Improve Code RED access, focused outreach and education to those most at risk, such as elderly of infirmed, and the community in general.	Emergency Management Director	Completed	The Police Department manages this.
Dam Failure, Flooding, Severe Storms, Severe Thunderstorm, Hurricane	Evaluate and repair North Webster Village Pond Dam located on French River along town's border as identified by the MA Office of Dam Safety	Highway Dept. / State	Deleted	Private owner - review funding for private dam improvements. Most of the dam is NOT in Webster. Does not want to put repair on the town's list if they do not own it.
All	Develop formal vegetative debris plan, develop agreements for debris site locations	Highway Dept.	Deleted	Delete.
Dam Failure, Flooding, Severe Storms, Severe Thunderstorm, Hurricane, Drought	Make repairs and maintain the hydroelectric plant on the French River, ensure mitigation actions in place.	Utility	Deleted	Private owner - Town would not write grant for private funding but could assist/support owner.
All	Increase communication/coordination between federal state, regional, county, municipal, private and non-profit agencies in the region to mitigate potential hazards and develop joint solutions.	All	Deleted	Too vague Delete.
All	Continue to actively enforce and comply with the Massachusetts Wetlands Protection Act	Conservation Commission	Deleted	Delete - This is not a mitigation action
Earthquake	Continue to enforce seismic standards in the State's Building Code	Building Inspector	Deleted	Delete - This is not a mitigation action
All	Seek funding to review and update the Hazard Mitigation plan on a five-year cycle.	All	Deleted	Delete - This is not a mitigation action

Category of Action & Hazard(S) To Mitigate	2018 Mitigation Action Item # and Description	Responsible Department	Status: Completed/ Existing Capability/ In Progress/ Deferred/ Deleted	Explanation Of Status as of 2024
All	Incorporate hazard mitigation into the MEPA review process	State	Deleted	Delete - This is not a mitigation action
Flooding, Severe Storms, Severe Thunderstorm, Hurricane	Sweep streets at least once per year to increase stormwater management capacity; capture and dispose of appropriately.	Highway Dept.	Existing Capability	Existing - this goes on every year - It is done twice - once in the spring and once in the fall.
Flooding, Severe Storms, Severe Thunderstorm, Hurricane	Properly clean (at least annually, or more often as may be required) all stormwater structures and basins.	Highway Dept.	Existing Capability	Existing - this goes on every year –Done twice - once in the spring and once in the fall. Cleaning annual low lying catch basin cleaning and drainage outlet cleaning.
All	Continue annual tree trimming program across the town to protect utility wires.	Highway Dept.	Existing Capability	Existing - It takes place in the fall and during any emergencies (late October and November). The last five years, National Grid has been through with their trimming program every other year.
Flooding, Severe Storms, Severe Thunderstorm, Hurricane	Maintain GIS system for stormwater infrastructure, upgrade as needed, ensure mapping is accurate and reflective of conditions on the ground.	Highway Dept.	Existing Capability	Ongoing with Tighe & Bond
Severe Thunderstorm, Hurricane	Investigate installation of an emergency warning system at Webster Lake, especially for thunderstorms and lightning storms to warn those on the water to get to shore and undercover	Emergency Management Director	Existing Capability	Town has CodeRED system, it is free and everyone in town can sign up for it
All	Develop and enhance working relationships with the utilities to improve mitigation actions. Maintain and improve communication during an emergency and ensure locations for the utility's emergency headquarters.	All	Existing Capability	Any type of weather event will be coordinated through fire and police. Run this one by the other departments but likely can be removed. We also have

Category of Action & Hazard(S) To Mitigate	2018 Mitigation Action Item # and Description	Responsible Department	Status: Completed/ Existing Capability/ In Progress/ Deferred/ Deleted	Explanation Of Status as of 2024
				direct communications with National Grid
All	Continue policy of educating appropriate officials in the Unified Incident Command process.	All	Existing Capability	Any type of weather event will be coordinated through fire and police. Run this one by the other departments but likely can be removed. We have sent links for all town employees to take the ICS classes that are available online
All	Continue open and active conversation with the French River Connection and the Webster Lake Association	All	Existing Capability	French River Connection does not exist. The Webster Lake Association is active, and they maintain active communication with the Town
All	Identify and become familiar with non-compliant and vacant properties and structures. Work with property owners to ensure compliance with bylaws	Town Administrator/Planning Board/Conservation Commission/Emergency Management Director	Existing Capability	This happens and goes through the Building Inspector/Board of Health.
All	Promote the full range of federal and state resources including those, translated, related to disaster mitigation such as education materials, training, and National Weather Service broadcasts. Make use of full range of town social media and web pages.	Emergency Management Director	Existing Capability	Already being done through social media and CodeRED
All	Educate developers and realtors about Flood Insurance Rate Maps, ensuring those who move into town are aware of potential risks with properties.	Emergency Management Director	Existing Capability	Insurance companies already sort that out
Drought	Actively monitor all dams in town, ensuring the dams are in good repair, especially during and after heavy rainstorms, ensuring the stability of the dams.	Highway Dept./State	Existing Capability	This is looked at annually.

MITIGATION STRATEGY

Category of Action & Hazard(S) To Mitigate	2018 Mitigation Action Item # and Description	Responsible Department	Status: Completed/ Existing Capability/ In Progress/ Deferred/ Deleted	Explanation Of Status as of 2024
All	Develop a means for sharing information on a regional basis about successful disaster mitigation planning programs. Create a feedback loop to improve hazard mitigation planning by establishing a formal post-disaster assessment process.	Emergency Management Director/State	Existing Capability	They are doing this, but this it is not really an action
All	Educate all segments of community about the importance of mitigating hazards and actions they can take to limit the effects of natural hazards Provide translated information and brochures where appropriate	Emergency Management Director	Existing Capability	They do stormwater education through the website.
Flooding, Severe Storms, Severe Thunderstorm, Hurricane	Replace collapsing corrugated pipe running under Lower Gore Road with box culvert to mitigate roadway flooding and avoid road closure and increased response times during stormwater events.	Highway Dept.	In Progress	Carry over to 2024 plan
All	Develop educational and outreach tools to reach typically marginalized populations particularly in designated environmental justice areas. Locate pamphlets in the new library.	Emergency Management Director	In Progress	Carry over to 2024 plan
All	Update Webster Mass. Municipal Vulnerability Preparedness Program	All	In Progress	Town should apply for funding to complete MVP 2.0 which emphasizes climate vulnerable populations and offers funding for pilot projects.
All	Incorporate hazard mitigation actions into appropriate planning processes such as the Master Plan, Open Space and Recreation Plan and land use planning.	All	In Progress	Master Plan has been completed. Ask Ann or Carol.
All	Integrate hazard mitigation into transportation projects, including upsizing stormwater infrastructure and requiring underground utilities	Planning Board/State/MassDOT	In Progress	Be more specific about which locations need stormwater upsizing
All	Ensure integration of hazard mitigation in any development occurring in town by incorporating mitigation into site plan review, 40B review, and other zoning mechanisms. In particular, consider any downstream flooding impacts caused by new projects, including flooding effects across town lines. Develop parking regulations to reduce impervious surfaces.	Planning Board/Zoning Board of Appeals	In Progress	Seems like there are multiple actions in this one. This is an Ann question.

Category of Action & Hazard(S) To Mitigate	2018 Mitigation Action Item # and Description	Responsible Department	Status: Completed/ Existing Capability/ In Progress/ Deferred/ Deleted	Explanation Of Status as of 2024
All	Inventory shelter and emergency resources. Identify what services are available at the different shelters (food and food preparation, potable water, back-up power supply, showers, etc.) Identify whether the location of different shelters would be impacted by hazards, for example flooding, making a shelter inaccessible to residents. Ensure shelters are suitable and available for different kinds of emergencies.	Emergency Management Director/State	In Progress	No emergency generator at the library.

Projects **Ongoing** or **In Progress** have been included in 2024 Mitigation Actions **Table 7-3.**

Projects that have been **Completed or Deleted** are removed from the Future Action Table

Mitigation Action and Adaptation Strategy for 2024

C4 a b

The Planning Team developed a revised Mitigation Action Plan for the 2024 Plan. The revised plan includes 7 projects listed as in progress from the 2018 Plan, and 23 new projects identified by Town and Planning Team members. The completed list of 30 projects were reviewed and refined by members of the Planning Team who would lead in implementing the action.

The goal of the Plan is to reduce Webster's vulnerability to hazards, and by selecting and implementing the most cost-effective mitigation actions the Town will be on the road toward implementing that goal. The Planning Team completed a Risk and Benefit Assessment to prioritize the most cost-effective mitigation actions, as described below.

Benefit Cost Review Methodology

C5 a

The cost benefit review is the first step in completing a prioritization of mitigation projects. FEMA does not dictate how the cost benefit review is completed; however, it is a required element for the plan. For the Webster HMP, the prioritization of projects was based on a benefit cost review using the FEMA STAPLEE method. STAPLEE is a cost/benefit analysis tool that includes considerations for **S**ocial, **T**echnical, **A**dministrative, **P**olitical, **L**egal, **E**nvironmental and **E**conomic issues.

In its simplest application, the STAPLEE method consists of a table where actions (and mitigation options) are shown along the vertical axis and the STAPLEE categories along the horizontal axis (see inset below). Each action is analyzed per the categories in STAPLEE, and a mark is placed in each category that the action affects in a positive way. The action with the most marks achieves a higher priority.

STAPLEE Criteria	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
Considerations → for Alternative Actions ↓	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/ Waste Sites	Consistent with Community Environmental Goals	Consistent with Federal Laws

For Webster's HMP, the basic STAPLEE basic method was modified to allow for a more detailed evaluation accounting for both **benefits** and **costs** and reflects the types of mitigation actions being considered for the Town. For many of the criterion values, a range of scores were assigned. **Table 7-2** includes the values that were considered for each STAPLEE criteria and potential scores. A final score for each mitigation action was tabulated as the sum of the cost score and the benefit score.

Table 7-2
STAPLEE Benefit Cost Review: Criteria, Considered Values and Rating Scores

CRITERIA	COSTS		BENEFITS	
	Cost Values	Cost Rating Scores	Benefit Values	Benefit Rating Scores
Social	Adversely Affects Segment of the Population or Community Values	-3=yes -2=maybe -1=no	Benefits a Large Segment of the Population	3=large 2=med 1=small
Technical	Years to Implement Project	-1=1 year -2= 2-3 years -3= 4 or more	Easy to Implement with Local Resources	3= yes
Administrative	Operations and Maintenance $$ Required	-3=high -2=med -1=low or none	Sufficient Staffing Available	3=yes 2=maybe 1=no
Political	Public Opposition	-3=high -2=med -1=low	Local Champion-Politically Acceptable	3= yes
Legal	Action Potentially Subject to Legal Challenge	-3 Subject to legal challenge	Existing Local Authority to Implement	3= state or local authority
Economic	Approximate Cost	$=$0-$50,000 $$= $50,001-$100,000 $$$ = $100,001-$1,000,000 $$$$= >$1,000,001	Funding Available	3= yes
Environmental	Adverse Environmental Impacts	-3=high -2=med -1=low	Other Community Goals Achieved	3=yes

Once a total cost benefit rating score was calculated for each mitigation action, all of the mitigation actions were ranked as high, medium and low priority for implementation by hazard category based on the range of scores for each hazard.

Table 7-3 includes the list of 30 future mitigation actions sorted by type of hazard including the total benefit cost rating score and final overall ranking. All Hazards includes Flood, Drought, Changes in Groundwater, Extreme Temperatures, Hurricanes and Tropical Cyclones, Other Severe Weather, Tornados, Severe Winter Storms/ Nor'easters, Landslides and Mudflows, Earthquakes, and Wildfires.

C4-b
C5 b

The Approximate Costs utilize the same notation as Table 7-2 Economic Cost Rating. The timeframe for implementation of each action is divided into near term (1-2 years), mid-term (3-4 years) and long term (5 years or more).

Table 7-4 includes the problem statements and solutions for each of the 30 future mitigation actions sorted by priority.

Table 7-3
2024 Mitigation Action Plan

Hazard	Mitigation Action	Project Type	Lead Department	Additional Funding Sources	Approximate Cost	Timeframe	Consistency with Mitigation Goals	Consistency with other Town Plans	Score	Priority Ranking
All Hazards	Hazard Mitigation Public Outreach	Prevention/ Public Education and Awareness	Emergency Management Director	CIP	$	2	Maintain Hazard Awareness	CEMP, Master Plan, MVP	13	High
All Hazards	Update Master Plan to include addressing needs of climate vulnerable populations	Prevention/ Public Education and Awareness	Planning Board	MVP/ LAND/ Conservation Fund Grants/ MA Land and Later Grants	$$$	3	Minimize hazard risks for future development	Master Plan, OSRP	11	High
All Hazards	Incorporate hazard mitigation into transportation projects, including upsizing stormwater infrastructure and requiring underground utilities	Structural	TBD by Board of Selectmen/ State/ MassDOT	TIP/ CIP	$$$	4	Protection of Existing Infrastructure, Maintain Hazard Awareness	Master Plan	9	Medium
All Hazards	Update municipal environmental regulations to address hazard mitigation	Prevention	Planning Board/Zoning Board of Appeals	MVP Action Grant	$$$	4	Protection of Natural Resources	Master Plan	5	Low
All Hazards	Shelter inventory and implementation of findings	Emergency	Emergency Management Director	None	$	2	Protect the health and safety of the public. Ensure that essential services can function during and after a hazard event.	CEMP	10	High
All Hazards	Investigate options for improved program or upgraded Code RED program.	Prevention/ Public Education and Awareness	Emergency Management Director	CIP	$$	1	Protection of Existing Infrastructure/ Hazard Awareness	CEMP, MVP	12	High

Hazard	Mitigation Action	Project Type	Lead Department	Additional Funding Sources	Approximate Cost	Timeframe	Consistency with Mitigation Goals	Consistency with other Town Plans	Score	Priority Ranking
All Hazards	MVP 2.0 participation and Seed Project implementation	Prevention/ Public Education and Awareness	All Departments	MVP	$	2	Minimize hazard risks for future development	Master Plan/ MVP	13	High
All Hazards	Update bylaws to provide Smart Growth tools	Prevention	Planning Board	MVP/ LAND/ Conservation Fund Grants/ MA Land and Later Grants	$$$	3	Minimize hazard risks for future development. Increase resilience by protecting and enhancing natural resources	Master Plan	10	High
All Hazards	Senior Center Shelter Plan	Emergency Services Protection	Emergency Management Director	FEMA HMGP	$$	2	Protect the health and safety of the public. Ensure that essential services can function during and after a hazard event.	CEMP, MVP	9	Medium
All Hazards	High School Shelter Plan	Emergency Services Protection	Emergency Management Director	Town Budget	$$	2	Protect the health and safety of the public. Ensure that essential services can function during and after a hazard event.	CEMP, MVP	9	Medium
All Hazards	Establish a community liaison to coordinate hospital services with at risk populations	Public Education and Awareness	Health Department	Town Budget	$	2	Protect the health and safety of the public	CEMP, MVP	13	High

MITIGATION STRATEGY

Hazard	Mitigation Action	Project Type	Lead Department	Additional Funding Sources	Approximate Cost	Timeframe	Consistency with Mitigation Goals	Consistency with other Town Plans	Score	Priority Ranking
All Hazards	Improve back up power at Library	Emergency Services Protection	Emergency Management Director, Library Trustees	FEMA HMGP	$$$	1	Ensure that essential services can function during and after a hazard event.	CEMP, MVP	3	Low
All Hazards	Natural Hazard Public Education	Public Education and Awareness	Emergency Management Director	Town Budget	$	2	Maintain Hazard Awareness	CEMP, MVP	12	High
All Hazards	Evaluation of Climate Vulnerable Population Housing Needs	Prevention	Health Department	MassDEP Housing Grant	$$	3	Protect the health and safety of the public	Master Plan	2	Low
Rising Groundwater Levels	Provide resources for mitigation of rising groundwater levels	Prevention	Board of Selectmen	Town Budget	$$$$	3	Protect existing properties and structures	Master Plan	1	Low
Flooding	Historic property and essential service Hazard Awareness Action Plan	Public Education & Awareness	Board of Selectmen	Town Budget	$$$	3	Protect existing properties and structures	Master Plan	-2	Low
Flooding	Wastewater collection system flood assessment	Structural	Water & Sewer	MA-MVP/ FEMA HMGP	$$	3	Protect existing properties and structures	MVP	14	High
Flooding	Town Hall flooding mitigation	Structural	Board of Selectmen	FEMA HMGP	$$$	2	Protect existing properties and structures	MVP	9	Medium
Flooding	Police Emergency Operations building drainage improvements	Structural	Emergency Management Director	MA-MVP/ FEMA HMGP	$$$	1	Protect existing properties and structures	CIP, MVP	9	Medium
Flooding	Emergency roadway improvements	Structural	Library Trustees	MA DOT-TIP	$$$$	3	Minimize hazard risks for future development	CIP, MVP	8	Medium

Hazard	Mitigation Action	Project Type	Lead Department	Additional Funding Sources	Approximate Cost	Timeframe	Consistency with Mitigation Goals	Consistency with other Town Plans	Score	Priority Ranking
Flooding	Lower Gore and Sutton Road culvert improvements	Structural	Highway Department	MA DEP-SRF	$$$$	3	Protect existing properties and structures	CIP, MVP	12	High
Flooding	Mill Brook- Flood Mitigation	Structural	Highway and MassDOT	DCR Technical Assistance	$	2	Increase resilience by protecting and enhancing natural resources	CIP	9	Medium
Earthquakes	Develop culvert asset management program	Structural	Highway and MassDOT	MA DEP-SRF	$$$$	3	Protect existing properties and structures	CIP	5	Low
Flooding	Stormwater regulations update	Prevention	Planning Board	Town Budget	$$$	3	Minimize hazard risks for future development	Master Plan	8	Medium
Flooding	Webster Wetland Protection Bylaw	Prevention	Conservation Commission	Town Budget	$	2	Increase resilience by protecting and enhancing natural resources	Master Plan/ MVP	10	High
Flooding, Severe Weather- including strong winds and extreme precipitation, Severe Thunderstorms	Improvements to culvert at Upper Lower Gore Rawson Road Intersection at Route 16	Structural	Highway and MassDOT	MA DOT-TIP	$$$$	3	Protect existing properties and structures	Master Plan/ MVP	5	Low
Flooding, Tornado, Severe	Review Webster Lake Management Plan with Climate Change	Natural Resource Protection &	TBD by Board of Selectman	MA MVP	$$$	3	Increase resilience by protecting and	MVP	9	Medium

Hazard	Mitigation Action	Project Type	Lead Department	Additional Funding Sources	Approximate Cost	Timeframe	Consistency with Mitigation Goals	Consistency with other Town Plans	Score	Priority Ranking
Winter Storms		Green Infrastructure					enhancing natural resources			
Flooding, Tornado, Severe Winter Storms	Evacuation protocols during extreme events	Property Protection, Emergency Service Protection	Emergency Management Director	FEMA HMGP	$	1	Protect the health and safety of the public	CEMP	14	High
Severe weather including strong winds and precipitation, severe winter storms, tornados	Address tree related hazards to reduce risk to Town infrastructure	Property Protection, Emergency Service Protection	Highway and Utility Company	MA MVP	$$	1	Increase resilience by protecting and enhancing natural resources	MVP	8	Medium
Dam Failure	Coordination with Private Dam owners for inspection and improvements including East Village Dam, Club Pond Dam and Webster Lake Dam	Property Protection	Board of Selectmen	FEMA BRIC	$$$$	4	Protect existing properties and structures	CIP, CEMP	10	High

Table 7-4
2024 Mitigation Action Problems and Solutions

Hazard	Mitigation Action Title	Description of Problem	Description of Solution	Project Type	Lead Department
High Priority Ranking					
All Hazards	Hazard Mitigation Public Outreach	Marginalized populations, particularly those in designated environmental justice areas, may not have adequate access to information about hazard mitigation or the actions they can take to reduce the effects of natural hazards. Traditional outreach efforts may not reach these groups effectively, and there may be language barrier preventing full understanding. Without targeted educational tools and translate materials, these communities remain vulnerable during emergencies.	Develop educational and outreach tools specifically designed to reach marginalized populations. Place pamphlets and resources in accessible locations, such as a public library or Town Hall, and ensure materials are available in multiple languages to overcome language barriers. Conduct outreach campaigns to educate all segments of the community about the importance of hazard mitigation and practical actions they can take to reduce risks.	Prevention/ Public Education and Awareness	Emergency Management Director
All Hazards	Update Master Plan to include addressing needs of climate vulnerable populations	The master plan needs to be updated and address issues from the Hazard Mitigation Plan especially targeting needs of climate vulnerable populations.	Seek funding and work with vendor to update the Town 2014 Master Plan	Prevention/ Public Education and Awareness	Planning Board
All Hazards	Shelter inventory and implementation of findings	Existing shelters may lack essential services such as food preparation, potable water, backup power, and showers. Additionally, the location of shelters may be vulnerable to natural hazards such as flooding, making them inaccessible during emergencies. It is unclear whether the shelters are suitable and available for different types of emergencies, leaving the community at risk in a crisis.	Conduct a comprehensive inventory of all shelter and emergency resources to assess the availability of critical services. Evaluate the location of each shelter to determine their vulnerability to hazards and ensure accessibility during emergencies. Based on findings, upgrade shelters to meet needs of various emergency situations, ensuring they are resilient, accessible, and equipped to serve the community effectively during different types of crises.	Emergency	Emergency Management Director
All Hazards	Investigate options for improved program or upgraded Code RED program.	The current emergency notification system may be insufficient for effectively altering residents during emergencies, This can result in delayed communication, limited reach, or inefficiencies in providing critical information to the community.	Investigate options to improve or upgrade the existing Code RED program, evaluating new technologies or systems that enhance communication capabilities.	Prevention/ Public Education and Awareness	Emergency Management Director
All Hazards	MVP 2.0 participation and Seed Project implementation	The Town is not currently certified under the MA Municipal Vulnerability Preparedness (MVP) 2.0 Program, which limits access to funding, resources, and support for resilience-building projects. Without this certification, the Town may miss	Pursue the certification in the MVP 2.0 to gain access to state resources, funding, and technical support for resilience initiatives.	Prevention/ Public Education	All Departments

Hazard	Mitigation Action Title	Description of Problem	Description of Solution	Project Type	Lead Department
		opportunities to enhance its preparedness for climate-related hazards and implement effective mitigation strategies.		and Awareness	
All Hazards	Update bylaws to provide Smart Growth tools	The Town needs additional tools to discourage housing in environmentally sensitive areas around and near Lake Webster	Seek funding for assistance to update municipal bylaws to provide for consistency with smart growth methods	Prevention	Planning Board
All Hazards	Establish a community liaison to coordinate hospital services with at risk populations	A need was identified to better communicate services and emergency management to vulnerable populations in Webster	Establish a community Liaison to coordinate hospital services with at risk populations	Public Education and Awareness	Health Department
All Hazards	Natural Hazard Public Education	Presently there's a disjointed approach due to fact that multiple departments are involved and no one department is assigned the task to develop and manage content.	Increase communication within town and public education on emergency services, planning, needs between all populations, including but not limited to town staff, public, vulnerable populations, private sector, critical infrastructure (both town and privately owned) Identify and assess existing systems and methods of communication such as social media, CODE Red, multi-lingual population outreach, and distribution to time-sensitive information to those impacted by an event or potential for future event. Seek out programs to develop a unified approach to public education and outreach. Assign staff to complete and maintain web and social media content.	Public Education and Awareness	Emergency Management Director
Flooding, Tornado, Severe Winter Storms	Evacuation protocols during extreme events	The need for efficient and controlled evacuation will become more important as climate change increases the frequency and intensity of storm events. Evacuation is event dependent and may impact the whole Town. Certain areas including Browns Brook, Upper / Lower Road Intersection, Thompson Road (access to UMass Memorial Hospital at Harrington), Mine Brook, Lake Parkway, East Main Street at the Mill Brook Spillway are especially vulnerable.	Seek funding for a study of all evacuation routes and their efficiencies and capacity; public outreach and education; specific outreach to property owners directly in identified high vulnerability areas. Study the capacities of the intersections of Gore (Route 16) / Lower Gore / Rawson Road; Gore Road (Route 16) / I395 Interchange and the East Main / Worcester Road (Route 12 / Thompson Road / Gore Road. Apply for grants to make improvements.	Property Protection, Emergency Service Protection	Emergency Management Director

MITIGATION STRATEGY

Hazard	Mitigation Action Title	Description of Problem	Description of Solution	Project Type	Lead Department
Dam Failure	Coordination with Private Dam owners for inspection and improvements including East Village Dam, Club Pond Dam and Webster Lake Dam	Dams along the French River at Pearl Street, Perryville, North Main Street, Mill Brook, Route 16 / Fish and Game and other locations include privately owned dams that have been identified by the data as deficient, and are located near dense populations	Work with private dam owners and the MA Office of Dam Safety to evaluate and seek out funding to assist in repairs and maintenance. This is a high priority.	Property Protection	Board of Selectmen
Flooding	Wastewater collection system flood assessment	Areas along the French River are especially prone to flooding which impacts the wastewater collection system	Evaluate flood risk areas along French River, identify and prioritize, implement stormwater controls, identify Town responsibilities and delegate tasks	Structural	Water & Sewer
Flooding	Lower Gore and Sutton Road culvert improvements	Sutton Rd. Culvert Backs up due to beavers, experiences flooding during rain events	Seek funding for design, permitting and construction of culvert improvements projects	Structural	Highway Department
Flooding	Webster Wetland Protection Bylaw	Webster should enact a wetlands bylaw and examine enhanced development controls at wetlands to sustain natural barriers to flooding	Finalize Webster Wetlands By-law	Prevention	Conservation Commission
Medium Priority Ranking					
All Hazards	Strategic infrastructure planning	Transportation projects may not account for hazard mitigation, leaving infrastructure vulnerable to flooding, storm damage, and other natural hazards. Existing stormwater infrastructure may be undersized, leading to drainage issues, while above-ground utilities are more susceptible to storm-related damage.	Integrate hazard mitigation into all transportation projects by upsizing stormwater infrastructure to better handle increased rainfall and flood risks. Require the installation of underground utilities to protect against storm damage and ensure more reliable service during emergencies.	Structural	TBD by Board of Selectmen/ State/ MassDOT
All Hazards	Senior Center Shelter Plan	Need shelter with backup power for residents during emergencies	1 - Prepare and plan for emergencies, meet criteria for Red Cross Certified Shelter 2 - Public education and communication on role as a shelter and use of CodeRed (education on CodeRed for citizens and town staff on usage) 3 - Look to Red Cross certify shelter 4- Develop shelter plan (i.e. which shelter can hold how many people)	Emergency Services Protection	Emergency Management Director

MITIGATION STRATEGY

Hazard	Mitigation Action Title	Description of Problem	Description of Solution	Project Type	Lead Department
All Hazards	High School Shelter Plan	Need shelter with backup power for residents during emergencies - Does High School now have a generator, or does that need to be added to this?	1 - Plan to meet criteria for Red Cross Certified Shelter 2 - Public education and communication on role as a shelter and use of CodeRed (education on CodeRed for citizens and town staff on usage) 3 - include Red Cross designation as a shelter into current rebuilding plans	Emergency Services Protection	Emergency Management Director
Severe weather including strong winds and precipitation, severe winter storms, tornados	Address Tree related hazards to reduce risk to Town infrastructure	Tree hazards during severe storm events	1- Establish tree management 2 - Develop urban forestry plan, add individual on staff to identify tree health and determine what is hazardous 3 - Place new utilities underground	Property Protection, Emergency Service Protection	Highway and Utility Company
Flooding	Investigation of Town Hall Flooding Issues	Town Hall basement flooding/leaking roof, can't open windows, been under rehab for several years, flooding, leaking, Groundwater induced flooding, susceptible servers, equipment in basement	Flood Management and Investigation of alternatives	Structural	Board of Selectmen
Flooding	Police Emergency Operations building drainage improvements	Building is located in floodplain	Drainage improvement investigation	Structural	Emergency Management Director
Flooding	Emergency Roadway improvements	Evacuation difficulties at roadways around lake with poor road conditions	investigate roadway improvements and mark evacuation routes	Structural	Library Trustees
Flooding, Tornado, Severe Winter Storms	Webster Lake Climate Resilience Plan	Climate change will impact ecology, water quality and flooding in and around Lake Webster. A management plan is needed to proactively understand how to best adapt to these changes	1 - Assess for climate change impacts (ecological impacts) and contamination, water quality 2 - Develop Boat wash guidelines 3 - Prioritize acquisition of open space of tributaries to the lake 4- improve site plan requirements, update bylaw for lake watershed protection area	Natural Resource Protection & Green Infrastructure	TBD by Board of Selectmen
Flooding	Mill Brook - Flood Mitigation	Flooding along Mill Brook has increased in recent years in part due to climate change and exacerbated	1-Assess options for Beaver Control 2 - Identify where water level control devices could be	Structural	Highway and MassDOT

Hazard	Mitigation Action Title	Description of Problem	Description of Solution	Project Type	Lead Department
		by beaver activity. The Town needs to wit implement an effective strategy for dealing with both factors.	implemented to mitigate flooding and allow beaver to exist		
Flooding	Stormwater regulations update	Stormwater Regulations have been drafted but not voted on by the Planning Board	Final review and vote to pass Webster stormwater regulations	Prevention	Planning Board
Low Priority Ranking					
All Hazards	Update municipal environmental regulations to address hazard mitigation	Hazard mitigation is not consistently integrated into development projects, leaving the Town vulnerable to increased flooding and other risks. Current zoning and review processes including Site Plan Review, Floodplain By-law, Lake Watershed Protection district, Lake Residential District, local wetlands regulations may not account for downstream flooding impacts. Additionally, regulations on parking and impervious surfaces may not adequately reduce flood risk.	Seek out grants to build into the capital plan funds to evaluate and make recommendations for updates and consistency and unified approach to environment factors as it relates to development. Incorporate hazard mitigation into site plan review, 40B processes, and other zoning mechanisms to address flooding impacts from new developments. Update parking regulations to limit impervious surfaces, reducing flood risks both locally and across Town lines.	Prevention	Planning Board/Zoning Board of Appeals
All Hazards	Improve back up power at Library	Needs a generator to allow facility to function during natural hazard event to protect records and provide access to climate vulnerable populations for information and use as heating and cooling center. This building has also flooded in the past.	Install backup power generator	Emergency Services Protection	Emergency Management Director, Library Trustees
All Hazards	Evaluation of Climate Vulnerable Population Housing Needs	Given the high elderly population in Webster currently and as projected in the future, as well as their relatively low income, a determination needs to be made as to whether such facilities will meet their needs.	Meet needs of elderly and disables residents by conducting a detailed needs assessment of the housing options for the Town's aging population to ascertain actual demand for assisted or congregate living versus assistance for staying in and maintaining their own homes. Identify ways in which the elderly can age in place. Address accessibility and cooling issues for senior and affordable housing in Webster (e.g. one way access only, lack of backup power, and air conditioning).	Prevention	Health Department
Rising Groundwater Levels	Provide resources for mitigation of rising groundwater levels	Areas located in the Lake Watershed Protection district and all structures located directly in and immediately adjacent to flood zones are flooding more frequently due to climate change. Climate vulnerable populations including seniors may not	Seek out programs that provide education, grants and low-cost financing for clean-up and flood proofing. Town to provide public information on website and social media	Prevention	Board of Selectmen

Hazard	Mitigation Action Title	Description of Problem	Description of Solution	Project Type	Lead Department
		have the resources to address the clean-up efforts properly			
Flooding	Historic Property and Essential Service Hazard Awareness Action Plan	The Town has a large number of historic properties in flood zones particularly in the historic downtown along the French River and areas of essential services such as the Price Chopper Plaza. Natural hazards have potential to result in loss of historic structure, environmental contamination, and impacts to EJ neighborhoods, and general population limiting access to food supply and essential services	Research programs and funding for public education and outreach to Property Owners and service agencies who can assist in outreach. Provide professional development for staff such as the Building Commissioner and Conservation Agent with regards to administering the Floodplain By-law.	Public Education & Awareness	Board of Selectmen
Flooding	Develop culvert asset management program	Develop a prioritized inventory of problem culverts and road crossing for use in seeking external financial support. Planning must comply with Mass Wetland Protection Act. Culverts must be improved and not replaced in kind.	Seek funding for Bridge and Culvert Inventory as an asset management grant through SRF	Structural	Highway and MassDOT
Flooding, Severe Weather-including strong winds and extreme precipitation, Severe Thunderstorms	Improvements to culvert at Upper Lower Gore Rawson Road Intersection at Route 16	dangerous intersection, high grades and poor sightlines, part of evacuation route	Upgrade collapsing corrugated pipe running under Lower Gore Road with box culvert to mitigate roadway flooding and avoid road closure and increased response times during stormwater events. Continue to investigate roadway improvements and redesign	Structural	Highway and MassDOT

7.3 PROJECT TIMELINE FOR 2024 MITIGATION ACTIONS

Table 7-4 includes 13 projects ranked with a high priority, 7 projects with a medium priority and 10 projects with a lower priority over all hazard categories. Although all projects are important to the Town, a number of priority projects are summarized below relative to recommended timing of the individual mitigation actions. The Town has identified its Capital Improvement Plan, Open Space Plan, Comprehensive Emergency Management Plan and targeted grants as mechanisms to integrate mitigation actions over the next five years.

7 priority projects are identified to begin in year one requiring one-two years to complete:

- Update bylaws to provide Smart Growth Tools
- Stormwater regulation update
- Hazard Mitigation Public Outreach
- MVP 2.0 participation and Seed Project Implementation
- Establish a community liaison to coordinate hospital services with at risk populations
- Lower Gore and Sutton Road Culvert Improvements
- Webster Wetland Protection Bylaw

6 Priority projects identified to begin in year two or three include:

- Coordination with Private Pam Owners for inspection and improvements
- Police Emergency Operation building drainage improvements
- Update Master Plan to address needs of climate vulnerable populations
- Provide resources for mitigation of rising groundwater levels
- Address tree related hazards to reduce risk to Town infrastructure

7.4 CONTINUED COMPLIANCE WITH NFIP

C2a

The Town continues to enforce required elements of the National Flood Insurance Program so that they may continue to participate in the program including:

- Issuing or denying floodplain development/ building permits
- Inspecting all development to assure compliance with the local floodplain zoning by-law
- Maintaining records of floodplain development
- Assisting in the preparation and revision of floodplain maps
- Helping residents obtain information on flood hazards, floodplain map data, flood insurance and proper construction measures.

The Town periodically reviews the zoning by-law for consistency and uses the most recent FIRM data to determine base flood elevation or the best available scientific data for determinations of base flood elevation if no FIRM data is available to achieve a reasonable measure of flood protection.

E2 a

7.5 CHANGES IN PRIORITY FROM 2018 TO 2024

While flooding continues to be the number one priority for Webster, the 2024 risk and vulnerably analysis have shifted priorities to include addressing the full range of identified natural hazards. Mitigation projects were included for the following natural hazards that were not part of the 2018 Plan:

- Changes to Groundwater
- Tornadoes

7.6 ADDITIONAL INFORMATION ABOUT FUNDING SOURCES

Appropriate action is needed to ensure that financial resources are available to implement hazard mitigation projects. Such projects need to be included in capital improvement programs at the state and local levels. Federal funding programs are available to eligible municipalities. The availability of current federal funding sources changes regularly and is dependent upon Congress' ongoing budget appropriations process. Currently, www.grants.gov is a comprehensive website to track available funding from federal agencies. Also, federal appropriations from Congress may be tracked through the Federal Registers at www.federalregister.gov.

The following is a summary of FEMA and other programs which fund hazard mitigation and resiliency projects and activities, including the primary sources of federal hazard mitigation funding in Massachusetts:

FEMA and Other Funding Programs

FEMA Program	Type of Assistance	Availability	Managing Agency	Funding Source
National Flood Insurance Program (NFIP)	Pre-Disaster Insurance	Any time (pre- and post-disaster)	DCR Flood Hazard Management Program	Property Owner, FEMA
Severe Repetitive Loss (SRL) (Part of the NFIP)	Grants to state emergency management offices to reduce damage to insured severe RLPs	Varies	MEMA	Up to 90% FEMA/ 10% state government
Repetitive Flood Claims Program (RFC) (Part of the NFIP)	Grants to states and municipalities to reduce damage to insured RLPs	Any time	FEMA	100% FEMA
Community Rating System (CRS) (Part of the NFIP)	Disaster Insurance Discounts	Any time (pre- and post-disaster)	DCR Flood Hazard Management Program	Property Owner, FEMA

Flood Mitigation Assistance (FMA) Program	Cost-share grants for pre-disaster planning and projects	Annual pre-disaster grant program	DCR & MEMA	75% FEMA/25% local government or organization
Hazard Mitigation Grant Program (HMGP)	Post-disaster Cost-Share Grants	Post disaster program	DCR & MEMA	75% FEMA/25% local government or organization
Building Resilient Infrastructure and Communities (formerly the Pre-Disaster Mitigation Program)	National, competitive grant program for multiple hazard mitigation projects and "all hazards"	Annual pre-disaster mitigation program	DCR & MEMA	75% FEMA/25% local government or organization
Small Business Administration (SBA) Mitigation Loans	Pre- and Post-disaster loans to qualified businesses	Ongoing	MEMA	Small Business Administration
Infrastructure Support Program (formerly Public Assistance)	Post-disaster aid to state and local governments	Post Disaster	MEMA	FEMA
Municipal Vulnerability Preparedness Action Grants	Funding for designated MVP Communities to advance priority climate adaptation actions to address climate change	Annually	EOEEA	Commonwealth of Massachusetts
Dam Repair and Removal Grants	Implement projects for the repair and removal of dams, levees, seawalls and other forms of flood control	Annually	EOEEA	Commonwealth of Massachusetts
Culvert Replacement Municipal Assistance Grants	Replace degraded and undersized culverts to meet MA Stream Crossing Standards	Annually	Department of Ecological Restoration (DER)	Commonwealth of Massachusetts

The Federal Emergency Management Agency (FEMA), which is part of the Department of Homeland Security, administers the National Flood Insurance Program, the Community Rating System, the Flood Mitigation Assistance Program (FMA), the Hazard Mitigation Grant Program (HMGP), and the Building Resilient Infrastructure and Communities (BRIC). These programs are administered in coordination with DCR and MEMA. FEMA also prepares and revises flood insurance studies and maps as well as information on past and current acquisition, relocation, and retrofitting programs. The Mitigation Division provides expertise in other natural and technological hazards, including hurricanes, earthquakes, and hazardous materials, to state and local government agencies.

Immediately following Presidential declarations, FEMA's Response and Recovery Division works closely with state agencies, especially MEMA, in assisting in the short-term and long-term recovery effort. FEMA assists disaster-affected communities through emergency funding programs, such as Infrastructure Support and Human Services. In coordination with its Mitigation Division, Response and Recovery distributes information on hazard mitigation methods and acquisition/relocation initiatives as well as coordinating HMGP grants for mitigation projects to protect qualifying damaged public and private nonprofit facilities through the Infrastructure Support Program. In addition to these programs, FEMA also provides disaster recovery and hazard mitigation training at its Emergency Management Institute in Emmitsburg, Maryland.

For the latest information on this and other mitigation funding programs, go to FEMA's website at **www.fema.gov**.

National Flood Insurance Program (NFIP)

The National Flood Insurance Program (NFIP), established by Congress in 1968, provides flood insurance to property owners in participating communities. This program is a direct agreement between the federal government and the local community that flood insurance will be made available to residents in exchange for community compliance with minimum floodplain management requirements. Since homeowners' insurance does not cover flooding, a community's participation in the NFIP is vital to protecting property in the floodplain, as well as ensuring that federally backed mortgages and loans can be used to finance property within the floodplain.

Pursuant to the Flood Disaster Protection Act of 1973, any federal financial assistance related to new construction or substantial improvements (greater than 50% of a structure's market value) of existing structures located in the 100-year floodplain is contingent on the purchase of flood insurance. Such federal assistance includes not only direct aid from agencies but also from federally insured institutions. Thus, for property owners to be eligible for purchasing flood insurance, their respective community must be participating in the NFIP and in compliance with the NFIP.

Communities participating in the NFIP must:

- Adopt the Flood Insurance Rate Maps as an overlay regulatory district;
- Require that all new construction or substantial improvement to existing structures in the flood hazard area will be elevated; and
- Require design techniques to minimize flood damage for structures being built in high hazard areas, such as floodways or velocity zones.

The NFIP standards are contained in the Massachusetts State Building Code (Chapter 16 of the 9th Edition), which is implemented at the local level by municipal building inspectors. In Massachusetts, 341 out of 351 (97%) of Massachusetts municipalities participate in the NFIP.

Severe Repetitive Loss Program

The Severe Repetitive Loss Program was authorized by the Bunning-Beruter-Blumaneauer Flood Insurance Reform Act of 2004 with amended the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss structures.

MEMA must apply for these funds but may work with other state agencies or local governments. Priority is given to programs that will have the greatest cost-benefit ratio in keeping with the purpose of the program. Grants may be used for acquisition, demolition, and relocation but cannot be used for maintenance or repair.

Funds are allocated to the state based on the percentage of validated SRL properties and may be up to 90 percent federal and 10 percent local.

Repetitive Flood Claims Program (RFC)

The Repetitive Flood Claims Program was authorized by the Bunning-Beruter-Blumaneauer Flood Insurance Reform Act of 2004 which amended the National Flood Insurance Act of 1968 to provide funding to reduce the risk of flood damage to repetitive loss structures.

The program is 100 percent federally funded, and the applicant must demonstrate that the proposed activities cannot be funded under the Flood Assistance Program. (See below.)

Community Rating System (CRS)

A voluntary initiative of the NFIP, the Community Rating System (CRS) encourages communities to undertake activities that exceed the minimum NFIP floodplain management standards. Communities participating in CRS can reduce flood insurance premiums paid by policyholders in that community by performing such activities as maintaining records of floodplain development, publicizing the flood hazard, improving flood data, and maintaining open space. Communities can gain additional credit under CRS by developing a flood mitigation plan.

Flood Hazard Mitigation Program

Authorized by the National Flood Insurance Reform Act of 1994, the Flood Mitigation Assistance (FMA) program makes cost-share grants available for flood mitigation planning and projects, such as property acquisition, relocation of residents living in floodplains, and retrofitting of existing structures within a floodplain. Flood hazard mitigation plans, approved by the state and FEMA, are a pre-requisite for receiving FMA project grants. Communities contribute a minimum of 25% of the cost for the planning and project grants with an FMA match of up to 75%.

Hazard Mitigation Grant Program (HMGP)

Established under Section 404 of the Stafford Disaster Relief and Emergency Relief Act (PL 100-707), this program provides matching grants (75% Federal, 25% Local) for FEMA-approved hazard mitigation projects following a federally declared disaster. These grants are provided on a competitive basis to state and local and tribal governments as well as non-profit organizations. The grants are specifically directed toward reducing future hazard losses and can be used for projects protecting property and other resources against the damaging effects of floods, hurricanes, earthquakes, high winds, and other natural hazards. HMGP in Massachusetts encourages non-structural hazard mitigation measures, such as:

- The acquisition of damaged structures and deeding the land to a community for open space or recreational use
- Relocating damaged or flood-prone structures out of a high hazard area
- Retrofitting properties to resist the damaging effects of natural disasters. Retrofitting can include wet- or dry-flood proofing, elevation of the structure above flood level, elevation of utilities, or proper anchoring of the structure.

Funding proposals are submitted for review by Massachusetts' Interagency Hazard Mitigation Committee with final approval given by the Commissioner of the DCR, the Director of MEMA, and FEMA's Region I office. The committee uses a list of criteria which is described on page 34 of this plan as well as in the Hazard Mitigation Grant Program Administrative Plan.

Pre-Disaster Mitigation (PDM) Program now BRIC

As a result of amendments by the Disaster Relief and Recovery Act of 2018, the Pre-Disaster Mitigation program was replaced with the new Building Resilient Infrastructure and Communities (BRIC) program. The BRIC program aims to shift the federal focus away from reactive disaster spending and toward research-supported, proactive investment in community resilience. All applicants must be participating in the National Flood Insurance Program (NFIP) if they have been identified through the NFIP as having a Special Flood Hazard Area (a Flood Hazard Boundary Map (FHBM) or Flood Insurance Rate Map (FIRM) has been issued). Also, the community must not be suspended or on probation from the NFIP. Applicants must also have an up-to-date HMP.

Small Business Administration Mitigation Loans

The SBA's Regional Mitigation Loan Program was developed in support of FEMA's Regional Mitigation program. Businesses proposing mitigation measures to protect against flooding must be in a Special Flood Hazard Area (SFHA). Businesses may consult FIRM maps to find out if the business is in a SFHA. For information pertaining to hazard identification mapping and floodplain management, contact the local community floodplain administrator or the State floodplain manager. To apply for a regional mitigation loan, a business must submit a complete Regional Mitigation Small Business Loan Application within the 30-day application period announced by the SBA. SBA will publish a Notice of Availability of Regional Mitigation Loans in the Federal Register announcing the availability of regional mitigation loans each fiscal year. The Federal Register notice will designate a 30-day application period with a specific opening date and filing deadline, as well as the locations for obtaining and filing loan applications. Furthermore, SBA will coordinate with FEMA and will issue press releases to the local media to inform potential loan applicants where to obtain loan applications.

Public Assistance Program

The Federal Emergency Management Agency's Public Assistance Program is triggered for counties declared major disaster areas by the President. Communities and public agencies in designated counties are eligible for partial reimbursement (75%) of expenses for emergency services and removal of debris, and partial funding (75%) for repair and replacement of public facilities that were damaged by the declared disaster. Massachusetts funds an additional 12.5% of these projects. Eligible applicants for Infrastructure Assistance include:

- State government agencies/departments;
- Local governments (county, city, town, village, district, etc.); and
- Certain private non-profit organizations.

Typical federal/state aid can include:

- Reimbursable payment of 87.5% of the approved costs for emergency protective measures deployed in anticipation of the storm;
- Reimbursable payment of 87.5% of the approved costs for emergency services and debris removal;
- Payment of 75% of the costs for the permanent repair or replacement of damaged public property; and
- Funding for repair/construction of damaged highways other than those on the Federal Aid System.

Special Appropriations Following State Disasters

Although there is no separate state disaster relief fund in Massachusetts, the state legislature will enact special appropriations for those communities sustaining damages following a natural disaster that are not large enough for a presidential disaster declaration.

State Revolving Fund

This statewide loan program through the Executive Office of Energy and Environmental Affairs assists communities in funding local stormwater management projects which help to minimize and/or eliminate flooding in poor drainage areas.

Massachusetts Land and Water Conservation Fund

The Land and Water Conservation Fund provides 50 percent of the total project costs to purchase land for conservation or recreation purposes. Massachusetts has spent $95.6 million since 1965 to purchase almost 4,000 acres of land under this program. The program is administered by DCR.

Major Flood Control Projects

The state provides 50% of the non-federal share on the costs of major flood control projects developed in conjunction with the U.S. Army Corps of Engineers. This program is managed by DCR.

Massachusetts Municipal Vulnerability Preparedness (MVP) Action Grants

Once designated an MVP Community, the Executive Office of Energy and Environmental Affairs (EEA), through the MVP Program, offers funding resources to advance climate adaptation actions identified in the community's MVP Summary of Findings. In FY22, the MVP Program offered over $21 million in Action Grant Funding.

Massachusetts EOEEA Dam and Seawall Repair or Removal Grants and Funds

The Massachusetts Dam and Seawall Repair or Removal Fund was established by the Legislature to promote public, health, public safety, and ecological restoration. The program offers financial resource for planning, design and construction to qualified applicants to implement repairs to key infrastructure that provides storm damage protection and flood and erosion control for dams, levees, seawalls and other forms of inland and coastal structures.

Massachusetts EOEEA Department of Ecological Restoration Culvert Replacement Municipal Assistance Grant

The purpose of this funding is to encourage municipalities to replace aging culverts with better designed crossings that meet improved structural and environmental design standards and flood resiliency criteria. Only projects that intend to meet the goals of the Massachusetts Stream Crossing Standards will be considered for funding.

Section 8 Plan Evaluation and Maintenance

8.1 WHO IS INVOLVED?

Each department identified in the Webster Multi-Hazard Mitigation Plan is responsible for implementing specific mitigation actions detailed in the Mitigation Actions section of the plan (**Section 7**). Every proposed action listed in the Future Mitigation Action section is assigned to a specific "lead" department as a way to assign responsibility and accountability and increase the likelihood of subsequent implementation. Annual review will enable specific actions to be modified, if needed, rather than wait until the 5-year update, allowing mitigation projects to evolve in a timely manner as circumstances dictate.

D1 a

Town Administration will jointly be responsible for ensuring that the Plan is monitored, evaluated, and updated throughout the next five years.

8.2 HOW WILL THE PLAN BE MAINTAINED?

The following activities describe how the plan will be maintained and updated over the next five years:

D2 a

Plan Monitoring

Members of the Planning Team will communicate annually to report on the implementation status of each Mitigation Action identified in **Section 7**, noting accomplishments, challenges, and recommended modifications to identified actions. The Planning Team will also describe and document any new hazard data that can be incorporated in the Hazard Profile section of the Plan, noting any new hazard location, extent, and impact.

At least once per year, the Planning Team will update the implementation status of Mitigation Actions and an evaluation of the appropriateness of the actions, noting any changes warranted.

D2 b

Plan Evaluation

The Planning Team will communicate annually to evaluate the purpose and goals of the Hazard Mitigation Plan to ensure the Plan continues to serve its purpose. The annual review will include the following activities:

- Submit survey to all members of the implementation group 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.
- Review survey results and make recommendations if any changes to the plan are needed
- Review of the Mitigation Goals in the 2024 Webster Multi-Hazard Mitigation Plan
- Discuss recent activities to reduce loss of life and property such as grants received/applied for and any complete Mitigation Actions

- Discuss ongoing or recent planning efforts that are consistent with the Mitigation Goals and Actions of the 2024 Webster Multi-Hazard Mitigation Plan

Continued Public Participation

D1 a

Public participation is an integral component of the mitigation planning process and will continue to be essential as this plan is implemented and updated over time. Based on the high level of interest in the mitigation planning process, Town residents and stakeholders are interested in mitigation. The 2024 Webster Multi-Hazard Mitigation Plan included several education and outreach mitigation actions designed to engage the public. The Town intends to involve the public throughout the five-year implementation of this plan, as well as in the reviewing and updating processes. The Town Administration will take the lead in soliciting participation from the public. Efforts to involve the public include:

D3 b

- Advertising on Town's website and posting news and announcements on the Town's social media pages
- Town will record with closed captioning all meetings to air on the public television station
- Copies of this plan will remain on the Town's website. Updates to the plan will also be posted on the Town's website
- The Town of Webster will continue to work with private industry, regional agencies, and adjacent communities as this plan is implemented

Plan Update

D2 c

The 2024 Webster Multi-Hazard Mitigation Plan will be reviewed and updated every five years to ensure there is no lapse in Plan coverage. The Plan update process will be scheduled one to one and a half years before the Plan is set to expire.

8.3 WHEN WILL THE PLAN BE MAINTAINED?

A start date and time periods were assigned to each Mitigation Action in Section 7 to assess whether actions are being implemented in a timely fashion. Also, the Planning Team will communicate annually to discuss progress on Mitigation Actions.

Following a disaster declaration, the 2024 Webster Multi-Hazard Mitigation Plan will be revised as necessary to reflect lessons learned or to address specific issues and circumstances arising from the event. It will be the responsibility of the Town Administration to coordinate with the Planning Team and ensure that appropriate stakeholders are invited to participate in the plan revision and update process following a declared disaster event.

D3 a

8.4 INCORPORATION WITH OTHER PLANS

The 2018 Multi-Hazard Mitigation Plan concepts were integrated throughout City plans developed since 2018 including the following plans:

PLAN EVALUATION AND MAINTENANCE

Capital Improvement Plan (2019)

Open Space and Recreation Plan (2024)

Webster Comprehensive Emergency Management Plan (2021)

Including mitigation principles into these plans, and into Town policy and budget processes helped to leverage concepts from the 2018 Plan related to reducing risk and increasing resilience.

Upon FEMA approval of the 2024 Webster Multi-Hazard Mitigation Plan 5-year update, the Planning Team will provide all interested parties and implementing departments with access to a copy of the Plan and will initiate a discussion regarding how the Plan can be integrated into that department's ongoing work.

D3 b

At a minimum, the Plan will be shared with the following departments, commissions, and boards:

- Fire Department
- Police Department
- Planning Board
- Conservation Commission
- Building Inspector
- Board of Selectmen
- Town Administrator
- Emergency Management
- Highway Department
- Water & Sewer Department
- Health Department
- Historical Commission
- Community Preservation Committee

The Plan will also be posted on the Town's website. The posting of the Plan on the website will include a mechanism for citizen feedback such as an e-mail address to send comments.

Section 9 Plan Adoption

Once the draft of the Webster Hazard Plan is reviewed by the Planning Team, stakeholders, and the general public, the Plan is reviewed by MEMA and FEMA. If approved by MEMA and FEMA, the Webster Board of Selectman can officially adopt the Plan. If and when the Plan is approved, it enters into the five year "maintenance" phase. This Section describes the timeline for plan adoption and includes documentation of the Plan adoption by the Board of Selectmen.

9.1 TIMELINE FOR PLAN ADOPTION

The timeline for Plan Adoption is as follows:

December 2024: After initial approval by the Webster Planning Board at its 12/30/2024, meeting, the Planning Team submitted the Webster Multi-Hazard Mitigation Plan to MEMA on 1/3/2025. MEMA reviewed the Plan and returned it to the Town on DATE with required edits. FEMA reviewed the Plan and returned it to MEMA on DATE with additional edits. The Webster Multi-Hazard Mitigation Plan was revised on DATE and was then submitted to FEMA for final review.

DATE: FEMA issued an Approval Pending Adoption notice on DATE.

DATE: The Webster Board of Selectmen officially adopted the Multi-Hazard Mitigation Plan at a regularly scheduled meeting.

F1 a

9.2 PLAN ADOPTION

The Certificate of Adoptions is provided in this section.

PLAN ADOPTION

PUT ON SELECTBOARD
LETTERHEAD
DATE

TOWN OF WEBSTER
CERTIFICATE OF ADOPTION

A RESOLUTION ADOPTING THE TOWN OF WEBSTER

MULTI-HAZARD MITIGATION PLAN

WHEREAS the Town of Webster established a Committee to prepare the *Multi-Hazard Mitigation Plan*; and

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

WHEREAS a duly noticed public meeting was held by the Board of Selectmen on _____, and

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

NOW, THEREFORE BE IT RESOLVED that the Town of Webster formally approves and adopts the *Multi-Hazard Mitigation Plan* in accordance with M.G.L. 40 §4 or the charter or the bylaws of the Town of Webster.

ADOPTED AND SIGNED ON [Month___Day___, 20__]

[INCLUDE SIGNATURE BLOCKS HERE]

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APPENDIX A- BIBLIOGRAPHY

Appendix A - Bibliography

Webster Hazard Mitigation Plan 2024 5-year Update References

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APPENDIX B- PUBLIC OUTREACH

Appendix B - Public Outreach

DRAFT: Town of Webster Multi-Hazard Mitigation Plan – Five Year Update
https://www.webster-ma.gov/DocumentCenter/View/24992/DRAFT-Town-of-Webster-Multi-Hazard-Mitigation-Plan--Five-Year-Update

Hi All –

Webster is pleased to announce that the final draft of our Multi-Hazard Mitigation Plan 5 Year Update is published and ready for review and public comment (link below). There is a thirty-day review period and we are reaching out to our surrounding neighbors and key community organizations for their input. Please distribute this information.

Draft Webster Multi-Year Hazard Mitigation Plan 5 Year Update

Comments are due on or before Monday, December 30, 2024 at noon and should be sent to planning@webster-ma.gov

Feel free to reach out to me if you have any questions. My direct extension is 1030. Thank you and have a Happy Thanksgiving.

Sent November 27th
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Sent December 2nd:
Ken White – Chairman CBNI Tribal Council – acw1213@verizon.net
Stacy Kelleher – Vice Chairwoman CBNI Tribal Council - skelleher@ct.metrocast.net
Note: The email address for Ken White bounced back twice. It was delivered to the Vice Chairwoman

Town of Webster Department Heads departmentheads@webster-ma.gov
Webster Board of Selectmen – selectmen@webster-ma.gov
Greg Lynskey – South Worcester County Communications Center – lynskeyg@swccc911.net
Gary Milliard – Webster Emergency Medical Services - garymilliard@gmail.com
Planning Board
Conservation Commission

Tighe&Bond
Engineers | Environmental Specialists

1

Image credit: Marjorie Turner Hollman

WEBSTER MULTI-HAZARD MITIGATION PLAN
5-YEAR UPDATE 2024

Webster Planning Board Meeting
June 24, 2024

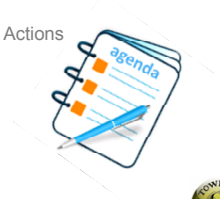
FEMA

Tighe&Bond

2

Agenda

- Purpose of HMP Update
- 2024 Plan Update Overview
- Natural Hazards & Climate Change
- Community Asset Update
- Vulnerability Assessment & Mitigation Actions
- Public Engagement



Tighe&Bond

3

WELCOME

Webster was awarded a **$29K FEMA grant** for the 5- year update of the Webster Natural Hazard Mitigation Plan.

Once the Plan is completed and approved by FEMA it unlocks **additional funding opportunities** for Webster from FEMA/MEMA and Commonwealth of Massachusetts

Tighe&Bond

4

WHY PREPARE A HAZARD MITIGATION PLAN ?

- Required to qualify for Hazard Mitigation Grants per Disaster Mitigation Act of 2000, 44 CRF Part 201.6
- Documents historic impacts from natural hazard and community vulnerability
- Educates the public on the risk of natural hazards to property damage, life and public health and the benefits of mitigating hazards so the community is better prepared and can recover more quickly
- Prioritizes mitigation projects to meet multiple community goals
- May improve scoring for Community Rating System, results in lower flood insurance premiums
- Improves chances for obtaining other State and Federal - MVP, BRIC, and EPA Congressionally Directed Spending, etc.

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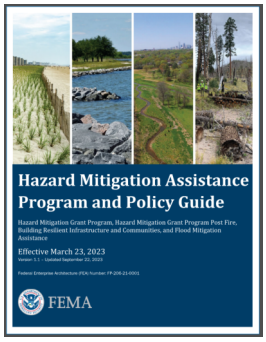
HMP UPDATE



- **Bring plan into compliance with:**
  - 2023 MA State Hazard Mitigation and Climate Action Plan (SHMCAP)
  - 2023 FEMA Hazard Mitigation Assistance Program and Policy Guide

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2024 PLAN CHANGES

- Expand community outreach to target vulnerable populations
- Incorporates climate change
- Evaluates impacts on community assets, including FEMA Community Lifelines
  - ❑ Environmental
  - ❑ Societal
  - ❑ Economic
  - ❑ Built infrastructure
- Develop problem statements to better define mitigation actions

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HAZARD MITIGATION PLANNING PROCESS

1) Define potential risk due to natural hazards including impacts of climate change
2) Identify key community assets and vulnerability to risk
3) Define mitigation projects to improve resiliency
4) Prioritize projects for areas most at risk

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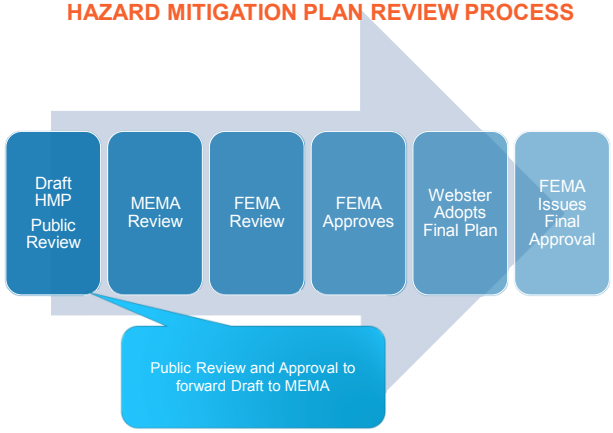
HAZARD MITIGATION PLAN REVIEW PROCESS



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NATURAL HAZARDS AND CLIMATE CHANGE

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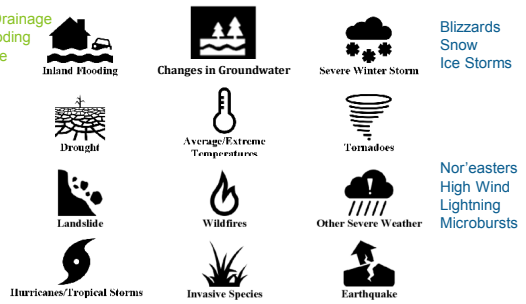
WHAT ARE NATURAL HAZARDS?

Poor Urban Drainage
Regional Flooding
Culvert Failure



Blizzards
Snow
Ice Storms

Nor'easters
High Wind
Lightning
Microbursts

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WEBSTER NATURAL HAZARD RANKING MATRIX

Type of Natural Hazard	History of Occurrence in Webster	Hazard Probability	Geographic Extent	Severity of Impact	Hazard Risk Ranking	Score (Sum)
Hydrologic Impact						
Flooding from precipitation (including Dam Overtopping)	Yes	4	2	1	3	7
Changes in groundwater	Yes	4	3	3	2	10
Drought	Yes	4	3	3	2	10
Atmospheric Impact						
Extreme Temperature	Yes	3	3	3	2	9
Hurricanes/Tropical Cyclones	Yes	1	3	2	4	6
Severe Winter Storms / Nor'easters	Yes	5	3	3	1	11
Other Severe Weather- High Winds, Thunderstorms	Yes	4	3	3	2	10
Tornadoes	Yes	3	1	3	3	7
Geologic Impact						
Earthquake	Yes	1	2	1	5	4
Landslide and mudflow	Yes	1	1	1	5	3
Other Hazards						
Wildfires	Yes	2	1	1	5	4
Invasive Species	Yes	4	2	1	3	7

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TOP NATURAL HAZARDS – PAST & PRESENT

- Changing Groundwater
- Extreme Temperatures & Drought
- Other Severe Weather - High Wind, Hurricanes, Nor'easters, Thunderstorm Wind
- Severe Winter Storms- Nor'easter, Blizzards, Heavy Snow & Ice Storms

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CLIMATE CHANGE PROJECTIONS

23-29 high heat days per year expected by 2050 and annual average temperature increase of 5.9 to 7.9º F

By 2070 Massachusetts is expected to receive 12-42% more winter precipitation

Severe weather is expected to increase including strong winds, tornadoes, extreme precipitation and droughts. Precipitation amounts from the heaviest storms in the Northeast has increased by 55% since 1958

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IMPACTS OF CLIMATE CHANGE

Increasing Temperatures

- Heat-related illnesses
- Health of plants, animals, and ecosystems
- Reduced crop productions
- Larger demand on energy systems
- Stress on infrastructure

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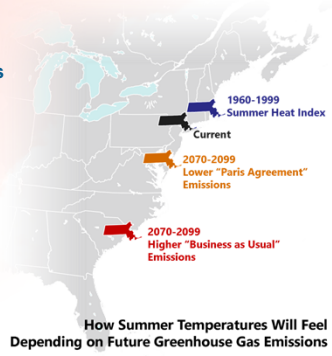
Migrating Massachusetts

By the end of the century, summers in Massachusetts will "feel" more like summers in the South.



How Summer Temperatures Will Feel Depending on Future Greenhouse Gas Emissions

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IMPACTS OF CLIMATE CHANGE

Heavy Precipitation

- Increased total rainfall
- Increase risk of flooding
- Increase damage to property and infrastructure
- Changes to rainfall and snowfall patterns

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See the full report at bit.ly/maclimate

2022 MASSACHUSETTS CLIMATE CHANGE ASSESSMENT

How are you impacted by climate change in Massachusetts?

Central Region

Let's find out!

18

Human Sector

Top Impacts :

- **Reduction in food safety and security** due to production and supply chain issues, as well as spoilage during power outages.
- **Health and cognitive effects from extreme heat,** including premature death and learning loss.

2022 MASSACHUSETTS CLIMATE CHANGE ASSESSMENT

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Infrastructure Sector

Top Impacts:

- **Damage to electric transmission and distribution infrastructure** associated with heat stress and extreme events.
- **Loss of urban tree cover** due to heat, drought, and increased pests.

2022 MASSACHUSETTS CLIMATE CHANGE ASSESSMENT

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Natural Environment

Top Impacts:

- **Freshwater ecosystem degradation** due to warming waters and increased runoff.
- **Declining forest health** because of warming temperatures, changing precipitation, increasing pest occurrence, more frequent and intense storms, and increased wildfire risk.

21

Economic Sector

Top Impacts:

- **Reduced ability to work, particularly for outdoor workers during extreme heat, as well as commute delays due to damaged road infrastructure.**
- **Decrease in agricultural productivity as crop yields are impacted by precipitation patterns, extreme weather, pests, and other climate factors.**

22

Governance Sector

Top Impacts:

- **Increased costs to maintain infrastructure and services during potentially sudden population growth due to climate migration.**
- **Increase in demand for State and municipal government services due to the impacts identified in the Human sector including emergency response, food assistance, and state-sponsored health care.**

23

COMMUNITY ASSETS

24

INFRASTRUCTURAL ASSETS

Built Environment: Critical facilities necessary for a community's response to and recovery from emergencies, infrastructure critical for public health and safety, economic viability, or for critical facilities to operate.

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PEOPLE – SOCIETAL ASSETS

People: Areas of greater population density, or population with unique vulnerabilities or less able to respond and recover during a disaster.

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ECONOMIC ASSETS

Economy: Major employers, primary economic sectors and commercial centers where loss or inoperability would have severe impact on the community and ability to recover from a disaster.

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ENVIRONMENTAL ASSETS

Natural Environment: Areas that provide protective function to reduce magnitude of hazard impact and increase resiliency. Areas of sensitive habitat that are vulnerable to hazard events, protection of areas that are important to community objectives, such as the protection of sensitive habitat, provide socio-economic benefits, etc.

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VULNERABILITY ASSESSMENT

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VULNERABILITY ASSESSMENT

- Hurricanes- High Winds
- Earthquakes
- Flooding
- Vulnerability of Future Development

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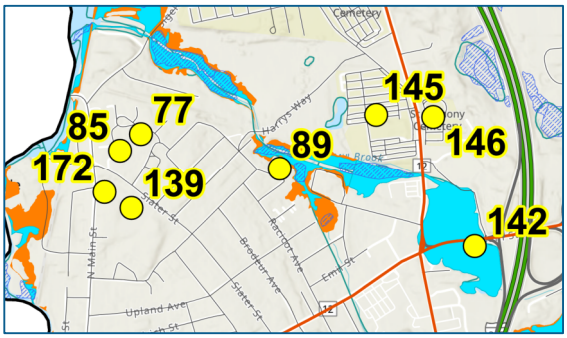
Update Risk Assessment Maps

- Maps must be large enough to visualize impacts for property owner



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MITIGATION STRATEGY

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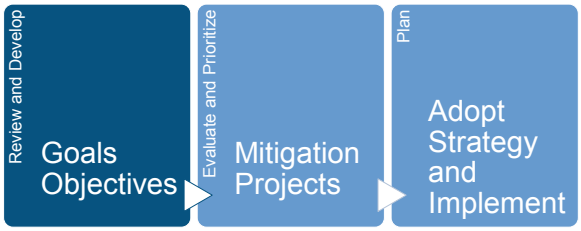
MITIGATION STRATEGY



33

MISSION STATEMENT

2024

A resiliency vision for Webster includes empowering residents, communities and Community Leaders to make near, mid and long-term changes that will reduce future climate change impacts, protect its vital community assets, and adapt to changes already occurring. The mitigation actions included in the 2024 Hazard Mitigation Plan complement and support this resiliency vision.

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TYPES OF MITIGATION ACTIONS

- **Prevention**
- **Property Protection**
- **Public Education and Awareness**
- **Natural Resource Protection and Green Infrastructure**
- **Structural Projects**
- **Emergency Services Protection**

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EXAMPLES OF PROBLEMS & MITIGATION SOLUTIONS

Problems

- Main road floods during storms, blocking emergency response.
- Power outages during heat waves lead to health concerns.
- Sewer pump stations become submerged and inoperable
- Senior housing without back-up generators during heat waves.
- Residents without access transportation during hurricane evacuation.
- Limited areas of refuge in schools during tornados.

Solutions

- Critical road elevated and passable by emergency management.
- Hardened utility lines reduce outages due to ice storms.
- Undersized culvert replaced to reduce flooding in key intersection.
- Improvement to communication systems during extreme weather.
- Private businesses provide services aligned with emergency operations.
- Floodplains provide stormwater storage and downstream flood reduction

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EXAMPLE MITIGATION ACTIONS IN WEBSTER

- **Prevention**
  - Identify opportunities to develop/assess redundances, update practices to reflect new changing regulations for Water and Wastewater facilities
  - Collaborate with Harrington Hubbard Hospital for emergency preparedness
- **Public Education and Awareness**
  - Increase public outreach on use of Senior Center as emergency shelter and available emergency Services
  - Provide education on CodeRed system
  - Community wide evacuation planning & education
- **Natural Resource Protection**
  - Implement a tree inventory and management program to identify tree health
  - Evaluate beaver control strategies to mitigate flooding and co-exist with beavers
  - Prioritize acquisition of open space to Webster Lake tributaries
- **Structural Projects**
  - Assessment of mill bridges structural integrity
  - Drainage improvements to Fire Station parking area, consider Green Solutions
  - Roadway improvements for Upper and Lower Gore Road at Rawson Road

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FUNDING SOURCES FOR HAZARD MITIGATION AND CLIMATE ADAPTATION

State Source:

- Community One Stop for Growth
- DER Culvert Replacement Municipal Assistance Grants
- District Local Technical Assistance
- Food Security Infrastructure Grant Program
- Gap Energy Grant Program
- MassWorks Infrastructure Program
- MEMA Emergency Management Performance Grant
- MVP Action Grants
- Regila Restoration Partnership Program
- State Transportation Improvement Program
- Water Utility Resilience Program

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FUNDING SOURCES FOR HAZARD MITIGATION AND CLIMATE ADAPTATION

Federal Source:

- America the Beautiful Challenge
- American Rescue Plan Act Funds
- Community Development Block Grants
- Department of Energy Low-Income Weatherization Assistance Program
- FEMA HMGP
- FEMA BRIC
- FEMA FMA
- Landscape Scale Restoration Program

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PUBLIC ENGAGEMENT

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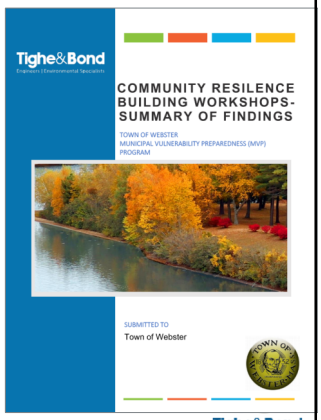
BUILDING ON MVP PROJECT WORSHOPS



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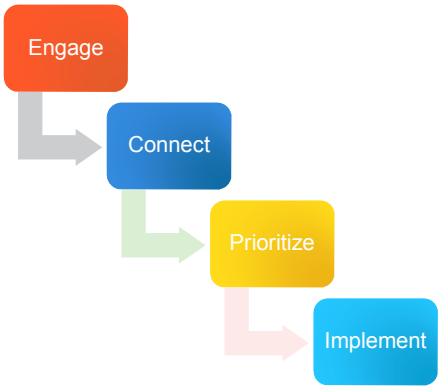
PUBLIC ENGAGEMENT OBJECTIVES



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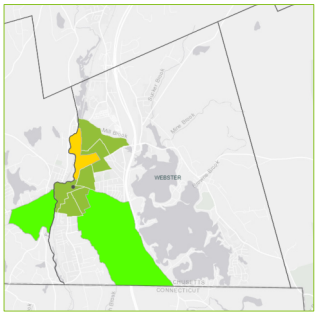
MEANINGFUL ENGAGEMENT STRATEGY

- Work through existing advocacy networks, employers
- Identify direct climate impacts to communities with environmental justice concerns (economic, health, public safety)
- Identify short-and long-term mitigation measures



Source: Neighborhoods at Risk

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ENGAGEMENT TOOLS

Scan the code for the Webster Natural Hazard Risks Survey!

Tornado Damage, August 2018
Image source: WCVB

Take the survey here: https://qk2xd856qe1.typeform.com/to/YtAbaT3o
or scan the QR code above.

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COMMENTS OR QUESTIONS?

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Contacts

- **Ann Morgan, Director of Planning and Economic Development, HMP Project Lead**
  - Phone: 508-949-3800 x1030
  - Email: amorgan@webster-ma.gov
- **Gabrielle Belfit, CFM, Senior Environmental Scientist, Project Manager, Tighe & Bond**
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  - Email: GCBelfit@TigheBond.com

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WEBSTER MULTI-HAZARD MITIGATION PLAN
5-YEAR UPDATE 2024

Community Focus Group Meeting
October 15, 2024

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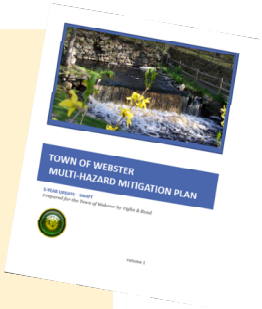
AGENDA

- Introductions
- 2024 Plan Update Overview
- Key Components of the Plan
  - Natural Hazards & Climate Change
  - Mitigation Strategy
- Q&A and Open Discussion



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INTRODUCTIONS

- Ann Morgan, Town of Webster
- Joey Wigglesworth, Town of Webster
- Gabrielle Belfit, Tighe & Bond, PM
- Hannah Bonvie, Tighe & Bond, Planner

COMMUNITY FOCUS GROUP PURPOSE

To promote meaningful engagement and encourage participation from a broader range of stakeholders in Webster's community.

Input collected during today's focus group will be incorporated into the Hazard Mitigation Plan update.

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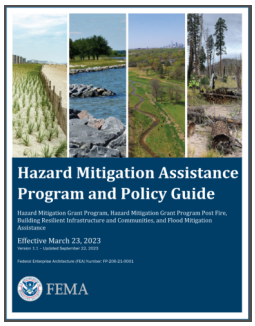
2024 HMP UPDATE

- **Compliance with FEMA**
- **Expand public outreach**
  - Addressing updated FEMA Guidance
  - Receive feedback from a broad cross section of the Webster community – through survey and posting draft for comments
  - Encourage **active participation and involvement** in understanding natural hazards and identifying the needs of vulnerable populations in Webster
  - Document outreach into HMP Update



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HAZARD MITIGATION PLANNING PROCESS

1) Define potential risk due to natural hazards including impacts of climate change
2) Identify key community assets and vulnerability to risk
3) Define mitigation projects to improve resiliency
4) Prioritize projects for areas most at risk

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NATURAL HAZARDS & CLIMATE CHANGE

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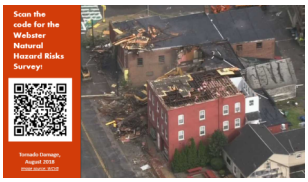
MEANINGFUL ENGAGEMENT STRATEGY

- **Working through existing advocacy networks to identify needs**
- **Identify direct climate impacts to communities with environmental justice concerns (economic, health, public safety)**
- **Understanding the power of the community's lived experience**
- **Identify short-and long-term mitigation measures to address climate disparities**



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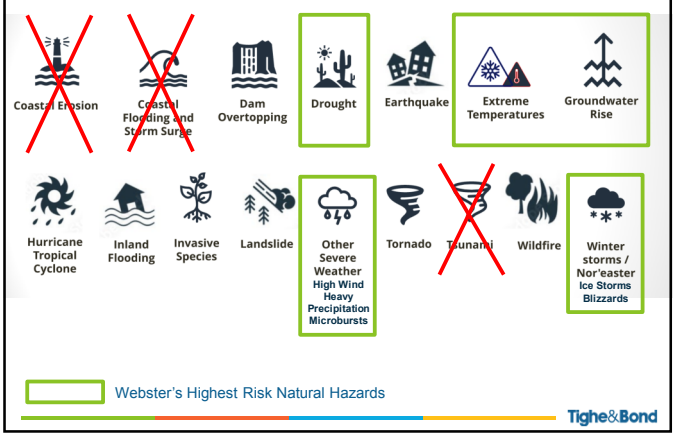
2023 SHMCAP NATURAL HAZARDS



Webster's Highest Risk Natural Hazards

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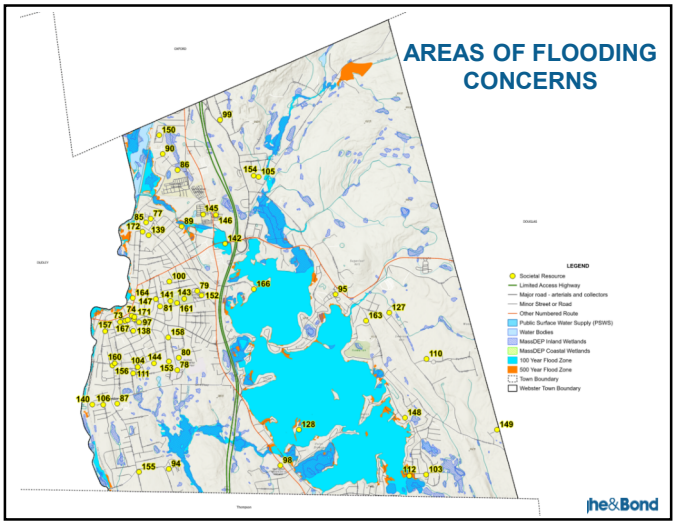
AREAS OF FLOODING CONCERNS



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CLIMATE CHANGE PROJECTIONS & IMPACTS

23-29 high heat days per year expected by 2050 and annual average temperature increase of 5.9 to 7.9° F

- Heat Related Illness
- Health of plants, animals, ecosystems
- Reduced crop production
- Larger demand on energy systems
- Stress on infrastructure

By 2070 Massachusetts is expected to receive 12-42% more winter precipitation

Precipitation amounts from the heaviest storms in the Northeast has increased by 55% since 1958

- Increased total rainfall
- Increased risk of flooding
- Increase damage to property and infrastructure
- Changes to rainfall and snow patterns

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QUESTIONS & DISCUSSION – RISK ASSESSMENT

- What impacts from natural hazards have you personally experienced in Webster?
- What was the most difficult part of dealing with the natural hazard?
- What community assets have aided you during storm/natural hazard recovery? (e.g., gas stations, fire department, grocery stores)
- Are there specific groups, services, or people you rely on during emergencies (e.g., local non-profits, faith-based organizations, family, neighbors, etc.)?

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MITIGATION STRATEGY

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MITIGATION STRATEGIES

Mitigation Actions should address specific vulnerabilities identified in the Risk Assessment

- **Webster must identify & implement one mitigation action for each natural hazard**
- **A comprehensive range of actions must be considered**
- **Must reduce risk to infrastructure and benefit underserved communities and socially vulnerable populations**
- **Actions must be achievable and demonstrate risk reduction**
- **Actions identify a lead department, funding source, cost, and timeframe**

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PROJECT TYPES APPROPRIATE TO INCLUDE IN HMP

1. **Prevention:** planning and zoning, building codes, CIP
2. **Property Protection:** acquisition, elevation, relocation, structural retrofits
3. **Public Education and Awareness:** outreach and education, hazard information centers
4. **Natural Resource Protection and Green Infrastructure:** LID, sediment and erosion control, stream corridor restoration, watershed management, wetland restoration
5. **Structural Projects:** storm water controls (e.g., culverts), seawalls, retaining walls
6. **Emergency Services Protection:** protection of warning system capability, protection of critical facilities, and protection of emergency response infrastructure

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EXAMPLE MITIGATION ACTIONS

Hazard Addressed	Examples of Mitigation Actions
Flooding, Hurricanes, Winter Storms, Other Severe Weather	Identify high school as secondary emergency shelter and provide public outreach on Council on Aging primary emergency shelter.
All Hazards	Emergency power generators will be added or improved as needed.
Other Severe Storms	Implement trail improvements and tree management.
Flooding, Severe Storms	Develop stormwater asset management plan to upgrade drainage system and retrofit where possible with green infrastructure.
All Hazards	Plan upgrades to meet water quality standards at all Town wells and pump stations.
Flooding	Conduct capacity planning study for culverts to analyze design, permitting, and construction.
All Hazards	Provide community outreach and education on natural hazard emergency preparedness for private businesses.

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QUESTION & DISCUSSION – MITIGATION STRATEGIES

- Are there specific challenges you encounter when trying to access emergency services, shelters, or resources during or after a natural hazard?
- Do you know where to go for help or information during a natural hazard event?
- What would make it easier for you and your community to recover after a natural hazard event (e.g., financial aid, access to services, housing assistance, etc.)?
- What could local authorities or organizations do to help better prepare or support you during natural hazard events?
- Are there particular services or resources that are lacking in your community that would help you during emergencies (e.g., transportation, communication systems, medical aid, etc.)?

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THANK YOU

QUESTIONS & DISCUSSION

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Contacts

Ann Morgan, Director of Planning and Economic Development
Town of Webster HMP Project Lead
- Phone: 508-949-3800 x1030
- Email: amorgan@webster-ma.gov

Gabrielle Belfit, CFM
Senior Environmental Scientist, Tighe & Bond
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Image credit: Marjorie Turner Hollman

WEBSTER MULTI-HAZARD MITIGATION PLAN
5-YEAR UPDATE 2024

Webster Planning Board Meeting
November 25, 2024

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Webster's Hazard Mitigation Plan Core Team

Ann Morgan
Joey Wigglesworth
Richard LaFond
Ted Tetreault
Camille Griffin
Carol Cyr
Tom Cutler
Kenneth Pizzetti
Brian Hickey
Sebastian Mroczka

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PURPOSE OF PUBLIC MEETING

1. Requirement of Federal HMP and EEA contract
2. Mitigation Strategy Highlights
3. Action Identification & Ranking
4. HMP Review Process

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BACKGROUND ON HAZARD MITIGATION PLANNING

- **FEMA Requirements:**
  - Disaster Mitigation Act of 2000, 44 CRF Part 201.6
  - 2023 FEMA Hazard Mitigation Assistance Program and Policy Guide
- **To maintain eligibility for FEMA/MEMA funding, must update plan every 5 years**
- **Commonwealth of Massachusetts State Hazard Mitigation & Climate Adaptation Plan 2023 must be considered in update**

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2024 PLAN CHANGES

- Expand community outreach to target vulnerable populations
- Incorporates climate change
- Evaluates impacts on community assets, including FEMA Community Lifelines
  - ❑ Environmental
  - ❑ Societal
  - ❑ Economic
  - ❑ Built infrastructure
- Develop problem statements to better define mitigation actions

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WHY DO THIS PLANNING?

Help Webster Build Resilience and Preparedness:

- Build on the Town's existing emergency management capabilities
- Plan for more frequent and intense weather events that are linked to climate change
- Engage multiple stakeholders in the planning process
- Improve access to funding for mitigation and adaptation

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HMP GRANT PROCESS

1. Establish Core Team
2. Complete Evaluation/Assessment
   - Evaluate Natural Hazard Risks
   - Inventory Community Assets
   - Multi-Hazard Vulnerability Assessment
   - Capabilities Assessment
   - Develop Mitigation Actions

3. Draft Hazard Mitigation Plan Update
4. Hold Public Meeting mid-process
5. Final HMP Report
6. **Hold Final Public Meeting and Public Comment Period for review**

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RECAP OF HMP PROGRESS TO DATE

Section 1	Introduction
Section 2	Planning Process
Section 3	Local Profile
Section 4	Natural Hazard Risk
Section 5	Community Asset Inventory
Section 6	Vulnerability Assessment
Section 7	Capabilities Assessment
Section 8	Mitigation Strategy
Section 9	Plan Evaluation and Maintenance
Section 10	Plan Adoption

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TOP NATURAL HAZARDS – FUTURE

	Once a year or more often	Once every 3-5 years	Once in a decade	Once in a lifetime	Never	Not sure
Blizzard	34.4%	46.9%	18.8%	0%	0%	0%
★ Nor'easter	71.9%	25%	3.1%	0%	0%	0%
Ice Storm	40.6%	43.8%	12.5%	0%	0%	3.1%
Flooding	28.1%	18.8%	31.2%	12.5%	3.1%	6.2%
Dam Overtopping and/or Failure	9.4%	6.2%	18.8%	18.8%	21.9%	25%
Drought	34.4%	50%	9.4%	0%	0%	6.2%
★ Extreme Temperatures	59.4%	40.6%	0%	0%	0%	0%
Tornado	9.4%	34.4%	34.4%	12.5%	0%	9.4%
Landslide	6.2%	6.2%	18.8%	6.2%	37.5%	25%
Wildfire	6.2%	9.4%	15.6%	12.5%	43.8%	12.5%
★ High Wind	62.5%	25%	6.2%	3.1%	0%	3.1%
★ Thunderstorm	96.9%	3.1%	0%	0%	0%	0%
Microburst	31.2%	34.4%	18.8%	3.1%	3.1%	9.4%

Q: How often have each of the following natural hazard occurred in your community?

★ Natural Hazard Priority

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COMMUNITY ASSET CATEGORIES

FEMA defines a community asset as anything that is important to the character and function of a community.

FEMA Community Asset Categories	Critical Sectors	Characteristics of Community Assets
People	Schools, Vulnerable Populations, Cultural Facilities	Areas of greater population density, or population with unique vulnerabilities or less able to respond and recover during a disaster.
Built Environment	Critical Municipal Facilities, Water, Wastewater, Energy, Stormwater, Transportation, Cultural Resources	Critical facilities necessary for a community's response to and recovery from emergencies, infrastructure critical for public health and safety, economic viability, or needed for critical facilities to operate.
Economy	Marinas, Business and Industry	Major employers, primary economic sectors and commercial centers where loss or inoperability would have severe impact on the community and ability to recover from a disaster.
Natural Environment	Natural Resources	Areas that provide protective function to reduce magnitude of hazard impact and increase resiliency. Areas of sensitive habitat that are vulnerable to hazard events, protection of areas that are important to community objectives, such as the protection of sensitive habitat, provide socio-economic benefits, etc.

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11

VULNERABILITY ASSESSMENT

- **Hurricanes- High Winds**
- **Earthquakes**
- **Flooding**
- **Vulnerability of Future Development**

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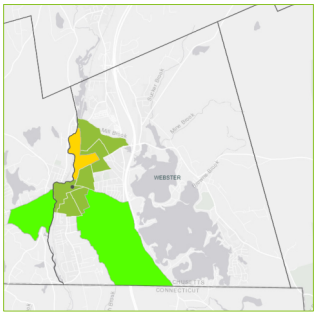
12

CLIMATE VULNERABLE POPULATION ENGAGEMENT

- **Identify direct climate impacts to communities with environmental justice concerns (economic, health, public safety)**
- **Initiated discussions with focus group**
  - Attendees included Pastor of Reconciliation & Peer Recover Center and Tri Valley, Inc.
  - Identified climate vulnerable populations: seniors, individuals with substance abuse disorders, individuals with disabilities



Source: MA 2020 Environmental Justice Populations Map Viewer

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13

MISSION STATEMENT

2024

A resiliency vision for Webster includes empowering residents, communities and Community Leaders to make near, mid and long-term changes that will reduce future climate change impacts, protect its vital community assets, and adapt to changes already occurring. The mitigation actions included in the 2024 Hazard Mitigation Plan complement and support this resiliency vision.

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14

NEW MITIGATION ACTIONS (2024-2029)

1. **Develop New Mitigation Actions to address key vulnerabilities to current and future natural hazards**
2. **Prioritize Mitigation Strategies for action over the next 5-year planning period.**

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TYPES OF MITIGATION ACTIONS

- **Prevention**
- **Property Protection**
- **Public Education and Awareness**
- **Natural Resource Protection and Green Infrastructure**
- **Structural Projects**
- **Emergency Services Protection**

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16

PRIOIRITZTION METHOD FOR MITIGATION ACTIONS

STAPLEE METHOD
Seven criteria are used to evaluate each mitigation action:

- Social
- Technical
- Administrative
- Political
- Legal
- Economic
- Environmental

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HIGH PRIORITY MITIGATION ACTIONS

Mitigation Action	Timeframe	Geographic Area
Hazard Mitigation Public Outreach	2	Townwide
Update Master Plan to include addressing needs of climate vulnerable populations	3	Townwide
Shelter inventory and implementation of findings	2	Townwide
Investigate options for improved program or upgraded Code RED program.	1	Townwide
MVP 2.0 participation and Seed Project implementation	2	Townwide
Update bylaws to provide Smart Growth Tools	3	Townwide
Establish a community Liaison to coordinate hospital services with at risk populations	2	Townwide
Wastewater collection System Flood Assessment	3	Townwide
Lower Gore and Sutton Road culvert improvements	3	Lower Gore and Sutton Road
Webster Wetland Protection Bylaw	2	Townwide
Evacuation protocols during extreme events	1	Townwide
Coordination with Private Dam owners for inspection and improvements including East Village Dam, Club Pond Dam and Webster Lake Dam	4	Private Dams

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MEDIUM & LOWER PRIORITY MITIGATION ACTIONS

Mitigation Action	Timeframe	Geographic Area
Strategic infrastructure planning	4	Townwide
Senior Center Shelter Plan	2	Townwide
High School Shelter Plan	2	Townwide
Town Hall Flooding Mitigation	2	Townwide
Police Emergency Operations Building Drainage improvements	1	Townwide
Emergency Roadway improvements	3	Townwide
Mill Brook- Flood Mitigation	2	Mill Brook Area
Stormwater Regulations Update	3	Townwide
Webster Lake Climate Resilience Plan	3	Townwide
Address Tree related hazards to reduce risk to Town infrastructure	1	Townwide
Improvements to culvert at Upper Lower Gore Rawson Road Intersection at Route 16	3	Upper Lower Gore Rawson Road Area
Develop culvert asset management program	3	Townwide
Historic Property and Essential Service Hazard Awareness Action Plan	3	Townwide
Provide resources for mitigation of rising groundwater levels	3	Townwide
Evaluation of Climate Vulnerable Population Housing Needs	2	Townwide
Improve back up power at Library	1	Townwide
Update Municipal Environmental Regulations to address hazard mitigation	4	Townwide

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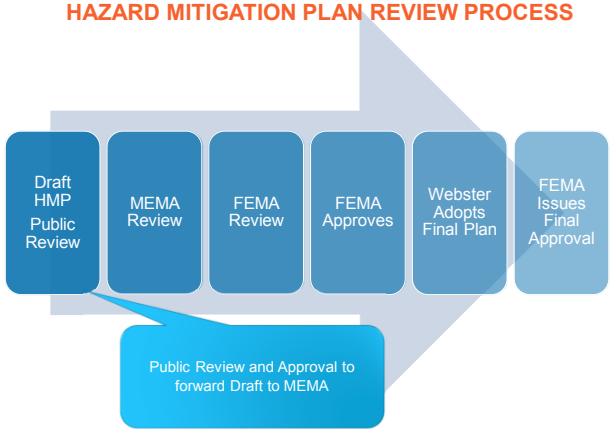
HAZARD MITIGATION PLAN REVIEW PROCESS



20

MITIGATION ACTIONS ACTIVITY

More Mitigation Measures, More Savings

One dollar invested in mitigation = six dollars U.S. saves in future costs

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21

FUNDING SOURCES FOR HAZARD MITIGATION AND CLIMATE ADAPTATION

State Source:

- Community One Stop for Growth
- DER Culvert Replacement Municipal Assistance Grants
- District Local Technical Assistance
- Food Security Infrastructure Grant Program
- Gap Energy Grant Program
- MassWorks Infrastructure Program
- MEMA Emergency Management Performance Grant
- MVP Action Grants
- Regila Restoration Partnership Program
- State Transportation Improvement Program
- Water Utility Resilience Program

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FUNDING SOURCES FOR HAZARD MITIGATION AND CLIMATE ADAPTATION

Federal Source:

- America the Beautiful Challenge
- American Rescue Plan Act Funds
- Community Development Block Grants
- Department of Energy Low-Income Weatherization Assistance Program
- FEMA HMGP
- FEMA BRIC
- FEMA FMA
- Landscape Scale Restoration Program
- Thriving Communities Technical Assistance Center Program

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23

Contacts

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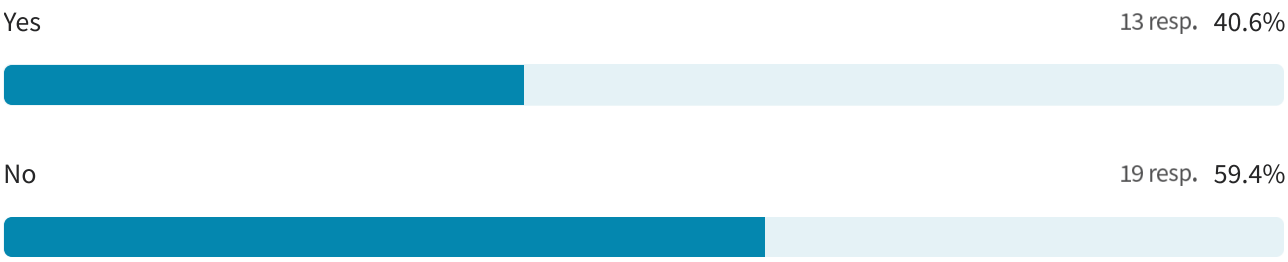
24

2024 Webster Hazard Mitigation Plan Update Natural Hazards Survey

32 responses

During the past 5 years, in the community you currently reside in, have you or someone in your household directly experienced a natural disaster? This could be an earthquake, severe windstorm, flood, wildfire, or other type of natural disaster?

32 out of 32 answered



What community assets have assisted and aided the community's population through a natural hazard event, such as blizzards, flooding, and extreme heat? Please be specific and list the three most important that come to mind (example assets: gas stations, pharmacies, supermarkets, towing services, etc.).

32 out of 32 answered

1. Snow plowing 2. Electric restoration 3. Flood prevention

DPW , Police Fire Rescue , Board of Health

Department of public works, emergency services, supermarkets

Dpw,fire,police and ems

public safety department, supermarket, gas station

DPW, National Grid, library

Police/emergency, Plowing, supermarkets

Municipal services(plowing, police, fire) Supermarkets, gas stations

Supermarkets

PD,Fire dept, EMS

Grocery Store, Gas stations, Hospital

gas stations, supermarkets, home depot type stores

public library, supermarket, senior center

Gas stations, grocery store

Utilities, town services, non-profits

Grocery stores, gas stations

First responders

Police, Fire depts., and Senior Center.

Gas stations, medical access, supermarkets

DPW, Police, Fire

Emergency Services, grocery stores, gas stations

Contractors, cooling centers, food bank, red x

highway dept., supermarkets, gas stations

Senior center, police and fire and ambulance, town services ie plows and sanders

Super market, town hall, utility company

What infrastructure has been impacted by natural hazard events in your community? Please be specific and list the three most important that come to mind (examples infrastructure: roadways, municipal buildings, power utilities, water or sewer utilities, stormwater drainage, dams, etc.).

32 out of 32 answered

1. Power lines 2. Roads 3. Water infrastructure

Power , Storm water flooding roads , Sewer

Power utilities, storm water drainage, downed trees

Utility, drainage,

electric & communications

route 395, store/apartments at Chase Ave, power utilities

Highways, power utilities, water drainage

Power utilities, trees that fell blocking roads, w water quality

Drainage

Roads

Drainage, municipal buildings, small businesses

power, storm drainage, internet

none

Bridge

Stormwater drainage, roadway flooding

power utilities

Drought, power, sewer

Flooding of town hall offices, electrical utility, roads.

Power utilities, storm water drainage, roadways

Power utilities, storm water systems and critical roadways

power, roads, drainage, (tornado took out some structures)

Dam entering Webster Lake at Rt. 16 in disrepair; lower gore undersized culverts/icing; water supply with drought (and PFAS) and less baseflow and recharge with less snow and flashier precipitation; aerial power supply vulnerable to debris and wind; flooding at town hall

roadways, power utilities, water

Road ways Utilities Drainage

Storm water system

Thinking about your response to Question #8, can you describe specific impacts?

32 out of 32 answered

Roads impassable, electricity outages, water quality impacts

Tornado , Heavy Rain

Overflow of storm water from floods and blizzards, downed trees on major roadways, winter storms causing inability to leave home because of driveway being plowed in by hired plow drivers.

Flooded streets

power & cable loss

Road surface damaged on rte 395, buildings destroyed at Chase Ave by tornado, occasional loss of electrical service in wind/ice storms

The drain at the end of our driveway couldn't handle a heavy rain and the water backed up our driveway and knocked over our garbage cans. I wasn't sure if we could drive through it if needed.

Blocking roads with limited egress, loss of power causes seasonal issues like heat air conditioning, concern about EMS access

None

Asphalt:potholes

Several small businesses were lost due to a tornado. Many times, the Police Station becomes a destination for citizens to go to for assistance.

no power and no internet means you cannot work

none

Flooding damaged bridge

Stormwater drains in our area are overwhelmed on a regular basis, and several local road (i.e. Joe Jenny) flood regularly.

Losing power causes us to use generators

No

Town Hall offices flooded.

No power or communication has caused household distress.

Power outages, road flooding and road closures

Loss of power from severe storms; tornado damaged structures on Main Street and East Main

See above, increased heat from heat island effects esp. to vulnerable communities

losing power during big storms

Not at this time

Flooding

What major employers, primary economic sectors, and commercial centers would severely impact the community if lost or inoperability were to occur in the future and thereby curtail your community's ability to recover from a disaster? Please be specific and list the three most important that come to mind.

32 out of 32 answered

Public emergency services, government agencies, and grocery stores

Hospital , grocery store , schools

Supermarket closure, inability of town communication, medical facility closure.

Marfi

Price Chopper shopping center, police & fire

Mapfre Insurance, Price Chopper, lake real estate

Grocery stores, Gas stations, Pharmacy

Shopping centers for food, medicine,gasoline, EMSservices, police and fire services

None

Mapfre

Umass Webster

gas stations, hardware stores, supermarkets

supermarket

Grocery store

Mapfre, Indian Ranch, downtown Webster

Police, Fire, EMT departments, grocery and gas stations

First responders, schools,retail

Mapfre Insurance Company, grocery stores.

Access to food and medicines, ability of police, fire, EMS to access my home, loss of power and communications

Supermarkets, gas stations and phone services

Major businesses like MAPFRE and Goya; grocery stores and pharmacies; other supply businesses like hardware/gas.

Harrington Hospital, Grocery stores (pchops), power supply/fueling (oil/gas) stations

mapfre

Grocery stores Schools Road damage

Town hall

Which populations, groups of people, or communities are less able to respond and recover during a disaster? Please be specific and list the three most important that come to mind (examples include: elderly populations, environmental justice populations, special needs schooling, mobility disabled, child care, shelters, homeless, etc.).

32 out of 32 answered

Elderly and homeless

Homeless , Nursing facilities , Low income housing

Elderly, mobility disabled, homeless.

Elderly disability children

elderly

elderly, families with young children, mobility disabled

Elderly, low income, homeless

Elderly population, mobility impaired, school aged children

None

Elderly

The elderly, those on assisted living and in low income housing with limited transportation

elderly, mobility disabled

homeless, low income families, renters

Elderly, special needs, mobility impaired

Elderly, disabled, economically depressed, homeless...anyone without the resources to deal or escape. This is obvious.

elderly and handicap

Elderly, minority, homeless

Elderly & homeless.

Elderly and disabled, young children, homeless

Elderly, homeless and rural residents

Those who don't have insurance; low income/transient population; the elderly

Elderly, children (school/daycare), EJ, folks without access to a motor vehicle or with mobility Impairments, folks who do not speak English, unhoused

elderly populations

Elderly Disabled Homeless

Elderly, shelters and homeless

Thinking about your response to Question #11, are any of these populations living in high-risk areas, and if so, where?

32 out of 32 answered

Yes, in senior living facilities

Pontiac Ave , Brookside Rehab

Private homes, in wooded areas near cemeteries.

All schools all assisted living and care facility

unknown

Not obviously higher risk than the rest of town

Not sure

Convalescent homes, hospitals, limited road access in disasters like Killdeer rd

None

No

Yes, many live in the Main Street area, which has been vulnerable to natural disasters.

unsure

downtown area could be impacted in a French River flooding event

Not that I know of

There is water everywhere in and around Webster, so everyone lives in a high-risk area.

not sure

I'm sure they are.

Low-income housing near French River.

?

Thinly settled areas

Those living along the French River. Example-floods in the 50s

More urbanized areas have more exposure to increased extreeme heat events and tend to have more EJ and mobility impaired residents.

no

Not sure

Yes

What natural resources does your community value and provide protective functions to reduce the magnitude of hazard impacts and increase community resiliency? Please be specific and list the three most important natural resource areas that come to mind, including the name and location if you know (examples include: open spaces, wetlands and water bodies, trails, recreation areas, etc.).

32 out of 32 answered

Lakes, trails, rivers & parks

Webster Lake , French River , Memorial Beach

Water bodies

Lake, recreational and wetlands

unknown

Lake Chargoggagogg..., French River, Mine Brook Wildlife Management Area

Water bodies, recreation areas, wetlands

Webster lake, beach area , municipal water sources

None

Lake

Webster Lake and The French River immediately come to mind. The mill structures located in the town also pose an inherent danger of fire risk.

---

wetlands and waterbodies

---

none that I know of

Webster Lake

I have no idea what you're asking here.

---

lake, rivers and open spaces

Nothing specific unfortunately

Webster Lake wetlands.

Natural water and wetlands areas. Dead standing trees in all areas in town. Potable water sources.

Not sure

Memorial Beach, French River Walk, playing fields

Webster Lake, Trees, French River, state forest

The lake

Webster Lake

Not sure

Thinking about your response to Question #13, what climate exposure effects have there been on natural resources, if any?

32 out of 32 answered

None so far

Heavy rain or Drought

Unknown

All

unknown

Increased run-off from heavier rains

Warm climate has caused less snow/run off for rivers and waterbodies

Water quality, wind damage to homes and trees, roads with only one access point

None

?

N/A

increased erosion and sedimentation into wetlands and waterbodies reduce capacity of the to mitigate storage of precipitation

unclear what has been affected by climate change

None that I have seen

X

drought and flooding

Climate change impacts water, drought, temperature, weather, allergies etc

Drinking water wells' contaminations.

Stress of excessive water and drought, hot and cold temperature, dry and humid conditions

N/A

Erosion during storms, damage to structures

Changes in precipitation and increased temperatures and development increase vulnerability of the Lake to eutrophication (on top of vigorous public (ab)use that errode shoreline and stir up sediment from the lake bottom), warmer water temps, flashier/faster thawing precip events, leading to lower baseflow and warmer water temps, shallow depths make the lake difficult to navigate in drought; acquatic invasive introduction and spread at boat ramps; tree health and vulnerability to changing climate; development impacts on water quality

do not know

Unknown

N/a

Please describe extreme weather events or climate hazards you feel are most significant for your community in the last 5 years (examples include: August 2018 Tornado, Tropical Storm Fred, 2020 New England Derecho, etc.).

32 out of 32 answered

2015 blizzard

Tornado , Ice storms ,Hurricanes

Heavy snowfall, decrease in usage of town water due to malfunctioning well, high winds in storms.

All

major snow storms

August 2018 tornado, Hurricane Sandy, heat/drought in 2020 or 2021(?)

Not sure

Various thunderstorms with large quantity of rain and high wind, rainstorms have overfilled the lake

None

Tornado

Tornado, various windstorms and snowstorms

microbursts and blizzards - typical

increased drought years, tornado

..

Unknown

none

2018 tornado, warmer winters, drought

2018 tornado. Drinking water well contamination.

All major weather events including climate change

Flooding September 2019,

Increased potential for tornados which used to be rare, as well as tropical storms and derechos. The August 2018 tornado is a good example.

Drought; extreme heat is increasing every year; summer 2021 rain events (and ongoing higher volume events occurring more frequently - especially combo of snow then thaw followed by rain - systems struggle to drain); 2018 tornado

August 2018 Tornado, winter storms

No

Increased Tornado threats in MA causing anxiety. And flooding in neighboring towns

Thinking about your response to Question #15, where are the high-risk areas?

32 out of 32 answered

Major roads

French River

Any populous area.

The town

rural roads

Brown's Brook on Gore Rd, French River behind post office

Not sure

Low lying road areas and certain properties around the lake, killer road access to rt 16

None

?

all town

areas within floodplains or subject to flooding

low lying areas where flooding is possible, forests if drought years increase

...

Almost everywhere in Webster. There is only one way out if there is extreme flooding (Rt. 395 south). Every other road crosses water or passes it at a low spot.

none

Schools, lake areas, etc

Near Webster Lake where most of the town's drinking water wells are located.

All areas

All low lying areas and areas with inadequate storm water management

Downtown, town complex on Main Street, schools

Low lying and highly urbanized areas for heat and drainage, historic structures for tornados,

do not know

Don’t know

Every where

What is unique about your community?

32 out of 32 answered

Lake

Center of my universe , Middle of New England

Social media information from Police, communication from town about hazards and potential dangers via social media and phone messages.

The lake

---

lake

The lake, the diversity

The lake.

Access to lake, limited egress point!

None

Xx

It is very diverse both ethically and economiocally

---

largest fresh waterbody in MA

---

polite people, increasing diversity

Webster Lake

A mix of wealthy lake residents, blue & white collar suburban areas, and an economically depressed milltown-type downtown area.

Webster Lake

Webster Lake

Recreation areas of Webster Lake, Samuel Slater Museum, good School System.

Small land area and big water area

Nothing

Our history and lake

Webster Lake

large lake in town

No

New here not totally sure but there has been a lot of flooding

What are the most important/influential institutions, organizations, or businesses in your community?

32 out of 32 answered

Don’t know

Town government , Mapre , Hospital

Police, emergency personnel.

All

Mapfre

town government, Bartlett High School, Gladys Kelly Library, Price Chopper, CVS,

Not sure

Banks, Insurance co, library, senior center

None

Mapfre

Town Departments

mapfre, WLA

library, Price Chopper

Webster Lake Association

Mapfre, Indian Ranch, public safety, churches.

Grocery store, bank, insurance, police, fire

Schools, library

Mapfre Ins. Co., Police Dept., Town Administrator.

Town government (especially safety, education, highway and water/sewer)

Mapfre Insurance and IPG Photonics

MAPFRE; Business Alliance; Planning, Zoning, and Conservation Boards

Commerce Insurance, large land owners, WLA, Library

mapfre

No

Main Street and town hall

What are the prominent geographic features of your community?

32 out of 32 answered

Lake

Lake , river and 395

Nothing specific.

The lake

lake

The lake

The lake

Lake, water sources

None

Webster Lake

Webster Lake

webster lake

French River, Webster Lake

..

Very large natural lake.

webster lake

The lake

Large lake.

Rivers, hills and lake

Webster Lake and French River

The lake and the French River

Webster Lake, French River, Forests, 395

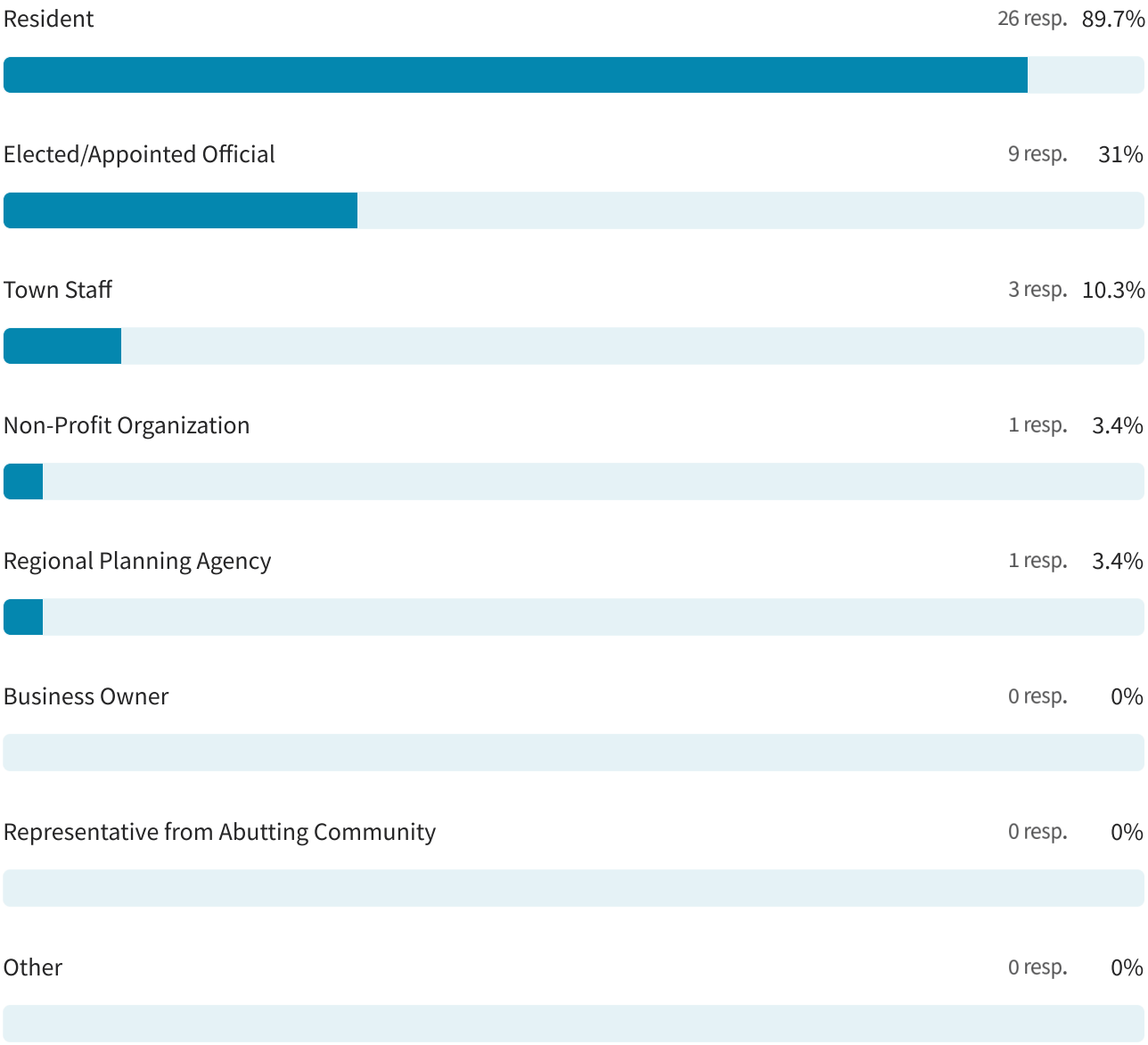
lake

No

Webster lake

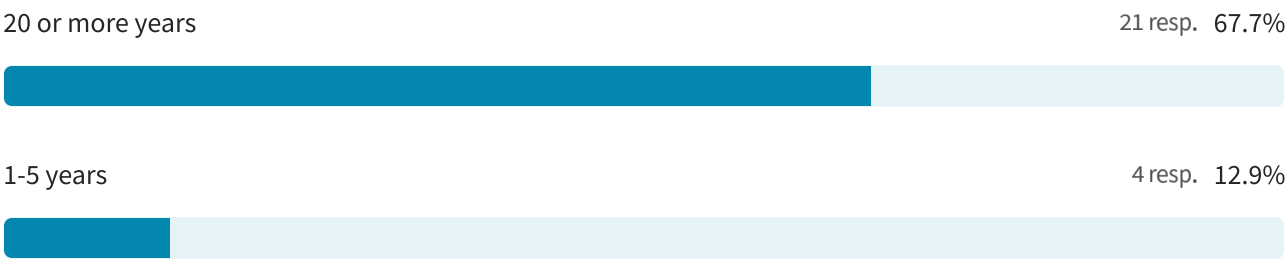
What is your affiliation with the Town of Webster? (Select all that apply)

29 out of 32 answered



How long have you lived in the state?

31 out of 32 answered



10-19 years 4 resp. 12.9%

6-9 years 1 resp. 3.2%

Less than 1 year 1 resp. 3.2%

Do you own or rent your home?

25 out of 32 answered

Own 21 resp. 84%

Rent 4 resp. 16%

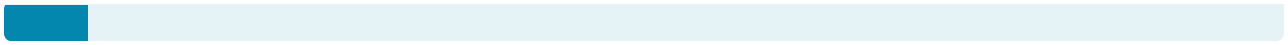
Do you own/rent a:

31 out of 32 answered

Single-family home 26 resp. 83.9%

Duplex 3 resp. 9.7%

Apartment (3-4 units) 2 resp. 6.5%



Apartment (5 or more units in structure) 0 resp. 0%

Condominium/townhouse 0 resp. 0%

Manufactured home 0 resp. 0%

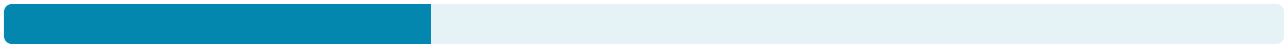
Other 0 resp. 0%

Whom would you most trust to provide you with information about how to make your household and home safer from natural disasters? (Please check up to three)

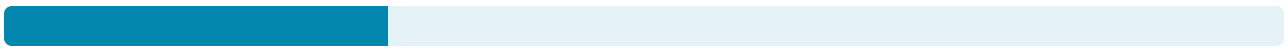
30 out of 32 answered

Government agency 16 resp. 53.3%

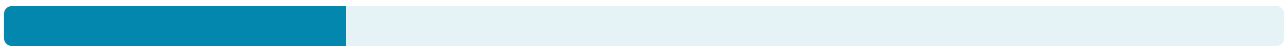
News media 10 resp. 33.3%



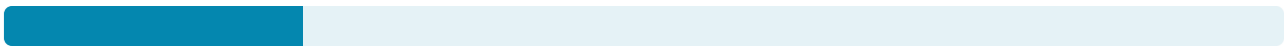
Utility company 9 resp. 30%

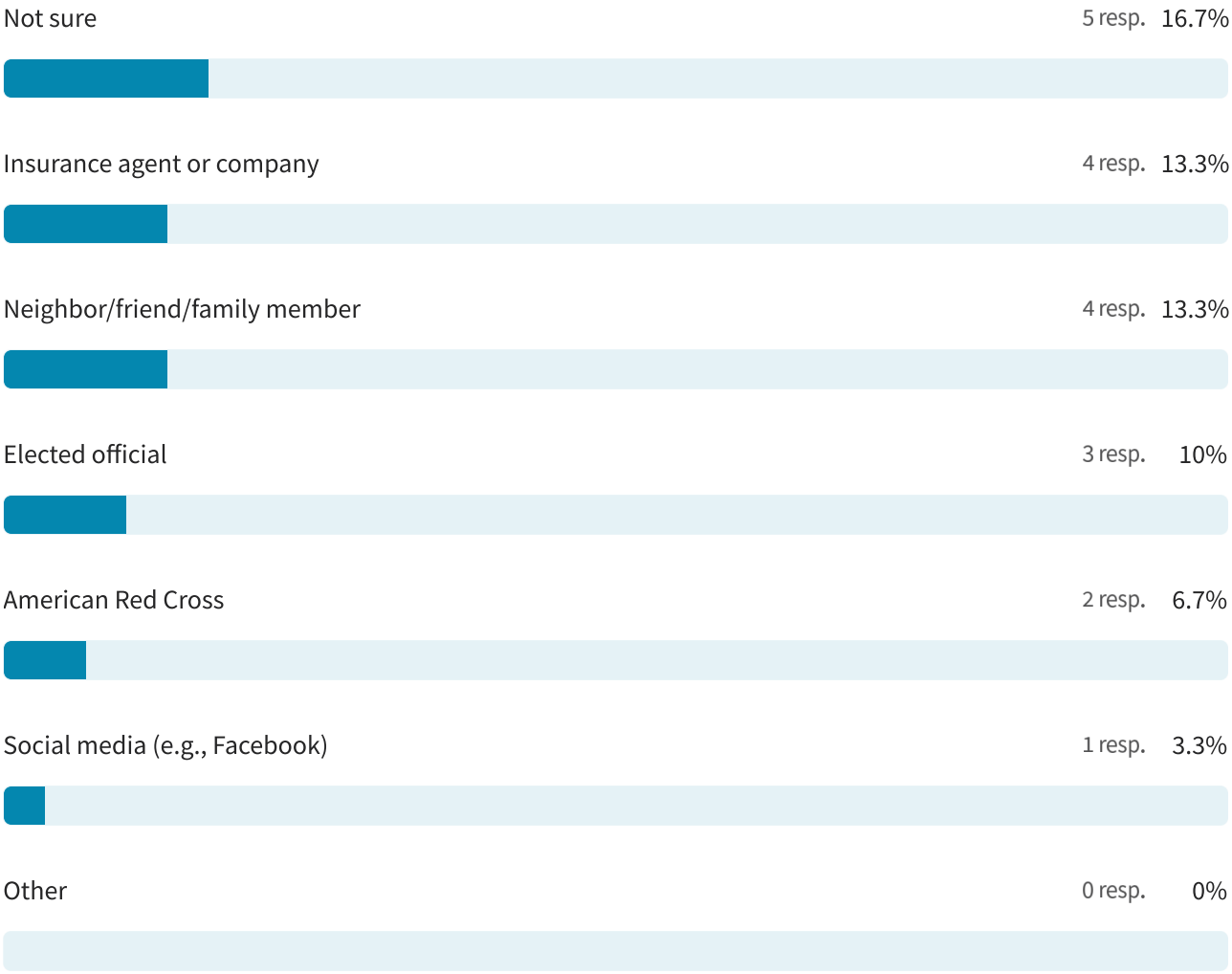


University or research institution 8 resp. 26.7%



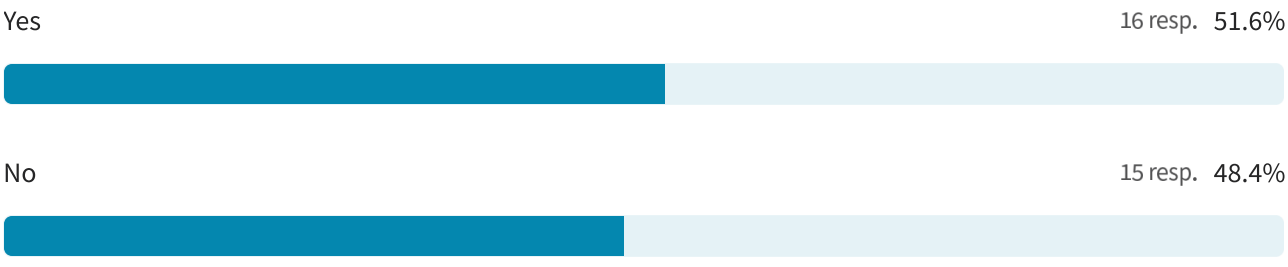
Other non-profit organization 7 resp. 23.3%





Prior to receiving this survey, were you aware of your community's hazard mitigation plan?

31 out of 32 answered



APPENDIX C- FEMA CAPABILITIES WORKSHEET

Appendix C- FEMA Capabilities Worksheet

EXISTING CAPABILITIES OF WEBSTER TO ADDRESS NATURAL HAZARDS

Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities.

Please review the list below- taken from the July 2018 Adopted HMP. Provide any comment you would like to see in the updated plan. Comments might include specific improvements since the last plan, or identified weakness based on experience over the last 6 years. Please add any new Implementation Elements as appropriate.

Existing Flood Hazard Mitigation Resources					
Existing Measure	**Lead Agency**	**Area Covered**	**Effectiveness/ Enforcement**	**2018 Adopted HMP Recommended these Improvements/ Changes**	**Is this Element still effective? If not, what changes are needed for 2024 HMP Update?**
Participation in National Flood Insurance Program (NFIP). Provides flood insurance for structures located in flood-prone areas. Also, communities participating in the NFIP have adopted and enforce ordinances, bylaws and regulations that meet or exceed FEMA requirements to reduce the risk of flooding. Webster monitors building activity within the flood plain to ensure compliance with provisions of state building code.	DCR	Town-wide	Effective	Webster should seek to limit development in the 100-year flood zone. It should investigate joining the Community Rating System (CRS) under NFIP to enable its residents to obtain lower flood insurance rates. Webster should educate its residents about NFIP.	Ongoing.
Floodplain Zoning District Bylaw in place. Requires all development to be in compliance with state building code requirements for construction in floodplains. Webster has a Floodplain District (§650-22) in its Zoning Bylaws.	Building Commissioner / Zoning Enforcement Officer	Floodplain District	Very effective	No changes recommended	Ongoing. Town Meeting voted to update the Floodplain By-Law May 2023
Stormwater Management policy and regulations in place. Planning Boards or Conservation Commissions review projects for consistency with MA DEP standards. This helps ensure adequate on site retention and recharge. Webster does have a Stormwater Management Bylaw (570)	Building Commissioner Planning Board Conservation Commission	Town-wide	Effective	No changes recommended	Ongoing – Draft Stormwater Regulations to be reviewed and voted upon by the Planning Board 2025.
Lake Watershed Protection District. The purpose of the Lake Watershed Protection District is to protect, preserve and maintain the existing and potential ground and surface water resources of the Town of Webster and the watershed of Webster Lake. Webster should continue active enforcement of this bylaw (§650-24).	Building Commissioner Planning Board	Lake Watershed Protection District	Very Effective	No changes recommended	Ongoing.
Local Open Space and Recreation Plan. Local plan identifying significant natural resources and identifying mechanisms to ensure their protection. Following Mass. Department of Conservation and Recreation guidance for development of OSRPs, this document does not focus on specific hazards. Open Space Plans can provide many tools. Towns must commit to making the land acquisitions and regulatory changes, giving increased attention to preserving undeveloped flood-prone areas and associated lands. Webster's Open Space and Recreation Plan is in the process of being updated in 2018.	Recreation Director	Town-wide	Effective	Plan is expired as of 2016. Webster is in the process of updating the Plan as per Mass. DCR guidance. Where allowable, Webster should use the update to integrate hazard mitigation activities and recommendations.	Plan was updated in 2018 and adopted in 2019.

Existing Flood Hazard Mitigation Resources					
Existing Measure	**Lead Agency**	**Area Covered**	**Effectiveness/ Enforcement**	**2018 Adopted HMP Recommended these Improvements/ Changes**	**Is this Element still effective? If not, what changes are needed for 2024 HMP Update?**
Local wetlands protection bylaw and regulations. Local bylaws building upon the State's Wetlands Protection Act and Regulations. These add regulatory oversight provisions for development within the jurisdictional buffer zone, adding increased attention to alteration of wetlands and the opportunity to preserve capacity and quality. Webster does not have a Wetlands Bylaw	Conservation Agent Conservation Commission	Town-wide	Effective	Webster should enact a wetlands bylaw and examine enhanced development controls at wetlands to sustain natural barriers to flooding	The Commission is working on developing a Wetlands By-law
Drainage system maintenance and repair program. Plan to keep municipal drainage facilities (storm drains, culverts, etc.) in good order. Webster performs street sweeping and catch basin cleaning from April to November.	Highway Department Planning Department	Town-wide	Effective	Webster should examine a public education program for residents on storm drain clearance and other best practices	Ongoing along with other public education material in accordance with the Town's MS4 permit.
Tree Trimming. Plan to ensure routine maintenance of trees to reduce likelihood of vegetative debris in response to storm events. Webster conducts roadside mowing from April-November to remove juvenile trees. Tree trimming (take-downs and clearing dead branches) takes place as needed.	Highway Department	Town-wide	Effective	Webster should work with its electrical utility to coordinate a more systematic tree trimming program	
Culvert Maintenance and Replacement. Maintain existing culverts through regular maintenance and (in some cases) beaver controls; replace/expand culverts where needed to allow for adequate stormwater flow. The Town has historically maintained and replaced problem culverts when needed and as funding allows.	Highway Department	Town-wide	Somewhat effective	Current efforts are piecemeal and are limited by lack of resources and systematic approach. Webster should develop a prioritized inventory of problem culverts for use in seeking external financial support. Planning must comply with 2014 Mass. Wetlands Protection Act update; culverts may not be replaced in- kind.	
CodeRED System. Emergency warning system that sends voicemail/text/email alerts to residents (text/email alerts are optional). Code RED enables the town to provide residents with critical information quickly in a variety of situations, such as severe weather, unexpected road closures, missing persons and evacuation of buildings or neighborhoods.	Town Administrator	Town-wide	Very effective	Promote Code RED all residents are familiar with the program.	
New Capabilities					
Public Information & Outreach Media outreach includes town website, local cable broadcast, social media page.	Various Departments	Town-wide	Potentially effective.	Presently there's a disjointed approach due to fact that multiple departments are involved and no one department is assigned the task to develop and manage content.	Some web content exists through the Planning Department and Conservation webpages.

EXISTING CAPABILITIES OF WEBSTER TO ADDRESS NATURAL HAZARDS

Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities.

Please review the list below- taken from the July 2018 Adopted HMP. Provide any comment you would like to see in the updated plan. Comments might include specific improvements since the last plan, or identified weakness based on experience over the last 6 years. Please add any new Implementation Elements as appropriate.

Existing Flood Hazard Mitigation Resources					
Existing Measure	**Lead Agency**	**Area Covered**	**Effectiveness/ Enforcement**	**2018 Adopted HMP Recommended these Improvements/ Changes**	**Is this Element still effective? If not, what changes are needed for 2024 HMP Update?**
Participation in National Flood Insurance Program (NFIP). Provides flood insurance for structures located in flood-prone areas. Also, communities participating in the NFIP have adopted and enforce ordinances, bylaws and regulations that meet or exceed FEMA requirements to reduce the risk of flooding. Webster monitors building activity within the flood plain to ensure compliance with provisions of state building code.	DCR	Town-wide	Effective	Webster should seek to limit development in the 100-year flood zone. It should investigate joining the Community Rating System (CRS) under NFIP to enable its residents to obtain lower flood insurance rates. Webster should educate its residents about NFIP.	Ongoing.
Floodplain Zoning District Bylaw in place. Requires all development to be in compliance with state building code requirements for construction in floodplains. Webster has a Floodplain District (§650-22) in its Zoning Bylaws.	Building Commissioner / Zoning Enforcement Officer	Floodplain District	Very effective	No changes recommended	Ongoing. Town Meeting voted to update the Floodplain By-Law May 2023
Stormwater Management policy and regulations in place. Planning Boards or Conservation Commissions review projects for consistency with MA DEP standards. This helps ensure adequate on site retention and recharge. Webster does have a Stormwater Management Bylaw (570)	Building Commissioner Planning Board Conservation Commission	Town-wide	Effective	No changes recommended	Ongoing – Draft Stormwater Regulations to be reviewed and voted upon by the Planning Board 2025.
Lake Watershed Protection District. The purpose of the Lake Watershed Protection District is to protect, preserve and maintain the existing and potential ground and surface water resources of the Town of Webster and the watershed of Webster Lake. Webster should continue active enforcement of this bylaw (§650-24).	Building Commissioner Planning Board	Lake Watershed Protection District	Very Effective	No changes recommended	Ongoing.
Local Open Space and Recreation Plan. Local plan identifying significant natural resources and identifying mechanisms to ensure their protection. Following Mass. Department of Conservation and Recreation guidance for development of OSRPs, this document does not focus on specific hazards. Open Space Plans can provide many tools. Towns must commit to making the land acquisitions and regulatory changes, giving increased attention to preserving undeveloped flood-prone areas and associated lands. Webster's Open Space and Recreation Plan is in the process of being updated in 2018.	Recreation Director	Town-wide	Effective	Plan is expired as of 2016. Webster is in the process of updating the Plan as per Mass. DCR guidance. Where allowable, Webster should use the update to integrate hazard mitigation activities and recommendations.	Plan was updated in 2018 and adopted in 2019.

Existing Flood Hazard Mitigation Resources					
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New Capabilities					
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Capability Assessment Worksheet

Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible. Complete one worksheet for each jurisdiction.

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Y 2014	Needs to be updated. The Town Administrator and Board of Selectmen are in discussion on this matter. An updated plan should address mitigation strategy.
Capital Improvements Plan	Y 2019	
Economic Development Plan	N	None at this time.
Local Comprehensive Emergency Management Plan	Y 2024	Just Updated
Continuity of Operations Plan		**??**
Transportation Plan	N	None at this time.
Stormwater Management Plan	Y 2023	Yes. There is quite a bit of crossover between the HMP Update and the work on the MS4 Permit.
Community Wildfire Protection Plan	N	None at this time.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	No others.

Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code	Y	Yes
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	
Fire department ISO rating	Y	4/4Y
Site plan review requirements	Y	Yes
Land Use Planning and Ordinances	**Yes/No**	**Is the ordinance an effective measure for reducing hazard impacts?** **Is the ordinance adequately administered and enforced?**
Zoning ordinance	Y	Yes and yes.
Subdivision ordinance	Y	Yes and yes.
Floodplain ordinance	Y	Very effective. Webster has a Floodplain District (§650-22) in its Zoning Bylaws.
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Stormwater Management Bylaw. Effective at reviewing projects and ensuring adequate on site retention and recharge. Lake Watershed Protection (LWP) zoning district regulations are very effective.
Flood insurance rate maps	Y	Effective.
Acquisition of land for open space and public recreation uses	Y	Local Open Space and Recreation Plan. Tool for development and land acquisitions, preserving land, etc.
Other	Y	Municipal Vulnerability Preparedness (MVP) Plan updated in 2021.

How can these capabilities be expanded and improved to reduce risk?

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	**Yes/No**	**Describe capability** **Is coordination effective?**
Planning Board	Y	High functioning board. Coordination is very effective.
Mitigation Planning Committee		None at this time.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Drainage system maintenance and repair program, tree trimming plan, and culvert maintenance and replacement program.
Mutual aid agreements		Limited agreement – fire only. Very effective.
Staff	**Yes/No** **FT/PT[1]**	**Is staffing adequate to enforce regulations?** **Is staff trained on hazards and mitigation?** **Is coordination between agencies and staff effective?**
Chief Building Official	Y	Building Commissioner. Additional staff would be helpful in the future. Training- in the future. Coordination between agencies – very effective.
Floodplain Administrator		Building Commissioner / Zoning Enforcement Officer with support from the Planning Department and Conservation Agent.
Emergency Manager	Y	Emergency Management Director
Community Planner	Y	Director of Planning & Economic Development. One full time staff (Director) and one part time clerk. Understaffed. No training on hazards / mitigation.
Civil Engineer	Y/N	The Town has an on-call services engineering firm which also serves as a peer review engineer for the Planning Board, Conservation Commission, Highway Department, etc.
GIS Coordinator	Y	The Town does not have GIS staff. GIS needs are contracted out through the Assessor Department and the Water/Sewer Department.
Conservation Agent	Y	One full time agent and one part-time clerk.

Technical	Yes/No	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (Reverse 911, outdoor warning signals)	Y	CodeRED, very effective at alerting residents.
Hazard data and information		
Grant writing	Y/N	No one designated staff person for grant writing. Departments apply for relevant grants as needed / wanted.
Hazus analysis	N	
Other		

How can these capabilities be expanded and improved to reduce risk?

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding		
Authority to levy taxes for specific purposes		
Fees for water, sewer, gas, or electric services		
Impact fees for new development	N	
Storm water utility fee		
Incur debt through general obligation bonds and/or special tax bonds		
Incur debt through private activities		
Community Development Block Grant	Y	
Other federal funding programs		
State funding programs		
Other		

How can these capabilities be expanded and improved to reduce risk?

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)		
Natural disaster or safety related school programs	Y	Senior and School Programing through Fire Department
StormReady certification		
Firewise Communities certification		
Public-private partnership initiatives addressing disaster-related issues		
Other		

How can these capabilities be expanded and improved to reduce risk?

APPENDIX D- FEMA PLAN REVIEW TOOL

Appendix D- FEMA Plan Review Tool

Tool to be added after Public Review