

CITY of BOSTON

NATURAL HAZARD MITIGATION PLAN

Public Meeting
September 2, 2026

Weston & Sampson

MEET THE TEAM

Office of Emergency Management



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LoPresti Park, photo by Weston & Sampson

AGENDA

01 NHMP Overview

02 2026 NHMP Chapters

03 Next Steps

04 Conclude



Boston City Hall, photo by Weston & Sampson

What is a Natural Hazard Mitigation Plan?

Purpose of Natural Hazard Mitigation Plan (NHMP)

01 **Identify natural hazards** that pose the greatest risk to Boston.

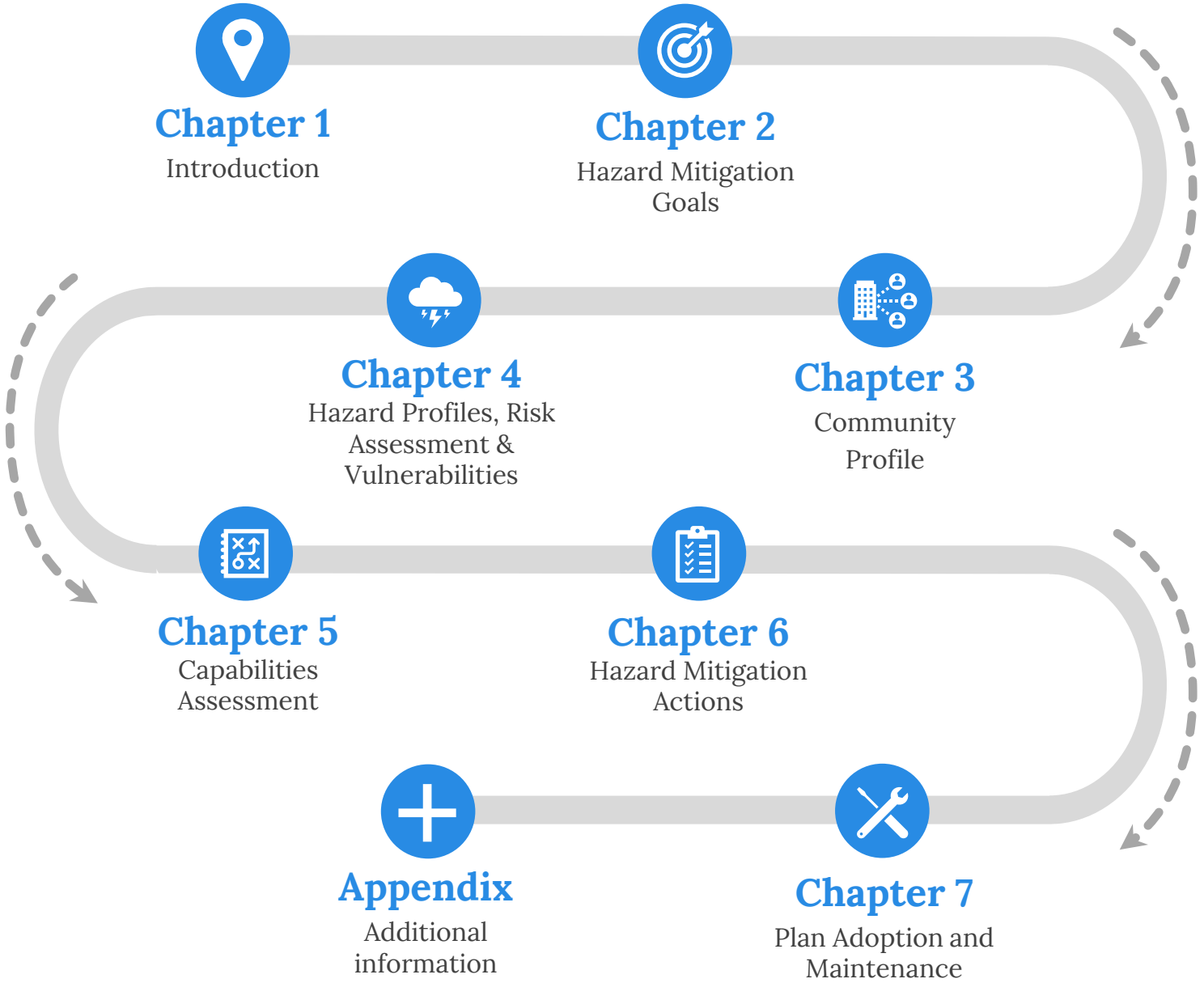
02 **Assess vulnerability** of residents, infrastructure, and critical facilities.

03 Develop **strategies and projects** to minimize or eliminate future hazard impacts.

04 **Strengthen coordination** across City departments, regional agencies, and community partners.

05 **Maintain eligibility** for FEMA mitigation grants and federal disaster recovery funding.

NHMP OVERVIEW



VALUE OF HAZARD MITIGATION PLANNING



EVERY $1 spent on mitigation

SAVES $6 on disaster recovery



Boston City Hall, photo by Weston & Sampson

Planning Process & Public Engagement

PLANNING PROCESS

City Staff



Executive Steering Committee

14 key City staff

who guide the planning process, provide input, and review progress.

4 Meetings

Stakeholders



Local Planning Team (LPT)

96 stakeholders

including representatives from neighboring communities, local and regional agencies, businesses, academia, nonprofit organizations, and other community partners.

2 Workshops

Public



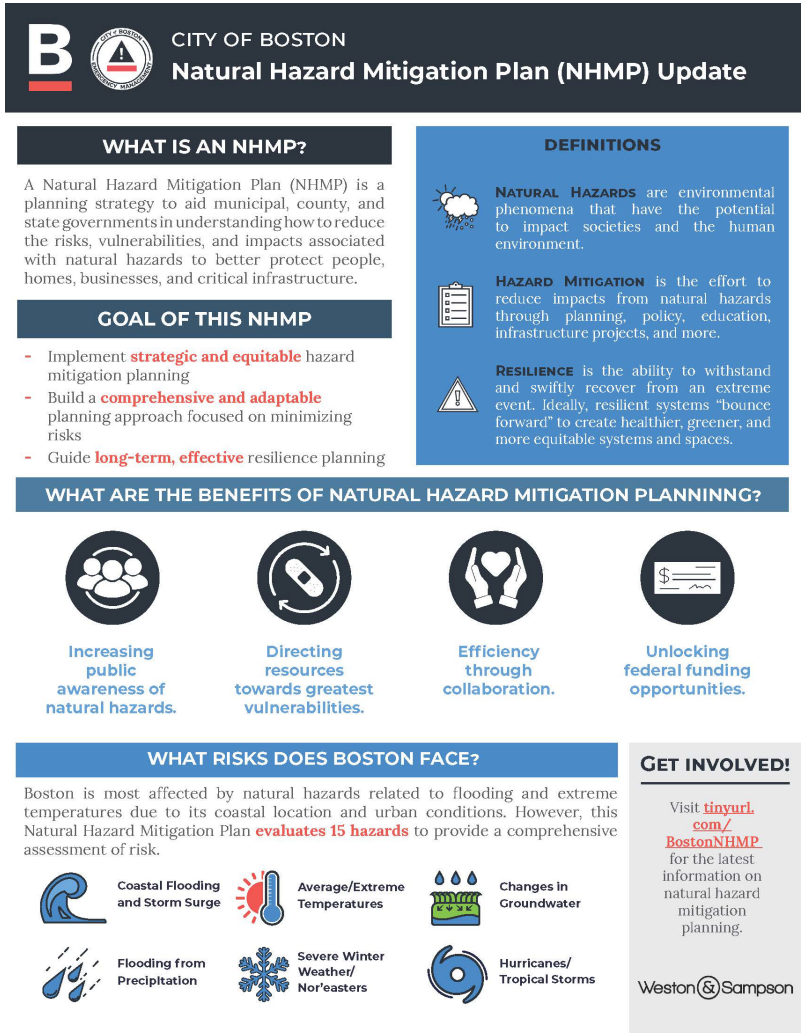
Public Engagement

Everyone

Results from public meetings, workshops, and other feedback sessions are integrated into the final report.

Meetings, Workshops, Events, Social Media, & Public Survey

Website and Social Media Outreach





Boston NHMP 2026 Update Public Survey

The City of Boston's Office of Emergency Management is updating the 2021 Natural Hazard Mitigation Plan (NHMP). This involves looking at Boston's historic hazards and future climate change projections to pinpoint vulnerable areas and develop strategies to mitigate damage from extreme events. Learn more about the project details online at tinyurl.com/BostonNHMP. Your experiences of previous natural hazard events and ideas for becoming more resilient are critical to understanding vulnerability across Boston's neighborhoods!

La Oficina de Gestión de Emergencias de la ciudad de Boston está actualizando el Actualización del Plan de Mitigación de Riesgos Naturales (NHMP) 2021. Esto implica analizar los riesgos históricos de Boston y las proyecciones futuras del cambio climático para identificar las zonas vulnerables y desarrollar estrategias para mitigar los daños causados por fenómenos extremos. Para obtener más información sobre los detalles del proyecto, visite tinyurl.com/BostonNHMP. ¡Sus experiencias con fenómenos naturales anteriores y sus ideas para aumentar la resiliencia son fundamentales para comprender la vulnerabilidad de los barrios de Boston!

* Indicates required question

Notice of accomodations

English: Interpretation, translation, and disability accommodation services are available to you at no cost. If you need them, please contact us at kyron.owens@boston.gov, or 617-635-4680.

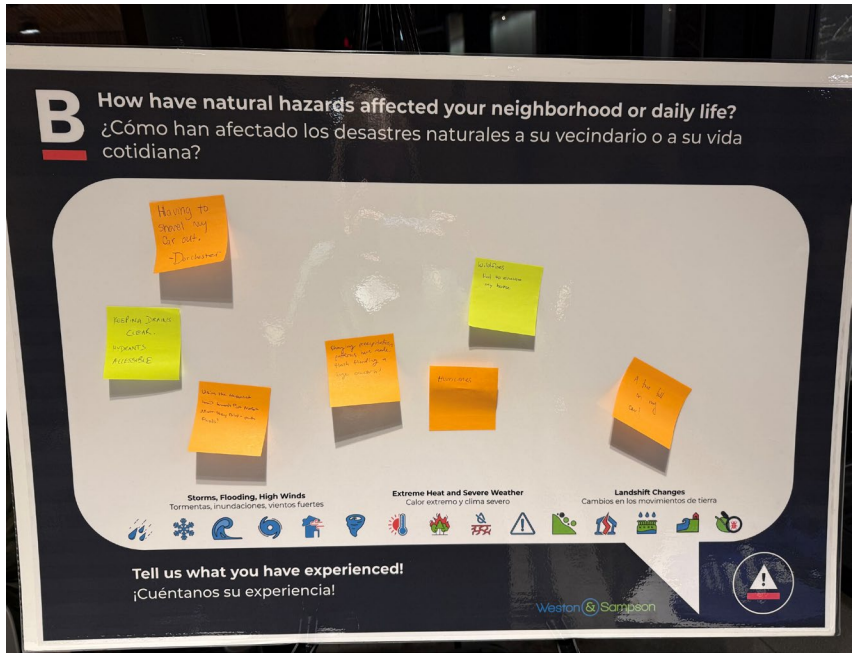
Spanish - Español: Hay servicios de interpretación, traducción y adaptaciones para discapacidades a su disposición sin costo alguno. Si los necesita, por favor póngase en contacto con nosotros mandando un correo electrónico a kyron.owens@boston.gov, o llamando al 617-635-4680.

Haitian Creole -Kreyòl ayisyen: Sèvis entèpretasyon, tradiksyon, ak sèvis akomodasyon pou andikape disponib pou ou gratis. Si w bezwen sèvis sa yo, tanpri kontakte nou nan kyron.owens@boston.gov 617-635-4680.

Traditional Chinese - 繁體中文: 我們可以為您提供免費的口譯, 筆譯, 和殘疾人士合理照

Public Engagement Events

- **Office of Green Infrastructure Event**
- **Focus Groups**
  - East Boston Senior Center
  - Brighton Senior Center
- **OEM RCPGP –** Art for a Change with Boston Public Schools
- **Public Meeting**











Boston City Hall, photo by Weston & Sampson

Hazard Mitigation Goals

HAZARD MITIGATION GOALS

Implement strategic and equitable hazard mitigation planning by building a comprehensive and adaptable approach that integrates social, economic, and environmental solutions focused on minimizing risks that guide long term effective resilience planning.

Build **informed, connected communities** ready for natural hazards.



Encourage the **protection of private property** and buildings.



Create **community resilience** and promote neighborhood-level education and stewardship.





Support vulnerable populations before, during, and after hazard events.



Coordinate investments citywide, countywide, and statewide.



Enhance post-disaster recovery by fostering a collaborative mindset and increasing energy independence.



Boston City Hall, photo by Weston & Sampson

Community Profile

OVERVIEW OF ASSET CATEGORIES

Categories based on the **FEMA Local Mitigation Planning Handbook** (2025) and **Local Mitigation Planning Policy Guide** (2025)

People



- **Underserved** communities
- **Socially vulnerable** populations

Structures



- Existing **buildings** and **infrastructure**
- Future or planned **developments**

Community Lifelines and Other Critical Facilities



- Fundamental **services** and **facilities** in the community
- Support **response planning** and **operations**
- Essential to human **health** and **safety** or to **economic security**

Natural, Historic, and Cultural Resources



- **Environmental** and **natural resources**
- **Historic resources** that tell the story of your community
- Assets of the **local culture** that are unique or cannot be replaced

Economy



- Major **employers, economic sectors,** and **commercial centers**

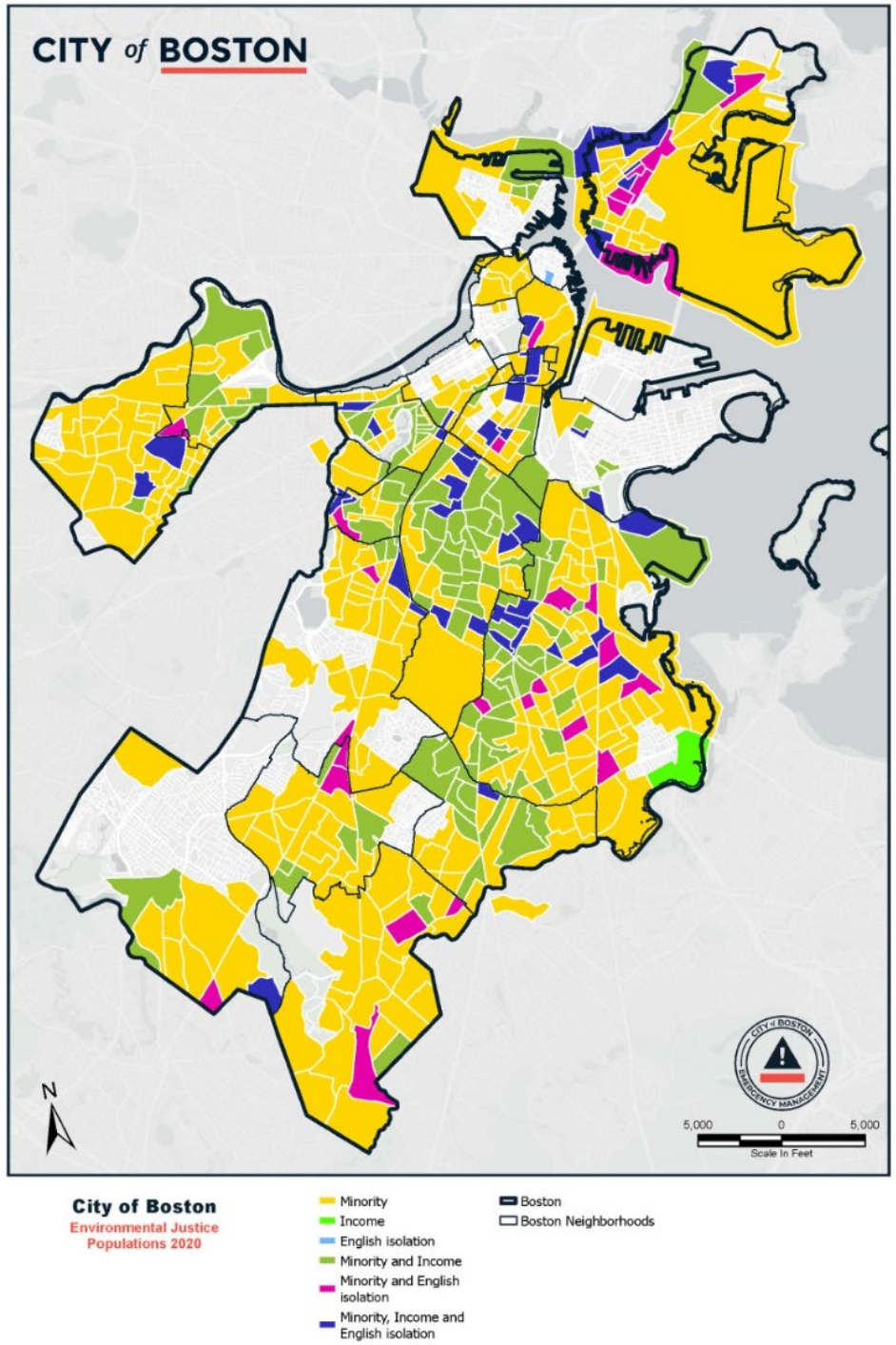
Activities that Have Value to the Community



- **Activities** that are important to the community
- Long-standing **traditions, seasonal markets, tourists**

PEOPLE

BOSTON		MASSACHUSETTS	
AGE			
14% Under 18	**13%** 65 and over	**19%** Under 18	**18%** 65 and over
EDUCATION			
55.8% Bachelor's degree or higher		**47.8%** Bachelor's degree or higher	
SOCIAL			
26.6% Foreign-born	**2.3%** Veteran	**34.3%** Speak language other than English at home	**18.1%** Foreign-born	**4.1%** Veteran	**25.3%** Speak language other than English at home
INCOME			
$96,931 Median household income	**15.6%** Poverty rate	**$99,858** Median household income	**10.4%** Poverty rate
HOUSING			
314 K Housing units	**36%** Owner-occupancy rate	**$703 K** Median value of owner-occupied housing units	**3.05 M** Housing units	**62%** Owner-occupancy rate	**$571 K** Median value of owner-occupied housing units



STRUCTURES



Deployable flood barrier at the Aquarium T station (Source: City of Boston)

The City of Boston contains:

86,846 residential buildings

399 buildings at Logan Airport

673 government buildings

27 deployable flood barriers

1,122 industrial and **5,995 commercial** buildings

and **4,720** institutional buildings

COMMUNITY LIFELINES



Safety and Security
Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety



Hazardous Materials
Facilities, HAZMAT, Pollutants, Contaminants



Food, Hydration, Shelter
Food, Hydration, Shelter, Agriculture



Energy
Power Grid, Fuel



Health and Medical
Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management



Transportation
Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime

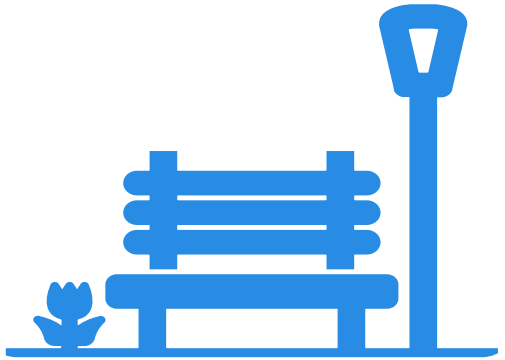


Water Systems
Potable Water Infrastructure, Wastewater Management



Communications
Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch

NATURAL, CULTURAL, HISTORIC RESOURCES



Environmental and **natural resources** add to a community's identity and quality of life



Historic resources tell the story of your community through time



Cultural resources are aspects of the local culture that are unique or irreplaceable

ACTIVITIES THAT HAVE VALUE TO THE COMMUNITY



Local Food Festival (Source: Boston Local Food)



Harborfest (Source: Boston Harborfest)



Pride Parade (Source: Boston.com)



Lunar New Year Festival (Source: TheScopeBoston.org)



Saint Anthony's Feast (Source: The Boston Calendar)



Walk for Hunger (Source: Project Bread)

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When you think of Boston, what assets are most important to you?

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When you think of Boston, what assets are most important to you?

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- Esplanade
- Library
- Harbor and waterways
- Harbirwalk
- Accessible Education
- Clinical Trials
- Evacuation routes, roads and highway infrastructure,
- High Quality Healthcare
- Airport
- Food centers, hospitals
- DCR beaches
- Franklin Park
- Franklin Park
- Proximity to higher education, free classes, free workforce development programs , green spaces , civic infrastructure investments
- Jamaica Pond
- Parks/green spaces, Esplanade
- Public pools, walk on Charles River
- LIBRARY



Boston City Hall, photo by Weston & Sampson

Hazards, Risks, and Vulnerabilities

**Change from 2018, updated to follow ResilientMass Plan*

WHAT ARE NATURAL HAZARDS?



Flooding from Precipitation



Coastal Flooding and ***Storm Surge***



Coastal Erosion



Hurricanes / Tropical Cyclones



Tsunamis



Changes in Groundwater



Severe Winter Weather / Nor'easters



Average/ Extreme Temperatures



Drought ***(including groundwater impacts)***



Wildfire



Earthquakes



Landslides/ ***Mudflows***



Tornadoes

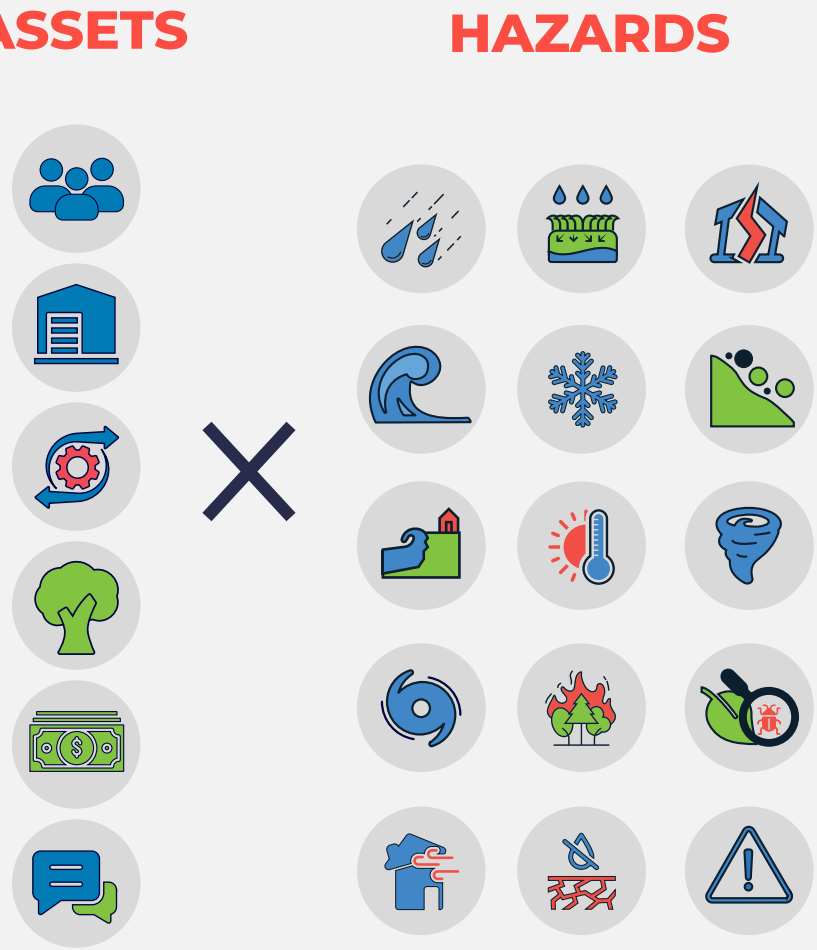


Invasive Species



Other Severe Weather

VULNERABILITY VS. IMPACTS



"Vulnerability is a description of which assets, including structures, systems, populations and other assets as defined by the entity, **within locations identified to be hazard prone, are at risk** from the effects of the identified hazard(s)."

FEMA

Use information from Hazard Profiles and Asset Inventory.

Vulnerability: Define what parts of the city are most likely to be affected

Impacts: The potential consequences

FLOODING FROM PRECIPITATION

- **Flooding from Precipitation:** Non-coastal flooding, includes riverine flooding and stormwater flooding due to rain.

Stormwater Flooding:

- Poor and undersized drainage
- High amounts of impervious surface
- Undersized culverts

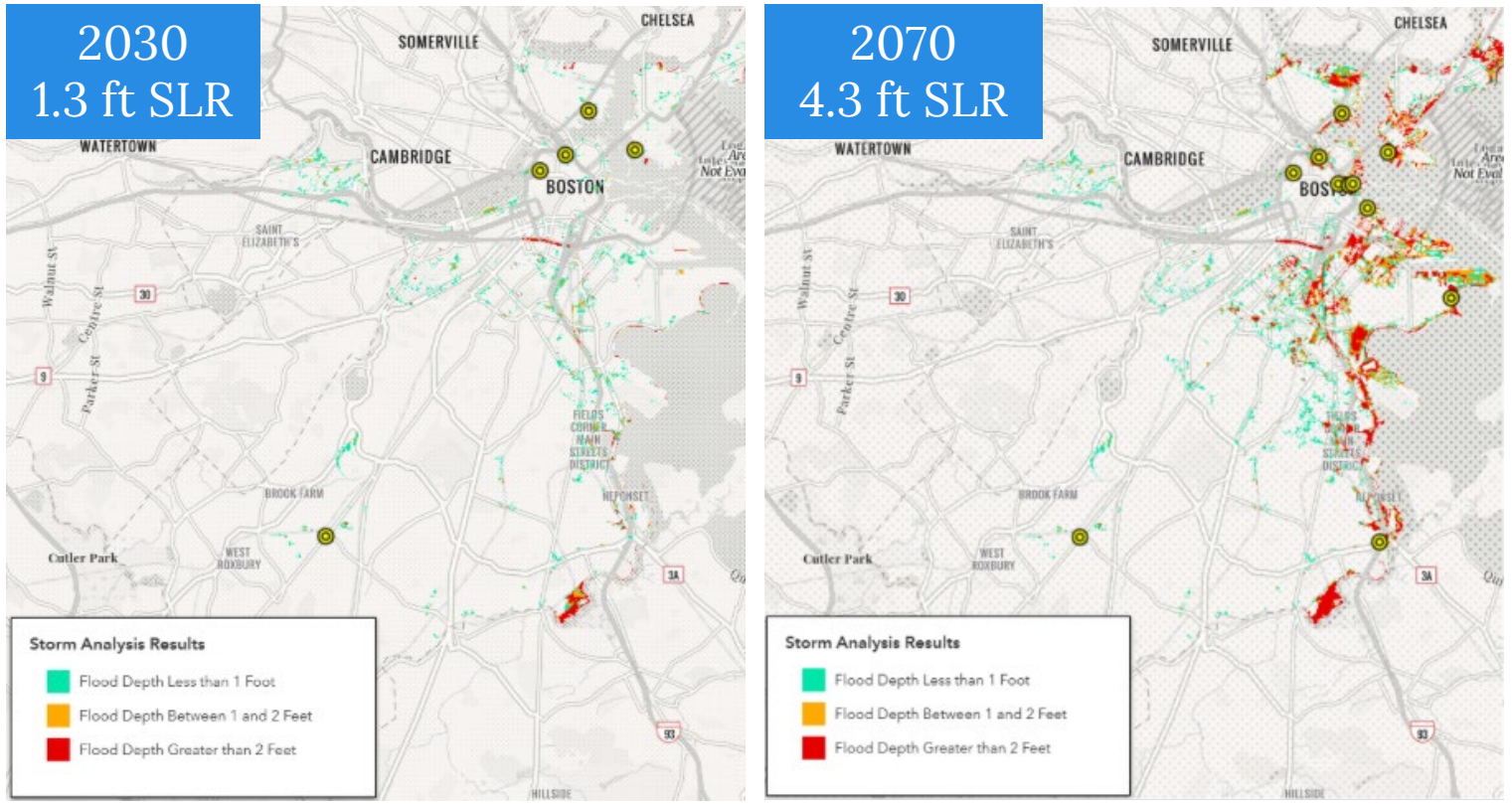
Riverine Flooding:

- Overtopping of banks along rivers and other waterbodies

Ice Jams:

- accumulation of ice that acts as a natural dam and restricts the flow of a body of water

Thunderstorm Flooding from 10-year 6-hour Storm

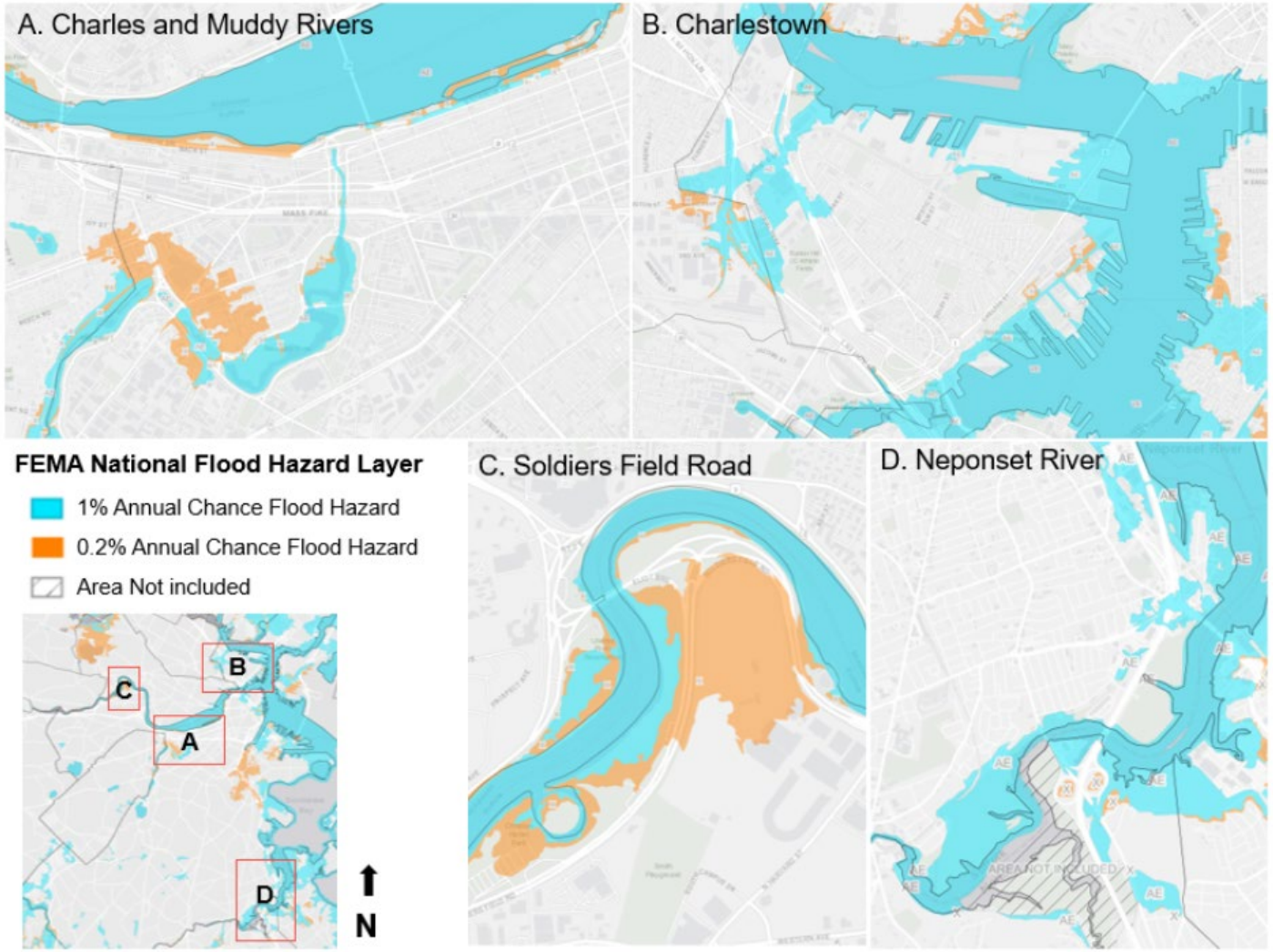


Source: BWSC Inundation Model

FLOODING FROM PRECIPITATION

FEMA Flood Zones
Geographic areas that FEMA has defined according to varying levels of flood risk

- **500-year Storm:** 0.2% annual chance of occurring
- **100-year Storm:** 1% annual chance of occurring



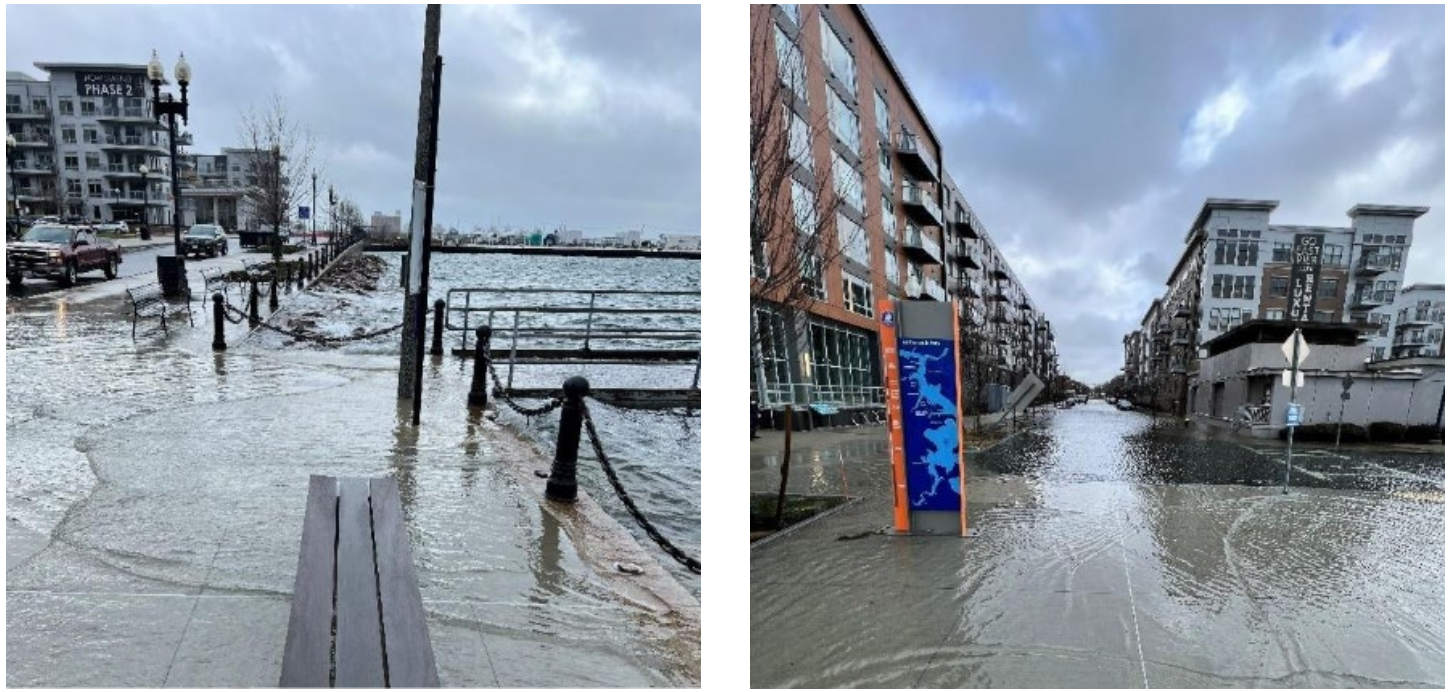
Source: FEMA National Flood Hazard Layer

COASTAL FLOODING AND STORM SURGE

- **Coastal Flooding:** Ocean waters inundate land, primarily due to high astronomical tides, sea level rise, wave action, and storm surge.

Previous Occurrences Include:

- Jan 2018
- Mar 2018
- Oct 2018
- Nov 2018
- Jan 2019
- Oct 2019
- Apr 2020
- Sept 2020
- Dec 2020
- Feb 2021
- Jul 2021
- Jan 2022
- Dec 2022
- Jan 2023
- Jan 2024
- Mar 2024
- Apr 2024

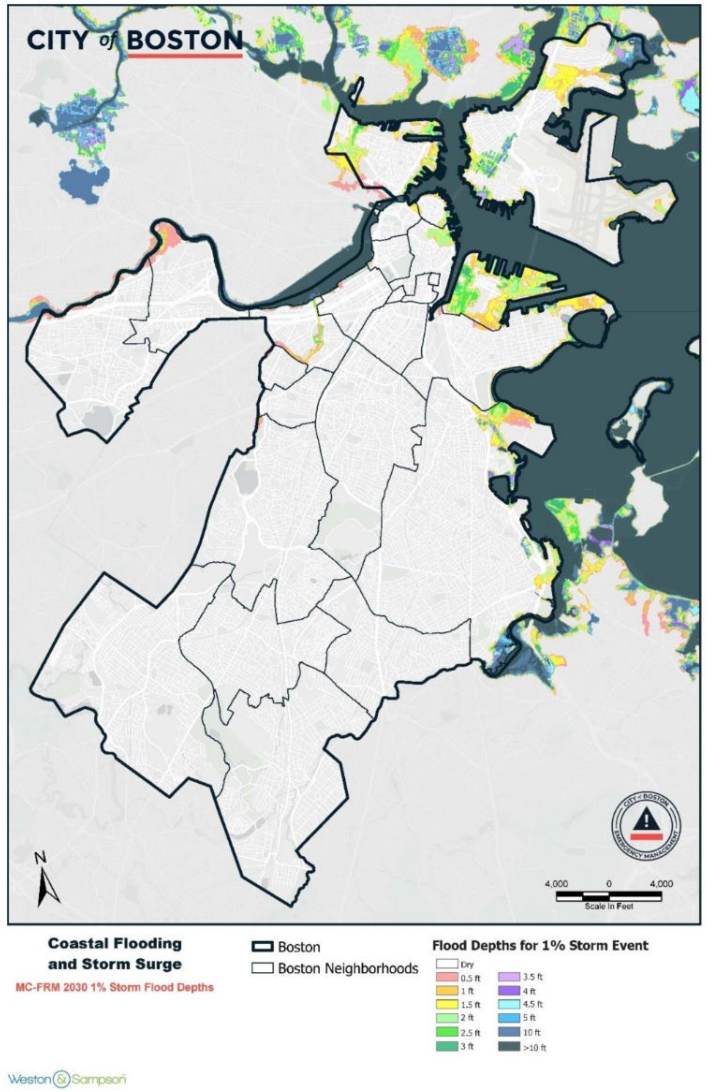


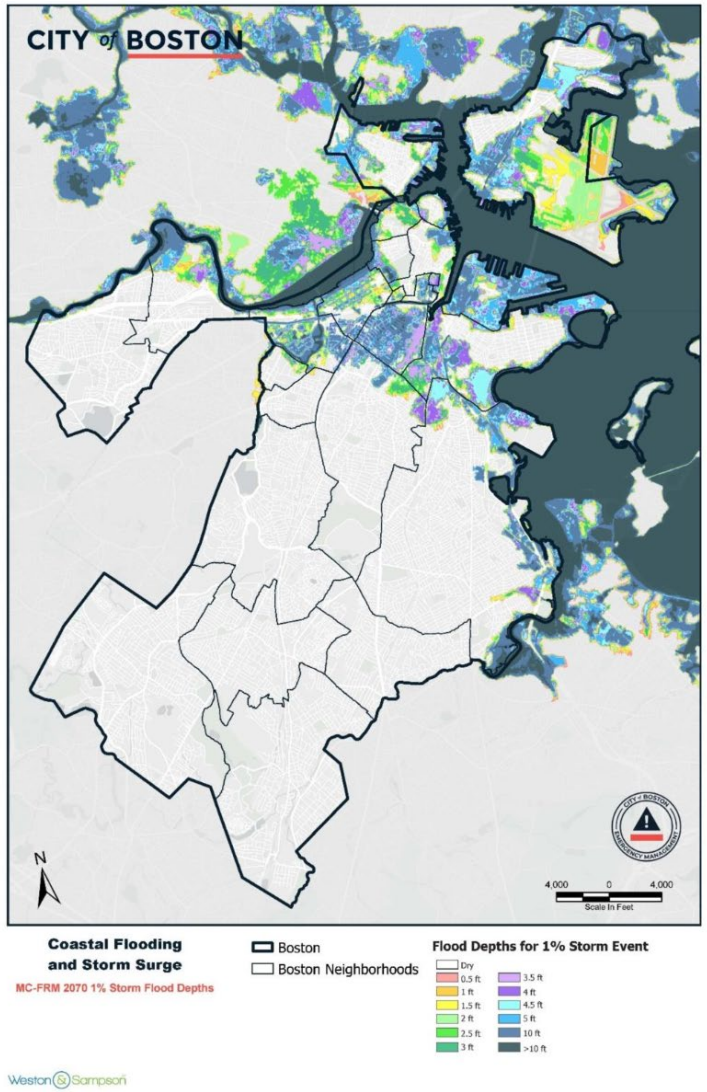
December 2022 flooding at Lewis Mall in East Boston. Source: Weston & Sampson

COASTAL FLOODING AND STORM SURGE

MC-FRM

Massachusetts Coast Flood Risk Model

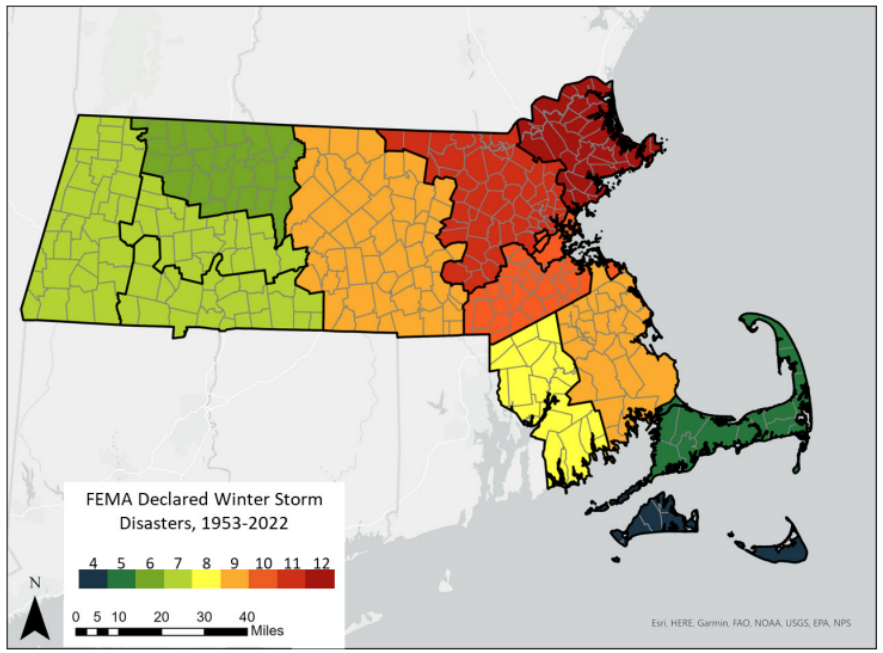




Source: MC-FRM 2030 and 2070 1% Storm Coastal Flood Depths

SEVERE WINTER WEATHER/NOR'EASTERS

- **Severe Winter Storms:** heavy snow, ice accumulation, freezing temps & wind chill
- **Nor'easter:** Storms or wind blowing from the northeast
- **Ice Storms:** occur when freezing rain creates a half inch of ice accretion



Source: FEMA (2023).

Figure 5.13-1. FEMA winter storm–related declared disasters by county, 1953 to 2022.

Source: ResilientMass Plan (2023)

FEMA Disaster Declarations

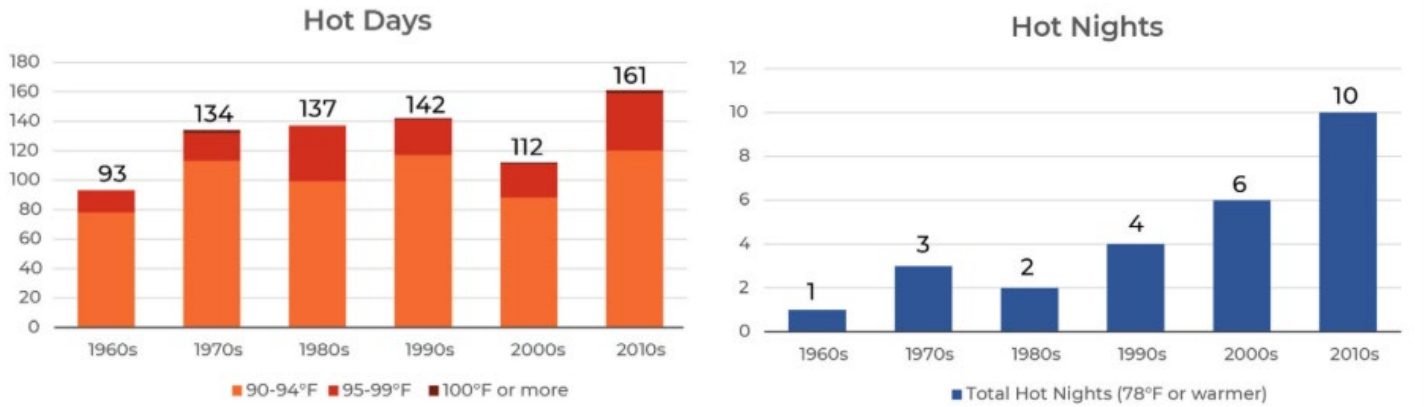
- **2013 Blizzard Nemo:** Brought over 24 inches of snow and high winds, causing major transportation disruptions and power outages. *(DR-4110-MA)*
- **2015 Winter Storm Juno**: Resulted in significant snowfall and coastal flooding impacts across Boston. *(DR-4214-MA)*
- **January 2018 Nor'easter ("Bomb Cyclone"/Winter Storm Grayson):** Combined heavy snowfall with record coastal flooding, impacting East Boston and downtown waterfront areas. *(DR-4366-MA)*

January 2026 Winter Storm, Winter Storm Fern
February 2026 Nor'easter, Winter Storm Hernando

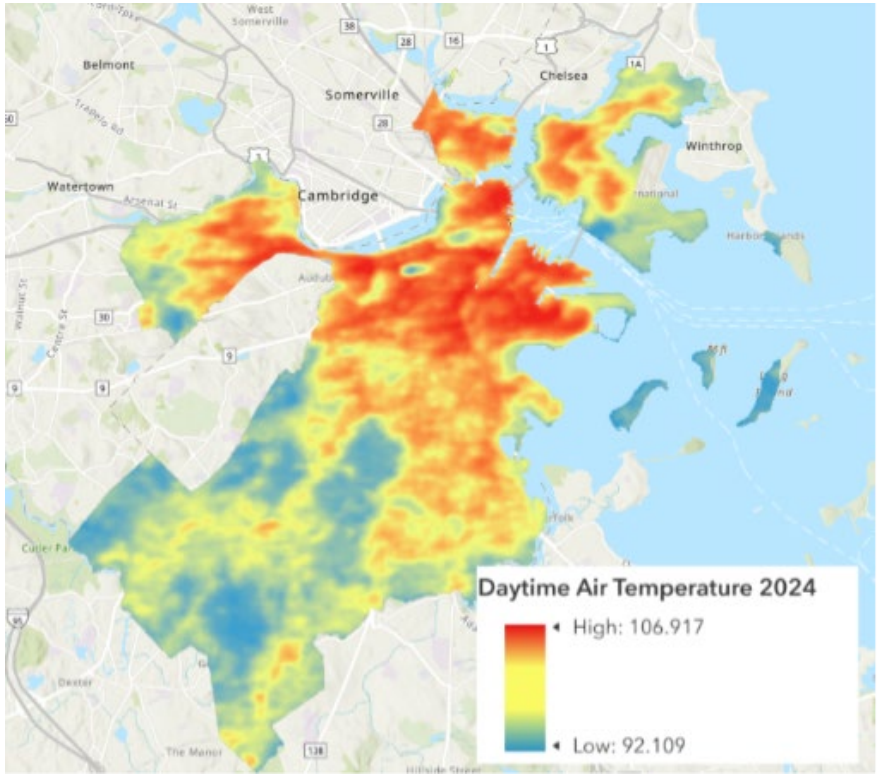
AVERAGE/EXTREME TEMPERATURES

- **Extreme Temperatures:** Very high or low temperatures that can affect human health and the natural and built environments.
- **Average Temperatures:** Long-term climate normals, typically calculated over a 30-year period

In the last decade, Boston experienced more hot days and nights than any decade in the previous 50 years:



Source: Boston Heat Resilience Plan



Source: Boston Heat Map Explorer

WHAT WE'VE HEARD FROM YOU...



Flooding from Precipitation

Local Planning Team participants reported that intense rainfall in July 2023 **flooded basements and garden-level units in the Back Bay and South End**. Some residents who had lived in these neighborhoods for decades reportedly had not previously experienced flooding of this type.

Workshop participants identified senior centers, libraries, air conditioning, and shaded areas as important resources during heat waves. Some participants **emphasized that there are not always enough accessible places where residents can get out of the heat**.



Average/Extreme Temperatures



Other Severe Weather

Workshop participants **associated high winds with falling signs, tree limbs, and other unsecured objects**, as well as concerns about downed trees and utility infrastructure blocking streets or sidewalks.

Participants noted that **winter storms can disrupt access to essential services**, including closing food pantries and making them difficult to reach even after reopening. Snow accumulation and parking constraints can also prevent home-based caregivers from reaching residents who depend on their services.



Severe Winter Weather/Nor'easters

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Tell us a story about extreme weather events in Boston. These may be something you dealt with specifically or something you are aware of that impacted the community.

How did this event impact emergency response, city staff, the residents, businesses, etc.?

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Open text poll

Tell us a story about extreme weather events in Boston. These may be something you dealt with specifically or something you are aware of that impacted the community. How did this event impact emergency response, city staff, the residents, businesses, etc.?

0 0 3

(1/2)

- Coastal flooding and water spouting through manholes. Dumpsters floating down the street. Water flooding across main street corridors and into basements.
- We rely on the T! If it doesn't work out lives are much harder logistically. And extreme heat or cold or flooding all can cause disruptions
- The air quality from forest fires was also a challenge this summer. Hard to be inside cooped up
- Snow clean up this past winter!
- I'm much more aware of the heat now that I have kids. They really have a hard time cooling down and a hard time sleeping when it is hot. We had to get

Tell us a story about extreme weather events in Boston. These may be something you dealt with specifically or something you are aware of that impacted the community. How did this event impact emergency response, city staff, the residents, businesses, etc.?

(2/2)

0 0 3

a window unit for their room
because of the heat. It just really
makes me reflect on how our brains
don’t work as well when we are hot.
And how crabby we are.



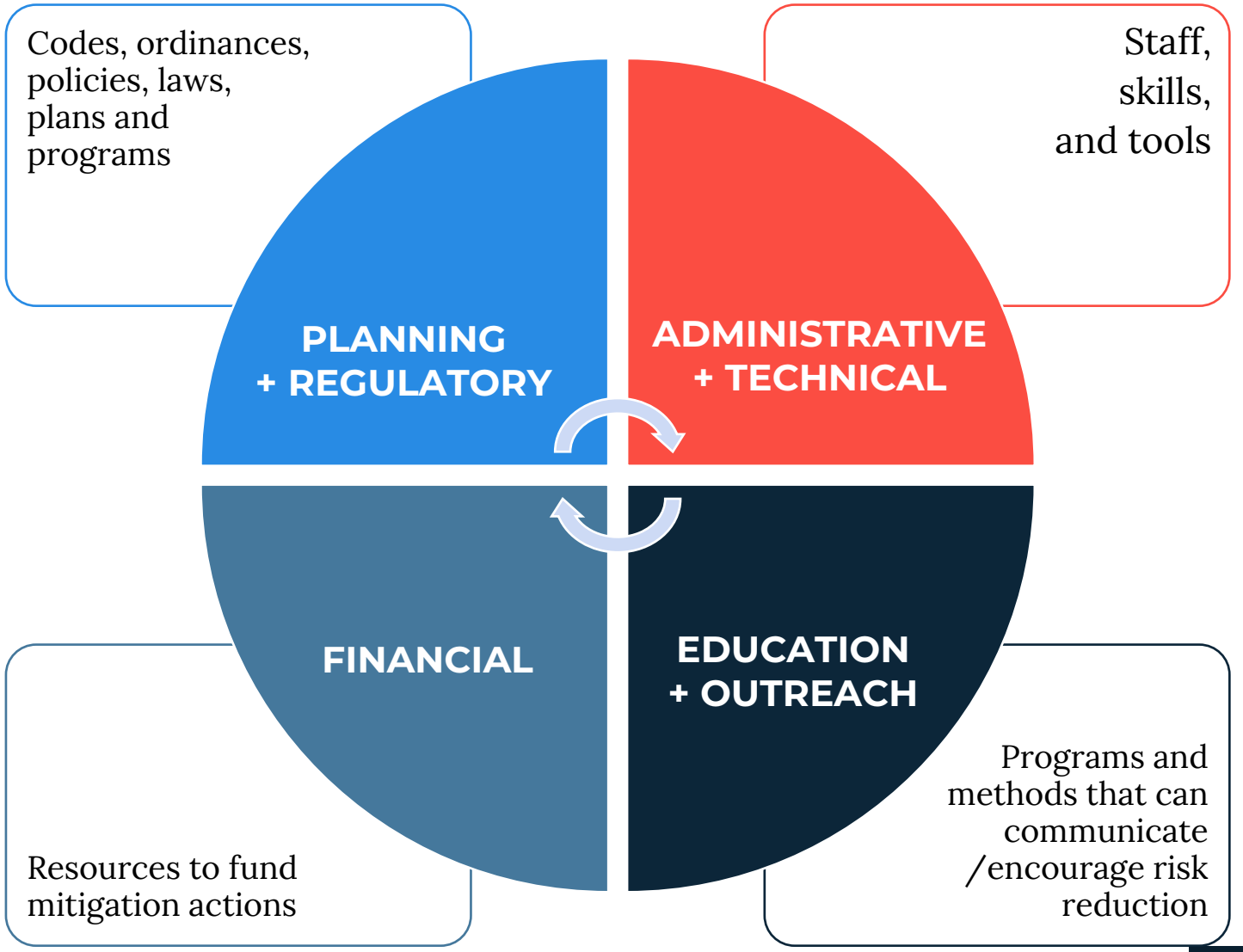
Boston City Hall, photo by Weston & Sampson

Capabilities Assessment

CAPABILITIES ASSESSMENT

The City of Boston has a unique set of capabilities that enable it to carry out the NHMP and increase resilience.

Capabilities include laws, policies, programs, staff, funding, and other resources.



FLOODPLAIN REGULATION & MANAGEMENT

- As of April 30th, 2026, Boston currently has **5,854 active NFIP policies**
  - representing approximately $1.64 billion in coverage;
  - just over $5 million in annual premium and fees.
- There are **27 Repetitive Loss and 1 Severe Repetitive Loss** (RL/SRL) properties in the community.
- Boston has also **advanced floodplain management through regulatory tools such as the Coastal Flood Resilience Overlay District (CFROD)**, which supports climate-ready development and risk reduction in areas vulnerable to coastal flooding.



Dec. 2022 flooding overtopping Bennington Street in East Boston.
Source: Resilient Bennington Street Report

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What could the City of Boston improve on to prepare for natural hazards?

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What could the City of Boston improve on to prepare for natural hazards?

0 0 5

(1/2)

- Disaster education! If we experience a blackout like Gary, Indiana is currently experiencing how is the city preparing us for this? Some people don't know what they need to do to get fresh water.
- Cut through red tape to make it easier for city agencies and community orgs to actually prepare/respond. Statutory funding would also be helpful
- community preparedness
- traffic flow
- Investing in affordable innovative relief tech such as cheaper solar panels and generators for low income communities.
- Update things like building codes and internal temperature requirements for both commercial and residential properties. Lots of old homes don’t have any cooling and leave tenants responsible
- Consideration of ferries for water rescues and evacuations
- Solar plus Battery storage at BCYF, BPS and BPL locations

What could the City of Boston improve on to prepare for natural hazards?

0 0 5

(2/2)

- I would like to see the city have more initiatives geared to providing relief services to under served communities impacted by these natural hazards. If it is heat I would love to see mobile cooling vans all throughout Dorchester
- adaptive communication response system
- Would love to see investment in resilience hubs and a real resilience hub program



Boston City Hall, photo by Weston & Sampson

Mitigation Actions

WHAT IS THE MITIGATION STRATEGY?

Serves as the **long-term blueprint for reducing the potential losses** identified in the risk assessment.

GOALS

What long term goals do you want to achieve?

ACTIONS

What specific actions will local government, community organizations, and others take to reduce risk to hazards?

ACTION PLAN

How will the actions be prioritized and implemented?

MITIGATION ACTIONS

A measure, project, plan, or activity proposed to reduce or eliminate current and future vulnerabilities described in the risk assessment.

Local Plans and Regulation

These actions include government authorities, policies or codes that influence the way land and buildings are developed and built.

Structure and Infrastructure Projects

These actions involve modifying existing structures and infrastructure to protect them or remove them from a hazard area.

Natural Systems Protection

This action can include GI and low impact development, NBS, and more to incorporate natural features/processes into the built environment.

Education and Awareness Programs*

These actions keep residents informed about potential natural hazard events and impacts.

*Many of these types of actions are eligible for funding through the FEMA HMA program.

MITIGATION ACTION PLAN

Matrix including the following:

- Action ID
- Description
- Hazard(s) Addressed
- Goal Alignment
- Responsible and Coordinating Bureaus and Agencies
- Timeframe
- Benefits
- Costs ($ - $$$$$ scale)
- Technical Feasibility
- Potential Funding Sources
- Prioritization (High, Medium, Low)

#	Action Title	Action Description	Primary Responsible Department(s)	Supporting Departments / Partners	Is there sufficient staff to implement the project?	Is training required for the staff to implement the project?	Does the action advance other local objectives or plans?	What is the scale of the overall benefit?	Does the action build resilience for priority populations?	Would the action mitigate economic loss/damage?	Will the action reduce life/safety risk?	Overall Priority
					Yes No Maybe	Yes No Maybe	Yes No Maybe	High (regional, town-wide) Medium (neighborhood specific) Low (site specific)	Yes No Maybe	Yes No Maybe	Yes No Maybe	High Medium Low
1	Public education on extreme cold and preventing frozen pipes	Provide targeted public education through BWSC and partner agencies on preparing for extreme cold events, including preventing frozen pipes, protecting plumbing systems in residential and commercial buildings, and reducing infrastructure-related service disruptions during prolonged cold periods.	BWSC		Yes	No	Maybe	High	Maybe	Maybe	No	Medium
2	Expand urban canopy and implement cooling/shade infrastructure on public property and right-of-way	Plan, expand, and maintain urban tree canopy and public cooling infrastructure (e.g., shade structures, water features, cooling corridors) across all neighborhoods, including establishing lifecycle maintenance models, standardized O&M cost frameworks, and data-driven prioritization aligned with the Citywide Heat Resiliency Study and Urban Forest Master Plan.	Parks; Streets; OCR	BPS; BCYF; Public Facilities; BPDA; BPHC; Environment; DoIT	Maybe	No	Yes	High	Yes	Maybe	Yes	High

MITIGATION ACTIONS

Action Title	Description	Prioritization
Expand urban canopy and implement cooling/shade infrastructure on public property and right-of-way	Plan, expand, and maintain urban tree canopy and public cooling infrastructure (e.g., shade structures, water features, cooling corridors) across all neighborhoods, including establishing lifecycle maintenance models, standardized O&M cost frameworks, and data-driven prioritization aligned with the Citywide Heat Resiliency Study and Urban Forest Master Plan.	High
Maintain and implement the Natural Hazard Mitigation Plan (NHMP)	Maintain, update, and implement the NHMP by coordinating across City departments and aligning local actions with state and federal programs. Track progress and use the NHMP to prioritize and guide hazard mitigation investments.	High
Flood resilience projects in parks and wetlands	Design, permit, and construct nature-based and engineered flood mitigation projects in parks and wetland systems (e.g., Moakley Park, Canterbury Brook & Boston Nature Center), improving stormwater storage, coastal resilience, and ecosystem function.	High
MBTA coordination for resilience improvements and tabletop exercises	Coordinate with the MBTA and state partners to assess vulnerabilities, implement resilience improvements at transit stations and lines, and conduct joint emergency preparedness exercises for flood and seismic risks.	High
USACE partnership and coastal storm projects	Coordinate with the U.S. Army Corps of Engineers to complete the Coastal Storm Risk Management Feasibility Study and advance to Congressional authorization, Project Partnership Agreement negotiation, and first-round project design.	High

*For actions ranked medium and low priority, please refer to the full draft plan.

MITIGATION ACTIONS

Action Title	Description	Prioritization
Deployable and permanent flood barriers	Expand, deploy, and maintain both temporary and permanent flood barrier systems across vulnerable areas, including operational protocols, staffing, and maintenance programs for deployable barriers.	High
Update street tree design standards	Update and implement improved design standards for street trees to enhance drought tolerance, survival rates, and long-term ecosystem benefits.	High
Stormwater mitigation programs	Implement a comprehensive stormwater management strategy, including infrastructure upgrades, system modeling, plan implementation, regulatory updates, and public outreach programs to reduce flooding.	High
Emergency exercises and evacuation planning	Expand and refine emergency preparedness through evacuation planning, route optimization, and hazard-specific tabletop and field exercises across multiple scenarios.	High
Energy provider coordination	Establish and maintain coordination protocols with energy providers to support emergency response operations and critical facility support during severe winter weather events.	High
FEMA CRS participation	Apply for and maintain participation in FEMA's Community Rating System (CRS), including documenting eligible activities and improving floodplain management practices to reduce insurance costs.	High

*For actions ranked medium and low priority, please refer to the full draft plan.



Boston City Hall, photo by Weston & Sampson

Plan Maintenance

PLAN MAINTENANCE

Plan maintenance ensures the document **remains current, actionable, and aligned with evolving hazards, priorities, and funding opportunities**.





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Plan Review

WE WANT TO HEAR FROM YOU!

Review the Draft Plan and Submit Your Comments!

The full draft plan can be found on the City of Boston's website:

boston.gov/nhmp

City of Boston Natural Hazard Mitigation Plan - Stakeholder Review & Comment

https://tinyurl.com/BosNHMP-PublicComment



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Thank You!
Questions?

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