DRAFT

TOWN OF FRANKLIN

HAZARD MITIGATION PLAN

2020 UPDATE

MAPC 50 YEARS
METROPOLITAN AREA PLANNING COUNCIL
SMART GROWTH AND REGIONAL COLLABORATION

Draft Plan Update
July 21, 2020

ACKNOWLEDGEMENTS & CREDITS

This plan was prepared for the Town of Franklin by the Metropolitan Area Planning Council (MAPC) under the direction of the Massachusetts Emergency Management Agency (MEMA) and the Massachusetts Department of Conservation and Recreation (DCR). The plan was funded by the Massachusetts Municipal Vulnerability Preparedness Program.

MAPC Officers
President, Erin Wortman, Town of Stoneham
Vice President, Adam Chapdelaine, Town of Arlington
Secretary, Sandra Hackman, Town of Bedford
Treasurer, Sam Seidel, Gubernatorial
Executive Director, Marc D. Draisen, MAPC

Credits

Project Manager	Martin Pillsbury
GIS and Data Services:	Caitlin Spence

Massachusetts Emergency Management Agency

Director:	Samantha Phillips

Department of Conservation and Recreation

Commissioner:	Jim Montgomery

Franklin Local Hazard Mitigation Team

Bryan Taberner, AICP	Director, Planning and Community Development
Joe Barbieri	Deputy Fire Chief
Amy Love	Town Planner, Planning and Community Development
Gus Brown	Building Commissioner
Laurie Ruszala, P.E.	Water and Sewer Superintendent
Brutus Cantoreggi	Director, Department of Public Works
Michael D'Angelo	Director of Public Facilitates
Mike Maglio	Town Engineer, Department of Public Works
Jim McLaughlin	Fire Chief
Thomas Lynch	Chief of Police
James West	Lieutenant, Police Dept.
Lucas Giguere	Assistant Superintendent of Schools
James P. Klich	Deputy Fire Chief
Chrissy Whelton	Assistant Town Administrator
Carlos Rebelo	Department of Public Works
Cathy Liberty, MPH	Health Director
Bill Blanchard	EMS Lieutenant, Fire Department
Deacon Perrotta	Director of Operations, Department of Public Works
Jennifer Delmore	Conservation Agent, Planning and Community Development

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SECTION 1: 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 Boston region of Massachusetts, hazard mitigation planning tends to focus most on flooding, the most likely natural hazard 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.

PLANNING PROCESS

Preparation of this plan update was conducted by the Town of Franklin in a coordinated process with the neighboring Town of Bellingham as part of a Municipal Vulnerability Preparedness (MVP) project for the two towns. Coordination of the Hazard Mitigation Plan updates for each town was led by Local Hazard Mitigation Teams in Franklin and Bellingham, composed of staff from key municipal departments. The two-town Municipal Vulnerability Preparedness (MVP) program focused on identifying climate risks and resilience strategies, which were integrated into the Hazard Mitigation Plans for both towns. The project was kicked off by a joint meeting of the MVP Core Team for both towns held on September 12, 2019 in Franklin. The two towns collaborated to hold a joint MVP workshop on November 20, 2019 in Franklin. The results of that workshop are included in this Hazard Mitigation Plan. The Franklin local Hazard Mitigation Team met three times during plan development, on October 21, 2019, February 20, 2020, and May 27, 2020. Of note, due to the COVID-19 pandemic in the Spring of 2020, the final team meeting was conducted remotely via Zoom. At the series of three meetings, the local team identified critical infrastructure, mapped sites where the impacts of natural hazards most affect the town, updated the inventory of new development sites, endorsed goals for the updated plan, provided updates to the Town's existing mitigation measures, and prioritized and endorsed new or revised hazard mitigation recommendations that would benefit the town.

Public participation in the planning process is important for improving awareness of the potential impacts of natural hazards and to build support for the actions the Town takes to mitigate them. The Town's Local Hazard Mitigation Team hosted two public meetings, the first during plan development on March 2, 2020, which also provided a Listening Session for the joint MVP project, and the second, held via Zoom on June 23 , 2020, which provided an opportunity for the public to review and comment on the draft plan update, which was posted on the Town's website for public review. Key town stakeholders and neighboring communities were notified and invited to attend the meeting and review the draft plan. Comments received by the town are included in Appendix C.

RISK ASSESSMENT

The Franklin Hazard Mitigation Plan assesses the potential impacts to the town from flooding, high winds, winter storms, brush fire, geologic hazards, extreme temperatures, and drought. The risk assessment identifies the historic and existing impacts for each category of natural hazard, as

well as the impacts of a warming climate identified in the CRB Workshop. The geographic extent of the hazards is shown in the map series in Appendix A. The Franklin Local Hazard Mitigation Planning Team identified 127 Critical Facilities. These are also shown on the map series and listed in Table 28, identifying which facilities are located within the mapped hazard zones.

Hazards U.S. – Multihazards (HAZUS-MH) is a standardized methodology developed by FEMA that utilizes Geographic Information Systems (GIS) analysis to estimate physical, economic, and social impacts of disasters. The HAZUS-MH analysis for Franklin estimates property damages from Hurricanes of category 2 and 4 ($32 million to $126 million), earthquakes of magnitudes 5 and 7 ($701 million to $5.6 billion), and the 1% and .2% chance of flooding ($17 to $22 million).

HAZARD MITIGATION GOALS

The Franklin Local Hazard Mitigation Team reviewed and endorsed the following hazard mitigation goals at the February 20, 2020 team meeting. The team added an eleventh goal focused on incorporating future climate change projections.

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

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

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

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

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

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

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

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

9. Consider the potential impacts of future climate change. Incorporate climate sustainability and resiliency in hazard mitigation planning.

10. Protect the Town's water supplies, which draw from groundwater sources in the Charles River watershed.

HAZARD MITIGATION STRATEGY

The Franklin Local Hazard Mitigation Team identified a hazard mitigation strategy that includes a number of mitigation measures that would serve to reduce the Town's vulnerability to natural hazards. Overall, the hazard mitigation strategy recognizes that mitigating hazards for Franklin will be an ongoing process as our understanding of natural hazards and the steps that can be taken to mitigate their damages changes over time. Global climate change and a variety of other factors impact the Town's vulnerability in the future, and local officials will need to work together across municipal lines and with state and federal agencies in order to understand and address these changes. The hazard mitigation strategy will be incorporated into the Town's other related plans and policies.

PLAN REVIEW & UPDATE PROCESS

The process for developing Franklin's Hazard Mitigation Plan 2020 Update is summarized in Table 1.

Table 1: Plan Review and Update Process

Section	Reviews and Updates
Section 3: Public Participation	The Local Hazard Mitigation Planning Team placed an emphasis on public participation for the update of the Hazard Mitigation Plan, discussing strategies to enhance participation opportunities at the first local committee meeting. During plan development, the plan was discussed at two public meetings hosted by the Hazard Mitigation Team. The plan was also available on the Town's website for public comment. Public comments received are shown in Appendix C.
Section 4: Risk Assessment	MAPC gathered the most recently available hazard and land use data and met with town staff to identify changes in local hazard areas and development trends. Town staff reviewed critical infrastructure with MAPC staff in order to create an up-to-date list. The Risk Assessment integrates projected climate impacts. MAPC also used the most recently available version of HAZUS and assessed the potential impacts of flooding using the latest data.
Section 5: Goals	The Hazard Mitigation Goals were reviewed and endorsed by the Franklin Local Hazard Mitigation Planning Team.
Section 6: Existing Mitigation Measures	The list of existing mitigation measures was updated to reflect current mitigation activities in the town with input from the local Hazard Mitigation Team.
Sections 7 and 8: Hazard Mitigation Strategy	Mitigation measures from the previous plan (2010) were reviewed and assessed as to whether they were completed, in progress, or deferred. The Local Hazard Mitigation Team determined whether to carry forward measures into the 2020 Plan Update or modify or delete them. The Plan Update's hazard mitigation strategy reflects both new

	measures and measures carried forward from the 2010 plan. The updated mitigation measures were prioritized based on current conditions.
Section 9: Plan Adoption & Maintenance	This section of the plan was updated with a new on-going plan implementation review and five year update process that will assist the Town in incorporating hazard mitigation issues into other Town planning and regulatory review processes and better prepare the Town for the next comprehensive plan update. The major steps for plan maintenance are also summarized in the planning timeline on page 20.

As indicated in Table 33, Franklin made good progress implementing mitigation measures identified in the 2010 Hazard Mitigation Plan. In particular, the Town had success with completed several drainage improvement projects, including Populatic Pond, Beaver Street, Sheppard's Brook, Summer Street, Partridge Street, and Wyllie Road. The town also reconstructed two dams on Pleasant Street and Miller Street, constructed a new Public Works facility, and installed generators in several town facilities and two schools. The town adopted a Wetlands Bylaw, a Stormwater Bylaw, and a Stormwater Utility bylaw.

Several projects that were not completed will be continued into this plan update. These include a radio upgrade for emergency operations; developing and implementing a beaver management plan, protection of open space, bylaw revisions, installation of a generator for town hall, and upgrades to water mains and fire hydrants, and public education on brushfire hazards.
Some projects were partially completed, and/or will be continued to the next plan for on-going maintenance.

Moving forward into the next five-year plan implementation period there will be many more opportunities to incorporate hazard mitigation into the Town's decision-making processes. Town will document any actions taken within this five-year cycle of the Hazard Mitigation Plan on challenges met and actions successfully adopted as part of the ongoing plan maintenance to be conducted by the Franklin Hazard Mitigation Implementation Team, as described in Section 9 Plan Adoption and Maintenance.

SECTION 2: INTRODUCTION

PLANNING REQUIREMENTS OF THE FEDERAL DISASTER MITIGATION ACT

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

Federal hazard mitigation planning and grant programs are administered by the Federal Emergency Management Agency (FEMA) in collaboration with the states. These programs are administered in Massachusetts by the Massachusetts Emergency Management Agency (MEMA) in partnership with the Department of Conservation and Recreation (DCR).

The Towns of Franklin and Bellingham contracted with the Metropolitan Area Planning Council (MAPC) to assist the two Towns in updating their local Hazard Mitigation Plans and to conduct the Municipal Vulnerability Preparedness project, which is integrated into this plan updates of both Towns.

WHAT IS A HAZARD MITIGATION PLAN?

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

PREVIOUS FEDERAL/STATE DISASTERS

Since 1991, there have been 24 natural hazard events that triggered federal or state disaster declarations that included Plymouth County. These are listed in Table 2 below. The majority of these events involved flooding, while others were due to hurricanes or nor'easters, and severe winter weather.

Table 2: Presidentially Declared Disasters, 1991-2020

Disaster Name	Date of Event	Declared Areas
Hurricane Bob	August 1991	Counties of Barnstable, Bristol, Dukes, Essex, Hampden, Middlesex, Plymouth, Nantucket, Norfolk, Suffolk
Severe Coastal Storm No Name Storm	October 1991	Counties of Barnstable, Bristol, Dukes, Essex, Middlesex, Plymouth, Nantucket, Norfolk, Suffolk

Disaster Name	Date of Event	Declared Areas
Blizzard	March 1993	Statewide
Blizzard	January 1996	Statewide
Severe Storms, Flood	October 1996	Counties of Essex, Middlesex, Norfolk, Plymouth, Suffolk
Heavy Rain, Flood	June 1998	Counties of Bristol, Essex, Middlesex, Norfolk, Suffolk, Plymouth, Worcester
Severe Storms, Flood	March 2001	Counties of Bristol, Essex, Middlesex, Norfolk, Suffolk, Plymouth, Worcester
Snowstorm	March 2001	Berkshire, Essex, Franklin, Hampshire, Middlesex, Norfolk, Worcester
Snowstorm	February 2003	Statewide
Snowstorm	December 2003	Barnstable, Berkshire, Bristol, Essex, Franklin, Hampden, Hampshire, Middlesex, Norfolk, Plymouth, Suffolk, Worcester
Flooding	April 2004	Essex, Middlesex, Norfolk, Suffolk, Worcester
Snow	January 2005	Statewide
Hurricane Katrina	August 2005	Statewide
Severe Storms, Flooding	October 2005	Statewide
Severe Storms, Flooding	May 2006	Statewide
Severe Storm, Inland, Coastal Flooding	April 2007	Statewide
Severe Storms, Flooding	December 2008	Statewide
Severe Storms, Flooding	March/April 2010	Bristol, Essex, Middlesex, Suffolk, Norfolk, Plymouth, Worcester
Severe Winter Storm, Snowstorm	January 2011	Berkshire, Essex, Hampden, Hampshire, Middlesex, Norfolk, Suffolk
Tropical Storm Irene	August 2011	Barnstable, Berkshire, Bristol, Dukes, Franklin, Hampden, Hampshire, Norfolk, Plymouth
Severe Winter Storm, Snowstorm and Flooding	February, 2013	Statewide
Severe winter storm, snowstorm and flooding	April 2015	Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk, Worcester
Severe winter storm and flooding	March 2018	Barnstable, Bristol, Essex, Nantucket, Norfolk, Plymouth

Disaster Name	Date of Event	Declared Areas
Severe winter storm and Snowstorm	March 2018	Essex, Middlesex, Norfolk, Suffolk, Worcester

Source: MA Hazard Mitigation and Climate Adaptation Plan

FEMA FUNDED MITIGATION PROJECTS

Franklin has not previously received FEMA funded mitigation projects.

COMMUNITY PROFILE

The Town of Franklin is a suburban community located 28 miles southwest of Boston along Interstate highway 495. The town is mostly within the Charles River watershed, in the headwaters area of the watershed. A small portion of the town is in the Blackstone River watershed. Franklin is one of the highest elevated towns in Norfolk County.

Settlement of the town began in 1676, after the ending of King Philip's war. Its early years saw settlers involved in small scale farming and grazing, but the town's abundant water power ensured early industrial development. There were cotton mills, felt makers and boot and shoe manufacturers established in Franklin in the 18th and 19th century, but the dominant industry in the town from 1799 on was the making of straw bonnets, and Franklin became one of the centers of straw bonnet manufacturing. Franklin renamed itself in 1778 to honor to Benjamin Franklin. Although over 30 communities in the colonies eventually so honored Franklin, the Massachusetts Town of Franklin was the first to do so. Ambassador Franklin in turn showed his appreciation of the tribute by sending the town a library of 116 volumes which formed the nucleus of a public library. Franklin prides itself on the wide spectrum of architectural styles preserved in the community. Visitors can see handsome Greek revival and Italianate buildings, as well as High Victorian Gothic, Second Empire and Queen Ann, among others.

Franklin is located in southeastern Massachusetts and bordered by Norfolk and Wrentham on the east and south, Bellingham on the west, and Medway on the north. Franklin is about 26 miles southeast of Worcester; 28 miles southwest of Boston; 26 miles north of Providence, Rhode Island. Franklin is situated in the Greater Boston Area, which has many rail, air, and highway facilities. Principal highways are State Route 140 and Interstate Route 495, the outer belt around Boston. Commuter rail service to Back Bay Station and South Station, Boston, is available from Forge Park and downtown Franklin. Conrail services a freight rail line through Franklin. Franklin is also affiliated with the Greater Attleboro Taunton Regional Transit Authority (GATRA). The Norfolk Airport, a General Aviation (GA) facility, is easily accessible.

Franklin belongs to the Southwest Area Planning Subregion (SWAP) of the Metropolitan Area Planning Council. Franklin is also a member of the I-495/Metrowest Partnership. The town is governed by a Town Council with a Town Administrator. The town maintains a website at

www.franklinma.gov (Narrative based on information provided by the Massachusetts Historical Commission and the Department of Housing and Community Development).

Franklin has just over 34,000 residents. Notably, 25% of Franklin's population lives alone, and 50% of those living alone are over 65 years old. Other demographic characteristics are summarized in Table 3.

Table 3: Franklin Demographic Characteristics

Population = 34,064 people

- 5.1% are under age 5
- 24.9% are under age 18
- 11.9% are over age 65
- 7.8% have a disability
- 10.2% speak a language other than English-at home
- 1.9 speak English "less than well"
- 90.4% of the population is white
- Median Household income $115,355
- Percent in poverty: 4.0 %

Number of Housing Units = 11,928

Source: 2019- American Community Survey

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

- Franklin has been proactive in addressing the impact of stormwater and other natural hazards. The town has been a leader in adopting Green Infrastructure such as Rain Gardens.
- Franklin is a designated Green Community and is in the process of becoming certified by the state as a Municipal Vulnerability Preparedness community as part of this project.
- Franklin lies within the headwater portion of the Charles River watershed and is has several smaller tributaries to the river.
- Franklin relies on local groundwater sources for all of its public water supply. Water quantity and quality are important concerns for maintaining the water supply and the for the health of the many streams and wetlands within the town.
- Franklin relies on the Charles River Water Pollution Control District's wastewater treatment facility in Medway, MA to manage most if it's wastewater treatment neds.
- Records from flooding in 2010 highlight that flood damage during such an extreme event occurs mostly in areas outside of the designated flood zone (only 1.8% of flood claims were within the FEMA designated flood hazard area).

SECTION 3: PLANNING PROCESS & PUBLIC PARTICIPATION

MAPC employs a six-step planning process based on FEMA's hazard mitigation planning guidance focusing on local needs and priorities but maintaining a regional perspective matched to the scale and nature of natural hazard events. Public participation is a central component of this process, providing critical information about the local occurrence of hazards while also serving as a means to build a base of support for hazard mitigation activities. MAPC supports participation by the general public and local stakeholders through two public meetings hosted by the local Hazard Mitigation Team, posting of the plan to the Town's website, and invitations sent to neighboring communities, town boards and commissions, and other local or regional entities to review the plan and provide comment.

PLANNING PROCESS SUMMARY

The six-step planning process outlined below is based on the guidance provided by FEMA's Local Multi-Hazard Mitigation Planning Guidance. Public participation is a central element of this process, which attempts to focus on local problem areas and identify needed mitigation measures based on where gaps occur in the existing mitigation efforts of the municipality. In plan updates, the process described below allows staff to bring the most recent hazard information into the plan, including new hazard occurrence data, changes to a municipality's existing mitigation measures, and progress made on actions identified in previous plans.

Figure 1: Six-Step Planning Process

1. **Map the Hazards** – MAPC relies on data from a number of different federal, state, and local sources in order to map the areas with the potential to experience natural hazards. This mapping represents a multi-hazard assessment of the municipality and is used as a set of base maps for the remainder of the planning process. A particularly important source

of information is the knowledge drawn from local municipal staff on where natural hazard impacts have occurred. These maps can be found in Appendix B.

2. **Assess the Risks & Potential Damages** – Working with local staff, critical facilities, infrastructure, vulnerable populations, and other features are mapped and contrasted with the hazard data from the first step to identify those that might represent particular vulnerabilities to these hazards. Land use data and development trends are also incorporated into this analysis. In addition, MAPC develops estimates of the potential impacts of certain hazard events on the community. MAPC drew on the following resources to complete the plan:

    - Blue Hill Observatory
    - FEMA, Flood Insurance Rate Maps for Norfolk County, MA, 2012
    - FEMA, Hazards U.S. Multi-Hazard
    - FEMA, Local Mitigation Plan Review Guide, October 2011
    - Fourth National Climate Assessment, 2018
    - Massachusetts Office of Dam Safety, Inventory of Massachusetts Dams 2018
    - Massachusetts State Hazard Mitigation Plan, 2013
    - Massachusetts State Hazard Mitigation and Climate Adaptation Plan, 2018
    - Metropolitan Area Planning Council, GIS Lab, Regional Plans and Data
    - National Weather Service
    - Nevada Seismological Library
    - New England Seismic Network, Boston College Weston Observatory, http://aki.bc.edu/index.htm
    - NOAA National Climatic Data Center, http://www.ncdc.noaa.gov/
    - Northeast Climate Adaptation Science Center
    - Northeast States Emergency Consortium, http://www.nesec.org/
    - Towns of Bellingham and Franklin Community Resilience Building Workshop, 2019
    - Town of Franklin General By-Laws
    - Town of Franklin Master Plan 2013
    - Town of Franklin Open Space and Recreation Plan 2016
    - Town of Franklin Zoning By-Laws
    - Tornado History Project
    - US Census, 2010 and American Community Survey 2017 5-Year Estimates
    - USGS, National Water Information System http://nwis.waterdata.usgs.gov/usa/nwis

3. **Review Existing Mitigation** – Municipalities in the Boston Metropolitan Region have an active history in hazard mitigation as most have adopted flood plain zoning districts, wetlands protection programs, and other measures as well as enforcing the State building code, which has strong provisions related to hazard resistant building requirements. All current municipal mitigation measures have been documented.

4. **Develop Mitigation Strategies** – MAPC works with the local municipal staff to identify new mitigation measures, utilizing information gathered from the hazard identification,

vulnerability assessments, and the community's existing mitigation efforts to determine where additional work is necessary to reduce the potential damages from hazard events. Additional information on the development of hazard mitigation strategies can be found in Section 7.

5. **Plan Approval & Adoption** – Once a final draft of the plan is complete it is sent to MEMA for the state level review and, following that, to FEMA for approval. Typically, once FEMA has approved the plan the agency issues a conditional approval (Approval Pending Adoption), with the condition being adoption of the plan by the municipality. More information on plan adoption can be found in Section 9 and documentation of plan adoption can be found in Appendix D.

6. **Implement & Update the Plan** – Implementation is the final and most important part of any planning process. Hazard Mitigation Plans must also be updated on a five year basis making preparation for the next plan update an important on-going activity. Section 9 includes more detailed information on plan implementation.

2010 PLAN IMPLEMENTATION & MAINTENANCE

The2010 Town of Franklin Hazard Mitigation Plan contained a risk assessment of identified hazards for the town and mitigation measures to address the risk and vulnerability from these hazards. Since approval of the plan by FEMA progress has been made on implementation of many of its recommended mitigation measures. The Town had success with completed several drainage improvement projects, including Populatic Pond, Beaver Street, Sheppard's Brook, Summer Street, Partridge Street, and Wyllie Road. The town also reconstructed two dams on Pleasant Street and Miller Street, constructed a new Public Works facility, and installed generators in several town facilities and two schools. The town adopted a Wetlands Bylaw, a Stormwater Bylaw, and a Stormwater Utility bylaw.

THE LOCAL HAZARD MITIGATION TEAM

MAPC worked with the local community representatives to establish a Local Hazard Mitigation Team for Franklin. MAPC briefed the local representatives as to the desired composition of that team as well as the need for public participation in the local planning process.

The Local Hazard Mitigation Team is central to the planning process as it is the primary body tasked with developing a mitigation strategy for the community. The local team was tasked with working with MAPC to set plan goals, provide information on the hazards that impact the town, update existing mitigation measures, and helping to develop new mitigation measures for this plan update. The Local Hazard Mitigation Team membership is listed below.

Bryan Taberner, AICP	Director, Planning and Community Development
Joe Barbieri	Deputy Fire Chief
Amy Love	Town Planner, Planning and Community Development
Gus Brown	Building Commissioner

Laurie Ruszala, P.E.	Water and Sewer Superintendent
Brutus Cantoreggi	Director, Department of Public Works
Michael D'Angelo	Director of Public Facilitates
Mike Maglio	Town Engineer, Department of Public Works
Jim McLaughlin	Fire Chief
Thomas Lynch	Chief of Police
James West	Lieutenant, Police Dept.
Lucas Giguere	Assistant Superintendent of Schools
James P. Klich	Deputy Fire Chief
Chrissy Whelton	Assistant Town Administrator
Carlos Rebelo	Department of Public Works
Cathy Liberty, MPH	Health Director
Bill Blanchard	EMS Lieutenant, Fire Department
Deacon Perrotta	Director of Operations, Department of Public Works
Jennifer Delmore	Conservation Agent, Planning and Community Development

The Franklin Planning Board, Conservation Commission, and Building Department are the primary municipal entities responsible for regulating development in town. Input and feedback for the plan update was assured through the participation of the Director of Planning and Community Development, the Conservation Administrator, and the Building Commissioner. In addition, representatives of most town departments, boards and commissions participated in an all-day Community Building Resilience workshop on November 20, 2019. In addition, MAPC, the State-designated regional planning authority for Franklin, works with all agencies that that regulate development in the region, including the listed municipal entities and state agencies, such as the Massachusetts Department of Transportation, the Department of Environmental Protection, and the Department of Conservation and Recreation.

The Local Hazard Mitigation Planning Team met on the following dates: October 21, 2019, February 20, 2020, and May 27, 2020. The purpose of the meetings was to introduce the Hazard Mitigation planning program, review and update hazard mitigation goals, and to gather information on local hazard mitigation issues and sites or areas related to these. The team also coordinated the Municipal Vulnerability Preparedness Workshop held on November 20 along with the Town of Bellingham, at an MVP Core Team meeting on September 12, 2019. Local team Meetings focused on verifying local information on hazard areas and development trends, updating existing mitigation practices, reviewing the status of mitigation measures recommended in the 2010 hazard mitigation plan, and developing new or revised mitigation measures for the updated plan. The agendas for these meetings are included in Appendix A.

PUBLIC MEETINGS

Public participation in the hazard mitigation planning process is important, both for plan development and for later implementation of the plan. Residents, business owners, and other community members are an excellent source for information on the historic and potential impacts

of natural hazard events and particular vulnerabilities the community may face from these hazards. Their participation in this planning process also builds understanding of the concept of hazard mitigation, potentially creating support for mitigation actions taken in the future to implement the plan. To gather this information and educate residents on hazard mitigation, the Town hosted two public meetings, one during the planning process and one after the draft plan was available for review. The first public meeting was held in the Franklin Municipal Building on February 6, 2020. This meeting also provided an opportunity for a public Listening Session on the Community Resilience Building Workshop that had been held on November 20, 2019.

The public had an opportunity to provide input on the draft Franklin Hazard Mitigation Plan Update 2020 at the second public meeting held on July 28, 2020. Due to restrictions on public gatherings related to the COVID-19 pandemic, the Town hosted this meeting remotely via the Zoom online platform. Both meetings were publicized in accordance with the Massachusetts Public Meeting Law. See public meeting notices in Appendix C.

In addition to the two public meetings, Franklin and neighboring Bellingham held an all-day workshop attended by 41 town staff, board and committee members, and community stakeholders. The workshop focused on climate impacts to infrastructure, society, and the environment, and its findings and recommendations are summarized in Appendix E.

LOCAL STAKEHOLDER INVOLVEMENT

The local Hazard Mitigation Planning Team was encouraged to reach out to local stakeholders that might have an interest in the Hazard Mitigation Plan including neighboring communities, agencies, businesses, nonprofits, and other interested parties. Notice was sent to the following organizations and neighboring municipalities inviting them to attend the public meeting and review the Hazard Mitigation Plan and submit comments to the Town:

- Dean College
- Metacomet Emergency Communications Center
- Charles River Pollution Control District
- Tri-County Regional Vocational Technical High School
- Franklin School Department
- Hockomock Area YMCA
- Franklin Matters
- Metacomet Land Trust
- National Grid
- Franklin Agricultural Commission
- Franklin Performing Arts Company
- Town of Bellingham
- Town of Medway
- Town of Norfolk
- Town of Wrentham

See Appendix C for public meeting notices. The draft Franklin Hazard Mitigation Plan 2020 Update was posted on the Town's website for the second public meeting. Members of the public could access the draft document and submit comments or questions to the Town.

PUBLIC COMMENT

In the first public meeting on February 6, 2020, participants expressed support for strategies that will address stormwater flooding, and encouraged the town to continue to take proactive steps to mitigate the impacts of climate change. In the Community Resilience Building workshop that took place on November 20, 2019, participants developed a robust list of priorities to increase resilience to climate-related natural hazards. These are documented in Appendix E. The draft plan was reviewed by the public at the second public meeting on July 28, 2020, and the plan was available for comment for several weeks after the meeting. Comments received by the town are shown in Appendix C. *[to be added after the meeting]*

CONTINUING PUBLIC PARTICIPATION

Following the adoption of the plan update, the Franklin Hazard Mitigation Team will continue to provide residents, businesses, and other stakeholders the opportunity to learn about the hazard mitigation planning process and to contribute information that will update the town's understanding of local hazards. As updates and a review of the plan are conducted by the team, these will be placed on the Town's web site, and any meetings of the Franklin Hazard Mitigation Team will be publicly noticed in accordance with town and state open meeting laws.

PLANNING TIMELINE: PLAN DEVELOPMENT AND APPROVAL

September 12, 2019	Meeting of the Bellingham-Franklin MVP Core Team
October 21, 2019	Meeting#1 of the Franklin Local Hazard Mitigation Team
November 20, 2019	Bellingham-Franklin MVP Workshop
February 6, 2020	First Public Meeting at the Franklin Municipal Building
February 20, 2020	Meeting#2 of the Franklin Local Hazard Mitigation Team
May 27, 2020	Meeting#3 of the Franklin Local Hazard Mitigation Team
July 28, 2020	Second Public Meeting hosted by the Town via Zoom
TBD	Draft Plan Update submitted to MEMA
TBD	Notice of Approvable Pending Adoption (APA) sent by FEMA
TBD	Plan Adopted by the Franklin Town Council
TBE	FEMA final approval of the plan for 5 years, until *[to be added]*

PLANNING TIMELING: POST-APPROVAL PLAN IMPLEMENTATION

After the plan has been approved by FEMA, the Town will observe the following timeline to implement the plan over the five-year approval period and prepare for the next plan update.

If the Town wishes to apply for a FEMA grant to prepare the next plan update, which will be due in 2025, a grant application should be submitted approximately two years before this plan expires, in order to allow time for the grant to be approved, and the next plan update to be completed before this plan expires. See Section 9 for more details on plan adoption and maintenance.

2022	Conduct Mid-Term Plan Survey on Progress
2023	Seek FEMA grant to prepare next plan update
2024	Begin process to update the plan
2025	Submit Draft 2025 Plan Update to MEMA and FEMA
2025	FEMA approval of 2025 Plan Update

SECTION 4: RISK ASSESSMENT

The risk assessment analyzes the potential natural hazards that could occur within the Town of Franklin as well as the relationship between those hazards and current land uses, potential future development, and critical infrastructure. This section also includes a vulnerability assessment that estimates the potential damages that could result from certain large-scale natural hazard events. In order to update Franklin's risk assessment, MAPC gathered the most recently available hazard and development data and met with Town staff to identify changes in local hazard areas and development trends. MAPC also used FEMA's damage estimation software, HAZUS.

With the adoption of the Hazard Mitigation and Climate Adaptation Plan 2018 (SHMCAP), Massachusetts became the first state to integrate climate projections in a state hazard mitigation plan. Following the state model, the projected impacts of our warming climate on natural hazards are integrated throughout the risk assessment. Key impacts include rising temperatures, which in turn affect precipitation patterns, sea level, and extreme weather.

> *"Global climate is changing rapidly compared to the pace of natural variations in climate that have occurred throughout Earth's history. Global average temperature has increased by about 1.8°F from 1901 to 2016, and observational evidence does not support any credible natural explanations for this amount of warming; instead, the evidence consistently points to human activities, especially emissions of greenhouse or heat-trapping gases, as the dominant cause."*
>
> Fourth National Climate Assessment, 2018 (Chapter 2-1)

CLIMATE CHANGE OBSERVATIONS AND PROJECTIONS

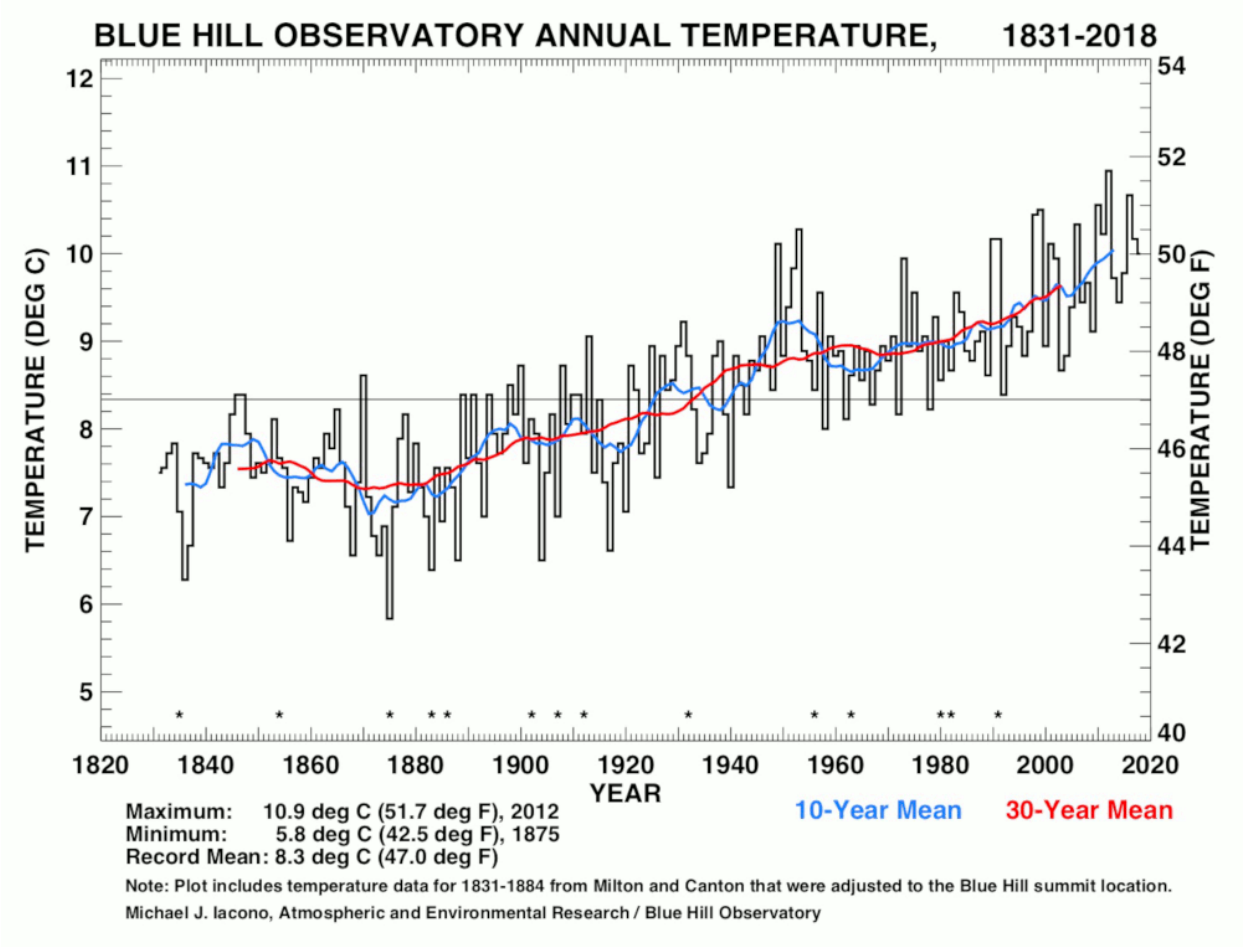
Climate change observations come from a variety of data sources that have measured and recorded changes in recent decades and centuries. Climate change projections, however, predict future climate impacts and, by their nature, cannot be observed or measured. As a result of the inherent uncertainty in predicting future conditions, climate projections are generally expressed as a range of possible impacts.

Temperature

Our climate has always been regulated by gases, including carbon dioxide, methane, and nitrous oxide, that blanket the earth. These gases trap heat that would otherwise be reflected out to space; without them our planet would be too cold to support life. We refer to these gases as "greenhouse gases" (GHGs) for their heat trapping capacity. The combustion of fossil fuels, our primary energy source in the age of industrialization, releases GHGs into the atmosphere. In the past century, human activity associated with industrialization has contributed to a growing concentration of GHGs in our atmosphere.

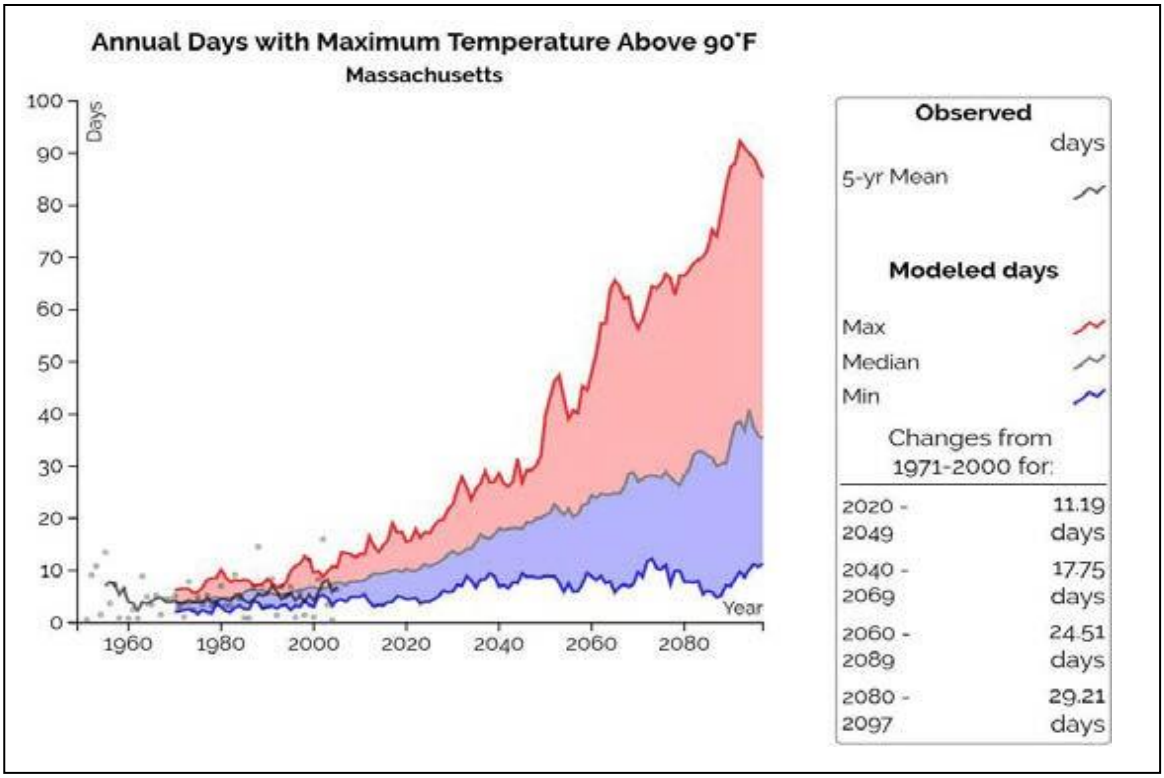
Records from the Blue Hill Observatory in Milton, MA show that average temperatures (30-year mean) have risen approximately 3 degrees (F) in the almost 200 years since record keeping began in 1831.

Figure 2: Observed Increase in Temperature



Climate projections include an increase in average temperature and in the number of extreme heat days. Extreme cold day are projected to decrease in number. The Northeast Climate Adaptation Science Center (NECASC) projects average temperatures in Massachusetts will increase by 5 degrees F by mid-century and nearly 7 degrees F by the end of the century. These increases may be slightly less in coastal communities. Figure 3 shows the NECASC range of projections for increases in the number of days over 90 degrees annually.

Figure 3: Projected Increase in Annual Days Over 90 Degrees F



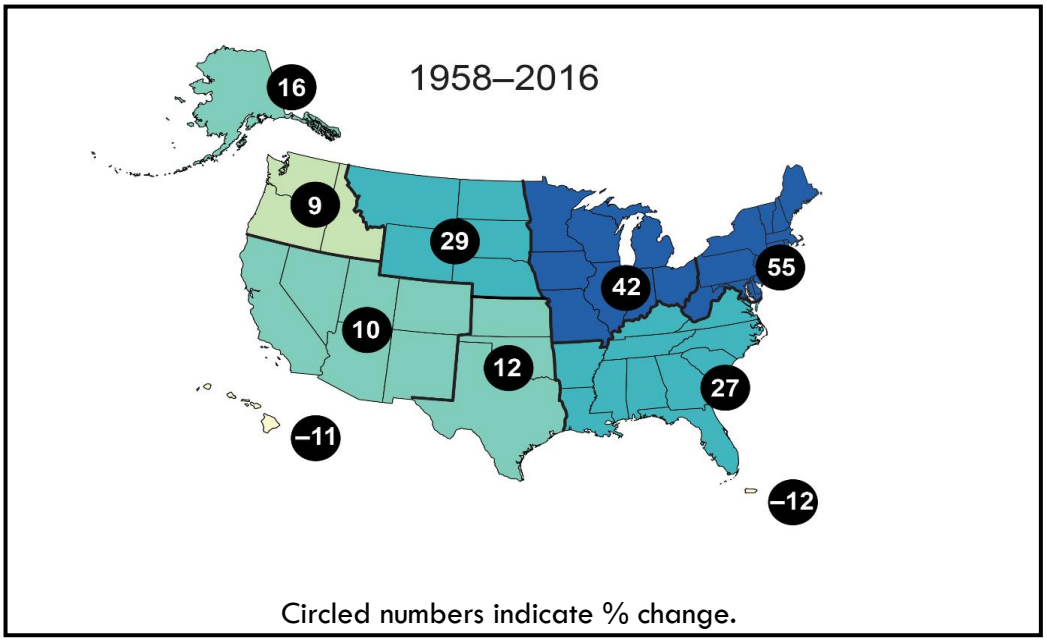
Source: Northeast Climate Adaptation Science Center

Precipitation Patterns

Annual precipitation in Massachusetts has increased by approximately 10% in the fifty-year period from 1960 to 2010 (MA Climate Adaptation Report, 2011). Moreover, there has been a significant increase in the frequency and intensity of large rain events. For the Northeast US, according to the Fourth National Climate Assessment 2018, in the past sixty years there has been a 55% increase in the amount of annual precipitation that falls in the top 1% of storm events (Figure 4). Changes in precipitation are fueled by warming temperatures which increase evaporation and, therefore, the amount of water vapor in the air.

Total annual precipitation in Massachusetts is projected to increase by 1 to 6 inches by mid-century, and by 1.2 to 7.3 inches by the end of this century (SHMCAP p. 2-22). The Fourth National Climate Assessment predicts that the pattern of increasing frequency and intensity of extreme rain events will continue. They project by 2070 to 2099, (relative to 1986 to 2015) a 30-40% increase in total annual precipitation falling in the heaviest 1% of rain events (Figure 5).

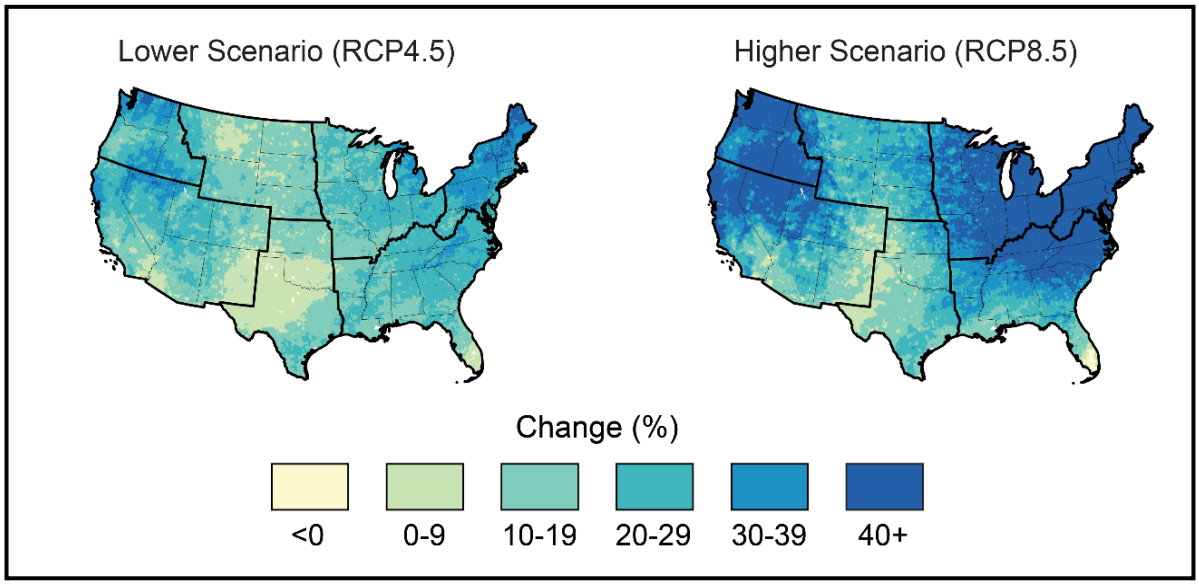
Figure 4: Observed Change in Total Annual Precipitation Falling in the Heaviest 1% of Events



Source: Fourth National Climate Assessment, 2018

Despite overall increasing precipitation, more frequent and significant summer droughts are also a projected consequence of climate change. This is due to projections that precipitation will increase in winter and spring and decrease slightly in the summer and, a result of earlier snow melt, and higher temperatures that will reduce soil moisture.

Figure 5: Projected Change in Total Annual Precipitation Falling in the Heaviest of 1% of Events for 2070-2099



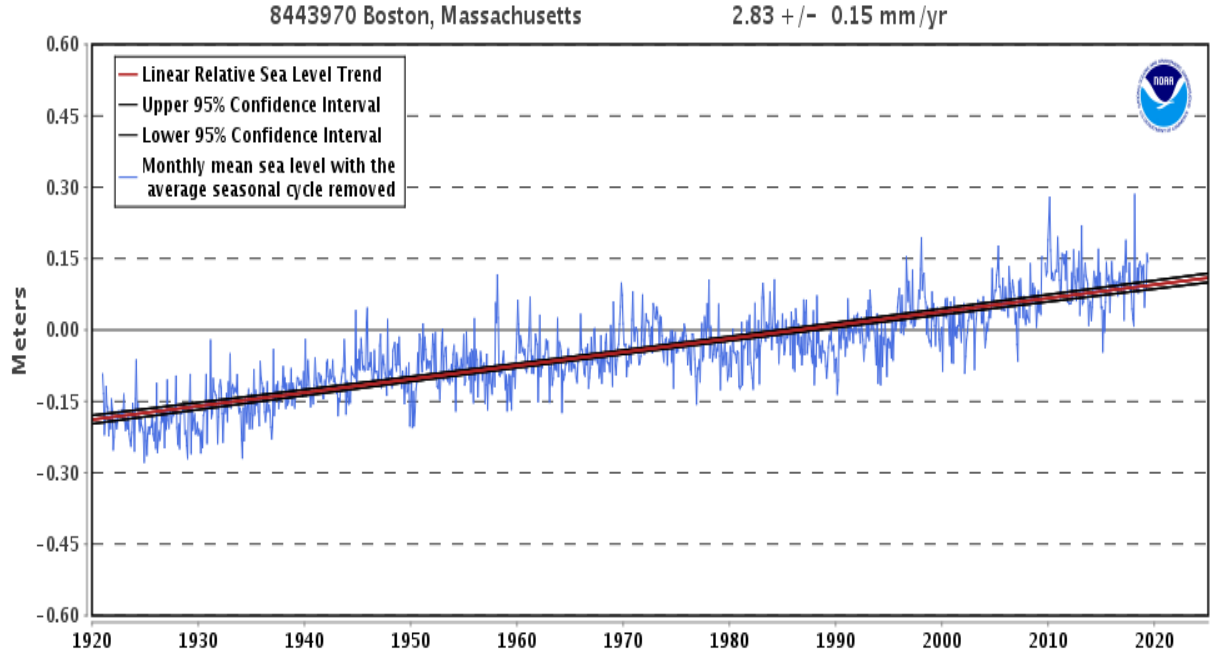
Source: Fourth National Climate Assessment, 2018

Sea Level Rise

Although Franklin is not a coastal community, information on sea level rise is included as an important trend that has implications for the regional economy, and considering that Franklin is on the MBTA Commuter Rail line, and a number of local residents commute to jobs in Boston.

Records from the Boston Tide Station show nearly one foot of sea level rise in the past century (Figure 6). Warming temperatures contribute to sea level rise in two ways. First, warm water expands to take up more space. Second, rising temperatures are melting land-based ice which enters the oceans as melt water. A third, quite minor, contributor to sea level rise in New England is not related to climate change. New England is still experiencing a small amount of land subsidence (drop in elevation) in response to the last glacial period.

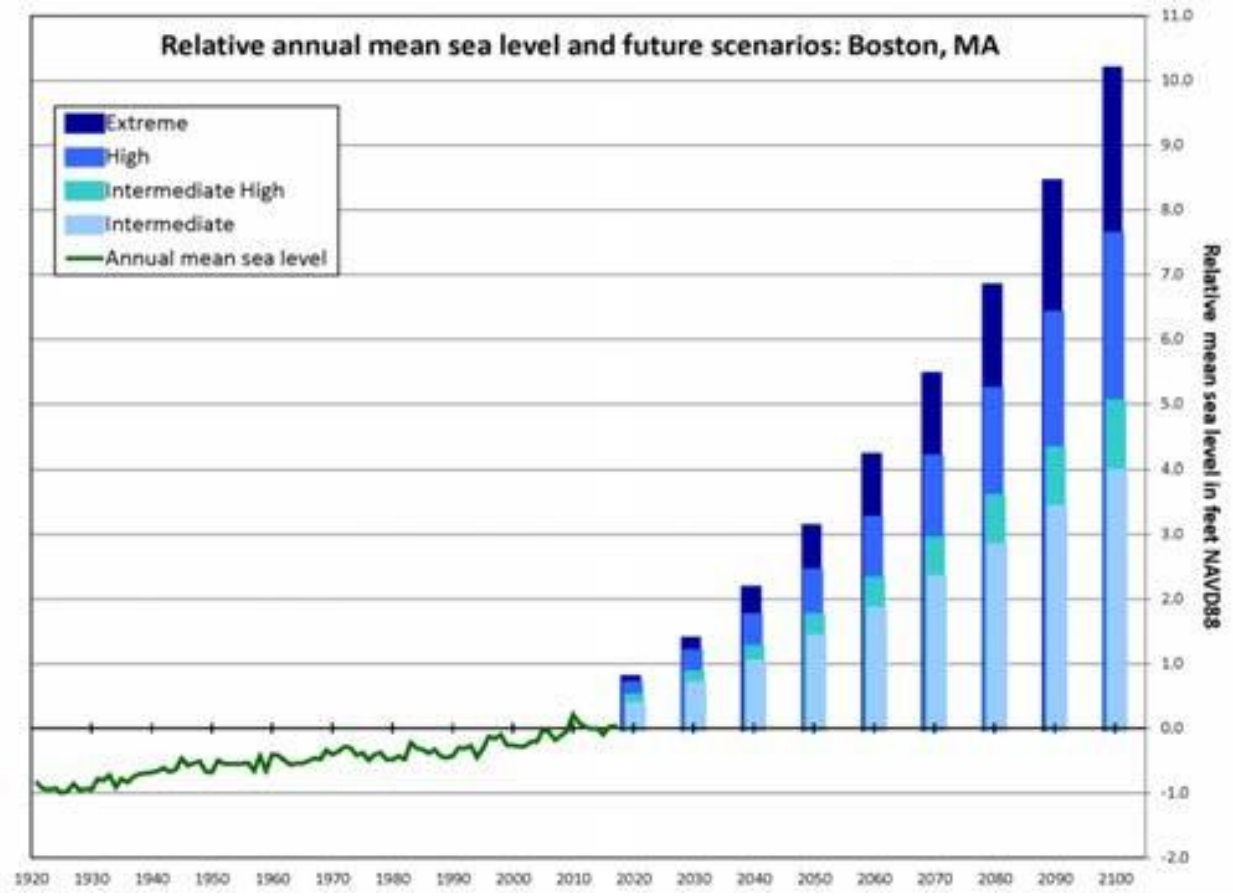
Figure 6: Observed Increase in Sea Level Rise



Source: NOAA

Projections of sea level rise through 2100 vary significantly depending on future greenhouse gas emissions and melting of land-based glaciers. Currently sea level is rising at an increasing rate. Figure 7 shows the recent rate of sea level rise, and a range of sea level rise scenarios. Projections for 2100 range from 4 feet to 10 feet. With ten feet representing the most extreme scenario. For 2050, the projections range approximately 1.5 to 3 feet.

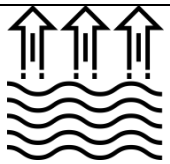
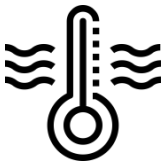
Figure 7: Recent and Projected Increase in Sea Level Rise



Source: SHMCAP

Following the general outline of the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, this local hazard mitigation plan organizes consideration of natural hazards based on their relationship to projected climate changes. Table 4 below, from the SHMCAP, summarizes the natural hazards reviewed in this plan, climate interactions, and expected impacts.

Table 4: Climate Change and Natural Hazards

Primary Climate Change Interaction	Natural Hazard	Other Climate Change Interactions	Representative Climate Change Impacts
 **Changes in Precipitation**	Inland Flooding	Extreme Weather	Flash flooding, urban flooding, drainage system impacts (natural and human-made), lack of groundwater recharge, impacts to drinking water supply, public health impacts from mold and worsened indoor air quality, vector-borne diseases from stagnant water, episodic drought, changes in snow-rain ratios, changes in extent and duration of snow cover, degradation of stream channels and wetland
	Drought	Rising Temperatures, Extreme Weather	
	Landslide	Rising Temperatures, Extreme Weather	
 **Sea Level Rise**	Coastal Flooding	Extreme Weather	Increase in tidal and coastal floods, storm surge, coastal erosion, marsh migration, inundation of coastal and marine ecosystems, loss and subsidence of wetlands
	Coastal Erosion	Changes in Precipitation, Extreme Precipitation	
	Tsunami	Rising Temperatures	
 **Rising Temperatures**	Average/Extreme Temperatures	N/A	Shifting in seasons (longer summer, early spring, including earlier timing of spring peak flow), increase in length of growing season, increase of invasive species, ecosystem stress, energy brownouts from higher energy demands, more intense heat waves, public health impacts from high heat exposure and poor outdoor air quality, drying of streams and wetlands, eutrophication of lakes and ponds
	Wildfires	Changes in Precipitation	
	Invasive Species	Changes in Precipitation, Extreme Weather	
 **Extreme Weather**	Hurricanes/Tropical Storms	Rising Temperatures, Changes in Precipitation	Increase in frequency and intensity of extreme weather events, resulting in greater damage to natural resources, property, and infrastructure, as well as increased potential for loss of life
	Severe Winter Storm / Nor'easter	Rising Temperatures, Changes in Precipitation	
	Tornadoes	Rising Temperatures, Changes in Precipitation	
	Other Severe Weather (Including Strong Wind and Extreme Precipitation)	Rising Temperatures, Changes in Precipitation	
Non-Climate-Influenced Hazards	Earthquake	Not Applicable	There is no established correlation between climate change and this hazard

OVERVIEW OF HAZARDS AND IMPACTS

Table 5 summarizes the frequency and severity of hazard risks for Massachusetts and Franklin. The Massachusetts frequency assessment is based on data in the SHMCAP. The Franklinfrequency assessment reflects data from the National Climatic Data Center (NOAA) for Norfolk County, from the SHMCAP, and the local Hazard Mitigation Team.

Table 5: Hazards Risk Summary

Hazard	Frequency		Severity	
	Massachusetts	Franklin	Massachusetts	Franklin
Flooding	Substantial every 3rd year	Medium 1 event in 10 years	Serious	Serious
Drought	1% any given month	Medium 1% any given month	Minor	Minor
Landslides	Every other year	Very Low None Recorded	Minor	Minor
Extreme Temperatures	2 heat events and 1 cold event event/year	Medium 4 heat events in 10 years/2 cold events in 10 years*	Minor	Minor
Brush Fires	One notable event per year	Very Low No significant events in 10 years	Minor	Minor
Hurricane/Tropical Storm	One every two years	High One every two years	Serious	Extensive
Severe Winter Storms/Nor'easters	One notable event per year	High One notable event per year	Extensive	Serious
Tornadoes	1.7 per year	Very Low None recorded	Serious	Serious
Other Severe Weather (Thunderstorms/High Winds)	20-30 thunderstorms annually; 43.5 high wind events annually	High 3 events per year	Minor	Minor
Earthquake	10 - 15% chance of Mag 5 in 10-years	Very Low None recorded	Extensive	Extensive

Source, Massachusetts State Hazard Mitigation Plan, adapted for Franklin

Frequency

- **Very low:** events that occur less frequently than once in 100 years (less than 1% per year)
- **Low:** events that occur from once in 50 years to once in 100 years (1% to 2% per year);
- **Medium:** events that occur from once in 5 years to once in 50 years (2% to 20% per year);
- **High**: events that occur more frequently than once in 5 years (Greater than 20% per year).

Severity

- **Minor**: Limited and scattered property damage; limited damage to public infrastructure and essential services not interrupted; limited injuries or fatalities.
- **Serious:** Scattered major property damage; some minor infrastructure damage; essential services are briefly interrupted; some injuries and/or fatalities.
- **Extensive:** Widespread major property damage; major public infrastructure damage (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and/or fatalities.
- **Catastrophic:** Property and public infrastructure destroyed; essential services stopped; numerous injuries and fatalities.

It should be noted that several of the hazards listed in the 2018 Massachusetts State Hazard Mitigation plan are not applicable to the Town of Franklin, as follows:

- **Coastal hazards:** since Franklin is an inland community, the Town is not vulnerable to Coastal Flooding, Coastal Erosion, and Tsunamis.
- **Ice jams** are not a hazard in Franklin. The US Army Corps Ice Jam Database shows no record of ice jams in Franklin.
- **Major Urban Fires**, due to the lack of significant wildfire areas in close proximity to urban development that could pose a significant threat of major urban fire.

CHANGING PRECIPITATION PATTERNS

OVERVIEW OF TOWN-WIDE WATER RESOURCES

The town of Franklin is located in the Charles River watershed, as the river forms the northern boundary of the town. The extreme southwest corner of Franklin is part of the Blackstone River watershed. Several rivers and streams meander across the town including Sheppard's Brook, Mine Brook, Miller Brook, Uncas Brook, Dix Brook, and Miscoe Brook. The town has one reservoir, the Franklin Reservoir, which is not used for public water supply. Franklin is also home to several lakes and ponds, including Populatic Lake, Uncas Pond, Beaver Pond, and Woodward Swamp.

Franklin is located in the headwater section of the Charles River watershed, which is 80 miles in length, the longest river with its entire length in Massachusetts. The Charles River watershed has a drainage area of approximately 308 square miles and encompasses all or part of 35 municipalities. The watershed drains to the north and east from Franklin and is divided into three distinct regions, which include the suburban and rural upper watershed, the lakes district or suburban middle watershed, and the urban lower watershed, which includes Boston and Cambridge as the river flows to Boston Harbor.

In the 1960's studies by the US Army Corps of Engineers revealed that the communities upstream of Newton had a history of only minimal flooding. Extensive marshes, swamps and wet meadows scattered around the upper watershed were holding floodwaters and then only slowly letting them go. In 1974 Congress authorized the "Charles River Natural Valley Storage Area," allowing

for the acquisition and permanent protection of 17 scattered wetlands in the middle and upper watershed. Final acquisition totaled 8,103 acres, with 3,221 acres of land acquired in fee and 4,882 acres in flood easement, at total project cost of $8,300,000. In Franklin, much of the marshland along Mine Brook has been permanently protected by the Natural Valley Storage Project of the U.S. Army Corps of Engineers. It should be noted that within the Charles River watershed, flooding within the lower watershed (Boston metro area) is controlled with dams and channelization, while the upper watersheds, wetlands and other natural storage areas are relied upon to protect the area from flooding.

FLOODING HAZARDS

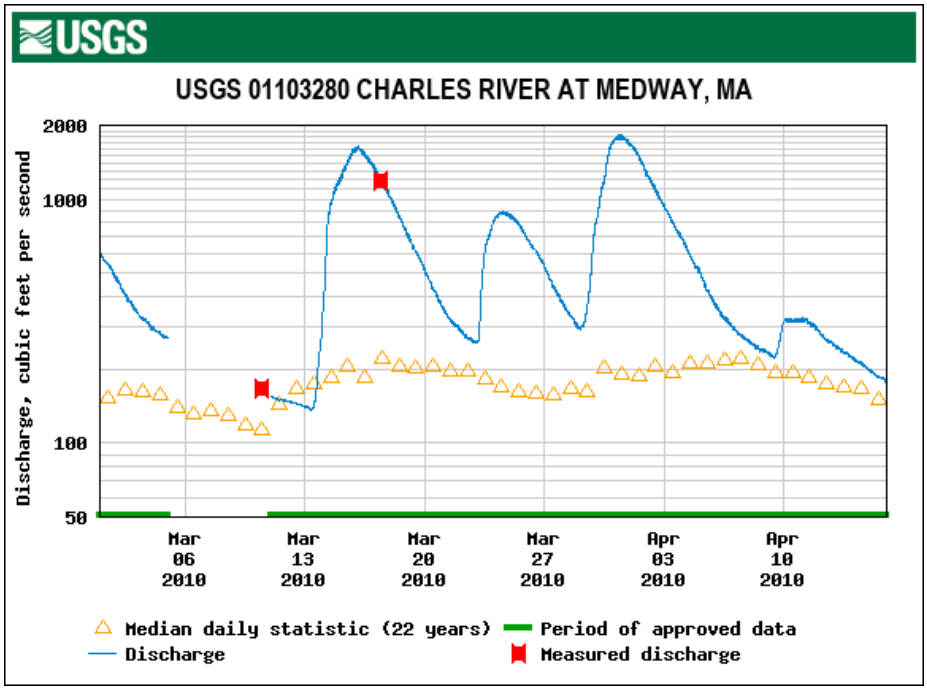
Flooding was the most prevalent natural hazard identified by local officials in Franklin. Flooding can be associated with overflowing rivers and streams in their floodplains, stormwater flooding associated with impervious surfaces and stormwater infrastructure, as well as n some communities beaver dams. According to the Local Team, beavers are a significant problem to the town.

Inland flooding is generally caused by hurricanes, nor'easters, severe rainstorms, and thunderstorms. Northeasters are most common in winter. Hurricanes and severe thunderstorms are most common in the summer and early fall. Climate change has the potential to exacerbate these issues over time due to increasing extreme rainfall events. Increase in average annual rainfall may also lead to more incidents of basement flooding caused by high seasonal groundwater levels.

The March 2010 rainstorms fit the profile of a type of event expected to increase in frequency as the climate warms. That is, significant precipitation, falling in late winter, on frozen ground, as rain rather than snow. The Blue Hill Observatory in Milton recorded 17.7 inches of rain from three storms in the 19 days from March 13 to 31. As shown in the USGS gage in Medway, the closest gage to Franklin downstream on the Charles River, flow reached 1,500 cubic feet per second (cfs) on March 16,and peaked again on March 31 at 1,760 cfs. The river's flow stayed well above the median for this time of year, about 200 cfs, for several weeks until mid-April (Figure 6).

The March 2010 storms were a federally declared disaster making federal assistance available to property owners who did not carry flood insurance. Based on the claims, Franklin experienced widespread flood damage, with 332 disaster claims, 99% of which were located *outside* of FEMA Flood Hazard Zones. See Map 3 in Appendix A for claim locations.

Figure 6: March-April 2010 Charles River Flow at Medway



Source: USGS National Water Information System

Local data for previous flooding occurrences are not collected by the Town of Franklin. The best available local data is for Norfolk County through the National Environmental Information Center. Norfolk County, which includes the Town of Franklin, experienced 34 flood events from 2010 through 2019 (see Table 6). No deaths or injuries were reported and the total reported property damage in the county was $25 million dollars. Nearly all of the damage is attributed to the events in March 2010. This is an average of 3.2 flood events each year.

Table 6: Norfolk County Flood Events, 2010 through 2019

Date	Deaths	Injuries	Property Damage
03/14/2010	0	0	16.64M
03/29/2010	0	0	8.320M
04/01/2010	0	0	0.00K
07/24/2010	0	0	20.00K
08/05/2010	0	0	0.00K
08/25/2010	0	0	8.00K
08/28/2011	0	0	0.00K
08/15/2012	0	0	0.00K
10/29/2012	0	0	0.00K
06/07/2013	0	0	0.00K
07/29/2013	0	0	0.00K
08/09/2013	0	0	15.00K

Date	Deaths	Injuries	Property Damage
10/22/2014	0	0	0.00K
10/23/2014	0	0	0.00K
8/15/2015	0	0	0.00K
8/18/2015	0	0	0.00K
6/07/2016	0	0	5.00K
8/14/2016	0	0	5.00K
4/1/2017	0	0	5.00K
7/12/2017	0	0	0.00K
7/18/2017	0	0	1.00K
8/2/2017	0	0	0.00K
9/30/2017	0	0	10.00K
10/25/2017	0	0	0.00K
10/29/2017	0	0	0.00K
1/12/2018	0	0	0.00K
1/13/2018	0	0	0.00K
4/16/2018	0	0	0.00K
7/06/2018	0	0	10.00K
10/29/2018	0	0	0.00K
11/03/2018	0	0	0.00K
4/15/2019	0	0	0.00K
7/06/19	0	0	0.00K
7/19/19	0	0	0.00K
Total	**0**	**0**	**25 M**

Source: NOAA, National Environmental Information Center

Potential flood damages to Franklin have been estimated using HAZUS-MH. Total damages building and business interruption losses are estimated at $17 million for a 100-year (1% annual chance) storm and $22 million for a 500-year (0.05 % annual chance) storm.

DAM FAILURE

Dams can fail because of structural problems or age, independent of any storm event. Dam failure can follow an earthquake by causing structural damage. Dams can also fail structurally because of flooding arising from a storm or they can overspill due to flooding. 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 path of the dam's floodwaters.

A concern for dams in Massachusetts is that many were built in the 19th century without the benefits of modern engineering or construction oversight. In addition, some dams have not been properly maintained. The increasing intensity of precipitation is the primary climate concern related to dams, as they were most likely designed based on historic weather patterns. The SHMCAP indicates that changing precipitation patterns may increase the likelihood of overflow events. Dam failure is a highly infrequent occurrence, but a severe incident could result in loss of lives and significant property damage. According to the Association of State Dam Safety Officials, three dams have failed in Massachusetts since 1984, one of which resulted in a death. There has not been a dam failure recorded in the Town of Franklin

According to the DCR Office of Dam Safety, there are three dams in Franklin, none of which are classified as high hazard (Table 7). Two dams are owned by the Town of Franklin, and one is privately owned by the Milldam Management Corporation. The two town-owned dams are classified as low hazard, and have recently been rebuilt. The privately-owned dam is classified as significant according to DCR's definitions shown below. Based on the previous record of no recorded dam failures in Franklin, dam failure is a very low frequency event, occurring less frequently than once in 100 years (less than 1% chance per year).

Table 7: Dams in Franklin

Dam Name	River	Owner	Hazard Classification
Sanford Mill Pond Dam	Charles River	Private: Milldam Management Corporation	Significant
DelCarte Open Space Dam No. 3	Miller Brook	Town of Franklin	Low
DelCarte Open Space Dam No. 5	Miller Brook	Town of Franklin	Low

Source: DCR Office of Dam Safety

DCR Dam Hazard Classification

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

Significant: 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)

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

LOCALLY IDENTIFIED AREAS OF FLOODING

Information on potential flood hazard areas was taken from two sources. The first is the National Flood Insurance Rate Maps. The FIRM flood zones are shown on Map 3 in Appendix A. The "Locally Identified Areas of Flooding" described in Table 8 below were identified by the Local

Hazard Mitigation Team as areas where flooding is known to occur. These areas do not necessarily coincide with the flood zones from the FIRM maps. Flooding sources include inadequate drainage systems, high groundwater, and other local conditions. The numbers correspond to the numbers on Map 8, "Local Hazard Areas."

Table 8: Locally Identified Areas of Flooding

ID	Name	Description
1	Populatic Pond	During large rain storms or in an annual spring event Populatic Pond exceeds its banks and floods nearby houses and roadways. These floods have resulted in roadway closures. The town has straightened Populatic Street and modified the drainage to address this issue.
7	*Pleasant Street and Miller Street*	There is a series of old dams that run along Pleasant Street and Miller Street. During large rain storms Miller Brook exceeds its banks and causes minor flooding to several single family homes.
10	Spring Street	Beaver activity causes culverts to get backup up, leading to overtopping the road in larger rainfall events.
11	Spruce Pond	Beaver activity causes drainage control structure to clog up, causing flooding at the adjacent condominium in larger rainfall events

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REPETITIVE LOSS STRUCTURES

As defined by FEMA, a repetitive loss property is a NFIP-insured structure that has had two or more paid flood losses of $1,000 or more in any given 10-year period since 1978. There are 5 repetitive loss properties in Franklin. These repetitive loss properties had a total of 9 losses from 1978 to 2019, totaling $60,950 in paid claims. For more information on repetitive losses see https://www.fema.gov/txt/rebuild/repetitive_loss_faqs.txt and https://www.fema.gov/repetitive-flood-claims-grant-program-fact-sheet.

Table 9 summarizes the number of repetitive loss structures located within several categories of flood zones in Franklin and the number of losses and total claims associated with them.

Table 9: Summary of Repetitive Losses and Claims

	A, AE, AO, AH Zones	VE Zone	B, C, X Zones	Total
Number of Properties	3	0	1	5
Number of Losses	7	0	2	9
Total Payments	$55,849	0	$5,101	$60,950
Buildings	$49,819		$5,101	$54,921
Contents	$6,030		0	$6,029

Source: Department of Conservation and Recreation, FEMA Repetitive Loss data

DROUGHT

Drought is a temporary irregularity in precipitation and differs from aridity since the latter is restricted to low rainfall regions and is a permanent feature of climate. Drought is a period characterized by long durations of below normal precipitation. Drought conditions occur in virtually all climatic zones, yet its characteristics vary significantly from one region to another since it is relative to the normal precipitation in that region. Drought can affect agriculture, water supply, aquatic ecology, wildlife, and plant life.

Droughts are projected to increase in frequency and intensity in the summer and fall as weather patterns change. Drought impacts can include reduced groundwater and surface water levels, affecting water quality and quantity, and the organisms that rely on aquatic resources. Drought also increases stress on plant communities and, the likelihood of forest and brush fires. Communities may be affected by water use restrictions, affecting drinking water supply and outdoor water use. Economic sectors impacted could include recreation, agriculture, and forestry.

Five levels of drought have been developed to characterize drought severity: Normal, Advisory, Watch, Warning, and Emergency. These drought levels are based on the conditions of natural resources and are intended to provide information on the current status of water resources. The levels provide a basic framework from which to take actions to assess, communicate, and respond to drought conditions.

Franklin does not collect data relative to drought events. Because drought tends to be a regional natural hazard, this plan references state data as the best available data for drought. The SHMCAP using data collected since 1850, calculates that statewide there is a 1% chance of being in a drought emergency in any given month. For drought warning and watch levels, the chance is 2% and 8% respectively in any given month (Table 10).

Table 10: Frequency of Massachusetts Drought Levels

Drought Level	Frequency Since 1850	Probability of Occurrence in a Given Month
Drought Emergency	5 occurrences	1% chance
Drought Warning	5 occurrences	2% chance
Drought Watch	46 occurrences	8% chance

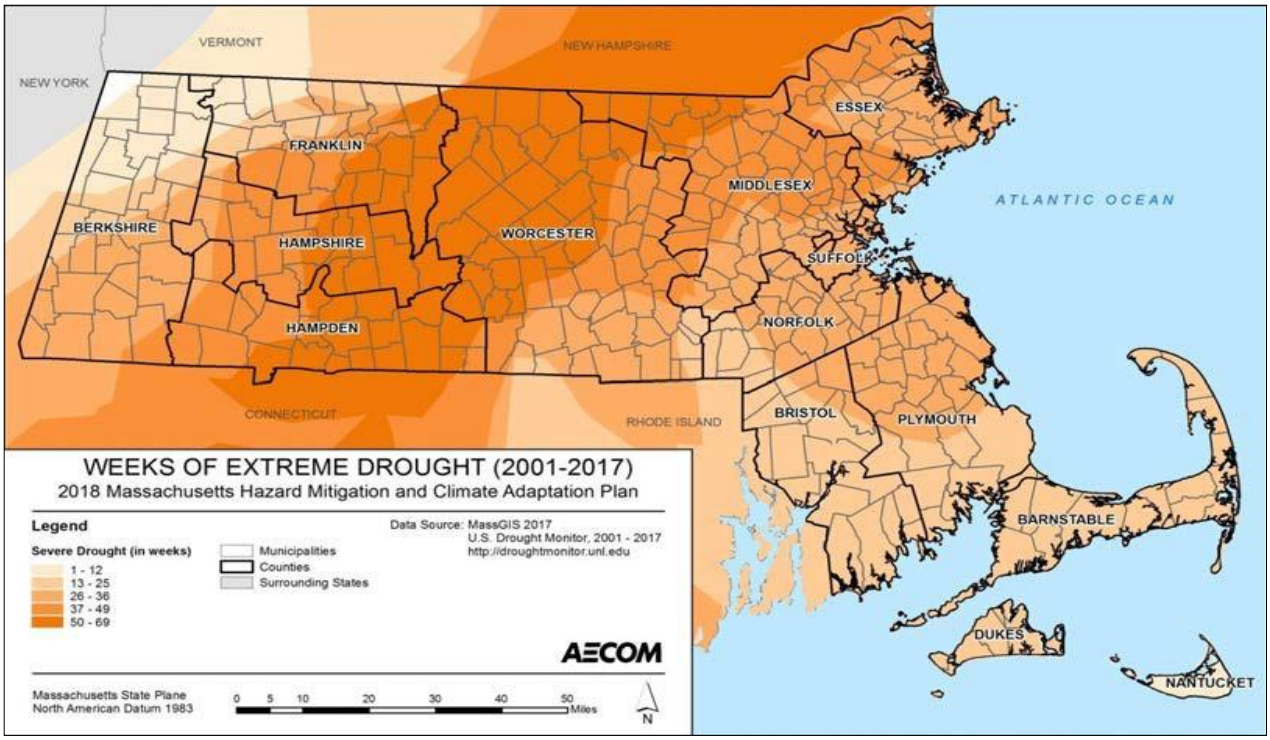
Source: SHMCAP

Drought emergencies have been reached infrequently, with five events occurring between 1850 and 2012: 1883, 1911, 1941, 1957, and 1965 to 1966. Due to its long duration, the drought from 1965 to 1966 is viewed as the most severe drought to have occurred in Massachusetts in modern times. The drought that extended from July 2016 to April 2017 reached the Drought Warning level. Determinations regarding the end of a drought or reduction of the drought level focus on two key drought indicators: precipitation and groundwater levels. These two factors have

the greatest long-term impact on stream flow, water supply, reservoir levels, soil moisture, and the potential for forest fires.

The U.S. Drought Monitor characterizes droughts as moderate, severe, extreme, or exceptional. Severe drought is characterized by likely crop and pasture losses, water shortages, and water restrictions. As shown in Figure 9 below, Franklin experienced between 26 and 36 weeks of severe drought between 2001 and 2017.

Figure 8: Weeks of Severe Drought (2001-2017)



Source: SHMCAP

LANDSLIDES

According to the U.S. Geological Survey, "The term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over steepened slope is the primary reason for a landslide, there are other contributing factors." Among the contributing factors are: erosion by rivers or ocean waves over steepened slopes; rock and soil slopes weakened through saturation by snowmelt or heavy rains; earthquake created stresses that make weak slopes fail; excess weight from accumulation of rain or snow; and stockpiling of rock or ore from waste piles or man-made structures. In Massachusetts, according to the SHMCAP, the most common cause of landslides are geologic conditions combined with steep slopes and/or heavy rains. Landslides associated with heavy rains typically occur on steep slopes with permeable soils underlain by till or bedrock.

Landslides can result from human activities that destabilize an area or can occur as a secondary impact from another natural hazard, such as flooding. In addition to structural damage to buildings and the blockage of transportation corridors, landslides can lead to sedimentation of water bodies. Typically, a landslide occurs when the condition of a slope changes from stable to unstable. Natural precipitation such as heavy snow accumulation, torrential rain, and run-off may saturate soil, creating instability enough to contribute to a landslide. More frequent extreme rain events may increase the chance of landslides as saturated soils are conducive to landslides. Drought may also increase the likelihood of landslides if loss of vegetation decreases soil stability.

The SHMCAP, utilizing data from the MA Department of Transportation from 1986 to 2006 to estimates that, on average, roughly one to three known landslides have occurred each year. A slope stability map published by the MA Geological Survey and UMass-Amherst indicates that the most significant risk of landslide is in western Massachusetts.

Franklin is classified as having low susceptibility and a Low of landslides (see Map 4, Appendix A). Should a landslide occur in the future, the type and degree of impacts would be highly localized. The town's vulnerabilities could include damage to structures, damage to transportation and other infrastructure, and localized road closures. Injuries and casualties, while possible, would be unlikely given the low extent and impact of landslides in Franklin. There are no recorded instances of landslides having occurred in the Town of Franklin.

RISING TEMPERATURES

AVERAGE AND EXTREME TEMPERATURES

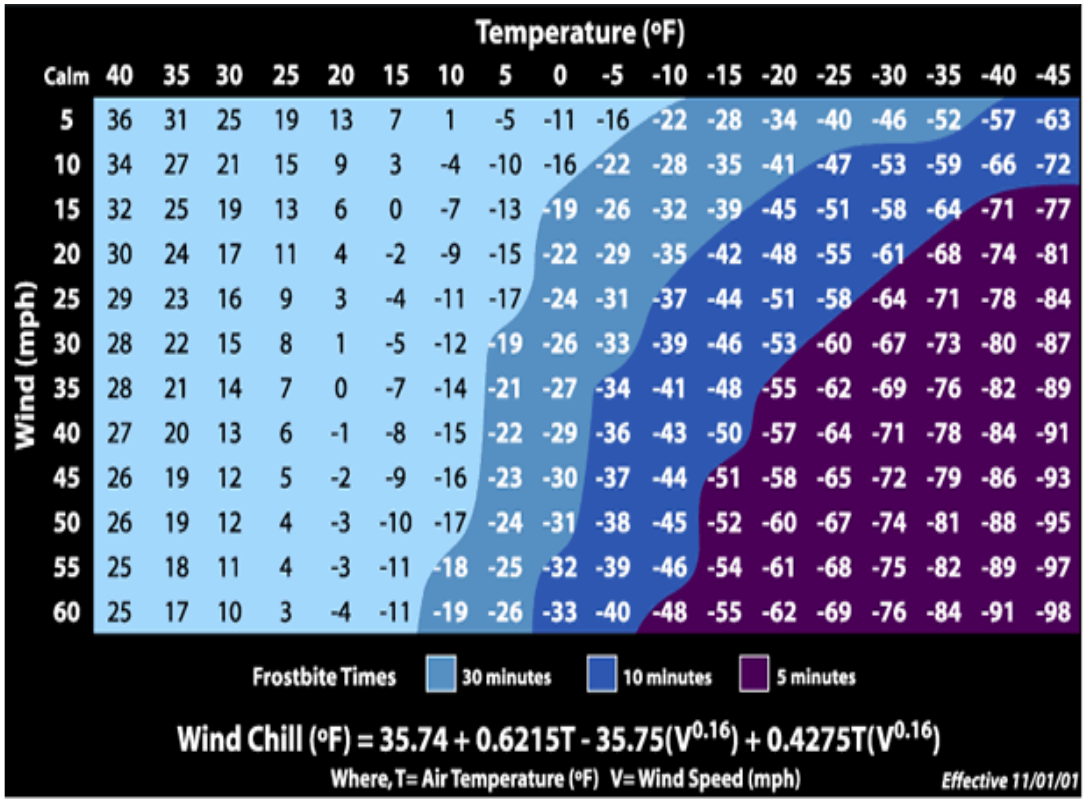
Extreme temperatures occur when either high temperature or low temperatures relative to average local temperatures occur. These can occur for brief periods of time and be acute, or they can occur over long periods of time where there is a long stretch of excessively hot or cold weather. Franklin has four well-defined seasons. The seasons have several defining factors, with temperature one of the most significant. Extreme temperatures can be defined as those that are far outside of the normal seasonal ranges for Massachusetts

EXTREME COLD

Extreme cold temperature is typically measured using the Wind Chill Temperature Index, which is provided by the National Weather Service (NWS). The wind chill is the apparent temperature felt on exposed skin due to the combination of air temperature and wind speed. The index is provided in Figure 11 below. Extreme cold is a dangerous situation that can result in health emergencies for susceptible people, such as those without shelter, those who are stranded, or those who live in homes that are poorly insulated or without heat.

The best available local data for previous occurrences of extreme cold are for Norfolk County, through the National Environmental Information Center. There have been two extreme cold events recorded in the past ten years, which caused no deaths, no injuries, or property damage, as shown in Table 11. This is an average of one event every 5 years.

Figure 9 Wind Chill Temperature Index and Frostbite Risk



Source: National Weather Service

Table 11: Norfolk County Extreme Cold and Wind Chill Occurrences 2010-2019

Date	Deaths	Injuries	Damages
2/13/2016	0	0	0
2/16/2016	0	0	0

Source: NOAA, National Environmental Information Center

EXTREME HEAT

A heat wave in Massachusetts is defined as three or more consecutive days above 90°F. Another measure used for identifying extreme heat events relies on the Heat Index. According to the National Weather Service (NWS), the Heat Index is a measure of how hot it really feels relative humidity is factored in with the actual air temperature.

The NWS issues an advisory when the heat index (Figure 12) is forecast to exceed 100°F for two or more hours; an excessive heat advisory is issued if the forecast predicts the temperature will rise above 105°F.

Figure 10: Heat Index Chart

Relative Humidity (%) \ Temperature (°F)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Category	Heat Index	Health Hazards
Extreme Danger	130 °F – Higher	Heat Stroke or Sunstroke is likely with continued exposure.
Danger	105 °F – 129 °F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Extreme Caution	90 °F – 105 °F	Sunstroke, muscle cramps, and/or heat exhaustions possible with prolonged exposure and/or physical activity.
Caution	80 °F – 90 °F	Fatigue possible with prolonged exposure and/or physical activity.

The best available local data on previous excessive heat occurrences are for Norfolk County, through the National Environmental Information Center. In the past ten years there has been one excessive heat day recorded, and no deaths, injuries, or property damage (see Table 12). This is an average of one extreme heat occurrence every ten years.

Table 12: Norfolk County Extreme Heat Occurrences 2010-2019

Date	Deaths	Injuries	Damage
7/6/2010	0	0	0

Source: NOAA, National Environmental Information Center

Extreme cold events are predicted to decrease in the future, while extreme heat days, as well as average temperatures are projected to increase. The projected increase in extreme heat and heat waves is the source of one of the key health concerns related to climate change. Prolonged exposure to high temperatures can cause heat-related illnesses, such as heat cramps, heat exhaustion, heat stroke, and death. Heat exhaustion is the most common heat-related illness and if untreated, it may progress to heat stroke. People who perform manual labor, particularly those who work outdoors, are at increased risk for heat-related illnesses. Prolonged heat exposure and the poor air quality and high humidity that often accompany heat waves can also exacerbate pre-existing conditions, including respiratory illnesses, cardiovascular disease, and mental illnesses.

Older adults are often at elevated risk due to a high prevalence of pre-existing and chronic conditions. In Franklin 11.9% of the population is over age 65. People who live in older housing

stock and in housing without air conditioning have increased vulnerability to heat-related illnesses. Power failures are more likely to occur during heat waves, affecting the ability of residents to remain cool during extreme heat. Individuals with pre-existing conditions and those who require electric medical equipment may be at increased risk during a power outage. Heat impacts are more likely to be felt by residents without air conditioning, by those who work outdoors, and those with underlying health conditions.

Due to what is termed the "heat island effect", areas with less shade and more dark surfaces (pavement and roofs) will experience even hotter temperatures; these surfaces absorb heat during the day and release it in the evening, keeping nighttime temperatures warmer as well. Map 10 in Appendix A displays areas that are among the hottest 5% of land in the MAPC region based on land surface temperature derived from satellite imagery on July 13, 2016, when the high temperature at Logan Airport was 92°F. Hot spots are typically associated with areas of impervious surfaces and little or no tree cover. In Franklin there are over a dozen hot spots distributed throughout the more developed central area of the town. These include business and commercial areas along the Interstate 495 corridor as well as the more densely developed town center area.

WILDFIRE

A wildfire is a non-structure fire occurring in a forested, shrub or grassland areas. In the Boston Metro region these fires rarely grow to the size of a wildfire, as seen more typically in the western U.S. A more likely occurrence is brush fires that typically burn no more than the underbrush of a forested area. There are three different classes of wildfires:

- Surface fires are the most common type and burn along the floor of a forest, moving slowly and killing or damaging trees
- Ground fires are usually started by lightning and burn on or below the forest floor
- Crown fires spread rapidly by wind, jumping along the tops of trees

A wildfire differs greatly from other fires by its extensive size, the speed at which it can spread out from its original source, its potential to unexpectedly change direction, and its ability to jump gaps such as roads, rivers, and fire breaks. Wildfire season can begin in March and usually ends in late November. The majority of wildfires typically occur in April and May, when most vegetation is void of any appreciable moisture, making them highly flammable. Once "green-up" takes place in late May to early June, the fire danger usually is reduced somewhat. As the climate warms, drought and warmer temperatures may increase the risk of wildfire as vegetation dries out and becomes more flammable.

Fires can present a hazard where there is the potential to spread into developed or inhabited areas, particularly residential areas where sufficient fuel materials might exist to allow the fire the spread into homes. Protecting structures from fire poses special problems and can stretch firefighting resources to the limit. If heavy rains follow a fire, other natural disasters can occur,

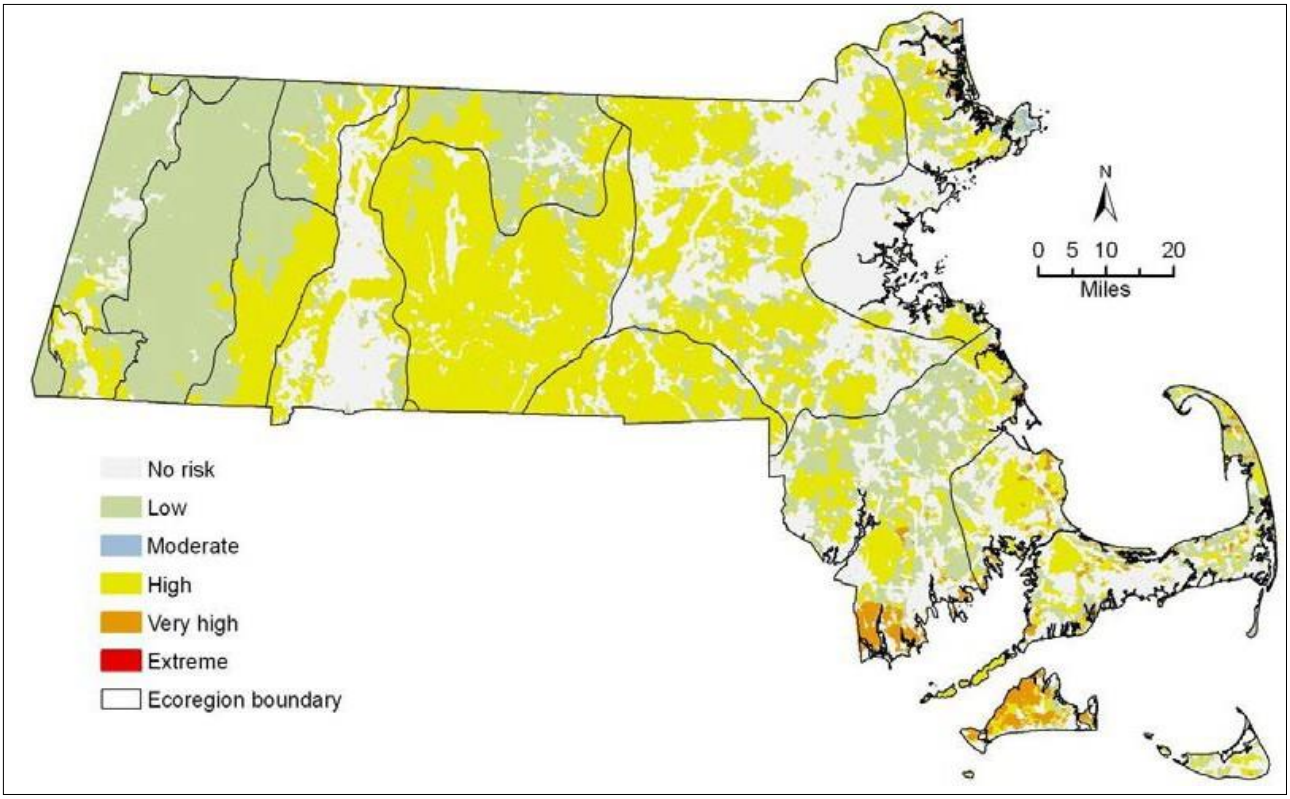
including landslides, mudflows, and floods. If the wild fire destroys the ground cover, then erosion becomes one of several potential problems.

POTENTIAL BRUSHFIRE HAZARD AREAS

The SCHMCAP depicts statewide fire risk incorporating three risk components: fuel, wildland-urban interface, and topography (Figure 12). The wildland-urban interface reflects communities where housing and vegetation intermingle, and fire can spread from structures to vegetated areas. The most susceptible fuels are pitch pine, scrub oak and oak forests. Topography can affect the behavior of fires, as fire spreads more easily uphill. Franklin is shown in the moderate and high-risk zones.

Brushfire was not identified by the Hazard Mitigation Team as a significant hazard. The town responds to about 30 brush fires annually. There have been no reports of significant property damage or deaths related to brush fires. Most brush fires occur in areas of public open space or by disregarded cigarettes near major roadways. These fires typically result in minimal property damage and there have been no deaths as the result of brush fires. The town did not identify particular parcels for brush fire concern, but rather a low level of concern in all open spaces.

Figure 11: Wildfire Risk Areas



Source: SHMCAP

EXTREME WEATHER

HURRICANES AND TROPICAL STORMS

A hurricane is a violent wind and rainstorm with wind speeds of 74 to 200 miles per hour. A hurricane is strongest as it travels over the ocean and is particularly destructive to coastal property as the storm hits land. A tropical storm has similar characteristics, but wind speeds are below 74 miles per hour. Climate models suggest that hurricanes and tropical storms will become more intense as warmer ocean waters provide more fuel for the storms. In addition, rainfall amounts associated with hurricanes are predicted to increase because warmer air can hold more water vapor. Since 1900, 39 tropical storms have impacted New England (NESEC). Massachusetts has experienced approximately 32 tropical storms, nine Category 1 hurricanes, five Category 2 hurricanes and one Category 3 hurricane.

Given its location the Town of Franklin's entire area is vulnerable to hurricanes, which occur between June and November. As shown on Map 5 in Appendix A, hurricanes have historically tracked through Franklin in 1861, 1868, and 1869. Category 2. A hurricane or storm track is the line that delineates the path of the eye of a hurricane or tropical storm. The town also experiences the impacts of the wind and rain from hurricanes and tropical storms regardless of whether the storm track passed through the town. The hazard mapping indicates that the 100-year wind speed in Franklin is 110 miles per hour. Hurricanes since 1938 are shown in Table 13.

Table 13: Hurricane Records for Massachusetts, 1938 to 2020

Hurricane Event	Date
Great New England Hurricane*	September 21, 1938
Great Atlantic Hurricane*	September 14-15, 1944
Hurricane Doug	September 11-12, 1950
Hurricane Carol*	August 31, 1954
Hurricane Edna*	September 11, 1954
Hurricane Diane	August 17-19, 1955
Hurricane Donna	September 12, 1960
Hurricane Gloria	September 27, 1985
Hurricane Bob	August 19, 1991
Hurricane Earl	September 4, 2010
Tropical Storm Irene	August 28, 2011
Hurricane Sandy	October 29-30, 2012

*Category 3

Source: National Oceanic and Atmospheric Administration

Hurricane intensity is measured according to the Saffir/Simpson scale, which categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure, and storm surge potential. These are combined to estimate potential damage. Table 14 gives an overview of the wind speeds, surges, and range of damage caused by different hurricane categories:

Table 14: Saffir/Simpson Scale

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

Source: NOAA

Hurricanes typically have regional impacts beyond their immediate tracks. Falling trees and branches are a significant problem because they can result in power outages when they fall on power lines or block traffic and emergency routes. Hurricanes are a town-wide hazard in Franklin. Potential hurricane damages to Franklin have been estimated using HAZUS-MH. Total damages building and business interruption losses are estimated at $32million for a Category 2 hurricane and $126 million for a Category 4 hurricane. Hurricanes and tropical storms are an infrequent event having passed directly through Franklin only three times in 150 years.

SEVERE WINTER STORM/NOR'EASTER

A northeast storm, known as a nor'easter, is typically a large counterclockwise wind circulation around a low-pressure center. Featuring strong northeasterly winds blowing in from the ocean over coastal areas, nor'easters are relatively common in the winter months in New England occurring one to two times a year. The storm radius of a nor'easter can be as much as 1,000 miles and these storms feature sustained winds of 10 to 40 mph with gusts of up to 70 mph. These storms are accompanied by heavy rain or snow, depending on temperatures. Many of the historic flood events identified in the previous section were associated with nor'easters, including the "Perfect Storm" event in 1991. More recently, blizzards in February 2013, January 2015, and in March 2018 were large nor'easters that caused significant snowfall amounts.

Franklin is vulnerable to both the wind and precipitation that accompany nor'easters. High winds can cause damage to structures, fallen trees, and downed power lines leading to power outages. Intense rainfall can overwhelm drainage systems causing localized flooding of rivers and streams as well as urban stormwater ponding and localized flooding. Fallen tree limbs as well as heavy snow accumulation and intense rainfall can impede local transportation corridors, and block access for emergency vehicles.

SEVERE WINTER STORM/BLIZZARD

A blizzard is a winter snow storm with sustained or frequent wind gusts to 35 mph or more, accompanied by falling or blowing snow which reduces visibility to or below ¼ mile. These conditions must be the predominant condition over a three-hour period. Extremely cold temperatures are often associated with blizzard conditions but are not a formal part of the

definition. The hazard related to the combination of snow, wind, and low visibility significantly increases when temperatures drop below 20 degrees.

Winter storms are a combination hazard because they often involve wind, ice, and heavy snow fall. The National Weather Service defines "heavy snow fall" as an event generating at least four inches of snowfall within a 12-hour period. Blizzards and winter storms are often associated with a Nor'easter event, a large counterclockwise wind circulation around a low-pressure center often resulting in heavy snow, high winds, and rain.

The National Weather Service defines "heavy snow fall" as an event generating at least four inches of snowfall within a 12-hour period. The Northeast Snowfall Impact Scale (NESIS), developed by Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service (Kocin and Uccellini, 2004), characterizes and ranks high impact northeast snowstorms. These storms have large areas of 10-inch snowfall accumulations and greater. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. NESIS scores are a function of the area affected by the snowstorm, the amount of snow, and the number of people living in the path of the storm. The largest NESIS values result from storms producing heavy snowfall over large areas that include major metropolitan centers. The NESIS categories are summarized in Table 15.

Table 15: NESIS Categories

Category	NESIS	Value Description
1	1 – 2.499	Notable
2	2.5 – 3.99	Significant
3	4 – 5.99	Major
4	6 – 9.99	Crippling
5	10+	Extreme

Source: Massachusetts State Hazard Mitigation Plan, 2013

The most significant winter storm in recent history was the "Blizzard of 1978," which resulted in over three feet of snowfall and multiple day closures of roadways, businesses, and schools. In Franklin, blizzards and severe winter storms have occurred in the following years (Table 16):

Table 16: Severe Weather Major Disaster Declarations in Eastern MA

Storm Event	Date
Severe Winter Storm and Snowstorm	March 2018
Severe Winter Storm, Snowstorm, and Flooding	January 2015
Severe Winter Storm, Snowstorm, and Flooding	February 2013
Hurricane Sandy	October/November 2012
Severe Storm and Snowstorm	October 2011
Tropical Storm Irene	August 2011

Severe Winter Storm and Snowstorm	January 2011
Severe Winter Storm and Flooding	December 2008
Severe Storms and Inland and Coastal Flooding	April 2007
Severe Storm and Flooding	October 2005
Severe Storms & Flooding	March 2001
Blizzard	January 1966
Winter Coastal Storm	December 1992
Severe Coastal Storm	October 1991
Hurricane Bob	August 1991
Hurricane Gloria	September 1985
Coastal Storm, Flood, Ice, Snow	February 1978
Hurricane, floods	August 1955
Hurricanes	September 1954

Source: FEMA

As with hurricanes, warmer ocean water and air will provide more fuel for storms. According to the SHMCAP it appears that Atlantic coast nor'easters are increasing in frequency and intensity.

Winter storms, including heavy snow, blizzards, and ice storms, are the most common and most familiar of the region's hazards that affect large geographic areas. The majority of blizzards and ice storms in the region cause more inconvenience than they do serious property damage, injuries, or deaths. However, periodically, a storm will occur which is a true disaster, and necessitates intense large-scale emergency response. The impacts of winter storms are often related to the weight of snow and ice, which can cause roof collapses and also causes tree limbs to fall. This in turn can cause property damage and potential injuries. Power outages may also result from fallen trees and utility lines.

Winter storms are a potential town-wide hazard in Franklin. Map 6 in Appendix A indicates that the average annual average snowfall in Franklin is between 48 and 72 inches. A number of public safety issues can arise during snow storms. Impassible streets are a challenge for emergency vehicles and affect residents and employers. Snow-covered sidewalks force people to walk in streets, which are already less safe due to snow, slush, puddles, and ice. Large piles of snow can also block sight lines for drivers, particularly at intersections. Refreezing of melting snow can cause dangerous roadway conditions. In addition, transit operations may be impacted, as they were in the 2015 blizzards which caused the closure of the MBTA system for one day and limited services on the commuter rail for several weeks.

Data for Norfolk County from the National Environmental Information Center is the best available local data on previous occurrences and impacts of heavy snow events. From 2010 through 2019,

Norfolk County experienced 18 heavy snowfall events, resulting in no injuries, deaths, or property damage (Table 17).

Table 4: Heavy Snow Events and Impacts in Norfolk County, 2010 through 2019

Date	Deaths	Injuries	Property Damage ($)
1/12/2011	0	0	0
1/26/2011	0	0	0
12/29/2012	0	0	5K
2/8/2013	0	0	0
3/7/2013	0	0	0
3/18/2013	0	0	0
12/14/2013	0	0	0
1/2/2014	0	0	0
1/21/2014	0	0	0
2/5/2014	0	0	0
1/26/2015	0	0	0
2/2/2015	0	0	0
2/8/2015	0	0	0
2/14/2015	0	0	0
1/23/16	0	0	0
2/5/2016	0	0	100K
3/14/2017	0	0	0
11/15/2018	0	0	0
Total	**0**	**0**	**105K**

Source: NOAA, National Environmental Information Center

Heavy snow is considered to be high frequency events based on past occurrences, as there have been 18 events in the past ten years, for an average of almost 2 events each winter. As with nor'easters, warmer ocean water and air will provide more fuel for storms. According to the SHMCAP changing atmospheric patterns favor the development of winter storms.

TORNADO

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. These events are spawned by thunderstorms and occasionally by hurricanes and may occur singularly or in multiples. They develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. Most vortices remain suspended in the atmosphere. Should they touch down, they become a force of destruction. Some ingredients for tornado formation include:

- Very strong winds in the mid and upper levels of the atmosphere
- Clockwise turning of the wind with height (from southeast at the surface to west aloft)
- Increasing wind speed with altitude in the lowest 10,000 feet of the atmosphere (i.e., 20 mph at the surface and 50 mph at 7,000 feet)
- Very warm, moist air near the ground with unusually cooler air aloft
- A forcing mechanism such as a cold front or leftover weather boundary from previous shower or thunderstorm activity

Tornado damage severity is measured by the Fujita Tornado Scale, in which wind speed is not measured directly but rather estimated from the amount of damage. As of February 1, 2007, the National Weather Service began rating tornados using the Enhanced Fujita-scale (EF-scale), which allows surveyors to create more precise assessments of tornado severity. The EF-scale is summarized in Table 18.

Table 5: Enhanced Fujita Scale

Fujita Scale			Derived		Operational EF Scale	
F Number	Fastest ¼ mile (mph)	3-second gust (mph)	EF Number	3-second gust (mph)	EF Number	3-second gust (mph)
0	40 – 72	45 – 78	0	65 – 85	0	65 – 85
1	73 – 112	79 – 117	1	86 – 109	1	86 – 110
2	113 – 157	118 – 161	2	110 – 137	2	111 – 135
3	158 – 207	162 – 209	3	138 – 167	3	136 – 165
4	208 – 260	210 – 261	4	168 – 199	4	166 – 200
5	261– 318	262 – 317	5	200 – 234	5	Over 200

Source: Massachusetts State Hazard Mitigation Plan, 2013

The frequency of tornadoes in eastern Massachusetts is low; on average, there are six tornadoes that touchdown somewhere in the Northeast region every year. The strongest tornado in Massachusetts history was the Worcester Tornado in 1953 (NESEC). More recent tornado events in Massachusetts were in Springfield in 2011 and in Revere in 2014. The Springfield tornado caused significant damage and resulted in four deaths in June of 2011. The Revere tornado touched down in Chelsea just south of Route 16, moved north into Revere's business district along Broadway, and ended near the intersection of Routes 1 and 60. The path was approximately two miles long and 3/8 mile wide, with wind speeds up to 120 miles per hour. Approximately 65 homes had substantial damages and 13 homes and businesses were rendered uninhabitable.

Since 1950, there have been eleven tornadoes in Norfolk County recorded by the Tornado History Project. There have been one F3 and one F2, and three FI tornados. These eleven tornadoes resulted in a total of one fatality and 23 injuries and $4.1 million in damages, as summarized in Table 19. This an average of one tornado every 6 years.

Table 6: Tornado Records for Norfolk County

Date	Fujita	Fatalities	Injuries	Width	Length	Damage
June 1953	3	0	17	667	28	$500K – 5M
11/21/1956	2	0	0	17	0.1	$500-$5000
8/9/1972	1	1	6	30	4.9	$5K-$50K
9/6/1973	1	0	0	10	1.1	$5K-$50K
7/10/1989	0	0	0	23	0.1	$500-$5000
5/18/1990	0	0	0	10	0.2	$500-$5000
5/18/1990	0	0	0	10	0.2	$500-$5000

Date	Fujita	Fatalities	Injuries	Width	Length	Damage
6/30/2001	0	0	0	80	0.1	-
8/21/2004	1	0	0	40	6	$1,500,000
5/9/2013	0	0	0	50	0.38	$20,000
06/23/2015	0	0	0	200	0.48	-

Source: The Tornado History Project

Buildings constructed prior to current building codes may be more vulnerable to damages caused by tornadoes. Evacuation of impacted areas may be required on short notice. Sheltering and mass feeding efforts may be required along with debris clearance, search and rescue, and emergency fire and medical services. Key routes may be blocked by downed trees and other debris, and widespread power outages are also typically associated with tornadoes.

Although tornadoes are a potential town-wide hazard in Franklin, tornado impacts are relatively localized compared to severe storms and hurricanes. Damages from any tornado in Franklin would greatly depend on the track of the tornado. The more densely developed areas in the central part of town and along the Interstate 495 would have the greatest vulnerability for damages should a tornado pass that those areas of the town. Based on the record of previous occurrences since 1956, Tornado events in Franklin are a very low frequency event as there not been a tornado event recorded in the town.

According to the SHMCAP, it is possible that severe thunderstorms which can include tornadoes may increase in frequency and intensity due to climate change. However, scientists have less confidence in the models that seek to project future changes in tornado activity.

OTHER SEVERE WEATHER

SEVERE THUNDERSTORMS

While less severe than the other types of storms discussed, thunderstorms can lead to localized damage and represent a hazard risk for communities. A thunderstorm typically features lightning, strong winds, rain, and/or hail. Thunderstorms sometime give rise to tornados. On average, these storms are only around 15 miles in diameter and last for about 30 minutes. A severe thunderstorm can include winds of close to 60 mph and rain sufficient to produce flooding.

The best available data on previous occurrences of thunderstorms in Franklin is for is for Norfolk County through NOAA's National Environmental Information Center. For the years 2010 through 2019, NOAA records show 30 thunderstorm events in Norfolk County (Table 20). This is an average of 3 events per year. These thunderstorms resulted in a total of $307,500 in property damage. There were no injuries or deaths reported.

Table 20: Norfolk County Thunderstorm Events, 2010 to 2019

DATE	MAGNITUDE	DEATHS	INJURIES_DIRECT	PROPERTY DAMAGE
6/6/2010	53	0	0	0
6/20/2010	50	0	0	5,000
6/24/2010	50	0	0	0
8/19/2011	50	0	0	1,000
6/23/2012	50	0	0	25,000
8/10/2012	50	0	0	5,000
8/15/2012	40	0	0	500
6/17/2013	50	0	0	3,000
7/29/2013	50	0	0	20,000
7/3/2014	50	0	0	20,000
7/28/2014	60	0	0	50,000
6/23/2015	50	0	0	5,000
8/4/2015	50	0	0	10,000
8/15/2015	50	0	0	10,000
2/25/2016	50	0	0	15,000
6/7/2016	50	0	0	10,000
7/18/2016	50	0	0	50,000
7/22/2016	50	0	0	50,000
7/23/2016	40	0	0	5,000
8/14/2016	50	0	0	5,000
6/9/2017	45	0	0	1,000
6/13/2017	48	0	0	1,000
6/23/2017	50	0	0	1,000
8/2/2017	50	0	0	2,500
9/6/2017	50	0	0	1,000
7/17/2018	45	0	0	3,000
9/6/2018	50	0	0	1,000
11/3/2018	50	0	0	500
7/17/2019	50	0	0	2,000
7/31/2019	50	0	0	5,000
TOTAL		**0**	**0**	**307,500**

Source: NOAA, National Environmental Information Center

Severe thunderstorms are a town-wide hazard for Franklin. The town's vulnerability to severe thunderstorms is similar to that of nor'easters. High winds can cause falling trees and power outages, as well as obstruction of key routes and emergency access. Heavy precipitation may also cause localized flooding, both riverine and urban drainage related.

Based on the record of previous occurrences, severe thunderstorms in Franklin are high frequency events as this hazard has occurred an average of three times per year in the past ten years. As

noted previously, the intensity of rainfall events has increased significantly, and those trends are expected to continue. The SHMCAP does not specifically address whether climate will affect the intensity or frequency of thunderstorms.

ICE STORMS

The ice storm category covers a range of different weather phenomena that collectively involve rain or snow being converted to ice in the lower atmosphere leading to potentially hazardous conditions on the ground. Hail size typically refers to the diameter of the hailstones. Warnings and reports may report hail size through comparisons with real-world objects that correspond to certain diameters shown in Table 21:

Table 21: Hail Size Comparisons

Description	Diameter (inches)
Pea	0.25
Marble or mothball	0.50
Penny or dime	0.75
Nickel	0.88
Quarter	1.00
Half dollar	1.25
Walnut or ping pong ball	1.50
Golf ball	1.75
Hen's egg	2.00
Tennis ball	2.50
Baseball	2.75
Tea cup	3.00
Grapefruit	4.00
Softball	4.50

While ice pellets and sleet are examples of these, the greatest hazard is created by freezing rain conditions, which is rain that freezes on contact with hard surfaces leading to a layer of ice on roads, walkways, trees, and other surfaces. The conditions created by freezing rain can make driving particularly dangerous and emergency response more difficult. The weight of ice on tree branches can also lead to falling branches damaging electric lines.

The best available local data on previous ice storm occurrences in Franklin is for is for Norfolk County through NOAA's National Environmental Information Center. Norfolk County experienced 12 events from 2010 to 2019, with no recorded property damage, injuries, or deaths (Table 22).

Ice storms are considered to be medium frequency events based on past occurrences, and as defined by the Massachusetts State Hazard Mitigation Plan. This hazard occurs once in five years to once in 50 years, with a 2% to 20% chance of occurring each year. There is some indication that as winters warm, temperatures may be more likely to produce icing conditions.

Table 22: Norfolk County Hail Events, 2010 through 2019

DATE	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE
6/5/2010	1.5	0	0	0
6/20/2010	1	0	0	0
6/1/2011	0.75	0	0	0
6/23/2012	0.88	0	0	0
7/18/2012	0.75	0	0	0
5/21/2013	0.75	0	0	0
9/1/2013	0.75	0	0	0
8/7/2014	0.75	0	0	0
5/12/2015	0.75	0	0	0
6/23/2015	1	0	0	0
8/4/2015	1	0	0	0
6/30/2019	0.75	0	0	0
TOTAL		**0**	**0**	**0**

*Magnitude refers to diameter of hail stones in inches
Source: NOAA, National Environmental Information Center

NON-CLIMATE INFLUENCED HAZARDS

EARTHQUAKES

Earthquakes are the sole natural hazard for which there is no established correlation with climate impacts. Damage in an earthquake stems from ground motion, surface faulting, and ground failure in which weak or unstable soils, such as those composed primarily of saturated sand or silts, liquefy. The effects of an earthquake are mitigated by distance and ground materials between the epicenter and a given location. An earthquake in New England affects a much wider area than a similar earthquake in California due to New England's solid bedrock geology (NESEC).

Seismologists use a magnitude scale known as the Richter scale to express the seismic energy released by each earthquake. The typical effects of earthquakes in various ranges are summarized in Table 23.

According to the State Hazard Mitigation Plan, New England experiences an average of five earthquakes per year. From 1668 to 2007, 355 earthquakes were recorded in Massachusetts (NESEC). Most have originated from the La Malbaie fault in Quebec or from the Cape Anne fault located off the coast of Rockport. The region has experienced larger earthquakes in the distant

Table 23: Richter Scale and Effects

Richter Magnitudes	**Earthquake Effects**
Less than 3.5	Generally not felt, but recorded
3.5- 5.4	Often felt, but rarely causes damage
Under 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to about 100 km. across where people live.
7.0- 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or greater	Great earthquake. Can cause serious damage in areas several hundred meters across.

Source: Nevada Seismological Library (NSL), 2005

past, including a magnitude 5.0 earthquake in 1727 and a 6.0 earthquake that struck in 1755 off the coast of Cape Anne. More recently, a pair of damaging earthquakes occurred near Ossipee, NH in 1940. A 4.0 earthquake centered in Hollis, Maine in October 2012 was felt in the Boston area. Historic records of some of the more significant earthquakes in the region are shown in Table 24.

Table 24: Historical Earthquakes in Massachusetts or Surrounding Area

Location	Date	Magnitude
MA - Cape Ann	11/10/1727	5
MA - Cape Ann	12/29/1727	NA
MA - Cape Ann	2/10/1728	NA
MA - Cape Ann	3/30/1729	NA
MA - Cape Ann	12/9/1729	NA
MA - Cape Ann	2/20/1730	NA
MA - Cape Ann	3/9/1730	NA
MA - Boston	6/24/1741	NA
MA - Cape Ann	6/14/1744	4.7
MA - Salem	7/1/1744	NA
MA - Off Cape Ann	11/18/1755	6
MA - Off Cape Cod	11/23/1755	NA
MA - Boston	3/12/1761	4.6
MA - Off Cape Cod	2/2/1766	NA
MA - Offshore	1/2/1785	5.4
MA - Wareham/Taunton	12/25/1800	NA
MA - Woburn	10/5/1817	4.3
MA - Marblehead	8/25/1846	4.3
MA - Brewster	8/8/1847	4.2
MA - Boxford	5/12/1880	NA
MA - Newbury	11/7/1907	NA
MA - Wareham	4/25/1924	NA
MA - Cape Ann	1/7/1925	4

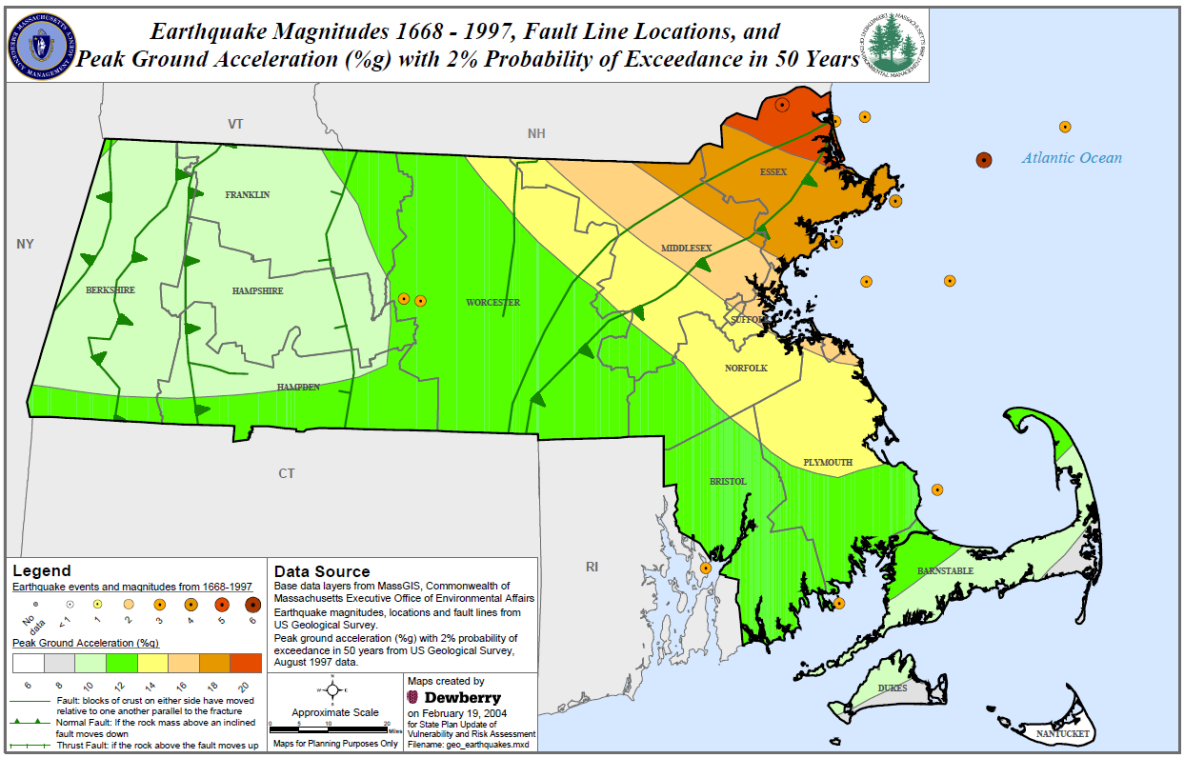
Location	Date	Magnitude
MA - Nantucket	10/25/1965	NA
MA - Boston	12/27/74	2.3
MA - Nantucket	4/12/12	4.5
ME - Hollis	10/17/12	4.0

Source: Boston HIRA

One measure of earthquake risk is ground motion, which is measured as maximum peak horizontal acceleration, expressed as a percentage of gravity (%g). The range of peak ground acceleration in Massachusetts is from 10 %g to 20 %g, with a 2% probability of exceedance in 50 years. Franklin is in the lower end of the range for Massachusetts, at 12 %g, making it a relatively low area of earthquake risk within the state, which as a whole is considered to have a low risk of earthquakes compared to the rest of the country. There have been no recorded earthquake epicenters within Franklin.

Although New England has not experienced a damaging earthquake since 1755, seismologists state that a serious earthquake occurrence is possible. There are five seismological faults in Massachusetts, but there is no discernible pattern of previous earthquakes along these fault lines. Earthquakes occur without warning and may be followed by aftershocks. The majority of older buildings and infrastructure were constructed without specific earthquake resistant design features.

Figure 12: State of Massachusetts Earthquake Probability Map



Earthquakes are a hazard with multiple impacts beyond the obvious building collapse. Buildings may suffer structural damage which 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.

According the SHMCAP there is a 10-15% chance of a magnitude 5 earthquake in a given ten-year period. Earthquakes are a potential town-wide hazard in Franklin. Although new construction under the most recent building codes generally will be built to seismic standards, much of the development in the town pre-dates the most recent building code. Potential earthquake damages to Franklin have been estimated using HAZUS-MH. Total building and income loss damages are estimated at $709 million for a 5.0 magnitude earthquake and $5.1 billion for a 7.0 magnitude earthquake. Other potential impacts of earthquakes, such as sheltering needs and debris removal, are detailed in Table 30.

LAND USE AND DEVELOPMENT TRENDS

Existing Land Use

Land use statistics available from Mass. GIS are from the statewide MacConnell Land Use analysis based interpretation of aerial photography. Table 25 shows the acreage and percentage of land in 26 categories. Notably, forested land is the largest category in Franklin at nearly 8,000 acres, or 46.1% of the town, and adding the 4.8% of forested wetlands brings the total forest coverage to over half of the town. The largest developed land use category is residential; if the five residential categories are aggregated, total residential uses cover make up 4,700 acres, or 27.1% of the town. Commercial and industrial combined make up 5.2% of the town at 917 acres. Wetlands make up 5.3% and crop and pasture cover 2.3% of the town. The remaining fifteen land use categories with 1% or less of land area total 1,575 acres, representing 9.1% of land area of the town.

Table 25: Town of Franklin, MA Land Use

Land Use Type	Acres	Percentage
Crop Land (1)	**224.0**	**1.3%**
Pasture (2)	**166.6**	**1.0%**
Forest (3)	**7978.7**	**46.1%**
Wetland (4)	**1006.9**	**5.8%**
Mining (5)	**7.1**	**0.0%**
Open Land (6)	**141.8**	**0.8%**
Participation Recreation (7)	**195.2**	**1.1%**
Water-Based Recreation (9)	**11.3**	**0.1%**
Multi-Family Residential (10)	**311.7**	**1.8%**
High Density Residential (11)	**42.0**	**0.2%**
Medium Density Residential (12)	**2184.0**	**12.6%**

Low Density Residential (13)	**2054.0**	**11.9%**
Commercial (15)	**256.2**	**1.5%**
Industrial (16)	**661.5**	**3.8%**
Urban Open (17)	**101.2**	**0.6%**
Transportation (18)	**279.4**	**1.6%**
Water (20)	**121.4**	**0.7%**
Powerline (24)	**183.9**	**1.1%**
Golf Course (26)	**158.0**	**0.9%**
Urban Public (31)	**183.7**	**1.1%**
Cemetery (34)	**23.7**	**0.1%**
Orchard (35)	**26.5**	**0.2%**
Nursery (36)	**9.1**	**0.1%**
Forested Wetland (37)	**828.8**	**4.8%**
Very Low Density Res. (38)	**107.7**	**0.6%**
Brushland/Successional (40)	**24.6**	**0.1%**
TOTAL ACRES	**17,289**	

Source: Mass. GIS, MacConnell Land Use Statistics

For more information on how the land use statistics were developed and the definitions of the categories, please go to https://docs.digital.mass.gov/dataset/massgis-data-land-use-2005.

Economic Elements

Franklin is a major regional economic hub for the area southwest of Boston. Franklin's earliest commercial development was concentrated around the town center area and later along arterial roadways such as Route 140. Since the 1980's major commercial and industrial development in Franklin has focused along the Interstate 495 corridor. That highway provides access from the region beyond Franklin, as does the MBTA Commuter Rail, which has two stations in Franklin, t Forge Park and the town center.

Cultural and Historic Resource Areas

Franklin has a distinct downtown district around the town center. The town center includes the Dean College campus, the Franklin Performing Arts Company, and a number of historic sites. The Franklin Master Plan (2013), includes the following description of the town's historic resources:

"Franklin has a rich history that is highlighted in its two historic districts, the Franklin Common National Register Historic District, and Dean Junior College National Register Historic District. Buildings and houses in these two districts represent structures built in the late 19th and early 20th centuries by some of Franklin's most prominent members of society. Individual properties listed on the National Register of Historic Places consist of two Town-owned structures: the Red Brick Schoolhouse and the Ray Memorial Library. Other privately owned buildings that have preservation restrictions include the Aldis Homestead, the Joseph P. Ray-Arthur W. Peirce House, and the; Dean College Administration Building and Chapel.

"Franklin also has a rich industrial history. Many of Franklin's historic mill buildings date back to the early industrial revolution. Many of these mill buildings are still visible in Franklin today,

having been rehabilitated into commercial buildings, condominiums, or apartment buildings, and some are still utilized for industrial uses." *(Narrative from Franklin Master Plan. 2013)*

DEVELOPMENT TRENDS

Development trends throughout the metropolitan region are tracked by MassBuilds, MAPC's Development Database, which provides an inventory of new development over the last decade. For this plan the database was reviewed and updated by Franklin's Director of Planning and Community Development. The database includes 31 projects in the Town of Franklin since 2009. It also includes several attributes of the new development, including housing units, and commercial space. The 31 developments in Franklin shown in Table 26 include a total of 822 housing units and 681,000 square feet of commercial space.

Table 26: Summary of Franklin Developments, 2009-2020

Name	Status	Year	Housing Units	Comm. Sq. Feet
Mill Estates	Open Space Residential Subdivision	2012	4	
Adirondack Club	Industrial Fitness Center.	2009		100,000
Maple Preserve	Ten-lot single-family subdivision	2020	10	
Sandy Knoll	Conventional Subdivision	2013	26	
A-Street Extension	Residential- 5 single family homes	2012	5	
648 Old W. Central St.	Multi- tenant retail, restaurant., medical office building with parking.	2015		8,955
Winter Garden Estates	Five-lot subdivision with single family homes.	2017	5	
Milford Regional Rehab	Physical therapy and rehabilitation office	2013		10,000
420-438 W. Central St	Quick-serve restaurant and two buildings for retail and offices. The restaurant has been completed	2020		8,500
Hayward Manor	Business Law offices. Conversion-renovation.	2009		5,000
New England Dental - 233 W. Central Street	Redevelopment of the former First Baptist Church site with a medical/office building	2011		6,112
Stivaletta Industrial Building	Industrial	2009		6,000
Beaulieu Business Park North	24,300 SF Office Space. 31,890 SF Warehouse Space, planned 2 multi-tenant industrial buildings and office.	2020		56,190
60 Earl's Way	Industrial Fuel tank storage.	2009		30,000
Village at Cook's Farm	55 detached condominiums for 55+ residents	2017	55	
Big Y Supermarket - 348 East Central St.	Supermarket	2012		56,500

Name	Status	Year	Housing Units	Comm. Sq. Feet
828 West Central S.	Stop & Shop Gas Station,	2015		3,000
656 King Street - Emeritus Senior Living	2-story Senior Assisted Living Facility	2014	81	0
Rosa Estates	Open Space Subdivision7 single family.	2009	7	0
Digital Federal Credit Union	Bank	2009		6,192
Southern Acres	6-lot subdivision with 5 single family homes. One lot set aside for drainage.	2014	5	0
0 Pond Street	6 unit townhouse condominium development	2020	96	0
5 Forge Parkway	Addition to existing building	2018		34,000
47 Summer Street	8-unit apartment building	2013	8	
Hamilton Storage Technologies	U.S. headquarters building for Hamilton Storage Technologies; light manufacturing	2013		51000
Acorn Hill Estates	Five lot subdivision with one lot set aside for drainage	2019	4	
485 East Central St - Franklin Retirement	Congregate housing.	2016	181	0
Walgreens Franklin - 160 East Central St.	Pharmacy with drive-thru	2009	0	14
The Key in Franklin	280-unit apartment complex, 40B	2018	280	0
Village at Cooks Farm	ingle-family dwelling units developed as a single condominium over 3 phases.	2020	55	0
Pond Street Priority Development Site 43D	The Pond Street Priority Development Site consists of two Town-owned parcels totaling 33.95+/- acres, Mixed use development; properties are built out.	2020	0	300,000

POTENTIAL FUTURE DEVELOPMENT

MAPC consulted with the Director of Planning and Community Development to determine areas that may be developed in the future, based on the Town's comprehensive planning efforts and current trends and projects. A total of 27 sites were identified and mapped. These areas are listed below in Table 27 and shown on Map 8 in Appendix A.

FUTURE DEVELOPMENT IN HAZARD AREAS

In order to characterize any potential change in the town's vulnerability associated with these developments, a GIS mapping analysis was conducted which overlaid the development sites with the FEMA Flood Insurance Rate Map and the map of Hot Spots. Table 27 shows the relationship between potential future development areas and these hazard areas. The analysis shows that three development sites have very small portions (1% or less) within Zone A or AE, and only one

site has a greater area in Zone AE (42%), typically a portion of the site that is not built on given the restrictive zoning requirements of the town. Six sites have small portions within the "500 year" flood Zone X (0.13% to 16%), while just two sites have larger areas in Zone X, (42.3% and 63.6%). It should be noted that other categories of natural hazards occur uniformly across all areas of the town, with no geographic variability. These include landslide risk (low incidence town-wide) average annual snowfall (36 to 48 inches town-wide), and maximum wind speed (110 miles per hour town-wide). This information is provided so that planners can ensure that development proposals comply with floodplain zoning and that careful attention is paid to drainage and other issues as well as mitigation of urban heat island impacts..

Table 27: Relationship of Potential Development to Hazard Areas

Map ID	Potential Future Project	Status	Flood Zones	Hot Spot*
K	**Uncas Avenue Development** Walsh Brothers, 9 lot subdivision & 9 duplexes (18 total housing units).	Permitted. Not built.		
L	**Chestnut Senior Village** 26-unit senior living condominium	Permitted. Not built.	63.66% in X: 0.2% Annual Chance of Flooding	
M	**Mine Brook Estates** Whitman Homes, 6 lot subdivision, Margaret's Cove. Whitman Homes.	Definitive Subdivision Plan approved (2019)		
O	**Maple Hill Subdivision** 58 lot subdivision, off Maple Street	Preliminary Subdivision Plan approved. Definitive Subdivision Plan currently in front of Planning Board	1.29% in X: 0.2% Annual Chance of Flooding	
P	**Schmidt Farm Subdivision** 215 Prospect St, 57 lots, 114.47 acres	Preliminary Subdivision Plan approved (2019).	16.09% in X: 0.2% Annual Chance of Flooding	
Q	**Madalene Village** 32 Townhouses, 25% affordable (40B), off Cottage Street.	ZBA approval received (2016).		
R	**Franklin Ridge.** 60 unit senior apartment building, 25% affordable (40B). 16.9+/- acre site.	ZBA approval received (2019).		
S	**Chestnut Street Apartments** 10 apartments	Received Use Variance from ZBA, applied to Planning Board for site plan approval.		
FF	**Bogan Estates** Bogans Way, Three-lot subdivision of single family homes. 11.85 +/- acres	1 House built		
GG	**Countryside Estates** Countryside Lane and September Drive. Subdivision with 9 single family homes.	7 homes built		

Map ID	Potential Future Project	Status	Flood Zones	Hot Spot*
T	**340 East Central Street, Marcus Properties,** 104 unit apartment Building. Additional 17,000 sf commercial development will be included.	Received Use Variance from ZBA for multifamily housing in CII (2019).		0.95% in Hot Spot
U	**94 East Central Street** Mixed use building with 13 condos, structured parking, 690 sf commercial space.	Planning and permitting underway.		
HH	**37-41 East Central Street,** Mixed Use Redevelopment, residential/ commercial including 6-residential units.	Project permitted 2013. Not built.		51.34% in Hot Spot
V	**Hennep Cultivation LLC,** 160 Grove Street, Marijuana Cultivation. Redevelopmcent of 8.5+ acre site, with new 100,000+ sf facility	Permitting underway	0.13% in X: 0.2% Annual Chance of Flooding	
X	**As Built Brewing, LLC** 40 Alpine Row Redevelopment, 6,100 sf Brewery, including a 1,525 sf Tasting Room	Permitting complete.		
Y	**GlenPharmer Distillery, LLC** 860 West Central Street Distillery with Tasting Room, restaurant, Redevelopment of historic mill.	Permitting complete.	42.34% in AE: 1% Annual Chance & 5.53% in AE: Regulatory Floodway & 12.28% in X: 0.2% Annual Chane	
Z	**Kearsage Upper Union LLC** Upper Union Street/Mount Street Solar Large Scale Ground Mounted Solar Energy (±1 MW, 3600 modules)	Permitting complete.	12.44% in X: 0.2% Annual Chance of Flooding	
AA	**GTE Franklin, LLC** 1256 West Central Street Non-Medical Marijuana Retail Facility, 4,000 sf	Permitting complete.	58.51% in X: 0.2% Annual Chance of Flooding	
BB	**Panther Way** 20,000 sf Commercial building & Bus Storage/Maintenance	Planning/Permitting		
CC	**19th Fairway Development**, 4 Liberty Way, Non-Medical Marijuana Cultivation & Product Manufacturing. 37,200 sf facility	Permitting complete.		
DD	**4SQ Development** 725 Union Street Hotel. 14,500+ sf, 100 rooms	Under construction		
EE	**Spring Street Renewables, LLC** Spring Street Solar	Permitting complete	1.26% in A: 1% Annual Chance of Flooding	

Map ID	Potential Future Project	Status	Flood Zones	Hot Spot*
	Large Scale Ground Mounted Solar Energy, 25 acre display (+/-6 MW)			
JJ	**420-438 West Central Street** Redevelopment of a site with an existing hardware store. Quick-serve restaurant and two buildings for retail and offices.	Restaurant complete	8.07% in X: 0.2% Annual Chance of Flooding	
KK	**505 West Central Street** Mixed commercial / office development consisting of 3 buildings.	2 of 3 lots built out - Wendy's, Midas. Plans being developed for 3rd building, 10,500 sf 1-story		
II	**Maple Street Solar (within Bellingham & Franklin) Large Scale Ground Mounted Solar Energy, 15 acres (4 MW)**	Permitting complete	0.69% in AE: 1% Annual Chance of Flooding	
N	**Highland Village 4 lot subdivision, West Central Street**	Definitive Subdivision Plan approved (2020)		
W	**14 Ruggles St Mixed Use, Apartments/Office, 3 housing units, 930 sf office**	Permitting complete.		

*Hot Spots are defined as the top 5% hottest land surface temperature in the MAPC region

CRITICAL FACILITIES & INFRASTRUCTURE IN HAZARD AREAS

Critical facilities and infrastructure includes facilities that are important for disaster response and evacuation (such as emergency operations centers, fire stations, water pump stations, communications, and electricity) and facilities where additional assistance might be needed during an emergency (such as nursing homes, elderly housing, day care centers, etc.). There are 131 facilities identified in Franklin. These are listed in Table 28 and are shown on the maps in Appendix A.

Table 28 shows the location of the critical facilities with respect to FEMA flood zones and other categories of hazards. It is notable that the only critical facilities located within FEMA flood zones are bridges, dams, and pump stations, which by definition are typically sited on or in close proximity to rivers and streams. None of the critical town buildings or other sites such as schools, child care centers, and elderly housing are located in a FEMA flood zone. Two other categories of hazards, landslide incidence and average annual snowfall, do not have any geographic variation across the town, falling into a single category for all facilities town-wide. The urban hear or "hot spot" analysis shows that there are five sites with the mapped hot spots, including one school, one business, the EMC tower, a commuter rail bridge, and a commuter rail station.

Explanation of Columns in Table 28

- ***Column 1: ID #:*** The first column in Table 28 is an ID number which appears on the maps that are part of this plan. See Appendix B.
- ***Column 2: Name****:* The second column is the name of the site.
- ***Column 3: Type*:** The third column indicates what type of site it is.
- ***Column 4: FEMA Flood Zone*:** The fourth column addresses the risk of flooding. A "No" entry in this column means that the site is not within any of the mapped risk zones on the Flood Insurance Rate Maps (FIRM maps). If there is an entry in this column, it indicates the type of flood zone. as follows: **Zone AE** Zones AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the FIS by detailed methods. Mandatory flood insurance purchase requirements apply.
- **Zone A** Areas subject to inundation by the 1-percent-annual-chance flood event. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
- **Zone AE** Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
- **Zone AH** Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are 1–3 feet. BFEs derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.
- **Zone X (shaded)** Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones. (formerly Zone B)
- **Zone X (unshaded)** Minimal risk areas outside the 1-percent and .2-percent-annual-chance floodplains. No BFEs or base flood depths are shown within these zones. (formerly Zone C)
- ***Column 5: Average Annual Snowfall***: All of Franklin falls into the category of 36.1 - 48.0 inches
- ***Column 6: Landslide Incidence***: All of Franklin falls into the Low Incidence category
- ***Column 7:*** Hot spots indicates areas that are within the 5% of hottest areas in the MAPC region based on satellite data from 2016.
-

Table 28: Critical Facilities and Relationship to Hazard Areas

MAP#	NAME	TYPE	Within FEMA Flood Zone	Avg. Annual Snow_Fall	Landslide Incidence	Within Hot Spot
1	Fire Station Headquarters	Fire Station	No	36.1 - 48.0	Low	No
2	Franklin Police Station	Police Station	No	36.1 - 48.0	Low	No
3	Benjamin Franklin Charter School	School	No	36.1 - 48.0	Low	No
5	Fire Station II	Fire Station	No	36.1 - 48.0	Low	No
6	Franklin High School	School	No	36.1 - 48.0	Low	No
7	Horace Mann / Oak / ECDC	School	No	36.1 - 48.0	Low	Yes
8	Davis Thayer School	School	No	36.1 - 48.0	Low	No
9	Dean College	School/Day Care	No	36.1 - 48.0	Low	No
10	John F. Kennedy School	School	No	36.1 - 48.0	Low	No
11	Keller/Sullivan School	School	No	36.1 - 48.0	Low	No
12	AH Alarm Robotics	School	No	36.1 - 48.0	Low	No
13	Remington/Jefferson School	School	No	36.1 - 48.0	Low	No
14	Parmenter School	School	No	36.1 - 48.0	Low	No
15	Oak Hill Village	Sewer Pump Station	No	36.1 - 48.0	Low	No
16	Bright Horizon Children's Center	Child Care	No	36.1 - 48.0	Low	No
17	Franklin Country Day	Child Care	No	36.1 - 48.0	Low	No
18	Kindercare Learning Centers	Child Care	No	36.1 - 48.0	Low	No
19	Next Generations	Child Care	No	36.1 - 48.0	Low	No
20	Franklin Children's School	Child Care	No	36.1 - 48.0	Low	No
21	Adironack Club	Child Care	No	36.1 - 48.0	Low	No
23	Muncipal Building	Municipal	No	36.1 - 48.0	Low	No
24	DPW Garage	Municipal	No	36.1 - 48.0	Low	No
25	DPW Administration	Municipal	No	36.1 - 48.0	Low	No
26	Central Park Terrace	Elder Housing	No	36.1 - 48.0	Low	No
27	Winter Street Elder Housing	Elder Housing	No	36.1 - 48.0	Low	No
28	Franklin Skilled Nursing & Rehab Ctr	Nursing home	No	36.1 - 48.0	Low	No
29	Benchmark Assisted Living	Assisted Living	No	36.1 - 48.0	Low	No
30	Garelick Farms	Sewer Pump Station	No	36.1 - 48.0	Low	No
31	Garelick Farms	Hazardous Materials	No	36.1 - 48.0	Low	Yes
32	AR Metalizing	Hazardous Materials	No	36.1 - 48.0	Low	No
33	Eastern Propane	Hazardous Materials	No	36.1 - 48.0	Low	No

MAP#	NAME	TYPE	Within FEMA Flood Zone	Avg. Annual Snow_Fall	Landslide Incidence	Within Hot Spot
34	EMC Tower	Communication Tower	No	36.1 - 48.0	Low	Yes
35	Union Street Water Storage Tank	Water Storage Tank	No	36.1 - 48.0	Low	No
36	Union Street Communication Tower	Communication Tower	No	36.1 - 48.0	Low	No
37	Verizon Communication Tower	Communication Tower/Fire/Police/ TV	No	36.1 - 48.0	Low	No
38	Forge Hill Water Storage Tank	Water Storage Tank	No	36.1 - 48.0	Low	No
39	Water Storage Tank & Pleasant St. Booster	Water Storage Tank/Booster Pump	No	36.1 - 48.0	Low	No
40	Hillside Tank 1	Water Storage Tank	No	36.1 - 48.0	Low	No
41	Hillside Tank 2	Water Storage Tank	No	36.1 - 48.0	Low	No
42	Bald Hill	Water Storage Tank	No	36.1 - 48.0	Low	No
43	Populatic St Sewer Pump Station	Sewer Pump Station	AE: 1% Annual Chance of Flooding	36.1 - 48.0	Low	No
44	Sahlin Circle Sewer Pump Station	Sewer Pump Station	AE: 1% Annual Chance of Flooding	36.1 - 48.0	Low	No
45	Palomino Drive Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
46	Dawn Marie Circle Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
47	Ainsley Drive Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
48	Bridle Path Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
49	Symmes Arces Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
50	Charles River Drive Sewer Pump Station	Sewer Pump Station	X: 0.2% Annual Chance of Flooding	36.1 - 48.0	Low	No
51	Anthony Road Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
52	Mine Brook Circle Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
53	Pleasant View Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
54	Milliken Avenue Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
55	Chestnut Ridge Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
56	East Central Street Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
57	Red Gate Lane Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
58	Squibnocket Road Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
59	Grove Street #1 Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
60	Grove Street #2 Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
61	Washington Street Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
62	Liberty Way Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
63	Jefferson Road Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No

MAP#	NAME	TYPE	Within FEMA Flood Zone	Avg. Annual Snow_Fall	Landslide Incidence	Within Hot Spot
64	Jackson Circle Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
65	Oxford Drive Sewer Pump Station	Sewer Pump Station	No	36.1 - 48.0	Low	No
66	Dam - Name Unknown	Dam	X: 0.2% Annual Chance of Flooding	36.1 - 48.0	Low	No
67	Dam - Name Unknown	Dam	X: 0.2% Annual Chance of Flooding	36.1 - 48.0	Low	No
70	Dam - Name Unknown	Dam	A: 1% Annual Chance of Flooding	36.1 - 48.0	Low	No
71	Pond St Bridge	Bridge	AE: 1% Annual Chance of Flooding	36.1 - 48.0	Low	No
72	Dam (Charles R.)	Dam	AE: 1% Annual Chance of Flooding	36.1 - 48.0	Low	No
73	Partridge St Bridge	Bridge	AE: Regulatory Floodway	36.1 - 48.0	Low	No
74	Beech St Bridge	Bridge	AE: Regulatory Floodway	36.1 - 48.0	Low	No
75	Acorn Pl Bridge	Bridge	No	36.1 - 48.0	Low	No
76	Chestnut St Bridge	Bridge	No	36.1 - 48.0	Low	No
77	Rt-140 Bridge	Bridge	No	36.1 - 48.0	Low	No
78	Railroad Bridge	Bridge	No	36.1 - 48.0	Low	No
79	Grove St Bridge	Bridge	AE: Regulatory Floodway	36.1 - 48.0	Low	No
80	Downtown Commuter Rail Bridge	Bridge	No	36.1 - 48.0	Low	Yes
81	Lincoln St Bridge	Bridge	AE: 1% Annual Chance of Flooding	36.1 - 48.0	Low	No
82	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
83	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
84	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
85	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
86	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
87	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
88	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
89	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
90	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
91	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
92	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
93	I-495 Bridge	Bridge	No	36.1 - 48.0	Low	No
94	Rt-140 Bridge	Bridge	X: 0.2% Annual Chance of Flooding	36.1 - 48.0	Low	No
95	Amigo	Special Needs	No	36.1 - 48.0	Low	No
96	Recreation Building	Town Facility	No	36.1 - 48.0	Low	No
97	Kenwood Circle Sewer Pumping Station	Pumping Station	No	36.1 - 48.0	Low	No
98	Beth Road Drainage Pumping Station	Pumping Station	A: 1% Annual Chance of Flooding	36.1 - 48.0	Low	No
99	Dean Ave Comm. Tower	Comm. Tower	No	36.1 - 48.0	Low	No

MAP#	NAME	TYPE	Within FEMA Flood Zone	Avg. Annual Snow_Fall	Landslide Incidence	Within Hot Spot
100	Bogan Way Comm. Tower	Comm. Tower	No	36.1 - 48.0	Low	No
101	Atria	Assisted Living	No	36.1 - 48.0	Low	No
102	Magnolia Heights	Assisted Living	No	36.1 - 48.0	Low	No
103	Eaton Place	55+ Housing	No	36.1 - 48.0	Low	No
104	Village at Oak Hill	55+ Housing	No	36.1 - 48.0	Low	No
105	YMCA	Recreational Facilities	No	36.1 - 48.0	Low	No
106	Tri-County Vocational School	School	No	36.1 - 48.0	Low	No
107	Prospect Hill Day Care	Day Care	No	36.1 - 48.0	Low	No
108	Qi Pre-School	Pre-School	No	36.1 - 48.0	Low	No
109	Facilities Department	Town Facility	No	36.1 - 48.0	Low	No
110	BJAT	Superfund Site	No	36.1 - 48.0	Low	No
111	Dean/Franklin Station	MBTA Station	No	36.1 - 48.0	Low	Yes
112	Forge Park Station	MBTA Station	No	36.1 - 48.0	Low	No
113	Milford Regional Urgent Care	Medical Facility	No	36.1 - 48.0	Low	No
114	Hayward Water Treatment Plant	Water Treatment	No	36.1 - 48.0	Low	No
115	Wells 1&2, 2a, 2b	Well	AE: 1% Annual Chance of Flooding	36.1 - 48.0	Low	No
122	Well #9	Well	X: 0.2% Annual Chance of Flooding	36.1 - 48.0	Low	No
117	Well #4	Well	No	36.1 - 48.0	Low	No
118	Well #5	Well	No	36.1 - 48.0	Low	No
119	Well #6	Well	No	36.1 - 48.0	Low	No
120	Well #7	Well	No	36.1 - 48.0	Low	No
121	Well #8	Well	No	36.1 - 48.0	Low	No
116	Well #3	Well	No	36.1 - 48.0	Low	No
123	Well #10	Well	No	36.1 - 48.0	Low	No
124	Grove St Water Treatment Plant	Well	No	36.1 - 48.0	Low	No
125	Bright Hill Booster	Booster	No	36.1 - 48.0	Low	No
126	Diana Estates Booster	Booster	No	36.1 - 48.0	Low	No
127	FIP Booster	Booster	No	36.1 - 48.0	Low	No
128	Tanglewood Booster	Booster	No	36.1 - 48.0	Low	No
129	Susan's Way Booster	Booster	No	36.1 - 48.0	Low	No
130	Washington Street Booster	Booster	No	36.1 - 48.0	Low	No
131	Cornwallis Booster	Booster	No	36.1 - 48.0	Low	No

VULNERABILITY ASSESSMENT

The purpose of the vulnerability assessment is to estimate the extent of potential damages from natural hazards of varying types and intensities. A vulnerability assessment and estimation of damages was performed for hurricanes, earthquakes, and flooding through the HAZUS-MH software.

Introduction to HAZUS-MH

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

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

There are three modules included with the HAZUS-MH software: hurricane wind, flooding, and earthquakes. There are also three levels at which HAZUS-MH can be run. Level 1 uses national baseline data and is the quickest way to begin the risk assessment process. The analysis that follows was completed using Level 1 data. Level 1 relies upon default data on building types, utilities, transportation, etc. from national databases as well as census data. While the databases include a wealth of information on the Town of Franklin, 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 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 to be a starting point for understanding potential damages from the hazards.

ESTIMATED DAMAGES FROM HURRICANES

The HAZUS software was used to model potential damages to the community from a 100-year and 500-year hurricane event; storms that are 1% and 0.2% likely to happen in a given year, and roughly equivalent to a Category 2 and Category 4 hurricane. The damages caused by these hypothetical storms were modeled as if the storm track passed directly through the town, bringing the strongest winds and greatest damage potential.

Though there are no recorded instances of a hurricane equivalent to a 500-year storm passing through Massachusetts, this model was included in order to present a reasonable "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 29: Estimated Damages from Hurricanes

	100-Year	500-Year
Building Characteristics		
Estimated total number of buildings	9,913	
Estimated total building replacement value (2014 $)	$5,223,000,000	
Building Damages		
# of buildings sustaining minor damage	345	1,670
# of buildings sustaining moderate damage	15	233
# of buildings sustaining severe damage	0	15
# of buildings destroyed	0	8
Population Needs		
# of households displaced	0	28
# of people seeking public shelter	0	11
Debris		
Building debris generated (tons)	1,629	2,981
Tree debris generated (tons)	9,039	21,974
# of truckloads to clear building debris	65	297
Value of Damages		
Property damage (buildings and content)	$30,966,220	$118,508,150
Losses due to business interruption	$1,106,760	$8,191,520
Total Losses	$32,072,980	$126,699,670

ESTIMATED DAMAGES FROM EARTHQUAKES

The HAZUS earthquake module allows users to define an earthquake magnitude and model the potential damages caused by that earthquake as if its epicenter had been at the geographic center of the study area. For the purposes of this plan, two earthquakes were selected: magnitude 5.0 and a magnitude 7.0. Historically, major earthquakes are rare in New England, though a magnitude 5 event occurred in 1963.

Table 30: Estimated Damages from Earthquakes

	Magnitude 5.0	Magnitude 7.0
Building Characteristics		
Estimated total number of buildings	9,913	
Estimated total building replacement value (2014 $)	$5,223,000,000	
Building Damages		
# of buildings sustaining slight damage	2,852	333
# of buildings sustaining moderate damage	1,541	2,119
# of buildings sustaining extensive damage	422	2,858
# of buildings completely damaged	107	4,578
Population Needs and Impacts		
# of households displaced	426	6,024
# of people seeking public shelter	241	3,404
# of injuries (range depending on time of day)	83 - 245	1,561 – 2,796
# of deaths (range depending on time of day)	4 - 13	71 - 201
Debris		
Building debris generated (tons)	123,000	922,000
# of truckloads to clear debris (@ 25 tons/truck)	4,920	36,880
Value of Damages		
Capital Stock Losses	$612,881,400	$4,580,152,300
Income Losses	$96,292,000	$545,536,000
Total Losses	$709,170,000	$5,125,690,000

ESTIMATED DAMAGES FROM FLOODING

The HAZUS flooding module allows users model the potential damages caused by a 100-year flood event and a 500-year flood event.

Table 31: Estimated Damages from Flooding

	100-Year Flood (1% chance)	500-Year Flood (0.05% chance)
Building Characteristics		
Estimated total number of buildings	9,913	
Estimated total building replacement value	$5,223,000,000	
Building Damages		
# of buildings sustaining limited damage	17	18
# of buildings sustaining moderate damage	5	9
# of buildings sustaining extensive damage	0	2
# of buildings substantially damaged	0	0
Population Needs		
# of households displaced	298	343
# of people seeking public shelter	2	3
Value of Damages		
Building Loss	$8,310,000	$11,700,000
Business Interruption	$8,960,000	$10,360,000
Total Losses	$17,260,000	$22,060,000

SECTION 5: HAZARD MITIGATION GOALS

The Franklin Hazard Mitigation Team reviewed the goals from the town's 2010 Hazard Mitigation Plan. All of the goals are considered critical for the Town and they are not listed in order of importance. The local team discussed and endorsed the goals and chose to add two additional goals for this 2020 plan update, addressing climate change (Goal 9) and protection of water resources (Goal 10).

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

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

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

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

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

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

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

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

9. Consider the impacts of climate change and incorporate climate mitigation and resilience in all planning effors.

10. Protect the Town's critical water resources and water supply interconnections with the Towns of Bellingham and Wrentham.

SECTION 6: EXISTING MITIGATION MEASURES

The existing protections in the Town of Franklin are a combination of zoning, land use, and environmental regulations, infrastructure maintenance, and drainage infrastructure improvement projects. Infrastructure maintenance generally addresses localized drainage clogging problems, while large scale capacity problems may require pipe replacement or invert elevation modifications. These more expensive projects are subject to the capital budget process and lack of funding is one of the biggest obstacles to completion of some of these. Franklin's adoption of a stormwater utility could contribute significantly to efforts to address stormwater improvements related flooding as well as water quality.

The Town's existing mitigation measures are listed by hazard type here and are summarized in Table 32 below. Many upgrades to existing measures are noted in the following sections.

EXISTING MITIGATION MEASURES FOR FLOOD-RELATED HAZARDS

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

- *Participation in the National Flood Insurance Program (NFIP)* – Franklin participates in the NFIP with 54 policies in force as of September 2019. There have been 24 claims paid for a total of $139,370. FEMA maintains an online database on flood insurance policies. This can be found on the FEMA website at https://www.fema.gov/policy-claim-statistics-flood-insurance.

The following information is provided on flood insurance policies for the Town of Franklin:

Flood insurance policies in force	54
Coverage amount of flood insurance policies	$14,116,200
Premiums paid	$51,552
Closed losses (losses that have been paid)	24
Total payments (total amount paid on losses)	$139,370

The Town complies with the NFIP by enforcing floodplain regulations, maintaining up-to-date floodplain maps, and providing information to property owners and builders regarding floodplains and building requirements.

- *Street Sweeping* – The Franklin Department of Public Works conducts seasonal street sweeping. All streets are swept two times per year as required by the MS4 Stormwater Permit issued by EPA in 2016. Street sweeping begins as soon as possible each spring.
- *Catch Basin Cleaning* – The town has about 2,000 catch basins in its stormwater system. All catch basins are cleaned as needed when they become one-third full of sediments, as required by the MS4 Stormwater Permit. The town has an inspection process using iPads in the field to identify and record catch basins that require cleaning. The town owns one batch basin cleaning truck, but also contracts out the service.
- *Enforcement of the State Building Code* – The Massachusetts State Building Code contains many detailed regulations regarding wind loads, earthquake resistant design, flood-proofing and snow loads.

- *The Massachusetts Stormwater Policy* – This policy is applied to developments within the jurisdiction of the Conservation Commission.

- *The MS4 Stormwater Permit Program*: includes monitoring, mapping, and upgrades to stormwater infrastructure, public education programs, detection and elimination of illicit discharges to the stormwater system, and construction and post-construction stormwater bylaws and regulations.

- *Infrastructure Improvements* – Within the past 10 years, the town upgraded much of its infrastructure such as culverts, bridges, roads, and drainage systems. Examples of local mitigation include the *Beaver Street Interceptor, a $5 million sewer Inflow/Infiltration project, upgrades to a* Prospect Street culvert, and major roadway reconstruction of Pond Street, Pleasant Street, Washington Street, and King Street.

- *Regulations and By-Laws* – The town has adopted several regulations and bylaws that address flooding, preserve open space, and protect the town from natural hazards, including the following:

  - Floodplain District, Franklin Zoning Bylaw, Chapter 185-24
  - Water Resources District, Franklin Zoning Bylaw, Chapter 185-40
  - *Subdivision of Land, Franklin By-Laws*, Chapter 300
  - *Wetlands Protection, Franklin Bylaws, Chapter 181*
  - Conservation Commission, Franklin Bylaws, Chapter 271
  - *Stormwater Management, Franklin Bylaws, Chapter 153*
  - Stormwater Enterprise Fund, Franklin Bylaws, Chapter 153, Section IV
  - *Schedule of Lot Area, Frontage, Yard and Height Requirements*: Provides setback requirements for construction and development within zoning districts.

EXISTING DAM FAILURE MITIGATION MEASURES

- *DCR dam safety regulations* – All dams are subject to the Division of Conservation and Recreation's dam safety regulations. The dams must be inspected regularly and reports filed with the DCR Office of Dam Safety.
- *Permits required for construction* – State law requires a permit for the construction of any dam.
- *The Comprehensive Emergency Management Plan* – The CEMP addresses dam safety.
- *The town has rebuilt two dams and removed one.*

EXISTING MITIGATION MEASURES FOR WIND-RELATED HAZARDS

- *Massachusetts State Building Code* – The town enforces the Massachusetts State Building Code whose provisions are generally adequate enough to mitigate most wind damage. The code's provisions are the most cost-effective mitigation measure against tornados given the extremely low probability of occurrence. If a tornado were to occur, the potential for severe damages would be extremely high.
- *Tree Trimming* – The Franklin outsources tree trimming to Mayer Tree Service, a local contractor. Also the local electric companies, National Grid, conducts regular tree trimming and removal. The town responds to downed tree limbs caused by winds, lightning strikes and weather related incidents.

EXISTING MITIGATION MEASURE FOR WINTER-RELATED HAZARDS

- *Roadway Treatments* – The town uses salt for roadway deicing in the winter. Selected areas are treated with magnesium chloride (MgCl).
- *Snow Removal & Disposal* – The town Highway Department performs regular snow plow operations during winter storms. The town does not do any snow disposal. Issues for te town include lack of enough contractors for large snow events and insurance.

EXISTING MITIGATION MEASURESFOR FIRE-RELATED HAZARDS

- *Permits Required for Outdoor Burning* – The Fire Department requires a written permit for outdoor burning from Jan 15-May 1. The property-owner must come into the Fire Station and fill out a form.
- *Fire Hydrant Regulations* – The Franklin Fire Department regulates that fire hydrants be installed at all new developments at the expense of the developer.
- *Subdivision Review* – The Fire Department is involved in reviewing subdivision plans from conceptual design through occupancy to ensure that there is adequate access for fire trucks and an adequate water supply.
- *Portable Water Pumps* – Rivers and ponds in town are available to be tapped into for water supply if necessary.
- *All Terrain Vehicles* – The town maintains all-terrain vehicles for fighting forest fires. These vehicles provide access to remote areas that otherwise would not be reachable.

EXISTING TOWN-WIDE MITIGATION FOR EARTHQUAKE HAZARDS

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

EXISTING MULTI-HAZARD MITIGATION MEASURES

- *Massachusetts State Building Code* – The State Building Code contains a section on designing for earthquake loads (780 CMR 1612.0). Section 1612.1 states that the purpose of these provisions is "to minimize the hazard to life to occupants of all buildings and non-building structures, to increase the expected performance of higher occupancy structures as compared to ordinary structures, and to improve the capability of essential facilities to function during and after an earthquake". This section goes on to state that due to the complexity of seismic design, the criteria presented are the minimum considered to be "prudent and economically justified" for the protection of life safety. The

code also states that absolute safety and prevention of damage, even in an earthquake event with a reasonable probability of occurrence, cannot be achieved economically for most buildings.

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

- *Multi-Department Review of Developments* (Technical Review Committee)– Multiple departments, such as the Town Administrator, Planning, Zoning, Health, Highway, Fire, Police, and Conservation, review all subdivision and site plans prior to approval.
- *Comprehensive Emergency Management Plan (CEMP)* – Every community in Massachusetts is required to have a Comprehensive Emergency Management Plan. These plans address mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies. These plans contain important information regarding flooding, dam failures and winter storms. Therefore, the CEMP is a mitigation measure that is relevant to many of the hazards discussed in this plan. The CEMP is available online through secure access for town personnel.
- *Portable Water Pumps* – Rivers and ponds in town are available to be tapped into for water supply if necessary.
- *FEMA Resources* – A tanker task force is available though State Fire mobilization. FEMA has 8-12 tankers that can be deployed anywhere in the US within 72 hours.
- *Reveres 911*– The town recently employed a Reveres 911 which allows the police to contact numerous residents at once in the case of an emergency or natural disaster.

COMPILATION OF EXISTING MITIGATION MEASURES

Table 32 summarizes the many existing natural hazard mitigation measures already in place in Franklin when the first Hazard Mitigation Plan was developed in 2010. Because of the number of entities, public and private, involved in natural hazard mitigation, it is likely that this list is a starting point for a more comprehensive inventory of all measures.

Table 32: Existing Natural Hazard Mitigation Measures in Franklin

Type of Existing Mitigation	Description	Effectiveness/Changes Needed
FLOOD HAZARDS		
1) Participation in the National Flood Insurance Program (NFIP)	The town participates in the NFIP and has adopted the effective FIRM maps. The town actively enforces the floodplain regulations.	There are 54 insurance policies in force / Encourage all eligible homeowners to obtain insurance
2) Street Sweeping	Every street gets swept once a year or as needed. High traffic areas are swept more regularly.	Effective. Has been updated to comply with MS4 / None
3) Catch Basin Cleaning	All 2,000 catch basins are cleaned out once a year.	Effective. Has been updated to comply with MS4 / None

4) Enforcement of the State Building Code	Regulates for wind loads, earthquake resistant design, flood-proofing and snow loads.	Most effective for new construction & redevelopment / None
5) Massachusetts Stormwater Regulations	This policy is applied to developments within the jurisdiction of the Conservation Commission.	Partially effective/need to be updated for MS4
6) Non-Point mapping	MS4 mapping of town-wide drainage	Completed, helps with MS4 program / None
7) Infrastructure Improvements	Infrastructure improvements include culverts, bridges, roads, and drainage systems	Partially Effective / Often need more funding, resources
8) Regulations, By-Laws, and Plans	Includes: Floodplain Protection, Water Resources Districts, NPDES	Effective/None.
DAM HAZARDS		
9) DCR Dam Safety Regulations	The state has enacted dam safety regulations mandating inspections and emergency action plans.	Partially effective/ Enforcement by DCR can be an issue due to staff capacity / None.
10) State permits required for dam construction	State law requires a permit for the construction of any dam.	Most effective for new construction or dam rebuilding. The town rebuilt 2 dams and removed one / None.
BRUSH FIRE HAZARDS		
11) Permits required for outdoor burning.	The Fire Department requires a written permit for outdoor burning. The permit must be obtained from the Fire Dept.	Effective/None.
12) Fire Hydrant Regulations	The Franklin Fire Department requires that fire hydrants be installed at all new developments at the expense of the developer.	Effective/None.
13) Subdivision Review	The Fire Department is involved in reviewing all subdivision plans.	Effective/None.
14) Portable Water Pumps	Rivers and ponds in town are available to be tapped for non-potable water supply such as firefighting if necessary.	Effective/None.
15) All-Terrain Vehicles	For fighting remote forest fires	Effective/None.
GEOLOGIC HAZARDS		
16) The Massachusetts State Building Code	The Town enforces the Massachusetts State Building Code.	Effective for construction since earthquake code revisions; older buildings may be more vulnerable / None
17) Comprehensive Emergency	Addresses mitigation, preparedness, response and recovery from a variety of	Emphasis is on emergency response / Periodically update

Management Plan (CEMP)	natural and man-made emergencies.	the plan
WIND HAZARDS		
18) Massachusetts State Building Code	The town enforces the Massachusetts State Building Code.	Most effective for new construction and redevelopment / None
19) Tree-Trimming	The town's contractor Mayer Tree Service, National Grid, and DPW conduct regular tree trimming and removal.	Effective for most situations / More capacity needed for large scale events
WINTER HAZARDS		
20) Roadway Treatments	The Highway Department conducts salting deicing services throughout the town during winter storms.	Effective for most situations / None
21) Snow Removal & Disposal	The town and its contractors conduct regular plowing and snow removal operations.	Effective for most situations / May be shortage of contractors for large scale events, insurance can be an issue
MULTI-HAZARDS		
22) Massachusetts State Building Code	Regulates wind loads, earthquake resistant design, flood-proofing and snow loads.	Most effective for new construction and redevelopment / None.
23) Multi-Department Review of Developments	Multiple department within town review site plans before development.	Most effective for new construction / None.
24) Comprehensive Emergency Management Plan (CEMP)	Addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Emphasis is on emergency response / Periodically update the plan
25) FEMA Tankers	FEMA has 8-12 tankers that can be deployed anywhere in the US within 72 hours.	Effective for most situations / None.
26) Reverse 911	The town employs Reverse 911 which allows the police to contact numerous residents at once in the case of an emergency or natural disaster.	Effective/None

MITIGATION CAPABILITIES AND LOCAL CAPACITY FOR IMPLEMENTATION

Under the Massachusetts system of "Home Rule," the Town of Franklin is authorized to adopt and from time to time amend local bylaws and regulations that support the town's capabilities to mitigate natural hazards. These include Zoning Bylaws, Subdivision and Site Plan Review Regulations, Wetlands Bylaws, Stormwater Bylaws, Health Regulations, Public Works regulations, and local enforcement of the State Building Code, the Wetlands Protection Act, and the MS4 Stormwater Permit. Local Bylaws may be amended by the Board of Selectmen to improve the town's capabilities, and changes to most regulations simply require a public hearing and a vote of the authorized board or commission. The town has adopted numerous such local bylaws as described above.

The Town of Franklin has recognized several existing mitigation measures that require implementation or improvements and has the capacity within its local boards and departments to address these. The Town's Planning Department is leading a comprehensive zoning bylaw review. The Public Works Department has overall responsibility for maintain and improving the towns' stormwater infrastructure, which has a major influence on localized flooding. The Conservation Commission enforces state and local wetland regulations, which help maintain the natural flood storage capabilities of the town's wetlands. The town's efforts to protect open space also contribute to minimizing impervious surfaces and preserving open and vegetated land that can reduce stormwater runoff and the flooding it causes

SECTION 7: MITIGATION MEASURES FROM PREVIOUS PLAN

IMPLEMENTATION PROGRESS ON THE PREVIOUS PLAN

At a meeting of the Franklin Hazard Mitigation Planning Committee, Town staff reviewed the mitigation measures identified in the 2010 Franklin Hazard Mitigation Plan and determined whether each measure had been implemented or deferred. Of those measures that had been deferred, the committee evaluated whether the measure should be deleted or carried forward into this Hazard Mitigation Plan 2020 Update. The decision on whether to delete or retain a particular measure was based on the committee's assessment of the continued relevance or effectiveness of the measure. Table 33 summarizes the status of mitigation measures from the 2010 plan.

As indicated in Table 33, Franklin made significant progress implementing mitigation measures identified in the 2010 Hazard Mitigation Plan. In particular, the Town had success with completed several drainage improvement projects, including Populatic Pond, Beaver Street, Sheppard's Brook, Summer Street, Partridge Street, and Wyllie Road. The town also reconstructed two dams on Pleasant Street and Miller Street, constructed a new Public Works facility, and installed generators in several town facilities and two schools. The town adopted a Wetlands Bylaw, a Stormwater Bylaw, and a Stormwater Utility bylaw.

Several projects that were not completed will be continued into this plan update. These include a radio upgrade for emergency operations; developing and implementing a beaver management plan, protection of open space, bylaw revisions, installation of a generator for town hall, and upgrades to water mains and fire hydrants, and public education on brushfire hazards.

There are a number of measures for which the Town does regular or periodic work, but they remain ongoing priorities. These include drainage infrastructure maintenance, open space purchases, public information on stormwater, and updates to the Comprehensive Emergency Management Plan.

Overall, ten mitigation measures from the 2010 plan will be continued in the plan update. Most retain the same priority in this 2020 Update, however the emergency communications upgrade has changed from medium to high priority. Moving forward into the next five year plan implementation period there will be many more opportunities to incorporate hazard mitigation into the Town's decision-making processes. The challenges the Town faces in implementing these measures are primarily due to limited funding and available staff time. This plan should help the Town prioritize the best use of its limited resources for enhanced mitigation of natural hazards.

Table 33: Status of Mitigation Measures from the 2010 Plan

Hazard Area/ Issue	Mitigation Recommended in the 2010 Plan	Hazard Type	Priority in 2010 Plan	2020 Status Completed / In Progress Not Completed / Notes	Include in 2020 Plan Update?
A) Populatic Pond Road and Drainage Mitigation	Roadway reconstruction; Drainage system with retention basin	Flooding/Drainage	High	Completed	NO
B) Beaver Street Culvert Enlargements	Upgrade culverts to 48 inches	Flooding/Drainage	High	Completed	NO
C) Improve GIS & Mapping Technology	Improve Mapping Capabilities	Multi-Hazards	High	Completed	NO
D) Upgrade Public Safety Building's Wind Resistant Windows	Upgrade the Public Safety buildings capabilities to withstand high wind storms	Wind	High	Completed – New Public Safety Building	NO
E) Development Beaver Mitigation Plan	Multi department development of plan	Flooding/Drainage	High	Not Completed	YES
F) Implement Beaver Mitigation Plan	Multi department implementation of plan	Flooding/Drainage	High	Not Completed	YES
G) Protection of Open Space	Protection of open space includes acquiring conservation land and land acquisition	Flooding/Drainage	High	In Progress	YES
H) Revisions to Development Bylaws and Regulations	Revise and strengthen existing regulations and by-laws	Flooding/Drainage	High	In Progress	YES

Hazard Area/ Issue	Mitigation Recommended in the 2010 Plan	Hazard Type	Priority in 2010 Plan	2020 Status Completed / In Progress Not Completed / Notes	Include in 2020 Plan Update?
I) Sheppard's Brook Mitigation	Upgrade Culvert, Drainage Analysis	Flooding/Drainage	Medium	Completed	NO
J) Summer Street Mitigation	Hydro Analysis	Flooding/Drainage	Medium	Completed	NO
K) Partridge Street Culvert Upgrade	Upgrade Culvert	Flooding/Drainage	Medium	Completed	NO
L) Emergency Generators for Municipal Facilities	Acquire emergency generators	Multi-Hazards	Medium	Partially completed; need generator for Town Hall	YES
M) Bury Utility Lines	Bury downtown utility lines	Wind/Winter	Medium	Not completed	NO
N) Brush Fire Regulations	Enforce backyard setback requirements for fire protection	Brush Fire	Medium	Not completed	YES
O) Brush Fire Education	Public Education on Brush Fire Prevention	Brush Fire	Medium	In progress: online permit for burning, social media	YES
P) Inter-municipal Communication	Improve communications between municipalities	Multi-Hazards	Medium	Not completed	YES
Q) Water-Related Public Education	Public education on water resources such as flood prevention and stormwater management	Flooding/Drainage	Medium	In progress – MS4 program	YES
R) New Fire Fighting Truck	Purchase a new firefighting truck	Brush Fire	Medium	Completed	NO
S) Water Main & Hydrant Improvements	Water main and fire hydrants installation and extensions	Brush Fire	Medium	In progress—5-year program	YES
T) Communications for Emergency Operations	Upgrading with wireless communications	Multi-Hazards	Medium	Not completed	YES

Hazard Area/ Issue	Mitigation Recommended in the 2010 Plan	Hazard Type	Priority in 2010 Plan	2020 Status Completed / In Progress Not Completed / Notes	Include in 2020 Plan Update?
U) Wyllie Road Mitigation	Hydro Analysis	Flooding/Drainage	Other	Completed	NO
V) Pleasant Street and Miller Street	Drainage improvements TBD	Flooding/Drainage	Other	Completed	NO

SECTION 8: HAZARD MITIGATION STRATEGY

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. FEMA currently has three mitigation grant programs: the Hazards Mitigation Grant Program (HGMP), the Pre-Disaster Mitigation program (PDM), and the Flood Mitigation Assistance (FMA) program. The three links below provide additional information on these programs.

https://www.fema.gov/hazard-mitigation-grant-program
https://www.fema.gov/pre-disaster-mitigation-grant-program
https://www.fema.gov/flood-mitigation-assistance-grant-program

Hazard Mitigation Measures can generally be sorted into the following groups:

- Prevention: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.
- Property Protection: Actions that involve the modification of existing buildings or infrastructure to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, flood proofing, storm shutters, and shatter resistant glass.
- Public Education & Awareness: Actions to inform and educate citizens, elected officials, and property owners about the potential risks from hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- Natural Resource Protection: Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- 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.
- 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.

(Source: FEMA Local Multi-Hazard Mitigation Planning Guidance)

REGIONAL AND INTER-COMMUNITY CONSIDERATIONS

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

REGIONAL PARTNERS

In developed urban and suburban communities such as the metropolitan Boston area, mitigating natural hazards, particularly flooding, is often more than a local issue. The drainage systems that serve these communities are complex systems of storm drains, roadway drainage structures, and other facilities owned and operated by a wide array of agencies including the Town, the Massachusetts Department of Transportation (MassDOT), the Massachusetts Bay Transportation Authority (MBTA), the Norfolk County Mosquito Control Project, and the Army Corps of Engineers (ACOE) which established the Charles River Natural Valley Storage project. The planning, construction, operation and maintenance of these structures are integral to the flood hazard mitigation efforts of communities. These agencies must be considered the communities' regional partners in hazard mitigation. These agencies also operate under the same constraints as communities do including budgetary and staffing constraints and they must make decisions about numerous competing priorities.

Following, is a brief overview of regional facilities found in Franklin and a discussion of inter-municipal issues.

OVERVIEW OF REGIONAL FACILITIES WITHIN OR NEAR FRANKLIN

Major facilities owned, operated and maintained by federal, state, regional or private entities in Franklin include: State Route 140, Interstate 495, MBTA Commuter Rail line with two stations in Franklin. In addition, Franklin utilizes the Charles River Pollution Control District for wastewater treatment, which operates a wastewater treatment facility located on the Charles River downstream from Franklin in Medway.

INTER-COMMUNITY CONSIDERATIONS

Franklin, as well as its surrounding communities, is undergoing significant development. In order to avoid or minimize impacts from any residential and commercial development, communication between Franklin and the surrounding communities, including input in the review processes, is vital.

Maintaining adequate drainage, floodplains, and water quality of the Charles River Basin and Blackstone River Basin is an important consideration for Franklin and the surrounding communities. This planning project, which includes a joint Municipal Vulnerability Preparedness Project with the Town of Bellingham, is a good example of regional cooperation.

NEW DEVELOPMENT AND INFRASTRUCTURE

As part of the process of developing recommendations for new mitigation measures for this plan update, the Town considered the issues related to new development, redevelopment, and infrastructure needs in order limit future risks. Taking into consideration the town's updated Zoning Bylaw, the Wetlands 'bylaw enforced by the Conservation Commission, the Stormwater Bylaw and the adoption of a Stormwater Utility, the town determined that existing regulatory measures are taking good advantage of local Home Rule land use regulatory authority to minimize natural hazard impacts of development. Priorities for the future include coordinated implementation and enforcement of these and other bylaws.

PROCESS FOR SETTING PRIORITIES FOR MITIGATION MEASURES

The last step in developing the Town's mitigation strategy is to assign a level of priority to each mitigation measure so as to guide the focus of the Town's limited resources towards those actions with the greatest potential benefit. At this stage in the process, the Local Hazard Mitigation Planning Team had limited access to detailed analyses of the cost and benefits of any given mitigation measure, so prioritization is based on the local team members' understanding of existing and potential hazard impacts and an approximate sense of the costs associated with pursuing any given mitigation measure.

Priority setting was based on local knowledge of the hazard areas, including impacts of hazard events, the extent of the area impacted, and the relation of a given mitigation measure to the Town's goals. In addition, the local Hazard Mitigation Planning Team also took into consideration factors such as the number of homes and businesses affected, whether or not road closures occurred and what impact closures had on delivery of emergency services and the local economy, anticipated project costs, whether any environmental constraints existed, and whether the Town would be able to justify the costs relative to the anticipated benefits.

Table 34 below demonstrates the prioritization of the Town's potential hazard mitigation measures. For each mitigation measure, the geographic extent of the potential benefiting area is identified as is an estimate of the overall benefit and cost of the measures. The benefits, costs, and overall priority were evaluated in terms of:

Estimated Benefits	
High	Action will result in a significant reduction of hazard risk to people and/or property from a hazard event
Medium	Action will likely result in a moderate reduction of hazard risk to people and/or property from a hazard event
Low	Action will result in a low reduction of hazard risk to people and/or property from a hazard event
Estimated Costs	
High	Estimated costs greater than $100,000
Medium	Estimated costs between $10,000 to $100,000
Low	Estimated costs less than $10,000 and/or staff time
Overall Priority	

High	Action very likely to have political and public support and necessary maintenance can occur following the project, and the costs seem reasonable considering likely benefits from the measure
Medium	Action may have political and public support and necessary maintenance has potential to occur following the project
Low	Not clear if action has political and public support and not certain that necessary maintenance can occur following the project

Table 34: Mitigation Measures Prioritization

Mitigation Action	Geographic Coverage	Estimated Benefit (H/M/L)	Estimated Cost (H/M/L)	Overall Priority (H/M/L)
FLOOD HAZARDS				
A) Develop and Implement Beaver Mitigation Plan	Site specific	High	Low	High
B) Protection of Open Space	Town-wide	Medium	Medium	High
C) Revisions to Development Bylaws/Regulation	Town-wide	Medium	Low	High
D) Water-Related Public Education	Town-wide	Medium	Low	Medium
MULTIHAZARDS				
E) Emergency Generators for Municipal Facilities	Site specific	High	Medium	Medium
F) Inter-municipal Cooperation	Town-wide	Medium	Low	Medium
G) Emergency Communications-Radio Upgrade	Town-wide	High	High	High
BRUSHFIRE HAZARDS				
H) Water Main & Hydrant Upgrades	Site-specific	Medium	High	Medium
I) Brush Fire Regulations	Town-wide	Medium	Low	Medium
J) Public Education	Town-wide	Medium	Low	Medium
Wind Hazards				
K) Wind hazards--tree damage mitigation	Site specific	Medium	Medium	Medium
Geologic Hazards				
L) Public Building earthquake assessments	Site specific	Low	Low	Low
Winter Hazards				
M. Public building snow load assessment	Site specific	Low	Low	Low
Drought Hazards				
N. Town-wide: drought mitigation	Town-wide	Medium	Low	Medium
Extreme Temperatures				
O. Extreme heat and cold mitigation	Town-wide	Medium	Low	Medium

Mitigation Action	Geographic Coverage	Estimated Benefit (H/M/L)	Estimated Cost (H/M/L)	Overall Priority (H/M/L)
P. Extreme heat mitigation	Town-wide	Medium	Low	Medium

DESCRIPTION OF MITIGATION MEASURES

Flooding Hazards

A) Develop and Implement a Beaver Mitigation Plan

Develop of a beaver mitigation plan using a multi-department process. The Conservation Commission, and Department of Public Works should be included in this process. The development of the plan will likely be funded by the Town. Implementing the beaver mitigation plan will involve cooperation from the Conservation Commission, and DPW.

B) Protection of Open Space

Although Franklin has not sustained significant flooding compared to more urban and densely populated towns, protection of open space is important in order to ensure that future development does not increase flooding. Potential open space protection recommendations include the following:

- Pass the Community Preservation Act permitted by Massachusetts General Law Chapter 44B, Sections 3 through 7) to help fund the acquisition of open space.
    - CPA establishes a dedicated funding source, derived from a 1-3 % surcharge on the annual property tax and state matching funds, for the purpose of preserving open space, historical preservation, community housing and recreation.
- Acquire additional conservation land to develop conservation areas centered around the Town's natural resource areas, with a focus on reducing stormwater runoff and flooding
- Continue open space purchases and negotiate conservation restrictions and easements
- Prioritize land acquisition or protection based on groundwater recharge standards.
- Develop partnerships with private landowners to acquire easements or land donations to protect sensitive open space or recreation lands where land acquisition is not an option.
- Identify key parcels of land which are most important for protecting natural resources and wildlife corridors
- Increase public awareness of the value of open space and encourage citizen input.

C) Revisions to Development Bylaws and Regulations

In order to prevent future flooding issues in the town due to new development, the following revisions to existing bylaws and regulations should be considered:

- Increase the current Stormwater Management Regulations for pipe size to accommodate more frequent larger storms (current regulations twenty five (25) year storm). The State recognizes that larger storm events have been occurring more frequently and subsequent building standards should reflect the higher frequency of larger storms.
- Modify the Water Resource Protection District to include all Zone II areas within the town, including those areas that contribute to the water supply of surrounding communities.
- Develop a bylaw that protects a 35-foot "no disturbance" buffer around all wetlands that prohibits grading, building and all other construction activities. Consider exempting repairs to existing structures to ensure that this action is not cost-prohibitive to owners.
- Amend zoning bylaws to exclude wetlands from the density calculations.

- Continue to address the on-going issue of non-point source pollution to protect the drinking water supply.
- Require aggressive and legally-binding operation and maintenance plans and reporting, with enforcement mechanisms, for private drainage facilities.
- Include construction and post-construction slope stabilization requirements in the site plan and subdivision regulations.
- Require the use of LID guidance for all developments in town, and not just those within the Aquifer Protection District.

D) Water-Related Public Education

Increase public awareness re: stormwater, use of pesticides, fertilizers and other chemicals as well as septic systems to reduce contaminants and hazardous materials from entering water sources in the cases of flooding. The town has begun a public outreach effort through its MS4 permit program

Multihazards

E) Emergency Generators for Municipal Facilities

In the event of a natural hazard event, the Franklin municipal buildings do not have generators with sufficient power to maintain emergency operations. The town has a mobile trailer generator and has installed fixed generators at the DPW and pumping stations, the Fire Department, the High School, and Parmenter School. The Town Hall needs to have a generator installed.

F) Inter-municipal Cooperation

Maintain cooperation with neighboring towns to protect water resources which cross town borders. The town has implemented a regional dispatch system since the previous plan.

G) Emergency Communications Upgrade

The Local Committee identified upgrading the town's communication infrastructure as a priority mitigation measure. A radio upgrade is needed. According to the Fire Chief, since going to regional dispatch, the town has found that the inability to access a secondary channel for incident communications may contribute to firefighter injury or worse. Franklin already owns the necessary channel, but the build out to use it would cost $300,000. This would ensure the town can maintain emergency operations in the case of natural hazards that affect normal modes of communication.

Brushfire Hazards

H) Water Main & Hydrant Upgrades

Water main and fire hydrants installation and extensions—Mount Street & Prospect Street

I) Brushfire Regulations

A town regulation for a minimum 75-foot backyard setback would help minimize risk to property and personal injury from brush fires, by keeping a buffer between vegetated/forested areas and structures.

J Public Education on Brush Fire Prevention

In order to reduce the risk of brush fires, further education of the public should be provided at conservation areas, for example with signage. In addition, homeowners in close proximity to forest

areas could be educated on vegetation management on their own properties and how to maintain buffers. The town has an online burning permit and public outreach on social media. The town currently has an online application for burning permits and outreach on social media.

Wind Hazards

K) Town-wide wind hazards, tree damage
Increase tree maintenance program and coordinate with utilities

Earthquake Hazards

L) Public Building earthquake assessment
Identify public buildings vulnerable to earthquakes and assess options to make them more resistant to earthquakes

Winter Hazards

M. Public Buildings snow load assessment
Identify public buildings vulnerable to damage from snow loads and conduct a structural assessment

Drought Hazards

N) Town-wide drought mitigation
Adopt guidelines for new development to promote drought tolerant landscaping and site design measures

Extreme Temperature Hazards

O) Town-wide extreme temperature public education
Conduct a public awareness program on extreme temperatures and resources available to residents

P) Town-wide extreme heat mitigation
Adopt Site Design regulations to increase shade tree plantings near buildings, increase trees used in parking areas and along public ways.

INTRODUCTION TO POTENTIAL MITIGATION MEASURES TABLE

Description of the Mitigation Measure – The description of each mitigation measure is brief and cost information is given only if cost data were already available from the community. The cost data represent a point in time and would need to be adjusted for inflation and for any changes or refinements in the design of a particular mitigation measure.

Priority – As described above and summarized in Table 35, the designation of high, medium, or low priority was done considering potential benefits and estimated project costs, as well as other factors in the STAPLEE (Social, Technical, Administrative, Legal, Economic, and Environmental) analysis.

Implementation Responsibility – The designation of implementation responsibility was done based on a general knowledge of what each municipal department is responsible for. It is likely that most mitigation

measures will require that several departments work together and assigning staff is the sole responsibility of the governing body of each community.

Time Frame – The time frame was based on a combination of the priority for that measure, the complexity of the measure and whether or not the measure is conceptual, in design, or already designed and awaiting funding. Because the time frame for this plan is five years, the timing for all mitigation measures has been kept within this framework. The identification of a likely time frame is not meant to constrain a community from taking advantage of funding opportunities as they arise.

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

Additional information on funding sources – The best way to determine eligibility for a particular funding source is to review the project with a staff person at the funding agency. The following websites provide an overview of programs and funding sources.

> Army Corps of Engineers (ACOE) – The website for the North Atlantic district office is http://www.nae.usace.army.mil/. The ACOE provides assistance in a number of types of projects including shoreline/streambank protection, flood damage reduction, flood plain management services and planning services.
>
> Massachusetts Emergency Management Agency (MEMA) – The grants page https://www.mass.gov/hazard-mitigation-assistance-grant-programs describes the various Hazard Mitigation Assistance Program.

Table 35: Potential Hazard Mitigation Measures

Hazard Category Issue/Location	**Mitigation Measure**	**Priority**	**Implementation Responsibility**	**Time Frame**	**Estimated Cost***	**Potential Funding Sources**
Flooding						
M) Develop and Implement Beaver Mitigation Plan	Multi department development of a plan to manage the impact of beavers	High	Conservation Commission, Dept. of Public Works	2021-22	Low: $5-$10 K and staff time	Franklin General Fund
N) Protection of Open Space	Protection of open space includes preserving conservation land by easement and land acquisition	High	Conservation Commission; Town Administrator	2020-25	Medium to High (Varies)	Franklin General Fund EOEEA, CPA?
O) Revisions to Development Bylaws/Regulation	Revise and strengthen existing regulations and by-laws	High	Planning and Community Development; Town Engineer	2020-21	Low: Staff Time	Franklin General Fund
P) Water-Related Public Education	Public education on water resources such as flood prevention and stormwater management	Medium	Dept. of Public Works, Conservation Comm.	2020-25	Low: Staff Time and educational materials	Franklin Stormwater Enterprise Fund
Multi Hazard						
Q) Emergency Generators for Municipal Facilities	Acquire emergency generator for Town Hall	Medium	Facilities Dept.	2022-23	Medium: $50-$70 K	Franklin Capital Funds; PDM
R) Inter-municipal Cooperation	Improve cooperation between municipalities	Medium	Public Safety	2021-22	Low: Staff Time	Franklin General Fund

Hazard Category Issue/Location	**Mitigation Measure**	**Priority**	**Implementation Responsibility**	**Time Frame**	**Estimated Cost***	**Potential Funding Sources**
S) Emergency Communications	Radio upgrade for emergency communications	High	Public Safety	2020-22	High: $300 K	Franklin Capital Funds
Wildfire Hazards						
T) Water Main & Hydrant Upgrades	Water main and fire hydrants installation and extensions—Mount Street & Prospect Street	Medium	Franklin Water Dept.	2022-24	High: $50 to $500K	Franklin Water Dept.
U) Brush Fire Regulations	Enforce Backyard Setback Requirements for Fire Protection	Medium	Fire Department	2021-22	Low -Staff time	Franklin General Fund
V) Public Education	Public Education on Brush Fire Prevention	Medium	Fire Department	2020-25	Low-Staff time	Franklin General Fund
Wind Hazards						
W) Town-wide wind hazards--tree damage	Increase tree maintenance program.	Medium	Dept of Public Works	2021-25	Medium	Franklin General Fund
Geologic Hazards						
X) Public Buildings-Earthquake hazards	Identify public buildings vulnerable and assess options to make them more resistant to earthquakes	Low	Facilities Dept.	2023-2025	Low: Staff time and assessment	Franklin General Fund
Winter Hazards						
M. Town-wide Public Buildings: Snow loads	Identify public buildings vulnerable to damage from	Low	Facilities Dept.	2023-2025	Low: Staff time and assessment	Franklin General Fund

Hazard Category Issue/Location	**Mitigation Measure**	**Priority**	**Implementation Responsibility**	**Time Frame**	**Estimated Cost***	**Potential Funding Sources**
	snow loads and conduct a structural assessment					
Drought Hazards						
N. Town-wide: drought	Adopt guidelines for new development to promote drought tolerant landscaping and site design measures	Medium	Planning Board; DPW/Engineering Conservation Commission	2021-2023	Low: Staff time	Franklin General Fund
Extreme Temperatures						
O. Town-wide: Extreme heat and cold	Conduct a public awareness program on extreme temperatures and resources available to residents	Medium	Board of Health	2022-2025	Low: Staff time and educational materials	Franklin General Fund
P. Town-wide: Extreme heat and cold	Adopt Site Design regulations to increase shade tree plantings near buildings, increase trees used in parking areas and along public ways.	Medium	Planning Board, DPW/Engineering Conservation Commission	2021-22	Low: Staff Time	Franklin General Fund

*** KEY to Cost categories:**

LOW:	Less than $50,000
MEDIUM	$50,000 to $100,00
HIGH:	Over $100,000

SECTION 9: PLAN ADOPTION & MAINTENANCE

PLAN ADOPTION

The Franklin Hazard Mitigation Plan 2020 Update was adopted by the Town Council on *[ADD DATE]*. See Appendix D for documentation. The plan was approved by FEMA on [*ADD DATE*] for a five-year period that will expire on [*ADD DATE*].

PLAN MAINTENANCE

MAPC worked with the Franklin Hazard Mitigation Planning Team to prepare this plan. After approval of the plan by FEMA, this group will meet to function as the Hazard Mitigation Implementation Team, with the LEPC and CRS Coordinators jointly designated as coordinators. Additional members could be added to the local implementation team from businesses, non-profits and institutions. The Town will encourage public participation during the next 5-year planning cycle. As annual updates and a review of the plan are conducted by the Hazard Mitigation Implementation Team, these will be placed on the Town's web site, and any meetings of the Hazard Mitigation Implementation Team will be publicly noticed in accordance with town and state open meeting laws.

IMPLEMENTATION AND EVALUATION SCHEDULE

Annual Review – The coordinator of the Hazard Mitigation Implementation Team will convene the team annually to consider changes or revisions to the plan that may be needed, progress and accomplishments, and any new hazards or problem areas that have been identified.

This information will be used to prepare a report or addendum to the local hazard mitigation plan in order to evaluate its effectiveness in meeting the plan's goals and identify areas that need to be updated in the next plan. The Hazard Mitigation Implementation Team, coordinated by the CRS and LEPC Coordinators, will have primary responsibility for tracking progress, evaluating, and updating the plan.

Begin to Prepare for the next Plan Update – FEMA's approval of this plan is valid for five years, by which time an updated plan must be approved by FEMA in order to maintain the town's approved plan status and its eligibility for FEMA mitigation grants. Given the lead time needed to secure funding and conduct the planning process, the Hazard Mitigation Implementation Team will begin to prepare for an update of the plan in year three. This will help the Town avoid a lapse in its approved plan status and grant eligibility when the current plan expires.

The Hazard Mitigation Implementation Team will use the information from the annual review to identify the needs and priorities for the plan update and seek funding for the plan update process. Potential sources of funding may include FEMA Pre-Disaster Mitigation grants and the Hazard Mitigation Grant Program. Both grant programs can pay for 75% of a planning project, with a 25% local cost share required.

Prepare and Adopt an Updated Local Hazard Mitigation Plan – Once the resources have been secured to update the plan, the Hazard Mitigation Implementation Team may decide to undertake the update themselves, contract with the Metropolitan Area Planning Council to update the plan or to hire another consultant. However, the Hazard Mitigation Implementation Team decides to update the plan, the group will need to review the current FEMA hazard mitigation plan guidelines for any changes. The Franklin Hazard Mitigation Plan Update will be forwarded to MEMA and DCR for review and to FEMA for approval.

INTEGRATION OF THE PLANS WITH OTHER PLANNING INITIATIVES

Upon approval of the Franklin Hazard Mitigation Plan 2020 Update by FEMA, the Local Hazard Mitigation Team will provide all interested parties and implementing departments with a copy of the plan and will initiate a discussion regarding how the plan can be integrated into that department's ongoing work. At a minimum, the plan will be reviewed and discussed with the following departments:

- Fire/Emergency Management
- Police
- Public Works
- Planning and Community Development
- Facilities Department
- Conservation Commission
- Water and Sewer Department
- Board of Health
- Building Department

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

The Hazard Mitigation Plan will be integrated into other town plans and policies as they are updated and renewed, including the Open Space and Recreation Plan, Comprehensive Emergency Management Plan, Master Plan, and Capital Plan.

SECTION 10: LIST OF REFERENCES

Blue Hills Observatory

FEMA, Local Mitigation Plan Review Guide, October 2011

FEMA, Flood Insurance Rate Maps for Norfolk County, MA, 2012

FEMA, Hazards U.S. Multi-Hazard (HAZUS-MH)

Fourth National Climate Assessment, 2018

Massachusetts Office of Dam Safety, Inventory of Massachusetts Dams 2018

Massachusetts State Hazard Mitigation Plan, 2013

Massachusetts State Hazard Mitigation and Climate Adaptation Plan, 2018

Metropolitan Area Planning Council, GIS Lab, Regional Plans and Data.

National Weather Service

Nevada Seismological Library

New England Seismic Network, Boston College Weston Observatory, http://aki.bc.edu/index.htm

NOAA National Environmental Information Center, http://www.ncdc.noaa.gov/

Northeast Climate Adaptation Science Center

Northeast States Emergency Consortium, http://www.nesec.org/

Town of Franklin, *Open Space and Recreation Plan,* 2016

Town of Franklin *Master Plan,* 2013

Town of Franklin, *General Bylaws*

Town of Franklin, *Zoning Bylaw*

Tornado History Project

US Census, 2010 and American Community Survey 2017

Town of Franklin, *General Bylaws*

USGS, National Water Information System, http://nwis.waterdata.usgs.gov/usa/nwis

APPENDIX A: HAZARD MAPPING

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

The map series consists of nine maps as described below. The maps in this appendix are necessarily reduced scale versions for general reference. Full sized higher resolution PDF's of the maps can be downloaded from: https://mapc-org.sharefile.com

Map 1.	Population Density
Map 2.	Land Use
Map 3.	Flood Zones
Map 4.	Earthquakes and Landslides
Map 5.	Hurricanes and Tornadoes
Map 6.	Average Snowfall
Map 7.	Composite Natural Hazards
Map 8.	Hazard Areas
Map 9	(Sea Level Rise, not included in this plan)
Map 10	High Land Surface Temperatures

Map1: Population Density – This map uses the US Census block data for 2010 and shows population density as the number of people per acre in seven categories with 60 or more people per acre representing the highest density areas.

Map 2: Land Use – This map shows land use based on the MassGIS statewide land use database. The map also shows potential future development sites and critical facilities, both of which were identified by the Local Hazard Mitigation Team.

Map 3: Flood Zones – The map of flood zones used the FEMA NFIP Flood Zones as depicted on the FIRMs (Federal Insurance Rate Maps) for Norfolk County as its source. This map is not intended for use in determining whether or not a specific property is located within a FEMA NFIP flood zone. The currently adopted FIRMS for Franklin are kept by the Town. For more information, refer to the FEMA Map Service Center website http://www.msc.fema.gov. The definitions of the flood zones are described in detail on this site as well. The flood zone map for each community also shows critical infrastructure and repetitive loss areas.

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

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

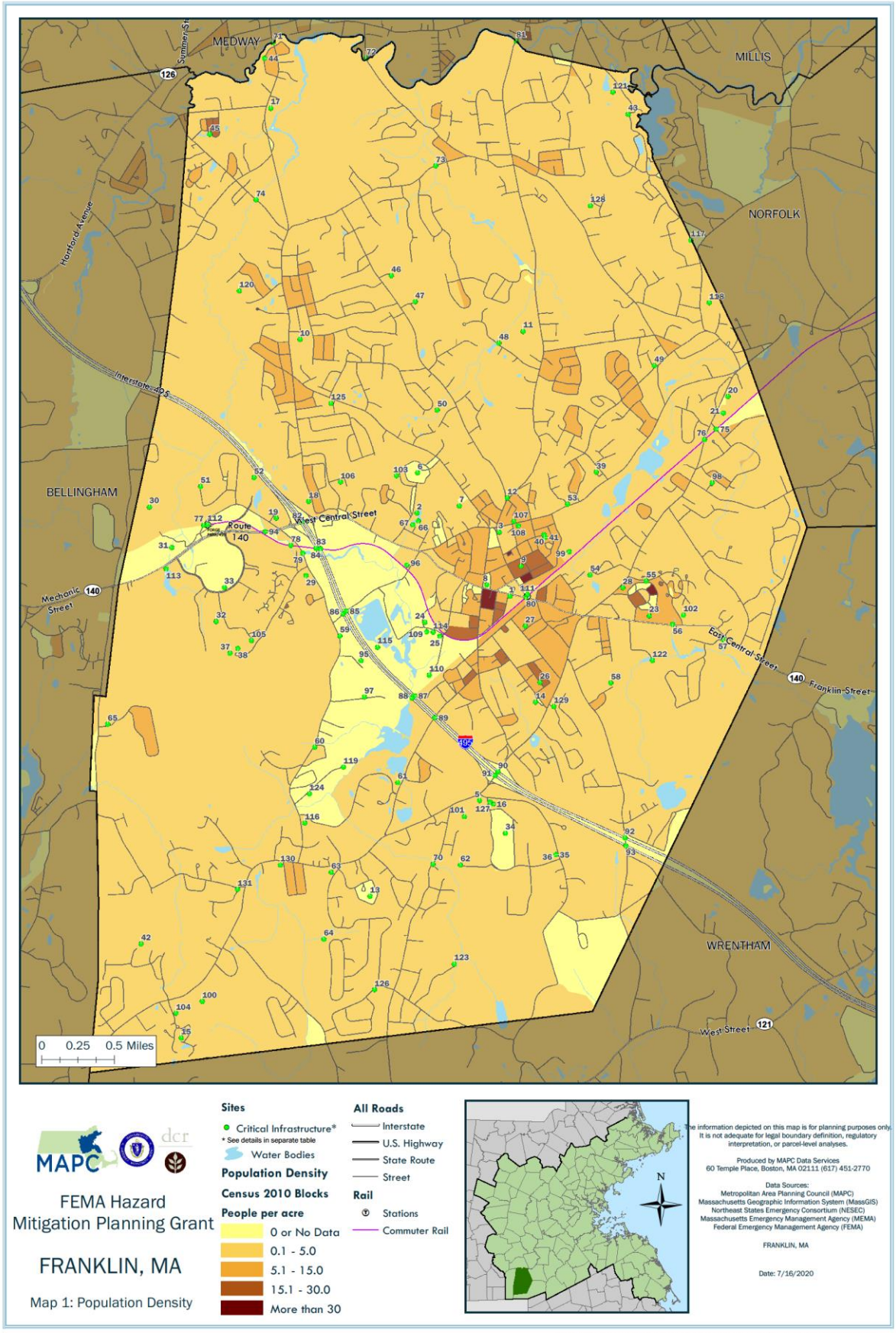
Map 5: Hurricanes and Tornadoes – This map shows the storm tracks for both hurricanes and tropical storms, if any occurred in or near this community. This information must be viewed in context. A storm track only shows where the eye of the storm passed through. In most cases, the effects of the wind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

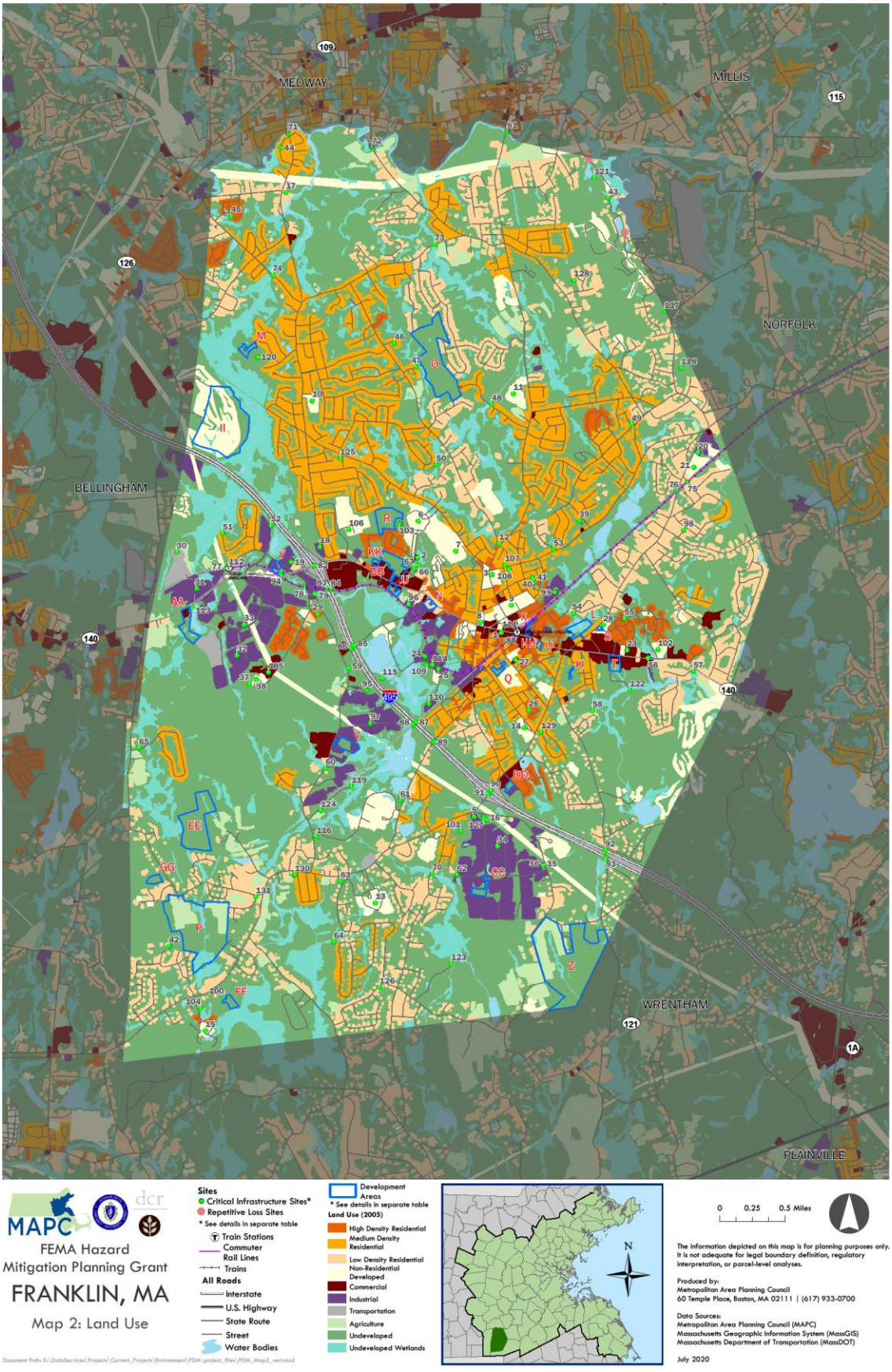
Map 6: Average Snowfall - - This map shows the average snowfall. It also shows storm tracks for nor'easters, if any storms tracked through the community.

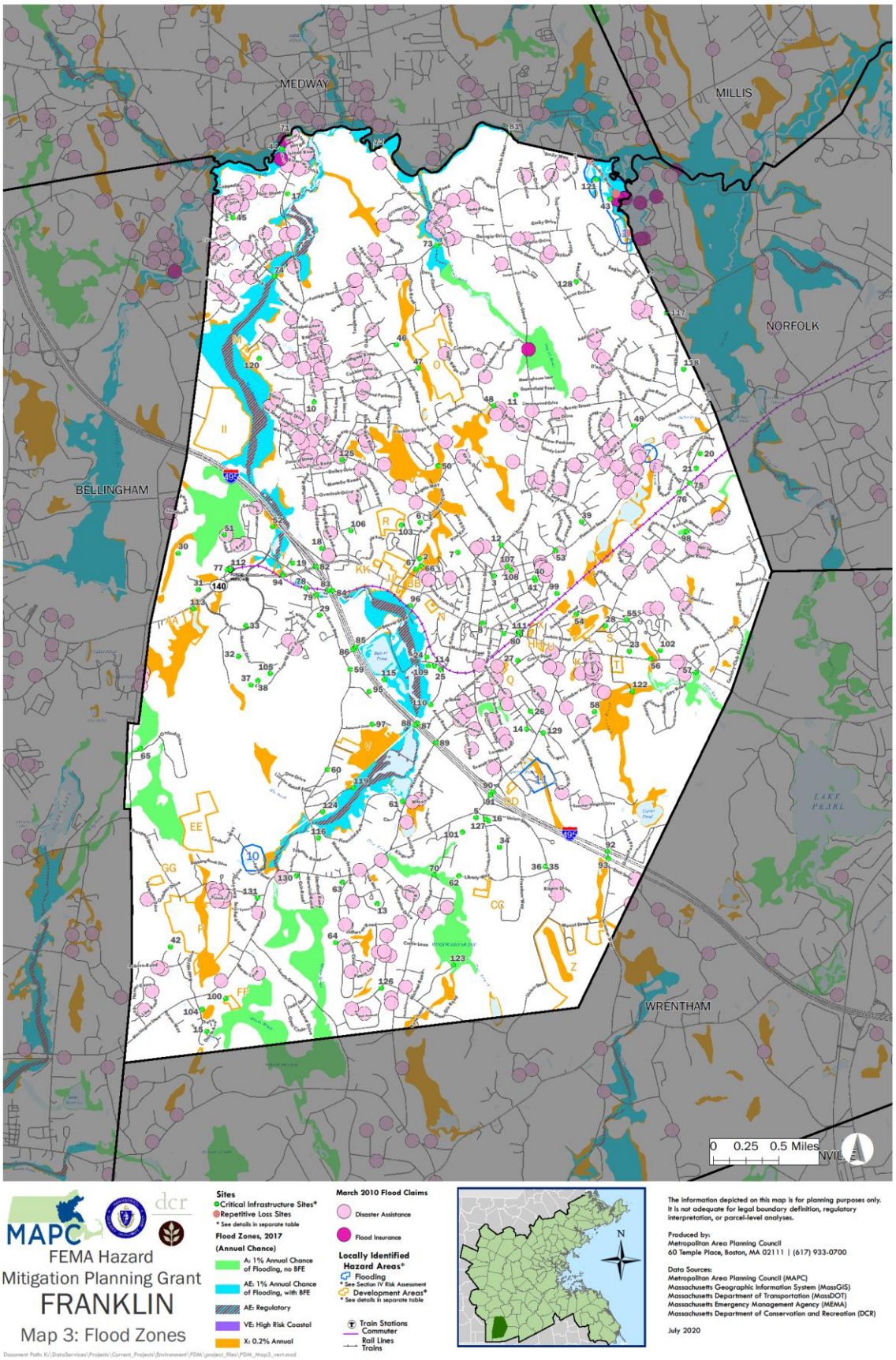
Map 7: Composite Natural Hazards - This map shows four categories of composite natural hazards for areas of existing development. The hazards included in this map are 100-year wind speeds of 110 mph or higher, low and moderate landslide risk, FEMA Q3 flood zones (100 year and 500 year) and hurricane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

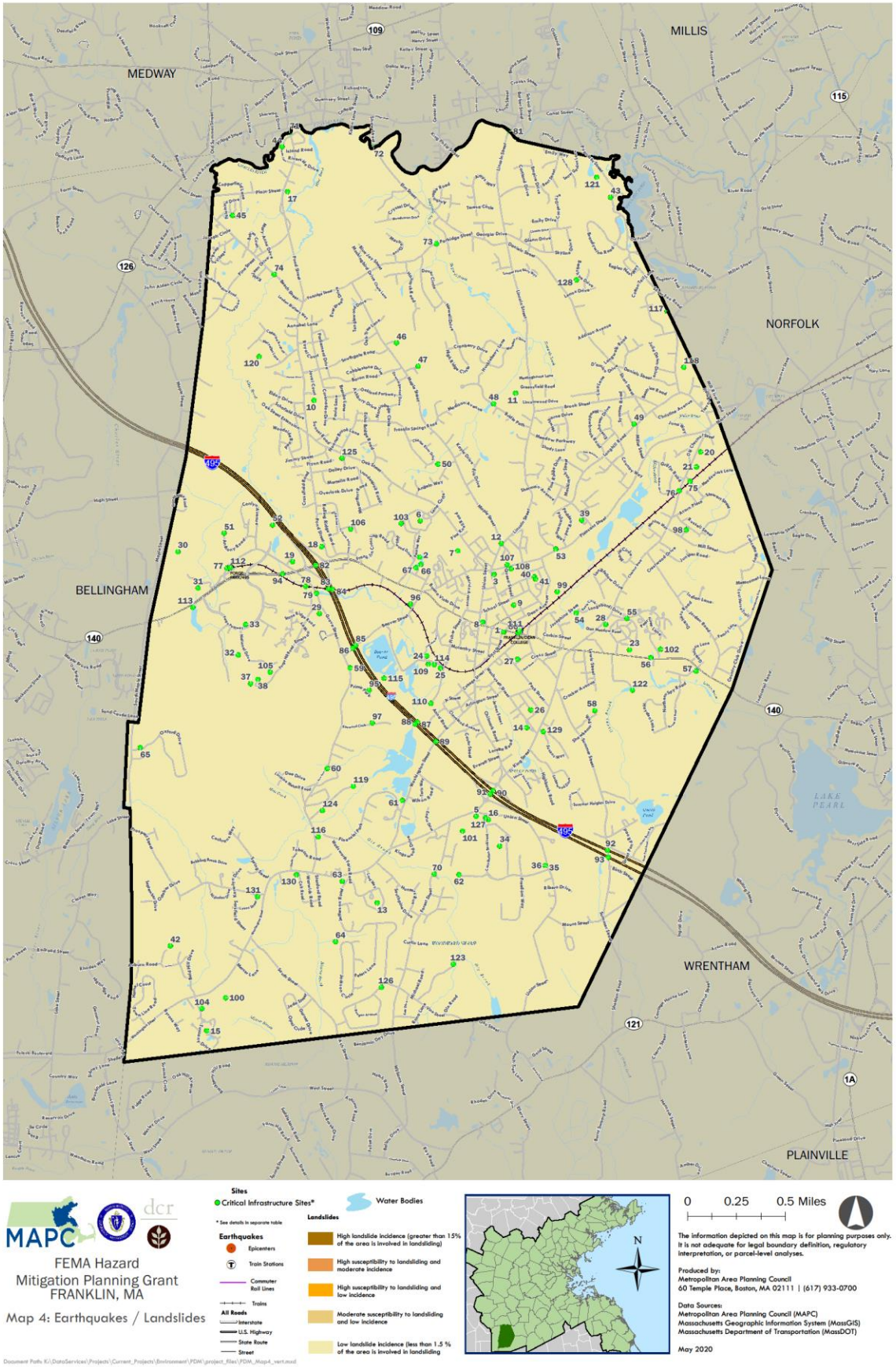
Map 8: Hazard Areas – For each community, locally identified hazard areas are overlaid on an aerial photograph dated April 2010. The critical infrastructure sites are also shown. The source of the aerial photograph is Mass GIS.

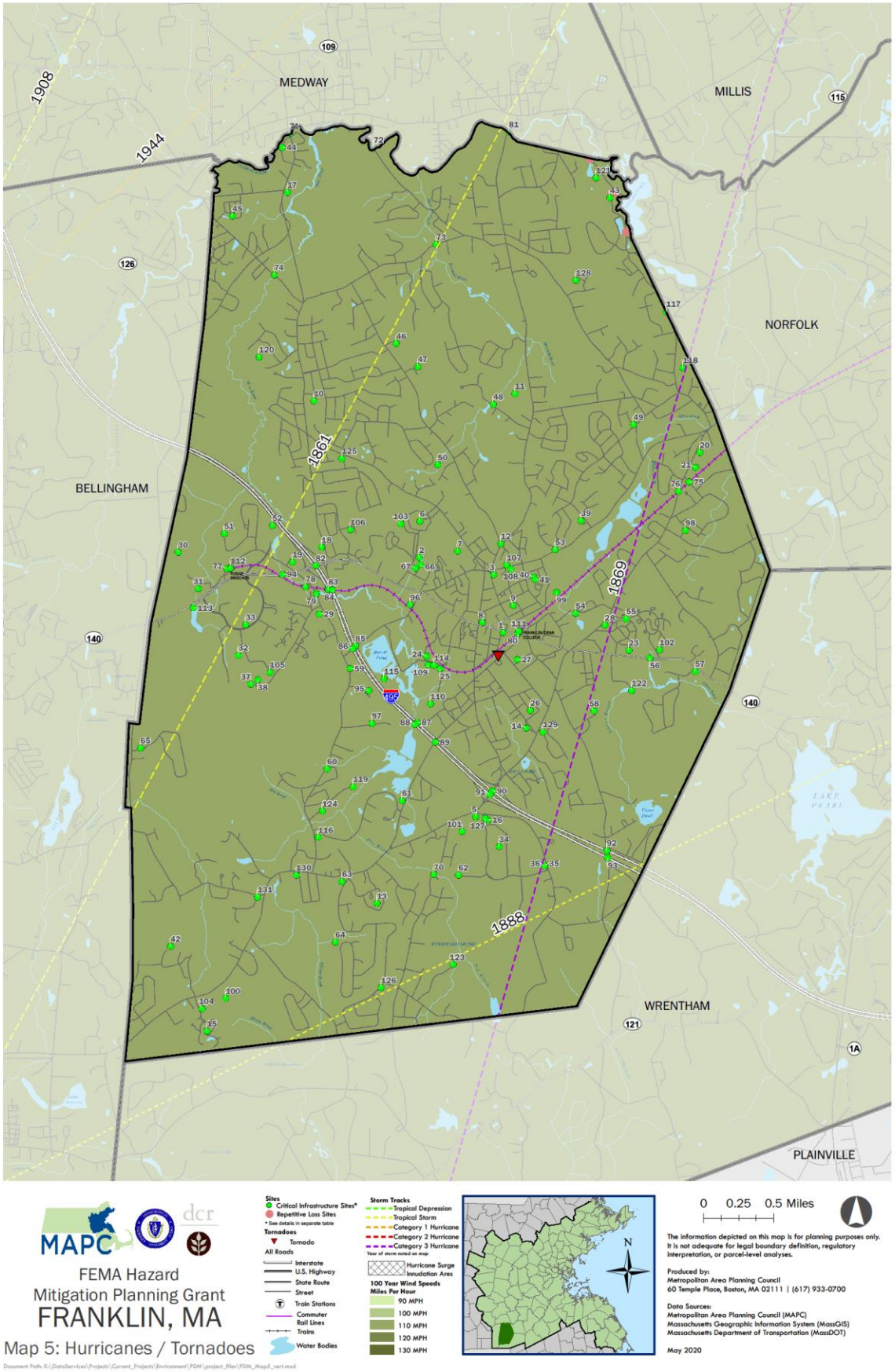
Map 10: High Land Surface Temperature - MAPC uses LANDSAT 30m spatial resolution satellite data to extract land surface temperature to assess a community's exposure to present-day extreme heat and any vulnerabilities to rising temperatures with climate change. The extreme heat analysis uses date from 2016 with satellite images on days of 90° or higher at Logan Airport, July 13 and August 30, 2016 and created land surface temperature using a methodology development by Walawender, Hajto, and Iwaniuk (2012) called Landsat TRS Tools. This map illustrates the hottest areas in the top fifth percentile for the 101 towns in Metropolitan Boston.

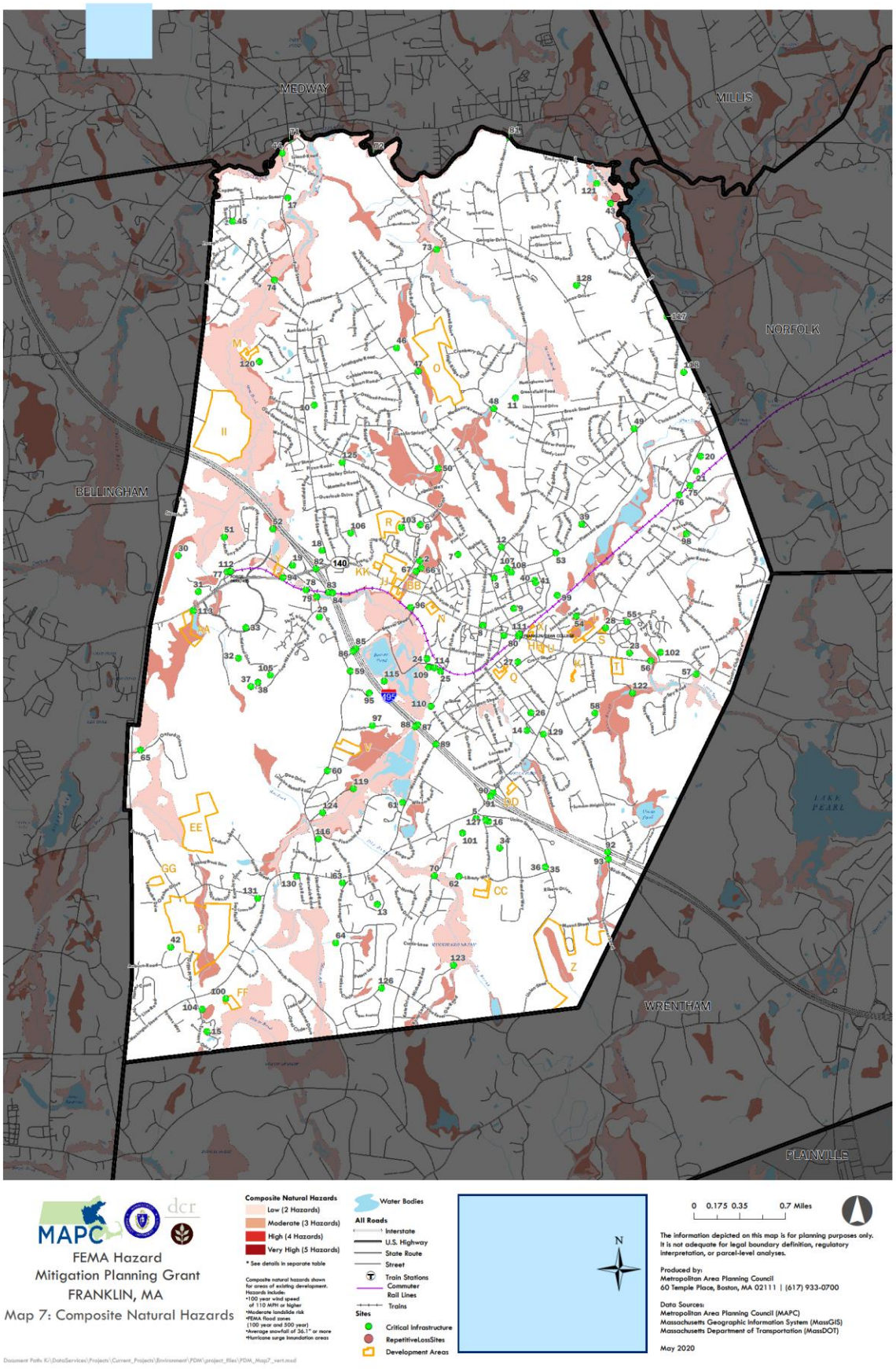

MEDWAY
MILLIS
NORFOLK
BELLINGHAM
WRENTHAM
Hanford Avenue
Interstate 495
West Central Street
Route 140
Mechanic Street
East Central Street
Franklin Street
West Street
0 0.25 0.5 Miles
MAPC
dcr
FEMA Hazard Mitigation Planning Grant
FRANKLIN, MA
Map 1: Population Density
Sites
Critical Infrastructure*
* See details in separate table
Water Bodies
Population Density
Census 2010 Blocks
People per acre
0 or No Data
0.1 - 5.0
5.1 - 15.0
15.1 - 30.0
More than 30
All Roads
Interstate
U.S. Highway
State Route
Street
Rail
Stations
Commuter Rail
N
The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.
Produced by MAPC Data Services
60 Temple Place, Boston, MA 02111 (617) 451-2770
Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Northeast States Emergency Consortium (NESEC)
Massachusetts Emergency Management Agency (MEMA)
Federal Emergency Management Agency (FEMA)
FRANKLIN, MA
Date: 7/16/2020
Path: K:\DataServices\Projects\Current_Projects\Environment\PDM\project_files\PDM_Map1_vert.mxd

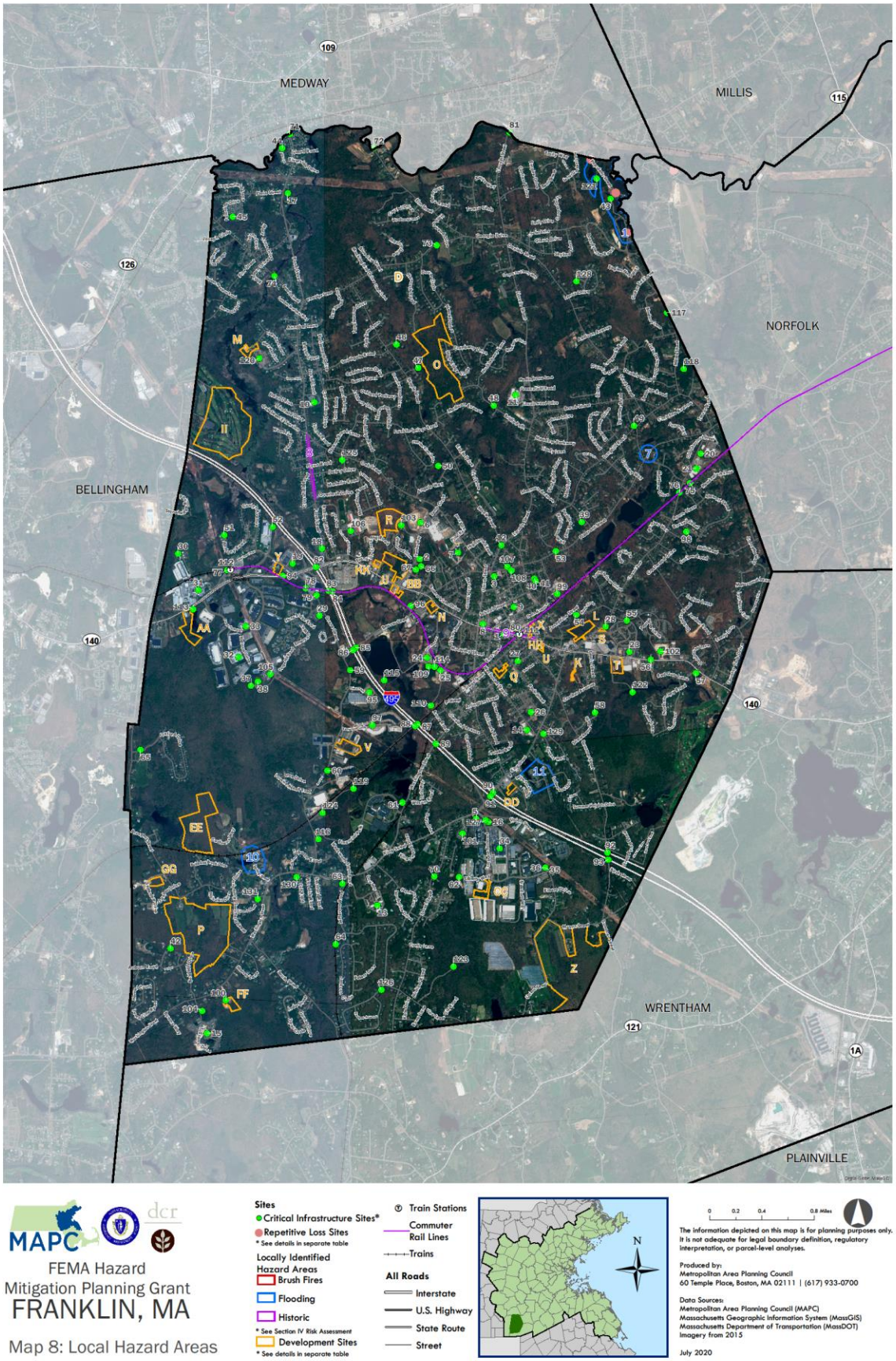

MEDWAY
MILLIS
NORFOLK
BELLINGHAM
WRENTHAM
PLAINVILLE
MAPC
dcr
FEMA Hazard
Mitigation Planning Grant
FRANKLIN, MA
Map 2: Land Use
Sites
Critical Infrastructure Sites*
Repetitive Loss Sites
* See details in separate table
Train Stations
Commuter Rail Lines
Trains
All Roads
Interstate
U.S. Highway
State Route
Street
Water Bodies
Development Areas
* See details in separate table
Land Use (2005)
High Density Residential
Medium Density Residential
Low Density Residential
Non-Residential Developed
Commercial
Industrial
Transportation
Agriculture
Undeveloped
Undeveloped Wetlands
N
0 0.25 0.5 Miles
The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.
Produced by:
Metropolitan Area Planning Council
60 Temple Place, Boston, MA 02111 | (617) 933-0700
Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Massachusetts Department of Transportation (MassDOT)
July 2020

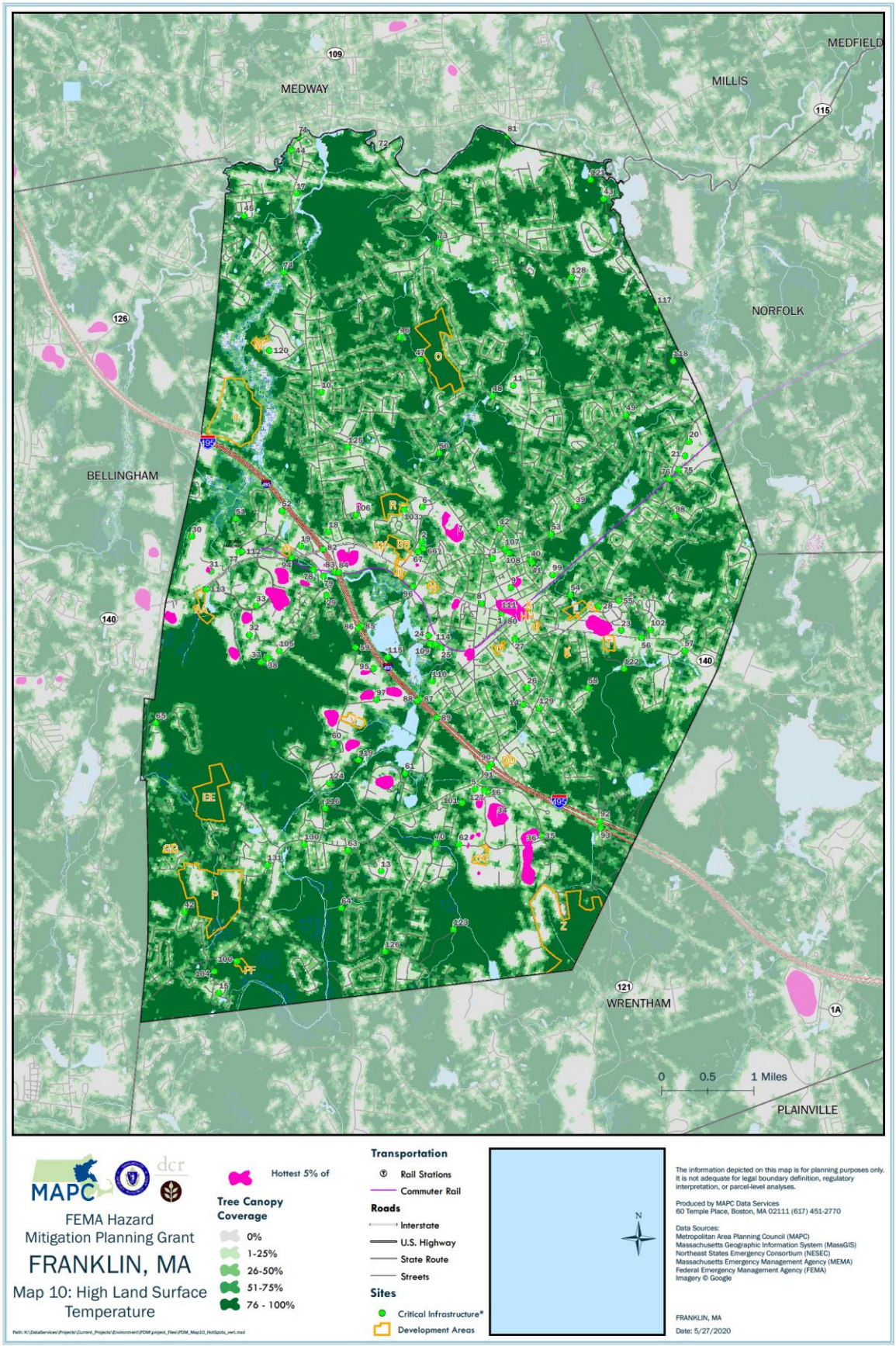

MEDWAY
MILLIS
NORFOLK
BELLINGHAM
WRENTHAM
0 0.25 0.5 Miles
MAPC
dcr
FEMA Hazard
Mitigation Planning Grant
FRANKLIN
Map 3: Flood Zones
Sites
Critical Infrastructure Sites*
Repetitive Loss Sites
* See details in separate table
Flood Zones, 2017
(Annual Chance)
A: 1% Annual Chance of Flooding, no BFE
AE: 1% Annual Chance of Flooding, with BFE
AE: Regulatory
VE: High Risk Coastal
X: 0.2% Annual
March 2010 Flood Claims
Disaster Assistance
Flood Insurance
Locally Identified Hazard Areas*
Flooding
* See Section IV Risk Assessment
Development Areas*
* See details in separate table
Train Stations
Commuter
Rail Lines
Trains
N
The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.
Produced by:
Metropolitan Area Planning Council
60 Temple Place, Boston, MA 02111 | (617) 933-0700
Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Massachusetts Department of Transportation (MassDOT)
Massachusetts Emergency Management Agency (MEMA)
Massachusetts Department of Conservation and Recreation (DCR)
July 2020


MEDWAY
MILLIS
NORFOLK
BELLINGHAM
WRENTHAM
PLAINVILLE
LAKE PEARL
MAPC
dcr
FEMA Hazard
Mitigation Planning Grant
FRANKLIN, MA
Map 4: Earthquakes / Landslides
Sites
Critical Infrastructure Sites*
* See details in separate table
Earthquakes
Epicenters
Train Stations
Commuter Rail Lines
Trains
All Roads
Interstate
U.S. Highway
State Route
Street
Water Bodies
Landslides
High landslide incidence (greater than 15% of the area is involved in landsliding)
High susceptibility to landsliding and moderate incidence
High susceptibility to landsliding and low incidence
Moderate susceptibility to landsliding and low incidence
Low landslide incidence (less than 1.5 % of the area is involved in landsliding
N
0 0.25 0.5 Miles
The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.
Produced by:
Metropolitan Area Planning Council
60 Temple Place, Boston, MA 02111 | (617) 933-0700
Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Massachusetts Department of Transportation (MassDOT)
May 2020


MEDWAY
MILLIS
NORFOLK
BELLINGHAM
WRENTHAM
PLAINVILLE
1908
1944
1861
1869
1888
109
115
126
140
121
1A
MAPC
dcr
FEMA Hazard
Mitigation Planning Grant
FRANKLIN, MA
Map 5: Hurricanes / Tornadoes
Sites
Critical Infrastructure Sites*
Repetitive Loss Sites
* See details in separate table
Tornadoes
Tornado
All Roads
Interstate
U.S. Highway
State Route
Street
Train Stations
Commuter Rail Lines
Trains
Water Bodies
Storm Tracks
Tropical Depression
Tropical Storm
Category 1 Hurricane
Category 2 Hurricane
Category 3 Hurricane
Year of storm noted on map
Hurricane Surge Inundation Area
100 Year Wind Speeds Miles Per Hour
90 MPH
100 MPH
110 MPH
120 MPH
130 MPH
N
0 0.25 0.5 Miles
The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.
Produced by:
Metropolitan Area Planning Council
60 Temple Place, Boston, MA 02111 | (617) 933-0700
Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Massachusetts Department of Transportation (MassDOT)
May 2020


MEDWAY
MILLIS
NORFOLK
BELLINGHAM
WRENTHAM
PLAINVILLE
LAKE PEARL
MAPC
dcr
FEMA Hazard
Mitigation Planning Grant
FRANKLIN, MA
Map 7: Composite Natural Hazards
Composite Natural Hazards
Low (2 Hazards)
Moderate (3 Hazards)
High (4 Hazards)
Very High (5 Hazards)
* See details in separate table
Composite natural hazards shown for areas of existing development. Hazards include:
•100 year wind speed of 110 MPH or higher
•Moderate landslide risk
•FEMA flood zones (100 year and 500 year)
•Average snowfall of 36.1" or more
•Hurricane surge inundation areas
Water Bodies
All Roads
Interstate
U.S. Highway
State Route
Street
Train Stations
Commuter Rail Lines
Trains
Sites
Critical Infrastructure
RepetitiveLossSites
Development Areas
N
0 0.175 0.35 0.7 Miles
The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.
Produced by:
Metropolitan Area Planning Council
60 Temple Place, Boston, MA 02111 | (617) 933-0700
Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Massachusetts Department of Transportation (MassDOT)
May 2020


MEDWAY
MILLIS
NORFOLK
BELLINGHAM
WRENTHAM
PLAINVILLE
MAPC
dcr
FEMA Hazard
Mitigation Planning Grant
FRANKLIN, MA
Map 8: Local Hazard Areas
Sites
Critical Infrastructure Sites*
Repetitive Loss Sites
* See details in separate table
Locally Identified
Hazard Areas
Brush Fires
Flooding
Historic
* See Section IV Risk Assessment
Development Sites
* See details in separate table
Train Stations
Commuter
Rail Lines
Trains
All Roads
Interstate
U.S. Highway
State Route
Street
N
0 0.2 0.4 0.8 Miles
The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.
Produced by:
Metropolitan Area Planning Council
60 Temple Place, Boston, MA 02111 | (617) 933-0700
Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Massachusetts Department of Transportation (MassDOT)
Imagery from 2015
July 2020


MEDFIELD
MEDWAY
MILLIS
NORFOLK
BELLINGHAM
WRENTHAM
PLAINVILLE
0 0.5 1 Miles
MAPC
dcr
FEMA Hazard
Mitigation Planning Grant
FRANKLIN, MA
Map 10: High Land Surface Temperature
Hottest 5% of
Tree Canopy Coverage
0%
1-25%
26-50%
51-75%
76 - 100%
Transportation
Rail Stations
Commuter Rail
Roads
Interstate
U.S. Highway
State Route
Streets
Sites
Critical Infrastructure*
Development Areas
N
The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.
Produced by MAPC Data Services
60 Temple Place, Boston, MA 02111 (617) 451-2770
Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Northeast States Emergency Consortium (NESEC)
Massachusetts Emergency Management Agency (MEMA)
Federal Emergency Management Agency (FEMA)
Imagery © Google
FRANKLIN, MA
Date: 5/27/2020

APPENDIX B: LOCAL TEAM MEETINGS

Bellingham-Franklin
Municipal Vulnerability Preparedness Project

MVP Core Team

First Meeting
September 12, 2019, 9:30 AM
Franklin Municipal Building
355 East Central Street
3rd Floor Training Room

AGENDA

1. Welcome and Introductions
2. Overview and Purpose of MA Municipal Vulnerability Preparedness (MVP) Program and Community Resilience Building Workshop Method
3. Overview of Hazard Mitigation Plans to be updated
4. The role of this MVP Core Team and MAPC
5. Pre-View: Examples of Workshop Materials
6. Date and Location of MVP Workshop and HMP Team Meetings
7. Discussion of Workshop Invitees
8. Other Business / Next steps

Franklin MVP/Hazard Mitigation Plan

Franklin Local Team Meeting #1
Monday, October 21, 2019
1:00 to 2:30 PM

Franklin Town Hall
335 E. Main St, 2nd Floor Training Room

AGENDA

---

1. Review Summary of the Hazard Mitigation Process
2. Update Critical Facilities Inventory and Mapping
3. Update Local Hazard Areas
    a) Flood Hazard Areas
    b) Other hazards (e.g. Brush fires, Extreme Heat, Winter Storms, etc)
4. Update New and Potential Development Sites
5. Prepare for MVP Workshop (Nov. 20, 2019)
    - Identify local stakeholders to invite
    - Review Workshop agenda
    - Review Workshop Materials

Bellingham-Franklin MVP/Hazard Mitigation Plan

Franklin Local Team Meeting #2

Thursday, February 20, 2020
10:00 to 11:30 AM

Franklin Town Hall, Room 205
335 E. Main Street, Franklin

AGENDA

1. **Review/De-brief MVP Workshop**
2. **Review and Update of Mitigation from the 2010 Plan**
   - Review and update the **Mitigation Goals** from the 2010 plan
   - Update the ***Existing*** **Mitigation Measures** from the 2010 plan
   - Status of the ***Recommended*** **Mitigation Measures** from the 2010 plan
3. **Prepare for MVP Public Forum (Listening Session)**
4. **Next Steps / Adjourn**

Bellingham-Franklin MVP/Hazard Mitigation Plan

Franklin Local Team Meeting #3

Wednesday, May 27, 2020
2:30 PM

Join Zoom Meeting

https://us02web.zoom.us/j/83768861168

Meeting ID: 837 6886 1168

One tap mobile
+19292056099,,83768861168#

Dial by your location +1 929 205 6099

Meeting ID: 837 6886 1168

AGENDA

1. Review and Finalize Mitigation Recommendations

- ❖ Review the attached draft mitigation recommendations:
  - Confirm the new mitigation measures (in red text)
  - Confirm and/or update data in columns to right side of table
  - Consider additional mitigation from the MVP workshop (page 3)
  - Add other mitigation measure agreed to by the team, if any

2. Prepare for the Final Public Meeting – Tuesday, June 23

3. Next Steps / Adjourn

WHEN: Monday, March 2, 2020 | 6:00 – 7:30 pm
WHERE: Franklin Municipal Building | 355 E. Central

On March 2, 2020 the Town of Franklin will host a Community Forum to discuss the potential impacts of climate change on Franklin, and actions the Town can take to prepare for those impacts. All Franklin residents, businesses, and civic organizations are invited and encouraged to participate.

The Community Forum will present the results of a Municipal Vulnerability Preparedness (MVP) Workshop that was held on November 20th jointly by the Towns of Franklin and Bellingham. The MVP Workshop brought together municipal officials, local businesses, institutions, and civic organizations to identify how the Town's are vulnerable to the impacts of climate change, as well as actions the municipalities can take to increase their resilience. The forum will also summarize the 2020 Update of the Town of Franklin's Hazard Mitigation Plan which is currently being prepared by the Metropolitan Area Planning Council.

Given recent events like the 2018 Nor'easters, the 2016 drought, and the record 110 inches of snow in 2015, we now find ourselves in an era of more unpredictable and severe weather with the potential to cause more damage to our residents, infrastructure, businesses, and institutions.

Your input is important to the Town of Franklin's community resilience building process.

CONTACT

Bryan Taberner, AICP
Town of Franklin
Department of
Planning & Community
Development

btaberner@franklinma.gov
508.520.4907

MAPC

How can we help? Let us know.

This Project is funded through the Executive Office of Energy and Environmental Affairs' Municipal Vulnerability Preparedness Grant Program.

Technical Assistance provided by Metropolitan Area Planning Council (MAPC).

Amanda Linehan, Communications Manager, Metropolitan Area Planning Council
617-933-0705, alinehan@mapc.org

CALENDAR LISTING / MEDIA ADVISORY

MARCH 2 FRAKLIN COMMUNITY FORUM WILL ADDRESS PREPAREDNESS FOR CLIMATE IMPACTS AND HAZARD MITIGATION PLAN

What: On March 2, 2020 the Town of Franklin will host a Community Forum to discuss the impacts of climate change on Franklin and actions the town can take to prepare for those impacts. The community forum will be held at 6:00 p.m. at the Franklin Municipal Building. All Franklin residents, businesses, and civic organizations are invited and encouraged to participate.

The Community Forum will present the results of a Municipal Vulnerability Preparedness (MVP) Workshop that was held on November 20 jointly by the Towns of Franklin and Bellingham and. The MVP Workshop brought together Town Board and Committee members, municipal staff, local businesses, institutions, and civic organizations to identify how Franklin and Bellingham may be vulnerable to the impacts of climate change, as well as the towns' strengths and actions they may take to increase their resilience.

The forum will also summarize the 2020 Update of the town's Hazard Mitigation Plan which is currently being prepared by Franklin with the assistance of the Metropolitan Area Planning Council (MAPC).

Who: Franklin residents, business owners, civic organizations and institutions are invited to attend the forum and provide their input as part of this on-going effort to plan for the Town's future.

When: Monday, March 2, 2020, 6:00 PM

Where: Franklin Municipal Building
Council Chambers
355 East Central Street
Franklin, MA

MAPC is the regional planning agency for 101 communities in the metropolitan Boston area, promoting smart growth and regional collaboration. More information about MAPC is available at www.mapc.org.

##

Town of Franklin
Public Forum on Municipal Vulnerability Preparedness and Hazard Mitigation Plan Update 2020

TIME	ACTIVITIES	
6:00	Arrive, sign in and review climate posters	All attendees
6:15	Welcome and Introductions	Jamie Hellen, Town Manager
6:20	Summary of Climate Trends and Impacts	Martin Pillsbury, MAPC
6:30	Overview of MVP workshop and top priority actions	Bryan Taberner, Director of Planning and Community Development
6:45	Questions and discussion on MVP Actions	All attendees
7:00	Overview of the Hazard Mitigation Plan Update 2020	Martin Pillsbury, MAPC
7:15	Questions and discussion on Hazard Mitigation Plan	All attendees
7:30	Next steps: finalize draft plan, 2nd public meeting	Bryan Taberner, Director of Planning and Community Development
7:45	Adjourn	

See the top MVP Actions and the Hazard Mitigation goals on reverse side

Hazard Mitigation Plan
Public Meeting

Natural hazards can have serious impacts on the Town of Franklin and its residents and businesses

The Town of Franklin has prepared an updated draft Hazard Mitigation Plan to help the town reduce its vulnerability to natural hazards such as flooding, hurricanes, droughts, and winter storms. The plan is part of a joint project with the Town of Bellingham that also included a Municiapl Vulnerability Preparedness workshop on climate resilience. Please join a public meeting via Zoom that will feature a presentation on the Hazard Mitigation Plan. Your questions and input are welcome, please join us!

Date:	Tuesday, July 28, 2020
Time:	6:-00 pm
Location:	Meeting via Zoom at this link: www.zoom.com/xxxx

For more information, please contact
Bryan Taberner at btaberner@franklinma.gov

Amanda Linehan, Communications Manager, Metropolitan Area Planning Council
617-933-0705, alinehan@mapc.org

CALENDAR LISTING / MEDIA ADVISORY

JULY 28 FRAKLIN PUBLIC MEETING ONLINE VIA ZOOM WILL PRESENT THE TOWN'S DRAFT HAZARD MITIGATION PLAN

What: On July 28, 2020 the Town of Franklin will host an online public meeting via Zoom to present the town's Draft Hazard Mitigation Plan. The presentation will be presentation will be made by the Metropolitan Area Planning Council (MAPC), which is assisting the Town with the preparation of its updated Hazard Mitigation Plan.

The Town of Franklin has prepared an updated Hazard Mitigation plan that documents natural hazards that affect the Town, such as floods, hurricanes, winter storms, and droughts, as well as recommended actions that the Town can take to reduce its vulnerability to these hazards. The community forum will be held online at 6:00 p.m. via Zoom at the link below.

The forum will also summarize Municial Vulnerability Preparedness project that Franklin undertook along with the Town of Bellingham.

Who: Franklin residents, business owners, civic organizations and institutions are invited to participate the public meeting and provide their questions and comments as part of this on-going effort to plan for a resilient future for the Town of Franklin.

When: Tuesday, July 28, 2020, 6:00 PM

Where: Online meeting via Zoom at:
www.zoom.com/xxxx

MAPC is the regional planning agency for 101 communities in the metropolitan Boston area, promoting smart growth and regional collaboration. More information about MAPC is available at www.mapc.org.

##

Town of Franklin

Public Meeting on the Draft Hazard Mitigation Plan Update 2020

July 28, 2020 6:00 p.m.

Remote Meeting - Held on "ZOOM" Platform for Citizen Participation

Due to continued concerns regarding the COVID-19 virus the Town will be conducting a remote/virtual Public Meeting for all public access and participation. In an effort to ensure citizen engagement and comply with open meeting law regulations, citizens will be able to dial into the meeting using the provided phone number (Cell phone or Landline Required) OR citizens can participate by copying the link (Phone, Computer, or Tablet required). The remote meeting link and phone number will be active for the duration of the meeting for citizens to ask questions and provide input on the Draft Plan.

Please click on the link https://us02web.zoom.us/j/89019941202 or call on your phone at 312-626-6799, meeting # 890 1994 1202.

TIME	AGENDA	
6:00	Welcome and introductions	All attendees
6:10	Overview of the Bellingham-Franklin Hazard Mitigation & Municipal Vulnerability Preparedness Project	Martin Pillsbury, MAPC
6:20	Presentation of the Draft Hazard Mitigation Plan 2020 Update	Martin Pillsbury, MAPC
6:30	Overview of MVP workshop and top priority actions	Bryan Taberner, Planning & Com. Dev.
6:45	Questions and discussion	All attendees
7:30	Next steps: finalize the plan, MEMA & FEMA Review	Martin Pillsbury, MAPC
7:45	Adjourn	

The Draft Hazard Mitigation Plan is available for review and downloading on the Franklin website at www.franklinma.gov/hazard_mitigation_plan

Questions and comments may be submitted by email to btaberner@franklinma.gov
Please submit any questions or comments by August 14, 2020.

APPENDIX D: PLAN ADOPTION

<TOWN LETTERHEAD>

CERTIFICATE OF ADOPTION
TOWN COUNCIL

TOWN OF FRANKLIN, MASSACHUSETTS

A RESOLUTION ADOPTING THE
TOWN OF FRANKLIN HAZARD MITIGATION PLAN 2020 UPDATE

WHEREAS the Town of Franklin established a Committee to prepare the *Town of Franklin Hazard Mitigation Plan 2020 Update*; and

WHEREAS the *Town of Franklin Hazard Mitigation Plan 2020 Update* contains several potential future projects to mitigate potential impacts from natural hazards in the Town of Franklin, and

WHEREAS, duly noticed public meetings were held by the LOCAL HAZARD MITIGATION PLANNING TEAM on March 2, 2020 and July 28, 2020 and

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

NOW, THEREFORE BE IT RESOLVED that the Town of Franklin Town Council adopts the *Town of Franklin Hazard Mitigation Plan 2020 Update*, in accordance with M.G.L. 40 §4 or the charter and bylaws of the Town of Franklin.

ADOPTED AND SIGNED this Date. _____

Name(s)

Title(s)

Signature(s)

APPENDIX E: MVP WORKSHOP RESULTS

HIGHEST PRIORITY ACTIONS FROM THE MVP WORKSHOP	VOTES
1. Emergency Sheltering and Evacuation • Work with senior facilities and housing on **emergency sheltering and evacuation** • **Identify vulnerable populations**, work with community and faith-based organizations to develop strategies to mitigate risks, provide shelters and transportation to shelters • Investigate **emergency services and shelters** and coordinate with Local Emergency Planning Committee; bring all stakeholders together; meet regionally • **Increase number and quality of shelters** – collaborate with community resources, EMP, Red Cross, hospitals, hotels, restaurants, etc. • Investigate **emergency access and backup plans** for Central Park Terrace senior housing • **Food Pantries**: increase outreach to foster support and expand existing sites	**27**
2. Communications and Vulnerable Populations • **Communications infrastructure**: identify ways to connect with people on EEE, extreme weather events • Plan to identify and leverage **services for demographic groups** that may slip between the cracks in social networks • **Increase awareness and educate the towns** on risks and mitigation through social media and town websites (EEE, etc) • Develop a **robust communication plan** for emergency events that includes other languages • Strengthen communications with Non-Governmental Organizations related to **language barriers** and establish a **Task Force to identify vulnerable populations**	**19**

3. Water Resources • Study **capacity of future water supply** for Franklin • **Water Quality:** reliance on wells: Communication & education; wetland protection, control/manage water bodies. • Review and update **stormwater regulations** • **Protect water supplies**	**16**
4. Environment / Sustainable Development • Address **growth management in a sustainable fashion**; preserve open space • Identify key **habitat areas for future protection** measures and conservation	**10**
5. Reliable Power & Tree Management • **Tree maintenance**; cut back; utilities and towns • **Audit commercial generators** in towns • Future development **– underground power lines**	**9**
6. Public Safety Resources • Increase resources for **Public Safety and Public Works** in both towns	**9**
7. Green Energy • Apply for Green Communities and other similar sources • Locate/site solar farms in areas that have been previously cleared; don't impact the natural landscape	**6**
8. Long-Term Infrastructure Planning • Culverts and bridges, capital improvements and maintenance • Continued improvement of infrastructure: design for a new future; long range impact requirements	**2**