



# **Hazard Mitigation Plan Update 2023**

Public Meeting  
October 25, 2023



**CITY OF  
CAMBRIDGE**



# WELCOME



Introduce yourself  
in the **chat**



This meeting is  
being **recorded**



For questions, please  
use the **Q&A Function**



**Susanne Rasmussen**  
Director of Environmental and  
Transportation Planning



**Leila Mekias**  
Climate Resilience  
Project Planner



**Robin Seidel**  
Project Manager,  
Weston & Sampson



**Jennie Moonan**  
Project Technical Lead,  
Weston & Sampson

# AGENDA



Climate Change



Hazard Mitigation Planning Overview



2023 HMP Scope of Work & Chapters Overview



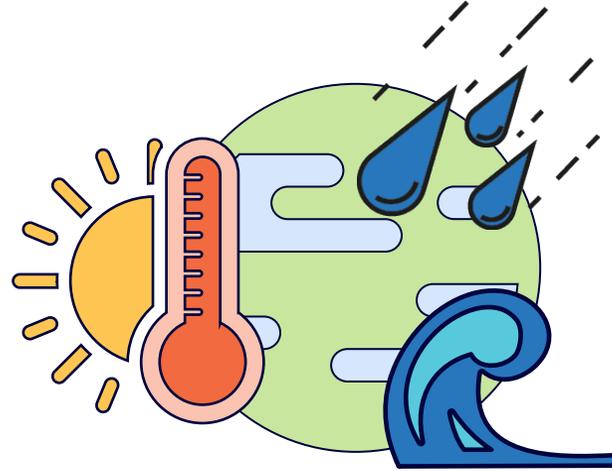
Next Steps and Discussion



Conclude



# CLIMATE CHANGE



Climate is the average course or condition of the weather over a period of decades.

Climate change is manifested by **sea level rise and storm surge, extreme precipitation, and extreme heat.**

Cambridge is designed and built for the climate of the past. We must have a plan that looks forward.

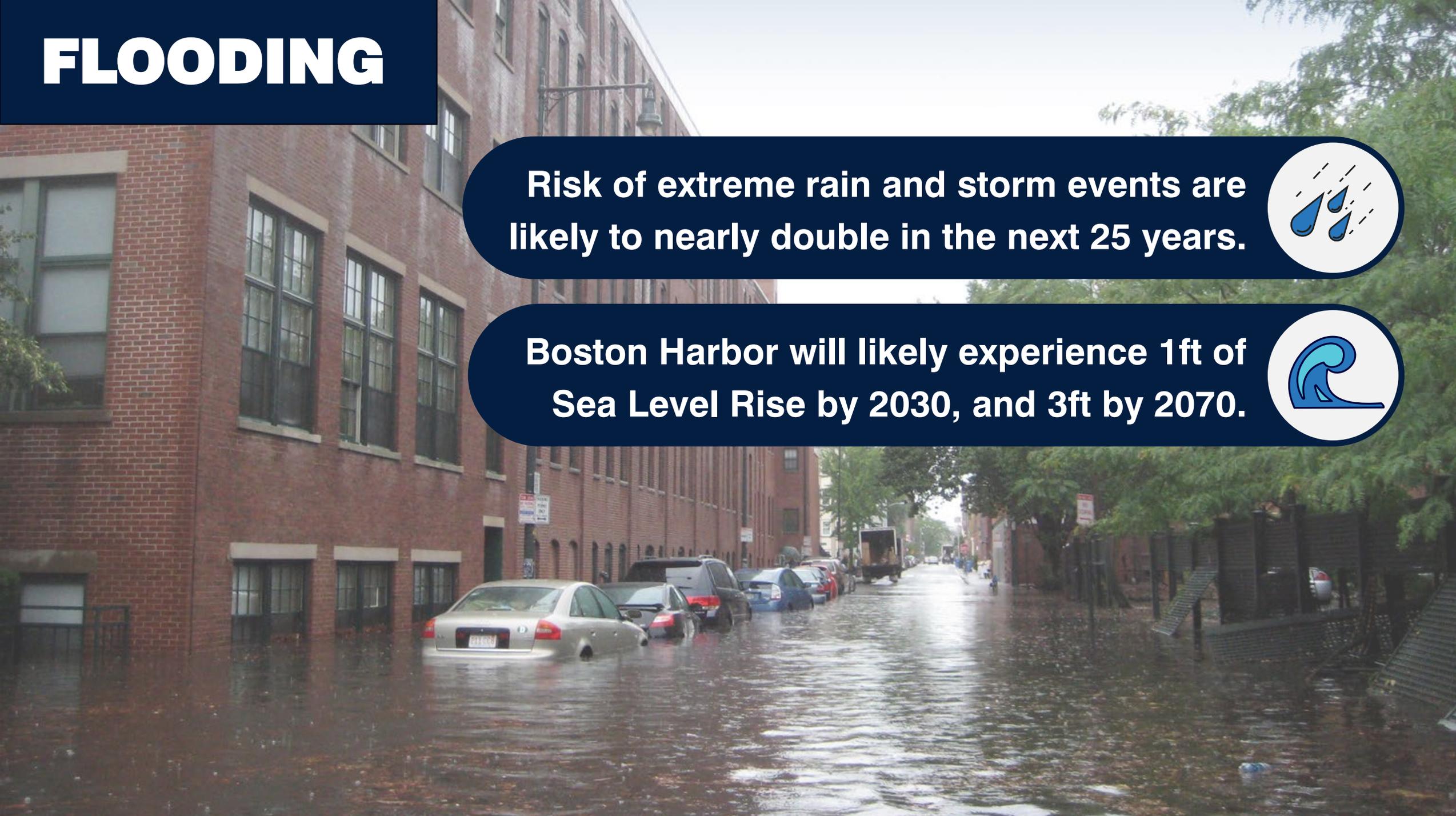
*- Resilient Cambridge Report*

# FLOODING

Risk of extreme rain and storm events are likely to nearly double in the next 25 years.



Boston Harbor will likely experience 1ft of Sea Level Rise by 2030, and 3ft by 2070.



# HEAT

The number of days above 90° is expected to reach 30 days by 2030 and 60 days by 2070.



# SEVERE WINTER WEATHER

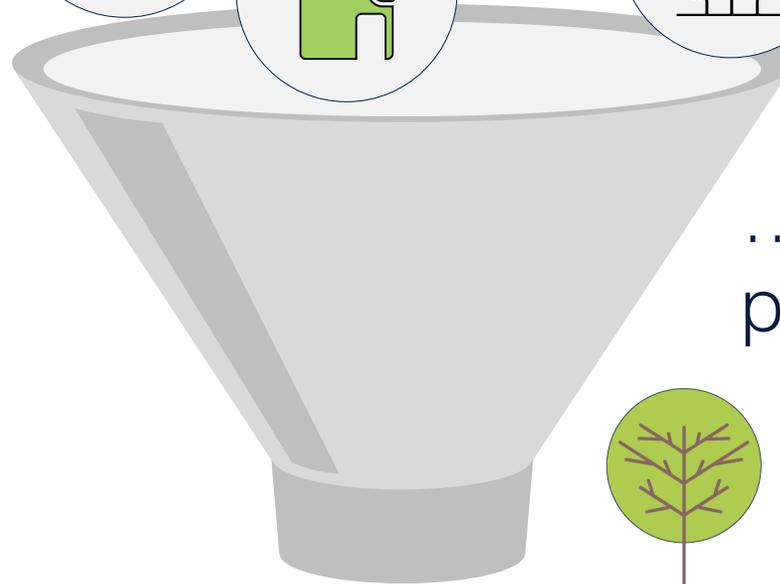
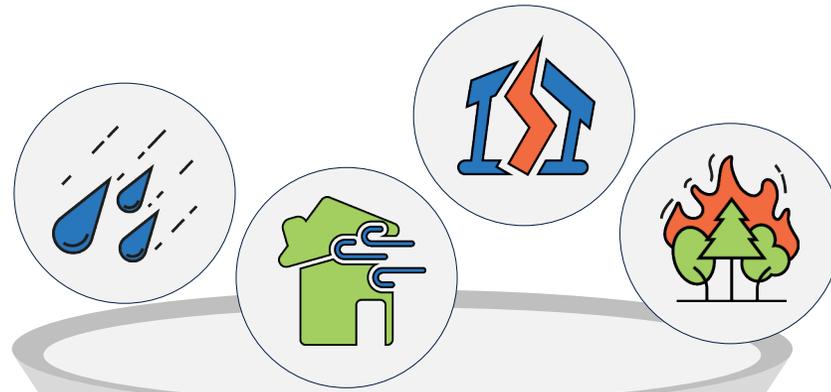
In Winter 2015, the City experienced a record-breaking 108.6 inches of snow.



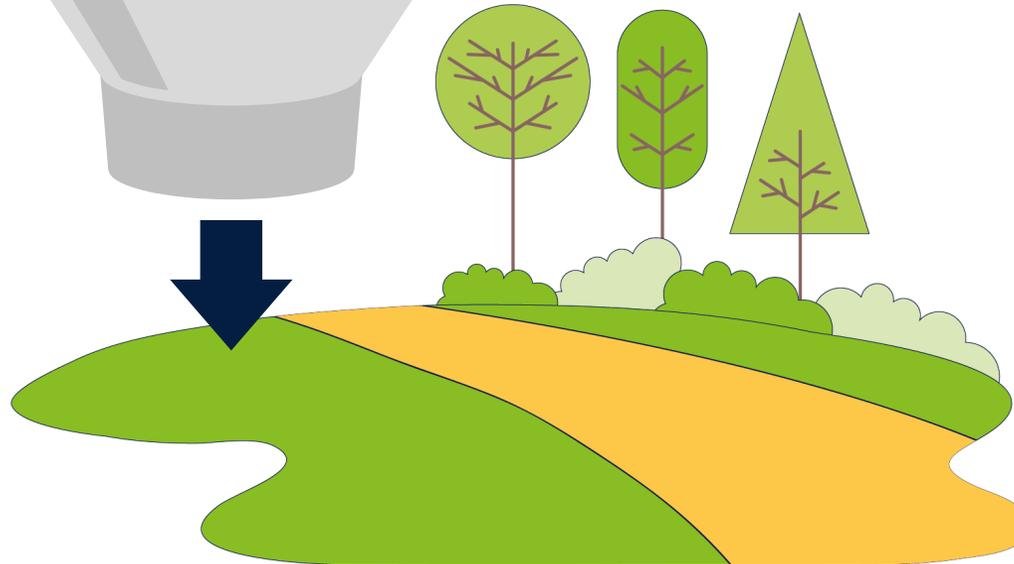
# WHAT IS HAZARD MITIGATION?



Reduce impacts from  
natural hazards...



...through plans,  
projects, and services.



# VALUE OF HAZARD MITIGATION PLANNING



**EVERY \$1** SPENT ON MITIGATION

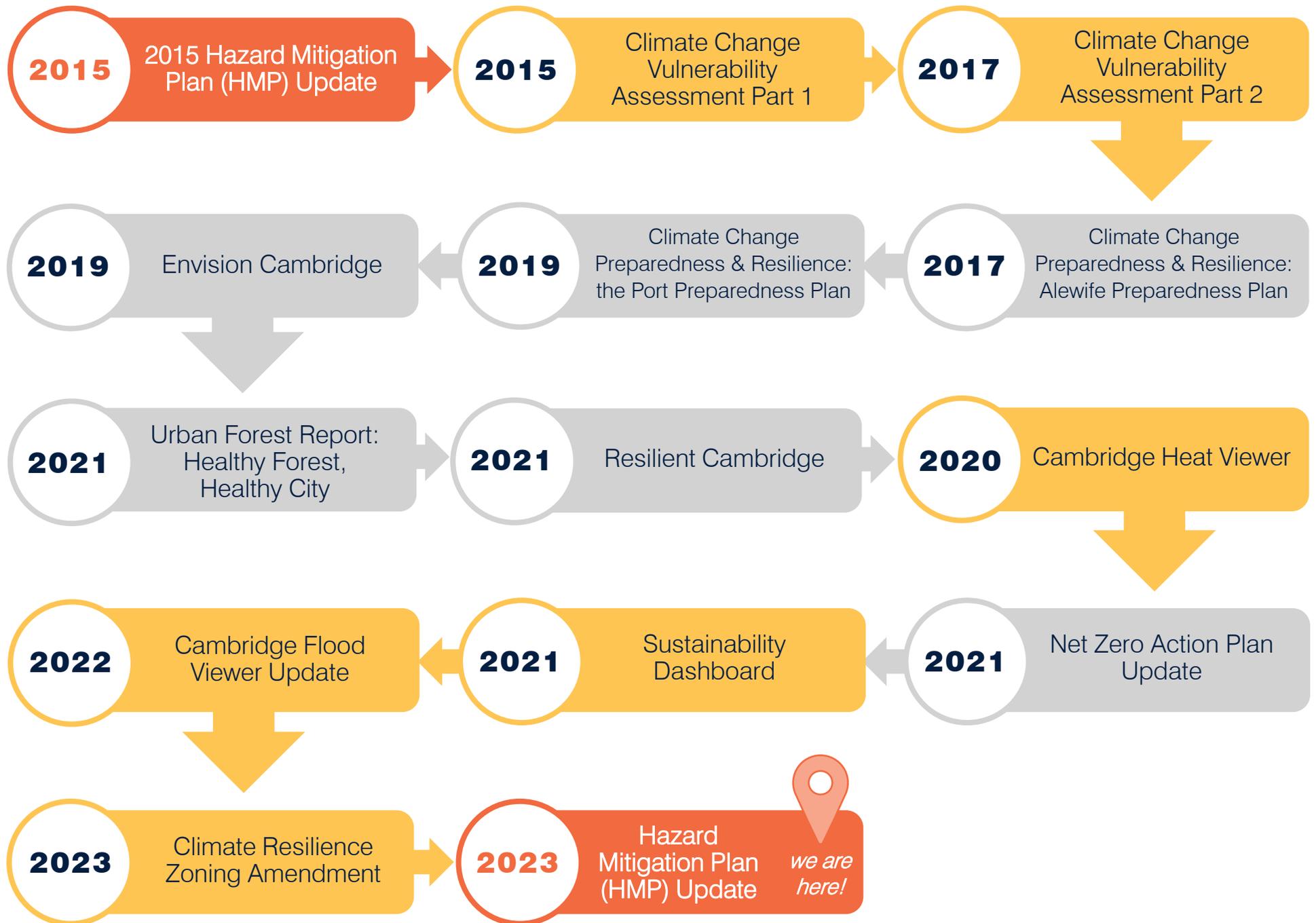


**SAVES \$6** ON DISASTER RECOVERY



How the HMP is different from other efforts!

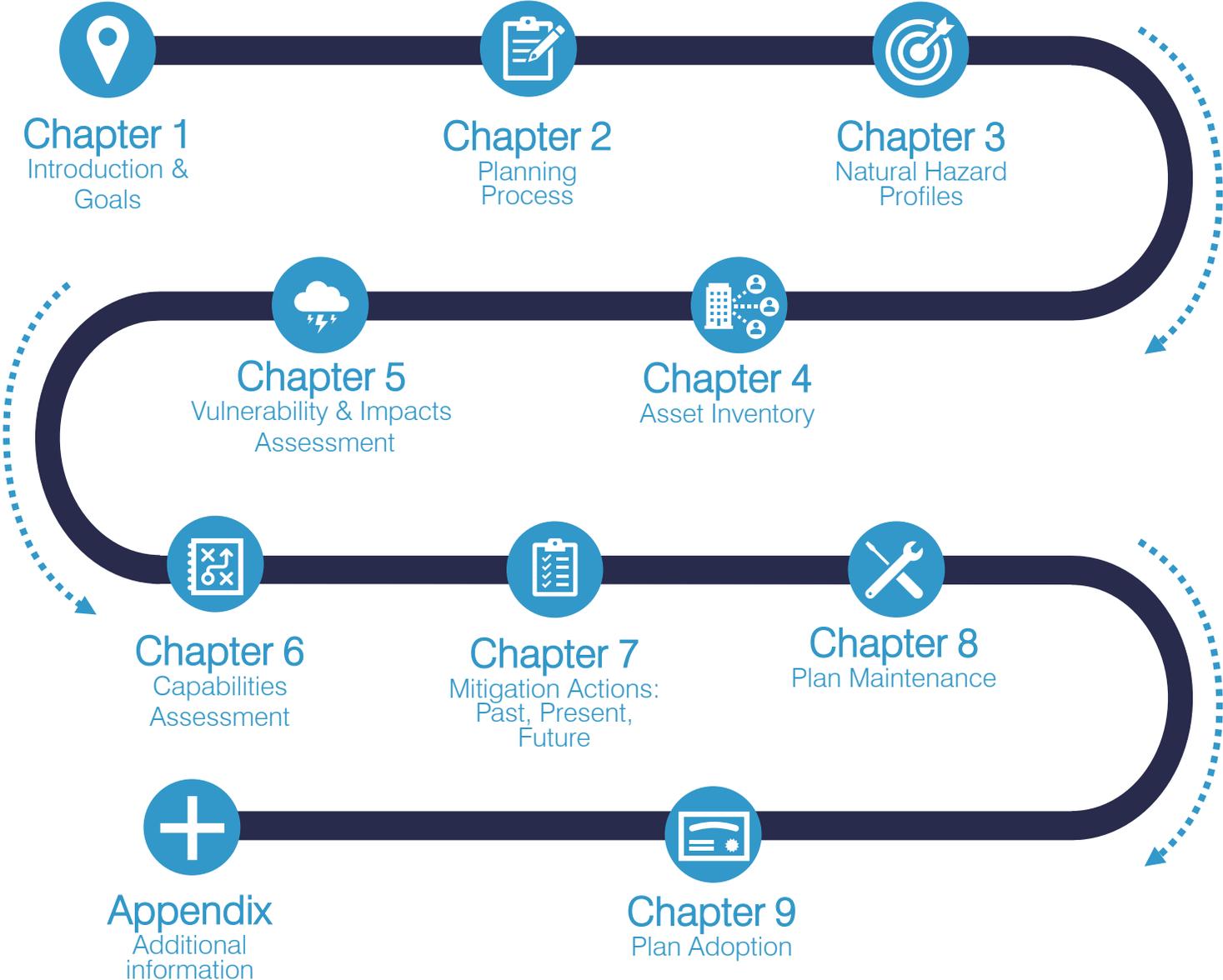
- HMPs
- City Plans
- City Actions





Questions?

# NHMP OVERVIEW



# CH 1: INTRODUCTION & GOALS



## MITIGATION GOALS:



### Protect

Equitably **Protect** Health and Safety of the Community



### Communication

Promote Public Preparedness and Resilience through **Communication**



### Coordinate & Collaborate

**Coordinate and Collaborate** among City Departments and with Community Partners on Hazard Mitigation Planning & Climate Adaptation



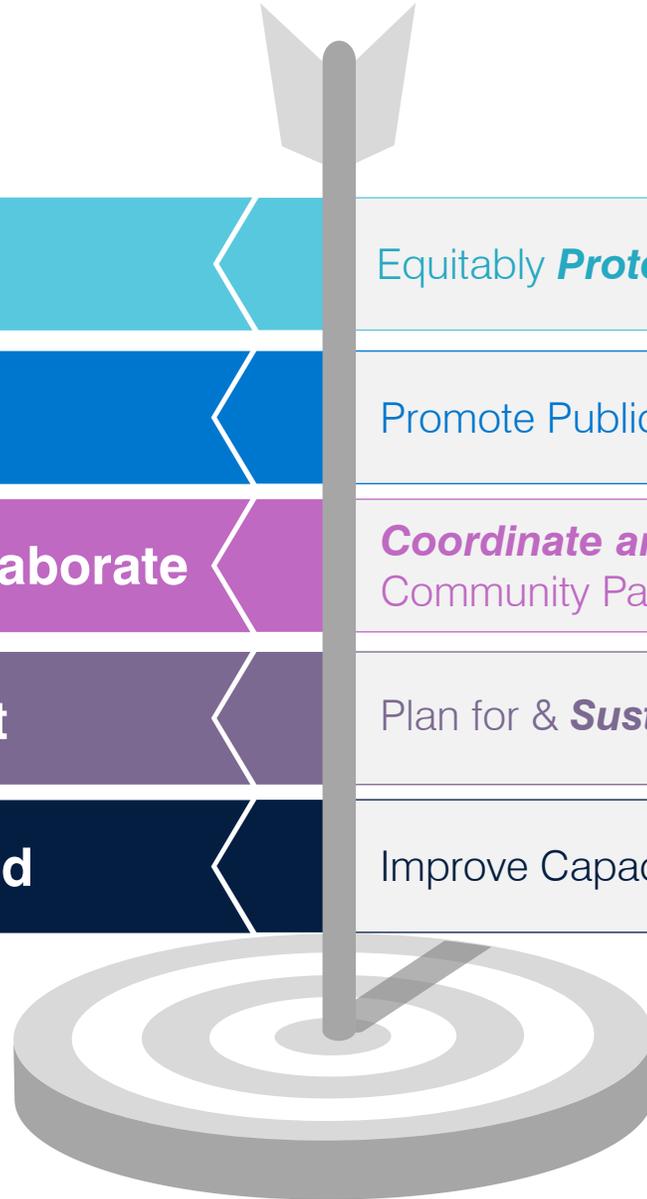
### Sustainably Invest

Plan for & **Sustainably Invest** in Priority Hazard Mitigation Implementation



### Monitor & Respond

Improve Capacity to **Monitor** Natural Hazards and **Respond** to Changes



# CH 2: PLANNING PROCESS



## City Staff



### Steering Committee

19 key City staff

who guides the planning process and endorse draft Goals

**6 Monthly Meetings  
& 3 Workshops**

## Stakeholders



### Hazard Mitigation Planning Team (HMPT)

90 stakeholders

including advocates, residents, business-owners, state and local agency representatives, and people from various other organizations.

**3 Workshops**

## Public



### Public Engagement

Everyone

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

**3 Public Meetings  
150+ Survey Responses**

# CH 3: NATURAL HAZARD PROFILES



HURRICANES  
/ TROPICAL  
STORMS



INLAND  
FLOODING



EXTREME  
TEMPERATURES



SEVERE WINTER  
WEATHER /  
NOR'EASTERS



COASTAL  
FLOODING



TSUNAMI



DROUGHT



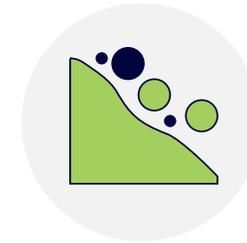
WILDFIRE



EARTHQUAKES



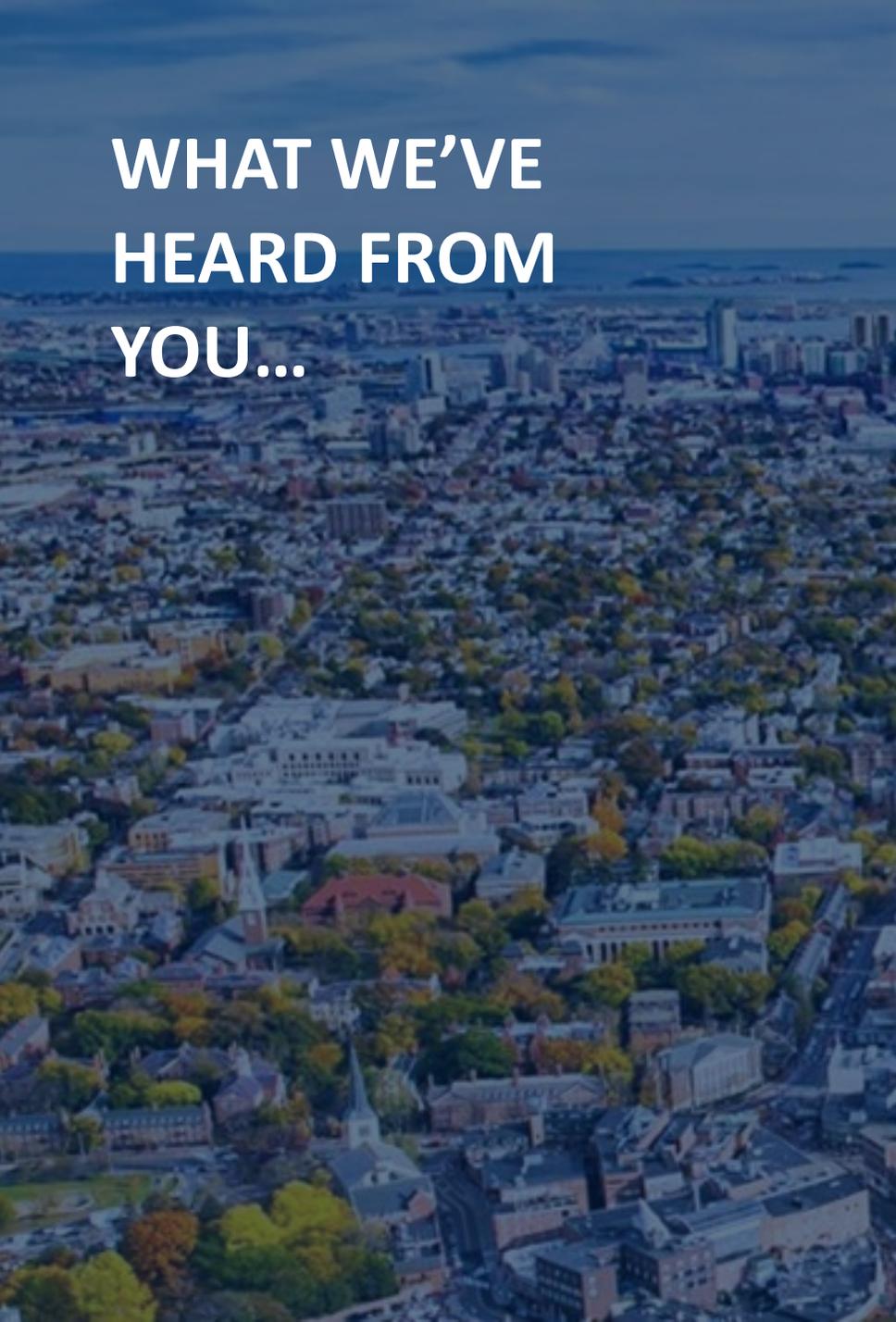
TORNADOES



LANDSLIDES



INVASIVE  
SPECIES



# WHAT WE'VE HEARD FROM YOU...

## Summary of Public Survey Results

### *Most concerning natural hazards*

1. Flooding
2. Extreme heat
3. Winter Storms / Nor'easters

### *Most concerning impact of natural hazards*

1. Power outages (>75%)
2. Damage to the home (72%)
3. Contaminated drinking water (69%)
4. Limited access to food or supplies (>50%)



# CH 3: NATURAL HAZARD PROFILES



## Chapter 3 Identifies the natural hazards that can affect the city:

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**Location:** Areas of Cambridge that might be affected

**Level of Intensity:** Potential size of natural hazard event

**Previous Events:** How often events have happened in the past?

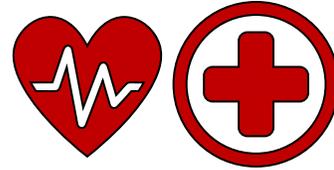
**Future Probability:** How likely they are to occur in the future?



# CH 4: ASSET INVENTORY



**Safety & Security**



**Health & Medical**



**Transportation**



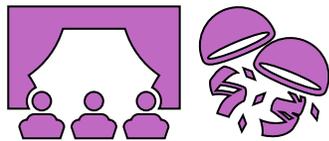
**Food, Water, Shelter**



**Parks & Greenspace**



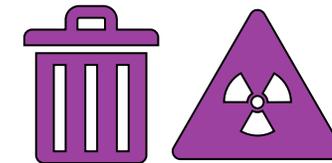
**Communications**



**Cultural, Historic,  
& Events**



**Energy**



**Hazardous Material  
Management**

# CH 4: ASSET INVENTORY

## Examples of assets in FEMA categories

### *People:*

- Populations, shelters, housing, schools, and food distribution

### *Structures:*

- Faith community buildings, grocery stores, medical facilities, transportation infrastructure, schools, and Fresh Pond Water Treatment Plant

### *Systems:*

- Power grid, cell towers, transit routes, MWRA facilities, and water/sewer system

### *Resources:*

- Parks, open spaces, community gardens, and arts and cultural facilities

### *Activities:*

- Festivals, events, community-building activities that strengthen social capital and resilience



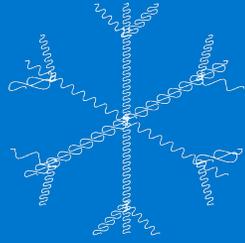
# CH 5: VULNERABILITY & IMPACT ASSESSMENT



**VULNERABILITY =**  
**ASSETS** that could be impacted by **HAZARDS**

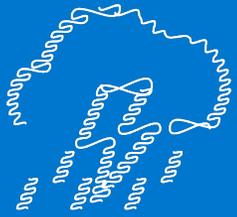


# WHAT WE'VE HEARD FROM YOU...



**Major blizzards have disrupted daily life and work, with power outages, mountains of snow to shovel, digging out the car, difficulty navigating on foot due to relentless ice that's never fully addressed by community.**

- Survey Respondent



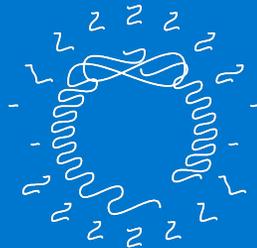
**My basement has flooded twice when we had storms that dumped 7-8 inches in 48 hours.**

- Survey Respondent



**Recent wildfire smoke affected by health**

- Survey Respondent



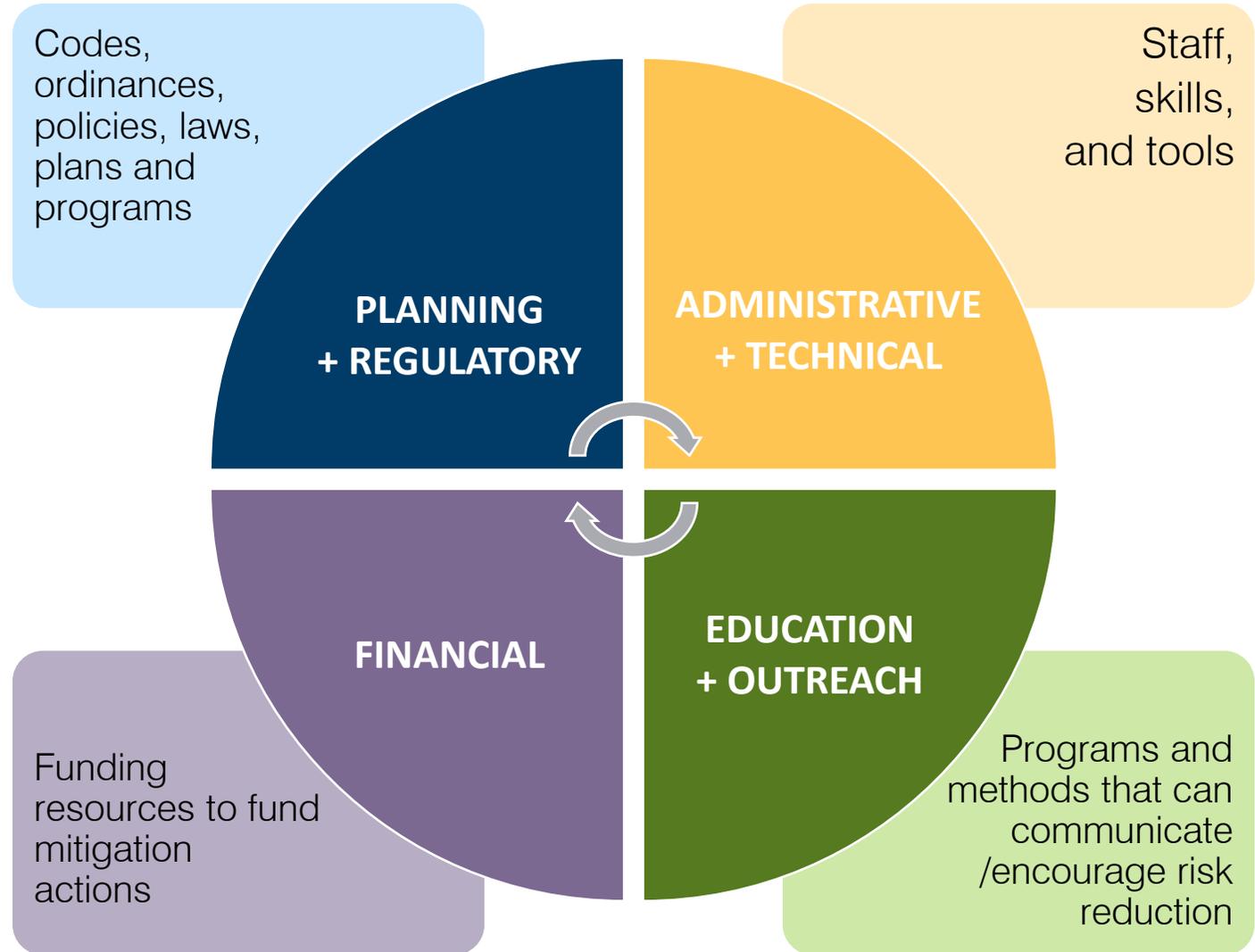
**Extremes of heat and cold or heavy snow make it difficult and unpleasant for me to get around. I don't have a car, and I still have to walk to or from the bus stop or T station and wait for the bus in bad weather conditions.**

-Survey Respondent

# CH 6: CAPABILITIES ASSESSMENT



*The City of Cambridge has a unique set of capabilities, in the form of laws, policies, programs, staff, funding and other resources, to carry out the HMP and increase resilience.*



# WHAT WE'VE HEARD FROM YOU...

## Summary of Public Survey Results

*What does the city DO WELL to prepare for natural hazards?*

1. Winter road treatment - salting and sanding (87%)
2. Public notification of upcoming extreme events (78%)
3. Snow removal/preparedness (75%)
4. Tree planting (63%)
5. Cooling stations (43%)

*What could the city IMPROVE ON to prepare for natural hazards?*

1. Flood protection and response (55%)
2. Climate resilience planning (50%)
3. Reliable public transportation (45%)
4. Tree planting (42%)
5. Renewable energy implementation (41%)

# CH 7: MITIGATION ACTIONS



Mitigation Actions are what that the whole plan has been building up to.

## Mitigation Actions....

...fulfill the goals in Chapter 1.



**Chapter 1**  
Introduction & Goals

...protect assets in Chapter 4...



**Chapter 4**  
Asset Inventory

...that are vulnerable to natural hazards in Chapter 3...



**Chapter 3**  
Natural Hazard Profiles

...in ways defined by Chapter 5.



**Chapter 5**  
Vulnerability & Impacts Assessment

...have been confirmed or added to through engagement processes in Chapter 2.



**Chapter 2**  
Planning Process

The City has or will create the capacity to undertake them as described in Chapter 6.



**Chapter 6**  
Capabilities Assessment

A mitigation action is a measure, project, plan, or activity proposed to reduce current and future vulnerabilities.

These actions will create resilience for the City of Cambridge (ability to withstand and swiftly recover from an extreme event). These actions will support adaptation to climate change.

# CH 7: MITIGATION ACTIONS

## EXAMPLE ACTIONS



Local Planning  
& Regulation

Structure &  
Infrastructure

Natural Systems  
Protection

Education and Awareness  
Programs

# CH 8: PLAN MAINTENANCE



## MONITORING THE PLAN

*The City will monitor the mitigation actions to ensure that they are going to plan.*



## EVALUATING THE PLAN

*The City will meet regularly, and after major natural hazard events, to evaluate how well the plan is working.*



## UPDATING THE PLAN

*The City will continue to update the Plan every 5 years.*



## INTEGRATING THE PLAN

*The City will integrate data, information, and actions from the HMP into other City plans and initiatives.*



## PUBLIC PARTICIPATION THROUGHOUT PLAN MAINTENANCE

*The City is committed to conducting equitable and impactful public participation. Public engagement activities will align with the evaluation, monitoring, and plan update meetings as well as with large natural hazard events.*

# NEXT STEPS



## Hazard Mitigation Plan (HMP) Planning Process



Assemble Core Team/Steering Committee



Determine Stakeholders



Hold Public Outreach Meeting



Workshops



Send to FEMA/Address Comments



Adopt



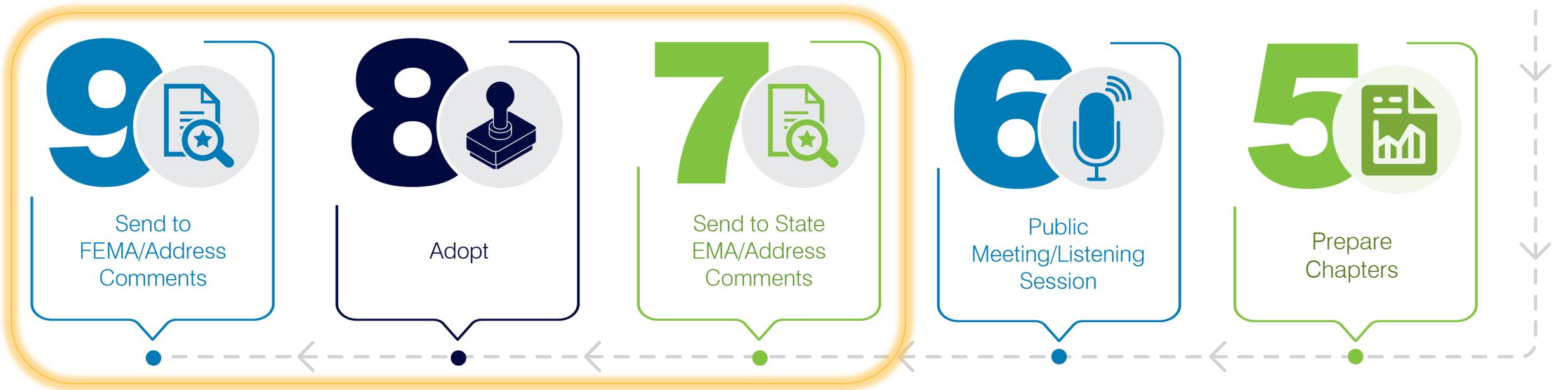
Send to State EMA/Address Comments



Public Meeting/Listening Session



Prepare Chapters





**Questions or Comments?**

# MITIGATION ACTIONS



#	Action	Timeframe to Start	Associated Goal(s)	Hazards
1	Develop program for enhanced staffing for disaster recovery	1-2 years	#5 Monitor & Respond	All
2	Perform a study to evaluate the replacement of manually operated components with remote operated components, including the evaluation of cybersecurity vulnerability of the public water supply system	1-2 years	#5 Monitor & Respond	Loss of Water Supply
3	Integrate resiliency strategies and considerations into implementation of open space projects.	1-2 years	#1 Protect	Extreme Heat, Precipitation Flooding, Drought
4	Extend swimming pool operational hours and season	1-2 years	#1 Protect	Extreme Heat
5	Collaborate with Cambridge public housing authority and community centers to identify community rooms to use as cooling centers and shelters during storms	1-2 years	#1 Protect	All
6	Develop an operations plan for DPW and Police on how to respond to flooding	1-2 years	#1 Protect, #5 Monitor & Respond	Precipitation Flooding, Coastal Flooding
7	Create an emergency response higher education and city collaboration plan	1-2 years	#3 Coordinate & Collaborate, #5 Monitor & Respond	All
8	Perform a vulnerability assessment of vaults where hard copy records are kept	2-5 years	#3 Coordinate & Collaborate, #5 Monitor & Respond	Precipitation Flooding, Coastal Flooding
9	Conduct maintenance activities to monitor and reduce brushfire risks	1-2 years	#5 Monitor & Respond	Brushfire
10	Prepare a Tree Pest Vulnerability Matrix or similar pest and disease threat assessment and management options report utilizing the most recent tree inventory	2-5 years	4. Sustainably Invest, #5 Monitor & Respond	Invasive Species
11	Conduct study to identify how to engage with the disability community during an emergency.	1-2 years	#1 Protect	All

# MITIGATION ACTIONS



#	Action	Timeframe to Start	Associated Goal(s)	Hazards
12	Develop an annual media campaign about signing up for code red notifications	1-2 years	#2 Communication	All
13	Provide a central location on the City's website to provide up-to-date notification and items such as extreme weather, air quality alerts, etc.	1-2 years	#2 Communication	All
14	Identify areas for green stormwater infrastructure and reducing impervious surfaces	in-progress/ongoing	#4 Sustainably Invest	Precipitation Flooding
15	Perform a study to identify how to best protect Fresh Pond reservoir from saltwater intrusion	2-5 years	#1 Protect, #3 Coordinate & Collaborate, #4 Sustainably Invest	Coastal Flooding
16	Prepare an Earthquake Emergency Plan	2-5 years	#1 Protect, # Monitor & Respond	Earthquake
17	Develop an enhanced communication plan and program related natural hazards in collaboration with community groups	2-5 years	#2 Communication	All
18	Purchase emergency radios for critical staff to utilize when an emergency event is expected where power and cell phone service may be compromised. Develop a plan for distribution and use.	1-2 years	#5 Monitor & Respond	All
19	Upgrade deicing / snow removal equipment, including smaller equipment that is able to accommodate bicycle facilities and pedestrian paths	in progress	#5 Monitor & Respond	Winter Storms
20	Install water fountains + cooling features locations at bus/bike routes	Ongoing	#1 Protect, #5 Monitor & Respond	Extreme Heat
21	Evaluate use of Microgrid(s) for critical facilities and implement recommendations	2-5 years	#5 Monitor & Respond	All

# MITIGATION ACTIONS



#	Action	Timeframe to Start	Associated Goal(s)	Hazards
22	Undertake interventions as a regional collaboration at Charles River and Amelia Earhart Dam to reduce overtopping/flanking	in-progress	#3 Coordinate & Collaborate, #4 Sustainably Invest	Coastal Flooding
23	Improve collection and conveyance system in the Port Neighborhood	In progress	#1 Protect, #4 Sustainably Invest	Precipitation Flooding
24	Complete in-progress stormwater management program: Green, Franklin + Sidney Streets, School, Pine, Cherry and Windsor Streets	Less than 1 year	#1 Protect, #4 Sustainably Invest	Precipitation Flooding
25	Update and Improve City's HeatViewer with best available information	2-5 years	#2 Communication	Extreme Heat
26	Update and Improve Floodplain Mapping* (Cambridge Flood Viewer)	in progress	#2 Communication	Precipitation Flooding, Coastal Flooding
27	Develop and update materials to support homeowners in completing retrofits related to flooding & heat (e.g., trainings, & educational materials on funding assistance)	2-5 years	#1 Protect	Extreme Heat, Precipitation Flooding, Coastal Flooding
28	Develop an emergency community support reference guide which provides a list of health services which are operational during extreme events for community reference(i.e. dialysis centers)	1-2 years	#1 Protect, #2 Communications	All
29	Update the climate change vulnerability assessment to include up-to-date climate information and new facilities and identify recommendations for municipal facility improvements for resiliency, including an updated flood duration study using MC-FRM	2-5 years	#3 Coordinate & Collaborate	Extreme Heat, Precipitation Flooding, Coastal Flooding
30	Implement actions of Cambridge Urban Forest Master Plan	in progress/ongoing	#1 Protect, #4 Sustainably Invest	Extreme Heat, Precipitation Flooding, Drought

# MITIGATION ACTIONS



#	Action	Timeframe to Start	Associated Goal(s)	Hazards
31	Complete study to evaluate shade needs (other than trees) referred to as "The Shade Study", and implement recommendations (e.g., adding shade structures)	in progress	#1 Protect	Extreme Heat
32	Encourage energy efficiency in buildings through zoning requirements and community engagement and support	Less than 1 year	#5 Monitor & Respond	Extreme Heat, Extreme Cold
33	Prioritize clean energy solutions for power such as solar, battery, geothermal, etc. where feasible	Less than 1 year	#5 Monitor & Respond	All
34	Coordinate with the MBTA their efforts to protect critical regional transit infrastructure in Cambridge	Less than 1 year	#3 Coordinate & Collaborate, #4 Sustainably Invest	All
35	Coordinate with adjacent communities for hazard preparation and response	1-2 years	#3 Coordinate & Collaborate	All
36	Continue to engage with the Charles River Climate Compact and Mystic River Watershed Association on regional collaboration	in-progress	#3 Coordinate & Collaborate	Precipitation Flooding, Coastal Flooding, Extreme Heat
37	Begin to develop a central emergency response plan and centralize emergency response within the city	Less than 1 year	#3 Coordinate & Collaborate	All
38	Design and construct updates to metering stations for Combined Sewers	in-progress	#5 Monitor & Respond	Precipitation Flooding
39	Collaborate with energy providers to protect critical community infrastructure	Less than 1 year	#3 Coordinate & Collaborate, #4 Sustainably Invest	All



# Hazard Mitigation Plan Update 2023

Thank You!



**CITY OF  
CAMBRIDGE**

