

SELECT BOARD

6:00 p.m. June 9, 2020

Needham Town Hall

Revised Agenda

Under Governor Baker’s emergency “Order Suspending Certain Provisions of the Open Meeting Law G.L. c. 30A, S20”, issued March 12, 2020 and in effect until termination of the emergency, meetings of public bodies may be conducted virtually provided that adequate access is provided to the public.

To listen and view this virtual meeting on a phone, computer, laptop, or tablet, download the “Zoom Cloud Meeting” app in any app store or at www.zoom.us. At the above date and time, click on “Join a Meeting” and enter the meeting 81178733033 or click the link below to join the webinar: <https://us02web.zoom.us/j/81178733033>.

	5:45	<p>Informal Meeting with Citizens</p> <p><i>One or more members of the Select Board will be available between 5:45 and 6:00 p.m. for informal discussion with citizens. While not required, citizens are encouraged to call the Select Board’s Office at (781) 455-7500 extension 204 in advance to arrange for an appointment. This enables the Board to better assure opportunities for participation and respond to citizen concerns.</i></p>
1.	6:00	<p>Public Hearing – Transfer of All Alcoholic Beverages License Change of LLC Membership Interest, Change of LLC Manager, and Change of Manager of Record for Spiga LLC d/b/a Spiga located at 18 Highland Circle</p> <ul style="list-style-type: none"> • Stephen Miller, Attorney • Marisa Iocco, Owner and Proposed New Manager
2.	6:10	<p>Updates to Needham’s Hazard Mitigation Plan and about the Municipal Vulnerability Preparedness Program</p> <ul style="list-style-type: none"> • Ms. Anne Herbst, Senior Regional Environmental Planner, Metropolitan Area Planning Council • Ms. Kim Donovan, Compliance Coordinator, Needham Department of Public Works
3.	6:25	Joint meeting with Park & Recreation Commission
4.	6:45	Alteration of Premises for Ray’s New Garden
5.	7:00	<p>Town Manager</p> <ul style="list-style-type: none"> • Naming of Public Safety Building Community Room • Town Manager’s Report
6.	7:15	<p>Board Discussion</p> <ul style="list-style-type: none"> • Economic Development • Committee Reports

CONSENT AGENDA *=Backup attached

1.	Accept a \$60 donation made to the Needham Health Division’s Traveling Meals program from Douglas and Susan Carpenter.
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2.	Approve placement of “June is Pride Month in Needham” signs on Town Hall property for a period of two weeks.
3.*	Approve minutes of May 20, 2020 and May 27, 2020.
4.	Approve a fee waiver for tents on commercial properties of \$200 in support of assisting the economic recovery of area restaurants.



**Select Board
TOWN OF NEEDHAM
AGENDA FACT SHEET**

MEETING DATE: 03/24/2020

Continued to: 5/12/2020

Continued to: June 9, 2020

REVISED

Agenda Item	Public Hearing – Transfer of All Alcoholic Beverages License Change of LLC Membership Interest, Change of LLC Manager, and Change of Manager of Record Spiga LLC d/b/a Spiga located at 18 Highland Circle
Presenter(s)	Stephen Miller, Attorney Marisa Iocco, Proposed Manager

1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
	<p><i>This hearing was originally scheduled for 3.24.2020 and due to COVID-19 was rescheduled until 5/12/2020, where it was continued to the meeting of June 9th.</i></p> <p>Attorney Stephen Miller is requesting a multiple license amendment for Spiga Transfer of License, Change of LLC Manager, Change in Manager and Change of Ownership Interest from Spiga LLC d/b/a Spiga, a restaurant with a license to serve All Alcoholic beverages at 18 Highland Circle. The new proposed manager will be Marisa Iocco.</p> <p>This is a public hearing and has been advertised in the Needham Times February 27, 2020.</p>
2.	VOTE REQUIRED BY SELECT BOARD
	<p>Suggested Motion: <i>That the Board vote to approve Spiga’s application for a change of Officers, Ownership Interest and Change of Manager to Marisa Iocco for its restaurant located at 18 Highland Circle and to forward this application to the ABCC for approval.</i></p>
3.	BACK UP INFORMATION ATTACHED
	<p>Application for multiple amendments only. Remainder of application to be distributed on 6/8/2020</p>



The Commonwealth of Massachusetts
 Alcoholic Beverages Control Commission
 95 Fourth Street, Suite 3, Chelsea, MA 02150-2358
 www.mass.gov/abcc

APPLICATION FOR MULTIPLE AMENDMENTS

1. BUSINESS ENTITY INFORMATION

Entity Name	Municipality	ABCC License Number
Spiga LLC	Needham	00023-RS-0770

Please provide a narrative overview of the transaction(s) being applied for. On-premises applicants should also provide a description of the intended theme or concept of the business operation. Attach additional pages, if necessary.

Application for Change of LLC Membership Interest, Change of LLC Manager, and Change of Manager of Record to Marisa Iocco. Existing LLC Manager and Member Marisa Iocco is purchasing 50% interest from LLC Member Carmelo Iritti. In turn, she is transferring 30% to Francesco Iacovitti for \$1.00 and sweat equity.

APPLICATION CONTACT

The application contact is the person who should be contacted with any questions regarding this application.

Name	Title	Email	Phone
Stephen V. Miller, Esq.	Attorney for Applicant	smiller@mqmlp.com	(617) 946-4600

2. AMENDMENT-Change of License Classification

<input type="checkbox"/> Change of License Category All Alcohol, Wine and Malt, Wine Malt and Cordials	Last-Approved License Category	
	Requested New License Category	
<input type="checkbox"/> Change of License Class Seasonal or Annual	Last-Approved License Class	
	Requested New License Class	
<input type="checkbox"/> Change of License Type* i.e. Restaurant to Club *Certain License Types CANNOT change once issued*	Last-Approved License Type	
	Requested New License Type	

3. AMENDMENT-Change of Business Entity Information

<input type="checkbox"/> Change of Corporate Name	Last-Approved Corporate Name:	
	Requested New Corporate Name:	
<input type="checkbox"/> Change of DBA	Last-Approved DBA:	
	Requested New DBA:	
<input type="checkbox"/> Change of Corporate Structure LLC, Corporation, Sole Proprietor, etc	Last-Approved Corporate Structure	
	Requested New Corporate Structure	

4. AMENDMENT-Pledge Information

<input type="checkbox"/> Pledge of License	To whom is the pledge being made:	
<input type="checkbox"/> Pledge of Inventory		
<input type="checkbox"/> Pledge of Stock		

5. AMENDMENT-Change of Manager

Change of License Manager

A. MANAGER INFORMATION

The individual that has been appointed to manage and control the licensed business and premises.

Proposed Manager Name Date of Birth SSN

Residential Address

Email Phone

Please indicate how many hours per week you intend to be on the licensed premises Last-Approved License Manager

B. CITIZENSHIP/BACKGROUND INFORMATION

Are you a U.S. Citizen? Yes No *Manager must be a U.S. Citizen
 If yes, attach one of the following as proof of citizenship US Passport, Voter's Certificate, Birth Certificate or Naturalization Papers.
 Have you ever been convicted of a state, federal, or military crime? Yes No
 If yes, fill out the table below and attach an affidavit providing the details of any and all convictions. Attach additional pages, if necessary, utilizing the format below.

Date	Municipality	Charge	Disposition
N/A	N/A	N/A	N/A

C. EMPLOYMENT INFORMATION *Please see additional page attached hereto.

Please provide your employment history. Attach additional pages, if necessary, utilizing the format below.

Start Date	End Date	Position	Employer	Supervisor Name
2017	Present	Chef/ GM	Spiga	Self
2016	2017	Executive Chef	Scopa	Gerry Riccio
2012	2017	Executive Chef	Gennaro	Gerry Riccio
2010	2011	Consulting Chef	Terra Mia	Carla Agrippino

D. PRIOR DISCIPLINARY ACTION

Have you held a beneficial or financial interest in, or been the manager of, a license to sell alcoholic beverages that was subject to disciplinary action? Yes No If yes, please fill out the table. Attach additional pages, if necessary,utilizing the format below.

Date of Action	Name of License	State	City	Reason for suspension, revocation or cancellation
N/A	N/A	N/A	N/A	N/A

I hereby swear under the pains and penalties of perjury that the information I have provided in this application is true and accurate:

Manager's Signature Date

5C. Employment Information (Continued)

Start Date	End Date	Position	Employer	Supervisor Name
2010	2011	Consulting Chef	Antico Forno	Carla Agrippino
2009	2010	Consulting Chef	Spiga	Carmelo Iriti
2003	2009	Executive Chef	Umbria	Frank de Pasquale
2003	2009	Executive Chef	Mare	Frank de Pasquale
2003	2009	Executive Chef	Bricco	Frank de Pasquale

6. AMENDMENT-Change of Officers, Stock or Ownership Interest

Change of Officers/Directors **Change of Ownership Interest (LLC Managers/LLP Partners, Trustees)** **Change of Stock (E.g. New Stockholder/ Transfer or Issuance of Stock)**

List all individuals or entities that will have a direct or indirect, beneficial or financial interest in this license (E.g. Stockholders, Officers, Directors, LLC Managers, LLP Partners, Trustees etc.). Attach additional page(s) provided, if necessary, utilizing Addendum A.

- The individuals and titles listed in this section must be identical to those filed with the Massachusetts Secretary of State.
- The individuals identified in this section, as well as the proposed Manager of Record, must complete a CORI Release Form.
- Please note the following statutory requirements for Directors and LLC Managers:
On Premises (E.g. Restaurant/ Club/Hotel) Directors or LLC Managers - At least 50% must be US citizens;
Off Premises(Liquor Store) Directors or LLC Managers - All must be US citizens and a majority must be Massachusetts residents.
- If you are a Multi-Tiered Organization, please attach a flow chart identifying each corporate interest and the individual owners of each entity as well as the Articles of Organization for each corporate entity. Every individual must be identified in Addendum A.

Name of Principal	Residential Address	SSN	DOB
Marisa Iocco	453 Washington Street, Boston, MA 02111	[REDACTED]	[REDACTED]

Title and or Position	Percentage of Ownership	Director/ LLC Manager	US Citizen	MA Resident
LLC Manager, LLC Member	70%	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No

Name of Principal	Residential Address	SSN	DOB
Francesco Iacovitti	5 Summer Street, Newton, MA 02464	[REDACTED]	[REDACTED]

Title and or Position	Percentage of Ownership	Director/ LLC Manager	US Citizen	MA Resident
LLC Manager, LLC Member	30%	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No

Name of Principal	Residential Address	SSN	DOB

Title and or Position	Percentage of Ownership	Director/ LLC Manager	US Citizen	MA Resident
		<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No

Name of Principal	Residential Address	SSN	DOB

Title and or Position	Percentage of Ownership	Director/ LLC Manager	US Citizen	MA Resident
		<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No

Name of Principal	Residential Address	SSN	DOB

Title and or Position	Percentage of Ownership	Director/ LLC Manager	US Citizen	MA Resident
		<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No

Name of Principal	Residential Address	SSN	DOB

Title and or Position	Percentage of Ownership	Director/ LLC Manager	US Citizen	MA Resident
		<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No

Additional pages attached? Yes No

CRIMINAL HISTORY
 Has any individual listed in question 6, and applicable attachments, ever been convicted of a State, Federal or Military Crime? If yes, attach an affidavit providing the details of any and all convictions. Yes No

MANAGEMENT AGREEMENT
 Are you requesting approval to utilize a management company through a management agreement? Please provide a copy of the management agreement. Yes No

6. AMENDMENT-Change of Officers, Stock or Ownership Interest

6B. CURRENT OFFICERS, STOCK OR OWNERSHIP INTEREST

List the individuals and entities of the current ownership. Attach additional pages if necessary utilizing the format below.

Name of Principal	Title/Position	Percentage of Ownership
Marisa locco	LLC Manager, LLC Member	50%
Carmelo Iriti	LLC Manager, LLC Member	50%

6A. INTEREST IN AN ALCOHOLIC BEVERAGES LICENSE

Does any individual or entity identified in question 6, and applicable attachments, have any direct or indirect, beneficial or financial interest in any other license to sell alcoholic beverages? Yes No If yes, list in table below. Attach additional pages, if necessary, utilizing the table format below.

Name	License Type	License Name	Municipality
N/A	N/A	N/A	N/A

6B. PREVIOUSLY HELD INTEREST IN AN ALCOHOLIC BEVERAGES LICENSE

Has any individual or entity identified in question 6, and applicable attachments, ever held a direct or indirect, beneficial or financial interest in a license to sell alcoholic beverages, which is not presently held? Yes No
If yes, list in table below. Attach additional pages, if necessary, utilizing the table format below.

Name	License Type	License Name	Municipality
Marisa locco	§12 Restaurant	Galleria Italiana	Boston
Marisa locco	§12 Restaurant	La Bettola	Boston

6C. DISCLOSURE OF LICENSE DISCIPLINARY ACTION

Have any of the disclosed licenses listed in question 6A or 6B ever been suspended, revoked or cancelled? Yes No If yes, list in table below. Attach additional pages, if necessary, utilizing the table format below.

Date of Action	Name of License	City	Reason for suspension, revocation or cancellation
N/A	N/A	N/A	N/A

9. FINANCIAL DISCLOSURE

Required for the following transactions:

- Change of Officers, Stock or Ownership Interest (E.g. New Stockholder/Transfer or Issuance of Stock)
- Change of Premises Information
- Pledge of License, Inventory or Stock

Purchase Price(s):

\$130,000.00 for the purchase of 50% of the membership interest; and \$1.00 for the the purchase of the 30% of the membership interest.

SOURCE OF CASH CONTRIBUTION

Please provide documentation of available funds. (E.g. Bank or other Financial institution Statements, Bank Letter, etc.)

Name of Contributor	Amount of Contribution
Marisa locco	\$3,650.00
Francesco Iacovitti	\$1.00
Total:	\$3,651.00

SOURCE OF FINANCING

Please provide signed financing documentation.

Name of Lender	Amount	Type of Financing	Is the lender a licensee pursuant to M.G.L. Ch. 138.
Carmelo Iriti	\$126,350.00	Seller-financed Promissory Note	<input type="radio"/> Yes <input checked="" type="radio"/> No
			<input type="radio"/> Yes <input type="radio"/> No
			<input type="radio"/> Yes <input type="radio"/> No
			<input type="radio"/> Yes <input type="radio"/> No

FINANCIAL INFORMATION

Provide a detailed explanation of the form(s) and source(s) of funding for the cost identified above.

Existing LLC Manager and Member, Marisa locco is purchasing a 50% membership interest from Carmelo Iriti for \$130,000.00. Of this amount, Marisa locco provided \$3,650.00 from her personal funds and \$126,350.00 are funded through a Seller-financed Promissory Note. In turn, Marisa locco is transferring 30% membership interest to Francesco Iacovitti for \$1.00 and other valuable consideration, namely sweat equity in the business.



**Select Board
TOWN OF NEEDHAM
AGENDA FACT SHEET**

MEETING DATE: 06/09/2020

Agenda Item	Updates to Needham's Hazard Mitigation Plan and about the Municipal Vulnerability Preparedness Program
Presenter(s)	Ms. Anne Herbst, Senior Regional Environmental Planner, Metropolitan Area Planning Council Ms. Kim Donovan, Compliance Coordinator, Needham Department of Public Works

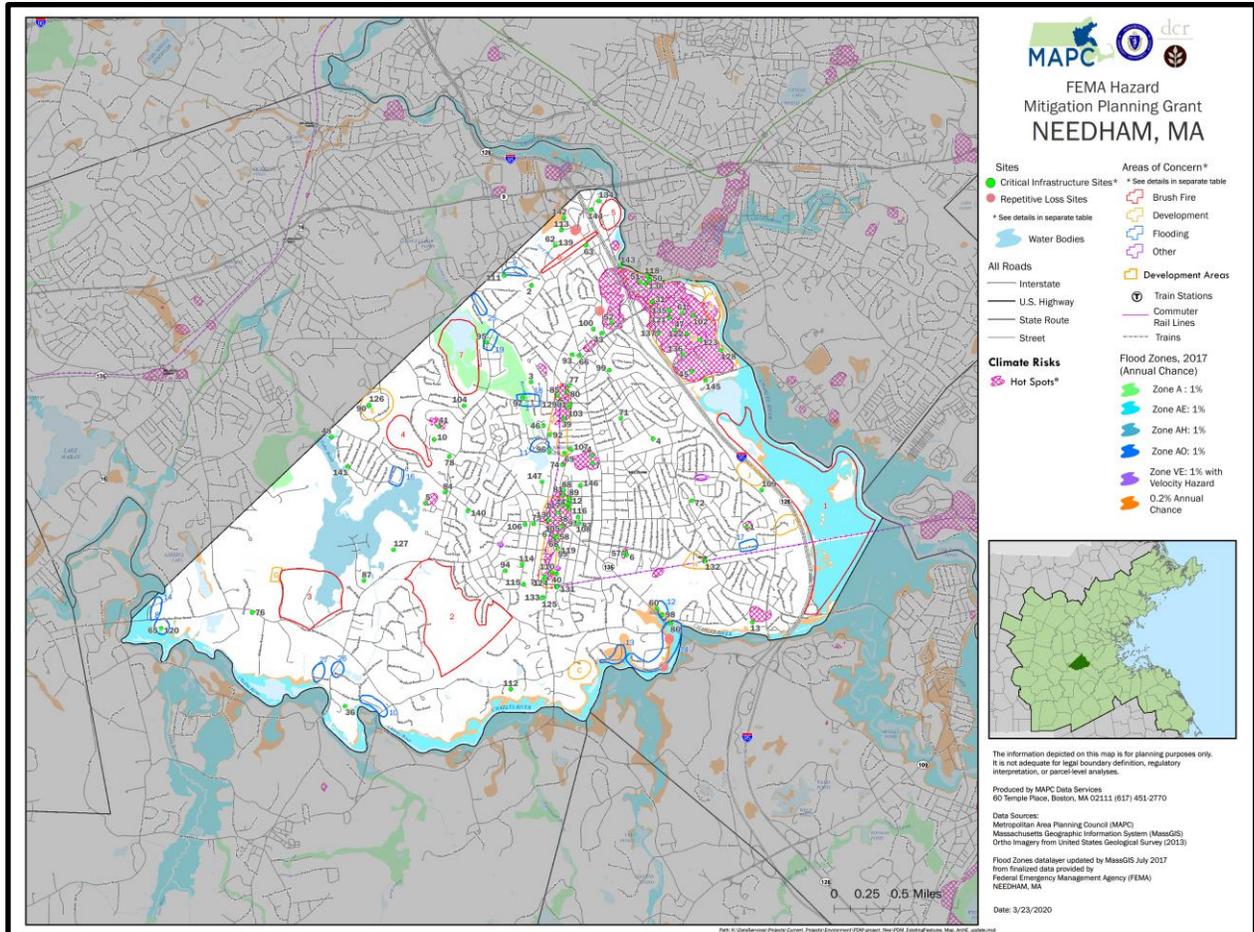
1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
	<p>Anne Herbst, Senior Environmental Planner with the Metropolitan Area Planning Council (MAPC), will present the final draft of Needham's update to the existing Hazard Mitigation Plan (HMP). The plan documents natural hazards that affect the Town, such as floods, hurricanes, and severe winter storms, and recommends actions the Town can take to reduce its vulnerability to these hazards. HMPs are prepared under the auspices of FEMA. Approval of the plan by FEMA will make Needham eligible for grants to address recommended actions. The Select Board will not be asked to adopt the plan at this time. After a two-week comment period the plan will go to MEMA and FEMA for review and then will come to the Select Board for adoption.</p> <p>Ms. Herbst will also update the Select Board on the completion of the Municipal Vulnerability Preparedness (MVP) program. Certification as an MVP community makes Needham eligible to apply for state grants to address climate vulnerabilities.</p> <p>The Hazard Mitigation Plan and the Municipal Vulnerability Report are available for review on the Town website at: http://www.needhamma.gov/4931/Municipal-Vulnerability-Preparedness.</p>
2.	VOTE REQUIRED BY SELECT BOARD
	No vote is required.
3.	BACK UP INFORMATION ATTACHED
	A copy of Needham's updated draft Hazard Mitigation Plan and MVP Report/Summary of Findings are attached.

DRAFT

TOWN OF NEEDHAM

HAZARD MITIGATION PLAN

2020 UPDATE



Draft Plan Update
June 2, 2020

ACKNOWLEDGEMENTS & CREDITS

This plan was prepared for the Town of Needham 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 Draisen, MAPC

Credits

Project Manager: Martin Pillsbury
 Lead Project Planner: Anne Herbst
 Mapping/GIS Services: Caitlin Spence

Massachusetts Emergency Management Agency

Director: Samantha Phillips

Department of Conservation and Recreation

Commissioner: Jim Montgomery

Needham Local Hazard Mitigation Planning Team

Rebecca Ping	Emergency Management Administrator, Project Coordinator
Kimberly Donovan	Compliance Coordinator
Sean Harrington	Superintendent Water and Sewer
Nicholas Ceurvels	Lieutenant Firefighter
Tony Del Gaizo	Town Engineer
Richard Merson	Public Works Director
Carys Lustig	Director of Finance and Administration for Public Services
Eleanor Rosellini	Green Needham Collaborative
Jessica Moss	Assistant Director of Counseling and Volunteers
Dave Roche	Building Commissioner
Steve Cusick	Water Treatment Plant Manager
Debbie Anderson	Conservation Administrator
Tiffany Zike	Public Health Nurse
John McGrath	Police Lieutenant
Barry Dulong	Director of Building Maintenance
Rhain Hayland	Superintendent Highway Division
Lee Newman	Director of 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

Planning for the Hazard Mitigation Plan update was led by the Needham Local Hazard Mitigation Planning Team, composed of staff from a number of different town departments. The team also led a parallel planning process as part of the Massachusetts Municipal Vulnerability Preparedness (MVP) program focused on identifying climate risks and resilience strategies. In the joint effort, the team met on November 13, 2019, December 11, 2019, and May 21, 2010 and discussed where the impacts of natural hazards most affect the town, goals for addressing these impacts, updates to the Town's existing mitigation measures, and new or revised hazard mitigation measures that would benefit the town.

Public participation in this 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 Planning Team hosted two public meetings. Due to the restrictions on public gatherings associated with the corona virus pandemic public outreach had to be handled creatively. The first meeting took place in the form of a website posted on May 4, 2020 that provided a video presentation and survey for participants to fill out. The video was viewed more than 70 times and 20 people filled out surveys. The second meeting on June 9, 2010 was held via Zoom and the draft plan update was posted on the Town's website for public review. Key town stakeholders and neighboring communities were notified and invited to review the draft plan and submit comments. As part of the MVP program, the town hosted an all-day workshop on January 10, 2020 where 39 participants identified climate resilience vulnerabilities and mitigation strategies. These strategies were also reviewed in the May website posting. See Public Comments for feedback. The top priorities are shown in Appendix E.

RISK ASSESSMENT

The Needham Hazard Mitigation Plan assesses the potential impacts to the town from flooding, high winds, winter storms, brush fire, geologic hazards, extreme temperatures, drought and, invasive species. For each risk, the assessment identifies the projected impacts of a warming climate. These are shown in the map series in Appendix B. The Needham Local Hazard Mitigation Planning Team identified 113 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) to estimate physical, economic, and social impacts of disasters. The HAZUS-MH analysis for Needham estimates property damages from Hurricanes of category 2 and 4 (\$36 million to \$138 million), earthquakes of magnitudes 5 and 7 (\$725 million to \$6.3 billion), and the 1% and .2% chance of flooding (\$27 to \$36 million).

HAZARD MITIGATION GOALS

The Needham Local Multiple Hazard Community Planning Team endorsed the following eleven hazard mitigation goals at the January 16, 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.

HAZARD MITIGATION STRATEGY

The Needham Local Hazard Mitigation Planning Team identified a number of mitigation measures that would serve to reduce the Town's vulnerability to natural hazard events. Overall, the hazard mitigation strategy recognizes that mitigating hazards for Needham 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 Needham’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 and the Select Board. The plan was also available on the Town’s website for public comment. See Public Comments for feedback.
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 Needham 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.
Sections 7 and 8: Hazard Mitigation Strategy	Mitigation measures from the 2009 plan were reviewed and assessed as to whether they were completed, in progress, or deferred. The Local Hazard Mitigation Planning 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 2009 plan. The Local Hazard Mitigation Team prioritized all of these measures 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.

As indicated in Table 33, Needham made good progress implementing mitigation measures identified in the 2009 Hazard Mitigation Plan. Considerable work has been done reduce infiltration into the sewer system. The Town is now moving its focus to inflow. Bypass protocols are in place to prevent sewer back-ups. The Town purchased portable generators for multiple locations. The control structure and weir at Walker Pond were completed. The Hazardous Materials Response plan was revised and updated. The Town continues to make open space purchases and regularly sets aside \$1.5 million for purchase of priority properties that may become available. The Town adopted a strong stormwater bylaw and completed a comprehensive stormwater management plan in compliance with MS4 requirements.

Some projects were partially completed, and/or will be continued to the next plan for on-going maintenance. A permanent generator is needed for the Senior Center and for sewer pump stations as they are upgraded. While many bridges have been updated, the Central Avenue bridge to Dover needs attention. Stormwater management and open space purchases are all ongoing priorities.

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. As in the past, the Town will document any actions taken within this iteration of the Hazard Mitigation Plan on challenges met and actions successfully adopted as part of the ongoing plan maintenance to be conducted by the Needham Hazard Mitigation Implementation Team, as described in Section 9 Plan Adoption and Maintenance.

SECTION 2: INTRODUCTION

PLANNING REQUIREMENTS UNDER THE FEDERAL DISASTER MITIGATION ACT

The Federal Disaster Mitigation Act, passed in 2000, requires that after November 1, 2004, all municipalities that wish to continue to be eligible to receive FEMA funding for hazard mitigation grants, must adopt a local multi-hazard mitigation plan 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 Town of Needham contracted with the Metropolitan Area Planning Council (MAPC), to assist the Town in updating its local Hazard Mitigation Plan to assist the Town in updating its local Hazard Mitigation Plan, which was first adopted in 2009 as a multijurisdictional plan.

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. This plan incorporates consideration of future risks due to projections for the increased frequency and severity of extreme weather fueled by a warming planet.

PREVIOUS FEDERAL/STATE DISASTERS

Since 1991, there have been 24 natural hazard events that triggered federal or state disaster declarations that included Norfolk 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, 1991-2018

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, 2018

FEMA FUNDED MITIGATION PROJECTS

Needham has not previously received FEMA funded mitigation projects.

COMMUNITY PROFILE

Needham covers nearly 13 square miles and is located 10 miles southwest of downtown Boston. The Charles River surrounds Needham on three sides. The Town of Needham was established in 1711. Through the mid-1800's Needham was primarily an agricultural community. With the development of rail access, Needham became home to seasonal estates and to the knitting industry. The construction of Route 128 in the mid-20th century brought new commercial ventures. Needham today is residential suburban community with significant business presence along Route 128.

Needham is a relatively affluent community with high median annual income and a low poverty rate. Needham has just over 30,000 residents. Roughly 87% of residents are White. There is a growing Asian population. Approximately half of the 8% of the population that identifies as Asian is of Chinese descent. Notably, 25% of Needham's population lives alone, and 50% of those living alone are over 65 years old.

The town maintains a website at <http://www.needhamma.gov/>

Table 3: Needham Characteristics

Population = 30,429 people <ul style="list-style-type: none"> • 5.7% are under age 5 • 26.9% are under age 18 • 18.2% are over age 65 • 4.4% of households are limited English-speaking • 1.7% of households have no vehicle available • 87% of the population is White
Number of Housing Units = 3,799 <ul style="list-style-type: none"> • 17.4% are renter-occupied housing units • 23.8% of housing units were built before 1940

Source: 2017 American Community Survey

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

- Needham has been proactive in addressing the impact of climate on natural hazards; the community is in the process of becoming certified by the state as a Municipal Vulnerability Preparedness community.
- Needham is lies within the Charles River watershed and is encircled by the river on three sides.
- Water quantity and quality are important concerns for maintaining drinking water supply and the for the health of the many brooks, river and wetlands within the town.
- Records from flooding in 2010 highlight that the more densely developed northeast half of the town is where flood damage occurred.
- A portion of Route 128 lies within Needham’s boundaries. Residents noted concerns about potential impacts from the transport of hazardous materials, and for extreme traffic tie-ups in the event of emergency evacuations.

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 other plan stakeholders through two public meetings, 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:

- Town of Needham General By-Laws
- Zoning By-Law of the Town of Needham
- Town of Needham Community Resilience Building Workshop Summary of Findings 2020
- Town of Needham Draft Open Space and Recreation Plan 2017
- 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 Flood Hazard Management Program
- Massachusetts Office of Coastal Zone Management Shoreline Change Data
- 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/>
- 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 must be 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.

2009 PLAN IMPLEMENTATION & MAINTENANCE

The 2009 Town of Needham 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 the measures. The Town has advanced a number of projects for implementation, addressing sewer infiltration, adoption of a Stormwater Bylaw and, land preservation.

THE LOCAL MULTIPLE HAZARD COMMUNITY PLANNING TEAM

MAPC worked with the local community representatives to organize a Local Hazard Mitigation Planning Team for Needham. 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 Planning 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, existing mitigation measures, and helping to develop new mitigation measures for this plan update. The Local Hazard Mitigation Planning Team membership is listed below.

Rebecca Ping	Emergency Management Administrator, Project Coordinator
Kimberly Donovan	Compliance Coordinator
Sean Harrington	Superintendent Water and Sewer
Nicholas Ceurvels	Lieutenant Firefighter
Tony Del Gaizo	Town Engineer
Richard Merson	Public Works Director
Carys Lustig	Director of Finance and Administration for Public Services
Eleanor Rosellini	Green Needham Collaborative
Jessica Moss	Assistant Director of Counselling and Volunteers – Council on Aging

Dave Roche	Building Commissioner
Steve Cusick	Water Treatment Plant Manager
Debbie Anderson	Conservation Administrator
Tiffany Zike	Public Health Nurse
John McGrath	Police Lieutenant
Barry Dulong	Director of Building Maintenance
Rhain Hayland	Superintendent Highway Division
Lee Newman	Director of Planning and Community Development

The Needham Planning Board and Conservation Commission are the primary entities responsible for regulating development in town. Feedback was assured through the participation of the Conservation Administrator and Director of Planning and Community Development. A member of the Planning Board and the Select Board and representatives of most town departments and many boards and commissions participated in an all-day workshop on natural hazards and climate impacts. In addition, MAPC, the State-designated regional planning authority for Needham, works with all agencies that regulate development in the region, including the listed municipal entities and state agencies, such as the Department of Transportation and the Department of Conservation and Recreation.

The Local Hazard Mitigation Planning Team met on the following dates: November 13, 2019, December 11, and May 21, 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 in early November. Later meetings focused on verifying information gathered by MAPC staff and discussion of existing mitigation practices, the status of mitigation measures identified in the 2009 hazard mitigation plan, and potential new or revised mitigation measures. 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 and climate impacts, 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 a complete draft plan was available for review.

In addition to the two public meetings, Needham held an all-day workshop attended by thirty-nine Needham town staff, board and committee members, and representatives of local

organizations. The workshop focused on climate impacts to natural hazards. The public had an opportunity to provide input to the Needham hazard mitigation planning process during via a website that provided a video and survey feedback option during the first two weeks in May. The draft plan update was presented at a Select Board meeting on June 9, 2020 held virtually via Zoom. The Select Board meeting was also broadcast on local cable television and the Town website. Both meetings were publicized in accordance with the Massachusetts Public Meeting Law. The attendance list for each meeting can be found in Table 4. See public meeting notices in Appendix C.

Table 4: Needham Public Meetings

Meeting #1 May 4 to May 18 (virtual)	
Total Attendance: 20+	
20 filled out surveys	
71 viewed the video	
Meeting #2 June 9, 2020	
Total Attendance:	
Name	Representing

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 review the Hazard Mitigation Plan and submit comments to the Town:

- Charles River Watershed Association
- Newton Needham Chamber of Commerce
- Green Needham
- League of Women Voters
- Babson College
- Needham Heights Neighborhood Assoc.
- Beth Israel Deaconess – Needham
- MWRA
- Olin College
- Town of Wellesley
- Town of Dover
- Town of Westwood
- Town of Dedham
- City of Boston
- City of Newton
- Needham Clergy Association

See Appendix C for public meeting notices. The draft Needham 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

Comments from the first public comment period indicated strong support for four priorities including protecting drinking water infrastructure, addressing stormwater flooding, strategies to both protect trees and protect the public from tree damage, and assuring robust and redundant utility and communications infrastructure. [Comments from the second meeting here.](#)

CONTINUING PUBLIC PARTICIPATION

Following the adoption of the plan update, the planning 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 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.

PLANNING TIMELINE

November 13, 2019	Meeting of the Needham Local Hazard Mitigation and MVP Planning Team
December 11, 2019	Meeting of the Needham Local Hazard Mitigation and MVP Planning Team
January 10, 2020	All day MVP Workshop
May 4-18, 2020	First Public Meeting held virtually
May 21 2020	Meeting of the Needham Local Hazard Mitigation and MVP Planning Team
June 9, 2010	Second Public Meeting with the Needham Select Board
	Draft Plan Update submitted to MEMA
	Draft Plan Update submitted to FEMA
	Notice of Approvable Pending Adoption sent by FEMA
	Plan Adopted by the Needham Select Board

FEMA final approval of the plan for 5 years, until xxxxxxxx

SECTION 4: RISK ASSESSMENT

The risk assessment analyzes the potential natural hazards that could occur within the Town of Needham 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 Needham's 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. 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

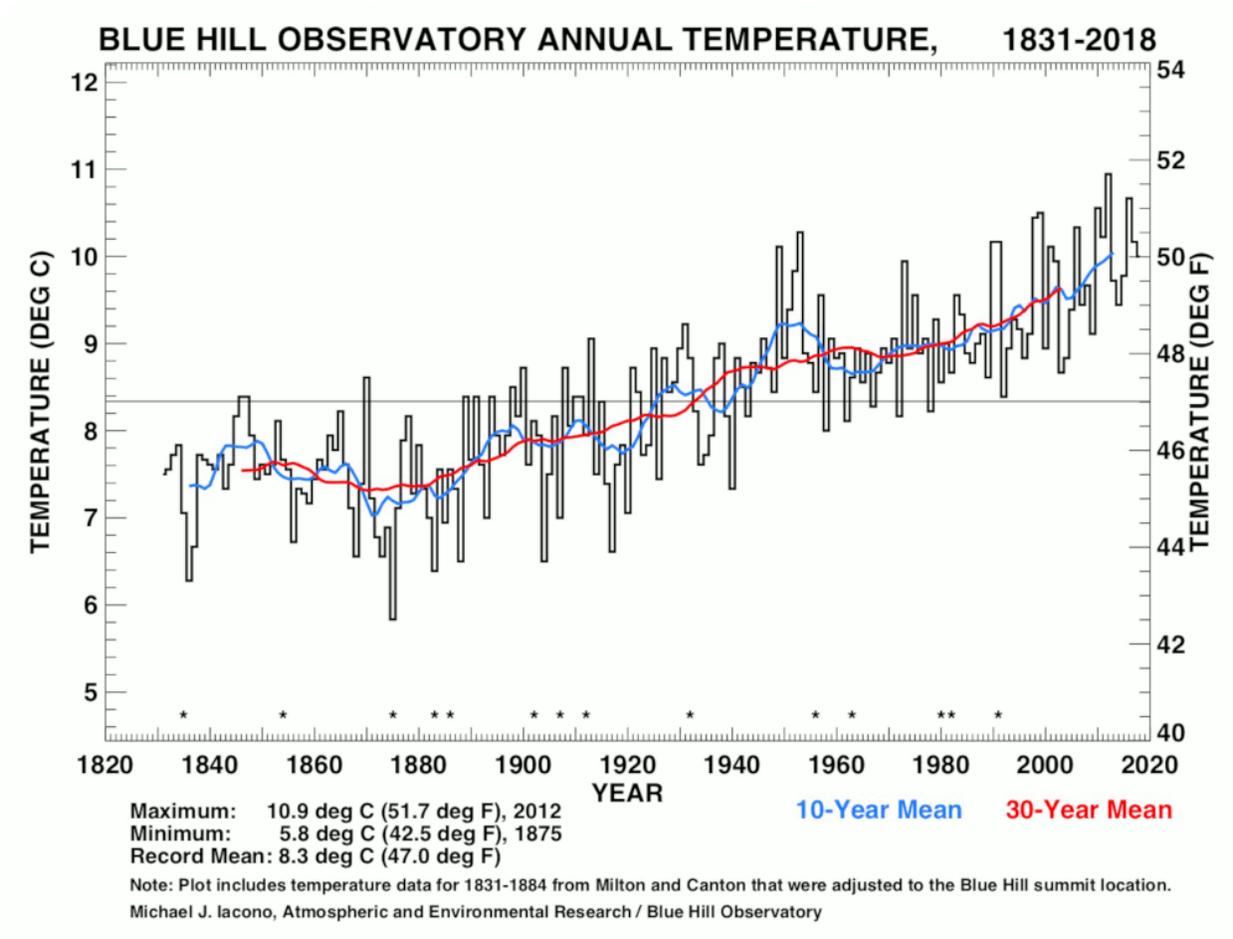
Climate change observations come from a variety of data sources that have measured and recorded changes in recent decades and centuries. Climate change projections, however, predict future climate impacts and, by their nature, cannot be observed or measured. As a result of the inherent uncertainty in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

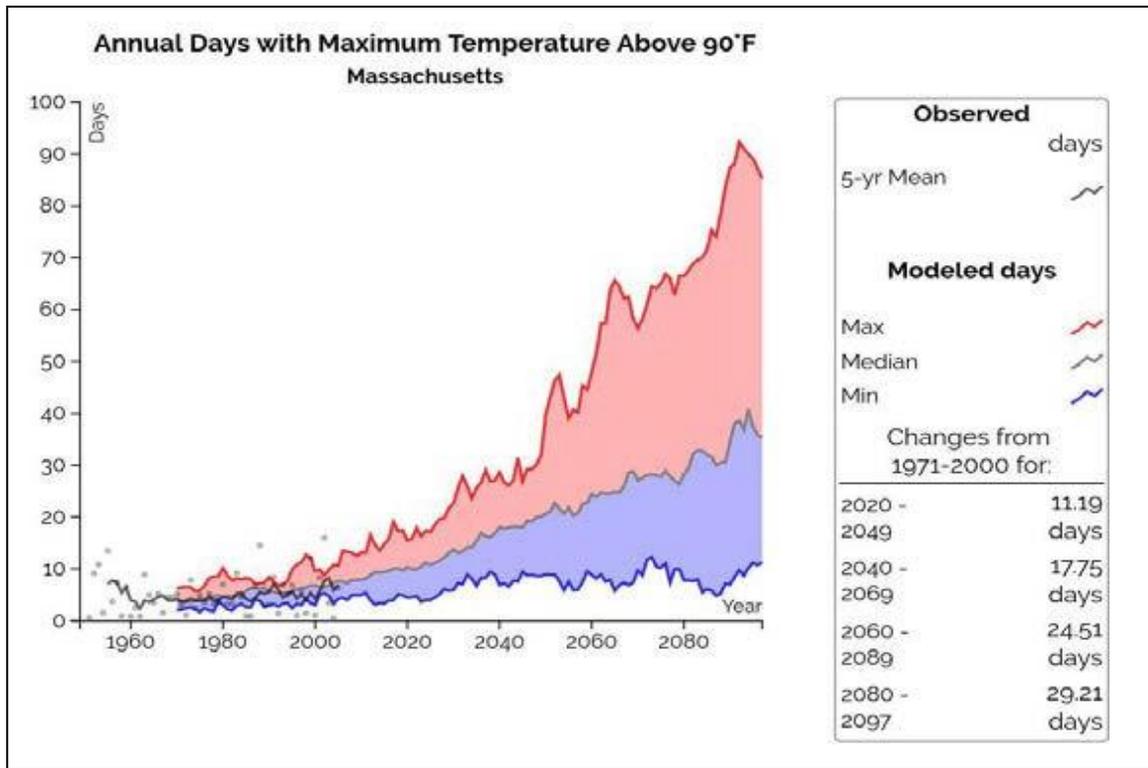
Records from the Blue Hill Observatory in Milton, MA show that average temperatures (30-year mean) have risen approximately 3 degrees (F) in the almost 200 years since record keeping began in 1831.

Figure 2: Observed Increase in Temperature



Climate projections include an increase in average temperature and in the number of extreme heat days. Extreme cold days 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. Table 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



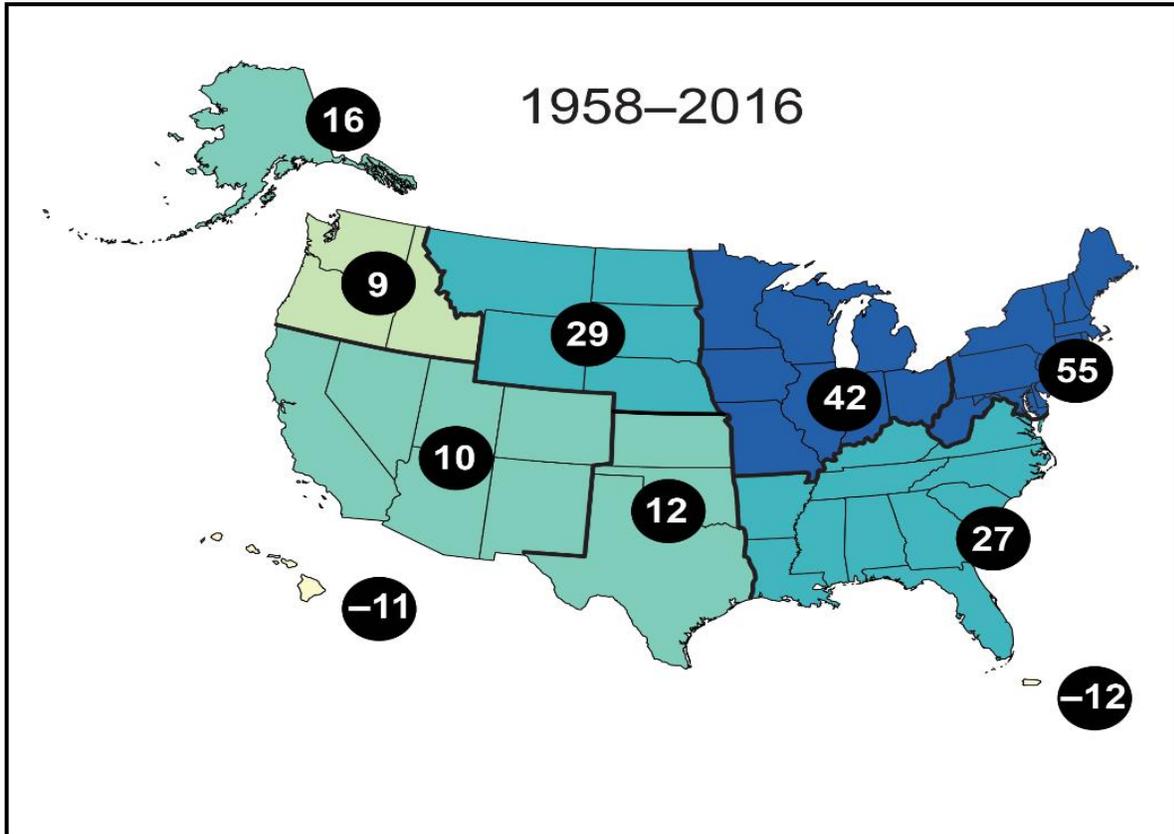
Source: Northeast Climate Adaptation Science Center

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. By 2070 to 2099, (relative to 1986 to 2015) they project a 30-40% increase in total annual precipitation falling in the heaviest 1% of rain events (Figure 5).

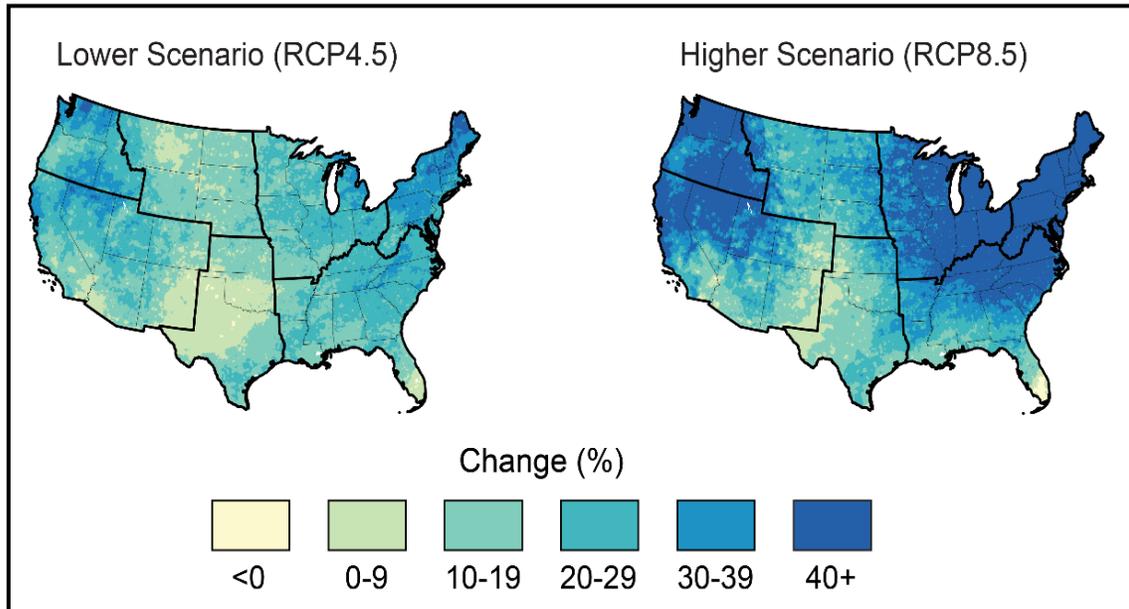
Figure 4: Observed Change in Total Annual Precipitation Falling in the Heaviest 1% of Events



Source: Fourth National Climate Assessment, 2018
Numbers circled in black indicate % change.

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

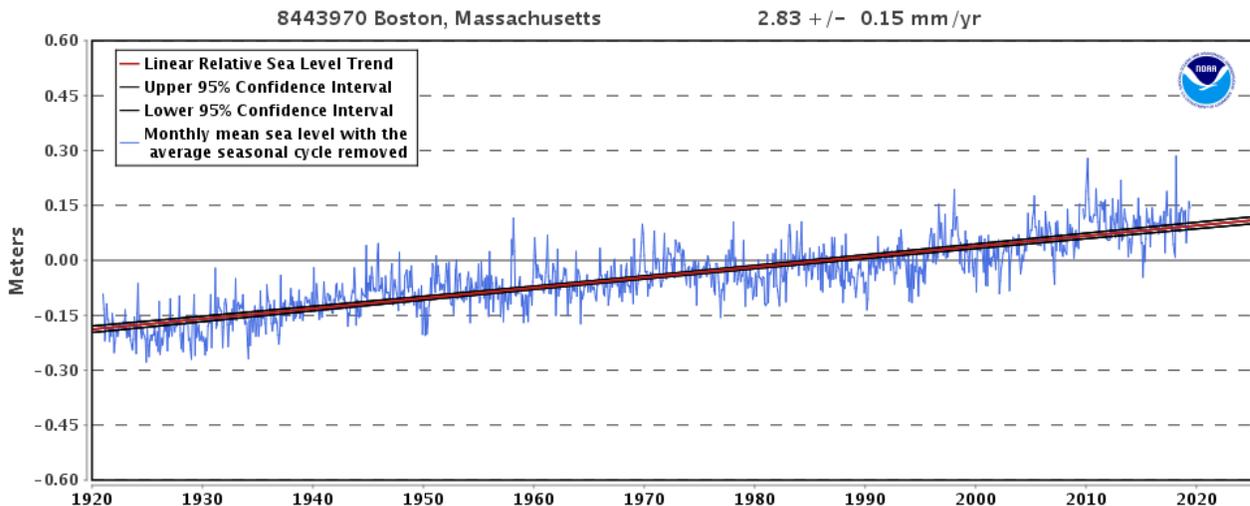


Source: Fourth National Climate Assessment, 2018

Sea Level Rise

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.

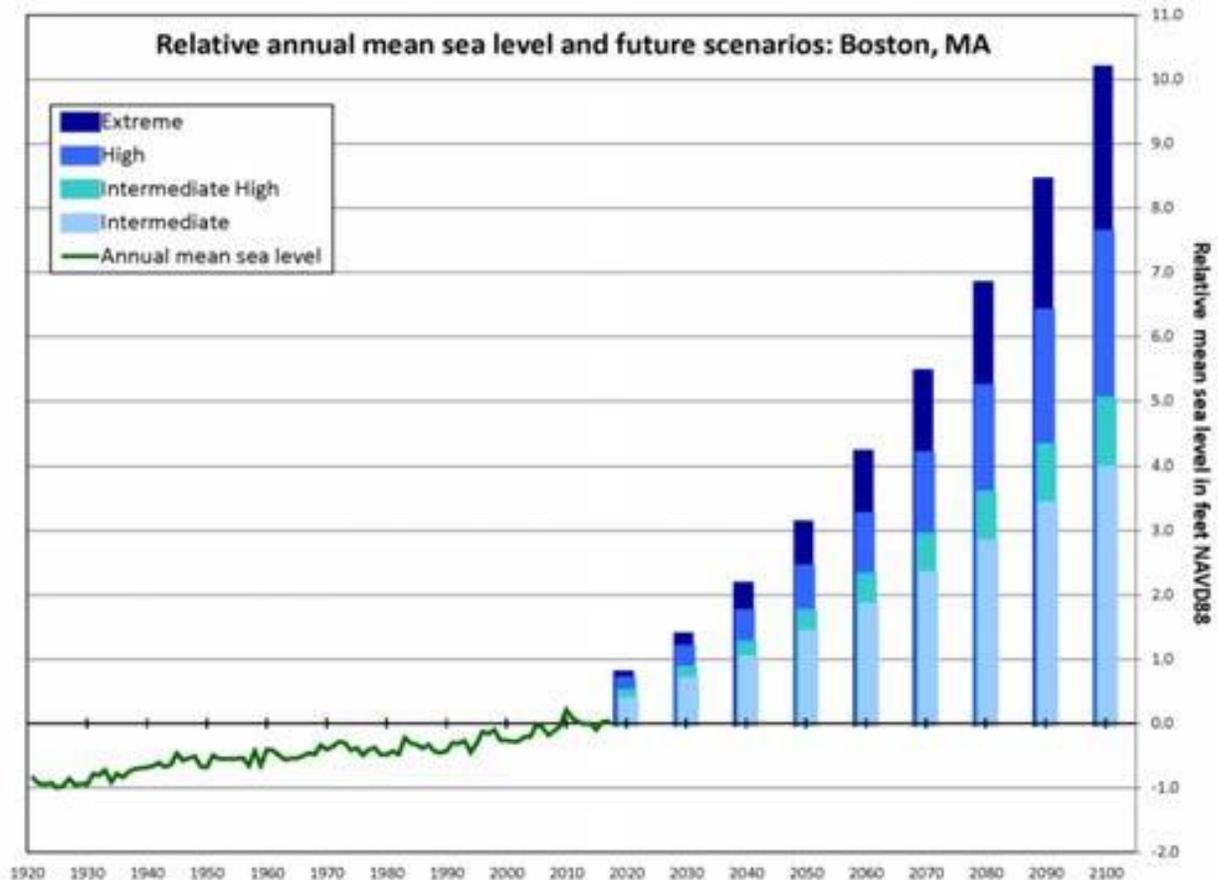
Figure 6: Observed Increase in Sea Level Rise



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 5 below, from the SHMCAP, summarizes the natural hazards reviewed in this plan, climate interactions, and expected impacts. It should be noted that a few of the hazards listed in the 2018 Massachusetts State Hazard Mitigation plan are not applicable to the Town of Needham. Ice Jams are an unlikely natural hazard; with only two occurrences in Norfolk County in 1970 and 1971. There was no damage reported as a result of these ice jams and Needham has chosen not to profile ice jams since they are a secondary hazard. Finally, since Needham is an inland community, Needham is not vulnerable to Tsunamis, Coastal Flooding, and Coastal Erosion; hazards related to coastal areas were not addressed.

Table 5: Climate Change and Natural Hazards

Primary Climate Change Interaction	Natural Hazard	Other Climate Change Interactions	Representative Climate Change Impacts
 <p>Changes in Precipitation</p>	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	
 <p>Sea Level Rise</p>	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	
 <p>Rising Temperatures</p>	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	
 <p>Extreme Weather</p>	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 7 summarizes the frequency and severity of hazard risks for Massachusetts and Needham. The Massachusetts frequency assessment is based on data in the SHMCAP. The Needham frequency assessment reflects data from the National Climatic Data Center (NOAA) for Norfolk County*, from the SHMCAP** and, from the local Hazard Mitigation Team***.

Table 6: Hazards Risk Summary

Hazard	Frequency		Severity	
	Massachusetts	Needham	Massachusetts	Needham
Inland Flooding	Substantial every 3 rd year	3.2 per year*	Serious	Serious
Drought	1% any given month	1% any given month***	Minor	Minor
Landslides	Every other year	None recorded**	Minor	Minor
Coastal Flooding	6 events per year	NA	Serious	NA
Coastal Erosion	Frequency can't be measured	NA	Serious	NA
Tsunami	1 in every 39 years	NA	Extensive	NA
Extreme Temperatures	2 heat events and 1 cold event event/year	4 heat events in 10 years/2 cold events in 10 years*	Minor	Minor
Brush Fires	One notable event per year	Notable events are rare	Minor	Minor
Hurricane/Tropical Storm	One every two years	1 recorded event	Serious	Serious
Severe Winter Storms/Nor'easters	One notable event per year	1.8 per year*	Extensive	Serious
Tornadoes	1.7 per year	None recorded	Serious	Serious
Other Severe Weather (Thunderstorms/High Winds)	20-30 thunderstorms annually; 43.5 high wind events annually	3 per year*	Minor	Minor
Earthquake	10 - 15% chance of Mag 5 in 10-year period	10 - 15% chance of Mag 5 in 10-year period***	Extensive	Extensive

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.

CHANGING PRECIPITATION PATTERNS

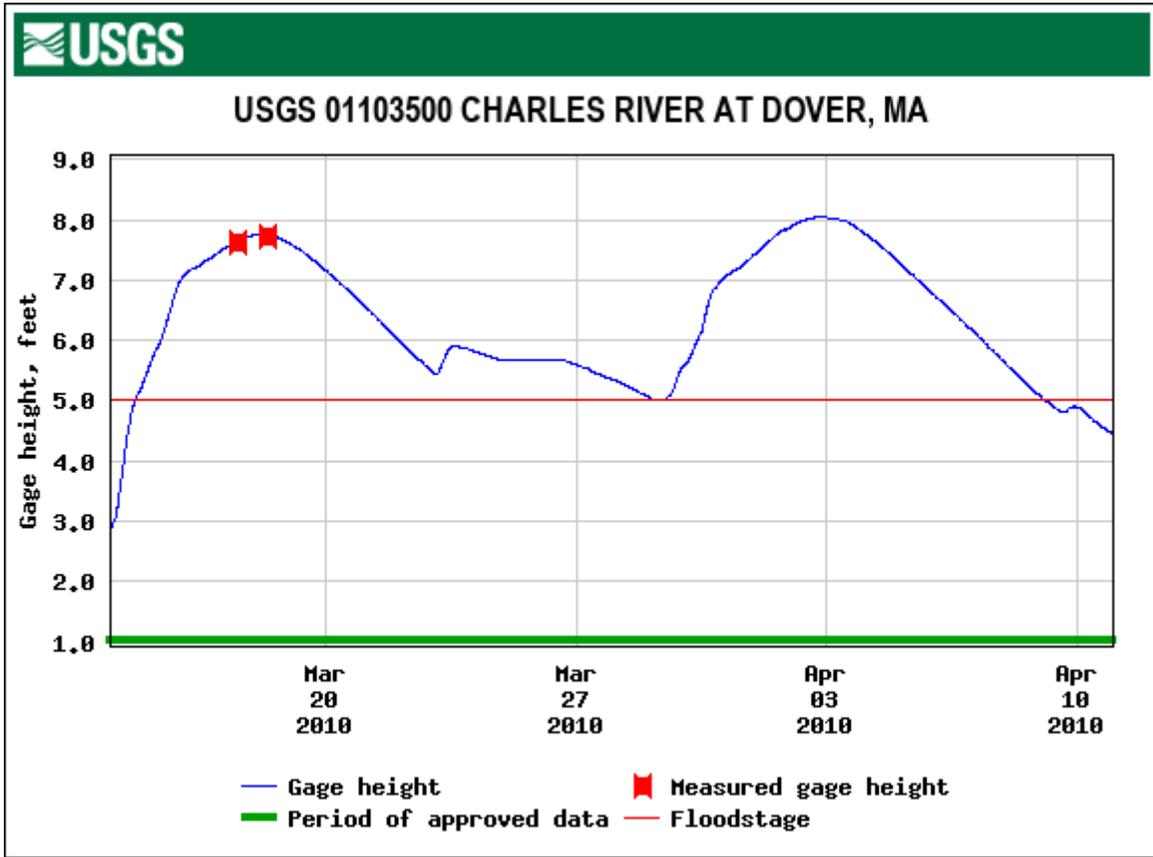
INLAND FLOODING

Inland flooding can be associated with overflowing rivers and streams, stormwater flooding associated with impervious surfaces and stormwater infrastructure, and in more rare cases ice jams, ground failures (erosion), and in some communities beaver dams. Inland flooding is generally caused by hurricanes, nor'easters, severe rainstorms, and thunderstorms. 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.

Flooding was the most prevalent serious natural hazard identified by local officials in Needham. Flooding can be caused by major storms, known as northeasters and hurricanes. Northeasters can occur at any time of the year, but they are most common in winter. Hurricanes are most common in the summer and early fall. Large rain storms or snowfalls can also lead to inland flooding.

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 as rain rather than snow, on frozen ground, and while vegetation is still dormant. 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 approximately ¼ mile downstream of South Street on the Charles River, river levels surged well above flood stage twice and stayed there for nearly a month (Figure 8). 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, Needham experienced extensive flood damage, with one flood insurance claim and 231 disaster claims, 99% of which were located *outside* of FEMA Special Flood Hazard Areas. The claims were most concentrated in the more densely developed northeast half of the town. See Map 3 in Appendix B for claim locations.

Figure 8: March 2010 USGS Charles River Gage



Local data for previous flooding occurrences are not collected by the Town of Needham. The best available local data is for Norfolk County through the National Climatic Data Center. Norfolk County, which includes the Town of Needham, experienced 32 flood events from 2010 through 2019. 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 7: 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

Date	Deaths	Injuries	Property Damage
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
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
01/12/2018	0	0	0.00K
01/13/2018	0	0	0.00K
04/16/2018	0	0	0.00K
07/06/2018	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
Total	0	0	25 M

Source: NOAA, National Climatic Data Center

ICE JAMS

Ice jams occur in cold weather when normally flowing water begins to freeze effectively damming the waterway and causing localized flooding in the area. Flooding may also occur when ice jams break up and ice may pile up at culverts or around bridges. There is no recent history of ice jams leading to flooding in Needham and Town staff did not identify this hazard as an issue for the town.

DAM FAILURE OR OVERTOPPING

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 overflow 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.

Data in this chart from August 2018 were provided by the DCR Office of Dam Safety. The Cochrane Dam is identified as located in Dover, but it is on the Charles between Dover and Needham. Only Rosemary Lake Dam is considered a High Hazard dam.

Table 8: Status of Dams in Needham

Dam Name	River	Owner	Hazard Classification
Rosemary Lake Dam	Rosemary Brook	Town of Needham, Select Board	High
Needham Reservoir Dam	Tributary of Charles River	Town of Needham, Select Board	Low
Sabrina Lake Dam - South	No inlet	Not Available for unregulated small dams	N/A
Cochrane Dam	Charles River	Department of Conservation and Recreation	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 INLAND FLOODING

Information on potential flood hazard areas was taken from two sources. The first is the National Flood Insurance Rate Maps (FIRM). The FIRM flood zones are shown on Map 3 in Appendix B. The “Locally Identified Areas of Flooding” described below were identified by Town staff as areas where flooding is known to occur. These areas do not necessarily coincide with the flood zones on the FIRM maps. Flood sources include inadequate drainage systems, high groundwater, and other local conditions. The numbers correspond to the numbers on Map 8, “Local Hazard Areas.”

Table 9: Locally Identified Areas of Flooding

Map ID	Name	Description
8	Water Treatment Plant at the Dover line	According to local officials, this site is a low flood hazard that also floods infrequently, since the road was raised when reconstructed. However, Public Works Superintendent Richard Merson did note that the flooding, in certain circumstances could be quite severe and could jeopardize the town’s well field of three fresh water wells. There is no current mitigation system in place. When the need arises the town has, in the past, sand-bagged the area to protect the wells, which supply eighty percent of the town’s annual water supply. Elevating the pumps is needed.
9	Wellesley Avenue	This moderate flooding hazard does not truly threaten homes, but does flood annually at this spot, because there is a low spot in the road that does not drain easily. There is an existing dry well and catch basins along the street also. Installation of an infiltration system has reduced but not eliminated flooding.
10	Red Wing Bay	Flooding at this site relates to the Cochrane Dam and can be quite serious, impacting three to four homes near the intersection of Fisher and South streets. The area is part of an old mill site, and thus sits against the river. The site floods approximately every ten years or so and there is no existing mitigation in place. A suggested course of action would be to

		construct a bypass structure off the side of the dam, allowing flood waters to get around the dam, instead of over it and avoiding the neighborhood in question. However, town staff noted that such a project would likely be cost-prohibitive for the benefit it would provide, and the priority is considered low.
11	Rosemary Street at Rosemary Lake outfall	Although DCR classifies this location as a high hazard dam, the town is working on having the location declassified as a dam. The flooding associated with overtopping this dam is considered to be low severity and low frequency, having occurred twice in the past twenty years. No buildings were flooding as a result of those events. The town has a protocol to lower the lake to prevent flooding. There is a control weir at the top of the dam and maintenance of the exiting dam and roadway are considered to be the best mitigation to keeping the dam from becoming a hazard. There is a low priority on other mitigation for the site.
12	Dedham Avenue at the DPW complex	Flooding here is associated with a manmade retention pond or reservoir that sits on the town owned DPW land. Flooding also occurs when Charles River flooding backs up Alder Brook. Flooding does not affect any homes but can flood Dedham Avenue and affect vehicles in the DPW lots and the building itself, which sits below the reservoir.
13	Wildwood Drive at the Charles River	Contained completely within the floodplain, this neighborhood is simply located in a poor location on the banks of the Charles. Flooding at this site can be moderate to severe and flooding can occur about every ten years. Flooding does not typically impact the homes themselves, but it does impact residential backyards along the northern bank of the Charles. There is no existing mitigation to deter the water, but a coffer dam or sand bag wall could provide relief for the residents. However, since the flooding takes place within the flood plain on private property it is considered a low priority by the town and real mitigation is thought to be cost prohibitive.
14	Winding River Road	This is a moderate severity flood hazard that floods on average once every ten years. According to town officials, drainage from this street flows into the Charles River, but when water levels are elevated, the water from the street cannot release into the river and it backs up into the neighborhood. Town officials would endorse a plan to mitigate the problem, but due to lack of funding Winding River Road has not been proposed because there are higher priorities around town. However, if flooding there were to increase in severity of frequency, it is possible the town could look at a measure to allow the water to be pumped over the river bank, above the water level, in order to alleviate flooding on the street. However, such a measure would likely be too costly at this point, given the benefit it would impart.

16	Carol Road at Great Plain Avenue	Issues at this site are related to the wetlands area surrounding the intersection. When the wetlands surcharge, water backs up into an underground brook on Carol Road. Several homes along Great Plain Avenue can be impacted by backyard flooding. The flooding is considered a low severity flooding and low frequency hazard, as it occurs once every ten years or less. There is a natural drain to the wetlands, which serves as the area’s only mitigation and the wetlands area is a designated and legally designed flood storage mechanism.
17	Grosvenor Road	This moderate flood hazard floods every ten years. Flooding occurred here in March 2010. Water does backup to the rear side of residential properties along the north side of the site and it can also flood an area ball field. There is an existing catch basin and a culvert under the commuter railroad tracks. The culvert needs to be enlarged. Recent development of a subdivision has improved drainage.
18	West Street at Rosemary Brook	Flooding here is moderate, with the frequency very low at every 25 years or so. There are no homes downstream of this flooding site, but there is a sewer pump station that could be in jeopardy if left unchecked in a big storm. There is a culvert under West Street that does a good job of handling the needs here in most circumstances. Potential future mitigation could include a larger culvert, if the downstream capacity indicated that such a move was acceptable. However, town officials have said they would need to study downstream capacity first and that this is a low priority.
19	Central Avenue at Rosemary Brook	Issues here are similar to those at West Street. The flooding here can be of a moderate severity, but the frequency is low, occurring only every 25 years or so. Again, officials would want to study the downstream capacity of the brook before expanding any culverts or drainage mechanisms. However, the site would likely remain a low priority to address, since the issues there are not serious or frequent.
24	Edgewater and Dedham Avenue	As with Wildwood Drive, the flooding here is contained mostly within the flood plain and the homes built along the river’s edge are in the flood plain and poorly sited. However, the bank here is fairly high, and flooding is said to be moderate and not very frequent, every ten years or so. There is no real mitigation here, and flood waters can reach into backyards. In a truly high rain water event, it would be possible for flooding to reach the homes and cause damage, but since the homes are in the flood plain on the edge of a river, it is not clear what can be done. Some options could include moving utilities out of the basements, or at least off basement floors, and construction of a coffer dam or retention dam to keep flood level waters in the river and off the Priority to undertake mitigation here is considered to be low.

25	Hunnewell Street	Moderate flooding in this neighborhood in the northern section of town is also fairly infrequent, with an occurrence of about every ten years. There are existing catch basins and a culvert, but it appears the capacity of these devices is not large enough. The town designed a larger drainage pipe for the area, with an estimated cost of between \$75,000 and \$120,000 and identified this project as a high priority. However, the town was not able to obtain the easements needed for the project.
26	Walker	Flooding at this site can be severe, impacting about four homes in the area, every five years. According to town officials, the outfall from Walker Pond needs maintenance and could also use a control structure, such as a small dam with a control weir atop. Such a project is estimated to cost upwards of \$250,000 and is considered a moderate priority, because of the repetitive damage to impacted homes.
27	Oxbow Road	This moderate severity flooding hazard is a product of drain water to the Charles River backing up in the surrounding neighborhood. There is an existing drainage pipe, but it is believed to be inadequate. Suggested future mitigation for this site could include expanding the size of the drain pipe, but as with flooding at Winding River (14), elevated water levels in the Charles can also create problems with the drainage flow. Thus, it is not clear how effective an expanded drainage pipe would be when the river waters are high. The area needs more study, and there is no estimated cost or timeline developed for any future mitigation here at this point. It is considered a low priority.

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, all single-family homes, in Needham. The properties are shown on the maps in Appendix A. These repetitive loss properties had a total of 15 losses from 1978 to 2018, totaling \$57,258 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 8 summarizes the number and location of repetitive loss structures located within Needham and the number of losses and total claims associated with them.

Table 10: Summary of Repetitive Losses and Claims

	A, AE, AO, AH Zones	VE Zone	X Zones	Total
Number of Properties	0	0	5	5
Number of Losses	0	0	15	15

Total Claims	0	0	\$57,258	\$57,258
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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.

Needham 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 9).

Table 11: 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

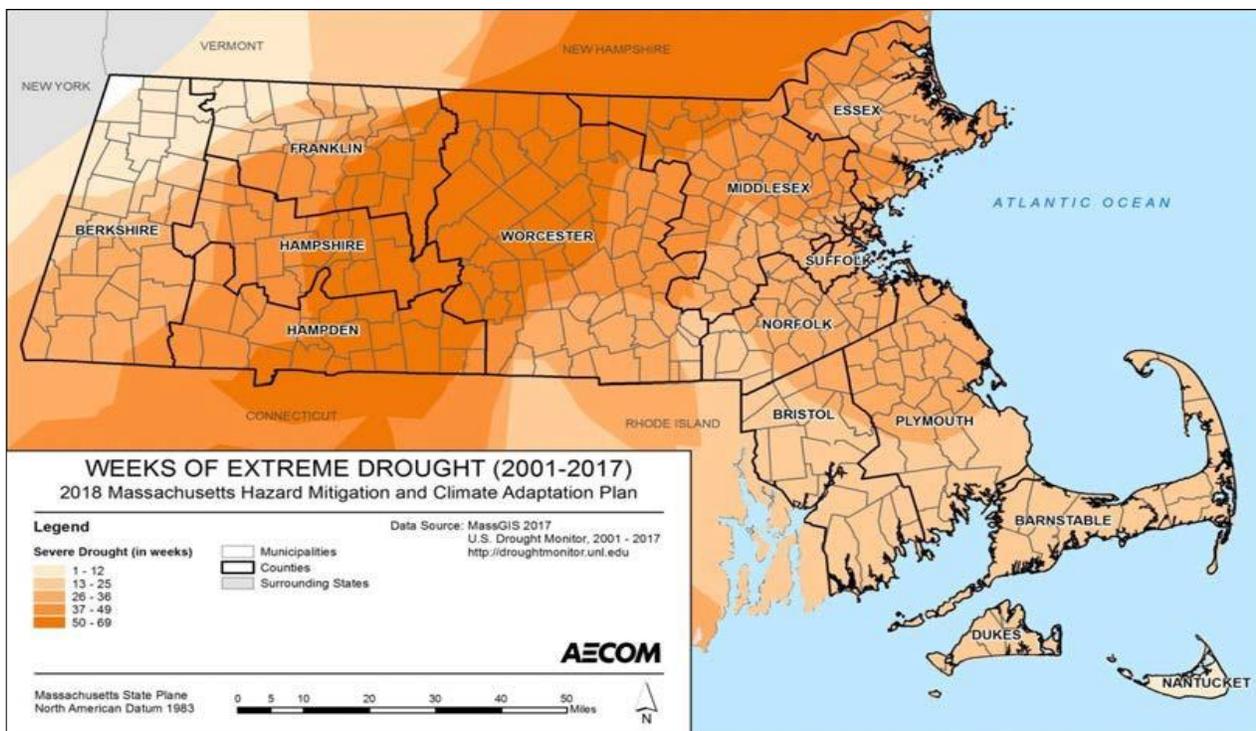
Source: SHMCAP

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, Needham experienced between 26 and 36 weeks of severe drought between 2001 and 2017. Drought affects Needham’s drinking water supply. In the most recent drought town officials note that excessive lawn watering caused the town to exceed permitted well water pumping levels.

Figure 9: 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.

Needham is classified as having low susceptibility and a low incidence of landslides (see Map 4, Appendix B). 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 Needham. There are no recorded instances of landslides having occurred in the Town of Needham.

RISING TEMPERATURES

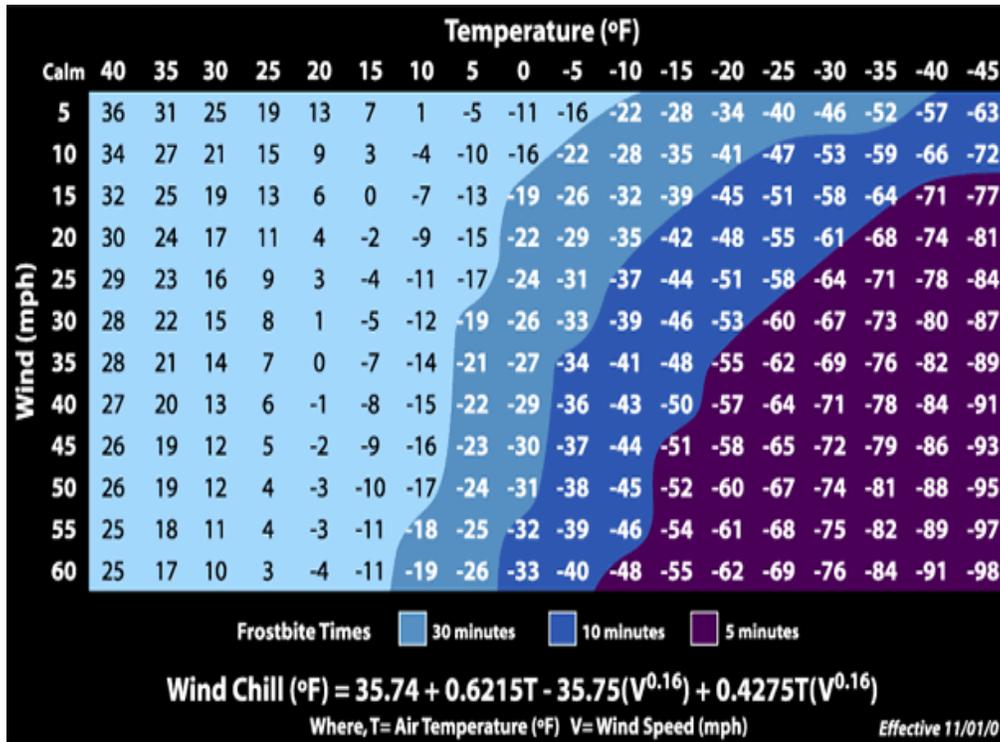
AVERAGE AND EXTREME TEMPERATURES

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. Needham 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.

Figure 10 Wind Chill Temperature Index and Frostbite Risk



Source: National Weather Service

The Town of Needham does not collect data for previous occurrences of extreme cold. The best available local data are for Norfolk County, through the National Climatic Data Center (NCDC). There have been two extreme cold events in the past ten years, which caused no deaths, no injuries, or property damage. This is an average of one event every 5 years.

Table 12: Norfolk County Extreme Cold and Wind Chill Occurrences 2010-2019

Date	Deaths	Injuries	Damages
2/16/2015	0	0	0
2/14/2016	0	0	0

Source: NOAA, National Climatic Data 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 11: Heat Index Chart

		Temperature (°F)															
		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
Relative Humidity (%)	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 Town of Needham does not collect data on excessive heat occurrences. The best available local data are for Norfolk County, through the National Climatic Data Center. In the past ten years there has been one excessive heat day and no deaths, injuries, or property damage (see Table 11). This is an average of one extreme heat occurrence every 2.5 years.

Table 13: Norfolk County Extreme Heat Occurrences 2010-2019

Date	Deaths	Injuries	Damage
7/22/2011	0	0	0
7/1/2018	0	0	0
7/3/2018	0	0	0
8/28/2018	0	0	0

Source: NOAA, National Climatic Data 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. 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.

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 B 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. The southwest half of Needham has extensive tree cover and no “hot spots”. The business and commercial areas along Route 128 that have extensive pavement, and buildings form a large hot spot. The areas surrounding the Needham Heights and Needham Center commuter rail stations are also hot spots. Many of the schools including Broadmeadow, Newman, Pollard, Walker, St. Sebastian, and the high school are in hot spots, again due to the prevalence of pavement and buildings. It is worth noting however, that heat impacts are more likely to be felt by residents without air conditioning, by those who work outdoors, and those with underlying health conditions.

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

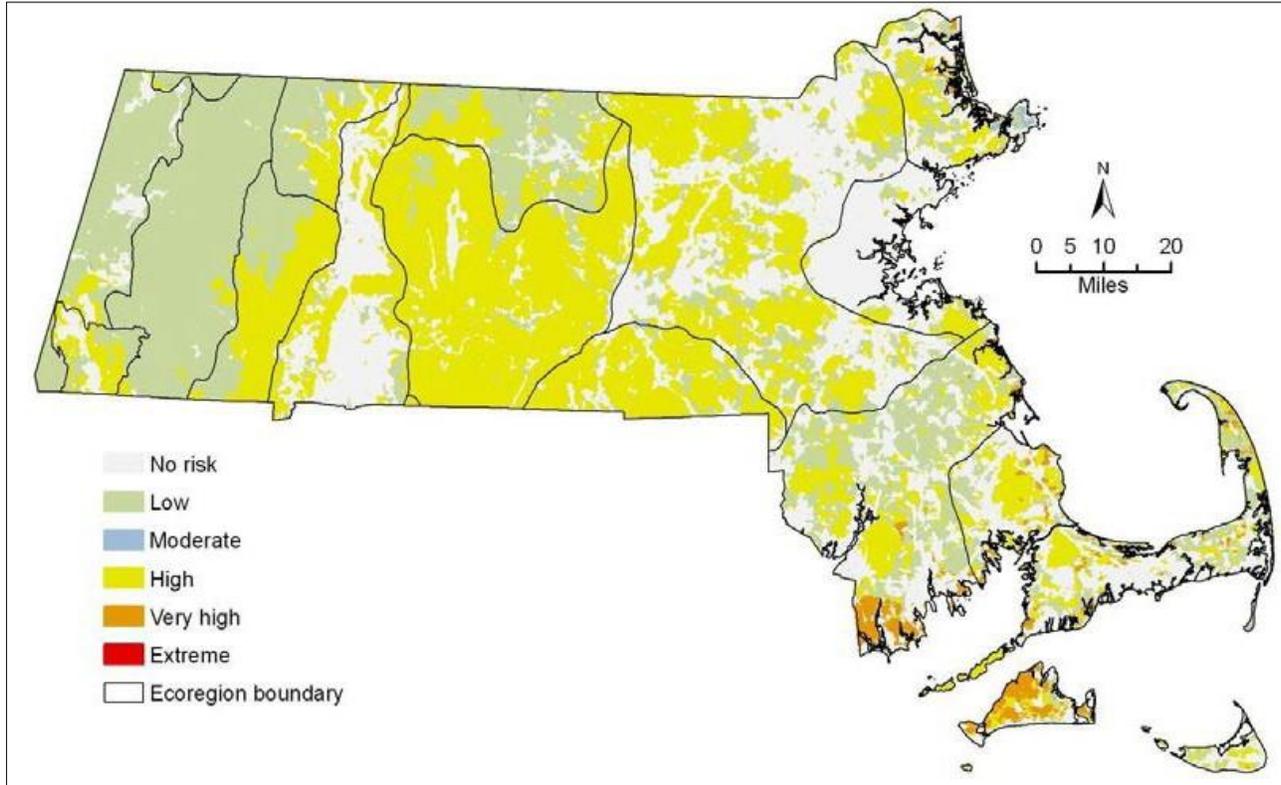
The SCHMCAP includes a graphic that depicts statewide fire risk incorporating three risk components: fuel, wildland-urban interface, and topography (Figure 12). The wildland-urban interface reflects communities where housing and vegetation intermingle, and fire can spread from structures to vegetated 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. Needham is shown in the moderate and high-risk zones. Fire was not identified as a common occurrence, but for some locations concern was expressed that access to forested areas and to adequate water supply could be a challenge. The most common cause of wildfires is the careless disposal of smoking materials and untended campfires.

The following areas of town were identified as having the highest potential for brush fires. The numbers correspond to the numbers on Map 8, “Hazard Areas”:

Table 14: Locally Identified Areas of Brushfire Risk

Map ID	Name	Description
1	Cutler Park	There have been both brush and bog fires here in recent years. Both water supply and physical access are problematic. The town has to shuttle in water and use out of town sources for supply.
2	Town Forest	There have been brushfires here. Water supply is a problem. Access is also an issue as the access roads need maintenance.
3	Ridge Hill Reservation	There was a meadow fire here in recent years.
4	Olin College	There have been no recent fires here.
5	New Pond (Hemlock Gorge)	This is DCR property. There is good access.
6	Echo Bridge (aqueduct)	This is DCR property. There is good access.
7	Brookside Road	This is an area of fire concern, both water supply and access are issues.

Figure 12: Wildfire Risk Areas



Source: SHMCAP

While there are substantial areas of fire risk, town officials indicate that significant brush fires are not a common occurrence.

INVASIVE SPECIES

The 2018 SHMCAP includes invasive species as a natural hazard for the first time. They are defined as “non-native species that cause or are likely to cause harm to ecosystems, economies, and/or public health”. Town officials indicated that invasives have had a negative effect on the health of forested water supply lands.

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.

Although uncommon, the Town of Needham’s entire area is vulnerable to hurricanes, which occur between June and November. As shown on Map 5 in Appendix B, a tropical storm tracked through Needham in 1944. 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 Needham is 110 miles per hour.

Table 15: Hurricane Records for Massachusetts, 1938 to 2018

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. The following gives an overview of the wind speeds, surges, and range of damage caused by different hurricane categories:

Table 16: 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 Needham. Potential hurricane damages to Needham have been estimated using HAZUS-MH. Total damages are estimated at \$36 million for a Category 2 hurricane and \$138 million for a Category 4 hurricane. Hurricanes and tropical storms are an infrequent event having passed directly through Needham only once.

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 precipitated by 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.

Needham 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. Nor'easters are also a cause of coastal flooding.

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.

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 below:

Table 17: 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 Needham, blizzards and severe winter storms have occurred in the following years:

Table 18: 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 Needham. Map 6 in Appendix A indicates that the average annual average snowfall in most of Needham 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.

The Town of Needham does not keep local records of winter storms. Data for Norfolk County is the best available data to help understand previous occurrences and impacts of heavy snow events. According to National Climate Data Center (NCDC) records, from 2010 through 2019, western Norfolk County experienced 18 heavy snowfall events, resulting in no injuries, deaths, or property damage (Table 18).

Table 19: 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

Date	Deaths	Injuries	Property Damage (\$)
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 Climatic Data 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 below:

Table 20: 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). 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. On August 9, 1972 a tornado crossed through Needham from Great Plain Avenue and Webster Street and northeast into Newton resulting in one fatality and six injuries. There have been one F3 and one F2, and three F1 tornadoes. These eleven tornadoes resulted in a total of one fatality and 23 injuries and \$4.1 million in damages, as summarized in Table 22. This an average of one tornado every 6 years.

Table 21: 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
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 Needham, tornado impacts are relatively localized compared to severe storms and hurricanes. Damages from any tornado in Needham would greatly depend on the track of the tornado. Based on the record of previous occurrences since 1956, Tornado events in Needham are a low frequency event as there is only one instance of tornado activity in Needham. According to the SHMCAP, it is possible that severe thunderstorms which can include tornadoes may increase in frequency and intensity. 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 Needham is for is for Norfolk County through the National Climatic Data Center (NCDC). For the years 2010 through 2019, NCDC records show 30 thunderstorm events in Norfolk County (Table 21). These storms resulted in a total of \$307,500 in property damage. There were no injuries or deaths reported. This is an average of 3 events per year.

Table 22: 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 Climatic Data Center

Severe thunderstorms are a town-wide hazard for Needham. 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. According to the National Climatic Data Center database several of the thunderstorms had impacts in Needham. On July 29, 2014 a microburst downed trees and powerlines on Country Way and Moseley Avenue. On July 18, 2016 trees and wires were downed on Hoover Street. On July 31, 2019 a tree went down on a house on Greendale Avenue and a tree was downed on a utility pole on Oakcrest Road.

Based on the record of previous occurrences, severe thunderstorms in Needham 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:

Table 23: 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.

Town-specific data for previous ice storm occurrences are not collected by the Town of Needham. The best available local data is for Norfolk County through the National Climatic Data Center. Norfolk County experienced twelve events from 2010 through 2019, for an average of 1.2 events per year. There is some indication that as winters warm, temperatures may be more likely to produce icing conditions. Indeed, town officials report that road icing conditions have been a problem in recent winters.

Table 24: 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 Climatic Data 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 below:

Table 25: 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

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 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 26: 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
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

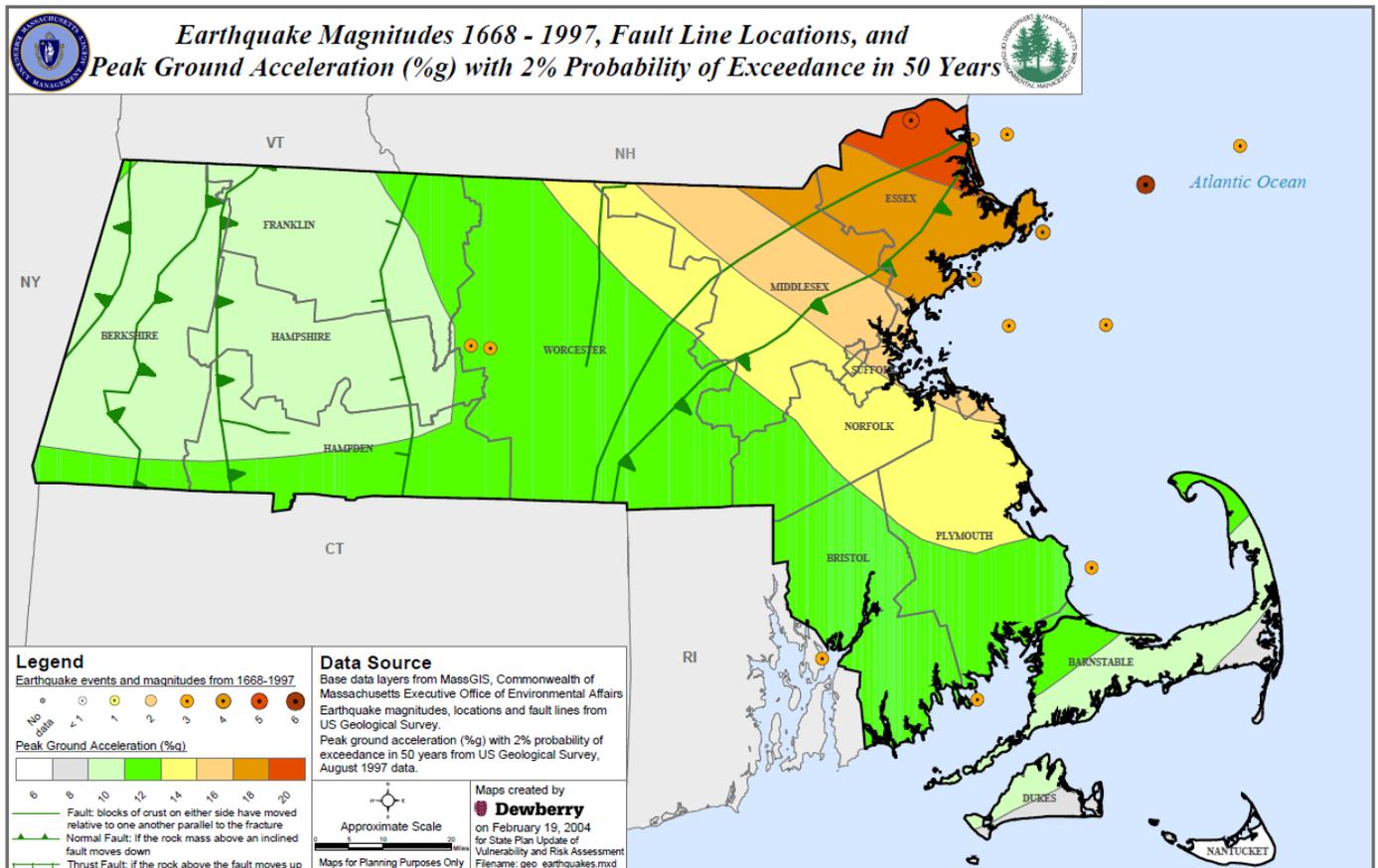
Source: Boston HIRA

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. Needham is in the middle part of the range for Massachusetts, at 14 %g to 16 %g, making it a relatively moderate area of earthquake risk within the state, although the state 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 Needham.

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 13: 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 to 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 Needham. 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 Needham have been estimated using HAZUS-MH. Total building damages are

estimated at \$725.5 million for a 5.0 magnitude earthquake and \$6.3 billion for a 7.0 magnitude earthquake. Other potential impacts are detailed in Table 30.

LAND USE AND DEVELOPMENT TRENDS

Existing Land Use

The most recent land use statistics available from the state are from aerial imagery completed in 2016. Table 28 shows the acreage and percentage of land in 13 categories. If the primary residential categories are aggregated, residential uses make up 47.5% of the area of the town. Commercial and industrial uses combined make up 5.8% of the town. Agriculture, Open Land, and Recreation total 17.7% of the land. The tax-exempt category represents 16.5% of Needham’s land. Most of this land is additional open space.

Table 27: Town of Needham, MA 2005 Land Use

Land Use Type	Acres	Percentage
Residential - single family	3496	42.9
Residential - multi-family	207	2.5
Mixed use, primarily residential	174	2.1
Mixed use, primarily commercial	0	0
Commercial	263	3.2
Mixed use, other	5	0.1
Industrial	214	2.6
Agriculture	35	0.4
Open land	1374	16.9
Recreation	30	0.4
Unknown	65	0.8
Right-of-way	937	11.5
Tax exempt	1342	16.5
Total	8142	100.0

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

Needham is primarily a suburban residential community. Many residents commute to Boston, which is easily accessible by public transportation. Needham does have several areas of concentrated economic activity. These include commercial and industrial areas located adjacent to Route 128. More development along Route 128 is anticipated in the next five years. Smaller scale commercial businesses are located along Highland Avenue and in close proximity to commuter rail. Not surprisingly, all of these locations are associated with the high heat areas mapped for Needham. Due to traffic congestion along Route 128, residents expressed concern about the need for monitoring evacuation plans and plan for handling hazardous waste.

NATURAL, CULTURAL, AND HISTORICAL RESOURCE AREAS

Needham has two historic districts, the McIntosh Corner and Town Hall Historic District. In addition, there are 18 buildings on the Massachusetts Register of Historic Places. Scenic roads in Needham include Charles River Street, South Street, and Central Avenue between Nehoidan Street and Marked Tree Road. Natural resources include Ridge Hill Reservation and Needham Town Forest. Cutler Park and Hemlock Gorge are DCR properties. The Charles River encircles Needham on three sides and Needham has many ponds, streams, and wetlands areas.

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. The database tracks both completed developments and those currently under construction. The database includes seven completed projects in the Town of Needham since 2105

The database also includes several attributes of the new development, including housing units, and commercial space. The seven developments in Needham include a total of 656 housing units and over 700,000 square feet of commercial space.

Table 28: Summary of Needham Developments, 2015-2020

Name	Status	Year	Housing Units	Commercial Square Feet	Project Type
Needham Bank expansion	Complete	2015	0	12,363	Commercial
Wingate	Complete	2016	0	52 rooms	Commercial
Rockwood Estates	Complete	2017	9	0	Residential
Needham Mews	Complete	2018	266	0	Residential
Homewood Suites	Complete	2018	0	31,148	Commercial
Second Avenue Residences	Complete	2019	390	0	Residential
Center 128	Complete	2020	0	740,000	Commercial

POTENTIAL FUTURE DEVELOPMENT

MAPC consulted with the Local Hazard Mitigation Planning Team to determine areas that may be developed in the future, based on the Town's comprehensive planning efforts and current trends and projects. These areas are listed below with their flood and heat risk outlined in Table 27. In order to characterize any change in the town's vulnerability associated with new developments, a GIS mapping analysis was conducted which overlaid the development sites with the FEMA Flood Insurance Rate Map and the hottest 5% of land surface in the MAPC region. Potential future development projects:

- A) Boston Children's Hospital: Proposed expansion in Founder's Park. Three additional buildings totaling 450,000 square feet.

- B) Hotel: 156 B Street, 180 units and 96,010 square feet
- C) 390 Grove Street: two lot subdivision
- D) Heather Lane: proposed new subdivision for 6 house lots and 5 residential compound lots.
- E) 1180 Great Plain Avenue: 40-B proposal for 16 rental units

FUTURE DEVELOPMENT IN HAZARD AREAS

Table 27 shows the relationship between potential future development areas and the applicable mapped hazard areas (flood zones and heat). This information is provided so that planners can ensure that development proposals comply with floodplain zoning and that careful attention is paid to drainage, heat, and other issues.

Table 29: Relationship of Potential Development to Hazard Areas

Map ID	Potential Future Project	Flood Zones	High Heat
A	Boston Children’s Hospital		75%
B	Hotel		100%
C	Grove Street Subdivision		
D	Heather Lane Subdivision	32% AE 16% X	
E	Great Plain Ave. 40B		

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 113 facilities identified in Needham. These are listed in Table 28 and are shown on the maps in Appendix B.

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: Locally-Identified Area of Flooding:** The fifth column indicates the risk of flooding in local hazard areas. A “No” entry in this column means that the site is not within any of the mapped flood hazard zones. If there is an entry in this column, it indicates the local hazard area.
- **Column 6: Hot spots** indicates areas that are within the 5% of hottest areas in the MAPC region based on satellite data from 2016.
-

Table 30: Critical Facilities and Relationship to Hazard Areas

ID	NAME	TYPE	FEMA FLOOD ZONE	LOCAL ID FLOOD ZONE	HOT SPOT
1	Broadmeadow Elementary School	School	No	No	Yes
2	Eliot School	School	No	No	No
3	Hillside Elementary School	School	No	No	No
4	William Mitchell Elementary School	School	No	No	No

ID	NAME	TYPE	FEMA FLOOD ZONE	LOCAL ID FLOOD ZONE	HOT SPOT
5	Newman Elementary School	School	No	No	No
6	Pollard Middle School	School	No	No	Yes
7	Needham High School	School	No	No	Yes
10	Charles River Assn. for Retarded Citizen	Special Needs	No	No	No
12	St. Joseph Elementary/Middle School	School	No	No	Yes
13	St. Sebastian's High School	School	No	No	No
24	Needham High School Shelter	Shelter	No	No	Yes
31	Riverside Community Care	School	No	No	Yes
36	Walker Home School	School	No	No	No
38	Town Hall	Municipal	No	No	Yes
39	Avery Manor Nursing Home	Nursing Home	No	No	Yes
40	Briarwood Nursing Home	Nursing Home	No	No	No
41	North Hill Retirement Community	Nursing Home	No	No	Yes
43	Wingate Nursing Home	Nursing Home	No	No	No
44	Verizon Telephone Switch Bldg	Communication Tower	No	No	Yes
45	Coca-Cola Bottling Company	Hazardous Material Site	No	No	Yes
46	Verizon	Communication Tower	No	No	No
47	Level III	Hazardous Material Site	No	No	Yes
48	Algonquin Gas Meter Station	Gas Distribution	AH	No	No
50	Kerivan-Lane Petroleum	Hazardous Material Site	X	No	Yes
51	Comcast of Needham Inc.	Hazardous Material Site	No	No	Yes
52	Muzi Motors Inc.	Hazardous Material Site	No	No	Yes
57	Pollard Middle School-Shelter	Shelter	No	No	Yes
58	Emergency Management/Operations Center	Emergency Operations Center	No	No	Yes
59	Beth Israel Deaconess Hospital	Hospital	No	No	No
60	Needham Department of Public Works	Municipal	X	No	No
61	Media Transmission Towers	Communication Tower	No	No	Yes
62	Media Transmission Towers	Communication Tower	No	No	No
63	St. Mary Pump Station	Water Pump Station	No	No	No
65	Water Treatment Plant	Waste Water Treatment	No	Water Treatment Plant	No
66	Needham Fire Department Station#2	Fire Station	No	No	No
67	Needham Fire Dept.	Fire Station	No	No	Yes
68	Needham Police Dept.	Police Station	No	No	Yes
69	Needham Public Library	Municipal	No	No	No
70	Roche Brothers Supermarket	Grocery Store	No	No	No
71	Water Storage Tank Storage #2	Water Storage Tank	No	No	No
72	Water Storage Tank Storage #1	Water Storage Tank	No	No	No
74	Sudbury Farms Supermarket	Grocery Store	No	No	Yes

ID	NAME	TYPE	FEMA FLOOD ZONE	LOCAL ID FLOOD ZONE	HOT SPOT
76	Duke Energy NG Transmission Line PC	Gas Distribution	No	No	No
77	Carter Methodist Church	Church	No	No	No
78	Charles River Industry	Special Needs	No	No	No
79	U.S. Post Office	Post Office	No	No	No
80	U.S. Post Office	Post Office	No	No	Yes
81	St Joseph's Church	Church	No	No	Yes
83	First Baptist Church	Church	No	No	No
84	Presbyterian Church	Church	No	No	No
85	Council on Aging	Senior Services	No	No	Yes
86	Public Services Administration Building	Municipal	X	Edgewater Drive	No
87	Recycling and Transfer Station	Municipal	No	No	No
88	School Administration Building	School	No	No	Yes
89	Monsignor Haddad Middle School	School	No	No	Yes
90	Olin College of Engineering	School	No	No	No
91	YMCA Afterschool	School	No	No	No
92	Needham Community Council/Food Pantry	Social Service	No	No	No
93	Daley Building	Municipal	No	No	No
94	High Rock School	School	No	No	No
95	Sunita Williams School	School	No	Central Avenue at Rosemary Brook	No
96	Rosemary Recreation Complex	Back-up EOC	No	No	No
97	West Street Sewer Pump Station	Sewer Pump	A	West Street at Rosemary Brook	No
98	Dedham Avenue Water Pump Station	Water Station	X	Dedham Ave at DPW complex)	No
99	Avita Memory Care	Nursing Home	No	No	No
100	Wingate of Needham	Nursing Home	No	No	No
101	CareWell Urgent Care	Medical Facility	No	No	Yes
102	Otrada Adult Day Care	Senior Services	No	No	Yes
103	Trader Joe's	Grocery Store	No	No	Yes
104	Volante Farms	Grocery Store	No	No	No
105	First Parish in Needham	Church	No	No	Yes
106	Congregational Church	Church	No	No	No
107	Christ Episcopal Church	Church	No	No	No
108	First Church of Christ Scientist	Church	No	No	No
109	Greendale Ave Worship Center	Church	No	No	No

ID	NAME	TYPE	FEMA FLOOD ZONE	LOCAL ID FLOOD ZONE	HOT SPOT
110	Chestnut Street Animal Hospital	Animal Hospital	No	No	Yes
111	Highland Avenue Animal Hospital	Animal Hospital	No	No	No
112	Stanley Tippet House	Long Term Care	No	No	No
113	Needham Public Housing	Senior Housing	No	No	No
114	Needham Public Housing	Senior Housing	No	No	No
115	Needham Public Housing	Senior Housing	No	No	No
116	Verizon Telephone Switch Building	Hazardous Material Site	No	No	Yes
117	Microwave Development Labs Inc	Hazardous Material Site	No	No	Yes
118	AT&T - MA3438	Hazardous Material Site	AE	No	No
119	Beth Israel Deaconess Hospital	Hazardous Material Site	No	No	No
120	Charles River Water Treatment Facility	Hazardous Material Site	No	Water Treatment Plant (No
121	Digital 105 Cabot, LLC	Hazardous Material Site	No	No	Yes
122	General Dynamics C4 Systems	Hazardous Material Site	No	No	Yes
123	Needham Nine Owners LLC	Hazardous Material Site	No	No	Yes
124	Needham Oil & Air	Hazardous Material Site	No	No	Yes
125	NSTAR Station 148 & 381	Hazardous Material Site	No	No	No
126	Olin College of Engineering	Hazardous Material Site	No	No	No
127	Recycle and Transfer Station	Hazardous Material Site	No	No	No
128	Celldex	Hazardous Material Site	No	No	Yes
129	Needham Heights	Train Stations	No	No	Yes
130	Needham Center	Train Stations	No	No	Yes
131	Needham Junction	Train Stations	No	No	No
132	Hersey	Train Stations	No	No	No
133	Eversource Electric Substation	Utility	No	No	No
134	Water Pump Station 3	Water Pump Station	No	No	No
135	Sheraton Needham Hotel	Hotel	No	No	Yes
136	Residence Inn by Marriott Boston Needham	Hotel	No	No	Yes
137	Hilton Homewood Suites	Hotel	No	No	Yes
139	Needham CO - LTPF9 (AT&T Services Inc)	Hazardous Material Site	No	No	Yes
139	WBZ Transmitter Site (American Tower)	Hazardous Material Site	No	No	No
140	Great Plain Pump Station	Sewer Pump Station	No	No	No
141	Alden Road Pump Station	Sewer Pump Station	No	No	No
142	Cook's Bridge	Sewer Pump Station	X	No	No
143	Reservoir B	Sewer Pump Station	AE	No	No
144	Reservoir A	Sewer Pump Station	No	No	No
145	Kendrick Street Pump Station	Sewer Pump Station	No	No	No
146	Warren Pump Station	Sewer Pump Station	No	No	No
147	Lake Drive Pump Station	Sewer Pump Station	No	No	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 <https://www.fema.gov/hazus/>

“HAZUS-MH is a nationally applicable standardized methodology and software program that contains models for estimating potential losses from earthquakes, floods, and hurricane winds. HAZUS-MH was developed by the Federal Emergency Management Agency (FEMA) under contract with the National Institute of Building Sciences (NIBS). Loss estimates produced by HAZUS-MH are based on current scientific and engineering knowledge of the effects of hurricane winds, floods and earthquakes. Estimating losses is essential to decision-making at all levels of government, providing a basis for developing and evaluating mitigation plans and policies as well as emergency preparedness, response and recovery planning.

HAZUS-MH uses state-of-the-art geographic information system (GIS) software to map and display 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 Needham, 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 31: Estimated Damages from Hurricanes

	Category 2	Category 4
Building Characteristics		
Estimated total number of buildings	10,974	
Estimated total building replacement value (2014 \$)	\$6,181,000,000	
Building Damages		
# of buildings sustaining minor damage	406	2,000
# of buildings sustaining moderate damage	29	350
# of buildings sustaining severe damage	1	21
# of buildings destroyed	0	11
Population Needs		
# of households displaced	0	9
# of people seeking public shelter	0	5
Debris		
Building debris generated (tons)	1,381	6,898
Tree debris generated (tons)	3,943	9,892
# of truckloads to clear building debris	55	276
Value of Damages		
Total property damage (buildings and content)	\$34,835,950	\$129,607,190
Total losses due to business interruption	\$1,063,630	\$8,700,670

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 32: Estimated Damages from Earthquakes

	Magnitude 5.0	Magnitude 7.0
Building Characteristics		
Estimated total number of buildings	10,974	
Estimated total building replacement value (2014 \$)	\$6,181,000,000	
Building Damages		
# of buildings sustaining slight damage	3,211	295
# of buildings sustaining moderate damage	1,741	2,117
# of buildings sustaining extensive damage	485	3,099
# of buildings completely damaged	126	5,433
Population Needs		
# of households displaced	281	5,440
# of people seeking public shelter	151	2,893
Debris		
Building debris generated (tons)	130,000	1,040,000
# of truckloads to clear debris (@ 25 tons/truck)	5,520	41,640
Value of Damages		
Total property damage	\$725,541,900	5,526,238,600
Total losses due to business interruption	\$151,616,900	\$806,267,800

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 33: Estimated Damages from Flooding

	100-Year Flood	500-Year Flood
Building Characteristics		
Estimated total number of buildings	10,974	
Estimated total building replacement value (2014 \$)	\$6,181,000,000	
Building Damages		
# of buildings sustaining limited damage	50	39

# of buildings sustaining moderate damage	23	51
# of buildings sustaining extensive damage	3	1
# of buildings substantially damaged	4	5
Population Needs		
# of households displaced	349	398
# of people seeking public shelter	115	18
Value of Damages		
Total property damage	\$26,730,000	\$36,220,000
Total losses due to business interruption	\$14,390,000	\$53,690,000

SECTION 5: HAZARD MITIGATION GOALS

The Needham Local Hazard Mitigation Planning Team reviewed and discussed the goals from the 2009 Hazard Mitigation Plan for the Town of Needham. All of the goals are considered critical for the Town and they are not listed in order of importance. Prior to the Hazard Mitigation Plan update process, the Town of Needham developed a Climate Change Vulnerability Analysis and Action Plan. The local team chose to incorporate climate considerations as noted in Goal 11.

- GOAL 1:** Ensure that critical infrastructure sites are protected from natural hazards.
- GOAL 2:** Protect existing residential and business areas from flooding
- GOAL 3:** Maintain existing mitigation infrastructure in good condition.
- GOAL 4:** Continue to enforce existing zoning and building regulations.
- GOAL 5:** Educate the public about zoning and building regulations.
- GOAL 6:** Work with surrounding communities to ensure regional cooperation and solutions for hazards affecting multiple communities.
- GOAL 7:** Encourage future development and redevelopment in areas that are not prone to natural hazards.
- GOAL 8:** Educate the public about natural hazards and mitigation measures.
- GOAL 9:** Make efficient use of public funds for hazard mitigation.
- GOAL 10:** Pursue land acquisition strategies.
- GOAL 11:** Consider the potential impacts of future climate change. Incorporate climate sustainability and resiliency in hazard mitigation planning.

SECTION 6: EXISTING MITIGATION MEASURES

The existing protections in the Town of Needham 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. Needham's adoption of a stormwater utility will contribute significantly to efforts to address stormwater flooding.

The Town's existing mitigation measures, which were in place prior to the original 2005 Plan, 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 MULTI-HAZARD MITIGATION MEASURES

Multi-Department Review of Developments – Multiple departments, such as Planning, Zoning, Health, Public Works, Fire, Police, and Conservation review all subdivisions 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.

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.

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

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

The town has a reverse 911 system and names can be added to the database via the town's website.

The Needham High School is the designated community shelter site.

The town has a Citizen Emergency Response Team (CERT) that provides training, supplies, and public education to neighborhoods.

The town also has a volunteer Medical Reserve Corps, that could be activated in times of emergency to provide medical care/vaccinations to large numbers of people.

The town works with the Council on Aging to help provide shelter to the elderly during extreme heat.

EXISTING TOWN-WIDE MITIGATION FOR FLOOD-RELATED HAZARDS

Needham 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) – Needham participates in the NFIP with 240 policies in force as of the August 30, 2019. FEMA maintains a database on flood insurance policies and claims. This database can be found on the FEMA website at <https://www.fema.gov/policy-claim-statistics-flood-insurance>.

The following information is provided for the Town of Needham:

Flood insurance policies in force (September 30, 2018)	149
Coverage amount of flood insurance policies	\$44,782,100
Premiums paid	\$296,268
Closed losses (losses that have been paid)	102
Substantial Damage Claims since 1978	7
Total payments (total amount paid on losses)	\$1,363,146

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.

Engineering staff developing a Drainage System Inventory and integrating the data into the Town's Geographical Information System (GIS).

Catch basins on public roads and property are cleaned annually. Street sweeping also occurs on an annual basis.

The Public Works Department provides maintenance to culverts, drainage pipes, and other drainage infrastructure on an as-needed basis. Drainage maintenance activities are coordinated with the state Department of Environmental Protection and Massachusetts Water Resources Authority.

The Town mitigates for beavers on a case-by-case basis. The town will use a trapper as necessary if there is an immediate threat and is a public health issue. A permit to do so is required by state law through the local Board of Health. In some instances, pond levels will be lowered in anticipation of potential flooding.

Needham's Zoning has a Flood Plain Protection District that restricts certain activities and requires a special permit for activities located within a flood zone.

Needham's Zoning has a Wetlands Protection Regulation, intended to protect wetland resource areas, and minimize flooding.

The Massachusetts Stormwater Policy is applied to developments within the jurisdiction of the Conservation Commission.

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

Open Space Residential Developments are allowed under Needham's Zoning.

The Town's Zoning also has an Aquifer Protection District to protect its drinking water supplies.

Needham has substantial protected open space and proactive land acquisition and preservation programs, including:

- The town's draft Open Space Plan and Community Preservation Plan are comprehensive and identify key parcels for purchase or protection.
- Low-lying wetland areas provide significant flood storage for the town's rivers.
- Flood plain has been preserved and is effective at minimizing flooding.

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

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.

EXISTING TOWN-WIDE MITIGATION FOR WIND-RELATED HAZARDS

The Public Works Department has an effective tree trimming in public areas and along Rights-of-Ways. They have a multi-year plan trimming program (approximately a 3-year cycle) to go over their whole system.

New developments must install buried utilities.

EXISTING TOWN-WIDE MITIGATION FOR WINTER-RELATED HAZARDS

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

Overnight parking bans are in effect year-round.

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

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

The Town provides public education to residents regarding roof collapses due to snow when conditions are dangerous. In addition, new codes are more stringent to better guard against roof collapses.

The town has sufficient snow storage .

EXISTING TOWN-WIDE MITIGATION FOR FIRE-RELATED HAZARDS

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

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

The Fire Department is trained and has experience in protecting the open lands in town, as well as wooded areas associated with Olin College or other private institutions.

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

EXISTING TOWN-WIDE MITIGATION FOR EARTHQUAKE HAZARDS

The town has shelters and backup facilities.

The Needham Water Department is proactive in being able to isolate portions of the water system and identify alternative firefighting water supply sources.

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

EXISTING TOWN-WIDE MITIGATION FOR LANDSLIDE HAZARDS

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

The town has an earth removal bylaw.

COMPILATION OF EXISTING MITIGATION

Table 32 summarizes the many existing natural hazard mitigation measures already in place in Needham when the first Hazard Mitigation Plan was developed in 2009. 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 34: Existing Natural Hazard Mitigation Measures in Needham

Type of Existing Mitigation Measures	Effectiveness	Improvements/ Changes Needed
MULTIPLE HAZARDS		
Multi-department review of developments	Yes	
Comprehensive Emergency Management Plan (CEMP)	Yes	
Enforcement of State Building Code	Yes	
Local Emergency Planning Committee (LEPC)	Yes	
Emergency Preparedness public education on the town website	Yes	Expanded to social media
Reverse 911	Yes	
Needham High is community shelter	Yes	Back-up sites as well
Citizen Emergency Response Team	Yes	CERT and MRC are combined
Medical Reserve Corps	Yes	
Sheltering for elderly during extreme heat	Yes	Shelter available to all

FLOOD HAZARDS		
Participation in the National Flood Insurance Program	Yes	
Stormwater system mapped in GIS	Yes	
Annual catch basin cleaning and annual street sweeping	Yes	
Drainage system maintenance is performed as needed, and under a general maintenance permit issued by the Conservation Commission	Yes	
Long-term stormwater plan and funding, and ongoing system improvements	Yes	
Beaver mitigation	Yes	
Flood Plain Conservancy District	Yes	
Wetlands Protection Bylaw and Regulations	Yes	
Massachusetts Stormwater Policy	Yes	
Stormwater Requirements in Subdivision Regulations and Site Plan Review	Yes	
Open Space Residential Developments allowed	Yes	
Aquifer Protection Overlay District	Yes	
Protected open space and proactive land preservation programs	Yes	
Public Education on stormwater through the NPDES Phase II program	Yes	
WIND HAZARDS		
DPW tree maintenance program	Yes	
Requirement for new developments to install underground utilities	Yes	
WINTER HAZARDS		
Overnight parking ban year-round.	Yes	
Standard snow operations, restricted salt	Yes	
Public Education on snow operations and winter maintenance is planned for town website	Yes	
Snow and Ice Removal Bylaw	Yes	
Sufficient space for municipal snow storage	Yes	
GEOLOGIC HAZARDS (EARTHQUAKE AND LANDSLIDE)		
Evacuation plan in CEMP	Yes	
Shelters and backup facilities available	Yes	
Water Department able to isolate portion of the water system and identify alternate firefighting supply sources	Yes	
Maximum slopes for subdivision roads	Yes	
Earth Removal Bylaw in the Aquifer Protection District	Yes	
FIRE HAZARDS		
Open Burn Permits Required	Yes	

Fire Department Development Review	Yes	
Fire Department provides public education on its website	Yes	Expanded to social media
Fire Department is trained for protecting open space	Yes	
Town provides public education on drought watches	Not currently	
DAMS		
DCR Dam Safety Regulations	Yes	
Construction permits required	Yes	

MITIGATION CAPABILITIES AND LOCAL CAPACITY FOR IMPLEMENTATION

Under the Massachusetts system of “Home Rule,” the Town of Needham 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, Health Regulations, Public Works regulations, and local enforcement of the State Building Code. Local Bylaws may be amended by the Select Board 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 of Needham has recognized several existing mitigation measures that require implementation or improvements and has the capacity within its local boards and departments to address these.

SECTION 7: MITIGATION MEASURES FROM PREVIOUS PLAN

IMPLEMENTATION PROGRESS ON THE PREVIOUS PLAN

At a meeting of the Needham Hazard Mitigation Planning Committee, Town staff reviewed the mitigation measures identified in the 2009 Needham 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 and whether the deferral of action on the measure was due to the inability of the Town to take action on the measure. Table 33 summarizes the status of mitigation measures from the 2009 plan.

Table 35: Mitigation Measures from the 2009 Plan

Mitigation Action	Priority in 2012 plan	Current Status	Include in 2020 plan?
Upgrade existing sewer/storm water drainage systems in affected areas	High	Considerable work has done to reduce infiltration. The town is now moving focus to inflow. In the interim, bypass protocols are in place.	Yes
Establish ability to have a portable generator for the town	High	2 large portable generators were purchased, the new Police and Fire building will have generators installed. Several sewer pumps have generators (as well as capacity to bypass in case of malfunction). Still need a permanent generator for the Senior Center, and sewer pump stations as they are upgraded.	Yes
Upgrades to culvert and drainage on Hunnewell Street	High	The town was not able to proceed with the project because it was unable to get needed easements from residents.	Yes
Build a Control Structure and Weir at Walker Pond	Medium	This project is complete although ongoing maintenance is needed.	No
Maintenance and Monitoring of Main Bridges	Medium	Maintenance and monitoring is a required and ongoing activity. Many of the bridges have been rebuilt or upgraded. The Central Avenue bridge to Dover is in need of evaluation and work.	Yes
Update Hazardous	Medium	The plan has been revised and updated.	No

Mitigation Action	Priority in 2012 plan	Current Status	Include in 2020 plan?
Materials Response Plan			
Assessment of Historic Structure Natural Hazard Vulnerability	Medium	This was not completed. It is not currently a town priority.	No
Identify Potential back-up sites for Emergency Operations	Medium	This task is complete.	No
Continuation of Open Space Protection and Land Acquisition	Not rated	This is an ongoing priority. The town makes \$1.5 million available each year as a placeholder should priority property become available for purchase.	Yes
Regulatory Revisions for Stormwater Management	Not rated	The town has a residential stormwater bylaw and follows federal NPDES requirements. The next step is to develop regulations for the bylaw. Town bylaw requires dry wells to capture roof and driveway runoff. The Planning Board supports Low Impact Development.	Yes
Maintenance of Existing Infrastructure	Not rated	This is complete. The town has a comprehensive stormwater maintenance plan. This is a federal requirement under NPDES.	No
Assessment of Municipal Structures for Susceptibility to Snow Loads	Low	This is not complete. The town shovels building with flat roofs as needed. This is not a current concern.	No

As indicated in Table 33, Needham made good progress implementing mitigation measures identified in the 2009 Hazard Mitigation Plan. Considerable work has been done to address sewer infiltration. The Town developed a comprehensive stormwater maintenance plan and adopted a new stormwater bylaw. Also completed was a hazardous materials management plan. Back up emergency operation are in place; open space purchases have been completed. Generators were purchase and the weir and control structure at Walker Pond were completed.

Several projects that were not completed will be continued into this plan update. While much work was done on area bridges, the Central Avenue bridge needs to be assessed and additional generators are needed in a few key locations. There are a number of measures for which the

Town does regular or periodic work, but they remain ongoing priorities. These include open space purchases and managing sewer infiltration and inflow.

Overall, six mitigation measures from the 2009 plan will be continued in the plan update. Most retain the same priority in this 2020 Update. 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.

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 more than a local issue. The drainage systems that serve these communities are complex systems of storm drains, roadway drainage structures, pump stations and other facilities owned and operated by a wide array of agencies including the Town, the Department of Conservation and Recreation (DCR), the Massachusetts Water Resources Authority (MWRA), Massachusetts Department of Transportation (MassDOT) and the Massachusetts Bay Transportation Authority (MBTA). 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 Needham and a discussion of inter-municipal issues.

OVERVIEW OF REGIONAL FACILITIES WITHIN NEEDHAM

Major facilities owned, operated and maintained by state or regional entities include:

- State Routes 128 and 135 (MassDOT)
- MBTA Needham Commuter Rail Line (MBTA)
- Cutler Park and Hemlock Gorge (Mass DCR)
- Charles River Natural Valley Storage Area – includes land in Needham owned by the Army Corps of Engineers for flood control purposes

INTER-COMMUNITY CONSIDERATIONS

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

- A) Coordinate and Review Developments on a Regional Basis
As Needham and the surrounding communities are undergoing development, it is vital that these communities communicate and provide input during the review processes. When addressing housing, transportation, and economic development projects, the impacts to neighbors must be addressed.

B) Charles River Watershed

Needham and the cities and towns within the Charles River watershed participate in an extensive, on-going effort to improve water quality in the Charles River.

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 Wetlands Act and bylaw enforced by the Conservation Commission and the recent adoption of a Stormwater Bylaw, 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 adoption of stormwater regulations.

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
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

INTRODUCTION TO 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 has specific eligibility requirements that would need to be taken into

consideration. In most instances, the measure will require a number of different funding sources. Identification of a potential funding source in this table does not guarantee that a project will be eligible for, or selected for, funding. Upon adoption of this plan, the local 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 36: Mitigation Measures Prioritization

Climate Change	ACTION	GEOGRAPHIC COVERAGE	LEAD	TIME FRAME	EST. BENEFIT	EST. COST	FUNDING SOURCE	PRIORITY
Changes in Precipitation 	Inland Flooding							
	Address sewer inflow	Site-specific	Public Works	On-going	High	High	Dept	High
	Upgrade culvert and drainage at Hunnewell Street	Site-specific	Public Works	2025	High	High	TM	Medium
	Monitor the condition of the Central Avenue bridge to Dover	Site-specific	Public Works	2021	Medium	High	Dept	Low
	Develop regulations for the recently adopted Stormwater Bylaw	Town-wide	Public Works Conservation	2021	High	Low	Depts	Medium
	Continue Open Space Protection and Land Acquisition	Site-specific	Conservation	On-going	Medium	High	CPA, TM	Medium
	Analyze flood risks of a 500-year storm to the Charles River well heads.	Site-specific	Public Works	2023	High	High	TM	High
	Drought							
	Promote drought tolerant landscaping/site design	Town wide	Planning Conservation	2021	High	Low	Dept	Medium
	Implement drought tolerant landscaping on town properties	Site-specific	PPBC Public Works	On-going	High	Low	Dept	Medium
	Advance permaculture to improve water quality and quantity	Site-specific	Public Works Conservation	On-going	High	Medium	Depts	Medium
Landslide								
Identify areas of potential landslide risk	Town-wide	Public Works	2025	Low	Low	Dept	Low	
Rising Temperatures 	Extreme Heat and Heat Waves							
	Purchase a generator for the library	Site-specific	Bldg. Maint.	2024	Low	High	Grant, Capital	Medium
	Investigate the feasibility of solar canopies at town sites.	Site-specific	Bldg. Const.	2021	High	Low	Dept	High
Develop a tree removal mitigation program	Town-wide	Planning	2022	Medium	Low	Dept	Medium	

	ACTION	GEOGRAPHIC COVERAGE	LEAD	TIME FRAME	EST. BENEFIT	EST. COST	FUNDING SOURCE	PRIORITY
	Wildfires							
	Provide public education on fire risk	Town-wide	Fire	On-going	High	Low	Dept	High
	Map forest access roads. Maintain adequate access.	Site-specific	Public Works	On-going	High	Medium	Dept	Medium
	Invasive species							
	Develop forestry management plan for treatment plant property	Site-specific	Public Works	2024	Medium High	High	Capital	Medium
Extreme Weather 	Hurricanes and Tropical storms (see Multihazards)							
	Severe Winter Storm/Nor'easter							
	Develop brining capacity	Town-wide	Public Works	2022	High	Medium	Capital	Medium
	Tornadoes (see Multihazards)							
	Other Severe weather (wind, thunderstorms) (see Multihazards)							
Multihazards	Multihazards							
	Address generator needs	Site-specific	Public Works	2024	High	High	Capital	Medium
Non-Climate Hazard	Earthquake							
	Assess retrofit or replacement costs of older town buildings	Site-specific	Public Works	2025	Low	Low	Dept	Low

DESCRIPTION OF MITIGATION MEASURES

Changes in Precipitation

Inland Flooding

Address sewer inflow: Considerable work has done to reduce infiltration. While that work continues, the Town is now moving focus to inflow. In the interim, bypass protocols are in place. Locations of focus include Warren and Grant Streets, and the Oak Street area.

Upgrade to Culvert and Drainage at Hunnewell Street: The Town completed plans for the project but was not able to proceed with the project because it was unable to obtain needed easements from residents. Moving forward with this project will most likely require revisiting the issue of easements.

Monitor the condition of the Central Avenue bridge to Dover: This would need to be a joint project with the Town of Dover. The approach to the bridge, the narrow passage, and the wooden railings are all safety concerns. The Town has secured funding to monitor shifting of stones in the bridge to assess the urgency of action.

Develop regulations for the recently adopted Stormwater Bylaw: The Town developed draft regulations. The next step will be to make revisions in response to the feedback received.

Continue Open Space Protection and Land Acquisition: This is an ongoing priority. The Town makes \$1.5 million available each year as a placeholder should priority property become available for purchase

Analyze flood risks of a 500-year storm to the Charles River well heads: Flooding in 1987 was problematic. Sand bagging has been required in the past. The wellheads and the roadways to access the pumps are both subject to flooding.

Drought

Promote drought-tolerant landscaping/site design: Drought conditions have strained water supply in recent years. A particular issue has been summer usage to maintain lawns.

Implement drought-tolerant landscaping on town properties: Implement landscaping projects and highlight the efforts, in order to promote adoption of practices by residents.

Advance permaculture to improve water quality and groundwater levels: The Town is working on a project in the Walker Pond watershed to improve soil quality for water retention and infiltration. Residents will be encouraged to adopt highlighted practices. The Town will seek to expand the project to other sub watersheds upon completion of the Walker Pond demonstration project.

Landslide

Identify areas of potential landslide risk: The town has no recorded history of landslides but will evaluate where the potential for landslide may exist.

Rising Temperatures

Extreme Heat and Heatwaves

Purchase a generator for the library: A generator for the library is a priority as the library serves as a cooling center.

Investigate the feasibility of solar canopies at town sites: The canopies generate clean energy, and with battery storage, could provide for energy resilience in the event of power outages. The Town is currently investigating several locations for a project.

Develop a tree removal mitigation program: Develop a bylaw to ensure replacement of trees that are removed.

Wildfires

Provide public education on fire risk: Address illegal burning and fire risks.

Map forest access roads. Maintain adequate access: Utilize GIS to map the forest access roads. Develop and implement plan to assure maintenance of adequate access.

Invasive species

Develop forestry management plan for treatment plant property: The 70-acre property has significant dead wood. Invasives have contributed to the poor condition of the forest. Develop a plan to determine the best strategies to address the dead wood and improve and maintain the health of the forested land.

Extreme Weather

Hurricanes/Tropical storms: see Multihazards

Severe Winter Storm/Nor'easter

Develop brining capacity: The Town has experienced more frequent icing conditions. The use of brine melts ice more quickly and can reduce the need for salt application. The Town will investigate purchase of equipment for brining or fabrication of a system.

Tornadoes: see Multihazards

Other Severe Weather: see Multihazards

Multihazards

Address generator needs: Install a permanent generator at the Senior Center at the Heights. Install generators at the sewer pump stations as they are upgraded.

Non-Climate Hazard

Earthquake

Assess retrofit or replacement costs of older town buildings: Consider condition of older town buildings that predate Building Code seismic requirements.

SECTION 9: PLAN ADOPTION & MAINTENANCE

PLAN ADOPTION

The Needham Hazard Mitigation Plan 2020 Update was adopted by the Select Board 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 Norwell Hazard Mitigation Team to prepare this plan. This group will continue to meet on an as-needed basis to coordinate the implementation and maintenance of this plan. A member of the Town staff will be designated as the team coordinator. Additional members could be added to the local team from businesses, non-profits, and institutions. The Town will encourage public participation during the next 5-year planning cycle. As updates and a review of the plan are conducted by the Hazard Mitigation Team, these will be placed on the Town's web site, and any meetings of the Hazard Mitigation Team will be publicly noticed in accordance with town and state open meeting laws.

IMPLEMENTATION AND EVALUATION SCHEDULE

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

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 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 Mid-Term progress 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 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 Town will need to review the current FEMA hazard mitigation plan guidelines for any changes in requirements for hazard mitigation plans since the previous plan. Once the next plan update is prepared, the Town will submit it to MEMA and FEMA for review and approval and adopt the plan update in order to obtain formal FEMA approval of the plan.

INTEGRATION OF THE PLANS WITH OTHER PLANNING INITIATIVES

Upon approval of the Needham 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
- Council on Aging
- Building Department
- Conservation

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

Town of Needham General By-Laws
Zoning By-Law of the Town of Needham
Town of Needham Community Resilience Building Workshop Summary of Findings 2020
Town of Needham Draft Open Space and Recreation Plan 2017
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 Flood Hazard Management Program
Massachusetts Office of Coastal Zone Management Shoreline Change Data
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/>
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>

APPENDIX A: MEETING AGENDAS

Needham Municipal Vulnerability Preparedness (MVP)
Hazard Mitigation Plan (HMP) Team Meeting

November 13, 2019

Public Service Administration Building

1. Welcome and Introductions
2. Overview and Purpose MVP and HMP projects
3. The role of this committee
4. MVP: a little more detail on the workshop
5. Set Date and Location of MVP Workshop
6. Discussion of Workshop Invitees
7. HMP: Update hazard areas, critical infrastructure, new development sites
8. Next steps

Needham Municipal Vulnerability Preparedness/ Hazard Mitigation Plan

Team Meeting
December 10, 2019
10:00-12:00
Charles River Room

MVP: Workshop – Friday, January 10, 9:30 to 3:30

1. Check in on invitations, logistics
2. Review the workshop agenda
3. Review the workshop posters
4. Identify the top four hazards

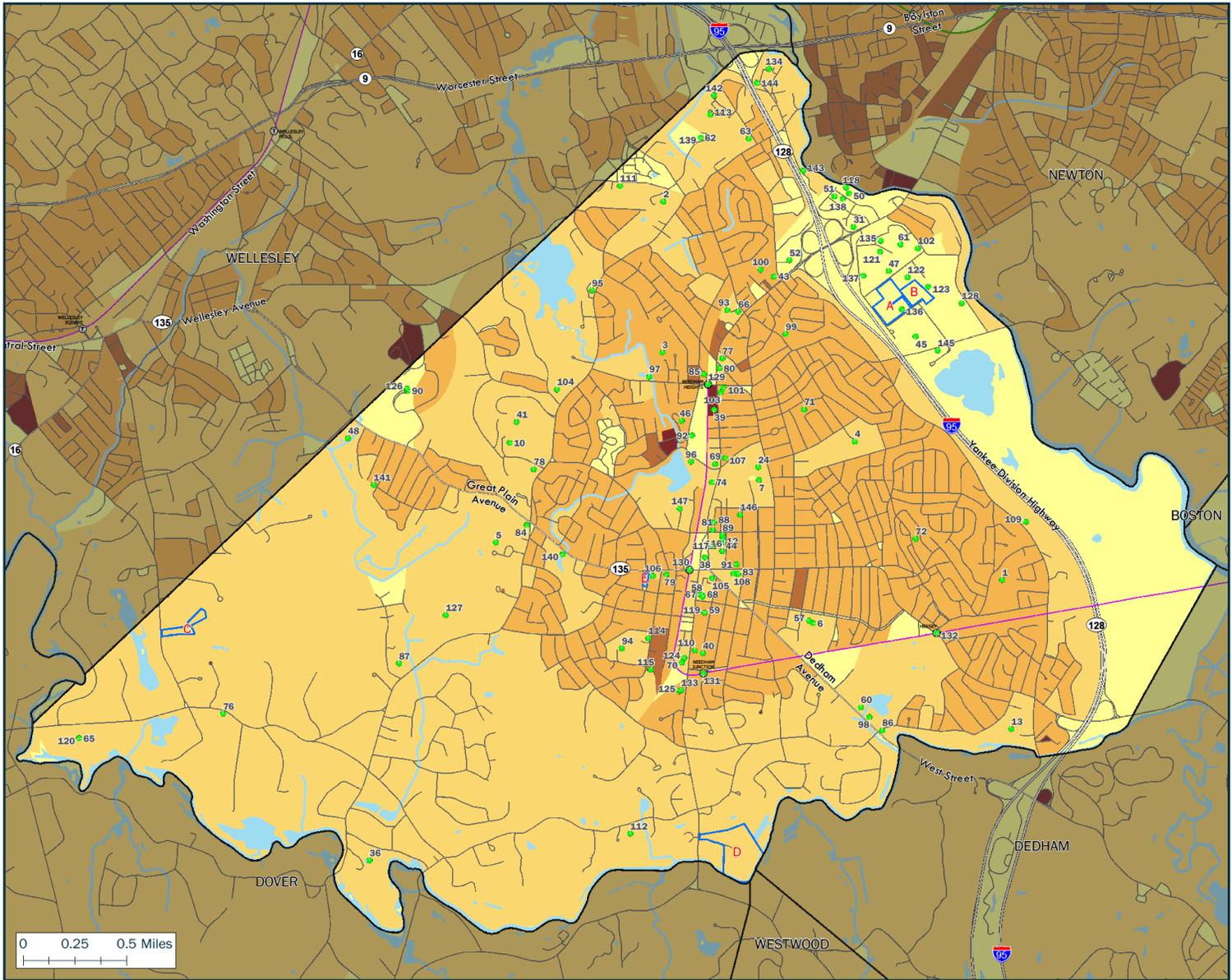
HMP

5. Review pre-existing mitigation measures from the 2008 plan
6. Review mitigation goals from the 2008 plan

Needham Municipal Vulnerability Preparedness/
Hazard Mitigation Plan
Team Meeting
May 21, 2020
1:30 – 3:30
via Zoom

1. Recap 1st public meeting and feedback
2. Review Hazard Mitigation goals
3. Develop mitigation measures for the plan update
4. Next steps – public meeting

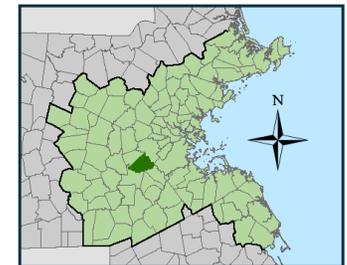
APPENDIX B: HAZARD MAPPING



FEMA Hazard Mitigation Planning Grant NEEDHAM, MA

Map 1: Population Density

- Sites**
- Critical Infrastructure*
 - Development Areas
- * See details in separate table
- Water Bodies**
- 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



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.

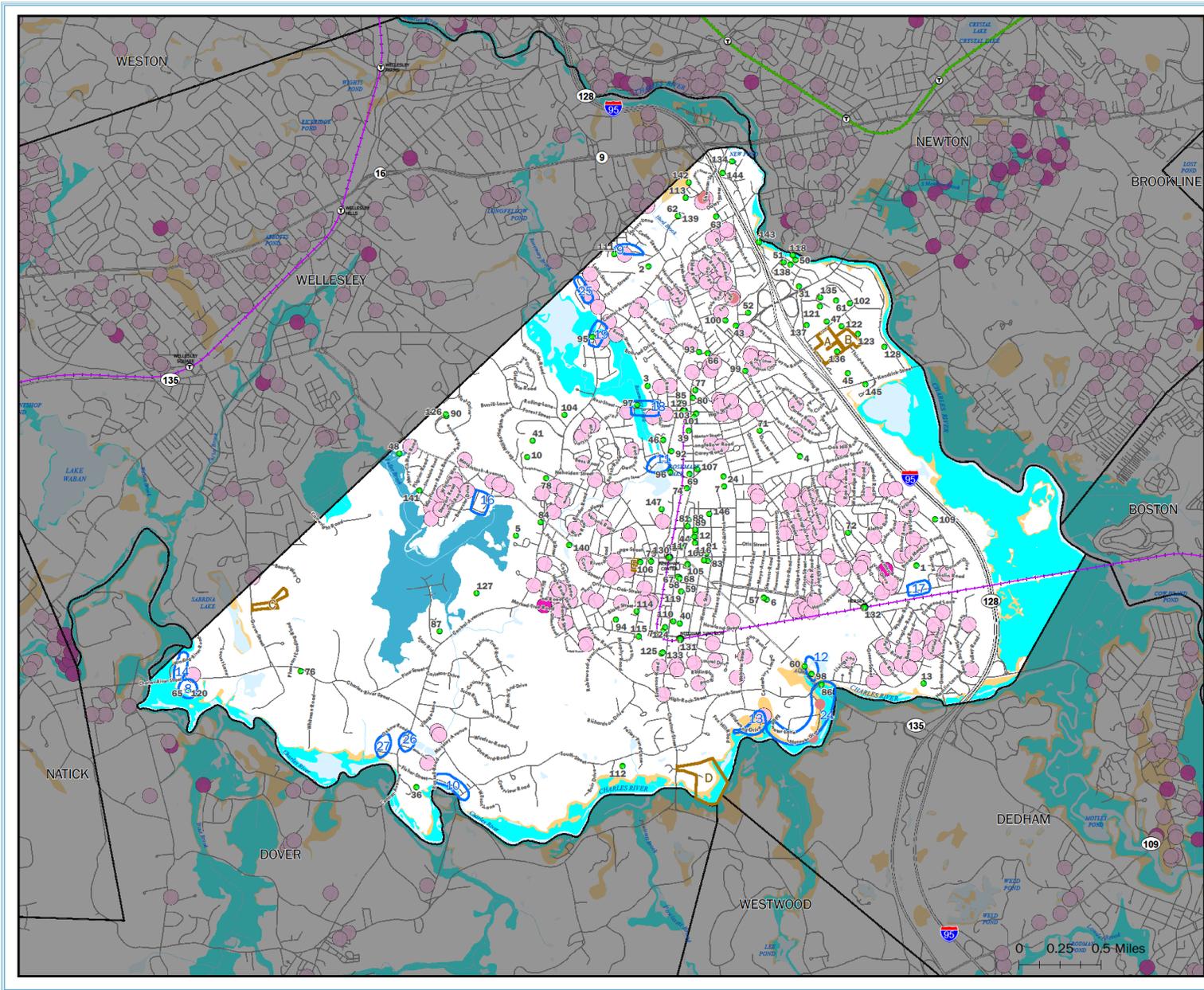
Produced by MAPC Data Services
60 Temple Place, Boston, MA 02111 (617) 451-2770

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)

NEEDHAM, MA

Date: 6/2/2020

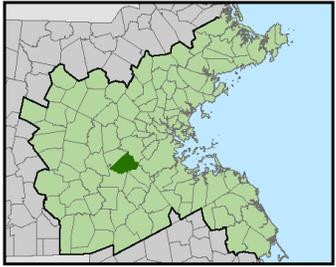
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FEMA Hazard Mitigation Planning Grant NEEDHAM, MA

Map 3: Flood Zones

- Sites**
- Critical
 - Repetitive Loss
 - Development
 - Locally Identified
- Water Bodies**
- All Roads**
- Interstate
 - U.S. Highway
 - State Route
 - Streets
- Rail**
- Stations
 - Commuter Rail
 - Trains
- Flood Zones, (Annual)**
- Zone A:
 - Zone AE:
 - Zone AH:
 - Zone AO:
 - Zone VE: 1% with Velocity Hazard
 - 0.2% Annual
- March 2010 Flood Claims**
- Disaster Assistance
 - Flood Insurance



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.

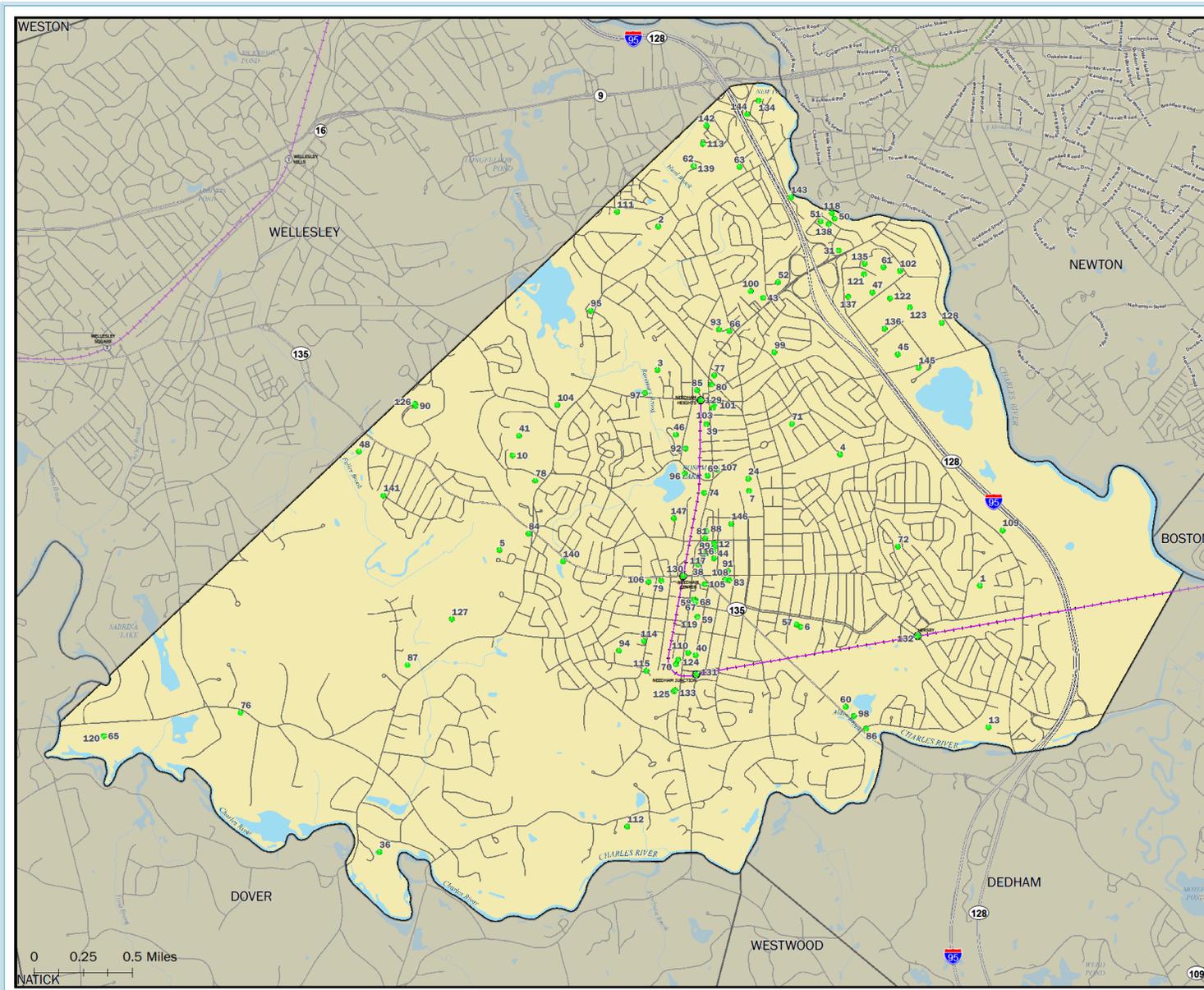
Produced by MAPC Data Services
60 Temple Place, Boston, MA 02111 (617) 451-2770

Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)

Flood Zones datalayer updated by MassGIS October 2013 from finalized data provided by Federal Emergency Management Agency (FEMA)

NEEDHAM, MA
Date: 6/2/2020

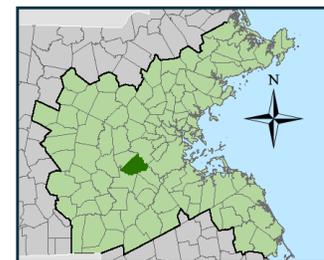
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FEMA Hazard Mitigation Planning Grant NEEDHAM, MA

Map 4: Earthquakes / Landslides

- Sites**
- Critical Infrastructure Sites*
 - * See details in separate table
- Water Bodies**
- All Roads**
- Interstate
 - U.S. Highway
 - State Route
 - Street
- Earthquakes**
- Epicenters
- 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)



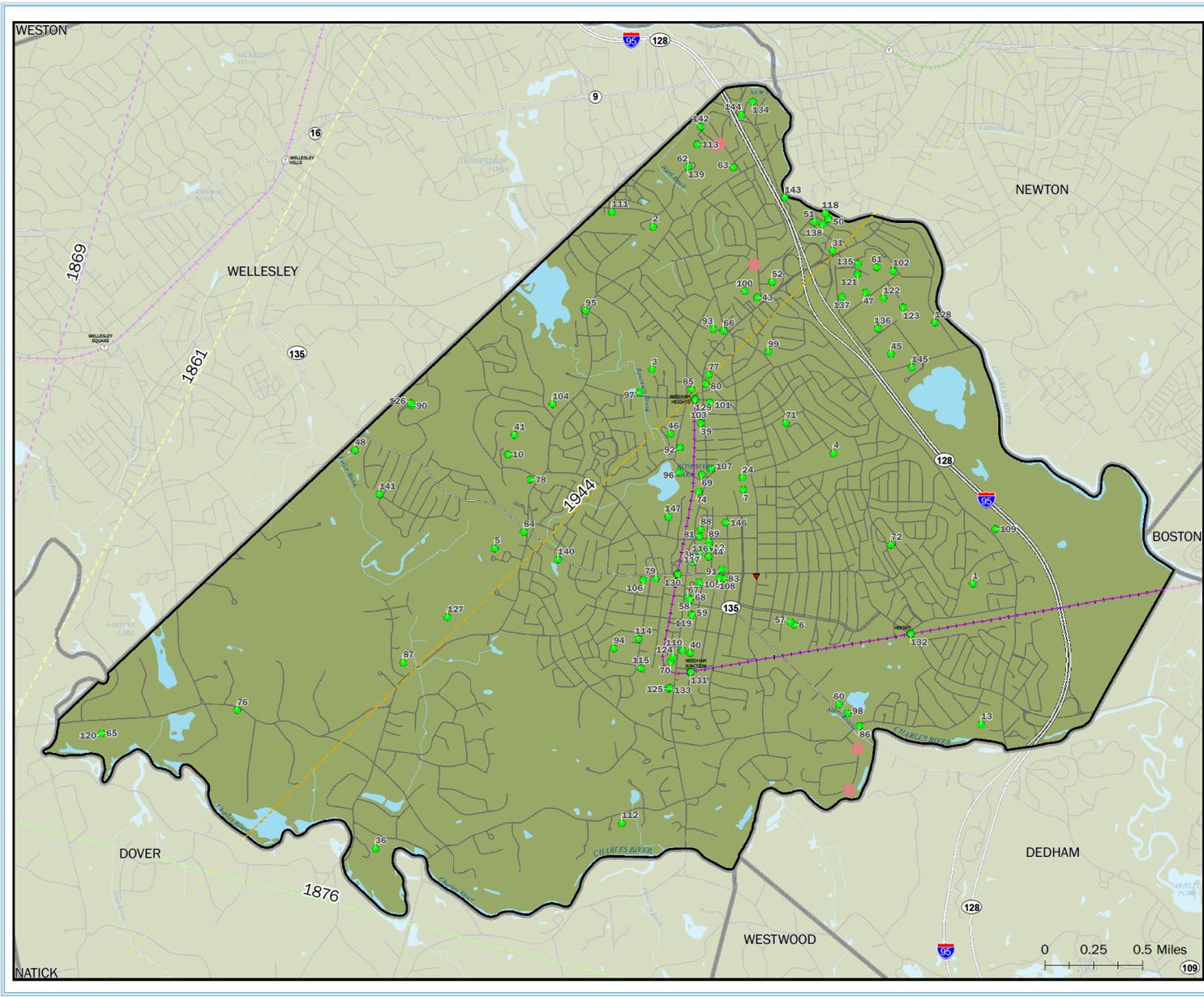
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Produced by MAPC Data Services
60 Temple Place, Boston, MA 02111 (617) 451-2770

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

Date: 3/23/2020
NEEDHAM, MA

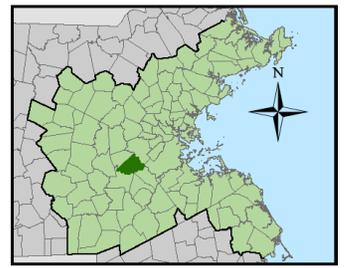
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FEMA Hazard Mitigation Planning Grant
NEEDHAM, MA

Map 5:
 Hurricanes / Tornadoes

- Critical Infrastructure Sites*
- Repetitive Loss Sites
- * See details in separate table
- Ⓜ Train Stations
- Commuter Rail Lines
- Trains
- ▼ Tornado
- 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
- Water Bodies



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 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)

Date: 3/23/2020

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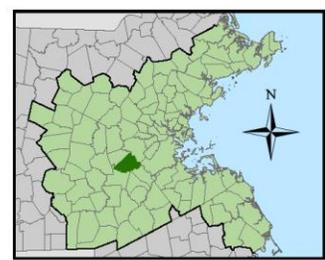


FEMA Hazard Mitigation Planning Grant NEEDHAM, MA

Map 6: Average Snowfall



- Sites**
- Critical Infrastructure Sites*
* See details in separate table
- Water Bodies
- Train Stations
- Commuter Rail Lines
- Trains
- Average Annual Snowfall**
- 36.1 to 48.0 inches
- 48.1 to 72.0 inches
- All Roads**
- Interstate
- U.S. Highway
- State Route
- Street



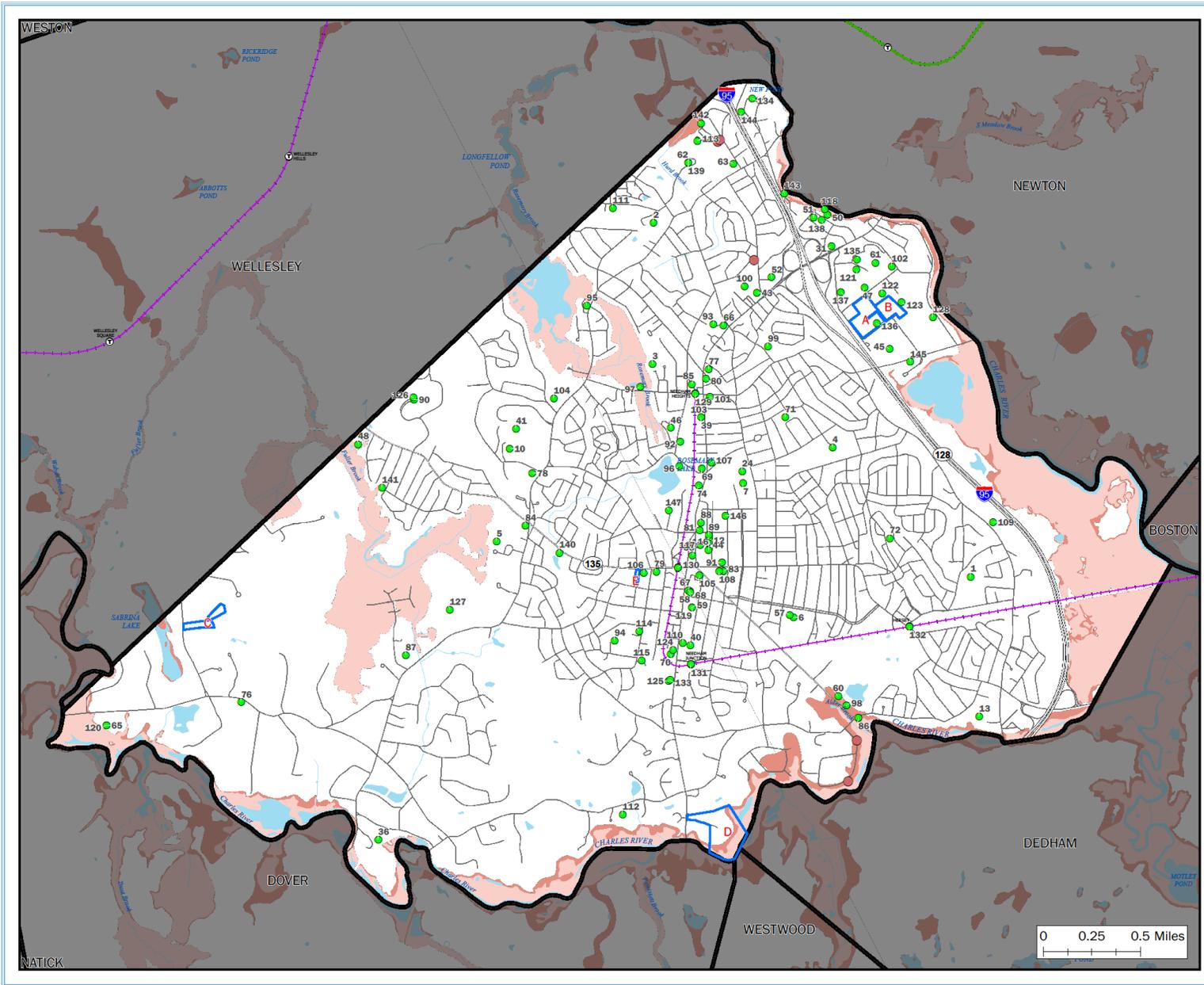
The information depicted on this map is for informational purposes only and is not adequate for legal boundary definition, interpretation, or parcel-level analyses.

Produced by MAPC Data Services
60 Temple Place, Boston, MA 02111 (617) 41-

Data Sources:
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System
Northeast States Emergency Consortium (NES)
Massachusetts Emergency Management Agency
Federal Emergency Management Agency (FEMA)

NEEDHAM, MA
Date: 3/23/2020

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MAPC

FEMA Hazard Mitigation Planning Grant NEEDHAM, MA

Map 7: Composite Natural Hazards

Sites

- Critical Infrastructure
- Repetitive Loss Sites
- Development Areas
* See details in separate table

Composite Natural Hazards

- Low (2 Hazards)
- Moderate (3 Hazards)
- High (4 Hazards)
- Very High (5 Hazards)

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

- Water Bodies

All Roads

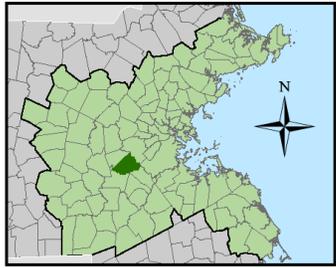
- Interstate
- U.S. Highway
- State Route
- Street

Train Stations

- Train Stations
- Commuter Rail Lines
- Trains

Subway Lines

- Blue
- Green
- Orange
- Red
- Silver

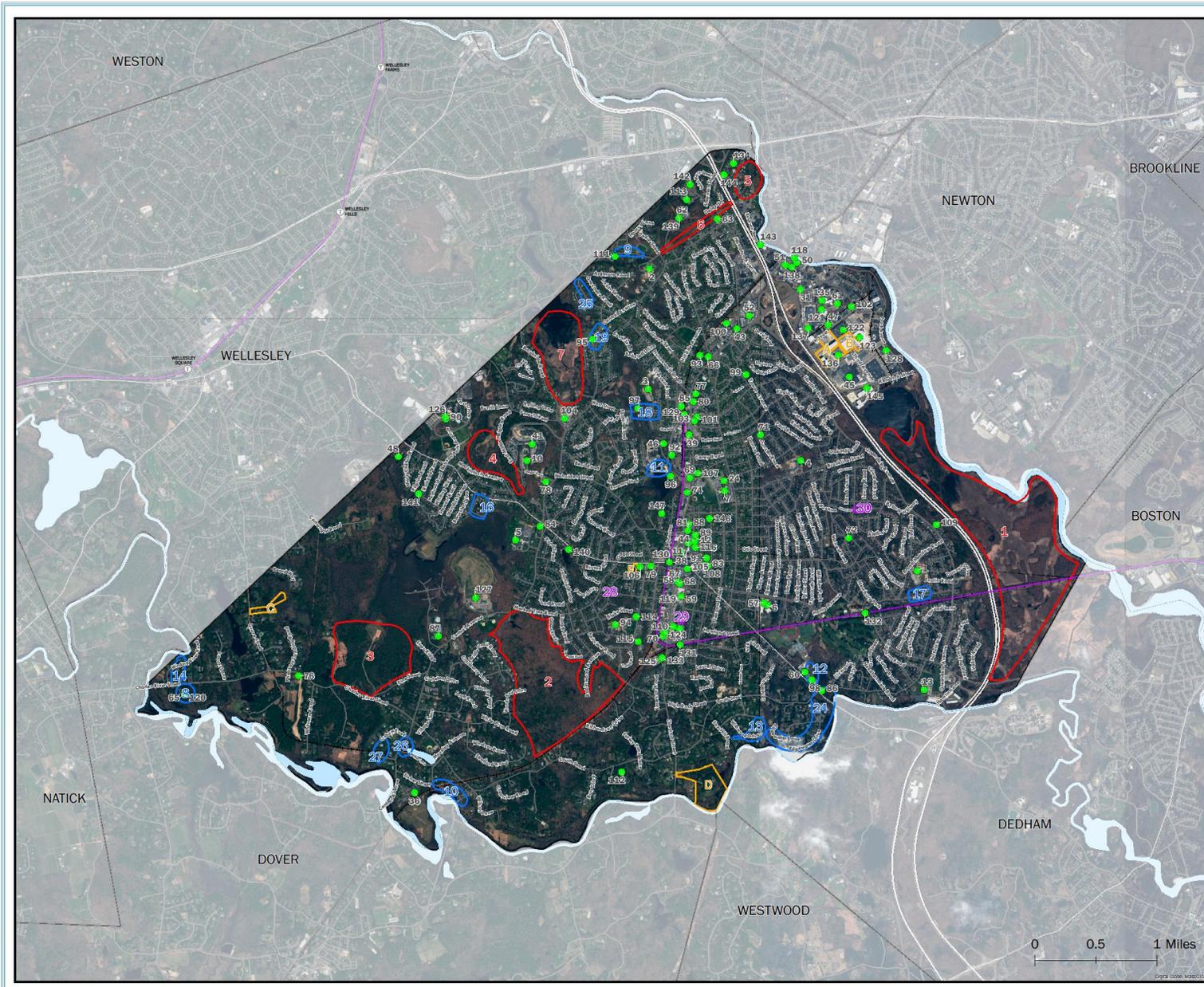


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60 Temple Place, Boston, MA 02111 (617) 451-2770

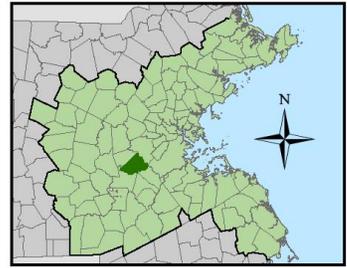
Data Sources

Composite Natural Hazard:
Wind, Landslide Risk, Snow - Northeast States Emergency Consortium (NESEC)
Flood Zones - 2013 FEMA/MassGIS
Roads/Trains/MassDOT/CTPS
Hurricane Surge - 2013 U.S. Army Corps of Engineers, New England District
Repetitive Loss Sites: DCR/Office of Flood Hazard Management
Critical Infrastructure: Metropolitan Area Planning Council (MAPC) /
NEEDHAM, MA
Date: 6/2/2020



FEMA Hazard
Mitigation Planning Grant
NEEDHAM, MA
Map 8: Local Hazard Areas

- Sites**
- Critical Infrastructure Sites*
 - Repetitive Loss Sites
 - * See details in separate table
 - Ⓜ Train Stations
 - Commuter Rail Lines
 - Trains
- Locally Identified Hazard Areas**
- Brush Fires
 - Flooding
 - Historic
 - Development Sites
 - * See Section IV Risk Assessment
 - * See details in separate table
- All Roads**
- Interstate
 - U.S. Highway
 - State Route
 - Street

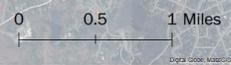


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Produced by MAPC Data Services
60 Temple Place, Boston, MA 02111 (617) 451-2770

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 © DigitalGlobe, 2015

NEEDHAM, MA
Date: 6/2/2020



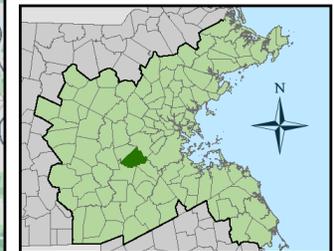


FEMA Hazard Mitigation Planning Grant
NEEDHAM, MA

Map 9: High Land Surface Temperature

- | | |
|---|--|
| <p>Tree Canopy Coverage</p> <ul style="list-style-type: none"> 0% 1-25% 26-50% 51-75% 76 - 100% | <p>Climate Hazards</p> <ul style="list-style-type: none"> Hottest 5% of region's land area <p>Sites</p> <ul style="list-style-type: none"> Critical Infrastructure* Development Areas <p><small>* See details in separate table</small></p> |
| <p>Transportation</p> <ul style="list-style-type: none"> Rail Stations Commuter Rail | <p>Hydrography</p> <ul style="list-style-type: none"> Perennial Stream Intermittent Stream Ditch/Canal Aqueduct Water Bodies |
| <p>Roads</p> <ul style="list-style-type: none"> Interstate U.S. Highway State Route Streets | |

0 0.5 1 Miles

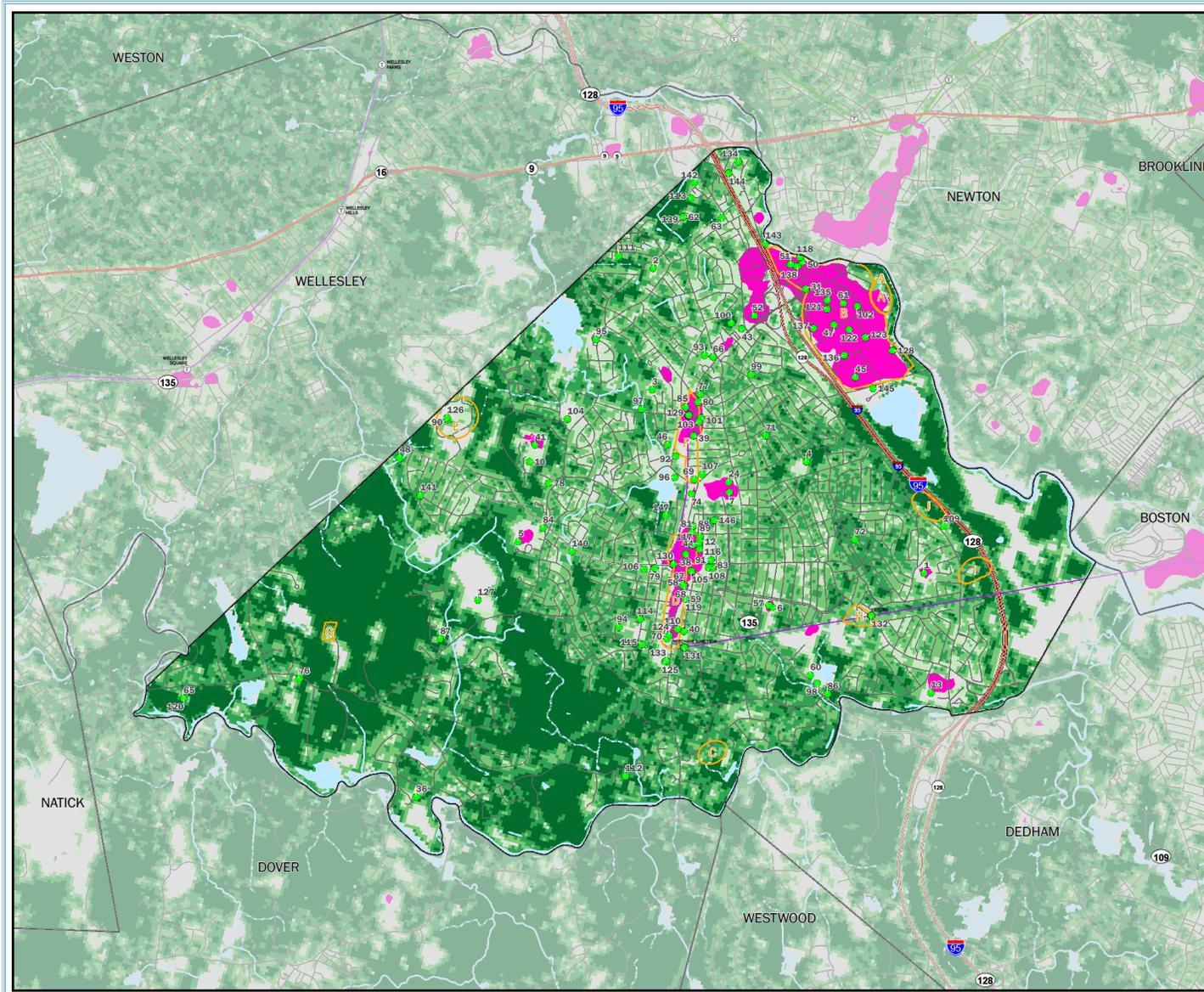


The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

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 60 Temple Place, Boston, MA 02111 (617) 451-2770

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 Northeast States Emergency Consortium (NESEC)
 Massachusetts Emergency Management Agency (MEMA)
 Federal Emergency Management Agency (FEMA)
 Imagery © Google
 NEEDHAM, MA

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 Date: 3/30/2020



APPENDIX C: PUBLIC MEETINGS

CALENDAR LISTING / MEDIA ADVISORY

NEEDHAM DRAFT HAZARD MITIGATION AND CLIMATE PLANS TO BE PRESENTED VIRTUALLY MAY 4-18

*Presentation of Needham's Hazard Mitigation and Climate Plans
and solicit public comments*

Who: Needham residents, business owners, representatives of non-profit organizations and institutions, and others who are interested in preventing and reducing damage from natural hazards and increasingly extreme weather.

What: A video presentation and feedback survey available on line.

The Hazard Mitigation plan identifies natural hazards affecting Needham such as floods, hurricanes, winter storms, and earthquakes. The climate plan focuses on hazards associated with our warming climate. The plans include actions that the Town can take to reduce future vulnerability to these hazards. The public is invited to offer feedback on priorities the town has identified to prepare for future extreme weather.

When: May 4- May 18

Where: **Website link:**

<https://www.mapc.org/resource-library/needham-feedback/>

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.

##

CLIMATE CHANGE AND NATURAL HAZARDS PREPAREDNESS



Our climate is changing and the Town of Needham is developing Climate and Hazard Mitigation plans to prepare for future extreme weather events. The plans will make the Town eligible to apply for funding of town priorities.

We are seeking your feedback on the priorities that should be included in the plans.

To learn about potential hazards facing Needham and provide your feedback please click the link to the website below. The site includes a short survey where you can offer your comments and suggestions about how Needham can best be prepared. Feedback received by May 18 will be included in the final report.

Website link:

<https://www.mapc.org/resource-library/needham-feedback/>

For more information, please contact Anne Herbst, Senior Environmental Planner at the Metropolitan Area Planning Council at (617) 933-0781 or email a Herbst@mapc.org.

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

CALENDAR LISTING / MEDIA ADVISORY

NEEDHAM'S HAZARD MITIGATION PLAN TO BE DISCUSSED AT JUNE 9 PUBLIC MEETING

- Who:** Needham residents, business owners, non-profit organizations and institutions, and others who are interested in preventing and reducing damage from natural hazards.
- What:** At a public meeting on Wednesday, June 9 at 6:00 PM, a presentation on the *Needham Draft Hazard Mitigation Plan, 2020 Update* will be hosted by the Select Board. The presentation will be made by the Metropolitan Area Planning Council (MAPC), which is assisting the Town with the preparation of the updated Hazard Mitigation Plan. There will be an opportunity for questions and discussion following the presentation.
- The Town of Needham has prepared the draft Hazard Mitigation plan to document natural hazards that affect the Town, such as floods, hurricanes, and severe winter storms, and to recommend actions that the Town can take to reduce its vulnerability to these hazards. Once completed and approved by the Federal Emergency Management Agency (FEMA), the Town will be eligible for federal Hazard Mitigation Grants from FEMA.
- When:** Tuesday, June 9, 2020, 6:00 PM
- Where:** Virtual meeting via Zoom
Link to meeting available at: <http://www.needhamma.gov/507/Agendas-Minutes>

HAZARD MITIGATION PLAN

PUBLIC MEETING

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



The Town of Needham has prepared a draft Hazard Mitigation Plan, as well as a Climate Plan, to help the town reduce its vulnerability to natural hazards such as flooding, hurricanes, and winter storms. Please join the Select Board for a public presentation of the Hazard Mitigation Plan. Your questions and suggestions for the draft plan are welcome, please join us!

Date: Tuesday, June 9, 2020

Time: 6:00 PM

Location: The meeting will be held virtually. Link available at: <http://www.needhamma.gov/507/Agendas-Minutes>

For more information, please contact Anne Herbst at (617) 933-0781 or email a Herbst@mapc.org.

Select Board agenda to go here

APPENDIX D: PLAN ADOPTION

<TOWN LETTERHEAD>

**CERTIFICATE OF ADOPTION
SELECT BOARD
TOWN OF NEEDHAM, MASSACHUSETTS**

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

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

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

WHEREAS, duly noticed public meetings were held by the LOCAL HAZARD MITIGATION PLANNING TEAM on May 4-18, 2020 and June 9, 2020 and

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

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

ADOPTED AND SIGNED this Date. _____

Name(s)

Title(s)

Signature(s)

APPENDIX E: MVP WORKSHOP RESULTS

Highest Priorities

Develop communication strategies: Several groups proposed targeted outreach to specific populations including seniors, low income residents, limited English language speakers, people with disabilities, people with cell phones, and people who work in Needham but live elsewhere. Creating a neighbor-to-neighbor outreach program was proposed.

Communicate and address health impacts: Provide outreach and education about extreme heat impacts and, mosquito and tick-borne illnesses. Develop heat exposure guidelines. Create a permanent shade structure at Rosemary Pond. Develop mosquito control plans, consider a regional plan, support environmentally friendly strategies.

Stormwater: While many groups highlighted Needham's new Stormwater Bylaw as a strength, stormwater management was identified as a top priority. Suggestions included providing needed funding and a long-term plan, addressing stormwater needs on large developments and ensuring new developments have increased capacity, incorporating nature-based solutions and, analyzing and planning for retrofits of undersized systems.

Water infrastructure: Monitoring and assessing vulnerabilities of the system was a general priority. Protecting the wells and water treatment plant, which are subject to flooding, was a key concern. In addition, assuring the protection and functioning of the St. Mary's Pump Station, town interconnections, and sewer pump stations was highlighted.

Tree and Forest Management: Develop a forest management plan to address invasive species, pests, and vulnerability to fire. Develop a tree bylaw. Identify locations to plant trees.

Ensure robust infrastructure: Consider cyber security, redundancy, and generator backup.

Upgrade the Central Avenue Bridge: Coordinate the work with the Town of Dover.

Focus on wetlands: Incorporate more climate concerns and resiliency in the local bylaw. Provide public education on the value and importance of wetlands.

Focus on seniors in public housing: Upgrade the building and infrastructure. Create additional green space. Develop a communications and coordination plan for emergencies.

Focus on residents with medical needs: Develop a list of medically fragile people for wellness visits during emergencies. Communicate the list with the hospital to ensure capacity for likely patients in the event of emergency.

Create a disaster response plan: The plan should include evacuation strategies.

Focus on hazardous materials: Map hazardous materials sites and communicate the information to the hospital.



**Town of Needham
Community Resilience Building
Workshop
Summary of Findings
May 2020**



Community Resilience Building Workshop Municipal Vulnerability Preparedness Program Summary of Findings

OVERVIEW

Recent years have seen notable weather extremes in Needham. The winter of 2015 brought record-breaking snow, resulting in downed trees and power outages. The following year the Needham area was under a drought warning from July to November 2016. The winter of 2018 once again brought severe winter storms with a succession of four nor'easters pummeling the town in March. In March 2010 rainfall was so significant that a federal disaster was declared for eastern Massachusetts, resulting in \$59 million in assistance to individual households and \$26 million in reimbursements to the state and municipalities. In Needham, 232 properties received flood insurance payments or disaster assistance. Globally, the past five years are the hottest in recorded history.

In 2017, the Commonwealth of Massachusetts inaugurated the Municipal Vulnerability Preparedness (MVP) program to assist municipalities in planning for and implementing strategies to adapt to predicted changes in our warming climate. The predicted changes include both increased flooding from large rain events and a greater likelihood of drought, increased extreme heat days and heat waves, and increased flooding from sea level rise.

The Town of Needham, seeking to be proactive in addressing future climate threats, applied for a state grant to complete the Community Resilience Building (CRB) Workshop under the MVP program. Concurrent with the MVP program, Needham is updating its Hazard Mitigation Plan (HMP). The HMP is a five-year plan, developed under the auspices of FEMA, that identifies strategies to address natural hazards. Upon completion of the projects, the Town of Needham will be eligible to apply for state and federal grants to address natural hazards and climate risks.

The Town of Needham is partnering with the Metropolitan Area Planning Council (MAPC) to complete the MVP program and the Hazard Mitigation Plan. The MVP Core Planning Team identified and recruited community stakeholders to participate in the one-day CRB Workshop. Thirty-nine people representing Needham town staff, members of Needham Boards and Commissions, and Needham community organizations gathered on January 10. The central objectives of the workshop were to:

- Define top local natural and climate-related hazards of concern;
- Identify existing and future strengths and vulnerabilities;
- Develop prioritized actions for the Community;
- Identify immediate opportunities to collaboratively advance actions to increase resilience.

Materials provided for the workshop included local and regional data for changes in temperature, precipitation, and sea level recorded to date, as well as future projections to the end of the century. Posters provided data and mapping specific to Needham infrastructure, demographics, and natural resources (see Appendix A). The participants considered Needham's strengths and vulnerabilities focusing on infrastructure, society, and the environment. Working in small groups, and then together in a large group, they prioritized actions designed to increase Needham's resilience to future extreme weather events.

TOP HAZARDS AND VULNERABLE AREAS

The Core Planning Team identified the top natural hazards. Based on their recent work on the Hazard Mitigation Plan and review of workshop materials, the team identified flooding, heat waves, severe storms (wind, ice, snow) and drought as the climate hazards of greatest concern facing Needham. Flooding, drought, and severe storms have affected Needham in recent years. Considering town demographics, the team also included extreme heat as a top hazard.

Top Hazards

- Flooding
- Heat Waves
- Severe Storms (wind, ice, snow)
- Drought

CURRENT CONCERNS AND CHALLENGES PRESENTED BY HAZARDS

Participants and town officials noted the increasing frequency and intensity of storms, including heavy rain events; the recent period of drought; and nor'easters that brought damaging winds and snowfall. The principal threats from nor'easters are power outages and damage from falling trees and limbs, as well as travel restrictions due to heavy snow. Large rain events result in flooding when stormwater drainage capacity is exceeded and when groundwater levels are high. Droughts are harmful to local aquatic resources and vegetation. Participants expressed concern for water quality



and quantity as Needham relies on groundwater resources for water supply. As these issues are not new, the Town of Needham, through its emergency management activities and hazard mitigation

planning, has taken many steps to prepare for extreme weather and prevent harm to people and property. Workshop participants shared concerns that projected climate threats will heighten current challenges, particularly flooding, water quality and supply, and damage to, and from, trees.

AREAS OF CONCERN

Geographic:

Some of Needham's climate challenges are widespread across the town. These include power outages and damage from falling trees. Stormwater flooding, as evidenced by the flood claims from 2010, is concentrated in the more densely developed northeastern end of town. Participants cited the stretch of Interstate 95 that runs within Needham as a source of multiple concerns including excessive heat, air pollution, severe evacuation bottlenecks that could occur in the event of an emergency, and risks from hazardous materials being transported on the highway and located in commercial areas adjacent to the highway.

Hurricane Irene



Source: Needham Patch

Societal:

Potential vulnerable populations identified include older adults, low income residents, limited English language speakers, people with disabilities, and people who work in Needham but live elsewhere. Participants prioritized outreach and developing support services for these

populations. Many participants highlighted the large number of assisted living, nursing home, and senior housing facilities located in Needham. Suggestions included outreach and assistance to ensure that facilities are prepared to manage emergencies, as well as direct outreach to older adults.

The town's Public Health Department, in collaboration with Emergency Management and the local Housing Authority, recently completed a series of three workshops targeted to older adults and their caregivers. The workshops focused on preparation for extreme weather and improving social cohesion. The workshops provided opportunities to develop relationships with the Housing Authority and to gain insight into the types of messaging and outreach strategies that are most effective. Notably, they found that a focus on emergency preparedness rather than climate change was more engaging due its near-term focus and relative simplicity. Moreover, a focus on personal protection was more engaging to the participants than legacy-based thinking (such as focusing on grandchildren). These insights will assist the town in crafting its outreach strategies and methods going forward.

Environmental:

Continued protection of town drinking water supply was a key concern. Needham relies on its aquifer, and the town supplements that supply with water from the MWRA. Participants identified protection of the aquifer as an important town strength. The recently adopted Stormwater Bylaw was also highlighted as a strength. Managing the impacts of on-going development and redevelopment is an important priority. The need for forest and tree management was highlighted by many participants. Concerns include managing fire, pests, and invasive species. Strategies to protect existing trees and encourage tree planting were also highlighted.

Infrastructure:

Specific infrastructure concerns included flooding threats to the Water Treatment Plant and associated pumping stations, as well as the DPW building. The Central Avenue bridge over the Charles River that connects to the Town of Dover was identified as being in poor condition. Undersized stormwater capacity is an on-going concern. In some locations infiltration and inflow into the sewer system requires bypass pumping to avoid system backups.

CURRENT STRENGTHS AND ASSETS

Workshop participants identified numerous Needham strengths and assets that will support resilience to future climate impacts. As shown below, participants identified many town strengths across environment, infrastructure and society.

Environment

- Adoption of a new stormwater bylaw with green infrastructure and dry well requirements.
- Active Conservation Commission.

- Protection of natural resources including public wetlands along the river, drinking water aquifer, and The Charles River Natural Valley Flood Storage Area that is protected by the Army Core of Engineers.
- Natural resources including Ridge Hill Reservation, Cutler Park, reservoirs, Rosemary Lake, Trout Pond, Town Forest, rail trails, Newman School and reservoir trails; wildlife including eagles; Charles River bordering the town on three sides.
- The aquifer, along with MWRA supplement, provides town drinking water.
- Trees on public ways are protected or replaced.
- The 9-hole golf course is using goats for management of invasives.
- Fire roads are well-maintained in the Town Forest.
- Agricultural resources including Volante Farms and the Needham Community Farm.
- Protection of FEMA floodplain areas; there is robust floodplain capacity.

Infrastructure

- The many public and private schools and colleges could serve as shelters.
- There are many hotels that could provide emergency shelter.
- Many public facilities, including Old Town Hall and the Rosemary Center, have generators.
- Beth Israel Deaconess Medical Center is located in town.
- There is good public and private transportation access with highway, rail, and bus.
- There is lots of privately owned solar, and solar at the transfer station and the Sunita L Williams School.
- The town has ample grocery stores, restaurants and gas stations.
- Town roads are not subject to flooding.
- Important infrastructure includes the dam at Rosemary Street, bypass pumps to separate stormwater and sewer, bridges (many of which have recently been rebuilt), the police and fire stations, generators and backup pumps.
- The bulk of residents live in walkable areas.
- There is an active food service program in the schools.
- The town has both school buses and Council on Aging buses.
- The town has a robust communications network including three new towers.
- Work is being done to increase redundancy of utility lines and clear obstructions.
- Water infrastructure includes the water treatment plant and wells at the Charles River, St. Mary's Pump Station (MWRA feed), sewer pump stations, and water interconnections with other towns.
- There is not a lot of manufacturing, so fewer pollutant sources.

Society

- The library is a good resource for elders and others and, provides good communication.
- The Senior Center is active and provides support services including van services (but does not have a generator).
- Needham Community Council has a good network and services many people.
- The YMCA is a good resource for communication and services.

- There is a strong network of religious organizations in town, including the Needham Clergy Association.
- There is a strong Local Emergency Planning Council.
- Public health and emergency communications provide good education.
- Youth and Family Services provides good support.
- The Chamber of Commerce can network and provide support.
- There is a high-quality EMS.
- Town communication: Alert Needham and social media are strong.
- Police, first responders, Reserve Medical Corps, hospital and DPW personnel are all strengths for the town. Interdepartmental coordination is a strength.
- RAVE system provides support to medically vulnerable people.
- Many lower income residents are in more walkable areas.
- Community cohesion includes block parties, small-lot neighborhoods, community websites (Next Door), volunteers, and service clubs. Strong community participation as shown in turnout for the MVP workshop.
- The DPW has heat days language in its contract.
- Parks and Recreation facilities and programs.

TOP RECOMMENDATIONS TO IMPROVE RESILIENCE

Each of the five workshop groups identified vulnerabilities and suggested solutions. The solutions were prioritized as High, Medium, or Low. Each group then identified their four highest priorities. The participants voted for their personal top four priorities from among the table group priorities. There was overlap in the top priorities of the five groups. The top five priorities were highlighted by more than one table group. Twelve distinct areas of focus emerged from the twenty highest priorities identified by the groups. The highest priorities are listed below in order of the number of votes they received. See Appendix B for all the recommendations.

Highest Priorities

Develop communication strategies: Several groups proposed targeted outreach to specific populations including seniors, low income residents, limited English language speakers, people with disabilities, people with cell phones, and people who work in Needham but live elsewhere. Creating a neighbor-to-neighbor outreach program was proposed.

Communicate and address health impacts: Provide outreach and education about extreme heat impacts and, mosquito and tick-borne illnesses. Develop heat exposure guidelines. Create a permanent shade structure at Rosemary Pond. Develop mosquito control plans, consider a regional plan, support environmentally friendly strategies.

Stormwater: While many groups highlighted Needham's new Stormwater Bylaw as a strength, stormwater management was identified as a top priority. Suggestions included providing needed funding and a long-term plan, addressing stormwater needs on large developments and ensuring new developments have increased capacity, incorporating nature-based solutions and, analyzing and planning for retrofits of undersized systems.

Water infrastructure: Monitoring and assessing vulnerabilities of the system was a general priority. Protecting the wells and water treatment plant, which are subject to flooding, was a key concern. In addition, assuring the protection and functioning of the St. Mary's Pump Station, town interconnections, and sewer pump stations was highlighted.

Tree and Forest Management: Develop a forest management plan to address invasive species, pests, and vulnerability to fire. Develop a tree bylaw. Identify locations to plant trees.

Ensure robust infrastructure: Consider cyber security, redundancy, and generator backup.

Upgrade the Central Avenue Bridge: Coordinate the work with the Town of Dover.

Focus on wetlands: Incorporate more climate concerns and resiliency in the local bylaw. Provide public education on the value and importance of wetlands.

Focus on seniors in public housing: Upgrade the building and infrastructure. Create additional green space. Develop a communications and coordination plan for emergencies.

Focus on residents with medical needs: Develop a list of medically fragile people for wellness visits during emergencies. Communicate the list with the hospital to ensure capacity for likely patients in the event of emergency.

Create a disaster response plan: The plan should include evacuation strategies.

Focus on hazardous materials: Map hazardous materials sites and communicate the information to the hospital.

High Priorities

- Develop strategies to reduce hotspots at critical facilities. Encourage green roofs, replace surface lots with structured facilities, revisit design standards. Look into solar canopies.
- All stormwater flows to the Charles River. Clear channels of trees, clear stormwater outfalls, remove sediment.
- Add water fountains and provide tick awareness at town parks and playgrounds.
- Monitor groundwater quality to protect the aquifer. Enforce protections.
- Assess invasive species and recruit volunteers to help manage invasives.
- Encourage standards to reduce water, plastics, and paper. Improve handling of recycling.
- Improve communication with the state regarding EEE. Consider not holding sports events in the evening.
- Maintain town fire roads. Assess fire vulnerability of town lands. Work with other towns on equipment sharing.
- Strategically expand generators to additional public facilities.
- Help assisted living facilities become resilient; provide information and guidelines. Analyze and plan for the need for emergency sheltering if facilities are not resilient.
- Coordinate regionally and with neighboring towns to address road flooding.
- Where possible, put electric wires underground; increase tree maintenance.
- Identify where groundwater is infiltrating the sewer system; do strategic repairs, continue Special Permit process that requires upgrades.
- Include generators for cooling the schools in the Capital Plan.

- Develop a small cell site to address the lack of cell network at the DPW building.
- Improve communications with Eversource; provide more resources for the Tree Warden to address risks to the electrical distribution system.
- Assess the need for upgrades to the gas distribution system to prevent/fix leaks.
- Review/change the parameters for opening and closing warming and cooling shelters. Consider a long-term shelter.
- Create additional water supply; install a redundant well.
- Provide education, communication, and assistance to residents in public housing at Linden Street.
- Encourage sign-up for the RAVE system, provide translation, have backup communication plan.
- Increase awareness of town facilities and communications systems.

Medium Priorities

- Educate the public to protect the trees on privately owned land.
- Encourage more vegetation and promote electric car infrastructure to address air pollution impact from cars.
- The Fire Department should continue planning to address brushfires along I-95 and lack of access to those areas.
- Continue working on adopting a protective tree bylaw to address loss of trees in residential areas.
- Reduce pesticide and pollutant runoff. Adopt a bylaw, restrict use, encourage natural landscaping.
- Continue annual funding for the stormwater program.
- Enforce stormwater management to address increasing impermeable surfaces resulting from development and tear downs (90 yearly).
- Preserve wildlife at the Ridge Hill/Nike site.
- Add Rosemary pool and building as a heating/cooling center.
- Develop a communication network with the hospital and pharmacies. Consider the need to stockpile medical supplies.
- Communicate with the MBTA regarding resilience. Develop better bus and walking connections to transit.
- Address hot spots at school parking lots with rain gardens, overhead solar panels.
- Address hot spots along Route 128. Add tree and trail requirements for large developments, require cooler roof materials, and nature-based solutions.
- Work with the Chamber to build up relationships with owners and developers.
- Make sure the Fire Department has information regarding hazardous materials in Route 128 developments.
- Push for speedier updates to gas pipes, and long-term strategy to move electricity underground. Gain public information from Eversource on gas line locations.
- Develop a regional disaster evacuation plan considering exit points at Dedham, Central, and Charles River Road.
- Investigate the need to protect facilities and pump stations as wastewater gets overwhelmed with stormwater.
- Study ways to improve cell service at the treatment plant.

- Engage Norfolk County Mosquito Control to address areas along tracks, the Charles river and swales.
- Consider a parking garage (and solar) at the town center to increase parking.
- Pursue upgrades to the DPW to address flooding and aging infrastructure.
- Schools could serve as shelters – consider solar installations and battery storage.
- Convert to environmentally sustainable generators.
- Coordinate with the many facilities that serve special needs populations. Be aware of their needs and emergency plans.
- Do outreach to low income residents about available town services.
- Consider the needs of outdoor workers. Monitor protocols for health and safety.
- Encourage new cell towers and services to address gaps on Rt. 135 near Wellesley.

Low Priorities

- Study drought issues; consider a water management plan.
- Enforce anti-idling to address air quality concerns.
- Manage open space for resilience, consider opportunities for green infrastructure.
- Work with the MBTA regarding emergency plans, alternatives in the event of shutdowns, and evacuation plans.
- Encourage more tree planting and permeable surfaces; make this a requirement for new development.
- Study issues associated with Route 128, including air quality, that may occur during emergencies.
- Monitor impacts of transfer station on nearby wetlands.
- Town Hall has flooded in the past.
- Address DPW parking lot flooding when dam overtops. Improve spillway.
- Address road flooding, e.g. junction of Chestnut and Pine. Add funding.
- Analyze projected resiliency of town bridges that are critical to transportation.
- The Town's civic infrastructure is centralized. Prioritize resiliency in this area.

No Priority Listed

- Investigate whether wood debris needs removal in protected forests.
- Develop a bylaw to protect trees on private property.
- Reduce greenhouse gas emissions. Develop a sustainability plan.
- Formalize outreach to medically vulnerable residents.
- Consider town-funded redevelopment of St. Mary's public housing (vulnerable to storm damage) Linden Chambers Senior Housing (in disrepair)
- Consider needs of large daytime (worker) population who take transit or drive.
- Be prepared with counselling services during disasters.
- Coordinate buses to cooling centers.
- Provide list of alternative resources (snowmobiles) if roads are closed.
- Evaluate evacuation plans in light of the potential for bottlenecks associated with I-95.

LISTENING SESSION

Due to the coronavirus pandemic the Listening Session was held virtually. The session was advertised via email and Needham social media. A video presentation and a copy of the draft report were made available on-line. Over 50 people viewed the video and 20 respondents filled out a survey. Their responses are summarized below.

Respondents were asked to identify their top 3 priorities from among the top twelve priorities identified in the workshop. The results are as follows:

Water infrastructure: 12
Stormwater: 10
Tree and forest management: 9
Robust infrastructure: 8
Wetlands protection: 4
Disaster response: 4
Communications: 4
Health impacts: 3
Senior public housing: 2
Hazardous materials plan: 2
Medical needs plan: 2
Central Avenue bridge: 0

We received many thoughtful and detailed comments the participants. Many respondents connected climate mitigation and resilience strategies. The following summarizes the responses to a question asking for additional strategies. Suggestions included:

- Be bold in reducing carbon emissions. Maintain and protect the power grid. Increased car tax, provided town-wide renewal transportation, ban fossil fuel infrastructure and companies from the Town; incentivize renewable energy and remote town functions including meetings and work.
- Move utilities underground.
- Develop energy independence and reduce greenhouse gasses. Increase residential solar power for resilience of the power grid and reduction of greenhouse gases.
- Address the negative effects of development, including tear downs and larger house construction, through improved zoning and open space planning.
- Increase housing density in order to provide for more wetlands to provide mitigation for development, and to reduce carbon footprints.
- Disaster planning should be an ongoing effort among Needham and state agencies and other relevant parties.
- Remove overhanging branches along power lines. We need fewer trees there, not more.
- Consider betterments to fund improved stormwater infrastructure. Monitor effectiveness of new stormwater and zoning bylaws.
- Develop a communication strategy that focuses on identifying and targeting those individuals or groups most at risk. For example, if the Town of Needham knew all of the elderly and those with limited means, we would know who would be at highest risk for heat related events and these people could be warned, but also local neighborhood groups or individuals could

assist as well. The co-benefits of this approach are to incorporate civic duty and neighborly cooperation. Emphasizing co-benefits with every proposed action (i.e. leads to better health, saves money etc.) can help people buy in to the process and make it more successful. In the big picture, avoiding heat stroke, flooding and contamination of the water supply are likely the biggest issues for Needham that need detailed plans to avoid illness and death.

- How big a risk is fire in our Town Forest? Has that been assessed?
- What about mental health services? With climate effects, heat and mental stress will become an issue. We see this with COVID and parallels do exist.

Finally, participants were asked for additional comments.

- Let's strive to meet the challenge of climate change with the bold attention required and lead that effort here at home. I'd like us to play more offence and less defense.
- Strike any references to the climate change. It's a left-wing fallacy, not anything that threatens the Town. We do not have weather that gets more and more destructive.
- I have noticed the town planting trees along the roadways under utility and power lines (i.e. West St). As part of the implementation of planting trees, I suggest consideration should be taken on the placement of plantings not to interfere with infrastructure.
- Too often trees are falling on South Street, and other streets and some poor soul has to go out and repair in a storm. Be proactive and do maintenance now, before disaster.
- The Needham Heights area lacks open spaces relative to other parts of town. The length of Rosemary Brook is an important resource that should be made accessible. There should be a boardwalk through the Sweet Preserve, and signage to encourage walking along this entire route - what a resource to teach children about the importance of wetlands.
- I echo the need for storm water management. With increased frequency of storms, floods are more likely, and there needs to be enough capacity for these floods to be absorbed in brooks and water retention space.
- The program participants identified several strengths/assets, and then included the magnification of these strengths as their highest priority needs. This is an expected outcome of assembling a group of mostly department managers and staff, and elected officials. Including the views of a less personally invested expert panel (in addition to or rather than the less-informed public-such as myself) would be a valuable exercise to account for the natural biases of the participants and to yield a more objective prioritization.
- I'm concerned that the current focus of these plans only represents a small subset of Needham's population (older, retired, less diverse), and that won't address the needs of the future population that these measures will impact more strongly. I would like to see a higher reliance on outside experts and controlled input from the current community (including myself) to ensure a demographically balanced response.
- Many of the "highest priority" strategies include or subsume more specific strategies which have been assigned to lower priority ratings. These substrategies should be called out in the final reporting so that these ideas are not lost in the more general and nebulous highest priority descriptions.
- I think the document should make it clear that our efforts here are to adapt to human caused climate change and that mitigation is addressed or should be addressed thru a different mechanism , though some actions of course can serve both mitigation and adaptation. This document should say clearly that climate change has arrived, it will affect Needham and these are the important actions we can take to adapt and avoid and limit the risk to human health,

our economic health and maintaining the social fabric of community especially for those at highest risk for harm to the effects of climate change.

CRB WORKSHOP INVITED PARTICIPANTS

* = representative attended

State Senator*

State Representative*

Needham Public Works*

Needham Building Department*

Needham Water, Sewer, and Drains*

Needham Water Treatment*

Needham Schools*

Needham Emergency Management*

Needham Conservation*

Needham Parks and Recreation*

Needham Finance and Administration*

Needham Fire*

Needham Town Manager Office*

Needham Information and Technology*

Needham Planning and Community Development*

Needham Police*

Needham Public Information*

Needham Public Health*

Needham Council on Aging*

Needham Youth and Family Services*

Needham Select Board*

Needham School Committee*

Needham Planning Board*

Needham Historical Commission*

Needham Commission on Disabilities*

Needham Conservation Commission*

Needham Town Technology Committee*

BID-Needham*

Babson College

League of Women Voters*

Needham Heights Neighborhood Association*

MWRA*

Charles River Watershed Association*

Babson College

MEMA

Green Needham*

Newton Needham Chamber of Commerce*

MA DEP

MA DOT

Wellesley Light Plant
 Dedham/Westwood Water District
 Eversource
 Tenant Representative Needham Housing Authority
 Olin College
 Walker School
 Charles River Center
 St. Sebastian
 Needham Community Farm
 Needham History Center and Museum
 Wingate
 Northhill
 Rotary
 Exchange
 Needham Clergy Association
 Riverside
 Needham Community Council
 Springwell

CRB WORKSHOP PROJECT TEAM

Needham Core Team

Rebecca Ping	Emergency Management Administrator, Project Coordinator
Deb Anderson	Conservation Agent
Nick Ceurvals	Fire Department
Steve Cusick	Manager, Water Treatment Plant
Anthony Del Gaizo	Town Engineer
Barry Dulong	Director, Building Maintenance
Sean Harrington	Superintendent, Water and Sewer
Rhain Hoyland	Superintendent, Highway Division
Robert Lewis	Assistant Director, Public Works
Carys Lustig	Assistant Superintendent, Water and Sewer
John McGrath	Police Department
Richard Merson	Director, Public Works
Jessica Moss	Council on Aging
David Roche	Building Department
Eleanor Rosellini	Green Needham
Tiffany Zike	Public Health Nurse

Facilitation Team

Anne Herbst	Metropolitan Area Planning Council (Lead Facilitator)
Ella Wise	Metropolitan Area Planning Council
Jennifer Kaplan	Metropolitan Area Planning Council
Martin Pillsbury	Metropolitan Area Planning Council
Iolando Spinola	Metropolitan Area Planning Council

Lizzie Grobbel

Metropolitan Area Planning Council

Citation

Metropolitan Area Planning Council. 2020. Town of Needham Municipal Vulnerability Preparedness Program. Community Resilience Building Workshop Summary of Findings. Needham, Massachusetts

Acknowledgements

Thank you to the MVP Core Team members, CRB workshop participants, and Emergency Management Administrator Rebecca Ping who served as the local Project Coordinator. Funding for the CRB Workshop was provided by the Commonwealth of Massachusetts through a grant from the Municipal Vulnerability Preparedness program.

Base Map

NEEDHAM

Critical Infrastructure

Critical Infrastructure

- Schools (PK - High School)
- Assisted Living Facility
- Nursing Home
- Rest Home
- Dams
- Police Stations
- Fire Stations
- Town Halls
- Libraries

Hazards

- Hot Spots*
- A: 1% Annual Chance of Flooding
- X: 0.2% Annual Chance of Flooding

Locally Identified Hazard Areas

- Brush Fire
- Flooding

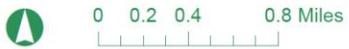
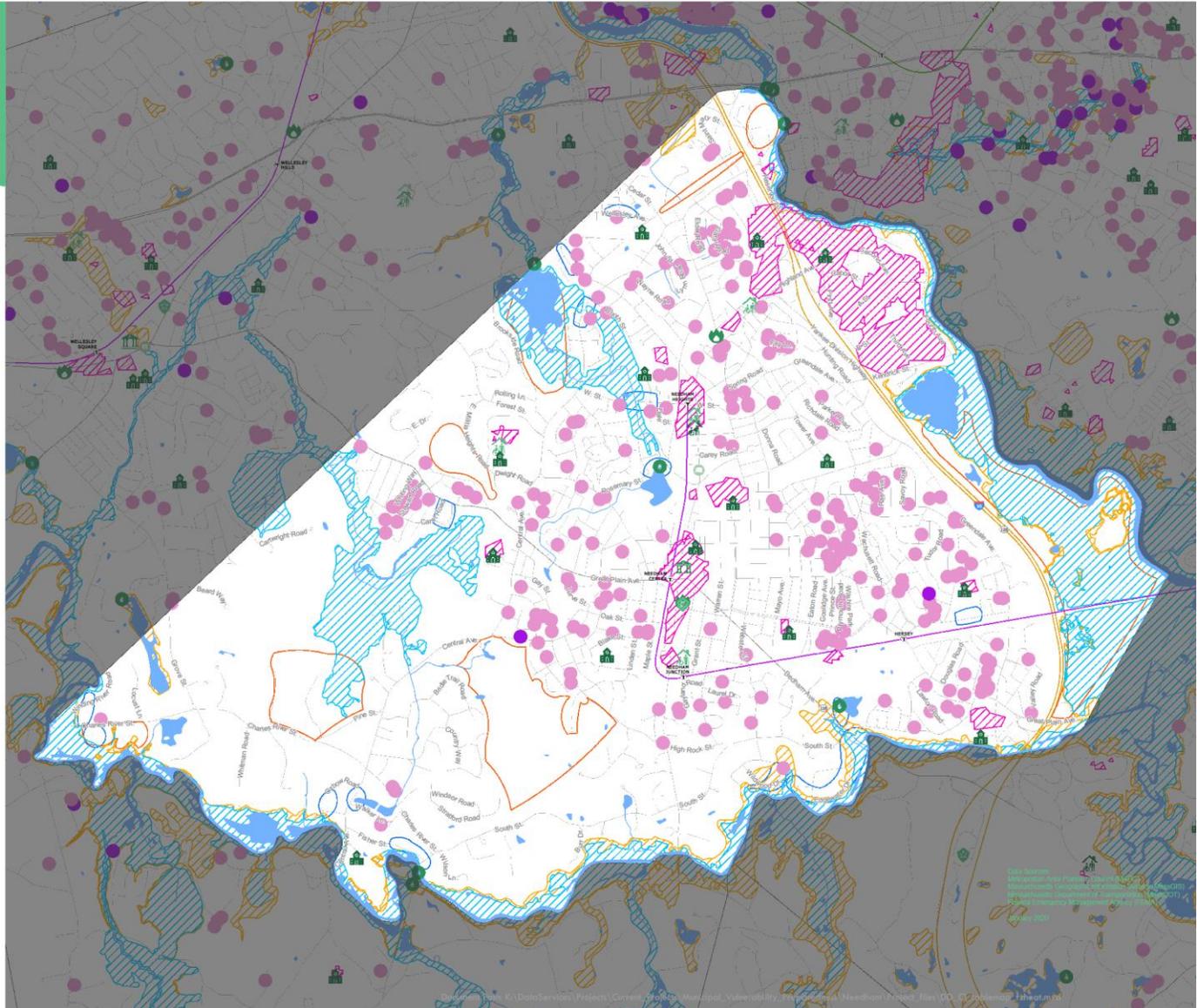
March 2010 Claims

- Flood Insurance
- Disaster Assistance

Other Features

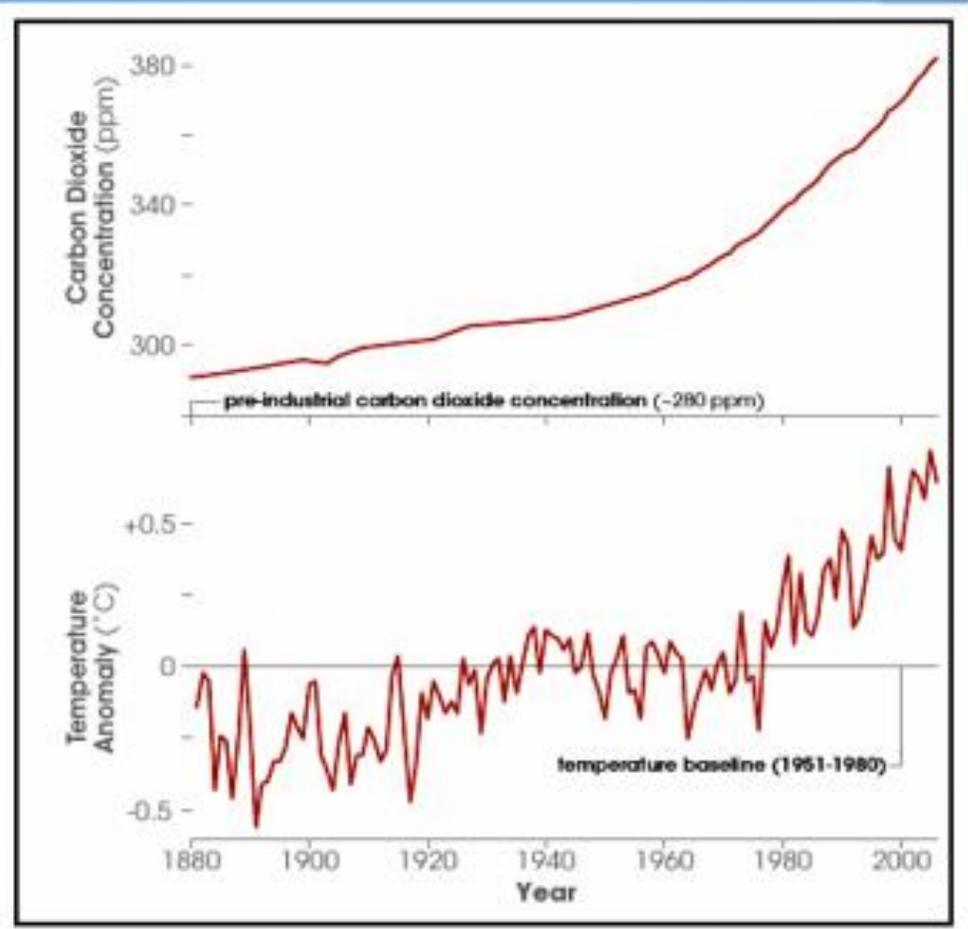
- Rivers and Streams
- Water Bodies

*Hot Spots are areas identified by MAPC as the hottest 5% of land area in the MAPC region. Data from 2016.





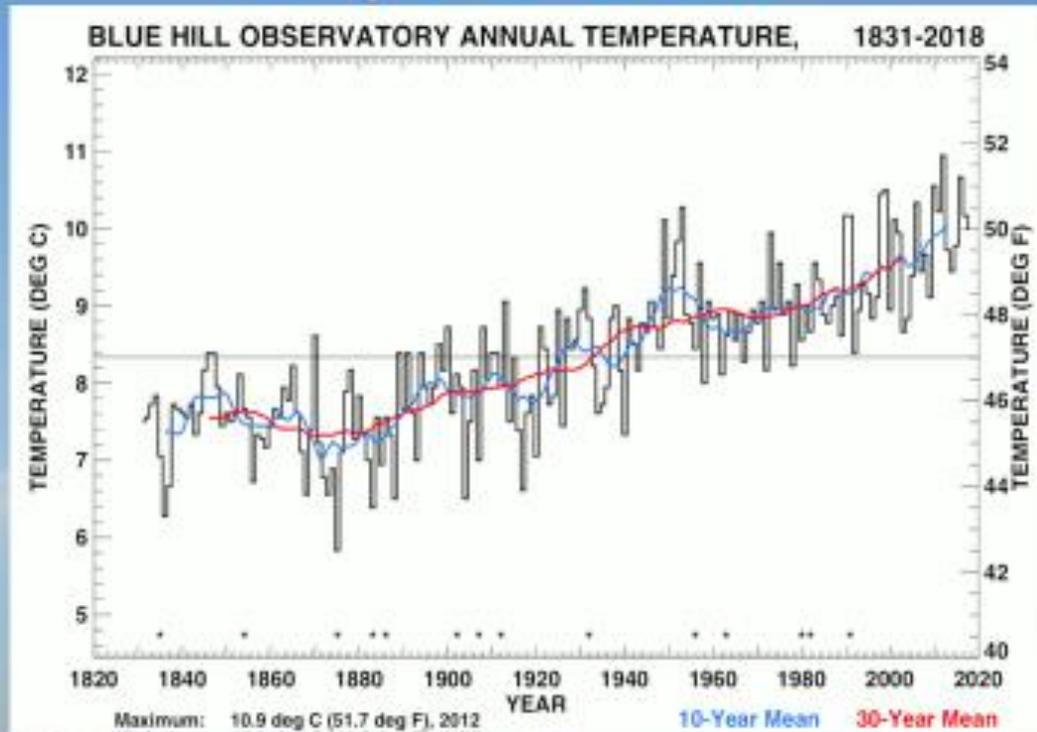
Global Temperature and CO₂ Trends



Source: MA Climate Change Adaptation Report 2011

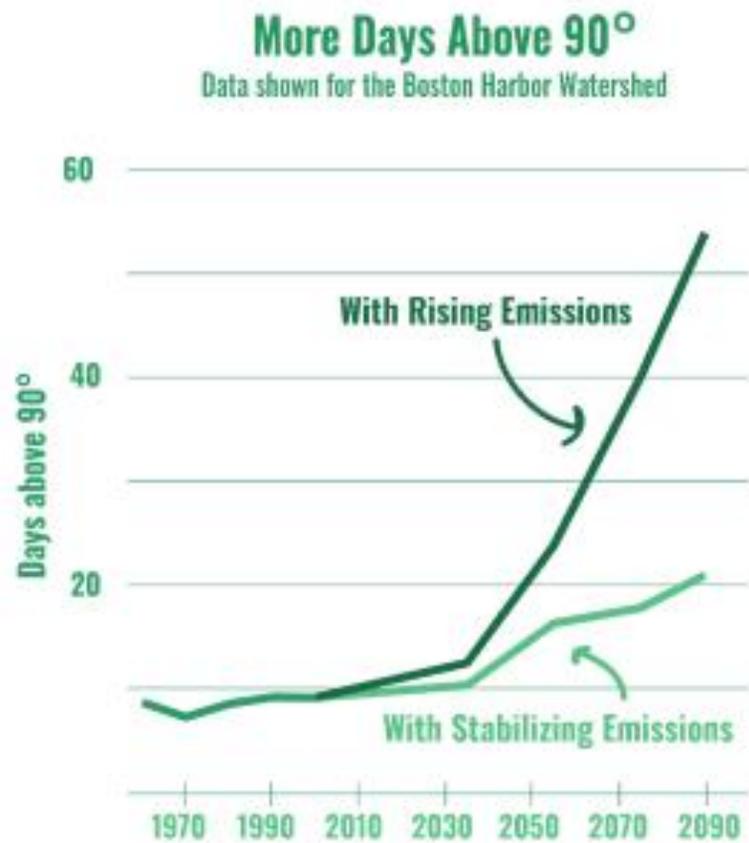
Temperature change: observed

Nearly 3° F since 1831



Blue Hill Observatory Annual Temperature, 1831-2018

Temperature
change:
projected



Source: Northeast Climate Adaptation Science Center

Precipitation change: observed

For the Northeast United States: 56% increase in the amount of rain that falls in the top 1% events from 1958 – 2016.

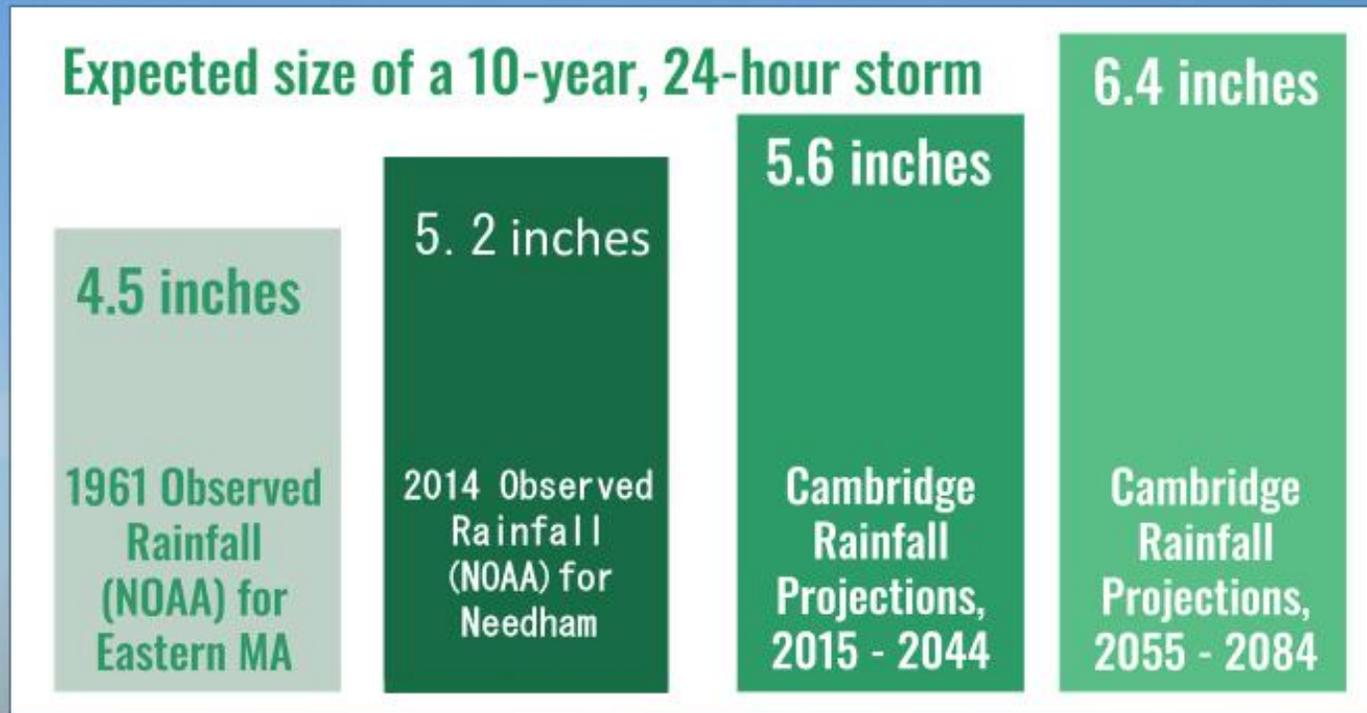
Source: US National Climate Assessment 2018



Source: MA Climate Change Adaptation Report 2011

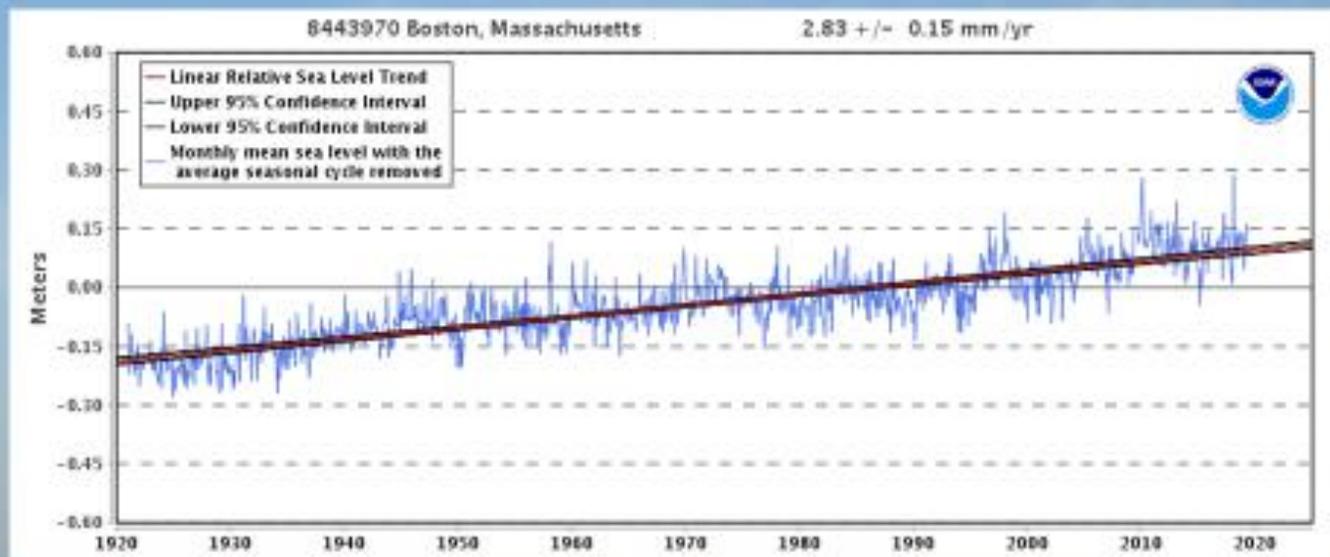
For Boston area: 10% increase over the past 50 years

Precipitation change: projected

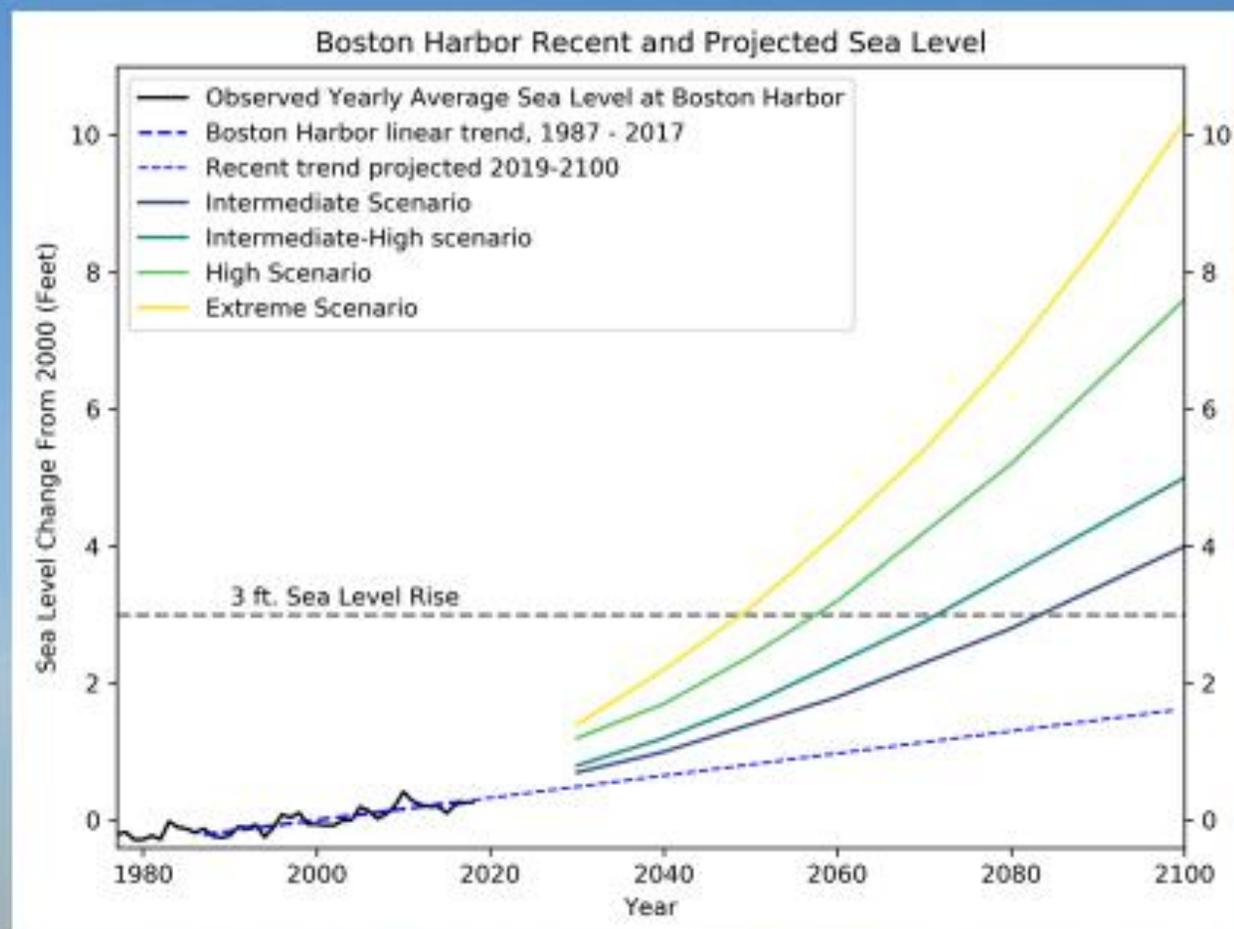


Sea level rise: observed

- Boston tide station
- Record from 1921-2018
- Equivalent to 11 inches in 100 years



Sea level rise: Projected to 2100 for Boston Harbor



Source: Northeast Climate Adaptation Science Center and MAPC

POSTERS

NEEDHAM

Critical Infrastructure

Infrastructure will be at risk to damage from flooding, and loss of function due to power outages. Increasing large rainfall events may subject roads, bridges, dams and buildings to more frequent or severe flooding. Areas that don't flood today may become vulnerable. FEMA flood zones reflect only current conditions, although the .2% (500-year) flood zones may indicate where future flooding will occur. FEMA flood zones also do not generally capture stormwater flooding. That is, flooding that exceeds the capacity of current stormdrains and culverts. We don't currently have models that project where future flooding from larger rain events will occur. Power outages affecting infrastructure and communications may become more frequent as result of high energy demand during heat waves. Winter outages could be caused by ice storms if warming results in temperatures hovering around freezing. The potential for more intense hurricanes could cause outages due to falling trees. Finally, buildings, roadways, and railways can be stressed by extreme heat. Heat can cause damage to expansion joints on bridges and highways, and may cause roadways to deteriorate more rapidly.

Critical Facilities

- Critical Facilities

Other Features

- Rivers and Streams
- Water Bodies

March 2010 Claims

- Flood Insurance
- Disaster Assistance

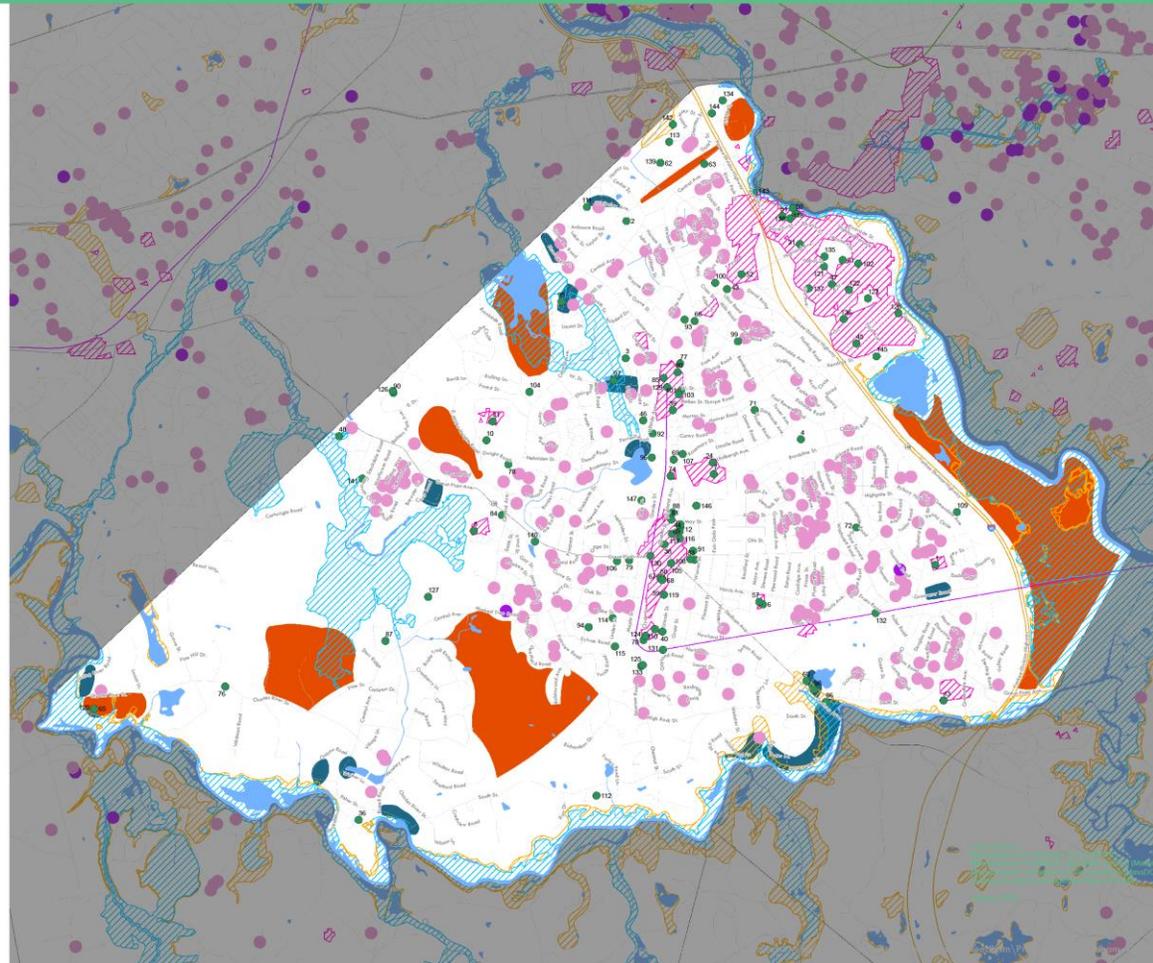
*Map labels are names identified by MITC on the March 2010 flood zone in the MITC report dated June 2011.

Label	Name
1	Brookline Elementary School
2	Ellis School
3	Hillside Elementary School
4	William Mitchell Elementary School
5	Newman Elementary School
6	Pollard Middle School
7	Needham High School
10	Charles River Assn. for Retarded Citizen
12	St. Joseph Elementary/Middle School
13	St. Sebastian's High School
24	Needham High School Shelter
31	Brandeis Community Care
36	Walker Home School
38	Town Hall
39	Avery Mason Nursing Home
40	Brianwood Nursing Home
41	North Hill Retirement Community
43	Wingate Nursing Home
44	Verizon Telephone Switch Bldg
45	Coca-Cola Bottling Company
46	Verizon
47	Level III
48	Algonquin Gas Meter Station
50	Kerivan-Lane Petroleum
51	Consort of Needham Inc.
52	Mall Meters Inc.
57	Pollard Middle School-Shelter
58	Emergency Management/Operations Center
59	Beth Israel Deaconess Hospital
60	Needham Department of Public Works
61	Media Transmission Towers
62	Media Transmission Towers
63	St. Mary Pump Station
65	Water Treatment Plant
66	Needham Fire Department Station#2
67	Needham Fire Dept.
68	Needham Police Dept.
69	Needham Public Library
70	Brother's Supermarket
71	Water Storage Tank Storage #2
72	Water Storage Tank Storage #1
74	Sudbury Farms Supermarket
76	Duke Energy HQ Transmission Line PC
77	Center Methodist Church
78	Charles River Industry
79	U.S. Post Office
80	U.S. Post Office
81	St. Joseph Church
83	First Baptist Church
84	Presbyterian Church
85	Council on Aging
86	Public Services Administration Building
87	Recycling and Transfer Station
88	School Administration Building
89	Manigault Haddad Middle School
90	Old College of Engineering
91	YMCA After-school

Hazards

- Hot Spots*
- A: 1% Annual Chance of Flooding
- X: 0.2% Annual Chance of Flooding
- Locally Identified Hazard Areas
- Brush Fire
- Flooding

Label	Name
92	Needham Community Council/Food Pantry
93	Daley Building
94	High Rock School
95	Santa Williams School
96	Recreatory Recreation Complex
97	West Street Sewer Pump Station
98	Dedham Avenue Water Pump Station
99	Arthur Mason's Care
100	Wingate of Needham
101	CareWell Urgent Care
102	Owens Adult Day Care
103	Troter Jack's
104	Volante Farm
105	First Parish in Needham
106	Congregational Church
107	Christ Episcopal Church
108	First Church of Christ Scientist
109	Greenfield Ave Worship Center
110	Charles Street Animal Hospital
111	Highland Avenue Animal Hospital
112	Stanley Tippet House
113	Needham Public Housing
114	Needham Public Housing
115	Needham Public Housing
116	Verizon Telephone Switch Building
117	Mitsubishi Development Labs Inc
118	AT&T - MA3438
119	Beth Israel Deaconess Hospital
120	Charles River Water Treatment Facility
121	Digital 105 Cobalt, LLC
122	General Dynamics C4 Systems
123	Needham Nike Chavez LLC
124	Needham Oil & Air
125	NSTAR Station 148 & 381
126	Old College of Engineering
127	Recycle and Transfer Station
128	CalDEX
129	Needham Heights
130	Needham Center
131	Needham Junction
132	Harvey
133	Eversource Electric Substation
134	Water Pump Station 3
135	Sheraton Needham Hotel
136	Residence Inn by Marriott Boston Needham
137	Hilton Homewood Suites
138	Needham CO - LTPF9 (AT&T Services Inc)
139	WBZ Transmitter Site (American Tower)
140	Great Plain Pump Station
141	Alden Road Pump Station
142	Cook's Bridge
143	Reservoir B
144	Reservoir A
145	Kendrick Street Pump Station
146	Warren Pump Station
147	Lake Drive Pump Station



Needham

Social Vulnerability

Social vulnerability refers to social, economic, demographic, or health factors that may make groups of people less resilient to climate change impacts. Certain vulnerabilities tend to be correlated; for example, older adults are more likely to have a disability and live alone than younger adults.

Our strategies for adapting to a changing climate should protect these populations in addition to our natural and built environment.

Who is most at risk from climate change impacts?

People who may be more susceptible to negative health effects: These can include older adults, young children, pregnant women, people with disabilities, and people with pre-existing health conditions, as they are more likely to be physically vulnerable to the health impacts of extreme heat and poor air quality caused by climate change. Individuals with physical mobility constraints, such as people with disabilities and seniors, may need additional assistance with emergency response.

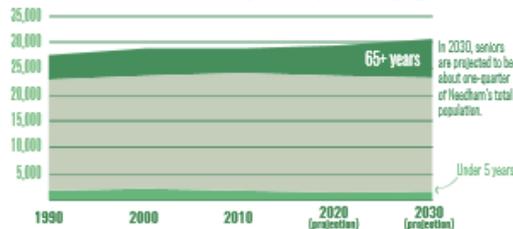
People who may have more difficulty adapting to, preparing for, or recovering from extreme weather events: Socioeconomic characteristics such as income and race can influence vulnerability to climate change. Low-income people are often more susceptible to financial shocks, which can occur after extreme weather and which can impact financial security and the ability to secure safe shelter and meet medical needs. Social isolation can also influence vulnerability, as it limits access to critical information, municipal resources, and social support systems. People at the most risk for social isolation include those living alone and people with limited English language proficiency.

People who live or work in vulnerable locations: Historic or predicted floodplain, urban flooding locations, areas prone to wildfire, heat islands, neighborhoods prone to power outages. Outdoor workers, first responders, those working in hot indoor environments.

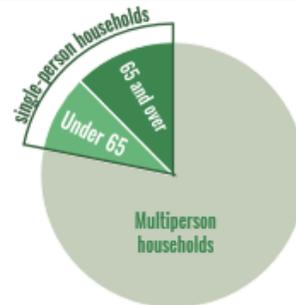
Older Adults and Young Children

Adults over 65 and children under 5 are more likely to develop health problems on very hot days or during heat waves. Older adults are also more likely to have disabilities or mobility constraints and may need additional assistance during emergencies. They are also more likely to live alone than younger adults.

Needham Recent and Projected Population by Age



People Living Alone



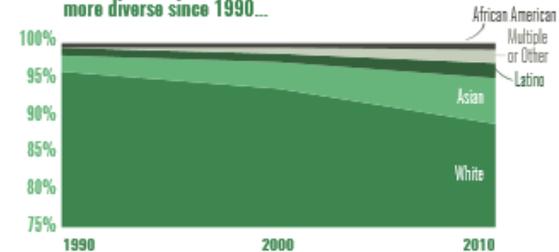
As of 2010, about 22% of Needham households consisted of someone living alone.

57% of people living alone were over 65.

Communities of Color

Particular racial or ethnic groups may also be more likely to have certain social vulnerabilities than others. For example, Black and Latino populations have a much higher rate of asthma hospitalizations than other groups. Heat waves and poor air quality can trigger asthma.

Needham is almost 90% white, but has become slightly more diverse since 1990...



Low-Income Households

19.8% ±2.7% of households in Needham are low-income

5.8% ±1.5% of households in Needham are below the poverty level

39.8% ±6.4% of seniors in Needham are low-income

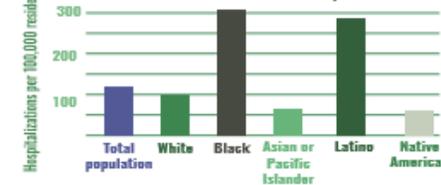
*A four-person household earning less than \$18,150 is considered low-income; a four-person household earning less than \$24,553 is below poverty level

People Who Work Outside



People who primarily work outside, such as parcel delivery people, construction workers, fishermen, or landscapers, may be at added risk from extra exposure to high heat and poor air quality.

Massachusetts Asthma Hospitalizations



Sources: American Community Survey (ACS) 2012-2016; United States Census 1990, 2000, 2010; MAPC Projections; Massachusetts Department of Public Health Asthma Data, 2008-2012

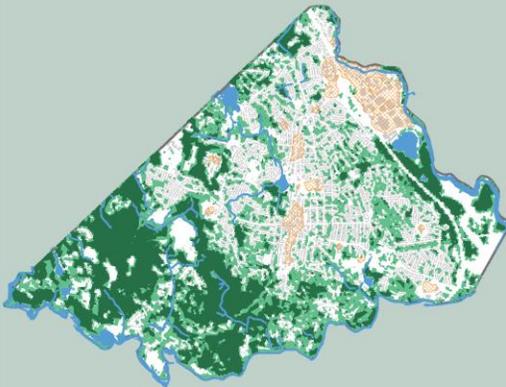
Needham

Natural Resources

Natural Resources lessen climate impacts by absorbing and storing carbon dioxide and by serving vital protective functions. Forests, open space, wetlands, rivers, and streams protect drinking water quality and quantity, provide flood control, and give relief from extreme heat. Healthy ecosystems are more resistant to stresses from a changing climate and better able to protect against heat and flooding.

Trees

Trees are important in mitigating the impact of heat waves. According to the EPA, suburban areas with mature trees are 4-6 degrees cooler than new suburbs without trees. Shaded surfaces can be 25-40 degrees cooler than the peak temperatures of unshaded surfaces. Trees also absorb remarkable quantities of precipitation. Research has shown that a typical medium-sized tree can intercept as much as 2,380 gallons of rain per year (USDA Forest Service).

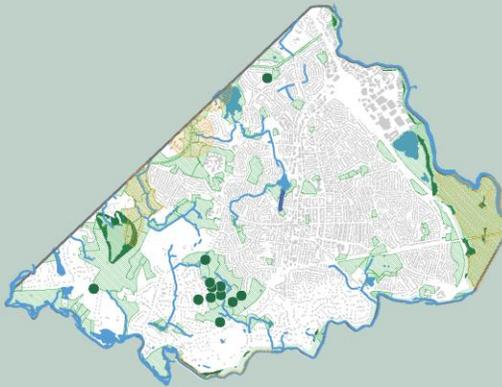


- Hot Spots
- 50% – 75% Tree Cover
- 75% – 100% Tree Cover
- Developed Land

Risk	Impact
Warming	Expected to shift forest type from Maple/Birch/Beech forest to Oak/Hickory forest similar to New Jersey. New pests and diseases
Flooding, Drought, Wildfire, Ice Storms	Weakens and damages trees

Valuable Habitat

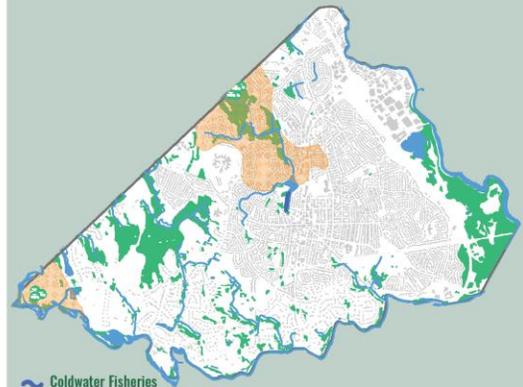
Core Habitat and Critical Natural Landscapes are state-identified intact landscapes, or exemplary natural communities, that are better able to withstand climate stresses and support the long-term survival of rare species and natural habitats. Rare Species Habitat identifies the known habitat areas for state-protected rare plant and animal species.



- ~ Coldwater Fisheries
- Vernal Pools
- Core Habitat
- Critical Natural Landscape
- Rare Species Habitat
- Open Space
- Developed Land

Water Resources

Needham contains, healthy, intact freshwater wetland systems that sustain critical ecosystem functions. These ecological assets protect water quality and quantity, provide flood control, and maintain overall ecosystem health for climate resilience.



- ~ Coldwater Fisheries
- Wellhead Protection Areas (Zone II)
- ⊠ Groundwater Pumping Station
- Wetlands
- Developed Land

Risk	Impact
Drought/Warming	Seasonal no-flow/ low-flow, reduced absorption capacity, diminished fish habitat, algal blooms, low dissolved oxygen, reduced drinking water supply
Flooding	Impaired waters, toxic exposure, contaminant leaching
Extreme Precipitation	Scouring, impaired waters, sewer overflows



Sources: MassGIS (Bureau of Geographic Information); BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World; Massachusetts Department of Fish and Game; Massachusetts Department of Environmental Protection; MassGIS (Bureau of Geographic Information); National Land Cover Database (NLCD)

APPENDIX B – TABLE MATRIX RESULTS

Participants were divided into small groups identified as Blue, Green, Orange, Yellow, and Red. Concerns were categorized as Environmental, Infrastructure, or Societal. Participants identified climate-related strengths and vulnerabilities for Needham. Solutions were proposed for the vulnerabilities. Solutions were then prioritized as High, Medium, or Low. Each table was asked to identify their top four priorities. The information was recorded in a matrix for each table and is reproduced in the chart below.

Table	Topic	Strengths (S) & Vulnerabilities (V)	S/V	Solutions	Priority
Blue	Environment	stormwater bylaw has been adopted; regulations are on the way	S		
Blue	Environment	bald eagles have been seen in town	S		
Blue	Environment	Vulnerable species require attention and resources	S/V	Forest Management Plan/Study	M
Blue	Environment	Ticks and other insects will require attention/resources	V	education/outreach/think about regional mosquito control plan	H
Blue	Environment	lots of wetlands in town - there have been fires there	V	public education, review wetlands bylaw for climate concerns and resilience	H
Blue	Environment	there is a working group for a tree bylaw	V	generate more support, for the bylaw, there is opposition	H
Blue	Environment	maximized residential development is having a negative impact on stormwater	V	monitor if new stormwater and zoning bylaws are effective in addressing this issue	H
Blue	Environment	Invasive plants species	V	Recruit resident volunteers to help with treatment	H
Blue	Environment	rats due to trash pickup and restaurants	V		H
Blue	Environment	Geese have a negative impacts (feces) beavers cause flooding	V		L
Blue	Environment	Drought is something to study	V	water management plan? Water bird study?	L
Blue	Environment	tree maintenance is ok, but also a challenge	V	educate the public so they can take action on their own land	M
Blue	Environment	private property tree maintenance could be better	V	educate the public so they can take action on their own land	M
Blue	Environment	air quality due to traffic and highway in town	V	more vegetation need, promote electric car infrastructure	M
Blue	Environment	cayotes are more active now, being pushed out of former habitats	V		M

Blue	Environment	larger trees in town are vulnerable - mostly the pines	V		M
Blue	Environment	Forested areas: cooling, wildlife, stormwater control +, ticks, fire, aging trees -	V/S	need Forest Mgmt. plan, research into a health assessment	H
Blue	Environment	Charles River cooling and wildlife habitat +, future flooding -	V/S	connect with Charles River Watershed Assoc. partner in a regional flooding model	M/H
Blue	Environment	Town has local well water			
Blue	Infrastructure	8 public and private schools and colleges, could serve as shelter	S	need generator, research on power infrastructure	
Blue	Infrastructure	active food services at the schools	S		
Blue	Infrastructure	BIDMC in town	S		
Blue	Infrastructure	Old Town Hall with backup generator can be useful in emergency	S	connect SSREC to fiber, better access for maintenance	
Blue	Infrastructure	roads in town are not prone to flooding	S		
Blue	Infrastructure	playgrounds and playing fields	S		
Blue	Infrastructure	Dam at Rosemary Street	S		
Blue	Infrastructure	library is a good resource for elders and others	S		
Blue	Infrastructure	water treatment plant is in a low area, sand bagging is needed in large storms	S/V	might need an earthen berm to protect it	H
Blue	Infrastructure	MBTA stations -shut downs in cold weather can affect town workforce	S/V	connect with MBTA, what other resources can be utilized, bus shelters, digital train alerts	L
Blue	Infrastructure	runoff is being investigated in some areas of town	S/V		
Blue	Infrastructure	stormwater and sewage are beyond capacity with large storms	V	town is investing capital, but more funding may be needed, more nature-based solutions needed	H
Blue	Infrastructure	some of the bridges in town are old	V	bridge to Dover needs study and improvement	H
Blue	Infrastructure	Fire and police building is out of date (new one coming)	V	something to look at , end in coming	L
Blue	Infrastructure	Rt 128 may require attention during emergencies, impacts on air quality	V	need to study this	L
Blue	Infrastructure	transfer station near the wetlands has a lot of impact on it	V	they have been working on it, monitor for the future	L
Blue	Infrastructure	hotspots at school parking lots	V	rain gardens, trees, solar panels over the lots,	M

Blue	Infrastructure	new development along Rt. 128 is a hot spot	V	add trees/trails to requirements for large development, look at requiring rooftop vegetation or cooler roof materials, need nature-based solutions	M
Blue	Infrastructure	Rt 128 ownership changes, need to review communications	V	work with Chamber to build up relationships with owners and developers	M
Blue	Infrastructure	hazardous materials might be located in Rt. 128 developments	V	Fire dept. needs info. For the future, public support might be needed	M
Blue	Infrastructure	DPW is in low-lying location near the river, at risk of flooding	V	study issue, look at increasing culvert size, or moving	M
Blue	Infrastructure	gas and electric in town are vulnerable	V	push utility to update gas pipes, move electricity underground - that is a long-term effort	M
Blue	Infrastructure	increasing numbers of electric cars in Needham,		need more charging stations	
Blue	Society	Rosemary Rec center is great emergency space has generator	S		
Blue	Society	Senior Center support services, but no generator for cooling center	S		
Blue	Society	YMCA - good communication, generator, cooling center, showers	S		
Blue	Society	Library has good communication	S		
Blue	Society	Needham Community Council has good network, services a lot of people	S		
Blue	Society	good local emergency committee	S		
Blue	Society	medically vulnerable residents are able to use RAVE system for support	S	VNA could also be a resource	
Blue	Society	A better Religion?? Strong network of religious groups in town	S		
Blue	Society	Needham Chamber of Commerce can network and support	S		
Blue	Society	public health and emergency services does good education	S		
Blue	Society	Rave System (reverse 911)	S/V	look into other language capacity	M
Blue	Society	there are 3 areas of public senior housing that need support	V	look at the buildings - they are old, more green space needed, need communication plan, more coordination	H

Blue	Society	Housing for disability/needs in town will need more support	V	create emergency plans and communication for the future, work with partners/plan in space but more support is needed	H
Blue	Society	language support will be needed in the future	V	build up town communication/interpretation services for non-English speaking residents	H
Blue	Society	long-term care and assisted living facilities	V	create emergency plans and communication for the future, work with partners/plan in space but more support is needed	M
Blue	Society	the low-income population (26%) is something to consider	V	education about services available in town for those who need it	M
Blue	Society	Landscaper/DPW/1st responders/Construction (outdoor workers)	V	protocols are in place and should continue - monitor it	M
Blue	Society	school are hot due to turf fields and parking	V		
Green	Environment	fire roads are maintained in the town forest	S		
Green	Environment	active Conservation Commission	S		
Green	Environment	Protected wetlands along river are publicly owned	S		
Green	Environment	aquifer w/ MWRA supplement provides drinking water	S		
Green	Environment	aquifer is well-protected	S		
Green	Environment	trees on public way are protected or replaced	S		
Green	Environment	hazardous materials trucks drive along I-95	V	map sites with haz mat and share with hospitals, etc.	H
Green	Environment	mosquito habitat breeding grounds	V	ID environmentally friendly control programs (e.g. educate on standing water)	H
Green	Environment	More tick-born illnesses	V	as above	H
Green	Environment	dead trees near well-field limit access, fire hazard	V		L
Green	Environment	fire hazard in peat along I-95 near industrial area, smoke hazards	V		L/M
Green	Environment	lots of invasive species, especially in wetlands, (plants and pests)	V	on-going management and restoration	M
Green	Environment	brush fire along I-95, lack of access	V	fire dept continue planning	M
Green	Environment	loss of tree cover in residential areas	V	continue working on adopting protective tree law	M
Green	Environment	Industrial are near Needham St. is a hazmat issue/ also at transfer station	V		

Green	Environment	limited debris clearance in some protected forests	V	study whether this is hazardous	
Green	Environment	lots of impermeable surfaces	V	study how to increase permeable surfaces in an environmentally friendly way	
Green	Environment	no bylaw protects privately owned trees	V	see above??	
Green	Environment	lots of radio frequency			
Green	Infrastructure	many public facilities have generators	S	support and expand to other facilities strategically	H
Green	Infrastructure	lots of privately owned solar	S	support it	L
Green	Infrastructure	solar farms contribute to the grid	S	expand, maybe in parking lots, be strategic, store in batteries, look into wind power,	
Green	Infrastructure	bypass pumps keep stormwater and sewer separate	S		
Green	Infrastructure	bulk of residents live in walkable areas	S		
Green	Infrastructure	lots of grocery stores	S		
Green	Infrastructure	highway/rail/bus access	S		
Green	Infrastructure	Olin College facility	S		
Green	Infrastructure	many hotels that can provide emergency shelter	S		
Green	Infrastructure	many bridges have recently been rebuilt	S		
Green	Infrastructure	resilient hospital, but very limited capacity	S/V	develop list of medically fragile for wellness checks, ID all assisted patients to ID total # of potential patients in a disaster	H
Green	Infrastructure	long-term care facilities could be strengths if well prepared	S/V	help assisted living facilities become resilient, provide info and guidelines	H
Green	Infrastructure	lots of public buildings but differences in the resources between them	S/V		
Green	Infrastructure	Many roads in neighboring Dover flood	V	coordinate with neighboring towns and region	H
Green	Infrastructure	lack of communication and planning between these resources e.g. Do hotels know they could shelter?	V	town staff should coordinate on all MVP priorities	H
Green	Infrastructure	overhead wires that supply electricity are vulnerable particularly in treed areas	V	when possible, underground wires, do more tree maintenance	H

Green	Infrastructure	SW capacity is designed for 25-year storm, but storms are getting bigger	V	analyze and plan for retrofits, update design standards	H
Green	Infrastructure	infiltration of sewer system when gw table is high	V	ID where infiltration is happening, strategically repair pipes, continue special permit process that requires upgrades	H
Green	Infrastructure	critical civic facilities are in hotspots - too much paving	V	plant trees, encourage green roofs, replace surface lots w/ structured, revisit design standards, look into solar canopies	H
Green	Infrastructure	many long-term care facilities, if not resilient, many vulnerable people	V	analyze and plan for emergency sheltering, need to check if it already exists	H
Green	Infrastructure	Town hall has flooded	V		L
Green	Infrastructure	dam near the DPW overtops, floods vehicle parking	V	design to go through spillway	L
Green	Infrastructure	Dependent on bridges	V	analyze projected resiliency of bridge infrastructure	L/M
Green	Infrastructure	Roads that get flooded due to SW overflow (DPW has mapped)	V	hard to know how many are vulnerable, DPW can study and strategize	L/M
Green	Infrastructure	aging and expanding natural gas system	V	lobby gas co's and state - hard to know what to do at town level	
Green	Infrastructure	low-lying roads/bridge in the southwest corner	V		
Green	Infrastructure	civic infrastructure is all in one place	V/S	prioritize resiliency in this area	L/M
Green	Society	lower income people are in more walkable areas	S		
Green	Society	several strong congregations	S		
Green	Society	interfaith council	S		
Green	Society	active ymca	S		
Green	Society	active senior center	S		
Green	Society	lots of block parties, small-lot neighborhoods	S		
Green	Society	Needham community websites (Next Door)	S		
Green	Society	high-quality EMS	S		
Green	Society	small # of unhoused	S/V		L
Green	Society	dispersed deed-restricted unit (not all in one project)	S/V		
Green	Society	some felt weakening civic engagement, neighborliness	V		L

Green	Society	lack of aware among new residents about potential hazards	V		L
Green	Society	people living in "garage unders" have been surprised by bad flooding	V		L
Green	Society	lack of evacuation routes	V		L
Green	Society	higher income people are in more remote areas	V	improve/build sidewalks	M
Green	Society	bad cell service on Rt. 135 near Wellesley	V	encourage new towers/service	M
Green	Society	lots of medically vulnerable residents, especially dependent on devices (Oxygen)	V	centralized number to call, need to be publicized and formalized	
Green	Society	lack of communication/coordination between hospital/assisted care/Fire/EMS	V		
Green	Society	socially isolated residents - don't know who are where they are	V	fire dept. has "SAFE" education program that could be expanded	
Green	Society	St. Mary's public hsg, very vulnerable to storm damage	V	look at town-funded redevelopment	
Green	Society	Linden Chambers senior housing in disrepair	V	look at town-funded redevelopment	
Green	Society	larger daytime population/ who work take transit or drive	V	be prepared with staff and equipment	
Green	Society	police fire have list of people to check for medical needs, but based on who calls them	V/S		
Orange	Environment	Protected drinking water/clean water	S	forest mgmt/ meadow	M
Orange	Environment	Natural Valley flood storage	S		
Orange	Environment	Goat scaping (private land)	S		
Orange	Environment	SW bylaw water quality and volume for MS4	S		
Orange	Environment	Town parks/playgrounds	S/V	need water fountains, tick awareness	H
Orange	Environment	Rosemary Lake, ponds, reservoir - impaired water bodies, contaminated	S/V		
Orange	Environment	Charles River, Alder /Fuller Brook	S/V		
Orange	Environment	coyotes, deer, fox, hedgehogs, otters, eagles, beavers	S/V	deer control, hunting otters and coyotes	
Orange	Environment	Invasive species	V	Assess species, volunteers	H
Orange	Environment	Mosquitoes, ticks (deer)	V	investigate what to do, more education and communication	H

Orange	Environment	trash management, plastics, recycling	V	encourage standards to reduce waste, plastics, paper. Better way to handle recycling	H
Orange	Environment	Pesticide runoff/contaminants/pollutants	V	local bylaw by citizens, restrict use, encourage natural landscaping	M
Orange	Environment	stormwater runoff	V		
Orange	Environment	Greenhouse gas emissions	V	town plan to reduce ghgs, sustainability plan, muni, electric vehicles and charging station	
Orange	Environment	Ridge Hill/Nike site	V/S	Preserve wildlife/education invasive species	M
Orange	Environment	Town Forest and the Charles River wellfield	V/S		
Orange	Environment	Marsh/bog - fire risk, cooling	V/S		
Orange	Environment	Toxic waste sites/reactor barrier wall (TCE) MDL, Celledex	V/S	don't create more	
Orange	Environment	DEP contaminated sites - Shell, Nike		don't create more	
Orange	Infrastructure	police/fire station	S	communications	L
Orange	Infrastructure	Rosemary pool and building, BOH	S	add as a heating/cooling center?	M
Orange	Infrastructure	schools, colleges	S		
Orange	Infrastructure	School buses and COA buses	S		
Orange	Infrastructure	restaurants, supermarkets, gas stations, town fueling station, solar array, public transit	S		
Orange	Infrastructure	generators, backup pumps	S	assess capacity, need, funding for more	
Orange	Infrastructure	Railroad - 4 train stations, good for evacuation, problem if a failure	S/V	contact MBTA re: emergency plan, alternative solutions, evacuation	L
Orange	Infrastructure	Hospital/pharmacies	S/v	need communication network, stash of medicines?	M
Orange	Infrastructure	Hotels-business district	S/V	should be part of disaster plan	
Orange	Infrastructure	transfer station	S/V	keep it	
Orange	Infrastructure	Cochran Dam	S/V		
Orange	Infrastructure	Electricity/Eversource reliability project	S/V		
Orange	Infrastructure	sewage pumping stations	V	CIP, maintenance, awareness of changes to industry standards	L

Orange	Infrastructure	SW drainage, road flooding e.g. Junction at Chestnut + Pine	V	continue follow up and discussions, SW bylaw and CIP, more \$	L
Orange	Infrastructure	bridges	V		L
Orange	Infrastructure	Gas lines - aging infrastructure, no accurate map	V	public access to Eversource	M
Orange	Infrastructure	traffic evacuation routes - exit points - Dedham, Central, Charles River Rd.	V	communicate and partner for disaster evacuation plan, communicate it regionally	M
Orange	Infrastructure	Proximity to other municipalities	V		
Orange	Infrastructure	town and community buildings as heating and cooling stations (short-term)	V/S	Review/change parameters for open and close (BOH) long-term shelter?	H
Orange	Infrastructure	drinking water supply/floodplain, MWRA option	V/S	add additional water supply, redundant well	H
Orange	Infrastructure	public housing at Linden St.	V/S	communication network, public information officer? Tech asst. for EAP to HA staff	H
Orange	Infrastructure	Radio communication and telemetry, general communications	V/S	develop neighborhood buddy system, emergency plan, ID vulnerable people	H
Orange	Infrastructure	I-95 and 128	V/S		
Orange	Society	town communication: Alert Needham, reverse 91, social media	S	more sign up, translation, backup plan, use as educational tool	H
Orange	Society	police, first responders, reserve medical corps, hospital personnel, DPW	S	ID organizer, database, put into action	H
Orange	Society	education of residents, preparedness tools	S	update and continue	S
Orange	Society	volunteers, service clubs, community council	S	could help with education, recruitment, ID populations	
Orange	Society	Rosemary (lake? Building?)	S		
Orange	Society	Local Emergency Planning Committee	S	help to organize communication effort	
Orange	Society	restaurants	S	loop in volunteer donations, power assistance	
Orange	Society	seniors living alone, in detached homes especially	V	create buddy system, ID who is alone, HHS, neighbors, expansion of sheriff program	H
Orange	Society	Low income residents	V	neighbor to neighbor program, connect with resources: community council, food pantries,	H

Orange	Society	ESL/language barriers	V	translate reverse 911, building relationships, community events, translation and interpretation available	H
Orange	Society	youth, lack of outdoor time	V	education and communication	L
Orange	Society	multiple groups are vulnerable, particularly in need of evacuation: nursing homes, assisted living, hospitals, public housing residents, day care centers	V	communications, ask about evacuation plans, provide technical assistance	
Orange	Society	seniors	V		
Orange	Society	handicapped/special needs, dialysis or medical needs, cognitive impairment	V	Have Fire Dept. communication, buddy system/plan	
Orange	Society	animals/pets what to do in emergency?	V	working on it?	
Orange	Society	isolated residents, homebound	V		
Orange	Society	Mental health/illness	V	education and counselling services at disaster events	
Orange	Society	Transportation to cooling centers	V	more coordination for buses	
Orange	Society	Walkability if roads are closed	V	list of alternative resources, e.g. snowmobiles	
Red	Infrastructure	3/4 of Needham's boundary is Charles River, there is robust floodplain capacity	S	maintain protections	L
Red	Infrastructure	redundancy project for utility lines	S	continue construction	L
Red	Infrastructure	there is a robust communications network in town	S	keep but, keep security protection for cyber security threats	M/H
Red	Infrastructure	not a lot of ?? Manufacturing (less pollution)	S		
Red	Infrastructure	Tree clearing from utility lines (?)	S	continue work	
Red	Infrastructure	the well system and treatment plant are in a critical area	V	find ways to protect perimeter of wells and treatment plan	H
Red	Infrastructure	no generator backup for schools (non-???) cooling?	V	capital plan for additional generator capacity	H
Red	Infrastructure	cell network at DPW building does not work (PSAB?)	V	develop a small cell site	H
Red	Infrastructure	the pool has no shade structure	V	create a permanent shade structure for lifeguards and visitors and ??	H/M
Red	Infrastructure	the wastewater system gets overwhelmed with stormwater	V	pump station review scenarios? Investigate protection of facilities	M

Red	Infrastructure	schools are not all air conditioned because of age?? (kids and ??)	V	plan to study systems and look for mitigation efforts - part of capital planning	M
Red	Infrastructure	treatment plan does not have cell service	V	study ways to improve cell service	M
Red	Society	library/senior center/YMCA/RRCs are potential cooling centers	S	strengthen facilities	H
Red	Society	communicate about a cooling center on Social Media/Alert Needham	S	get word out	H
Red	Society	?? People who work in emergency, like the medical reserve corps	S	awareness - get word out - increase funding	H
Red	Society	monthly local emergency meetings	S		
Red	Society	strong community involvement - good turnout for MVP	S		
Red	Society	DPW has heat days language in its contract	S	this language could be replicated elsewhere	
Red	Society	Needham school emergency mgmt. team needs action??	S		
Red	Society	25% of Needham lives alone (North Hill, Woodgate)	V	outreach to reach this population, work with the town clerk	H
Red	Society	I-95 can get bottlenecked, where will people go	V	do a study of evacuation routes, confirm current plans to see if they work with neighboring towns	
Red	Society	seniors and extreme weather, does there need to be outreach	V/S	public health and MAPC doing more outreach to senior about extreme weather	H
Red	Society	communication with non-English speaking population, other vulnerable groups	V/S	translation services for emergency messages; reach out prior to emergency, continue what is in place	H
Red	Society	support people who work in Needham but don't live in Needham	V/S	relook at continuity of operations, more subscriptions to alert Needham, work with Chamber to get the word out, check systems to make sure they work	H
Red	Society	community outreach and education - the town is working on it	V/S		
Red	Environment	SW bylaw passed; new homes will have dry wells	S		
Red	Environment	need to address mosquito impacts	V	no games at night? better communication with state on EEE ID, need info faster, local level plan is happening, need education	H
Red	Environment	impervious urban areas filter into rural natural areas (pervious)	V	stormwater program in place - but needs funding every year	M

Red	Environment	ticks protection during warm weather, trail maintenance	V/s	building trail steward system backup??	H
Red	Environment	dredging Lake Rosemary because it is Class 5, downstream brook is impaired	V/S	underway	M
Yellow	Environment	Charles River borders Needham on 3 sides	S	ongoing clearing of channel (trees) SW outfalls - clean sediment	H
Yellow	Environment	Cutler Park, reservoirs	S		L
Yellow	Environment	Ridge Hill Reservation	S		
Yellow	Environment	Rosemary Lake (being dredged), pool	S		
Yellow	Environment	Town Forest	S		
Yellow	Environment	Floodplains Town/FEMA flood overlay	S		
Yellow	Environment	9-hole golf course, invasive control with goats	S		
Yellow	Environment	Volente Farms, Needham Community Farm	S		
Yellow	Environment	Wildlife, Rail Trails, Williams School, eagles, etc.	S		
Yellow	Environment	Trail - Newman School, Rail Trail, DPW Pond trail	S		
Yellow	Environment	green infrastructure for new development, school, subdivision	S	follow MS4 requirements for green infrastructure	
Yellow	Environment	Trout Pond	S		
Yellow	Environment	Trees are mostly in the west of town, the east lacks trees	S/V	work on tree bylaw, ID areas to plant tree, assess vulnerability to fire	H
Yellow	Environment	Aquifer - good quality, vulnerable to flooding, drought, security	S/V	monitor groundwater quality; enforcement	H
Yellow	Environment	Back yards	S/V	communication/outreach/ demonstration project on native species	L
Yellow	Environment	Wetland, mosquitos and invasives	S/V	Coordinate with Norfolk County Mosquito Control	M
Yellow	Environment	Stormwater mgmt./ bylaw - must treat SW	S/V		
Yellow	Environment	Drought will cause fire vulnerability	V	maintain fire roads, work w/ other towns - shared equipment, assess fire vulnerability of town lands	H
Yellow	Environment	Air quality - from traffic near 128	V	enforce anti-idling, (at schools)	L
Yellow	Environment	loss of permeable surface to development - 90 teardowns/year	V	enforcement of stormwater management	M
Yellow	Infrastructure	water treatment plant and wells at the Charles River	S	monitor, protect, maintain	H

Yellow	Infrastructure	water interconnection with other towns	S	monitor, protect, maintain	H
Yellow	Infrastructure	10 sewer pump stations, 4 major	S	assess flood vulnerability, (replacement program in place)	H
Yellow	Infrastructure	St Mary's Pump station takes feed from MWRA (20% of supply)	S	monitor, protect, maintain	H
Yellow	Infrastructure	Open Space	S	manage with an eye towards resilience, opportunities for green infrastructure	L
Yellow	Infrastructure	Emergency communication system has 3 new towers	S	complete upgrades	L
Yellow	Infrastructure	Solar at the transfer stations	S		
Yellow	Infrastructure	Beth Israel Deaconess	S		
Yellow	Infrastructure	Bridges: Dover/Needham, Chestnut Street, Central St., Kendrick, Great Plain Ave.	S/V	upgrade Central Ave/Dover Bridge, coordinate with Dover	H
Yellow	Infrastructure	Reverse 911	S/V	upgrade town capabilities to reach cell phones/clean catch basins??	H
Yellow	Infrastructure	Needham Crossing Hot Spot (borders Charles River) transportation access is limited	S/V	encourage more tree planting and permeable surfaces, require this for new development	L
Yellow	Infrastructure	commuter rail is good if it is working, the town has 4 stops	S/V	communicate w/ MBTA on resilience, have a point of contact, better bus and walking to transit	M
Yellow	Infrastructure	stormwater system is undersized	V	assess drainage system, problem areas and mitigation options, (MS4)	H
Yellow	Infrastructure	electricity distribution - Eversource	V	improve communications, provide more resources for the Tree Warden	H
Yellow	Infrastructure	gas distribution - leaks	V	assess system - need for upgrades	H
Yellow	Infrastructure	mosquito control along track, Charles River, swales	V	Norfolk County Mosquito control	M
Yellow	Infrastructure	Public parking is limited at town center - also MBTA parking	V	possible parking garage/deck, add solar?	M
Yellow	Infrastructure	the DPW is dated and in a flood zone	V	Pursue DPW upgrades	M
Yellow	Infrastructure	Schools dispersed around town can be shelters. Vulnerability is air quality	V/S	investigate solar installations and battery storage	M

Yellow	Society	New Senior center is a good location (needs generator)	S	Assess options for environmentally sustainable generator	M
Yellow	Society	Shelter at the High School, Newman, Pollard schools	S	enhance environmentally sustainable generators	M
Yellow	Society	Council of Elders community-based work	S		
Yellow	Society	BIDMC in town	S		
Yellow	Society	interdepartmental communication and coordination	S		
Yellow	Society	senior center van service	S		
Yellow	Society	civically engaged town - could use more	S		
Yellow	Society	houses of worship - safe congregations	s		
Yellow	Society	Youth and Family Services	S		
Yellow	Society	Parks and Recreation, sports facilities and programs	S		
Yellow	Society	people with disabilities/illnesses, town has 2-3 ambulances	S/V	improve accessibility	M
Yellow	Society	Tippet House Hospice, Walker Home Therapeutic Day School, Avita Alzheimer's' Care	S/V	town should coordinate with the facilities, be aware of their needs and emergency plans	M
Yellow	Society	Communications on emergency shelter options	V	New public relations office to look into better communication, especially for seniors	H
Yellow	Society	Elderly population living alone independently	V	improved communication (as above) involve Needham Clergy, other civic associations	H
Yellow	Society	Low income housing	V	improved communication	H
Yellow	Society	limited English speakers, the does have translation services	V	improved communication	H



**Select Board
TOWN OF NEEDHAM
AGENDA FACT SHEET**

MEETING DATE: 06/09/2020

Agenda Item	Joint Meeting with Park & Recreation Commission to appoint a New Member
Presenter(s)	Select Board Park and Recreation Commission

1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
<p>The Select Board and the Park & Recreation Commission will recommend Matthew Toolan to be appointed to the vacant Commission seat due to the passing of one of the Commissioners (Dave DiCicco).</p>	
2.	VOTE REQUIRED BY SELECT BOARD
<p><i>Suggested Motion:</i> That the Select Board and the Park and Recreation Commission vote to appoint Matthew Toolan to the Park and Recreation Commission for the final year of Mr. DiCicco's term, which ends in 2021.</p>	
3.	BACK UP INFORMATION ATTACHED
<p>None</p>	



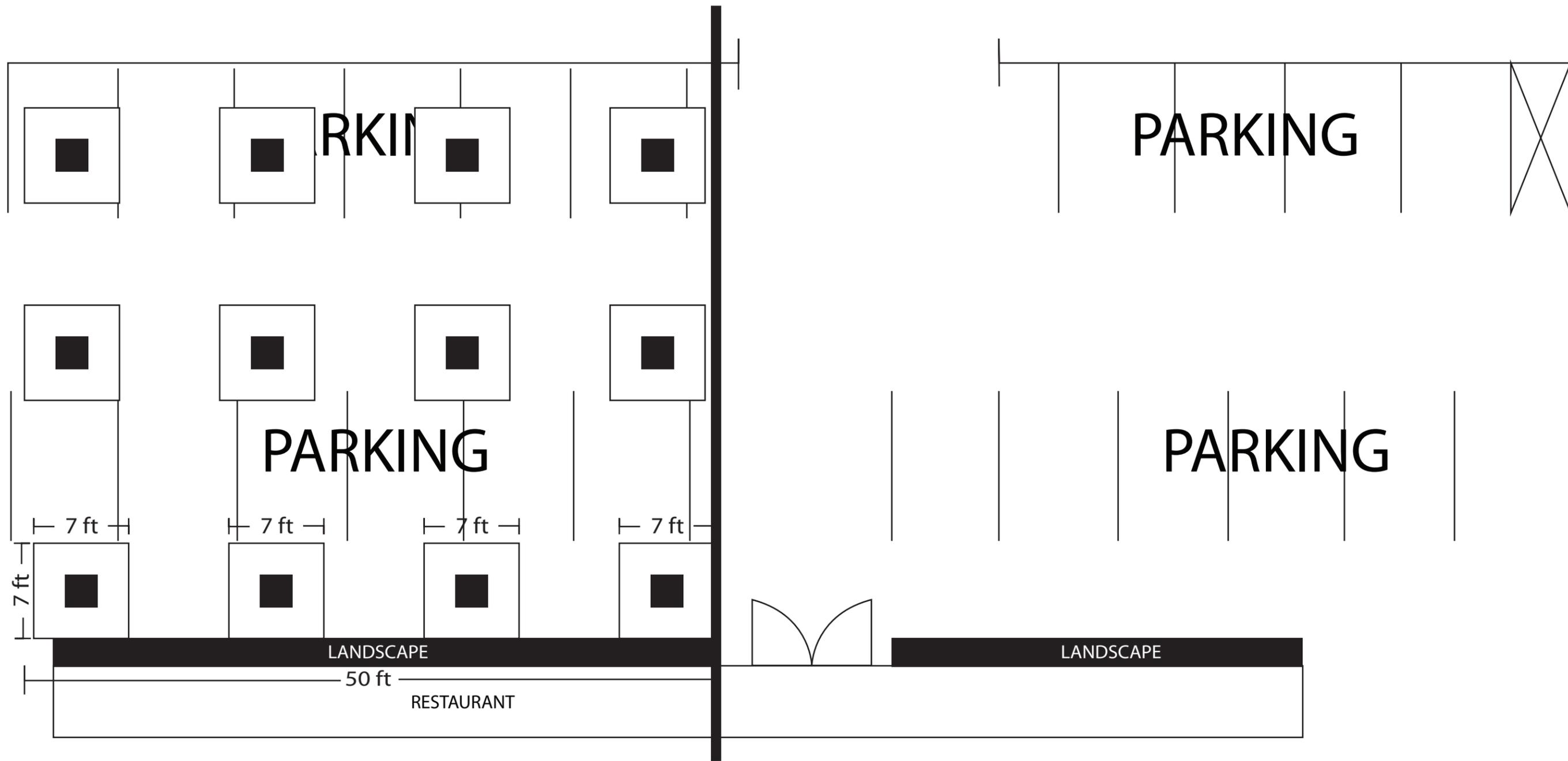
**Select Board
TOWN OF NEEDHAM
AGENDA FACT SHEET**

MEETING DATE: 06/9/2019

Agenda Item	Alteration of Premises for Liquor License Establishments: Ray's New Garden, 40 Chestnut Place
Presenter(s)	Kate Fitzpatrick, Town Manager

1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
	<p>COVID-19 Order No. 35 from the Office of the Governor of the Commonwealth of Massachusetts includes language for the Preparations and Accommodation for Outdoor Restaurant Dining Service. Specifically it addresses outdoor table service being allowed and the permission for the Local Licensing Authority (LLA) to grant approval for a change in the description of the licensed premises for the purpose of permitting outdoor alcohol service as the LLA may deem reasonable and proper, and issue an amended license to existing license holder, without further review or approval by the Alcoholic Beverages Control Commission (ABCC).</p> <p>Ray's New Garden has presented a plan to provide outdoor seating in the privately owned parking lot on the premises. A map and photographs of proposed area are attached.</p>
2.	VOTE REQUIRED BY SELECT BOARD
	<p><i>Suggested Motion:</i> That the Board vote, pursuant to Covid-19 Order No. 35, to authorize the alteration of premises of Ray's New Garden, 40 Chestnut Place, Needham to include a portion of the parking lot as shown on attached drawings.</p>
3.	BACK UP INFORMATION ATTACHED
	<ul style="list-style-type: none">a. Map of proposed layout in parking lotb. Two pictures of proposed premises in parking lotc. Application to be provided separately

CHESTNUT PLACE



CLYDE ST







**Select Board
TOWN OF NEEDHAM
AGENDA FACT SHEET**

MEETING DATE: 6/9/2020

Agenda Item	Naming of Public Safety Complex Community Room
Presenter(s)	Kate Fitzpatrick, Town Manager

1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
<p>At the Board's meeting on May 27, 2020, Chief Schlittler proposed that the Board consider naming the community room of the new Public Safety Complex in honor of police officers Francis Oliver Haddock and Forbes Alexander McLeod, who lost their lives in service to the Town of Needham.</p> <p>In accordance with the Board's policy, a proposal to name a facility must be reviewed at one meeting and voted no sooner than the next regular meeting in order to allow for public comment.</p> <p>No comment was received since the last meeting, and the Town Manager will recommend that the Board take a vote to name the community room.</p>	
2.	VOTE REQUIRED BY SELECT BOARD
<p><i>Suggested Motion:</i> That the Board vote to name the community room of the new Public Safety Complex in honor of police officers Francis Oliver Haddock and Forbes Alexander McLeod, who lost their lives in service to the Town of Needham.</p>	
3.	BACK UP INFORMATION ATTACHED
<p>a. Letter from Chief Schlittler dated May 13, 2020 b. Select Board Naming Policy dated May 11, 2010</p>	



John J. Schlittler
 Chief of Police
 781-455-7570, ext. 217
 jschlittler@needhamma.gov

Needham Police Department

99 School Street
 Needham, MA 02492
 Telephone (781) 455-7570
 Fax (781) 453-9496



Town Manager Kate Fitzpatrick

Kate,

Everyday as I enter the parking lot of the Needham Police Station, I am greeted with the vision of construction on the new Public Safety Complex which is scheduled for completion in early 2022. I often think of the legacy of the men and women who proudly served this community since its inception in 1711. It is important to honor and memorialize those who have given so much to this town and in the case of Needham Police Officers Francis Oliver Haddock and Forbes Alexander McLeod they did so with their lives. Having the ability to repay the debt of these ultimate sacrifices seem impossible but we must try. In fact, there is no greater call in life than when a man or woman, lays down his, or her life in the service of others.

As we transition to the new public safety complex, I want to ensure that we remember the past and honor those who served before us. Although we plan to incorporate a hall of honor in our roll call room, I believe that Officers Francis Oliver Haddock and Forbes Alexander McLeod deserve to be honored and remember in a place that our entire community can share and understand the magnitude of their sacrifice. We recognize the essential role they provided in safeguarding the rights and freedoms of the citizens of Needham. We as a community should never forget the contributions and sacrifices that these two noble and brave officers made as they carried out their duties on February 2, 1934.

I had privilege to say a few words during the recent re-dedication of Haddock and McLeod memorial in September of 2019. I ended that speech with the following;

"Officers Francis Oliver Haddock and Forbes Alexander McLeod, I thank you on behalf of a grateful community for your service, dedication and sacrifice. We as a department will strive to continue to honor your legacies and build upon the foundation that you built. Understand that your memory lives on and you continue to inspire present and future officers who will continue to walk the beat with you beside them".

I can think of no better way to honor Officers Francis Oliver Haddock and Forbes Alexander McLeod than to name the community room within the new public safety complex after them. This seems like a small gesture to safeguard that future generations will understand and be able to reflect on their commitment, service and sacrifice to the town of Needham.

Respectfully,

A handwritten signature in blue ink that reads "John J. Schlittler". The signature is written in a cursive style with a large initial "J" and a distinct "S".

Chief John J. Schlittler

Town of Needham Board of Selectmen

Policy Number:	BOS-DIS-003
Policy:	Naming of Facilities and Placement of Materials
Date Approved:	April 13, 2005
Date Revised:	May 11, 2010
Approved:	 Chairman, Board of Selectman

Policy:

1. The Board of Selectmen is responsible for the naming (or renaming) of any facilities located on parcels of land under the jurisdiction of the Board. A facility is defined as a building, portion of a building, driveway, intersection, walkway, or other parcel or portion of a parcel of land and places or natural features contained therein. Once a facility has been named, renaming will be approved only in extraordinary circumstances.
2. The Board of Selectmen is responsible for approval of the placement of memorial objects, artwork, signs or other fixtures on parcels of land under the jurisdiction of the Board. Examples include, but are not limited to, plaques, memorial or ornamental signs, sculptures, banners, benches, trees or other plantings, fountains, detached structures, and walls.

Procedure:

1. A proposal to name a facility must be submitted in writing to the Board of Selectmen and must include a summary outlining the merits of the proposal. The proponent or his or her designee will present the request to the Board of Selectmen at a regularly scheduled meeting. The Board will vote on the proposal no sooner than the next regularly scheduled meeting, after allowing a period of time for public comment. The Board of Selectmen may appoint a committee to assist with its review of any proposal.
2. A proposal for the placement of a memorial object, piece of artwork, sign, or other fixture must be submitted in writing to the Board of Selectmen and must include a summary outlining the merits of the proposal. The Board will vote on the proposal at a regularly scheduled meeting.
3. The Board of Selectmen shall review existing facility names to avoid duplication, confusing similarity or inappropriateness.
4. Approval of the placement of a memorial object, artwork, sign or other fixture will only be made after a determination by the Board of Selectmen that the proposal will not: limit physical access to the site; endanger the peace or safety of the public; interfere with any utility or access thereto; be limited by unacceptable special restrictions, conditions or

covenants; or create a significant budgetary obligation on the Town for which no provision has been made.

5. Donation of funds, memorial objects, artwork, signs, fixtures, or in-kind services must be formally accepted by the Board of Selectmen in accordance with Massachusetts General Laws.
6. Requests for naming of facilities or placement of memorials on land not under the jurisdiction of the Board will be referred to the appropriate Board.



**Select Board
TOWN OF NEEDHAM
AGENDA FACT SHEET**

MEETING DATE: 6/9/2020

Agenda Item	Town Manager's Report
Presenter(s)	Kate Fitzpatrick, Town Manager

1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
	The Town Manager will update the Board on issues not covered on the agenda.
2.	VOTE REQUIRED BY SELECT BOARD
3.	BACK UP INFORMATION ATTACHED
	none



**Select Board
TOWN OF NEEDHAM
AGENDA FACT SHEET**

MEETING DATE: 06/09/2020

Agenda Item	Economic Development
Presenter(s)	Board Discussion

1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
Board members will discuss efforts to help local restaurants and other businesses impacted by the pandemic.	
2.	VOTE REQUIRED BY SELECT BOARD
3.	BACK UP INFORMATION ATTACHED
(Describe backup below)	
None	



**Select Board
TOWN OF NEEDHAM
AGENDA FACT SHEET**

MEETING DATE: 06/09/2020

Agenda Item	Committee Reports
Presenter(s)	Board Discussion

1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
<i>Board members will report on the progress and / or activities of their Committee assignments.</i>	
2.	VOTE REQUIRED BY SELECT BOARD
3.	BACK UP INFORMATION ATTACHED
(Describe backup below)	
None	

Town of Needham
Select Board
Minutes for Wednesday, May 20, 2020
By Zoom Video Conference
<https://us02web.zoom.us/j/88087254118>

5:00 p.m.

Call to Order:

A special meeting of the Select Board was convened by Chair Maurice P. Handel. Those participating were Matthew D. Borrelli, Marianne B. Cooley, Daniel P. Matthews, John A. Bulian, and Town Manager Kate Fitzpatrick. Also participating were Dave Davison, Assistant Town Manager/Finance. Denise Garlick, State Representative joined the meeting remotely. Recording Secretary Mary Hunt recorded the meeting remotely.

Mr. Handel announced this open meeting is being conducted remotely consistent with Governor Baker's Executive Order of March 12, 2020 due to the current state of emergency from the outbreak of the COVID-19 virus. He noted all public gatherings have been suspended as advised and directed by the Commonwealth. And, as such, suspending the requirement of the open meeting law to have all meetings in a public, accessible, physical location while encouraging and allowing members of all public bodies to participate remotely. Mr. Handel stated the meeting will not include public comment and the Needham Select Board and all attendees are convening by Zoom, as posted on the Town's website identifying how the public may join. He said all supporting documents used at this meeting are available on the Town's website www.needhamma.gov.

5:03 p.m.

Economic Development Opportunities:

Ms. Cooley said a small group convened including Maurice Handel, Marty Jacobs, Planning Board, Sandy Cincotta, Support Services Manager, Lee Newman, Planning & Community Development, Dennis Condon, Fire Chief, John Schlittler, Police Chief, and Tim McDonald, Health and Human Services to consider a proposal to help restaurants with outdoor seating for take-out food. She said the Town will experiment throughout the summer by putting tables and benches in public areas starting Memorial Day Weekend on the Town Common, Needham Heights, and in Eaton's Plaza next to Needham Bank. She said seating will be on a first come, first serve basis and take-out orders may include alcohol from the restaurant which may be consumed only in the designated areas. Ms. Cooley advised people to bring wipes to sanitize tables prior to eating. She noted waste containers will be provided, however she encouraged people to dispose of their waste at home. Ms. Cooley said the Town is open to discussion and proposals from other merchants on ways in which they might be able to do business outside their shops.

Mr. Handel said the Town is proactive and thanked Ms. Cooley and Town staff for their work in putting the plan together quickly. He stated the plan is only for the duration of the state of emergency.

Ms. Fitzpatrick also thanked Ms. Cooley, noting it is probable that the plan will need to be tweaked moving forward.

Mr. Handel said the Planning Board will be discussing the topic tonight and he is hopeful they will take a positive view on the proposed plan.

Ms. Cooley said the Planning Board has been asked to take a vote stating they will not enforce special permit provisions that will interfere with the activity during this time.

Mr. Bulian commented he thought the number of tables and chairs were too close to each other to practice social distancing. He said he hopes the number can be pared down.

Mr. Borrelli asked about parking lots being used in Phase 2? He said he likes what is happening and maybe it is something that can continue.

Ms. Cooley said state guidance will be coming out soon, and that she is hopeful parking lots can be used.

Mr. Matthews said it is important for people to behave responsibly and clean up after themselves. He reminded people to continue social distancing.

Motion by Mr. Bulian that the Select Board vote to authorize the consumption of alcohols defined by M.G.L. Ch. 138 S. 1 that has been sold in association with takeout service and food pursuant to Chapter 53 of the Acts of 2020, Section 13 and the Town Common, Needham Heights Common, Avery Square, and Eaton Plaza under provisions of 3.1.9 of the General Laws of the Commonwealth.

Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.

Ms. Cooley reiterated the motion is for alcoholic beverages purchased with take-out dinner only. It is not to bring your own or buy alcohol in a liquor store for consumption on the Town Common.

5:17 p.m.

2020 Town Meeting:

Ms. Fitzpatrick said the Town Moderator and many people have been asked as to the best way to hold the Annual and Special Town Meeting. She said two options are legally available, including inside at Needham High School using classrooms or outside at a park, field, or parking lot. She said over 200 Town Meeting Members responded to a survey indicating their preference (by a margin of approximately 20 people) was to hold Town Meeting outside. She said given recent guidance from the Commonwealth, it is recommended that the 2020 Town Meeting be held outside at Memorial Park on June 8, 2020 at 5:00 p.m. (Annual) 5:30 p.m. (Special). She said the warrant will be streamlined and all presentations by

proponents will be done in advance and available on the Town's website and on You Tube. She said an email address has been set up for Town Meeting on the Town's website for people to ask and have questions answered, which will also be posted. Ms. Fitzpatrick said the warrant will be sent to Members this week and logistics for this new way of having Town Meeting will be sent out next week.

Mr. Bulian referred to recommended safety guidelines from the Needham Board of Health asking Town Meeting Members to take their temperature prior to the meeting. He asked everyone to read the Board of Health guidance suggesting people bring bug spray.

Mr. Borrelli commented that holding a Town Meeting at Memorial Park is the best alternative. He said the concept will work.

Ms. Cooley concurred with Mr. Borrelli, however, said she favors moving to a virtual option when available.

Mr. Matthews said he appreciates the work during this difficult time and that holding the meeting safely will help the Town do its work.

Motion by Mr. Bulian that the Select Board vote to set the location and time of the Annual Town Meeting to 5 p.m. on June 8, 2020 at Memorial Park, and the time and location of the Special Town Meeting to 5:30 p.m. on June 8, 2020 at Memorial Park; and further, that the rain dates be June 10, 2020 or June 11, 2020.

Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.

Ms. Fitzpatrick indicated the Town Moderator can reset the dates of Town Meeting due to weather. She asked Chris Heep, Town Counsel for a comment.

Mr. Heep said once dates have been established, the Moderator can announce a continuance of Town Meeting to a later date.

Annual Town Meeting Warrant

Article 10 - Appropriate for Planning Consulting Assistance

Ms. Cooley explained the article and why it was withdrawn from the 2020 Annual Town Meeting Warrant. She said it now makes more sense for the Planning Board to have funds available for use to support their work next year, which will give the Town the greatest flexibility in taking actions related to traffic around the Highway Commercial 1 site. Ms. Cooley suggested reinstating Article 10 - Appropriate for Planning Consulting Assistance. Mr. Handel said the Select Board will not take a position tonight, as the article is merely being reinstated. Ms. Cooley concurred.

Motion by Ms. Cooley that the Select Board vote to reinstate and reinsert Article 10 - Appropriate for Planning Consulting Assistance into the 2020

Annual Town Meeting Warrant, notwithstanding the Board's prior vote to withdraw Article 10.

Second: Mr. Bulian. Unanimously approved 5-0 by roll call vote.

Mr. Borrelli asked for a presentation and more information by the Planning Board on the article.

Article 12 - Appropriate for Public Health Consulting Assistance

Mr. Matthews suggested withdrawing Article 12 as funds are not needed this year.

Motion by Mr. Matthews that the Select Board vote to withdraw Article 12 - Appropriate for Public Health Consulting Assistance from the 2020 Annual Town Meeting Warrant.

Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.

Ms. Cooley suggested Article 12 will be brought to the 2020 fall Town Meeting.

Discussion turned to two Citizen's Petitions deferred from the Annual Town Meeting Warrant in order to keep Town Meeting as brief as possible due to the pandemic.

Mr. Handel suggested both Citizen's Petitions be included, without prejudice, in the 2020 fall Town Meeting Warrant, as the signature requirement for a Special Town Meeting is significantly more burdensome on the applicant than for an Annual Town Meeting.

Motion by Mr. Borrelli that the Select Board vote to include Article 20 Citizen's Petition/Amend Zoning By-Law - Map Change to General Residence B Zoning District and Article 31 - Citizen's Petition - Storage of Receptacles Used for Household Waste Disposal Pickup at Residential Properties by Commercial Vendors in the 2020 fall Town Meeting Warrant.

Second: Mr. Bulian. Unanimously approved 5-0 by roll call vote.

Mr. Matthews clarified the Citizen's Petitions will be included in the Warrant as a courtesy so that the petitioners do not have to go through a more extensive petition process. He said doing so in no way states the view of the Select Board one way or another.

Mr. Matthews commented on Article 19 - Citizen's Petition/Amend Zoning By-Law - Pediatric Medical Facility in the New England Business Center District in the Annual Town Meeting Warrant. He suggested the Select Board vote to recommend adoption subject to modification from the Finance Committee, Planning Board, and Town Manager. He said the vote by Town Meeting will be significant and the public needs broad and complete information. He recognized negotiations are ongoing.

Motion by Mr. Matthews that the Select Board vote to recommend adoption of Article 19 - Citizen's Petition/Amend Zoning By-Law - Pediatric Medical Facility in the New England Business Center District in the Annual Town Meeting Warrant, subject to modification from the Finance Committee, Planning Board, and Town Manager.

Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.

Ms. Fitzpatrick said at the Select Board meeting next week a Community Host Agreement will be presented and representatives from Children's Hospital will be on hand. She said she sees no reason why the Select Board can't take a public position on the zoning.

Special Town Meeting Warrant

Mr. Borrelli suggested the Select Board continue to hold off on voting on Article 1 - Appropriate for Traffic Consulting & Engineering in the Special Town Meeting Warrant until the next Select Board meeting.

Mr. Matthews updated the Board on Article 32 - Citizen's Petition Sewer Line Extension in the Annual Town Meeting Warrant. He explained that at the request of the residents and the proponent, the Town will connect the neighborhood to a sewer line, as per its work plan. He said it is not a simple matter and that there are legal responsibilities, but it is in progress without the Citizen's Petition being acted on. He offered that it would be much better from the point of view of the Town in terms of trying to keep Town Meeting brief, and of the residents themselves, suggesting the petition be withdrawn. But, he said, only the petitioner can make the withdrawal. He said Counsel wrote to the petitioner and that he is hopeful the petitioner will respond. He said if the petition is not withdrawn, he will speak about it at the next Select Board meeting and ask for a vote to oppose the petition. Mr. Matthews said it is in no one's interest to act or have it considered further by Town Meeting. He said he is hopeful the Citizen's Petition will be withdrawn.

5:46 p.m.

Adjourn:

Motion by Mr. Bulian that the Select Board vote to adjourn the Special Select Board meeting of Wednesday, May 20, 2020.

Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.

A list of all documents used at this Select Board meeting are available at:

<http://www.needhamma.gov/Archive.aspx?AMID=99&Type=&ADID=>

**Town of Needham
Select Board
Minutes for Wednesday, May 27, 2020
By Zoom Video Conference
<https://us02web.zoom.us/j/89249143529>**

6:00 p.m. Call to Order:
A special meeting of the Select Board was convened by Chair Maurice P. Handel. Those participating were Matthew D. Borrelli, Marianne B. Cooley, Daniel P. Matthews, John A. Bulian, and Town Manager Kate Fitzpatrick. Also participating were Dave Davison, Assistant Town Manager/Finance. Recording Secretary Mary Hunt recorded the meeting remotely.

Mr. Handel announced this open meeting is being conducted remotely consistent with Governor Baker's Executive Order of March 12, 2020 due to the current state of emergency from the outbreak of the COVID-19 virus. He noted all public gatherings have been suspended as advised and directed by the Commonwealth. And, as such, suspending the requirement of the open meeting law to have all meetings in a public, accessible, physical location while encouraging and allowing members of all public bodies to participate remotely. Mr. Handel stated the meeting will not include public comment and the Needham Select Board and all attendees are convening by Zoom, as posted on the Town's website identifying how the public may join. He said all supporting documents used at this meeting are available on the Town's website www.needhamma.gov.

6:01 p.m. Public Hearing: Eversource Energy Grant of Location
Maureen Carroll, Eversource Energy Representative discussed with the Board 1 Eversource Energy Grant of Location:

1. Park Avenue
Ms. Fitzpatrick said all paperwork is in order.

Mr. Handel invited public comment. No comments were heard.

Motion by Mr. Bulian that the Select Board approve and sign a petition from Eversource Energy to install approximately 36 feet of conduit in Park Avenue. This work is necessary to provide underground electric service to 24 Park Avenue, Needham, MA.

Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.

6:05 p.m. Public Safety Project Update:
Steve Popper, Director of Design & Construction, Ken Sargent, Project Manager, and Stuart Chandler, Chair, Permanent Public Building Committee provided the Board with an update on the status of the Public Safety Building and Fire Station #2. A PowerPoint presentation was viewed.

Mr. Popper said completion of the new Fire Headquarters is anticipated in August 2020. He said the dispatch area is a significant piece of work, encompassing antenna towers and microwaves for communication. He commented Fire Station #2 is anticipated to be complete in September 2021, with the entire project including the new Police Headquarters expected to be complete in January 2022.

Mr. Sargent commented on the phased construction aspects of the project.

Mr. Popper commented the original budget of \$66.41 million has been adjusted upward by \$2.01 million. He said it is important to note 98% of the project has been “bought out,” and overruns are not anticipated. He said he is confident the project can be completed with the remaining \$1.36 million contingency. He said the project has been a well-managed team effort.

Mr. Chandler emphasized that with 98% of the project being “bought out,” it is a significant reduction in risk. He said the team has done a tremendous amount of work, made difficult with the COVID-19 situation. He said the timeline has been affected only slightly due to the pandemic.

Mr. Handel asked if the Board had any questions.

Mr. Borrelli asked if project completion is on target based on original dates? Regarding the budget, he said it would be helpful for the Select Board to be copied on any change orders as they happen.

Mr. Sargent said the original schedule called for completion of the Fire Headquarters by June 1, 2020. He said the completion date is now August 6, 2020, subject to potential delays. The higher project is scheduled for December 31, 2021 is now scheduled for completion in January 2022.

The Board thanked the presenters for the update.

6:22 p.m.

Naming of Community Room – Public Safety Building:

John Schlittler, Chief of Police asked the Board to consider naming the community room of the new Public Safety Complex in honor of police officers Francis Oliver Haddock and Forbes Alexander McLeod, who lost their lives in service to the Town of Needham in 1934.

Chief Schlittler told the Board what happened on February 2, 1934 at the Needham Trust Company when Officers Francis Haddock and Forbes A. McLeod were shot and killed when responding to the robbery. He said it is important to honor both officers in a place where the community can come and understand the magnitude of their sacrifice.

In accordance with the Board's policy, a proposal to name a facility must be reviewed at one meeting and voted on no sooner than the next regular meeting in order to allow for public comment.

The Board said they are happy Chief Schlittler brought the proposal to them for consideration.

Mr. Handel said the proposal will be voted on at the next Select Board meeting.

6:28 p.m. Mr. Handel asked Dave Davison, Assistant Town Manager/Finance to speak about the ways the Town's revenue will be affected by the COVID-19 situation and what is being done to address concerns.

Mr. Davison said a number of steps have been taken in evaluating the Town's revenue picture for FY2021, proactively adjusting estimates. He said the most significant change is the downward adjustment of local receipts, most notably in the meals and rooms tax revenues. He said it will take time to return to pre-COVID-19 levels. Also adjusted were motor vehicle excise taxes, interest rates, and building activity. Mr. Davison said most forecasts show a return to normal levels by the 2nd half of 2021. He commented on across the board reductions in state aid and outright elimination of most programs, except for unrestricted governmental aid. He said a 20% reduction is anticipated. Mr. Davison commented on Chapter 70 (Education Aid), noting the governor and legislature will do their best to avoid any reduction. He commented on state laws and that any significant reduction would decimate the education process across the state. He said the best estimate for Needham is a 20% adjustment in the area of full day kindergarten. He commented on property tax collection and new building growth. He said a number of funding articles in the Town Meeting warrant have either been deferred to fall Town Meeting or the requested appropriation has been reduced.

Mr. Bulian said the information from Mr. Davison should alleviate concerns from some Town Meeting members about whether the Town is anticipating the likely revenue downturn due to the pandemic.

Mr. Bulian commented the Town is "on it" in order to continue necessary operations of the Town.

Mr. Borrelli said the recap is helpful. He asked about appropriation of funds and articles deferred in the warrant.

Mr. Davison said some articles were deferred due to time considerations of Town Meeting. He said deferred appropriations will move to the fall 2020 Town Meeting warrant.

Ms. Cooley said it would be helpful for Town Meeting Members to hear Mr. Davison's explanation and the reasons for the deferral of some articles.

6:40 p.m. Children’s Hospital Zoning Presentation:
Robert T. Smart, Jr., Esq., Timothy Sullivan, Partner, Goulston & Storrs, Lisa Hogarty, Senior Vice President of Real Estate Planning and Development, Children’s Hospital, Joshua Greenberg, Vice President, Government Relations, Children’s Hospital, and Sean Manning, Director, VHB, and Christopher Heep, Town Counsel appeared before the Board with an overview of proposed zoning changes by Citizen’s Petition and the proposed project.

Mr. Smart explained the Citizen’s Petition proposes to amend the use table of the New England Business Center to allow for a pediatric medical facility by special permit.

Mr. Sullivan showed a Powerpoint presentation dated May 27, 2020 explaining four key items: Proposed Zoning Amendment, Planning Board Review of the amendment, parking, and trip generation, Proposed Agreements (PILOT and Host Community Agreement), and Additional Economic/Community Benefits.

Mr. Handel asked for questions and comments from the Select Board.

Mr. Handel said the project is extremely important and will have an amazing impact on the Town if approved by Town Meeting on June 8, 2020.

Mr. Borrelli concurred with Mr. Handel. He acknowledged the uniqueness of the Citizen’s Petition, the questions it may raise regarding the financial impact to the Town, and whether it is the best deal possible. He suggested the Town Meeting presentation include a comparative analysis of Children’s Hospital vs. an office building, and why the hospital buildout would be a better project for Needham. He concluded the use and synergy with Needham is great.

Ms. Cooley said she appreciates the work Children’s Hospital has done with the Town on the PILOT. She said there is strong community support, and many people will be pleased to have the amenity close to home.

Mr. Matthews concurred, saying the project is terrific. He said it is incumbent on the proponents and the Select Board to have clear and concise information for Town Meeting Members. He said the project is a “win-win” in many ways.

Mr. Bulian concurred, saying he looks forward to the Town Meeting presentation.

Mr. Handel concluded the project will be a signature achievement in Needham Crossing, with enormous visibility from Route 128 and benefits for the Town.

7:00 p.m. Appointments and Consent Agenda:
Motion by Mr. Borrelli that the Select Board vote to approve the Appointments and Consent Agenda as presented.

APPOINTMENTS: No Appointments were made at this meeting.

CONSENT AGENDA:

- 1. Approve the extension of Needham Downtown and Needham Heights parking permit expiration dates to September 1, 2020.**
- 2. Approve open session minutes of May 12, 2020.**
- 3. Accept a \$400 donation made to the Needham Health Division's Gift of Warmth program from the Christ Church in Needham.**
- 4. Accept a \$100 donation made to the Needham Health Division's Traveling Meals program from Jerald Owen, a Needham resident.**
- 5. Water and Sewer Abatement Order #1291**

Second: Ms. Cooley. Unanimously approved 5-0 by roll call vote.

7:00 p.m.

Town Manager:

Kate Fitzpatrick, Town Manager spoke with the Board regarding 3 items:

- 1. Approve PILOT Agreement and Host Community Agreement between the Town and Boston Children's Hospital**

Ms. Fitzpatrick recommended the Board vote to approve the PILOT Agreement and Host Community Agreement between the Town and Boston Children's Hospital.

Motion by Mr. Bulian that the Board vote to approve and sign the PILOT Agreement and Host Community Agreement between the Town and Boston Children's Hospital.

Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.

- 2. Town Meeting Planning**

The Board reviewed articles in the Annual Town Meeting Warrant and the Special Town Meeting Warrant.

Ms. Fitzpatrick advised the Board the Citizen's Petition for a sewer line extension at Walker Lane (Article 32 in the Annual Town Meeting Warrant) has been withdrawn by the petitioner.

Annual Town Meeting Warrant

Article 10 - Appropriate for Planning Consulting Assistance

Motion by Mr. Bulian that the Select Board vote to support Article 10 - Appropriate for Planning Consulting Assistance in the Annual Town Meeting Warrant.

Second: Ms. Cooley. Unanimously approved 5-0 by roll call vote.

Mr. Borrelli clarified a portion of the money may or may not be used for the Muzi site, which must be conveyed to Town Meeting Members so they can voice their

opinion. He suggested if Article 10 passes at Town Meeting, a joint meeting be held with the Finance Committee and Planning Board to decide how the money will be appropriated for a study. He commented if a developer eventually purchases the land, a “claw back provision” should be sought for future studies and mitigation. He commented on time limits.

Mr. Handel said the money is not to promote a traffic study, but rather to have it available should it become necessary. He said the Planning Board traditionally has required of developers certain studies that may still be important. He stated at this point no one knows if the site will be developed, only that if the Town does nothing the site will be developed using very outdated zoning by-laws. He said he does not have any objection to meeting with other Town boards.

Ms. Cooley said she believes the reason Article 10 is coming forward now is because it is not clear which money might need to be spent. She said having the funds available is critical to being on the path toward next year. She said it is believed timeliness is important in this area. Ms. Cooley concurred with Mr. Handel that inaction on the part of the Town guarantees some development under ancient zoning by-laws that will not be advantageous to Needham.

Special Town Meeting Warrant

Article 1 - Appropriate for Traffic Consulting & Engineering

Motion by Ms. Cooley that the Select Board vote to withdraw Article 1 - Appropriate for Traffic Consulting & Engineering in the Special Town Meeting Warrant.

Second: Mr. Bulian. Unanimously approved 5-0 by roll call vote.

Ms. Fitzpatrick confirmed 17 Articles in the Annual Town Meeting Warrant and 1 Article in the Special Town Meeting Warrant will be presented to Town Meeting on June 8, 2020.

3. Town Manager’s Report

Ms. Fitzpatrick reminded the Board that Town Meeting is scheduled for 5 p.m. on June 8, 2020 outside at the Memorial Park Fieldhouse parking lot. She said many logistics are being planned, including a sound system, chairs spaced 9 feet apart, and safety precautions. She noted all presentations will be done in advance of the meeting and available on the Town’s website and YouTube Channel. She said the meeting will not be videoed and there will not be paper handouts. She asked all Town Meeting Members to plan accordingly. She said Town Meeting Members will receive more logistical information next week.

Ms. Fitzpatrick updated the Board on re-entry to Town office buildings, with guidelines and precautions. She said Town offices will be staffed at 25%. She said next week the Public Works Department will be back to their full schedule rotation. She said employees will be required to wear face coverings, wipe surfaces clean,

and attest that when they arrive at work, they are symptom free. Ms. Fitzpatrick said on June 1, 2020 the PSAB, Rosemary Recreation Complex, and Town Hall will be open for business on an appointment basis only. She encouraged the public to call to make appointments. She said the library will continue to be closed but will begin curbside pickup of books and materials. She said the CATH will not open in Phase 1. Ms. Fitzpatrick said a special page on the Town's website will have re-entry information from the Town and local businesses.

Mr. Matthews congratulated Mr. Borrelli and Ms. Cooley on their re-election to the Select Board. He thanked Theodora Eaton, Town Clerk and all staff and workers for their work on the town election while under some very unique and difficult circumstances. He said everyone involved deserves the Select Board's thanks and appreciation.

7:15 p.m. Board Discussion:

1. Committee Reports

Ms. Cooley reported the Downtown Planning Group is meeting weekly. She said last weekend tables and chairs were available for the public to use to enjoy take-out food. She said activity and behavior has been appropriate. She said Greene's Field will also have tables for use very soon. She said more options are being explored to assist merchants, asking the Board if it is possible to designate a parking meter for 5-minute curbside pickup?

Mr. Handel said he supports the Town Manager having discretion to designate certain parking spaces for 5-minute curbside pickup.

Mr. Borrelli concurred, saying anything creative to help merchants should be done.

Mr. Bulian agreed. However, he said the number of requests will grow and must be managed, so that all businesses can accommodate their customers.

Mr. Matthews said the idea makes sense and there are ways to manage the number of 5-minute parking spaces fairly for all businesses.

Mr. Borrelli suggested doing everything that can be done to safely expedite the reopening of restaurants and businesses.

Ms. Cooley thanked the Planning Board for supporting certain non-enforcement by-laws to help businesses. She also thanked staff members including Sandy Cincotta, John Schlittler, Dennis Condon, Tim McDonald, and Lee Newman for their help.

7:30 p.m. Adjourn:

Motion by Mr. Borrelli that the Select Board vote to adjourn the Select Board meeting of Wednesday, May 27, 2020.

Second: Mr. Bulian. Unanimously approved 5-0 by roll call vote.

A list of all documents used at this Select Board meeting are available at:
<http://www.needhamma.gov/Archive.aspx?AMID=99&Type=&ADID=>